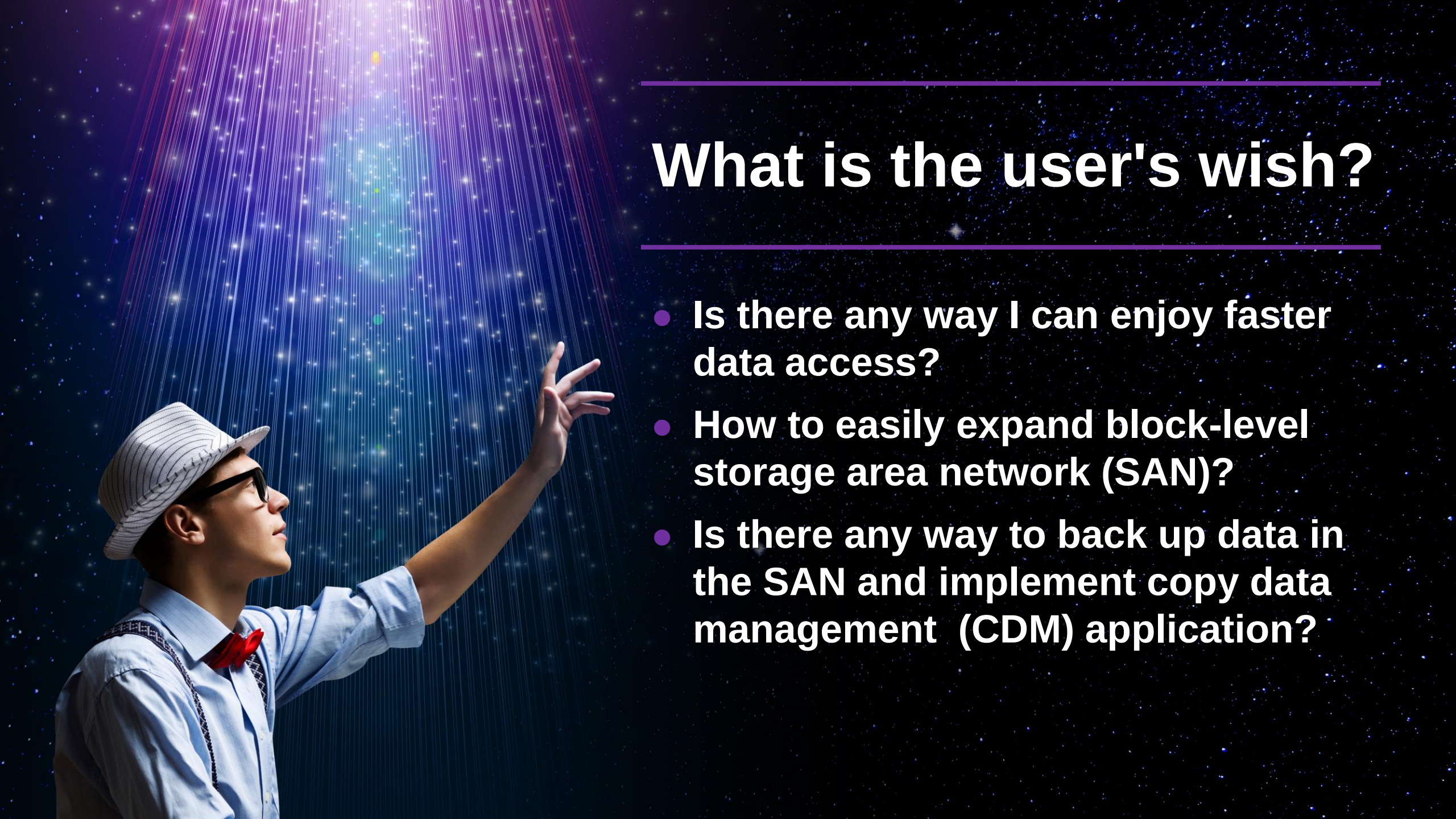




QNAP NAS now supports FC-SAN

**with QTS 4.4.1 and Marvell QLogic
fibre channel adapters**



A man wearing a straw hat, glasses, a light blue shirt, and a red bow tie is shown in profile, looking up and reaching his right hand towards a shower of colorful digital rain. The rain consists of many thin, vertical lines in shades of blue, purple, and green, with small, bright, multi-colored dots scattered throughout. The background is a dark, starry night sky.

What is the user's wish?

- Is there any way I can enjoy faster data access?
- How to easily expand block-level storage area network (SAN)?
- Is there any way to back up data in the SAN and implement copy data management (CDM) application?

QNAP wizard leads you to fulfill three wishes

1. QNAP NAS high performance storage space
2. Cross-border support Fibre Channel SAN provides users with a highly reliable, scalable, and affordable storage are network (SAN) solution
3. QNAP support Marvell QLogic 32Gb/16Gb/8Gb/4Gb FC adapters



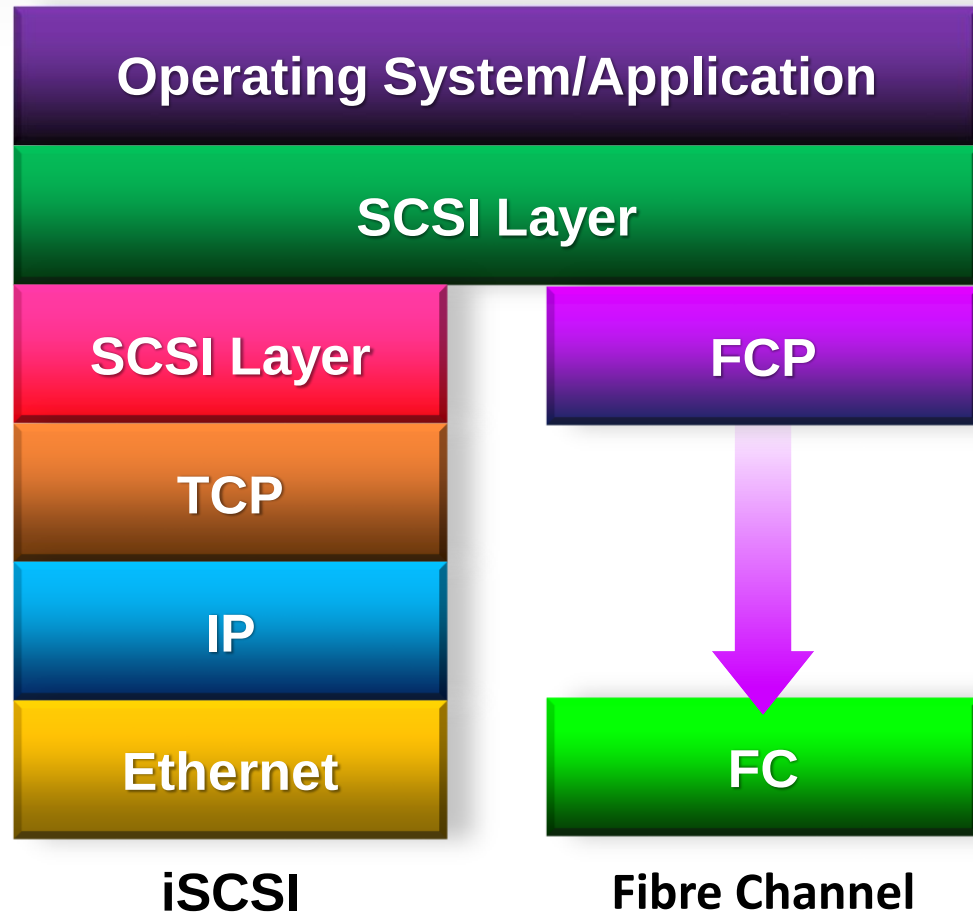
Why should companies build Fibre Channel storage area network?

- **Good connectivity :**
In a Fibre Channel Storage area Network (SAN) architecture, any server can be directly connected to any storage device, and any storage device can be directly connected to each other.
- **Good expandability :**
Enterprises can do extended action without increasing the load on the server and the local area network.
- **Good data sharing ability :**
Since the storage device is no longer connected to a specific server, resources can be shared by many servers and the main network performance is not affected when a large number of files are transmitted.



iSCSI vs. Fibre Channel Architecture

- Fibre Channel does not need to pass through Ethernet, and the physical layer in the system is less than iSCSI. When expanding the block-level storage network, Fibre Channel can be used to avoid network load.
- iSCSI needs to expand the block-level storage network via Ethernet.



Fibre Channel Reduces CPU Load

Speed/CPU		iSCSI		FC	
		25GbEx1	CPU%	32G	CPU%
Throughput (MB/s)	SW-1M	2709	56%	2944	39%
	SR-1M	2755	32%	2772	30%
	SW-512K	2707	61%	2951	37%
	SR-512K	2825	43%	2872	35%
IOPS	RW-4K	154793	81%	155197	77%
	RR-4K	108263	69%	113162	67%

Note: This test environment is RAID 0

Test environment : TS-1283XU-RP

- F/W: 4.4.1
- CPU: Intel(R) Xeon(R) E-2124 CPU @ 3.30GHz
- Tested SSD: Samsung SSD 850 PRO 512GB SATA*12, RAID 0
- RAM: 8 GB (4GB x 2)
- Block-based LUN; AIO enable
- FC 32G: QLogic Fibre Channel Adapter-QLE2742-SR-CK
- 25GbE: QXG-25G2SF-CX4, MTU 9000

IOmeter Global Configuration:

Maximum Disk Size: RAM*4/ Ramp Up Time: 30 seconds Seq / Run Time: 3 Minutes / 2-workers/ 64-outstanding Random / Run Time: 3 Minutes / 4-workers/ 32-outstanding

PC Environment

- CPU: Intel(R) Xeon(R) CPU E5-2630 v3 @ 2.40GHz
- OS: Windows Server 2016 Database Evaluation.
- Version: 10.0.14393 Build 14393
- Memory: 128 GB.
- FC 32G: QLogic Fibre Channel Adapter-QLE2742-SR-CK
- 25GbE: QXG-25G2SF-CX4, MTU 9000

Fibre Channel performance is good

Speed/CPU		FC	
		FC32Gx1(PC)	CPU%
Throughput (MB/s)	SW-1M	3133	30%
	SR-1M	4797	25%
	SW-512K	3154	29%
	SR-512K	2772	28%
IOPS	RW-4K	92632	40%
	RR-4K	195360	36%

Note: This test environment is RAID 5

IOmeter Global Configuration: Maximum Disk Size: RAM*4/ Ramp Up Time: 30 seconds

Seq / Run Time: 3 Minutes / 2-workers/ 64-outstanding

Random / Run Time: 3 Minutes / 4-workers/ 32-outstanding

Test environment : TS-2483XU-RP

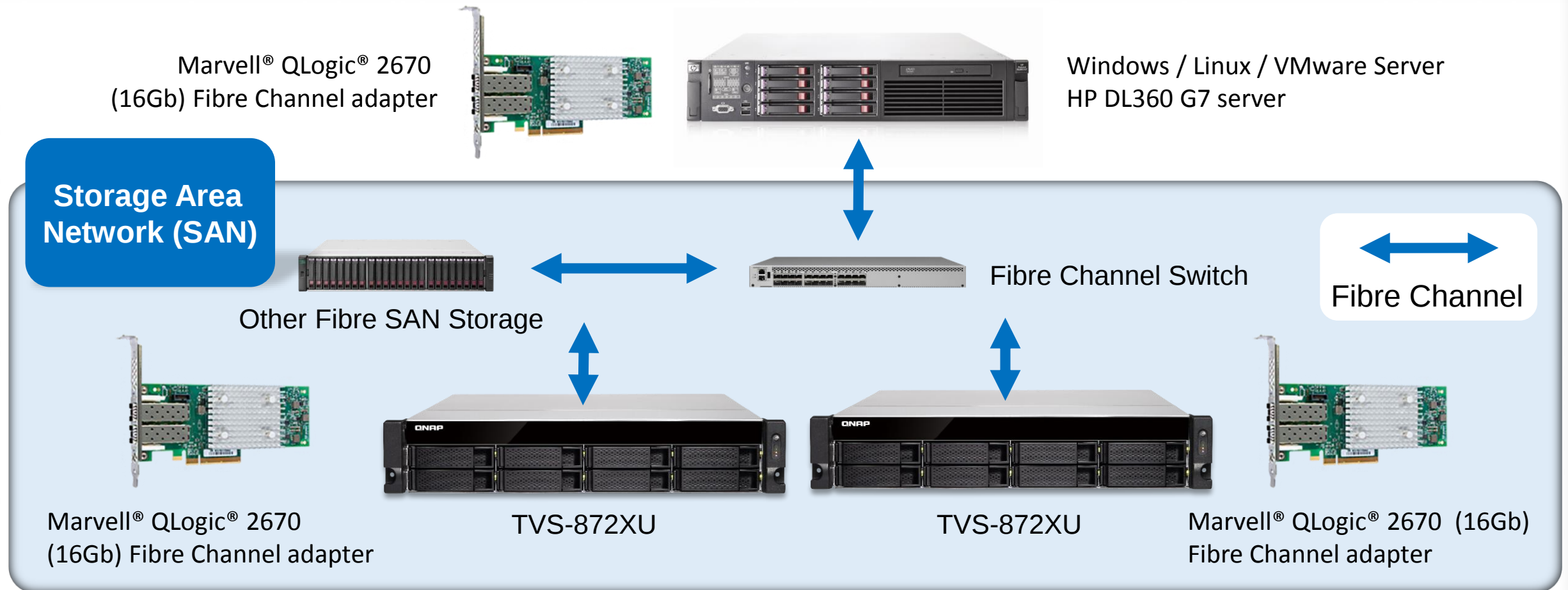
1. F/W: 4.4.1.0955 build 20190603
2. CPU: Intel(R) Xeon(R) E-2136 CPU @ 3.30GHz
3. SSD: Samsung SSD 850 PRO 512GB SATA*24,RAID 5
4. RAM: 16GB, 8GB*2
5. Thick volume; Block-based LUN; AIO enable; MPIO
6. FC32G: QLogic Fibre Channel Adapter

PC Environment

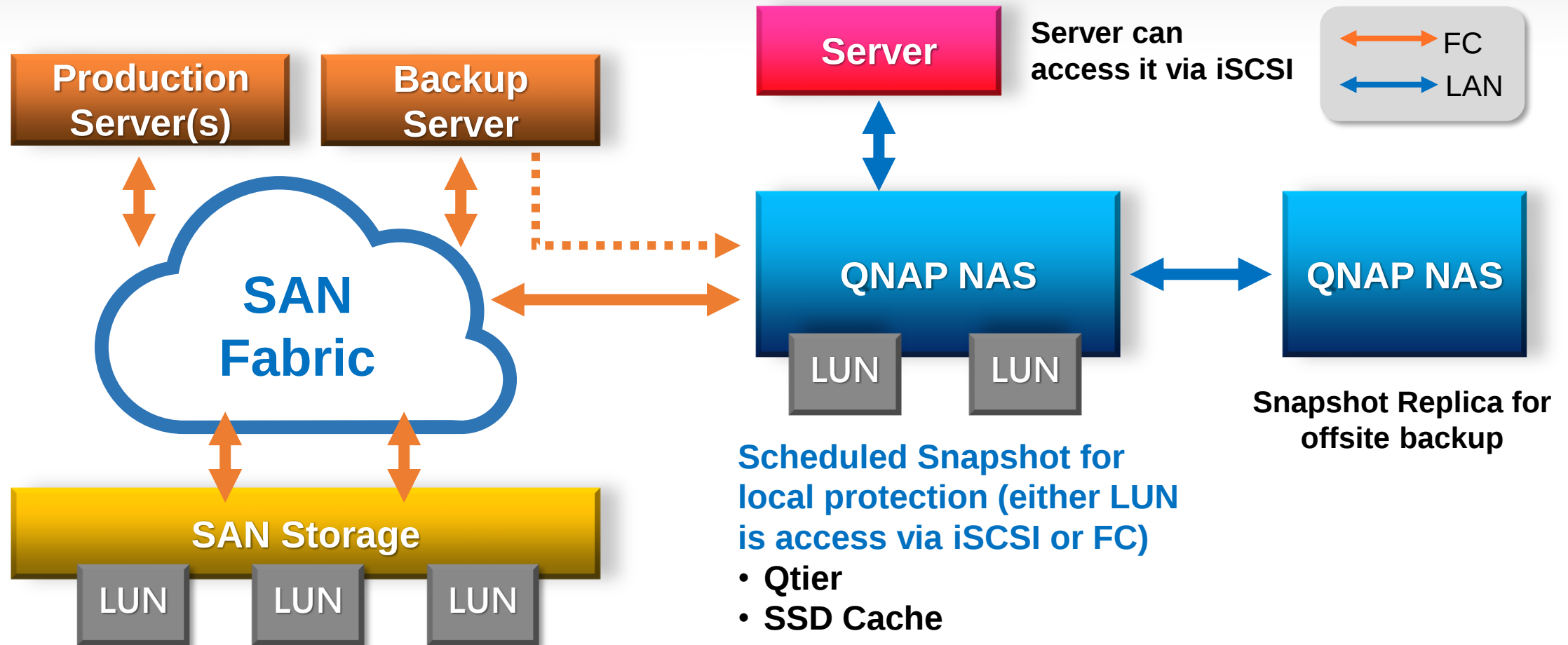
1. CPU1: Intel(R) Xeon(R) CPU E5-2630 v3 @ 2.40GHz, 2401 Mhz, 8 Core(s), 16 Logical Processor(s)
2. OS: Windows Server 2016 Datacenter Evaluation Build 14393
3. Memory: 128 GB.
4. FC32G: QLogic Fibre Channel Adapter

QNAP Fibre Channel Storage Area Network (SAN) Solution

Windows / Linux / VMware Server (Initiator node) + NAS(Target mode):



Enterprise Fibre Channel Storage Area Network and CDM Application with QNAP NAS



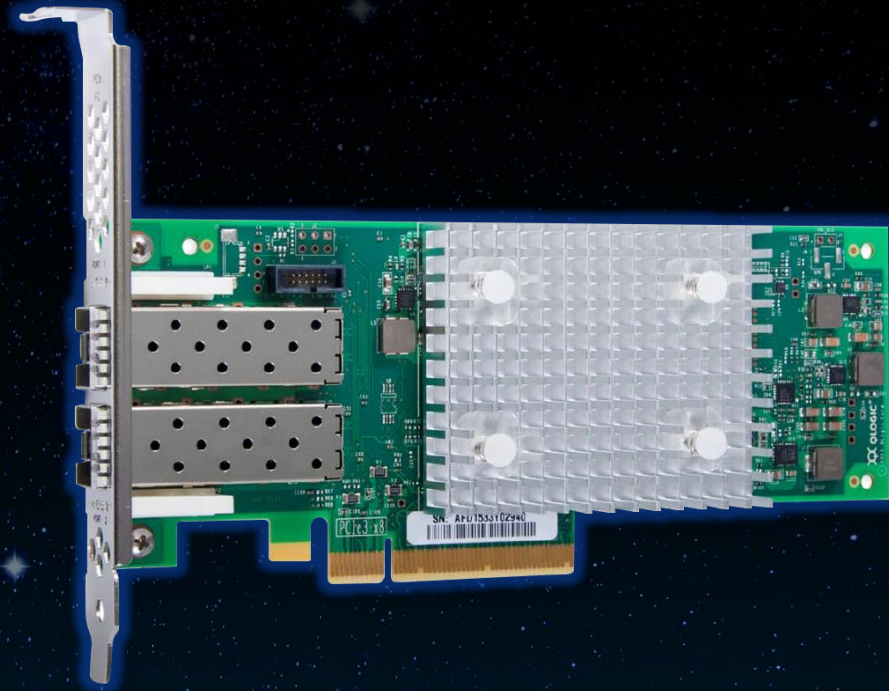
Support Marvell QLogic Fibre Channel Adapters



Partner with industry-leading FC adapters vendors to provide the most economical FC SAN storage solution.

**Support Marvell QLogic
32Gb/16Gb/8Gb/4Gb FC Adapters**

Compatibility list: qnap.com/compatibility/



Compatible with a variety of FC Adapters

Support 4G/8G/16G/32G

Marvell FC model	Interface	Support Speed	Technology generation	PCIe	Spec
QLE2742-SR-CK	2 X 32GFC	32G/16G/8G	Gen 6	3.0 x8	Low profile
QLE2740-SR-CK	1 X 32GFC	32G/16G/8G	Gen 6	3.0 x8	Low profile
QLE2692-SR-CK	2 X 16GFC	16G/8G/4G	Enhanced Gen 5	3.0 x8	Low profile
QLE2690-SR-CK	1 X 16GFC	16G/8G/4G	Enhanced Gen 5	3.0 x8	Low profile
QLE2672-CK	2 X 16GFC	16G/8G/4G	Gen 5	3.0 x8	Low profile
QLE2670-CK	1 X 16GFC	16G/8G/4G	Gen 5	3.0 x8	Low profile
QLE2562-CK	2 X 8GFC	8G/4G/2G	N/A	2.0 x8	Low profile
QLE2560-CK	1 X 8GFC	8G/4G/2G	N/A	2.0 x8	Low profile



Compatibility list: qnap.com/compatibility/

QNAP

4Gb & 8Gb FC Adapters market price

Build the most economical FC storage solution with QNAP NAS and 4Gb / 8Gb FC Adapters

Compatibility list: qnap.com/compatibility/



QLogic QLE2560-CK 8Gbps PCI-Express Fibre Channel Host Bus Adapter

\$65^{.84} (14 Offers)

Free Shipping

Used: **\$65.84** (1 Offers)



QLOGIC Qle2562 Sanblade 8Gb Dual Channel PCIe X8 Fibre Channel Host Bus Adapter

\$88^{.68} (2 Offers)

Free Shipping

[VIEW DETAILS ▶](#)



QLOGIC Qle2460 4Gb Single Port PCI Express X4 Low Profile Fibre Channel Hba With Standard Size

\$99^{.00}

\$9.95 Shipping

[ADD TO CART ▶](#)



QLogic QLE2462-E-SP 4Gbps PCI-Express Dual Port Fiber Channel Host Bus Adapter

\$99^{.00}

\$9.95 Shipping

[ADD TO CART ▶](#)

Source: 2019 May 21

<https://www.newegg.com/p/pl?Submit=ENE&N=100158104%2050013335%20600013863%20600013869&IsNodelId=1&Manufactory=13335&bop=And&Order=PRICE&PageSize=36>

Fibre Channel Support Rackmount NAS Models

Intel & AMD NAS support 32Gb/s FC Adapters

- TES-3085U (QTS), TES-1885U (QTS), TDS-16489U
- TS-2483XU, TS-1683XU-RP, TS-1283XU-RP, TS-983XU-RP, TS-983XU, TS-883XU-RP, TS-883XU
- TVS-EC2480U/1680U/1580MU/1280U, TS-EC880U
- TS-2477XU-RP, TS-1677XU-RP, TS-1277XU-RP, TS-977XU-RP, TS-977XU, TS-877XU-RP, TS-877XU
- TVS-2472XU-RP, TVS-1672XU-RP, TVS-1272XU-RP, TVS-972XU-RP, TVS-972XU, TVS-872XU-RP, TVS-872XU

ARM-NAS support 8Gb/s FC Adapters

- TS-1232XU, TS-1232XU-RP, TS-832XU, TS-832XU-RP, TS-432XU, TS-432XU-RP



Fibre Channel Support desktop NAS models

Intel & AMD NAS support 32Gb/s FC Adapters

- TS-2888X
- TS-1685
- TVS-1282, TVS-882, TVS-682
- TS-1677X, TS-1277, TS-877, TS-677
- TVS-872XT, TVS-672XT, TVS-472XT
- TVS-873/873e, TVS-673/673e, TVS-473/473e
- TS-873, TS-673, TS-473
- TVS-863, TVS-663, TVS-463

ARM NAS support 8Gb/s FC Adapters

- TS-1635AX
- TS-832X



Fibre Channel Suggested model

Entry-level SMB

TS-1635AX

- 16 bay (12 x 3.5" + 4. 2.5")
- Marvell Armada 8040 4-core 1.6 GHz
- Max 16GB RAM



SMB

TS-2483XU

- 24 bay (24 x 3.5")
- Intel® Xeon® E-2136 6-core 3.3 GHz
- Max 64GB RAM



Enterprise

TDS-16489U R2

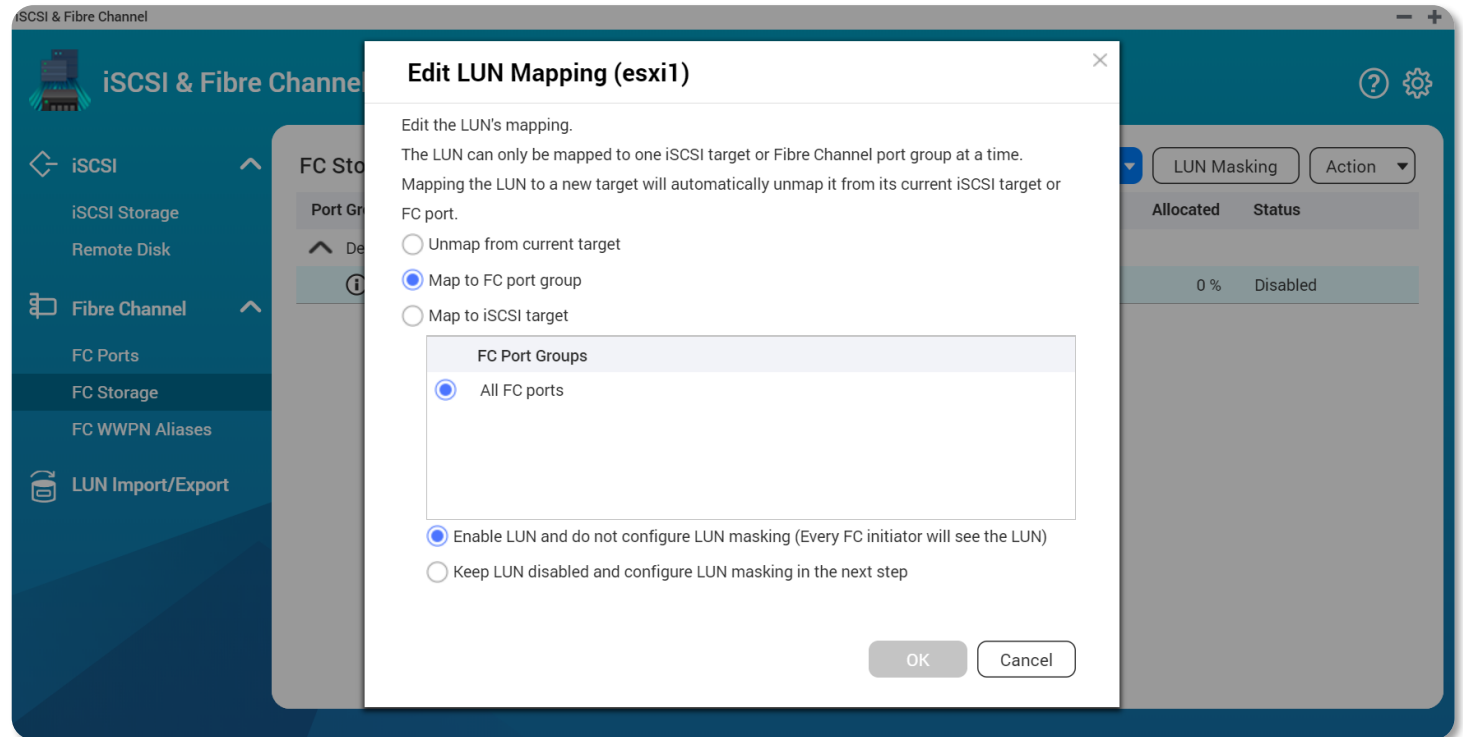
- 16 bay (16 x 3.5")
- Intel® Xeon® E5-2630 v4 10-core 2.2 GHz
- Max 256GB RAM



iSCSI and Fibre Channel manager

Features

- **Setting flexibility**
 1. **LUN Mapping** : LUN can be mapped to iSCSI or FC.
 2. **LUN Masking**:
Set which server access LUN.
 3. **FC Port Binding**: which server can access which ports.
- **Easy to identify**
Fibre Channel's WWPN can edit aliases.



Set LUN Masking

- **LUN Masking:**
Specify which server can access which LUN.

LUN Masking

Select one or more initiators to add to the list of authorized initiators.

Search:

☐	Alias ▲	WWPN
☐	qnap16p1	21:00:00:24:5e:be:00:0a
☐	qnap16p2	21:00:00:24:5e:be:00:0b
☐	server1p1	21:00:f4:e9:d4:58:32:46
☐	server1p2	21:00:f4:e9:d4:58:32:47

Add multiple WWPNs (1 per line)
Format: XXXXXXXXXXXXXXXX or XX:XX:XX:XX:XX:XX:XX:XX

WWPN

Add

Authorized Initiators List.

Only the FC initiators in the list can access the LUN. If the list is empty, all initiators are allowed to access the LUN.

☐	Alias ▲	WWPN
☒	server2fc16p1	10:00:00:10:9b:1b:cc:98
☒	server2fc16p2	10:00:00:10:9b:1b:cc:99

☒ Add unknown WWPNs to the FC WWPN Aliases List
☐ Enable LUN

Set FC Port Binding (Binding)

- **FC Port Binding :**
Set which server can bind which ports.

Fibre Channel Port Binding

Select one or more initiators to add to the list of authorized initiators.

Search:

☐	Alias ^	WWPN
☐	qnap16p1	21:00:00:24:5e:be:00:0a
☐	qnap16p2	21:00:00:24:5e:be:00:0b
☐	server1p2	21:00:f4:e9:d4:58:32:47
☐	server2fc16p1	10:00:00:10:9b:1b:cc:98

Add multiple WWPNs (1 per line)
Format: XXXXXXXXXXXXXXXX or XX:XX:XX:XX:XX:XX:XX:XX

WWPN

Authorized Initiators List.

Only the FC initiators in the list can connect to the FC port. If the list is empty, all initiators are allowed to connect.

Copy From

Remove All

Remove

☐	Alias ^	WWPN
☐	server1p1	21:00:f4:e9:d4:58:32:46

☒ Add unknown WWPNs to the FC WWPN Aliases List

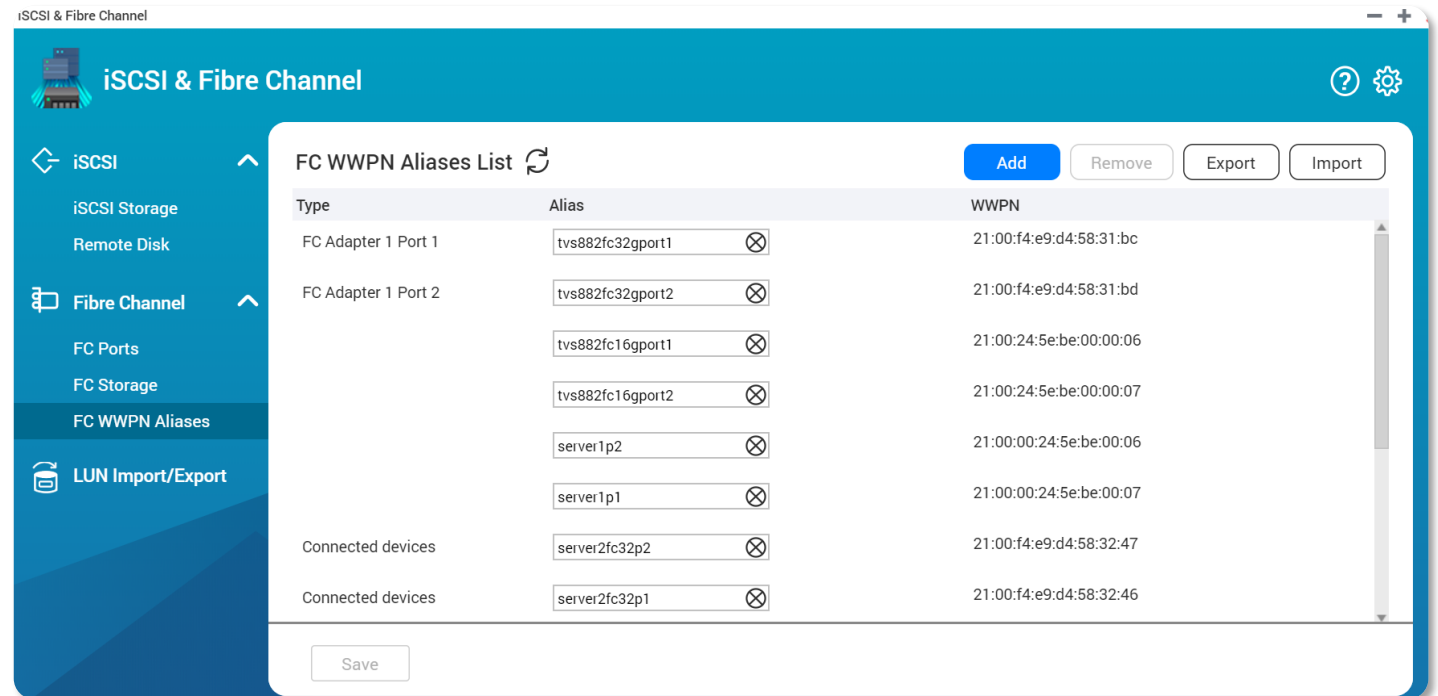
Add

OK

Cancel

Identify the server and Fibre Channel connections through the alias list

- **Edit alias :**
Specifies a list of WWPN aliases for Fibre Channel.
The user can easily identify the server and Fibre Channel ports in the storage area network.



Live Demo

iSCSI & Fibre Channel

iSCSI & Fibre Channel

iSCSI

- iSCSI Storage
- Remote Disk

Fibre Channel

- FC Ports
- FC Storage
- FC WWPN Aliases

LUN Import/Export

FC Storage

Create LUN Masking Action

Port Group	Type	Snapshots	Capacity	Allocated	Status
Default - All FC Ports					
esxi1 (Block-based LUN from Storage Pool 1)	Thin LUN	--	500.00 GB	0 %	Enabled



Fibre Channel SAN with snapshot protection and Qtier, SSD cache function

Data security, Operational efficiency

**iSCSI & Fibre Channel
management**
Simple and fast
creation of a Fibre
SAN environment



**Snapshot
Snapshot Replica
Snapshot Vault**



**Qtier, SSD cache
Accelerate
transmission
efficiency**



Snapshot and Snapshot Replica



Local Snapshot

Using QNAP NAS to easily create, manage and restore your file with snapshot



Snapshot Space Management

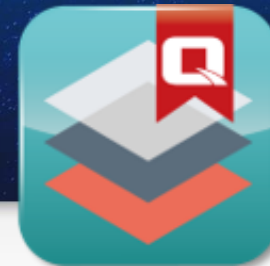
The “Out of volume” snapshot allows a Conservative but Completed snapshot protection



Snapshot Replica

Backup your snapshot to a remote NAS and enjoy a fast restoration experience with remote restore and 10GbE solution

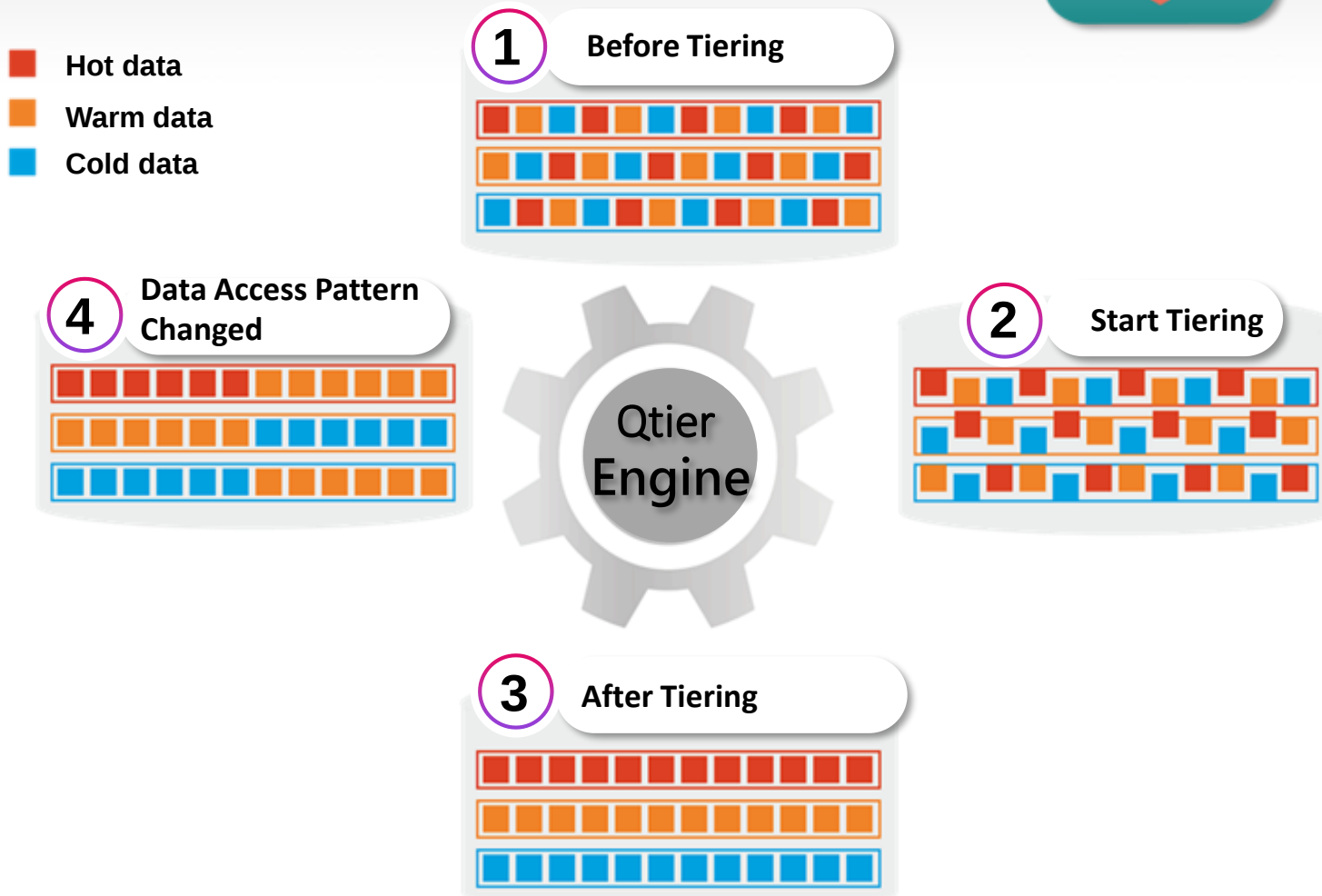
Qtier



QNAP allows the combination of SSD and HDD RAID into the same pool and migrate data automatically based on accessing pattern.

Support SATA, SAS, M.2, QM2 and U.2 SSD.

Provide higher capacity as SSD can be used to store data.



QNAP Suggested model

Entry-level SMB

TS-1635AX

- 16 bay (12 x 3.5" + 4. 2.5")
- Marvell Armada 8040 4-core 1.6 GHz
- Max 16GB RAM



SMB

TS-2483XU

- 24 bay (24 x 3.5")
- Intel® Xeon® E-2136 6-core 3.3 GHz
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Enterprise

TDS-16489U R2

- 16 bay (16 x 3.5")
- Intel® Xeon® E5-2630 v4 10-core 2.2 GHz
- Max 256GB RAM



Affordable price
Easy to use
Setting flexibility

QNAP NAS X Marvell QLogic FC adapters

Fibre Channel Storage Area Network
Best solution



QNAP

QNAP

QTS 4.4.1

You Best Choice!



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