StarWind Virtual SAN®
for vSphere Configuring Fibre Channel with Qlogic HBAs

2024

TECHNICAL PAPERS

Trademarks

"StarWind", "StarWind Software" and the StarWind and the StarWind Software logos are registered trademarks of StarWind Software. "StarWind LSFS" is a trademark of StarWind Software which may be registered in some jurisdictions. All other trademarks are owned by their respective owners.

Changes

The material in this document is for information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, StarWind Software assumes no liability resulting from errors or omissions in this document, or from the use of the information contained herein. StarWind Software reserves the right to make changes in the product design without reservation and without notification to its users.

Technical Support and Services

If you have questions about installing or using this software, check this and other documents first - you will find answers to most of your questions on the Technical Papers webpage or in StarWind Forum. If you need further assistance, please contact us .

About StarWind

StarWind is a pioneer in virtualization and a company that participated in the development of this technology from its earliest days. Now the company is among the leading vendors of software and hardware hyper-converged solutions. The company's core product is the years-proven StarWind Virtual SAN, which allows SMB and ROBO to benefit from cost-efficient hyperconverged IT infrastructure. Having earned a reputation of reliability, StarWind created a hardware product line and is actively tapping into hyperconverged and storage appliances market. In 2016, Gartner named StarWind "Cool Vendor for Compute Platforms" following the success and popularity of StarWind HyperConverged Appliance. StarWind partners with world-known companies: Microsoft, VMware, Veeam, Intel, Dell, Mellanox, Citrix, Western Digital, etc.

Copyright ©2009-2018 StarWind Software Inc.

Annotation

Relevant products

StarWind Virtual SAN

Purpose

This document guides users in configuring StarWind storage device and VTL device and sharing them as a FC targets, so they can be used in FC infrastructure with minimum latency and the highest performance.

Audience

This guide is intended for experienced system administrators and IT professionals who would like to have StarWind Virtual SAN devices shared via Fibre Channel protocol.

Expected result

The result of following this guide is that users will have StarWind VSAN devices shared via FC protocol.

Introduction

Fibre Channel is a high-speed data transfer protocol that provides reliable and secure delivery of raw block data. It supports point-to-point connection between devices as well as connection via switched fabric (via Fibre Channel switches). Fibre cChannel (FC) is used to build a dedicated network used for storage connectivity between shared storage and servers (SAN).

While FC provides fast and secure connection to block storage, StarWind delivers High Availability by replicating the storage between the nodes. By combining StarWind Virtual SAN for vSphere with FC, users effectively eliminate single points of failures in their storage infrastructure.

This guide is intended for experienced system administrators and IT professionals who would like to have StarWind Virtual SAN Highly Available devices shared via Fibre cChannel protocol..

A full set of up-to-date technical documentation can always be found here, or by pressing

the Help button in the StarWind Management Console.

For any technical inquiries please visit our online community, the Frequently Asked Questions page, or use the support form to contact our technical support department

Prerequisites

Make sure that the prerequisites for deploying FC on StarWind Virtual SAN for vSphere are met:

- StarWind Virtual SAN virtual machines are is installed on the ESXi host.
- Networks are configured and the required amount of storage is provisioned to StarWind VMs.
- Qlogic Fibre Channel adapters are installed in storage hosts.
- Fibre Channel adapter is passed through to StarWind Virtual SAN virtual machine.

In order to install StarWind Virtual SAN for vSphere and configure the networks, please refer to the following guide:
https://www.starwindsoftware.com/resource-library/starwind-virtual-san-for-vsphere-installation-and-configuration-guide

StarWind Virtual SAN for vSphere system requirements can be found here:
https://www.starwindsoftware.com/system-requirements

Preconfiguration Steps

1. Log in to StarWind Virtual SAN for vSphere using the following default credentials:

Username: user
Password: rds123RDS
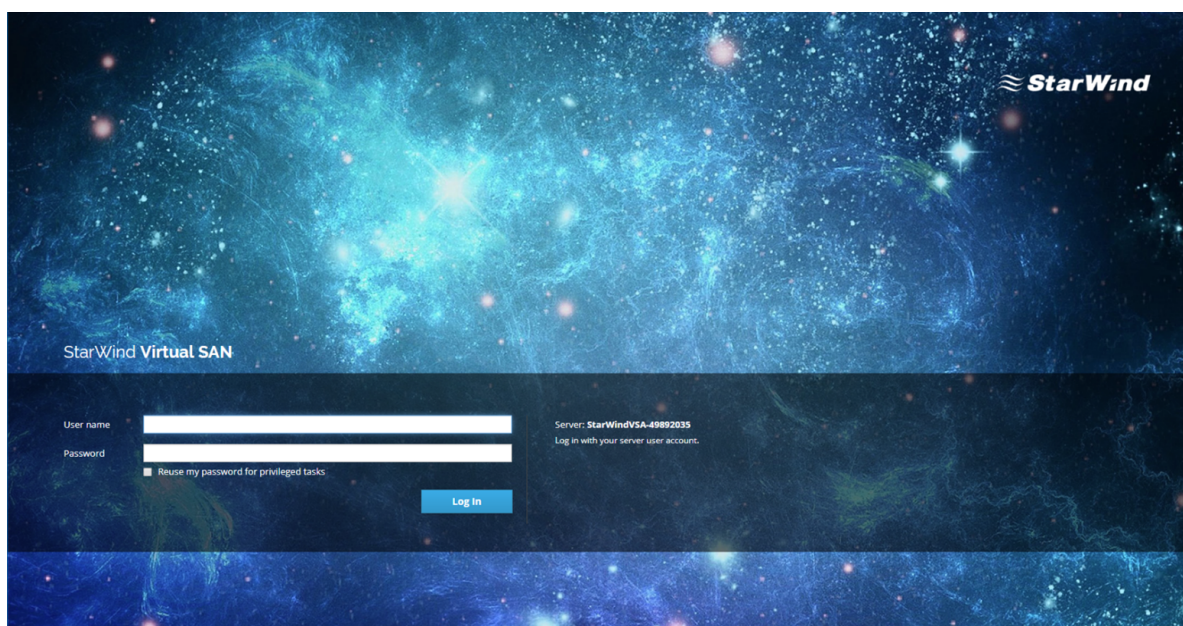
2. Navigate to the Terminal tab and list the available disks, run the following command to install Linux mainline kernel:

sudo yum –enablerepo=elrepo-kernel install kernel-ml

3. After successful installation, edit grup grub to boot from the kernel-ml:

sudo vi /etc/default/grub

```
GRUB_TIMEOUT=5
GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
GRUB_DEFAULT=0
GRUB_DISABLE_SUBMENU=true
GRUB_TERMINAL_OUTPUT="console"
GRUB_CMDLINE_LINUX="crashkernel=auto rhgb loglevel=0 ipv6.disable=1 quiet"
GRUB_DISABLE_RECOVERY="true"
```

Look for the line containing GRUB_DEFAULT=X, and change it to GRUB_DEFAULT=0
Save the configuration file.

4. Recreate the kernel configuration using the following command:
sudo grub2-mkconfig -o /boot/grub2/grub.cfg
Reboot the VM:
sudo reboot

5. Check kernel version after reboot:
uname -r

```
[user@starwindvsa-63894834 ~]$ uname -r
5.15.5-1.el7.elrepo.x86_64
```

6. By default, FC HBA QLogic starts in the initiator mode., iIt has to be turned to the target mode during the initiation. To do this, create a file /etc/modprobe.d/qla2xxx.conf with the parameter listed below, rebuild initrd and reboot.
cat <<EOF >> /etc/modprobe.d/qla2xxx.conf
options qla2xxx qlini_mode=disabled
EOF
dracut -f; reboot

7. Check HBA mode after restart:
cat /sys/module/qla2xxx/parameters/qlini_mode

8. Install targetcli
sudo yum install targetcli -y
sudo systemctl enable target.service
sudo systemctl start target.service

Configure Starwind Device

9. Create StarWind standalone device. Please refer to the following page:
https://www.starwindsoftware.com/help/CreatingaNewImageFileDevice.html

10. Discover and connect StarWind device via loopback (127.0.0.1)
iscsiadm -m discovery -t st -p 127.0.0.1
iscsiadm -m node -T iqn.2008-08.com.starwindsoftware:sw-sed-vsa-fc-01.starwind.local-vtl -p 127.0.0.1 -l

11. Check that StarWind device was successfully connected:
sudo iscsiadm -m node

```
[user@starwindvsa-63894834 ~]$ sudo iscsiadm -m node
127.0.0.1:3260,-1 iqn.2008-08.com.starwindsoftware:192.168.12.225-test
```

Configure Fibre Channel Target

1. Get HBA Port wwn for target and initiator VM:
cat /sys/class/fc_host/hostX/port_name

```
[root@starwindvsa-63894834 user]# cat /sys/class/fc_host/host16/port_name
0x5001438018756d08
```
NOTE. X – number of FC HBA.

2. Create block backstore for StarWind device:

sudo targetcli

backstores/block create dev=/dev/sdc name=test

3. Create a target with wwn = 5001438018756d08 (FC HBA wwn on the target machine)

/qla2xxx create naa.5001438018756d08

4. Create lun

/qla2xxx/naa.5001438018756d08/luns create /backstores/block/test

5. Create an ACL, with wwn = 21000024ff2f061e FC HBA wwn on the initiator machine)

6. Check the device connection on the initiator side.

Device can be formatted and used as a raw-block storage.

Configure Starwind Vtl Device

1. Create StarWind VTL. Please refer to the following page:
https://www.starwindsoftware.com/help/VirtualTapeDrive.html

2. Discover and connect StarWind VTL device via loopback (127.0.0.1)
iscsiadm -m discovery -t st -p 127.0.0.1
iscsiadm -m node -T iqn.2008-08.com.starwindsoftware:sw-vsa-01-vtl1 -p 127.0.0.1 -l

3. Check that StarWind VTL device was successfully connected:
sudo iscsiadm -m node

```
[root@starwindvsa-63894834 user]# iscsiadm -m node
127.0.0.1:3260,-1 iqn.2008-08.com.starwindsoftware:192.168.12.176-vtl1
```

Configure Fibre Channel Target For Starwind Vtl Device

4. Get HBA Port wwn for target and initiator VM:
cat /sys/class/fc_host/hostX/port_name

```
[root@starwindvsa-63894834 user]# cat /sys/class/fc_host/host16/port_name
0x5001438018756d08
```

NOTE: X – number of FC HBA

5. Create pscsi backstores for the changer & drive slotssudo targetcli
mkdir -p /sys/kernel/config/target/core/pscsi_0/changer
uuidgen > /sys/kernel/config/target/core/pscsi_0/changer/wwn/vpd_unit_serial
echo scsi_host_id=34,scsi_channel_id=0,scsi_target_id=0,scsi_lun_id=0 >
/sys/kernel/config/target/core/pscsi_0/changer/control
echo /dev/sch0 > /sys/kernel/config/target/core/pscsi_0/changer/udev_path
echo 1 > /sys/kernel/config/target/core/pscsi_0/changer/enable

for i in {1..4}; do \
mkdir -p /sys/kernel/config/target/core/pscsi_0/tape$i; \
uuidgen > /sys/kernel/config/target/core/pscsi_0/tape$i/wwn/vpd_unit_serial; \
echo scsi_host_id=34,scsi_channel_id=0,scsi_target_id=0,scsi_lun_id=$i >
/sys/kernel/config/target/core/pscsi_0/tape$i/control; \

```
let "a=$i-1"; \
echo /dev/st$a > /sys/kernel/config/target/core/pscsi_0/tape$i/udev_path; \
echo 1 > /sys/kernel/config/target/core/pscsi_0/tape$i/enable;
done
```

6. Using targetcli check if backstores created successfully:

7. Create a target with wwn = 5001438018756d08 (FC HBA wwn on the target machine):
/qla2xxx create naa.5001438018756d08

8. Create an ACL, with wwn = 21000024ff2f061e FC HBA wwn on the initiator machine):
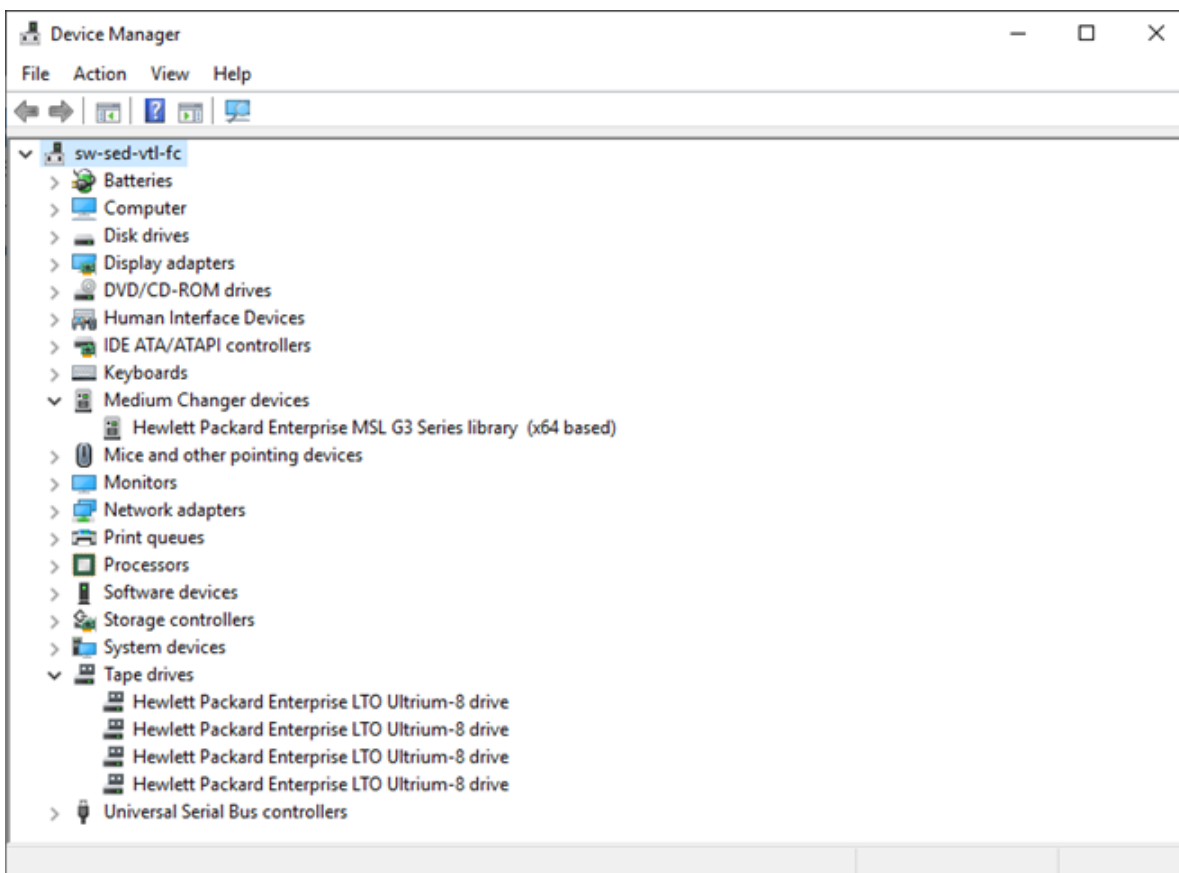/qla2xxx/naa.5001438018756d08/acls create 21000024ff2f061e

9. Create luns:
/qla2xxx/naa.21000024ff2f061e/luns create /backstores/pscsi/changer
/qla2xxx/naa.21000024ff2f061e/luns create /backstores/pscsi/tape1
/qla2xxx/naa.21000024ff2f061e/luns create /backstores/pscsi/tape2
/qla2xxx/naa.21000024ff2f061e/luns create /backstores/pscsi/tape3
/qla2xxx/naa.21000024ff2f061e/luns create /backstores/pscsi/tape4

10. Check the device connection on the initiator side.

VTL device can be used and used as a backup target.

Conclusion

Following this guide system administrators and IT professionals can get step-by-step instructions on configuring StarWind devices and share them as FC targets via Qlogic HBA, connected to StarWind Controller Virtual Machine. This gives the powerful combination of StarWind Virtual SAN and the Fibre Channel protocol to achieve a rapid data transfer storage infrastructure.

Contacts

US Headquarters	EMEA and APAC
+1 617 829 44 95	+44 2037 691 857 (United Kingdom)
+1 617 507 58 45	+49 800 100 68 26 (Germany)
+1 866 790 26 46	+34 629 03 07 17 (Spain and Portugal)
	+33 788 60 30 06 (France)

Customer Support Portal: https://www.starwind.com/support

Support Forum: https://www.starwind.com/forums

Sales: sales@starwind.com

General Information: info@starwind.com

StarWind Software, Inc. 100 Cummings Center Suite 224-C Beverly MA 01915, USA
www.starwind.com ©2024, StarWind Software Inc. All rights reserved.