

StarWind x Veeam Hardened Backup Repository: Configuration Guide for Proxmox Virtual Environment [KVM], StarWind x Veeam Hardened Backup Repository Deployed as a Controller VM using Web UI

2026

TECHNICAL PAPERS



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Annotation

Relevant products

StarWind x Veeam Hardened Backup Repository (StarWind x VHBR)

Purpose

StarWind x Veeam Hardened Backup Repository (StarWind x VHBR) is a software solution that runs as a Virtual Machine on top of the Proxmox host and turns it into a modern and robust backup repository.

This document outlines how to configure the StarWind x Veeam Hardened Backup Repository (StarWind x VHBR) on Proxmox host. It covers the steps on how to create a Hardened Repository in StarWind x Veeam Hardened Backup Repository (StarWind x VHBR) and connect it to Veeam Backup & Replication for achieving backups immutability.

Audience

This technical guide is intended for storage and virtualization architects, system and backup administrators, and partners designing virtualized environments StarWind x Veeam Hardened Backup Repository (StarWind x VHBR).

Expected result

The end result of following this guide will be a fully configured StarWind x Veeam Hardened Backup Repository (StarWind x VHBR) on a Proxmox host with a Hardened Repository created and connected to Veeam Backup & Replication.

Prerequisites

StarWind x Veeam Hardened Backup Repository system requirements

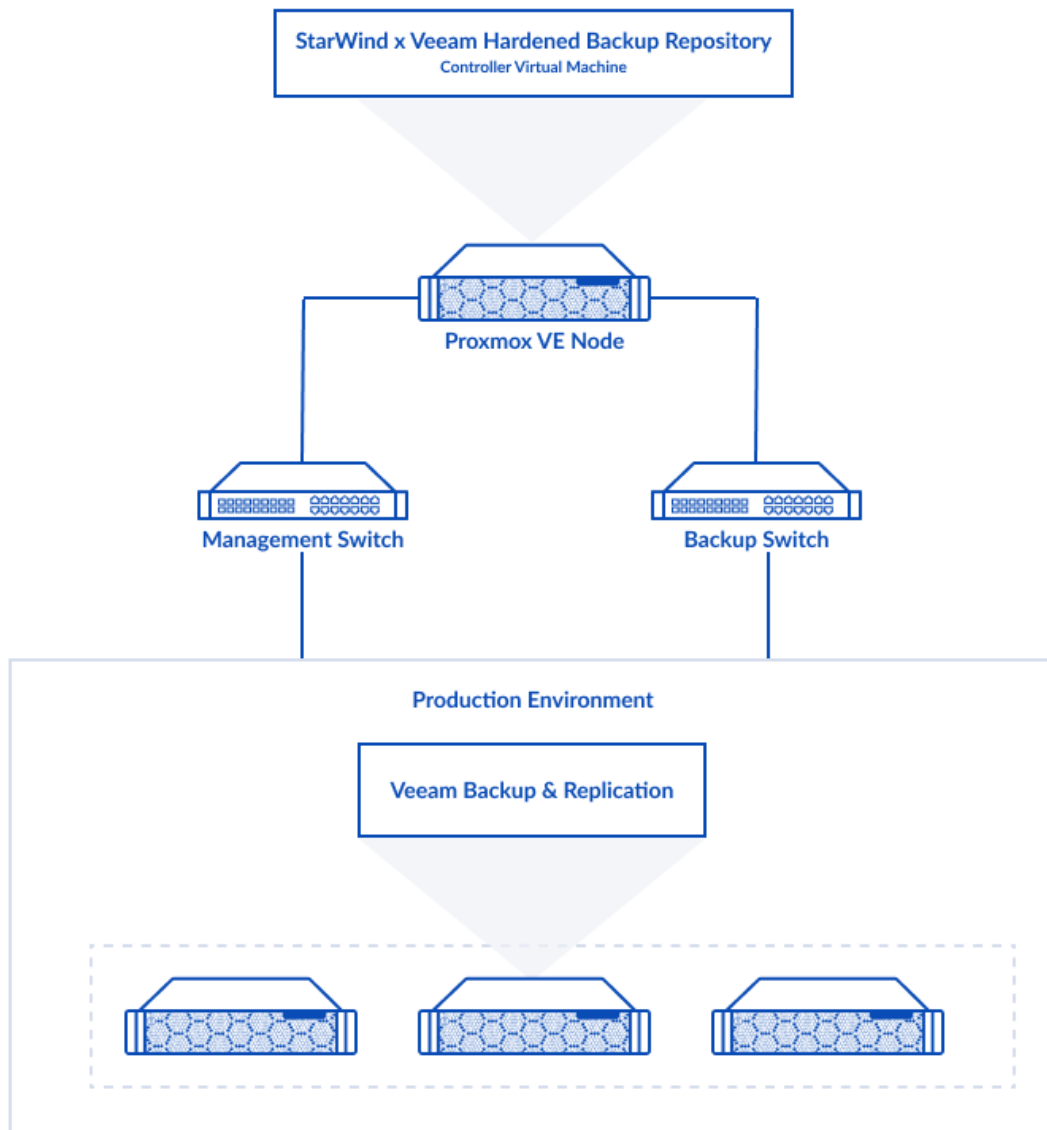
Prior to installing StarWind x Veeam Hardened Backup Repository, please make sure that the system meets the requirements, which are available via the following link: <https://www.starwindsoftware.com/system-requirements#svhbr>

Recommended RAID settings for HDD and SSD disks:

<https://knowledgebase.starwindsoftware.com/guidance/recommended-raid-settings-for-hdd-and-ssd-disks/>

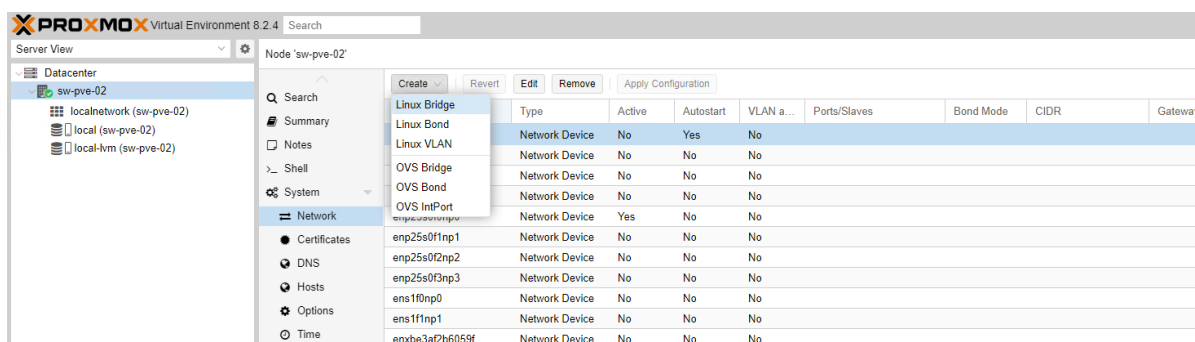
Solution diagram

The diagrams below illustrate the network and storage configuration of the solution:



Preconfiguring Proxmox Host

1. Configure network interfaces that will be used for the backup traffic. In this document, 172.16.30.x subnet is used for the backup traffic. Choose node and open System -> Network page. Click Create. Choose Linux Bridge.



2. Create Linux Bridge and set IP address. Set MTU to 9000. Click Create.

Create: Linux Bridge

Name:

vmbr1

IPv4/CIDR:

172.16.30.10/24

Gateway (IPv4):

IPv6/CIDR:

Gateway (IPv6):

Autostart:

☒

VLAN aware:

☐

Bridge ports:

enp177s0f0np0

Comment:

MTU:

9000

Help

Advanced ☒

Create

3. Verify network configuration in /etc/network/interfaces file. Login to the node via SSH and check the contents of the file.

```
auto lo
iface lo inet loopback

iface enp25s0f0np0 inet manual

iface enp177s0f1np1 inet manual
    mtu 9000

iface enp202s0f0np0 inet manual

iface enp202s0f1np1 inet manual

iface enxbe3af2b6059f inet manual

iface enp25s0f1np1 inet manual

iface enp25s0f2np2 inet manual

iface enp25s0f3np3 inet manual

iface ens1f0np0 inet manual

iface ens1f1np1 inet manual

auto enp177s0f0np0
iface enp177s0f0np0 inet manual
    mtu 9000

auto vmbr0
iface vmbr0 inet static
    address 172.27.31.112/24
    gateway 172.27.31.10
    bridge-ports enp25s0f0np0
    bridge-stp off
    bridge-fd 0

auto vmbr1
iface vmbr1 inet static
    address 172.16.30.10/24
    bridge-ports enp177s0f0np0
    bridge-stp off
    bridge-fd 0
    mtu 9000
```

4. Enable IOMMU support in kernel, if PCIe passthrough will be used to pass RAID Controller, HBA or NVMe drives to the VM. Update grub configuration file.

For Intel CPU:

Add "intel_iommu=on iommu=pt" to GRUB_CMDLINE_LINUX_DEFAULT line in /etc/default/grub file.

For AMD CPU:

Add "iommu=pt" to GRUB_CMDLINE_LINUX_DEFAULT line in /etc/default/grub file.

```

root@sw-pve-02:~# cat /etc/default/grub
# If you change this file, run 'update-grub' afterwards to update
# /boot/grub/grub.cfg.
# For full documentation of the options in this file, see:
#   info -f grub -n 'Simple configuration'

GRUB_DEFAULT=0
GRUB_TIMEOUT=5
GRUB_DISTRIBUTOR=`lsb_release -i -s 2> /dev/null || echo Debian`
GRUB_CMDLINE_LINUX_DEFAULT="quiet intel_iommu=on iommu=pt"
GRUB_CMDLINE_LINUX=""

# If your computer has multiple operating systems installed, then you
# probably want to run os-prober. However, if your computer is a host
# for guest OSes installed via LVM or raw disk devices, running
# os-prober can cause damage to those guest OSes as it mounts
# filesystems to look for things.
#GRUB_DISABLE_OS_PROBER=false

# Uncomment to enable BadRAM filtering, modify to suit your needs
# This works with Linux (no patch required) and with any kernel that obtains
# the memory map information from GRUB (GNU Mach, kernel of FreeBSD ...)
#GRUB_BADRAM="0x01234567,0xfefefefe,0x89abcdef,0xefefefef"

# Uncomment to disable graphical terminal
#GRUB_TERMINAL=console

# The resolution used on graphical terminal
# note that you can use only modes which your graphic card supports via VBE
# you can see them in real GRUB with the command `vbeinfo'
#GRUB_GFXMODE=640x480

# Uncomment if you don't want GRUB to pass "root=UUID=xxx" parameter to Linux
#GRUB_DISABLE_LINUX_UUID=true

# Uncomment to disable generation of recovery mode menu entries
#GRUB_DISABLE_RECOVERY="true"

# Uncomment to get a beep at grub start
#GRUB_INIT_TUNE="480 440 1"

```

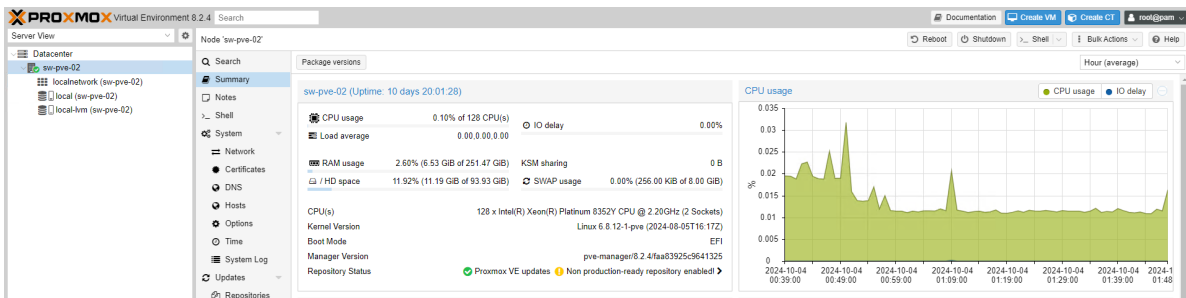
5. Reboot the host.

Deploying Starwind X Veeam Hardened Backup Repository

1. Download StarWind x Veeam Hardened Backup Repository zip archive: <https://www.starwindsoftware.com/resource-library/veeam-hardened-backup-repository/#download>
2. Extract the CVM.qcow2 file from the downloaded archive.
3. Upload CVM.qcow2 file to the Proxmox Host via any SFTP client (e.g. WinSCP) to /root/ directory.

/root/		
Name	Size	Changed
..		9/27/2024 2:32:23 AM
CVM.qcow2	9,704,576 KB	10/4/2024 1:44:11 AM

4. Create a VM without OS. Login to Proxmox host via Web GUI. Click Create VM.



5. Choose node to create VM. Enable Start at boot checkbox and set Start/Shutdown order to 1. Click Next.

Create: Virtual Machine

General
OS
System
Disks
CPU
Memory
Network
Confirm

Node:
sw-pve-02
Resource Pool:
VM ID:
100
Name:
SW-VHR

Start at boot:
☒
Start/Shutdown order:
1
Startup delay:
default
Shutdown timeout:
default

Tags
No Tags
+

? Help
Advanced
☒
Back
Next

6. Choose Do not use any media and choose Guest OS Linux. Click Next.

Create: Virtual Machine

General
OS
System
Disks
CPU
Memory
Network
Confirm

☐ Use CD/DVD disc image file (iso)

Storage: local
ISO image:

☐ Use physical CD/DVD Drive

☒ Do not use any media

Guest OS:

Type: Linux
Version: 6.x - 2.6 Kernel

Advanced ☒
Back
Next

7. Specify system options. Choose Machine type q35 and check the Qemu Agent box. Click Next.

Create: Virtual Machine

General
OS
System
Disks
CPU
Memory
Network
Confirm

Graphic card: Default

Machine: q35

Firmware

BIOS: Default (SeaBIOS)

SCSI Controller: VirtIO SCSI single

Qemu Agent: ☒

Add TPM: ☐

Help

Advanced ☒

Back

Next

8. Remove all disks from the VM. Click Next.

Create: Virtual Machine

General
OS
System
Disks
CPU
Memory
Network
Confirm

No Disks

+ Add

? Help
Advanced ☒
Back
Next

9. Assign at least 8 cores to the VM and choose Host CPU type. Click Next.

Create: Virtual Machine

General
OS
System
Disks
CPU
Memory
Network
Confirm

Sockets:
1

Cores:
8

Type:
host

Total cores:
8

VCPUs:
8

CPU limit:
unlimited

CPU Affinity:
All Cores

CPU units:
100

Enable NUMA:
☐

Extra CPU Flags:

Default	- ☐ ☒ ☐ ☐ +	md-clear	Required to let the guest OS know if MDS is mitigated correctly
Default	- ☐ ☒ ☐ ☐ +	pcid	Meltdown fix cost reduction on Westmere, Sandy-, and IvyBridge Intel CPUs
Default	- ☐ ☒ ☐ ☐ +	spec-ctrl	Allows improved Spectre mitigation with Intel CPUs
Default	- ☐ ☒ ☐ ☐ +	ssbd	Protection for "Speculative Store Bypass" for Intel models
Default	- ☐ ☒ ☐ ☐ +	ibpb	Allows improved Spectre mitigation with AMD CPUs
Default	- ☐ ☒ ☐ ☐ +	virt-ssbd	Basis for "Speculative Store Bypass" protection for AMD models

? Help

Advanced ☒

Back

Next

10. Assign at least 8GB of RAM to the VM. Click Next.

Create: Virtual Machine

General
OS
System
Disks
CPU
Memory
Network
Confirm

Memory (MiB): 8192

Minimum memory (MiB): 8192

Shares: Default (1000)

Ballooning Device: ☐

? Help
Advanced ☒
Back
Next

11. Configure Management network for the VM. Click Next.

Create: Virtual Machine

General
OS
System
Disks
CPU
Memory
Network
Confirm

☐ No network device

Bridge:
vmb0

Model:
VirtIO (paravirtualized)

VLAN Tag:
no VLAN

MAC address:
auto

Firewall:
☒

Disconnect:
☐

Rate limit (MB/s):
unlimited

MTU:
1500 (1 = bridge MTU)

Multiqueue:

? Help

Advanced ☒
Back
Next

12. Confirm settings. Click Finish.

Create: Virtual Machine

General
OS
System
Disks
CPU
Memory
Network
Confirm

Key ↑	Value
agent	1
balloon	0
cores	16
cpu	host
ide2	none,media=cdrom
machine	q35
memory	8192
name	SW-VHR
net0	virtio,bridge=vbr0,firewall=1
nodename	sw-pve-02
numa	0
onboot	1
ostype	l26
scsihw	virtio-scsi-single

☐ Start after created

Advanced ☒
Back
Finish

13. Connect to Proxmox host via SSH. Attach CVM.qcow2 file to the VM.

```
qm importdisk 100 /root/CVM.qcow2 local-lvm
```

14. Open VM and go to Hardware page. Add unused SCSI disk to the VM.

Add: Unused Disk

Disk
Bandwidth

Bus/Device:
SCSI
0

Cache:
Default (No cache)

SCSI Controller:
VirtIO SCSI single

Discard:
☐

Disk image:
local-lvm:vm-100-disk-0

IO thread:
☒

SSD emulation:
☐

Backup:
☒

Read-only:
☐

Skip replication:
☐

Async IO:
Default (io_uring)

? Help

Advanced ☒
Add

15. Attach Network interface for backup traffic.

Add: Network Device

Bridge:
vmbr1

Model:
VirtIO (paravirtualized)

VLAN Tag:
no VLAN

MAC address:
auto

Firewall:
☒

Disconnect:
☐

Rate limit (MB/s):
unlimited

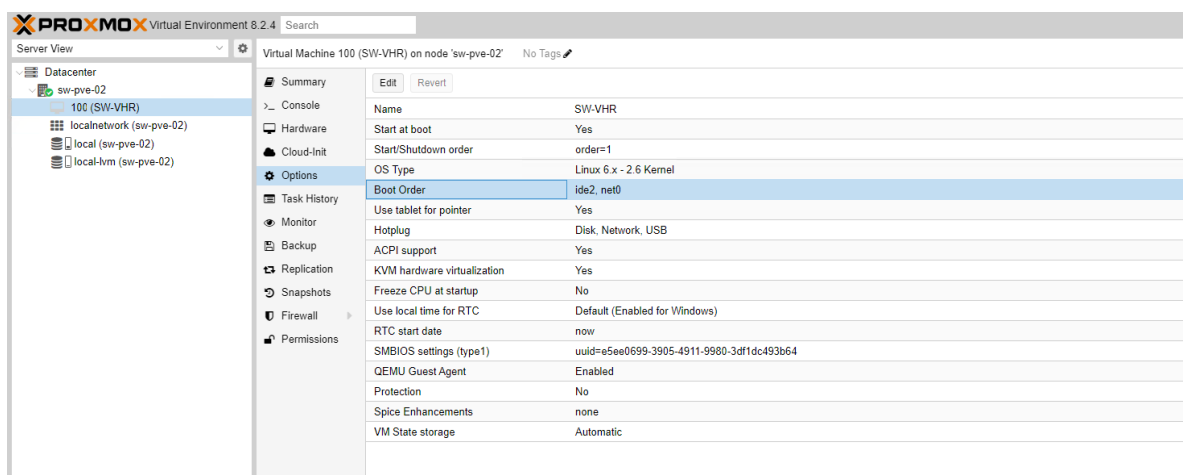
MTU:
9000

Multiqueue:

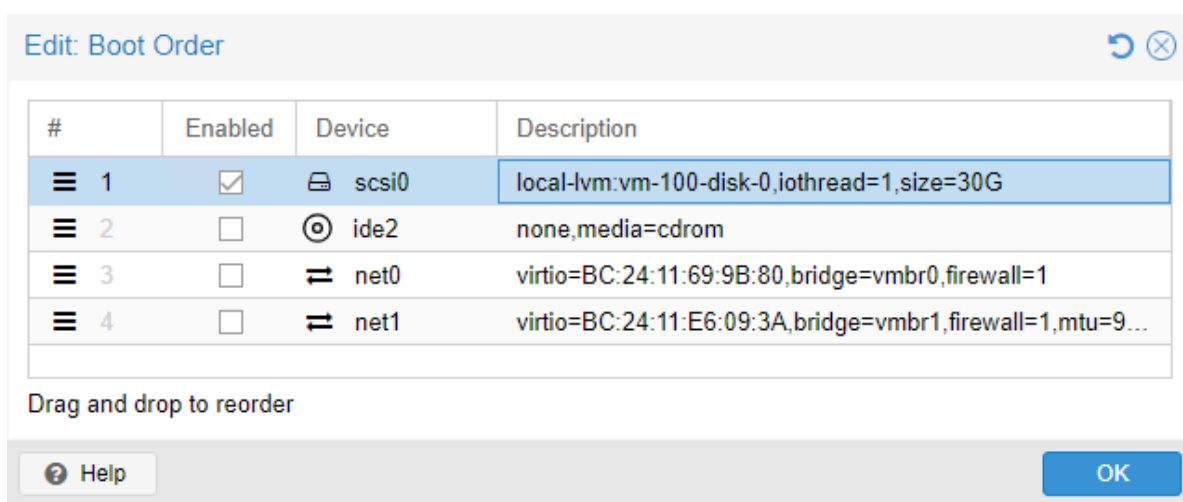
? Help

Advanced ☒
Add

16. Open Options page of the VM. Select Boot Order and click Edit.



17. Move scsi0 device as #1 to boot from.



Attaching Storage To Starwind X Veeam Hardened Backup Repository Cvm

Please follow the steps below to attach desired storage type to the CVM

Attaching Virtual Disk To Starwind X Veeam Hardened Backup Repository Cvm

1. Open VM Hardware page in Proxmox and add drive to the VM, which going to be used

as a backup repository StarWind service. Specify size of the Virtual disk and click OK.

NOTE. It is recommended to use VirtIO SCSI single controller for better performance. If multiple virtual disks are needed to be used in a software RAID inside of the CVM, VirtIO SCSI controller should be used.

2. Repeat step 1 to attach additional Virtual Disks.

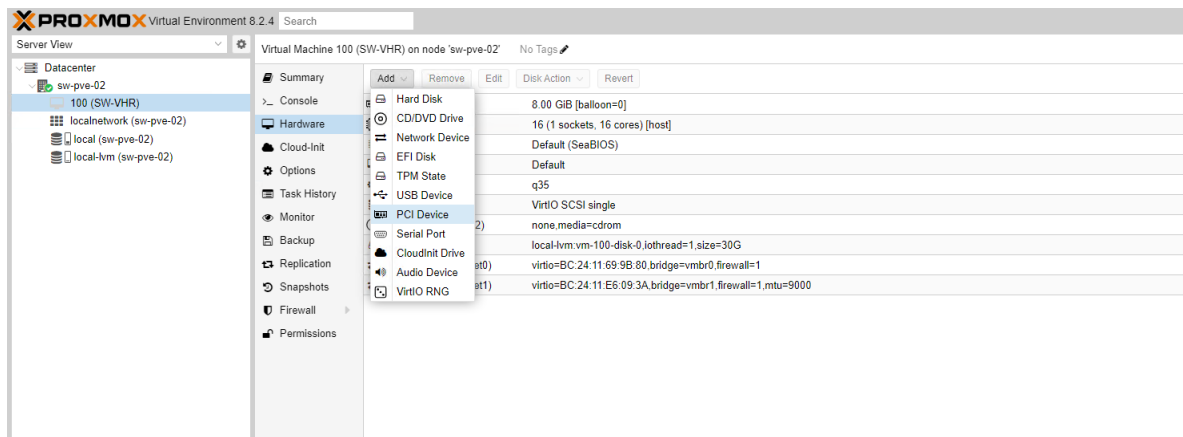
3. Start VM.

NOTE. When using Veeam Hardened backup repository, it is recommended to passthrough an entire RAID controller or HBA or NVMe drives directly to CVM to avoid hypervisor access to storage.

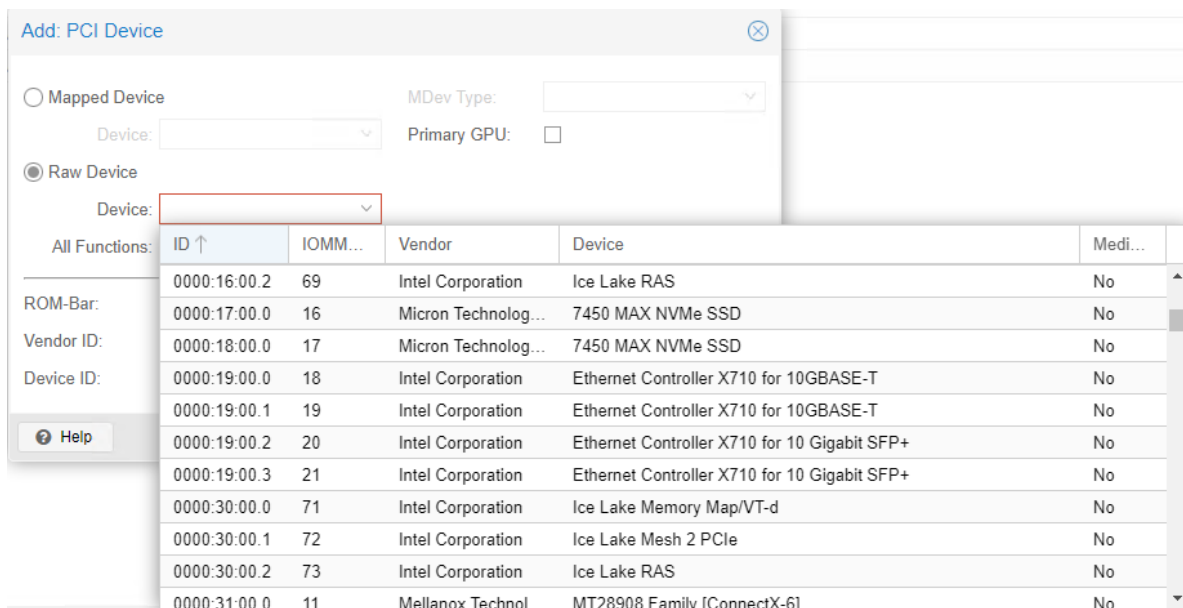
Attaching Pcie Device To Starwind X Veeam Hardened Backup Repository Cvm

1. Shutdown StarWind x Veeam Hardened Backup Repository CVM.

2. Open VM Hardware page in Proxmox and click Add -> PCI Device.



3. Choose PCIe Device from drop-down list.



4. Click Add.

Add: PCI Device

☐ Mapped Device

MDev Type:

Device:

☒ Raw Device

Device: 0000:68:00.0

All Functions:

ROM-Bar:
☒

Vendor ID:
From Device

Device ID:
From Device

PCI-Express:
☒

Sub-Vendor ID:
From Device

Sub-Device ID:
From Device

Advanced
☒

5. Edit Memory. Uncheck Ballooning Device. Click OK.

Edit: Memory

Memory (MiB): 8192

Minimum memory (MiB): 8192

Shares: Default (1000)

Ballooning Device:
☐

Advanced
☒

6. Start VM.

NOTE. In this guide, NVMe drives are passed through to CVM and will be collected in Software RAID5.

Initial Configuration Wizard

1. Start StarWind x Veeam Hardened Backup Repository CVM.
2. Launch VM console to see the VM boot process and get the IPv4 address of the Management network interface.

NOTE: in case VM has no IPv4 address obtained from a DHCP server, use the Text-based User Interface (TUI) to set up a Management network.

Default credentials for TUI: user/rds123RDS

3. Using the web browser, open a new tab and enter the VM IPv4 address to open Web Interface. Click “Advanced” and then “Continue to...”



Your connection is not private

Attackers might be trying to steal your information from **172.27.31.149** (for example, passwords, messages, or credit cards). [Learn more](#)

NET::ERR_CERT_AUTHORITY_INVALID

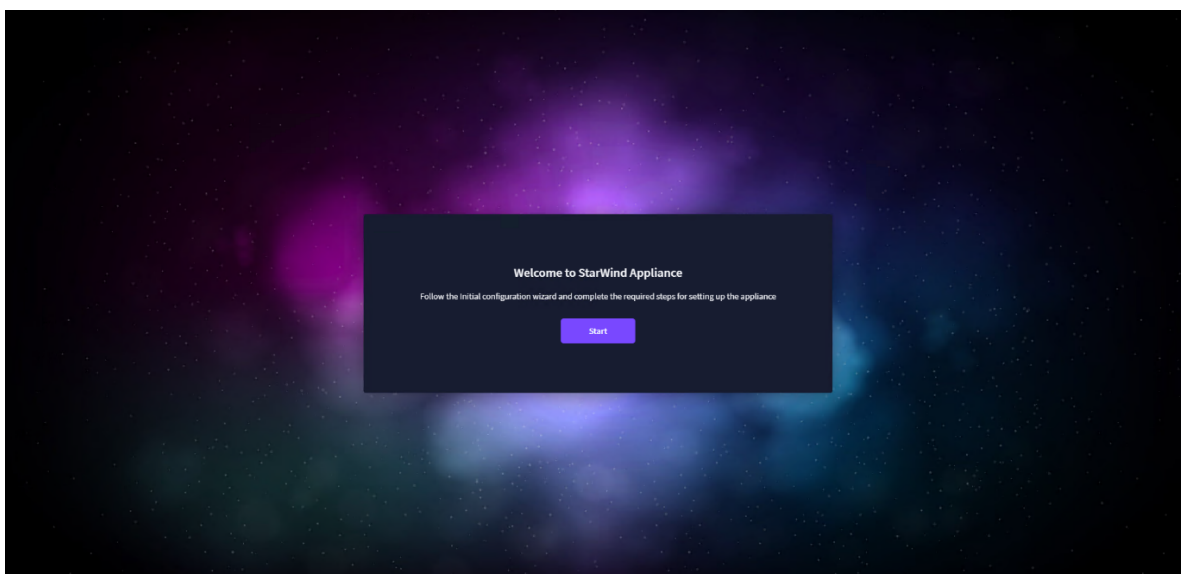


Turn on [enhanced protection](#) to get Chrome's highest level of security

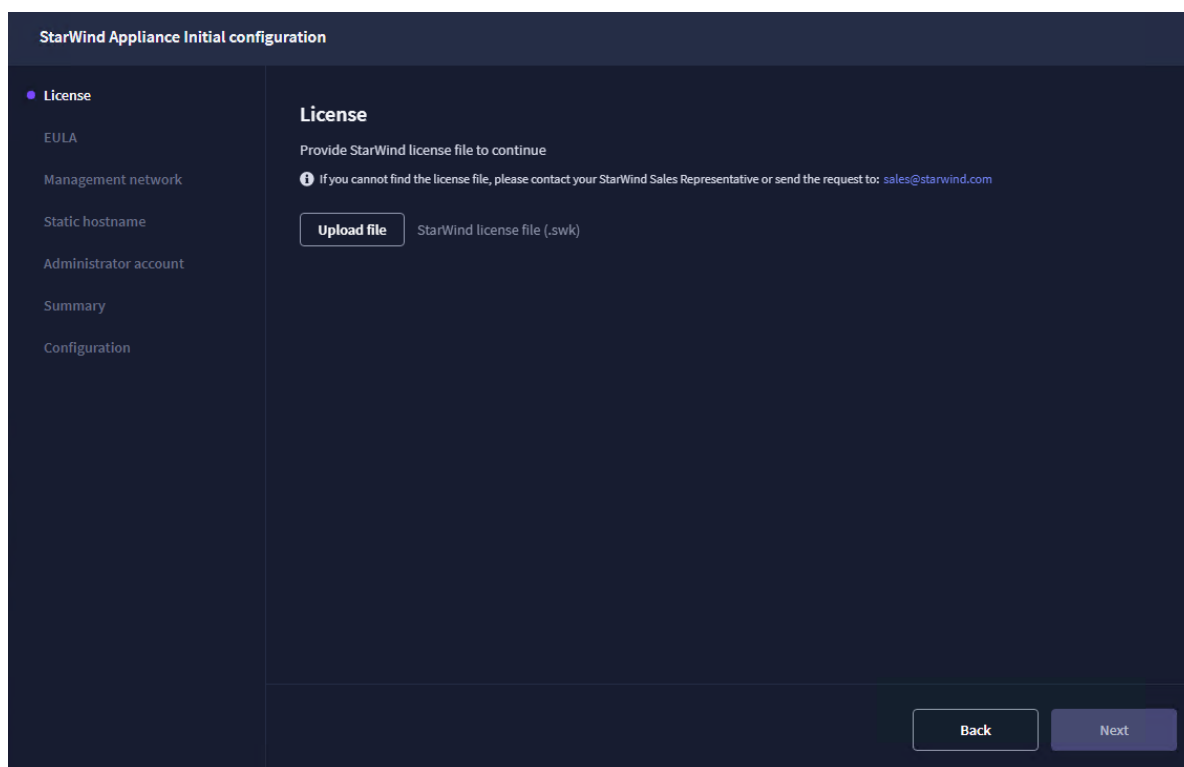
Advanced

Back to safety

4. StarWind x Veeam Hardened Backup Repository web UI welcomes you, and the “Initial Configuration” wizard will guide you through the deployment process.



5. In the following step, upload the license file.



6. Read and accept the End User License Agreement to proceed.

StarWind Appliance Initial configuration

License

EULA

Management network

Static hostname

Administrator account

Summary

Configuration

End-user license agreement

Review and accept the following license agreement to continue

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1. Definitions. Each of the expressions indicated below will have, in this Agreement, the meaning assigned to it, namely:

1.1. "Account Manager" shall mean the point of contact provided by StarWind to manage Licensee's account and support requests and identified as the Account Manager. StarWind may change the Account Manager in its sole discretion by giving

☒ I accept the terms of the license agreement

Back

Next

7. Review or edit the Network settings and click Next.

NOTE: Static network settings are recommended for the configuration.

StarWind Appliance Initial configuration

License

EULA

Management network

Static hostname

Administrator account

Summary

Configuration

Management network

Specify the unique IP address (static is recommended) and configure other network settings.

The Management network is used to communicate with services such as DNS and NTP and to access the appliance web UI from external clients.

IP mode

Static

NIC	Adapter model	Bandwidth	MAC address	IP address	Netmask	Gateway
enp7s18	VirtIO Ethernet Co...	10 Gbit	BC:24:11:69:9...	172.27.31.64	255.255.255.0	172.27.31.10

Name servers (optional):

DNS 1

172.27.31.1

DNS 2

8.8.8.8

Time settings (optional):

NTP server

Time zone

UTC

Separate servers with commas, a maximum of 3 servers

Back

Next

8. Specify the hostname for the virtual machine and click Next.

StarWind Appliance Initial configuration

License

EULA

Management network

Static hostname

Administrator account

Summary

Configuration

Static hostname

Set the current appliance hostname

Use Latin letters, numbers, and dash

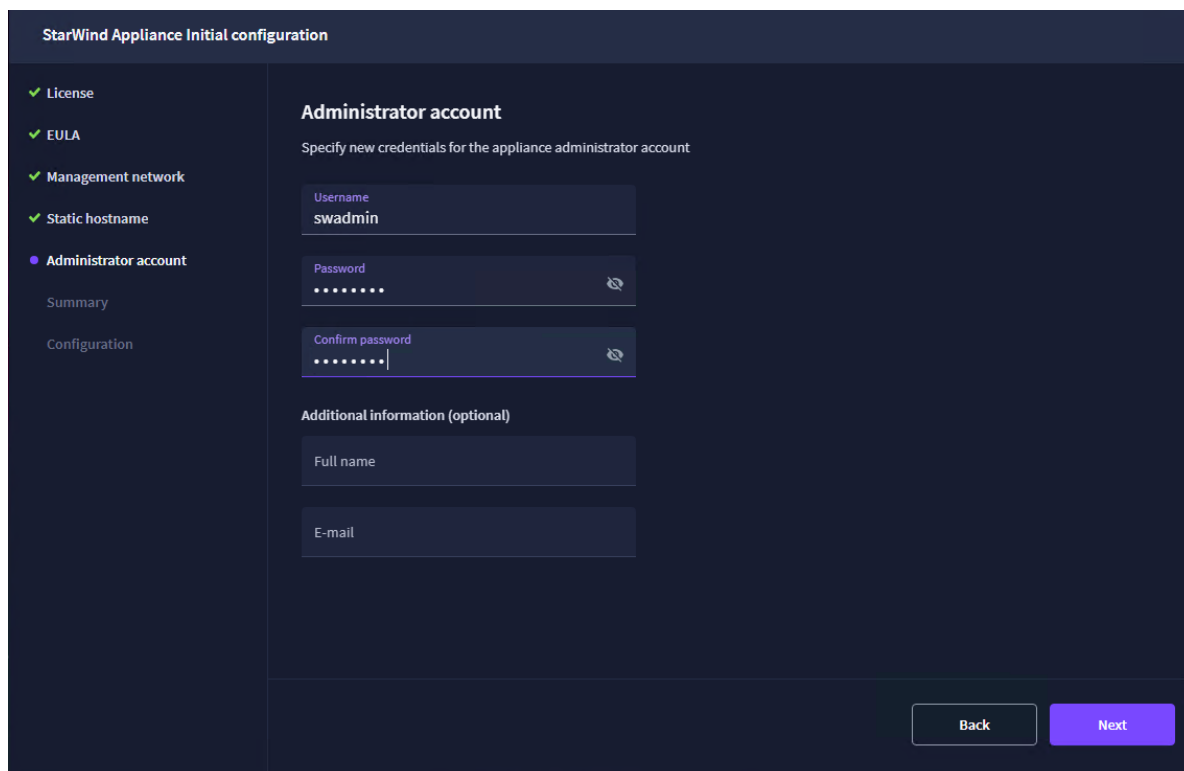
Hostname

SW-VHR

Back

Next

9. Create an administrator account. Click Next.



The screenshot shows the 'StarWind Appliance Initial configuration' window. On the left is a sidebar with a list of configuration steps: License, EULA, Management network, Static hostname, Administrator account (selected with a blue dot), Summary, and Configuration. The main area is titled 'Administrator account' and contains the instruction 'Specify new credentials for the appliance administrator account'. It features three input fields: 'Username' with the value 'swadmin', 'Password' with masked characters and a toggle icon, and 'Confirm password' also with masked characters and a toggle icon. Below these is a section for 'Additional information (optional)' with fields for 'Full name' and 'E-mail'. At the bottom right are 'Back' and 'Next' buttons.

10. Review your settings selection before setting up StarWind x Veeam Hardened Backup Repository.

StarWind Appliance Initial configuration

✓ License

✓ EULA

✓ Management network

✓ Static hostname

✓ Administrator account

● Summary

Configuration

Summary

License type

License	Trial
---------	-------

Network settings

Interface	ens160 (82574L Gigabit Network Connection)
Bandwidth	1 Gbit
MTU	1500
IP address	172.27.31.64
Appliance hostname	SW-VHR

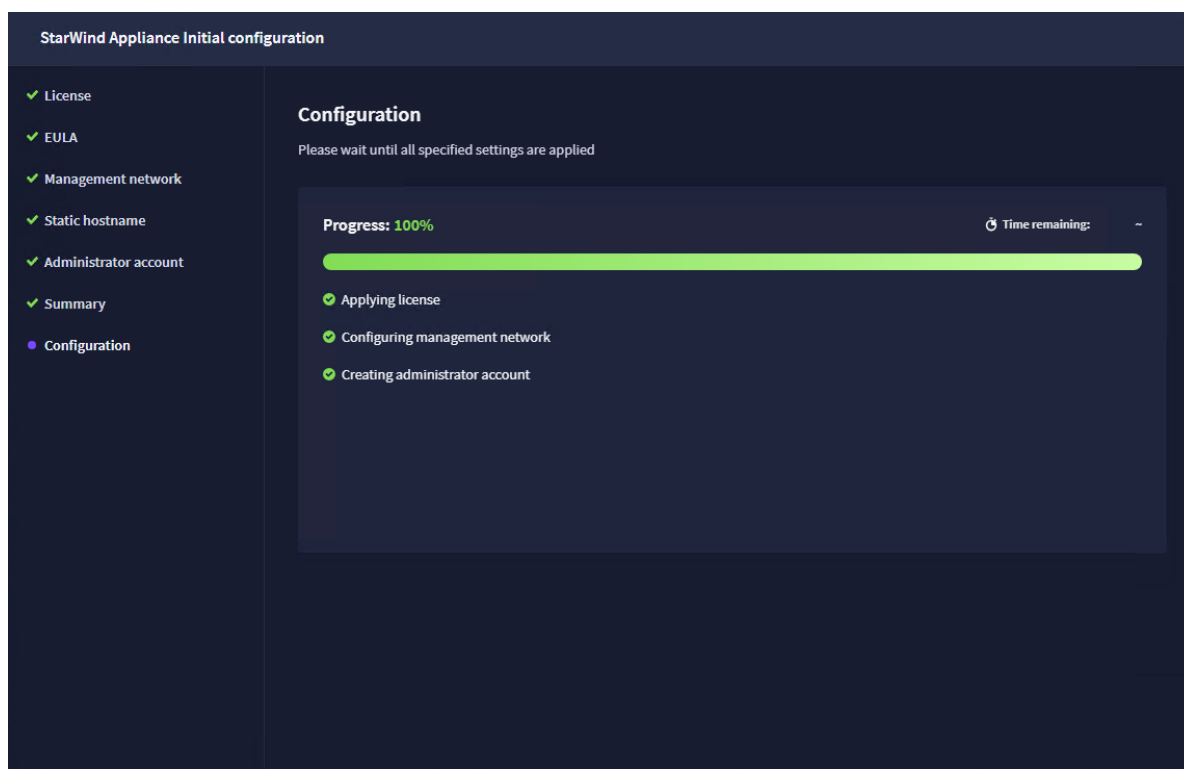
Credentials

Administrator username	swadmin
------------------------	---------

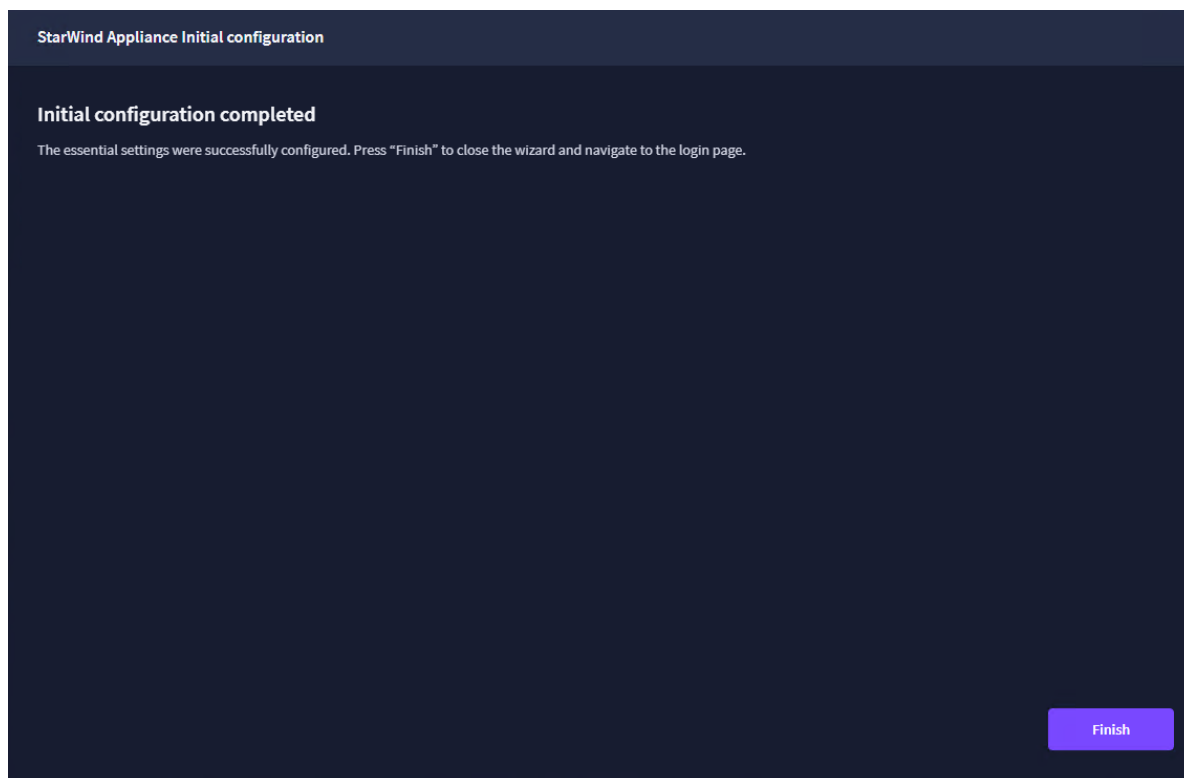
Back

Configure

11. Please standby until the Initial Configuration Wizard configures StarWind x Veeam Hardened Backup Repository for you.

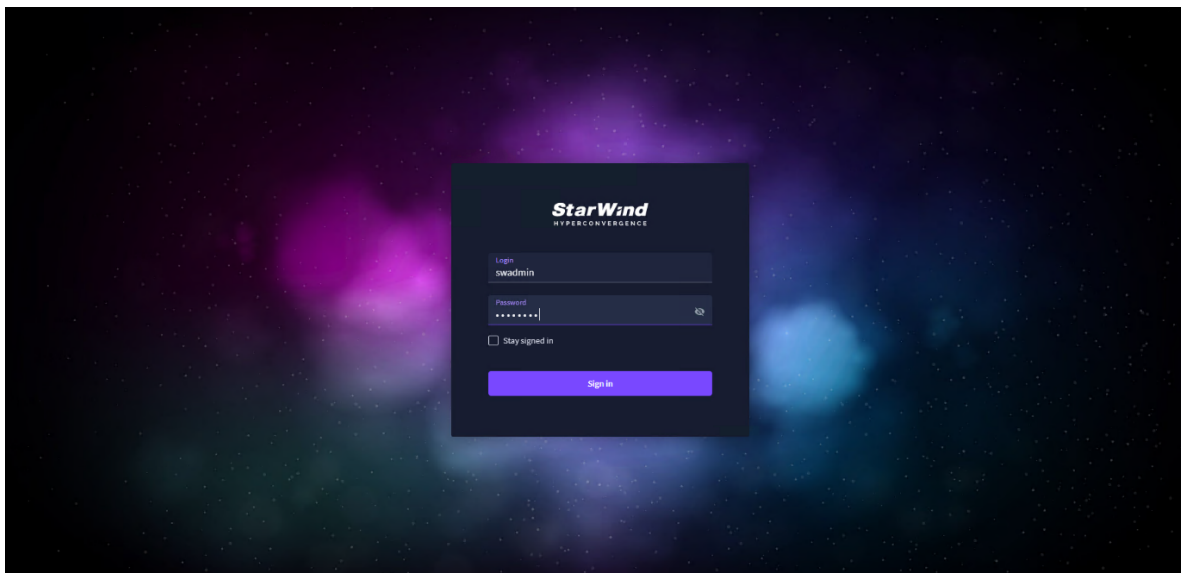


12. The appliance is set and ready. Click Finish to proceed to the Login page.

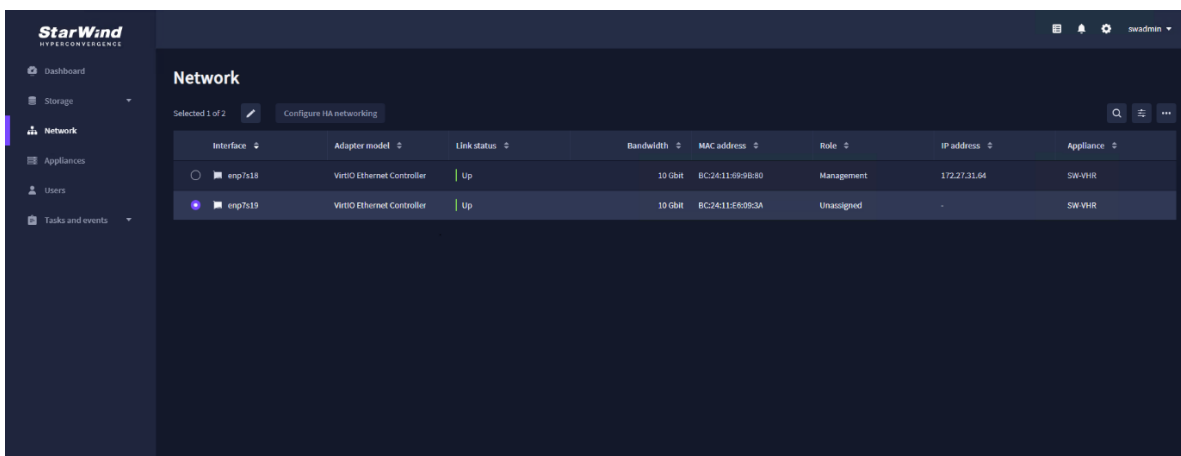


Configure Networking

1. Log in to the CVM WEB UI using the username and password specified during the initial configuration.



2. Navigate to the Network tab, select the network adapter that will be used for Data (Backup) traffic, and click the Edit icon.



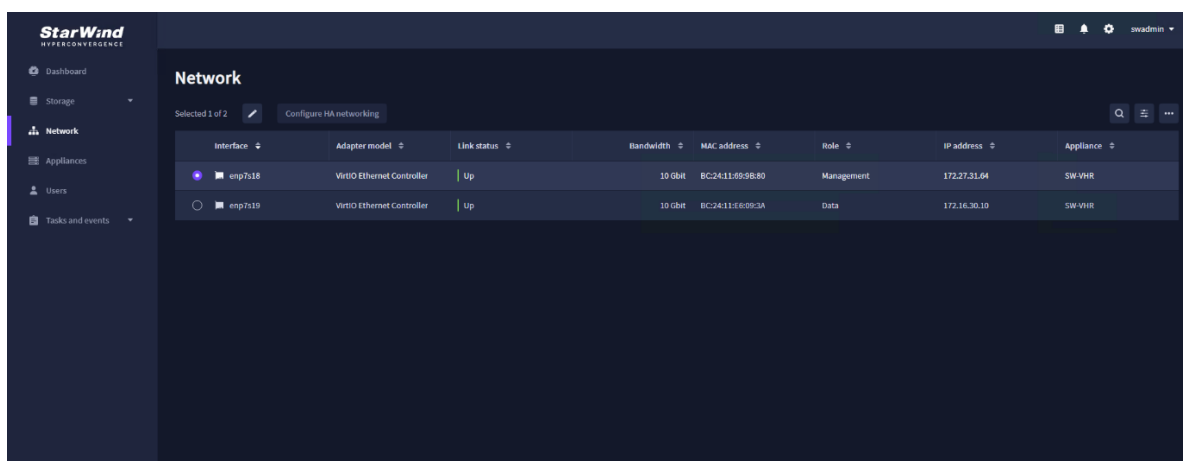
3. If the network adapter status is “Down”, uncheck the “Disable network adapter” checkbox. Make sure that the “Connect automatically on boot” checkbox is enabled and MTU is set to 9000 Assign the Data role to the network adapter, and specify the IPv4 address and network mask. Click Save.

Edit network adapter settings

×

Name enp7s19	Adapter model VirtIO Ethernet Controller
Role Data	IP mode Static
IPv4 address 172.16.30.10 e.g. 192.168.100.100	Netmask 255.255.255.0 e.g. 255.255.255.0 or CIDR notation (e.g. 24)
Gateway e.g. 192.168.100.1 or leave the settings empty	DNS Separate IP addresses with commas (,) or leave the settings empty
MTU 9000 The valid value in the range of 1500-9000	
☐ Disable network adapter ☒ Connect automatically on boot	
Cancel Save	

4. You should see the newly assigned “Data” role and IP address to the network adapter.



Add Physical Disks

Attach physical storage to StarWind x Veeam Hardened Backup Repository Controller VM:

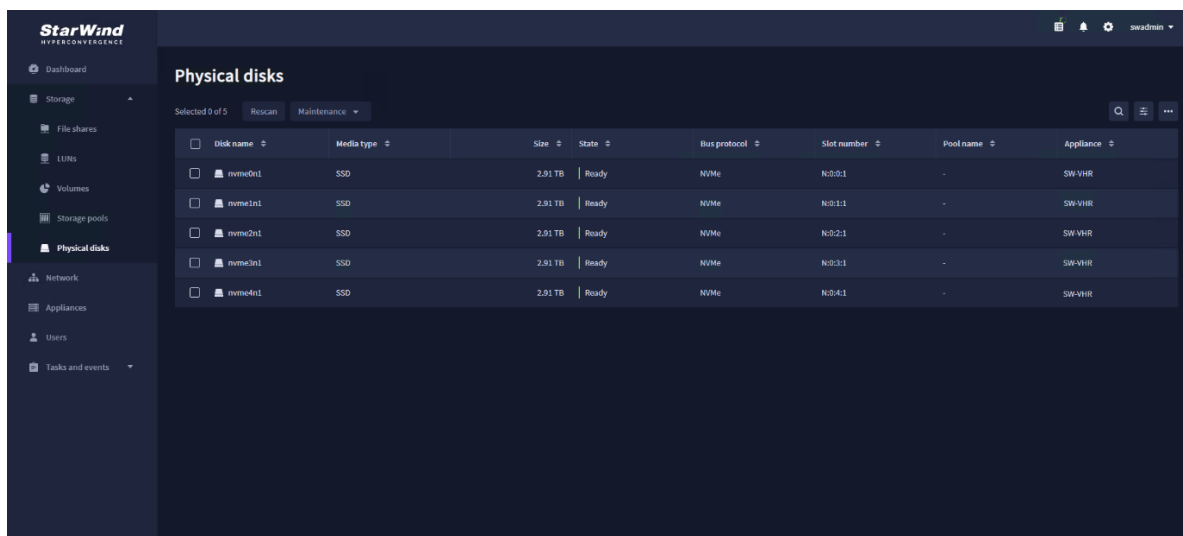
- Ensure that all physical drives are connected through an HBA or RAID controller.
- Add HBA, RAID controllers, or NVMe SSD drives to StarWind CVM via a passthrough device or add a virtual disk.

Learn more about storage provisioning guidelines in the [KB article](#).

NOTE. In this guide, NVMe drives are passed through to StarWind VBA CVM as an example.

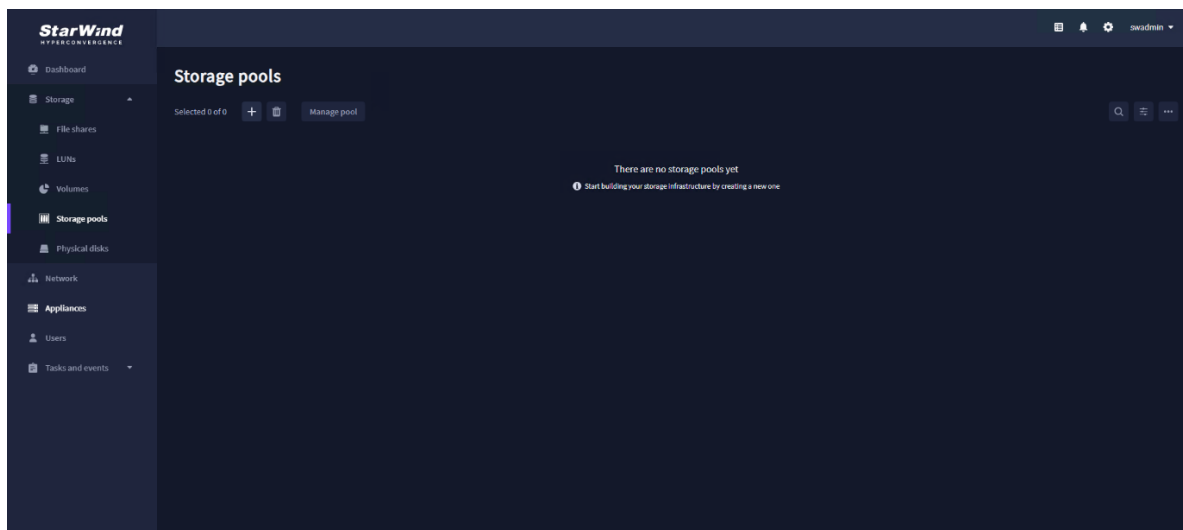
Create Storage Pool

1. Navigate to the Storage tab, select Physical disks and click Rescan.

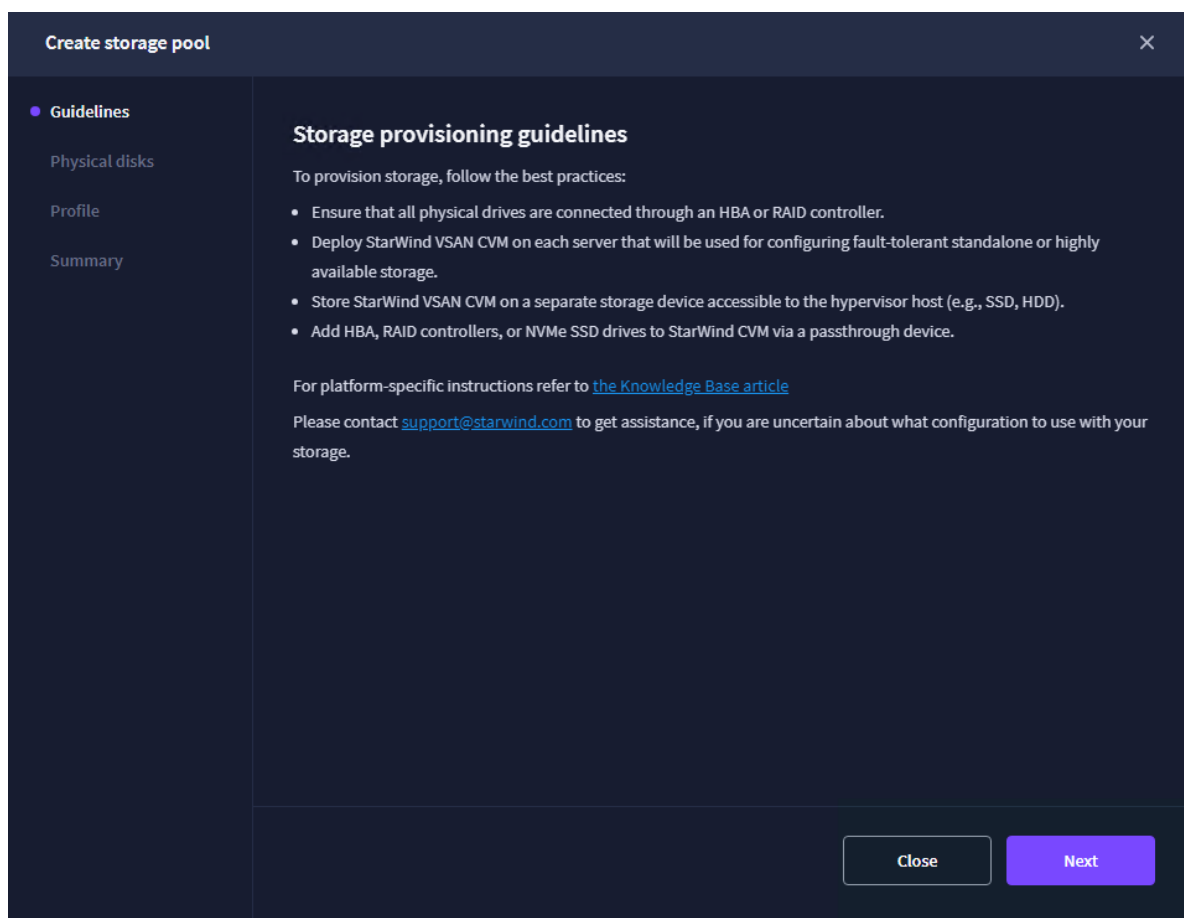


NOTE: StarWind x Veeam Hardened Backup Repository can use storage from a hardware RAID or create a Linux Software RAID or ZFS storage pools from the drives connected to an HBA controller. This guide uses Linux Software RAID as an example.

2. In the Storage tab, navigate to the Storage pools and click the “+” sign.



3. Verify the prerequisites and click Next.



4. Select the drives to create a Linux Software RAID and click Next.

Create storage pool

Guidelines

Physical disks

Profile

Summary

Physical disks

Select physical disks to include in storage pools on each node

SW-VHR

	Disk name	Media t...	Bus pro...	Size	Slot	Contro...
☒	nvme0n1	SSD	NVMe	2.91 TB	N:0:0:1	Micron_745...
☒	nvme1n1	SSD	NVMe	2.91 TB	N:0:1:1	Micron_745...
☒	nvme2n1	SSD	NVMe	2.91 TB	N:0:2:1	Micron_745...
☒	nvme3n1	SSD	NVMe	2.91 TB	N:0:3:1	Micron_745...
☒	nvme4n1	SSD	NVMe	2.91 TB	N:0:4:1	Micron_745...

Total raw capacity of selected disks: 14.55 TB

Back

Next

5. Select one of the preconfigured storage profiles or create a redundancy layout for the new storage pool manually according to your redundancy, capacity, and performance requirements. Software RAID-6 is highly recommended. To configure it, select Manual and click Next.

Create storage pool

Guidelines

Physical disks

Profile

Summary

Profile

Choose an optimal storage pool profile. Selected disks left unused will be assigned to hot spares.

Storage pool profile	Usable capacity	Fault tolerance	Hot spares
☐ High performance (recommended) Maximize storage performance while maintaining redundancy (Software RAID\RAID-10)	5.76 TB	2	- 1 +
☐ Better redundancy Maximize storage capacity while maintaining redundancy (ZFS\RAID-Z2)	7.77 TB	2	- 0 +
☐ High capacity Maximize redundancy while maintaining high storage capacity (Software RAID\RAID-5)	11.52 TB	1	- 0 +
☒ Manual Allows you to configure the storage pool layout manually.	-	-	-

Back

Next

6. Select Software RAID and then select Software RAID\RAID-6 from the Available storage pool layouts. Click Next.

Create storage pool

Guidelines

Physical disks

Profile

Manual configuration

Summary

Manual configuration

Choose the storage pool type and layout. Selected disks left unused will be assigned to hot spares.

Software RAID

- Better random write performance
- Better scalability
- Optimal for highly available (HA) SSD or HDD configurations

ZFS

- Enables storage snapshots
- Provides "bit rot" protection
- Optimal for HDD-based standalone configurations

Available storage pool layouts

Software RAID\RAID-6

Number of disk groups

1

Hot spare

0

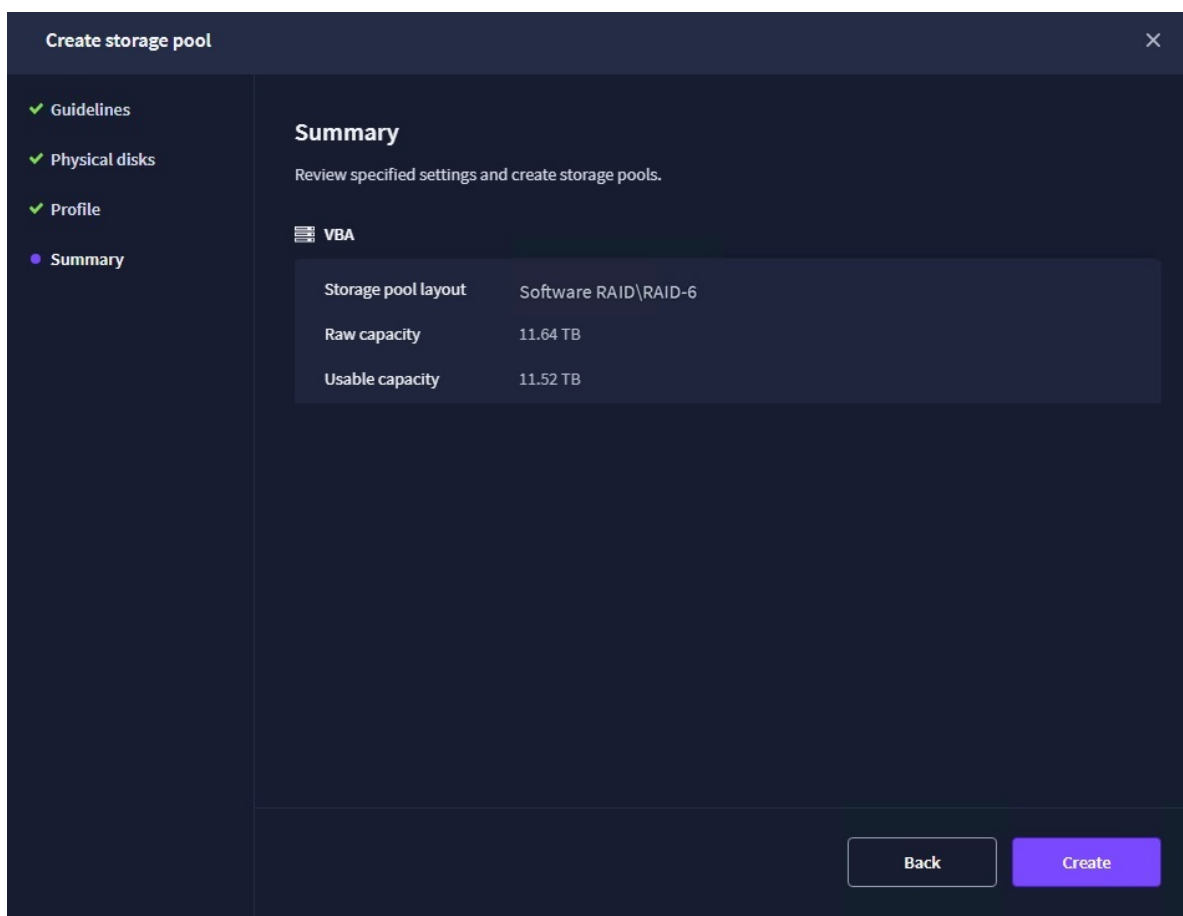
Disks in each group: 5

The estimated usable capacity for the configured storage pool layout:

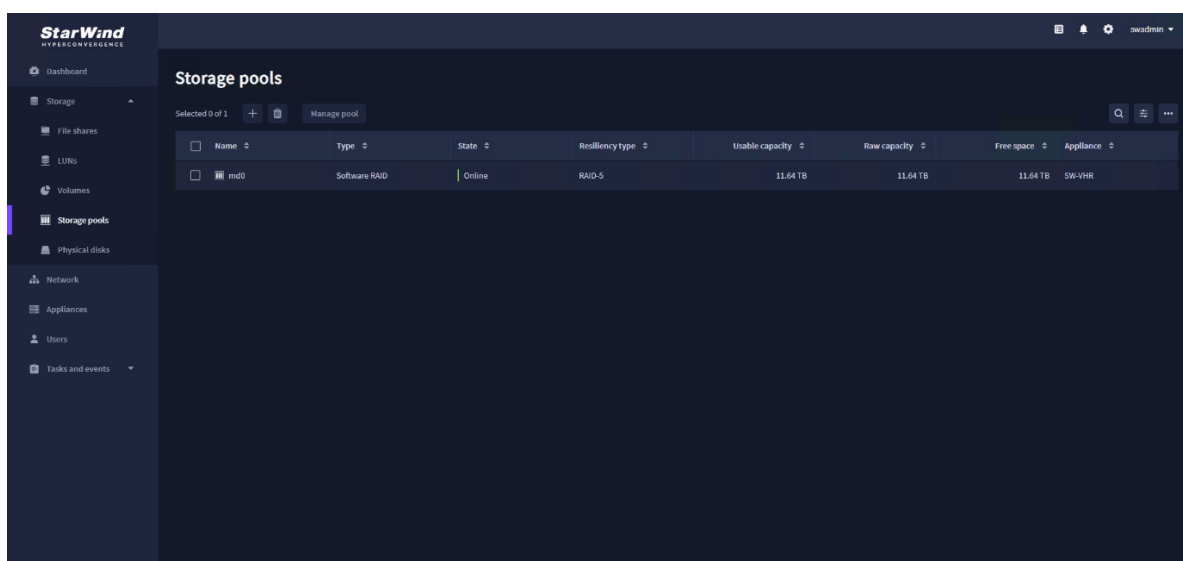
Back

Next

7. Review "Summary" and click the "Create" button to create the storage pool.



8. Wait until the Linux Software RAID synchronization process is fully complete and its state changes to Online.



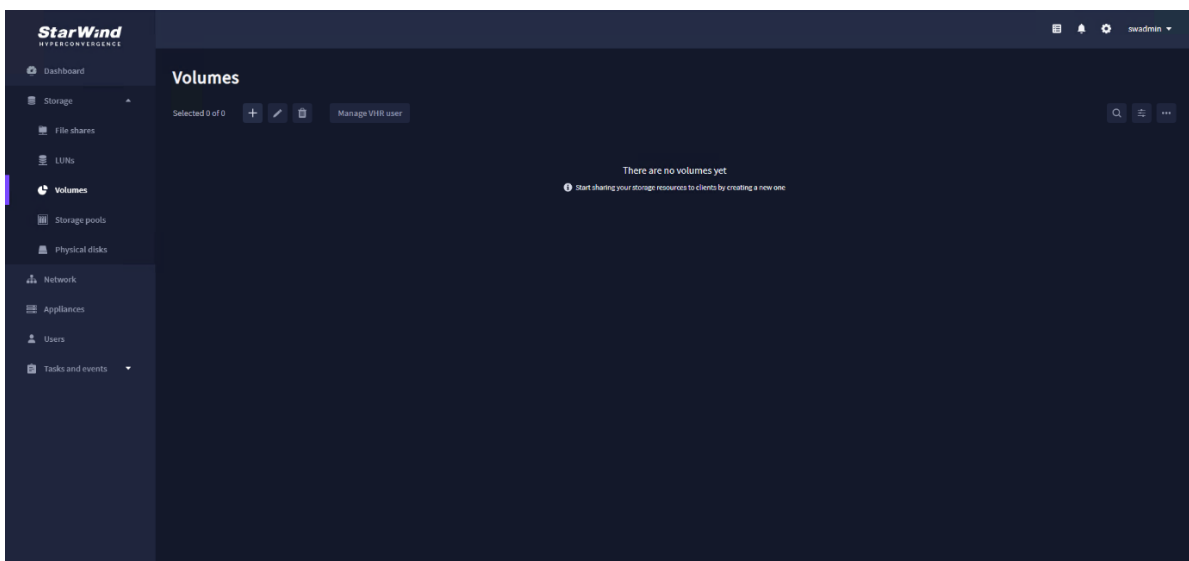
Create Backup Repository

StarWind x Veeam Hardened Backup Repository supports the creation of only hardened backup repository and non-hardened backup repository (direct attach Linux repository) for use with Veeam Backup & Replication.

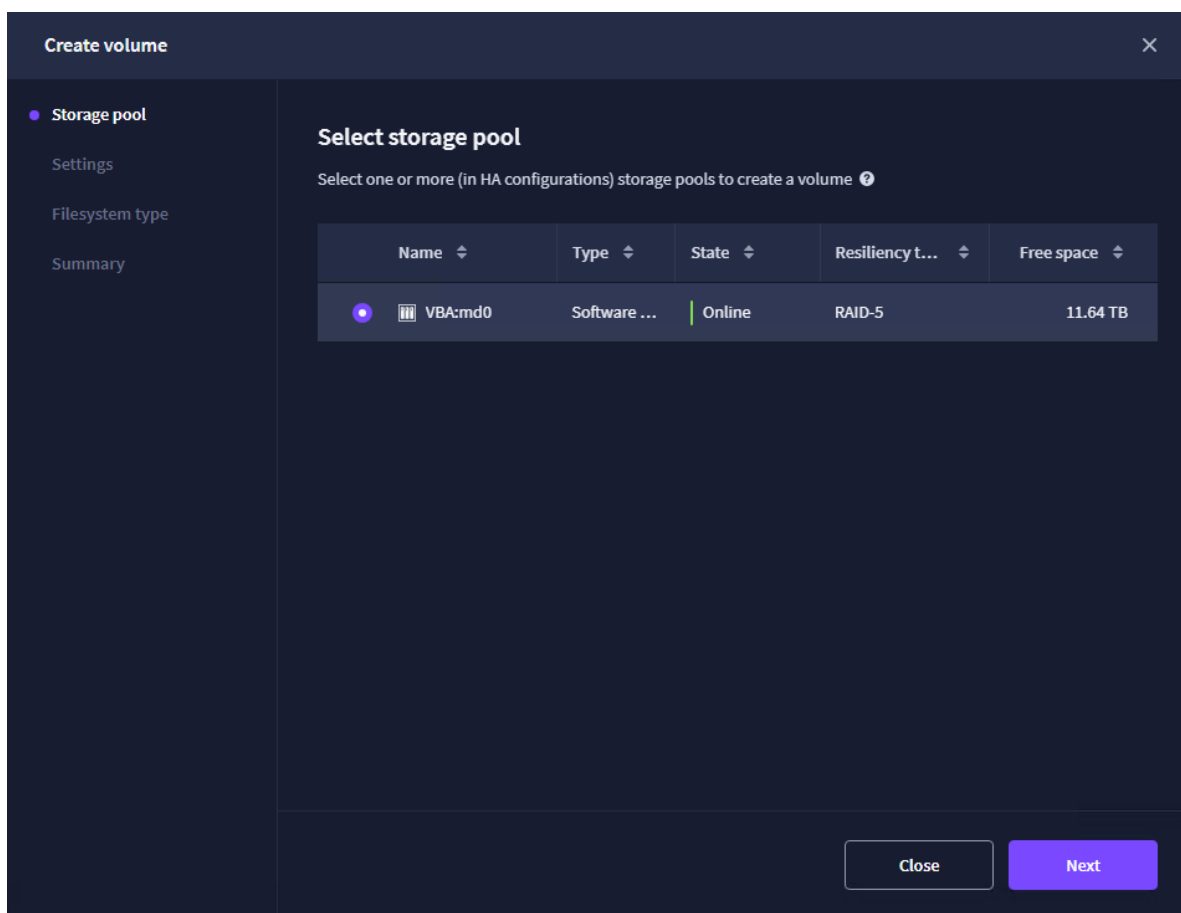
NOTE. Hardened Repository ensures immutability only when used with Veeam Backup & Replication.

Hardened Repository For Veeam Backup & Replication

1. Navigate to the “Volumes” tab and click the “+” button to open the “Create volume” wizard.



2. Select the storage pool that will be used for a new volume and click Next.



3. Specify the volume name and capacity. Click Next.

Create volume

✓ Storage pool

● Settings

Filesystem type

Summary

Specify settings

Specify the volume name and size

Name

sw-hardened-repo

You can use Latin letters, numbers, and dash

Size

11

Units

TB

Available storage pool capacity: 11.643 TB

Back

Next

4. Select the “Backup repository” volume type and click Next. Backup repository volume type has been specifically designed for use with Veeam Backup & Replication.

Create volume

✓ Storage pool

✓ Settings

● **Filesystem type**

Summary

Choose filesystem settings

Choose the preferred filesystem settings for the new volume

☐ **Standard**
The XFS volume is created with standard settings. Recommended for general use and the highest performance.

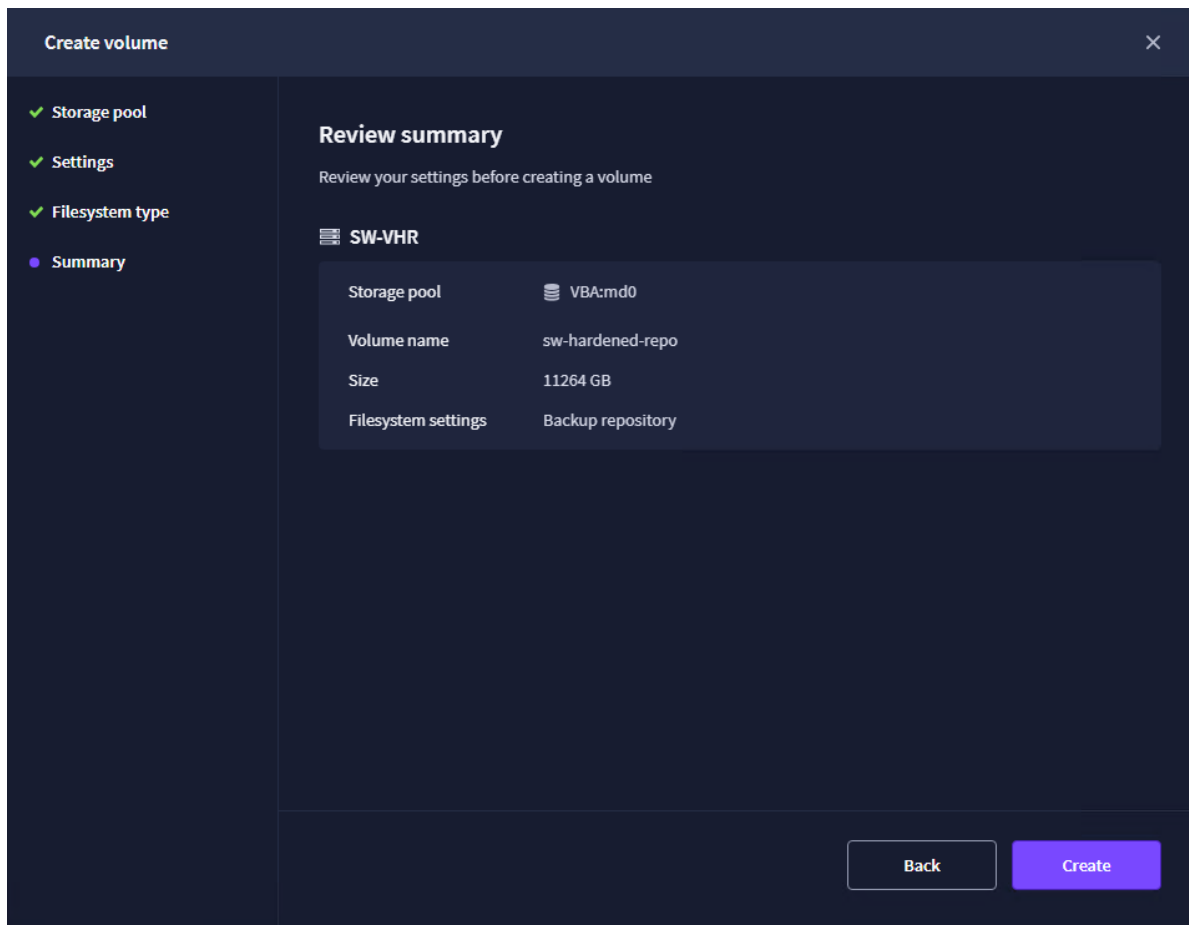
☐ **Raw**
An unformatted volume is created. Recommended for creating an NVMe-oF LUN

☒ **Backup repository**
The XFS volume is created with additional reflink (data block sharing) and CRC check flags.

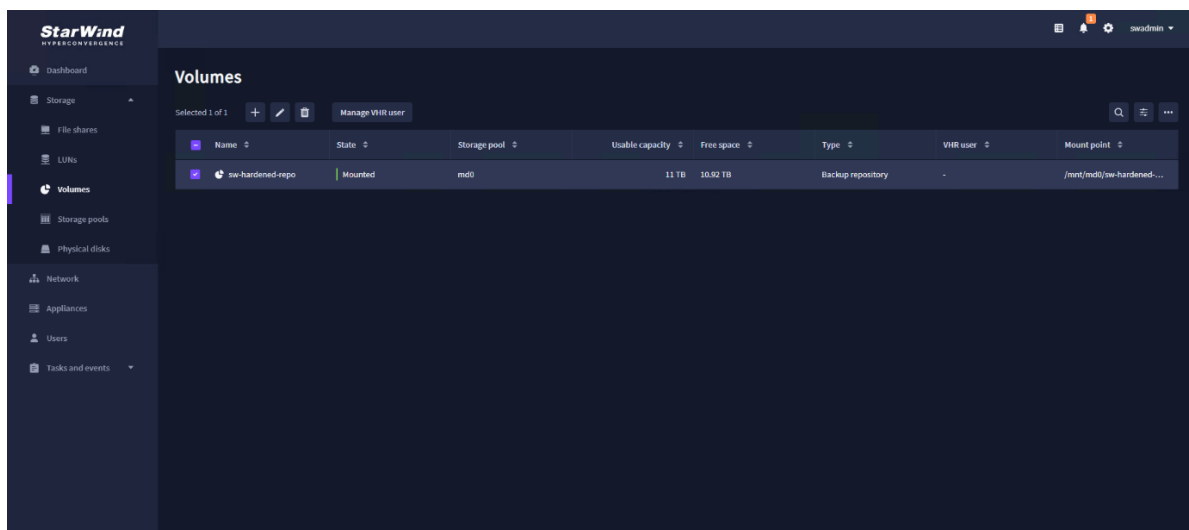
Back

Next

5. Review Summary and click Create.



6. Select the recently created Volume and click “Manage VHR user”. This will create a dedicated Veeam Hardened Repository user with limited permissions for the selected volume.



NOTE. If Hardened Repository is not required, you can skip the further steps of creating a VHR user. The backup repository can be then added to Veeam Backup & Replication as a Direct Attached Linux storage to benefit from faster Veeam transport Service.

7. Click the “+” sign to create a new VHR user.

Manage VHR user

Create a new or choose the existing Veeam hardened repository (VHR) user that will have exclusive access to **sw-hardened-repo**

+
Q

User	Date created	SSH access
------	--------------	------------

Cancel
Save

8. Specify the user name and password. Make sure to enable SSH access for VHR user.

Click Save.

Create Veeam user

×

The new user will be assigned to the **Veeam service** group. ?

Veeam user name

veeamuser

Can contain lowercase Latin letters, digits, underscores, periods and dashes

Password

••••••••

Must contain 8-64 characters, including numbers, symbols and capital letter

☒ Enable SSH for this user

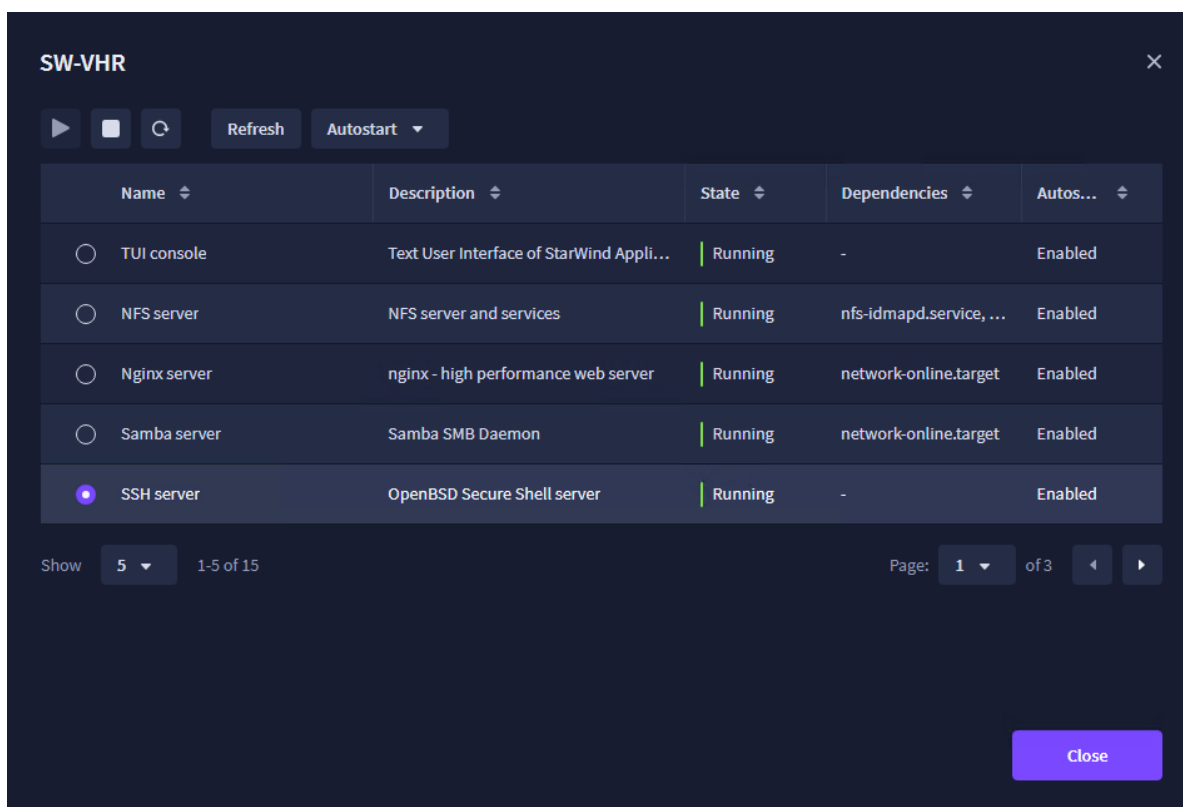
!

Disable SSH after adding the host and creating the hardened repository in the Veeam Backup & Replication console.

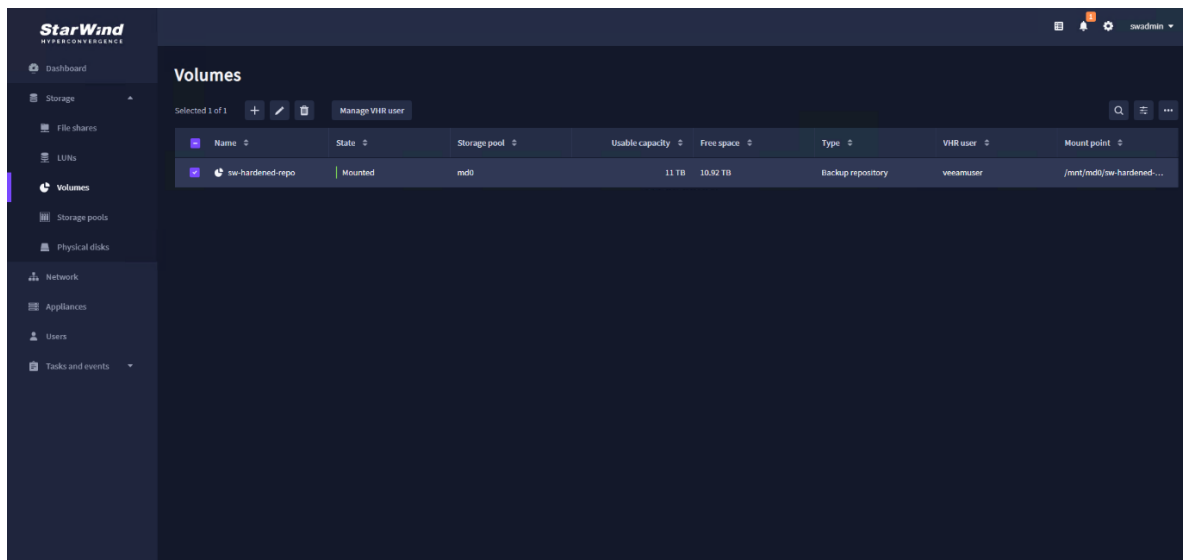
Cancel

Save

9. Make sure that SSH service is started and running in StarWind x Veeam Hardened Backup Repository CVM, For this, click the “settings icon”, navigate to “Services” and start SSH server.

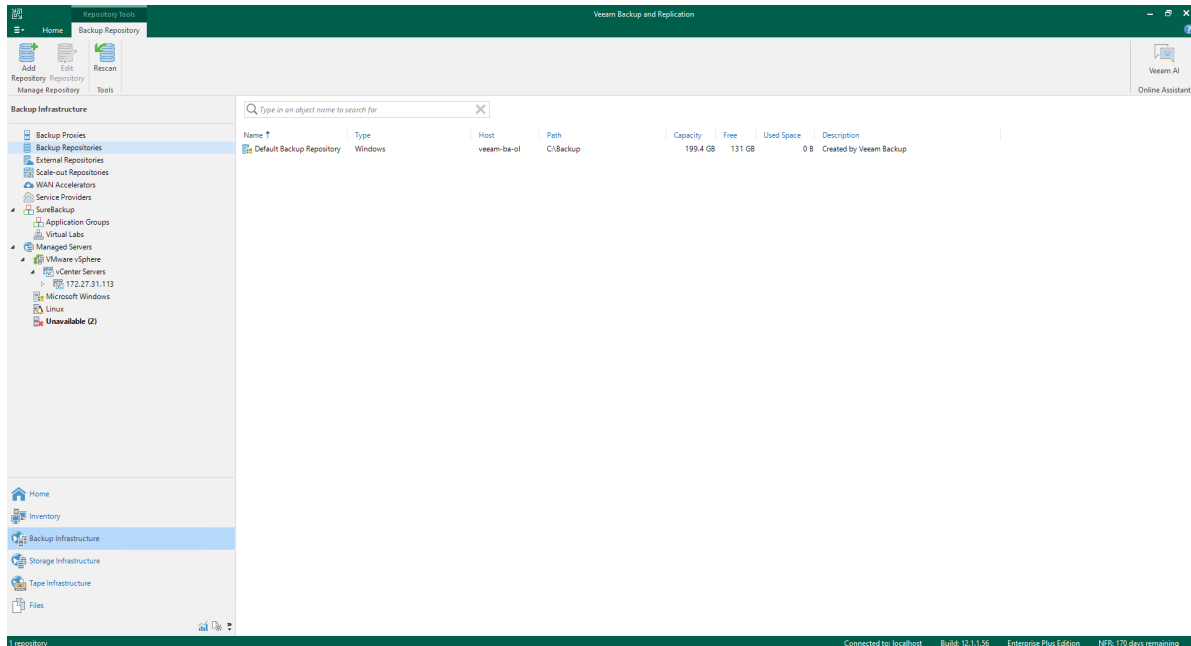


10. The recently created VHR user has been assigned to the volume.



Adding Hardened Repository To Veeam Backup & Replication

1. Open the Veeam Backup and Replication console, navigate to “Backup Infrastructure”, and select “Backup Repositories”.



2. Click “Add Repository” and select “Direct attached storage”.

Add Backup Repository ✕

Select the type of backup repository you want to add.



Direct attached storage

Microsoft Windows or Linux server with internal or direct attached storage. This configuration enables data movers to run directly on the server, allowing for fastest performance.



Network attached storage

Network share on a file server or a NAS device. When backing up to a remote share, we recommend that you select a gateway server located in the same site with the share.



Deduplicating storage appliance

Dell Data Domain, ExaGrid, Fujitsu ETERNUS CS800, HPE StoreOnce, Infinidat InfiniGuard or Quantum DXi. If you are unable to meet the requirements of advanced integration via native appliance API, use the network attached storage option instead.



Object storage

On-prem object storage system or a cloud object storage provider.

Cancel

3. Select "Linux (Hardened Repository)".



Direct Attached Storage

Select the operating system type of a server you want to use as a backup repository.

✕



Microsoft Windows

Adds local storage presented as a regular volume or Storage Spaces. For better performance and storage efficiency, we recommend using ReFS.



Linux

Adds local storage or locally mounted NFS share. For better performance and storage efficiency, we recommend using XFS. The Linux server must use bash shell, and have SSH and Perl installed.



Linux (Hardened Repository)

Requires a Linux server with internal or direct attached storage. This configuration enables protection against cybersecurity threats with immutable backups. The Linux server must use bash shell and have SSH installed. For reduced attack surface, minimal Linux installation is highly recommended.

Cancel

4. In the “New Backup Repository” wizard, specify the name and description for the new repository and click “Next”.

New Backup Repository
×



Name
Type in a name and description for this backup repository.

Name	Name: sw-vhr
Server	Description: Created by SW-VEEAMBR-OL\Administrator at 10/16/2024 9:16 AM.
Repository	
Mount Server	
Review	
Apply	
Summary	

< Previous
Next >
Finish
Cancel

5. Click “Add New...”.

New Backup Repository
×



Server
Choose repository server. You can select server from the list of managed servers added to the console.

Name

Server
Repository
Mount Server
Review
Apply
Summary

Repository server:

Add New...

Path	Capacity	Free

Populate

< Previous
Next >
Finish
Cancel

6. In the “New Linux Server” wizard, specify the IP address of the backup traffic network interface (Data) on StarWind x Veeam Hardened Backup Repository CVM and click “Next”.

NOTE: You can add a backup repository using the management IP address of StarWind x Veeam Hardened Backup Repository CVM or DNS name. It is recommended to add the backup traffic network (Data) to Veeam preferred Networks after the addition of backup repository in case a separate dedicated backup (Data) network is present:

https://helpcenter.veeam.com/docs/backup/vsphere/select_backup_network.html?ver=120

New Linux Server
×



Name
Specify DNS name or IP address of Linux server. The server must have SSH and Perl installed.

Name	DNS name or IP address: 172.16.30.10
SSH Connection	Description: Created by SW-VEEAMBR-OL\Administrator at 10/4/2024 8:09 AM.
Review	
Apply	
Summary	

< Previous
Next >
Finish
Cancel

7. Click “Add...” to add the VHR user account created previously that will be used for single-use credentials.

New Linux Server
×


SSH Connection
Provide credentials for service console connection, and adjust secure shell (SSH) port number using advanced settings if required.

Name	Single-use credentials:
SSH Connection	Add new single-use credentials ▼ Add...
Review	
Apply	
Summary	

Customize advanced connection settings such as SSH timeout and service ports.
Advanced...

< Previous
Next >
Finish
Cancel

8. Specify the VHR user account credentials and click “OK”. Specify Advanced settings if required and then click “Next”.

Credentials ✕

 Username:

Password: 

SSH port: 

Non-root account

☒ Elevate account privileges automatically

☐ Add account to the sudoers file

☐ Use "su" if "sudo" fails

Root password:

Description:

9. Review the components that will be installed and click “Apply”.

New Linux Server
×



Review
Please review your settings and click Apply to continue.

Name
SSH Connection
Review
Apply
Summary

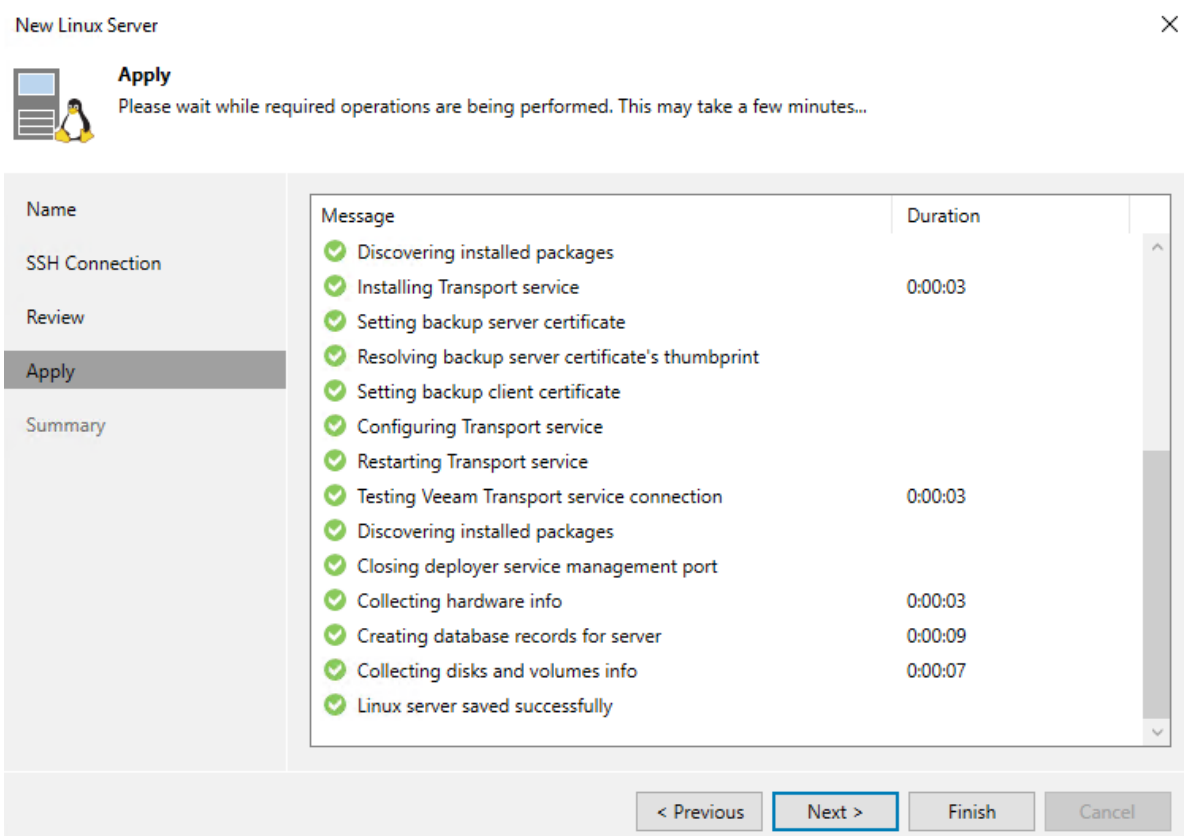
Due to these modifications the following components will be installed or removed on the target host:

Component name	Status
Installer	will be installed
Transport	will be installed

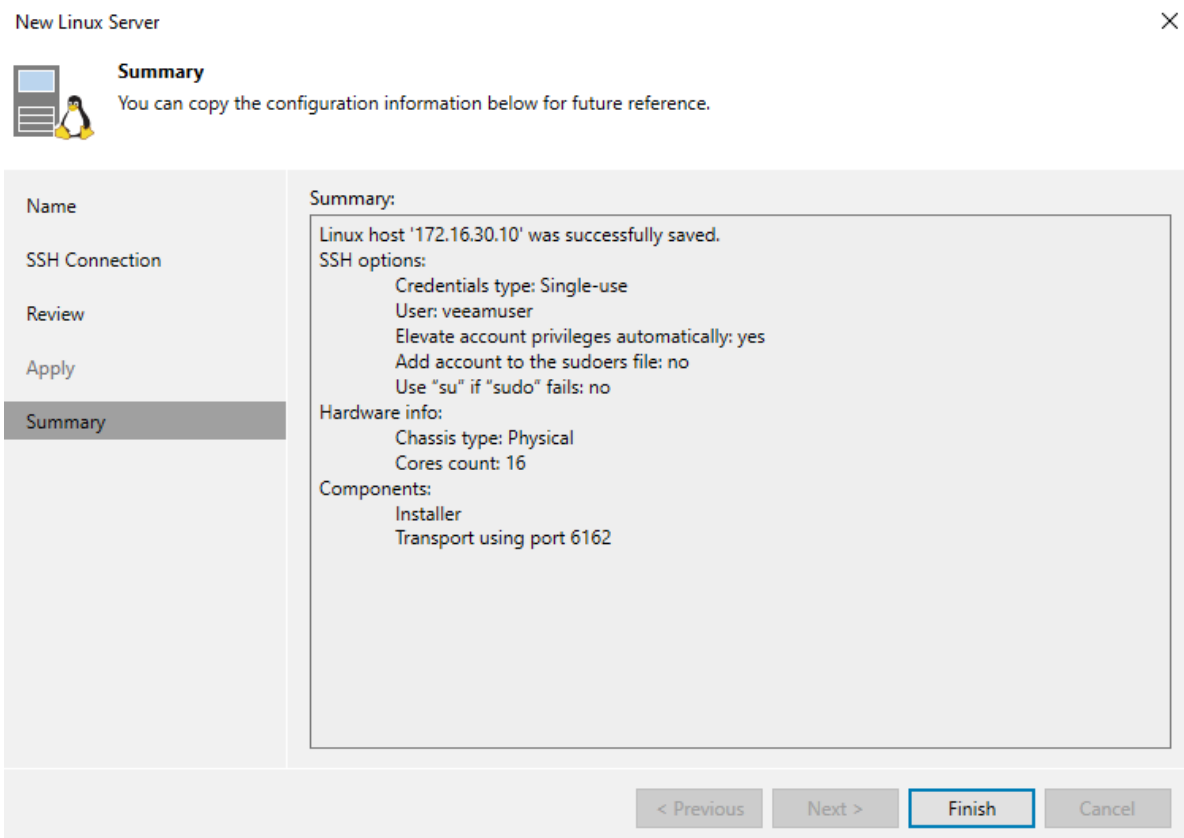
After you click Apply missing components will be installed on the target host.

< Previous
Apply
Finish
Cancel

10. Wait until the installation is complete and click “Next”.



11. Review the summary and click “Finish”.



12. In the “New Backup Repository” wizard, select the newly added StarWind x Veeam Hardened Backup Repository server and click “Populate”. Select the Backup repository volume created in StarWind x Veeam Hardened Backup Repository and click “Next”

New Backup Repository



Server

Choose repository server. You can select server from the list of managed servers added to the console.

Name	Repository server:																																						
Server	172.16.30.10 (Created by SW-VEEAMBR-OL\Administrator at 10/4/2024 8:09 AM.) Add New...																																						
Repository	<table border="1"> <thead> <tr> <th>Path</th> <th>Capacity</th> <th>Free</th> </tr> </thead> <tbody> <tr> <td>/ (/dev/mapper/main-root)</td> <td>28.7 GB</td> <td>18.5 GB</td> </tr> <tr> <td>/boot (/dev/sda3)</td> <td>456 MB</td> <td>240.6 MB</td> </tr> <tr> <td>/boot/efi (/dev/sda2)</td> <td>240.2 MB</td> <td>240.2 MB</td> </tr> <tr> <td>/dev (udev)</td> <td>3.8 GB</td> <td>3.8 GB</td> </tr> <tr> <td>/dev/shm (tmpfs)</td> <td>3.9 GB</td> <td>3.9 GB</td> </tr> <tr> <td>/mnt/md0/sw-hardened-repo (/dev/mapper/vg...</td> <td>11 TB</td> <td>10.9 TB</td> </tr> <tr> <td>/run (tmpfs)</td> <td>793.4 MB</td> <td>790.8 MB</td> </tr> <tr> <td>/run/lock (tmpfs)</td> <td>5 MB</td> <td>5 MB</td> </tr> <tr> <td>/run/user/1002 (tmpfs)</td> <td>793.3 MB</td> <td>793.3 MB</td> </tr> <tr> <td>/run/user/1003 (tmpfs)</td> <td>793.3 MB</td> <td>793.3 MB</td> </tr> <tr> <td>/sys/fs/cgroup (tmpfs)</td> <td>3.9 GB</td> <td>3.9 GB</td> </tr> </tbody> </table> Populate			Path	Capacity	Free	/ (/dev/mapper/main-root)	28.7 GB	18.5 GB	/boot (/dev/sda3)	456 MB	240.6 MB	/boot/efi (/dev/sda2)	240.2 MB	240.2 MB	/dev (udev)	3.8 GB	3.8 GB	/dev/shm (tmpfs)	3.9 GB	3.9 GB	/mnt/md0/sw-hardened-repo (/dev/mapper/vg...	11 TB	10.9 TB	/run (tmpfs)	793.4 MB	790.8 MB	/run/lock (tmpfs)	5 MB	5 MB	/run/user/1002 (tmpfs)	793.3 MB	793.3 MB	/run/user/1003 (tmpfs)	793.3 MB	793.3 MB	/sys/fs/cgroup (tmpfs)	3.9 GB	3.9 GB
Path	Capacity	Free																																					
/ (/dev/mapper/main-root)	28.7 GB	18.5 GB																																					
/boot (/dev/sda3)	456 MB	240.6 MB																																					
/boot/efi (/dev/sda2)	240.2 MB	240.2 MB																																					
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/dev/shm (tmpfs)	3.9 GB	3.9 GB																																					
/mnt/md0/sw-hardened-repo (/dev/mapper/vg...	11 TB	10.9 TB																																					
/run (tmpfs)	793.4 MB	790.8 MB																																					
/run/lock (tmpfs)	5 MB	5 MB																																					
/run/user/1002 (tmpfs)	793.3 MB	793.3 MB																																					
/run/user/1003 (tmpfs)	793.3 MB	793.3 MB																																					
/sys/fs/cgroup (tmpfs)	3.9 GB	3.9 GB																																					
Mount Server																																							
Review																																							
Apply																																							
Summary																																							

< Previous
Next >
Finish
Cancel

13. Make sure that the “Use fast cloning on XFS volumes” setting is enabled and specify the required retention period for immutability as well as other settings if required. Click “Next”.

New Backup Repository
✕

Repository

Type in path to the folder where backup files should be stored, and set repository load control options.

Name Server Repository Mount Server Review Apply Summary	Location Path to folder: /mnt/md0/sw-hardened-repo/backups Browse... Capacity: <Unknown> Populate Free space: <Unknown> ☒ Use fast cloning on XFS volumes (recommended) Reduces storage consumption and improves synthetic backup performance. Make recent backups immutable for: 7 days Protects backups from modification or deletion by ransomware, malicious insiders and hackers. GFS backups are made immutable for the entire duration of their retention policy. Load control Running too many concurrent tasks against the repository may reduce overall performance, and cause I/O timeouts. Control storage device saturation with the following settings: ☒ Limit maximum concurrent tasks to: 4 ☐ Limit read and write data rate to: 1 MB/s Click Advanced to customize repository settings. Advanced...
--	--

< Previous

Next >

Finish

Cancel

14. Select the Mount server and instant-recovery write cache folder. Specify additional Ports settings if required.

New Backup Repository
✕



Mount Server

Specify a server to mount backups to when performing advanced restores (file, application item and instant VM recoveries). Instant recoveries require a write cache folder to store changed disk blocks in.

Name	Mount server:		
Server	sw-veeambr-01 (Backup server)	Add New...	
Repository	Instant recovery write cache folder:		
	C:\ProgramData\Veeam\Backup\IRCache\	Browse...	
Mount Server	Ensure that the selected volume has sufficient free disk space to store changed disk blocks of instantly recovered machines. We recommend placing the write cache folder on an SSD drive. ☒ Enable vPower NFS service on the mount server (recommended) Ports... Unlocks instant recovery of any backup (physical, virtual or cloud) to a VMware vSphere VM. vPower NFS service is not used for instant recovery to a Microsoft Hyper-V VM.		
Review			
Apply			
Summary			

15. Review the settings and components that will be installed and click “Apply”.

New Backup Repository
×



Review
Please review the settings, and click Apply to continue.

Name
Server
Repository
Mount Server
Review
Apply
Summary

The following components will be processed on server sw-veeambr-ol:

Component name	Status
vPower NFS	already exists
Mount Server	already exists
VMware VDDK	already exists

☐ Search the repository for existing backups and import them automatically
☐ Import guest file system index data to the catalog

< Previous
Apply
Finish
Cancel

16. Wait until the backup repository is created and click “Next”.

New Backup Repository



Apply

Please wait while backup repository is created and saved in configuration, this may take a few minutes.

Name	Message	Duration
Server	✓ Starting infrastructure item update process	0:00:02
Repository	✓ Discovering installed packages	
Mount Server	✓ Registering client sw-veeambr-ol for package vPower NFS	
	✓ Registering client sw-veeambr-ol for package Mount Server	
	✓ Registering client sw-veeambr-ol for package VMware VDDK	
Review	✓ Discovering installed packages	
	✓ All required packages have been successfully installed	
Apply	✓ Detecting server configuration	
	✓ Reconfiguring vPower NFS service	0:00:07
	✓ Creating configuration database records for installed packages	
	✓ Collecting backup repository info	0:00:03
	✓ Opening deployer service management port	
	✓ Checking write permissions for the repository folder	
	✓ Enabling restricted mode for Installer	
	✓ Closing deployer service management port	
	✓ Creating database records for repository	0:00:04
	✓ Backup repository has been saved successfully	

[< Previous](#)
[Next >](#)
[Finish](#)
[Cancel](#)

17. Review the summary and click “Finish”.

New Backup Repository
×



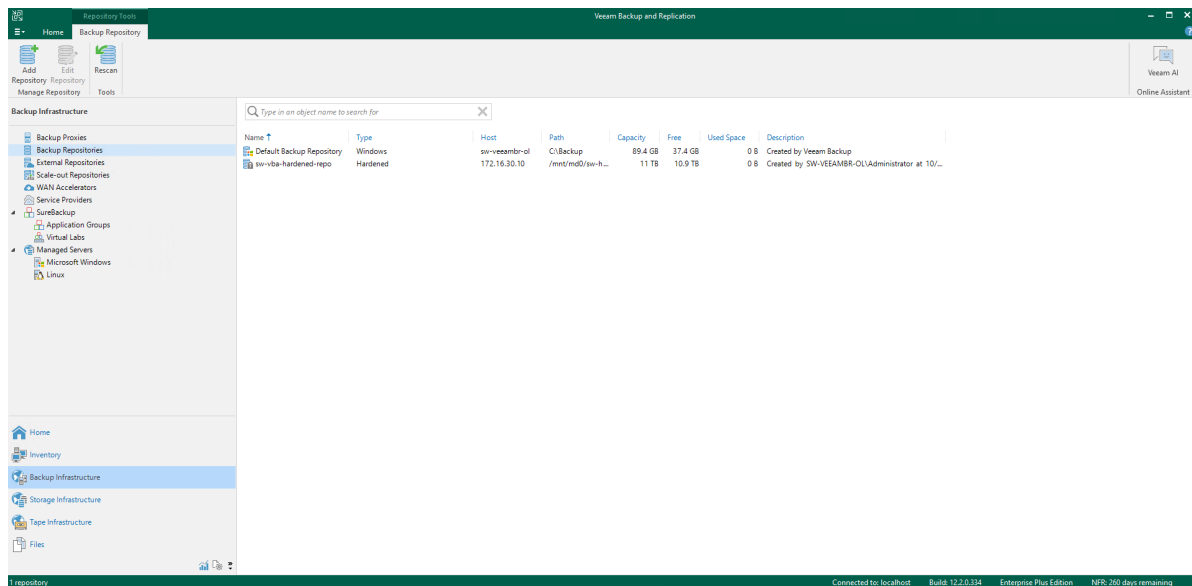
Summary
You can copy the configuration information below for future reference.

Name	Summary: Hardened backup repository 'sw-vba-hardened-repo' was successfully saved. Mount host: sw-veeambr-ol Backup folder: /mnt/md0/sw-hardened-repo/backups Write throughput: unlimited Max parallel tasks: 4 Fast cloning on XFS volumes: enabled Days of immutability: enabled for 7 days
Server	
Repository	
Mount Server	
Review	
Apply	
Summary	

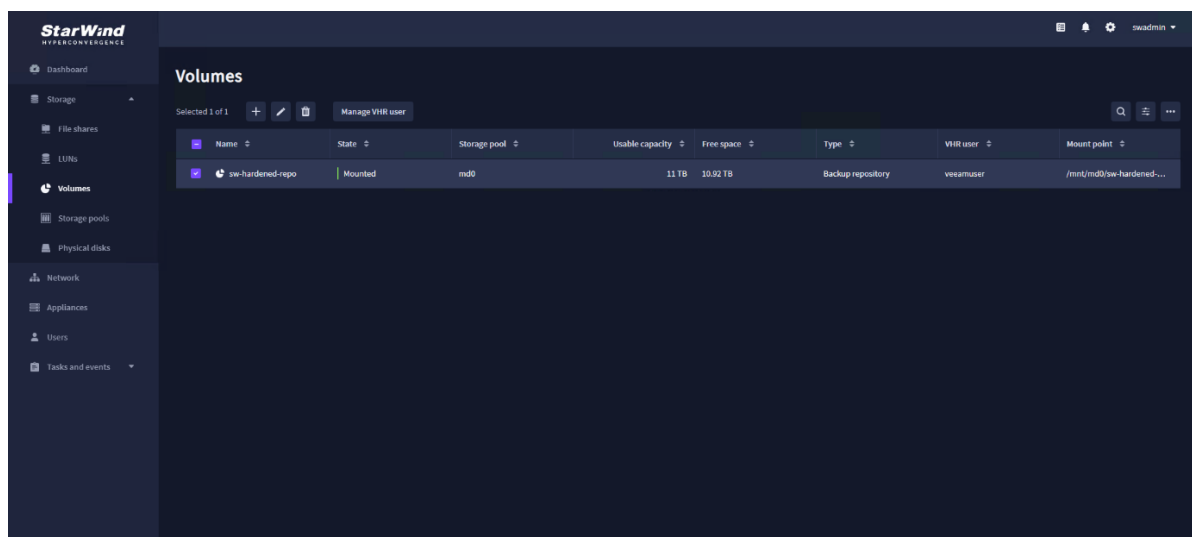
< Previous
Next >
Finish
Cancel

18. Veeam prompts whether you want to change the configuration backup location to the newly added repository. Select the preferred option according to your requirements.

19. Hardened Repository has been successfully added to Veeam Backup & Replication.



20. Navigate back to the “Volumes” tab in StarWind x Veeam Hardened Backup Repository CVM WEB UI, select the Backup repository volume and click “Manage VHR user”.



21. Change SSH access to “Disabled” to secure the StarWind Appliance from potential local threats such as credentials theft. Click “Save”.

Manage VHR user

×

Create a new or choose the existing Veeam hardened repository (VHR) user that will have exclusive access to **sw-hardened-repo**

+

Q

User	Date created	SSH access
veeamuser	10/04/2024 12:56:14	Disabled ▼

Cancel

Save

Conclusion

Following this guide, Veeam Hardened Linux Repository has been configured in StarWind x Veeam Hardened Backup Repository installed on a Proxmox host and added to Veeam Backup & Replication.

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