

StarWind Virtual SAN: Cost-Effective High Availability for ROBO, SMB & Edge

Executive summary

Shared storage remains one of the biggest cost and complexity drivers in virtualized environments. Traditional SANs are expensive to buy, rigid to scale, and demand specialized skills to operate. Many modern software-defined storage platforms promise simplicity but often replace hardware lock-in with licensing traps, strict hardware compatibility lists, and operational overhead that make them ill-suited for smaller environments with lean IT staff and limited budgets.

StarWind Virtual SAN (VSAN) takes a different approach. It replaces physical SAN hardware with software that turns local disks inside your servers into highly available shared storage. The result is a hyperconverged infrastructure (HCI) with predictable uptime, simplified operations, and a cost profile that works for remote and branch offices, small and mid-sized businesses, and edge deployments.

StarWind VSAN focuses on what matters most in these environments: minimal hardware footprint, true two-node high availability, transparent licensing, and 24/7/365 support that helps keep systems always running.

Gartner

★ 4.8 / 5

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The problem with traditional shared storage

Virtualization allows a single physical server to host many virtual machines. While this improves utilization, it also increases risk: when a host fails, everything on it goes down. High availability solves this by allowing workloads to move between hosts, but that requires shared storage accessible to all nodes in a cluster.

Traditional SANs solve the availability problem but introduce others:

- High capital cost for dedicated storage and networking hardware
- Complex initial setup and time-consuming ongoing management
- Vendor lock-in through proprietary components and strict hardware compatibility lists
- Poor economics for small clusters, especially two-node deployments

For SMB, ROBO, and edge scenarios, these trade-offs are often unacceptable. The infrastructure ends up overbuilt, overpriced, and significantly harder to operate compared to the workloads it supports.

How StarWind Virtual SAN solves the problem?

StarWind Virtual SAN replaces physical shared storage with a software layer that runs on your existing servers. Local disks and flash devices are pooled into a virtual shared storage system that is synchronously replicated between nodes.

From the hypervisor or application perspective, this storage behaves like a traditional SAN: shared, resilient, and always available. From an operational perspective, it removes the need for separate storage hardware entirely.

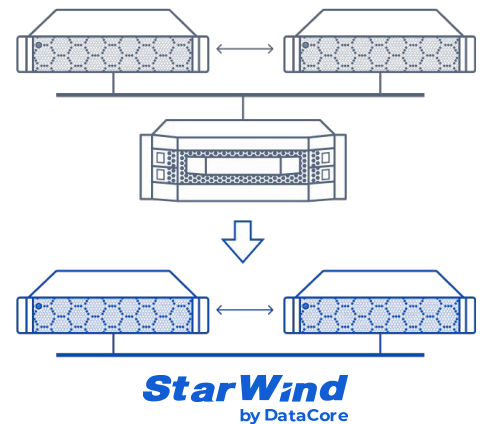
Key principles behind StarWind VSAN:

- Flexible hypervisor choice: vSphere, Hyper-V, Proxmox VE, various KVMs
- Use what you already have: standard x86 servers and commodity drives
- Keep the HCI cluster small and efficient, starting from just 2 nodes
- Eliminate single points of failure and ensure transparent workload failover through “active-active” synchronous replication between cluster nodes
- Simplify operations with modern web-UI and let StarWind engineers take care of setup and maintenance, removing burden from your IT staff

Architecture overview

At the heart of StarWind VSAN is a lightweight Linux-based virtual storage appliance that runs on each cluster node. These appliances mirror data in real time, ensuring that every write is safely stored on multiple nodes before it is acknowledged.

If one node fails, the remaining node continues serving data without interruption. When the failed node returns, data is automatically resynchronized.



The shortest path to HCI

Hyperconverged infrastructure (HCI) combines compute, storage, and networking on the same servers, simplifying deployment and operations by eliminating external storage systems (SAN/NAS). Many HCI platforms, however, require a full architectural reset, new hardware, and tightly coupled software stacks.







StarWind Virtual SAN takes a different approach. By converting local disks inside existing servers into highly available shared storage, it enables a hyperconverged architecture without forcing a platform replacement. Compute and storage are consolidated at the node level, while remaining accessible through standard protocols and familiar hypervisors.

This makes StarWind Virtual SAN the shortest path to HCI: organizations can adopt a hyperconverged model incrementally, using existing infrastructure, without redesigning their environment or committing to a closed ecosystem.

True 2-node high availability

Unlike many SDS platforms that rely on extra nodes, mandatory witness appliances, or licensed add-ons to achieve full protection, StarWind VSAN is designed for two-node clusters from the start. A built-in heartbeat mechanism with additional safeguards, and multiple customizable witness options ensure cluster quorum and prevent split-brain scenarios while keeping the cluster footprint small and predictable. Where the workload calls for stronger protection, for example, mission-critical systems or active-active deployments spanning three sites, StarWind Virtual SAN also supports 3-way synchronous mirroring. With three nodes holding identical data, the cluster maintains a natural majority and can survive the loss of any one node without an external witness.

StarWind Virtual SAN: Key features

CONSUMERS			
Applications & virtual machines running on supported hypervisors			
ACCESS METHODS			
iSCSI	NVMe-oF (TCP & RDMA)		
OPERATION & INSIGHTS	DATA SERVICES		COMMAND / CONTROL
Monitoring and Alerting	 Synchronous 2-way and 3-way mirror	 Caching	Web UI
Self-Healing and Auto-rebuild	 Transparent failover and failback	 Load balancing	Command-line shell (CLI)
Proactive support	 Encryption	 Storage pooling	PowerShell automation
STORAGE PROTOCOLS			
NVMe	iSCSI	SAS / SATA	

Storage protocols and performance

StarWind Virtual SAN provides shared storage using industry-standard protocols, making it compatible with a wide range of hypervisors and applications.

Supported access methods include:

- iSCSI over standard Ethernet for universal compatibility
- NVMe over Fabrics (TCP & RDMA) for modern all-flash infrastructures

The storage stack is optimized to extract maximum performance from commodity hardware. This allows organizations to achieve low latency and high throughput without expensive specialized controllers or proprietary networking.

Data protection and resiliency

High availability in StarWind VSAN is built on synchronous replication.

Every write is committed to multiple nodes at the same time, which delivers:

- Zero RPO: no data loss on node failure
- Zero RTO: immediate continuation of service

Additional mechanisms ensure consistency and stability:

- Node majority and witness voting to prevent split-brain
- Automatic failover and resynchronization
- Optional software RAID (MDRAID) to protect against local disk failures

Operations and management

StarWind VSAN is designed to be operated by generalist IT teams, not storage specialists. Management capabilities include: Web-based UI built into the storage appliance, centralised monitoring of storage health and performance, PowerShell and REST API for integration with existing tools and workflows.

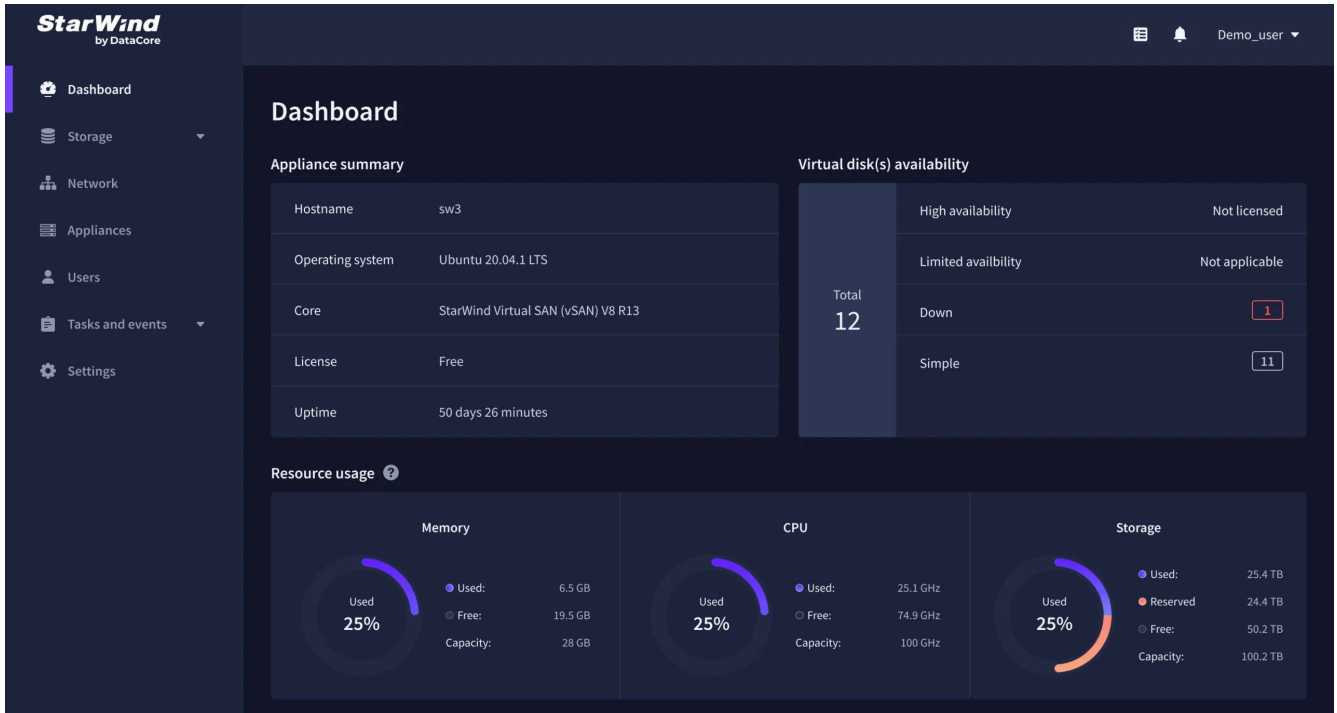


Figure 1: StarWind Virtual SAN Web UI - Dashboard

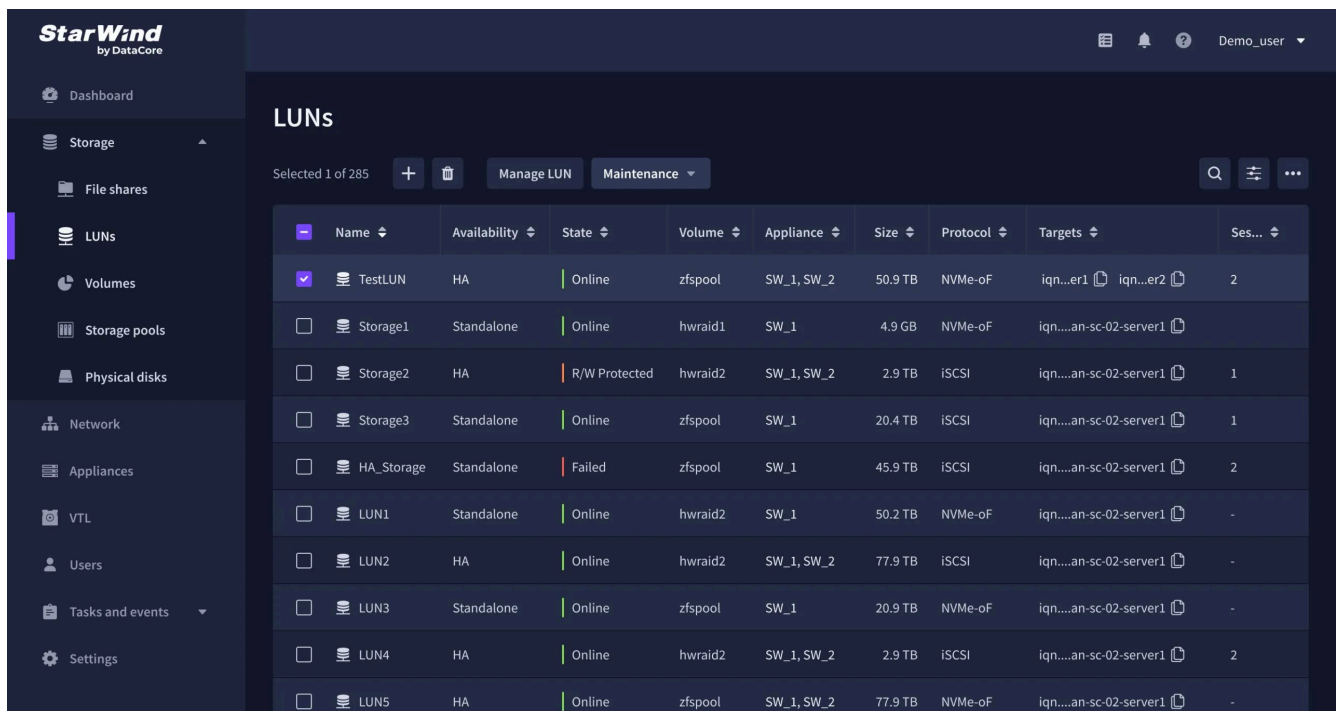


Figure 2: StarWind Virtual SAN Web UI - LUNs page

Cost model and licensing

Cost efficiency is a core design principle of StarWind Virtual SAN. The platform prioritizes availability, operational simplicity, and predictable behavior over rarely used features and artificial licensing tiers. This results in a clear, sustainable cost model aligned with real-world budget-conscious deployments.

Licensing is straightforward and transparent:

- All features are available from day one
- No limits on CPU sockets or cores
- Pricing scales with replicated capacity across nodes*

**Capacity here means storage protected by synchronous mirroring across nodes, not just raw disk capacity.*

By removing the need for external SAN hardware and minimizing cluster size, StarWind VSAN significantly reduces both capital and operational expenses.

More than just support

StarWind treats technical support as an integral part of the product, not an optional add-on. This approach is reflected in consistent feedback from real-world customers across independent peer review platforms and established technical community forums.

Every StarWind deployment includes:

- Assisted setup by StarWind engineers at no extra cost
- Responsive technical support through a direct ticketing system

For environments that require extra peace of mind, ProActive Premium Support adds continuous system monitoring, early issue detection, and rapid incident response.

The goal is simple: keep systems running 24/7/365 and reduce the operational burden on internal IT teams.

Primary use cases

Edge and ROBO deployments

Designed for compact and resource-constrained locations, StarWind Virtual SAN delivers full high availability with just two nodes. Guided deployment and optional proactive support make it practical to run resilient workloads without local storage expertise.

Small and medium business infrastructure

StarWind Virtual SAN provides shared, highly available storage for SMBs without the cost or complexity of traditional SANs. Standard servers and local disks replace dedicated storage hardware, keeping operations simple and predictable.

Hardware modernization and SAN replacement

Existing servers and disks can be reused to build a shared storage layer, extending hardware life and simplifying refresh cycles. Organizations get the functional benefits of a SAN without introducing new expensive storage platforms.

High availability and operational continuity

Synchronous replication between nodes ensures continuous availability during maintenance or unplanned failures. Workloads remain online 24/7/365 without manual intervention or complex recovery processes.

Foundation for hyperconverged infrastructure

StarWind Virtual SAN forms the storage foundation for flexible hyperconverged architectures built on existing hardware and preferred hypervisors. It enables an incremental move to HCI without a full platform rebuild.

Cost-focused infrastructure optimization

By eliminating physical shared storage and dramatically simplifying support and operations, StarWind Virtual SAN significantly reduces infrastructure overhead while maintaining predictable performance and availability.

Conclusion


StarWind Virtual SAN delivers shared storage without the baggage of traditional SANs or overengineered SDS platforms. By focusing on 2-node efficiency, hardware and hypervisor freedom, and exceptional operational simplicity, it provides a practical path to high availability for environments where cost, space, and staffing matter.

For organizations that want predictable uptime, clear licensing, and storage that works quietly in the background, StarWind VSAN offers a straightforward alternative to both legacy SANs and heavyweight hyperconverged stacks.

Got questions?

Whether you're just starting your virtualization journey or fine-tuning the final solution, our team of experts is here to assist you. From project planning to addressing your technical questions, we are always ready to help.

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