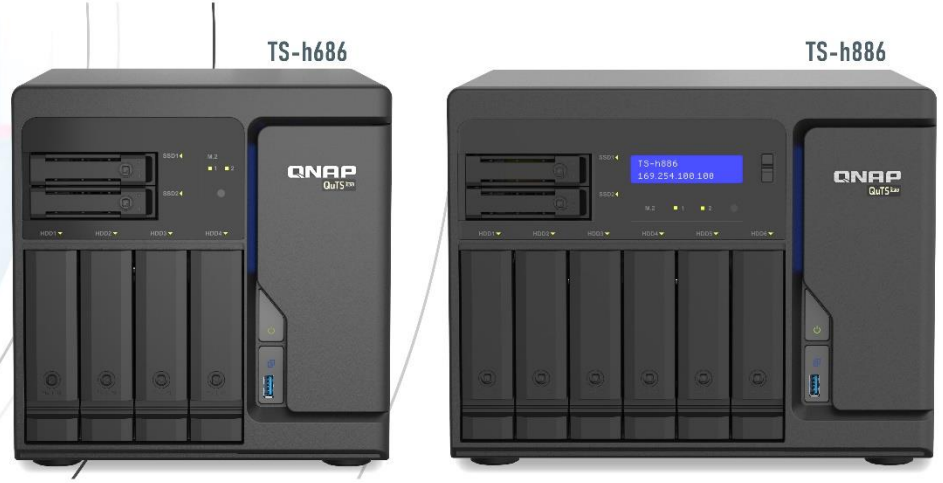
QNAP

TS-h686 / TS-h886

2.5GbE

ZFS

intel XEON inside



The first QuTS hero desktop NAS with an Intel® Xeon® D CPU and 2.5GbE ports for SMB

Why Choose a Desktop NAS over a Rackmount One

No server room in the company

Internal use in a department

NAS has outdoor needs

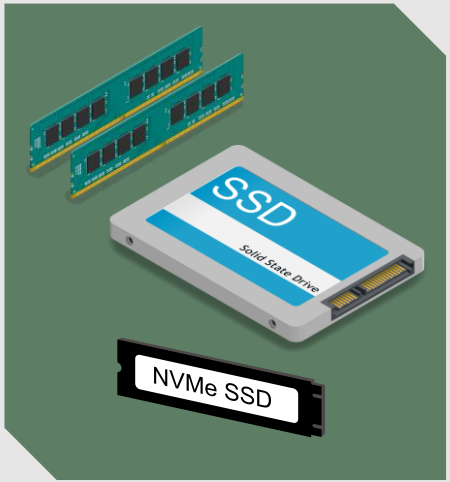
Smart Investment: Expand when Necessary

- When purchasing a business entry level NAS, you should not only consider current requirements, but also reserve the expandability to future-proof your investment

Storage Expansion

Network Expansion

Performance Expansion



Enterprise OS

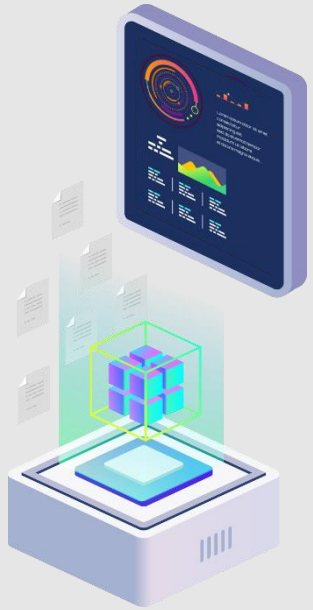
QuTS hero with ZFS

Why we choose ZFS file system for our enterprise NAS

The 3rd QuTS hero dedicated machine launched by QNAP

Because we know that enterprises all value these ...

- Enterprises implement a lot of All Flash solutions, and SSD wear out has become the key to IT cost structure
- Digital transformation relies on massive data analysis and requires PB-level storage space
- Instant disaster recovery capability & complete data protection are the competitiveness indexes of an enterprise
- Corporate data cannot tolerate unintentional error; it is essential to ensure data integrity.



Powerful data reduction: Extend the SSD endurance

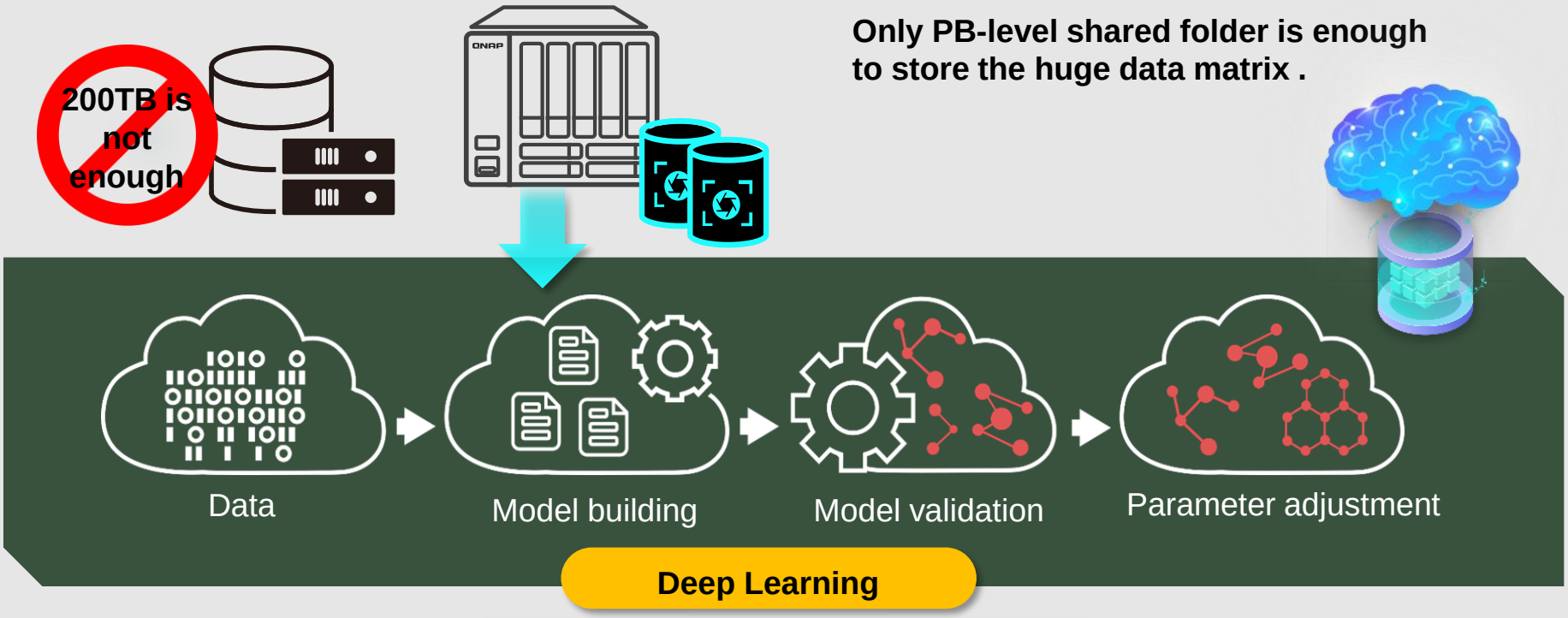
only available when inline dedup/compress enabled

ZFS file system with inline deduplication & inline compression features.

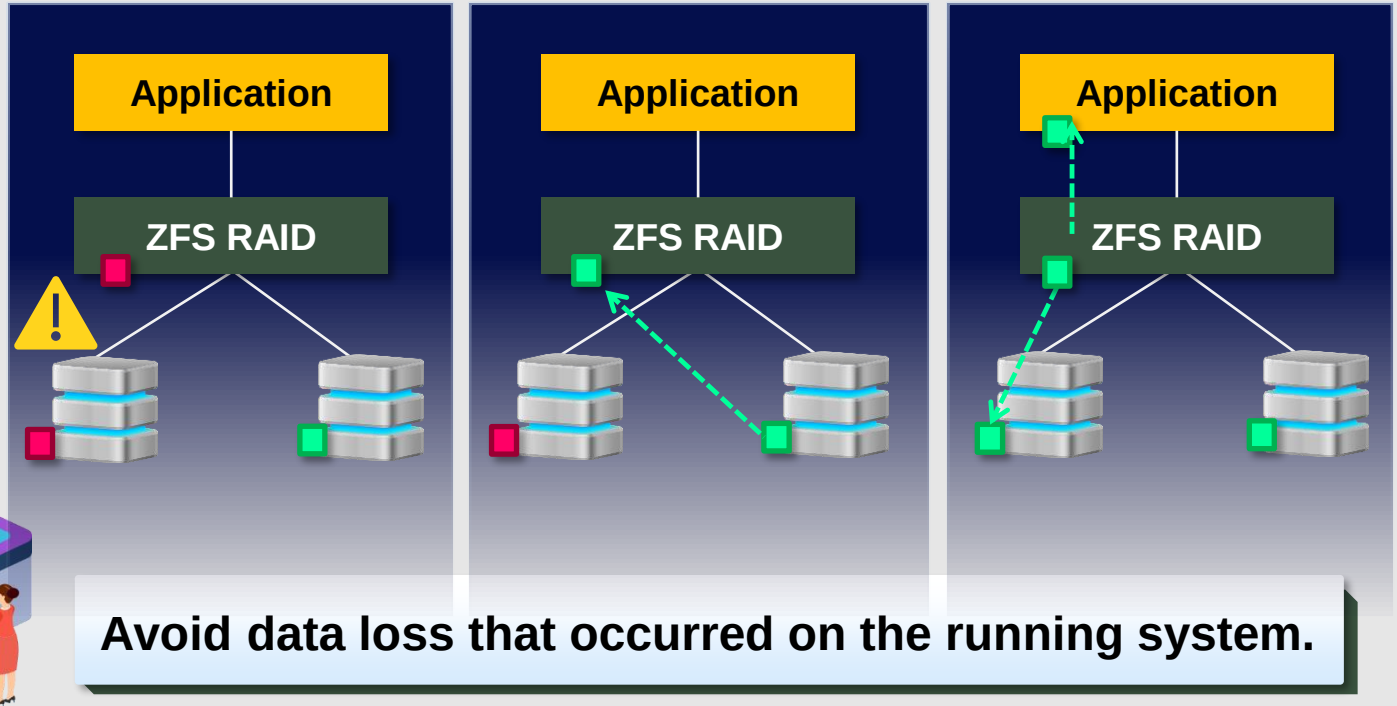
The ZFS file system can be the best choice to pair with the all-flash and SSD storage because it reduces the data size and pattern that need to be written to the SSD directly.

Amazing massive storage

The best data carrier of big data analysis/edge computing/AI inference



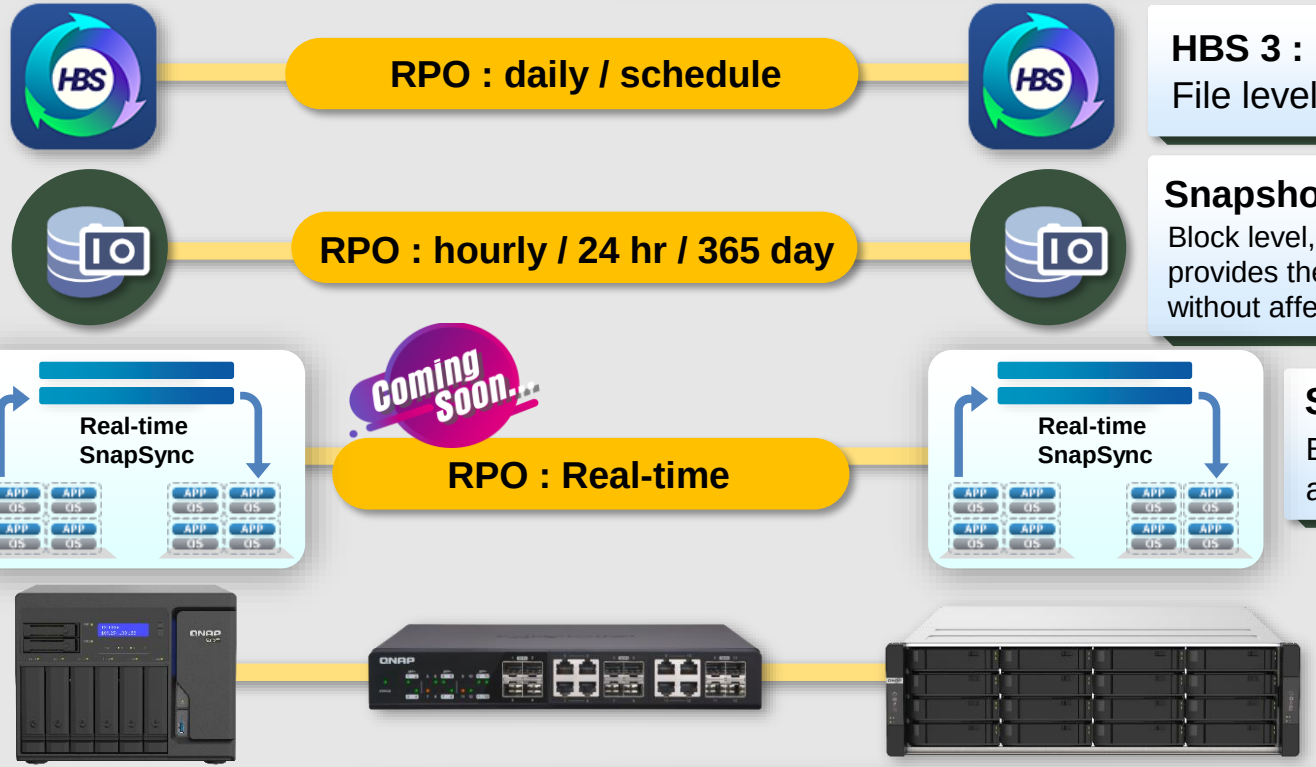
Silent data corruption & self-healing



Avoid data loss that occurred on the running system.

Three-layer backup solution :

Provide you the most complete data backup protection



HBS 3 :
File level, multi-version management

Snapshot & Replica:
Block level, multi-version management; ZFS provides the most lightweight snapshot without affecting storage performance at all.

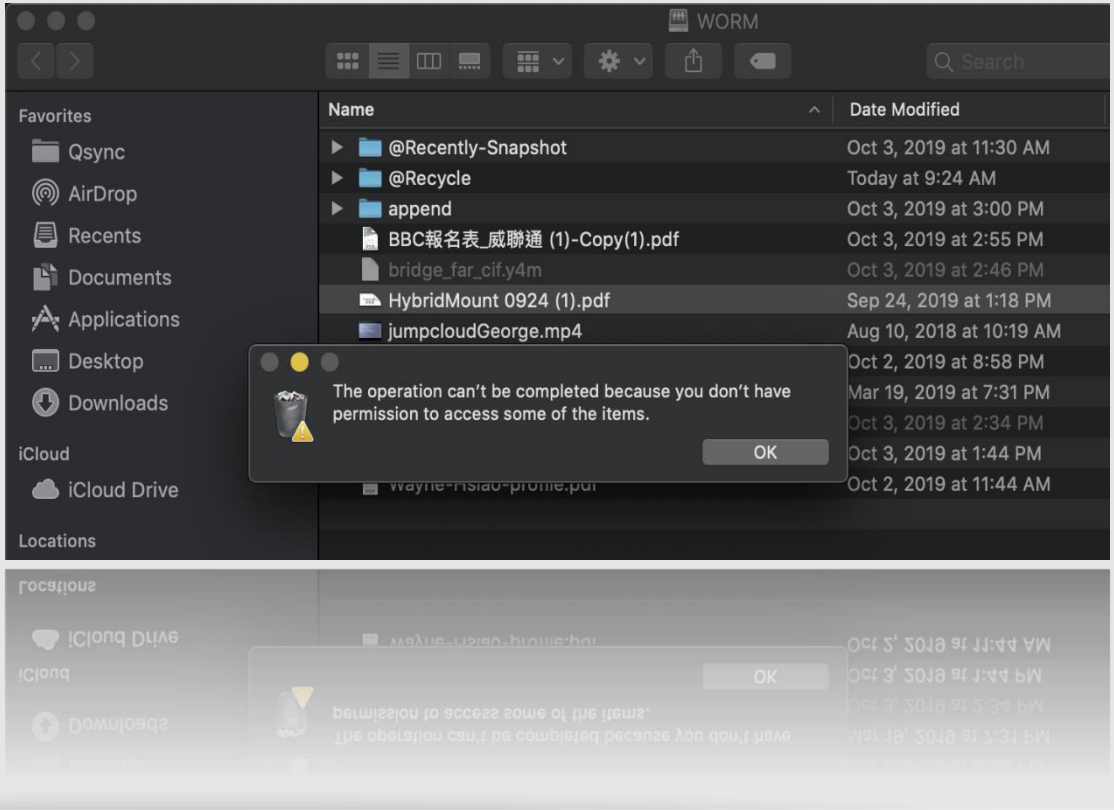
SnapSync:
Block level, Mirror the data copy and always kept up to date.

WORM (Write Once Read Many times)

WORM is used to avoid modification of saved data. Once this feature is enabled, data in shared folders can only be read and cannot be deleted or modified to ensure data integrity.

Enterprise Mode: Remove the shared folder through QTS hero UI or SSH commands (QCLI).

Compliance Mode: Have to take the Storage Pool offline and remove the Pool if want to destroy data.



TS-h686/TS-h886 – Affordable Xeon D NAS

4 x 2.5GbE!

2.5GbE x 4

TS-h686-D1602-8G

- Intel Xeon D-1602 2C4T processor
- 8GB DDR4 ECC RAM (2x 4GB)
- 2 x NVMe M.2 SSD port (Gen3 x4)
- 4 x 2.5GbE LAN port
- 2 x PCIe Gen3 x8 slot
- Built-in QuTS hero OS

4 x 2.5GbE!

2.5GbE x 4

TS-h886-D1622-16G

- Intel Xeon D-1622 4C8T processor
- 16GB DDR4 ECC RAM (2x 8GB)
- 2 x NVMe M.2 SSD port (Gen3 x4)
- 4 x 2.5GbE LAN port
- 2 x PCIe Gen3 x8 slot
- Built-in QuTS hero OS

Intel Xeon D Enterprise Processor

Intel® Xeon® D-1622
4-core / 8-thread processor
2.6 GHz, max. boost to 3.2 GHz

Intel® Xeon® D-1602
2-core / 4-thread processor
2.5 GHz , max. boost to 3.2 GHz

Support ECC Memory (Error Correcting Code)

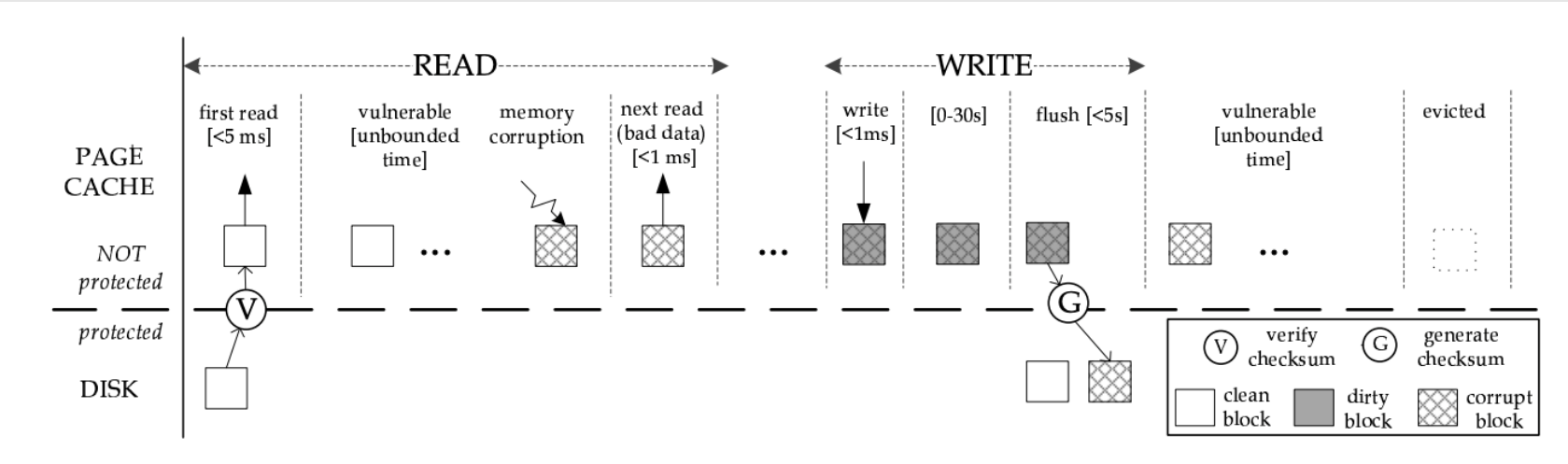
Running reliably without data corruption

ECC

- Intel Xeon processors support ECC which automatically detects and repairs single-bit error on-the-fly.
- Supports up to **128GB**

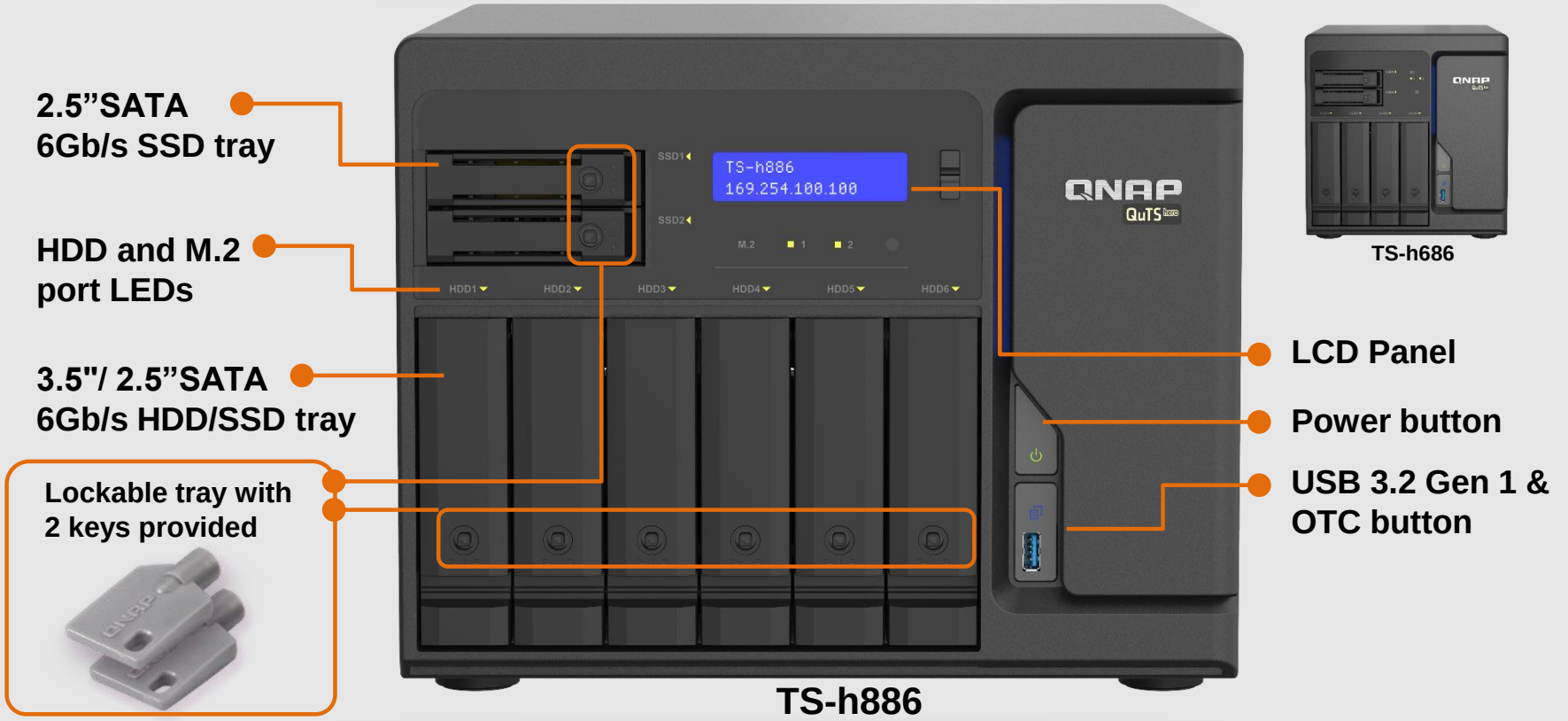
ECC Memory is Important for ZFS

- **ZFS "Trusts" the contents of memory**
  - Data checksum is done after reading from memory.
  - Corrupt in-memory-data will cause ZFS to use the wrong data to checksum and store in the hard drive

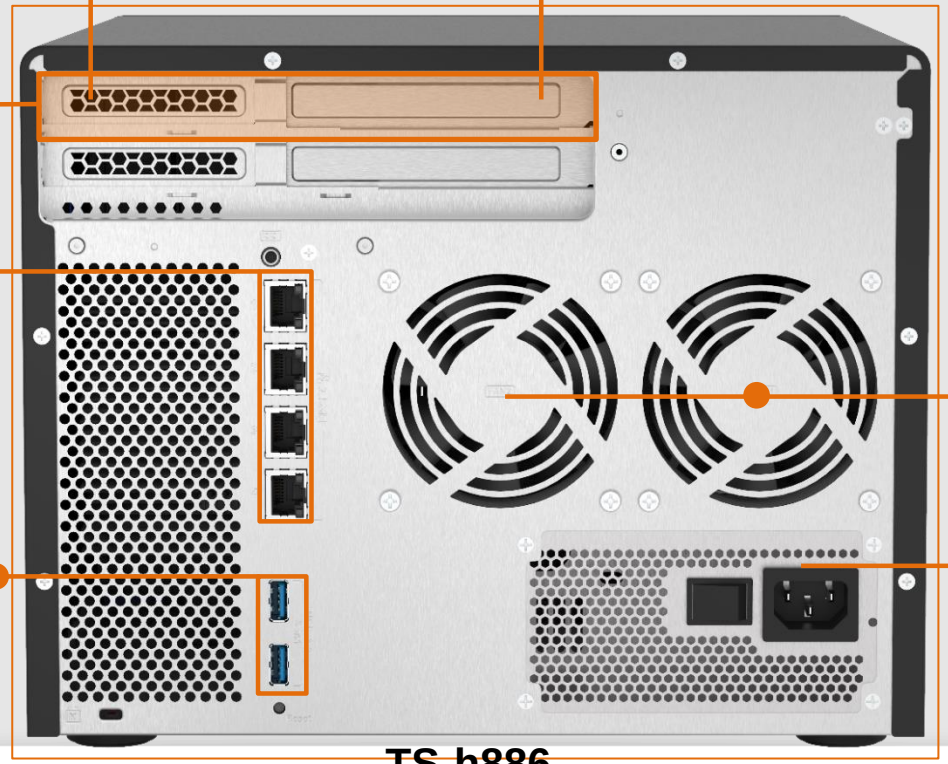


Data source: https://research.cs.wisc.edu/wind/Publications/zfs-corruption-fast10.pdf

TS-h686/ TS-h886 Front View



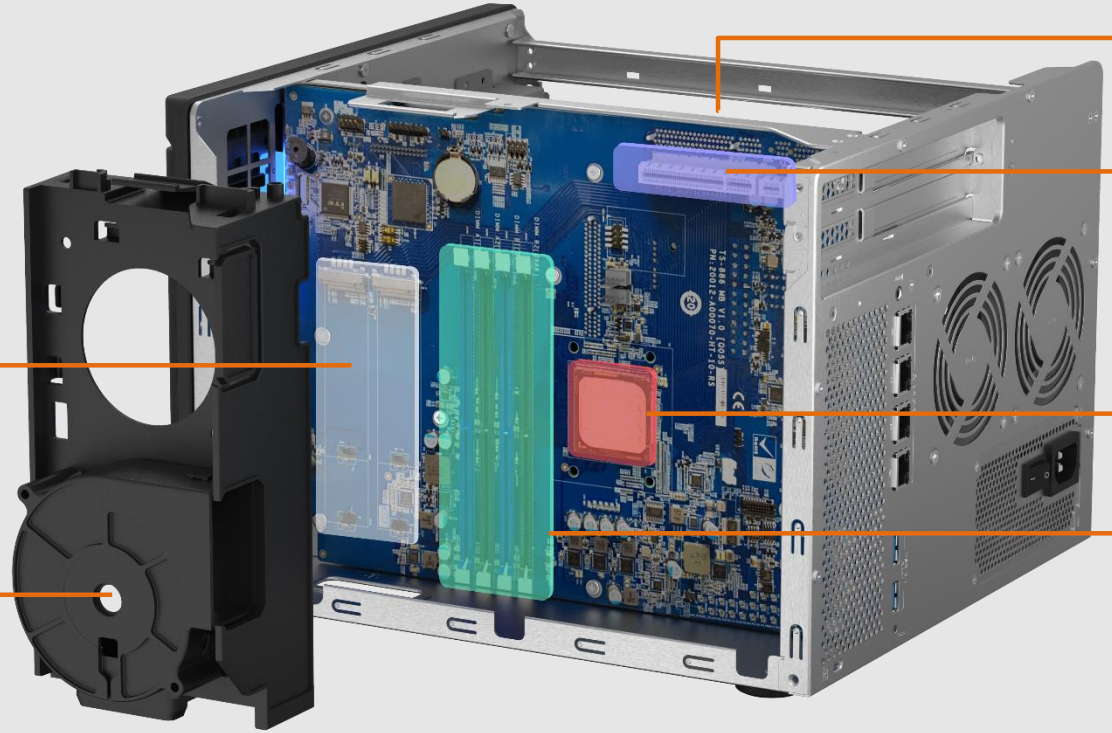
Rear View



TS-h886

TS-h686

Internal Design



1 x PCIe Gen3 x8 slot (HDD side)

1 x PCIe Gen3 x8 slot (CPU side)

2 x NVMe Gen3 x4 M.2 port (2280/22110)

Intel Xeon D processor

1 x 6cm CPU cooling fan

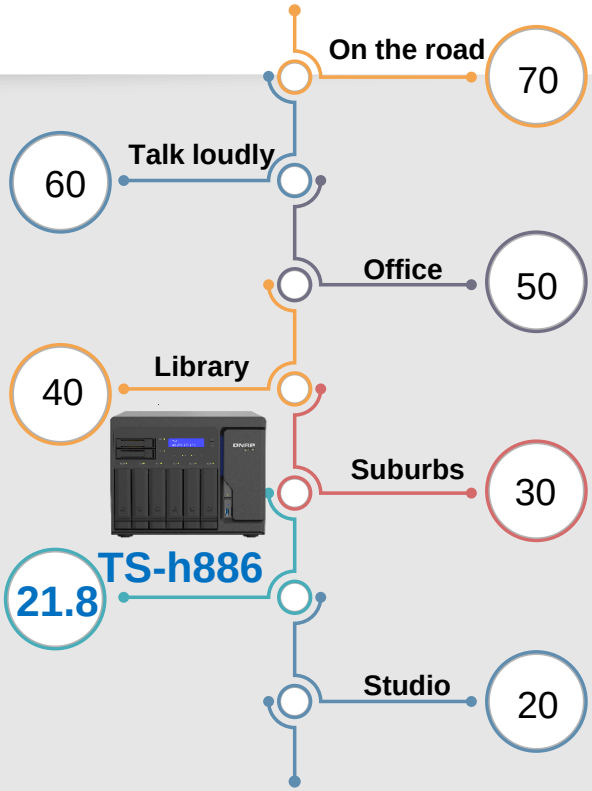
4 x DDR4 long-DIMM slot

Multi-zone Heat Dissipation for Low-noise Operation

The multi-zone heat dissipation utilized in the TS-hx86 enables the dynamic adjustment of the system fan and CPU fan speeds in different zones of the system. It works smoothly and quietly on your desk.

CPU Zone

HDD Zone



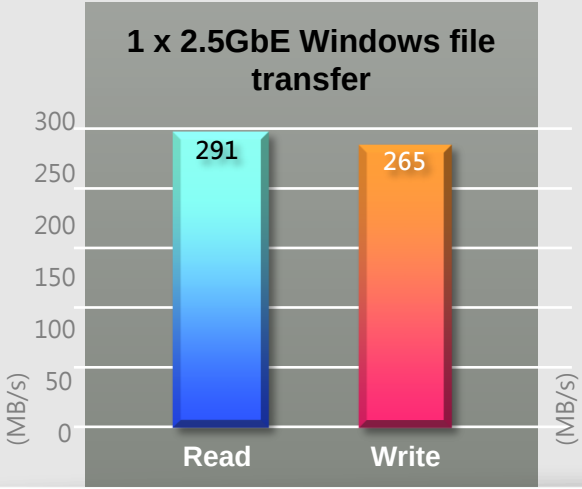
Sound pressure test：sound pressure is measure at the front bystander position with low fan speed.

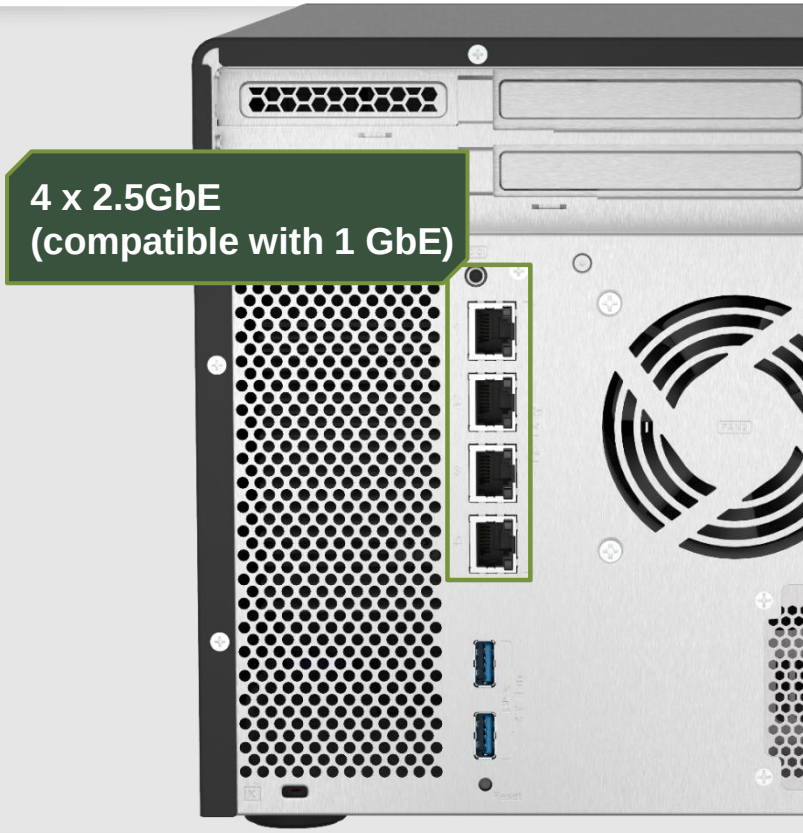
Built-in Four 2.5 GbE LAN Ports

New motherboards & Wi-Fi routers are equipped with 2.5*GbE.*

2.5GbE Benefits:

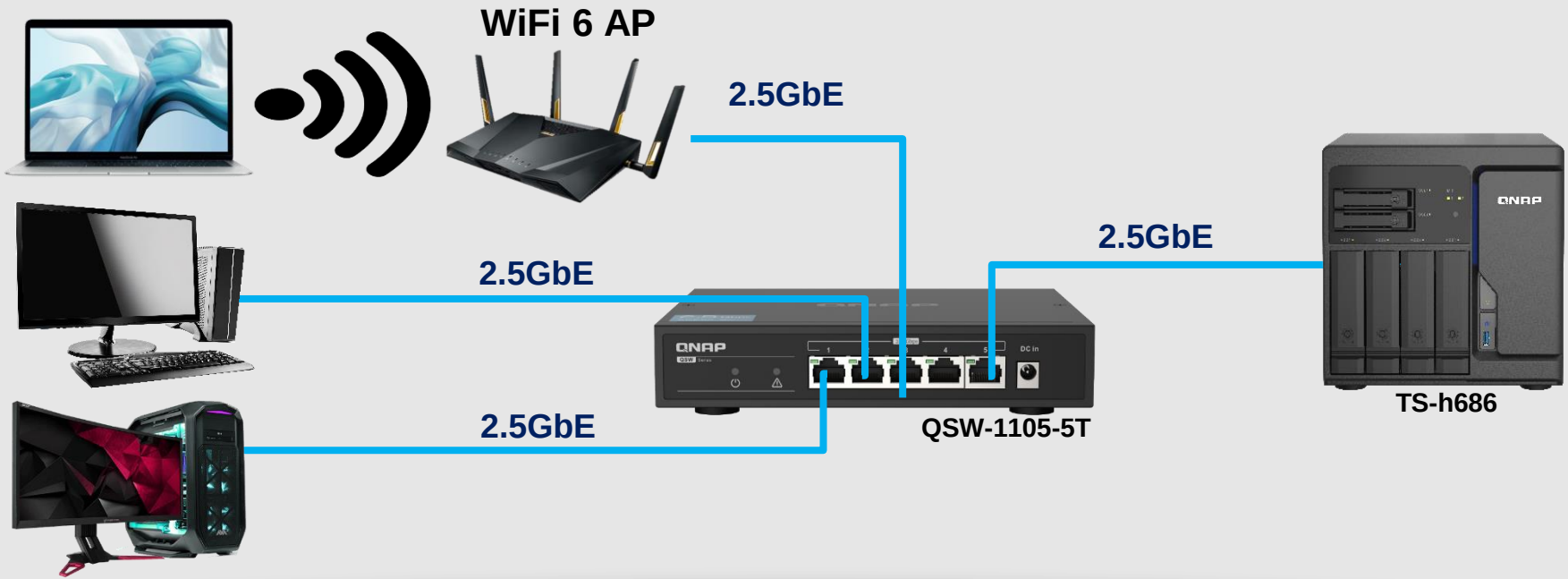
- Up to 2.5x performance
- Use the existing wiring infrastructure to support 2.5GbE





QNAP 2.5GbE 5-Port Network Switch

- Set up a multi-user collaboration workflow
- Can use current RJ45 Cat5e cable, saving money for replacing cable



Upgrade Network Bandwidth with 5GbE Adapter

- **Versatile options**
  - Support single-port, dual-port, and qual-port adapters

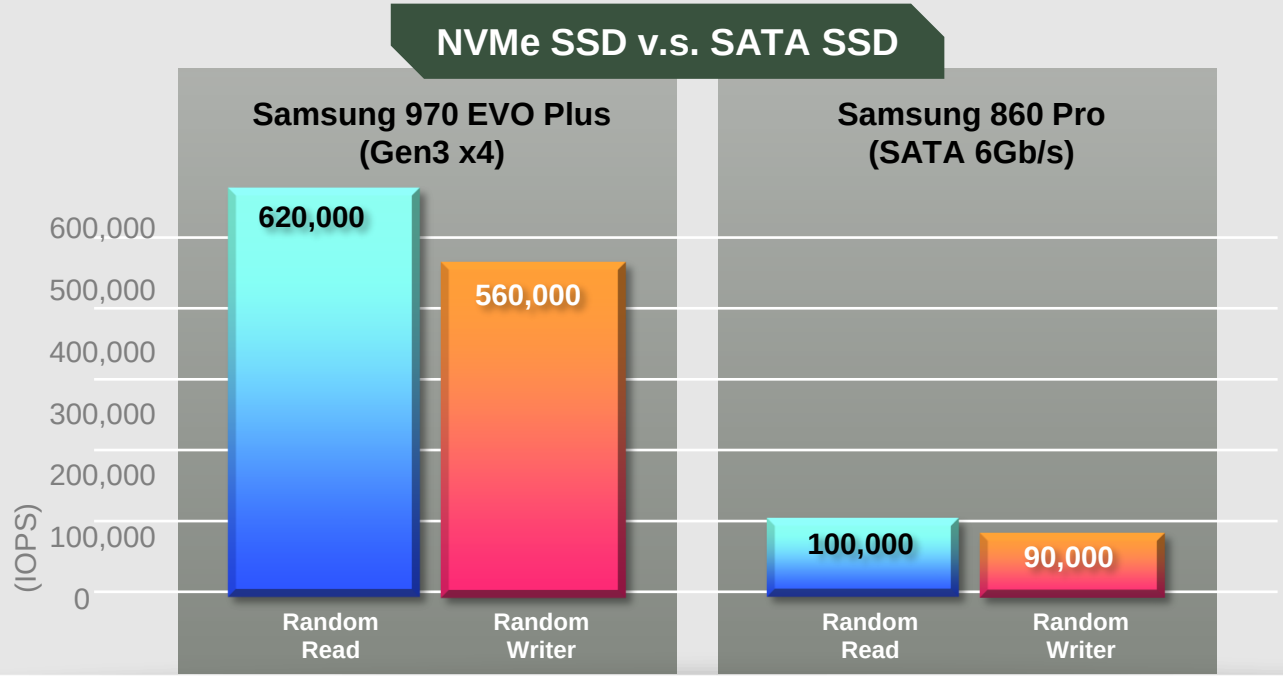
Single port：QXG-5G1T-111C

Dual port：QXG-5G2T-111C

Quad port：QXG-5G4T-111C

Built-in Two PCIe Gen3 x4 M.2 SSD slots

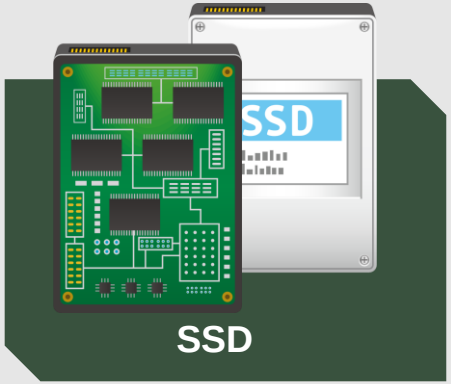
- Support **PCIe Gen3 x4 M.2 SSD,** providing up to 3.2 GB/s bandwidth per slot
- Boost random IOPS for multiple concurrent connections



* Performance information is from Samsung official website

Tiered storage configuration for a QuTS hero NAS

- Step1: system drive
  - Creating an SSD RAID with at least two SSDs for the system drive is recommended.
- Step2: read/wrie cache
  - Use NVMe M.2 SSD for a read/write cache.
- Step3: data storage
  - Allocate HDDs/SSDs to create a RAID for storing files and application data.



System Drive

Read/Write Cache

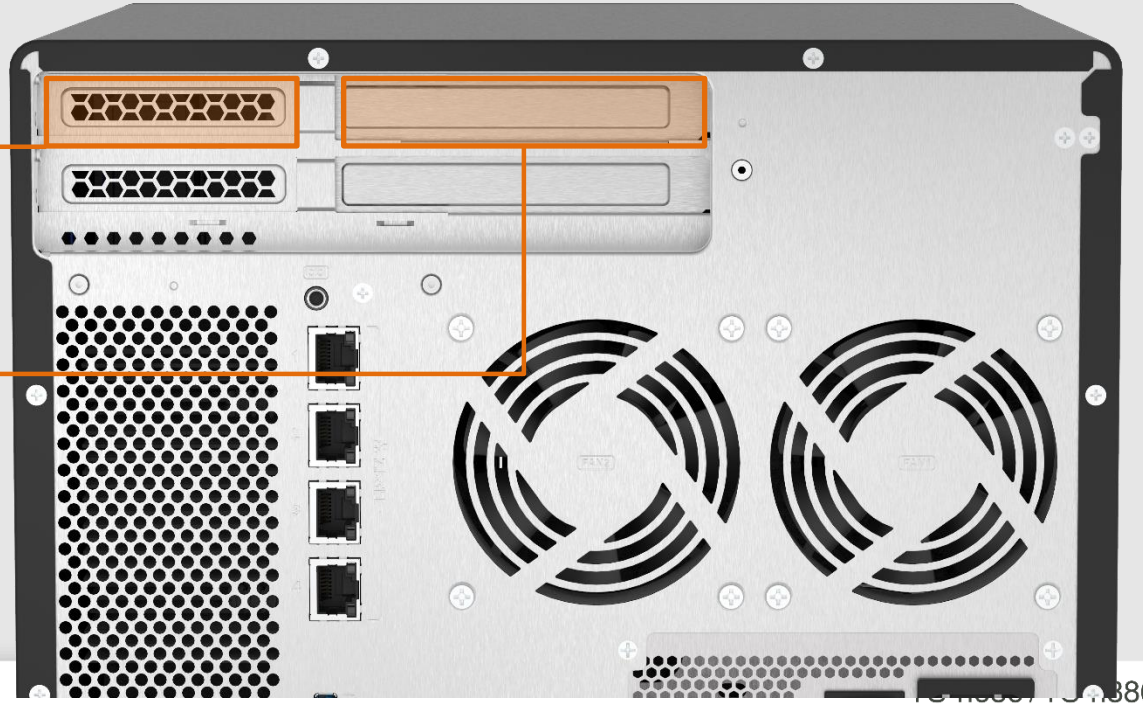
Data Storage

Two PCIe Gen3 x8 Slots Provide the Horsepower for Expansion

- Each PCIe Gen3 x8 slot provides up to 64 Gb/s bandwidth
- Two expansion slots offer the flexibility for expansion

PCIe slot 2：
Support half high, half length (HHHL) PCIe card

PCIe slot 1：
Support full high, full length (FHFL) PCIe card



Complete Expansion Solutions

Storage Expansion: TL SATA JBOD - economical and flexible expansion enclosures

- By installing QNAP QXP expansion card, NAS can access the TL SATA JBOD with high performance
- A single SFF-8088 cable for up to 4 x SATA 6Gb/s = **24 Gb/s** transfer speed. Using multiple cables can achieve up to **64 Gb/s** between the host and JBOD.

TL SATA JBOD

TL-D400S

TL-D800S

TL-D1600S

Ready to use by including a QXP PCIe SATA expansion card and SFF cable(s)

TL-D400S

\+

1 x QXP-400eS-A1164
PCIe 4-port SATA card

\+

1 x 1M SFF-8088 cable

TL-D800S

\+

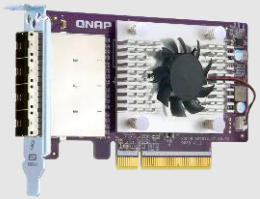
QXP-800eS-A1164
PCIe 4-port SATA card

\+

2 x 1M SFF-8088 cable

TL-D1600S

\+



1 x QXP-1600eS
PCIe 16-port SATA card

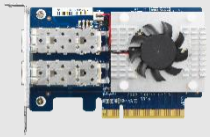
\+

4 x **1M SFF-8088 to SFF-8644 cable**

Network Expansion：
Versatile Network Expansion Accessories

10GbE Network Card

2 x SFP+

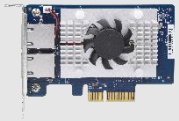


QXG-10G2SF-CX4

2 x RJ45

LAN-10G2T-X550

2 x RJ45

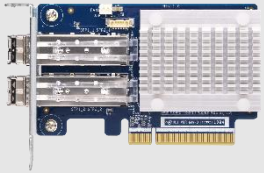


QXG-10G2T-107

1x RJ45

QXG-10G2T-107

Fibre Channel



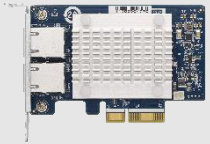
QXG-32G2FC/QXG-16G2FC

5GbE Network Card

1 x RJ45

QXG-5G1T

2 x RJ45



QXG-5G2T

4 x RJ45

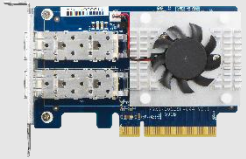
QXG-5G4T

40/25GbE Network Card

40Gb/s

LAN-40G2SF-MLX

25Gb/s

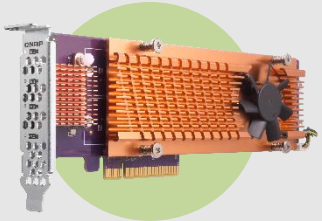


QXG-25G2SF-CX4

Performance Expansion：
Expand more NVMe SSD with QM2 Card

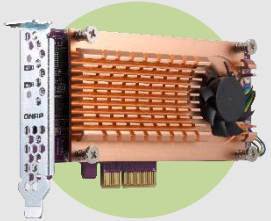
Need more NVMe M.2 SSD for acceleration？Sure！Achieve that with QNAP QM2 cards

Without changing existing configurations



QM2-4P-384 (Gen 3 x8)

4 x M.2 2280 PCIe Gen 3 x4 NVMe SSD slot



QM2-2P-384 (Gen 3 x8)

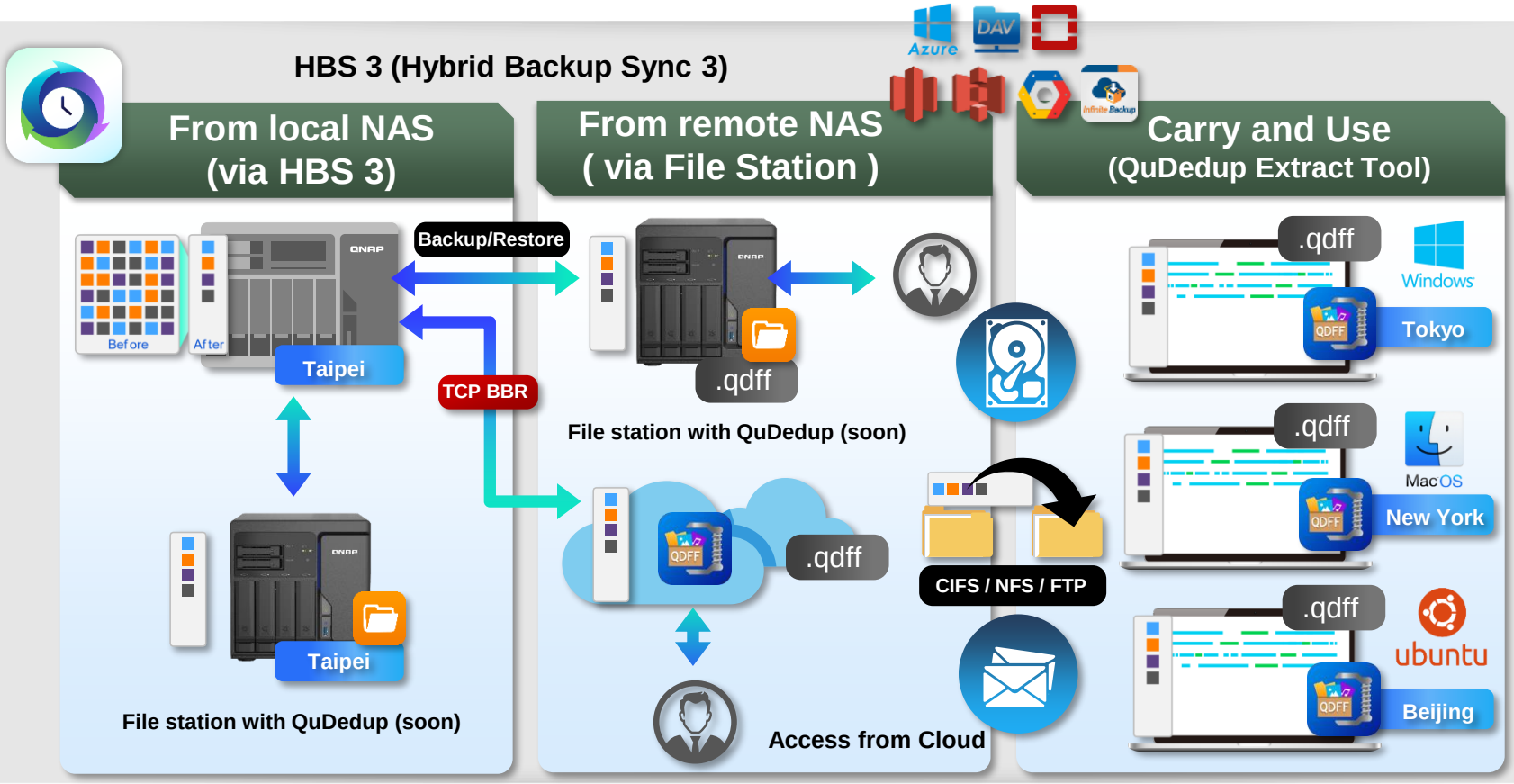
2 x M.2 22110/2280 PCIe Gen 3 x4 NVMe SSD slot

Note: QM2-4P-384 can only be installed in PCIe slot 1

QuTS Hero

Applications

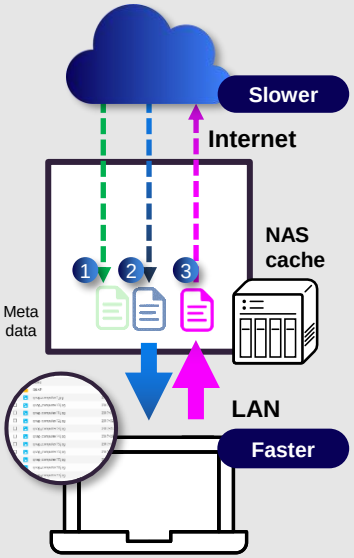
Complete Backup 3-2-1 with HBS 3.0



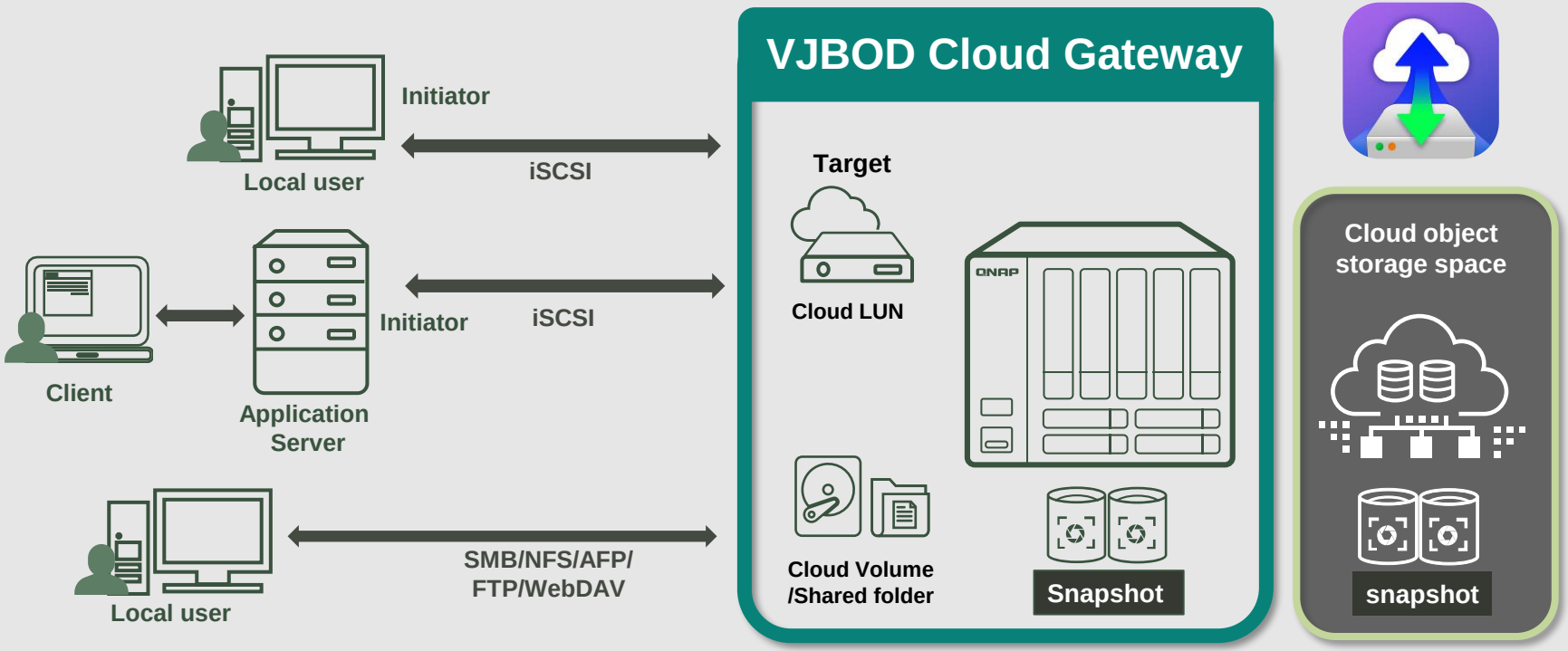
HybridMount provides two modes for file-based cloud storage gateway

	File Station Mount	File Cloud Gateway
Setup Method	Mount cloud drives	Select “File Cloud Gateway” mode and create a dedicated cache space
Connections	No limit	2 free and perpetual connections. Purchase license for more connections
Access Performance	Depends on network speed	High performance thanks to caching
Access in File Station	Supported	Supported
Access through SMB / NFS / AFP	Not supported	Supported
Sync with the cloud	Sync only when browsing	Sync constantly for quick access
Integration with QTS Apps	Not supported	Supported

- Online collaboration
- File data analysis



Enterprise LUN backup: VJBOD Cloud block-based gateway



Boxafe:

Comprehensive Backup Solution for Google™ G Suite and Microsoft 365®

- Keep important data in your hands.
- Move older data out of the cloud to reduce cost

Google™ G Suite

Gmail
Backup all your emails and attachments in Gmail

Google Drive
Backup all your file versions in Google Drive and supports My Drive and Shared Drive (coming soon)

Contacts
Backup all your contacts in Google Contacts

Calendar
Backup all your events and attachments in Google Calendar

Microsoft 365®

Outlook
Backup all your emails and attachments in Outlook

Contacts (People)
Backup all your contacts in Outlook People

Calendar
Backup all your events and attachments in Outlook Calendar

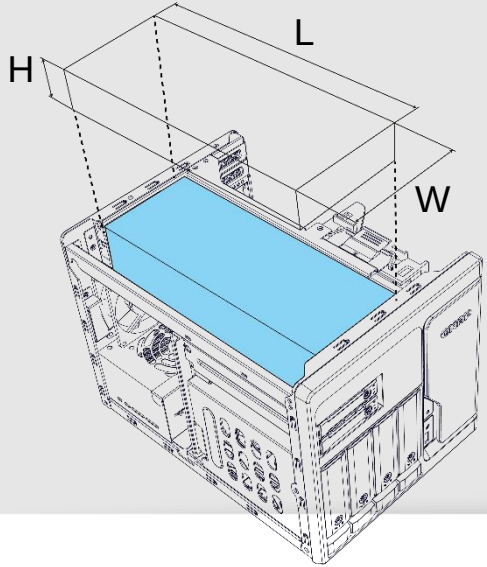
OneDrive
Backup all your files in OneDrive and support SharePoint (coming soon)

Install a Graphics Card for HDMI Output and GPU-accelerated Computing

The TS-hx86 series offers a PCIe Gen3 slot to support low-profile graphics cards that do not need additional power to boost performance of applications such as video editing , 4K UHD transcoding, imaging processing in QTS and performance of virtual machines via GPU passthrough.

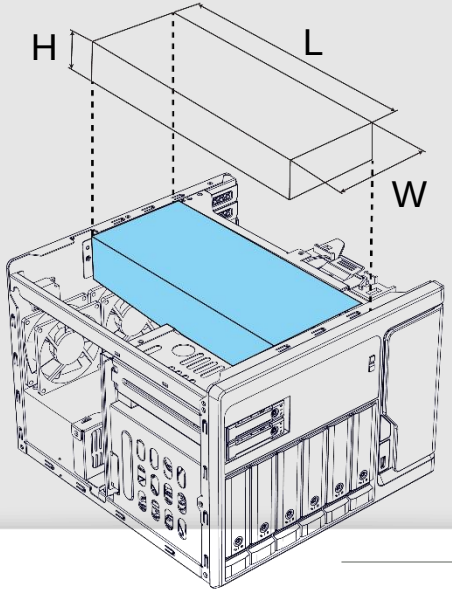
GPU Dimension in TS-h686

W x H x L: 126mm x 40mm x 261mm



GPU Dimension in TS-h886

W x H x L: 119mm x 45mm x 266mm



GPU-accelerated Software

File Station
On-the-fly transcoding & offline transcoding

QuMagie
On-the-fly transcoding & offline transcoding

Photo Station
On-the-fly transcoding

Video Station
On-the-fly transcoding

Media Stream Add-on
Video stream transcoding

HD Station
Local display and decode

HD Player
Local display and decode

QVR Pro
Local display and decode

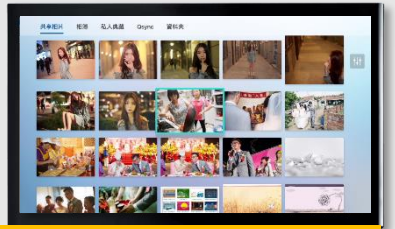
QuAI
AI inference acceleration

Virtualization Station
GPU passthrough

GPU-accelerated Application- Multimedia Workers

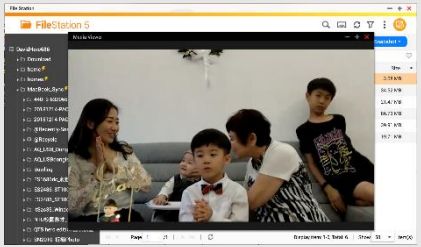
Material
Ingest

Media streaming Add-on
Stream acceleration



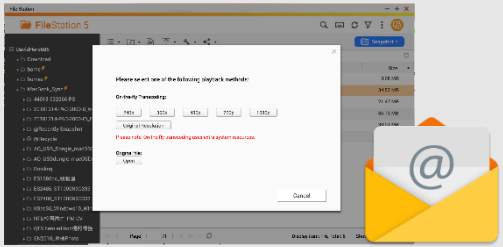
AppTV/ Chrome Cast/ smart TV

File Station
Video preview acceleration



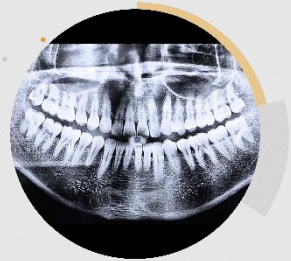
HD Station
HDMI ouput

File Station
Offline transcoding
and sharing



GPU-accelerated Application- AI Inference NAS

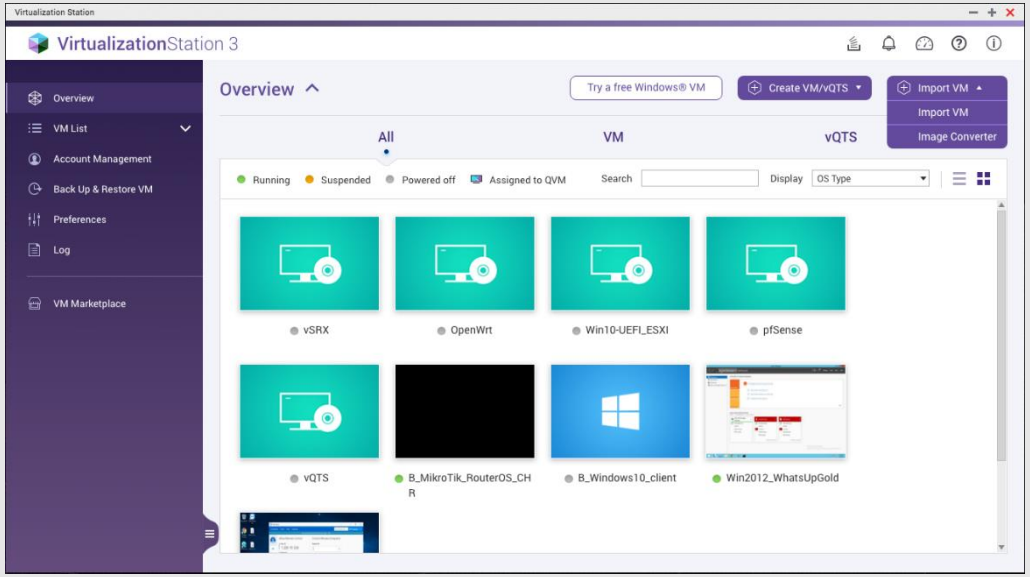
The last step of the AI is built up an inference host according to the Deep Learning model. GPU cards have been widely adopted to accelerate the inference process. QNAP QuAI SDK and GPU assist accelerate technology has been used in Medical Inference successfully.



GPU-accelerated Applications - Virtualization Station

With Virtualization Station, you can create multiple virtual machines to run various operating systems such as Windows, Linux, UNIX and Android on a QNAP NAS.

- Operate VM via **remote desktop**
- VM Import/Export
- VM backup and snapshot
- Virtual switch: support multiple network modes
- Support USB device connection
- **GPU passthrough** with an external graphics card for VM



TS-h686 / TS-h886

is your best choice!

2.5GbE

ZFS

intel XEON inside

QuTS hero

TS-h686

TS-h886