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Hitachi Vantara and Brocade Modernize Mainframe Disaster Recovery

Everything You Need To Support Expanding Business Demands — and Nothing You Don't

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Contents

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Executive Summary

Mainframe environments are strategic to the business, and workloads are always mission-critical. As your organization grapples with swiftly changing business demands and regulatory mandates, so must you address relentless data growth and risk. Business continuity and resilience are essential to maintaining operations, no matter what.

Some solutions will automate disaster recovery (DR) to help you dial down recovery point and time objective (RPO and RTO) goals. The tradeoff, however, is being stuck with an overly complex behemoth that can add to your mainframe management challenges during a crisis. Think: mysterious black box.

Hitachi Vantara and Brocade recommend a simpler approach, one that continuously and rapidly adapts and scales as needed, without the hefty lock-in or complexity. Hitachi Mainframe Recovery Manager (HMRM) removes the risk from complex mainframe environments to keep your business operational 24/7. Mainframe Recovery Manager orchestrates and automates for operational simplicity, easy recovery and integration with your existing mainframe tools and APIs. You maintain complete control, with improved RTO/RPO at a better total cost of ownership (TCO).

Mainframe Recovery Manager is business resiliency at its best: open, visible, understandable. No black box required.

Introduction

Modernizing your infrastructure is required to meet today's business challenges. Most mainframe environments are inherently complex, and we all want to get in front of epic IT challenges before they wreak havoc. Time is the unaffordable luxury here. Let's examine what is really at stake and how to strategically gain traction with mainframe resilience that can transform the business.

What's at Stake: Problem Statement

The digital era permeates all aspects of business life, as we know it. How you manage and protect data affects, well, everything.

Your organization's unique issues may be around modernizing IT, adding new services or meeting expanded regulatory requirements. You may be focused on managing mainframe system-based replication solutions while maintaining, testing or increasing DR capabilities.

Whether you tackle existing challenges or new business goals, there is no luxury of time to solve mission-critical issues.

In a 2016 Minimum Reliability Survey, nearly 80% of corporations reported a requirement of at least four nines (99.99%) uptime for mission-critical environments . Increasingly, business operations demand continuous application availability 24/7, which can translate to zero or near-zero RPOs and RTOs. Downtime is not acceptable in most instances, and no one wants the notoriety of outages made public. These disruptive events cause an inability to meet business or customer service level agreements (SLAs).

Unfortunately, complexity across the mainframe landscape can become the risk during an outage. Dealing with failover scenarios or massive coordination of resources in the midst of an outage or rolling disasters is stressful. These issues often have unintended and costly consequences. In fact, human error due to complexity is cited as one of the top contributors to outages and cyber-crimes.

Complete, unplanned outages typically last 66 minutes longer and cost twice as much as partial outages. A recent, independent study revealed that 81% of businesses across 47 vertical markets estimate the average hourly cost of downtime (exclusive of catastrophic outages) exceeds $300k. More than 33% of corporate respondents indicated that a single hour of downtime could average $1 million to over $5 million, not including penalties, litigation fees or damages.

So, how do you reconcile risks and complexities to meet the continual increase of business requirements and regulations? How can you ensure application data integrity across multiple systems without adding more complexity? The imperative is clear: Deploy simpler business resiliency for your mainframe ecosystems.

Their Way: A Look at Competitor Solutions

You probably have considered or might even be using one of the alternative solutions for meeting mainframe availability environments. Let's take a brief look at two of these solutions: IBM® Geographically Dispersed Parallel Sysplex™ (GDPS®) and Dell EMC Geographically Dispersed Disaster Restart (GDDR). (See Table 1 for a comparison of these solutions with Mainframe Recovery Manager.)

IBM GDPS is designed to provide near-continuous data and systems availability across sites separated by virtually unlimited distances. Its road map and features include something for everyone, including future additional configurations that can lead to full active-active function. GDPS comprises myriad complex products and architectures to address various customer requirements.

EMC GDDR is focused on automating disaster restart of applications and systems within mainframe environments in the event of a planned or unplanned outage. Also intricate in design, GDDR leverages multiple architectures and replication suites to eliminate any single point of failure for disaster restart plans in mainframe environments. The EMC GDDR accommodates a true model for four data centers (4DC).

TABLE 1. MAINFRAME AVAILABILITY SOLUTION COMPARISON

FUNCTION	IBM Geographically Dispersed Parallel Sysplex™ (GDPS®)	EMC Geographically Dispersed Disaster Restart (GDDR)	Hitachi Mainframe Recovery Manager (HMRM)
Synchronous replication storage failover automation	GDPS or Peer to Peer Remote Copy (PPRC), Metro/Global Mirror (MGM)	Yes	Yes
Asynchronous replication storage failover automation	GDPS/Global Mirror (GM), MGM, z/OS® Metro/Global Mirror (zMGM)	Yes	Yes
Image load	Yes	Yes	Yes
Image activate	Yes	Yes	Yes
OOCoD/CBU activation	Yes	Yes	Yes
3 data center (3DC) sync/async storage orchestration	GDPS/MGM, zMGM	Yes	Yes
4 data center (4DC) (local sync, async to remote, with remote sync replication different between GDDR and GDPS)	GDPS/MGM, zMGM 4DC	Symmetrix Quadrilateral Ascynchronous Replication (SQAR)	No
Read-only secondary system with transaction distribution	GDPS "active-active" v1	No	No
Fully active-active workload distribution	Road map	No	No

Every day, 2.5 billion gigabytes of data are generated . Solutions that attempt to take the "everything to everyone" approach, such as these, can quickly add greater complexity and risk into the very environments you wish to simplify.

In the age of "everything now and faster," it can be phenomenally difficult and stressful to configure and implement all the intricacies, map to existing tools and add software. Then, you must ensure you have the resources to manage a solution of magnitude. With the effort expended to implement these large solutions, you can end up with a semi-permanent level of vendor lock-in, and the opacity similar to a black box.

Rethinking the encyclopedic deployment? We get it. A simpler, more focused and lower-cost automation solution is integral to abridging these issues. Your mainframe ecosystem can greatly benefit from automated manageability, especially for time-sensitive services and during emergency situations. What if you could streamline mainframe failover and recovery with the tool suite you already have in place? What if you could have the functionality you actually care about and nothing you don't?

Enter, Hitachi Mainframe Recovery Manager.

A Simpler Approach: Hitachi Vantara and Brocade Deliver Mainframe Resiliency

Hitachi Vantara and Brocade have a long, proven history of delivering mainframe resilience. At Hitachi Vantara, we use mainframe services across many of our own businesses and support an ever-expanding ecosphere of mainframe tiering, analytics and functionality for customers. Brocade, too, delivers leadership in mainframe technology innovation, enabling a foundation for virtualized and cloud-optimized data centers. What we have learned from decades of mainframe experience is that the simpler the solution, the better. Together, our mainframe resiliency solutions are straightforward, scalable and streamlined.

One Architecture, Singular Simplicity

We listened and collaborated with our mainframe customers to understand what resonates most for them to achieve modern business resiliency. Hitachi Mainframe Recovery Manager delivers mainframe processor, host and replication orchestration. Mainframe Recovery Manager is practical and easy to deploy, so you get results faster, without the typical complexity, risk or cost. Delivered as a service, Mainframe Recovery Manager is based on one cohesive, tightly integrated architecture for singular simplicity.

The solution leverages Hitachi Vantara replication software and integrates with your existing tools and APIs. The Hitachi orchestration layer supports consistent performance across replication technologies, so you gain an agile, responsive and adaptive mainframe environment. Mainframe Recovery Manager incorporates operational minimalism and uses Brocade Fibre Channel flash storage networking to expedite data access. The solution enables you to:

- Maintain control while reducing risk at a lower cost.
- Boost IT agility while lowering the cost of service delivery.
- Improve the quality of SLAs and meet even the more difficult business goals.

Let's take a closer look at Mainframe Recovery Manager and what it can do for you.

What Is Included

The technologies that comprise Mainframe Recovery Manager work together seamlessly to perform the necessary aspects of business resiliency, without disruption or complicated maneuvers.

Hitachi Virtual Storage Platform (VSP) F Series and G Series

Hitachi Virtual Storage Platform is a flagship product, routinely lauded for its innovation, performance and comprehensive features. Mainframe Recovery Manager supports hard disk drive (HDD), solid-state drive (SSD) and flash, via VSP F series (all-flash) or VSP G series (hybrid-flash) digital infrastructure. Both guarantee 100% continuous data availability and deliver fully nondisruptive maintenance.

Designed to scale and grow with your needs, VSP leverages common software tools, thick or thin capacity, and virtualization. VSP employs the Hitachi Storage Virtualization Operating System (SVOS) mainframe analytics recorder feature for detailed, time-coherent VSP performance data, to help you efficiently analyze Hitachi Vantara storage systems.

You can set management practices for provisioning and protection while reducing overhead, training and the margin for error. We use purpose-built ASICs on the front-end director for performance-enhanced, extended-distance IBM® FICON®. You gain more processors and better throughput.

Brocade Gen 6 Fibre Channel With Fabric Vision Technology

The network is integral to modernizing your mainframe environment. Brocade Gen 6 FICON with Fabric Vision Technology enables deep SAN fabric insights for easier network management and analytics. Reduce complexity across our software-defined architecture for mainframe resilience while expediting data access and scalability.

Gen 6 yields up to four times greater application performance of earlier versions, which is up to 100 million IOPS. You gain consistently predictable and optimized performance. Tightly integrated with IBM Workload Manager for z/OS®, Gen 6 fosters automatic and dynamic balancing of system resources. This helps to minimize risk and disruptions, and to reduce latency, traffic congestion and potential bottlenecks through the SAN. Provisioning Brocade fabric technology with Mainframe Recovery Manager generates seamless connectivity, agile IT and continuous business operations.

Mainframe Innovation: READ MORE

https://www.hitachivantara.com/en-us/products/storage.mainframe-storage.html#categorycontent

Brocade Mainframe Technologies

Brocade connects nearly 80% of all mainframe infrastructures in the market today. With over 30 products designed for mainframe resilience, Brocade directors, switches and extension technologies help drive nonstop operations at maximum efficiency.

Improving your mainframe architecture demands stellar IOPS throughput performance and response times, as well as optimal connection configurations. Using a switched FICON network, Brocade helps you to significantly uplevel performance, reliability, flexibility and availability of storage systems. A switched FICON network enables fan-in and fan-out configurations, which maximize resource utilization, localize failures and boost availability.

Hitachi Vantara Replication Technologies

Mainframe Recovery Manager is indeed a game changer, with versatile, comprehensive and automated business continuity solutions. Our replication solutions ensure ongoing compatibility with IBM z/OS mainframe technologies.

In-System

- Hitachi ShadowImage in-system replication: Create point-in-time copies from remote replication secondary devices without disruption of remote replication processes.
- Hitachi Compatible Mirroring for IBM® FlashCopy®: Provide functionality on par with IBM FlashCopy, with point-in-time volumes and data sets via IBM commands in z/ OS environments.
- Hitachi Compatible Mirroring for IBM® FlashCopy® SE: Provide functionality equivalent to IBM FlashCopy SE, with point-in-time volumes, and virtual volume pools as targets.

Remote Replication

- Hitachi Universal Replication (HUR): Our asynchronous remote replication has no distance limitation between sites and uses remote storage controllers to pull, which reduces processor overhead on the primary controller. HUR protects production performance and RPOs during replication anomalies and enables quick failover and failback without full data copy. HUR delivers advanced configuration support for multiple data centers and delta-resync, plus unique cache- and disk-based journaling to store data being replicated. Together, HUR and TrueCopy support cascade and multitarget configurations.
- Hitachi TrueCopy: Our synchronous remote replication software guarantees zero data loss, whether in 2 data center (2DC) or 3 data center (3DC) scenarios with HUR. Performance over longer metro distances is improved, due to round-trip reduction. TrueCopy supports multivendor products, including IBM GDPS/PPRC and z/OS Basic HyperSwap®, and copies data between controllers, sharing volumes with other Hitachi Vantara replication technologies.

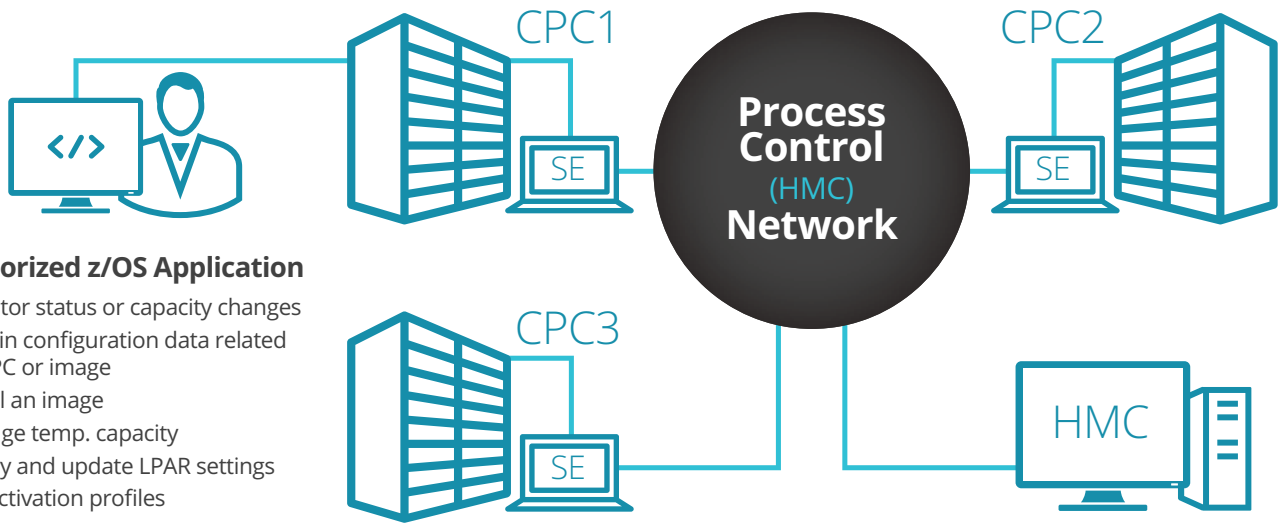
Replication Management

- Hitachi Business Continuity Manager (BCM): Our mainframe host software orchestrates an easy-to-use, centralized, automated replication management utility for IBM Z and z/OS environments. Accelerate deployment, visibility and control with a single, consistent interface based on familiar TSO/ISPF panels to improve disaster recovery effectiveness. BCM automates discovery of Hitachi Vantara storage and operations for Hitachi ShadowImage, TrueCopy and Universal Replicator operations.

Orchestration Capabilities

Mainframe Recovery Manager delivers unique processor orchestration capabilities via IBM's Base Control Program internal interface (BCPii). See Figure 1.

Figure 1: Overview of BCPii



Mainframe Recovery Manager executes IBM BCPii commands to maintain attributes of the production image being managed, also known as a logical partition (LPAR), and to orchestrate the reset, deactivate, activate and load of processor images or LPARs. These BCPii commands are identical to the commands issue manually by any IBM Z® processor customer from the hardware management console (HMC). The beauty of Mainframe Recovery Manager's minimalistic architecture is that you can manually intervene, using familiar HMC commands, to affect automation issues. Additionally, Mainframe Recovery Manager allows:

- Authorized z/OS applications to have control over systems in the HMC network.
- Direct communication with management console support elements rather than going over an IP network.
- A z/OS address space to manage authorized interaction with the interconnected hardware

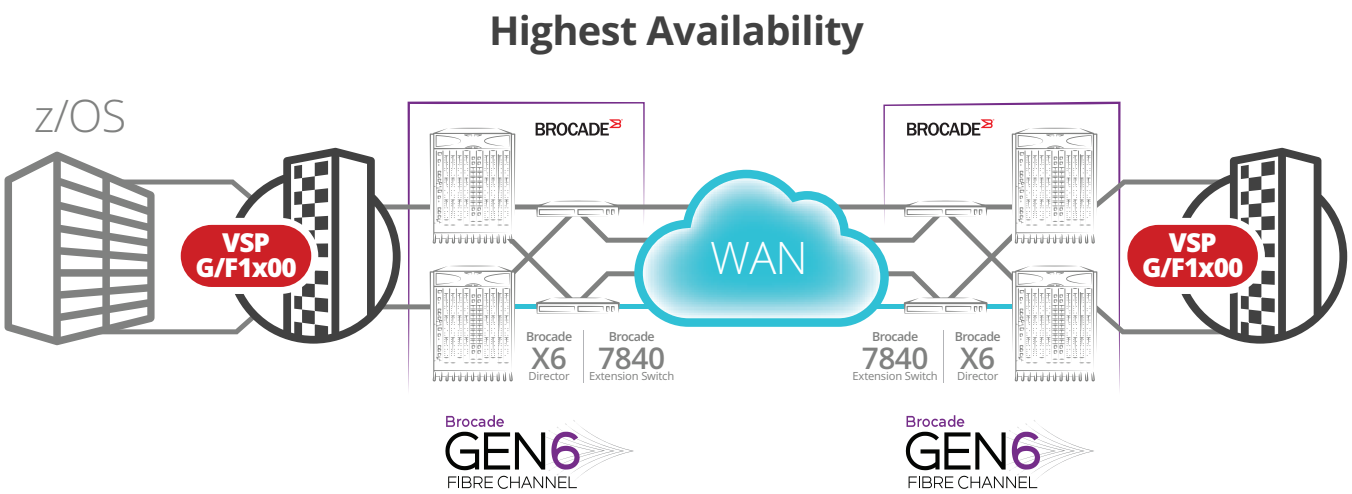
The Service Offering

Unlike DR solutions that require you to mastermind and manage many moving parts, Hitachi Mainframe Recovery Manager solution is delivered as a managed service. We deliver greater orchestration, so you can recover easier, faster and more completely.

Mainframe Recovery Manager services begin with an assessment of your unique mainframe ecosystem. We work with you to tailor Mainframe Recovery Manager to your specific goals. You may prefer a single, push-the-button environment or customized automation levels for various stages of failover and testing. Full implementation and ongoing support are included in Mainframe Recovery Manager services. If you are new to Hitachi Vantara replication, our services experts can also manage the complete design and implementation, along with any migrations you require.

Depending on availability levels required, Mainframe Recovery Manager can be tailored for failover, for highly available devices or full redundancy of devices, links and connections. For example, Figure 2 highlights a configuration that specifically caters to high availability (HA), which is critical for many mainframe environments. In this case, redundant Brocade directors, switches and SAN extension switches, are activated at the primary and remote sites with redundant telco links between the sites. In the case of link failure, failover to the redundant link occurs to ensure HA. If each Brocade director is connected to extension switches at each location, they can failover along the redundant path if the primary path fails.

Figure 2: Mainframe Recovery Manager Configuration for High Availability, Remote Connectivity



How It Works

Mainframe Recovery Manager is instrumental in orchestrating the “restart” of IBM Z processors, operating systems and custom applications, in the following circumstances.

- Unplanned disaster event from the primary site to a secondary site.
- Planned production workload switch from primary site to secondary site.
- Planned production workload switch back from secondary site to primary site.
- Planned disaster recovery test in parallel to production running “business as usual” at the primary site.

For IBM Z compatible storage arrays provisioned on Hitachi VSP, the Mainframe Recovery Manager will automatically and methodically perform the following disaster recovery tasks:

- Ensure availability of secondary devices in any remote replication pair, for use in production mainframe applications and systems.
- Create a golden point-in-time copy of these secondary devices prior to any updates being made.
- Query and optionally set attributes of Images (LPARs) onto the secondary site mainframe processors, prior to activation, according to admin-defined settings.
- Activate secondary site IBM Z Images.
- Activate any required IBM Z processor Capacity Backup (CBU) or On/Off Capacity on Demand (OOCoD) as needed for production workloads at the secondary site.
- Initiate the load of production IBM z/OS to secondary site IBM Z Images.
- Wait for all secondary site IBM z/OS operating systems to be application-ready.
- Issue Mainframe Recovery Manager operator prompt to solicit predefined authentication prior to production application startup across all IBM z/OS operating systems.
- Allow pre-existing system and application automation processes to complete customer-specific disaster recovery processes.

Because Mainframe Recovery Manager exemplifies a minimalistic architecture, you have familiar tools and commands to intervene manually in the event of any problems with automation sequences.

Summary of Benefits

In summary, Hitachi Mainframe Recovery Manager removes the burden of juggling all those replication activities so you can improve mainframe resiliency — and do more with less. Mainframe Recovery Manager is a sleek, simplified and cost-efficient approach that helps you realize the following benefits:

- Centralized orchestration of replication technologies supports better RPO and RTO.
- Solution is delivered as a service via Hitachi Vantara Global Services Solutions (GSS).
- Flexible entry points for price, capacity and performance let you can scale up or down as business needs dictate.
- Automation and common management tools help reduce human error that can contribute to downtime, data loss and IT overhead.
- The need for specialized training and expertise to support DR goals is lessened, while complete visibility and control are maintained.
- It provides comprehensive storage management with native mainframe configuration, and is the only solution to do so.

With a holistic Hitachi Vantara and Brocade mainframe storage solution, you can realize transparent data-at-rest encryption with zero upstream performance degradation for open systems and mainframes. You can deploy advanced mainframe analytics for storage systems to avoid time-critical performance problems. When you add Mainframe Recovery Manager, you amplify these attributes.

For More Information

To learn more about how Hitachi Mainframe Recovery Manager can improve your mainframe resiliency goals, please visit www.HitachiVantara.com

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