

System Requirements

To ensure the promised performance and stability, the systems running StarWind solutions must meet the minimum system requirements that are listed below:

StarWind Virtual SAN (VSAN) for Hyper-V

CPU	Minimum one physical 1.7 GHz processor
RAM	4GB If using cache or Asynchronous Replication, an appropriate amount of RAM should be added
Network	Heartbeat failover strategy: 2x network interfaces (1xStarWind Synchronization and 1xiSCSI traffic/Heartbeat) + 1x network interface (Management/Heartbeat) At least one Heartbeat interface must be on a separate network adapter and redundant Node Majority failover strategy: 2x network interfaces (1xStarWind Synchronization and 1xiSCSI traffic) + 1x network interface (Management/Witness node)
Network Bandwidth	Synchronous Replication: Minimum 1 GbE or higher Latency requirements: < 5 ms Asynchronous Replication: Minimum 100 MbE or higher. The data link must be capable to transmit the replicated amount of data within the desired backup window
OS	Supported Windows Server version: 2 012 or later
Storage	3 GB disk space reserved for installation and logging. The StarWind virtual disks must reside on the separate partition from the StarWind installation disk Hardware RAID controller is highly recommended Microsoft Storage Spaces is supported Asynchronous Replication : The storage with replication journals on the primary server should have higher or equal write performance in comparison with the production storage array (on 100% sequential write with 8MB block size). The space reserved for the journal disk must exceed the amount of data written to the production storage array within the time frame between snapshots plus extra 25%

Software RAID implementations are NOT supported. For recommended RAID settings, please, read the [KB article](#).

IMPORTANT NOTE: Server with LSFS devices and Data Recovery (DR) server (in case of Asynchronous Replication) should fit the [LSFS device requirements](#).

StarWind Virtual SAN (VSAN) for vSphere

CPU	Minimum 4 virtual 1.7 GHz processors reserved
RAM	4GB If using cache, an appropriate amount of RAM should be assigned
Network	Heartbeat failover strategy: 2x network interfaces (1xStarWind Synchronization and 1xiSCSI traffic/Heartbeat) + 1x network interface (Management/Heartbeat) At least one Heartbeat interface must be on a separate network adapter and redundant Node Majority failover strategy: 2x network interfaces (1xStarWind Synchronization and 1xiSCSI traffic) + 1x network interface (Management/Witness node)
Network Bandwidth	Synchronous Replication: Minimum 1 GbE or higher Latency requirements: <5 ms
Hypervisor	Supported vSphere version: 5.5 or later
Storage	20 GB Virtual Disk reserved for OS. The StarWind virtual disks must reside on the separate partition from the StarWind installation disk All Virtual Disks must be Thick Provision Eager Zeroed or the entire HBA/RAID controller must be passed through to the Virtual Machine

For recommended RAID settings, please, read the [KB article](#).

StarWind Virtual HCI Appliance (vHCI)

Supported cluster configurations:

- 2-node cluster witness-less (Heartbeat);
- 2-node cluster with a witness node (Node Majority);
- 3-node cluster (Heartbeat or Node Majority);
- [GRID](#) (Heartbeat or Node Majority).

Software requirements	Minimal	Optimal
CPU		
Architecture		X86-64
Frequency	1.7	2.1 or higher
Cores		
For Hyper-V (per-node)	1 or higher	2 or higher
For Hyper-V (per-node)	2 or higher	4 or higher
vCPU		
For vSphere (per-node)	2	4
RAM/vRAM		
	4 GB	8 GB
Network ports		
	For Heartbeat: 2 x StarWind dedicated (4 x StarWind dedicated in case of 3-node cluster) 1 x Management	
	For Node Majority: 1 x StarWind dedicated 1 x iSCSI dedicated 1 x Management	
Network Bandwidth		
	1 GbE	10 GbE or higher
Supported Operating Systems (Hypervisors)*		
	Windows Server 2016, 2019, 2022 w/ Hyper-V. Standard or Datacenter; VMware vSphere 6.5, 6.7, 7.0, 8.0. Any update	

Software requirements	Minimal	Optimal
Network Latency	Less than 5 ms	Less than 2 ms
Storage**		
For Hyper-V (per-node)	3 GB for installed software	
For Hyper-V (per-node)	For Hyper-V (per-node) 16 GB (Thin VMDK)	
	A separate array for data storage recommended	

* StarWind vSAN is a certified storage provider for [VMware](#) and [Windows Server with Hyper-V](#).

** Supported RAID configurations for main data storage you can find [here](#).

StarWind Command Center (Cluster management — Optional)	Minimal	Optimal
vCPU	2	4
vRAM	4 GB	8 GB
Network ports	1 x External Virtual Switch Connection	
Storage	50 GB (Dynamic VHDX)	

Recommended Hardware Configuration	Minimal	Optimal
Server Vendor	Any	
Server Form Factor	Rack, Tower, Edge	
TPM	Optional	Recommended

Recommended Hardware Configuration	Minimal	Optimal
CPU		
Architecture		X86-64
Vendor		Vendor AMD or Intel
RAM Configuration	Near Balanced	Balanced
Number of Sockets	1	2 or higher
Storage		
Controllers	Redundant or not redundant OS partition; Single controller for OS and Main storage arrays allowed	Redundant OS partition; Separate controllers for OS and Main storage arrays are highly recommended
Storage Media	SAS/SATA HDD; SAS/SATA SSD	SAS/SATA SSD; NVMe
Recommended Vendors	WD DC for HDD; Intel, Micron, KIOXIA for SSD	Intel, Micron, KIOXIA for SSD; Solidigm, Micron, and KIOXIA for NVMe
Networking		
Throughput	1 GbE or higher	10 GbE or higher
Type		Ethernet
Number of NICs	2, where: 1 x for Management; 1 x for StarWind	
Recommended Vendor	Broadcom, Intel for Management; Intel, Mellanox for StarWind	Intel for Management; Mellanox for StarWind
PSU	Single PSU	Dual, Hot-Plug, Redundant PSU
GPU		Any
BMC	Any Edition	Enterprise or alternative

IMPORTANT NOTE: The final hardware configuration should include actual infrastructure needs (client services and VMs) and minimal or optimal configurations of the software described above. To calculate the actual needs of existing infrastructure, StarWind highly recommends the following infrastructure assessment tools – [Veeam ONE](#) or [Live Optics](#).

StarWind SAN & NAS

CPU	Minimum 4 virtual 1.7 GHz processors reserved If using ZFS pools, 8 virtual 1.7 GHz processors reserved
RAM	4GB If using cache, an appropriate amount of RAM should be assigned If using ZFS pools, at least 16GB of RAM should be assigned
Network	2x network interfaces (1xManagement and 1xiSCSI/Data traffic) At least one Heartbeat interface must be on a separate network adapter and redundant
Network Bandwidth	Synchronous Replication: Minimum 1 GbE or higher Latency requirements: <5 ms
Hypervisor*	VMware vSphere Hypervisor ESXi version: 6.5 or later Microsoft Hyper-V server: 2016 or later
Storage	20 GB Virtual Disk reserved for OS. The StarWind virtual disks must reside on a partition that is separate from the StarWind installation disk. All Virtual Disks are recommended to be Thick Provision Eager Zeroed or the entire HBA/RAID controller must be passed through to the Virtual Machine. Supported direct-attached storage configurations: <ul style="list-style-type: none">• Passthrough Hardware RAID Controller• Passthrough Host Bus Adapter• Attach VMDK disks based on top of Datastore• Attach Physical disks via RDM

* StarWind SAN & NAS can be deployed on top of your hypervisor or directly on bare metal (no hypervisor required).

For recommended RAID settings, please, read the [KB article](#).

StarWind Virtual Tape Library (VTL)

CPU	Minimum one 1.7 GHz processor	
RAM	4GB	
Network	1 NIC interface (VTL traffic) + 1 NIC (Management)	
Network Bandwidth	Minimum 100 MbE or higher Latency requirements: 1 00 ms or less	
Hypervisor	Supported Windows Server version: 2012 or later	
Storage	3 GB disk space reserved for installation and logging. The StarWind virtual disks must reside on the separate partition from StarWind installation disk	
Supported Backup	Acronis Backup (10 – 12.5)	IBM TSM & Spectrum Protect (6.2.2 – 8.1.11)
	ArcServe Backup (11.5 – 17)	HP DataProtector (7.x – 9.0)
	ArcServe UDP (5.x – 7.0)	Microsoft DPM* (2012 – 2019)
	Bacula (9.2.0 – 9.6.6)	Veeam Backup & Replication (9.0 – 11.0)
	Commvault (9.0 – 11.20)	Veritas/Symantec BackupExec (12.x – 20.6)
	EMC AVAMAR (via ADMe) (6.1 – 7.5)	Veritas/Symantec NetBackup (6.x – 8.3)
	EMC NetWorker (7.6 – 19.2)	Quest NetVault Backup (12.x – 13.x)

* Microsoft DPM 2016 may require additional tweaks due known connection stability issues with LTO Tape Libraries.

Software RAID implementations are NOT supported. For recommended RAID settings, please, read the [KB article](#).

IMPORTANT NOTE: In order to fit the ransomware resiliency, the VTL should be located on the dedicated storage/host which must be isolated from the production environment. Please read the following document for details: [Backing up StarWind Virtual SAN Environment: Best Practice](#).

StarWind Management Console

CPU	Minimum one 1 GHz processor
RAM	256MB
Network	1 NIC interface
Network Bandwidth	Minimum 100 MbE or higher
Supported OS	Server OS: Microsoft Windows Server 2008 R2; 2012; 2012 R2; 2016; 2019; 2022 Desktop OS: Windows 7; 8; 8.1; 10
Storage	56 MB disk space reserved for installation and logging

IMPORTANT NOTE: Windows Server Core or Microsoft Hyper-V Server as a base OS is incompatible with the StarWind Management Console local installation. In this case, StarWind Management Console should be installed on any other computer. Please note that for remote management with default settings, port 3261 must be open.

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