

QNAP



QNAP NAS 升級 QTS 4.4.1

加裝 ATTO Celerity Fibre Channel 卡
立即使用 FC-SAN



ATTO

The Power Behind the Storage





常見的客戶需求有哪些？

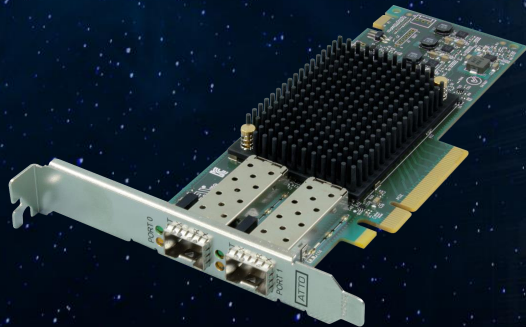
- 有甚麼方式能讓我快速且安全地存取資料？
- 如何輕鬆地擴建區塊層級的網路儲存空間？
- 有甚麼方式可以備份 SAN 的資料，並實現複本資料管理 (CDM) 應用？

QNAP NAS x ATTO 光纖通道擴充卡

1. QNAP NAS 高效能儲存空間
2. 跨界支援 Fibre Channel SAN 給用戶高可靠、可擴充、且價格更實惠的 FC-SAN 儲存方案
3. QNAP 支援 ATTO Celerity™ FC 32Gb & 16Gb 擴充卡



The Power Behind the Storage



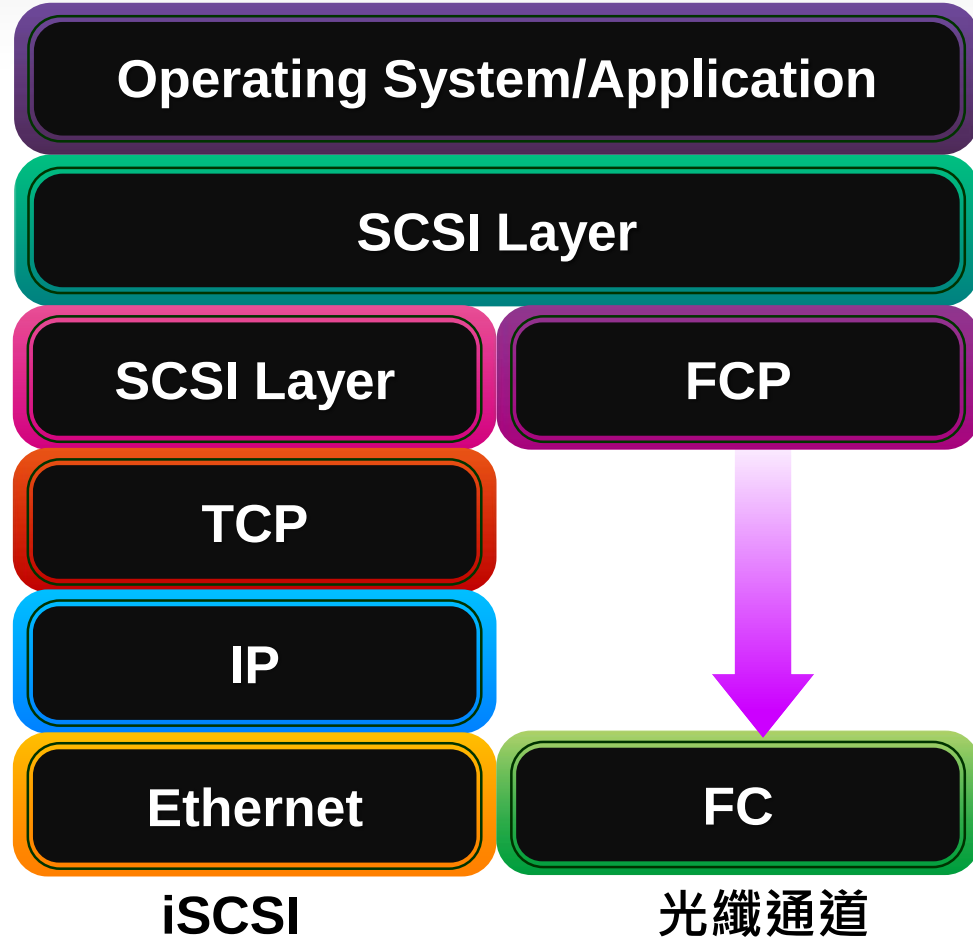
企業為什麼要建置 FC-SAN

- **連接性佳：**
在光纖通道儲存網路 (FC-SAN) 架構下，任一伺服器可與任一儲存裝置直接相連，任一儲存裝置也可彼此直接相連。
- **擴充性佳：**
企業可以在不增加伺服器與區域網路負擔的情況下進行擴充。
- **資料分享能力佳：**
因儲存裝置不再與特定的某一伺服器相連，所以多部伺服器可共享資源，且大量檔案傳輸時亦不影響主網路效能。



iSCSI 與 FC 架構比較

- 光纖通道不需透過乙太網路，且在系統中的物理層比 iSCSI 較少，在擴建區塊層級的儲存網路時，用光纖通道可免去網路負擔。
- iSCSI 需透過乙太網路，擴建區塊層級的儲存網路。



光纖通道可減輕 CPU 負擔

Speed/CPU		iSCSI		FC	
		25GbEx1	CPU%	32G	CPU%
Throughput (MB/s)	SW-1M	2709	56%	2946	39%
	SR-1M	2755	32%	2770	30%
	SW-512K	2707	61%	2950	37%
	SR-512K	2825	43%	2870	35%
IOPS	RW-4K	154793	81%	155197	77%
	RR-4K	108263	69%	113162	67%

備註：此測試環境為 RAID 0

測試環境：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: ATTO Fibre Channel Adapter
- 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

Server 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: ATTO Fibre Channel Adapter
- 25GbE: QXG-25G2SF-CX4, MTU 9000

光纖通道效能佳

Speed/CPU		FC	
		FC32Gx1(PC)	CPU%
Throughput (MB/s)	SW-1M	3132	30%
	SR-1M	4798	25%
	SW-512K	3154	29%
	SR-512K	2772	28%
IOPS	RW-4K	92632	40%
	RR-4K	195360	36%

備註：此測試環境為 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

測試環境：TS-2483XU-RP

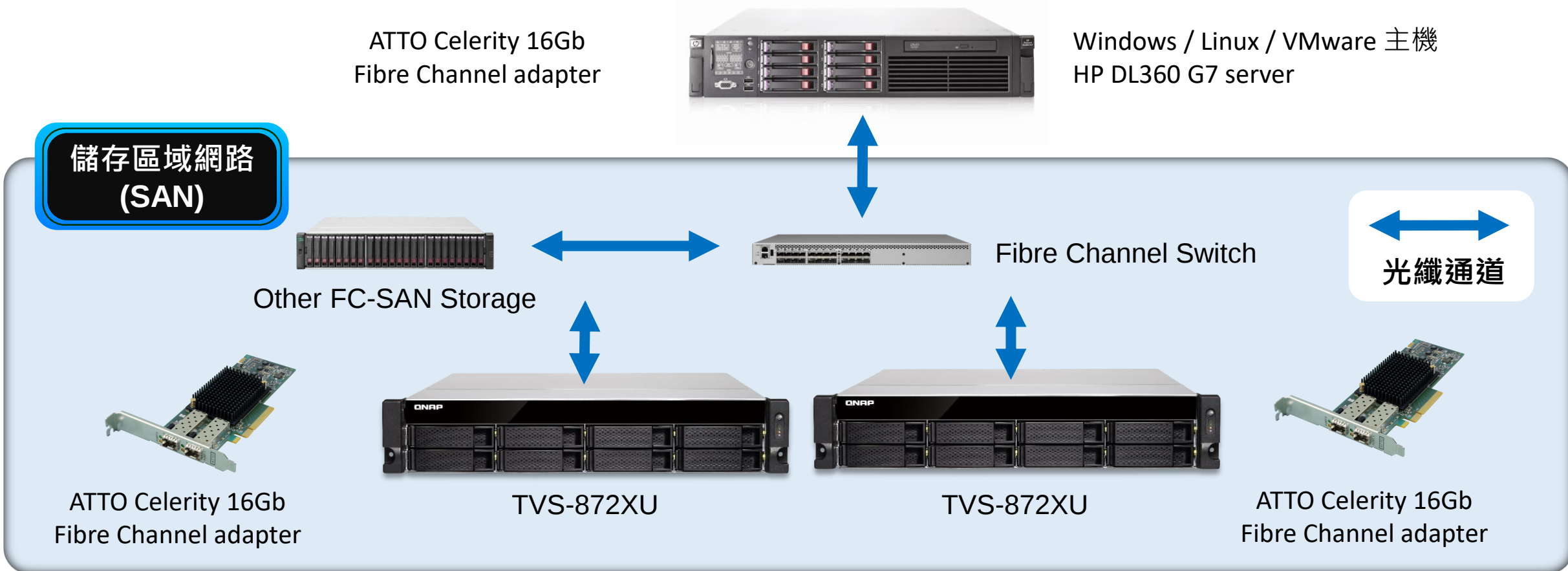
1. F/W: 4.4.1.0955 build 20190603
2. CPU: Intel(R) Xeon(R) E-2136 CPU @ 3.30GHz
3. SSD: Samsung SSD 850 PRO 512GB SATA*24,RAID 5
4. RAM: 16GB, 8GB*2
5. Thick volume; Block-based LUN; AIO enable; MPIO
6. FC32G: ATTO Fibre Channel Adapter

PC Environment

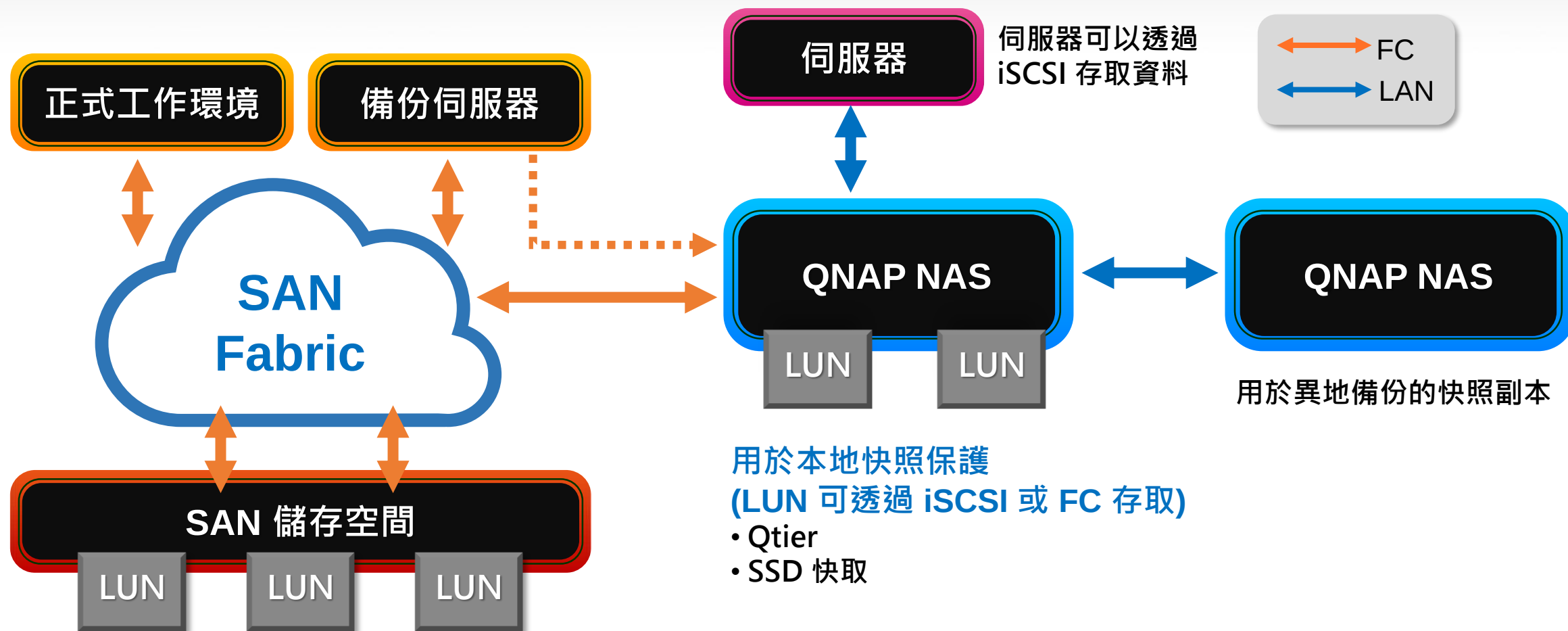
1. CPU1: Intel(R) Xeon(R) CPU E5-2630 v3 @ 2.40GHz, 2401 Mhz, 8 Core(s), 16 Logical Processor(s)
2. OS: Windows Server 2016 Datacenter Evaluation Build 14393
3. Memory: 128 GB.
4. FC32G: ATTO Fibre Channel Adapter

QNAP FC-SAN 解決方案

Windows / Linux / VMware 主機 (啟動器模式) + NAS (目標模式) :



企業 FC-SAN 與 QNAP NAS 達成 CDM 應用



支援市場 ATTO Celerity™ Fibre Channel 介面卡

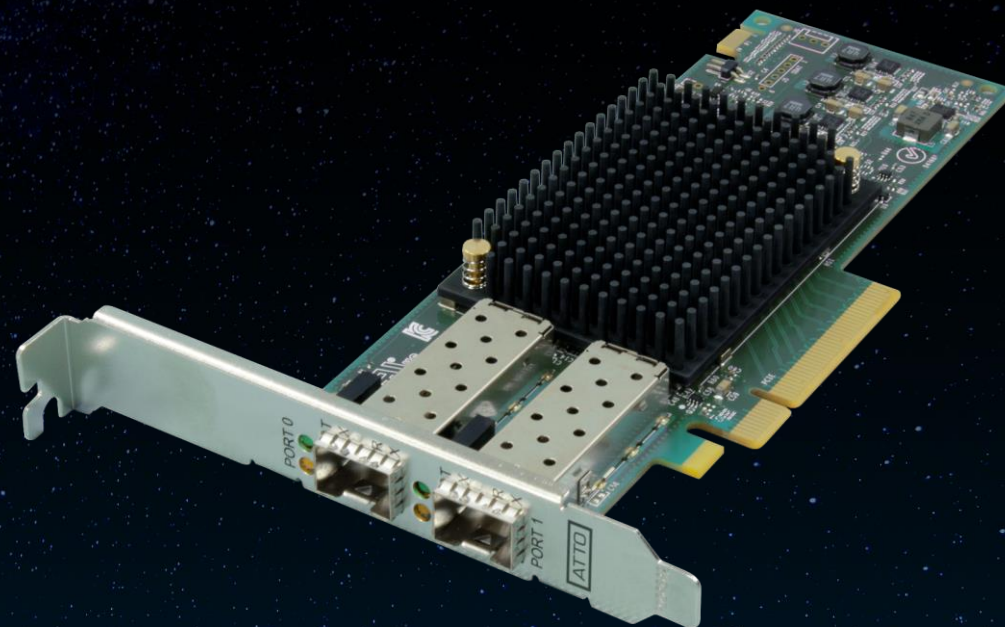
ATTO

The Power Behind the Storage

與業界領先的 FC 介面卡供應商合作，
提供最經濟的 FC-SAN 存儲解決方案。

支援 ATTO Celerity™
32Gb & 16Gb FC 擴充卡

相容性列表: qnap.com/compatibility/



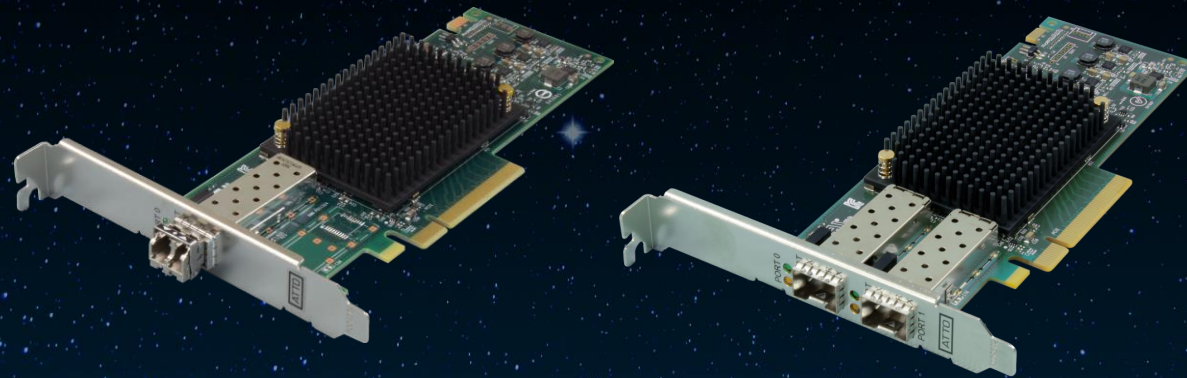
相容多款 FC 介面卡，支援 4G/8G/16G/32G

ATTO FC 卡	介面	支援速度	技術世代	PCIe	高度規格
CTFC-322E	2 X 32GFC	32G/16G/8G	Gen 6	3.0 x8	Low profile
CTFC-321E	1 X 32GFC	32G/16G/8G	Gen 6	3.0 x8	Low profile
CTFC-162P	2 X 16GFC	16G/8G/4G	Gen 6	3.0 x8	Low profile
CTFC-161P	1 X 16GFC	16G/8G/4G	Gen 6	3.0 x8	Low profile

相容性列表: qnap.com/compatibility/



The Power Behind the Storage



QNAP

30 YEARS

1988 - 2018

ATTO

**The Power Behind
the Storage**

Fibre Channel HBAs | Thunderbolt™ Adapters | Ethernet Adapters | SAS/SATA RAID | Fibre Channel Bridges | Storage Controllers

QNAP

Corporate Overview



- Established in 1988 – Upstate NY Headquarters
- Experienced engineering leadership
- Scalable manufacturing capacity
- Products – host bus adapters, NICs, storage controllers, bridging appliances and software
- Interconnect expertise – Fibre Channel, SAS, Ethernet, SATA, iSCSI, Thunderbolt, NVMe
- Customers – Original Equipment Manufacturers through End Users (supported with a robust channel)
- Worldwide distribution



Customers and Partnerships

ATTO

The Power Behind the Storage

OEM Customers



End Customers

ABC • Agilent Technologies • Amtrak • AOL • AT&T • Bank of America • Bell Laboratories
Boeing • CBC • CNN • Cox • Delta • Deutsche Bank • Disney • Dow • DreamWorks
Emory University • ESPN • FedEx • GE • H&R Block • Honeywell • Indiana University • KFC
Lockheed Martin • Lucent Technologies • Mercedes Benz • Minolta • Mitsubishi
Motorola • MTV • Nationwide • Nike • Northwestern University • P&G • Pixar
Praxair • Raytheon • RiteAid • RR Donnelley • Salomon Smith Barney • SHOWTIME
Skywalker Sound • Smithsonian Institution • SONY • Starbucks • TIME
University of Baltimore • University of Florida • University of San Diego • USA Today
US Dept. of Homeland Security • West Virginia University • Westinghouse • Ziff Davis

Technical Alliances



Technology Meets Products



Bridges

Thunderbolt™ Adapters

Storage Controllers

RAID Adapters

Network Interface Cards

Host Bus Adapters

SAS/SATA

Thunderbolt

Ethernet

**Fibre
Channel**

NVMe

Core Technology

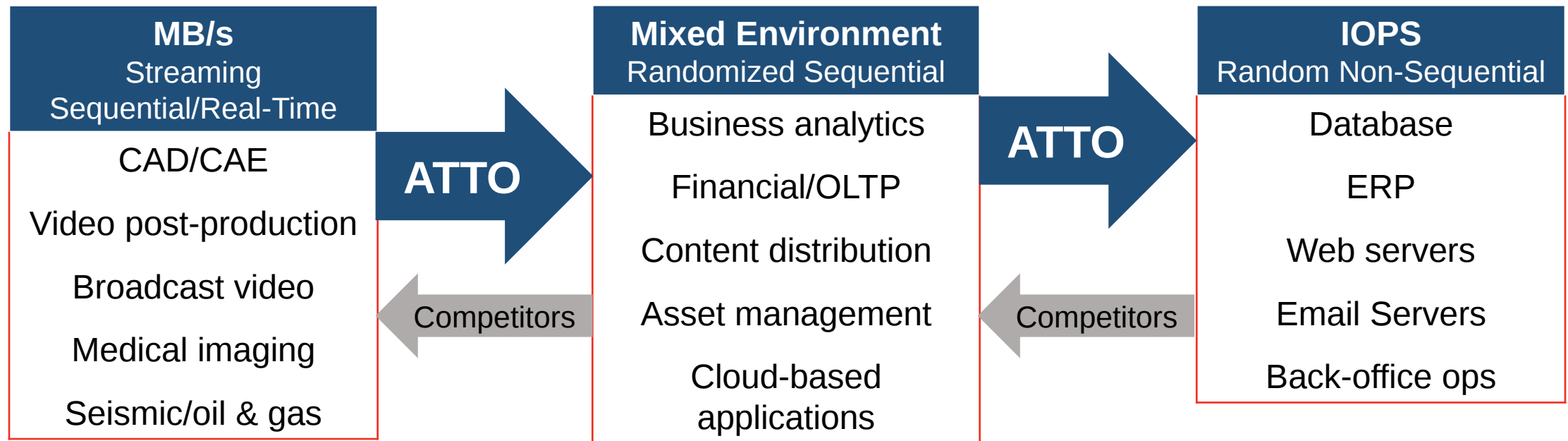
Latency Management

Bandwidth Optimization

Data Intensive Environments



ATTO develops high-performance products that manage latency in the most demanding, real-time environments, resulting in accelerated application performance and enhanced transaction processing



Product Line



- **Host Bus Adapters**
 - Fibre Channel
 - SAS/SATA
- **Network Interface Cards**
 - 10/25/40/50/100Gb Ethernet
- **Thunderbolt™ Adapters**
 - Fibre Channel
 - Ethernet
 - SAS/SATA
- **Storage Controllers**
 - Fibre Channel-to-SAS/SATA
 - Ethernet-to-SAS/SATA
- **Software**
 - ATTO ConfigTool™
 - Latency Scout™



Technical Differentiators



- **ATTO Advanced Data Streaming (ADS™) Technology**

- Provides controlled acceleration of data to ensure smooth streaming and most consistent performance

- **ATTO MultiPath Director™**

- Enables macOS®, Windows® and Linux® workstations and servers to connect directly to enterprise-class storage with redundant controllers, providing failover and load balancing capabilities across multiple paths to the storage

- **ATTO DriveAssure™ Technology**

- Compensates for misbehaving drives to prevent premature drive failures and slow downs to maximize system uptime and ensures 100% throughput during data rebuilds

- **ATTO intelligent Bridging Architecture™**

- Combines powerful hardware with an efficient software data engine to deliver the flexibility of “anything-to-anything” connectivity

- **ATTO vConfigTool™**

- A software plug-in to integrate centralized management and monitoring within a VMware vCenter® environment to accelerate adapter deployment; optimize configurations and reduce VMware host infrastructure costs

- **ATTO Latency Scout™**

- A storage I/O diagnostic utility that boosts data center performance by identifying bottlenecks, allowing for the optimization of system performance and infrastructure uptime

Fibre Channel Competitive Review



Company	Strength	Weakness	Market Perception	Competitive Strategy
ATTO	High Performance products and solutions, Support & Service	Brand awareness in IT	Performance and support leader	Niche Markets, Responsiveness, Customer Support
Marvell Cavium QLogic	Market share leader focused on driving incremental revenue from the target solutions	Limited mindshare to T2/3; so many acquisitions ... are they really focused on their channel customers?		I/O solution provider focused on storage connectivity
Broadcom Emulex	Focus is on IT markets, Strong T1/T2 OEM relationships for both Silicon and HBA	Lacking mindshare to T3; so many acquisitions ... are they really focused on their channel customers?	Strong feature set, IT market leader	IT and T1/T2 OEM focus

Target Mode Support

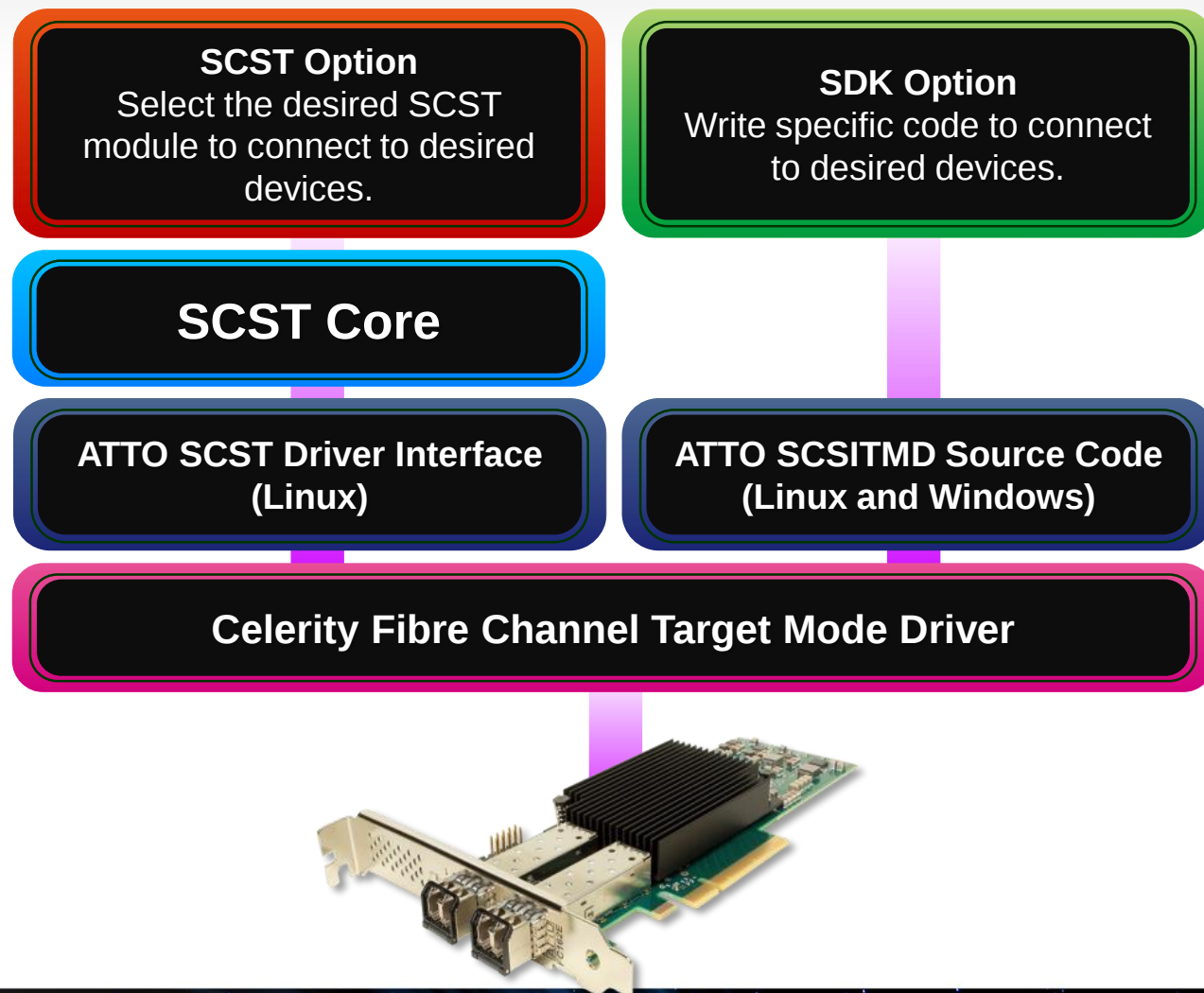
ATTO

The Power Behind the Storage

Celerity 32Gb/s and 16Gb/s Fibre Channel HBAs

- Target Mode Support

- Design solutions from ground up for the greatest flexibility with ATTOs Software Developers Kit (SDK)
 - Provides the ability to offer value added features/software
 - Available for Linux, Windows and FreeBSD platforms
- Design solutions from pre-set modules for quicker time to market with ATTOs SCST
 - Available for Linux platforms



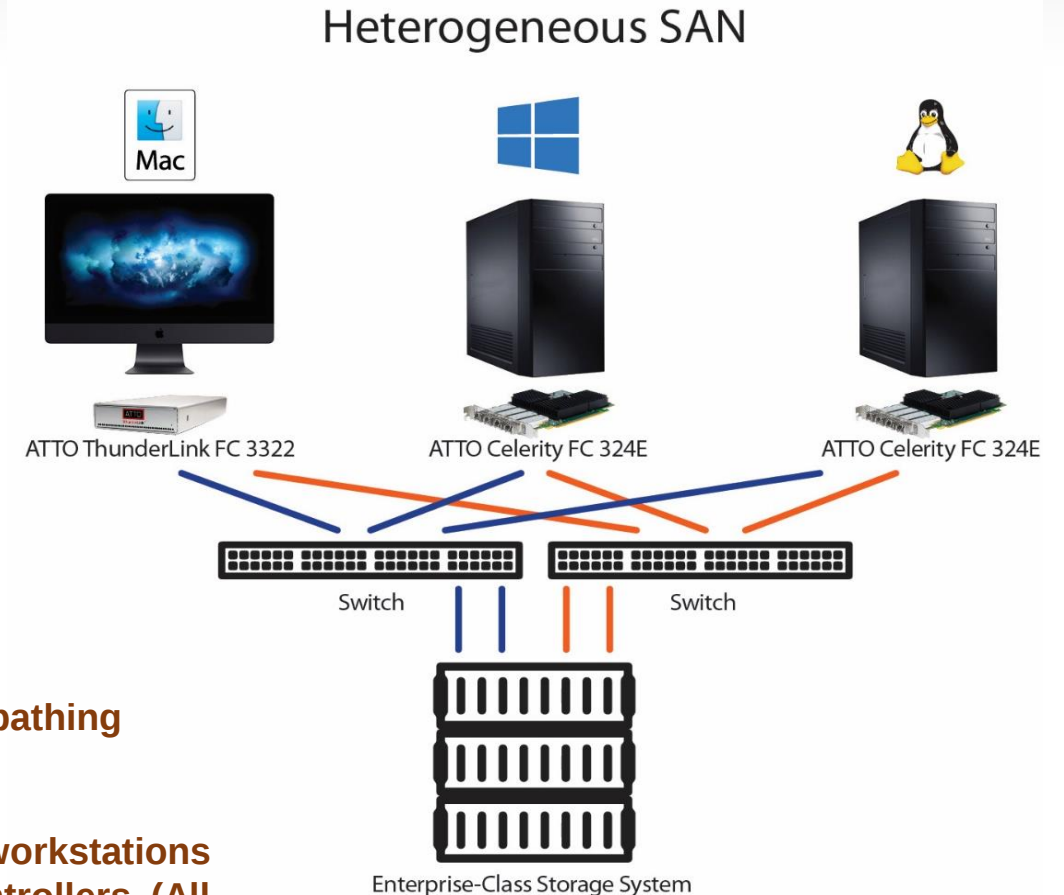
MultiPath Director



- High-Availability Storage - Automatic path failover and failback provides uninterrupted access to storage.
- Superior Performance - Load balancing increases overall system performance by using more than one Fibre Channel path to transfer data.
- Improved Productivity - Workstations can share storage, enabling collaborative workflows and real-time access to content to meet project deadlines.
- Flexible Connectivity - Ability to mix Windows, Linux and Mac workstations in a heterogeneous environment.
- Simplified Management - ATTO Configuration Tool simplifies administration, troubleshooting and management of multiple paths to storage.

*** ATTO is the ONLY Fibre Channel HBA manufacturer with its own multipathing driver – MultiPath Director.**

*** In addition to Server environments, ATTO's MultiPath Director allows workstations to connect directly to Enterprise-class storage enclosures with dual controllers. (All competitors are forced to use multipathing functions available only in Server Operating Systems.)**



Where to Purchase

- Solkenix has been ATTO's Distributor in Taiwan since 2001
 - Experts in first-line support for ATTO product & solutions. Fibre Channel, iSCSI/Ethernet, SAS, and Thunderbolt products
 - <https://www.solkenix.com/>
- Rest of the World
 - <https://www.atto.com/howtobuy/>



How To Buy
Find a distributor or reseller

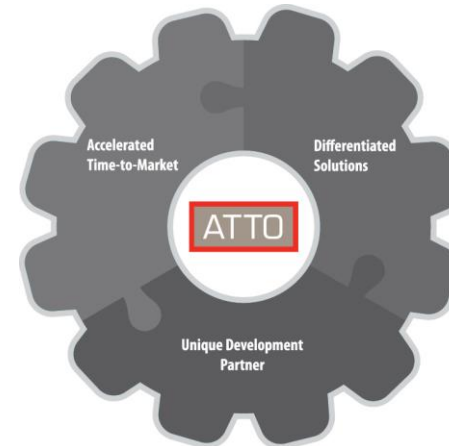


QNAP x ATTO Summary

- Together QNAP and ATTO offer the highest-performing and lowest cost solutions
- Take advantage of the Try-before-you-buy offer before it expires

QNAP®

&



QTS iSCSI 與光纖通道管理員

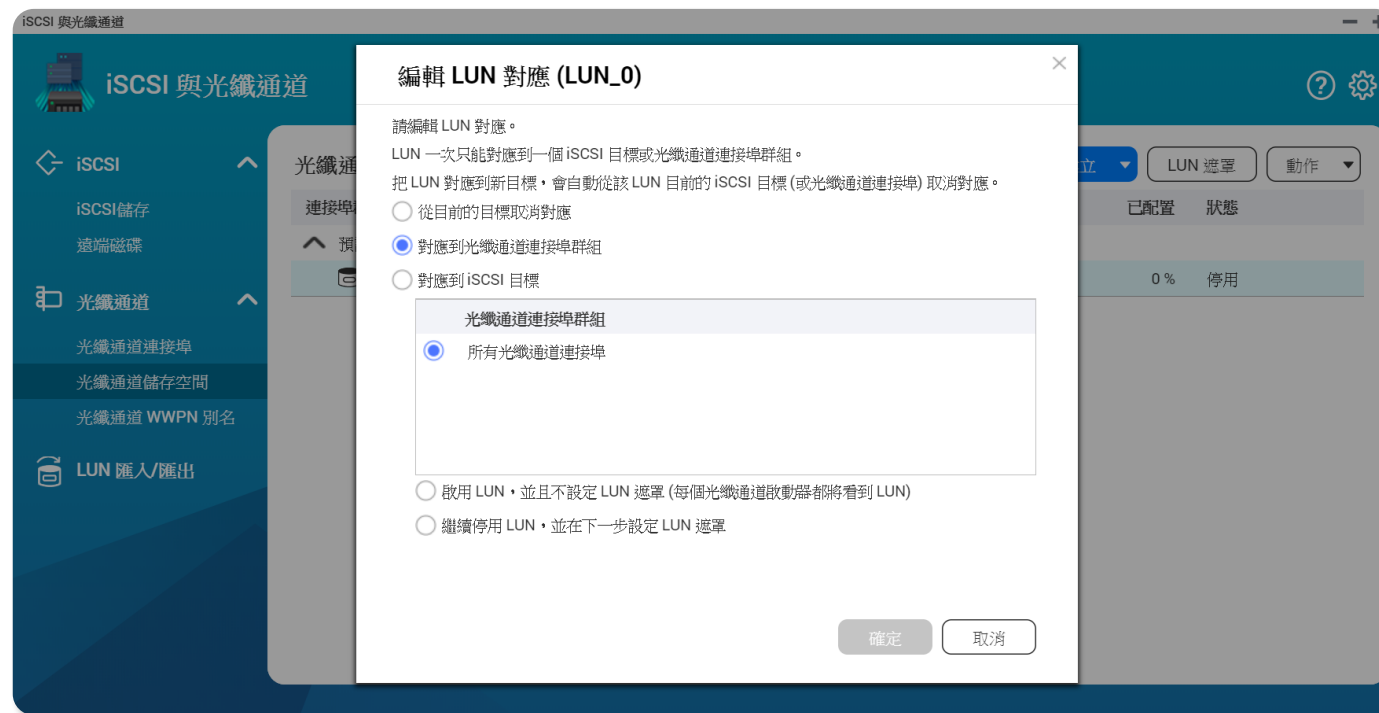
功能特色

• 設定彈性

1. LUN 對應：輕鬆對應到 iSCSI 或光纖通道。
2. LUN 遮罩：設定伺服器存取 LUN。
3. 光纖通道連接埠繫結：綁定連接埠與伺服器。

• 易於辨識

光纖通道的 WWPN 可以編輯別名。



設定 LUN 遮罩

- **LUN 遮罩：**
指定哪個伺服器可以存取哪個LUN。

LUN 遮罩

請選取一個或多個啟動器，以加入授權啟動器清單。

搜尋：

☐	別名*	WWPN
☐	server1p1	21:00:f4:e9:d4:58:32:46
☐	server1p2	21:00:f4:e9:d4:58:32:47
☐	server2fc16p2	10:00:00:10:9b:1b:cc:99
☐	server2fc32p1	21:00:f4:e9:d4:54:89:48

新增多個 WWPN (每行一個)
格式：XXXXXXXXXXXXXXXX 或 XX:XX:XX:XX:XX:XX:XX

WWPN

授權啟動器清單。

只有清單中的光纖通道啟動器可以存取 LUN。如果清單空白，則允許所有啟動器存取 LUN。

移除全部

移除

☐	別名*	WWPN
☒	server2fc16p1	10:00:00:10:9b:1b:cc:98

☒ 將未知的 WWPN 加入 [光纖通道 WWPN 別名清單]。
☒ 啟用 LUN

確定

取消

QNAP

設定光纖通道連接埠繫結 (Binding)

- 光纖通道連接埠繫結：
編輯哪個伺服器可以綁定哪個連結埠。

光纖通道連接埠繫結 ×

請選取一個或多個啟動器，以加入授權啟動器清單。

搜尋：

☐	別名 *	WWPN
☐	server1p1	21:00:f4:e9:d4:58:32:46
☐	server1p2	21:00:f4:e9:d4:58:32:47
☐	server2fc16p1	10:00:00:10:9b:1b:cc:98
☐	server2fc32p1	21:00:f4:e9:d4:54:89:48

新增多個 WWPN (每行一個)
格式：XXXXXXXXXXXXXXXX 或 XX:XX:XX:XX:XX:XX:XX:XX

WWPN

授權啟動器清單。

只有清單中的光纖通道啟動器可以連線到光纖通道連接埠。如果清單空白，則允許所有啟動器執行連線。

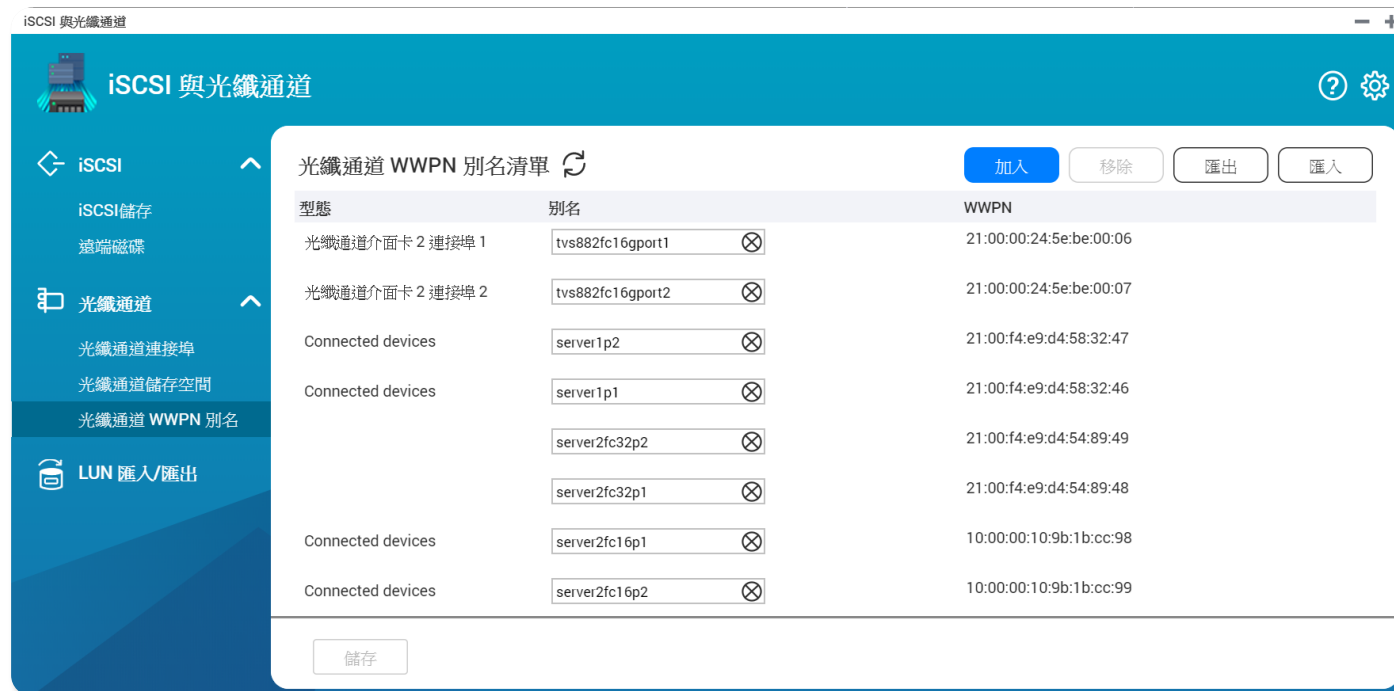
☐	別名 *	WWPN
☐	server2fc16p2	10:00:00:10:9b:1b:cc:99

☒ 將未知的 WWPN 加入 [光纖通道 WWPN 別名清單] -

透過別名清單來辨識伺服器與光纖通道連接埠

- 編輯別名：

指定光纖通道的 WWPN 別名清單。
使用者易於辨識儲存區域網路中的
伺服器及光纖通道連接埠。



FC-SAN 搭配快照保護及 Qtier / SSD 快取 兼顧資料安全及操作效能

iSCSI & Fibre Channel
management
簡單又快速打造 FC-
SAN 環境



快照功能
快照備份任務
快照保險庫



Qtier, SSD 快取
加速傳輸效能



快照與快照備份任務



本地快照支援

QNAP NAS 內建支援快照保護，可在儲存與快照或檔案總管輕易擷取、閱覽、還原快照。



快照空間管理

建立完整磁碟區或 LUN，若欲啟用快照應以少量分配逐步擴充為原則。



快照備份任務

建立快照差異備份任務，並且透過遠端快照還原直接由網路還原回本機。

Qtier



除了全 SSD 儲存，QNAP Qtier 自動分層可將 SSD 和 HDD RAID 整合為一組儲存池，並智能判斷冷熱資料，自動在分層間移動。

一般 SATA/SAS SSD 外，也支援 M.2 與 QM2 PCIe 外接卡。

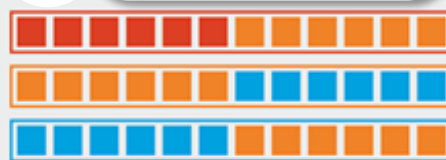
儲存不僅受惠於 SSD 的強大效能，更保有最大的儲存大容量。

■ 熱資料
■ 暖資料
■ 冷資料

1 分層前
頻繁存取資料效能未優化



4 資料存取行為改變



2 開始分層



3 分層後
頻繁存取資料效能已優化



Qtier
引擎

Live Demo

iSCSI 與光纖通道

光纖通道儲存空間

建立 LUN 遮罩 動作

連接埠群組	型態	快照	容量	已配置	狀態
預設 - 所有光纖通道連接埠					
LUN_0 (區塊類型LUN來自於 儲存池 1)	精简 LUN	-	12.00 GB	0 %	停用



Fibre Channel 支援的機架型 NAS 型號

Intel & AMD NAS 支援 32Gb/s & 16Gb/s ATTO FC 介面卡

- 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



Fibre Channel 支援的直立 / 桌上 NAS 型號

Intel & AMD NAS 支援 32Gb/s & 16Gb/s ATTO FC 介面卡

- 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



Fibre Channel 的建議機種

FC 16Gb TS-1277

- 12 bay (8 x 3.5" + 4. 2.5")
- AMD Ryzen 7 8-core 3.0GHz
- Max 64GB RAM



FC 32Gb TS-2483XU

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



FC 32Gb TDS-16489U R2

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



價格親民
操作簡單
設定彈性

QNAP NAS X ATTO Celerity™ FC 擴充卡

光纖通道儲存網路
最佳解決方案



QNAP

QNAP



QTS 4.4.1

是您最好的選擇!



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