

QNAP

TS-hx77XU-RP

TS-h977XU-RP
TS-h1277XU-RP
TS-h1677XU-RP
TS-h2477XU-RP

User Guide

Contents

1. Preface

About This Guide.....	3
Audience.....	3
Document Conventions.....	3

2. Product Overview

About the TS-hx77XU-RP.....	4
Hardware Specifications.....	4
Package Contents.....	7
Components.....	8
Front Panel.....	8
Rear Panel.....	10
System Board.....	12
Drive Numbering.....	15
Installation Requirements.....	17
Safety Information.....	17
Setting Up the NAS.....	18

3. Installation and Configuration

Hardware Installation.....	20
Drive Installation.....	20
Replacing Memory Modules.....	27
Replacing Expansion Cards.....	34
Hot-Swapping Redundant Power Supply Units.....	42
Installing Handles on the TS-h977XU-RP.....	44
Rail Kits.....	45
Expansion Unit Installation.....	45
QuTS hero Installation.....	51
Installing QuTS hero Using Qfinder Pro.....	52
Installing QuTS hero Using the Cloud Key.....	54

4. Basic Operations

Power Button.....	57
Reset Button.....	57
LEDs.....	58
Audio Alert.....	59

5. Troubleshooting

Forcing Qfinder Pro or myQNAPcloud to Locate the NAS.....	61
Hot-swapping Failed Drives.....	61
Support and Other Resources.....	62

6. Glossary

Cloud Key.....	63
myQNAPcloud.....	63
myQNAPcloud Link.....	63
QNAP ID.....	63
Qfinder Pro.....	63
QuTS hero.....	63

7. Notices

Limited Warranty.....	64
Disclaimer.....	64
GNU Public License.....	64
CE Notice.....	72
UKCA Notice.....	72
FCC Notice.....	72
VCCI Notice.....	73
BSMI Notice.....	73
SJ/T 11364-2006.....	73

1. Preface





About This Guide

This guide provides information about the device and step-by-step instructions on installing the hardware. It also provides instructions on basic operations and troubleshooting information.

Audience

This document is intended for consumers and storage administrators. This guide assumes that the user has a basic understanding of storage and backup concepts.

Document Conventions

Symbol	Description
	Notes provide default configuration settings and other supplementary information.
	Important notes provide information on required configuration settings and other critical information.
	Tips provide recommendations or alternative methods of performing tasks or configuring settings.
	Warnings provide information that, when ignored, may result in potential loss, injury, or even death.

2. Product Overview

This chapter provides basic information about the QNAP device.

About the TS-hx77XU-RP

Equipped with an AMD Ryzen™ processor, the TS-hx77XU-RP NAS is a powerful solution for the storage, backup, sharing, and centralized management of your data. The new powerful AMD Ryzen™ processors enable the TS-hx77XU-RP to run on QNAP's NAS ZFS file based operating system QuTS hero. Featuring a versatile PCIe expansion card slot and scaling up to 64 GB of memory, the TS-hx77XU-RP adapts to your changing business needs. Each TS-hx77XU-RP also features four network ports (two 10GbE SFP+ and two 1GbE RJ45) for increased bandwidth and throughput, and a pre-installed dual-port 10Gbase-T RJ45 network expansion card. The TS-hx77XU-RP is able to leverage its AES-NI encryption engine to accelerate the performance of encrypted file transfers.

Hardware Specifications








Tip




Model specifications are subject to change without prior notice. To see the latest specifications, go to <https://www.qnap.com>.

Ordering P/N	Drive bays	Memory	Power supply
TS-h977XU-RP-3700X-32G	9	AMD Ryzen™ 7 3700X	Redundant
TS-h1277XU-RP-3700X-32G	12	AMD Ryzen™ 7 3700X	Redundant
TS-h1277XU-RP-3700X-128G	12	AMD Ryzen™ 7 3700X	Redundant
TS-h1677XU-RP-3700X-32G	16	AMD Ryzen™ 7 3700X	Redundant
TS-h2477XU-RP-3700X-32G	24	AMD Ryzen™ 7 3700X	Redundant

Component	TS-h977XU-RP-3700X-32G	TS-h1277XU-RP-3700X-32G TS-h1277XU-RP-3700X-128G	TS-h1677XU-RP-3700X-32G TS-h2477XU-RP-3700X-32G
Processor			
CPU	AMD Ryzen™ 7 3700X		
Frequency	8-core/16 thread 3.6 GHz base/Turbo 4.4 GHz		
Architecture	x86 64-bit		
Encryption engine	AES-NI		
Memory			
Pre-installed memory	TS-h977XU-RP-3700X-32G, TS-h1277XU-RP-3700X-32G: 32 GB RAM: 2 x 16 GB UDIMM DDR4 TS-h1277XU-RP-3700X-128G: 128 GB RAM: 4 x 32 GB UDIMM DDR4		32 GB RAM: 2 x 16 GB UDIMM DDR4

Component	TS-h977XU-RP-3700X-32G	TS-h1277XU-RP-3700X-32G TS-h1277XU-RP-3700X-128G	TS-h1677XU-RP-3700X-32G TS-h2477XU-RP-3700X-32G
Memory slots	4 x Long-DIMM DDR4		
	 Important <ul style="list-style-type: none"> Use only QNAP memory modules to maintain system performance and stability. For NAS devices with more than one memory slot, use QNAP modules with identical specifications. Using unsupported modules may degrade performance, cause errors, or prevent the operating system from starting. 		
Maximum memory	128 GB RAM: 4 x 32 GB		
Flash memory	5 GB (dual-boot OS protection)		
Storage			
Drive bays	<ul style="list-style-type: none"> 4 x 3.5-inch SATA 6 Gbps 5 x 2.5-inch SATA 6 Gbps 	12 x 3.5-inch SATA 6 Gbps	TS-h1677XU-RP: 16 x 3.5-inch SATA 6 Gbps TS-h2477XU-RP: 24 x 3.5-inch SATA 6 Gbps
	 Note The drive bays are backward compatible with SATA 3 Gbps drives.		
Drive compatibility	3.5-inch bays: <ul style="list-style-type: none"> 3.5-inch SATA hard disk drives 2.5-inch SATA hard disk drives 2.5-inch SATA solid-state drives 2.5-inch bays: <ul style="list-style-type: none"> 2.5-inch SATA hard disk drives 2.5-inch SATA solid-state drives  Important 2.5-inch drive trays only support drives with a maximum height of 9.5 mm.		
SSD cache acceleration support	<ul style="list-style-type: none"> 3.5-inch drive bays: 1 to 4 2.5-inch drive bays: 5 to 9 	3.5-inch drive bays: 1 to 12	<ul style="list-style-type: none"> TS-h1677XU-RP: 3.5-inch drive bays: 1 to 16 TS-h2477XU-RP: 3.5-inch drive bays: 1 to 24
Hot-swapping	Supported		
Network			
10 Gigabit Ethernet ports	<ul style="list-style-type: none"> 2 x 10GbE SFP+ SmartNIC 2 x 10GbaseT RJ45 		2 x 10GbE SFP+ SmartNIC

Component	TS-h977XU-RP-3700X-32G	TS-h1277XU-RP-3700X-32G TS-h1277XU-RP-3700X-128G	TS-h1677XU-RP-3700X-32G TS-h2477XU-RP-3700X-32G
Gigabit Ethernet ports	2 x GbE RJ45		
External I/O Ports & Expansion Slots			
PCIe slots	1 x PCIe 3.0 x16	<ul style="list-style-type: none"> • 2 x PCIe 3.0 x4 • 2 x PCIe 3.0 x8 	
		 Note Certain PCIe slot lengths are affected by installation of expansion cards in neighboring PCIe slots. For details, see Replacing Expansion Cards .	
 Tip For the list of compatible drive models and expansion cards, go to https://www.qnap.com/compatibility .			
USB ports	<ul style="list-style-type: none"> • 4 x USB 3.2 Gen 1 Type-A • 1 x USB 3.2 Gen 2 (10Gbps) 5V/1A Type-A 	<ul style="list-style-type: none"> • 4 x USB 3.2 Gen 1 Type-A • 1 x USB 3.2 Gen 2 (10Gbps) 5V/3A Type-C • 1 x USB 3.2 Gen 2 (10Gbps) 5V/1A Type-A 	
Interface			
Buttons	<ul style="list-style-type: none"> • Power • Reset 		
Dimensions			
Form factor	1U Rackmount	2U Rackmount	<ul style="list-style-type: none"> • TS-h1677XU-RP: 3U Rackmount • TS-h2477XU-RP: 4U Rackmount
Dimensions (H x W x D)	43.3 x 482.6 x 505.54 mm (1.70 x 19.00 x 19.90 in)	88.3 x 482 x 562 mm (3.48 x 18.98 x 22.13 in)	<ul style="list-style-type: none"> • TS-h1677XU-RP: 130 x 481 x 573.5 mm (5.11 x 18.94 x 22.58 in) • TS-h2477XU-RP: 176.15 x 481.04 x 672.02 mm (6.94 x 18.94 x 26.46 in)
Net weight	8.62 kg (19.00 lbs)	13.73 kg (30.27 lbs)	<ul style="list-style-type: none"> • TS-h1677XU-RP: 15.26 kg (33.64 lbs) • TS-h2477XU-RP: 22.66 kg (49.96 lbs)
Others			

Component	TS-h977XU-RP-3700X-32G	TS-h1277XU-RP-3700X-32G TS-h1277XU-RP-3700X-128G	TS-h1677XU-RP-3700X-32G TS-h2477XU-RP-3700X-32G
Rail compatibility	<ul style="list-style-type: none"> • TS-h977XU-RP, TS-h1277XU-RP: RAIL-B02 • TS-h1677XU-RP: RAIL-A03 • TS-h2477XU-RP: RAIL-A02 <div style="border-left: 2px solid #0070C0; padding-left: 10px; margin-top: 10px;">  Note <ul style="list-style-type: none"> • Rail kits are not included with the NAS and must be purchased separately. For details, contact an authorized reseller or go to http://shop.qnap.com. • Information on rail kit installation can be found in the installation guide included in the rail kit package. </div>		
Power supply unit	<ul style="list-style-type: none"> • TS-h977XU-RP: 2 x 300W, 100-240V AC, 50/60 Hz • TS-h1277XU-RP: 2 x 300W, 100-240V AC, 50/60 Hz • TS-h1677XU-RP: 2 x 500W, 100-240V AC, 50/60 Hz • TS-h2477XU-RP: 2 x 800W, 100-240V AC, 50/60 Hz 		
System battery	CR2032 lithium battery (3V, 225 mAh) <div style="border-left: 2px solid #D9534F; padding-left: 10px; margin-top: 10px;">  Important <p>Dispose of used batteries according to local regulations or the instructions of the battery manufacturer.</p> </div>		
Sound level	43.8 db(A)	37.2 db(A)	TS-h1677XU-RP: 46.6 db(A) TS-h2477XU-RP: 27.5 db(A)
	<div style="border-left: 2px solid #0070C0; padding-left: 10px; margin-top: 10px;">  Note <p>The sound level was tested at a bystander position, which is within one meter of the NAS. The test NAS operated at low speed with the maximum number of drives installed.</p> </div>		
Fans	System: 3 x 40 mm, 12V DC fans	System: 2 x 70 mm, 12V DC fans	System: 4 x 92 mm, 12V DC fans
Operating temperature	0°C to 40°C (32°F to 104°F)		
Relative humidity	<ul style="list-style-type: none"> • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F) 		

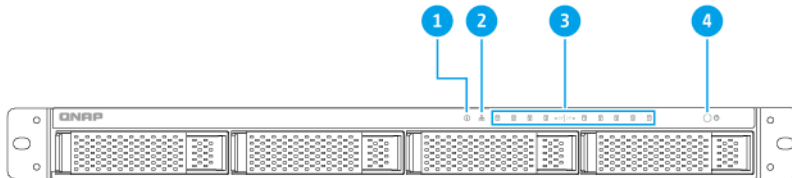
Package Contents

Item	Quantity
TS-hx77XU-RP	1
Power cord	2

Item	Quantity
Ethernet cable	<ul style="list-style-type: none"> • TS-h977XU-RP, TS-h1277XU-RP: 2 x 1GbE (Cat5e), 2 x 10GbE (Cat6a) • TS-h1677XU-RP, TS-h2477XU-RP: 1 x 1GbE (Cat5e)
Screws for 2.5-inch drives	<ul style="list-style-type: none"> • TS-h977XU-RP: 32 • TS-h1277XU-RP: 36 • TS-h1677XU-RP: 64 • TS-h2477XU-RP: 96
Screws for 3.5-inch drives	<ul style="list-style-type: none"> • TS-h977XU-RP: 16 • TS-h1277XU-RP: 48 • TS-h1677XU-RP: 64 • TS-h2477XU-RP: 96
Quick Installation Guide (QIG)	1

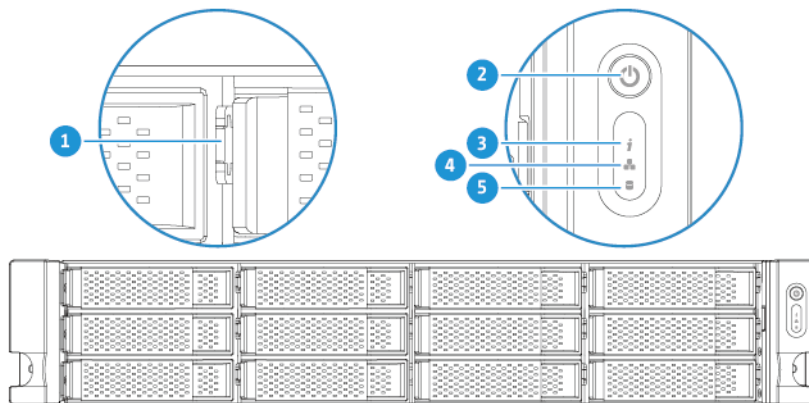
Components

Front Panel



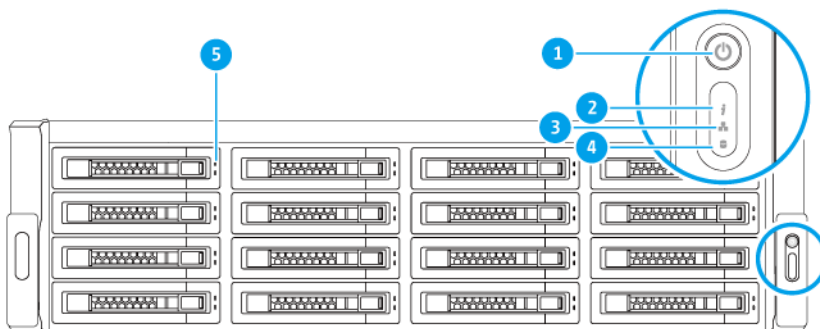
TS-h977XU-RP

No.	Component	No.	Component
1	Status LED	3	Drive LEDs
2	LAN LED	4	Power button



TS-h1277XU-RP

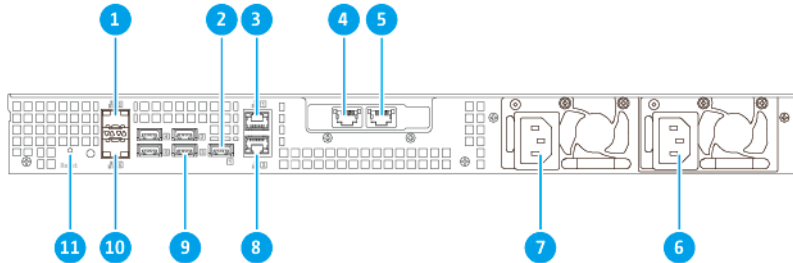
No.	Component	No.	Component
1	Drive LEDs	4	LAN LED
2	Power button	5	Expansion unit LED
3	Status LED	-	-



TS-h1677XU-RP, TS-h2477XU-RP

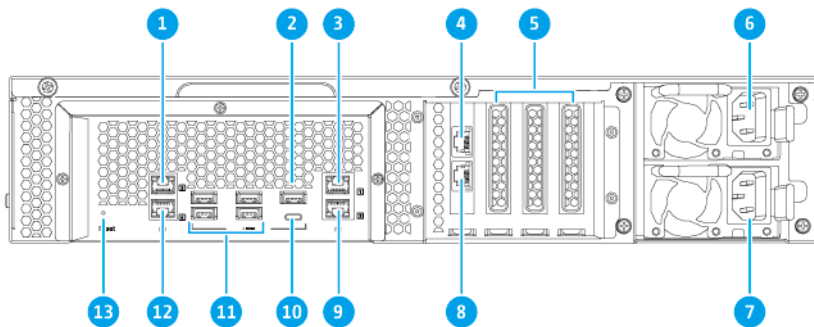
No.	Component	No.	Component
1	Power button	4	Expansion unit LED
2	Status LED	5	Drive LEDs
3	LAN LED	-	-

Rear Panel



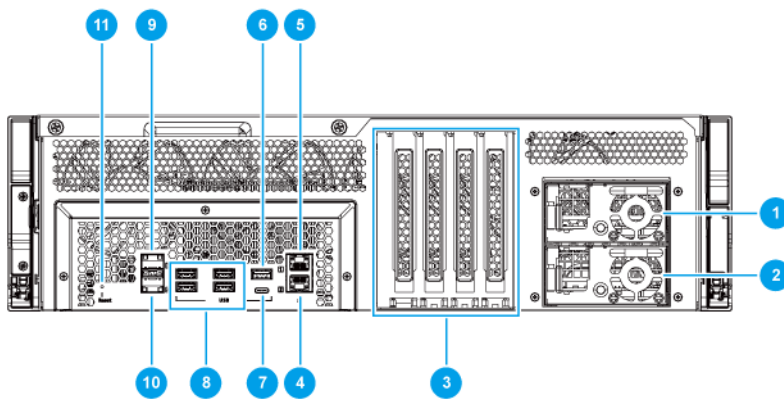
TS-h977XU-RP

No.	Component	No.	Component
1	Ethernet port 3 (10GbE SFP+)	7	Power supply unit 2
2	USB 3.2 Gen 2 Type-A port	8	Ethernet port 2 (GbE RJ45)
3	Ethernet port 1 (GbE RJ45)	9	USB 3.2 Gen 1 Type-A ports
4	Ethernet port 6 (10GBase-T RJ45)	10	Ethernet port 4 (10GbE SFP+)
5	Ethernet port 5 (10GBase-T RJ45)	11	Reset button
6	Power supply unit 1	-	-



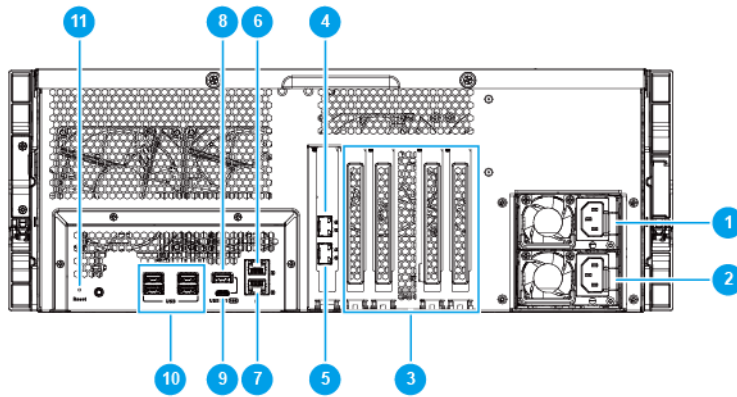
TS-h1277XU-RP

No.	Component	No.	Component
1	Ethernet port 3 (10GbE SFP+)	8	Ethernet port 5 (10GBase-T RJ45)
2	USB 3.2 Gen 2 Type-A port	9	Ethernet port 2 (GbE RJ45)
3	Ethernet port 1 (GbE RJ45)	10	USB 3.2 Gen 2 Type-C port
4	Ethernet port 6 (10GBase-T RJ45)	11	USB 3.2 Gen 1 Type-A ports
5	PCIe low-profile covers	12	Ethernet port 4 (10GbE SFP+)
6	Power supply unit 1	13	Reset button
7	Power supply unit 2	-	-



TS-h1677XU-RP

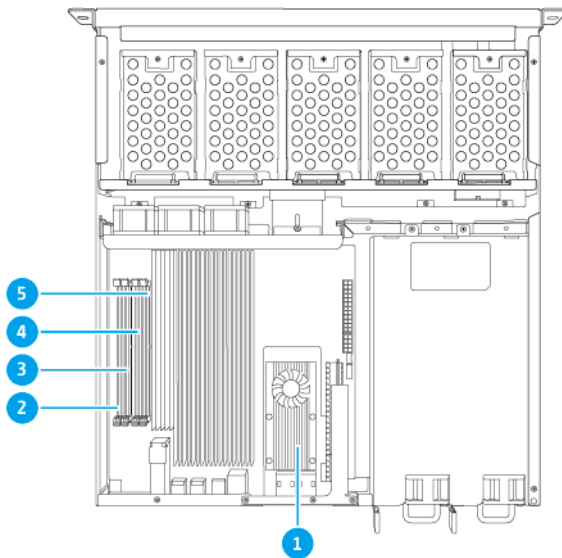
No.	Component	No.	Component
1	Power supply unit 1	7	USB 3.2 Gen 2 Type-C port
2	Power supply unit 2	8	USB 3.2 Gen 1 Type-A ports
3	PCIe full-height covers	9	Ethernet port 3 (10GbE SFP+)
4	Ethernet port 1 (GbE RJ45)	10	Ethernet port 4 (10GbE SFP+)
5	Ethernet port 2 (GbE RJ45)	11	Reset button
6	USB 3.2 Gen 2 Type-A port	-	-



TS-h2477XU-RP

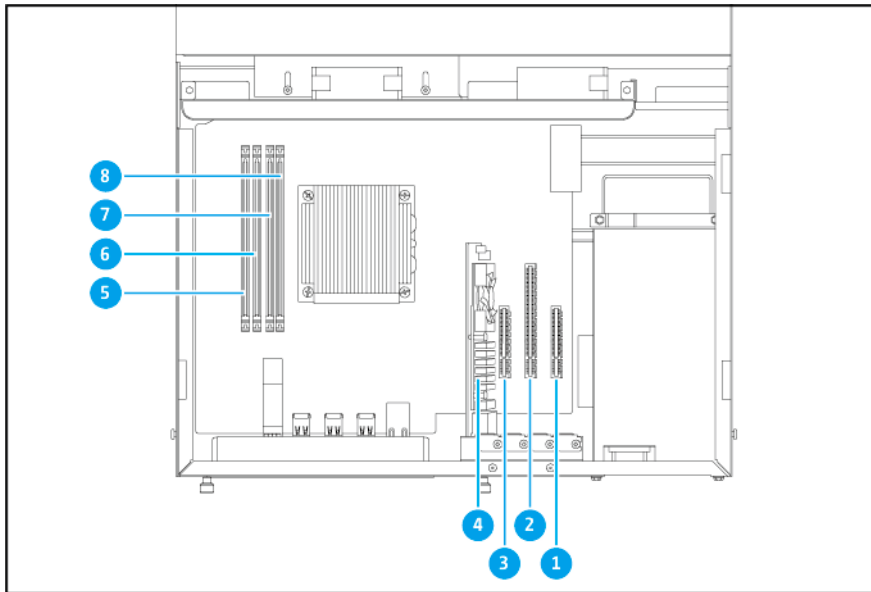
No.	Component	No.	Component
1	Power supply unit 1	7	Ethernet port 2 (GbE RJ45)
2	Power supply unit 2	8	USB 3.2 Gen 2 Type-A port
3	PCIe full-height covers	9	USB 3.2 Gen 2 Type-C port
4	Ethernet port 4 (10GbE SFP+)	10	USB 3.2 Gen 1 Type-A ports
5	Ethernet port 3 (10GbE SFP+)	11	Reset button
6	Ethernet port 1 (GbE RJ45)	-	-

System Board



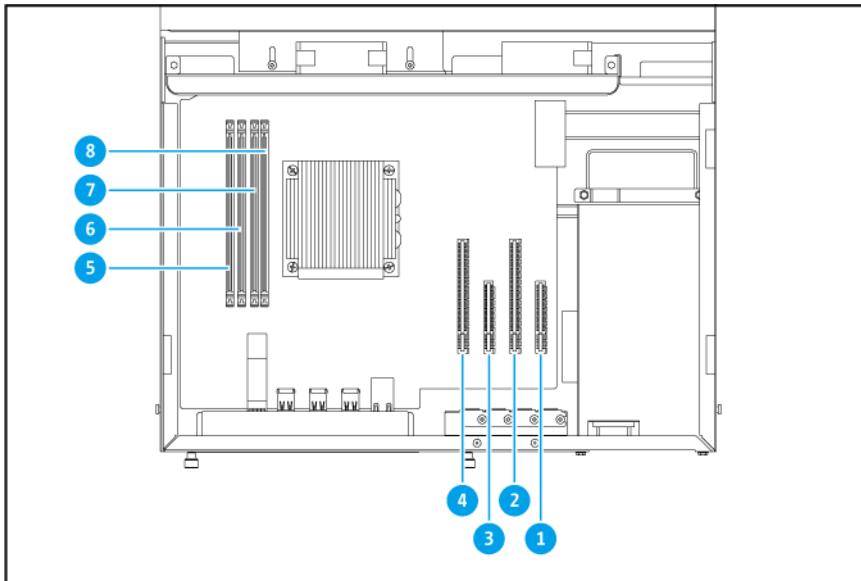
TS-h977XU-RP

No.	Component	No.	Component
1	PCIe slot 1 (PCIe 3.0 x16) <div style="display: flex; align-items: center;"> <div style="border: 1px solid blue; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"> 8 </div> <div style="margin-left: 5px;"> <p>Note A dual-port 10Base-T expansion card is installed on this PCIe slot.</p> </div> </div>	4	Memory slot 2 (Channel A, DIMM 2)
2	Memory slot 4 (Channel B, DIMM 4)	5	Memory slot 1 (Channel A, DIMM 1)
3	Memory slot 3 (Channel B, DIMM 3)	-	-



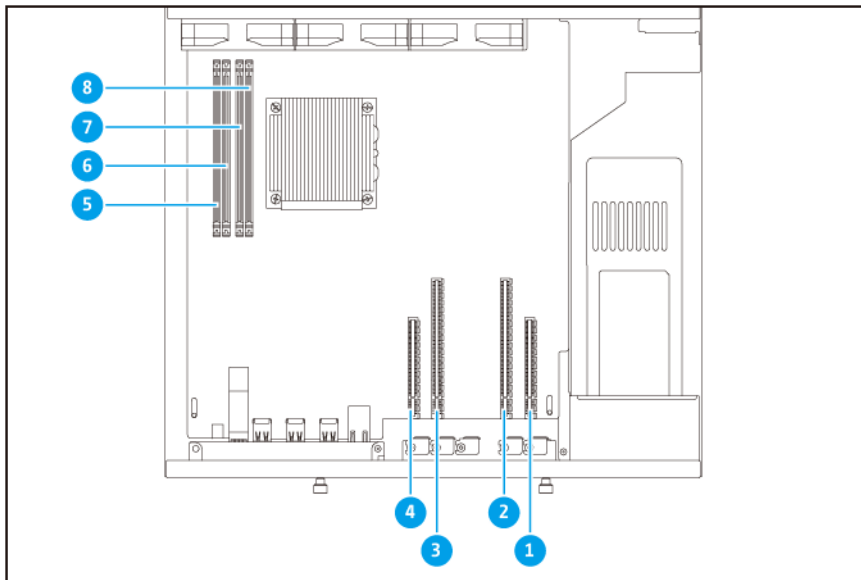
TS-h1277XU-RP

No.	Component	No.	Component
1	PCIe slot 1 (PCIe 3.0 x4)	5	Memory slot 4 (Channel B, DIMM 4)
2	PCIe slot 2 (PCIe 3.0 x8)	6	Memory slot 3 (Channel B, DIMM 3)
3	PCIe slot 3 (PCIe 3.0 x4)	7	Memory slot 2 (Channel A, DIMM 2)
4	PCIe slot 4 (PCIe 3.0 x8) <div style="display: flex; align-items: center;"> <div style="border: 1px solid blue; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"> 8 </div> <div style="margin-left: 5px;"> <p>Note A dual-port 10Base-T expansion card is installed on this PCIe slot.</p> </div> </div>	8	Memory slot 1 (Channel A, DIMM 1)




TS-h1677XU-RP

No.	Component	No.	Component
1	PCIe slot 1 (PCIe 3.0 x4)	5	Memory slot 4 (Channel B, DIMM 4)
2	PCIe slot 2 (PCIe 3.0 x8)	6	Memory slot 3 (Channel B, DIMM 3)
3	PCIe slot 3 (PCIe 3.0 x4)	7	Memory slot 2 (Channel A, DIMM 2)
4	PCIe slot 4 (PCIe 3.0 x8)	8	Memory slot 1 (Channel A, DIMM 1)

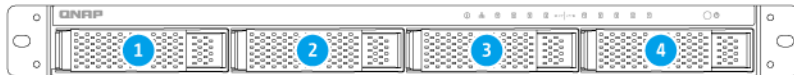


TS-h2477XU-RP

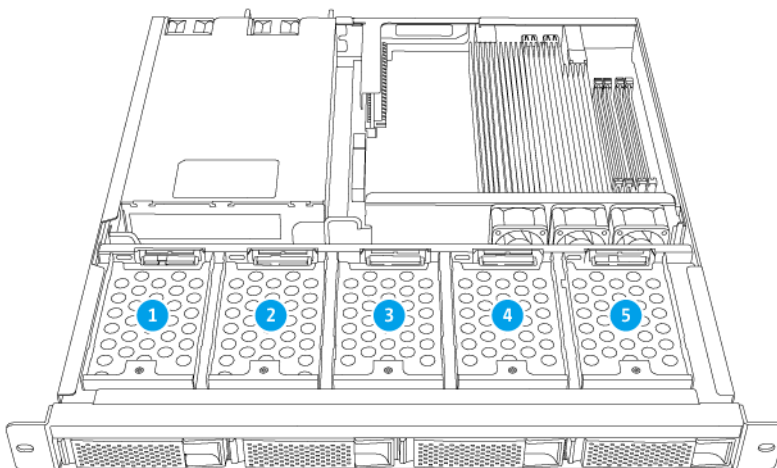
No.	Component	No.	Component
1	PCIe slot 1 (PCIe 3.0 x4)	5	Memory slot 4 (Channel B, DIMM 4)
2	PCIe slot 2 (PCIe 3.0 x8)	6	Memory slot 3 (Channel B, DIMM 3)

No.	Component	No.	Component
3	PCIe slot 3 (PCIe 3.0 x8)	7	Memory slot 2 (Channel A, DIMM 2)
4	<div style="display: flex; align-items: center;">  <div> <p>Note A dual-port 10GbE (SFP+) expansion card is installed on this PCIe slot.</p> </div> </div>	8	Memory slot 1 (Channel A, DIMM 1)

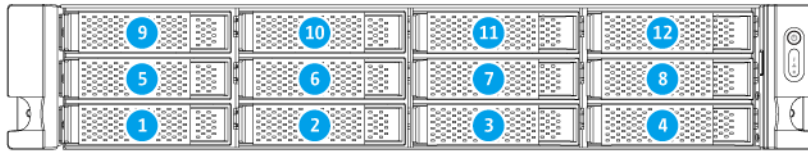
Drive Numbering



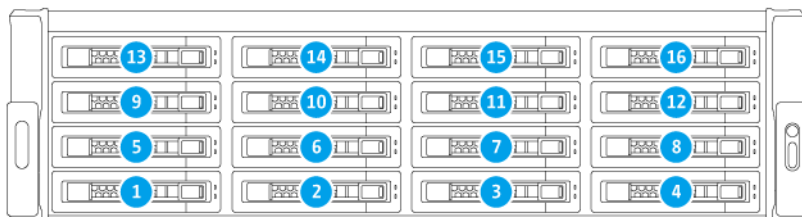
TS-h977XU-RP 3.5-inch Trays



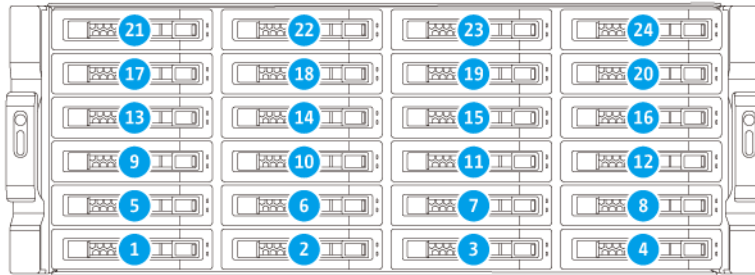
TS-h977XU-RP 2.5-inch Trays



TS-h1277XU-RP



TS-h1677XU-RP



TS-h2477XU-RP

Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> Room temperature: 0°C to 40°C (32°F to 104°F) Non-condensing relative humidity: 5% to 95% Wet-bulb temperature: 27°C (80.6°F) Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals
Hardware and peripherals	<ul style="list-style-type: none"> Storage drives For the list of compatible drive models, go to https://www.qnap.com/compatibility. Network cable
Tools	<ul style="list-style-type: none"> Phillips #1 or #2 screwdriver Anti-static wrist strap

Safety Information

The following instructions help ensure personal safety and environmental safety. Read these instructions carefully before performing any operations.

General Instructions

- The device should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.
- Only qualified, skilled, and authorized persons with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the device.

- To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.
- Observe electrostatic discharge (ESD) procedures to avoid potential injury or damage to components.

Power

- To reduce the risk of fire or electric shock, ensure that you only connect the power cord to a properly grounded electrical outlet.



Devices with redundant power supply may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords from the device before installing or replacing system components.

System Battery

- To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.
- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

Moving Parts



Moving fan blades: Keep your body parts away from moving fan blades while the device is connected to a power source.



Moving components: Keep your body parts away from other moving components.

Setting Up the NAS



Important

Read all safety requirements and information carefully before setting up the NAS or installing NAS components.

1. Place your NAS device in an environment that meets the requirements.
For details, see [Installation Requirements](#).
2. Optional: Replace memory modules.
For details, see [Replacing Memory Modules](#).
3. Optional: Replace expansion cards.
For details, see [Replacing Expansion Cards](#).
4. Install the NAS on a rack.

5. Install the drives.

For details, see the following topics:

- [Installing 3.5-inch Hard Drives on 3.5-inch Trays](#)
- [Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays](#)
- [Installing 2.5-inch Solid-State Drives on 2.5-inch Trays on the TS-h977XU-RP](#)

6. Connect the power cord and all applicable cables.**7.** Power on the NAS.**8.** Install QuTS hero.

For details, see [QuTS hero Installation](#).

9. Log on to QuTS hero.

3. Installation and Configuration

This chapter provides specific hardware and firmware installation and configuration steps.

Hardware Installation

This section provides information on installing drives, memory modules, and expansion cards.

Drive Installation

The TS-hx77XU-RP is compatible with 3.5-inch hard drives, 2.5-inch hard drives, and 2.5-inch solid-state drives.

Installing 3.5-inch Hard Drives on 3.5-inch Trays



Warning

- Installing a drive and installing QuTS hero deletes all data on the drive.

-



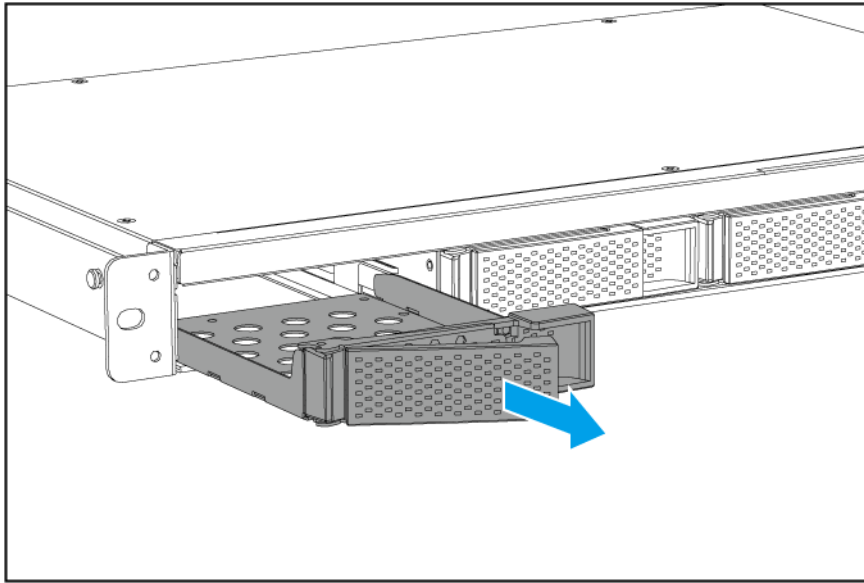
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

-



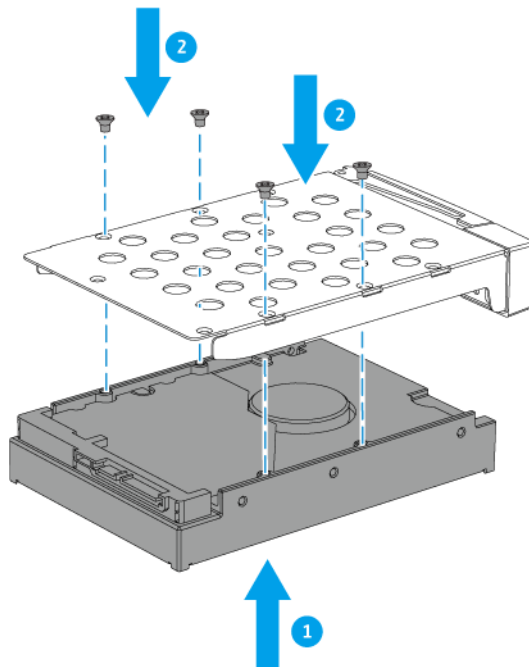
Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
2. Remove the drive tray.
 - a. Pull the handle to release the tray.
 - b. Pull the tray out.



3. Install a drive on the tray.

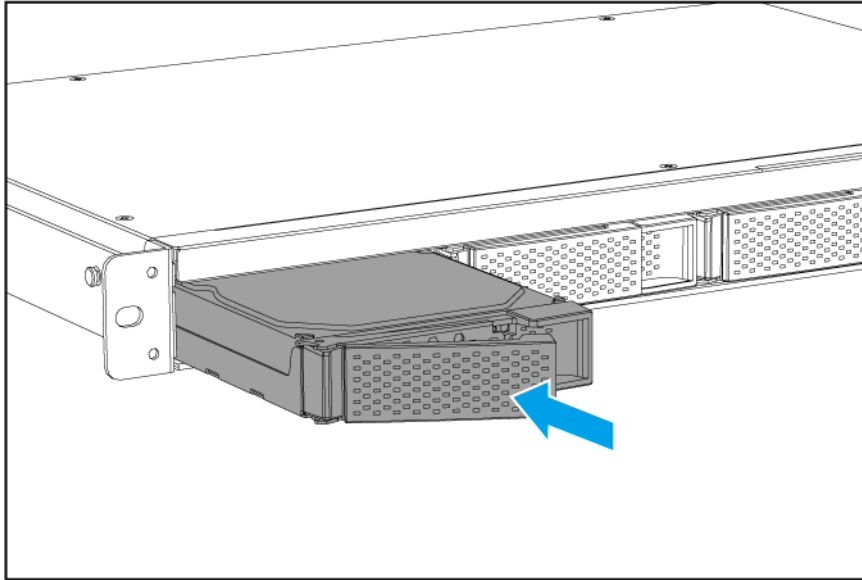
- a. Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
- b. Attach the screws.



4. Load the tray into the bay.

- a. Insert the tray into the bay.

- b. Push the handle.



5. Power on the NAS.

Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays



Warning

- Installing a drive and installing QuTS hero deletes all data on the drive.

-



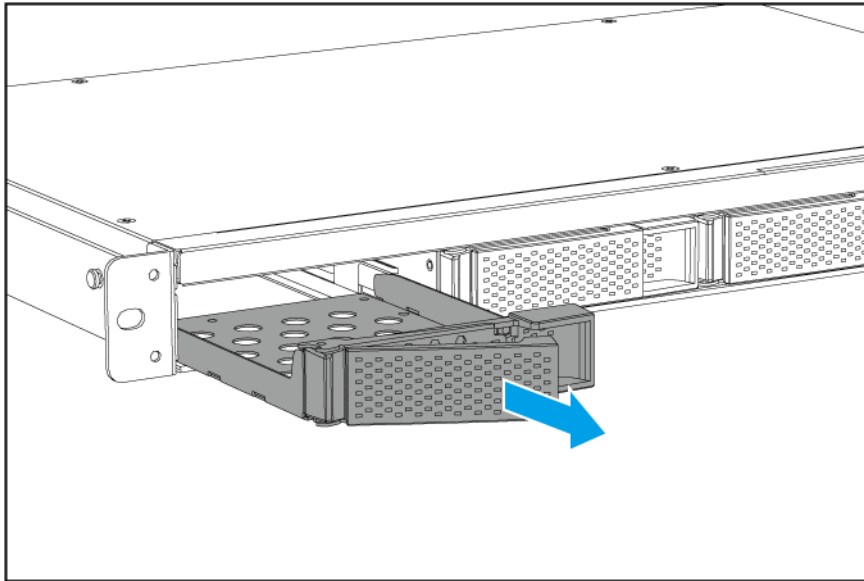
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

-



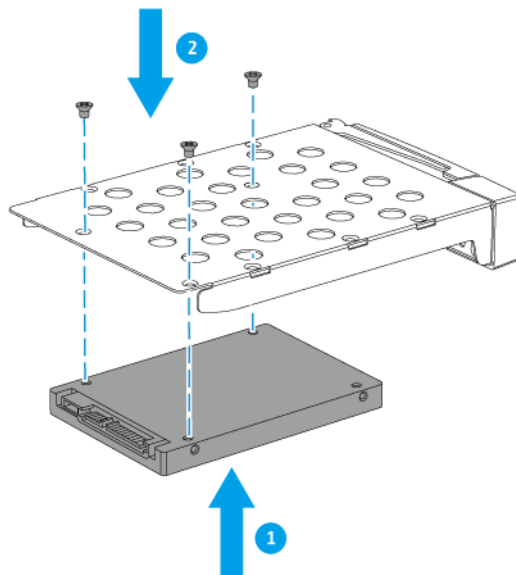
Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
2. Remove the drive tray.
 - a. Pull the handle to release the tray.
 - b. Pull the tray out.



3. Install a drive on the tray.

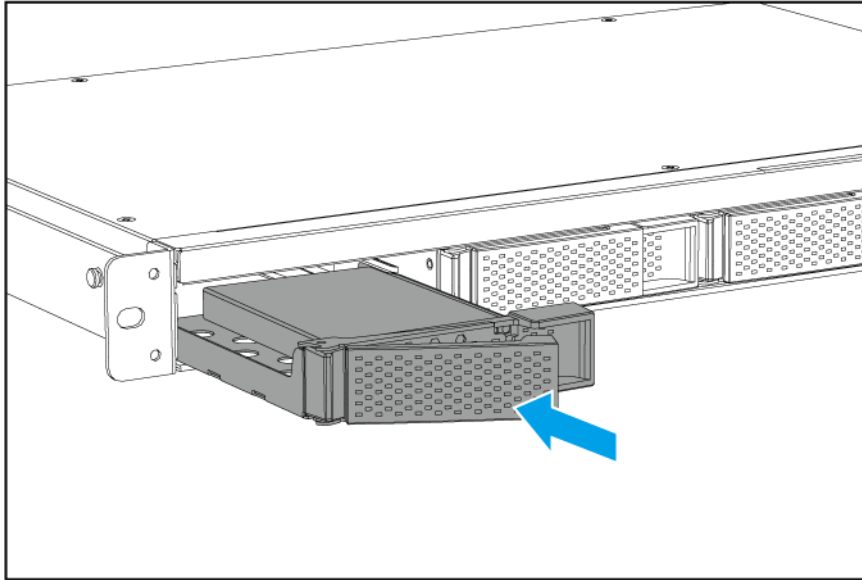
- a.** Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
- b.** Attach the screws.



4. Load the tray into the bay.

- a.** Insert the tray into the bay.

- b. Push the handle.



5. Power on the NAS.

Installing 2.5-inch Solid-State Drives on 2.5-inch Trays on the TS-h977XU-RP



Warning

- Installing a drive and installing QuTS hero deletes all data on the drive.

-



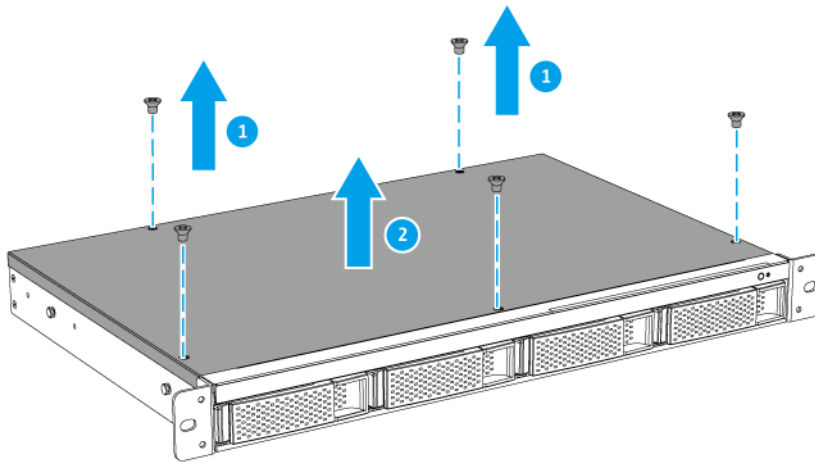
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

-



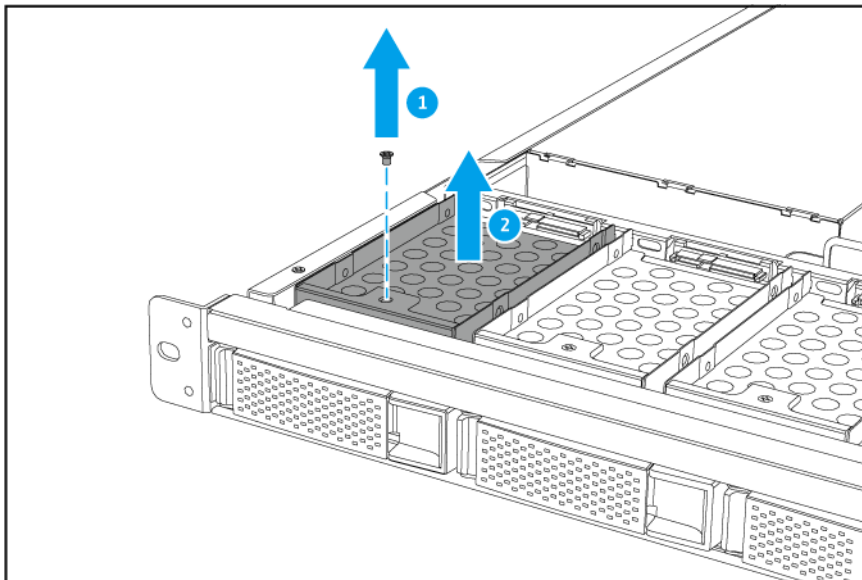
Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
2. Remove the case cover.
 - a. Remove the screws.
 - b. Lift the cover up.



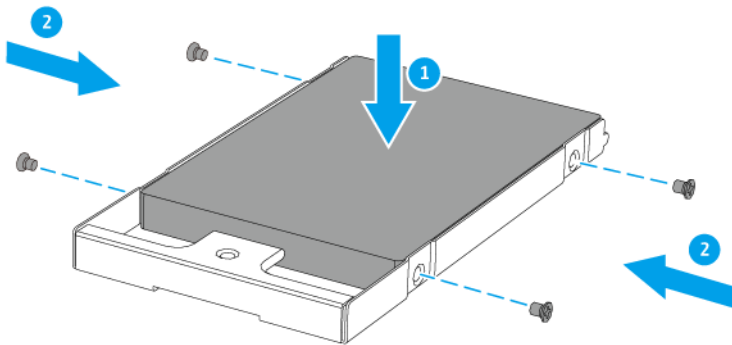
3. Remove the drive tray.

- a. Remove the screws.
- b. Pull the tray out.

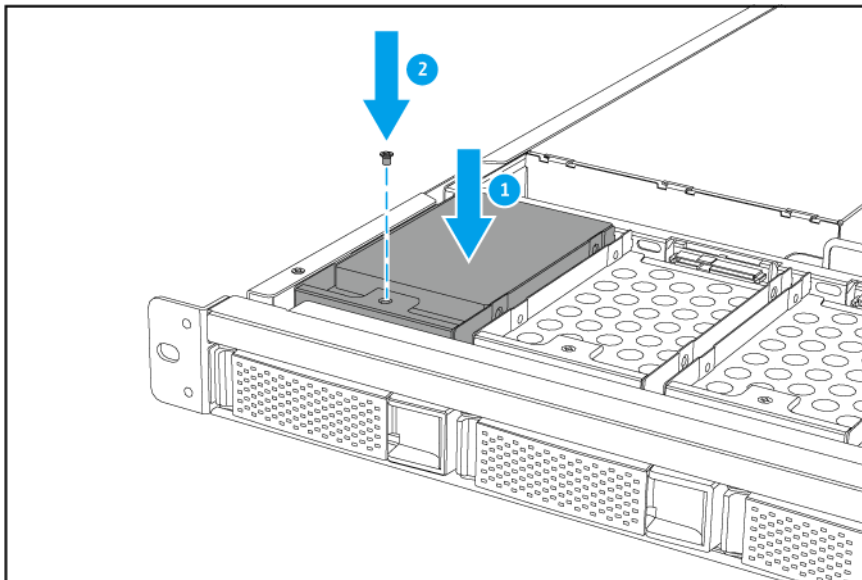


4. Install a drive on the tray.

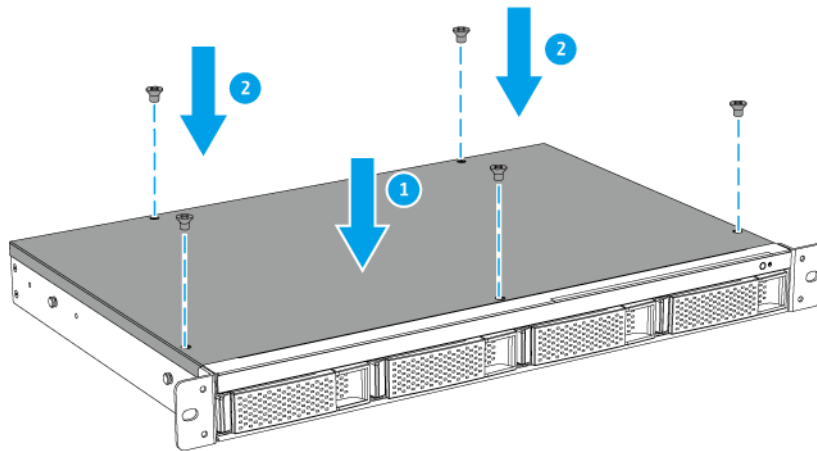
- a. Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
- b. Attach the screws.



5. Load the tray into the bay.
 - a. Insert the tray into the bay.
 - b. Attach the screws.



6. Attach the case cover.
 - a. Place the cover on the NAS.
 - b. Attach the screws.



7. Power on the NAS.

Replacing Memory Modules

The TS-hx77XU-RP has four memory slots. You can increase the memory capacity of the NAS by upgrading the memory module.

Use only QNAP modules of the same type and capacity to maintain system performance and stability. You can purchase QNAP memory modules from authorized resellers.

Replacing Memory Modules on the TS-h977XU-RP



Important

QNAP recommends installing modules in pairs to run dual-channel mode.

- Ensure that each memory channel uses identical modules. See table below for details:

Channel name	Slot numbering
Channel A	Slots 1, 2
Channel B	Slots 3, 4

- Install the pairs in sequence and follow the assigned slots for each pair.
- When installing one module use the slot furthest from the CPU (slot 4).
- Install memory modules in groups of two or four. When installing two memory modules, install the memory in memory slots 2 and 4. When installing four modules, install the memory in slots 2,4 and then slots 1, and 3.

For details on slot numbering, see [System Board](#).



Warning

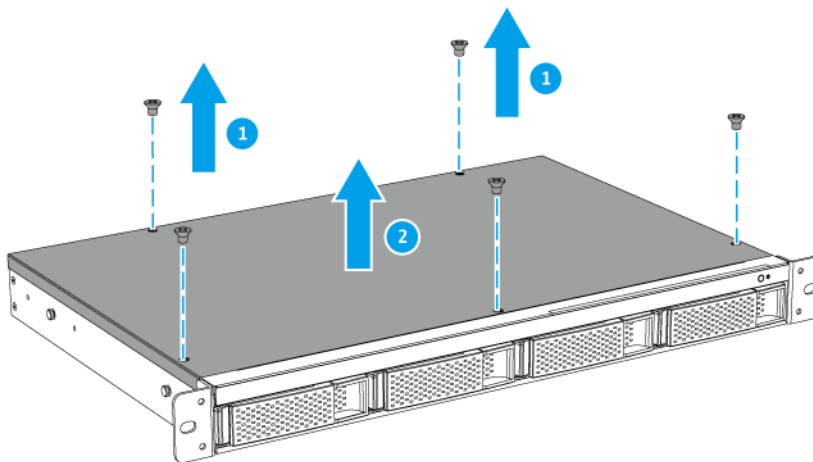


Moving fan blades: Keep your hands and other body parts away from moving fan blades.



Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the front cover.
 - a. Remove the screws.
 - b. Lift the cover off the device.



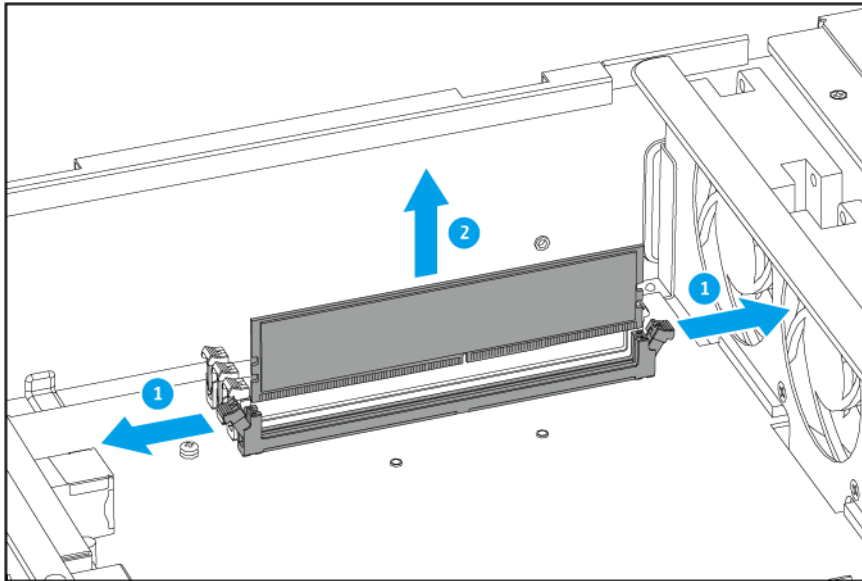
5. Remove an existing module.
 - a. Push the retention clips outward simultaneously to release the module.



Warning

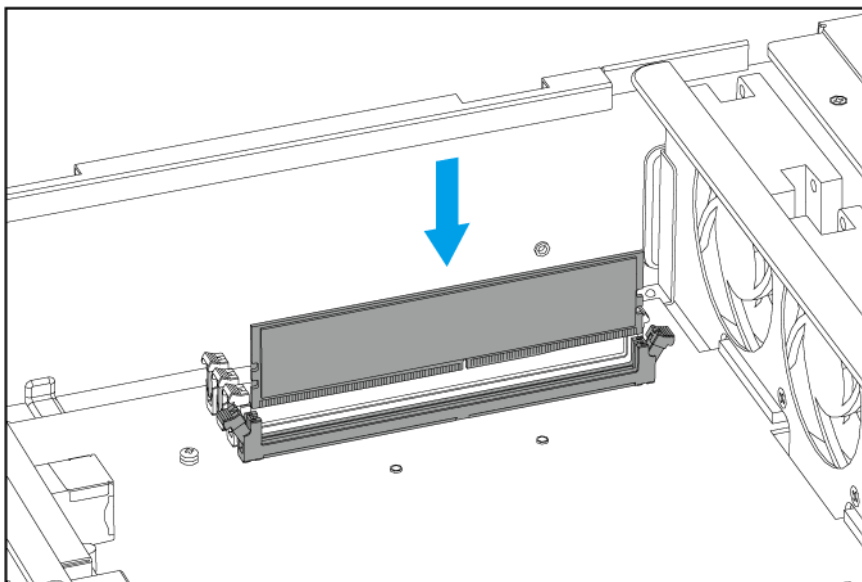
Attempting to remove a module that is not completely released may damage the module and the motherboard.

- b. Hold the module by the edges.



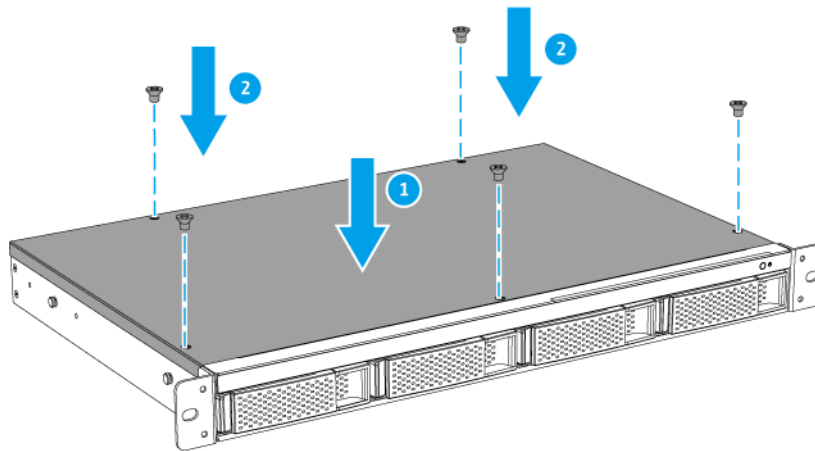
6. Install a new module.

- a. Align the notch with the ridge in the slot.
- b. Insert the module into the slot.
- c. Verify that the metal connectors are completely inserted into the slot.
- d. Carefully press down on the module until the retention clips lock the module into place.



7. Attach the case cover.

- a. Place the cover on the device.
- b. Attach the screws.



8. Connect all cables and external attachments.
9. Power on the device.
10. Verify that the module is recognized by the device.
 - a. Log on to QuTS here as administrator.
 - b. Go to **Control Panel > System > System Status > Hardware Information** .
 - c. Check the value for **Total memory**.

Replacing Memory Modules on the TS-h1277XU-RP, TS-h1677XU-RP, and TS-h2477XU-RP



Important

QNAP recommends installing modules in pairs to run dual-channel mode.

- Ensure that each memory channel uses identical modules. See table below for details:

Channel name	Slot numbering
Channel A	Slots 1, 2
Channel B	Slots 3, 4

- When installing one module use the slot furthest from the CPU (slot 4).
- Install the pairs in sequence and follow the assigned slots for each pair.
- Install memory modules in groups of two or four. When installing two memory modules, install the memory in memory slots 2 and 4. When installing four modules, install the memory in slots 2,4 and then slots 1, and 3.

For details on slot numbering, see [System Board](#).



Warning

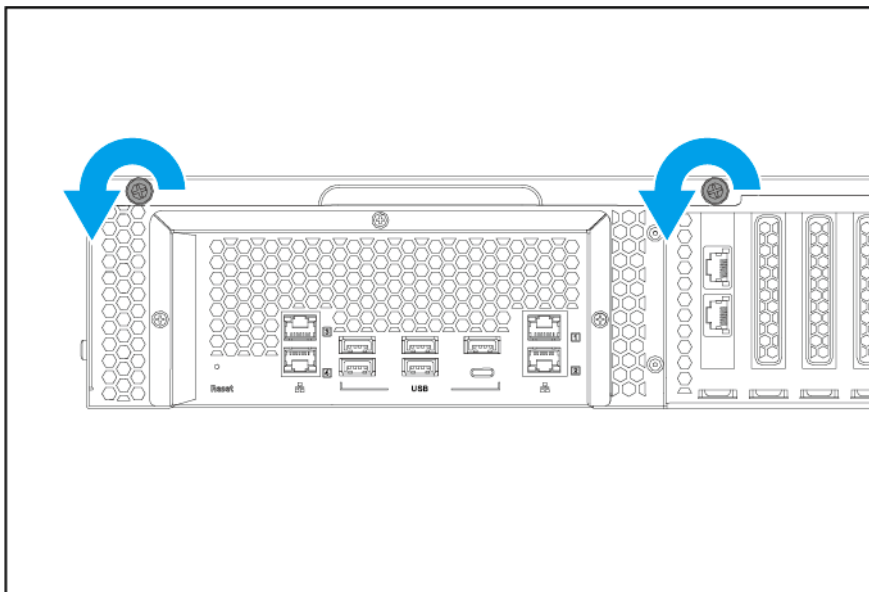


Moving fan blades: Keep your hands and other body parts away from moving fan blades.

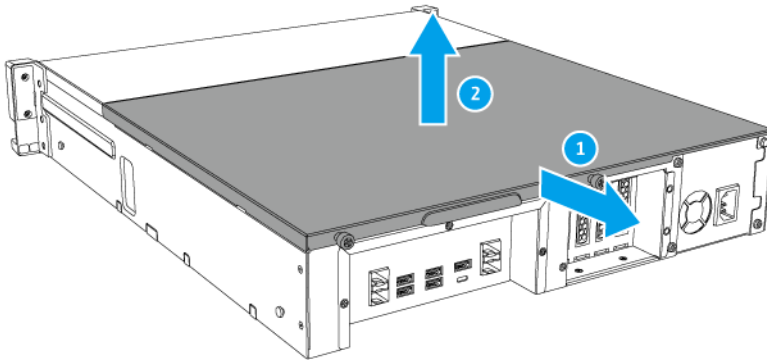


Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
 - a. Loosen the screws.



- b. Slide the cover back.
- c. Lift the cover off the device.



5. Remove an existing module.

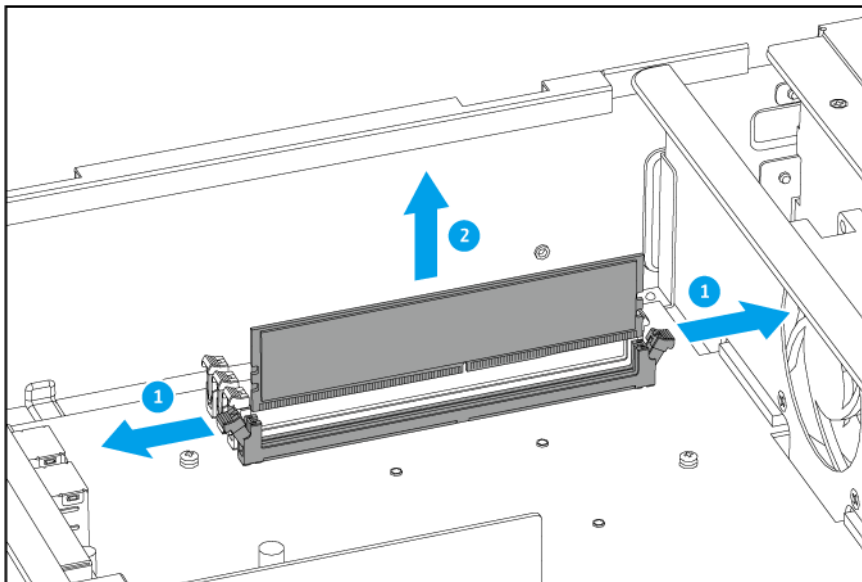
- a. Push the retention clips outward simultaneously to release the module.



Warning

Attempting to remove a module that is not completely released may damage the module and the motherboard.

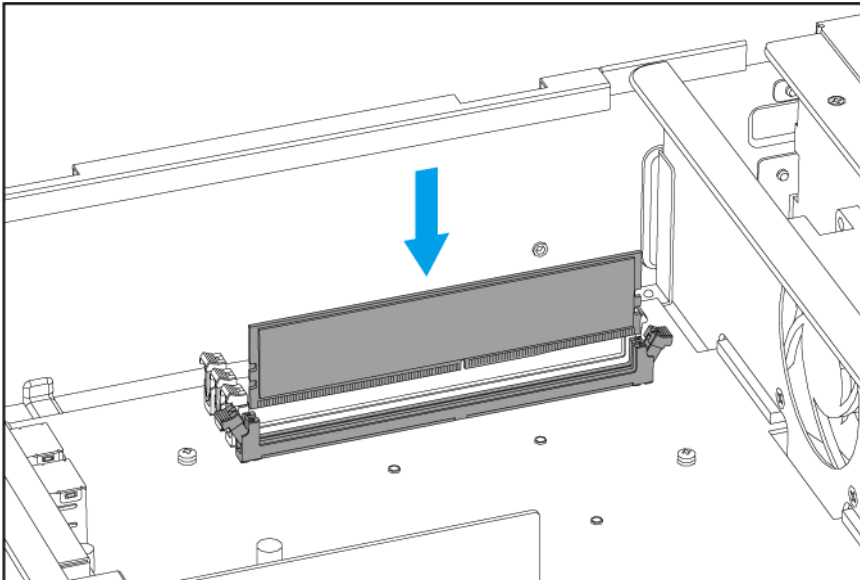
- b. Hold the module by the edges.



6. Install a new module.

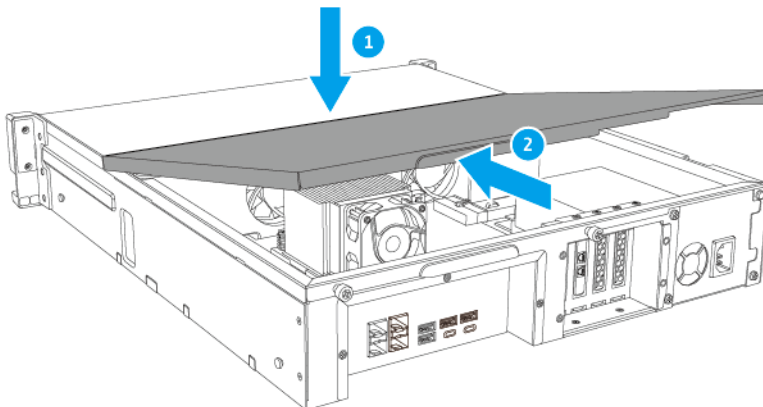
- a. Align the notch with the ridge in the slot.
- b. Insert the module into the slot.

- c. Verify that the metal connectors are completely inserted into the slot.
- d. Carefully press down on the module until the retention clips lock the module into place.

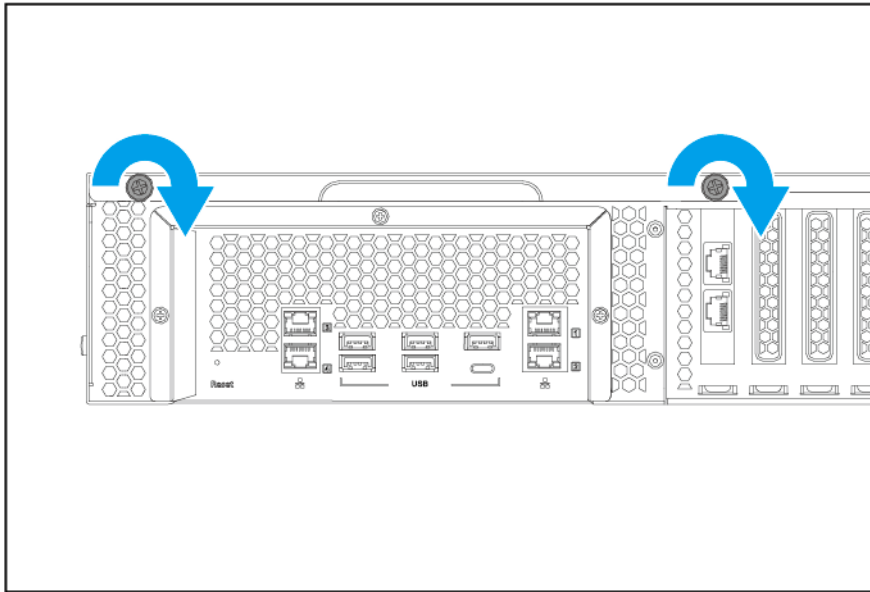


7. Attach the case cover.

- a. Place the cover on the device.
- b. Slide the cover forward.



- c. Tighten the screws.



8. Connect all cables and external attachments.
9. Power on the device.
10. Verify that the module is recognized by the device.
 - a. Log on to QuTS hero as administrator.
 - b. Go to **Control Panel > System > System Status > Hardware Information** .
 - c. Check the value for **Total memory**.

Replacing Expansion Cards

The TS-hx77XU-RP supports selected expansion cards, some of which require QNAP PCIe brackets. QNAP-branded expansion cards purchased from the company website are shipped with the brackets necessary to fit all QNAP NAS models.

Replacing Expansion Cards on the TS-h977XU-RP



Note

A dual-port 10GBase-T network expansion card is pre-installed on the PCIe 3.0 x16 slot.



Warning

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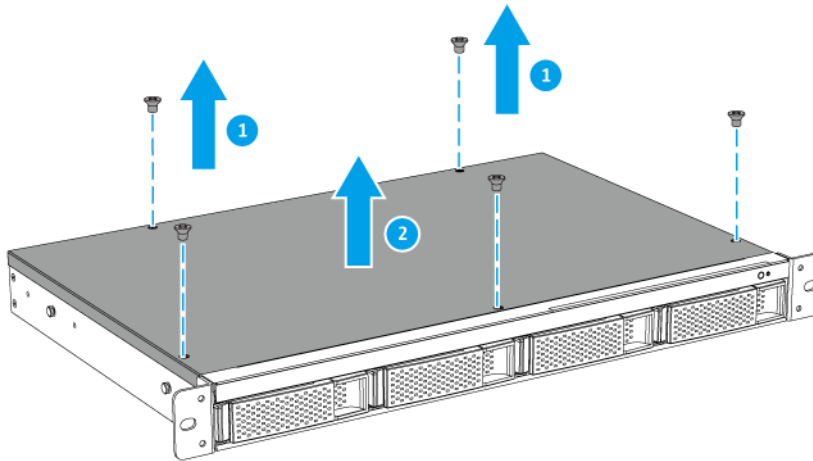


Moving fan blades: Keep your hands and other body parts away from moving fan blades.



Other moving components: Keep your hands and other body parts away from other moving components.

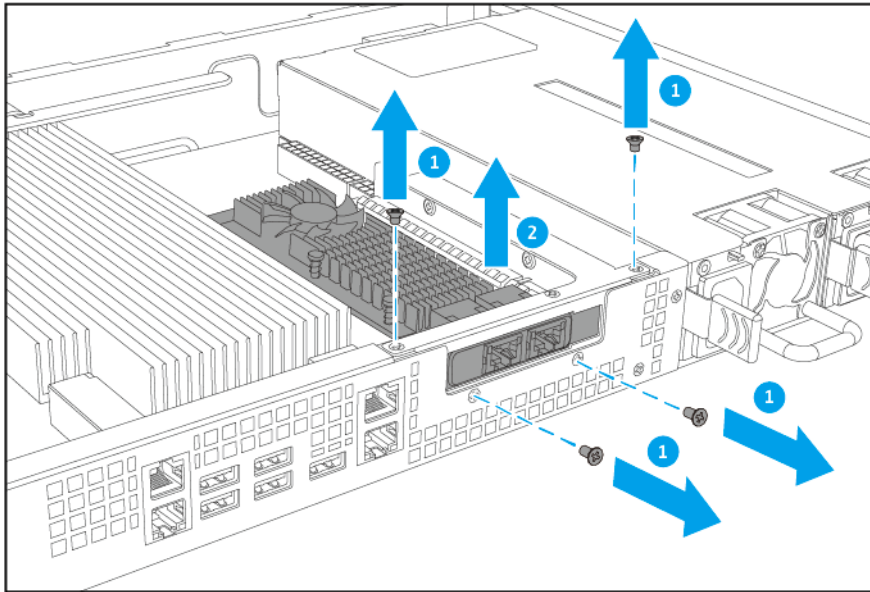
1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
 - a. Remove the screws.
 - b. Lift the cover off the device.



Warning

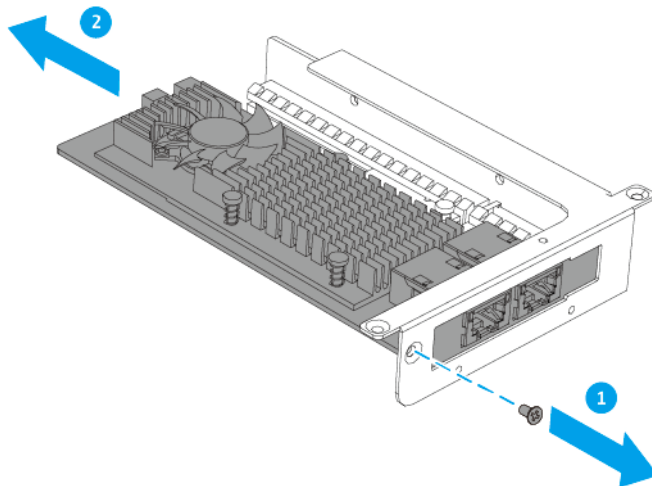
To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.

5. Remove the PCIe module.
 - a. Remove the screws from the module.
 - b. Remove the module from the chassis.



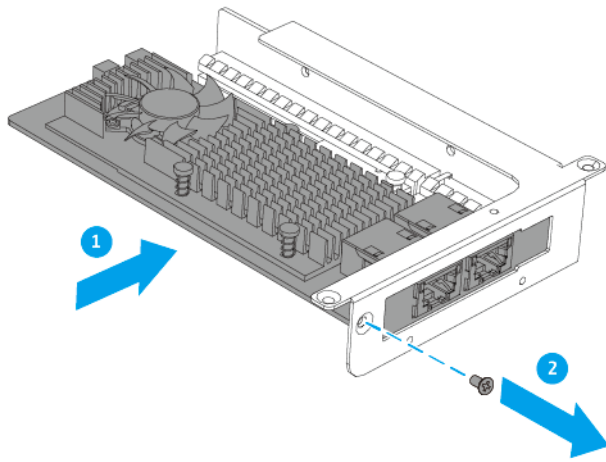
6. Remove the existing expansion card.

- a. Remove the screw that secures the cover to the chassis.
- b. Hold the card by the edges.
- c. Carefully pull the card out of the slot.



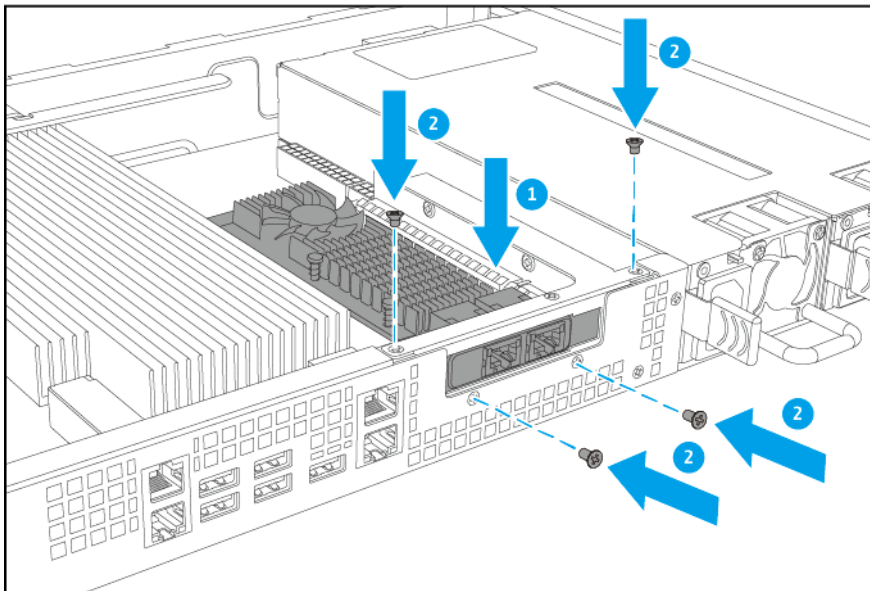
7. Install the expansion card.

- a. Hold the card by the edges.
- b. Insert the card into the slot.
- c. Attach the screw.



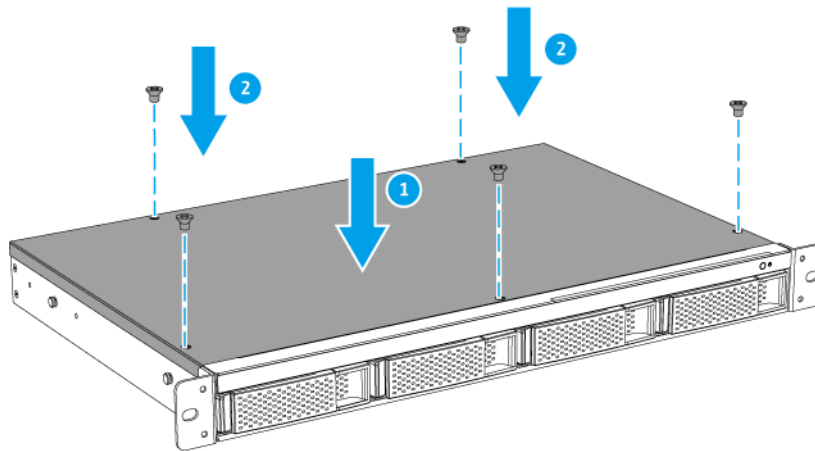
8. Install the PCIe module.

- a. Align the PCIe module with the system board.
- b. Insert the PCIe module connector into the system board slot.
- c. Attach the screws.



9. Attach the case cover.

- a. Place the cover on the device.
- b. Attach the screws.



10. Connect all cables and external attachments.
11. Connect the power cord to the electrical outlet.
12. Power on the device.

Replacing Expansion Cards on TS-h1277XU-RP, TS-h1677XU-RP, and TS-h2477XU-RP



Note

The following note is applicable to TS-h1277XU-RP and TS-h1677XU-RP.

- TS-h1277XU-RP: A dual-port 10Gbase-T network expansion card is pre-installed on PCIe 3.0 x8 slot 4.
- Slot 2 will reduce its speed from x8 to x4 if an expansion card is installed in slot 1.
- Slot 4 will reduce its speed from x8 to x4 if an expansion card is installed in slot 3.



Note

The following note is applicable to TS-h2477XU-RP.

- A dual-port 10GbE (SFP+) network expansion card is pre-installed on PCIe 3.0 x8 slot 4.
- Slot 2 will reduce its speed from x8 to x4 if an expansion card is installed in slot 1.
- Slot 3 will reduce its speed from x8 to x4 if an expansion card is installed in slot 4.



Warning

-

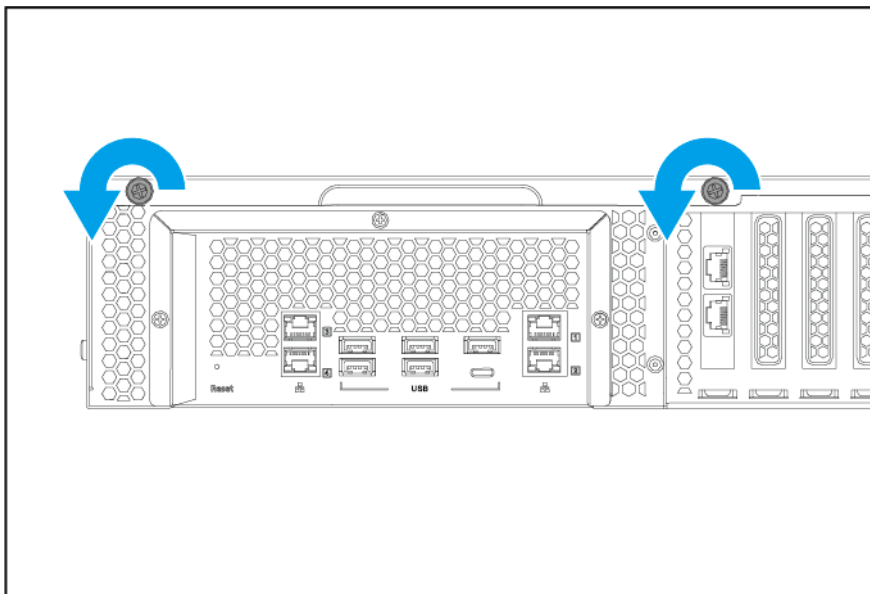


Moving fan blades: Keep your hands and other body parts away from moving fan blades.

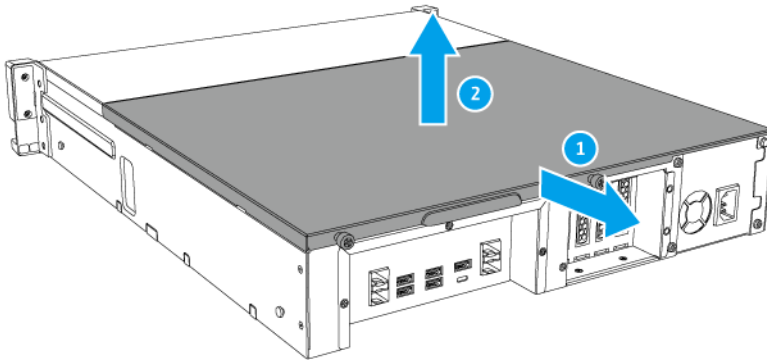


Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
 - a. Loosen the screws.

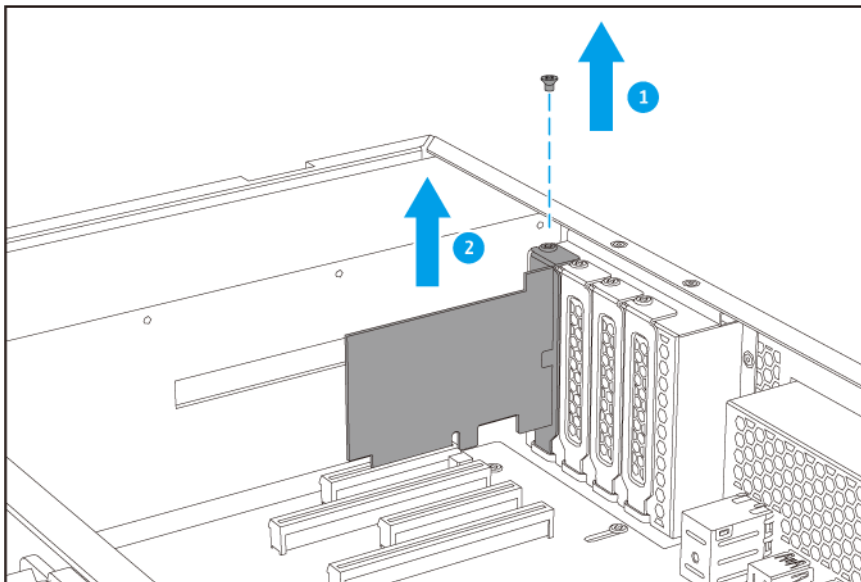


- b. Slide the cover back.
 - c. Lift the cover off the device.



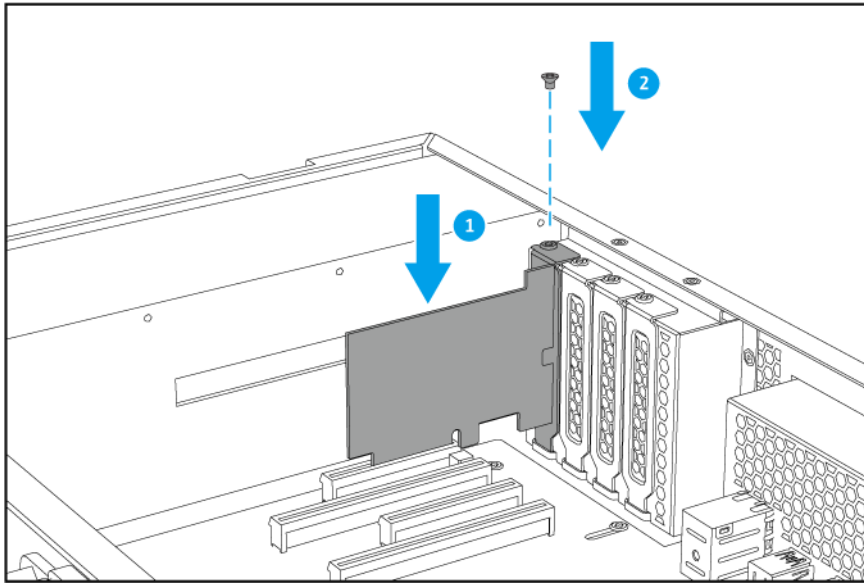
5. Remove the existing expansion card.

- a. Remove the screw that secures the cover to the chassis.
- b. Hold the card by the edges.
- c. Carefully pull the card out of the slot.



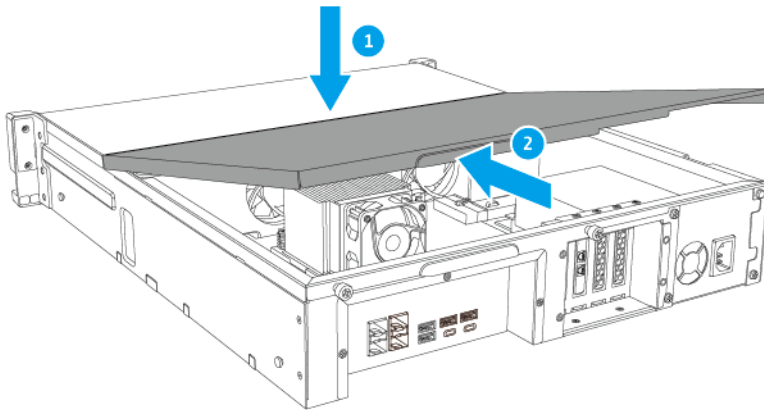
6. Install the expansion card.

- a. Hold the card by the edges.
- b. Insert the card into the slot.
- c. Attach the screw.

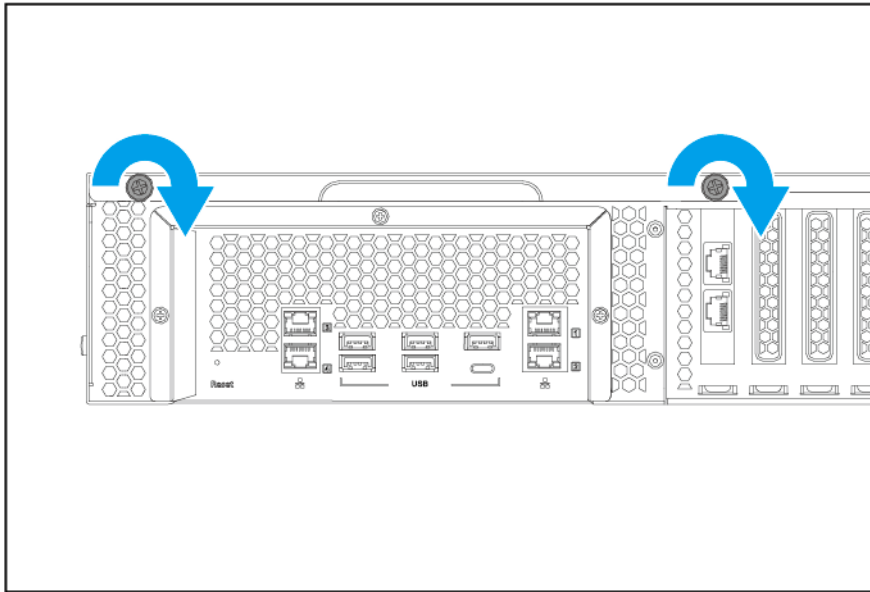


7. Attach the case cover.

- a.** Place the cover on the device.
- b.** Slide the cover forward.



- c.** Tighten the screws.



8. Connect all cables and external attachments.
9. Connect the power cord to the electrical outlet.
10. Power on the device.

Hot-Swapping Redundant Power Supply Units



Warning

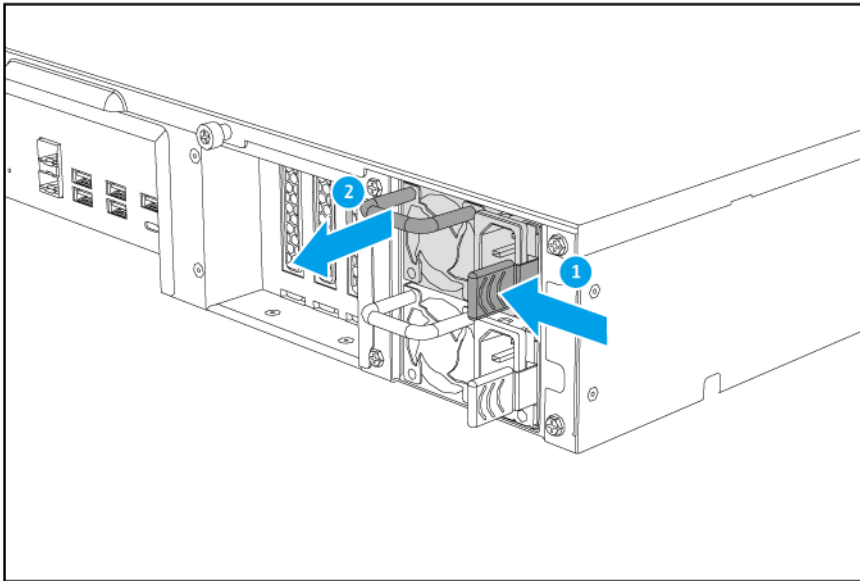
- Electric shock hazard.

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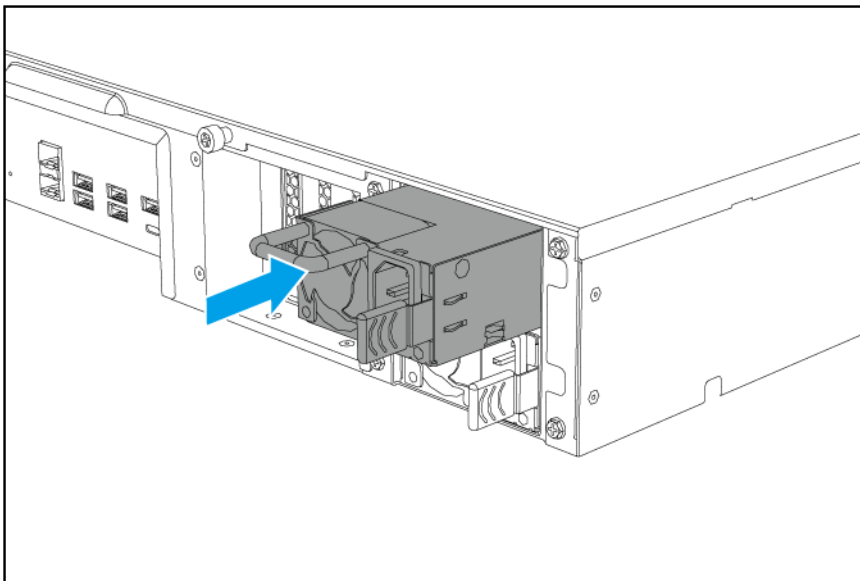


The NAS may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords before installing or replacing system components.

1. Power off the NAS.
2. Disconnect the power cord from the electrical outlet and the power supply unit (PSU) that you are replacing.
3. Firmly press the latch toward the handle and then pull the PSU out.



4. Insert the new PSU.

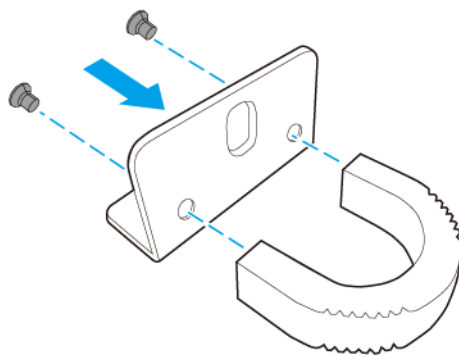


5. Connect the power cord to the PSU and the electrical outlet.
6. Power on the device.
7. Enable alerts for PSU failures.
 - a. Log on to QuTS hero as administrator.
 - b. Go to **Control Panel > System > Hardware > General** .
 - c. Select **Enable Redundant Power Supply Mode**.
 - d. Click **Apply All**.

Installing Handles on the TS-h977XU-RP

Installing handles enables you to better grip and further secure the NAS on a rack. Handles on the TS-h977XU-RP require manual installation.

1. Power off the NAS.
2. Install a handle on an angle bracket.
 - a. Align the openings on the handle with the two round screw holes on the angle bracket.
 - b. Attach the screws to lock the handle to the angle bracket.

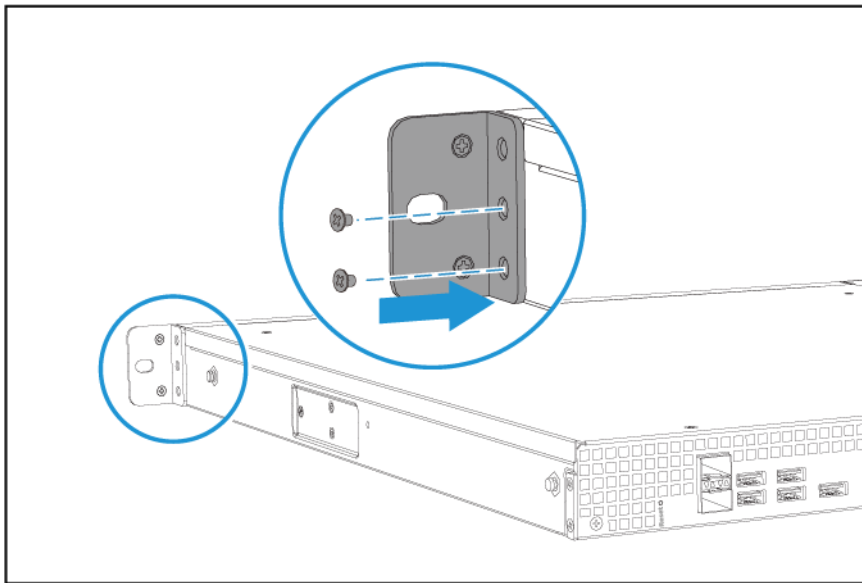


3. Install the angle bracket on the device.
 - a. Align the holes on the angle bracket with the holes on the chassis.

**Note**

Ensure that the handle faces the same direction as the front panel.

- b. Attach the screws.



4. Install a second handle on the other side of the chassis.
5. Power on the NAS.

Rail Kits

Rail kits are not included with the NAS and must be purchased separately. For details, contact an authorized reseller or go to <http://shop.qnap.com>.

The TS-hx77XU-RP is compatible with the following rail kit model:

Model	Compatible Rail Kit
<ul style="list-style-type: none"> • TS-h977XU-RP • TS-h1277XU-RP 	RAIL-B02
TS-h1677XU-RP	RAIL-A03-57
TS-h2477XU-RP	RAIL-A02-90

You can find installation information in the rail kit package.

Expansion Unit Installation

The TS-hx77XU-RP supports SAS expansion units, USB expansion units, and SATA JBOD expansion units. For details, please see table below.

You can purchase storage expansion accessories from QNAP or an authorized reseller.

For details, go to <https://shop.qnap.com/>.

For the list of compatible expansion units and the maximum number of applicable expansion units, go to <http://www.qnap.com/go/compatibility-expansion>.

Expansion Unit Model	Description	Required Accessories
REXP-1620U-RP	<ul style="list-style-type: none"> • Uses a SAS 12 Gbps (SFF-8644) interface • Supports SAS/SATA HDD/SSD 	<ul style="list-style-type: none"> • SAS-12G2E storage expansion card • mini-SAS SFF-8644 cable • RAIL-A03-57
REXP-1220U-RP	<ul style="list-style-type: none"> • Uses a SAS 12 Gbps (SFF-8644) interface • Supports SAS/SATA HDD/SSD 	
REXP-1610U-RP	<ul style="list-style-type: none"> • Uses a SAS 6 Gbps (SFF-8644) interface • Supports SATA/HDD/SSD 	
REXP-1210U-RP	<ul style="list-style-type: none"> • Uses a SAS 6 Gbps (SFF-8644) interface • Supports SATA/HDD/SSD 	
TL-R1620Sep-RP	<ul style="list-style-type: none"> • Uses a SAS 12 Gbps (SFF-8644) interface • Supports SAS/SATA HDD/SSD 	<ul style="list-style-type: none"> • One of the following storage expansion cards: <ul style="list-style-type: none"> • SAS-12G2E • QXP-820S-B3408 • QXP-1620S-B3616W • mini-SAS SFF-8644 cable • RAIL-B02
TL-R1220Sep-RP		
TL-D400S	<ul style="list-style-type: none"> • Uses a SATA 6 Gbps (SFF-8088) interface • Supports SATA/HDD/SSD 	<ul style="list-style-type: none"> • 1 x SFF-8088 connector cable • QXP-400eS-A1164 host bus adapter
TL-D800S		<ul style="list-style-type: none"> • 2 x SFF-8088 connector cables • QXP-800eS-A1164 host bus adapter
TL-D1600S		<ul style="list-style-type: none"> • 4 x SFF-8088 to SFF-8644 connector cables • QXP-1600eS host bus adapter
TL-R400S		<ul style="list-style-type: none"> • 1 x SFF-8088 connector cable • QXP-400eS-A1164 host bus adapter • RAIL-B02
TL-R1200S-RP		<ul style="list-style-type: none"> • 3 x SFF-8088 to SFF-8644 connector cables • QXP-1600eS host bus adapter • RAIL-B02

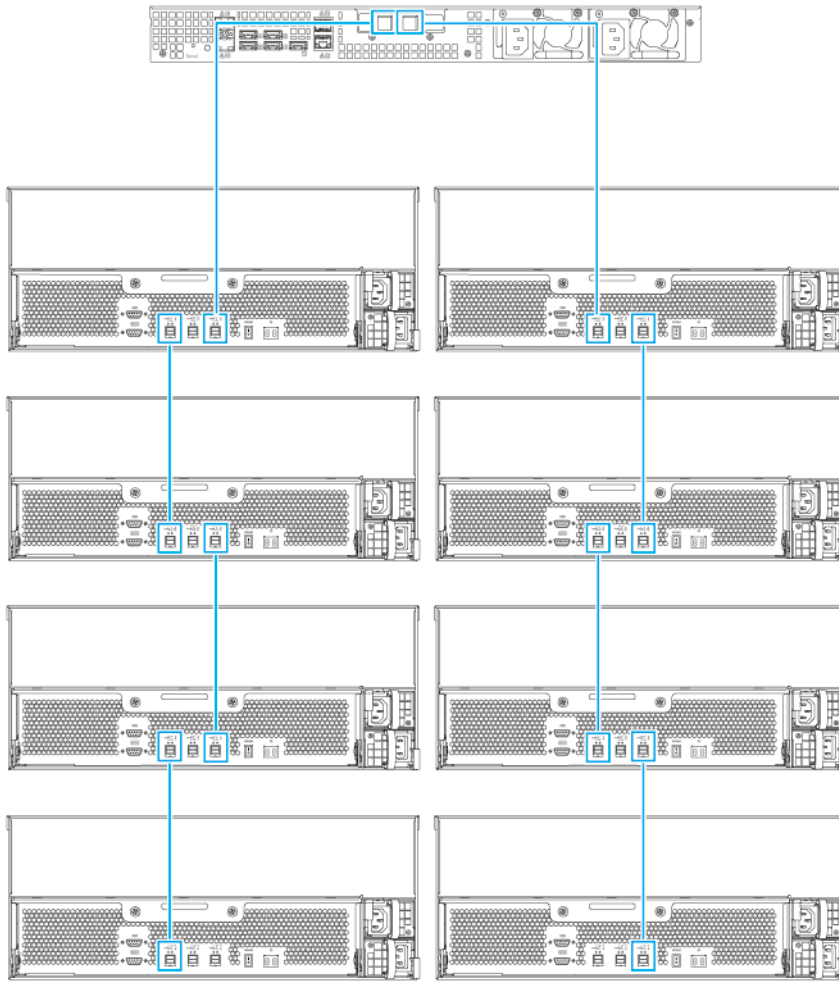
Expansion Unit Model	Description	Required Accessories
TR-002	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA drives 	<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TR-004	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA drives 	<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TR-004U		<ul style="list-style-type: none"> • USB 3.2 Gen 1 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable • RAIL-B02
TL-D800C	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA drives 	<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TL-R1200C-RP		<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable • RAIL-B02

Connecting SAS Expansion Units

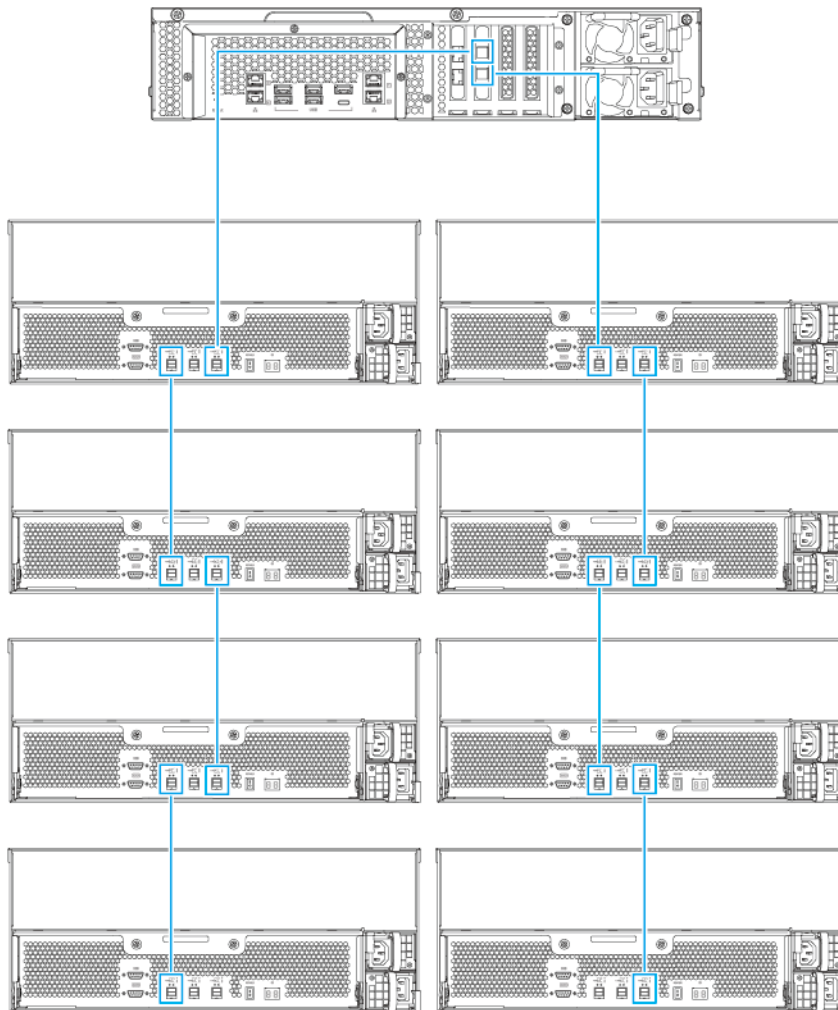
To connect the device to SAS expansion units, a storage expansion card must be installed in the device.

For required accessories details, see [Expansion Unit Installation](#).

1. Install a storage expansion card on the PCIe slot.
For details, see [Replacing Expansion Cards](#).
2. Connect the expansion units to the device using the following topology.



TS-h977XU-RP



TS-h1277XU-RP, TS-h1677XU-RP, and TS-h2477XU-RP

3. Power on the expansion units.
4. Verify that the expansion units are recognized by the device.
 - a. Log on to QuTS hero as administrator.
 - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
 - c. Verify that the expansion units are listed.

Connecting SATA JBOD Expansion Units

To connect the device to SATA JBOD expansion units, a host bus adapter must be installed on the NAS.

For required accessories details, see [Expansion Unit Installation](#).

1. Power off the NAS.
2. Install a host bus adapter on the PCIe slot.



Important

The QNAP QXP host bus adapter is required for connecting the SATA JBOD enclosure to a host device. Third-party host bus adapters are not compatible with QNAP JBOD enclosures.

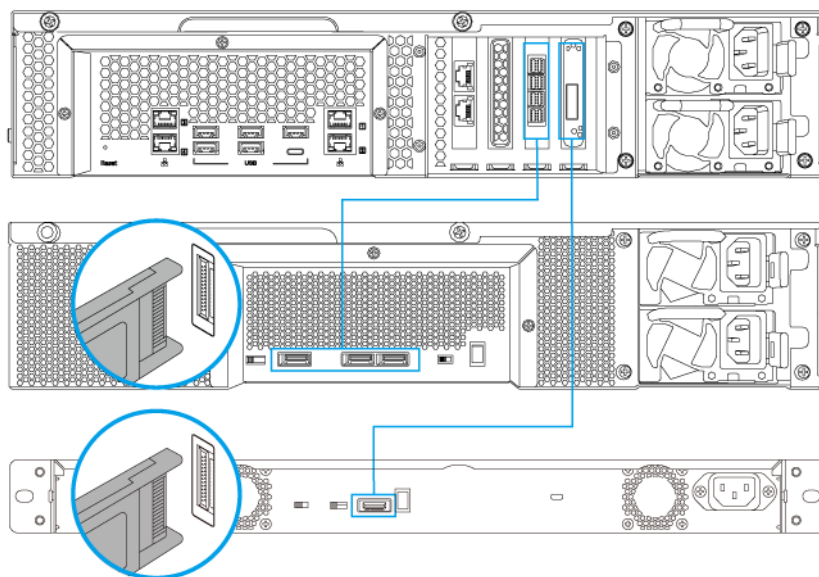
For details, see [Replacing Expansion Cards](#).

3. Connect the expansion units to the NAS using the following topology.



Note

This image shows connecting the NAS to JBOD expansion units TL-R400S and TL-R1200S-RP.



4. Power on the SATA JBOD expansion units.
5. Power on the NAS.
6. Verify that the expansion units are recognized by the NAS.
 - a. Log on to QuTS hero as administrator.
 - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
 - c. Verify that the expansion units are listed.

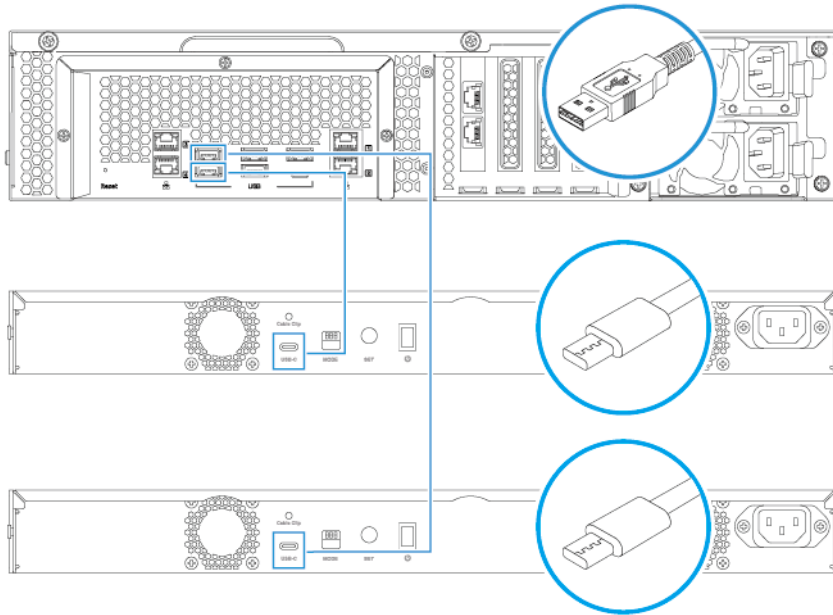
Connecting USB Expansion Units

To connect the device to USB expansion units, USB Type-A to USB Type-C cables or USB Type-C to USB Type-C cables are required.

For required accessories details, see [Expansion Unit Installation](#).

1. Connect the expansion unit to the NAS.

- a. Connect the USB cable to the USB Type-C port on the expansion unit.
- b. Connect the USB cable to a USB 3.2 Gen 2 Type-A port on the NAS.



2. Power on the expansion units.
3. Verify that the expansion units are recognized by the NAS.
 - a. Log on to QuTS hero as administrator.
 - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
 - c. Verify that the expansion units are listed.

QuTS hero Installation

The TS-hx77XU-RP uses the QNAP QuTS hero operating system. You can install QuTS hero using any of the following methods.

Method	Description	Requirements
Qfinder Pro installation (Recommended)	<p>If the NAS is connected to your local area network, you can do the following:</p> <ul style="list-style-type: none"> • Locate the NAS using Qfinder Pro. • Complete the steps in the Smart Installation Guide wizard. 	<ul style="list-style-type: none"> • Computer • Network cable • Qfinder Pro installer

Method	Description	Requirements
Cloud installation	<p>If the NAS is connected to the internet, you can do the following:</p> <ul style="list-style-type: none"> • Scan the QR code on the NAS. • Specify the Cloud Key. • Log into your myQNAPcloud account. • Use myQNAPcloud Link to remotely access your NAS. • Complete the steps in the Smart Installation Guide wizard. 	<ul style="list-style-type: none"> • Computer or mobile device • myQNAPcloud account • Cloud Key

You can also install the QNAP QTS operating system. If your NAS is connected to the internet, the option to install QTS will appear in the Smart Installation Guide wizard using any of the methods in the table. You can also manually download the QTS firmware from download.qnap.com.



Warning

QuTS hero and QTS use different file systems. Switching operating systems will reset the NAS and delete all data.

Installing QuTS hero Using Qfinder Pro



Warning

Installing QuTS hero deletes all data on the drives. Back up your data before proceeding.

1. Power on the device.
2. Connect the device to your local area network.
3. Run Qfinder Pro on a computer that is connected to the same local area network.



Note

To download Qfinder Pro, go to <https://www.qnap.com/utilities>.

4. Locate the NAS in the list and then double-click the name or IP address.
The **Smart Installation Guide** opens in the default web browser.
5. Click **Start Smart Installation Guide**.
The **Install Firmware** window appears.
6. Install firmware using any of the following methods:

Installation methods	Steps
Automatic	<p>Click Start. Automatically searches for available firmware updates and installs firmware.</p>

Installation methods	Steps
Manual installation	<ol style="list-style-type: none"> a. Click Manual Installation. The Install Firmware window appears. b. Click Browse. The upload file window appears. c. Select file. d. Click Open. Starts firmware installation.
Skip	<ol style="list-style-type: none"> a. Click Skip. Skips firmware installation.

7. Specify the following information

- **NAS name:** Specify a name with 1 to 14 characters. The name supports letters (A to Z, a to z), numbers (0 to 9), and hyphens (-), but cannot end with a hyphen.
- **Password:** Specify an administrator password with 1 to 64 characters. The password supports all ASCII characters.

8. Click **Next**.

9. Specify the time zone, date, and time.



Tip

QNAP recommends connecting to an NTP server to ensure that the NAS follows the Coordinated Universal Time (UTC) standard.

10. Click **Next**.

The **Configure the network settings** screen appears.

11. Select **Obtain an IP address automatically (DHCP)**.

12. Click **Next**.

The **Cross-platform file transfer service** screen appears.

13. Select the types of devices that you will use to access shared folders on the NAS.

14. Click **Next**.

15. Review the settings.

16. Click **Apply**.

A confirmation message appears.



Warning

Clicking **Yes** deletes all data on the drive before installing QuTS hero.

17. Click **Yes**.

- The **QuTS hero** installation progress bar appears.
- **QuTS hero** is installed.



Note

It may take a couple of minutes to complete QuTS hero installation.

18. Optional: Click **Go to NAS Management**.



Tip

Click **Go to NAS Management** to set more advanced QuTS hero configurations and settings. For details, see QuTS hero User Guide.

Installing QuTS hero Using the Cloud Key



Warning

Installing QuTS hero deletes all data on the drives. Back up your data before proceeding.

1. Power on the device.
2. Connect the device to the internet.
3. Go to the QNAP Cloud Installation page using one of the following methods:
 - On your computer, go to <http://install.qnap.com/>.
 - Scan the QR code on the NAS using a mobile device.

The web page lists all the uninitialized QNAP NAS devices on the local network.

4. Locate the NAS in the list and then click **Initialize**.



Note

If your NAS is not listed, follow the instructions on the web page to specify the Cloud Key on the NAS.

The installation wizard opens in the default web browser.

5. Create an account or sign in to myQNAPcloud.



Note

You must return to this page to complete the installation after creating an account.

6. Specify the myQNAPcloud device name for the NAS.



Note

- The myQNAPcloud device name is used when remotely accessing the NAS.
- For security purposes, the myQNAPCloud Link remote connection service will be disabled on your NAS after initialization. You can enable it by connecting to QuTS hero through LAN and then installing myQNAPCloud Link.

7. Click **Next**.
The **Smart Installation Guide** opens in the default web browser.

8. Perform any of the following actions.

- To check for the latest available version, click **Start**.
The wizard downloads the latest available version, and then the NAS restarts after the download is complete. If a newer version is not available, the wizard automatically displays the **Smart Installation Guide**.
- To install the out-of-the-box version, click **Skip**.

9. Click **Start Smart Installation Guide**.
The **Install Firmware** window appears.

10. Install firmware using any of the following methods:

Installation methods	Steps
Automatic	Click Start . Automatically searches for available firmware updates and installs firmware.
Manual installation	<p>a. Click Manual Installation. The Install Firmware window appears.</p> <p>b. Click Browse. The upload file window appears.</p> <p>c. Select file.</p> <p>d. Click Open. Starts firmware installation.</p>
Skip	Click Skip . Skips firmware installation.

11. Specify the following information

- **NAS name:** Specify a name with 1 to 14 characters. The name supports letters (A to Z, a to z), numbers (0 to 9), and hyphens (-), but cannot end with a hyphen.
- **Password:** Specify an administrator password with 1 to 64 characters. The password supports all ASCII characters.

12. Click **Next**.

13. Specify the time zone, date, and time.



Tip

QNAP recommends connecting to an NTP server to ensure that the NAS follows the Coordinated Universal Time (UTC) standard.

14. Click **Next**.

The **Configure the network settings** screen appears.

15. Select **Obtain an IP address automatically (DHCP)**.

16. Click **Next**.

The **Cross-platform file transfer service** screen appears.

17. Select the types of devices that you will use to access shared folders on the NAS.

18. Click **Next**.

19. Review the settings.

20. Click **Apply**.

A confirmation message appears.



Warning

Clicking **Confirm** deletes all data on the drive before installing QuTS hero.

21. Click **Confirm**.

QuTS hero is installed.

22. Optional: Click **Go to NAS Management.**




Tip

Click **Go to NAS Management** to set more advanced QuTS hero configurations and settings.
For details, see QuTS hero User Guide.


4. Basic Operations

This chapter describes basic NAS operations.

Power Button

Operation	User Action	Result
Power on	Press the button once.	The device powers on.
Power off	Press and hold the button for 1.5 seconds.	The device powers off.
Force power off	Press and hold the button for 5 seconds.	The device powers off.  Important Use this method only when the device is unresponsive.


Reset Button

Operation	User Action	Result
Basic system reset	Press and hold the button for 3 seconds.	<p>The following settings are reset to default:</p> <ul style="list-style-type: none"> • System administrator password: The default password is the first MAC address in uppercase letters without special characters. For example, if the first MAC address is 00-08-9B-F6-15-75, then the admin password will be 00089BF61575. <p> Tip You can find the first MAC address using Qfinder Pro. A label attached to the device also lists the address as MAC1.</p> <ul style="list-style-type: none"> • TCP/IP configuration: <ul style="list-style-type: none"> • Obtain IP address settings automatically via DHCP • Disable jumbo frames • If port trunking is enabled (multi-LAN models only), the port trunking mode is reset to “Active Backup (Failover)”. • System port: 8080 (system service port) • Security level: Low (Allow all connections) • LCD panel password: (blank) • VLAN: Disabled
Advanced system reset	Press and hold the button for 15 seconds.	<p>The default factory settings are restored.</p> <ul style="list-style-type: none"> • To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.

LEDs

LEDs indicate the system status and related information when the device is powered on. The following LED information applies only when the drive is correctly installed and when the device is connected to the network or to a host.

For details on the location of the LEDs, see [Front Panel](#).

LED	Status	Description
System Status	Flashes green and red alternately every 0.5 seconds	<ul style="list-style-type: none"> The drive is being formatted. The device is being initialized. The operating system is being updated. RAID rebuilding is in progress. Online RAID Capacity Expansion is in progress. Online RAID Level Migration is in progress. The firmware is being updated. <p> Important When updating the firmware, do not remove the power cord or USB cable, and do not force-exit the application.</p>
	Red	<ul style="list-style-type: none"> The drive is invalid. The shared folder has reached its full capacity. The shared folder is about to reach its full capacity. The system fan is not functioning. An error occurred when accessing (read/write) the data. A bad sector is detected on the hard drive. The device is in degraded read-only mode (two member drives failed in RAID 5 or RAID 6 but the data can still be read). A hardware self-test error occurred.
	Flashes red every 0.5 seconds	The device is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).
	Flashes green every 0.5 seconds	<ul style="list-style-type: none"> The NAS is starting up. The device is not configured. A drive is not formatted.
	Green	The device is ready.
Off	<ul style="list-style-type: none"> All drives are in standby mode. The device is powered off. 	

LED	Status	Description
LAN	Orange	The network connection is operating.
	Flashes orange	The device is being accessed from the network.
	Off	The device is not connected to a network.
Drive	Green	The drive is ready.
	Flashes green	Data is being accessed.
	Red	A drive read/write error occurred.
	Flashes red	The drive is being located in QuTS hero.
Expansion	Orange	An expansion unit is connected.
	Off	No expansion unit has been detected.

Audio Alert

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> The NAS is starting up. When the reset button is pressed for 3 seconds, the NAS resets configurations. When the reset button is pressed for 10 seconds, the NAS resets configurations and reboots. The operating system was updated. The device is starting USB One-Touch Copy.
	2	The USB device has been removed (USB One Touch copy button).
	3	<ul style="list-style-type: none"> Cannot detect installed disk. The firmware was updated.

Duration	Frequency	Description
Long beep (1.5 seconds)	3 (every 5 minutes)	<ul style="list-style-type: none"> • A power error occurred. • The system fan is not functioning. • The fan module has been removed. • The NAS data cannot be copied to the external storage device connected to the front USB port.
	2	<ul style="list-style-type: none"> • The storage pool is about to reach full capacity. • The storage pool has reached full capacity. • A storage pool status error occurred. • The shared folder is about to reach its full capacity. • The shared folder has reached its full capacity. • The drives are in degraded mode. • The drive is rebuilding. • The USB device is being removed (USB one-touch copy button). • A shared folder status error occurred. • A drive is plugged in or out. • The iSCSI is about to reach full capacity.
	1	<ul style="list-style-type: none"> • The NAS was powered off by force shutdown (hardware shutdown). • The NAS was powered on successfully and is ready.
Long and short beeps	1 long and 2 short beeps	The JBOD expansion unit has been removed.

5. Troubleshooting

This chapter describes basic troubleshooting information.

Forcing Qfinder Pro or myQNAPcloud to Locate the NAS

If Qfinder Pro or myQNAPcloud is unable to locate the NAS during QuTS hero installation, the drives or data may be faulty.

1. Power off the NAS.
2. Remove all drives.
3. Power on the NAS.
4. Locate the NAS using Qfinder Pro or myQNAPcloud.
5. Reinsert the drives.
6. Continue with the QuTS hero installation.

Hot-swapping Failed Drives

The NAS supports hot-swapping of drives in the following situations:

RAID Type	Number of Disks	Situation
RAID 1	2	One member drive fails.
RAID 5	≥ 3	One member drive fails.
RAID 6	≥ 4	One or two member drives fail.
RAID 10	≥ 6	One disk per subgroup fails.
RAID 60	≥ 8	Two disks per subgroup fail.
Triple Mirror	Multiple of 3. (For example, 3, 6, 9, 12 disks and so forth.)	One or two member drives fail.
RAID-TP	≥ 5	One, two, or three member drives fail.

1. Log on to QuTS hero.
2. Go to **Main Menu > Storage & Snapshots > Storage > Disks/VJBOD** .
3. Locate the failed drive.
4. Prepare a new hard drive with a capacity that is the same as or larger than the failed hard drive.
5. Remove the failed drive from the device.
6. Wait for 20 seconds or until the device beeps twice.
7. Remove the failed drive from the drive tray.
8. Insert the new drive into the drive tray.
9. Install the new drive.
The NAS beeps twice.
10. Go to **Main Menu > Storage & Snapshots > Storage Space** .

11. Locate the shared folder that contains the new drive and then verify that the status is `Rebuilding`.

Support and Other Resources

QNAP provides the following resources:

Resource	URL
Documentation	https://download.qnap.com
Compatibility List	https://www.qnap.com/compatibility
NAS Migration Compatibility	https://www.qnap.com/en/nas-migration
Expansion Unit Compatibility	http://www.qnap.com/go/compatibility-expansion
Service Portal	https://service.qnap.com
Product Support Status	https://www.qnap.com/en/product/eol.php
Downloads	https://download.qnap.com
Community Forum	https://forum.qnap.com
QNAP Accessories Store	https://shop.qnap.com

6. Glossary

Cloud Key

Unique 8-digit code assigned to each NAS device

myQNAPcloud

Provides various remote access services such as DDNS and myQNAPcloud Link

myQNAPcloud Link

Enables you to access QNAP devices over the internet without configuring complex port forwarding settings

QNAP ID

User account that enables you to use myQNAPcloud remote access and other QNAP services

Qfinder Pro

QNAP utility that lets you locate and access QNAP NAS devices in your local area network

QuTS hero

QNAP NAS operating system featuring ZFS file system

7. Notices

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Version 3, 29 June 2007

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- d. Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with

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