

QNAP

TS-x77XU

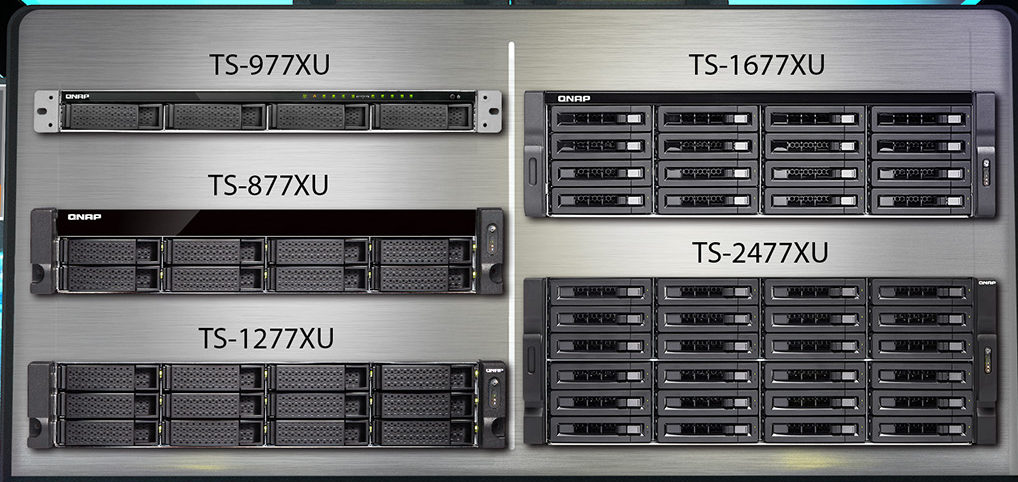
REBORN

AMD

Ryzen™ 3 1200

Ryzen™ 5 2600

Ryzen™ 7 2700



New to the Ryzen NAS Family

New

TS-x77XU rackmount NAS

2 x SFP+ 10G Mellanox CX4
SmartNIC



TS-2477XU-RP



TS-1677XU-RP



TS-1277XU-RP



TS-877XU
TS-877XU-RP



TS-977XU
TS-977XU-RP

2 x 10GBASE-T

TS-x77 desktop NAS



TS-1677X



TS-1277



TS-877



TS-677

TS-x77XU Reborn



Ryzen 1700

- # of CPU Cores: 8
- # of Threads: 16
- Max Boost Clock: 3.7 GHz
- Base Clock: 3 GHz
- Default TDP / TDP: 65 W

Ryzen 2700

- # of CPU Cores: 8
- # of Threads: 16
- Max Boost Clock: **4.1 GHz**
- Base Clock: **3.2 GHz**
- Default TDP / TDP: 65 W



Ryzen 1600

- # of CPU Cores: 6
- # of Threads: 12
- Max Boost Clock: 3.6 GHz
- Base Clock: 3.2 GHz
- Default TDP / TDP: 65 W

Ryzen 2600

- # of CPU Cores: 6
- # of Threads: 12
- Max Boost Clock: **3.9 GHz**
- Base Clock: **3.4 GHz**
- Default TDP / TDP: 65 W

Coming Soon

8-bay



TS-877XU-RP-2600-8G

Ryzen 5 2600, 8GB RAM (2x 4GB)

TS-877XU-1200-4G

Ryzen 3 1200, 4GB RAM (1x 4GB)

TS-877XU-RP-1200-4G

Ryzen 3 1200, 4GB RAM (1x 4GB)

12-bay



TS-1277XU-RP-2600-8G

Ryzen 5 2600, 8GB RAM (2x 4GB)

TS-1277XU-RP-1200-4G

Ryzen 3 1200, 4GB RAM (1x 4GB)

16-bay



TS-1677XU-RP-2700-16G

Ryzen 7 2700, 16GB RAM (2x 8GB)

TS-1677XU-RP-1200-4G

Ryzen 3 1200, 4GB RAM (1x 4GB)

TS-1677XU-RP-2600-8G

Ryzen 5 2600, 8GB RAM (2x 4GB)

QNAP
TS-x77XU
« REBORN »

Complete product portfolio – 1U 9-bay

Single PSU
250W

Redundant PSU
2 x 300W



TS-977XU-1200-4G
Ryzen 3 1200, 4GB RAM (1x 4GB)



TS-977XU-RP-1200-4G
Ryzen 3 1200, 4GB RAM (1x 4GB)



TS-977XU-RP-2600-8G
Ryzen 5 2600, 8GB RAM (2x 4GB)



9-bay

Ready on Sep.- Oct.

5 x **SSD** (inside)
4 x **HDD**



QNAP
TS-x77XU
« REBORN »

Complete product portfolio – 4U 24-bay

Redundant PSU
2 x 800W



TS-2477XU-RP-2600-8G

Ryzen 5 2600, 8GB RAM (2x 4GB)



TS-2477XU-RP-2700-16G

Ryzen 7 2700, 16GB RAM (2x 8GB)

24-bay

Ready on Sep.- Oct.

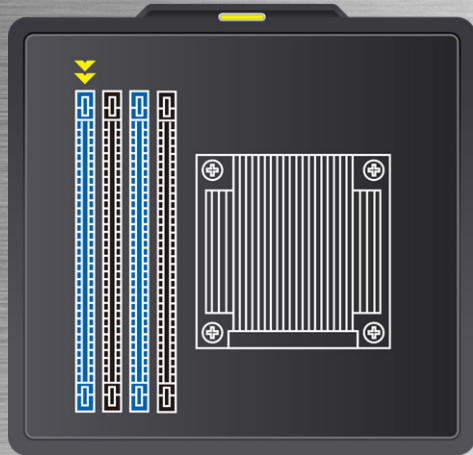


Supports up to 64 GB Memory

- Supports Dual-channel and Long-DIMM x4
- Installing memory in pair to take advantage of dual-channel

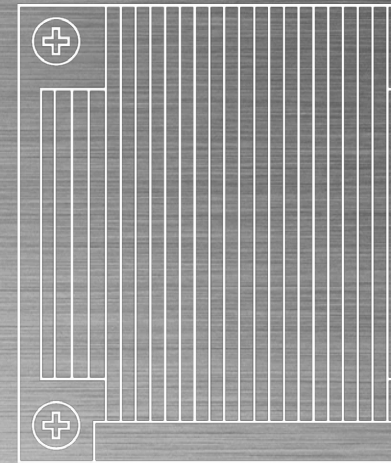
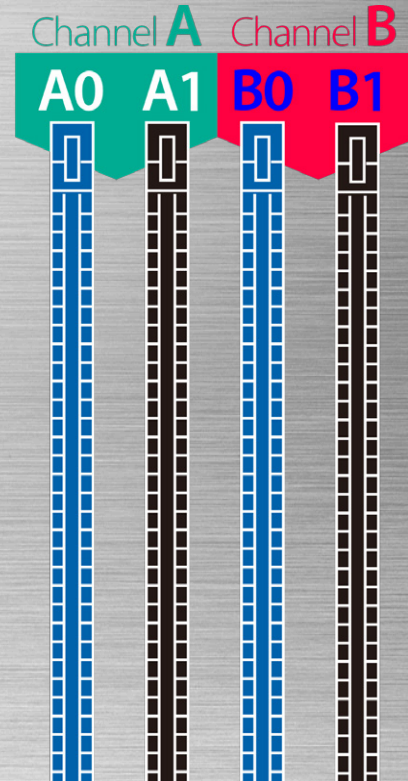
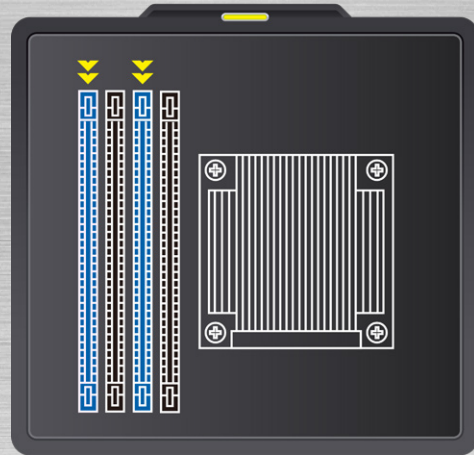
One module

Install in **A0** slot



Two modules

Install in **A0** and **B0** slots




TS-x77XU Memory Accessories

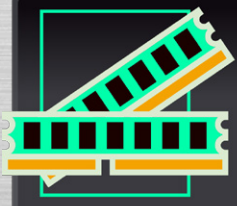
Ordering P/N	Specification
RAM-4GDR4A1-UD-2400	DDR type: DDR4(288PIN) Capacity: 4 GB Manufacturer: ADATA Frequency: DDR4-2400 Manufacturer P/N: AD4U2400W4G17-BSSZ
RAM-8GDR4A1-UD-2400	DDR type: DDR4(288PIN) Capacity: 8 GB Manufacturer: ADATA Frequency: DDR4-2400 Manufacturer P/N: AD4U240038G17-BSSZ
RAM-16GDR4A1-UD-2400	DDR type: DDR4(288PIN) Capacity: 16 GB Manufacturer: ADATA Frequency: DDR4-2400 Manufacturer P/N: AD4U2400316G17-BSSZ

Customized Memory


- High memory NAS for your project
- 16 GB, 32GB or 64GB for each SKUs



(4GB x 4)
16 GB



(8GB x 4)
32 GB



(16GB x 4)
64 GB



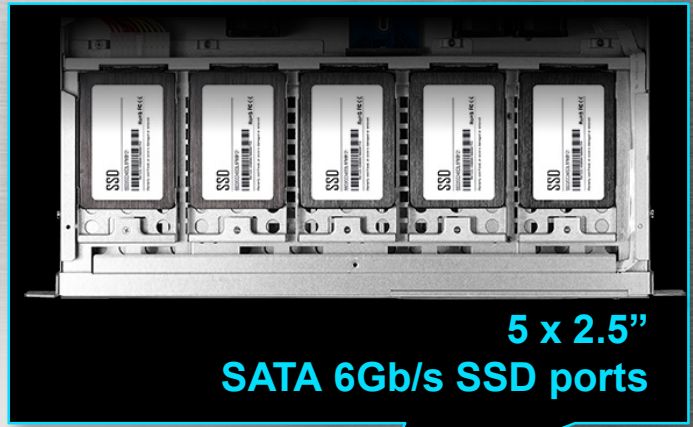
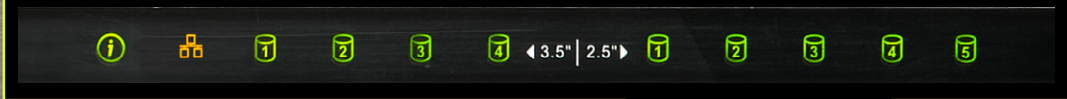
CTO SKUs
have longer lead time

QNAP
TS-x77XU
« REBORN »

TS-x77XU
Hardware
Introduction

Enjoy Qtier and SSD cache in a 1U NAS

LED indicators:
System status, network, disks

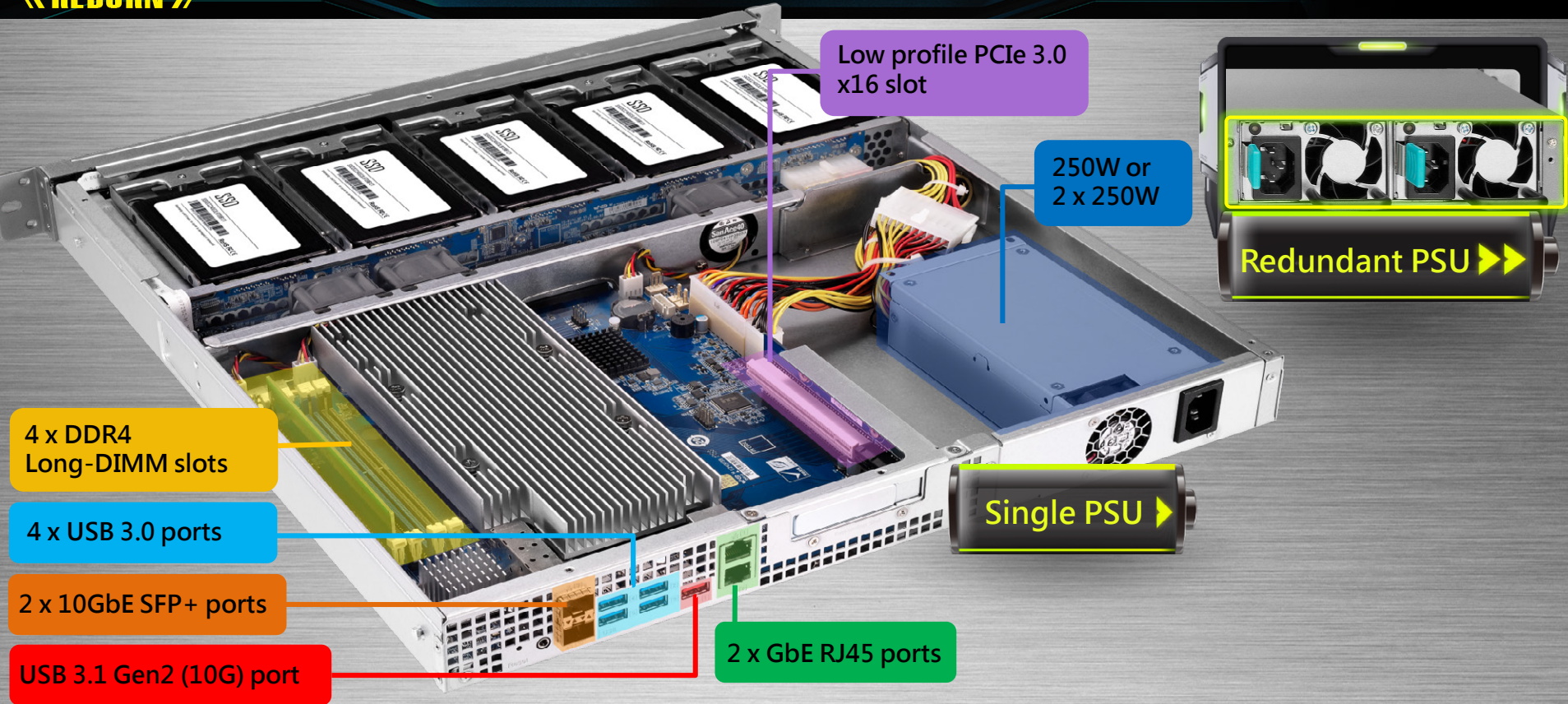


5 x 2.5\"
SATA 6Gb/s SSD ports



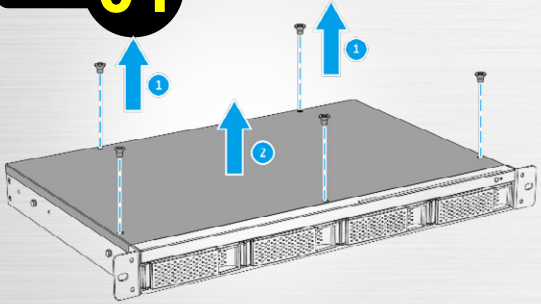
4 x 3.5\"SATA 6Gb/s HDD/SSD ports

1U TS-977XU/TS-977XU-RP rear view

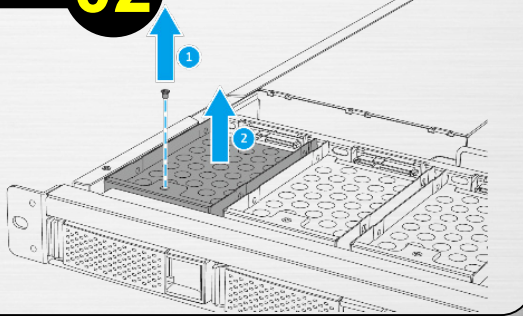


TS-977XU SSD Installation

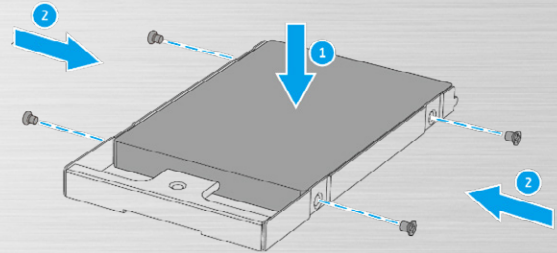
STEP 01



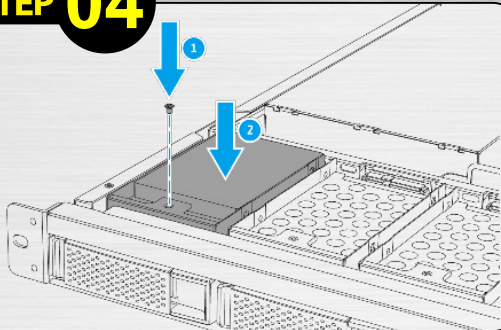
STEP 02



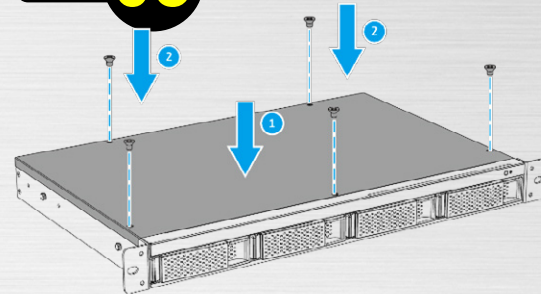
STEP 03



STEP 04



STEP 05



2/3/4U TS-x77XU Front View

24/ 16/ 12/ 8 x 3.5" SATA 6Gb/s HDD/SSD Ports

TS-1277XU / TS-1277XU-RP



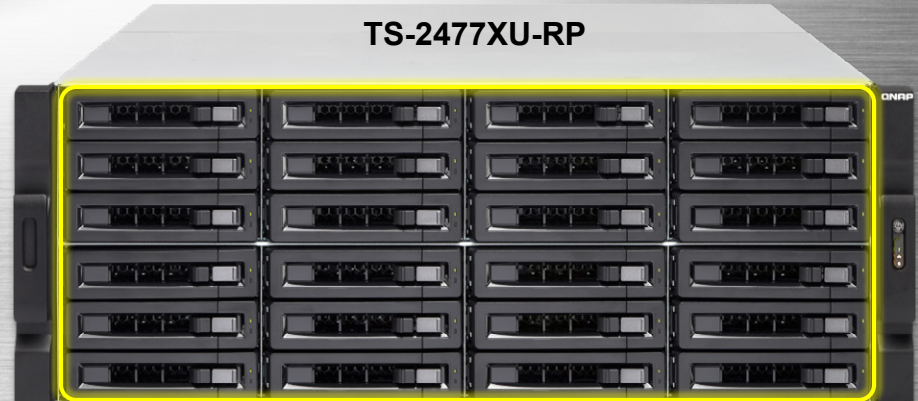
TS-877XU / TS-877XU-RP



TS-1677XU / TS-1677XU-RP



TS-2477XU-RP



2/3/4U TS-x77XU Front View

2U



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

3U



4U

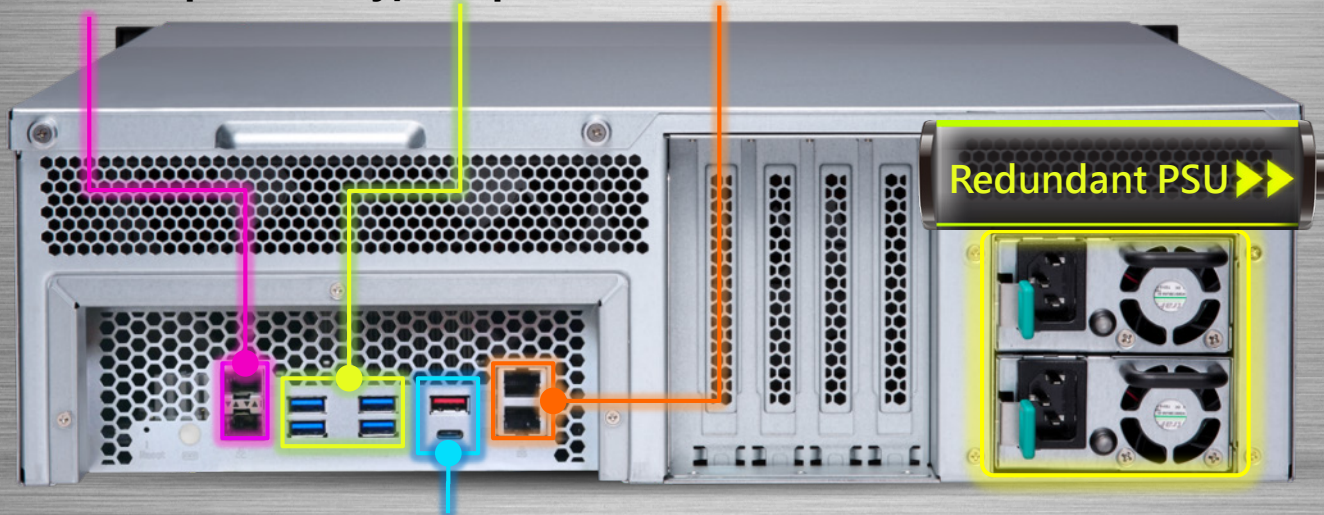


2/3/4U TS-x77XU Rear View

2 x 10Gb SFP+
SmartNIC ports

4 x USB 3.0
Type-A ports

2 x 1Gb
Network ports



USB 3.1 Gen2 (10G) Type-A & Type-C ports

8-bay
Single
PSU



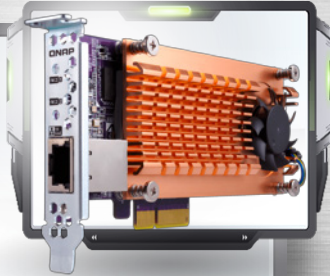
Redundant PSU

24-bay
Redundant
PSU



Industry-leading PCIe expansion options

QM2 provides 10GBASE-T port and/or M.2 SSD slots for SSD cache or Qtier tiered storage for optimized storage performance.



40GbE/10GbE and wireless network expansion cards provide high bandwidth, low latency, or wireless AP functionality.



USB 3.1 Gen 2 expansion cards provide 10Gb/s for external USB devices. Type-A port is also backward compatible with USB 3.0/2.0 devices.



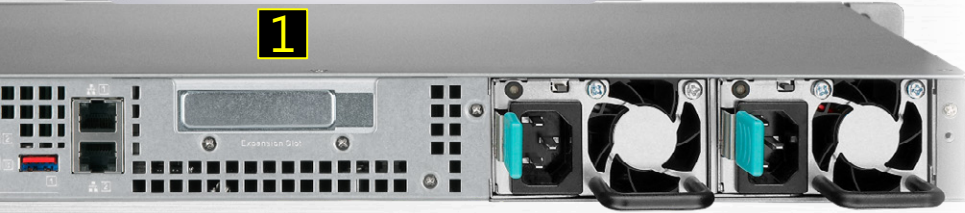
SAS expansion cards are for adding support of REXP expansion units for up to 40 additional SAS/SATA drives.



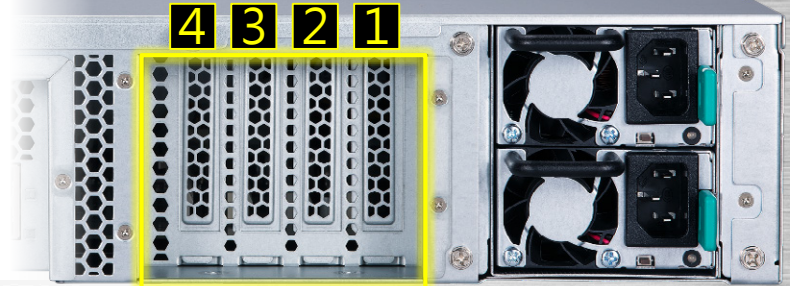
TS-x77XU PCIe slots

1/2U: : low profile

1



4 3 2 1

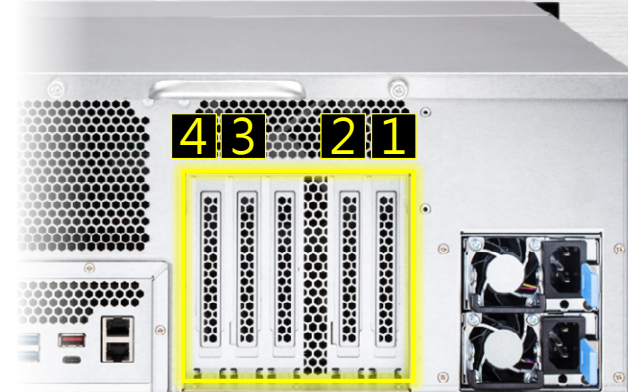


3/4U: full height

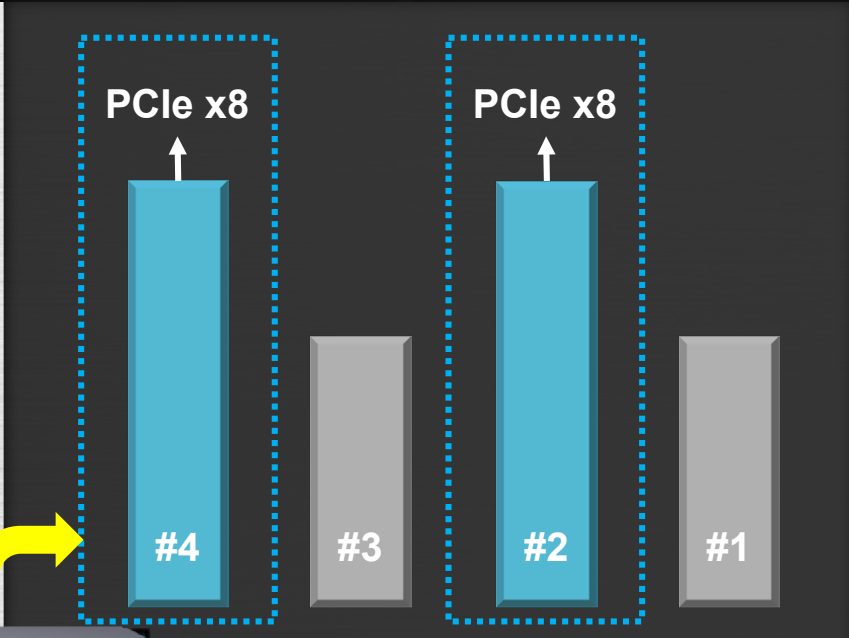
4 3 2 1



4 3 2 1



Flexible PCIe Allocation (2/3U)



2 x PCIe x8 slot (CPU)

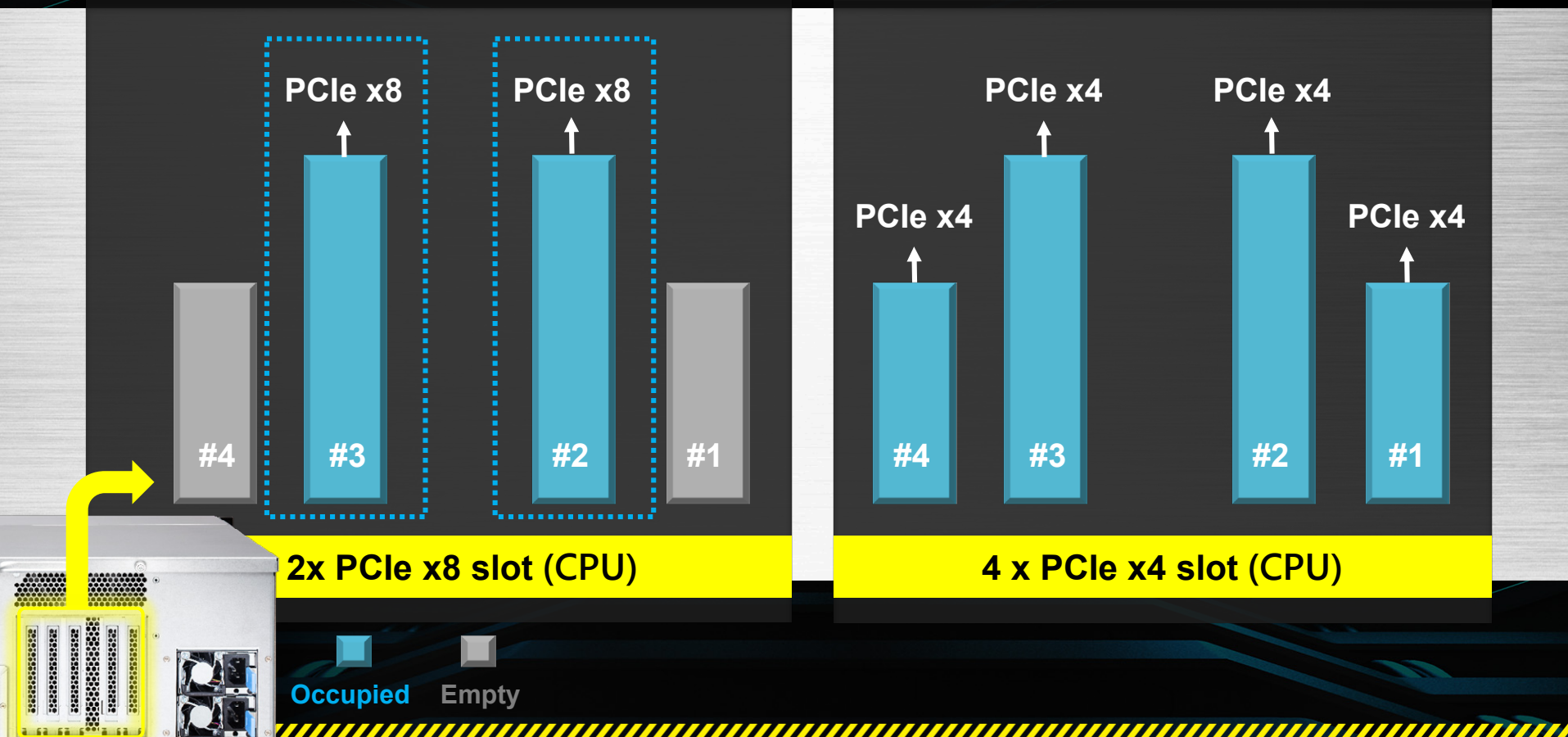


4 x PCIe x4 slot (CPU)



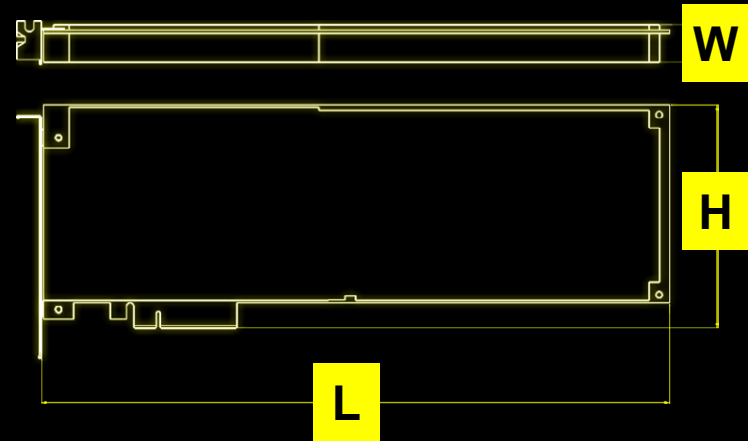
Occupied Empty

Flexible PCIe Allocation (4U)



GPU card slots and supported dimensions

	Slot	size W x H x L (mm)
TS-877XU TS-877XU-RP	Slot 2	37 x 68.9 x 214
	Slot 4	37 x 68.9 x 214
TS-1277XU TS-1277XU-RP	Slot 2	37 x 68.9 x 214
	Slot 4	37 x 68.9 x 214
TS-1677XU TS-1677XU-RP	Slot 2	38.5 x 111 x 214
	Slot 4	38.5 x 111 x 214
TS-2477XU-RP	Slot 2	55 x 138 x 312
	Slot 3	55 x 138 x 312



Do more with graphics cards

3/4U NAS 500W+ power supply »

Support full-high GPU card which required external power



TS-1677XU-RP



2U NAS 250W/300W power supply »

Support half-high GPU card and required no external power: NVIDIA GT1030, etc.

Add-on GPU Card Applications



AI
Computing
Acceleration

QTS/vQTS
Computing
Acceleration

**Virtualization
Station**
GPU Passthrough

Ride the AI wave with "QuAI"

QNAP QuAI

▶▶ AI Developer Package



QuAI is intended for data scientists and developers to quickly build, train, and optimize their AI models on QNAP NAS.



AI



QNAP NAS



GPU accelerated
computing



QuAI



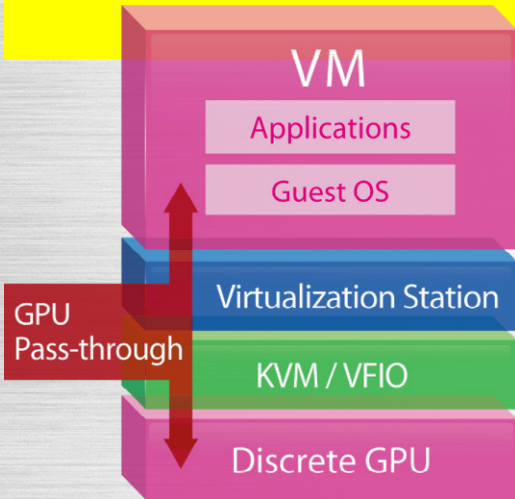
Smooth Video Experience

- Virtualization Station
- HybridDesk Station, Linux Station
- QVR Pro Client (HD Station)
- Video Station
- Plex Media Server

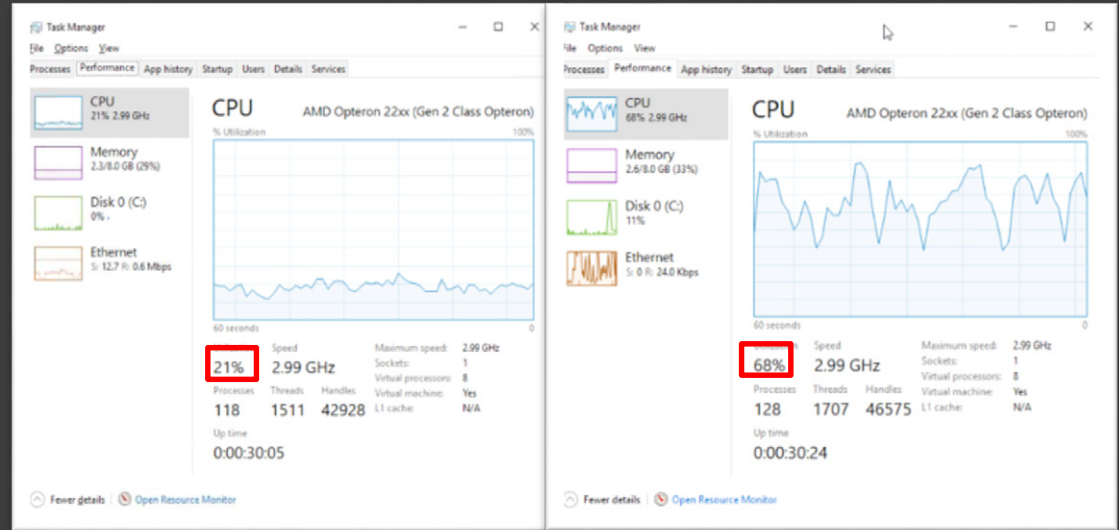


GPU boosts image/video processing

For OpenGL & DirectX applications



H/W accelerated with GPU to lower CPU usage.



w/ GPU



w/o GPU

Tool-less rail kit

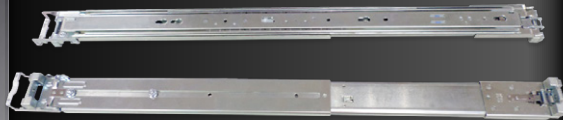
RAIL-B02



Supported NAS:
TS-877XU/1277XU

Max. Load: **20** kg

RAIL-A03-57



Supported NAS:
TS-1677XU

Max. Load: **57** kg

RAIL-A02-90



Supported NAS:
TS-2477XU

Max. Load: **90** kg

QNAP
TS-x77XU
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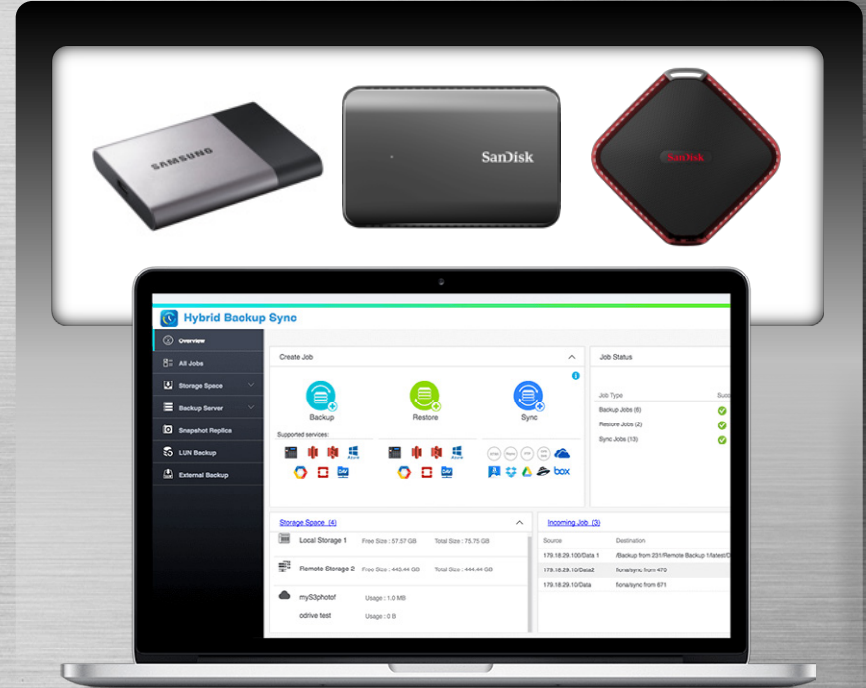
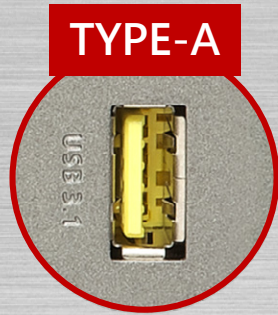
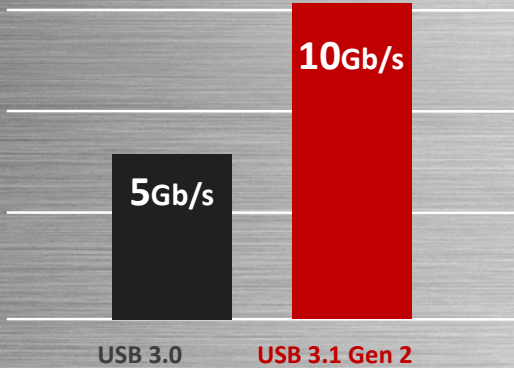
Hardware upgrade made easy

Pull it out and lift
up the cover



More Efficient Backup with USB 3.1 Gen 2

2X USB 3.1
SPEED UP



Super high capacity surveillance



Surveillance Station 5.1

Default: **8 free channels**
Max: 80 CH (optional license)



QVR Pro

Default: **8 free channels**
Max: 128 CH (optional license)

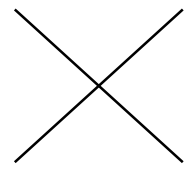


QUSBCam2

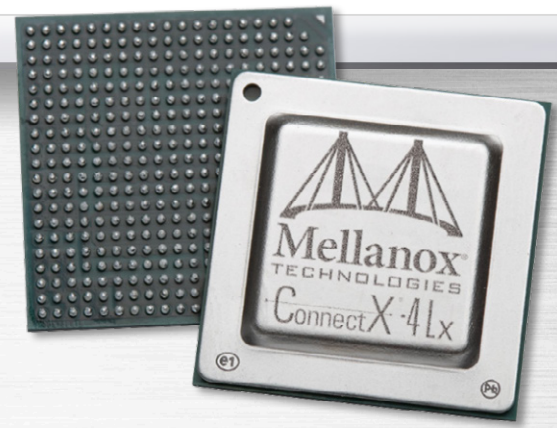
Up to 1080p USB Webcam recording



10GbE SmartNIC with offload function

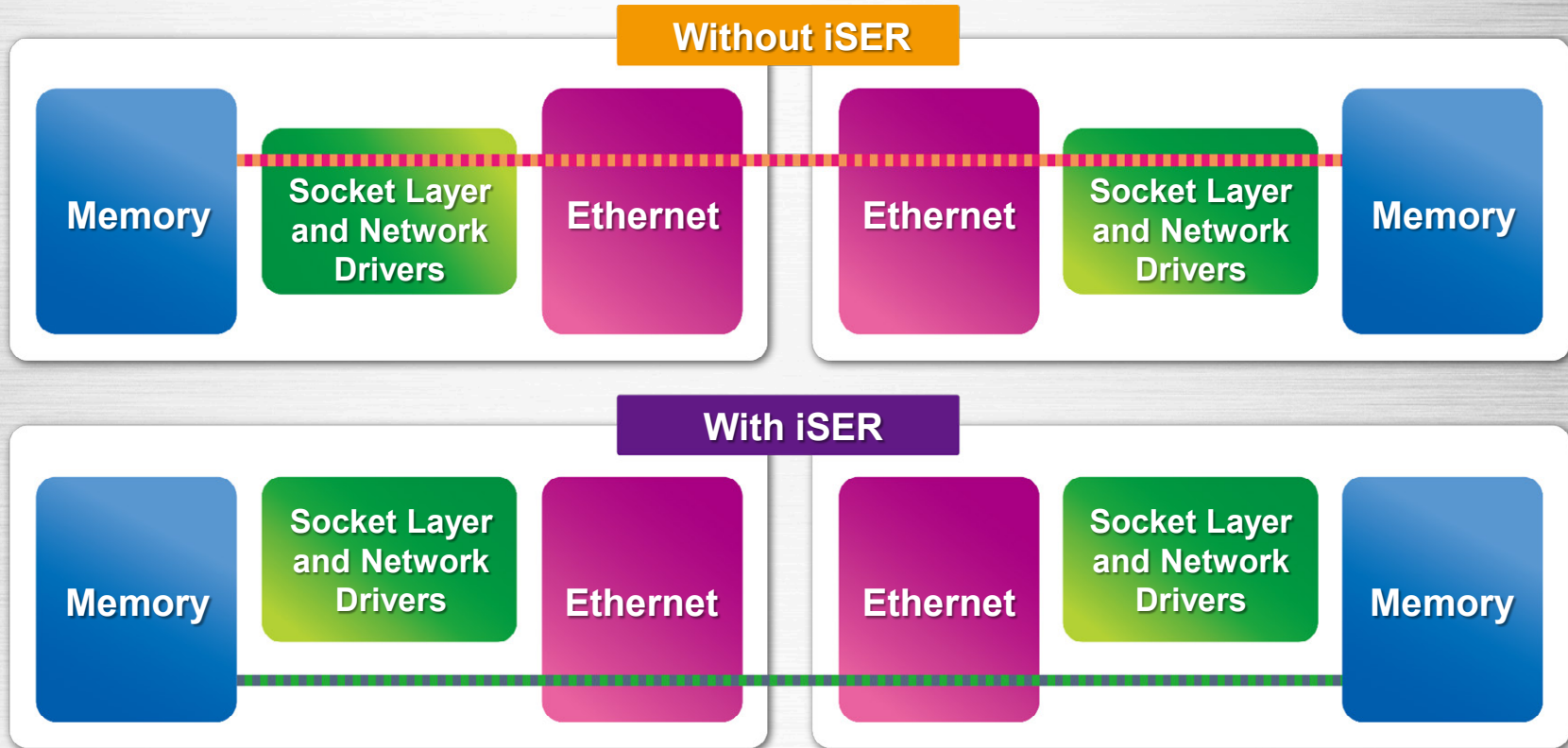


- **Built-in Mellanox ConnectX-4 Lx 10GbE SmartNIC**
- **Supports iSER**



Offload tasks from CPU with iSER

iSER (iSCSI Extension for RDMA)



Comes with two 10GbE Ports

Tested in QNAP Labs. Figures may vary by environments.

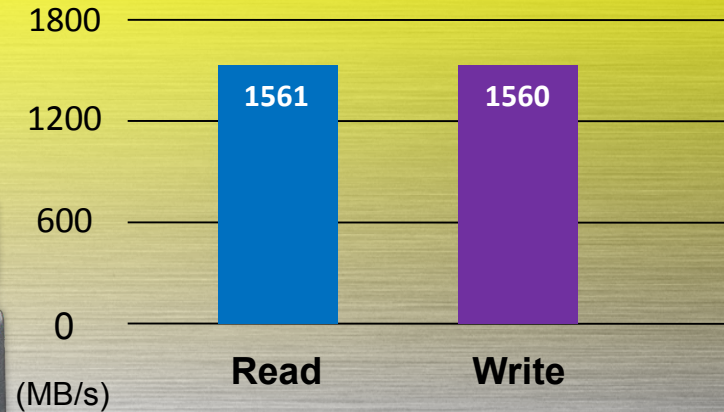
Test environment:

NAS: TS-1677XU-1700-16G with QTS 4.3.4

Volume type: RAID 5; 16 x Intel S3500 240GB SSDs (SSDSC2BB240G4)



10GbE x 2 (Sequential)



QNAP
TS-x77XU
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Virtual QTS

↓
vQTS

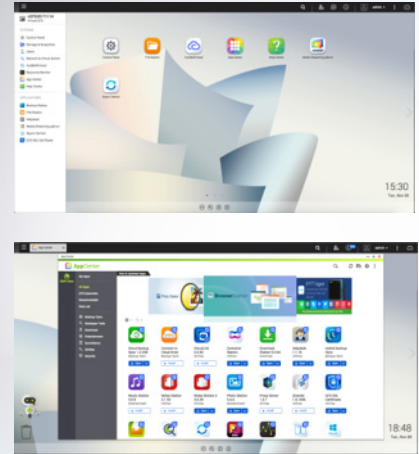
One-for-many

Running vQTS via Virtualization Station

**Conventional VM:
Windows, Linux, UNIX**



Virtual QTS - vQTS

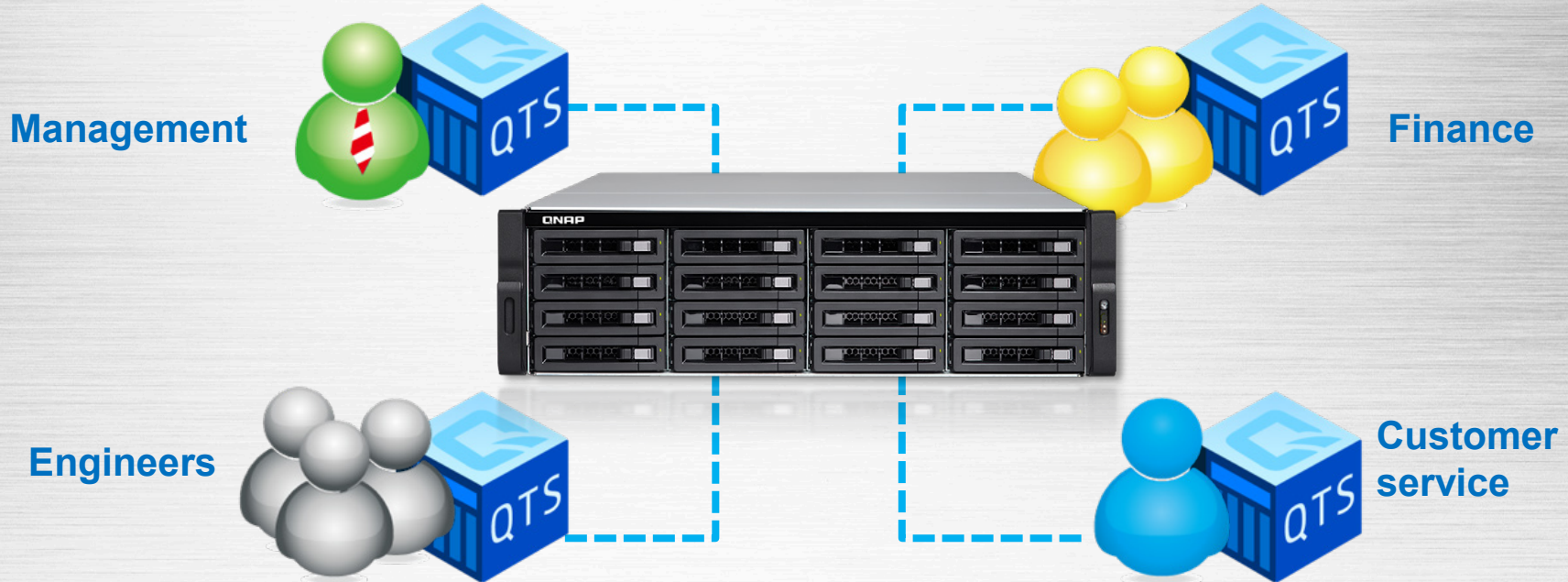


**Virtualization
Station**



One-for-many

It allows IT admins to flexibly allocate system resources to different departments or groups for different privileges and applications.



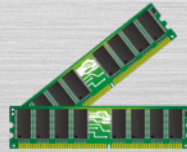
Dedicated resource allocation

Allocation of dedicated HW resources

(CPU, RAM, storage space, and Internet) ensures performance quality.



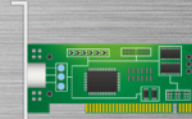
Quad-core



4 GB



250 GB



1

Octa-core

8 GB

500 GB

2



The best platform for vQTS

Numbers of allowed vQTS instances are based on the numbers of cores of the physical CPU.



AMD Ryzen™ 5 2600 6-core =



AMD Ryzen™ 7 2700 8-core =



QTS & virtualization increase productivity

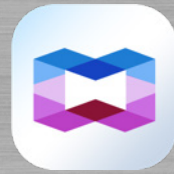
NEW

QTS 4.3.5
Storage & Snapshot Manager, and new virtualization network functions

Supports Windows/Linux VMs and containers



Virtualization Station



Container Station

QNAP
TS-x77XU
« REBORN »

Double the ROI of
purchasing SSDs

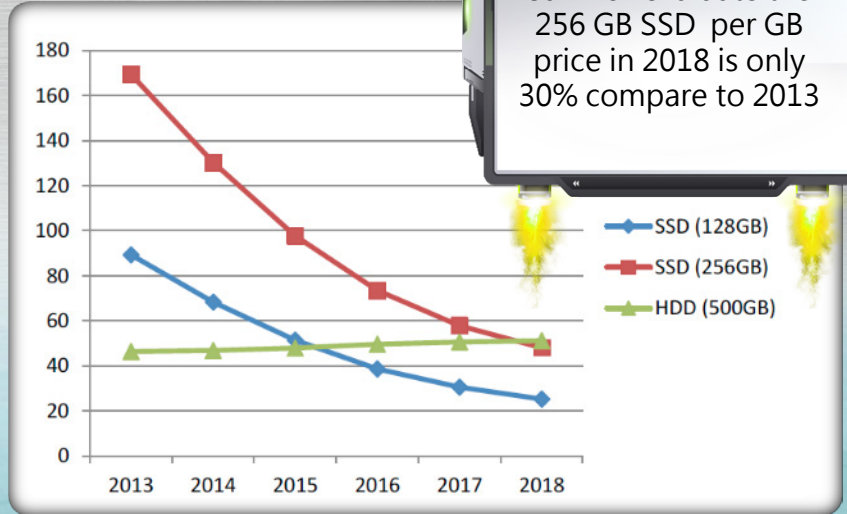
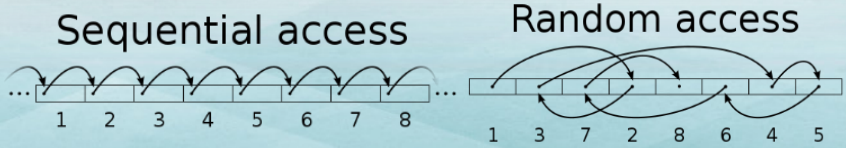
QTS 4.3.5

SSD Over-provisioning, Snapshot Remote Restore

SSD Usage In Network Attach Storage

- SSD can provide high random IOPS for multi-clients sync and business applications that can not be achieved by HDD.
- In 2018, SSD price also comes close to the sweet spot.
- Besides choosing the right SSD, you should also choose right NAS!

Drive Type	Sequential Access (MB/s)	Random Access (IOPS)
HDD	100	350
SSD	300	60000



<https://www.sandisk.com/business/datacenter/resources/white-papers/the-ssd-enabled-pc-total-cost-of-ownership>

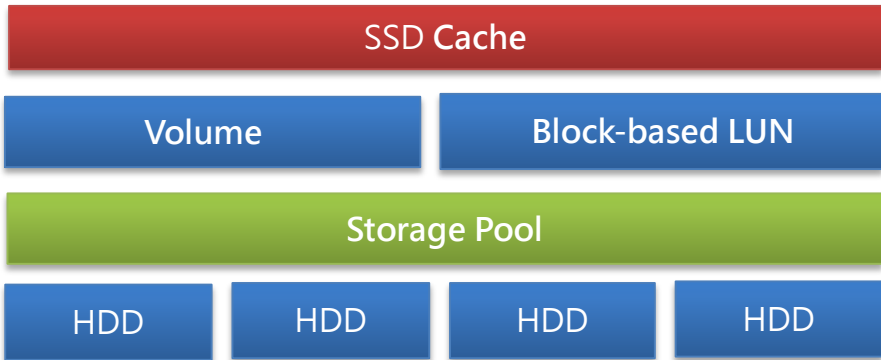
SanDisk's Statistic for Global SSD/HDD Price Trend

QNAP SSD Global Cache and Qtier

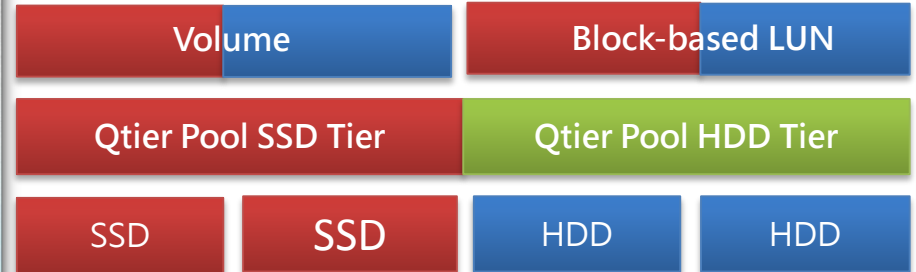
IT manager can have different SSD configurations with TS-x77XU

- For real-time performance boost, deploy SSD Global Cache or All flash storage
- For continued data tiering between hot and cold data, deploy the Hybrid Storage Qtier™ Auto Tiering

SSD Cache let all data enter cache and read hot data from the storage in real time

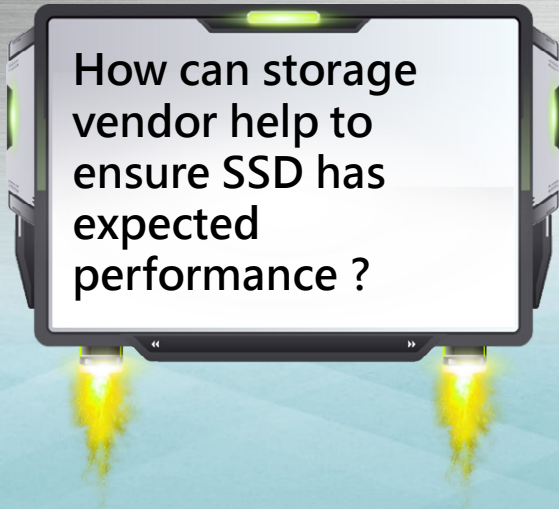


Qtier utilizes SSD space and let data block be reallocated based on hot or cold in the storage

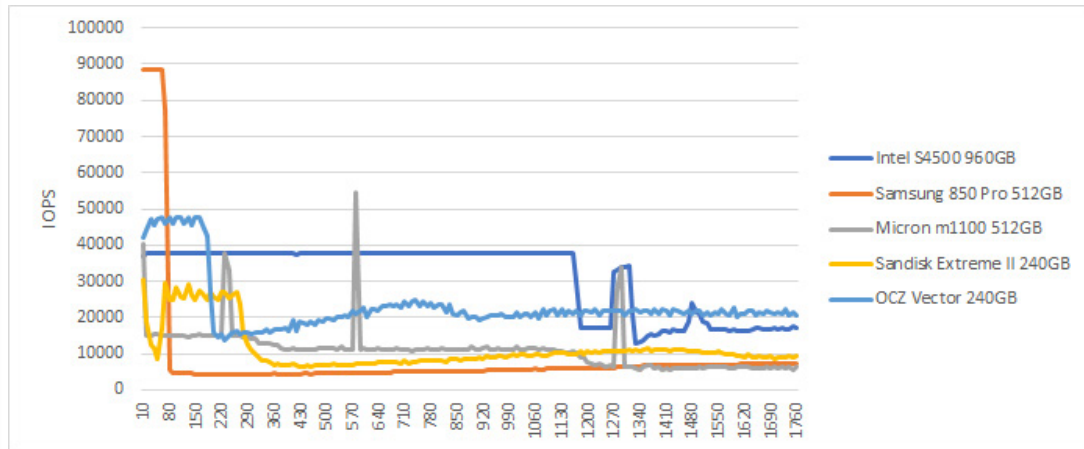


Different SSD has Different Performance!

- SSD Write amplification cause performance degradation
- In QNAP Lab, engineer use FIO to test different SSD, and all SSD have showed consisted write performance degrade.
- Different SSD's controller and Garbage Collection Algorithm will effect the long term performance



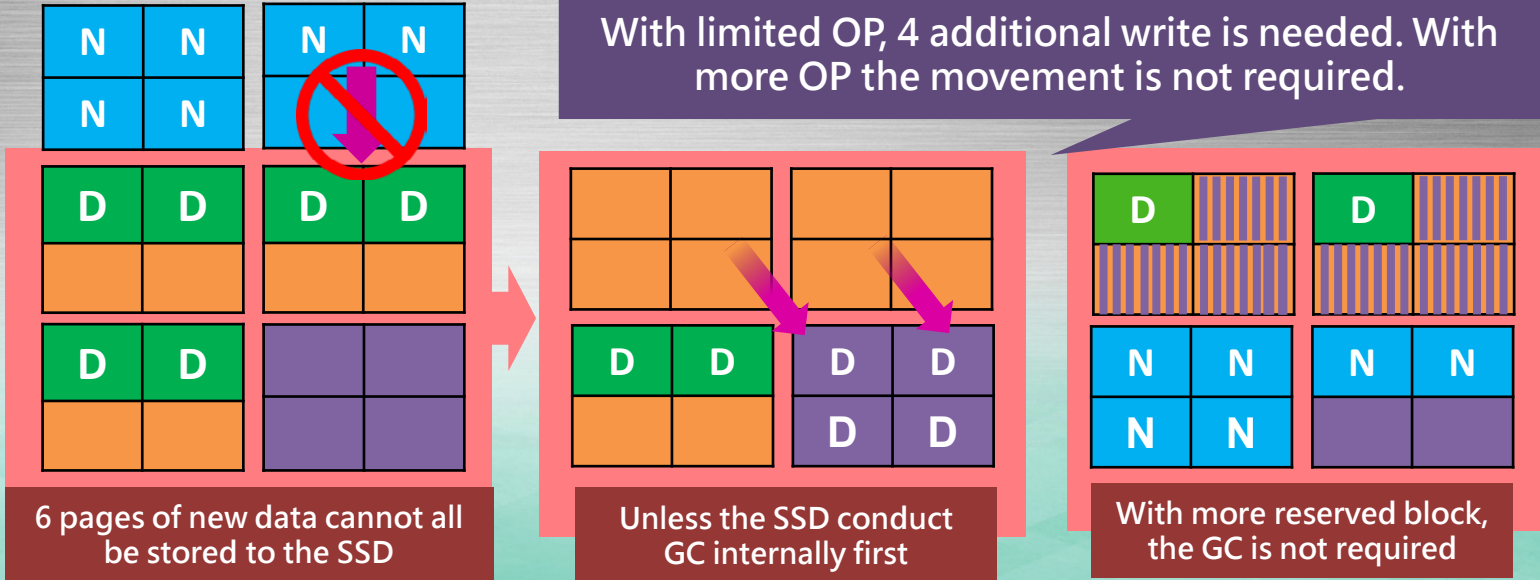
Different SSD in QNAP NAS's FIO consisted performance (IOpattern: RW-4K):



What is SSD Over-provisioning

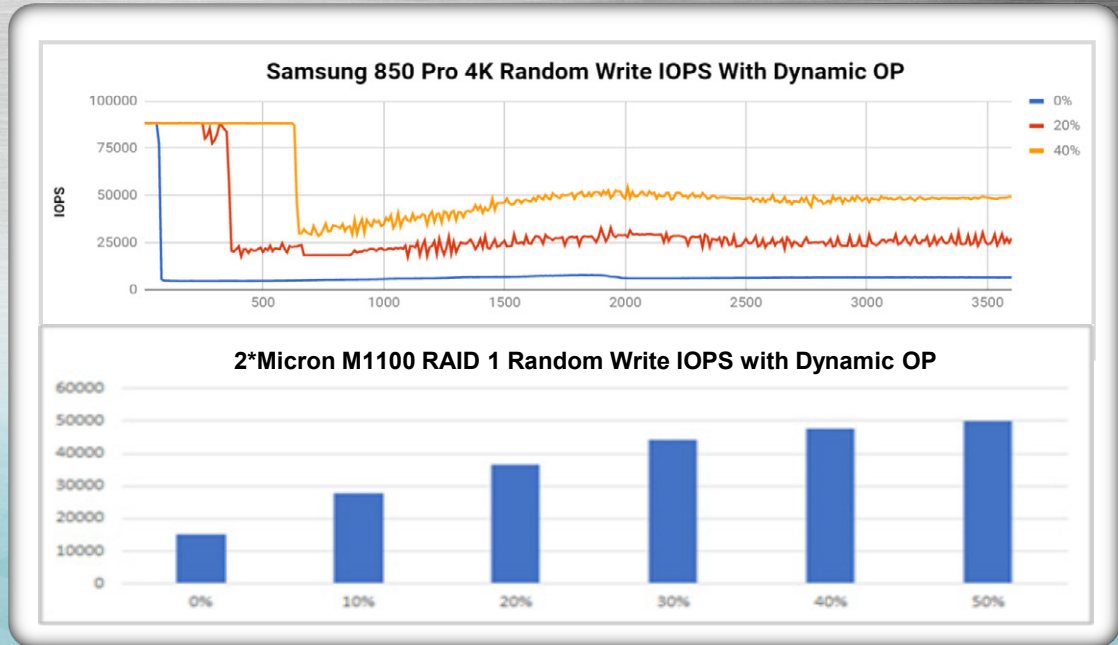
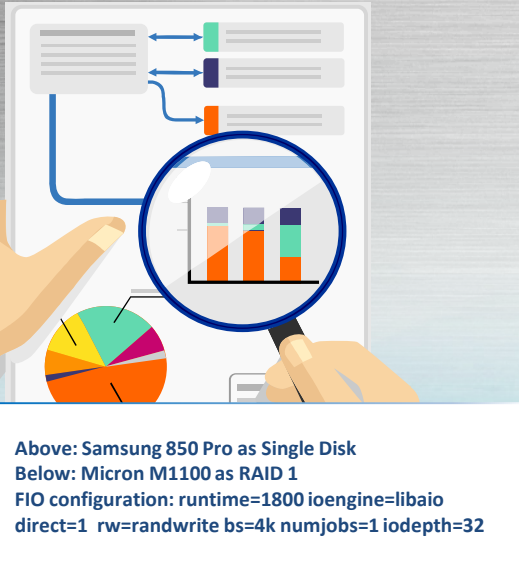
- SSD Over-provisioning reserves space in the SSD to decrease write amplification & increase consisted performance and endurance.
- Reason: to avoid Garbage Collection in any giving point of time

N	New D
D	Valid D
Invalid D	Invalid D
OP	OP
OP	OP



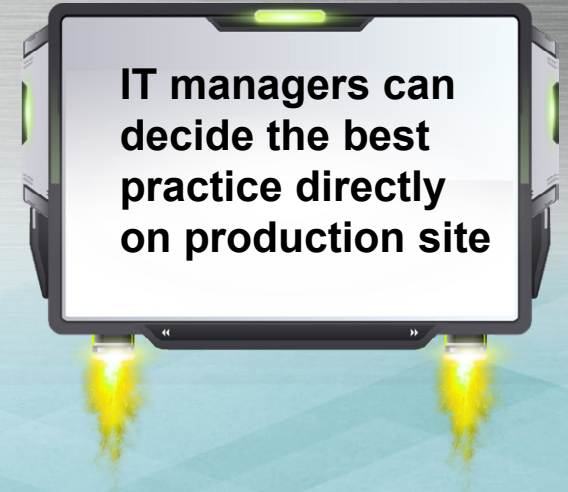
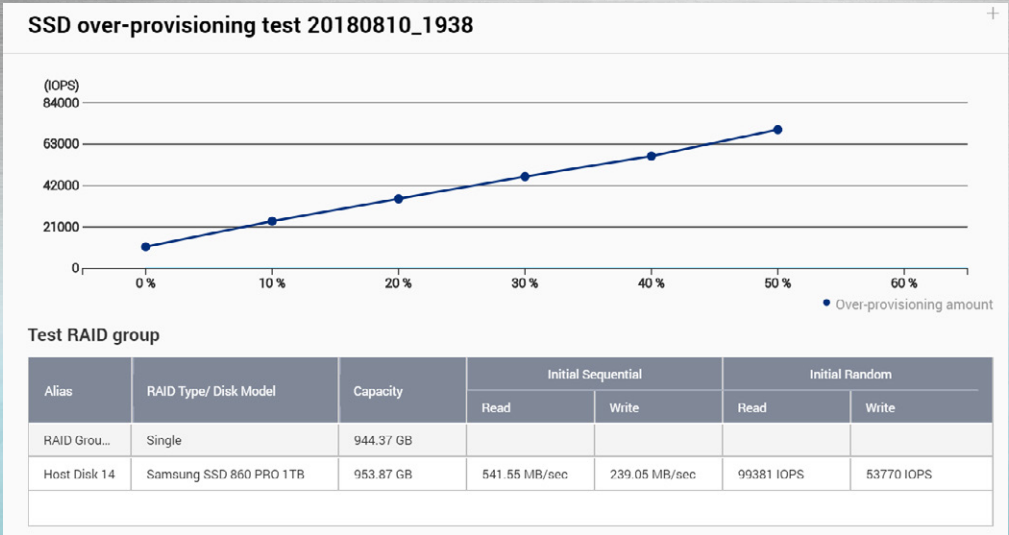
The Advantage of Software-defined SSD Extra Over-provisioning

- With QTS System, user can assign more OP to the SSD RAID.
- At QNAP Lab, the effect of over-provisioning can not only be observed on single consumer-level Samsung 850 Pro to gain the performance same as data center SSD, but also be seen on SSDs as a RAID.



Choose SSD is Hard, Choose QNAP is Simple

- IT managers' biggest challenges in deploying SSD is to measure the SSD performance and how it can solve storage bottleneck.
- With QNAP SSD Profiling Tool, users can not only set OP, but further test SSD RAID performance with different OP amount.



QNAP

TS-x77XU

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DEMO

**Using SSD Profiling
Tool on TS-x77XU**

QNAP Global SSD Cache

The QNAP SSD Cache can be applied to multiple volume / LUN

Cache Type

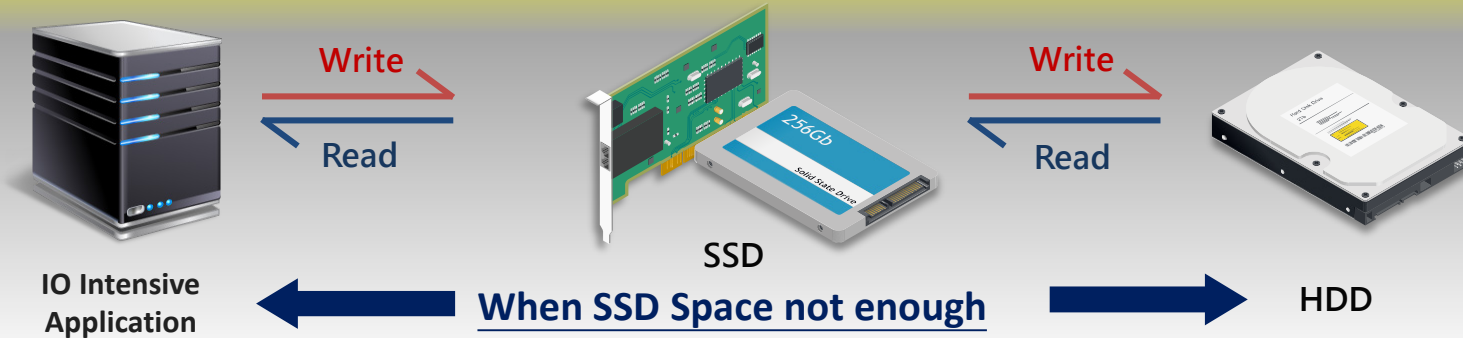
Read-Only → Copy frequently used data to SSD

Read-Write → Not only copy data, new data can also be temporarily stored in SSD

(New) Write-Only → Only new data will be written into the cache

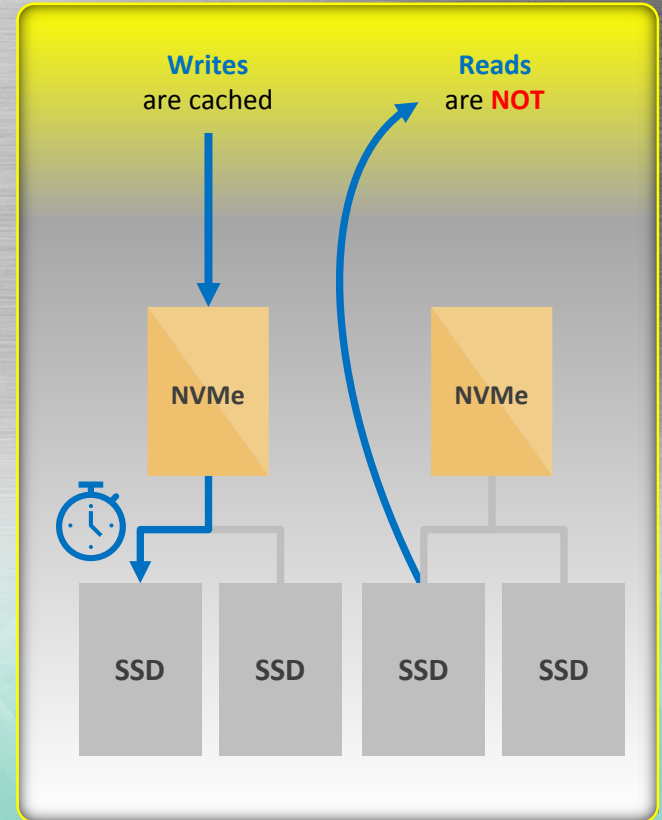
How Read-write Cache work:

Data from clients and storage will both be cached



The Write-only Cache Increase ROI of SSD Cache with high Writing Demand

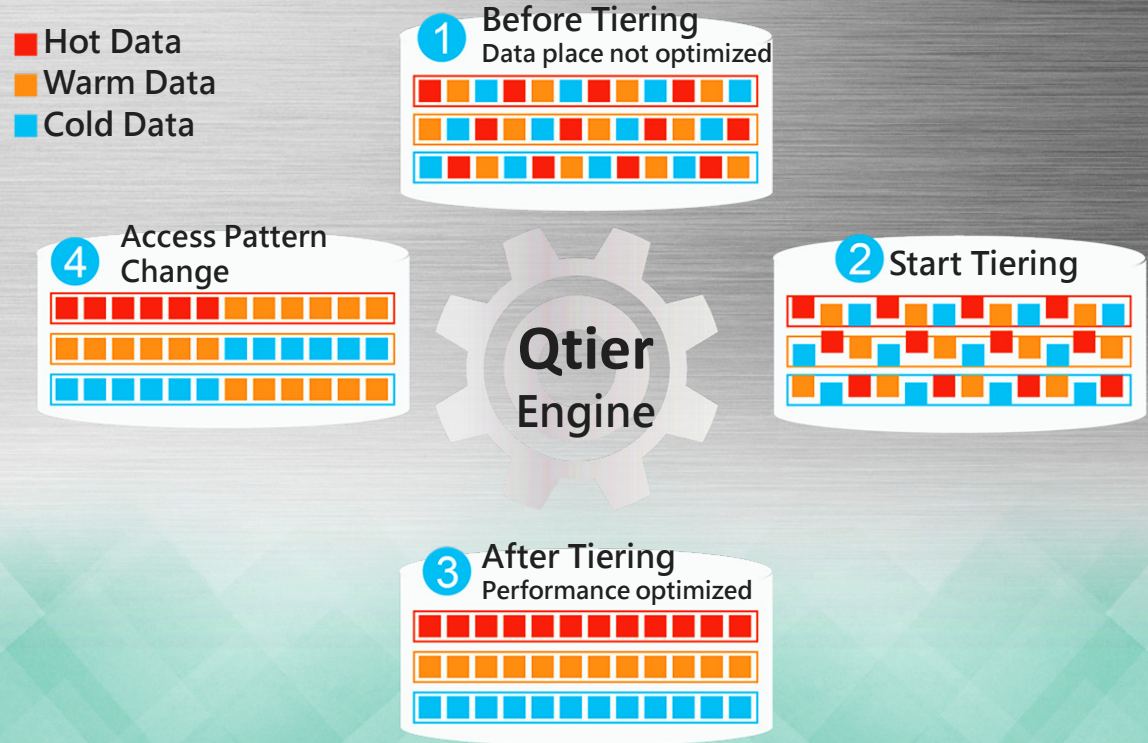
- Write-only cache is promoted by Microsoft for endurance control.
- QNAP believe Write-only Cache can increase the ROI of purchasing SSD in below scenario:
 1. File Server focusing on write operations
 2. Database with more write operation (Such as IOT monitoring server)
 3. Use high endurance SSD (Intel Optane™) with other SSD



Qtier (Auto-Tiering) Increase Capacity and Performance at the Same Time

Beside SSD Cache, Qtier™ can migrate data between SSD and HDD directly

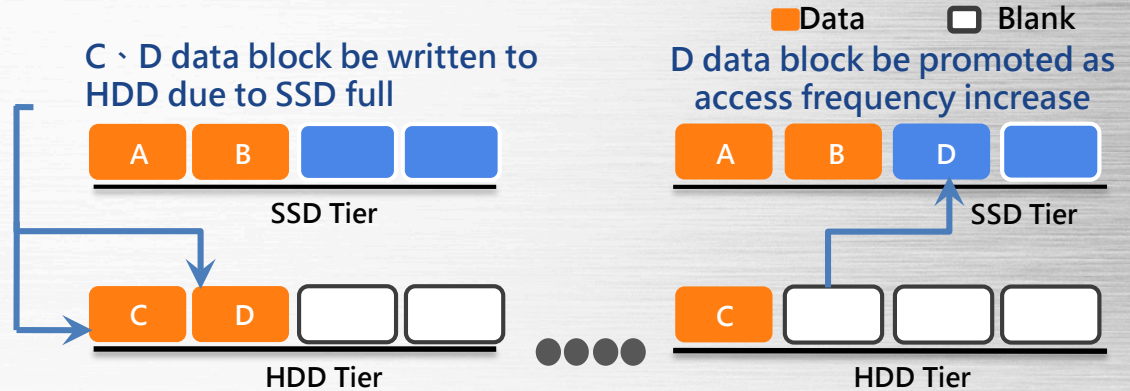
SSD capacity can be utilized with limited memory requirement.



Qtier 2.0 IO Aware tiering for real time performance boost

Beside tiering on schedule, Qtier now can simulate SSD Cache behavior

It can utilize SSD capacity while boost performance in real Time thus increase SSD ROI



Block	Hit
C	50
D	50

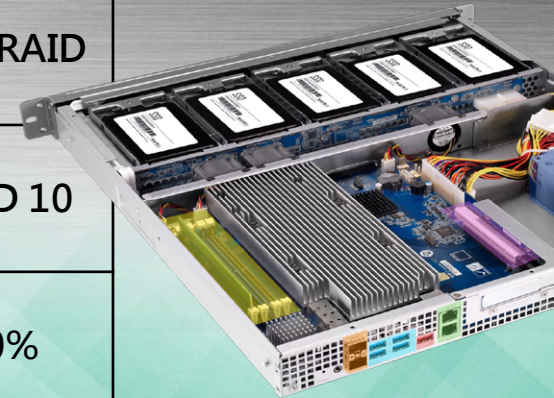
Block	Hit
C	50
D	200

TS-x77XU SSD Multiple Configurations

In addition to acting as a backup server, SSD Over-provisioning, Global Cache and Qtier let TS-x77XU be deployed as production server

With 5 x 2.5" SATA 6Gb/s SSD 1U Rackmount can use SSD too!

Scenario	File Server	Web, Application, Virtualization Server	Synchroni- zation, Vi- deo Editing	Surveillance, Backup, Log Server	Business- Critical Database
SSD Config	Qtier™	Qtier™	Read- Write Cache	Write-Only Cache	SSD RAID
SSD RAID	RAID 6	RAID 10	RAID 5	RAID 10	RAID 10
SSD OP	10%	20%	20%	30%	30%



Businesses need lower RTO

In the survey of 300 Enterprises and SMBs at Taiwan:

- **60%** has used Remote Replication as Backup Plan.
- **50%** of businesses expected the recovering time should be within **1 Hour**.
- But **also 50%** of businesses experience actual recovering exceed **1 Day!**

Can businesses only manually transfer data back from the remote end when disaster happen?



Restore From Remote Snapshot Vault

- The Snapshot Manager is now actively connected to Snapshot Vault
- Support monitor and restore selected folders and files **from the source NAS directly!**



Remote Snapshot Vault

DataVol1 (V_DataVol1 At Ripple3085, 172.17.22.95)
Ready

Select snapshot location: Remote Ripple3085 (DataVol1_rep)

Local Demo1677U

Remote Ripple3085 (DataVol1_rep)

Now 08/15 10:13
08/15 10:17

2018/08/16 12:00:01

- GMT+08_2018-08-16_1200
- GMT+08_2018-08-16_1100
- GMT+08_2018-08-16_1000
- GMT+08_2018-08-16_0900
- GMT+08_2018-08-16_0800
- GMT+08_2018-08-16_0700
- GMT+08_2018-08-16_0600
- GMT+08_2018-08-16_0500

Backups

Container

Download

ISOs

Multimedia

Public

Taken: 2018-08-16 12:00:01

Replicated: No

Expires After: -

Status: ✓ Ready

Capacity: 297.24 GB

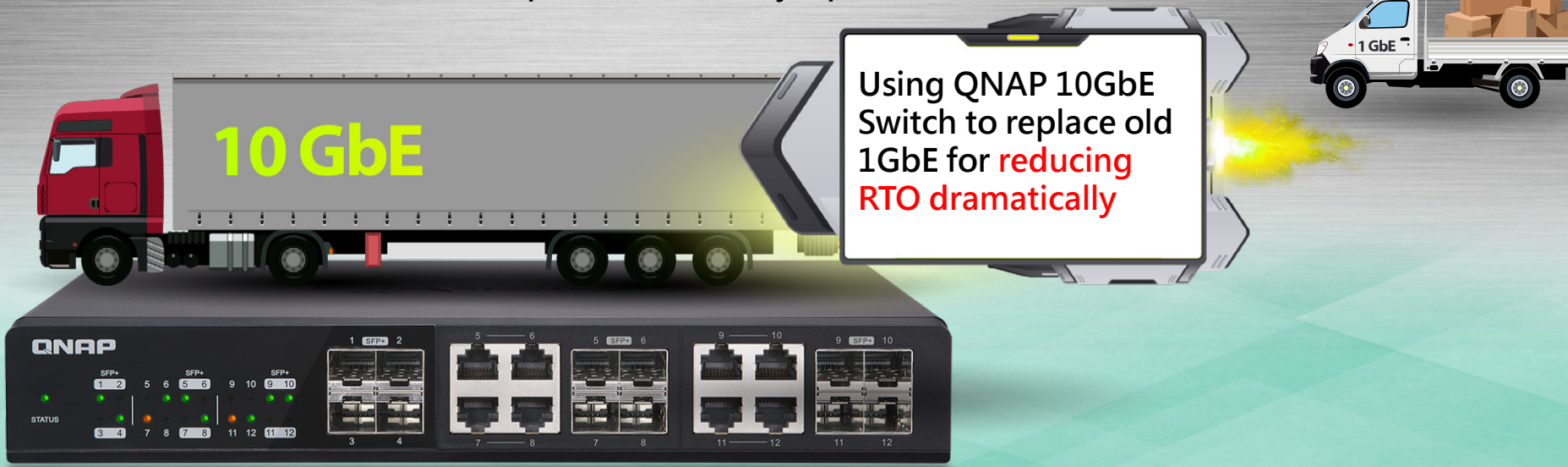
Description: No description

Restore Clone Revert volume snapshot

Both the source and destination NAS must be upgraded to 4.3.5 to support this function

Drastically Reduce Recover Time With 10GbE Network

- The Remote Snapshot Vault Recovering is based on Ethernet service.
- Using 1GbE network, recovering large data still takes hours.
- Pair the Snapshot Replica Solution with 10GbE or even faster interfaces to increase both the backup and recovery speed !



The Forth Way: Snapshot Export/Import

- Export a snapshot from snapshot manager or snapshot vault
- Using external storage device, the exported imaged can be imported to another NAS to create new volume or LUN
- The same image can also be used to revert source volume or LUN



With QTS 4.3.5 Power of Storage:

01

Software-defined SSD Extra OP

Measure & set unique over-provisioning amount on the NAS

02

SSD Global Cache & Qtier™

Using Cache or Auto Tiering to maximum SSD ROI

03

Remote Snapshot Restore

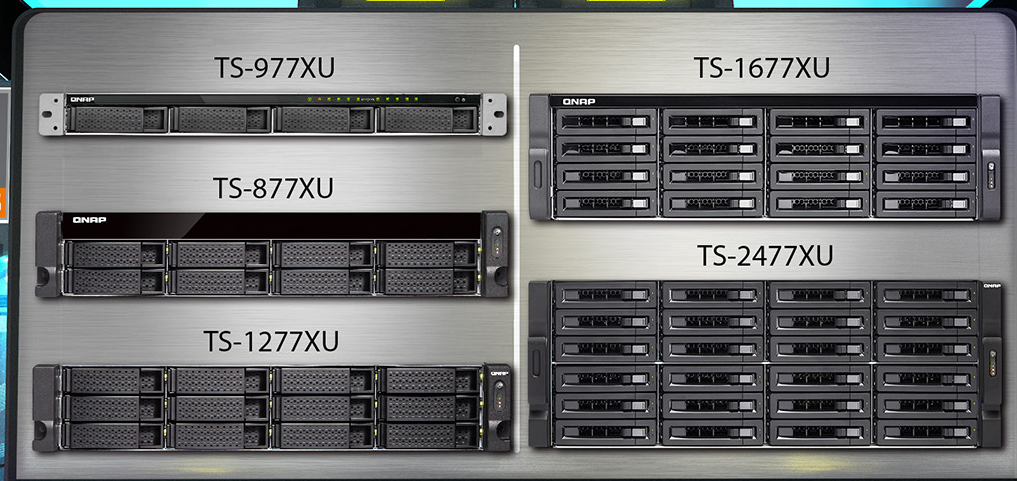
Using 10GbE network to reduce RTO



QNAP

TS-x77XU

◀◀ **Ryzen Enterprise NAS** ▶▶
Your Best Choice



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