QNAP

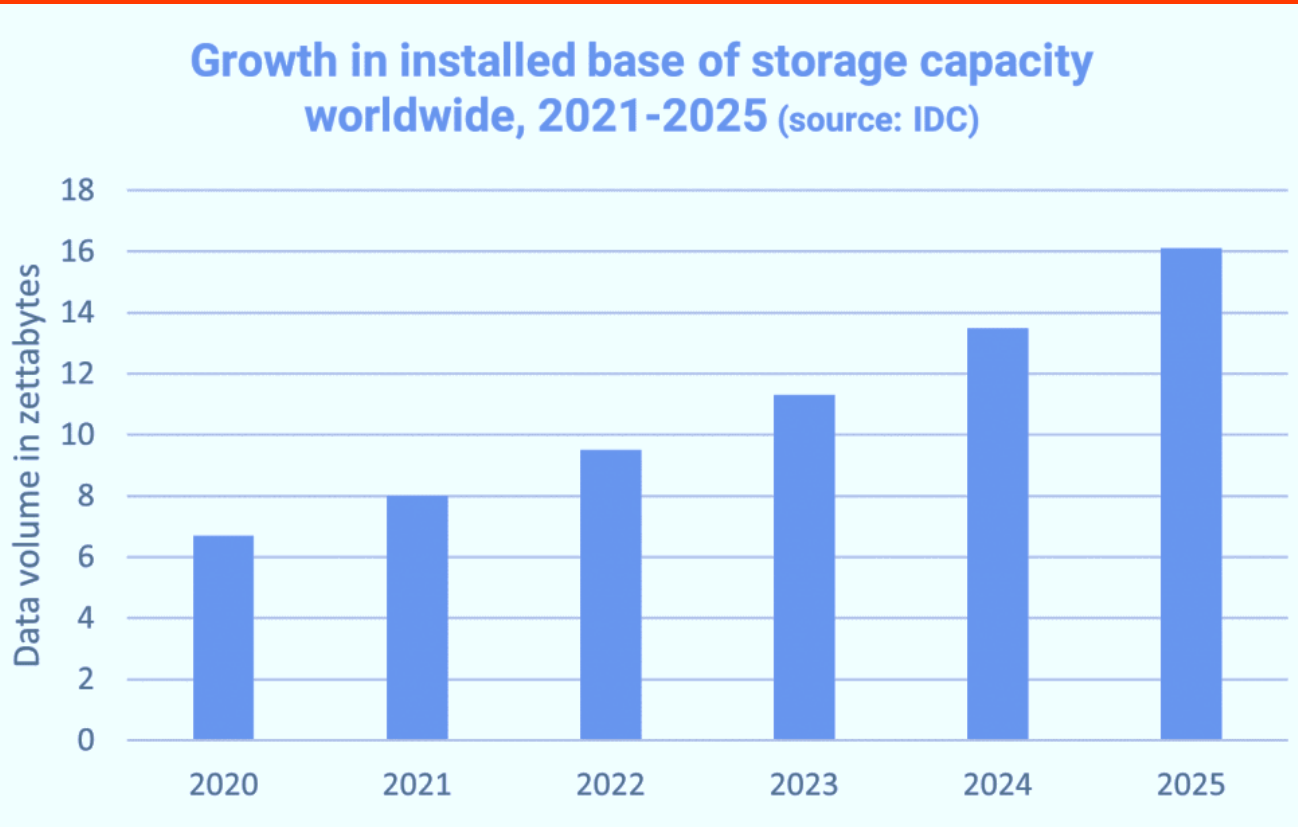
TS-h1277AXU-RP
TS-h1677AXU-RP

12-bay / 16-bay powerful rackmount ZFS NAS

Perfect Fusion of Capacity and Performance!

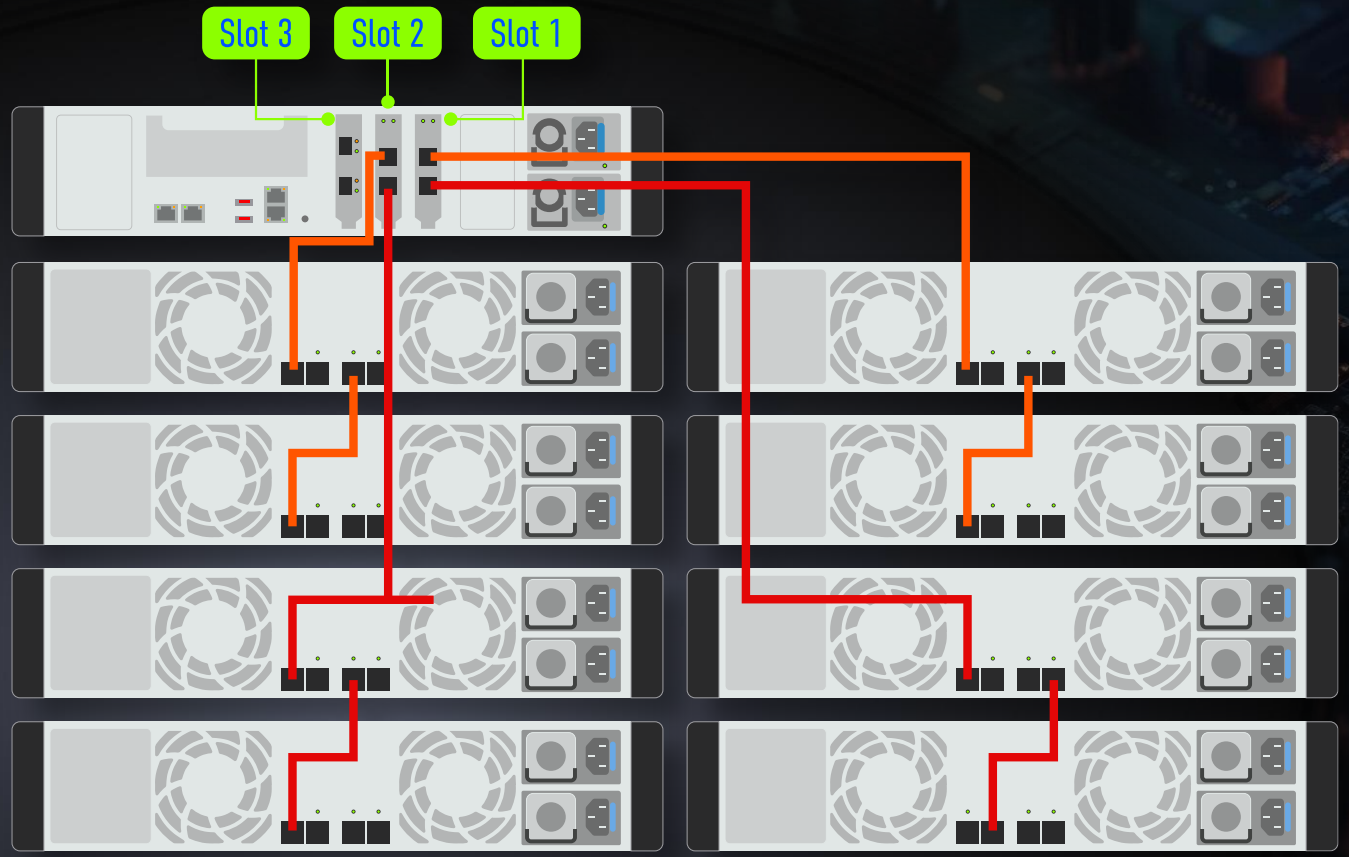
AMD RYZEN 7000 SERIES 5
AMD RYZEN 7000 SERIES 7
AMD RADEON GRAPHICS
10GbE
2.5GbE
M.2 NVMe SSD
2 x PCIe Gen5
PCIe
3 x PCIe Gen4

How Much Capacity Do You Need ?



- The storage usage grows at a rate of 30% to 40% per year.
- Data Protection: Frequent backups require additional storage space to prevent data loss or damage.
- Big data analysis requires large amounts of data storage and processing.
- Data Sharing: Central storage systems are needed for data sharing across departments as business expand.
- Security & Privacy: Companies use on-premised storage solutions to keep sensitive information within their own IT infrastructure.
- Growth of IoT: devices and their data also contribute to increased storage demand.

Petabyte Storage Solution



The TS-h1277AXU-RP and TS-h1677AXU-RP series products can support up to 8 QNAP TL-Rx00PES PCIe SATA JBOD enclosures. By connecting 8 TL-R2400PES-RP 24-bay PCIe SATA JBODs, a total storage capacity of up to 208 disks is achievable (with a maximum total capacity of 4PB, and actual usable space exceeding 3PB).

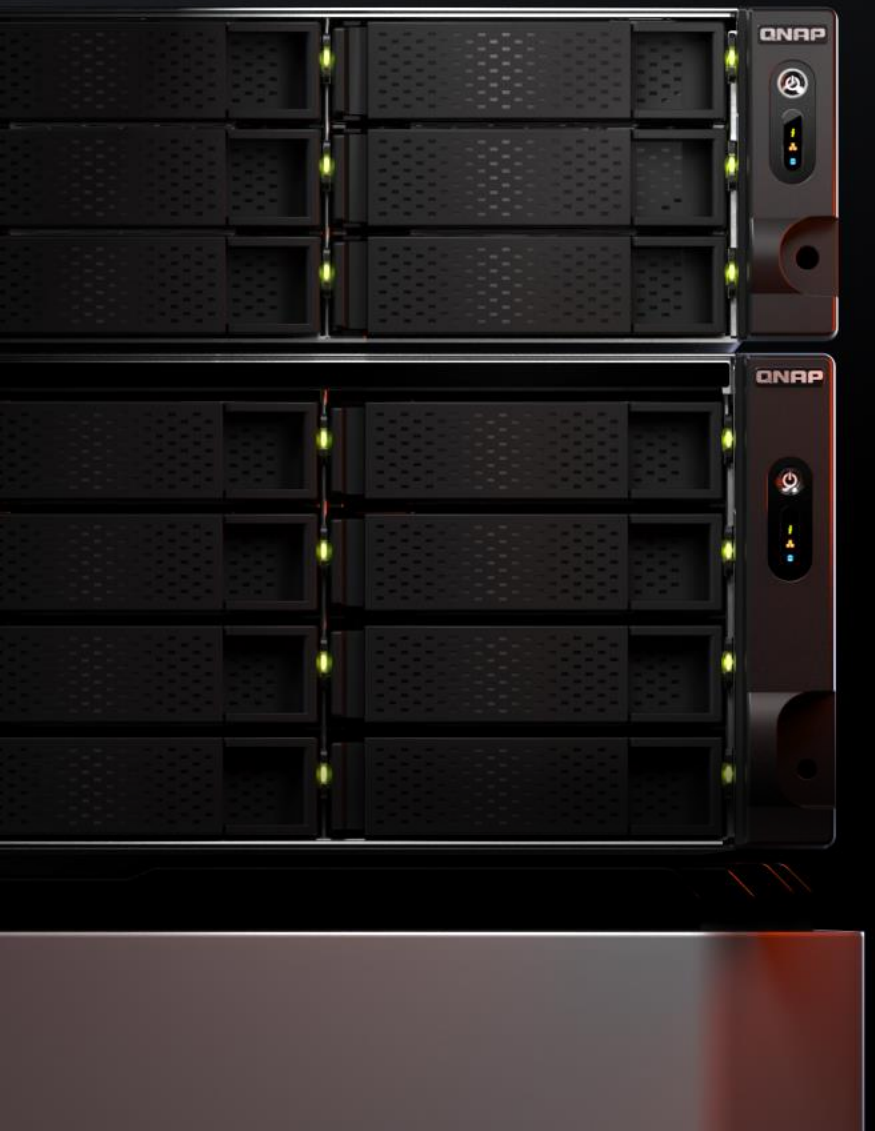
Note: The TL-R2400PES-RP is scheduled to be released in late February 2024. For information on NAS support quantities, please refer to the compatibility list at https://www.qnap.com/go/compatibility-expansion/pcie

The Next-Gen Ryzen 8-Core Rackmount NAS

2 x 10G BASE-T + 2 x 2.5G RJ45 | 3 x PCIe Gen 4 expansion slot | 2 x M.2 2280 PCIe Gen5 x 2

Designed for Enterprise Applications

TS-h1277AXU-RP & TS-h1677AXU-RP Takes Hardware Advancement to the Next Level



Ryzen™ 7 3700X

- # of CPU Cores: 8
- # of Threads: 16
- Max. Boost Clock: **4.4GHz**
- Base Clock: **3.6GHz**
- Memory Support: DDR4
- GPU: N/A

AMD Ryzen™ 7 7000 Series

- # of CPU Cores：8
- # of Threads：16
- Max Boost Clocl: **5.3GHz**
- Base Clock: **3.8GHz**
- Memory Support: **DDR5**
- GPU: **AMD Radeon™ graphics iGPU**

Ryzen™ 5 3600

- # of CPU cores: 6
- # of Threads: 12
- Max. Boost Clock: **4.2GHz**
- Base Clock: **3.6GHz**
- Memory Support: DDR4
- GPU: N/A

AMD Ryzen™ 5 7000 Series

- # of CPU Cores: 6
- # of Threads: 12
- Max. Boost CLock: 5.1GHz
- Base Clock: 3.8GHz
- Memory Support: **DDR5**
- GPU: **AMD Radeon™ graphics iGPU**

2U 12-bay & 3U 16-bay

12-bay

TS-h1277AXU-RP-R5-16G

Ryzen 5 7600 / Pro 7645, 16GB RAM (1 x 16GB)

TS-h1277AXU-RP-R7-32G

Ryzen 7 7700 / Pro 7745, 32GB RAM (1 x 32GB)

16-bay

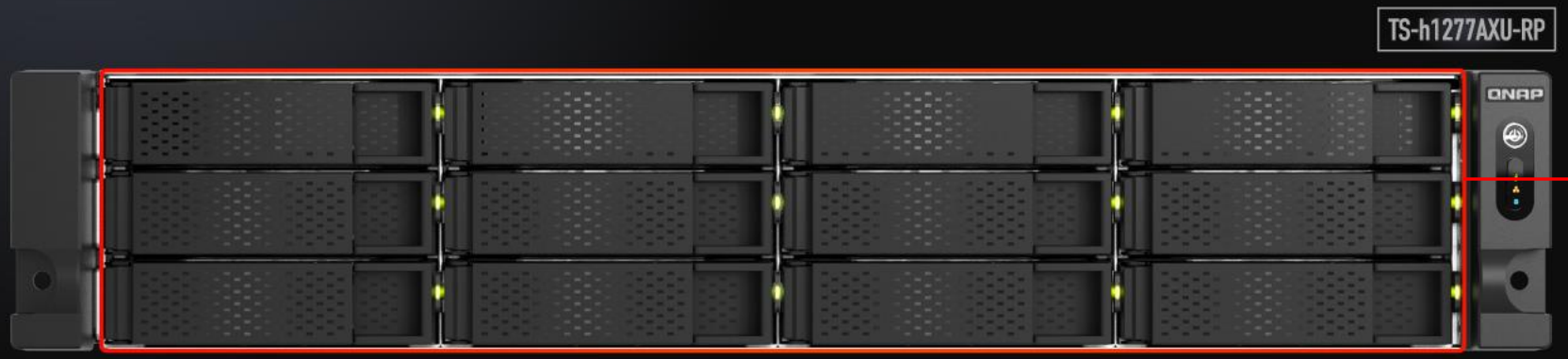
TS-h1677AXU-RP-R7-32G

Ryzen 7 7700 / Pro 7745, 32GB RAM (1 x 32GB)

TS-h1277AXU-RP / TS-h1677AXU-RP

Powered by AMD Ryzen™ 7000 Series processors based on the cutting-edge AMD socket AM5 platform, the ZFS-based TS-h1277AXU-RP / TS-h1677AXU-RP storage and backup solution unleashes superb performance and enterprise-level potential. With a revolutionary multi-core processor, DDR5 RAM, M.2 PCIe Gen 5, and redundant power supplies, the TS-h1277AXU-RP delivers excellent performance, ultra-large bandwidth, and trusted reliability for performance-demanding Tier 2 storage, virtualization, 4K video editing, and PB-level storage applications.

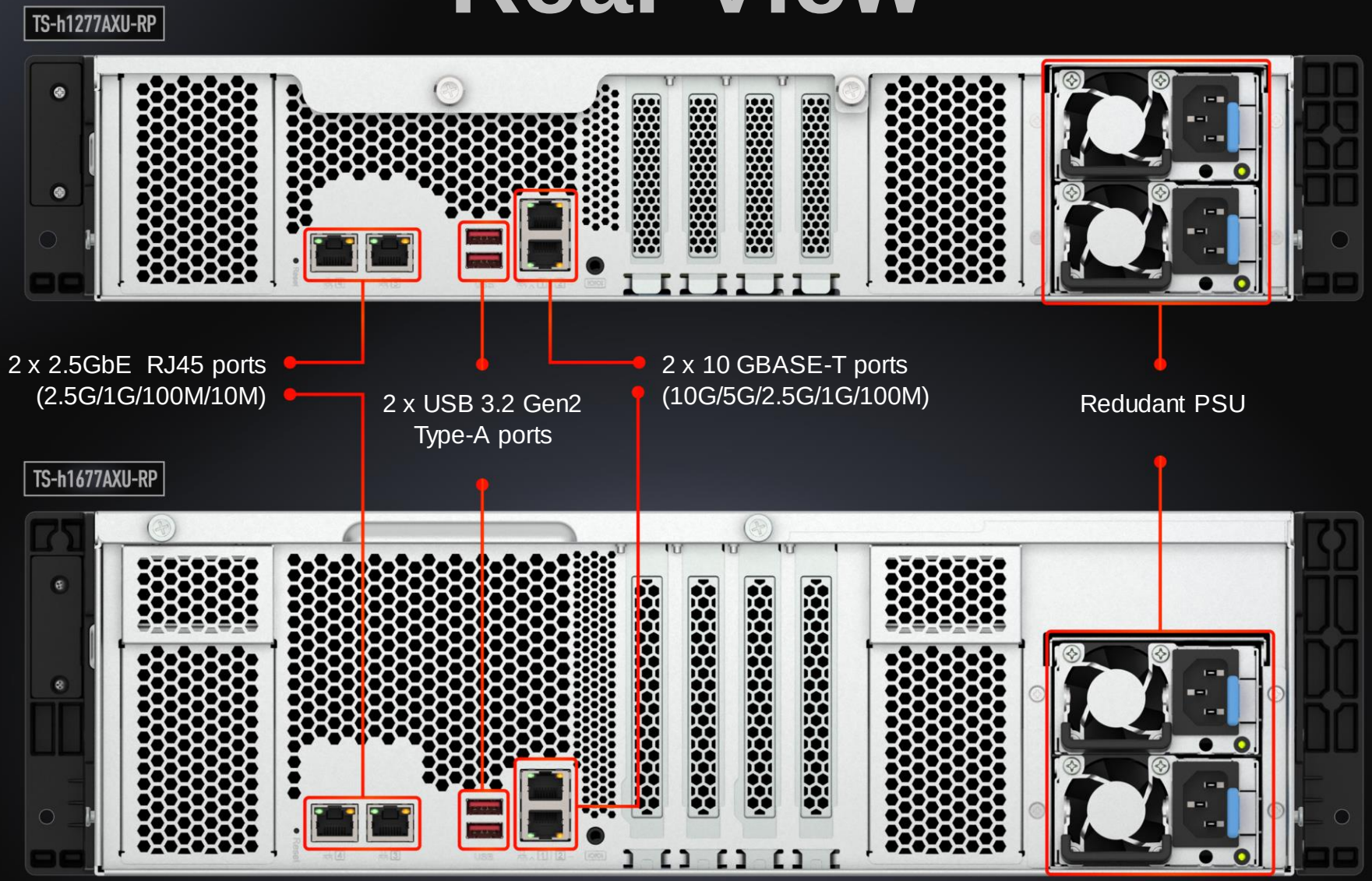
TS-h1277AXU-RP / TS-h1677AXU-RP
Front View



12 / 16 x 3.5″ /2.5” SATA 6Gb/s HDD/SSD slots, support diverse configurations

Power button & LED indicators: system status, network, external expansion enclosures, disks

TS-h1277AXU-RP / TS-h1677AXU-RP
Rear View



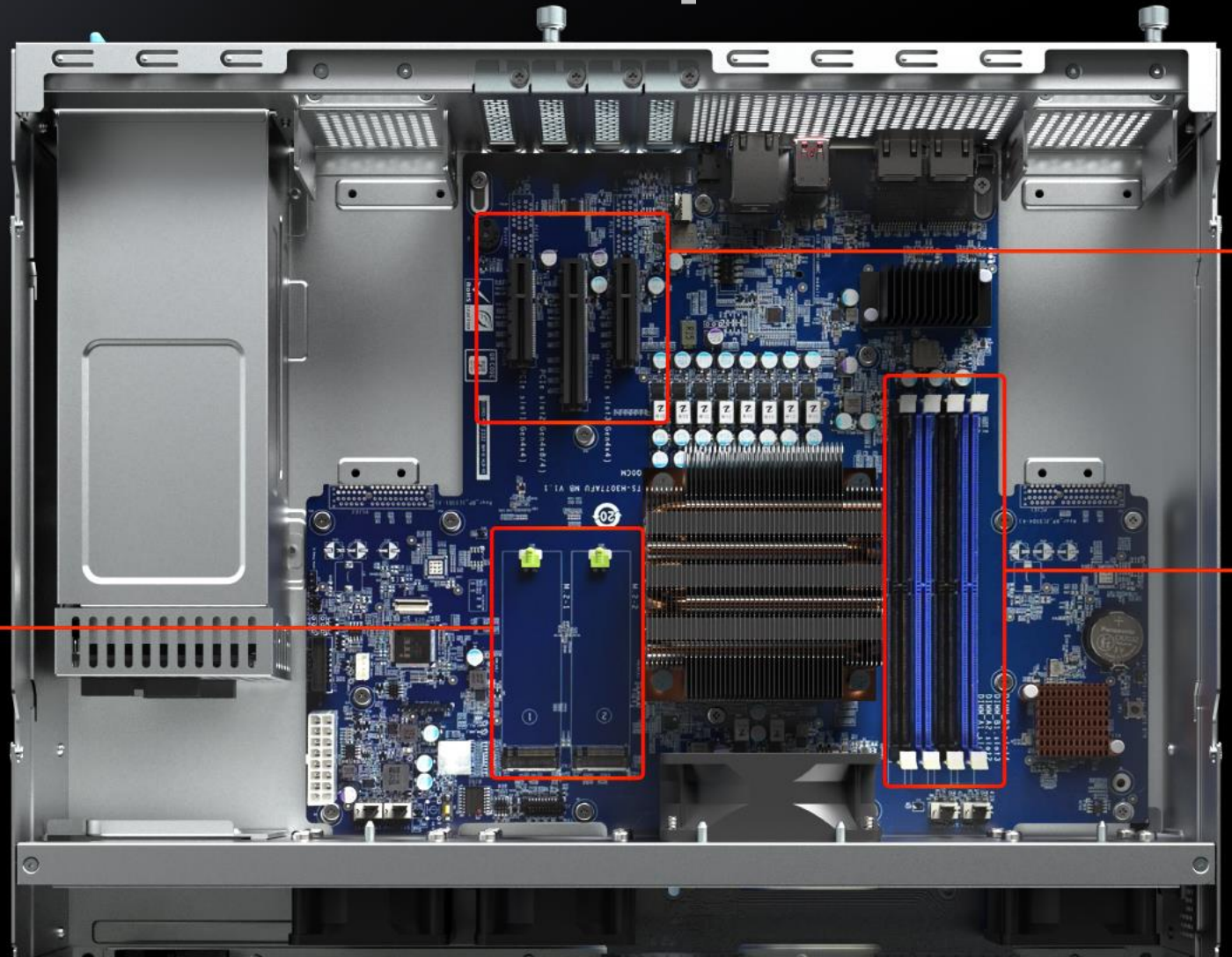
TS-h1277AXU-RP / TS-h1677AXU-RP Dimensions

Optional Rail Kit Accessory: RAIL-B02

Support models :
TS-h1277AXU-RP
TS-h1677AXU-RP
Max. Load Capacity :

Handles up to 45.5Kg when fully extended

TS-h1277AXU-RP / TS-h1677AXU-RP
Easily remove the top cover for upgrades



2 x M.2 2280 **PCIe Gen5** x2 slots, can be utilized individually for storage or employed to boost cache performance, ensuring ultimate efficiency.

3x **PCIe Gen4** expansion Slots (2x PCIe Gen4 x4, 1x PCIe Gen4 x8 or Gen4 x4) Balancing performance and expandability, offering the flexibility to expand with 25GbE Smart NIC, Fibre Channel, or JBOD.

4 x **DDR5** UDIMM RAM Slots, delivering immense bandwidth and expandable up to a maximum of 128GB. Shipped with non-ECC memory, with the option to upgrade to ECC memory. Note: ECC and non-ECC memory cannot be mixed.

Powerful 6-core/12-thread & 8-core/16-thread High Frequency 5nm Processors

Multicore Efficiency with Low Power Consumption

- AMD Ryzen™ 7 7000 series 8 Cores / 16 Threads
- AMD Ryzen™ 5 7000 series 6 Cores / 12 Threads

The all-new AMD AM5 high-performance processors deliver robust capabilities with up to 32MB cache, reaching a maximum frequency of 5.3 GHz. Equipped with integrated AMD Radeon™ Graphics, they support 4K video transcoding and accelerate various AI applications.

Max. Overclocking

5.3 GHz

Thumbnail Performance Compared to the Previous Generation x77XU

Boosted by 6.73X

8-Cores / 16-Threads

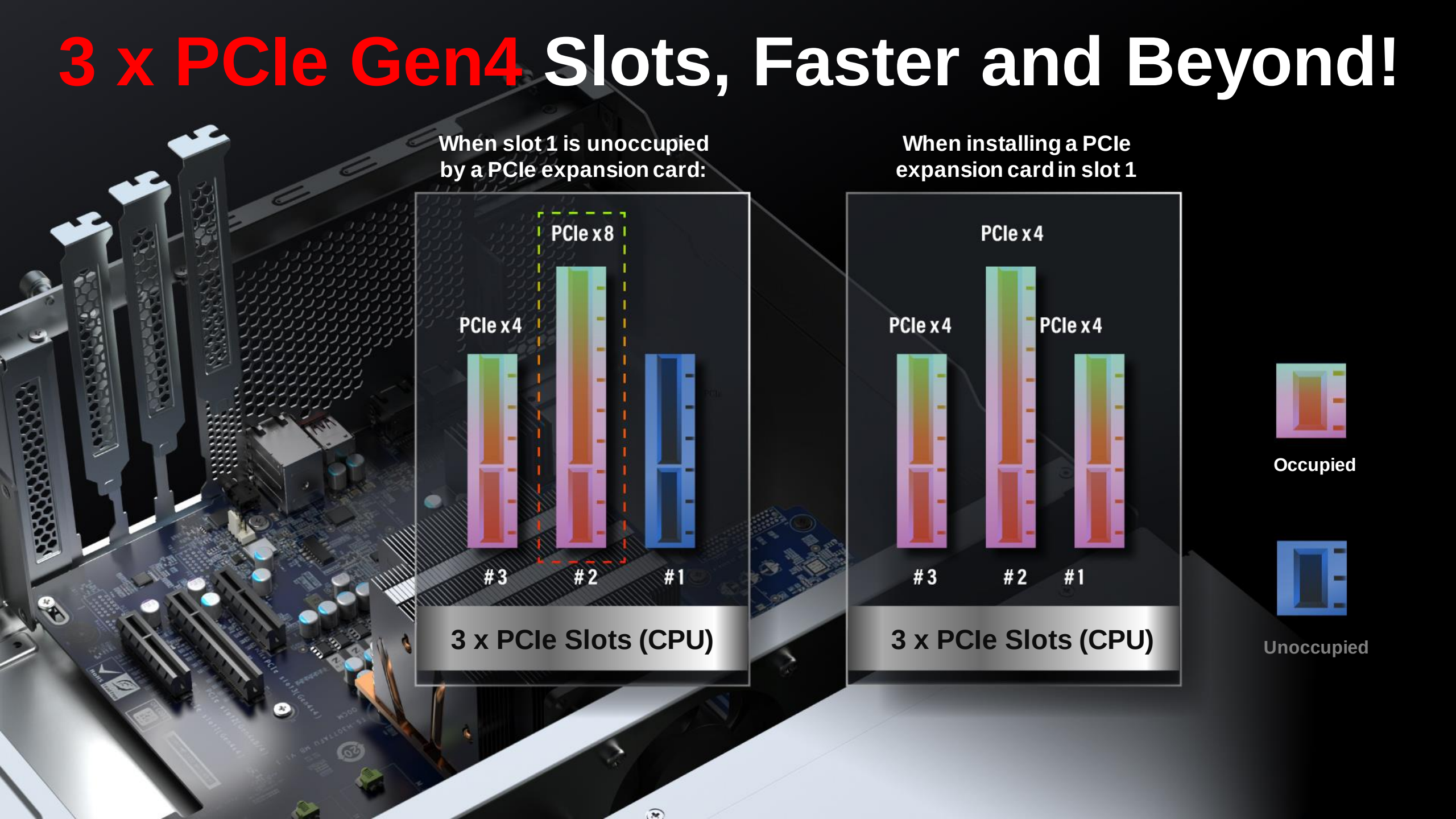
3.8 GHz

CPU Benchmark Compared to the Previous Generation x77XU

Boosted by 1.55X

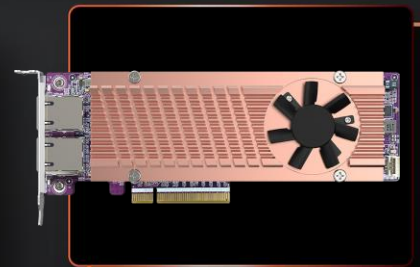
Note: Specifications on this page are based on the AMD Ryzen™ 7 7700 as an example. Detailed specifications may vary depending on the chosen CPU SKU.
For more information, visit: CPU Comparison (Ryzen7 7700 vs. Ryzen7 3700X)

3 x PCIe Gen4 Slots, Faster and Beyond!

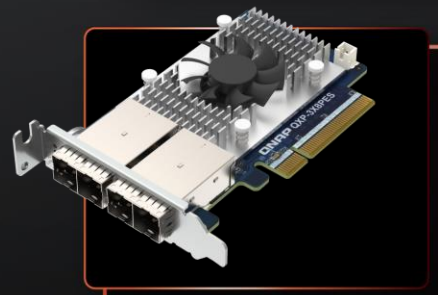


Leading the Industry: Diverse Range of QNAP PCIe Expansion Cards

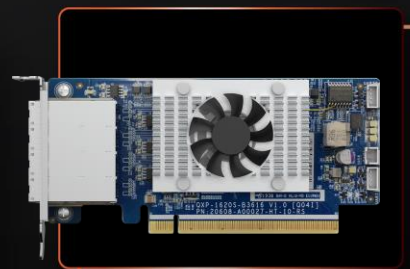
The 25GbE / 10GbE Network Expansion Cards (e.g., QXG-25G2SF-E810 or QXG-10G2SF-X710) offer high throughput and low latency, enabling enterprises to swiftly accomplish tasks.



The QM2 card (e.g., QM2-2P410G2T) features 10GBASE-T Ethernet ports and/or M.2 NVMe SSD slots, instantly adding more SSD cache for accelerated storage.



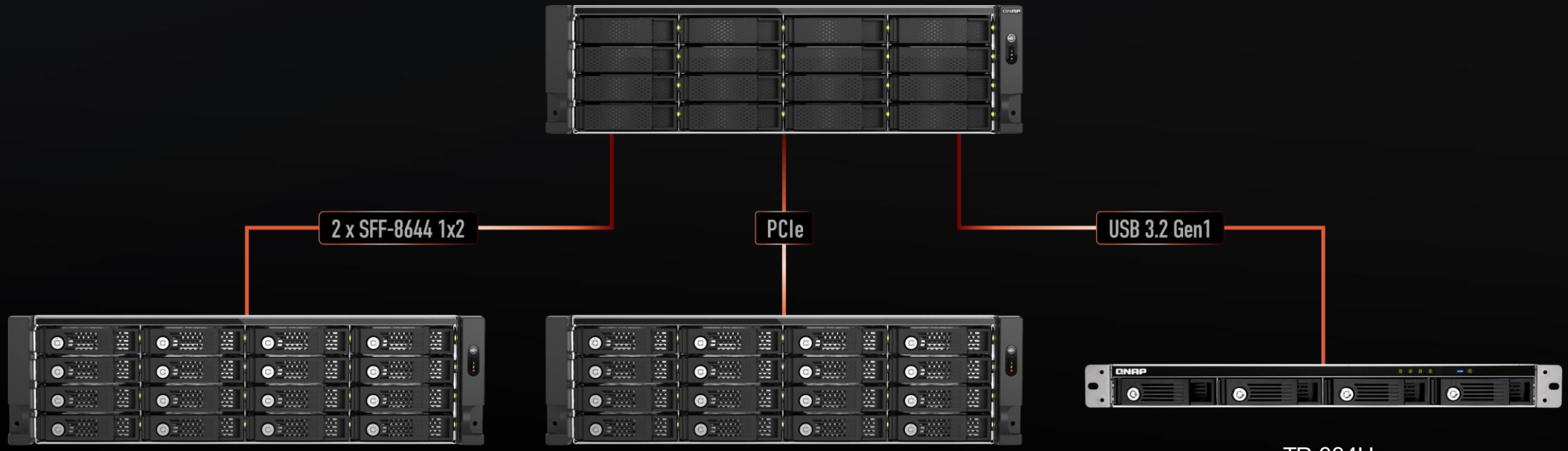
The QXP-3X4PES or QXP-3X8PES expansion card is designed specifically for NAS in conjunction with the QNAP TL-Rx00PES-RP JBOD series storage expansion devices. It can connect up to 192 additional SATA hard drives, expanding storage capacity to over 1PB.



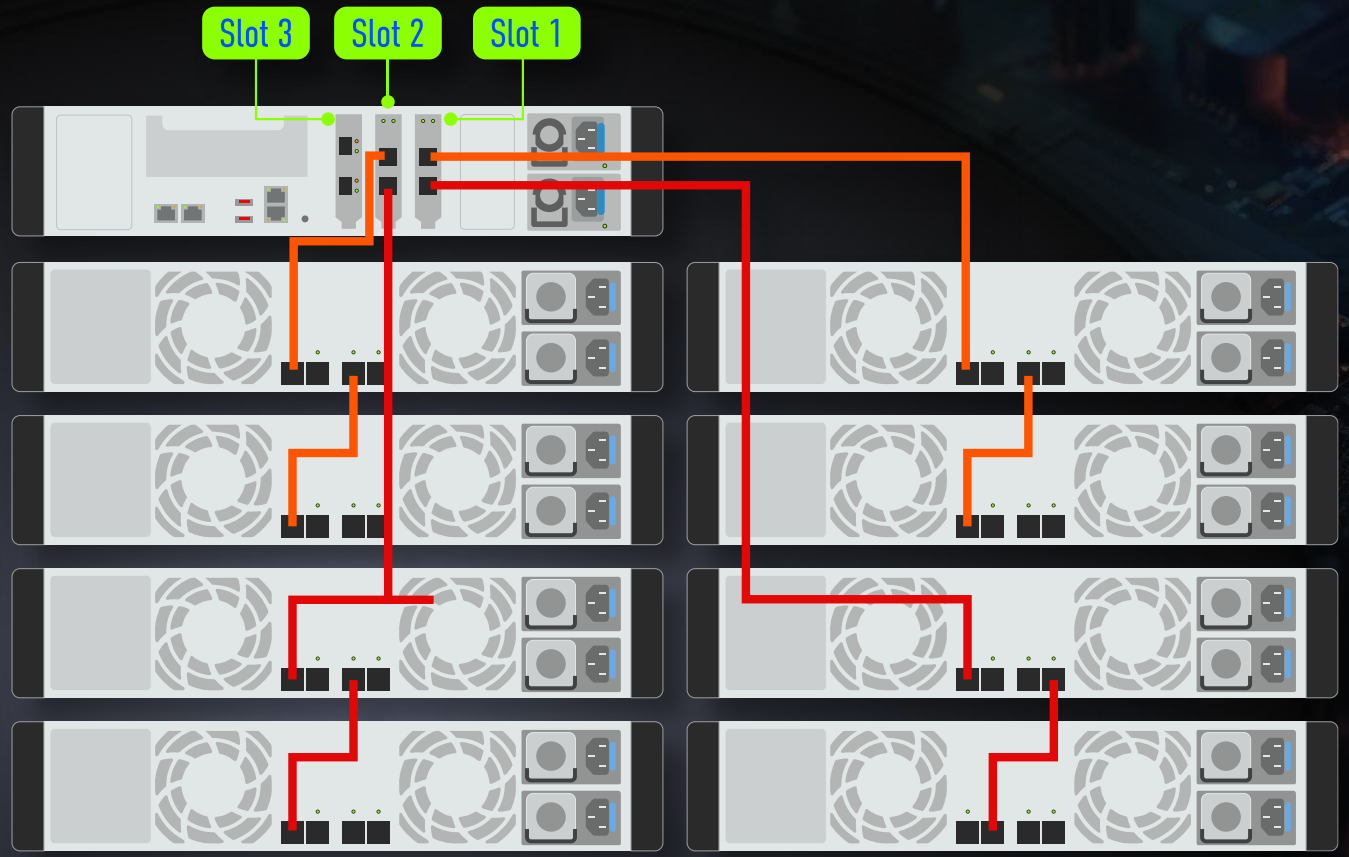
The SAS expansion card (QXP-820S-B3408) is specifically designed for NAS in conjunction with the QNAP TL SAS JBOD series storage expansion devices. It can connect up to 16 units of the 16-bay TL-R1620Sep-RP SAS JBOD, providing versatile storage solutions.

Versatile Storage Expansion Choices

The TS-h1277AXU-RP and TS-h1677AXU-RP offer flexible capacity expansion options, catering to various devices and scenarios through different interfaces. Options include VJBOD, USB JBOD, SAS JBOD, SATA JBOD, and TL-Rx00PES-RP PCIe SATA JBOD, providing adaptability based on specific equipment and requirements.



Petabyte-Grade Value Solution: Balancing Performance and Capacity



The TS-h1277AXU-RP and TS-h1677AXU-RP series can support up to 8 TL-Rx00PES PCIe SATA JBODs, providing a total space for up to 208 disks (total capacity reaching 4PB, with over 3PB of usable space). Simultaneously, they ensure optimal network performance with dual 25GbE ports, catering to the diverse capacity and performance expansion needs of enterprises in various scenarios.

TL-Rx00PES JBOD comes in 3 SKUs: TS-R1200PES-RP (12-bay, now available), TL-R1600PES-RP (16-bay, now available), and TL-R2400PES-RP (24-bay, launching in Feb 2024).
Note: For NAS compatibility details, refer to the compatibility list at https://www.qnap.com/go/compatibility-expansion/pcie

Quadrupling Performance Over The Previous Generation

The TS-h1277AXU-RP and TS-h1677AXU-RP, equipped with the AMD Ryzen™ 7000 Series processors, not only deliver high clock speeds but also provide increased bandwidth, ensuring robust performance for enterprise applications.

Protocol	Unit	IO Access	TS-h1277AXU-RP-R7-32G (32Gx1,8C16T)	TS-h1677AXU-RP-R7-32G (32Gx1,8C16T)	TS-h1277XU-RP-3700X-32G (32Gx1, 8C16T)	TS-h1677XU-RP-3700X-32G (32Gx1, 8C16T)
			5 host 25GbEx6		1 host 10GbEx4	
iSCSI	Throughput (MB/s)	SW-1M	4,293	4,370	2,669	2,971
		SR-1M	7,813	7,821	3,378	3,093
	IOPS	RW-4K	1,098,192	1,066,161	223,262	154,485
		RR-4K	1,602,966	1,595,523	311,089	349,317
SMB	Throughput (MB/s)	SW-1M	6,741	6,926	2,931	3,017
		SR-1M	15,547	16,185	3,907	4,031
	IOPS	RW-4K	635,292	646,372	141,503	100,838
		RR-4K	1,460,262	1,466,852	360,577	286,494

IOPS Comparison with the Previous Generation TS-hx77XU Series

Up to

4.57X

Throughput Comparison with the Previous Generation TS-hx77XU Series

Up to

4.02X

These test results were conducted in the QNAP laboratory, and actual performance may vary based on real-world environments.
NAS: TS-h1677AXU-RP-R7-32G, with QXG-25G2SF-CX61, QXG-25G2SF-E8102, OS: QuTS hero h5.1.2, Disk Group: Samsung 870 EVO 1TB x16 (RAID 5)
Client PCs: 5* Client PCs simultaneously reading and writing 16GB files (totaling 80GB), 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.

Next-Gen Memory Performance: Max 128GB DDR5 RAM and Optional ECC

More Powerful, Faster, and More Stable Than Ever!

- 4 x DDR5 UDIMM slots, supporting expansion up to a total of 128 GB, with an option to upgrade to ECC RAM.
- Clock speeds starting from 4800MT/s, delivering at least 50% higher performance compared to DDR4.
- Reduced power consumption, cost-effectiveness, and environmental consciousness. Approximately 20% lower power consumption compared to DDR4.

Clock Speed Comparison with the Previous Generation DDR4

Boosted by 1.5X up

RAM Order P/N

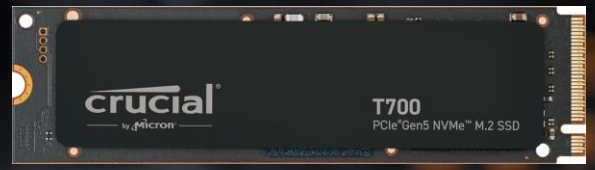
Ordering P/N	Memory
RAM-16GDR5T0-UD-4800	16G DDR5 UDIMM 4800MHz
RAM-32GDR5T0-UD-4800	32G DDR5 UDIMM 4800MHz
RAM-16GDR5ECT0-UD-4800	16G DDR5 ECC UDIMM 4800MHz
RAM-32GDR5ECT0-UD-4800	32G DDR5 ECC UDIMM 4800MHz

Dual M.2 2280 PCIe Gen 5 PCIe Slots Supporting Latest M.2 NVMe SSDs

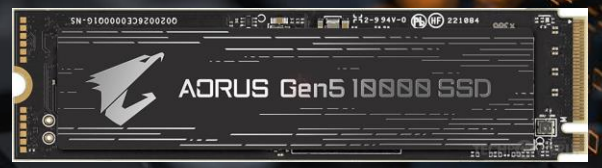
Faster, and Beyond - Unleash the Power of Speed!

- 2 x PCIe Gen5 x2 M.2 2280 SSD slots, providing users with robust bandwidth (performance twice that of PCIe Gen4)

- M.2 SSD Cache Acceleration for more agile data access. Enabling SSD caching enhances disk random access performance, reduces I/O latency, and significantly improves operational efficiency for applications requiring high IOPS, such as databases and virtualization.



Crucial CT4000T700SSD3

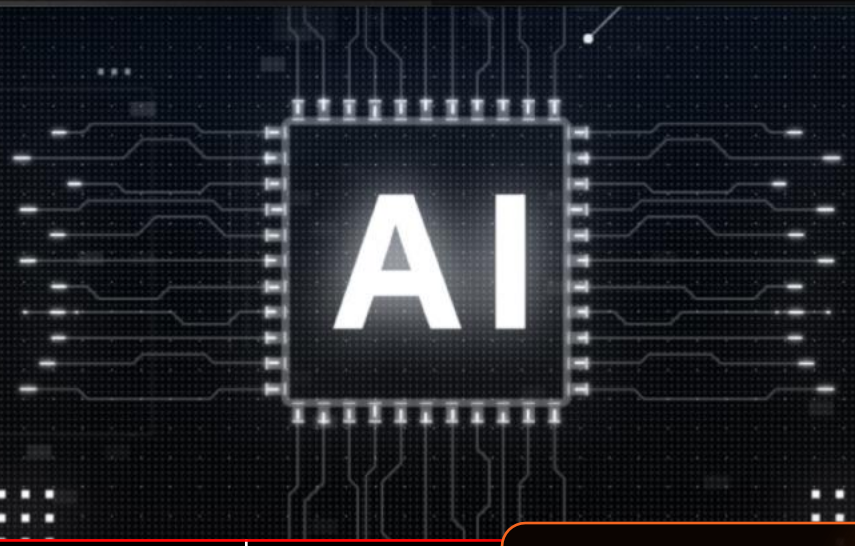


GIGABYTE AORUS Gen5 10000 SSD

MSI SPATIUM M570 PCIe 5.0 NVMe M.2 HS

Built-in GPU: Elevating AI Image Recognition and Video Transcoding Efficiency

The TS-h1277AXU-RP and TS-h1677AXU-RP come equipped with an integrated AMD Radeon™ Graphics GPU. Not only does it accelerate facial recognition efficiency, but it also enhances video transcoding, ensuring smoother streaming transmissions and improving compatibility across various platforms. Transcoding into H.264/265 further optimizes storage efficiency.



	TS-h1677AXU	TS-h1887XU	TS-h1677XU	TS-464eU	TS-453E
Thumbnail/Hour	**91009**	50055	11917	12834	11917
Facial Recog./Hour	**66740**	55616	37077	10215	10215
1080p Video FPS	**712**	w/o igpu	w/o igpu	171	167

Comparison with the Previous Generation 77XU Series

Boosted by

7.63X

SPEC: TS-h1277AXU-RP

HW SKU	TS-h1277AXU-RP-R5-16G	TS-h1277AXU-RP-R7-32G
CPU	Ryzen™ 5 7000 series 6C12T 3.8 ~ 5.1 GHz	Ryzen™ 7 7000 series 8C16T 3.8~5.3 GHz
Memory (default)	16GB (16GB x1) DDR5 none-ECC UDIMM	32GB (32GB x1) DDR5 none-ECC UDIMM
Max. Memory	128GB (4 x 32GB)	
Memory Slots	4 x **DDR5** UDIMM, ECC support	
O.S	QuTS hero (default) / QTS (optional)	
Disk Slots	12 x 3.5” SATA disk bays	
M.2 Slots	2 x M.2 2280 **PCIe Gen5** slots	
Networking	2 x 2.5GbE + 2 x 10GBASE-T	
PCIe Expansion Slots	3 x PCIe **Gen4 slot** (Slot 1: Gen4 x4, Slot 2: Gen4 x8 or Gen 4 x4, Slot 3: Gen4 x4) Support 10GbE, 25GbE x 2 NIC **Slot 2 provides the width of PCIe Gen4 x8 when Slot 1 is not in use, and provides the width of PCIe Gen4 x4 when Slot 1 is in use.	
USB Slots	2 x USB 3.2 Gen2 Type-A	
GPU	Yes	
PSU	Redundant PSU	
System Fan	3 x 60mm	

SPEC: TS-h1677AXU-RP

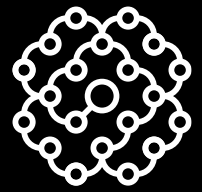
HW SKU	TS-h1677AXU-RP-R7-32G
CPU	Ryzen™ 5 7000 series 6C12T 3.8 ~ 5.1 GHz
Memory (default)	32GB (32GB x1) DDR5 none-ECC UDIMM
Max. Memory	128GB (4 x 32GB)
Memory Slots	4 x **DDR5** UDIMM, ECC support
O.S	QuTS hero (default) / QTS (optional)
Disk Slots	16 x 3.5” SATA disk bays
M.2 Slots	2 x M.2 2280 **PCIe Gen5** slots
Networking	2 x 2.5GbE + 2 x 10GBASE-T
PCIe Expansion Slots	3 PCIe **Gen4 slot** (Slot 1: Gen4 x4, Slot 2: Gen4 x8 or Gen 4 x4, Slot 3: Gen4 x4) Support 10GbE, 25GbE x 2 NIC **Slot 2 provides the width of PCIe Gen4 x8 when Slot 1 is not in use, and provides the width of PCIe Gen4 x4 when Slot 1 is in use.
USB Slots	2 x USB 3.2 Gen2 Type-A
GPU	iGPU
PSU	Redundant PSU
System Fan	3 x 60mm

QNAP

Enterprise-Grade Operating System

Powered by QuTS hero with Enterprise ZFS Technology

QuTS hero h5.1.x Highlights

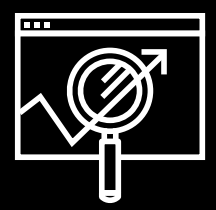


Data Integrity

- QuTS hero no longer needs file system c hecks (FSCK), with ZFS Mirror layer, COW (copy on Write) could keep the data integrity.

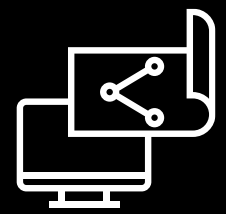
Data Protection

- The native ZFS snapshot feature allows max 65,536 snapshots (supports folder/LUN)
- SnapSync
- More RAID types available
- WORM (write once read many)
- SMB signing and Encryption AES-NI Acceleration
- SMB Signing with GMAC
- Authenticator and Passwordless



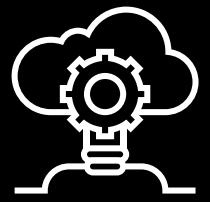
Data Efficiency

- Offers inline compression, inline co mpaction & inline deduplication for better storage utilization
- ZIL & L2ARC
- Write Coalescing
- Pool over provisioning
- SMB Multichannel
- iSCSI Read Zero Copy
- Enhanced performance on encrypted LUN/folder



Stability & Scalability

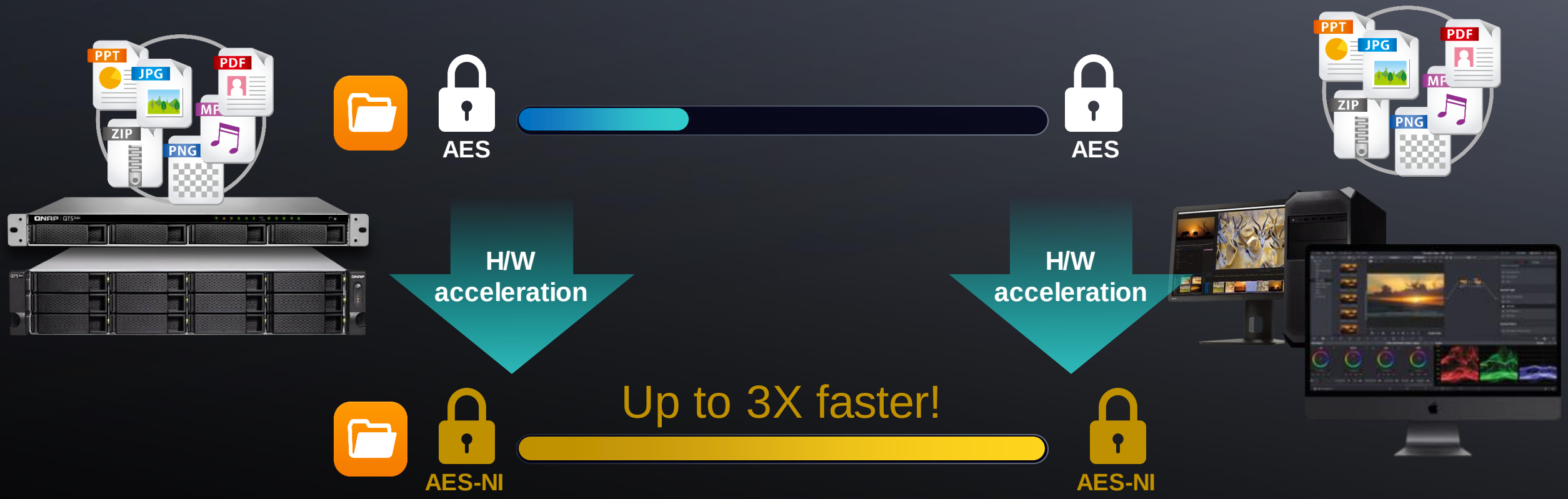
- Easily expanded to PB-level storage space.
- Provide ECC RAM supported model to reach the enterprise level stability
- Expand/Upgrade ZFS RAID
- Provide the service of SSD/HDD life prediction
- Predictive Migration



Management & Application

- Detailed ACL
- Protocols & Connection
- Delegated Administration
- AMIZ cloud
- NFS Fixed Ports

AES-NI Acceleration for SMB3 Signing and Encryption

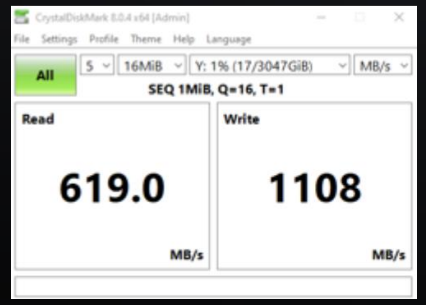


AES-NI accelerated SMB3 Signing and Encryption

Supports AES-128-GMAC for SMB signing acceleration

In 10Gb/s network, AES-NI enabled CPU, new GMAC algorithm outperforms the former CMAC algorithm significantly.

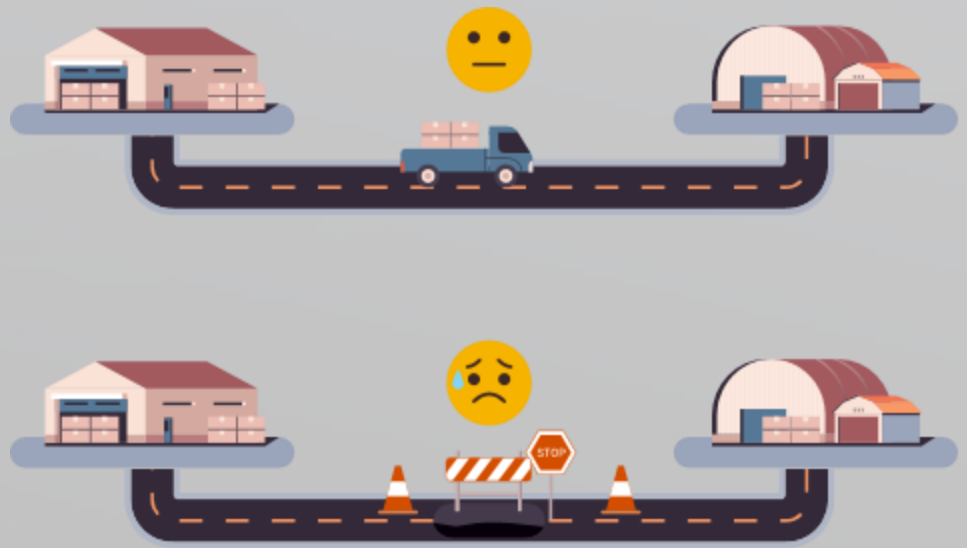
QuTS hero h5.1 supports AES-128-GMAC signing acceleration (only in Windows Server 2022 and Windows 11 clients) that not only greatly increases data signing efficiency over SMB 3.1.1 but also enhances the CPU utilization of the NAS system - providing the best balance of security and performance.

	CMAC	GMAC	
x86			2X Faster

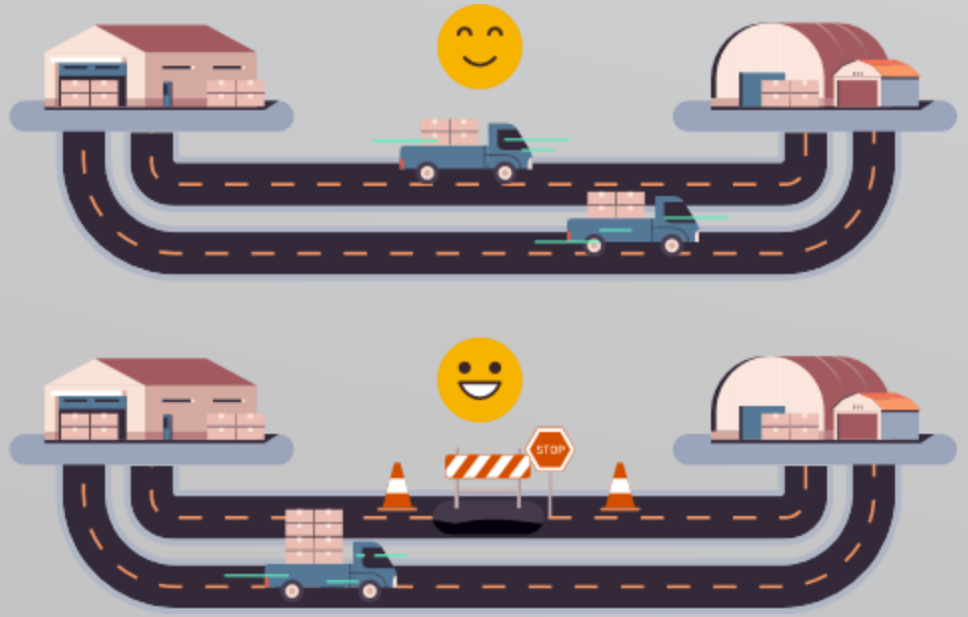
SMB Multichannel for Multiplied Network Performance and Fault-tolerant Connections

A SMB 3 client automatically establishes multiple connections to the SMB server for a single SMB session, and with the multiple connections achieves bandwidth aggregation and network fault tolerance.

Without Multichannel



With Multichannel

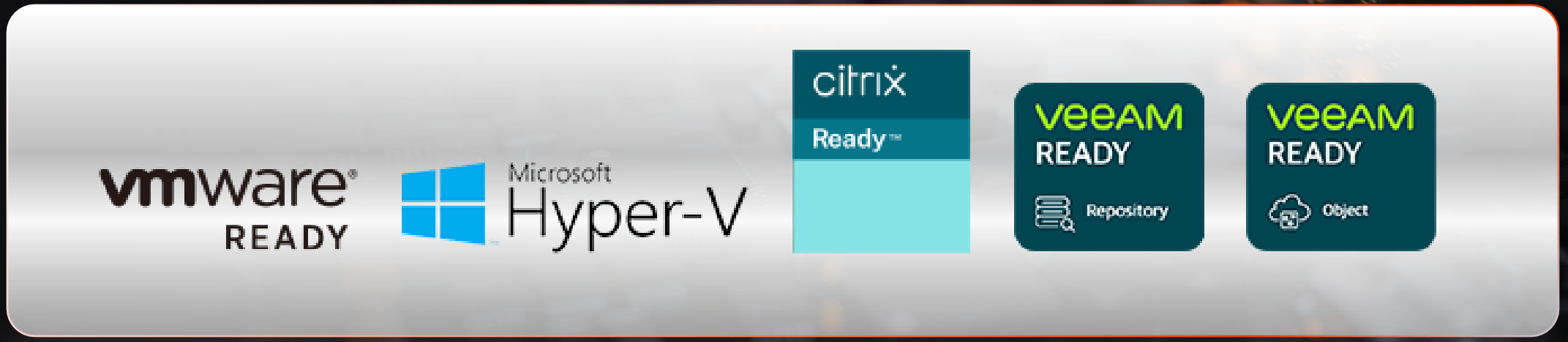


Faster!

Network fault tolerance!

Virtualization Storage Solutions

Virtualization applications significantly enhance the management efficiency and resource availability of enterprise IT. QNAP NAS provides a reliable, high-performance, and cost-effective storage solution for diverse virtualization platforms.

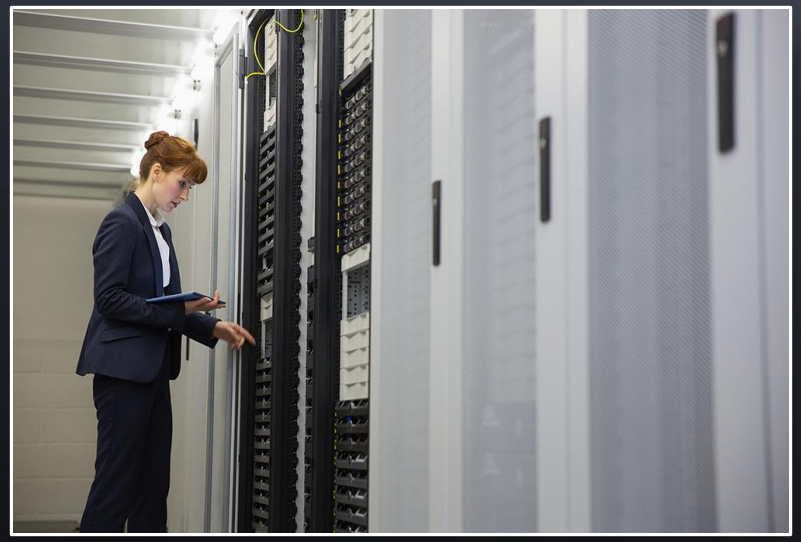


Note: Virtualization certifications are still in progress. The NAS models are expected to be certified by the end of Q1, 2024.

Performance-demanding NAS Applications

Virtualization

In the realm of non-structured data processing, breaking through the performance bottlenecks of I/O-intensive applications, ideal for extensive virtualization environments and Desktop Virtualization (VDI) applications.



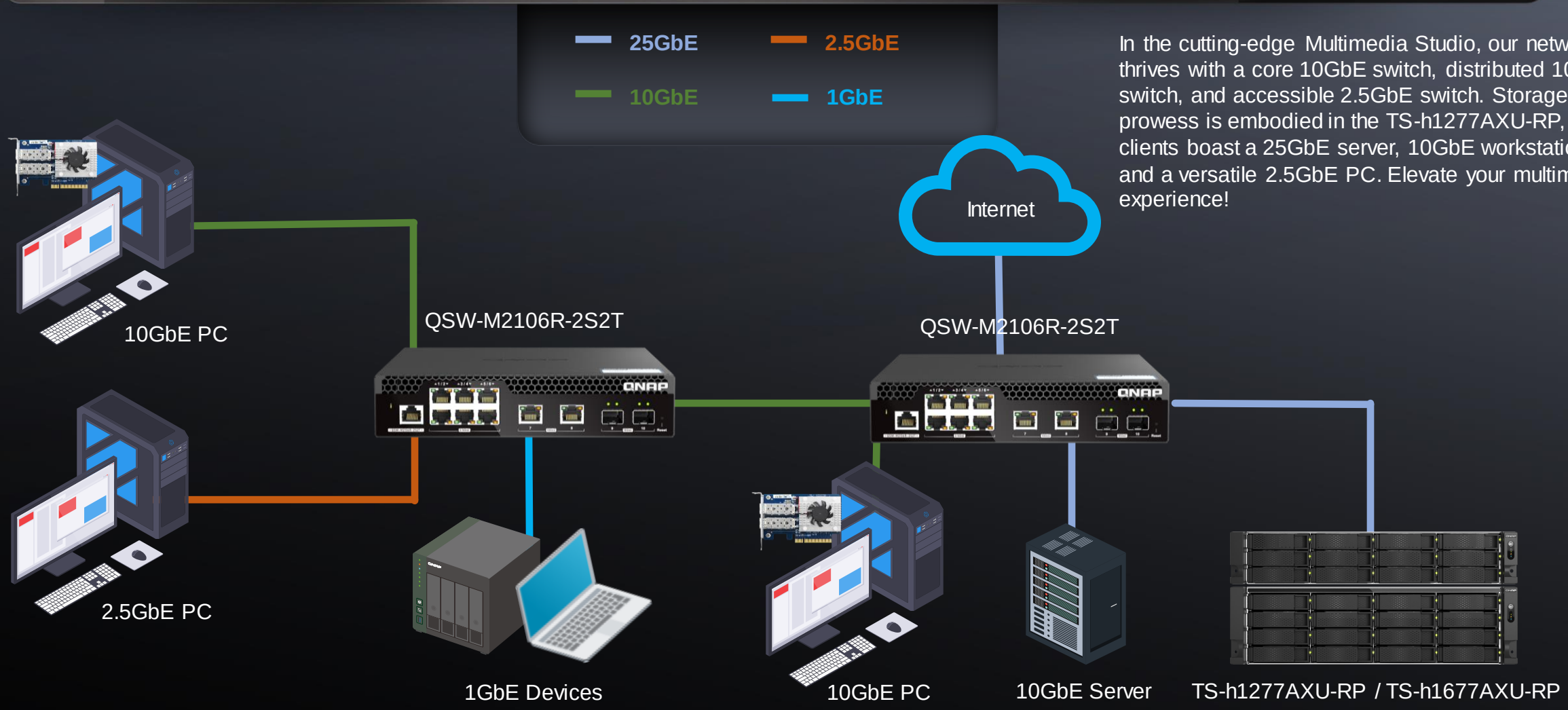
Data Centers

Delivering ultra-low latency and high IOPS performance, providing data centers hosting critical business systems and data with microsecond-level response times.

Media & Entertainment

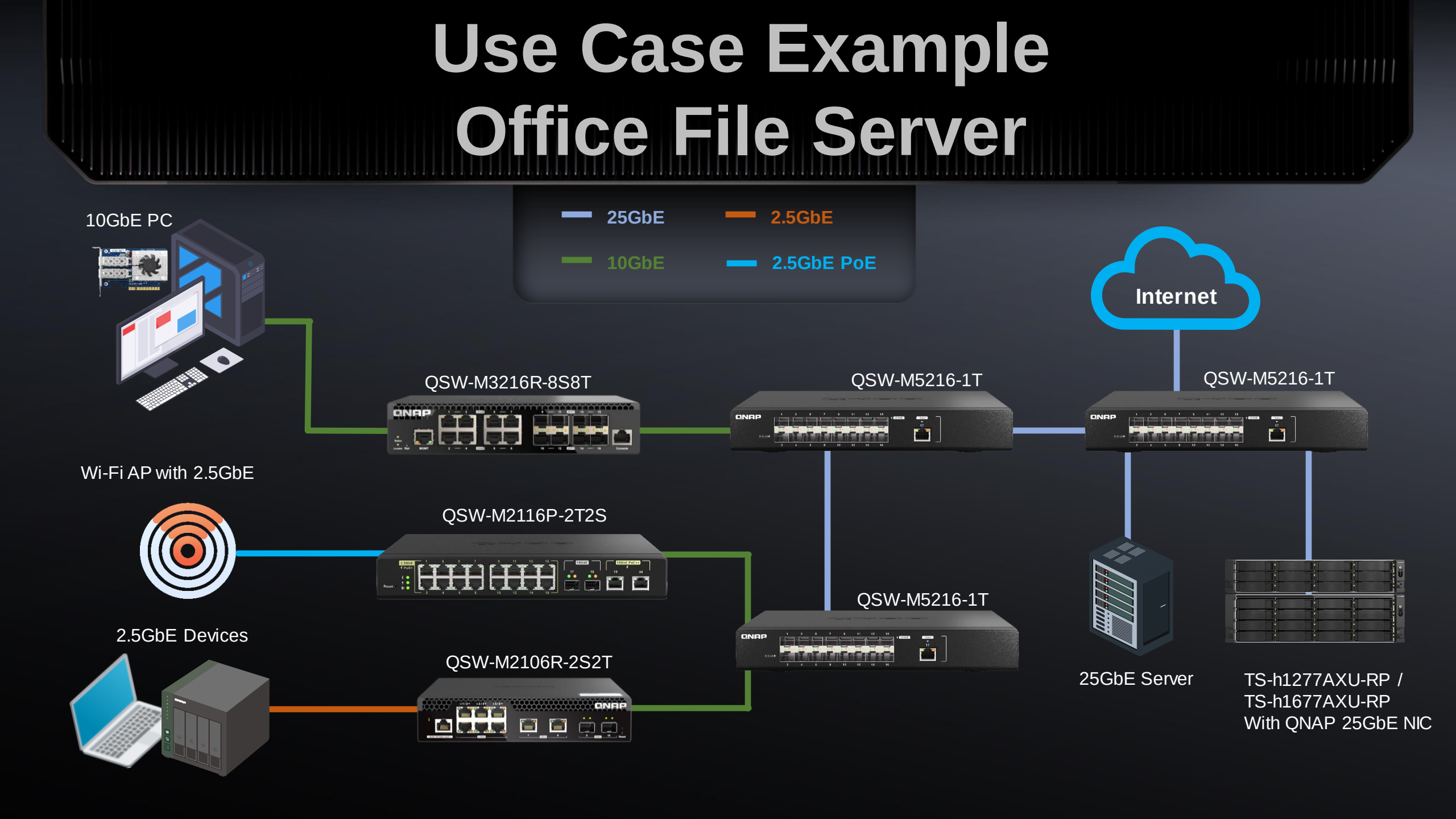
Meeting the demands of seamless 4K/8K media streaming and post-production needs, enhancing efficiency in multimedia workflows through faster data transfer, access, and backup.

Use Case Example
Multimedia Studio

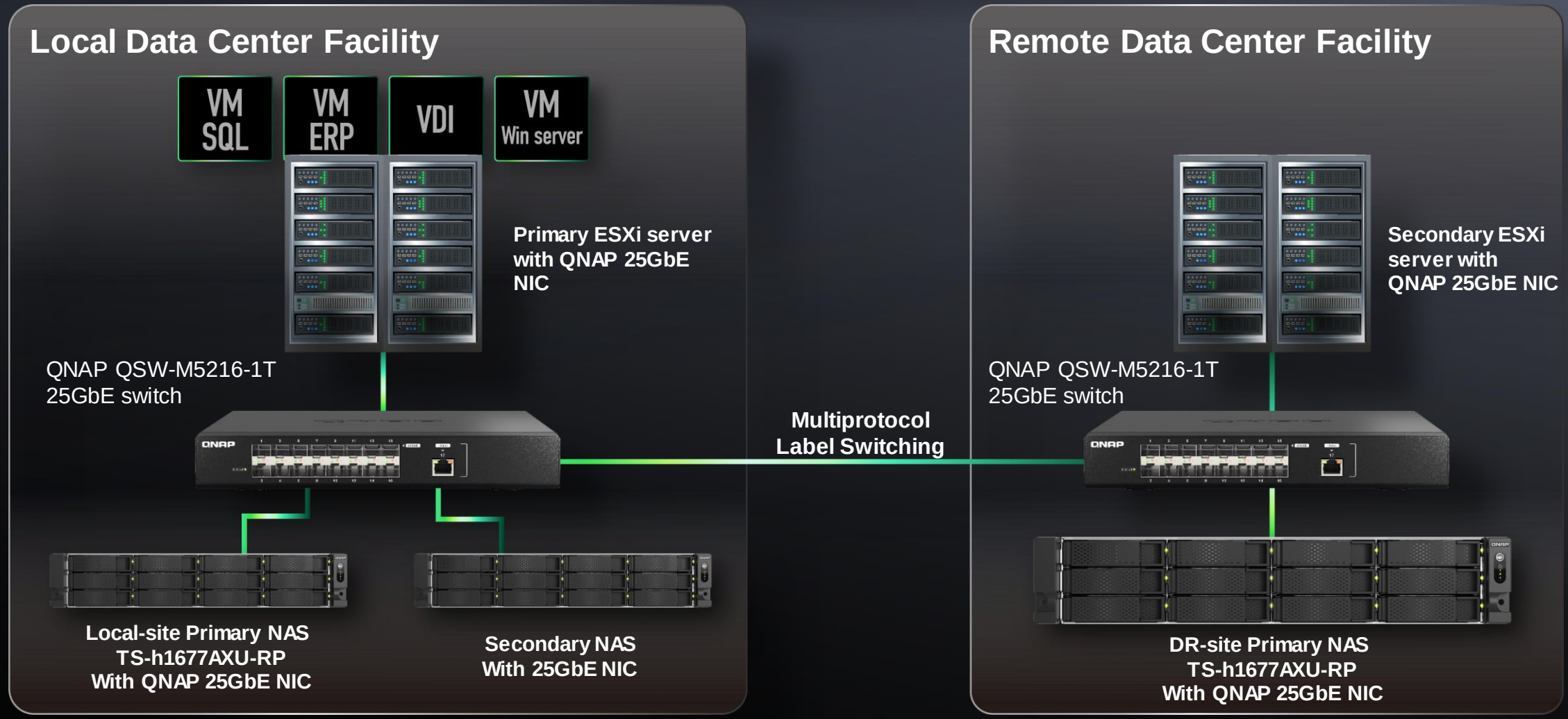


In the cutting-edge Multimedia Studio, our network thrives with a core 10GbE switch, distributed 10GbE switch, and accessible 2.5GbE switch. Storage prowess is embodied in the TS-h1277AXU-RP, while clients boast a 25GbE server, 10GbE workstation, and a versatile 2.5GbE PC. Elevate your multimedia experience!

Use Case Example
Office File Server



Use Case Example
Data Center Remote Redundancy



LIVE DEMO

Standard 5-Year Warranty and Support Services

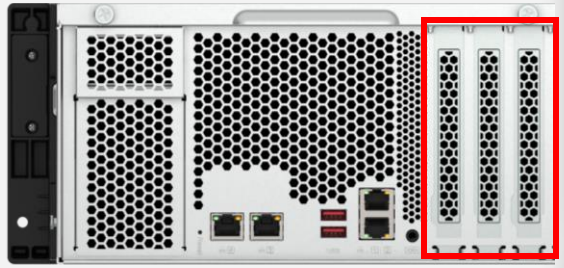
TS-h1277AXU-RP / TS-h1677AXU-RP enterprise NAS models come with an exclusive **5-year** hardware warranty, covering both hardware repairs and support services. QNAP offers this prestigious warranty service to ensure the continuous operation of your business organization and provide uninterrupted services to your customers.

25GbE NIC Ready

QXG-25G2SF-E810

QXG-25G2SF-CX6

3 x PCIe Gen4 expansion slots for Ethernet, FC, storage, and more



Support dual OS (Default is QuTS hero)

QTS

QuTS hero edition

Expand your storage capacity to 3PB+ with additional JBOD

Integrated graphics

AMD RADEON GRAPHICS

AMD RYZEN 7000 SERIES 7

Up to

8 Cores

AMD Ryzen™ 7000 series Processors

TS-hx77AXU

Enterprise 12/16-bay NAS

2 x 10GBASE-T + 2 x 2.5GbE + 2 x USB-A 3.2 Gen 2 10Gbps

vmware READY

Microsoft Hyper-V

citrix Ready

veeam READY Repository

veeam READY Object

Empower your enterprise with an efficient virtualization environment

16GB RAM

32GB RAM

Up to Total **128GB**

3PB up

(TS-h1677AXU-RP support up to 8x TL-R2400PES-RP installed with 22 TB HDD)

Storage capacity

Faster!

DDR5

Unleash performance with over 4800MT/s UDIMM, optional ECC support

Turbocharge your workflow with support for 2 x PCIe Gen5 x2 M.2 2280 NVMe SSDs

STANDARD 5 YEAR WARRANTY

Standard 5-Year Warranty

QNAP

TS-h1277AXU-RP
TS-h1677AXU-RP

12-bay / 16-bay ZFS Enterprise Rackmount NAS

Cost Effective.
Endless Possibilities.