StarWind® Storage Appliance

Value Proposition

For SMBs and Enterprises who are looking for high performance primary storage for server virtualization, VDI, database and Big Data scenarios, or inexpensive secondary backup tier, our solution is StarWind Storage Appliance. It unifies commodity servers, disks and flash, and associated software into an easily scalable storage platform.

Additionally, the appliance features an optional gateway to Azure public cloud, which helps to implement an effective Disaster Recovery plan or meet regulatory requirements. StarWind SA scales up by adding individual disks and flash modules, or JBODs, while adding ready controller nodes allows scaling out.

StarWind SA targets those, who need of high-performance primary storage or secondary storage for backup. In case there is a whole virtualization infrastructure to build from scratch, StarWind HCA will come in handy. Otherwise, if all the required hardware is present, StarWind Virtual SAN will be enough to build a high-performance virtualization setup.

Differentiation

Unlike storage vendors who utilize the classic approach, where application servers handle all the workload, we implement an open, software-modular design at storage controller level, taking care of data locality and offloading much I/O from network and application servers. StarWind Storage Appliance is fully customizable and expandable, while accepting third-party application modules as Windows services, containers or VMs on top of storage. Results data mining, analytics or just raw data processing applications run where their working data set actually dwells – in the controller. Thus, they skip network switched fabric layer completely, dramatically improving performance. StarWind SA provides exceptional management simplicity, enforced data security and highest possible performance. Moreover, StarWind SA needs neither external backup nor antivirus software. They both come preinstalled right on top of our storage platform being a good example of us using our own storage appliance customization feature. Customer is free from purchasing, installing and managing some of the business critical applications because it's now part of his storage array routine job. Less software to purchase, less components to manage, better overall performance all come as a set of gains

Unlike storage vendors, who utilize one or two uplink protocols, our solution inherits the multi-protocol unified storage feature of StarWind VSAN. StarWind SA supports industry standard fabrics like 1 and 10 GbE and application protocols like NFS, CIFS and iSCSI. We also add 25/50/100 Gb Ethernet and InfiniBand, VVOLS, RDMA capable SMB3 and iSER together with "cutting edge" NVMe over Fabrics.

We make sure we are squeezing out and delivering to consumer all possible IOPS and TBPS the underlying storage and network hardware is capable of.

Unlike typical storage platforms, StarWind Storage Appliance can benefit from hyperconverged architecture by being a capacity extension for StarWind HCA. It offers much freedom in configuration and customization of the IT infrastructure to meet the business requirements precisely without overprovisioning and overpaying. Besides, merging high-performance SA with StarWind HyperConverged Platform creates a setup of exceptional efficiency and reliability, because the Storage Appliance offloads much I/O from the already effective HCA.

Benefits

Exceptional Simplicity

StarWind Storage Appliance is designed to serve storage to various consumers, including different virtualization environments. It achieves this due to excellent connectivity and support of industry-standard uplink protocols. Little to no effort is required from on-site IT team to attach StarWind SA to any existing infrastructure. Besides, there is one point of support for the appliance as a whole.

Low Cost

StarWind HyperConverged Appliance is a ready storage solution that costs less than all the components would, if bought separately. Also, there is less hardware to purchase and maintain, because Storage Appliance inherits StarWind VSAN feature that allows it to utilize less hardware for the same workload. Besides, general models only include commodity components and no expensive proprietary hardware.

Performance and Features

StarWind HyperConverged Appliance is built with "best-of-breed" components – industry-leading software to squeeze maximum out of top-of-the-line hardware. It can run various applications, including antivirus, backup and management on top of the storage, offloading much of the I/O from the compute cluster. In addition, StarWind SA utilizes most of the features of StarWind Virtual SAN.

Features

HyperConverged

StarWind Storage Appliance is purpose-built as a storage separate from the compute cluster, and yet it can offer some benefits of hyperconvergence. The Storage Appliance can run various applications on the storage platform, including antivirus, backup, management, etc. As a result, StarWind SA minimizes data path, offloads much I/O from the compute cluster to the storage, boosting performance and removing all unnecessary wire interaction and consequent performance issues. In addition, it can serve as a capacity extension for a cluster based on StarWind HyperConverged Appliance, when there is no need to scale compute power.

Converged ("Compute and Storage separated")

StarWind SA is designed for "classic" converged (compute and storage separated) scenario, segregating storage from the main platform. It interacts with consumer infrastructure (virtualization, database servers, etc.) with ease, using industry-standard uplink protocols – iSCSI, SMB3, NFS, VVOLs on iSCSI, NVMe over Fabrics, iSER (coming soon), and fabrics – Ethernet, InfiniBand, SAS and SATA. Utilizing converged architecture, StarWind SA allows to scale compute and storage resources independently from each other.

Unified Storage – Multi-Protocol

StarWind SA can serve storage to various consumers, because it exposes industry-standard uplink protocols and physical connectivity. As for fabrics, StarWind SA supports the standard 1 and 10 GbE, as well as 25/50/100 GbE and InfiniBand. The protocols go as follows: SMB3 with dialect features, including RDMA-supporting SMB Direct and MPIO-utilizing SMB Multichannel, NFSv4.1 and iSCSI, VVOLs on iSCSI, innovative NVMe over Fabrics and iSER coming soon. StarWind SA offers significant versatility, being able to become a part of almost any architecture or virtual environment.

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

StarWind SA was created to handle database, Big Data and virtualization workload properly and avoid any performance degradation. To achieve that, it uses in-house developed technologies, such as Log-Structured File System. LSFS is designed to minimize the impact of random I/O, which dominates virtualization space. Basically, it makes small random writes into big sequential pages, getting better performance from HDD and avoiding other issues typically associated with virtualization workload. Being aware of the log-on-log issue, StarWind SA has it take care of.

Server-Side Cache

StarWind SA keeps performance high with the help of cost-efficient and reliable distributed multi-tiered RAM and flash caching. Converged architecture implies multiple layers of caches: server-side cache on the compute layer and storage cache. The former can be provided by StarWind HCA, StarWind VSAN, some OS component or third-party software. The latter resides on StarWind SA, provided by the built-in StarWind VSAN. StarWind SA uses flash for level 2 caching, rerouting all write-intensive I/O to level 1, where RAM is utilized. In addition, the caches are deduplicated and kept coherent between the nodes or controllers, adding to overall space-efficiency and reliability.

Fault Tolerance (FT) and High Availability (HA)

StarWind SA minimizes downtime by utilizing synchronous 2-way or 3-way replication, achieving 99.99% and 99.9999% uptime respectively. It basically "mirrors" data and caches between the nodes, achieving fault-tolerance of the entire storage pool, eliminating any single point of failure and minimizing downtime. Basically, StarWind builds a "grid", taking care of data locality and foregoing wide striping, so it's immune to classic fault-tolerance issues. With StarWind SA, the virtual environment will withstand failure of disks and even cluster nodes without compromising uptime.

Scale-Up and Scale-Out

StarWind SA can scale up and out to precisely meet business requirements without unnecessary expensive overprovisioning. Adding individual disks and flash modules to the storage node will increase storage capacity, as well as adding CPU-less JBOD shelves. Adding ready controller nodes will increase capacity and performance, bringing in more usable space, more I/O paths, more cache memory, increased bandwidth, higher controller and storage redundancy level. Thus, StarWind SA ensures money savings, because it allows to spend exactly as much as needed for the current workload, without the typical overpaying for overprovisioned setups.

Hardware Agnostic and Commodity Hardware

StarWind SA is based on commercial off-the-shelf servers and cost-efficient conventional components. There is no uber-expensive proprietary stuff utilized for primary functionality: no deduplication FPGAs, no ASICs, no modified MIPS firmware 64-bit CPUs, overpriced write-back cache NVRAM etc. The only exceptions are the special cases, where hardware firewall functionality and SAS and SATA uplinks to server are required. In addition, StarWind Storage Appliance bundles all the components together with support and costs less for consumer than they would if bought separately.

Asynchronous Replication

StarWind SA supports asynchronous replication and utilizes an industry-leading backup solution from Veeam, which is included in the appliance. It can replicate entire storage pools or individual objects, like virtual machines and files. Thus, it ensures the safety of stored data and minimizes the risk of data corruption in case of critical failures and disasters. StarWind SA also supports the utilization of Azure public cloud, or private cloud built with Microsoft Azure Stack, as DR site, allowing the deployment of backup to geographically-remote location without any additional troubles.

Snapshots and Automated Storage Tiering

StarWind SA goes well the 3-2-1 backup rule: 3 copies of data in 2 formats and 1 on a remote site, utilizing snapshots and asynchronous replication. It also employs a principle called "inter-node tiering", which offloads rarely-used "cold" data to inexpensive and slower secondary storage tier, preserving faster controller node for "hot" data, in other words – data which is used more often. This principle leads to better cost-efficiency, because there is no need to replicate the same hardware configuration between all the controller nodes, maintain two-way data migration path. As a result, there is less CPU usage and more IOPS for the whole storage cluster itself.

Deduplication and Compression

StarWind SA is efficient in conserving disk space, thanks to space reduction technologies of StarWind Virtual SAN, especially when it comes to petabytes of data and all-flash appliances, where capacity is extremely expensive. Deduplication and compression ensure better performance and capacity utilization, dramatically reducing the actual amount of data to transfer and process. Thus, StarWind Storage Appliance can cope with significantly more data than its raw capacity is. In addition to its own in-line deduplication, which is good for running VMs, StarWind SA can use third-party offline deduplication, for example – Windows built-in feature, which is less resource-critical and better for cold, rarely accessed data, like backup.

Virtual Storage Appliance

StarWind SA is built with the help of StarWind VSAN, so in order to promptly evaluate its capabilities, there is a specialized version of StarWind Virtual SAN designed to deploy from a pre-configured VMware or Hyper-V compatible VM appliance. With a suitable hardware set and the "Virtual Storage Appliance" application installed bare-metal, it is possible to emulate StarWind SA in a matter of minutes, without having to order the whole physical appliance for evaluation. Being the base of SA, StarWind VSAN is provides all the features of the appliance, once installed on similar hardware. For performance tests, it is highly recommended to consult our engineers for "fine tuning" to emulate the real appliance precisely.

Virtual Tape Library (VTL)

StarWind SA uses basically the same hardware and core software as StarWind VTL. Obviously, it is reasonable to get the latter appliance to build a virtual tape library, but in case it is necessary, StarWind SA may run the Virtual Tape Library as well. It will accelerate backup process, using SAS HDD to emulate tape hardware and sophisticated RAM and flash caching to achieve high performance. As a result, backup process fits into designated time window and doesn't overlap with production time and cause performance degradation.

Models

StarWind Storage Appliance comes in three models, each designed for a particular task.

SA 130

SA 130 is a high-capacity storage platform for the tasks, where capacity and cost efficiency are much more desirable than uptime. It is designed for sequential workloads: backups, archives, file storing, vaulting, etc. SA 130 features the built-in offline deduplication for better storage utilization, simple capacity management. The platform provides flexible scalability, in order to meet task requirements precisely. Basically, SA 130 provides a backup storage limited only by physical capacity of server racks. The family includes the high-capacity SA 130D and flash-accelerated SA 130H.

SA 230

SA 230 is a dual-array Fault-Tolerant scale-out storage platform. It is designed for performance-hungry workloads, where cost-efficiency and uptime are equally required: server virtualization and file storage, fault-tolerant backup, SQL and Oracle databases, VDI deployments, and dense virtualization storage. SA 230 features embedded cross-array replication, that basically mirrors data synchronously between the arrays, even if they are geographically distant. The model family includes SA 230D – the entry-level HA storage, and SA 230H – storage designed for more IO-intensive wokloads.

SA 330

SA 330 is an all-flash storage with an extra level of fault-tolerance, achieved by 3-way all-active synchronous replication. It is designed for maximum uptime and performance, and provide all-flash performance with much less flash than typical setups do. The primary data is pinned to flash storage, while live copies of the data, including cold data, reside on failover write-accelerated nodes. SA330 always keeps 3 live copies of the data for maximum redundancy. The model family includes SA 330F with 1 primary and 2 failover nodes, and SA 330RF, featuring 2 primary and 1 failover nodes.

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