



QNAP

TDS-h2489FU

24-bay U.2 NVMe PCIe Gen 4 全快閃儲存架構，
內建雙 Intel® Xeon® 第三代可擴充處理器，
高達共 32 核心及雙埠 25GbE 高速網路

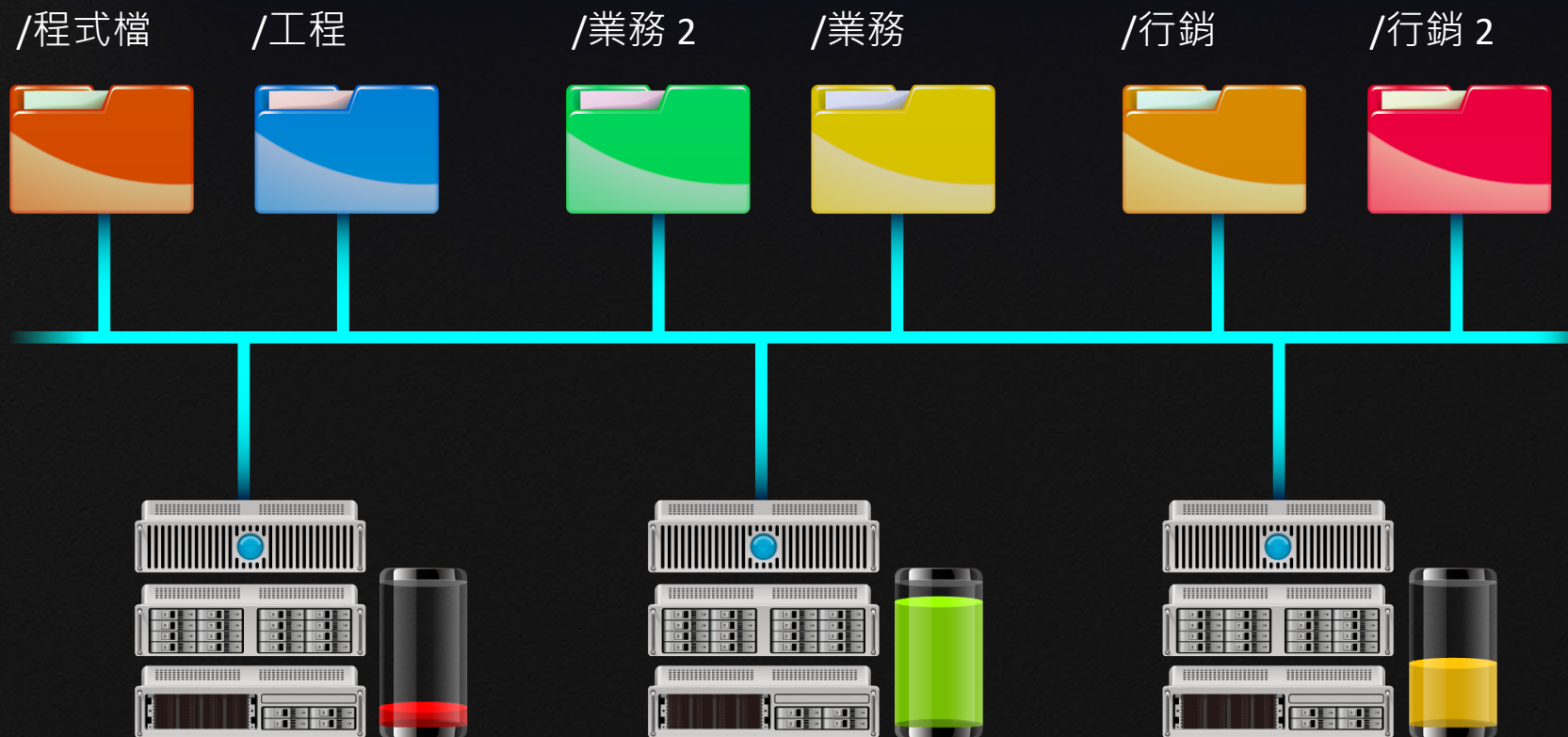


25GbE

QuTS hero

資料爆炸性成長與過多伺服器亂象可能導致企業擴展以及數位轉型受阻

檔案跑去哪裡？如何有效存放？



不平衡的負載 與容量耗用分配

- 新增多台檔案伺服器需要人工分配資料夾與儲存地
- 人工傳輸檔案到新伺服器
- 人工將應用程式與用戶導向新伺服器位置

如何滿足高速運算應用的企業儲存需求？



虛擬化

面對非結構性的資料處理，可突破 I/O 密集應用的效能瓶頸，極適合大量虛擬化環境與桌面虛擬化 (VDI) 應用。



資料庫

具備更低延遲與更高 IOPS 效能，讓承載企業龐大業務系統與關鍵資料的資料中心展現更快速的回應能力。

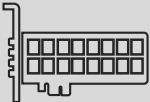


影視產業 (M&E)

滿足流暢的 4K/8K 影音串流和後製，讓數位媒體工作流享有更快的資料傳輸、存取與備份速度，產製流程效率更高。

需要使用 SSD 才能達到最高效能

如何挑選 SSD？主流 SSD 介面、外型、與效能

	外型	介面	主要尺寸
	2.5 吋 (支援熱插拔)	SATA	• 高度 7 mm
		SAS	• 高度 15 mm
		NVMe (U.2/U.3)	• 高度 7 mm • 高度 15 mm
	M.2	SATA	• 2230 (22 x 30 mm) • 2280 (22 x 80 mm) • 22110 (22 x 110 mm)
		NVMe	
	PCIe 卡 (AIC)	NVMe	• 全高 / 半高 • 全長 / 半長

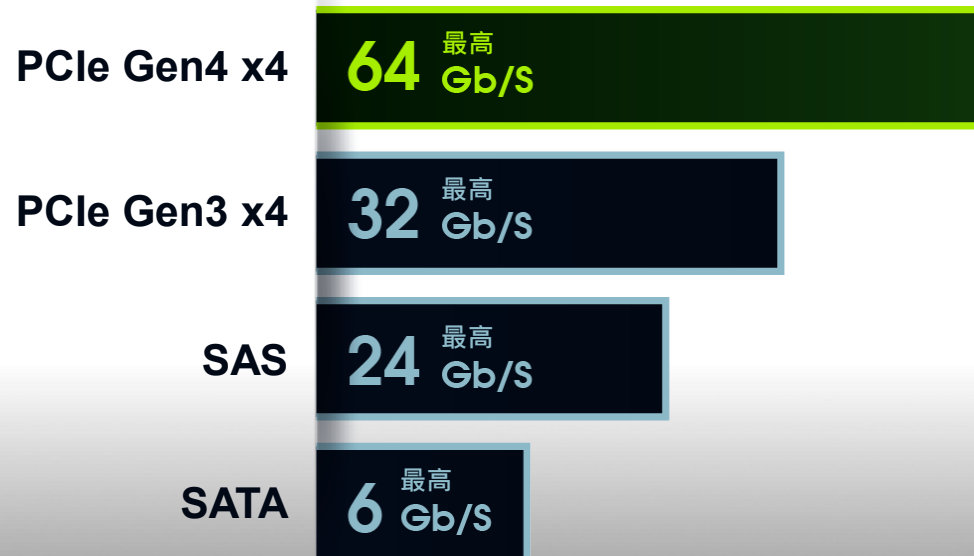
每一款 SSD 型號實際的連續/隨機寫入、讀取效能或 TBW 壽命卻可能大不相同而有極大價差! 購買前須多加比較。



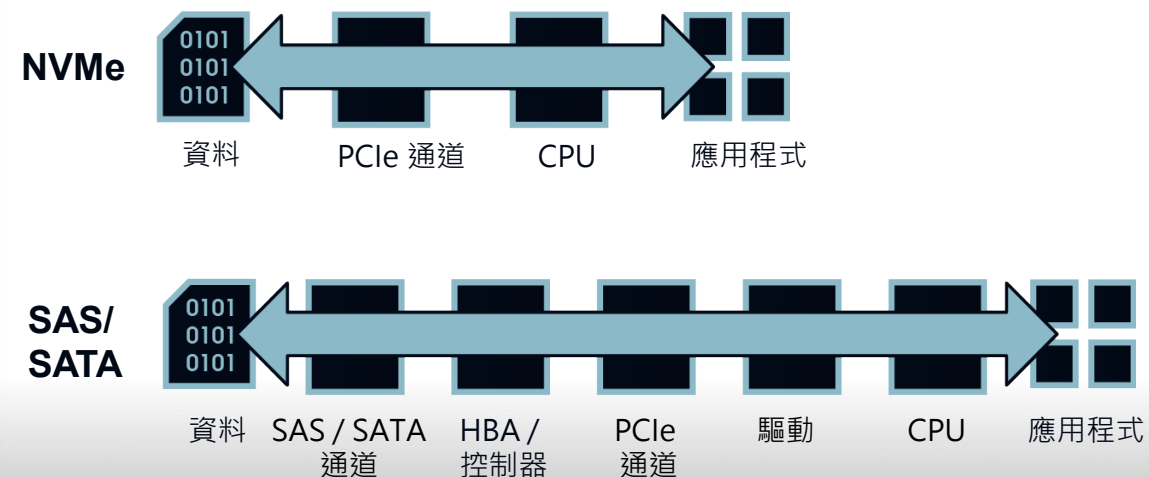
TBW 上方為隨機寫入，下方為循序寫入

為何未來 SSD 市場趨勢會是 PCIe NVMe SSD 而不是 SAS 或 SATA SSD?

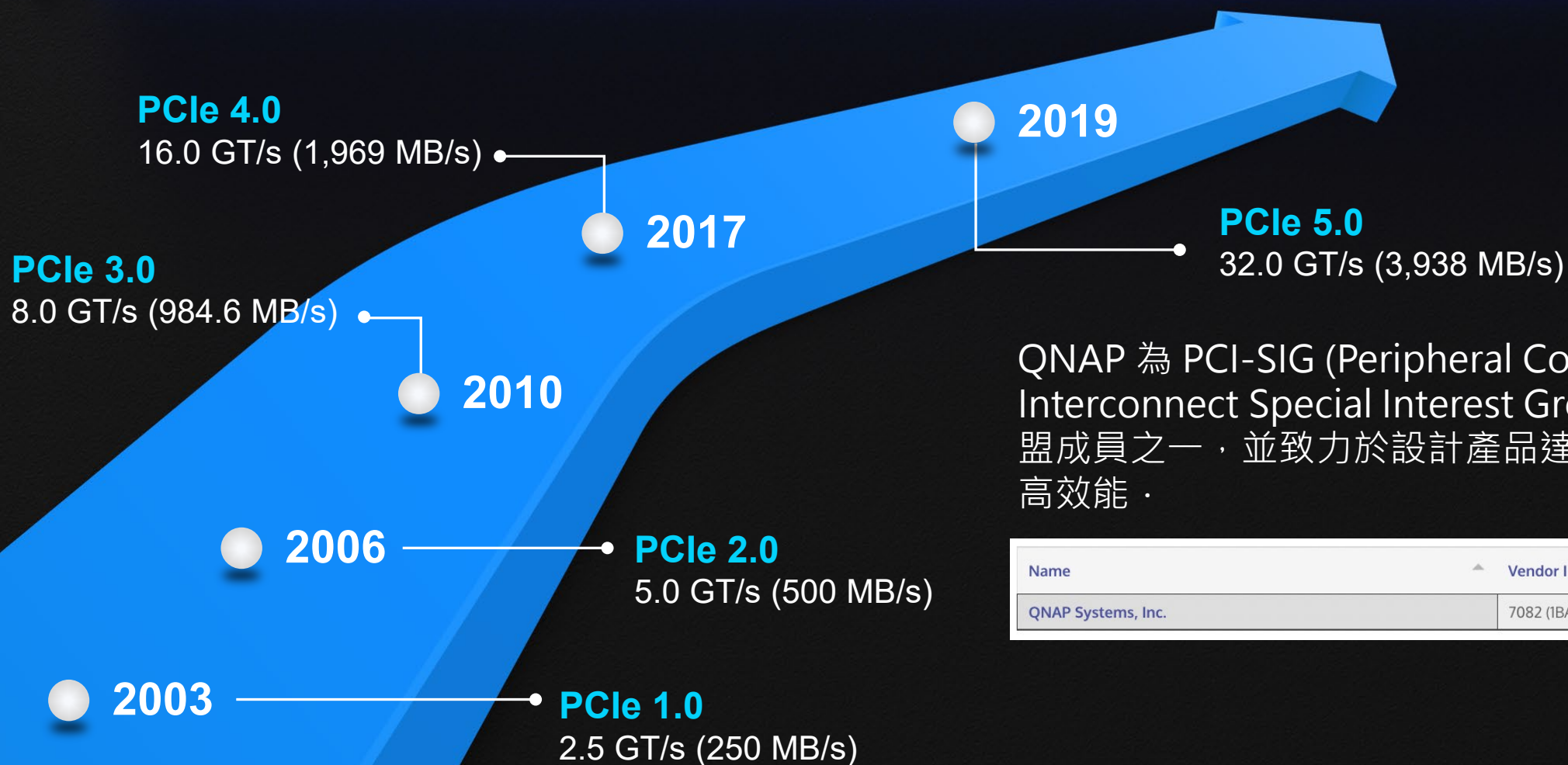
最高頻寬達
64 Gb/s (8GB/s)



低延遲
超短資料傳輸路徑



自 1992 年起，PCI-SIG 聯盟已陸續制定 PCIe 速度及相容性規範，如今成員已達 800+ 數量



QNAP 為 PCI-SIG (Peripheral Component Interconnect Special Interest Group) PCIe 標準聯盟成員之一，並致力於設計產品達最佳相容性與最高效能。

Name	Vendor ID
QNAP Systems, Inc.	7082 (IBAA Hex)

如何找到適用於大數據分析 / 邊緣運算 / AI 推論的高速且大量的資料載體？



200TB 不夠存放
巨量資料



單一資料夾大小上限達 PB 等級
=> 才放得下龐大的資料母體



資料



建模

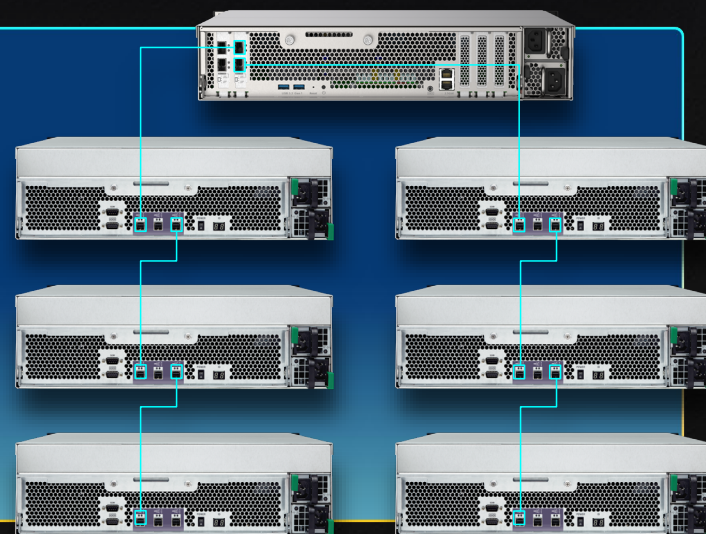


模組驗證



參數調整

深度學習 (Deep Learning)



連接多台 JBOD 擴充櫃以達 PB 等級資料

內建雙 Xeon 處理器，25GbE 並可升級 100GbE 的 QNAP all-flash NAS 全快閃 NVMe NAS

TDS-h2489FU 雙 CPU 25GbE NAS

- 24 x 2.5吋 U.2 NVMe PCIe Gen4 SSD 埠
+ 2 x M.2 2280 PCIe / SATA SSD combo 埠
- 雙處理器高達 32 核心與16 核心：2 x Intel Xeon Scalable Silver 4314 16核 / 4309Y 8核
- 32 個 DDR4 RDIMM 記憶體插槽，達 1TB 超大記憶體能力
- 25GbE 與 2.5GbE 並具備 PCIe Gen4 插槽可擴充 100GbE 網卡，Fibre Channel，或 SAS 擴充櫃



Microsoft
Hyper-v

CITRIX
XenServer



- ZFS 檔案系統守護資料安全性
- 資料減量技術
 - ✓ 提升儲存效率與投資報酬率
 - ✓ 去重複(de-duplication)、在線壓縮(inline compression)、資料壓實(data compaction)
- Unified Storage: iSCSI/ FC/ NFS/ CIFS/ FTP / S3
- Container Station 與 Virtualization Station 支援執行超多量軟體容器與虛擬機

搭載 2 個伺服器級第三代 Intel Xeon 白銀級 可擴充 (Scalable) 處理器，讓運算效率更加倍

- 2 x Intel® Xeon® Silver 4314
16 核 32 執行緒，最高 3.4 GHz
- 2 x Intel® Xeon® Silver 4309Y
8 核 16 執行緒，最高 3.6 GHz

2022
全新上市

Ice Lake SP

處理器代號

8 通道 ECC

記憶體

10nm

工藝製程

PCIe 4.0

高速介面

intel®

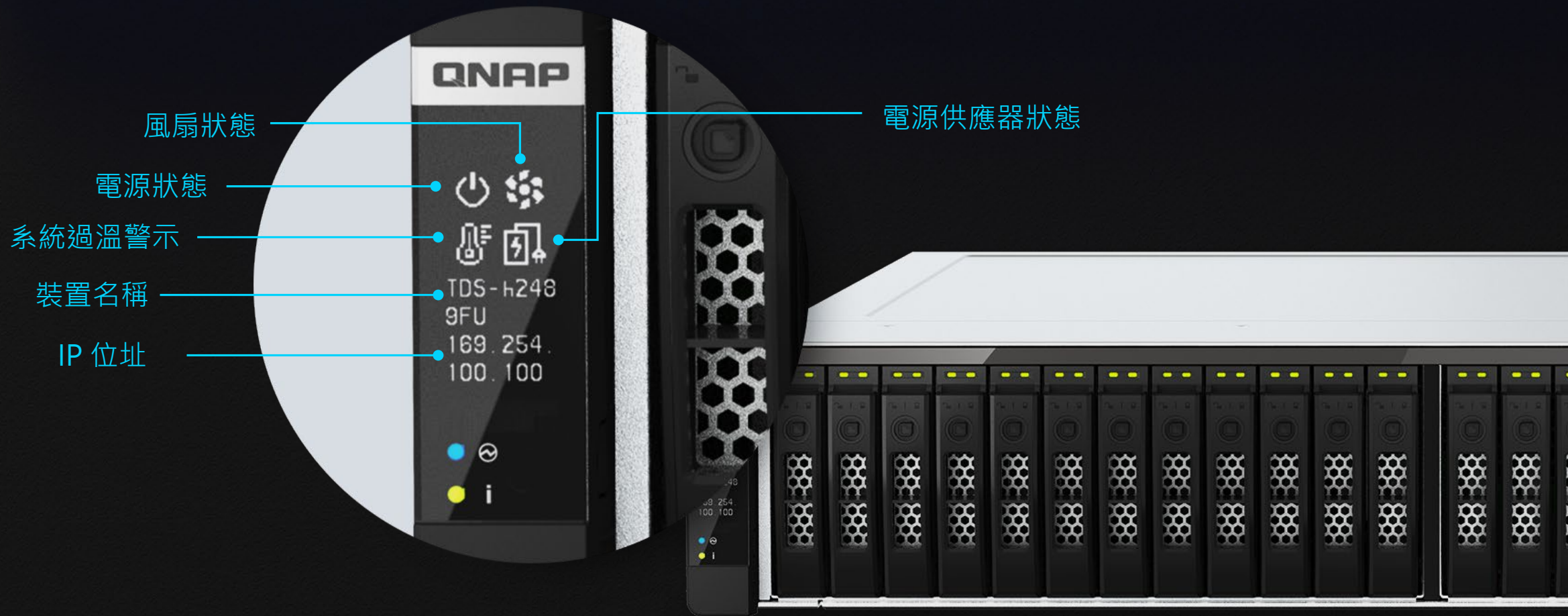
Xeon®

SILVER

TDS-h2489FU 正面硬體配置



一目了然的 OLED 系統狀態顯示



訂購料號與機架滑軌配件

訂購料號

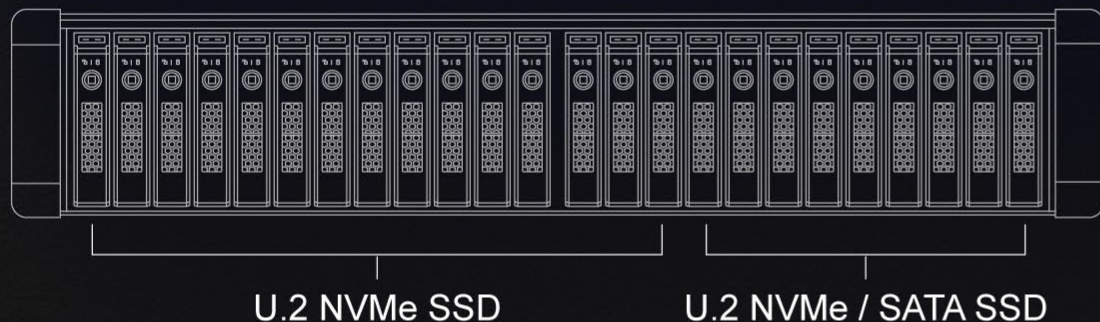
- TDS-h2489FU-4309Y-64G (8 x 8GB RDIMM)
- TDS-h2489FU-4314-128G (8 x 16GB RDIMM)
- TDS-h2489FU-4314-256G (8 x 32GB RDIMM)
- TDS-h2489FU-4314-512G (16 x 32GB RDIMM) 依訂單生產
- TDS-h2489FU-4314-1TB (32 x 32GB RDIMM) 依訂單生產

選購的機架滑軌

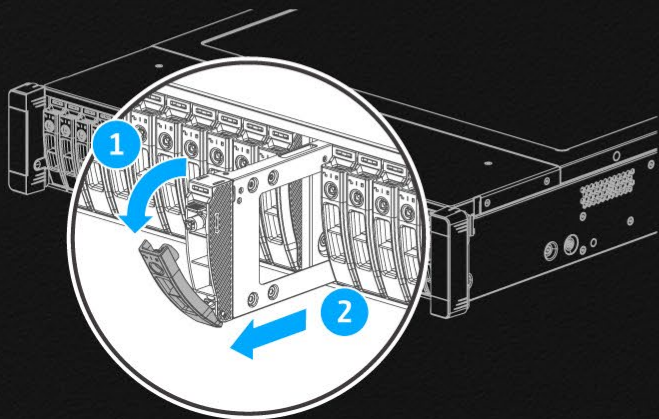
- RAIL-E03



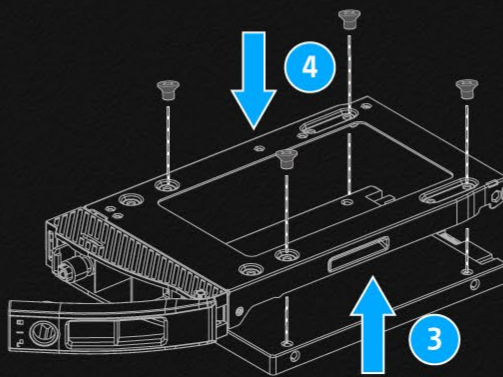
2.5 吋 SSD 安裝與可鎖式熱插拔拖盤



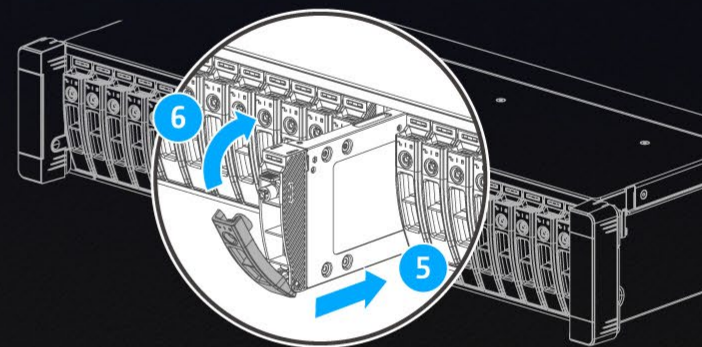
1. 拔除磁碟托盤



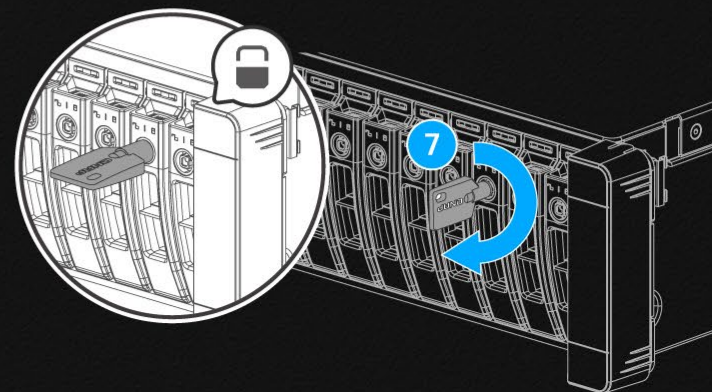
2. 使用螺絲固定



3. 裝回磁碟托盤

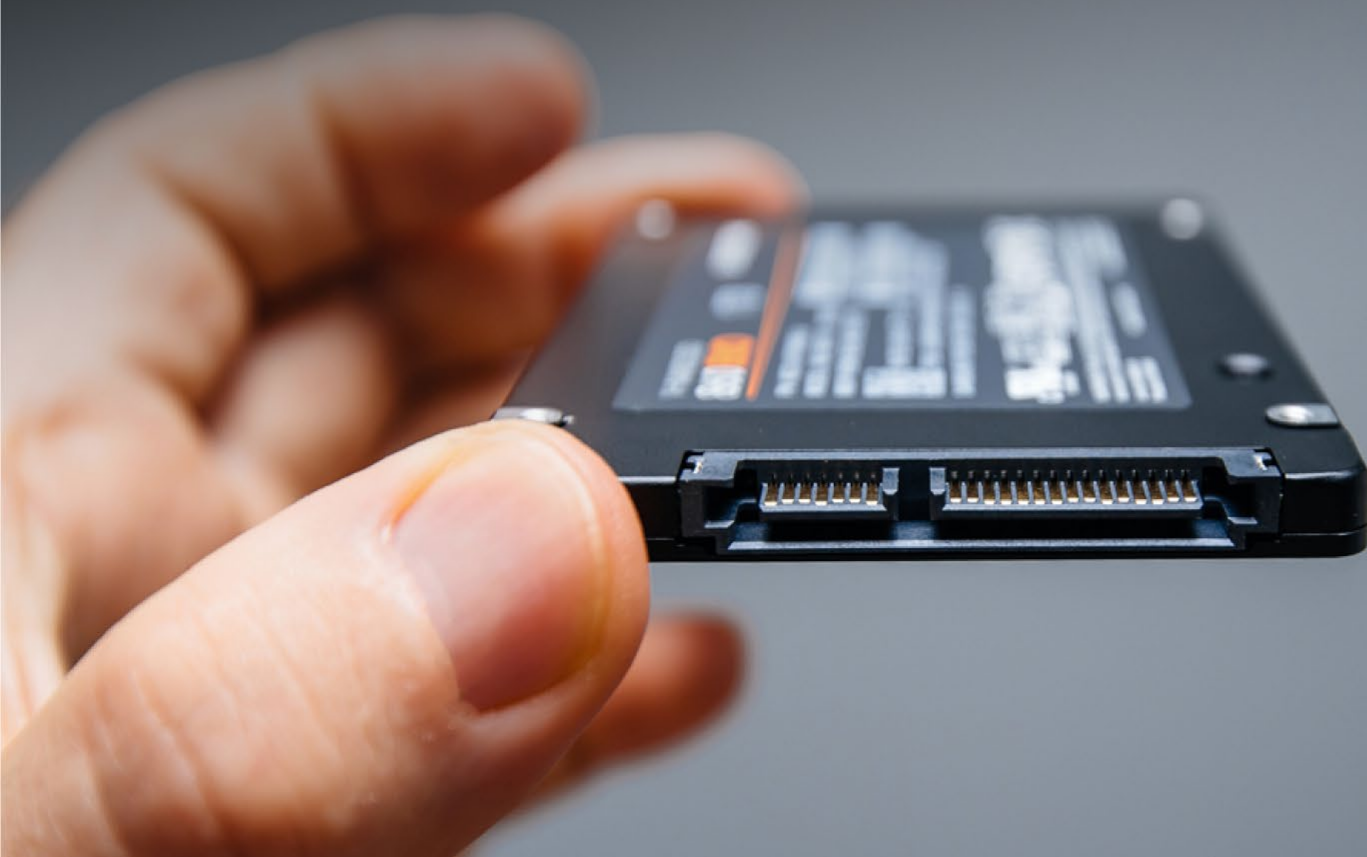


4. 使用隨附的鑰匙上鎖 (非必要性)



如果全快閃 NAS 使用的 U.2 NVMe SSDs 並未在您的區域銷售或是遠超過您的 IT 預算？

All flash NAS 所需的 24 x U.2 NVMe SSD



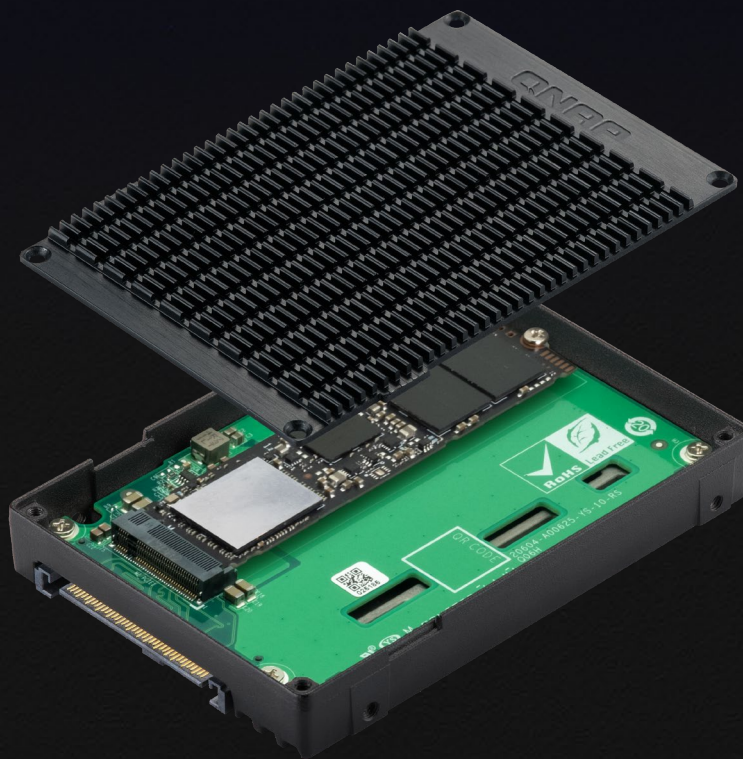
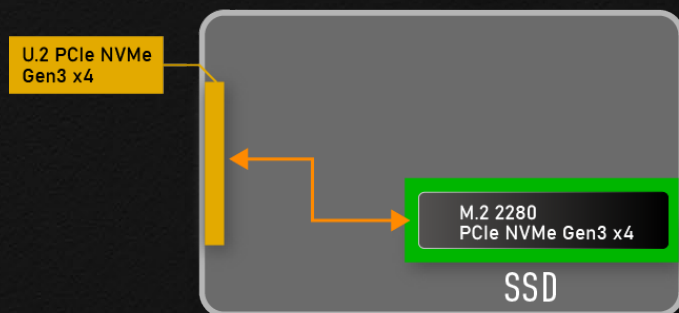
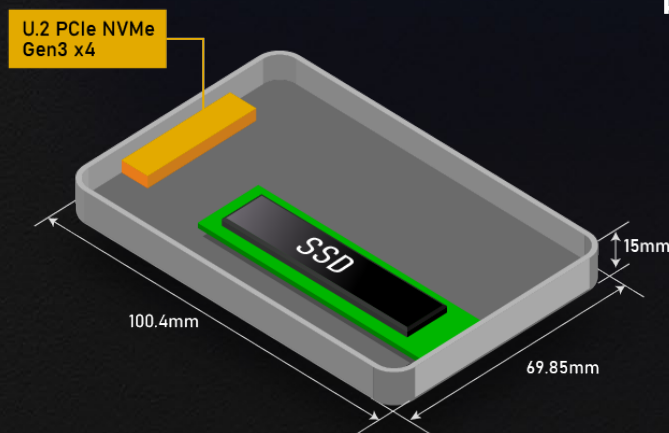
所在地區並未銷售
或是交期差？



購置成本太高
而超出 IT 預算？

安裝 M.2 NVMe SSDs 於 QNAP QDA-UMP4 U.2 對 M.2 SSD 轉接盒，經濟又彈性

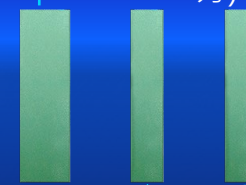
訂購料號: QDA-UMP4



U.2 NVMe 轉 M.2 NVMe PCIe 轉接盒，支援 PCIe 4.0 與 3.0

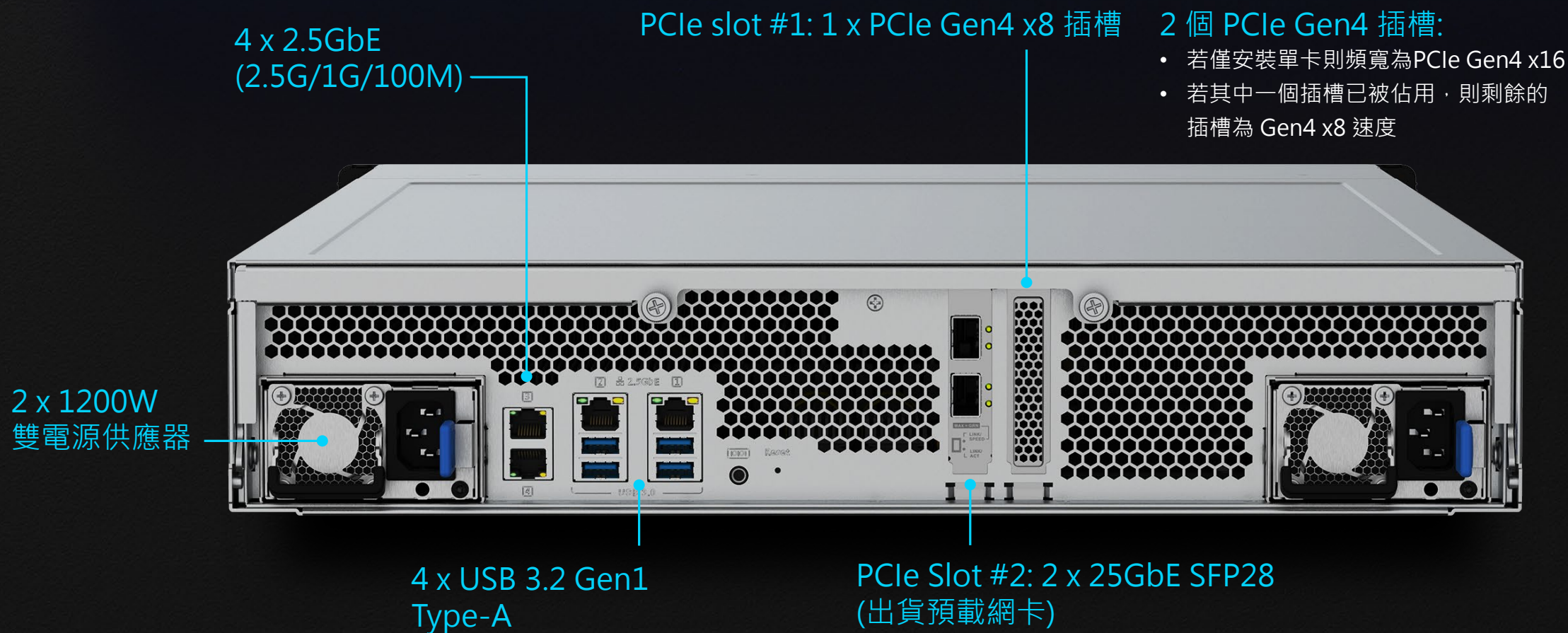
- 支援使用更易取得且更多選擇的 M.2 NVMe PCIe Gen4/Gen3 SSDs
- 高導熱金屬機身設計，附贈散熱墊，不擔心 M.2 SSD 過熱而影響效能或壽命

68 x 21 mm (用於 SSD 上方)

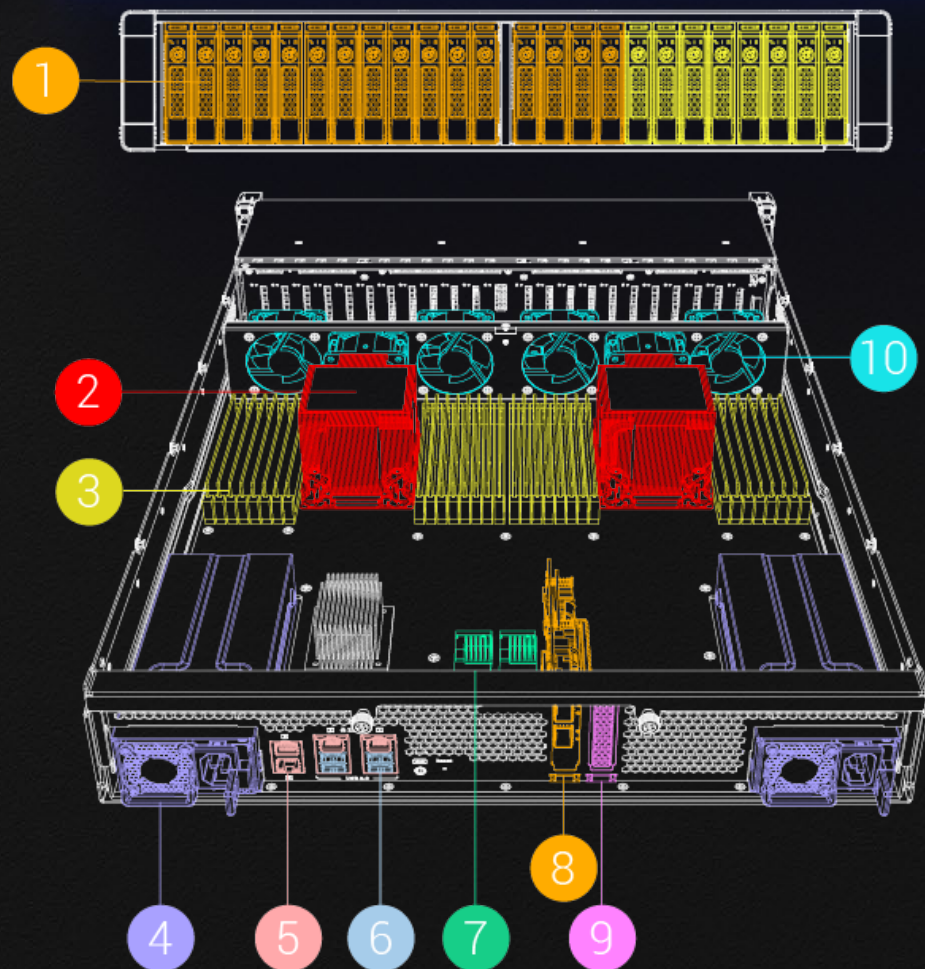


68 x 15 mm (用於 SSD 下方，單面 SSD 需使用兩片)

TDS-h2489FU 背面硬體配置



All flash NAS 超強配置，隨時應付需求



1 24 個 U.2 NVMe SSD 插槽

6 4 個 USB-A 3.2 Gen 1 埠

2 雙 Intel® Xeon® Silver 4300 系列處理器，
高達 32 總核心數

7 2 個 M.2 2280 PCIe Gen3
(x4 + x2) / SATA 6Gbps 埠

3 8 通道 32 條 DDR4
記憶體插槽，TB 級容量

8 2 個 25GbE SFP28 網路埠
(25GbE 雙埠網卡)

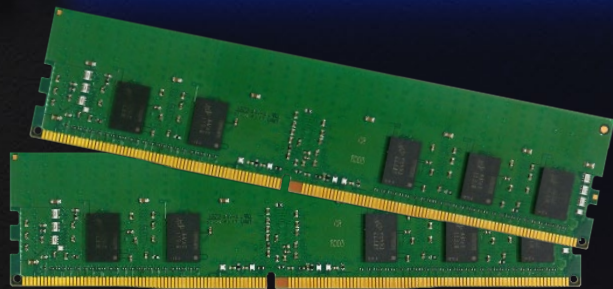
4 雙 1200W 電源供應器

9 2 個 PCIe Gen 4 插槽
(預載一張 25GbE 雙埠網卡)

5 4 個 2.5GbE RJ45 網路埠

10 系統散熱風扇

支援高達 1TB ECC DDR4 RDIMM 記憶體



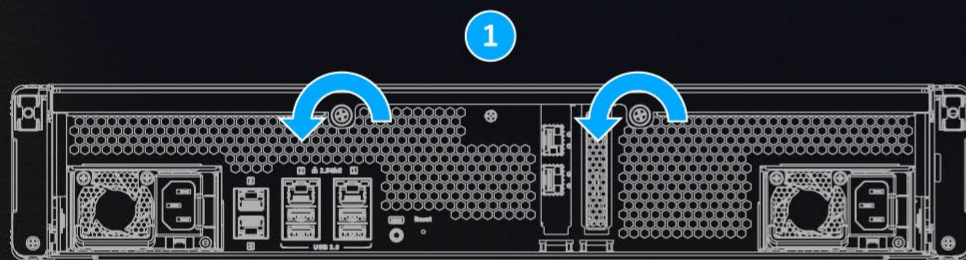
ECC 維持可靠性，避免資料毀損

Intel Xeon 伺服器級處理器支援 ECC Registered 記憶體，能自動偵測並即時修正單一位元錯誤。

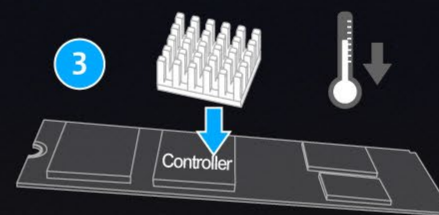
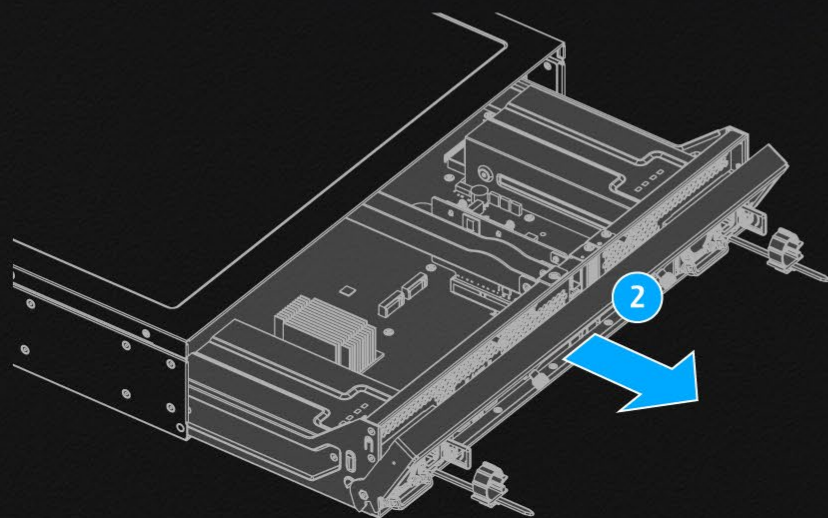
系統支援高達**1TB**記憶體

抽取式模組設計，快速安裝 M.2 2280 PCIe NVMe / SATA SSD 或升級記憶體配置

1. 鬆開後方固定螺絲

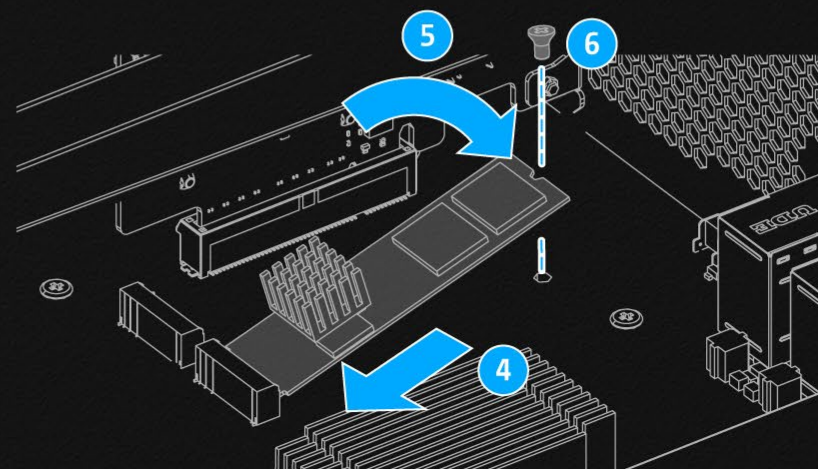


2. 拉出系統櫃



3. 可選購 M.2 SSD 散熱片 (8 片裝料號：HS-M2SSD-01)

4~6. 使用螺絲固定 M.2 SSD



PM9A3 Introduction

Q4, 2021 | Samsung Electronics., Ltd.

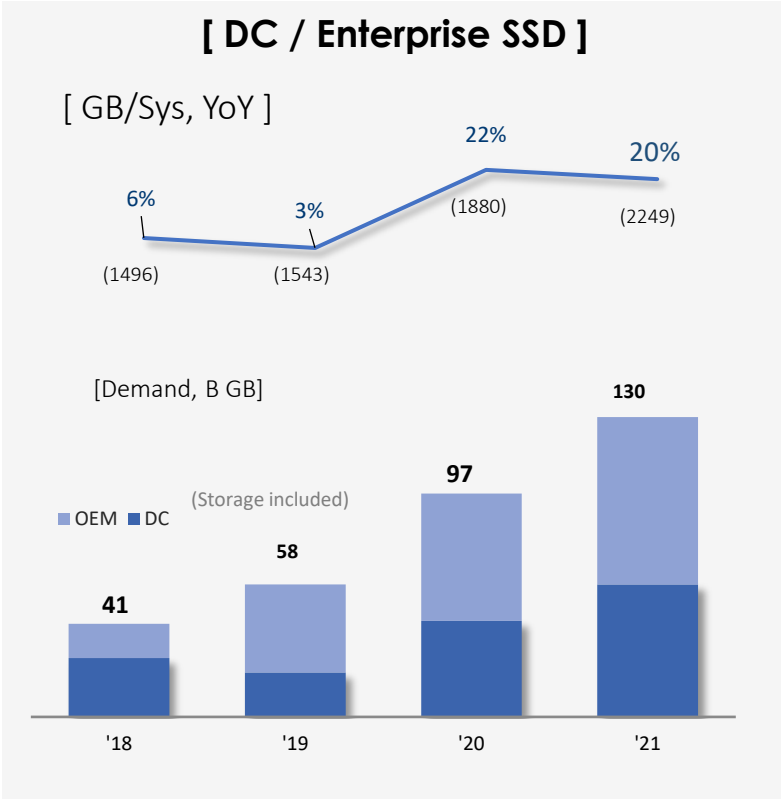
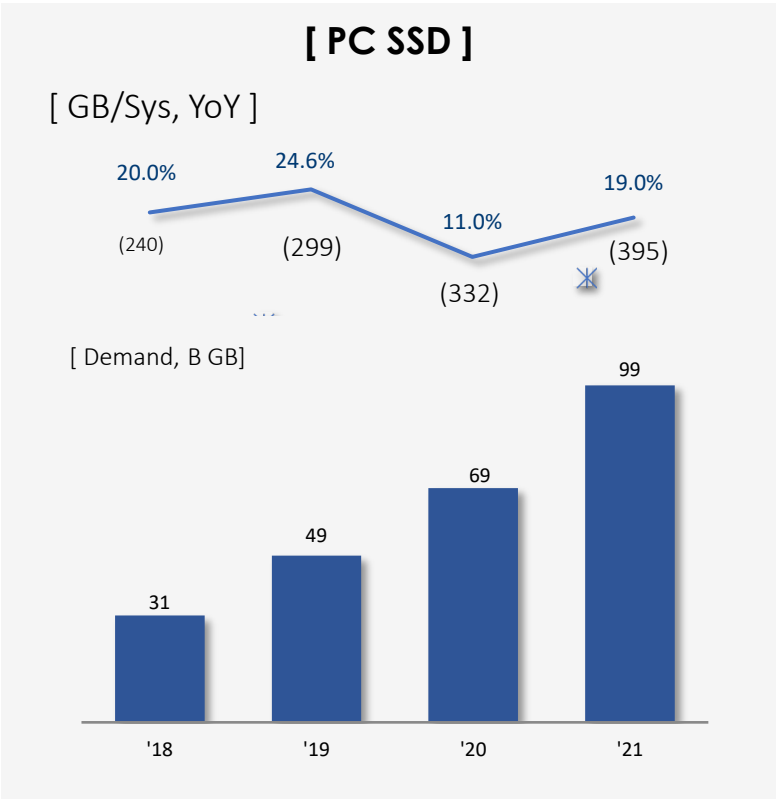
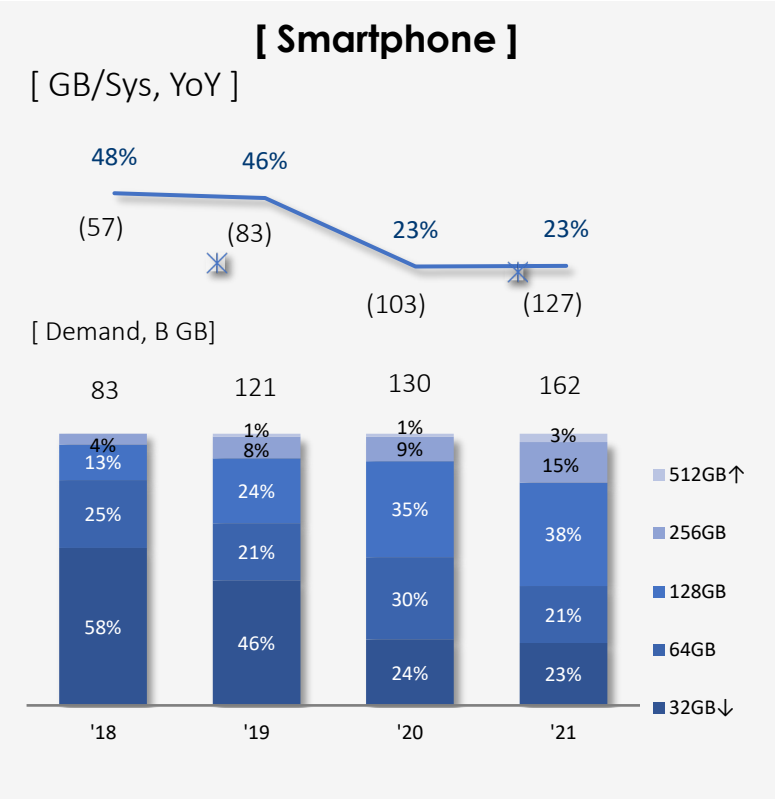
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Proprietary



NAND Solution Market outlook

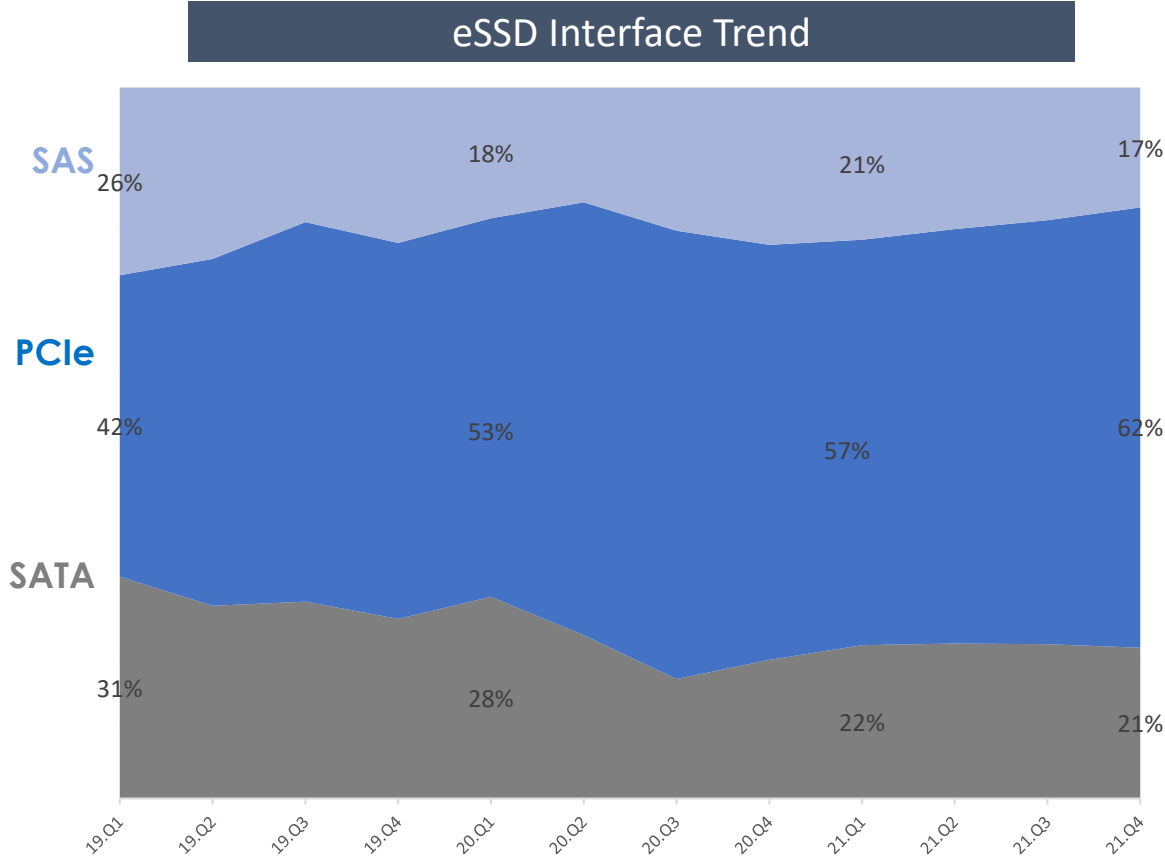
1. Enterprise SSD market to see continuing growth due to data explosion



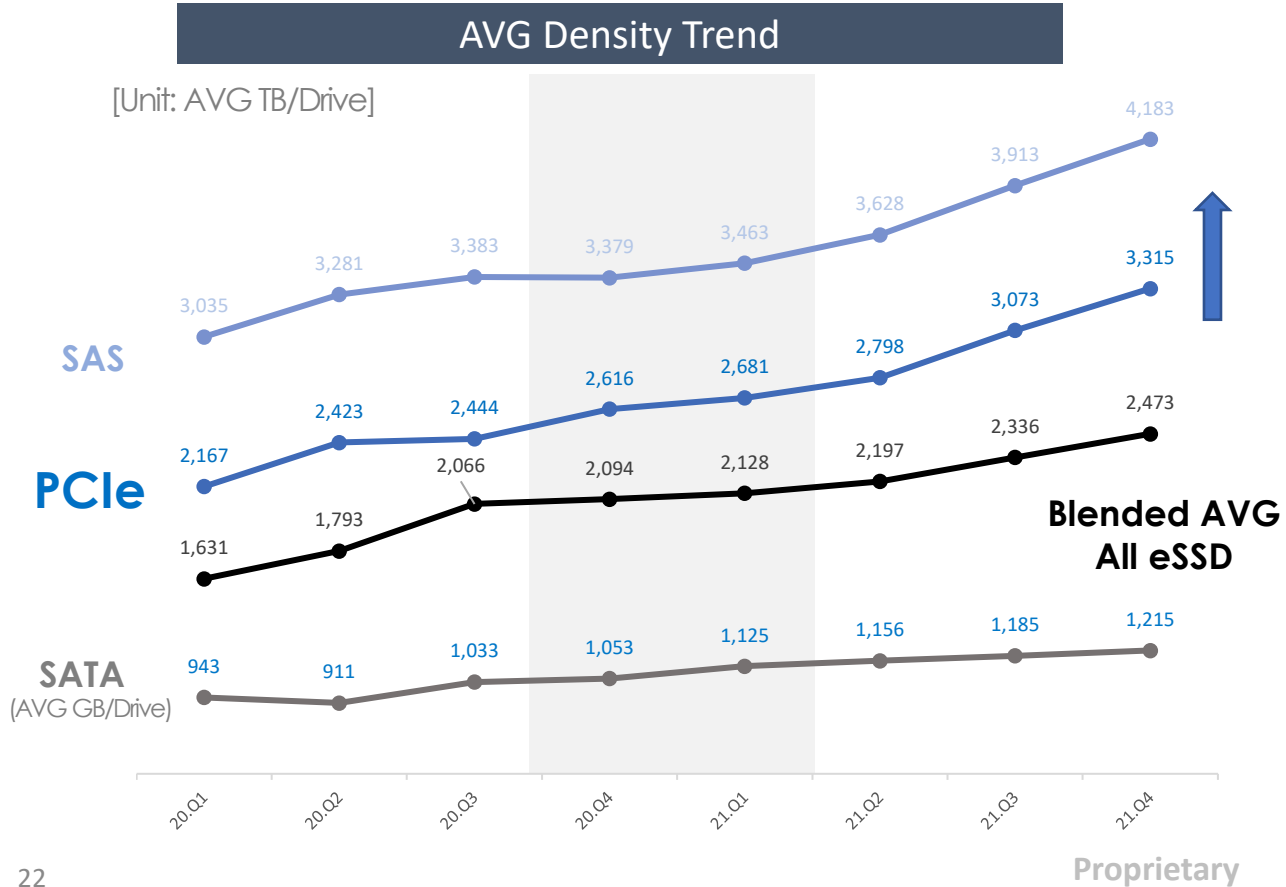
Source: Samsung, Forward Insights

Industry Interface Trend: NVMe Drives eSSD Growth

1. PCIe performance benefits drive interface conversion and higher density SSD – More than 8/16TB



Source: Samsung, Forward Insights



Technical trend of DC NVMe SSDs

1. From 2020, PCIe Gen4 based DC NVMe SSDs have been introduced continuously

- 1) SSD's own performances are getting higher and various types of new form-factors are being adopted to meet host level requirements.

2. Samsung is the leading company to support best in class performances and all kinds of form-factor



DEFEND

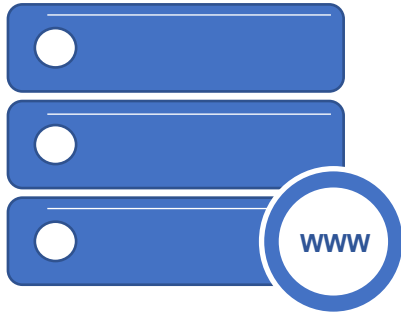
Diagnostic Easy Fix with Expedited,
NvMe-based Debugging Technology



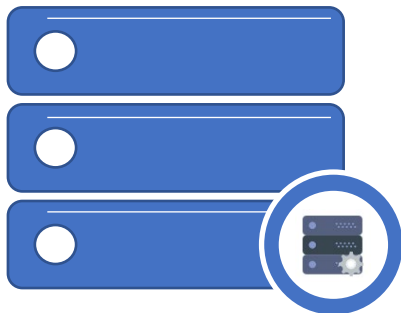
SAFE

Seamless and Accurate
Failure Evaluation Technology

Target Applications



- ① Multi-Tread & More functions
(Compute, Web servers, Mainstream servers)



- ② Mixed workload Service with PCIe Gen.4 speed
(Application servers, File servers)

PM9A3 Value Proposition

PM9A3

Samsung NVMe™ SSD PM9A3 provides the best in class PCIe Gen. 4 performances, various platform efficiencies, highly scalable design capability such as multiple form-factors and enhanced reliability with advanced V-NAND technology

Performance

- PCIe Gen.4 based performances for mainstream(Computing & Storage) servers with NVMe interface.
- Best in class QoS for various workload

Efficiency

- Improved energy efficiency, up to 80% power consumption per unit performance
- Faster emergency responsibility.

Design Capability

- Enhanced design scalability under host level constraints such as 1U server – providing multiple F/F for users' demands
- Leading technical priority of OCP and providing new reference design based on OCP specs

Performance: PCIe Gen.4 Generic version

1. PM9A3 provides best-in class PCIe Gen.4 performance for all kinds of form-factor

1) Random write performance is the key performance of PM9A3 → Refer to competitiveness of PM9A3.

2. Even though high performance, PM9A3 consumes small amount of power for datacenters' power efficiency

※ Refer to appendix for power budget of SSD form-factor, PM9A3 achieves high performance with enough margin.

Form Factor		U.2 (7mmT)				E1.S (9.5mmT)		M.2 (22x110mm)		
Capacity		7.68TB	3.84TB	1.92TB	960GB	3.84TB	1.92TB	3.84TB	1.92TB	960GB
Sequential (128KB, MB/s)	Read	6,700	6,900	6,800	6,500	6,800	6,800	5,500	5,500	5,000
	Write	4,000	4,100	2,700	1,500	4,000	2,700	2,000	2,000	1,400
Random (4KB, KIOPS)	Read	1,100	1,000	740	580	1000	850	800	800	550
	Write	200	190	130	70	190	130	85	85	60
Power (Watt)	Active (R/W)	11/13.5	11/13.5	10/12.5	9.5/8	11/13.5	10/12.5	8.2/8.2	8/8.2	7.5/6.5
	Idle	3.5	3.5	3.5	3.5	3.5	3.5	2.5	2.5	2.5

Performance: Best in class Latency and QoS

1. Latency

FormFactor		U.2 (2.5"mm 7mmT)				E1.S (9.5mmT)*		M.2 (22x110mm)		
Capacity		7.68TB	3.84TB	1.92TB	960GB	3.84TB	1.92TB	3.84TB	1.92TB	960GB
Sequential (128KB, us)	Read	20	20	20	20	20	20	20	20	20
	Write	20	20	20	20	20	20	20	20	20
Random (4KB,QD1, us)	Read	80	80	80	80	80	80	75	75	75
	Write	30	30	30	35	30	30	30	30	30
Drive Ready Time (sec)		8	8	8	8	8	8	5	5	5

* U.3 is under development for contracted server OEM companies first.

2.

FormFactor		U.2 (2.5"mm 7mmT)				M.2 (22x110mm)		
Capacity		7.68TB	3.84TB	1.92TB	960GB	3.84TB	1.92TB	960GB
Read (us)	QD1	0.1/0.15	0.1/0.15	0.1/0.15	0.1/0.15	0.1/0.15	0.1/0.15	0.1/0.15
	QD32	0.25/0.5	0.25/0.5	0.25/0.5	0.5/0.6	0.25/0.5	0.25/0.5	0.5/0.6
Write (us)	QD1	0.03/0.04	0.03/0.04	0.03/0.04	0.06/0.06	0.03/0.04	0.03/0.04	0.06/0.06
	QD32	0.35/0.5	0.35/0.5	0.35/0.6	0.6/0.6	0.7/0.7	0.7/0.7	0.8/0.8

Efficiency: Power consumption

1. **Regardless PCIe version, PM9A3 provides the lowest power consumption with the fastest performances.**
2. **Lower power consumption is the key factor of TCO for datacenters**
 - 1) Lower power means lower heat generation and it directly affects cooling cost of systems and datacenters※ Refer excel spread sheet for competitors power consumption level,

12V supply cond.		U.2 (2.5"mm 7mmT)				M.2 (22x110mm)		
Capacity		7.68TB	3.84TB	1.92TB	960GB	3.84TB	1.92TB	960GB
Active (Watt)	Read	11	11	10	9.5	8.2	8	7.5
	Write	13.5	13.5	12.5	8	8.2	8.2	6.5
Idle (Watt)		3.5	3.5	3.5	3.5	2.5	2.5	2.5
F/F Max Power		25W				8.25W		

1) Power consumption was measured in the 12V power pins of the connector plug in SSD. The active and idle power is defined as the highest averaged power value, which is the maximum RMS average value over 100 ms duration.

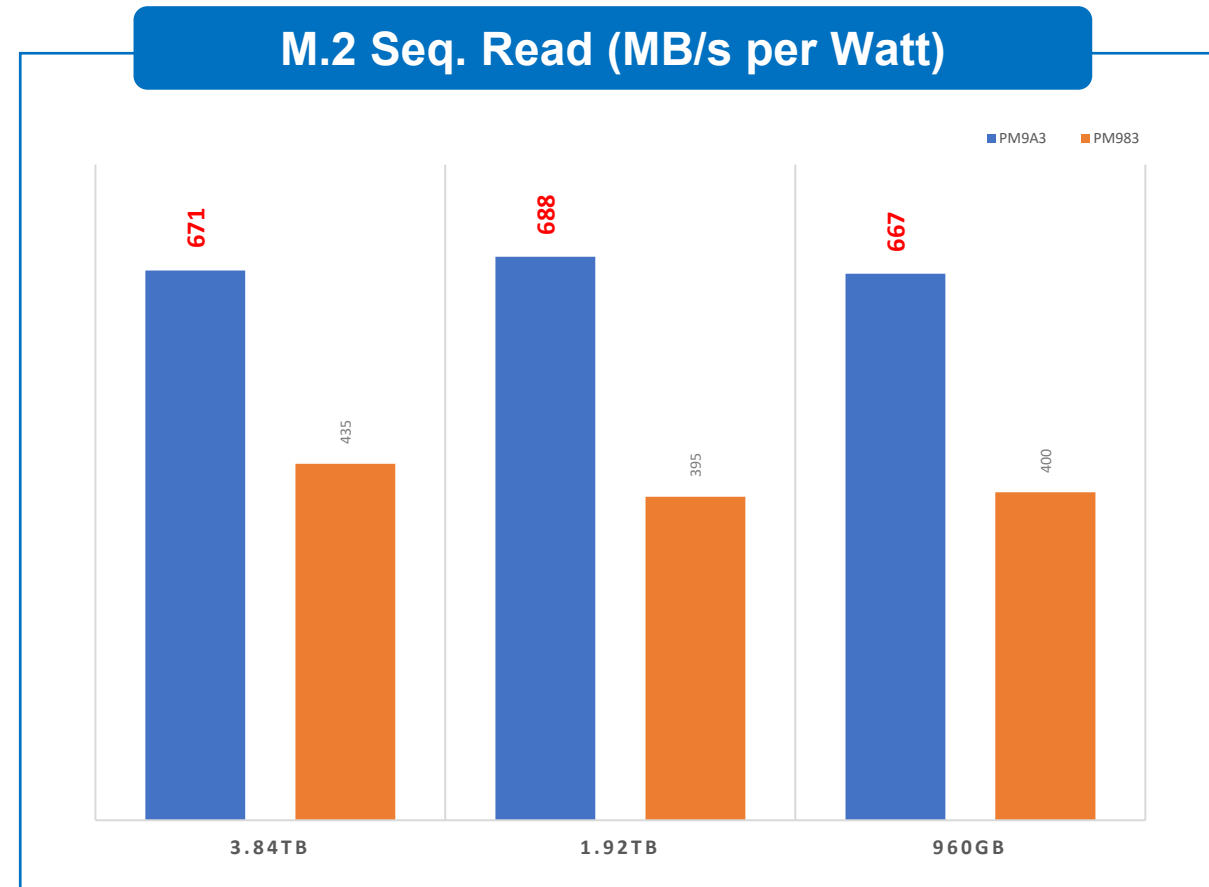
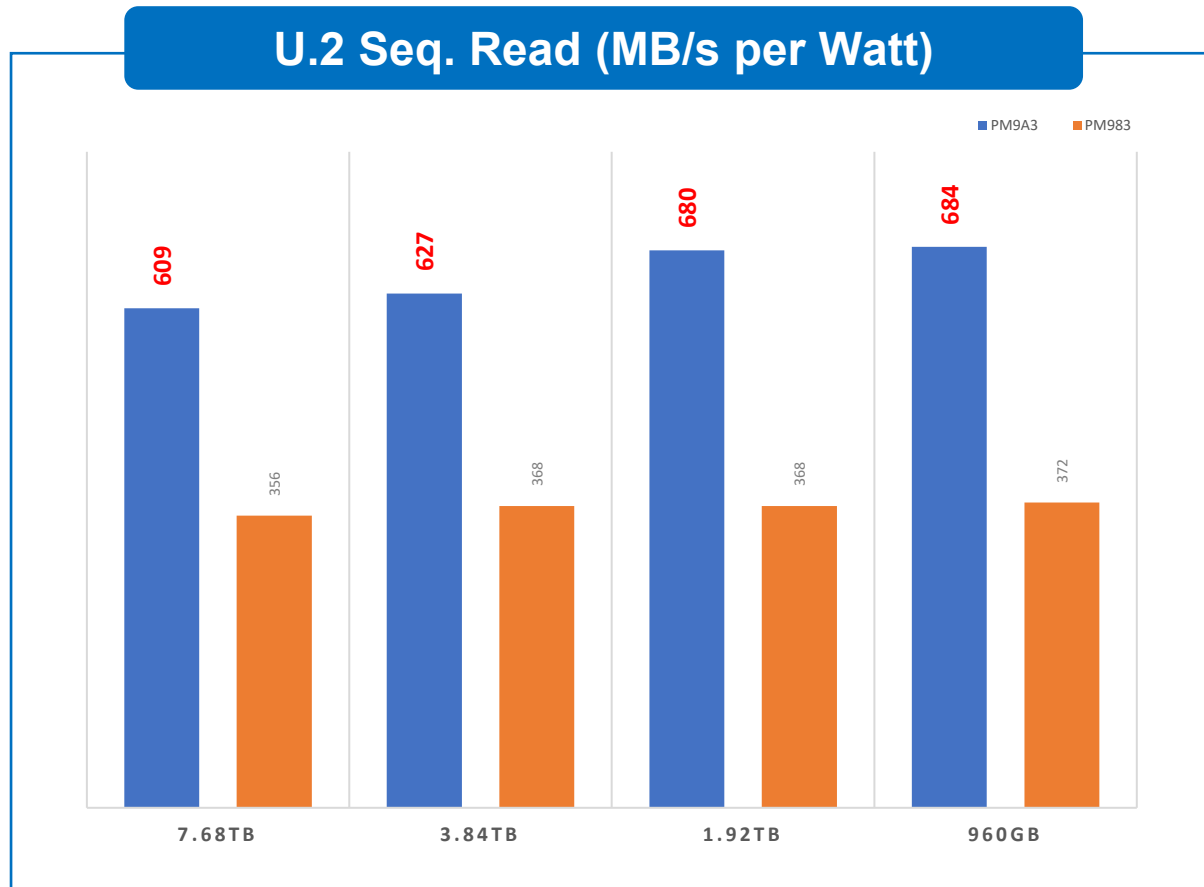
2) The measurement condition for active power is assumed for Maximum power between sequential or random performance in PCIe Gen4.

3) The idle state is defined as the state that the host system can issue any commands into SSD at any time

Efficiency: Efficient Power management (Seq. Read)

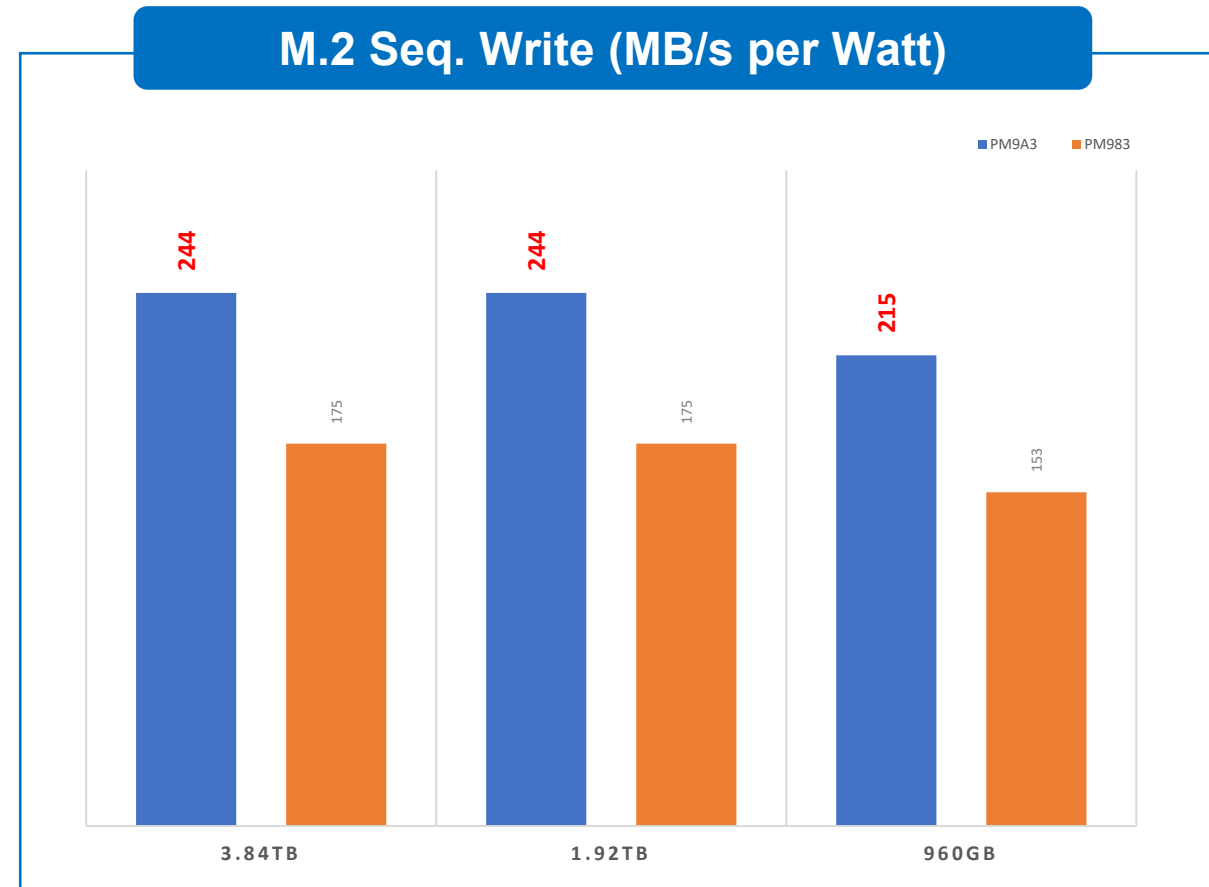
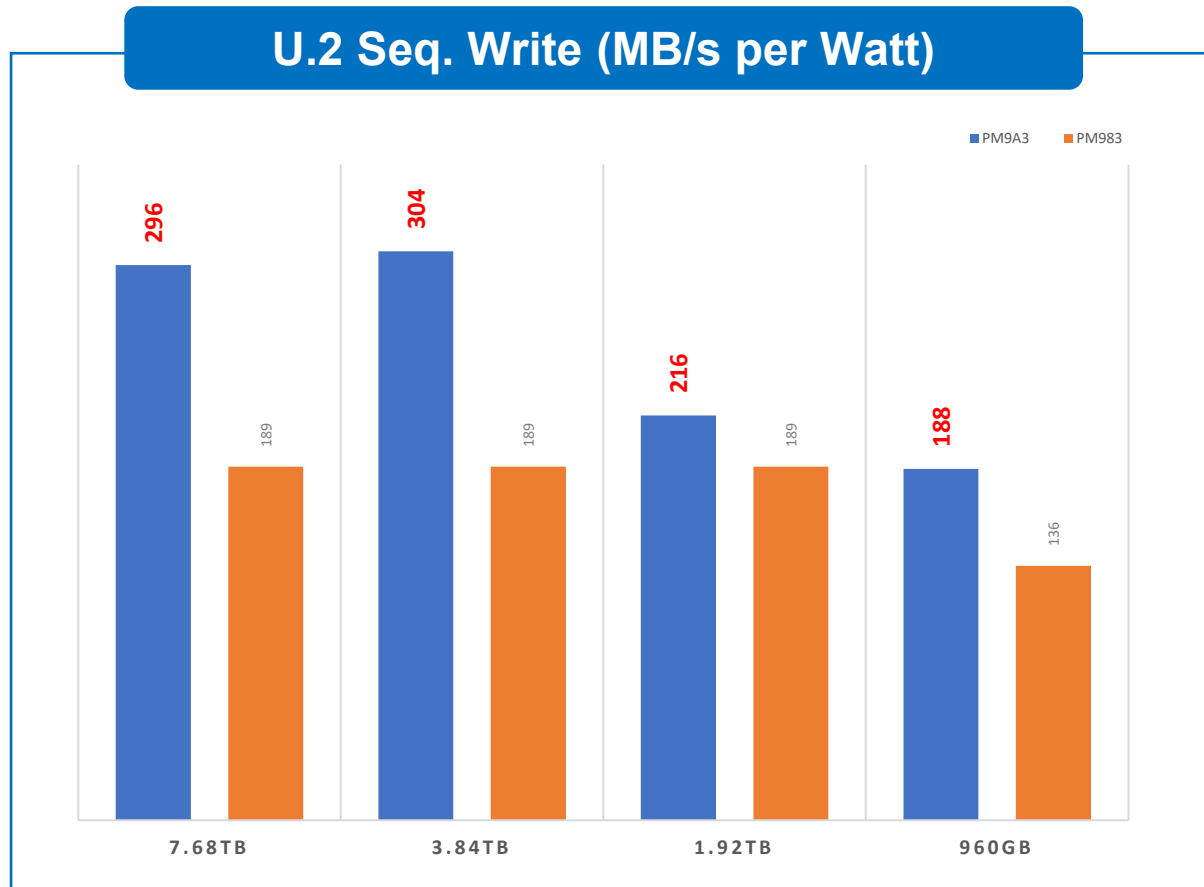
1. PM9A3 provides up to 1.8x times better power efficiency than previous generation, PM983

1) Even though PM9A3 is PCIe Gen.4 based SSD, less power consumption with higher performance



Efficiency: Efficient Power management (Seq. Write)

1. PM9A3 provides up to 1.6x times better power efficiency than previous generation



Design Capability: Multiple Form Factor

1. **Samsung can meet various form-factor needs from server manufacturers and DC architecture designers – M.2, U.2, E1.S, E1.L and U.3**



PM9A3 Overview

		PM9A3	PM983
Interface		PCIe Gen4x4	PCIe Gen3
Port configuration		Single port	Single port
CTRL		Elpis (8ch)	Phoenix (8ch)
NAND		V6(128L) TLC	V4(64L) TLC
Form-Factor		U.2, U.3, M.2, E1.S, E1.L	M.2, U.2
Capacity		15.36TB/7.68TB/3.84TB/1.92TB/960GB	7.68TB/3.84TB/1.92TB/960GB
Logical Block Address		512B(Default), 4KB	512B(Default), 4KB
NVMe.	NVMe Ver	1.4(Mandatory Only)	1.3c
	Sanitize	NVMe 1.3 Compliance (Block Erase, Crypto Erase)	Not Support
	Device Self test	Support	Not Support
SED		TCG/Opal	TCG/Opal
DWPD		1@5yr	1.3@3yr
Warranty		3	3

Security

1. AES 256-bit hardware-accelerated encryption with optional TCG Opal 2.0 feature to protect data at rest

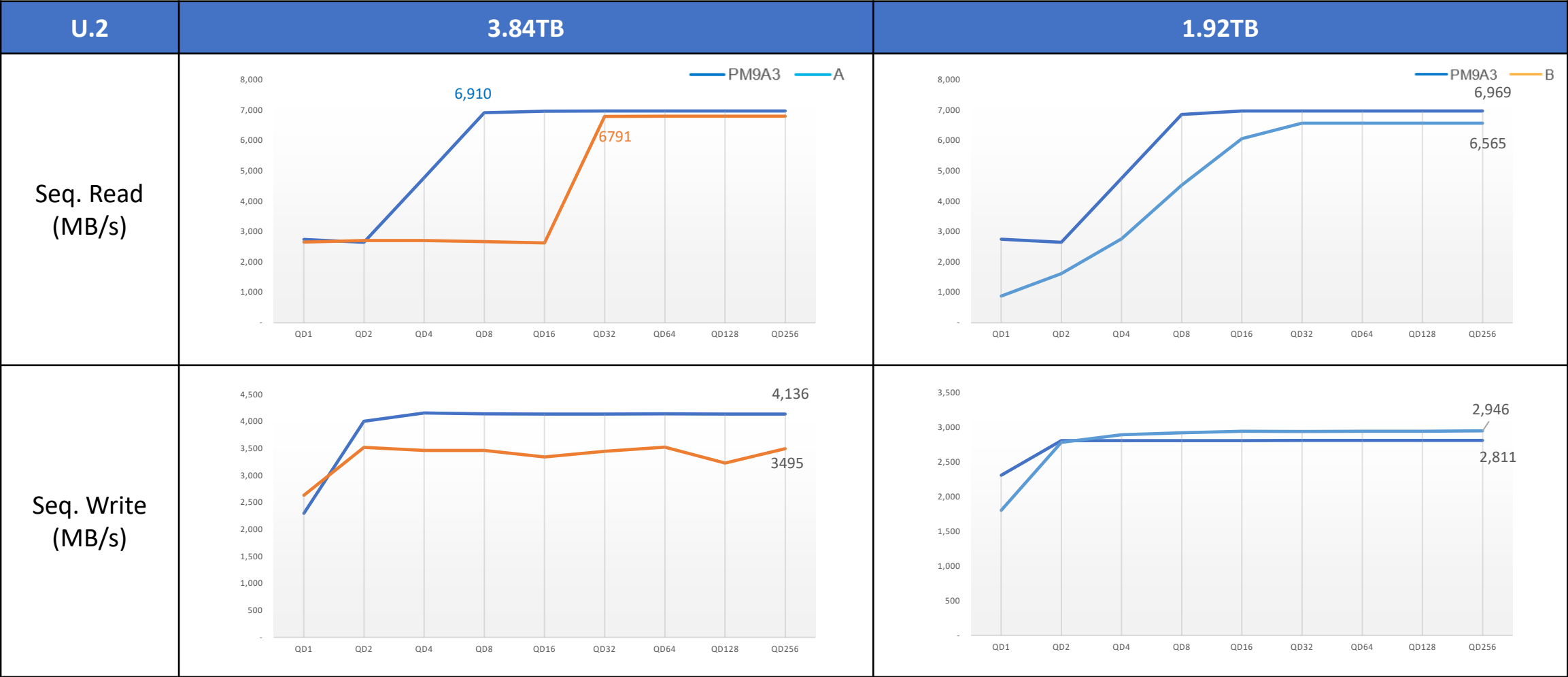
- 1) SED(Self-encrypting Drive) feature with no performance degradation
- 2) Advanced key management scheme guarantees no access to the encrypted data without knowing users' credentials
- 3) PUF(Physically Un-clonable Function) technology to provide an additional layer of security by encrypting sensitive information with a unique, random and unpredictable key

2. Secure FW boot and update to prevent the firmware from illegal modification

- 1) Hardware based immutable firmware verification at every power-on
- 2) Digital signature to protect firmware integrity based on RSA-3072
- 3) Key Revocation feature to revoke the firmware verification key in case of compromised signing key

128KB Sequential performance(MB/s)

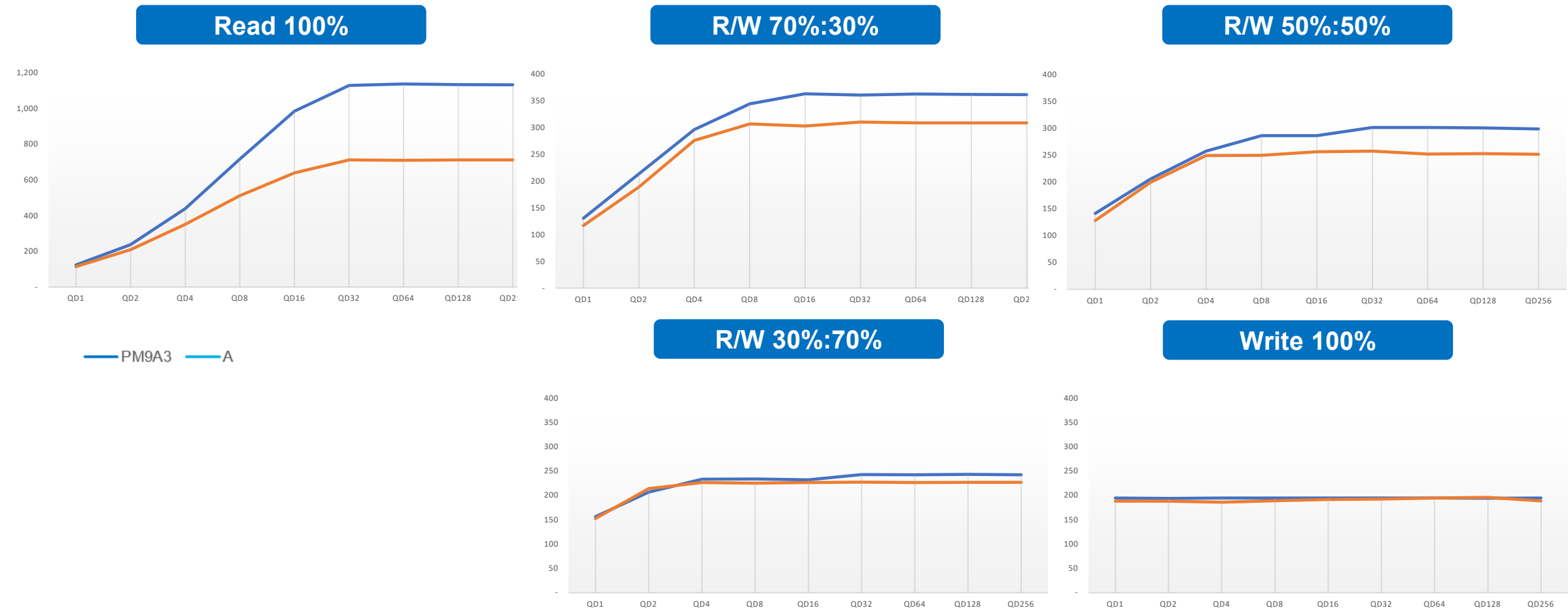
1. PM9A3 provides best-in class sequential read and write performance



4KB Random Performance(KIOPS): 3.84TB

1. PM9A3 provides robust 4KB ran performance in various types of mixed workload pattern

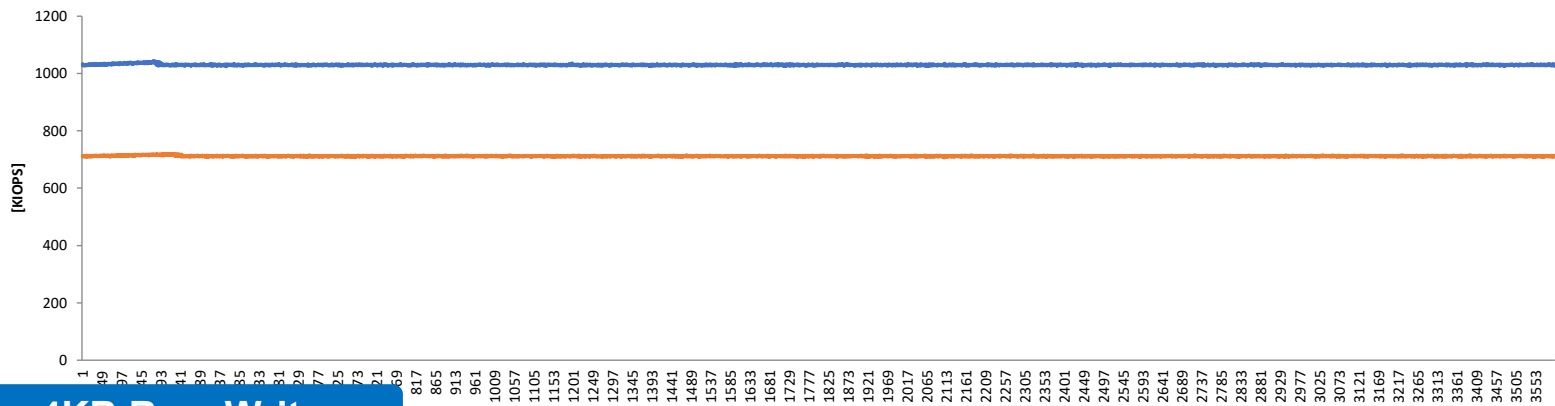
1) Datacenter customers are usually focusing on 70% Read case(mixed workload 7:3), PM9A3 shows up to 20% higher IOPs.



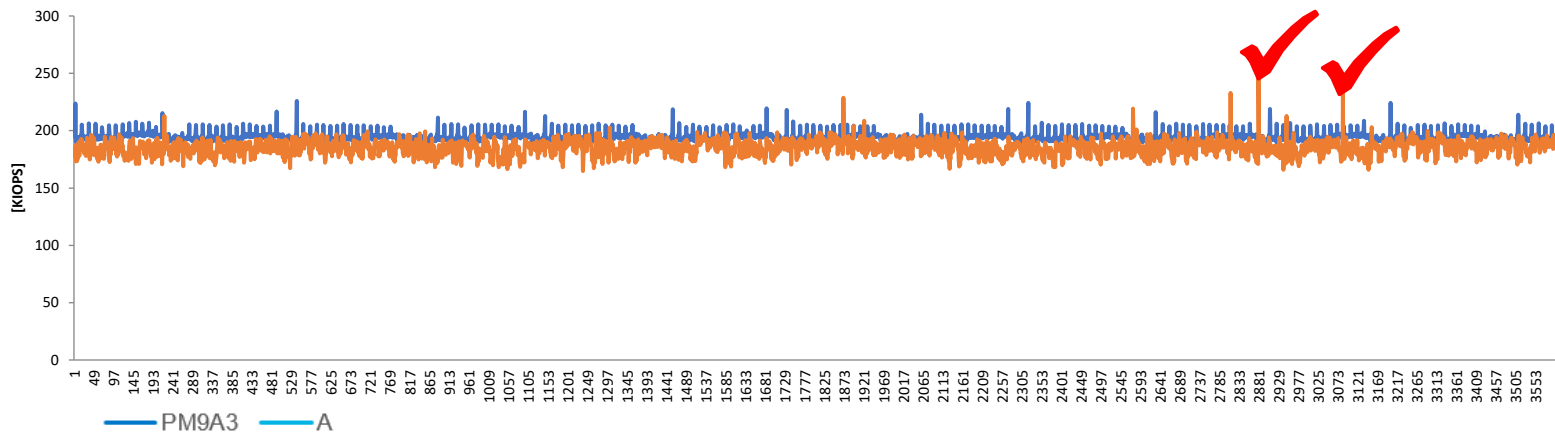
IOPS consistency: 3.84TB

1. PM9A3 shows stable IOPS consistency with Gen.4 performance compared to 16x based SSD

4KB Ran. Read



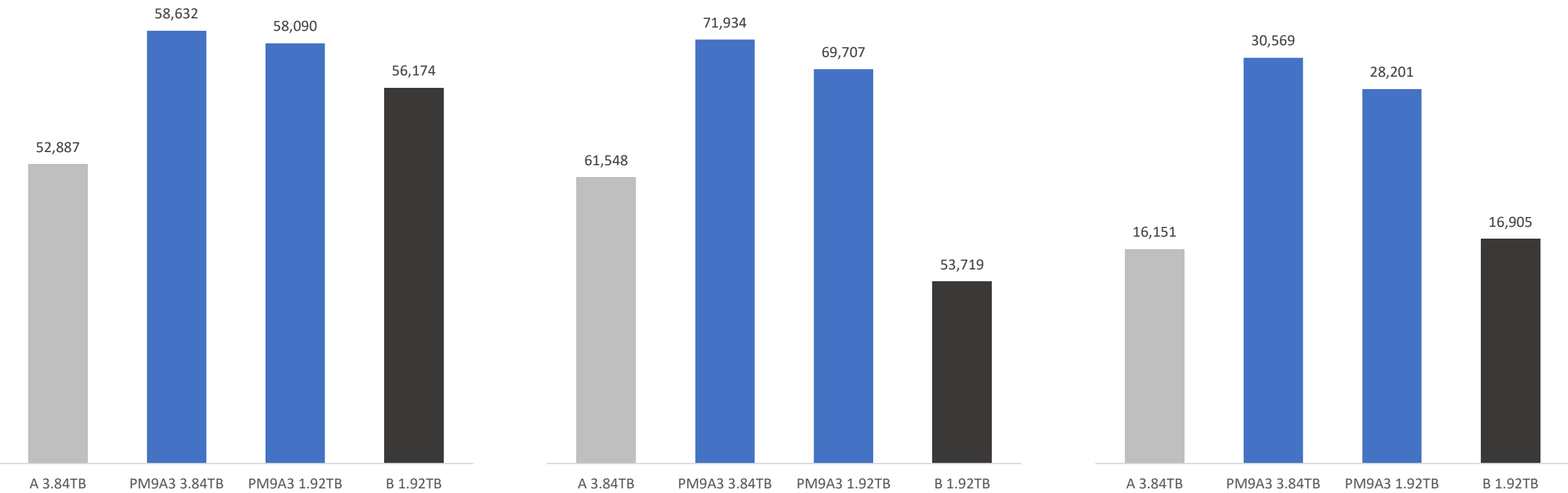
4KB Ran. Write



	PM9A3	A
Read	100%	99%
Write	97%	90%

User-environment simulation test (script base)

※ Higher score is better



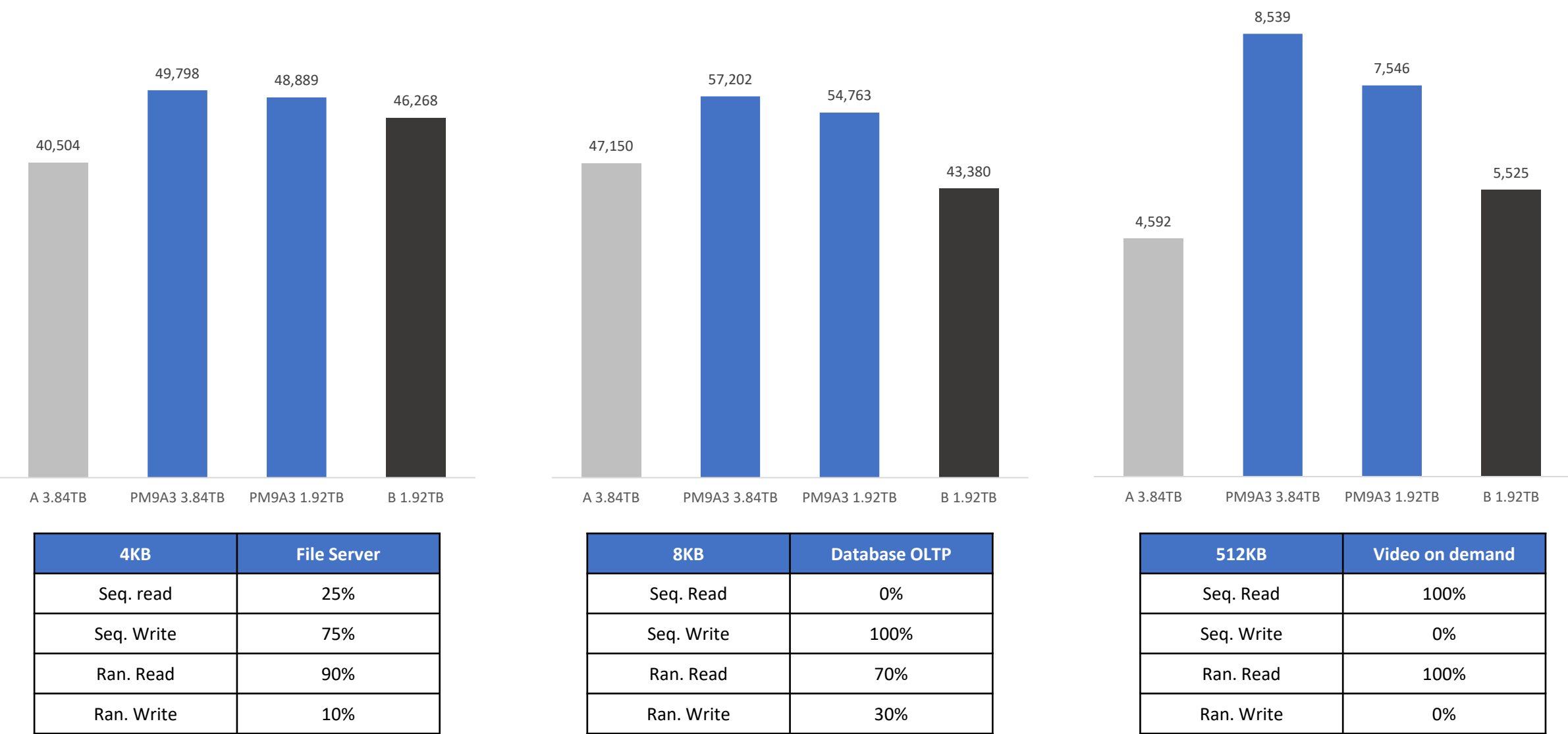
4KB	Web Server
Seq. read	25%
Seq. Write	75%
Ran. Read	95%
Ran. Write	5%

4KB	Exchange email
Seq. Read	0%
Seq. Write	100%
Ran. Read	67%
Ran. Write	33%

64KB	Media streaming
Seq. Read	100%
Seq. Write	0%
Ran. Read	98%
Ran. Write	2%

User-environment simulation test (script base)

※ Higher score is better



A close-up, angled view of a QNAP All Flash NAS unit. The device is black with a silver top panel. The front panel features a row of drive bays, some of which are open, revealing blue-lit flash storage modules. Two specific modules are highlighted with blue light and labeled '01' and '02'. The overall aesthetic is sleek and modern, with blue light accents providing a high-tech feel.

QNAP All Flash NAS

迅速反應、強大擴充

**TDS-h2489FU 具備在線資料縮減技術，
能大幅延長 SSD 的使用壽命**

必須在存入前減量才有效用

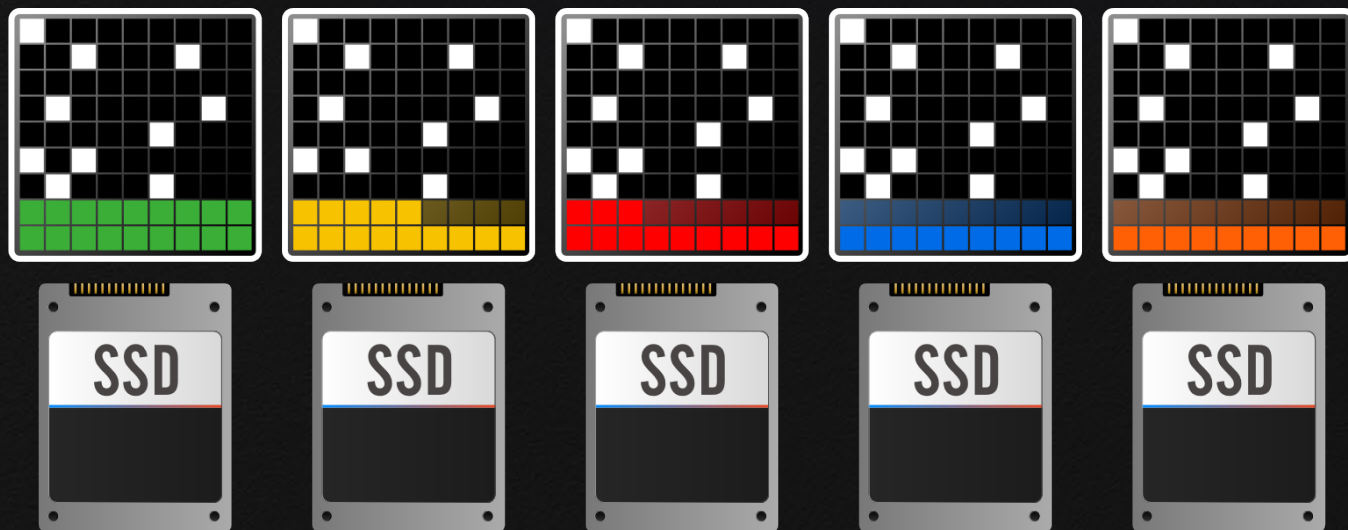
ZFS 檔案系統的重複數據刪除與壓縮功能

透過資料減量來大幅減少 SSD 的寫入次數，ZFS 檔案系統也因此成為 All Flash / 高速SSD系統的最佳搭配夥伴。

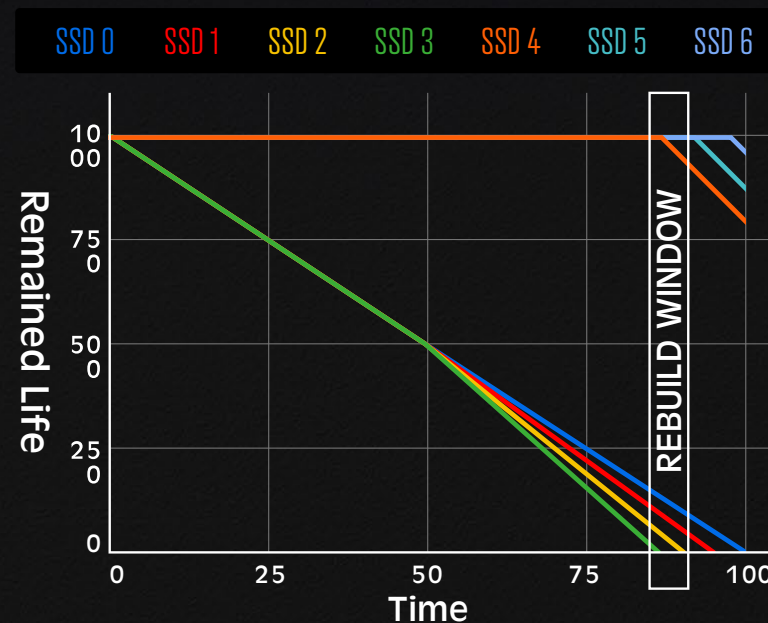




QSA 專利 動態分布



QSAL (QNAP SSD Anti-wear Leveling):
對應RAID 5 / 6 / 50 / 60 / TP這幾種的SSD
RAID Pool, 將會預設自動啟用.



彈性網路選擇，25GbE 網路埠搭配轉發器即可向下相容 10GbE/1GbE 網路

- 內建 25GbE 網路埠，適用 SFP28 光纖轉發器或 DAC 直連線材
- 向下相容支援 **1GbE** 及 **10GbE** 網路 (適用相容的 SFP/SFP+ 光纖轉發器)
- Auto-negotiation 可自動調整連接速度



QNAP QSW-M5216-1T 16埠 25GbE 交換器

10GbE SFP+
轉發器
(transceiver)



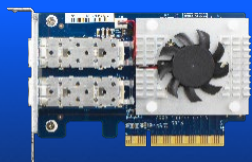
1GbE SFP
轉發器
(transceiver)



網路擴充：豐富的各式網路相關擴充配件

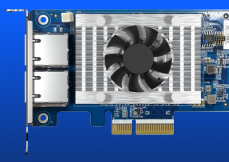
10GbE 網路卡

2 x SFP+



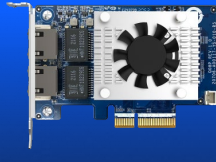
QXG-10G2SF-CX4

2 x RJ45



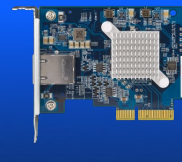
LAN-10G2T-X710

2 x RJ45



QXG-10G2TB

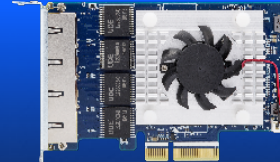
1 x RJ45



QXG-10G1T

5GbE網路卡

1/2/4 x RJ45



QXG-5G1T-111C

QXG-5G2T-111C

QXG-5G4T-111C

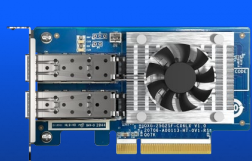
40/25GbE網路卡

2 x QSFP+ 40Gb/s



LAN-40G2SF-MLX

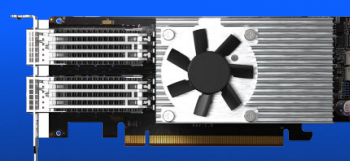
2 x SFP28 25Gb/s



QXG-25G2SF-CX6

100GbE 網路卡

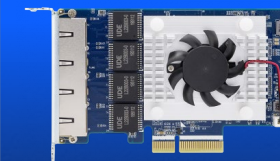
2 x QSFP28



QXG-100G2SF-E810

2.5GbE 網路卡

1/2/4 x RJ45



QXG-2G1T-I225

QXG-2G2T-I225

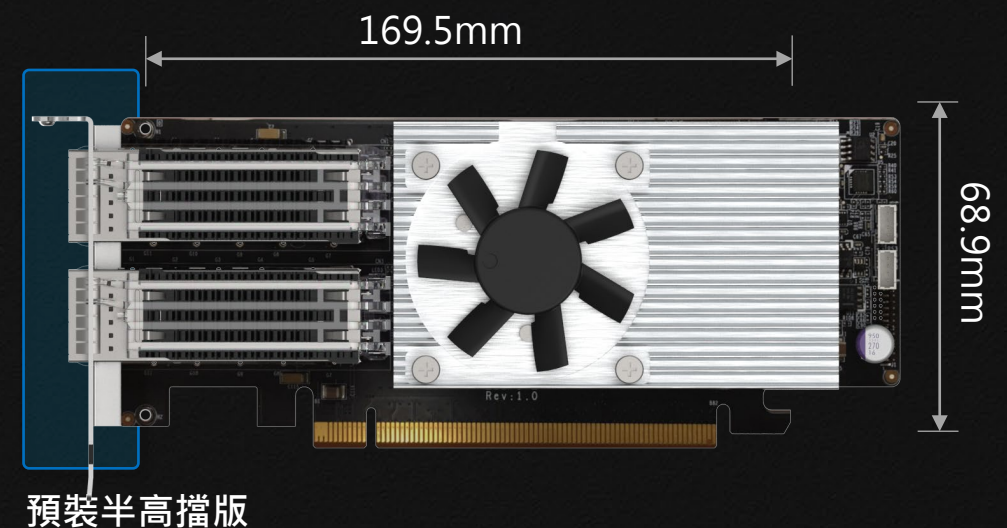
QXG-2G4T-I225

PCIe Gen4 擴充 100GbE 網路

- 安裝 QNAP QXG-100G2SF-E810 網路擴充卡，搭配 100GbE 網路交換機提升至 100GbE 網路環境
- 支援分割連接埠模式，搭配 25GbE 交換器有更彈性的選擇。也可透過連接埠分割，直接將 100GbE 網路擴充卡連接到 **4 台 25GbE** 或 **8 台 10GbE** 的終端設備



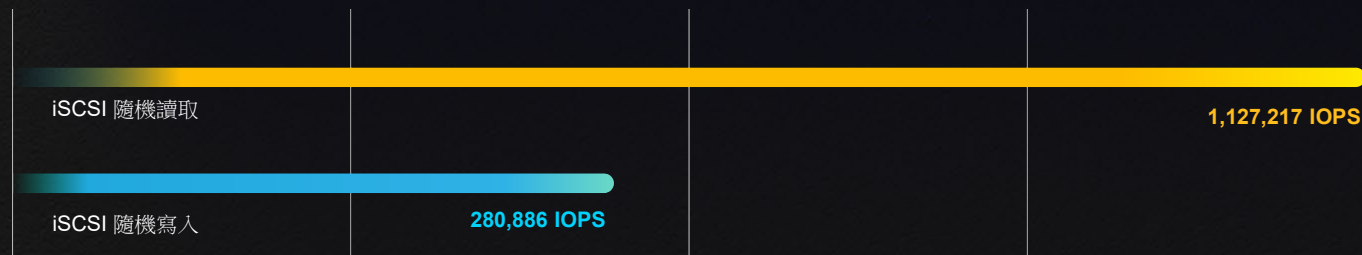
Mellanox 25 / 100 GbE Switch (SN2010)



32 總核心數 TDS-h2489FU-4314-128G

6 台 25GbE 用戶端環境同時存取效能

6 x 25GbE iSCSI, Random IOPS (4K), Compression On, Dedupe Off



6 x 25GbE SAMBA, Sequential Throughput (1MB), Compression On, Dedupe Off



- 高達百萬級 iSCSI 隨機讀取 IOPS!
- 16,165MB/s SMB 循序讀取與 11,022 MB/s SMB 循序寫入速度!



6 台 25GbE clients 同時存取

測試於 QNAP 實驗室，數據會因實際環境而有所不同。

測試環境：

NAS: TDS-h2489FU-4314-128G with QuTS hero 5.0

Volume type: Samsung PM9A3 960G Gen4 U.2 NVMe SSD x24 (RAID 50); Intel QXG-100G2SF-E810; QXG-25G2SF-CX4

Client PC: 6* Client PC simultaneously read and write 16GB file (= 96GB totally)

Intel Core™ i7-7700 4.20GHz CPU, 32GB DDR4 RAM, QXG-25G2SF-CX4, Windows® Server 2016, and Intel Core™ i3-8100 3.60GHz CPU, 4GB DDR4 RAM, QXG-25G2SF-CX4, Windows® Server 2016

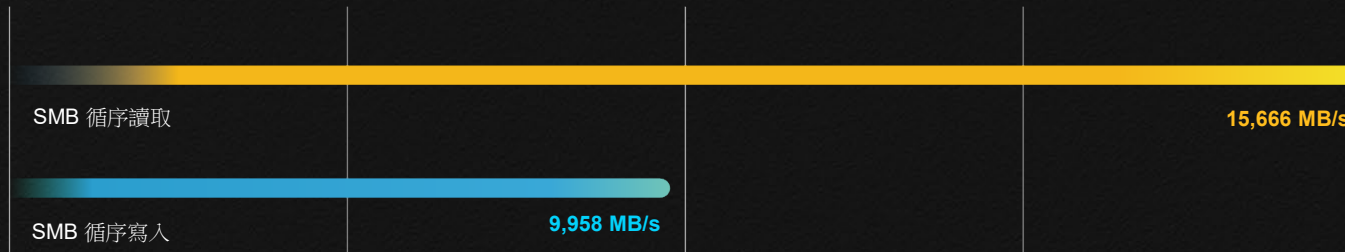
16 總核心數 TDS-h2489FU-4309Y-64G

6 台 25GbE 用戶端環境同時存取效能

6 x 25GbE iSCSI, Random IOPS (4K), Compression On, Dedupe Off



6 x 25GbE SAMBA, Sequential Throughout (1MB), Compression On, Dedupe Off



- 高達 745,479 iSCSI 隨機讀取 IOPS!
- 15,666 MB/s SMB 循序讀取與 9,958 MB/s SMB 循序寫入速度!



6 台 25GbE clients 同時存取

測試於 QNAP 實驗室，數據會因實際環境而有所不同。

測試環境：

NAS: TDS-h2489FU-4309Y-64G with QuTS hero 5.0

Volume type: Samsung PM9A3 960G Gen4 U.2 NVMe SSD x24 (RAID 50); Intel QXG-100G2SF-E810; QXG-25G2SF-CX4

Client PC: 6* Client PC simultaneously read and write 16GB file (= 96GB totally)

Intel Core™ i7-7700 4.20GHz CPU, 32GB DDR4 RAM, QXG-25G2SF-CX4, Windows® Server 2016, and Intel Core™ i3-8100 3.60GHz CPU, 4GB DDR4 RAM, QXG-25G2SF-CX4, Windows® Server 2016

Fibre Channel SAN

32Gb & 16Gb 儲存方案



QXP-32G2FC

雙埠 32Gbps FC 擴充卡

QXP-16G2FC

雙埠 16Gbps FC 擴充卡

適用於 NAS，高速且經濟實惠的 QNAP FC 高速擴充卡

* 不支援安裝於 Windows/Linux 主機

隨附 Optical FC 收發器



- TRX-32GFC-SFP-SR
32Gb/16Gb/8Gb

- TRX-16GFC-SFP-SR
16Gb/8Gb/4Gb

注意：光纖線材為選購配件。

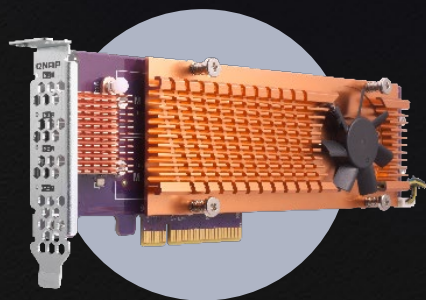


容量擴充：利用 QM2 卡擴展 M.2 NVMe SSD

需要更多的NVMe M.2 SSD作為加速嗎？沒問題！QM2擴充卡讓您擁有更多高速SSD

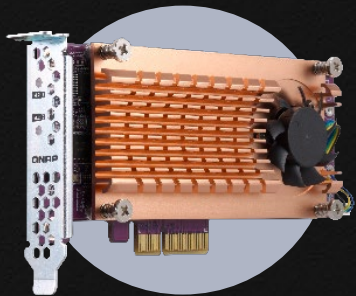


無須破壞 原有儲存架構與配置



QM2-4P-384 (Gen 3 x8 卡)

4 x M.2 2280 PCIe Gen 3 x4 NVMe SSD 埠



QM2-2P-384 (Gen 3 x8 卡)

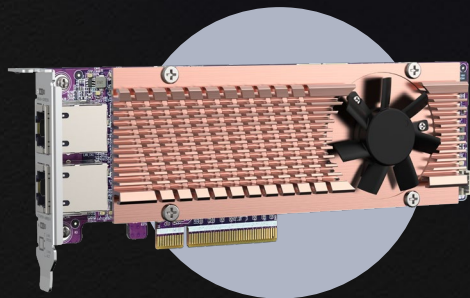
2 x M.2 22110/2280 PCIe Gen 3 x4 NVMe SSD 埠

容量擴充：利用 QM2 卡擴展 M.2 NVMe SSD

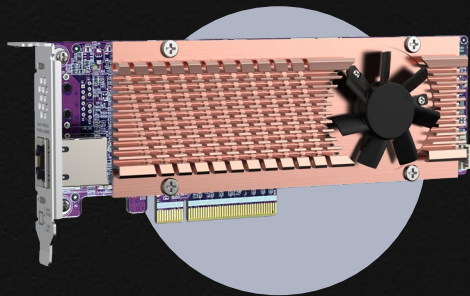
全新 PCIe Gen4 的 QM2 擴充卡，讓您擁有更多高速 SSD 與 10GbE 網路能力



PCIe 4.0 超高速全新介面

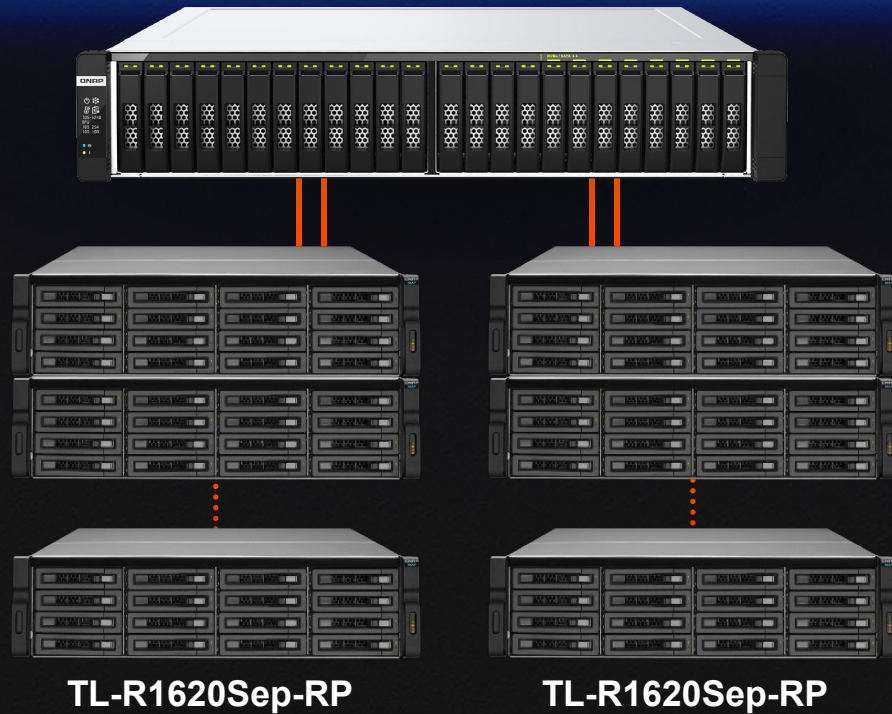


QM2-2P410G2T (Gen 4 x8 卡)
2 x M.2 2280 PCIe **Gen 4 x4** NVMe SSD 埠
+ 2 x 10GbE RJ45 網路埠



QM2-2P410G1T (Gen 4 x8 卡)
2 x M.2 2280 PCIe **Gen 4 x4** NVMe SSD 埠
+ 1 x 10GbE RJ45 網路埠

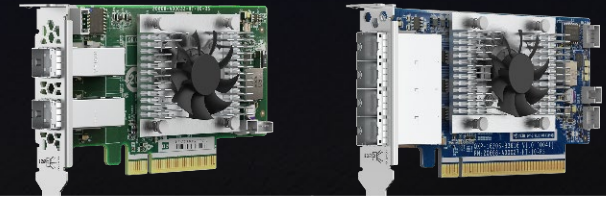
PB 級大容量的多台 QNAP SAS 12Gb/s 12-bay & 16-bay JBOD 儲存擴充



每台主機均可支援串接 16 台 QNAP SAS JBOD

- 12-bay TL-R1220Sep-RP 或 16-bay TL-R1620Sep-RP
- 每台主機支援百顆硬碟，1~2PB 的原始儲存空間(raw capacity)
- SAS JBOD 額外支援擴充 NAS 本機儲存池空間

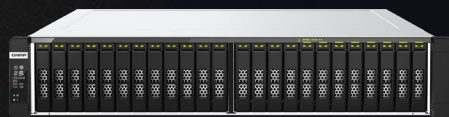
SAS HBA 擴充卡(選購)



	QXP-820S-B3408	QXP-1620S-B3616W
SAS晶片	Broadcom SAS3408	Broadcom SAS3616W
PCI 匯流排	PCIe3 x8	PCIe3 x16
IOPS	1.2X	1.8X
Bandwidth	6,850 MBs	13,700 MBs
埠數	External 8 port	External 16 port
連接頭	2 x SFF8644	4 x SFF8644

*以上數據為規格參考值，實際效能與搭配的主機、外接擴充櫃以及硬碟有關

QNAP NAS x Seagate JBOD 解決方案提供企業高效率數位轉型需求的超大容量 PB 級儲存空間



QNAP TDS-h2489FU
NAS



Seagate JBOD



超大容量

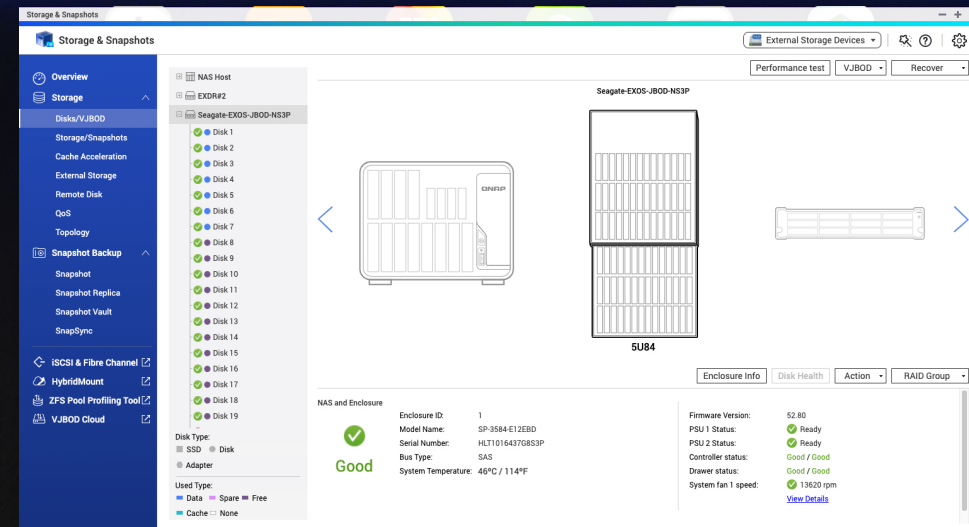
NAS 搭配 Seagate JBOD 全面滿足 4K/8K 多媒體剪輯、大資料儲存資料中心、高效率虛擬化應用等企業需求。

超高密度

Seagate Exos E 5U84 5U 高密度機架式 JBOD 能支援 84 顆硬碟提供單機高達 1.5 PB 超大儲存空間。

深度整合與管理

QNAP NAS 作業系統內對 *Storage & Snapshots* 網頁管理介面讓 NAS 與 JBOD 即時管理更有效率，並能有效減輕 IT 管理負擔。



- QNAP NAS 支援 **Seagate Exos E SAS JBOD** 跟 **100+ 硬碟數** 以提供 **petabytes (PBs)** 原始儲存容量 (raw capacity)。

注意：

- 需再額外選購 SAS HBA 擴充卡安裝至 NAS。
- 僅能作為獨立的儲存池或磁碟區，無法與 NAS 主機的儲存池或磁碟區合併使用，且系統應用僅能安裝於 NAS 本機。



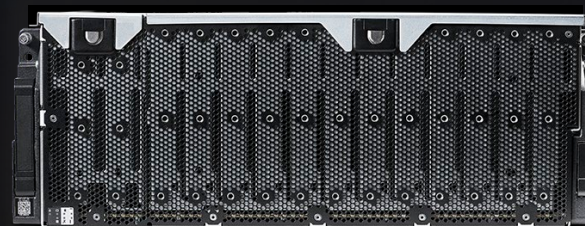
SEAGATE

促進業務成長，使用最佳成本的 Seagate Exos E JBOD 大幅擴充 QNAP all flash NAS 儲存空間



Exos E 2U12

- 最高 216 TB
- 12 x 18 TB 3.5" SAS HDD



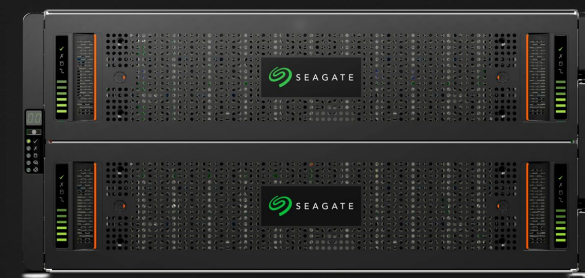
Exos E 4U106

- 最高 1.9 PB
- 106 x 18 TB 3.5" SAS HDD



Exos E 2U24

- 最高 57.6 TB
- 24 x 2.4 TB 2.5" SAS SSD

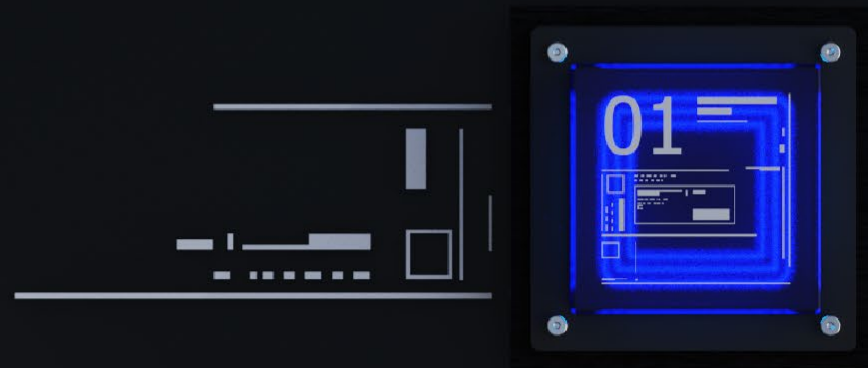
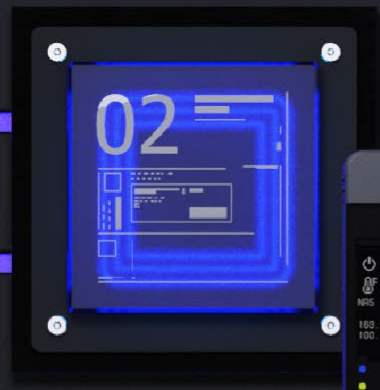


Exos E 5U84

- 最高 1.5 PB
- 84 x 18 TB 3.5" SAS HDD

注意：
2022 Q1 & Q2 陸續新增支援機型與最大連接數量，詳細支援清單請參考 QNAP 相容性列表 <https://www.qnap.com/en/compatibility-expansion?model=tds-h2489fu>

LIVE DEMO

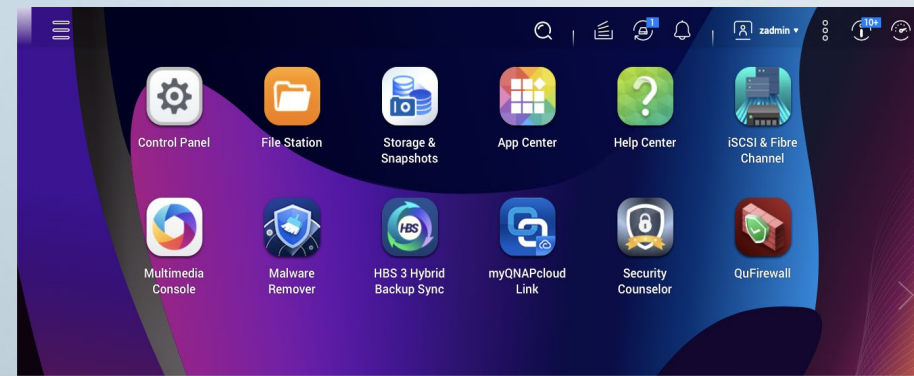
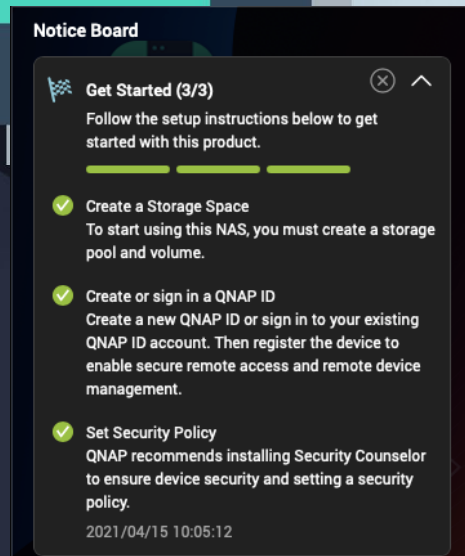


Kernel 5.10 LTS

採用 ZFS 檔案系統，QuTS hero 保障效能與資料完整

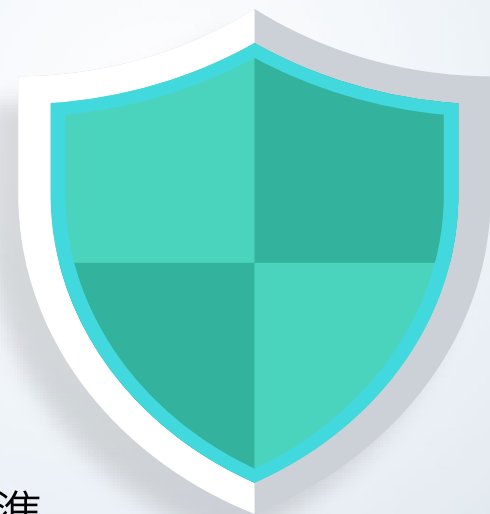
非 IT 也能安裝與使用

安裝精靈導引與管理帳號建立，視覺式網頁介面與多種 app 與行動裝置支援

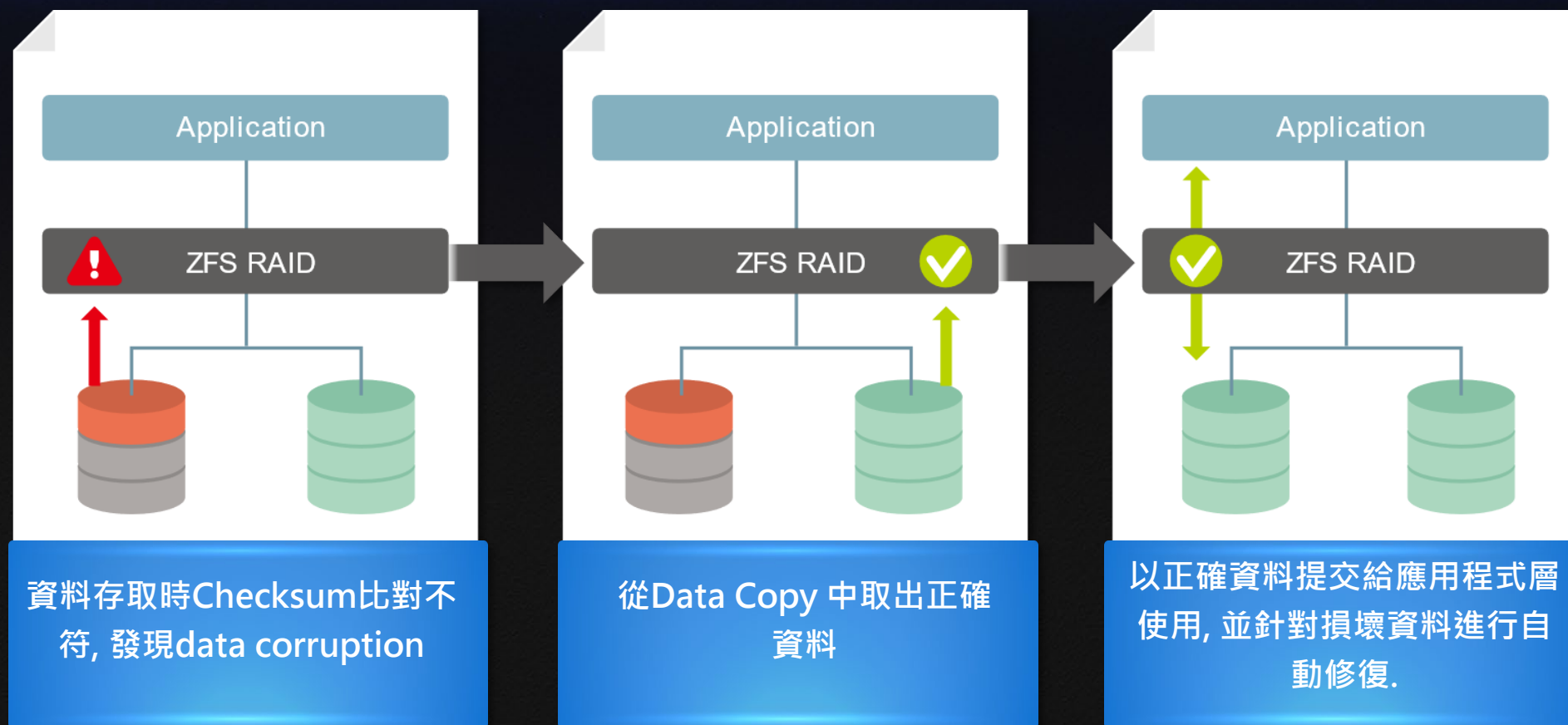


提升安全保護等級

- 支援 TLS 1.3
- 預設將 admin 帳號關閉
- 支援進階加密套件
- 調整安全設定, 更符合安全防護標準
- SSH Key 登入
- 韌體自動更新 (建議更新, 自動更新)
- App自動更新 (建議更新, 自動更新)



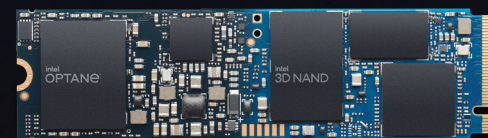
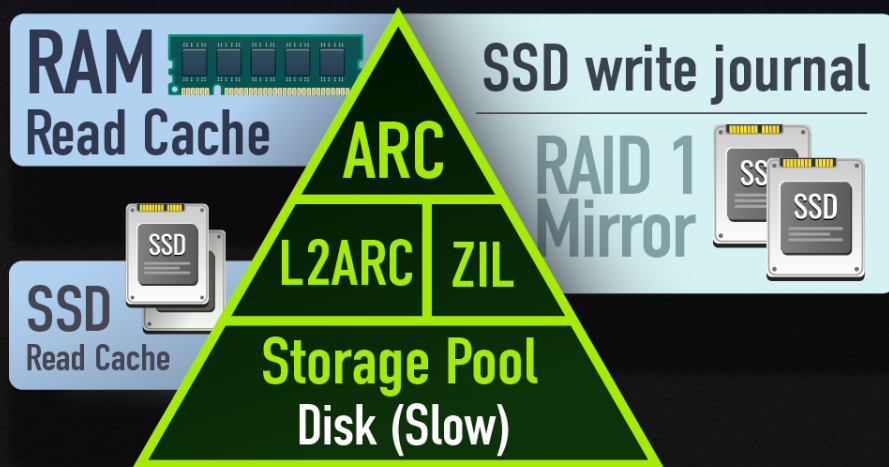
QuTS hero 強大的資料自我修復能力



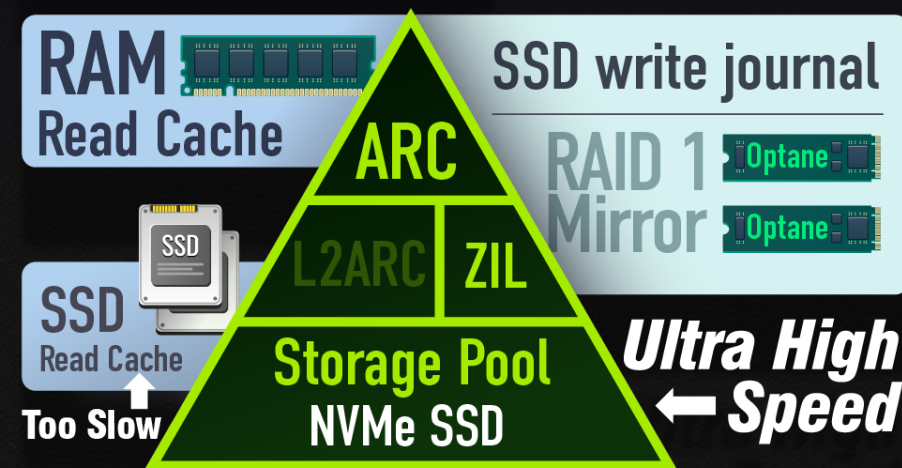
避免原始數據損壞

Dedicated ZIL - SLOG

AFA 不須使用read cache, 用了速度反而會拖慢pool效能. 而資料保護的ZIL仍然需要, 特別推薦小容量而高耐寫的Optane SSD



intel
OPTANE™
SSD



一次提供三階段的備份方式： 給您最齊全的資料備援保護



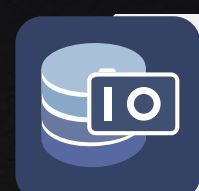
RPO : 每天 / 週期性



HBS 3 :
檔案類型，多版本控制
實現備份321的最佳工具



RPO : 每小時 / 24小時 / 365天



Snapshot & Replica:
區塊層級，多版本控制，ZFS提供最輕負
載量的快照，完全不影響儲存效能



RPO : 即時性 / 隨時隨地



SnapSync:
區塊層級，讓系統始終維持一份在最新狀
態的資料副本



HBS 3.0 輕鬆完成備份 3-2-1 的策略



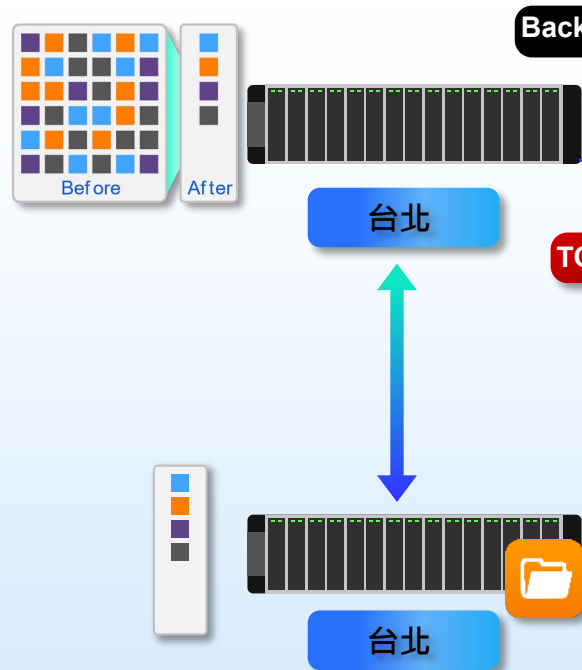
HBS 3 (Hybrid Backup Sync 3) 混合型備份與同步中心



本地 NAS 存取
(經 HBS 3)

遠端 NAS 存取
(經 File Station)

攜帶使用
(QuDedup Extract Tool 還原工具)



File Station支援 QuDedup 還原功能



File Station支援 QuDedup 還原功能

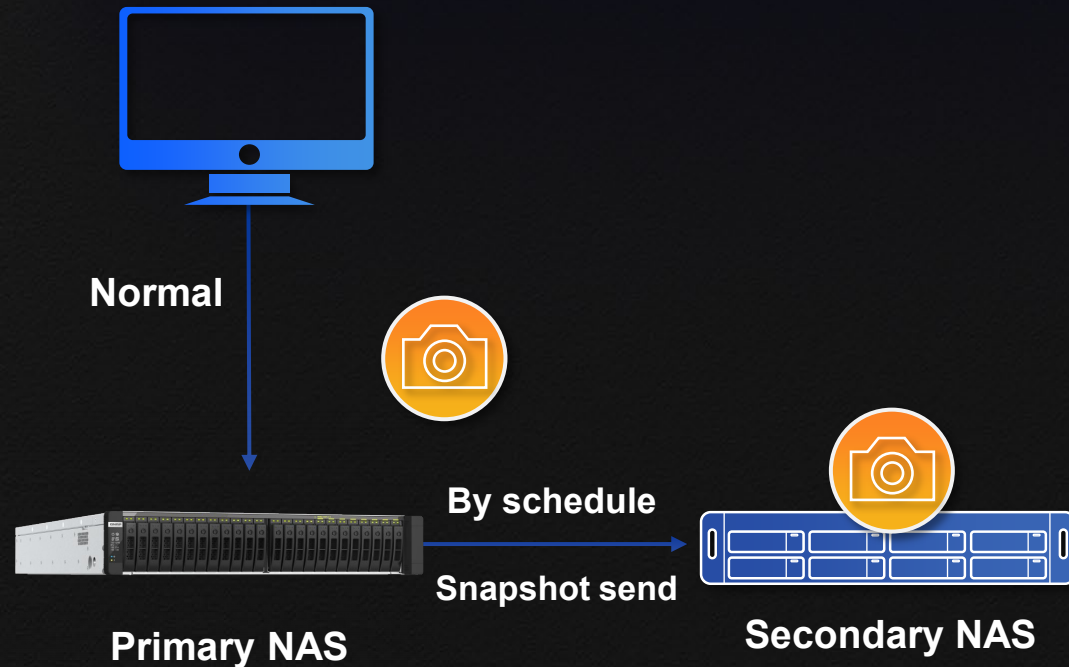
雲端存取



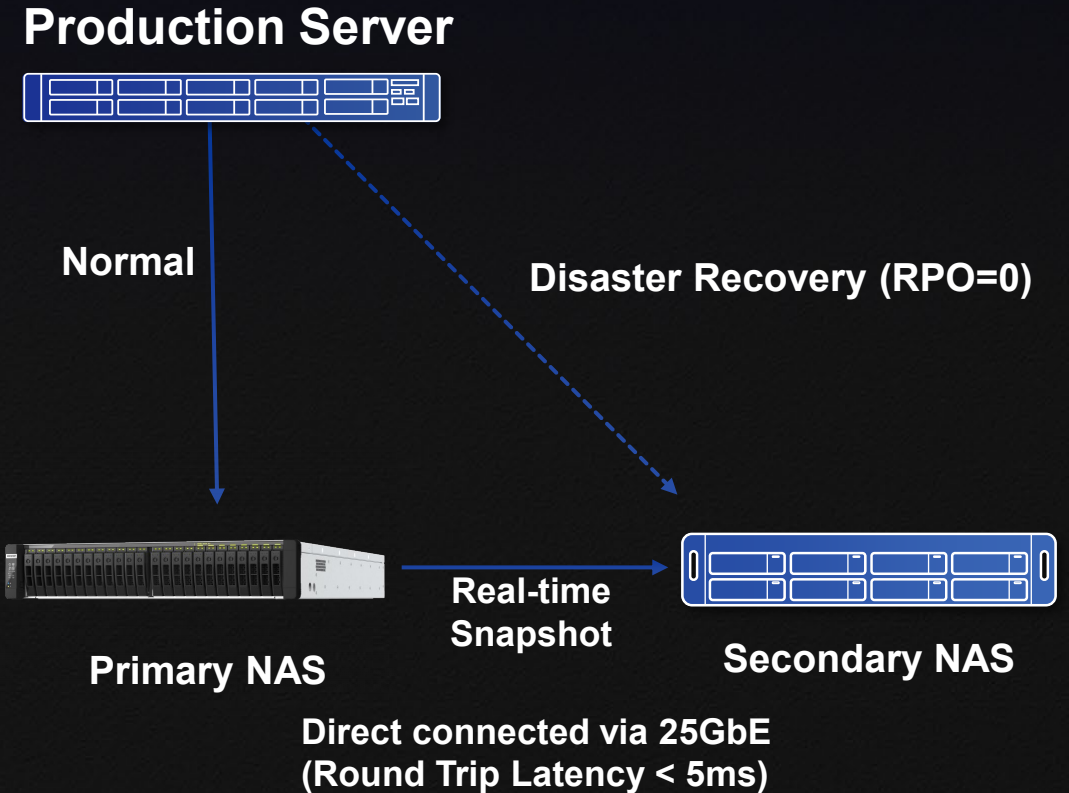
SnapSync 快照同步

最經濟高效的複合式備份，數據保護和災難復原解決方案

Schedule SnapSync: 5min~60min

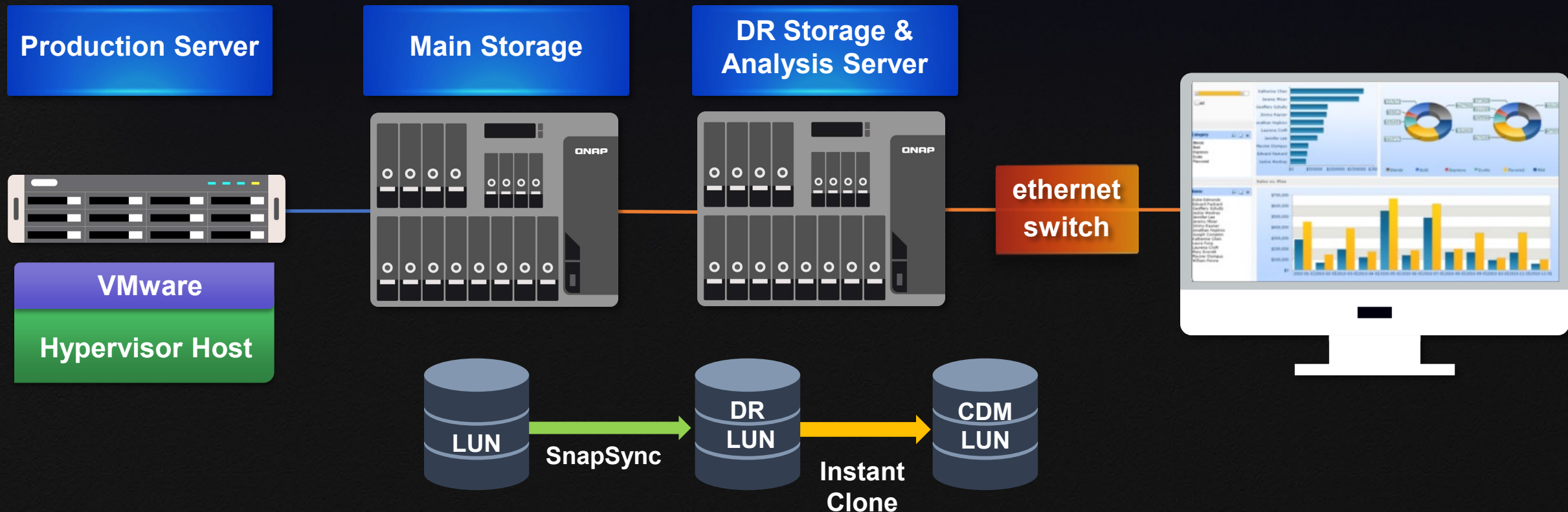


Realtime SnapSync: RPO=0



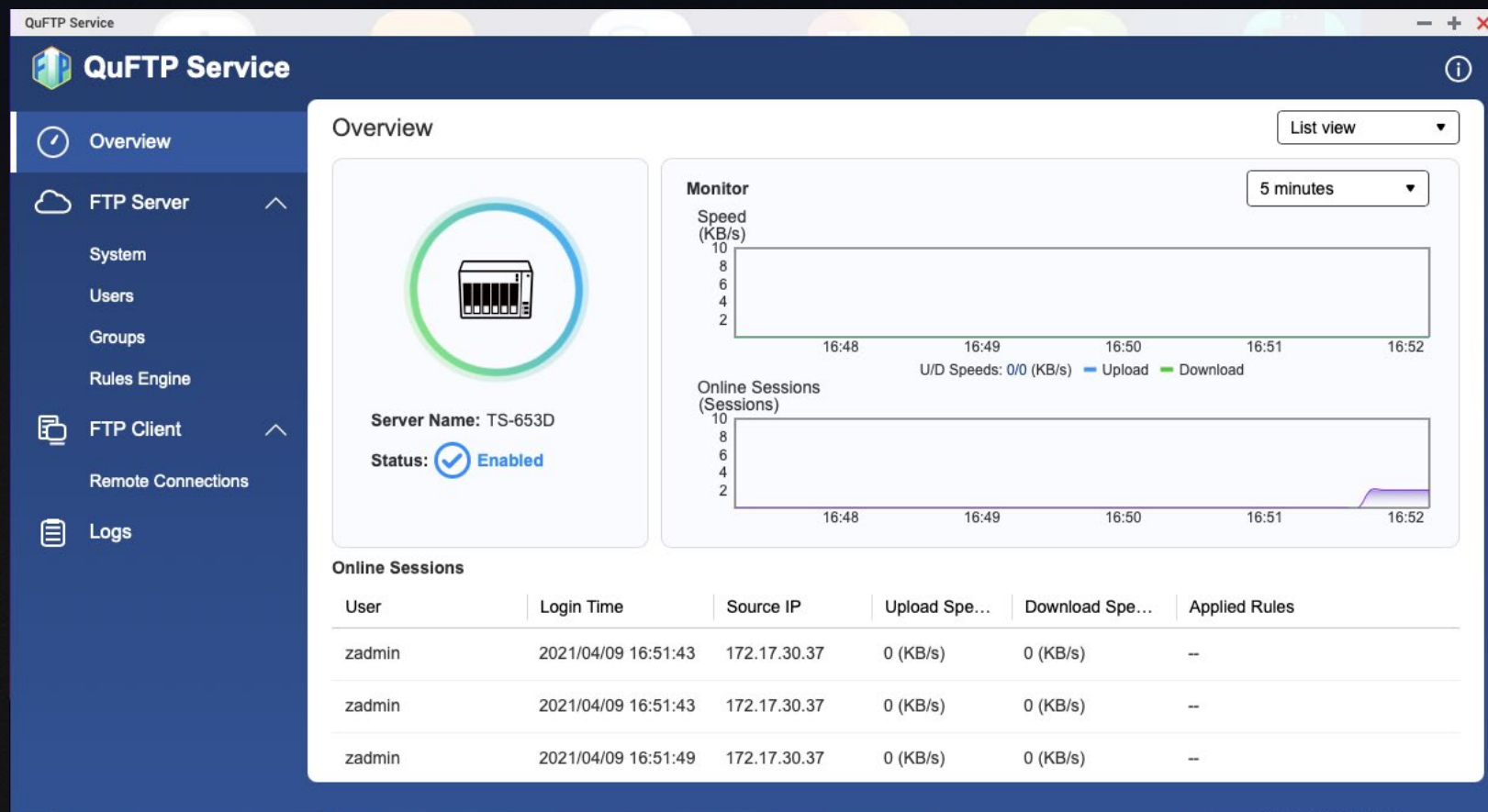
SnapSync + Instant Clone

最經濟高效的複本資料管理CDM (Copy Data Management) 解決方案



QuFTP 遠端檔案 FTP 存取服務

- 可獨立更新
- 支援 FTP 服務器
- 支援 TLS 設定
- 支援 QoS 設定
- 支援規格設定
- 支援 FTP 用戶端



更輕量，更快速的個人用 VPN 服務

- 全新 QVPN 支援 WireGuard VPN, 更加輕量, 容易設定, 支援多種用戶平台, 速度大幅提升, 是個人用戶, 在家工作的必備工具。
- 由Kernel層直接處理VPN加密封包, 傳輸速度更快。
- 僅用金鑰登入. (無一般帳號管理)



QuWAN

方便、快速搭建企業跨點的 SD-WAN 解決方案

QuWAN 是 QNAP 獨家的 SD-WAN 智慧網路優化方案，支援多分點自動組建 IPsec VPN 加密網路及雲端集中管理，可雲端部署 QVPN 終端裝置連線，並可運行於各式 QNAP 硬體設備或是 VMware ESXi 等自有 Hypervisor 平台上，讓中小企業以高成本效益的預算，超前部署靈活可靠的全新 IT 架構，因應企業數位轉型、商業拓展與遠距工作型態。



自動化 VPN 部署



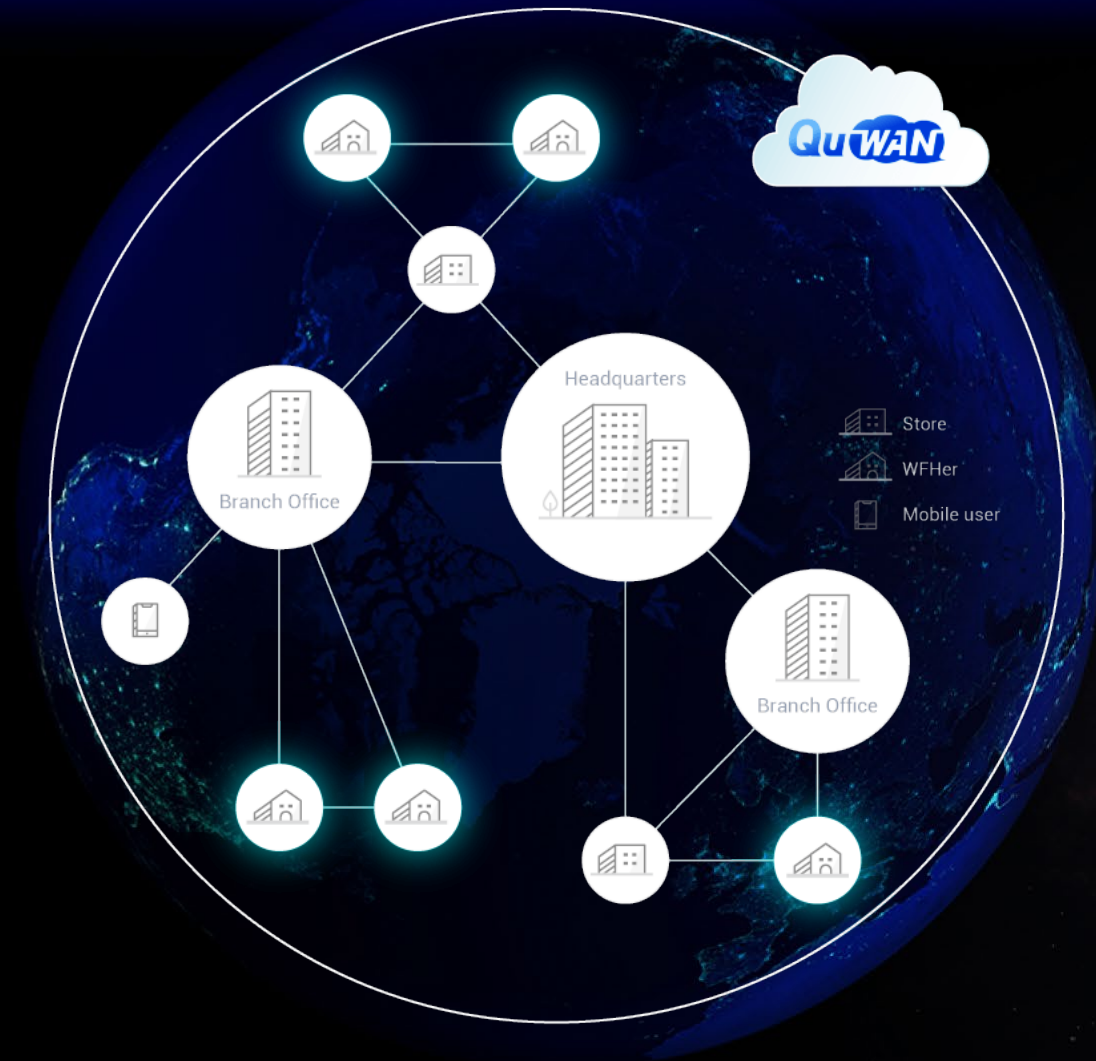
智慧優化頻寬



雲端集中管理



網路資安防護



Hyper Data Protector 虛擬機備份

高速主動式虛擬機備份

- 支援 VMware, Microsoft Hyper-V
- 免費授權讓VM備份無上限
- 高速主動式備份
- 立即還原
- 持續監控

Win10 / Server2016/ Server2019



QuObjects

立即讓 NAS 成為 S3 格式存取載體

物件的位址範例

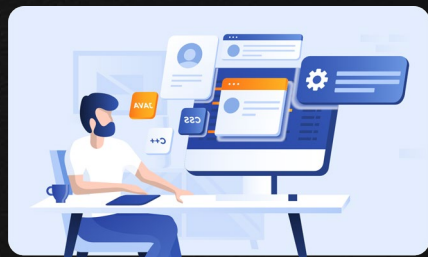
<https://alvin1.s3.ap-east-1.amazonaws.com/test1/292557.jpg>

bucket

雲服務商

資料夾

檔案名稱



S3



QuObjects

貯體 (bucket)

貯體 (bucket)

貯體 (bucket)

貯體 (bucket)

貯體 (bucket)

Object

Object

Object

Object

Object

Object

Object

Object

Object

Key

Data

Metadata

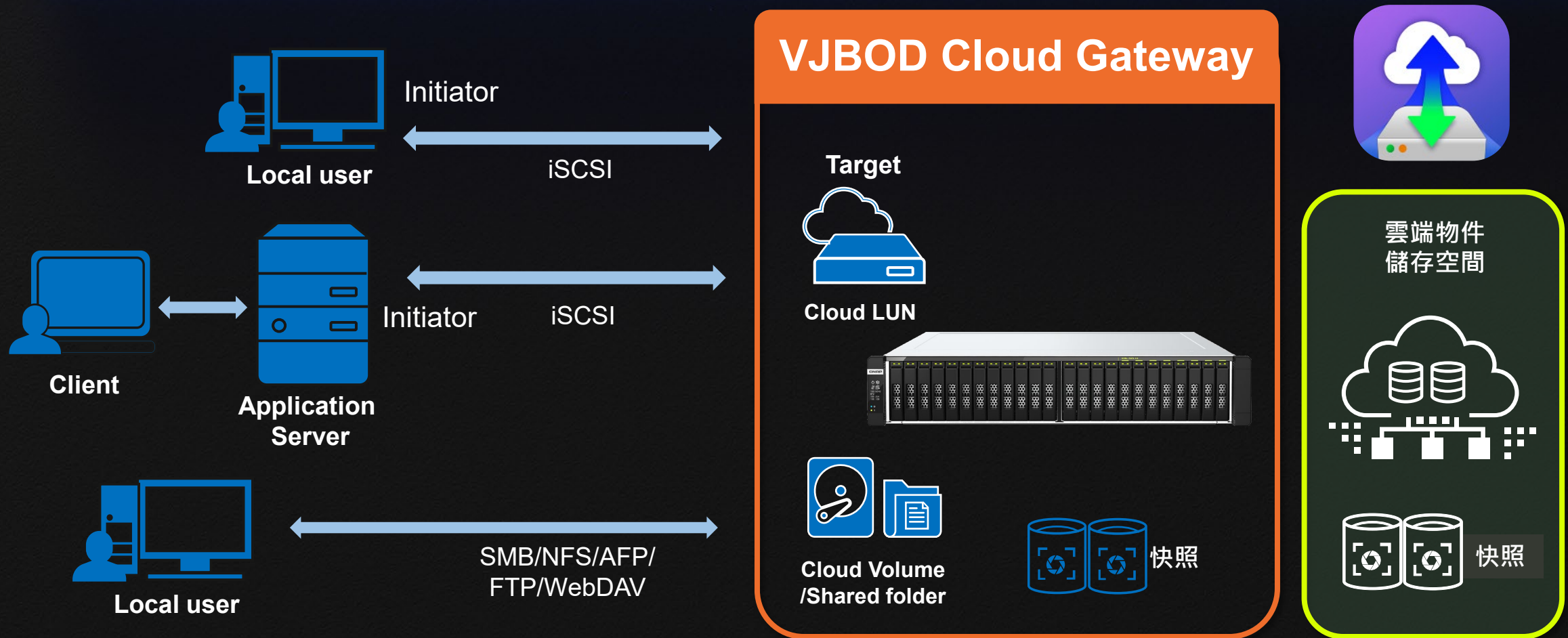


Diagram illustrating the benefits of Network Attached Storage (NAS) for data backup and recovery:

- Cloud Storage (Top):** Represented by a blue cloud icon with a green and blue arrow pointing upwards. It is associated with the text "較慢" (Slower) and "網際網路" (Internet).
- Local Network (Bottom):** Represented by a blue cloud icon with a green and blue arrow pointing downwards. It is associated with the text "較快" (Faster) and "區域網路" (Local Network).
- NAS Device (Middle):** A server icon labeled "NAS 快取空間" (NAS Cache Space).
- File Transfer (Arrows):** Three arrows labeled 1, 2, and 3 show the flow of data from the laptop to the NAS and then to the cloud storage.
- File List (Bottom Left):** A circular inset showing a list of files and folders, including "root", "1", "2", "3", "4", "5", "6", "7", "8", "9", "10", "11", "12", "13", "14", "15", "16", "17", "18", "19", "20", "21", "22", "23", "24", "25", "26", "27", "28", "29", "30", "31", "32", "33", "34", "35", "36", "37", "38", "39", "40", "41", "42", "43", "44", "45", "46", "47", "48", "49", "50", "51", "52", "53", "54", "55", "56", "57", "58", "59", "60", "61", "62", "63", "64", "65", "66", "67", "68", "69", "70", "71", "72", "73", "74", "75", "76", "77", "78", "79", "80", "81", "82", "83", "84", "85", "86", "87", "88", "89", "90", "91", "92", "93", "94", "95", "96", "97", "98", "99", "100", "101", "102", "103", "104", "105", "106", "107", "108", "109", "110", "111", "112", "113", "114", "115", "116", "117", "118", "119", "120", "121", "122", "123", "124", "125", "126", "127", "128", "129", "130", "131", "132", "133", "134", "135", "136", "137", "138", "139", "140", "141", "142", "143", "144", 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LUN 資料上雲與大型資料庫雲端備份利器： VJBOD cloud 區塊型雲網關



Boxafe

Google™ Workspace 與 Microsoft 365 的備份還原方案



- 親手掌握企業的資料
- 把重要資料移出雲端，節省服務成本

Google™ Workspace



Gmail

備份所有 Email 及附檔



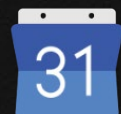
雲端硬碟

備份所有檔案，包含檔案的所有版本，支援備份 My Drive 及 Shared Drive



聯絡人

備份所有聯絡人資訊



日曆

備份所有日曆事件資訊及附檔

Microsoft 365®



信箱

備份所有 Outlook Email 及附檔



人員

備份所有 Outlook 聯絡人資訊



行事曆

備份所有 Outlook 行事曆事件資訊及附檔



SharePoint & OneDrive

備份所有檔案，包含 OneNote

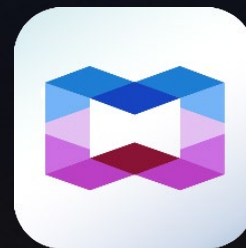
虛擬機工作站與容器工作站創建

VM 應用儲存一體機



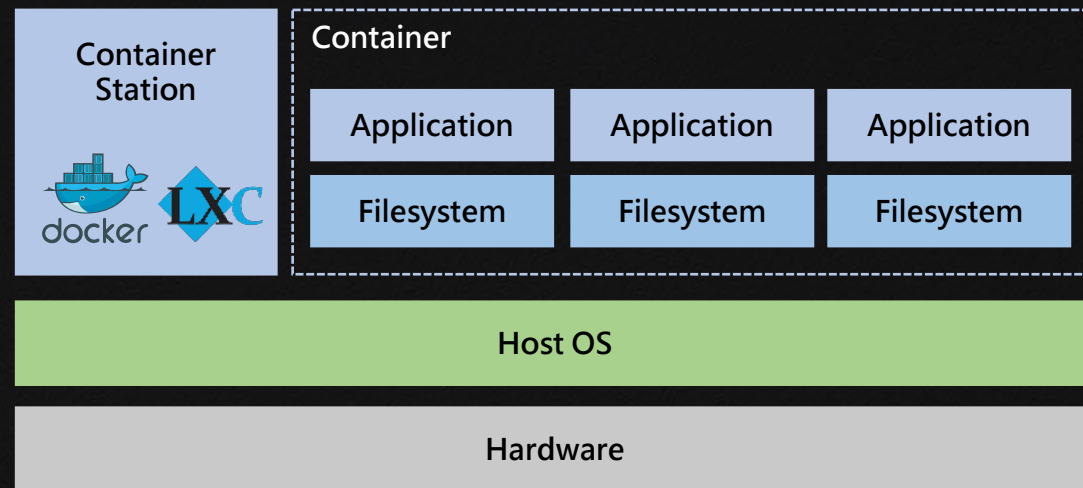
虛擬機工作站

Virtualization Station 允許您在 Turbo NAS 上建立虛擬機器來安裝 Windows、Linux®、UNIX®、Android、QuTScoud 等作業系統。



容器工作站

支援 LXC/LXD 與 Docker® 兩項輕量級虛擬技術。您可在 QNAP NAS 上執行完整的 Linux® 虛擬機，並由 Docker® Hub 線上市集下載來自全球各地數以千計的應用程式。

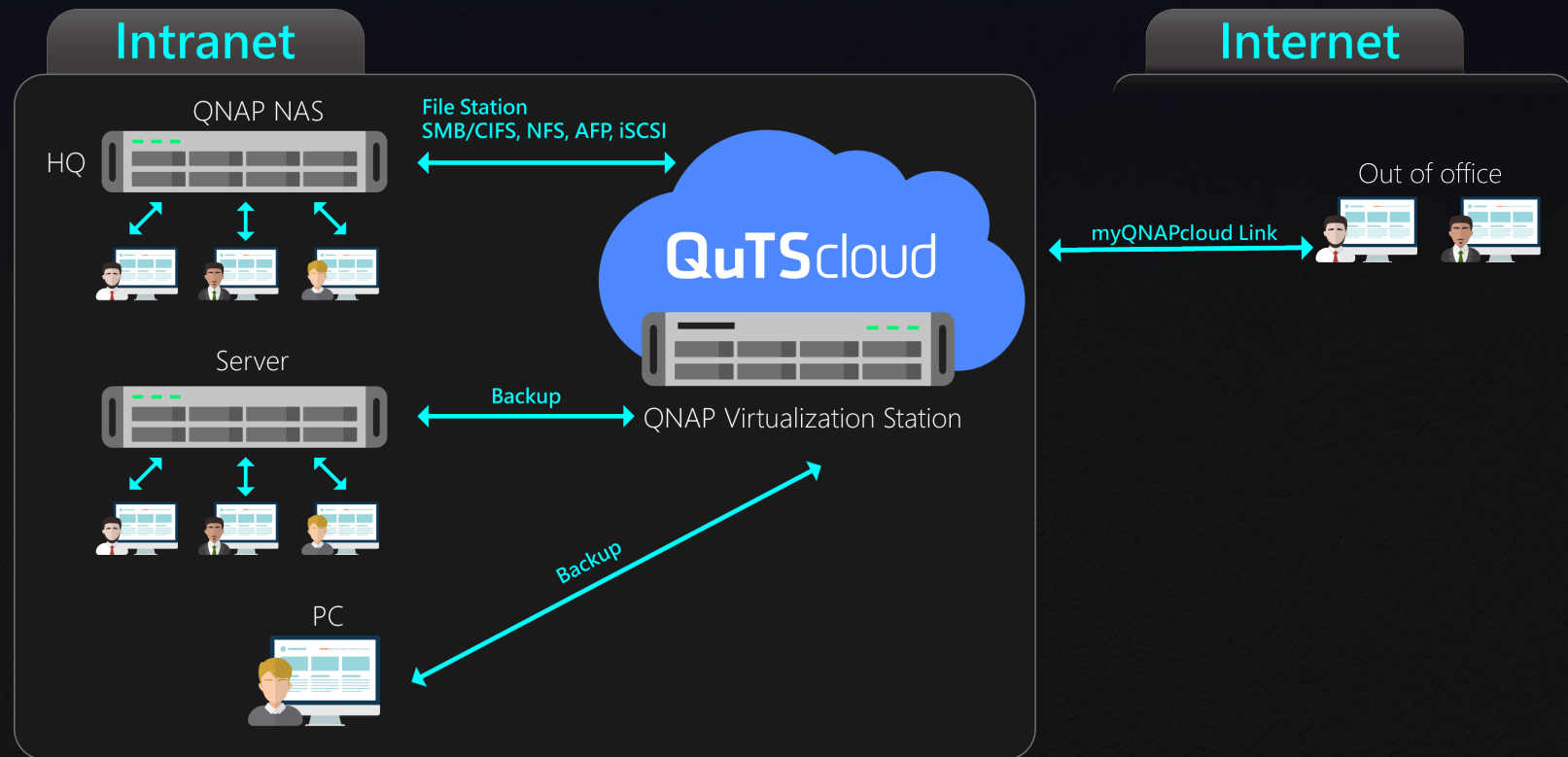


適合企業與工作團隊使用的 Virtual NAS 解決方案



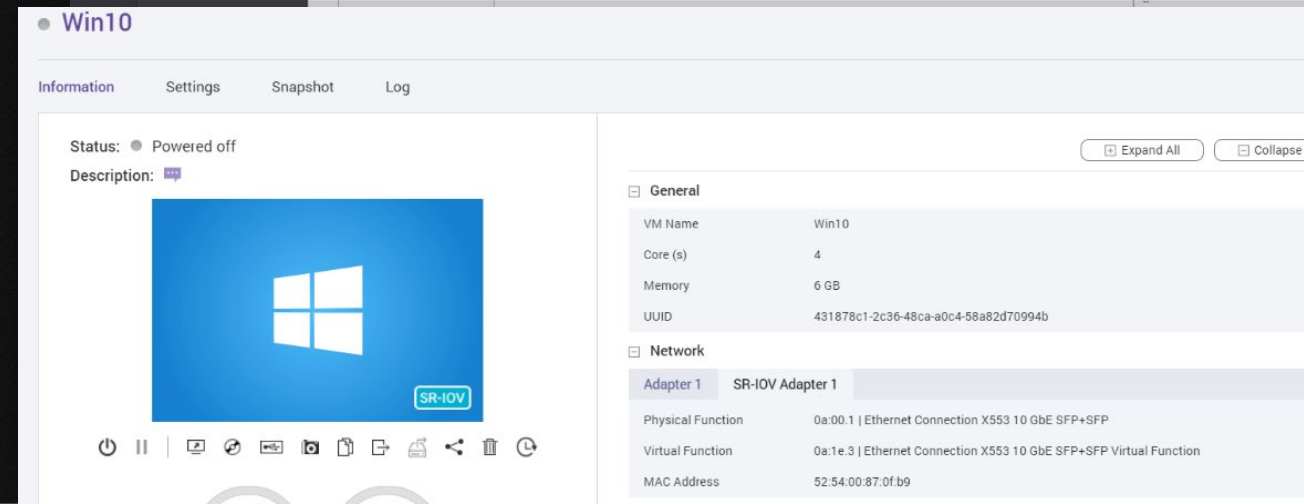
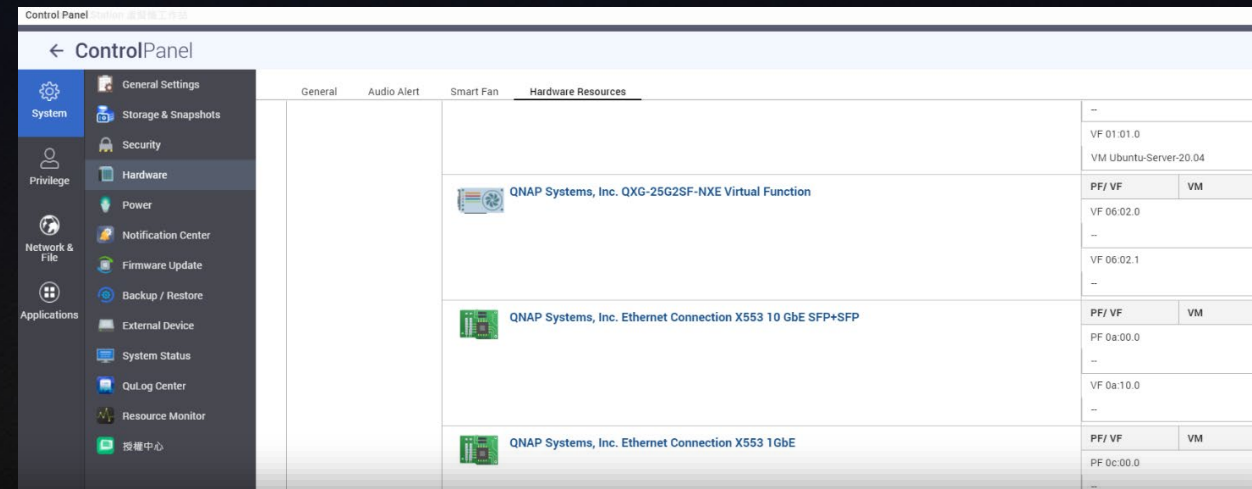
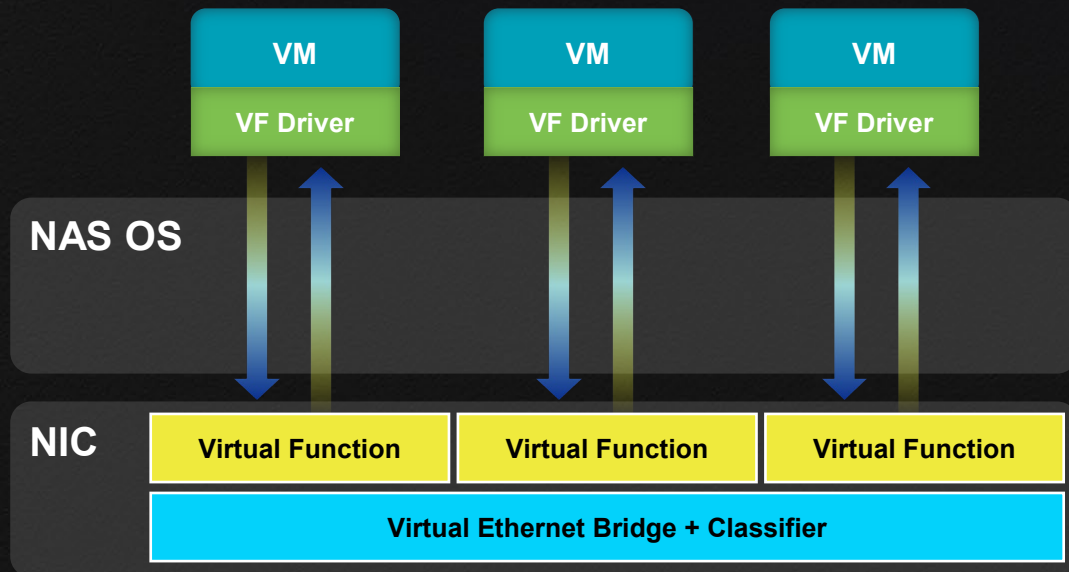
QuTScLOUD 虛擬設備 (Virtual Appliance) 內建與 QNAP 實體 NAS 相同的 QTS 智能作業系統，可輕鬆部署於 Virtualization Station。

企業組織可有效利用既有的虛擬環境架構，享有更高的配置及成本彈性，同時也節省了額外的硬體放置空間和維護心力，更獲得 QuTScLOUD 提供的豐富應用和資料管理的多重好處。



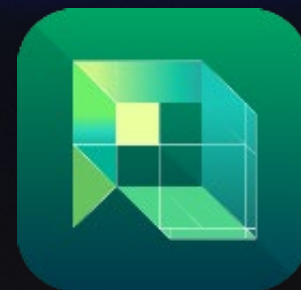
SR-IOV 讓虛擬機直用網卡硬體，提升網路效率 20%以上，低延遲與釋放 CPU 使用率

單一根 I/O 虛擬化 (Single-Root
Input/Output Virtualization, SR-IOV)
可提升虛擬機的網路效能

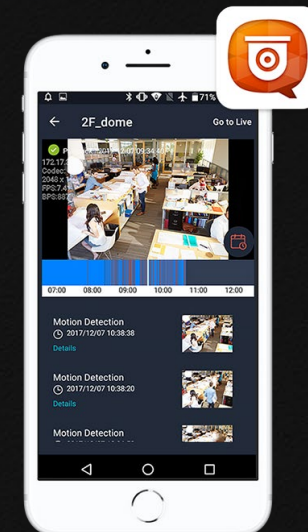
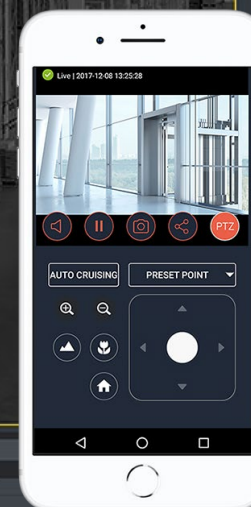
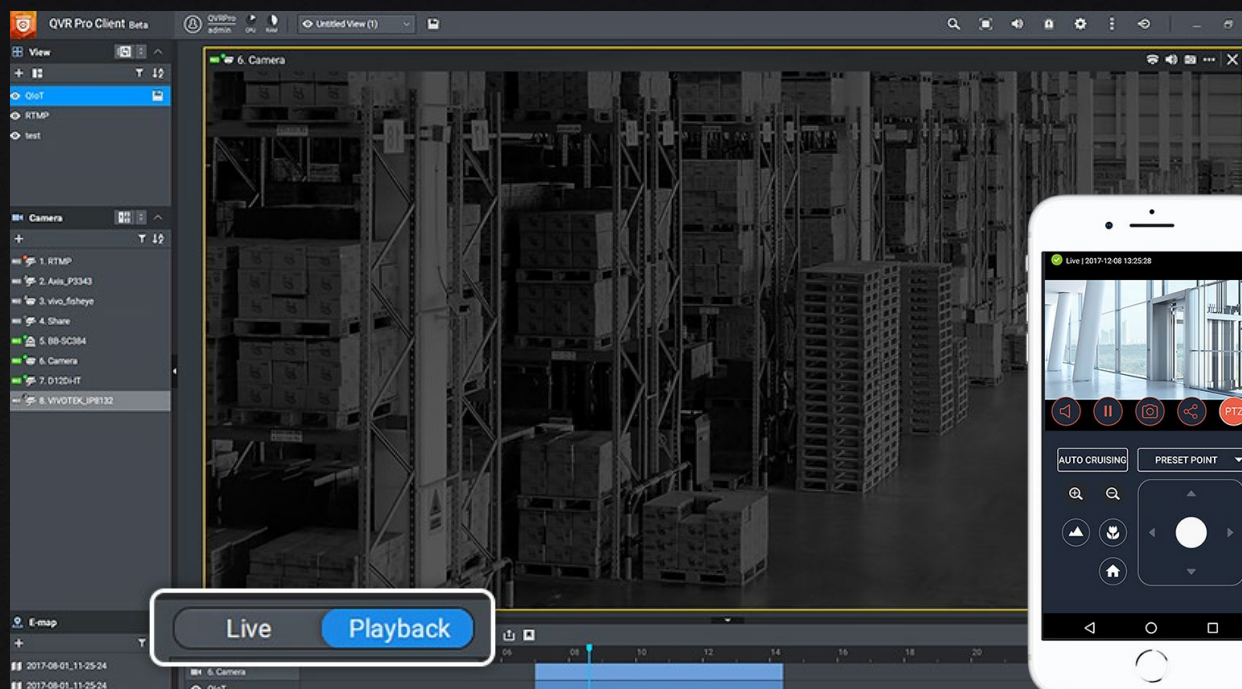
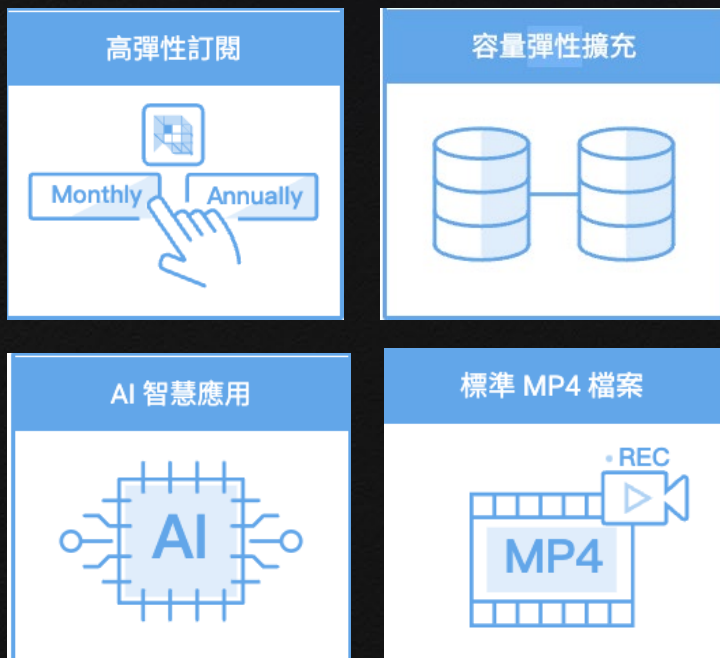


搭配網路攝影機與 QVR Elite 軟體 打造智慧安全監控系統

QNAP QVR Elite 智慧安全監控系統，訂閱制架設低門檻，每頻道最低只要 US \$1.99 訂閱月費，容量隨需擴充，並可整合多樣 QNAP AI 影像分析應用，為您打造最完善的 NAS 智慧安全監控、人臉辨識、門禁管理等應用。



• Windows/macOS/iOS/Android QVR Pro client



支援 Coral Edge TPU 助力 AI 運算加速

- 通過 Google 正式認證，支援 Coral M.2 與 USB TPU裝置
- 可同時支援多組TPU裝置

<https://coral.ai/products/>



Google

Control Panel

← ControlPanel

System Privilege Network & File Services Applications

- General Settings
- Storage & Snapshots
- Security
- Hardware
- Power
- Notification Center
- Firmware Update
- Backup / Restore
- External Device
- System Status
- QuLog Center
- Resource Monitor
- 授權中心

General Audio Alert Smart Fan Hardware Resources

You can install expansion cards to expand storage or enhance computing performance. For more information, check the [Compatibility List](#) page on the QNAP website.

Hardware Resources

類型	Hardware Devices	Resource Use ⓘ
TPU ⚙️	Global Unichip Corp. Coral Edge TPU.	Multimedia Console
	Global Unichip Corp. Coral Edge TPU.	Multimedia Console



Works with
Coral

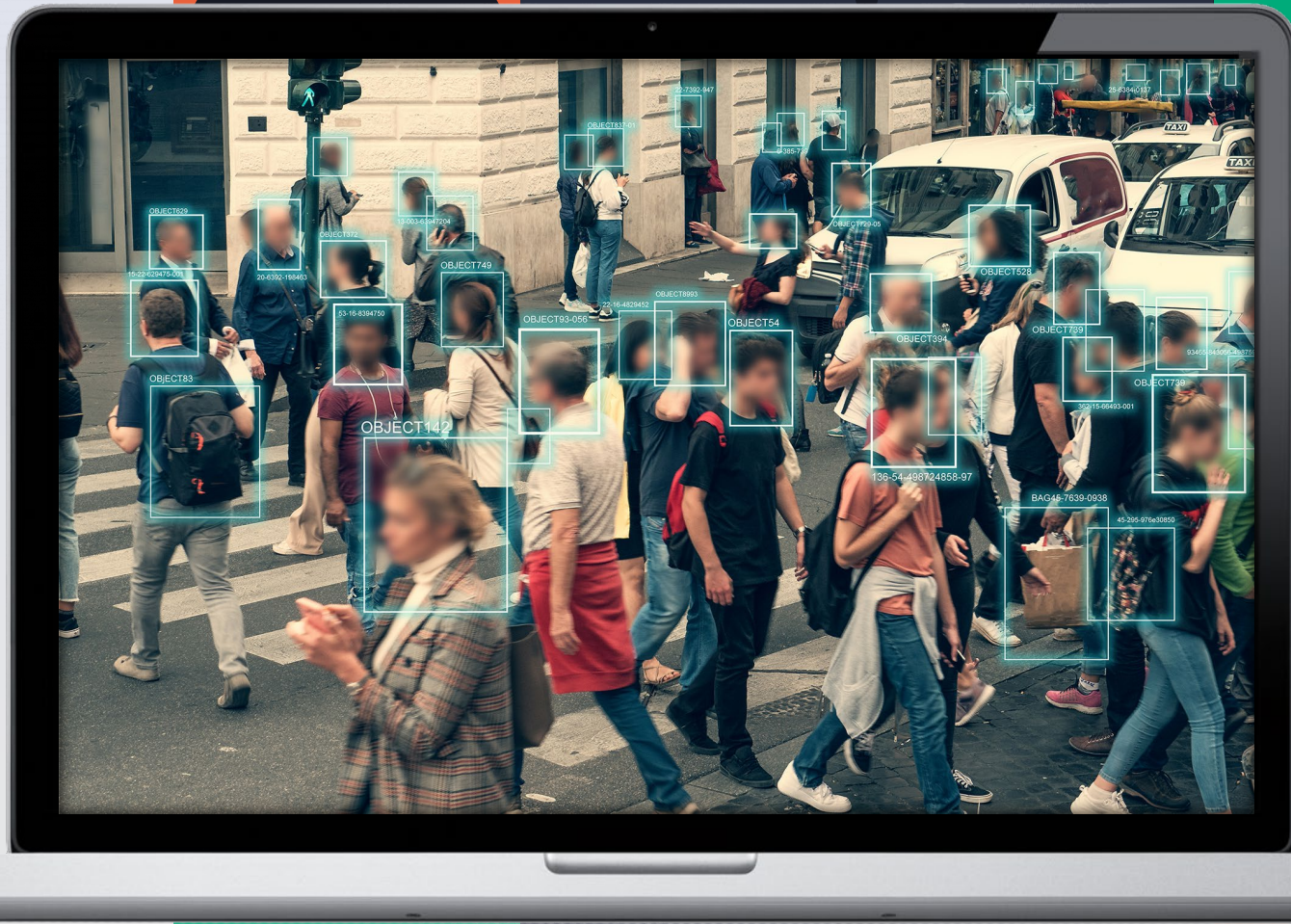


QVR Face Insight

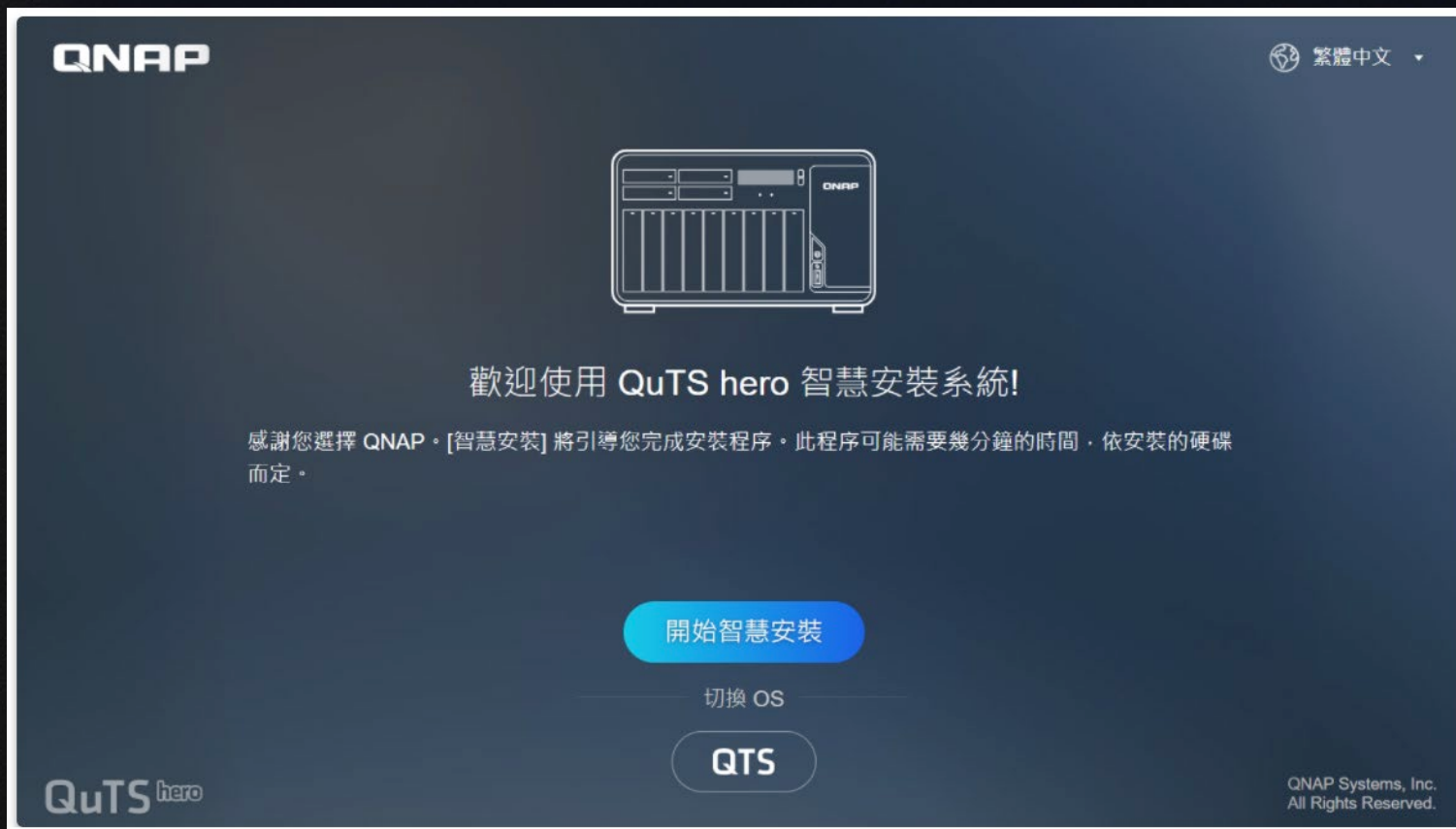
QNAP 智慧人臉辨識分析解決方案

智慧影像分析，一台 NAS 搞定

- 建立人臉資料庫，智慧把關更安心
- 動態人臉辨識與分析
- 口罩偵測辨識
- 支援 Edge TPU，加速人臉辨識分析
- 整合 QVR Pro 監控應用，發揮更多用途：串流影像、人臉搜索、建立 A I 事件



可彈性轉換 QuTS hero / QTS 作業系統， 獲得強悍效能



TDS-h2489FU 出貨搭載 QuTS hero 作業系統，提供獨特的資料完整度保護特性。您亦可依需求更改為 QTS 作業系統，獲得更強悍的資料傳輸效能及更精省的記憶體使用效率，並享有 Qtier 自動分層儲存功能。轉換為 QTS 作業系統的 TDS-h2489FU 可與其他同樣運行 QTS 的 QNAP NAS 進行系統遷移。

注意：

- 由於 QTS 與 QuTS hero 採用不同檔案系統，請用戶務必先空機 (不裝入硬碟) 切換作業系統後，再執行系統遷移。

5 年標準保固，涵蓋硬體維修與支援服務



TDS-h2489FU 享有高達 5 年的免費產品保固。
QNAP 提供如此尊榮的保固服務，協助您的企業組織
持續運作，提供不中斷的服務給予您的客戶。





TDS-h2489FU

雙處理器 (共 16 與 32 核心)、24-bay U.2
NVMe PCIe Gen4 全快閃陣列 25GbE NAS

intel®
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SILVER

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