# StarWind Virtual SAN®

Value Proposition

For SMB, ROBO, Cloud and Hosting providers, who look to cut down virtualization expenses, our solution is StarWind Virtual SAN. It is software that eliminates any need in physical shared storage by basically "mirroring" internal hard disks and flash between hypervisor servers. There is less hardware to buy in general, consequently less money is spent on purchase and maintenance. The existing hardware is used with maximum efficiency, so there is no money wasted at all.

StarWind Virtual SAN targets those who already have servers, or are bound to a particular vendor list to buy from. In case there is a new virtualization infrastructure to be built from scratch, StarWind offers a much better way – StarWind HyperConverged Appliance. It is a turnkey solution complete with hardware and software, powered by StarWind Virtual SAN. Those who need to build and maintain virtualization infrastructure at little to no expense, may be interested in StarWind Virtual SAN Free.
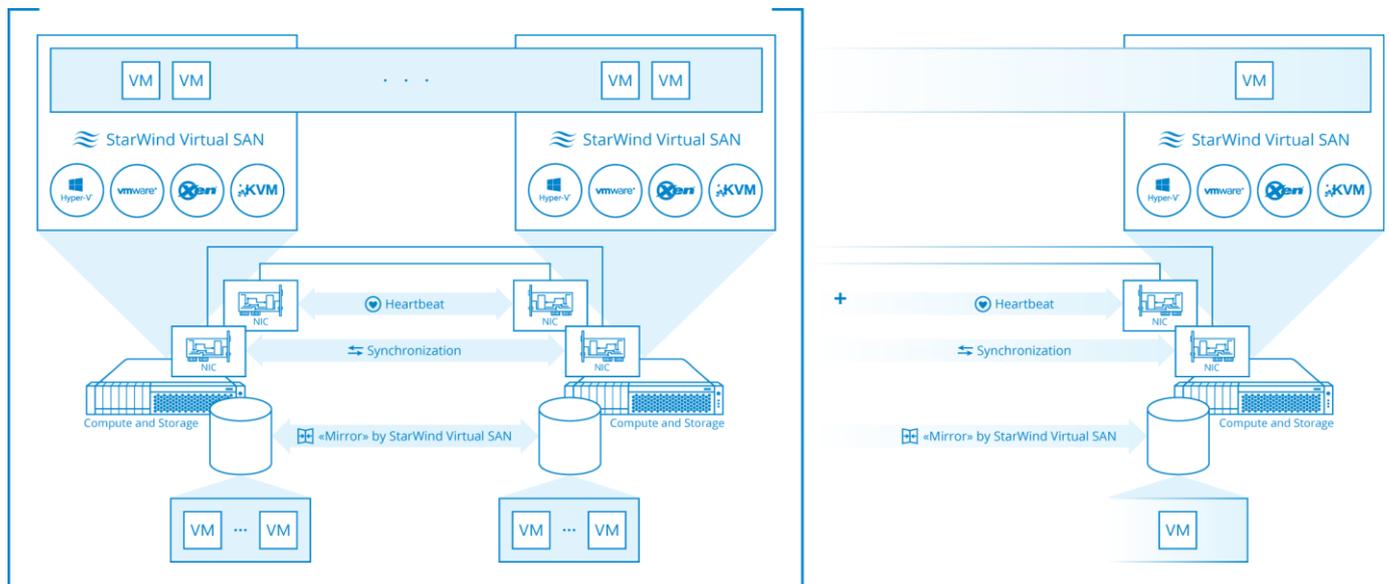
Hyperconverged architecture and scale-out

Differentiation

Unlike similar Software-Defined Storage solutions, ours is generally easier to manage, costs less and offers higher performance and more features. StarWind VSAN has a simple starting setup of just two nodes without the need for voting or quorum facilities and is exceptionally easy to operate. It cuts down the cost by requiring less hardware: no switches, no mandatory flash, no 10GbE and fewer servers.

StarWind VSAN needs only two licensed nodes to handle an infrastructure of as many nodes as needed. The basic configuration supports many features unavailable in most similar solutions, such as asynchronous replication, in-line and offline deduplication, Log-Structuring, multi-tiered RAM and flash cache, etc.

Unlike traditional hardware storage appliances, our solution is not hardware-bound, easier to operate, less expensive and better performing. StarWind VSAN supports converged scenario and can also go hyperconverged on top of existing hypervisor servers. It runs on inexpensive commercial off-the-shelf hardware that can be purchased in the nearest PC store, causing no hardware lock-in. Licenses are perpetual, so they will never expire and cause additional expenses in the long run for renewal. StarWind VSAN employs a number of technologies to handle virtualization workload with maximum efficiency: in-line and offline deduplication, Log-Structuring, multi-tiered RAM and flash cache, etc.

Unlike open source solutions of similar purpose, ours is completely in-house developed, with every feature accounted for. It is a simple native Windows application and a proven reliable production platform. StarWind VSAN is supported by StarWind and is eligible for Microsoft and VMware support services as well.

Full differentiation of StarWind Virtual SAN against competitors can be found [here](#).

Benefits

Exceptional Simplicity

Simplicity is a key feature. StarWind Virtual SAN runs as a native hypervisor component or in VM, and it does not require any deep storage and network administration or UNIX management skills. A typical system administrator with minimal experience in Hyper-V, VMware or Windows can install, configure and maintain VSAN operations.

Low Cost

StarWind Virtual SAN cuts the cost at least in half, meaning both Operational and Capital Expenditures. It eliminates the actual physical shared storage, corresponding infrastructure, as well as associated deployment and maintenance activities. StarWind VSAN works on commodity components, so there is not only less hardware to purchase and maintain, but also the required hardware is inexpensive.

High Performance

Performance is uncompromised by the minimalistic hardware footprint, reduced deployment and management costs. StarWind Virtual SAN brings to the table server-side flash and memory caches, log-structuring and an absolutely minimalistic I/O path. The resulting performance is unmatched by either typical virtual appliances or physical shared storage.

Features

Unified Storage – Multiple Uplink Protocols

StarWind Virtual SAN utilizes industry-standard communication protocols, working with almost all virtual environments and technologies. It exposes: SMB3 with dialect features, like SMB Direct and SMB Multichannel, NFSv4.1 and iSCSI, including VVOLs on iSCSI, NVMe over Fabrics and iSER coming soon. Thus, StarWind Virtual SAN can merge any virtual environments with any consumers and offer limitless usage scenarios. The typical are: bare-metal, converged ("compute and storage separated"), hyperconverged, Clustered Shared Volumes for SOFS, VVOLs on top of iSCSI, SMB3 file server, etc.

HyperConverged

Virtual SAN is a natural part of the hypervisor. The result is both outstanding performance and unified administration using hypervisor-specific management tools. VSAN "gets the job done" with all major virtualization platforms running on Hyper-V and Windows as a native application and on vSphere or Xen nested inside a VM. Non-virtualized clusters typically deployed for performance-intensive SQL Server and Exchange installations are also fully supported.
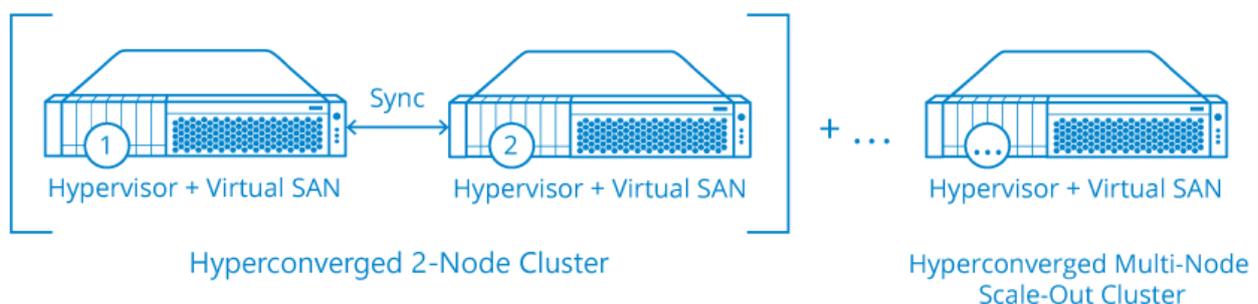
StarWind Virtual SAN hyperconverged architecture

Converged (Compute and Storage Separated)

StarWind Virtual SAN can also run on a dedicated set of hosts creating a separated storage layer being used by consumers. Though a hyper-converged scenario is an industry trend now, the differentiation of compute and storage layers makes sense if there is need to grow by capacity only. Typical use cases are shared storage for huge clustered SQL Server, Oracle, SAP, NoSQL deployments and an inexpensive block back-end for Scale-Out File Servers.
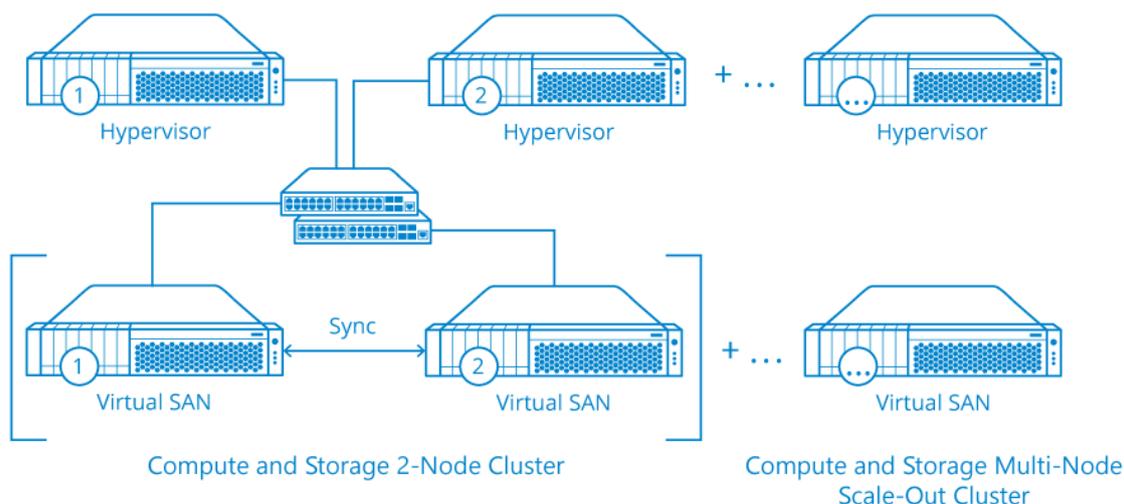
StarWind Virtual SAN compute and storage separated architecture

VM-Centric Storage and StarWind Log-Structured File System (LSFS)

Virtual SAN provisions and manages storage with VM workload in mind. General-purpose storage arrays are usually the best candidates to serve hypervisors. VSAN uses Log-Structured File System and sophisticated caching in order to avoid as much of a random I/O dominating VM world as possible but still without deploying extremely expensive and cost-inefficient all-flash model.

Server-Side Cache

Virtual SAN reduces I/O latency and eliminates much of the network traffic to an absolute minimum by utilizing distributed RAM and flash-based caches. Performance is drastically improved. Caches are kept coherent between multiple hosts so that a lightning-fast write back policy is safe and achievable with commodity hardware.

Fault Tolerance and High Availability

Virtual SAN basically "mirrors" the actual storage and caches between the given numbers of hosts creating a fault-tolerant storage pool. It is completely up to the system administrator as to how many replicas of a particular VM or LUN are kept alive and how many active storage controllers a cluster should use. Individual disks, memory modules, whole compute and storage hosts can fail but uptime is never compromised.

Scale-Up and Scale-Out

StarWind Virtual SAN flexibly adopts both Scale-Up and Scale-Out architectures. Capacity can be increased by simply throwing more spindles into the existing storage cluster node. Bringing in a new host with its own CPU, RAM and internal storage can scale storage capacity, I/O performance and VM number crunching facilities out.

Hardware Agnostic and Commodity Hardware

StarWind Virtual SAN utilizes inexpensive commodity hardware. "Magic" happens with the help of proprietary in-house developed software and general-purpose x64 servers, MLC flash, spinning disks and Ethernet. VSAN can definitely take care of higher-performing SAS, more reliable SLC flash and a faster 10 and 25/50/100 GbE network but all of that "higher league" gear is fully optional. For those, who do not have time for Do-It-Yourself "tinkering", StarWind offers exceptionally well-configured turnkey "ready nodes", called StarWind HCA. They are pre-built on best of breed commodity hardware, pre-tested by StarWind engineers and are shipped ready for work.

Asynchronous Replication

Virtual SAN comes with an effective mechanism to ensure that the mission-critical business data is replicated to a disaster recovery site, following the "3-2-1 backup rule". Replication is implemented to be asynchronous, background, deduplication, and compression-aware as well as snapshot-based. Primary I/O operations do not suffer from leaned resources and WAN channel requirements being sparse. StarWind also allows the use of public or private cloud as the remote site for asynchronous replication. In addition, StarWind VSAN supports asynchronous replication to private and public cloud, such as Azure. With enabled "geo-clustering" Azure can serve as a resilient remote DR site.

Snapshots and Automated Storage Tiering

StarWind Virtual SAN implements inter-node tiering technology to offload cold data such as snapshots from fast and expensive primary storage to slower but inexpensive secondary storage. The combined result allows the use of a much smaller amount of flash as primary tier with cheap spindles as a secondary tier.

Deduplication and Compression

StarWind Virtual SAN implements VM and flash-friendly space reduction technologies such as in-line deduplication and compression. The result increases usable capacity of all-flash configurations, boosts I/O performance as more data can be pinpointed to now virtually "bigger" deduplicated caches and also prolongs flash life since the amount of write operations is dramatically reduced.

Virtual Storage Appliance

Special version of StarWind Virtual SAN, promptly deployed from a pre-configured VMware and Hyper-V compatible VM appliance installs on existing hardware shared with hypervisor automatically without any manual adjustments, requiring no specialized knowledge from the IT team. This version is testing-ready, but being VM-based it will need some tinkering from StarWind engineers for a clearer performance evaluation.

Virtual Tape Library (VTL)

StarWind VSAN does VTL allowing the use of a fast spinning disks to emulate traditional physical tape drives, auto-loaders and libraries. The demand on this technology is driven by the fact that tape drives are very relevant, cost-effective and designed to store data for a long period of time. Lots of companies fall under regulatory requirements insisting on tapes with company data being vaulted. Virtual Tape Library allows seamless integration into existing backup infrastructure without the need to break it up. Disk-to-Disk-to-Tape backup provides a smaller backup window compared to traditional Disk-to-Tape scenario and gives better reliability because an intermediary copy of all backup data is stored in an extra location which is a spinning disk.

In 2016, Gartner named StarWind "Cool Vendor for Compute Platforms".

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