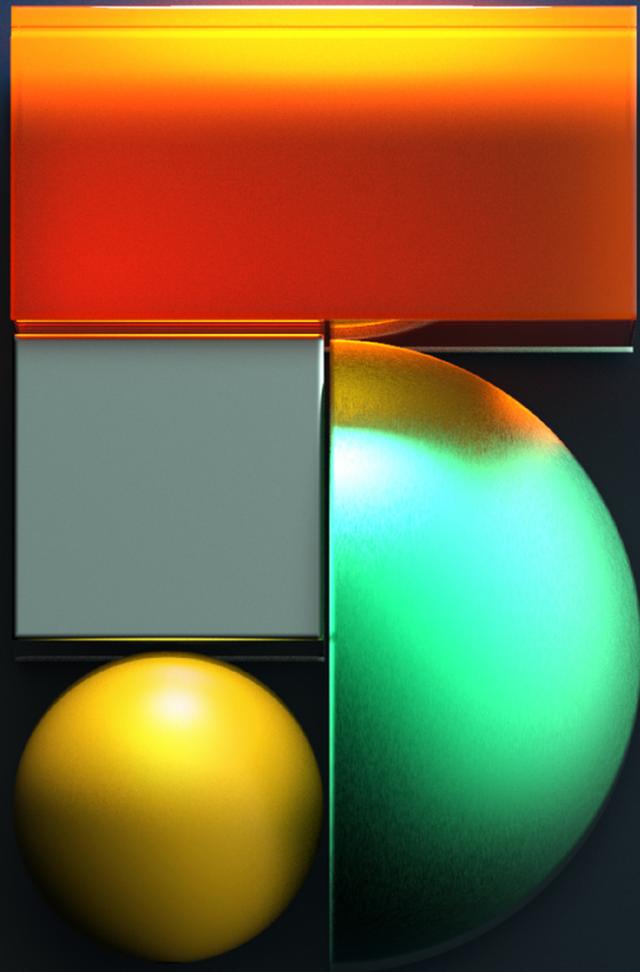


QNAP

QTS
QuTS hero 5.0 BETA

The AI-accelerated OS to reinforce data security
and protect your digital assets



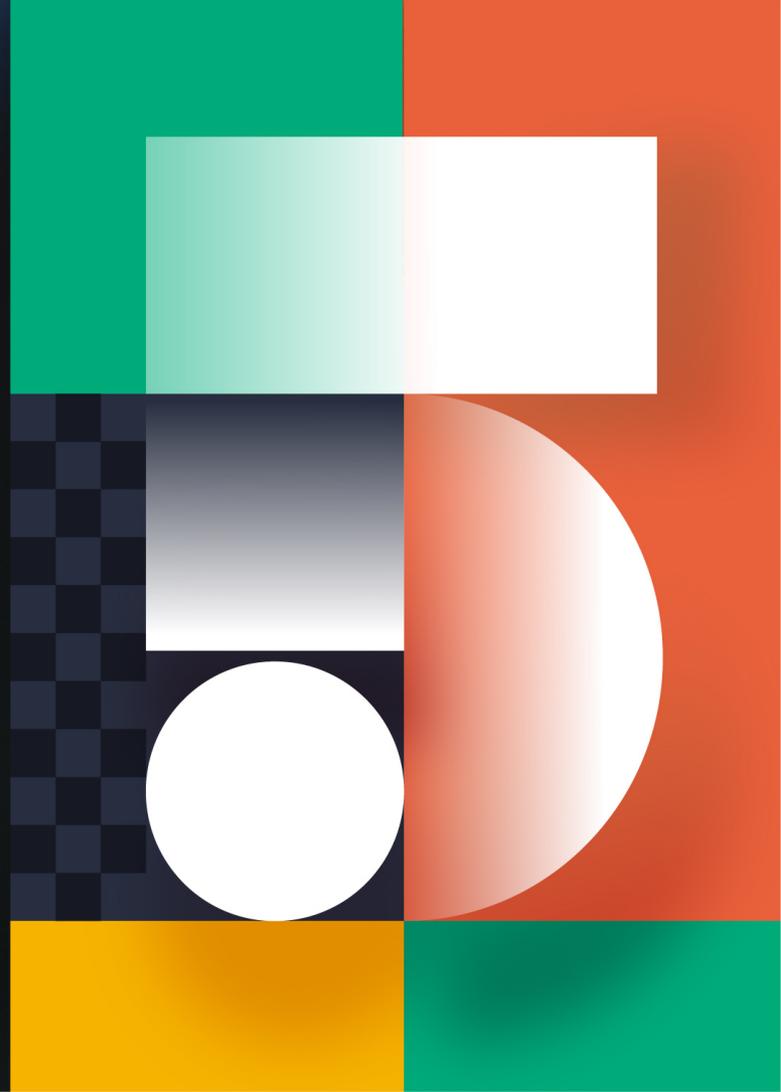
QTS 5.0

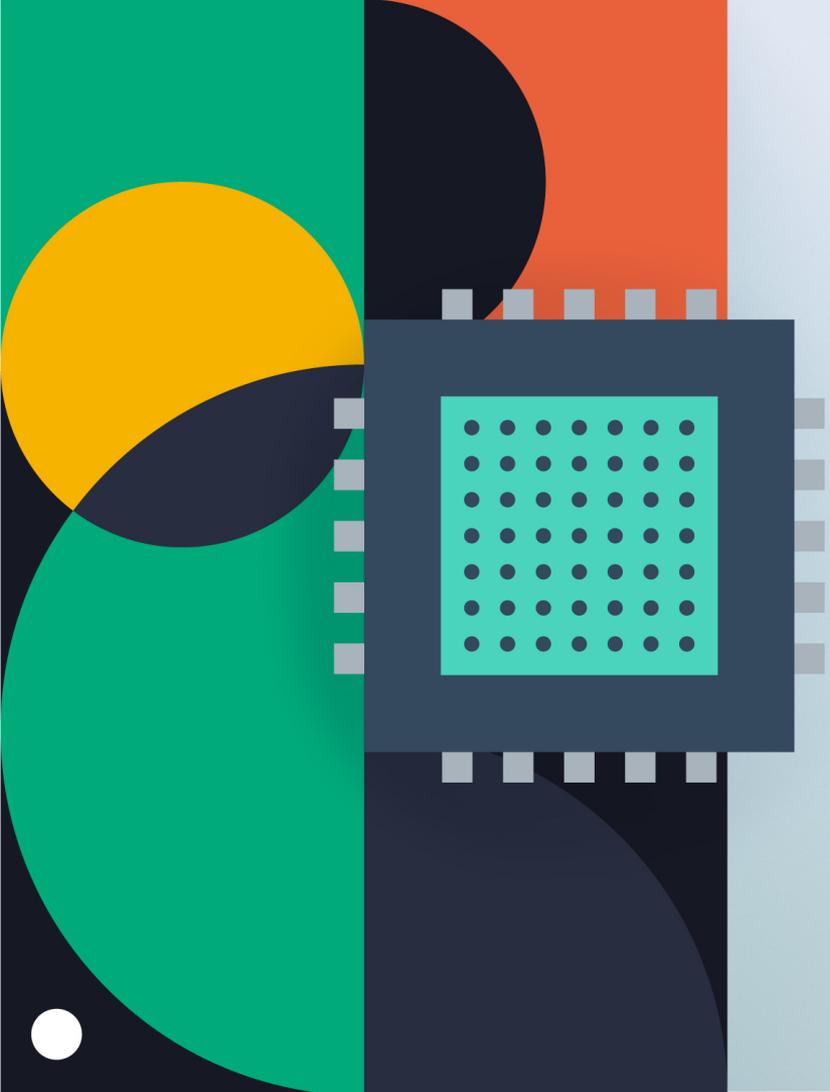
The latest version of QTS 5.0 brings a whole new experience to NAS users, strengthening the system from the kernel and optimizing the UI interface. Starting with the installation, a significant adjustment is made, and after the installation is complete, a guidance instruction is given to assist the user in completing the necessary operations and safety settings. The new cache module allows NVMe SSDs to take advantage of high-speed access. Need faster applications? Let AI accelerate to help, combined with Coral Edge TPU, photo management and surveillance systems to help users achieve tasks more effectively.



F O C U S

- Upgrade Kernel 5.10 LTS
- Optimize QTS management UI
- Improve NVMe and SSD cache performance
- Increase the level of security
- Faster WireGuard VPN service





Upgrade Kernel 5.10 LTS

New kernel upgrades that dramatically improve kernel security, enhance performance, improve AMD processor efficiency, and support next-generation hardware platforms and built-in graphic chips

*Due to architectural limitations, some models will not be able to upgrade.



Benefits of Kernel 5

- Improve kernel security
- Enhance effectiveness
- Improve AMD processor efficiency
- Supports next-generation hardware platforms and built-in graphic chips
- Built-in WireGuard VPN

Comparison Test TS-h2490FU (AMD EPYC 7302P)

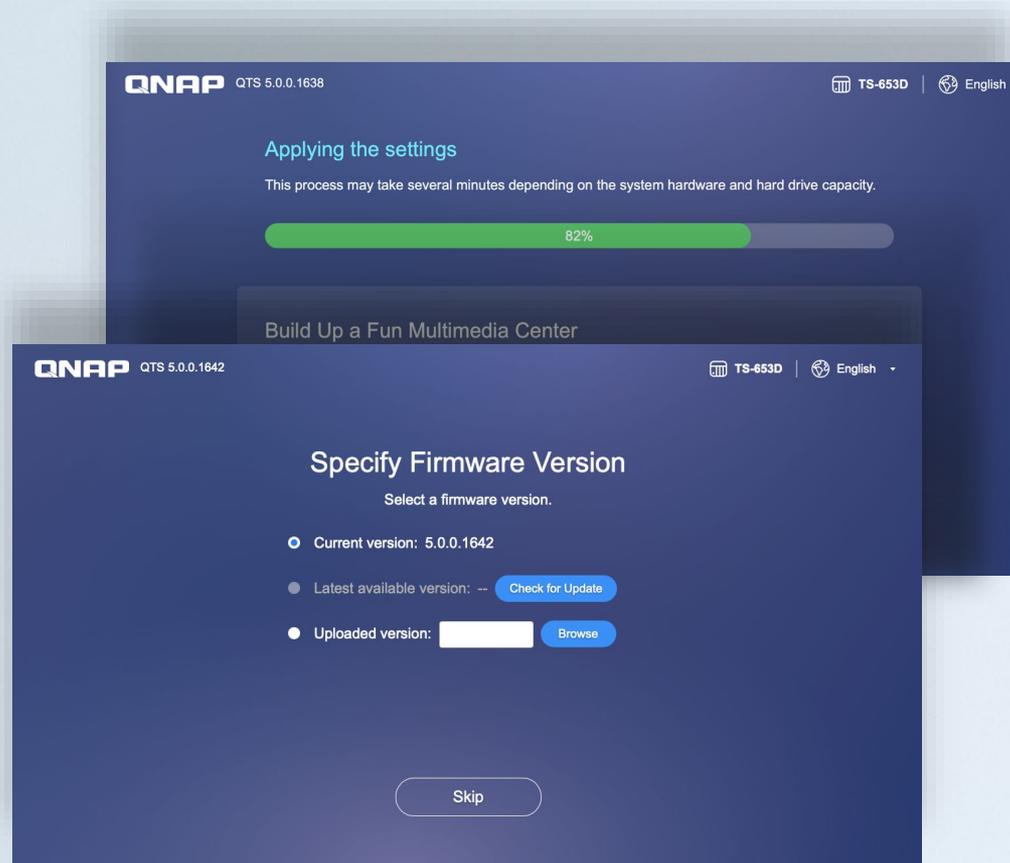
| Protocol | Unit | IO Access | Real Performance | | | | | |
|----------|----------------------|-----------|-------------------------------|-----------------|--------------|-------------------------------|-----------------|--------------|
| | | | QTS 5.0.0 Normal LUN / Folder | | | QTS 4.5.3 Normal LUN / Folder | | |
| | | | 1 host 25GbEx2 | Latency (ms) | NAS CPU % | 1 host 25GbEx2 | Latency (ms) | NAS CPU % |
| | | | | Avg. | | | Avg. | |
| iSCSI | Throughput (MB/s) | SW-1M | 2575 | 6 | 36% | 2181 | 7 | 13% |
| | | SR-1M | 5642 | 3 | 23% | 5036 | 3 | 17% |
| | | SW-512K | 2598 | 3 | 33% | 2182 | 4 | 13% |
| | | SR-512K | 5591 | 1 | 19% | 4248 | 2 | 10% |
| | IOPS | RW-4K | 96,734 | 1.00 | 33% | 89,043 | 1.00 | 17% |
| | | RR-4K | 171,989 | 0.00 | 36% | 164,891 | 0.00 | 33% |
| SMB | Throughput (MB/s) | SW-1M | 2210 | 7 | 22% | 2067 | 8 | 19% |
| | | SR-1M | 5219 | 3 | 12% | 4651 | 3 | 9% |
| | | SW-512K | 2077 | 4 | 22% | 2018 | 4 | 18% |
| | | SR-512K | 5265 | 2 | 12% | 4496 | 2 | 8% |
| | IOPS | RW-4K | 73,954 | 1 | 22% | 86,384 | 1 | 19% |
| | | RR-4K | 157,138 | 0 | 44% | 100,837 | 1 | 30% |

| NAS Configuration: | |
|--------------------|--------------------------------|
| Model | TS-h2490FU |
| CPU | AMD EPYC 7232P 3.1GHz (8C/16T) |
| RAM | DDR4-2666 64GB (8GB x8) |
| F/W | QTS 5.0.0 20210520 |
| F/W | QTS 4.5.3 20210515 |
| SSD | Micron 7300 3.8TB NVMe x12 |
| Pool RAID type | RAID5 |
| Pool OP | 10% |
| NIC | QNAP QXG-25G2SF-NXE 25GbE |



A new version Installation Wizard

- Simplify the steps
- Initialization and update the latest version firmware at the same time
- Create a new administration account



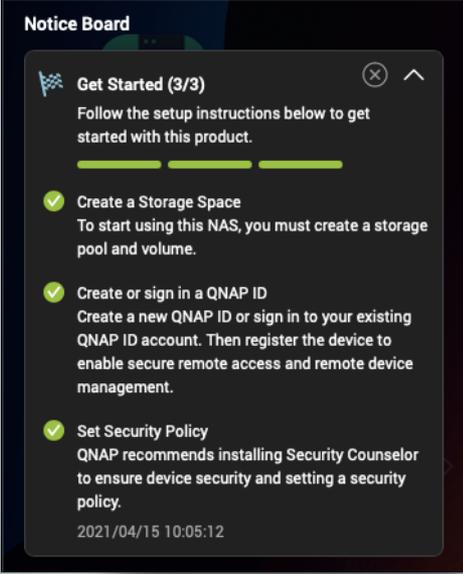
Optimize QTS UI management operations

Simplify the procedure, improve visual comfort and reaction speed, redesign the installation wizard, and post-installation guidance tips to make initial setup easier.



Notification Board

- Use the guide for the first time
- The notification information will be communicated into multiple categories to apply the overall display



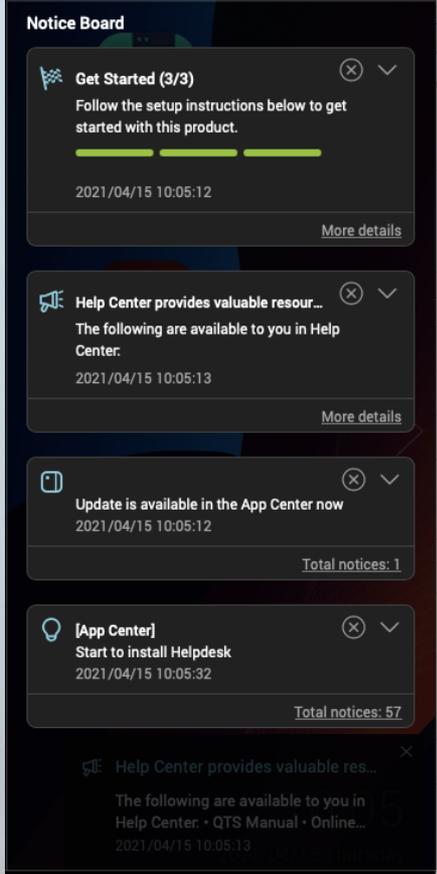
Notice Board

Get Started (3/3) [Close] [Expand]

Follow the setup instructions below to get started with this product.

2021/04/15 10:05:12

- ✓ Create a Storage Space
To start using this NAS, you must create a storage pool and volume.
- ✓ Create or sign in a QNAP ID
Create a new QNAP ID or sign in to your existing QNAP ID account. Then register the device to enable secure remote access and remote device management.
- ✓ Set Security Policy
QNAP recommends installing Security Counselor to ensure device security and setting a security policy.



Notice Board

Get Started (3/3) [Close] [Expand]

Follow the setup instructions below to get started with this product.

2021/04/15 10:05:12

[More details](#)

Help Center provides valuable resources [Close] [Expand]

The following are available to you in Help Center.

2021/04/15 10:05:13

[More details](#)

Update is available in the App Center now [Close] [Expand]

2021/04/15 10:05:12

Total notices: 1

[App Center] [Close] [Expand]

Start to install Helpdesk

2021/04/15 10:05:32

Total notices: 57

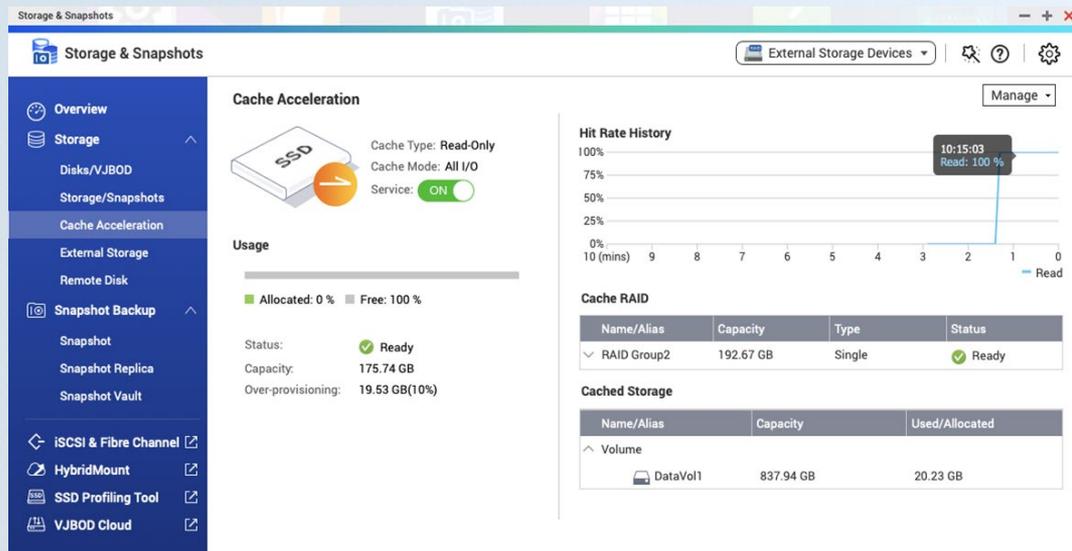
Help Center provides valuable resources [Close]

The following are available to you in Help Center: QTS Manual • Online...

2021/04/15 10:05:13

Improve NVMe SSD Performance

- With the new kernel, NVMe usage efficiency is greatly improved
- Optimized cache module, SSD space can be used more efficiently, and memory usage is less than before
- Improve the efficiency of multi-users access to the same folder
- Not only NVMe SSD, SATA or M.2 SSD have also been promoted

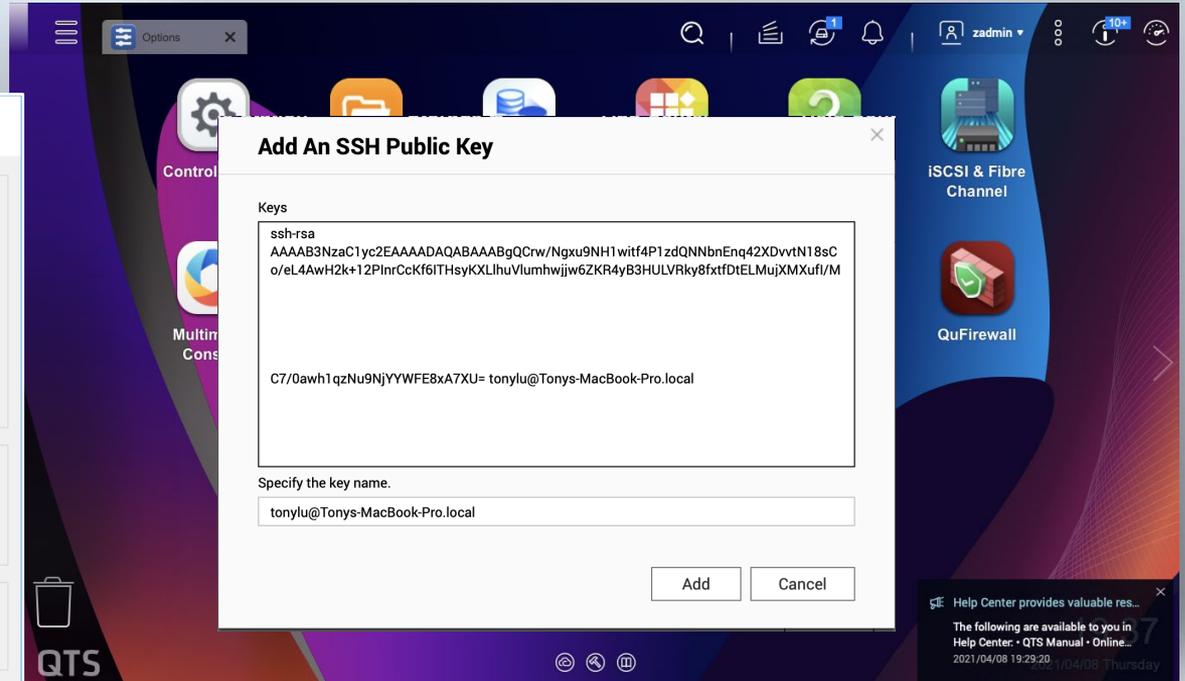
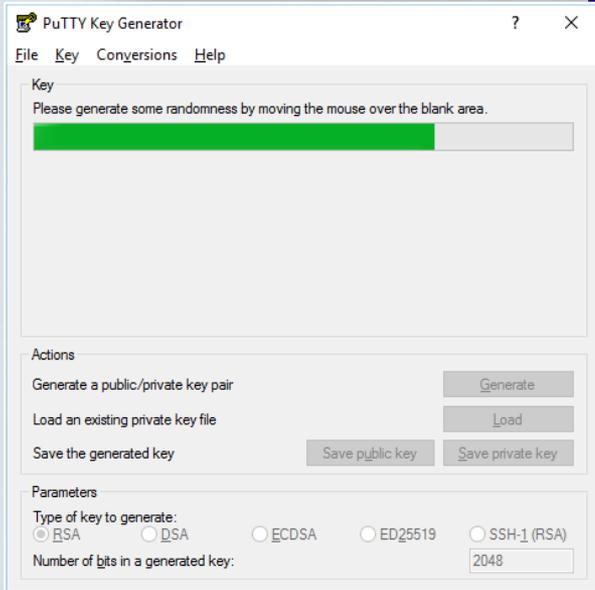


Increase the level of security

- Support TLS 1.3
- The admin account is disabled by default
- Advanced encryption suite support
- adjusted safety settings and more stronger safety protection options
- SSH Key login
- Firmware automatic updates (recommended updates, automatic updates)
- App automatic updates (recommended updates, automatic updates)
- Reverse proxy (TBD)



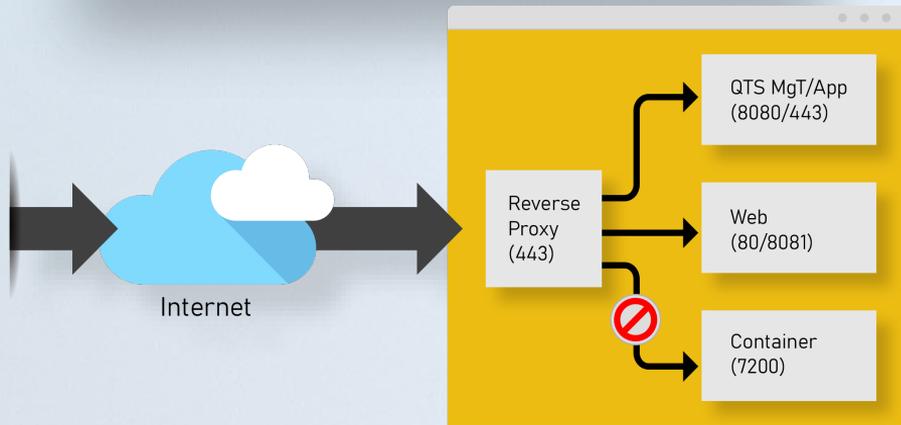
More secure to manage login by SSH Key



Generate SSH key in macOS

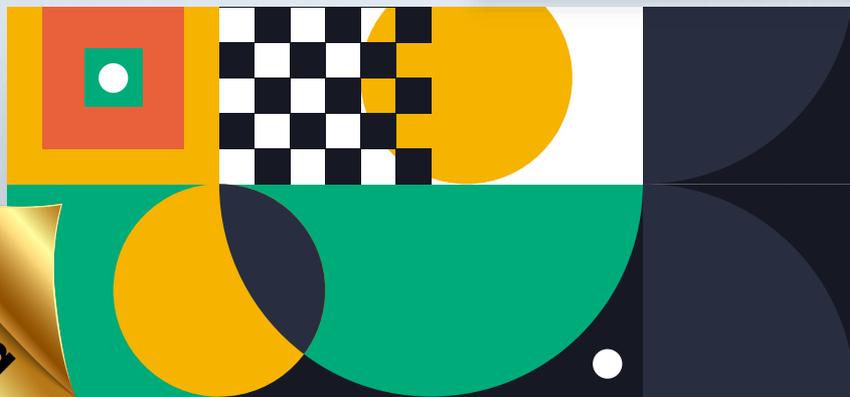
```
#ssh-keygen -t rsa  
#pbcopy < ~/.ssh/id_rsa.pub
```

```
Last login: Fri Apr 9 14:29:56 on console  
tonylu@Tonys-MacBook-Pro ~ % ssh-keygen -t rsa  
Generating public/private rsa key pair.  
Enter file in which to save the key (/Users/tonylu/.ssh/id_rsa):  
Enter passphrase (empty for no passphrase):  
Enter same passphrase again:  
Your identification has been saved in /Users/tonylu/.ssh/id_rsa.  
Your public key has been saved in /Users/tonylu/.ssh/id_rsa.pub.  
The key fingerprint is:  
  
tonylu@Tonys-MacBook-Pro.local  
  
The key's randomart image is:  
+---[RSA 3072]---+  
|                 |  
|   .   o         |  
|  . E           |  
| o . = +        |  
| . + + S B +    |  
| = = = * .      |  
| o X B = . .    |  
| . = . @ = = o  |  
| .oo+.***.     |  
+---[SHA256]---+  
tonylu@Tonys-MacBook-Pro ~ % █
```



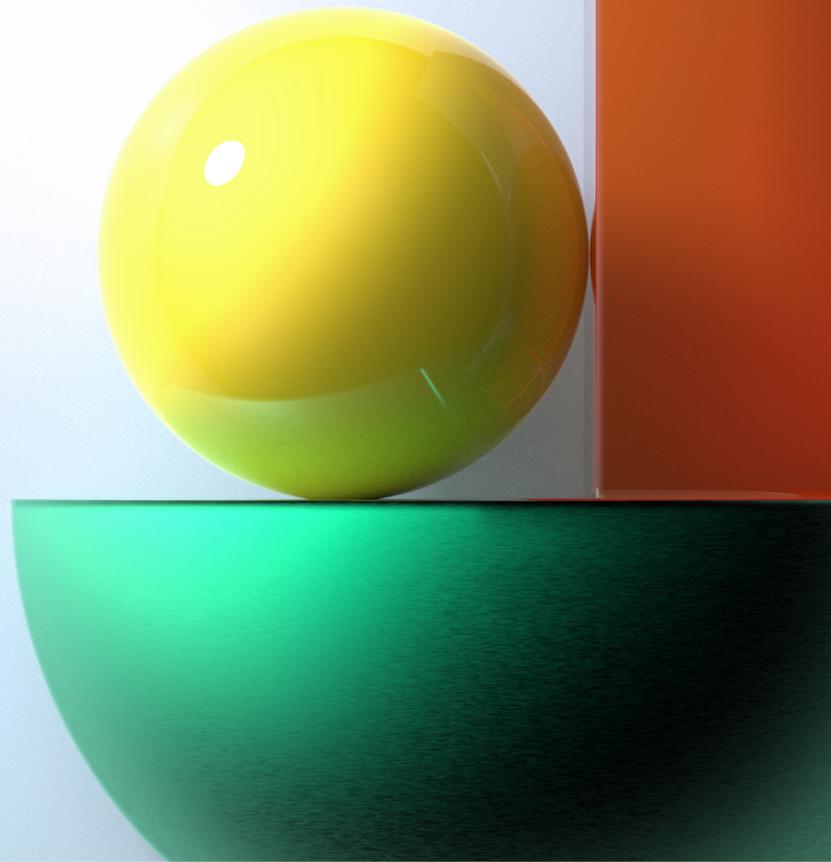
Reverse Proxy (Coming)

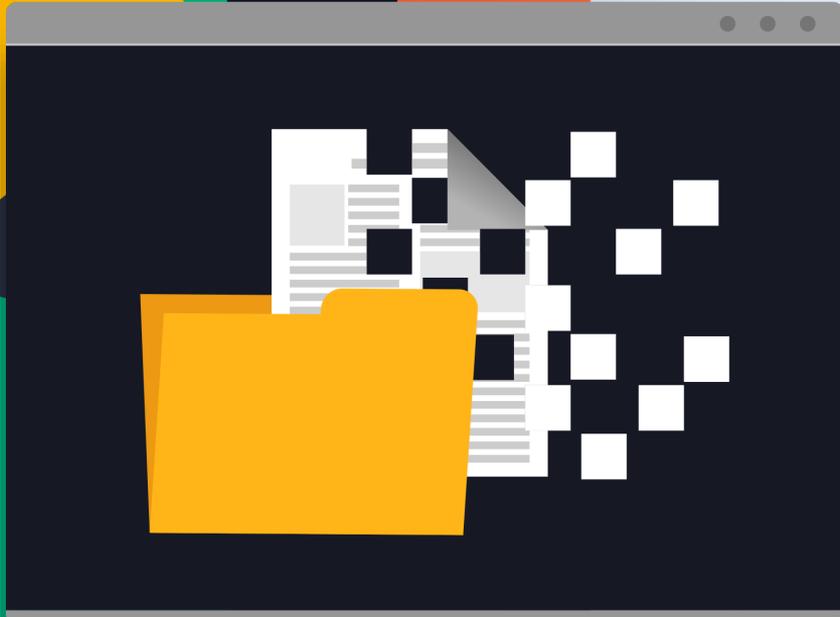
- Improve the security of web access services, especially over the Internet
- Use Reverse Proxy to hide sensitive service network ports to avoid potential risks



coming soon

LIVE DEMO



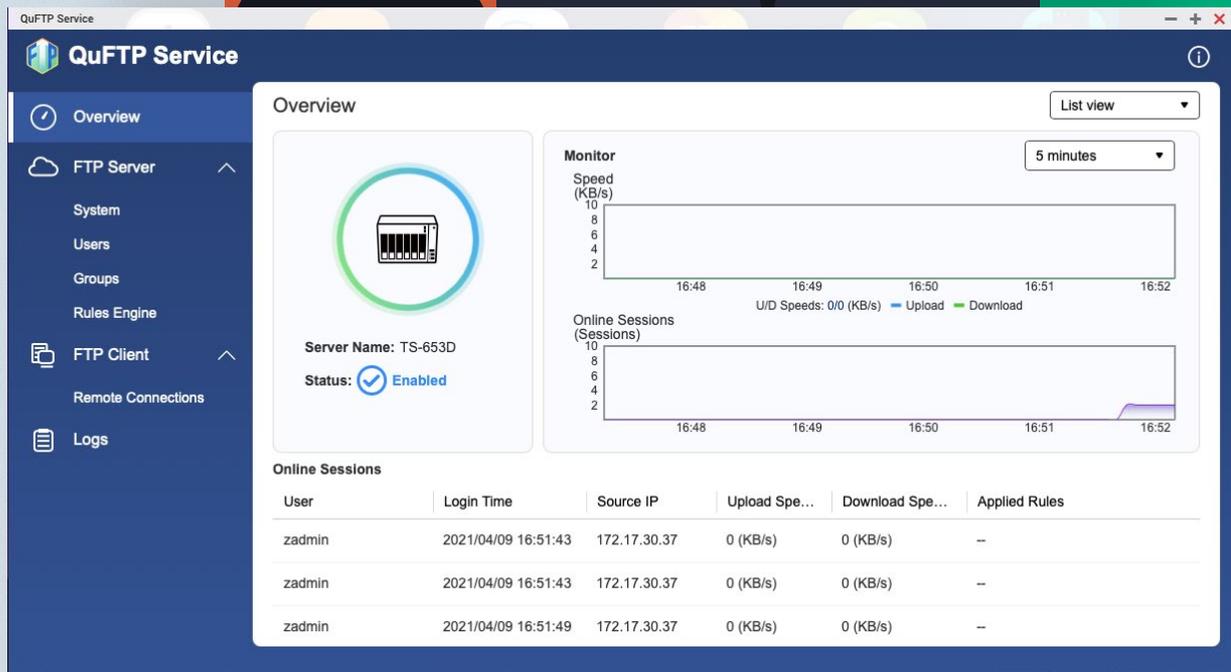


Strengthen File services

- The new QuFTP service brings more features
- Enhanced SMB/NFS performance, faster transfer of large files

QuFTP Service

- Can be updated independently
- FTP server is supported
- Support TLS settings
- Support QoS Settings
- Support for FTP clients



QoS Settings

- Based on user settings
- Limit upload and download speeds

The screenshot shows the 'Speed Limits' configuration window in the QuFTP Service interface. The window is titled 'Speed Limits' and has a close button (X) in the top right corner. It features two tabs: 'Users' (selected) and 'Groups'. Below the tabs is a dropdown menu set to 'Local Users' and a search input field. To the right of the search field is the text 'Rate: Upload/ Download (KB/s)'. The main content is a table with the following columns: 'Active', 'Name', 'Max. Upload Speed', 'Max. Download Speed', 'Group Max. Spe...', and 'Current Rates'. The table contains two rows: one for 'admin' with an unchecked 'Active' checkbox and dashes in the speed fields, and one for 'zadmin' with a checked 'Active' checkbox and '100' in both speed fields. At the bottom of the table, there is a pagination control showing 'Page 1 / 1' and a refresh icon. Below the pagination is the text 'Display Item: 1-2, Total: 2'. A note with an information icon states: 'Individual user account transfer limits take priority over group transfer limits. If a user account has several groups transfer limits, the largest group transfer limit will be applied. Global transfer limits are only applied if a user account has no user or group limits'. At the bottom right, there are 'Apply' and 'Cancel' buttons.

| Active | Name | Max. Upload Speed | Max. Download Speed | Group Max. Spe... | Current Rates |
|-------------------------------------|--------|-------------------|---------------------|-------------------|---------------|
| <input type="checkbox"/> | admin | -- | -- | --/-- | --/-- |
| <input checked="" type="checkbox"/> | zadmin | 100 | 100 | --/-- | --/-- |



Improve AI acceleration

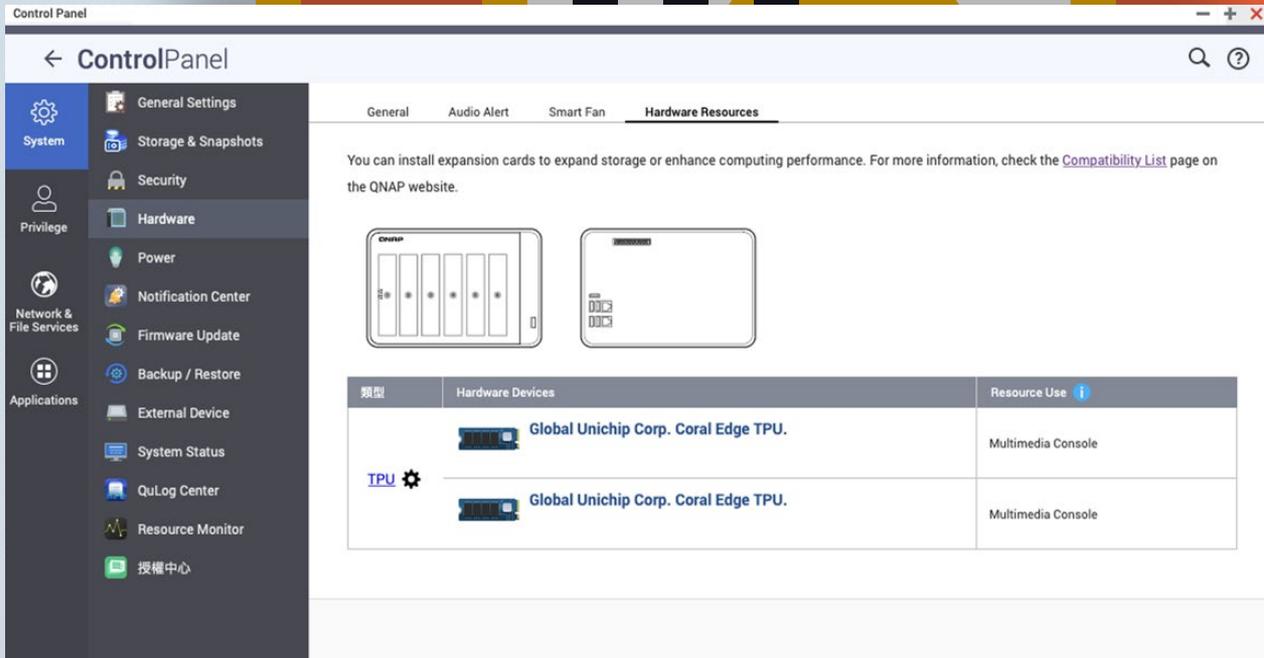
- With Coral Edge TPU, you can organize your photos, increase object recognition performance several times, and dramatically reduce the processor resources you need for processing
- Officially launches disk AI prediction service

Coral Edge TPU

- Supports a variety of TPU devices
- Multiple sets of TPU appliances can be supported at the same time

 With Coral
intelligence

Google



The screenshot shows the QNAP Control Panel interface. The left sidebar contains various system settings categories: System (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), Privilege, Network & File Services, and Applications. The main content area is titled 'ControlPanel' and shows the 'Hardware Resources' tab. It includes a warning message about expansion cards and a table listing installed hardware devices.

Control Panel

ControlPanel

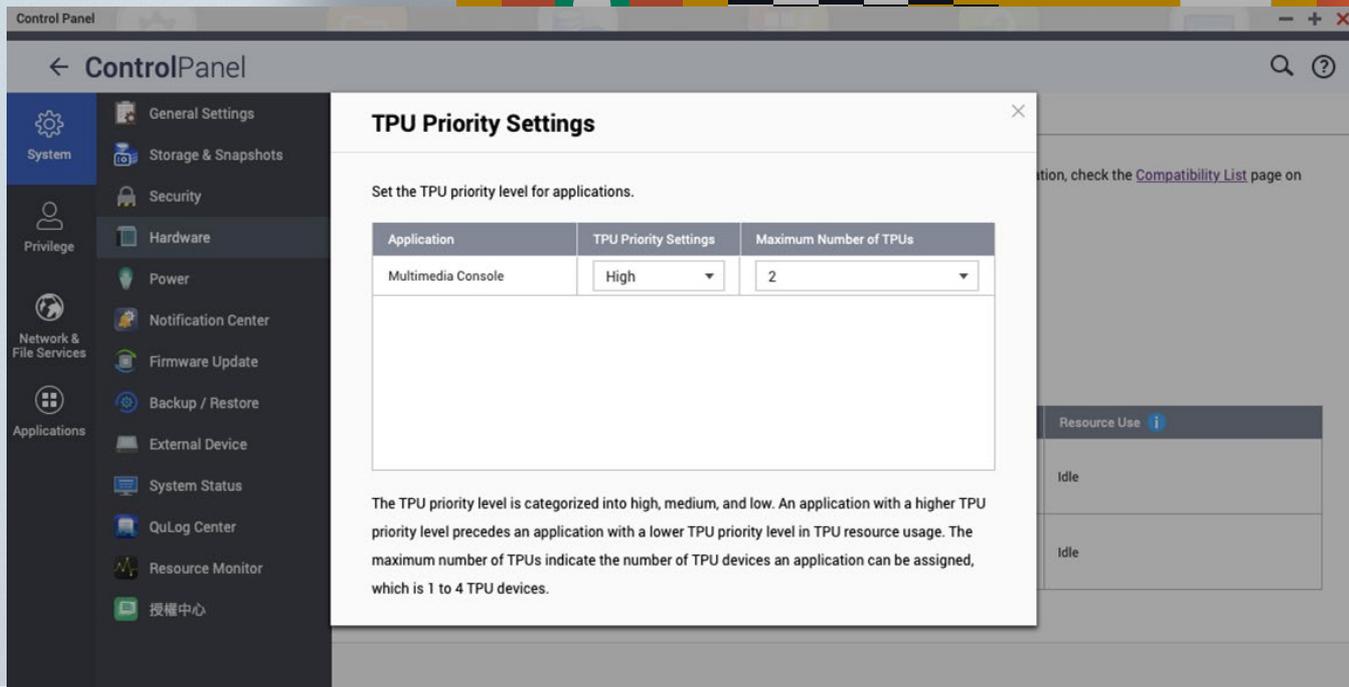
General Audio Alert Smart Fan **Hardware Resources**

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

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

Dynamically Adjust TPU Priority

- TPU priority can be specified in different level
- TPU device can be assigned to a specific application



The screenshot displays the Windows Control Panel interface. The 'Hardware' category is selected in the left sidebar. The 'TPU Priority Settings' window is open, showing a table with the following data:

| Application | TPU Priority Settings | Maximum Number of TPUs |
|--------------------|-----------------------|------------------------|
| Multimedia Console | High | 2 |

Below the table, a text box explains: "The TPU priority level is categorized into high, medium, and low. An application with a higher TPU priority level precedes an application with a lower TPU priority level in TPU resource usage. The maximum number of TPUs indicate the number of TPU devices an application can be assigned, which is 1 to 4 TPU devices."



QuMagie Support Enhancement AI Core

- QuMagie 1.5.1
- Support Coral Edge TPU

Settings

Content Management **QNAP AI Core** Backup / Restore Miscellaneous



QNAP AI Core 3.1.0
Entertainment
Enabled

Google TPU
Running

N/A

Facial Recognition

Status: Finished

Hidden People

People on this list do not appear on the "People" page and are ignored when Photo Station scans photos. To view and edit the list, click "Settings".

Object Recognition

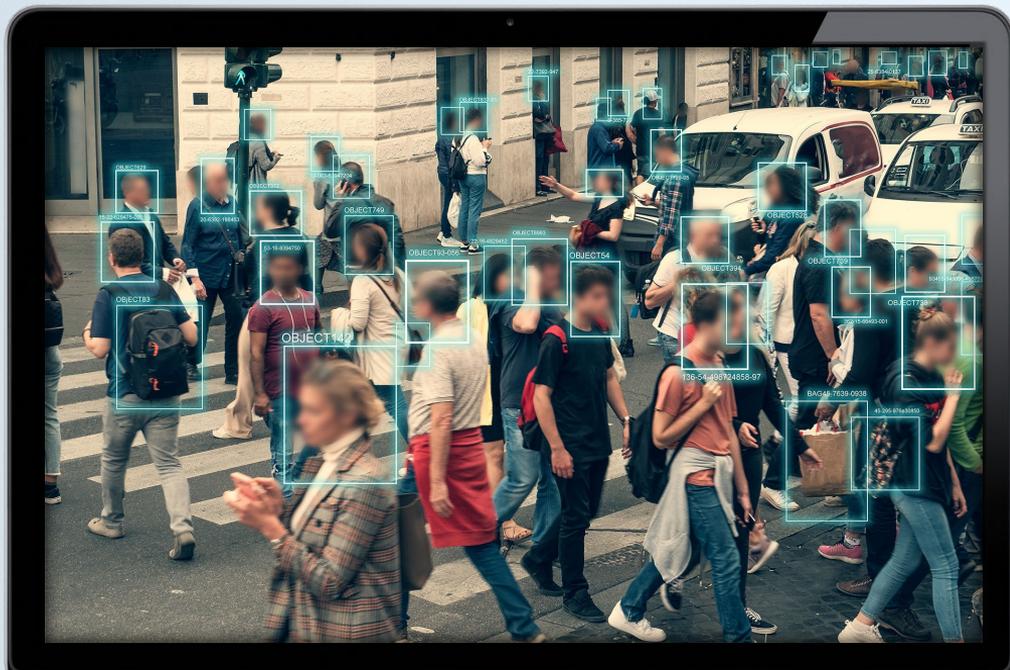
Status: Finished

[🔗 The intelligent classification feature uses GPU resources.](#)



QVR Face / Human

- QVR Face helps users build intelligent face recognition
- QVR Human proactively calculates the number of people passing through a specific region



DA Drive Analyzer

DA Drive Analyzer

Overview

DA Drive Analyzer Email alert: [Activated](#)

Drive enclosures: 1, Drives: 9 (HDD: 8; SSD: 0; NVME drives: 1)

Faulty

0

Defective drive detected.
Replace the drive.

Critical

0

90% risk of failure
Replace the drive as soon as possible.

Warning

0

70% risk of failure
Start planning for a drive replacement.

Normal

8

Drive(s) are functioning normally.

Data Analysis i...

0

There are no new drives in the cloud AI data analysi...

Important: Review Drive Status Drives: 0 (Faulty: 0, Critical: 0, Warning: 0)

License

License plan: DEMO

Drive Analyzer Powered by ULINK Tech Help Settings Tony

All systems (1) **SYSTEM 2 : RACK 0 (NAS) | 3**

System 2
Demo54D ...

Rack 0 (NAS) | 3

- Drive 0.1
- Drive 0.2
- Drive 0.3
- Slot 4 (Empty)
- Slot 5 (Empty)
- Slot 6 (Empty)

HARDWARE



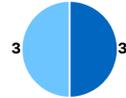
Rack 0 (NAS) | 6 Slots

TOTAL CAPACITY

TS-653D

2.95 TB

TOTAL DRIVES



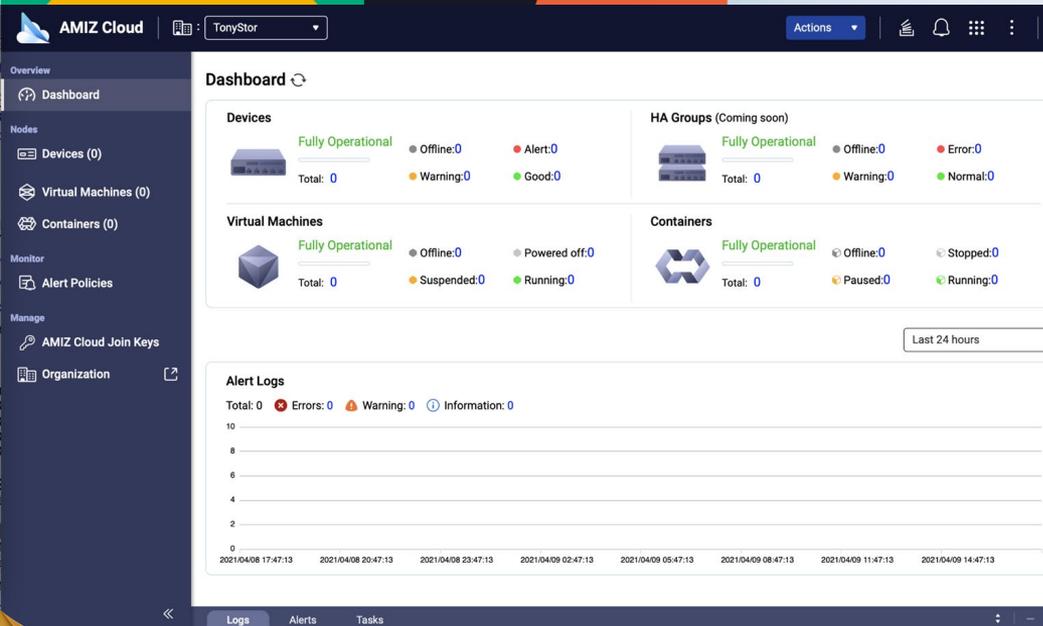
RAID CONFIGURATION

| Group | Drives | Types | Status |
|--------------|--------|--------|--------|
| RAID Group 2 | 1 | SINGLE | Ready |
| RAID Group 1 | 2 | RAID 1 | Ready |

| Drive | Health | Manufacturer | Model | Alerts | RAID Type | RAID Group | Last Received |
|-----------|--------|-----------------|-----------------------|--------|-----------|--------------|---------------|
| Drive 0.1 | NA | KINGSTON | SAMSUNG MZ7KM240HA... | 0 0 | SINGLE | RAID Group 2 | 06/19/2021 |
| Drive 0.2 | NA | SEAGATE | ST2000VN0001-1SF174 | 0 0 | RAID 1 | RAID Group 1 | 06/19/2021 |
| Drive 0.3 | NA | WESTERN DIGITAL | WDC WD10EFRX-68FYTN0 | 0 0 | RAID 1 | RAID Group 1 | 06/19/2021 |

Disk AI

- Official release
- Subscription
- Workload-based analysis
- Preventive maintenance replacement



Cloud Central Control, Stay in Control (TBD, RC)

Add NAS to AMIZ Cloud Central Control and stay on top of NAS status through AMIZ Cloud Services.

coming soon

Lighter, faster VPN services

- The new QVPN's WireGuard VPN, lighter, easier to set up, supports a variety of platforms, speed greatly improved, is an essential tool for individual users, working from home.
- Connecting NAS is safer and easier.



WIREGUARD
FAST, MODERN, SECURE VPN TUNNEL

coming soon

QTS 5.0 Beta program

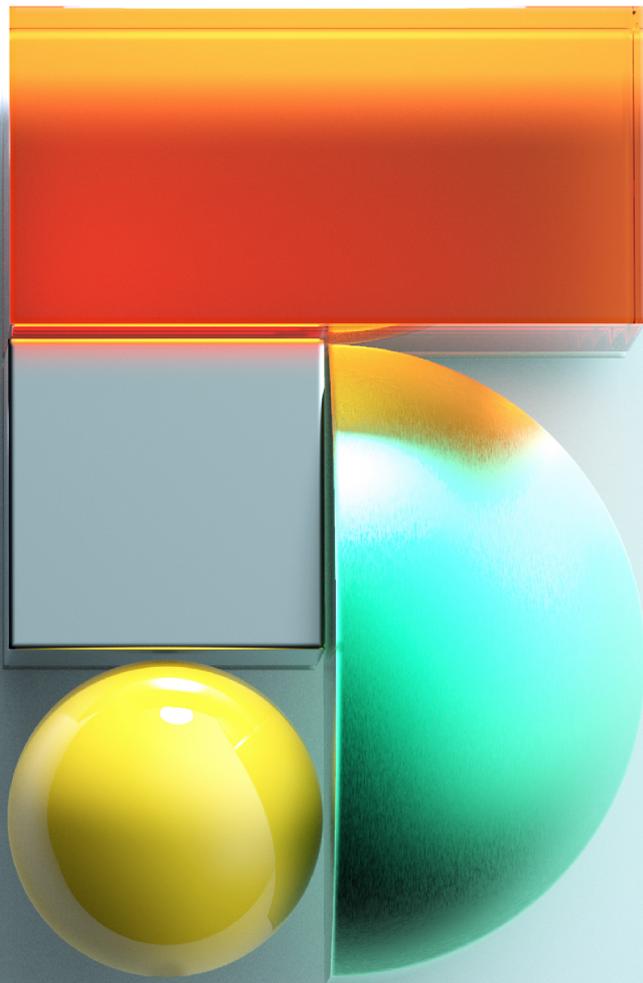
Duration 6/28~7/24

Support models

- TS-x51D2 (&TS-x51B)
- TS-x53D (&TS-x53B)
- HS-453DX
- TS-x73A (&TS-x73)
- TS-451DeU
- TS-x83XU

Known issues

- RDMA driver [CX3]
- QAT driver
- Marvell 1475 driver performance
- TS-873A QXG-5G2T-111C Port performance
- Partial 3rd-party Apps



The QNAP logo is displayed in white, bold, uppercase letters on an orange rectangular background.

QTS
QuTS hero

5.0 **BETA**

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