

WHITE PAPER

Deliver on the Promise of Digital Transformation

Hitachi and Brocade Deliver Data Resilience for the Digital Age

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Executive Summary

We are in the age of all things digital. Data underpins everything, from cloud, big data and internet of things (IoT) to the digital marketplace, digital transformation and the unending cavalcade of innovations. Consequently, continuous availability and pervasive data protection are the new norms for successfully managing all aspects of a data-driven business.

Today's CIO and IT leaders are charged with meeting nonstop, ever-changing business demands, security threats and high availability requirements. Data grows exponentially, without regard for your organization's ability to harness, store, protect, retain or govern it all. Expectations and challenges around data value, storage, governance and protection have never been greater.

Business continuity is definitely in vogue. You are continually tasked with answering to the "R" words: recovery point objectives (RPOs), recovery time objectives (RTOs) and return on investments (ROI). Service level agreements (SLAs) for performance, availability and recovery are among the most pressing storage challenges. Delivering bigger, faster connections across longer distances and improving performance and cost factors are always on your to-do list.

If you can make it all happen and come in under budget, you are undoubtedly the hero. When things go smoothly, no one notices. When mission-critical issues arise, such as data loss, downtime, sluggish performance and disrupted data access, IT takes the hit. Business operations, customer satisfaction and the bottom line can be affected, and someone takes the blame.

So, is it possible to curb the reactionary response to these endless day-to-day crises and get in front of rampant data growth and protection concerns? The buzz of digital transformation is not loud enough to drown out the volume of profound data challenges you face on a daily basis.

This paper considers impediments of today's data-driven business climate and the promise of digital resilience. Hitachi and Brocade spell out a holistic and cost-efficient approach to brokering this resilience across town or multiple data centers or the world. Together, we deliver advanced global-active device technology, next-generation network extension, and a comprehensive data replication, recovery and retention ecosystem.

Introduction

As digital technology weaves into the fabric of doing business, people in your position are called upon to advise the C-suite of feasibility for delivering new services and efficiencies. Meanwhile, you must address epic data growth, storage challenges, scalability and hyperscale demands while keeping existing systems up and running.

Business continuity, disaster recovery and data protection continue to demand your attention. In this always-on business climate, high availability is an ever-present requisite. As you work to solve these ambitious challenges, you face new unknowns with old budgets, and everything is mission-critical. Wouldn't it be great if all your business-critical data was protected continuously against every type of threat and could be instantly recovered in all scenarios within your budget without impacting operations? With all the digital transformation fanfare, you need to know the back end is protected and nimble for whatever comes your way.

Contemporary IT Leadership Checklist

Let's examine the challenges you face every day and how best to overcome them so you can achieve what the business wants, and thus what you want.

Meet Expanded Business Requirements

The C-suite wants to charter data-driven business transformation, and exploit data assets to make smarter decisions, gain competitive advantages and realize cost efficiencies. Lines of business (LOBs) are eager to capitalize on consumer data with high-touch, tailored engagement models and targeted selling opportunities. Employees and executives alike want speed and agility to address change amid evolving market dynamics, nonstop operations and unrelenting data growth. You need to guarantee that mission-critical data and apps are always available and agile.

Capitalize on Data for New Opportunities

Data is tightly and irrevocably connected to every aspect of the business culture and affects productivity, compliance, trends, processes and costs. IT must become an indispensable resource in the rush to leverage data for new insights, market opportunities and customer loyalty. The challenge is finding the sweet spot between command-and-control responsibilities and business innovation. In all the ways you launch digital transformation, continuous data availability is an absolute.

Balance Bimodal Realities With Hyperscale Digital Demands

Bimodal IT is the art and science of managing two separate, coherent modes of delivery: one focused on stability, the other on agility. You work to balance legacy infrastructure and insurmountable data growth with innovation accelerators that enable digital transformation. Now, the business wants you to address expanding service requests on the same playing field as popular Web 2.0 hyperscale data designs. You will need increased performance and high availability on a massive scale across everything from clusters, workloads, performance, storage and SLAs.

Avoid Mission-Critical Business Risks

The days of free good publicity have given way to the cringe of business gaffes caused by unexpected data outages, cyberattacks and other security threats. Even brief outages can have a huge impact on revenue, liability, customer opinion and brand image. Downtime is especially damaging for mission-critical business applications and their interdependent chains of connectivity. Data recovery expectations continue to rise: Everyone wants to know RPOs, RTOs and SLAs. Your disaster recovery infrastructure needs to ensure fast, uninterrupted replication of mission-critical data and apps to anywhere in the world.

Ensure Modern Data Stewardship

In the wake of the mobile digital era, data stewardship and governance have become a complex quagmire of responsibility. The challenge is to guide changes brought on by transformation and IoT. Compliance and auditability are critical. Your security policies and data governance must span the proliferation of clouds, devices and locations to uphold compliance with internal and regulatory mandates. Lengthy backups, clunky silos, and separate resiliency requirements for different data sets will make it increasingly problematic to manage data life-cycle requirements. Unified, flexible architecture can extricate your bogged down data enterprise.

Protect All of the Data All of the Time

Data reigns supreme across your business, and it must be protected no matter what or where. In a new study of IT trends, the second most worrisome issue of IT leaders is disaster recovery and IT continuity: Cybersecurity is the firstⁱ. Modern data protection implies that coverage will be global and comprehensive across every aspect of your enterprise to evoke digital resilience. Your approach must include adaptable, far-reaching, in-depth and nondisruptive strategies around disaster recovery, backup, archiving, replication and access. RPOs and RTOs really matter here.

Impacts of Not Addressing These Issues

Consumers live in a 24/7, always-on digital world. Application availability is paramount, and downtime is not an option. The information-based enterprise necessitates that data be constantly available for employees and customers without interruption.

How you protect data affects the bottom line. No one can afford to wait for the accidental hero to stop a gaping cyberattack. Vulnerabilities, such as application failures and interruptions or security threats can destroy any hope of executing even a well-thought-out digital strategy. Gartner analysis predicts that “by year-end 2020, 15% of all consumer-facing digital businesses will fail due to inadequate protection against unplanned end-to-end transaction downtimeⁱⁱ.”

Your data centers and systems might span multiple regions or the globe. Disparate processes, inadequate availability or insufficient safeguards across these interdependencies can disrupt what is most important. If your architecture cannot achieve continuous operations or maintain performance and integrity for critical applications, the business will not meet innovation demands. If you do not deliver a unified approach to virtualization, visibility and control, how can you possibly meet hyperscale-like data loads or harness unrelenting data traffic between sites?

You already understand that traditional high availability may no longer be good enough to support your chief applications and their interdependencies. High availability point products and solutions scattered throughout the organization are like plugs in a sinking ship: they complicate management issues and hamper rapid response to crises. Will you have to choose between widespread high availability and data protection or can you have both, everywhere it counts?

Consider the value of a “unified” enterprise architecture to achieving continuous application and data availability. What about the idea of an operational model that embraces application-awareness, the foundation for business-critical availability? What about leveraging automation for greater levels of consistency, reliability and cost-effectiveness, while reducing risks and interruption. How about a new era of digital resilience?

The survival of your business may depend on it.

Hitachi and Brocade Offer the Way Forward

Hitachi and Brocade resiliencies are recognized as industry gold standards. Our leadership and expertise together enable the behind-the-scenes resiliency capabilities that promote your front-and-center peace of mind. The data you have now is what will determine if and how you grow in the digital era. To usher in real business transformation,

you need to modernize your data centers for operational efficiency, risk mitigation, IT agility and business acceleration. You get there with trusted partners who understand and fulfill your goals. Our collective approach to impenetrable resilience is not piecemeal or tactical. Rather, we believe in eliminating the need for all those application-specific products that fracture your data management and governance. Having a singular and unified blueprint for virtualizing your storage and achieving both high availability and disaster recovery is imperative.

The Vehicles for Change

Here, we lay out the cohesive technologies that together will create the impenetrable data resilience solution you need to win in the digital space.

All-Flash Digital Infrastructure: Hitachi Virtual Storage Platform F Series

Hitachi Virtual Storage Platform (VSP) F series redefines resiliency with an all-flash digital infrastructure that guarantees continuous data availability, *period*. VSP F series delivers indispensable potency and performance for business-critical applications and federates extensive all-flash optimization for faster, smarter everything.

Do you require nonstop operations and data growth? No problem. Our VSP F series guarantees 100% data availability and high-availability performance to support concurrent, large I/O enterprise workloads. Rely on complete system redundancy, hot-swappable parts, superior data protection and nondisruptive updates, all from a centralized point of control.

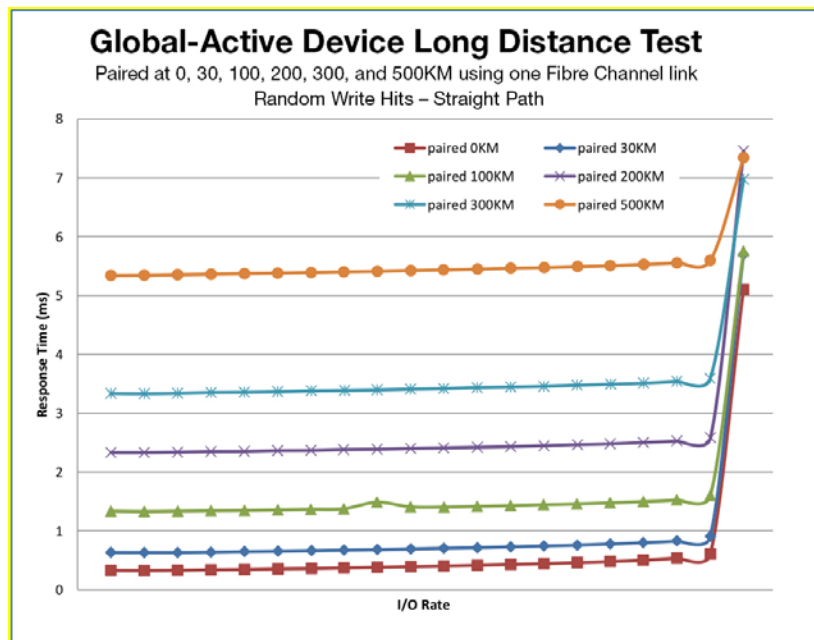
Continuous Operations for Active-Active Clusters: Global-Active Device

Hitachi Storage Virtualization Operating System (SVOS) is the lifeblood of VSP, delivering genius-level intelligence and simplified, unified operations across distributed environments. SVOS offers an optional global-active device feature, which supports active-active storage clustering for continuous application availability across two sites. It's always on, everywhere you need.

Disaster recovery is about how quickly your systems and processes cope and recover during and after the crisis. The best ways to measure success is via RTO and RPO. Global-active device from Hitachi allows you to meet strict SLAs for zero or near-zero RPOs and RTOs with nonstop, automated data protection and recovery, and no reconfiguration. Our active-active design enables transparent, automatic failover to second sites where an active copy of all data resides.

Global-active device extends typical distance limitations between active-active sites up to 500 km. Is this overkill? Not at all. We believe that the extended distance is necessary for meeting the world's most stringent data protection demands. One of the most effective ways to improve IT resiliency is to increase the geographical separation between data centers. Driven by demand by our customers, this always-on, go-the-distance global-active device extension solution was tested for low and consistent latency. While read I/Os are executed locally, the write I/Os are subject to increases in response times of 1 millisecond per 100km round trip. Figure 1 shows test results at various distances.

Figure 1. I/O rate versus response time is shown at various distances for 100% random write hit workload.



No interruptions allowed? Nondisruptively mirror data in real-time for synchronous replication and transparently migrate data for read/write copies of the same data in two places at the same time. Our global-active device works seamlessly with other advanced capabilities of SVOS, such as flash optimization, predictive monitoring and cognitive analyticsⁱⁱⁱ, Dynamic Provisioning, Dynamic Tiering, and local and distance replication.

Got Oracle? Our active-active bi-directionally mirrored storage delivers HA for stretched Oracle RAC clusters. You can eliminate Data Guard licensing costs and host-based replication complexities that siphon precious CPU cycles from your Oracle servers and require failover targets. F-series' in-system replication improves recovery time from logical corruption and fosters faster environment refreshes.

Brocade Gen 6 Fibre Channel Accelerates the All-Flash Data Center

Don't forget to consider the network when modernizing your storage environment. Brocade's Fibre Channel flash storage networking technology helps you expedite data access and scalability while boosting operational efficiencies. Moving to Brocade Gen 6 Fibre Channel from earlier versions can yield up to 4x the application performance, which is up to 100 million IOPS.

Gen 6 with Fabric Vision Technology gives you access to new network analytics tools. Identify, diagnose and eliminate potential bottlenecks through the SAN, while minimizing risk and disruptions. You can achieve maximum network uptime, extend SAN management and gain unparalleled visibility.



Data Recovery Simplicity: Hitachi Data Instance Director and Remote Replication

Adding uncompromising savvy to the pursuit for data resilience are Hitachi's reliability workhorses: Hitachi Universal Replicator (HUR) software and Hitachi Data Instance Director (HDID) software. You need reliability for all situations, not just those you can anticipate.

HUR adapts and tweaks dynamic network conditions to ensure business continuity and disaster recovery after widespread outages. It works via asynchronous replication of mission-critical data hosted on Hitachi storage to one or more remote sites over any distance. With unique journaling and caching algorithms, Universal Replicator helps you bolster bandwidth utilization, eliminate the impacts of network fluctuations or failures, and maintain data

integrity across heterogeneous storage. There is no need for redundant servers or replication appliances. HUR simplifies everything from bandwidth planning to efficient resiliency and flexibly balances business continuity with cost.

HUR supports the availability of up-to-date copies in dispersed locations and works in tandem with Hitachi TrueCopy for modern data replication among multiple data centers. TrueCopy handles synchronous remote replication and mirrors data between Hitachi storage across metro distances.

Add HDID to the solution for an end-to-end, unified data protection, retention and recovery management framework. HDID includes a unique whiteboard-like user interface with drag-and-drop elements for easy, on-the-fly creation and management of policy-based workflows. It combines remote replication for disaster recovery with in-system replication for local operational recovery. Scripting in legacy environments, if feasible, would take days, right? HDID can perform these tasks in minutes. You will no longer need myriad tools and point solutions. HDID helps you eliminate the silos of secondary systems and skill sets so you can align data protection requirements with data growth, SLAs and always-on business commitments. For your Oracle Database and application environments, HDID integrates and allows you to automate application-aware snapshots and clones with business-defined policies. Also, HDID will help you shrink or jettison backup windows.

Go the Distance for Disaster Recovery: Brocade 7840 Extension Switch

The Brocade 7840 Extension Switch with Brocade Fabric Vision technology moves more data over distance swiftly, securely and without disruption. Wholly aligned with Hitachi's global-active device, the Brocade 7840 delivers unmatched performance, integrated safeguards and continuous availability.

Meet disaster recovery and data protection priorities with Brocade network resiliency. Designed for the world's most demanding data centers, the Brocade 7840 is built on legendary Gen 5 Fibre Channel and Brocade Fabric Vision Technology. You gain cohesive automation, visibility and diagnostics of mission-critical operations for maximum uptime while simplifying operations and reducing costs.

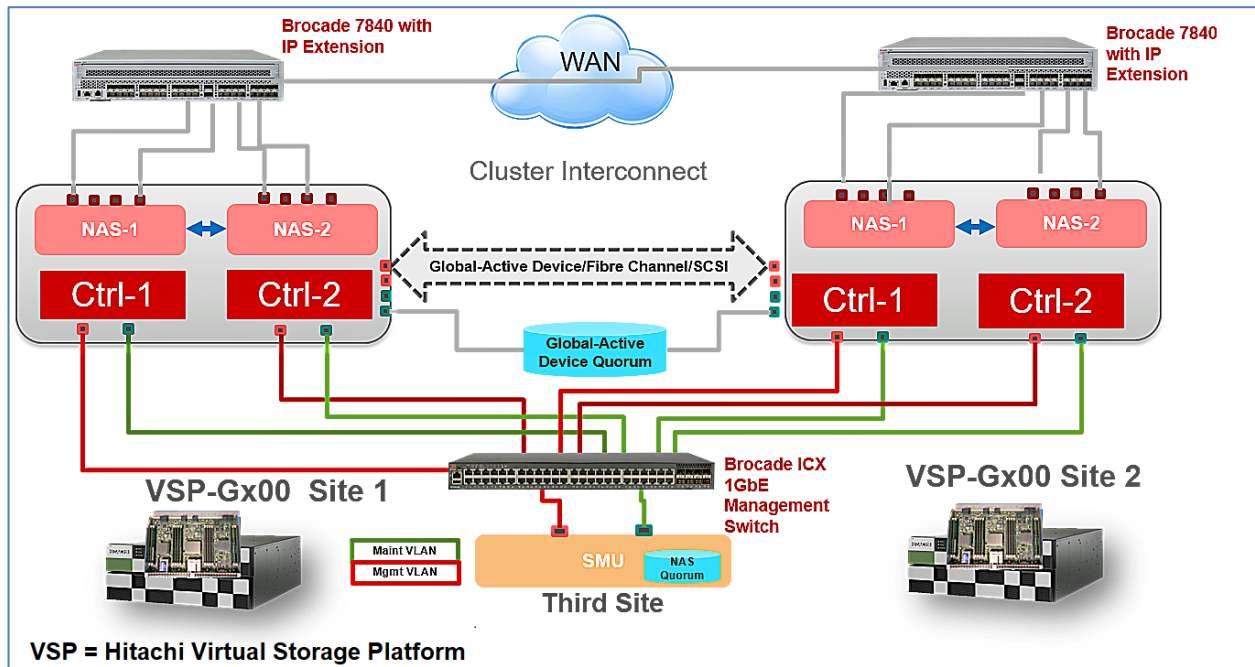
Dealing with unrelenting data traffic between sites? The Brocade 7840 exudes high-speed, secure transport across Fibre Channel, IBM® FICON® and IP storage environments. Next-gen high availability and IP extension proficiencies effortlessly meet customer SLAs, while advanced encryption accelerates data flows over distance without performance penalties. When you need more capacity, Brocade enables pay-as-you-grow scalability.

Need WAN optimization? Brocade Extension Trunking boosts WAN bandwidth utilization and alleviates link failure for open systems and mainframe storage across any distance. Brocade 7840 employs the industry's only WAN-side, nondisruptive firmware upgrades for highest application availability, and it proactively detects any WAN inconsistencies between data centers.

An Unbeatable Solution

Our unique Hitachi and Brocade solution powers holistic high availability and delta-resync protection at WAN distances. Our solution also exploits the tightest RTO and RPO, if regional disasters affect both local sites. HDID and global-active device partner to nondisruptively protect critical Oracle databases and business applications against data loss while supplying data recovery at the speed of business. You gain continuous availability of business-critical applications running on centralized or distributed platforms in on-premises and cloud environments. Figure 2 highlights logical connections.

Figure 2. Logical cluster connections for global-active device are part of the unique Hitachi and Brocade solution.



Catalysts to New Value and Business Continuity

You know the hurdles ahead. We know how to help you clear them with your business intact. Hitachi and Brocade have consistently proved success and leadership in delivering business continuity and data resilience. Our collective technologies come together at a time when you most need trusted partners and solutions that address your issues.

Business Innovation and Productivity

We are in a renaissance of business innovation. One of the most important benefits of deploying a holistic and flexible architecture is the ability to adapt to whatever happens next for the business. Over 80% of Fortune Global 100 companies are using Hitachi solutions and services to develop data into information for use in innovations.^{iv} Two customer examples follow. How you architect the data ecosystem will dictate how your organization proceeds with delivering on customer expectations, competitive positioning and innovations.

Success Story: SYNERGY Serves One Million Customers With Zero Downtime

Synergy is Western Australia's largest provider of gas and electricity and serves 1 million residential, business and industrial customers. After a substantial government merger, the new organization was experiencing large-scale capacity issues and performance degradation that affected customers. Costs were spiraling, and the energy provider needed a way to strategically scale the business while ensuring next-generation data replication and protection.

The solution was based on Hitachi VSP with global-active device. Synergy was able to successfully migrate 700TB of mission-critical data with zero business downtime and full application availability while significantly reducing total cost of ownership (TCO). For an organization that operates 24/7, the solution delivered business continuity and full application protection across a data-intensive virtual desktop infrastructure (VDI) environment with over 1,000 virtual machines.

"We had an instance where we lost one node from a SAP cluster, but due to Hitachi's active-active metro clustering capabilities, the business didn't even notice. The new business continuity design also negates the need to schedule regular downtime for applications and infrastructure testing, which brings further efficiencies and benefits."
— Matt Tranter, ICT Project Services Manager, Synergy

Success Story: Sichuan's Golden Tax Project Deploys Active-Active Success

The Sichuan Local Taxation Bureau is responsible for carrying out the People's Republic of China Golden Tax Project across a jurisdiction of 185 counties, 42 cities, 172 audit offices and 1,732 satellite offices. China launched the Golden Tax Project, which mandates the use of information technologies to manage VAT invoicing and compliance, and to reduce fraud. Setting up and deploying the Golden Tax Project in Sichuan required a highly available and straightforward tax collection system. Sichuan needed to be able to cull and analyze taxpayer information, invoices and payments. Decades later, the Sichuan Bureau faces new challenges with ongoing data protection, storage and performance of its core tax information control system.

The solution was based on Hitachi VSP with global-active device for data consistency, availability and protection in distributed environments. By building on its existing cloud computing platform, the Bureau can ensure data service continuity and performance without having to purchase unnecessary equipment.

Sichuan quickly realized a greater business continuity of core production data. Hitachi's guaranteed 100% availability plus fast deployment capabilities enabled the Sichuan Bureau to implement its new phases with optimized I/O and no data migration or downtime. Now, the tax bureau has a single-source pooled storage solution that is continuously updated and provides streamlined and automated operations.

"This provides us a read-write copy of the same data in two places at the same time. We believe this is the most mature and compact active-active storage solution in the industry. We did not need to change the original system architecture or migrate data, so there was no impact to services, we were able to deploy and go-live within two weeks."

— Jie Li, Deputy Director of Information Center, Sichuan Local Taxation Bureau

For More Information

To learn more about digital transformation or specific solutions for your data resilience goals, visit:

www.HDS.com and www.brocade.com.

[To learn more about a better bottom line, watch the Webcast: Maximize Your ROI With the Right Flash Storage Solution.](#)

ⁱ The 2017 SIM IT Trends Study: Issues, Investments, Concerns and Practices of Organizations and their IT Executives

ⁱⁱ Sources: Gartner Predicts 2015: Business Continuity Management and IT Disaster Recovery Management, Published: 26 November 2014, #G00270601

ⁱⁱⁱ <https://community.hds.com/community/products-and-solutions/storage-systems/blog/2017/03/01/hitachiquality>

^{iv} Innovate With Information —The Role of IT in Social and Business Innovation, Mary Ann Gallo and Douglas Howatt



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