

OUTDATED



THE REVOLUTIONARY SOLUTION

STARWIND NATIVE SAN FOR HYPER-V

TECHNICAL BENEFITS

Two-Node Configuration

We are proud to introduce the revolutionary StarWind two-node configuration for the Hyper-V environment!

COST ADVANTAGE – TWO NODES INSTEAD OF FOUR

You need only two things in order to create a true high availability cluster: the StarWind software and TWO Hyper-V servers. That's it! In contrast to the SAN solutions from the other vendors that require four nodes to provide the same level of reliability and fault-tolerance, StarWind achieves these goals with two nodes and delivers enterprise-level performance and rock-solid stability at the price reduced by half.

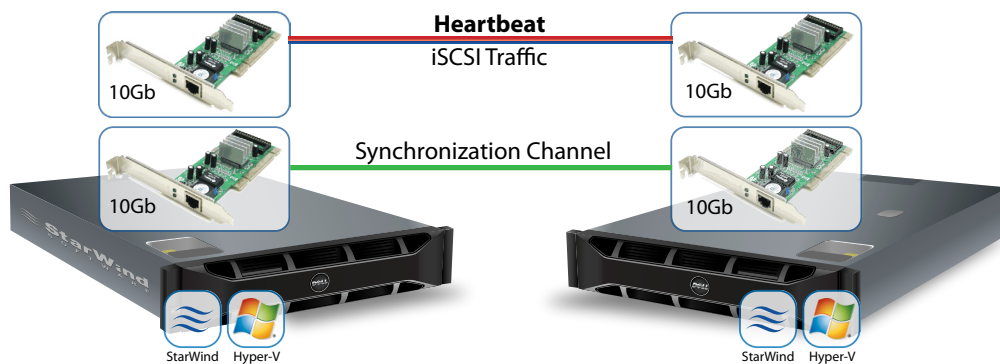


Diagram 1: Two-node SAN configuration for Hyper-V

With StarWind Native SAN for Hyper-V there is no need for additional servers, cabling and networking and you don't need extra Windows licenses. StarWind is native Windows application and it can run alongside with Hyper-V on the same physical server. This ability differentiates it from both hardware SANs and *NIX-based software SANs developed by the other vendors. As a result, StarWind requires only half of the expected hardware thus drastically increasing your ROI.

The table below provides the estimates of your SAN expenses and illustrates the obvious cost savings in comparison to the Classic SAN.

	Classic SAN	StarWind Native SAN
Hardware	\$15600	\$7800
Software	\$13700	\$11850
Network Expenses	\$8000	\$3000
IT labor (annual)	\$3120	\$1560
Maintenance (Electricity per year)	\$2649	\$1275
Grand Total	\$43069	\$25485

Table 1: Comparison of expenses for Classic SAN and StarWind Native SAN for Hyper-V

SPEED OF DATA TRANSFER

Since StarWind operates on the same server where Hyper-V software is installed, it doesn't need to redirect all I/O requests to another node over network. All read/write operations are performed to and from DAS. Thus, no network request is required for the read operation, and only one data transfer and one acknowledgement packet are required for the write operation.

Comparing to the other SAN solutions, StarWind software delivers much faster reads and at least two times faster writes using the same hardware.

ACTIVE-ACTIVE MODE ADVANTAGE

In StarWind Native SAN for Hyper-V we created fully symmetric High Availability using active-active model. Now forget about the out-of-date active-passive scenario! Our solution leaves behind servers in standby, poor resource utilization, unguaranteed switch time between nodes and low performance due to constant replication of all processes to the standby server.

Both cluster nodes working in the active-active mode, process the I/O requests simultaneously thus eliminating possibility of downtime for node switch.

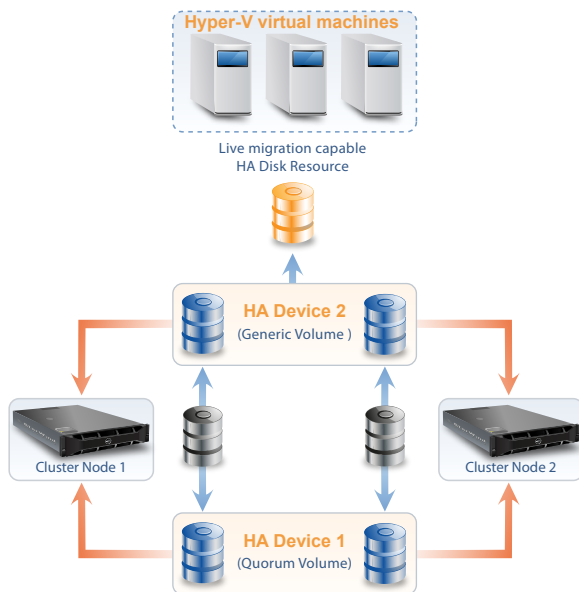


Diagram 2: Two-node configuration of active-active storage cluster

High Availability

StarWind High Availability makes use of Automatic Failover and

Failback technology ensuring that the Storage Area Network is available in case of a cluster node's failure. This makes your StarWind storage really highly-reliable and fault-tolerant.

In StarWind HA Active-Active Failover system data is load balanced across each node. If one node fails all storage traffic is automatically directed to another cluster node, thus ensuring continuous availability of data, applications, and services.

StarWind Native SAN supports the "Heartbeat" feature used by both nodes for constant monitoring each other and automatic failover in case of a failure without any assistance from the side of an administrator.

Data Deduplication

i Do you know that the virtual machines images stored on a SAN usually have an information overlap of about 20-30%? It means literally that the more VMs you have, the more duplicated information you store.

StarWind Native SAN is "equipped" with built-in Deduplication technology. Only unique data blocks are written to the storage disk, which allows you to considerably reduce your storage requirements. In such a way, just 2 TB of disk space that the usual Hyper-V server disposes of, can store 40-60 TB of VM images.

When this technology is used cache stores the deduplicated data, thus making it possible to effectively increase the size of cached data of a user. Consequently, 2 GB of RAM usually allocated for cache can be used as effectively as 40-60 GB because they keep only one unique instance of data and multiple references to it.

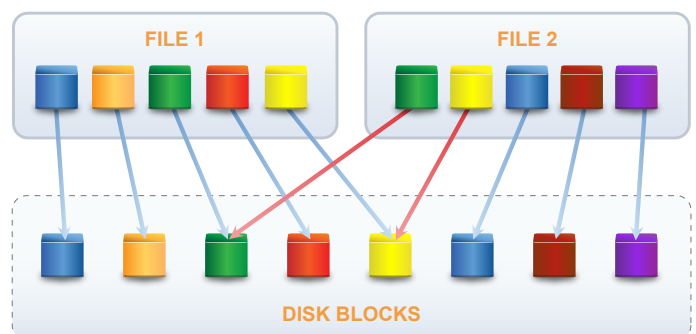


Diagram 3: StarWind variable-block Data Deduplication

Another apparent benefit you get with StarWind Deduplication is high running speed, which permits to process data blocks rapidly and effectively. StarWind uses the server's main memory as a level-one cache thus accelerating disk I/O and reducing access latency and response time.

With StarWind Deduplication you define the length of data blocks taken for analysis according to your needs. Data Deduplication is performed in-line: data analysis, hash-counting and comparison with index take place during the data transfer from client to target.

The benefits of StarWind Data Deduplication:

- Reduced storage requirements
- Saved disk space
- Improved bandwidth efficiency
- No data redundancy
- Rapid data processing
- Possibility to define block size depending on needs

Thin Provisioning

With this enterprise-class feature you get a powerful instrument which allows you to utilize your disk space in the most efficient way. Thanks to Thin Provisioning you purchase the space that is really required at the moment and that you are ready to use right now. Further, with the growth of data, you can easily add as much space as the storage demands without anyhow affecting the system's performance. Here the StarWind's support of Hot swap is really helpful.

With StarWind Thin Provisioning you pay only for the storage that you actually use without over-provisioning for the future. Over-provisioning usually results in the space left unused and demanding resources for serving it. Thin Provisioning allows you to avoid this money- and resource-consuming aspect.

StarWind Thin Provisioning allows you to:

- Purchase storage that is really necessary at the moment, not in advance
- Do more with less storage, increasing flexibility
- Raise utilization, efficiency, and ROI
- Take advantage of constantly falling price per gigabyte
- Reduce energy consumption and carbon footprint

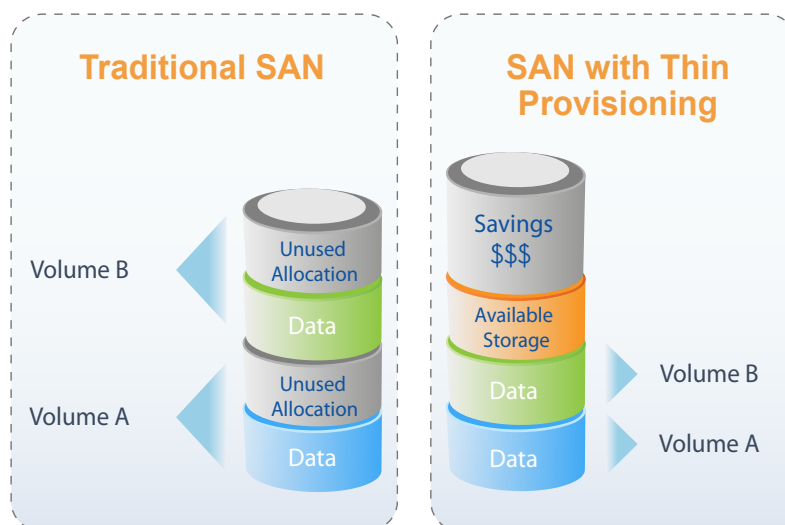


Diagram 4: StarWind Thin Provisioning

Asynchronous Replication

This magic feature plays a major role in any Disaster Recovery Plan and is important for off-site data protection and business continuity. Using Asynchronous Replication you can create a DR site and place there the mirror copy of your storage data. This site can be located in any place of our planet, thus eliminating the possibility of data loss should technical failure or natural disaster occur. If there is any problem, you will easily get the recent copy of your data with the maximum possible RTO and with near to zero downtime.

This powerful feature guarantees availability and safety of the storage data even in case of a disaster.

StarWind Asynchronous Replication allows you to:

- Replicate data off-site to a remote location over WAN using standard IP/Internet
- Ensure almost zero data loss in case of failure or disaster
- Create a robust Disaster Recovery plan
- Ensure Business Continuity and fail-safe data protection

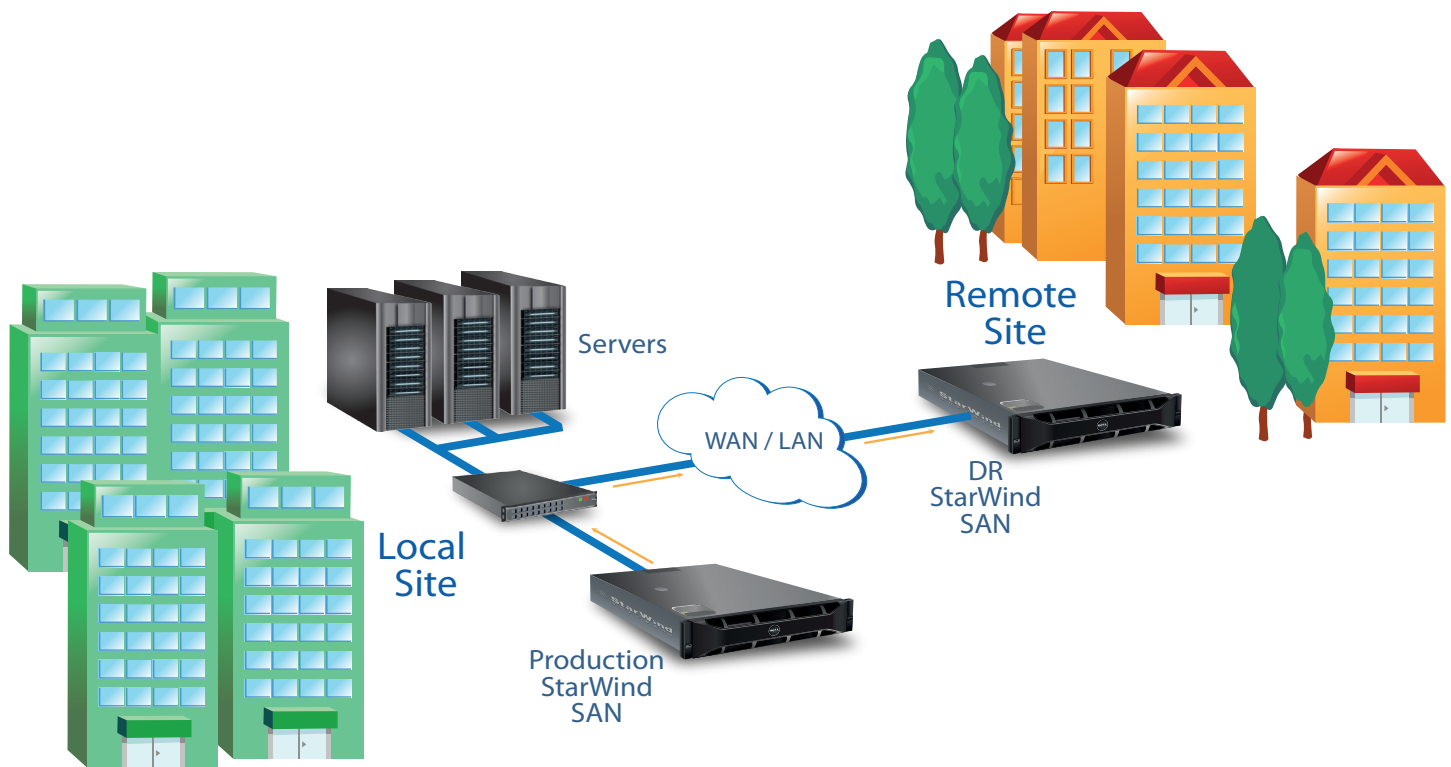


Diagram 5: StarWind Asynchronous Replication

BUSINESS BENEFITS

Now when you are aware of the technical might of StarWind Native SAN for Hyper-V we are ready to present the numerous business benefits that the solution provides.

BUSINESS CONTINUITY

The storage you build with StarWind offers reliability that you can definitely rely on. The two-node configuration provides zero downtime ensuring that the system will be up and running even in case of a failure. With StarWind SAN you get availability of the stored data, applications and services, thus making the business invulnerable to most of well-known problems that may possibly occur in any storage infrastructure.

CREATION OF GREEN IT INFRASTRUCTURE

Since only two servers are used in the two-node StarWind Native SAN configuration, your bills for electricity will be considerably lower as well as less heating power will be required for your storage. The two-node configuration helps you utilize your storage resources really effectively avoiding the waste of hardware in standby.



Do you know that just using two servers instead of four is equal to removing 8 tons of carbon dioxide from the environment or taking 3 cars off the road annually?!

REDUCED TOTAL COST OF OWNERSHIP (TCO)

- StarWind SAN is based on the existing infrastructure and allows you to avoid expenses on the additional hardware.
- High-Availability SAN can be built using only TWO existing Hyper-V servers, thus saving money on cabling, servers, and network, and requiring only half of the sum that would usually be required for creation of High Availability storage.

COST SAVINGS ON CAPITAL AND OPERATING EXPENSES

- Reduce CapEx through consolidation
- Reduce OpEx through automation
- Minimize lost revenue due to zero downtime

REDUCTION OF YOUR HARDWARE REQUIREMENTS AND SAVINGS ASSOCIATED WITH IT

- Increase utilization efficiency of the existing hardware by 5-15% up to 80%
- Achieve 20-30% lower cost-per-tion of application
- Reduce annual IT labor costs by more than 50%
- Reduce hardware requirements by 10:1

LOWER COSTS OF MAINTENANCE

StarWind Native SAN for Hyper-V requires zero downtime for server maintenance of:

- Hardware updates
- Updates / patches to the hypervisor
- Migration to newer servers

With StarWind you avoid overtime cost for maintenance and avoid administrative time in scheduling downtime.

USER BENEFITS

You will definitely find our solution friendly and attractive because of:

USER-FRIENDLY INTERFACE

StarWind GUI is intuitively understandable for anyone familiar with Microsoft Windows OS.

FAST AND EASY-TO-USE

With StarWind you can easily build your own SAN within several minutes turning any server into a high-performance reliable storage.

SINGLE MANAGEMENT CONSOLE

Single Management Console allows you to set up and manage your storage from the one window.

QUALIFIED TECHNICAL SUPPORT

StarWind provides technical support on the [24/7/365](#) basis. Our support engineers are highly-qualified specialists ready to provide you with any assistance and help required for your storage to run smoothly.

NO NEED FOR ADDITIONAL TRAINING

StarWind Native SAN for Hyper-V installs on the industry-standard servers and is based on the iSCSI protocol. There is no necessity to purchase additional servers, switches, and cabling in order to deploy Storage Area Network. In your server room there is everything you need for the high-availability storage. With the StarWind solution you utilize the hardware that you are familiar with and software that can be intuitively used by your administrators experienced in Microsoft Windows. Therefore, there is no need in any additional knowledge or trainings, which consequently lessens the initial expenses on creation and setup of a new shared storage.

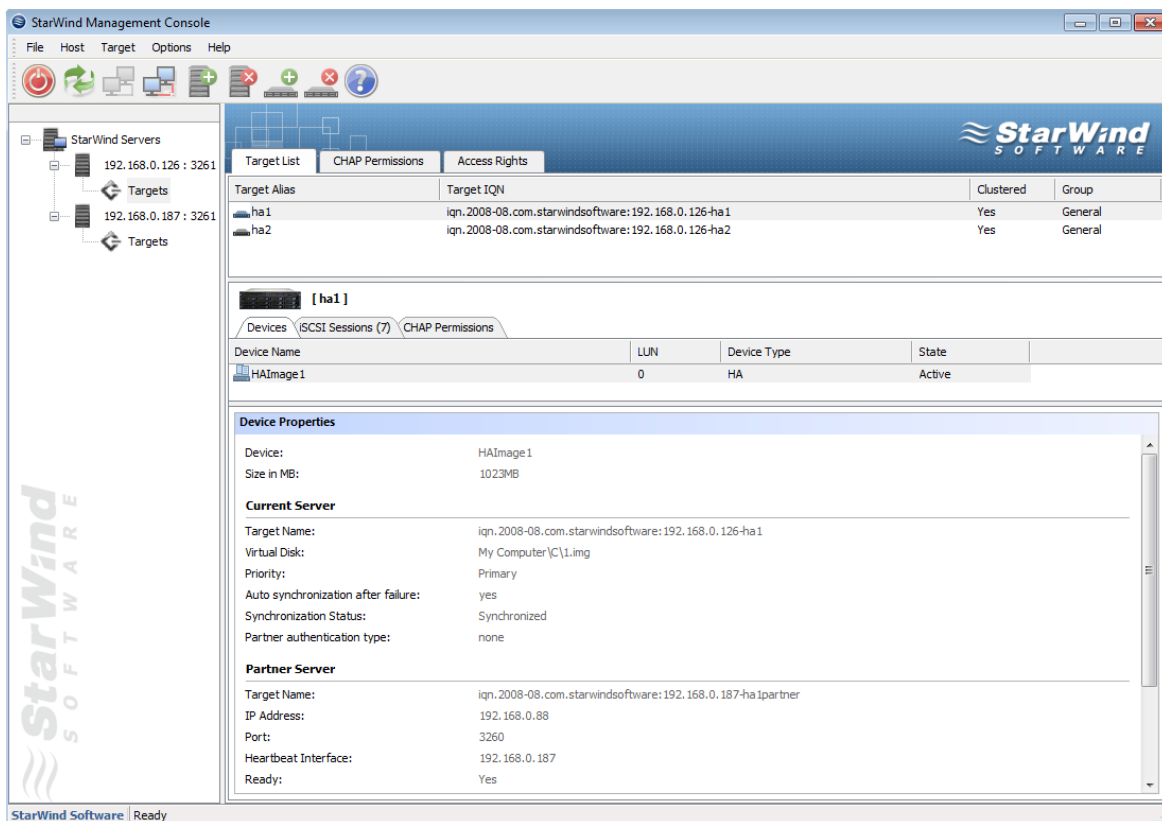


Diagram 6: StarWind Management Console

THE RECOMMENDED SYSTEM REQUIREMENTS FOR STARWIND NATIVE SAN:

- Windows Server 2008 R2
- Intel Xeon E5620 (or higher), or equivalent AMD Opteron 4 GB of RAM
- 1 GB for application data and log files
- Dedicated disk volumes
- Gigabit Ethernet

StarWind supports all Windows Operating Systems from Windows Server 2003 to Windows 2008 R2 family, including Server Core editions and free Microsoft Hyper-V Server. Windows Server 2008 and 2008 R2 are required for High Availability configuration. Management console may be installed on any Microsoft Windows above Windows XP.

Summary

Whatever your scenario is, if you use clustered virtualization, you definitely need a shared storage. StarWind is a smart, powerful and affordable solution that runs on your existing x86 servers and allows you to create your own shared storage within minutes.

Building a highly available and fault-tolerant enterprise-class Storage Area Network with StarWind Native SAN is a fairly straightforward process and the resulted SAN reduces complexity, saves time managing your storage and expands your storage capabilities affordably.

About StarWind Software

StarWind Software is a global leader in Storage Virtualization and iSCSI storage for small and midsize companies. StarWind's flagship product is a storage virtualization software platform that turns any industry-standard Windows Server into a fault-tolerant, fail-safe iSCSI SAN. It is designed for use as networked storage for VMware, Hyper-V, Microsoft SQL Server, Microsoft Exchange, Microsoft Share-Point and other server applications configured in server clusters. StarWind Software is focused on providing small and midsize companies with affordable high availability technology which was previously only available in high-end storage products. The advanced, enterprise-class features include Synchronous Mirroring with Automated Failover and Failback, Remote Replication across a WAN, CDP and Snapshots, Thin Provisioning and Virtual Tape Array (VTA).

Since 2003, StarWind has pioneered the iSCSI industry and has been the solution of choice for over 30,000 global users in over 100 countries, from small and midsize companies, to governments, and Fortune 1000 companies.

Related Links

To download a fully functional Trial version of StarWind Native SAN for Hyper-V or to get more information about the solution outlined in this paper visit: www.starwindsoftware.com



Turn Any Server Into a SAN.
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www.starwindsoftware.com

ABOUT STARWIND

Since 2003, StarWind has been the storage solution of choice for thousands of global customers in over 50 countries, from SMBs, to governments, and to Fortune 1000 clients. StarWind has pioneered the iSCSI / IP SAN industry with its storage virtualization software that converts any Windows Server into a reliable and scalable shared storage.

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