

Hitachi Virtual Storage Platform One

How Hitachi Block Storage Delivers Eight Nines of Availability

Hitachi Vantara



Table of Contents

03	Built-In Reliability: Architecture and Capabilities
03	Executive Summary
04	Availability That Answers Stringent Business Requirements
04	Hitachi Reliability: Our Heritage
05	Predictive Resilience in Action
05	Delivering Availability Across Hybrid Environments
06	Clarifying Proof Points
06	Our Eight Nines Value Proposition
06	Our Key Architectural Differentiators
06	How We Best Competitor Claims (NetApp®, HPE®, Everpure®)
06	How We Confirm and Assure Availability
06	How We Provide Value for Company Personas
07	Future-Ready Reliability
07	Why Hitachi?
07	Hitachi Designs Reliability Into Every VSP

Built-In Reliability: Architecture and Capabilities

Executive Summary

Hitachi Vantara leads the industry in enterprise storage reliability. Decades of proven Hitachi performance underpin the largest high-end block storage installed base. Platforms like Hitachi Virtual Storage Platform 5000 (VSP 5000) series and Hitachi Virtual Storage Platform One Block High End (VSP One Block High End) deliver fleet-level eight nines (99.999999%) availability in hardware alone, without replication. This availability level is statistically projected from the system architecture redundancy design and component availability and validated throughout the life cycle of the installed base of thousands of systems.

It ensures low risk for workloads in finance, healthcare and manufacturing. Individual systems get our 100% Data Availability Guarantee with financial remedies. This sets Hitachi apart from competitors.

In designing a system for eight nines of availability, Hitachi has implemented “x4” resilience throughout the architecture. While individual components may fail:

- Shared memory has 4 locations to be mirrored.
- Controllers have 4 paths to communicate to each other across 4 independent switches.
- Back-end drive boxes have 4 paths, each to a separate controller, with drive parity protection spread across drive boxes to avoid parity outages from a single drive box failure (for 6+2 or 3+1 parity).

Finally, on the front end, hosts can have paths to as many controllers as desired, whether in the same or different quad controller block.

Tests include voltage fluctuations, power cycling, thermal stress and aging tests to ensure expected availability in the field. Hitachi performs component-level Weibull analysis (a statistical method used across engineering industries to predict failure rates and life cycle reliability) to validate long-term availability expectations across the installed base.



Active-active controllers work with AI-powered Hitachi Remote Ops. They resolve 90% of issues proactively. Nondisruptive upgrades are designed to avoid a temporary single point of failure, in most cases maintaining x3 redundancy and 75% of processing resources per 4 controller block.

Administrators who want to extend this redundancy all the way through the host connections can connect hosts via 4 paths, each to a different controller, and:

- Position fleet eight nines as engineering confidence.
- Pivot to per-system guarantees for SLAs.

This builds trust, cuts TCO and wins in tough markets where failure isn't an option (finance, healthcare, manufacturing, etc.).

Availability That Answers Stringent Business Requirements

Hitachi high-end block storage platforms, including the VSP 5000 series and VSP One Block High End, achieve a fleet-level eight nines (99.999999%) availability expectation across the entire installed base over its expected lifetime. This statistical measure validates post general availability (post GA) across thousands of systems and highlights reliability for mission-critical workloads in finance, healthcare, manufacturing and government. Individual systems are protected by our 100% Data Availability Guarantee, which provides financial remedies for data unavailability. However, this guarantee is not offered by default: It must be added per sales contract.

Organizations choose Hitachi for proven scale-out architectures and multilayered resiliency with a global, AI-powered proactive monitoring infrastructure. Nondisruptive upgrades and advanced error detection deliver predictable service continuity, enabling enterprises to meet tight SLAs while protecting their reputations. Additional guarantees extend across:

- Performance — SLA-backed IOPS and latency.
- Cyber resilience — with ransomware detection and clean recovery.
- Sustainability — energy efficiency and carbon footprint reduction.

This makes our eight nines availability a key differentiator for enterprises with stringent service continuity demands, such as financial institutions, government agencies and manufacturers.

Note: Eight nines does not commit to specific unplanned downtime limits (e.g., 315 milliseconds or 0.32 seconds per year) on any single system; statistically, a small fraction may experience higher downtime while the fleet average holds. Comparatively, most storage systems in market today guarantee six nines of availability, which is over 30 seconds of unplanned downtime, and most cloud providers guarantee five nines, which is over 5 minutes of unplanned downtime.

Hitachi validates our 100% Data Availability Guarantee through over 20 years of field-proven performance across VSP systems, backed by Hitachi Remote Ops, with analysis of trillions of data points annually to proactively resolve 90% of issues. This optional guarantee — requiring dual-parity RAID, redundant paths and qualified components — provides equipment replacement credits for covered data unavailability, signaling greater confidence than competitors' limited offerings.

Hitachi Reliability: Our Heritage

For decades, Hitachi has engineered storage solutions with an unwavering commitment to availability and reliability — qualities that have become synonymous with our brand. This commitment is validated by real-world performance data from customer deployments across diverse industries, all of which understand that infrastructure resilience is no longer optional but essential for business continuity.

This level of Hitachi reliability resonates across industries:

- **Destek Bank** exemplifies Hitachi performance, achieving an impressive near-100% service continuity through a three-data-center architecture with active-active replication that enables recovery of mission-critical applications within minutes.
- **La Molisana's** CIO Maurizio Maio emphasizes that their operations “simply cannot afford performance or stability issues,” as even brief disruptions could cascade into production delays, impact to sales and compromised business analysis. VSP One Block has proven its worth by delivering a 2.5x performance improvement while maintaining the fleet-level reliability validated in production.
- **FarmaMondo** relies on Hitachi for “highly reliable infrastructure” to ensure their global offices maintain 24/7 connectivity to central IT systems, achieving near-100% availability.



As Kemal Ozcan of Destek Bank notes, Hitachi Vantara's solutions provide “seamless failover” capabilities that transform reliability from an aspiration into a measurable business advantage.

These customer stories underscore a fundamental truth: Reliability is embedded in Hitachi's DNA. Through continuous engineering innovation and field-proven performance, our customers trust us to deliver the availability and dependability their businesses demand.

Predictive Resilience in Action

Hitachi predictive resilience capabilities, powered by AI-driven analytics in Hitachi Ops Center, enable the fleet-level eight nines availability expectation. Using AI-driven analytics within Hitachi Ops Center, potential faults are detected and addressed well before they can impact operations. This proactive approach minimizes unplanned downtime by identifying early warning signs and enabling rapid remediation. Integration with Hitachi Remote Ops and automated service workflows further accelerates problem resolution, ensuring continuous system health and availability.

These technologies form a core part of how VSP One delivers its legendary reliability, maintaining supporting service continuity across hybrid environments and strict service level agreements. By preventing outages rather than reacting to them, Hitachi gives customers confidence in uninterrupted access to their data, fully supporting the promise of eight nines availability.

Delivering Availability Across Hybrid Environments

VSP One SDS Block provides resilient, software-defined block storage built for hybrid operations across on-prem and public cloud environments. Its distributed architecture scales up to 18 nodes in the cloud and 32 nodes on-prem, using Hitachi Polyphase Erasure Coding (HPEC) and optional mirroring to maintain service continuity. Depending on the protection model, availability reaches five nines with mirroring/Multi-AZ and six nines with HPEC 4D+2P.

By decoupling data protection from the underlying hardware, VSP One SDS Block improves resilience in public cloud deployments, using automated failover and multinode redundancy to sustain workloads even during infrastructure disruptions. The platform integrates consistently across environments — including Amazon Web Services® (AWS®), Microsoft® Azure® and Google Cloud Platform® (GCP®) — and supports features such as two-way asynchronous replication, thin provisioning, snapshots and data mobility, to simplify hybrid-cloud continuity strategies.

With support for high-performance protocols like NVMe-oF/TCP and Fibre Channel, VSP One SDS Block delivers predictable performance and scalable, cost-efficient growth. It provides a strong, unified foundation for enterprise block storage across diverse hybrid cloud architectures.



Clarifying Proof Points

Delivering “eight nines” requires a balance of engineering precision and business value that resonates with storage administrators, cloud architects and IT leadership.

Our Eight Nines Value Proposition

When defining the eight nines value proposition, it is vital to distinguish between a fleet-wide statistical average and a single-system guarantee.

- **Engineering Confidence:** Eight nines (99.999999%) is a measure of Hitachi engineering excellence and fleet-level performance across thousands of systems. It represents the “statistical expectation” of reliability based on our “x4” resilient architecture.
- **Ability to Pivot to 100%:** If an organization requires a contractually backed SLA for their specific array, the appropriate step is to pivot immediately to our 100% Data Availability Guarantee. This is a specific, financial-remedy-backed commitment that protects their individual investment. Hitachi is the ONLY vendor that offers a 100% Data Availability Guarantee across the entire storage portfolio.

Our Key Architectural Differentiators

Consider these technical “x4 resilience” points in the Hitachi solution:

- **No Single Point of Failure:** While competitors often settle for dual-controller setups, Hitachi high-end platforms utilize a quad-controller block architecture.
- **Mirror Cache Protection:** VSP models use a mirrored global cache architecture in which every write is synchronously mirrored to a partner controller’s cache before it is acknowledged to the host. This ensures that even if an entire controller fails at midwrite, the data remains consistent and immediately recoverable. Mirror cache is maintained across redundant PCIe paths, eliminating single points of failure and enabling rapid destage to protected media during power loss events.
- **Drive Box Parity:** Parity is spread across different drive boxes. This ensures that even a total failure of a single drive box does not result in a parity outage.

How We Best Competitor Claims (NetApp®, HPE®, Everpure®)

- **The “Marketing Nines” Trap:** Competitors often market downtime caps (e.g., “6 nines”) but bury the requirements in fine print or charge extra for the guarantee.
- **Hitachi Confidence:** Our confidence comes from the fact that our fleet-level reliability is validated post general availability across a massive installed base. We don’t just predict reliability; we have decades of field data proving it.
- **Proactive vs. Reactive:** Hitachi Remote Ops resolves 90% of issues proactively using AI-driven analytics. We fix problems before the your team even knows they exist.

How We Confirm and Assure Availability

- **Verifying Eight Nines Availability:** We accomplish this through a combination of pre-GA statistical modeling (component ARR and Weibull analysis) and post-GA validation. By tracking the performance of thousands of VSP systems in production environments over a 3-year window, we can mathematically demonstrate that the fleet average meets the 99.999999% threshold.
- **Measuring Downtime — Less Than 0.32 Seconds per Year:** Eight nines remains our validated fleet level expectation. For organizations requiring a system specific commitment, Hitachi provides the 100% Data Availability Guarantee, which is contractually backed and includes financial remedies.
- **Requirements for the 100% Data Availability Guarantee:** This guarantee is available for VSP One Block and VSP 5000 series. It typically requires adhering to best practices, such as dual-parity RAID and redundant pathing. It provides a level of financial assurance our competitors rarely match without significant complexity.

How We Provide Value for Company Personas

- **For the Storage Admin:** We deliver peace of mind. Nondisruptive upgrades mean no more weekend maintenance windows.
- **For the Cloud Architect:** We focus on hybrid continuity. VSP One SDS Block brings this same engineering DNA to software-defined and cloud environments.
- **For the CFO/CIO:** We concentrate on lower TCO. Proactive AI resolution and the elimination of downtime-related losses directly impact the bottom line.

Future-Ready Reliability

Hitachi Virtual Storage Platform One, including VSP One Block High End, sets the standard for fleet-level, eight nines availability expectation, and is engineered for AI-era workloads with AI-driven operations. VSP One Block High End is built for mission-critical workloads and the demands of AI. It provides high-performance scalability and resilience with resilient infrastructure, seamlessly supporting next-generation controllers and upgrades.

The platform's AI-driven autonomous operations continuously monitor health and automatically resolve issues before they impact availability, reducing manual intervention and errors. By integrating sustainability and operational efficiency, VSP One Block High End helps organizations lower rework, conserve power through predictable availability and reduce their carbon footprint — all while maintaining a resilient secure and sustainable infrastructure. Together, VSP One and the VSP One Block High End enable enterprises to outpace change, innovate confidently and drive the most demanding digital transformations with guaranteed availability.

Why Hitachi?

- **Fleet-wide validation:** Thousands of VSP arrays average eight nines fleet-wide. Your single array? Backed by our 100% guarantee that competitors can't match.
- **How do we prove eight nines?** Statistical validation across our installed base. Your SLA? 100% data availability with credits.
- **NetApp/HPE uptime:** We guarantee data availability with real penalties. Our confidence shows.
- **Hitachi value:** Zero downtime risk across hybrid cloud. Lower TCO. Meet any SLA.

About Hitachi Vantara

Hitachi Vantara is transforming the way data fuels innovation. A wholly owned subsidiary of Hitachi, Ltd., we're the data foundation the world's leading innovators rely on. Through data storage, infrastructure systems, cloud management and digital expertise, we build the foundation for sustainable business growth.

Hitachi Vantara

Corporate Headquarters
2535 Augustine Drive
Santa Clara, CA 95054 USA
hitachivantara.com | community.hitachivantara.com

Contact Information
USA: 1-800-446-0744
Global: 1-858-547-4526
hitachivantara.com/contact

Hitachi Designs Reliability Into Every VSP

Fleet-level eight nines prove this reliability across thousands of systems. Our optional 100% Data Availability Guarantee protects individual arrays.

Organizations gain trust in mission-critical operations. They cut TCO and meet strict SLAs. No-single-point-of-failure designs deliver hybrid cloud continuity.

Choose Hitachi Vantara for proven leadership. Competitors lack confidence. Drive your digital transformation with unbreakable Hitachi storage.

Additional Resources

Hitachi Polyphase Erasure Coding (HPEC) — White Paper

[Revolutionizing Data Protection with Polyphase Erasure Coding \(PDF\)](#)

VSP 5000 Series — Architecture Overview (Docs Portal)

[VSP 5000 Series Technical Overview](#)

Ops Center Analyzer — Predictive Analytics & AI-Driven Availability

[Ops Center Analyzer Overview](#)

Customer Guarantees — 100% Data Availability & Modern Storage Assurance

[Hitachi Vantara Customer Guarantees \(VSP One\)](#)

VSP One SDS Block — Product Documentation & Architecture

[VSP One SDS Block — Docs Landing](#)