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White Paper

Eight Nines of Uptime: How VSP One Block Redefines Reliability for Mission-Critical Enterprises.



Hitachi Vantara

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Ensuring High Availability for Mission-Critical Workloads: Executive Summary

Organizations running mission-critical applications operate in environments where even seconds of downtime can lead to financial loss, operational disruption and reputational risk. For these organizations, availability is not a marketing claim; rather, it is a measurable requirement that directly impacts business continuity and risk tolerance. Hitachi Vantara has long delivered industry-leading availability, and with Hitachi Virtual Storage Platform One (VSP One), applies that experience through a modern, resilient platform architecture built to support the most demanding workloads.

This white paper explains how eight nines (99.999999%) data availability is claimed for enterprises with VSP One Block High End. It details the architectural design principles, validation methodology, operational practices and accountability models that together enable ultra-high availability.

Why Availability Claims Require Proof

Many vendors promote high availability using theoretical designs, conditional service-level agreements or marketing-driven metrics. These claims often depend on fine-print assumptions, optional features or paid professional services. When downtime occurs, remedies may be limited or unenforceable.

Hitachi takes a different approach. Eight nines is not an aspirational target — it is a measured, validated outcome supported by:

- Redundant, fault-tolerant system architecture
- End-to-end data path protection
- Predictable operational behavior
- Financial accountability when availability targets are not met

What Eight Nines Means

Eight nines equates to less than 315 milliseconds of unplanned downtime per year. Achieving this level of availability requires eliminating single points of failure and ensuring that component failures do not translate into service disruption.

Unlike uptime metrics based solely on hardware reliability or software process restarts, our availability measurement focuses on data accessibility to applications — the metric that ultimately matters to the business.



How Eight Nines Is Claimed for Enterprises With VSP One Block High End

1. Architecture Designed for Continuous Availability

VSP One Block High End systems are engineered for enterprises with a fully redundant, symmetrical architecture. Every critical component — controllers, cache, interconnects, power, cooling and firmware execution paths — is designed to tolerate failures without interrupting data access.

Key architectural principles include:

- Active-active controllers with no preferred path dependencies
- Persistent cache protection across controller failures
- Full isolation of faults to prevent cascading impact
- Nondisruptive firmware and microcode updates

2. End-to-End Data Path Protection

Availability is not just about controllers; it is about protecting the entire data path. VSP One implements continuous integrity checking and correction from host interface to persistent media, ensuring that faults are detected and handled transparently.

This design prevents silent data corruption and ensures that recovery actions occur without application interruption.

3. Proven Operational Predictability

High availability depends on predictable behavior during both normal operations and fault conditions. VSP One systems are validated to ensure consistent performance and deterministic recovery actions when components fail.

Operational predictability is achieved through:

- Controlled failure domain design
- Automated recovery mechanisms
- Strict change management and compatibility validation

4. Validation Through Real-World Measurement

Eight nines is not only extrapolated from component meantime between failure (MTBF) calculations. It is also grounded in a combination of:

1. Architectural modeling that indicates what the design should support.
2. Validation testing (including heat runs and electrical variation testing).
3. Measured availability data from large-scale production environments operating under real workloads.

Operational monitoring in Hitachi Remote Ops is then used to refine future models and assumptions over time.

Availability calculations account for:

- Actual unplanned downtime
- Data accessibility impacts
- Observed recovery behavior



This empirical approach ensures the claim reflects real customer environments rather than lab-only conditions.

5. Accountability With Real Penalties

Hitachi stands behind its availability claims with contractual accountability. Availability commitments for VSP One Block include financial penalties if targets are not met, reinforcing confidence that eight nines is an operational guarantee — not marketing language.

Predictive Resilience as an Operational Complement

While eight nines availability is achieved through deterministic architecture, fault isolation and validated recovery behavior, predictive resilience complements — rather than underpins — the availability claim. Capabilities provided through Hitachi Virtual Storage Platform 360 (VSP 360) management software apply analytics, telemetry and health monitoring across the infrastructure stack to help identify emerging conditions and surface risks earlier and support proactive operational actions. Importantly, eight nines does not depend on prediction or intervention.

What This Means for Organizations

Organizations running mission-critical systems operate under strict availability expectations, where downtime directly affects revenue, customer trust and regulatory compliance. When availability shortfalls occur, the impact is immediate — disrupting operations, increasing risk exposure and forcing costly mitigation efforts.

To credibly claim eight nines availability, Hitachi does not rely on theoretical reliability models or isolated lab tests alone. Availability is established through a combination of architectural fault-injection testing, controlled failure validation and long-term observation of production environments operating under real workloads. These practices are designed to confirm that component failures, maintenance activities and software updates do not result in loss of data accessibility.

System designs are validated by deliberately introducing faults — such as controller failures, cache disruptions and path interruptions — and verifying deterministic recovery behavior without application impact. This testing is reinforced by measured availability data collected across deployed VSP One Block systems, using defined criteria for data accessibility over sustained operating periods. Together, these methods provide a defensible basis for the eight-nines claim, grounded in both validation discipline and real-world operational evidence.

For these organizations, ultra-high availability is not optional. It is a requirement that influences platform selection, architectural decisions and long-term operational strategy. Without predictable, validated availability, enterprises are left compensating through complexity, layering and operational overhead.

VSP One Block addresses this challenge by combining deterministic availability architecture, measured validation and contractual accountability. This approach reduces risk at the infrastructure layer rather than shifting it to operations teams.

As a result, organizations benefit from reduced operational risk, predictable service continuity, lower cost and complexity compared to layered availability designs. And they can be confident that availability commitments align with business-critical SLAs.



VSP One Platform Consistency

While the eight nines claim applies specifically to VSP One Block High End, the broader VSP One platform benefits from shared design principles, software consistency and operational tooling. This allows organizations to standardize a single data platform while aligning availability levels to specific workload requirements.



Take the Next Step With VSP One

Eight nines availability is not achieved through isolated technologies or contractual language alone. It requires a disciplined combination of architecture, validation, operational rigor and accountability.

With VSP One Block, Hitachi Vantara delivers a transparent, defensible approach to ultra-high availability — one that organizations can trust for their most critical data services. For those evaluating platforms for zero-tolerance environments, these principles provide a practical framework for assessing availability claims and making informed infrastructure decisions.

Evaluate VSP One for Your Most Critical Workloads

Explore detailed platform documentation to dive deeper into the VSP One capabilities and deployment models that will answer your high-availability challenges:

- VSP One Platform Overview
- VSP One Block High End Overview
- Availability Guarantees and Support Services

Get in Touch for Specifics

To see how eight nines availability can be applied in your environment, connect with a Hitachi Vantara expert to discuss architecture options, configuration considerations, and operational requirements for VSP One Block.

Contact our experts today

Learn More



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.

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