
BROCADE
A Broadcom Company
HITACHI
Inspire the Next
Hitachi and Brocade.
Alone, Exceptional.
Together, Unrivalled.
OPEN GUIDE
HITACHI AND BROCADE: AN INTERACTIVE GUIDE

Brocade's SAN networking portfolio and Hitachi Vantara's storage solutions combine to deliver the highest performing, lowest latency enterprise-class solution in the world.

Together, Hitachi Vantara and Brocade represent the global benchmark for future-proof integrated storage networking performance, availability, resilience, simplicity, and security for the evolving mid-market organization.

Integrating simpler automation architecture, the lowest power consumption, and the most advanced SAN monitoring and diagnostics in the industry, Hitachi and Brocade's joint vision and offering dramatically cuts both complexity and TCO to put ambitious mid-market businesses like yours on the path to the data-driven digital infrastructure of tomorrow.

READ MORE

Contents

Introduction

Hitachi and Brocade: Reinventing What's Possible.

Given today's need for enhanced infrastructure resilience – minimum downtime and risk, maximum application and analytics performance, and optimum security , operational efficiency, and TCO – enterprises need to 'do more with less'.

But how? By modernizing the data center to capitalize on new capabilities and insights. By simplifying with AI-driven automation to adapt, scale, and future-proof the business. By amplifying productivity with technologies that rocket-boost performance, protection, and efficiencies. And by doing all of this in the smartest most seamless way possible.

That is what Hitachi Vantara and Brocade deliver – the global benchmark for enterprise-class storage networking performance, availability, resilience, simplicity, security, and future-proofing. Data advantage without equal.

A 20-Year Alliance; A Shared Vision

Sharing a 20-year collaboration and a joint vision for supporting tomorrow's digital infrastructure, Brocade's SAN networking portfolio and Hitachi Vantara's storage solutions combine to deliver the highest performing, lowest latency enterprise-class solution in the world. The perfect alliance for the digital era.

It's tomorrow's data velocity and agility today. Enabling the organization to manage vast data volumes without extended storage spend, it drives an up to 4:1 total data efficiency guarantee ratio, the lowest cost per IOPS in the industry*, and lower power, space, and cooling costs.

It provides relentless application performance and protection; highly secure, scalable, resilient, low-latency storage networking; total capacity agility aligned with shifting operational demand. Faster, easier, lower TCO operations. All with automated provisioning and management, smarter data dissemination, and new levels of data compression.

In practical terms, that means:

- Less compliance risk and downtime. Fewer multiple-vendor technical support headaches – all the technology, tools, and experience to run the data center in one place.
- Effortless, ongoing service and security improvements as well as IT and business alignment via thousands of managed service professionals.
- Up-to-the-moment scalability via unique financing models.
- Perpetual risk mitigation with tools and accelerators to keep driving savings and improved service levels.
- Faster automation with intuitive starter packs and predefined service templates.
- Easy, automated multi-vendor orchestration driving cost and time savings without the need for rip and replace.
- Better, faster ROI via improved storage utilization.

* Transactions per second

Clear, Tangible Benefits

As evidenced by the fact that more than 80% of the Fortune 100 are under our wing, the benefits are as tangible as they are clear:

Application delivery streamlined by up to **90%***

Manual tasks reduced by up to **70%***

Provisioning time reduced by up to **90%***

Enabling you get to market faster, unlock maximum operational success, and deliver better customer experiences, Hitachi's 100% data availability guarantee coupled with Brocade's renowned networking resilience means you don't need to worry about outages.

Plus, as the fastest, simplest, most scalable, intelligent, future-proof storage networking solutions in the world today, they will grow and evolve as you do. With built-in NVMe, AI, and automation. No need to relearn anything. No disruption. No rip, no replace.

- Detailed IT insights, predictive analytics and built-in best practices.
- Intuitive user-interface tools with AI-centric automation.
- Intelligent dashboards with global views and quick provisioning.
- Improved end-user experience with global views and seamless integration across all systems and fabrics.
- Open, common API platforms (REST, Ansible, Python).

*Source: Hitachi

Hitachi for the Enterprise

Hitachi Virtual Storage Platform 5000 Series:

FAST-TRACKING YOUR DIGITAL TRANSFORMATION

Built on Hitachi's legendary resiliency and performance, the Hitachi Virtual Storage Platform (VSP) 5000 Series is an ideal foundation for the modern data center. The enterprise NVMe data platform for any workload at any scale.

INNOVATE THROUGH BETTER DESIGN

The VSP 5000 Series is a solution built to enable you to build yours. From edge to core to cloud. Block, file and object. Detached, converged, hyper-converged; and front-end virtualized capabilities for legacy systems. On-the-fly dedupe optimization. Self-protecting IO architecture. Quadruple redundant fabric and 100% data availability.

SCALE UP AND OUT RAPIDLY

VSP 5000 Series is able to scale to 69PB of raw capacity while maintaining predictable service levels. Powered by Hitachi Storage Virtualization Operating System RF (SVOS RF) it means 24/7 application availability, and top-drawer NVMe, flash, and I/O traffic performance.

CONSOLIDATE WORKLOADS

Delivering 33 million IOPS of performance and best-in-class latency (as little as 39 microseconds), VSP 5000 consolidates diverse workloads and applications from a single footprint, helping you eliminate ineffective silos, reduce data center costs, and adapt to shifting capacity demands and service levels effortlessly.

MIX, MATCH, AND MERGE

Traditional, transactional, and mainframe workloads. Containerized applications, analytics and DevOps. The VSP 5000 Series accelerates it all – all while allowing you to intermix NVMe and SAS flash media at the most economic $/GB rates available, manage everything as a single entity, and ensure seamless upgrade paths to SCM.

- 100% data availability
- 39µs latency
- 33 Million IOPS
- 4:1 effective capacity
- 69PB scale
- 24/7 app availability
- Best $/GB rates available

Hitachi for the Mid-Range

Hitachi Virtual Storage Platform E Series:

DO MORE WITH LESS

An agile hybrid, flash, and NVMe cloud offering that seamlessly mitigates both risks and costs, the Hitachi VSP E Series drives availability and non-stop data center operations. With rapid setup, Hitachi's 100% data-availability guarantee, simple yet powerful management and virtualization, and robust container support for DevOps acceleration, it's the ideal option for the mid-range.

It means optimum performance and uptime, simplified operations, and fewer outages – all reducing outlay, power, space, cooling, and therefore TCO.

OPTIMIZED RESILIENCE

Supporting the real-time data demands of mission critical new applications via latencies as low as 64 microseconds while ensuring maximum application uptime, VSP E Series helps you bounce back fast in the event of an outage and cut the risk of data theft and leakage with FIPS 140-2 encryption and industry-leading data erasure.

NEW REALMS OF CLOUD-DRIVEN AGILITY

VSP E Series means you can adapt and scale storage usage at a moment's notice, even across on-premises storage volumes. And with Hitachi's EverFlex financing delivering even greater flexibility via cloud-like pay-per-use agility, capacity and performance can be balanced exactly in line with changing needs. All while underpinning your wider infrastructure with easy storage integration and tiering for rapid disaster recovery and seamless business continuity.

OPERATIONAL EFFICIENCY

With new levels of compression and deduplication delivering an up to 4:1 data efficiency guarantee, VSP E Series means that vast data volumes can be tackled, managed, and leveraged without extra storage spend. It also provides the lowest cost per IOPS (transactions per second) in the industry.

- 100% data availability
- 4:1 data efficiency guarantee
- Latencies as low as 64 microseconds
- The lowest cost per IOPS (transactions per second) in the industry

Brocade® Gen 7: The Fast, Intelligent Foundation for the Autonomous SAN

Brocade® Gen 7: enabling the autonomous SAN

Everything is moving at an incredible pace in the data center, demanding more from IT.

Next-generation servers and storage will move more data through your infrastructure than ever before. Flash and NVMe are processing things at unimaginable speeds, enabling new applications and capabilities such as advanced analytics, business intelligence, and data-intensive workloads that drive new levels of performance and capacity requirements.

These advancements, coupled with the ever-increasing demand for faster, more reliable data access, means the network will need to evolve. As delivery is accelerated, so too is the complexity to manage and make sense of the data. Humans are just not fast enough. The SAN needs to be smarter, and be able to manage itself. With Brocade Gen 7 you can realize an autonomous SAN that unleashes the performance and maximizes the ROI of your server and storage investments.

Why Brocade Gen 7?

Any issue, anywhere in the SAN, can cost millions of dollars in lost transactions and productivity. That's the bottom line.

Trouble is, with everything else in the data center moving extremely fast, your SAN may impede this performance and begin to struggle. What's working now may not be good enough for much longer.

If you don't upgrade your SAN, your ROI from new applications, and new storage and server technology, could be hanging by a thread.

Of course, you can play it safe, especially in uncertain times. But the business needs the performance now.

So, sure, you can wait. Everything's working fine. It makes no sense to risk something new until things have settled down.

But the truth is, things are never going to settle down. Now, you need a SAN that's ready for a world that works in a different way. You need to lay down the foundation now, rather than trying to catch up later.

You need Gen 7 Fibre Channel from Brocade.

LEARN MORE

Tell Me More...

Applications are being written and deployed right now that can make the difference between growth and stagnation for the business. They are driving efficiency and creating great customer experiences. These applications take it for granted that the infrastructure is fast enough and smart enough to let them do what they can do.

The complexity is set to increase, with more applications and endpoints, from tools installed and used at remote locations, to consolidated workloads on a growing number of virtual machines, and more subtle security threats opening up vulnerabilities. And who knows what next-generation technology will add to the mix?

Brocade Gen 7 brings together hardware and software to create a SAN that's ready for new dimensions of speed, efficiency and reliability.

Unmatched performance, powerful analytics and advanced automation capabilities make the autonomous SAN possible.

LEARN MORE

Gen 7: The New Dimension

FASTER

SCALABLE

INTELLIGENT

RESILIENT

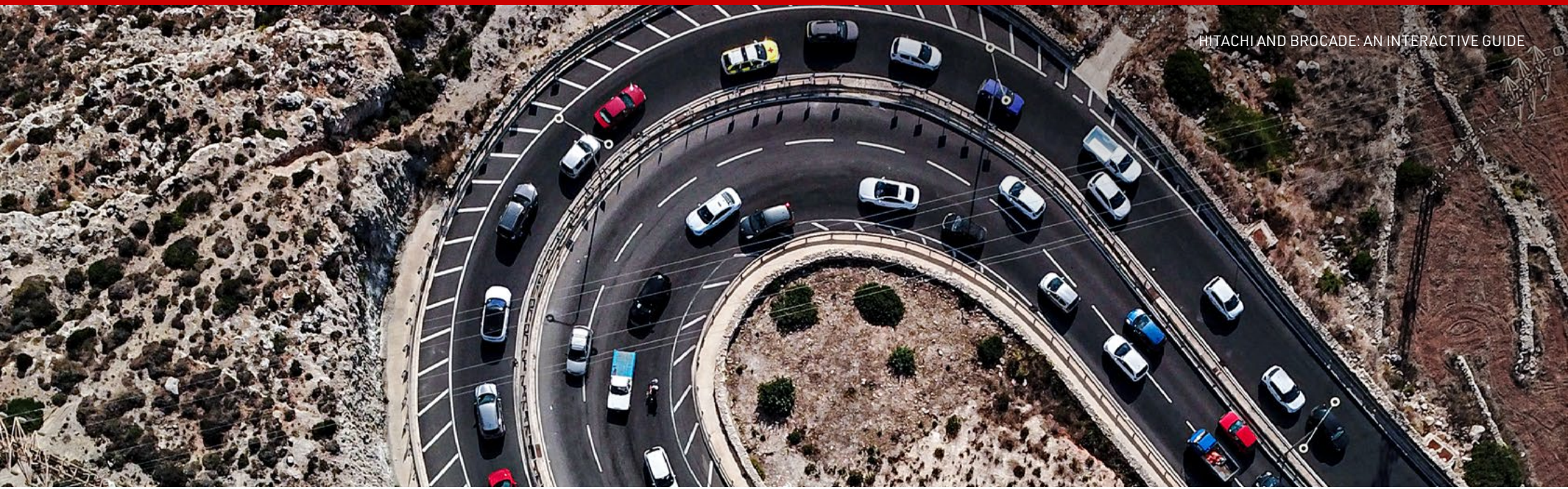
FLEXIBLE

Maximize NVMe and high transaction workloads with Gen 7.

Gen 7 delivers double the performance with 64G line-rate speed along with 50% lower latency compared to Gen 6.

WATCH HERE

See how Brocade Gen 7 enables the autonomous SAN.



Digging a Little Deeper

See how Brocade Gen 7 enables the autonomous SAN.

When we talk about lower latency, we literally mean half the latency of Gen 6. That is down to 460 nanoseconds.

It's not just the doubling of the physical speed. The intelligence built into Gen 7 allows it to monitor, learn and measure how applications flow across the fabric. The SAN can find problems and fix them by itself without intervention.

You get a continuous cycle of automatic detection, repair and optimization, happening at speeds that barely register as incidents.

Brocade Gen 7 also gives you 50% more buffers per ASIC over Gen 6. This means it can handle more traffic and provide greater distance, cope with bursty workloads, and manage congestion, keeping traffic flowing reliably, at speed.

Here's what a future-ready storage fabric looks like.

Modern storage fabrics need to be in place now to keep pace with the demands of the business. But they must also be able to analyze and automate, ready for today's and tomorrow's ever-increasing demands.

According to analysts ESG, a modern storage fabric must:

- **Deliver persistent, essential low latency and bandwidth improvements** to accelerate new and existing applications.
- **Support end-to-end NVMe** protocol communication and diagnostics, allowing NVMe to coexist seamlessly with existing storage protocols. This capability ensures investment protection.
- **Offer integrated intelligence and automation** that is built on analytics and telemetry data to further simplify and optimize the environment.

Brocade Gen 7 switches and directors provide this type of modern data center foundation.

They allow NVMe to coexist seamlessly with existing storage protocols, reducing the risk associated with adopting and integrating new technologies. Better still, Gen 7 substantially augments the performance of NVMe storage with 50% lower latency, coupled with advanced intelligence and learning to maximize the efficiency of the infrastructure from end to end.

Meet the Autonomous SAN

We've seen the hardware advantages of Gen 7. Now let's see how the software takes things to a whole different dimension of performance.

When things are happening at nanosecond speed, the smallest change can have a huge impact. Imagine a premium sports car on a test track. The slightest flaw in the track or slowdown in the network might be manageable at cruising speed. But at full throttle, the impact can be disastrous. Picture driving at top speed in the fog.

Yet even this example is on a human scale. In the Gen 7 SAN, things are happening faster than we can imagine. They have to, because the complexity and scale of the traffic is only going to grow.

The autonomous SAN uses the intelligence and telemetry built into Brocade Gen 7 Fibre Channel to optimize the network and resolve issues as fast as they happen. Because at these speeds, if a human had to intervene it would already be too late.

The Autonomous SAN is Self-Learning, Self-Optimizing and Self-Healing

It can automatically identify and resolve most of the routine problems that occur in a modern storage network.

It can also find and fix the issues that can occur in an infrastructure operating at fast speeds. Only when it can't resolve an issue itself – like a failing server – does it call for intervention.

As a result, today's generalist admins can manage a Brocade Gen 7, SAN without needing to get involved in the granular detail of keeping a SAN running. They can focus on the bigger strategic issues, making sure the business has the infrastructure it needs. If and when it needs help, the autonomous SAN will tell the admin what happened, where it happened, and what needs to be done to fix the problem.

For good measure, it will also tell the admin what it has done to work around the issue and keep everything optimized and running until things are resolved.

The ability of Gen 7 to self-correct autonomously finally allows the modern business infrastructure to achieve the reliable performance it needs.

Now the infrastructure can scale and adapt that performance in line with constantly changing demand. All the leaps forward in server performance, and the speed and flexibility of Flash and NVMe,can now reach their full potential.

See what an autonomous SAN can do.

See what an autonomous SAN can do.

Realizing the Autonomous SAN

Brocade solutions for the autonomous SAN provide end-to-end visibility of the entire network, including storage, hosts, and virtual machines.

SELF-LEARNING

Telemetry and analytics that help you understand your SAN, and help your SAN understand itself.

Brocade Self-Learning is a collection of features that leverages Brocade's ASIC capabilities from Gen 7 to collect a comprehensive set of data. These data points are transformed into actionable intelligence that can monitor and alert when there are any abnormal changes.

Through these capabilities, the SAN can identify individual applications and their performance characteristics across the fabric, as well as identify the performance of the various devices that comprise the fabric: the switches, hosts, and targets.

SEE MORE

SELF-OPTIMIZING

The SAN turns that understanding into action, recognizing and prioritizing different traffic flows to maintain optimum performance.

Using actionable intelligence gathered from self-learning capabilities, Brocade Fibre Channel SANs automatically apply priorities for specific data traffic to help guarantee performance levels and monitor for traffic pattern shifts.

Learning traffic behavior enables the network to make smarter decisions on traffic prioritization, congestion avoidance, and adjustment to ensure optimal network performance for applications and storage.

When something does change, the Brocade autonomous SAN technology will isolate the port traffic for the misbehaving device to a virtual channel in the fabric and allow all other traffic to go around to maintain optimal performance.

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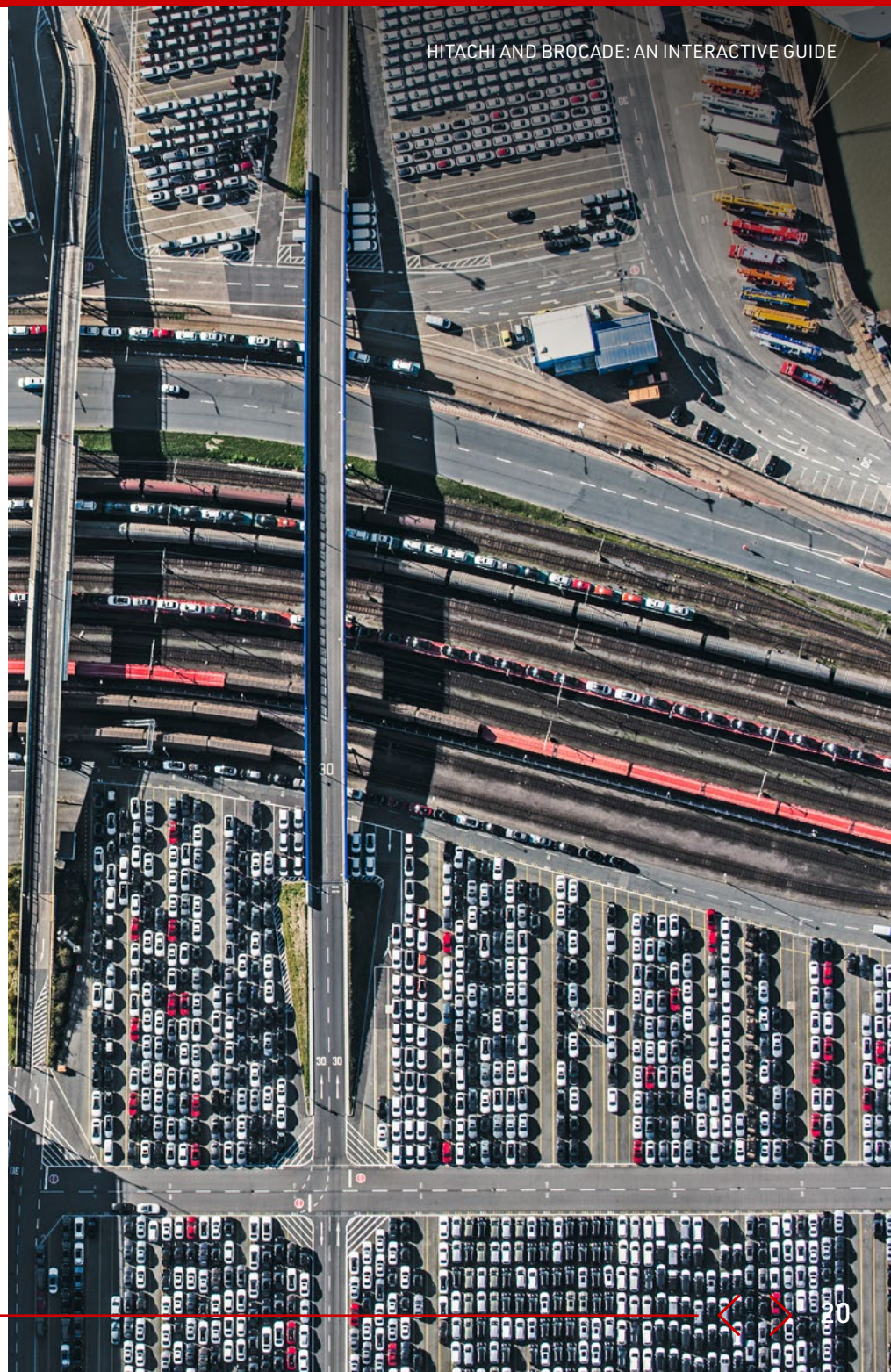
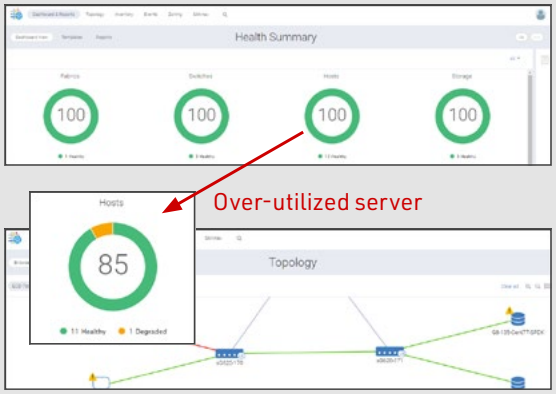
SEE MORE



Use Case 1: Avoid Performance Degradation

Instantly notify end devices of congestion:

Brocade monitors millions of performance and health characteristics

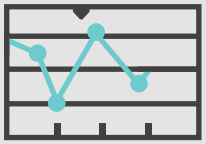


Over time workloads grow and VMs are added per server

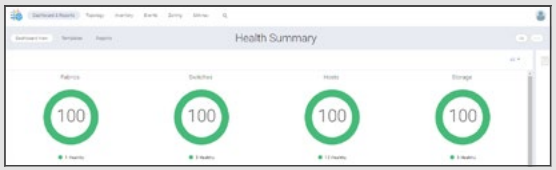
Brocade sends notification of congestion to end devices

End device (HBA) automatically takes action to address congestion

Server causing the issue ispaced to optimize resource utilization



Everything is back to normal

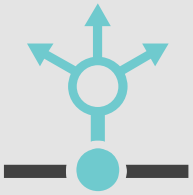


Use Case 2: Ensure Data Delivery and Failover Faster

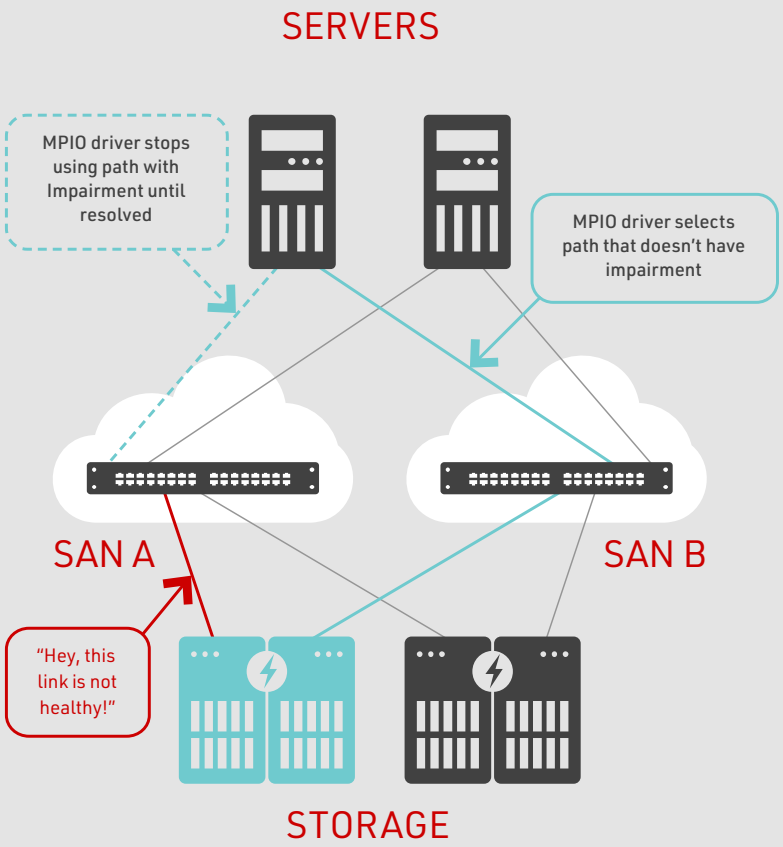
Fail over from physical issues:

Continuously monitors fabric paths

Brocade SAN instantly sends notifications of impairment



Automatically fail over to avoid impaired path with MPIO

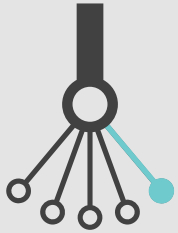


Use Case 3: Eliminate Performance Impacts

Automatically taking corrective action on misbehaving devices.

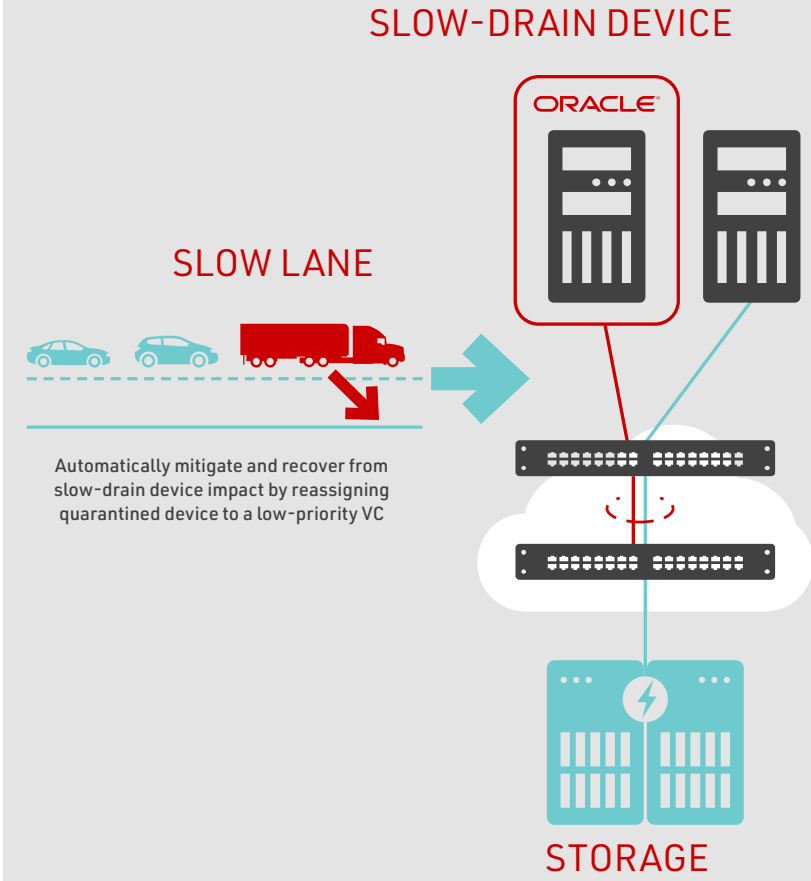
Monitoring detects the slow-drain device

All switches in a fabric informed of the slow-drain device



Flows designated to the slow-drain device reassigned to low priority VCs

Buffer credits free up for regular flows sharing the same path



Build Your Foundation for the Autonomous SAN with the Brocade X7 Directors

Meeting the demands of continuous data growth and critical applications, the Brocade X7 Director is ideal for large-scale storage environments that require increased capacity, greater throughput, and higher levels of resiliency and operational efficiency.

With a 50% latency reduction compared to Gen 6, Brocade X7 Directors maximize the performance of NVMe storage and high-transaction workloads, eliminating I/O bottlenecks and unleashing the full performance of next-generation storage. In addition, the Brocade X7 Director lays the foundation for the autonomous SAN by harnessing the power of analytics and the simplicity of automation to optimize performance, ensure reliability, and simplify management.

The Brocade X7 Directors provide up to 384 64Gb/s line rate ports or up to 512 32Gb/s line rate ports, enabling organizations to scale more devices, applications, and workloads. With diverse deployment options, multiprotocol flexibility, and mixed blade capability, organizations can adapt and optimize their businesses to meet next-generation storage and server requirements.

For investment protection, Brocade X7 Directors offer three generations of backward compatibility support for connectivity to 8, 16, and 32Gb/s Fibre Channel products. The Brocade X7 also supports mix-and-match blades, allowing Gen 6 and Gen 7 blades to be installed in the same chassis.

Scale up to 384 64Gb/s line rate ports or up to 512 32Gb/s line rate ports

2x performance and scale compared to Gen 6

50% lower latency Integrated analytics and advanced automation

Traffic Optimizer and congestion management

Mix and match Gen 6 and Gen 7 blades

Scale Out the Autonomous SAN with the Brocade G720 Switch

Built to maximize performance and simplify tasks.

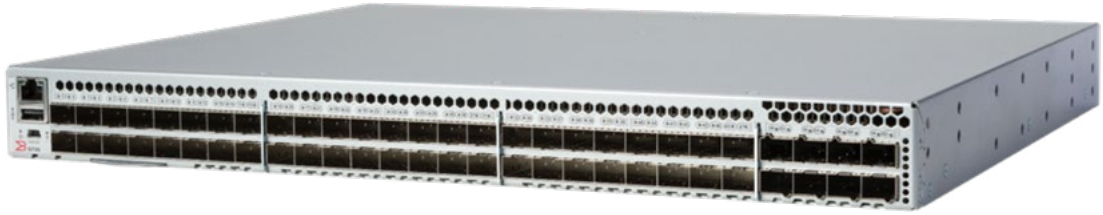
The Brocade G720 Switch is simple to deploy, configure and manage, and enables ease of scale.

As with Brocade X7 Directors, all enterprise-class software licenses are included, such as Fabric, Vision, ISL Trunking, Integrated Routing, FICON CUP, and Extended Fabrics to give you everything you need to manage your environments today and for years to come.

Brocade G720 Switch

- 1U, 24 to 56 64Gb/s ports
- 2x performance
- 50% lower latency
- All optional software licenses included

Brocade GEN7 FIBRE CHANNEL



Conclusion

The business always wants faster, more reliable data access. To meet those ever-increasing demands, you need a modernized infrastructure that maximizes performance, simplifies management, and ensures continuous availability. The solution you need is Brocade Gen 7 Fibre Channel.

Our Gen 7 hardware platforms, combined with software for SAN management and autonomous SAN capabilities, will maximize the performance, productivity, and efficiency of your storage investments and resources.

Brocade Gen 7 is the intelligent, scalable foundation you need to create an infrastructure ready to deliver the new business vision.

Next Steps

Unlock the Future with the Brocade Hitachi Alliance.

Combined, Brocade's SAN networking portfolio and Hitachi Vantara's storage solutions to deliver the highest performing, lowest latency enterprise-class storage networking solution in the world – the global benchmark for storage networking performance, availability, resilience, simplicity, and security.

Simpler automation and architecture. Lower power consumption. The industry's most advanced SAN monitoring and diagnostics. Reduced complexity and TCO. The clearest possible path to the data-driven digital infrastructure of tomorrow.

Hitachi and Brocade.
Alone, Exceptional. Together,Unrivalled.

HITACHI
Inspire the Next

Speak to One of Our Specialists About How You Can Benefit From the **Hitachi Brocade Alliance Today.**

Want to find out more?

HITACHI VANTARA VSP 5000 SERIES

HITACHI VANTARA VSP E SERIES

broadcom.com/modernize-your-san

Brocade Gen 7

Website:
Brocade® X7 Director

Website:
Brocade® G720 Switch

ESG Showcase:
The Accelerated Foundation for the Modern Data Center

Autonomous SAN

Solution Brief:
Brocade Autonomous SAN Solution Brief

ESG Showcase:
The Necessity of an Automatic IT Environment

About Hitachi Vantara

Hitachi Vantara, a wholly-owned subsidiary of Hitachi, Ltd., guides our customers from what's now to what's next by solving their digital challenges. Working alongside each customer, we apply our unmatched industrial and digital capabilities to their data and applications to benefit both business and society. More than 80% of the Fortune 100 trust Hitachi Vantara to help them develop new revenue streams, unlock competitive advantages, lower costs, enhance customer experiences, and deliver social and environmental value. Visit us at **hitachivantara.com.**