



**QNAP**

# **TS-hx87XU-RP**

**TS-h1887XU-RP**

**TS-h2287XU-RP**

**User Guide**

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# 1. Product Overview

This chapter provides basic information about the QNAP device.

## About the TS-hx87XU-RP

The high-capacity TS-hx87XU-RP is powered by an Intel® Xeon® E-2300 series processor, supports up to 128 GB DDR4 ECC memory, and provides an HDD/SSD hybrid storage architecture that delivers reliable server-grade performance. Running the ZFS-based QuTS hero operating system, the TS-hx87XU-RP supports inline data deduplication, up to 65536 snapshots, real-time SnapSync, and QSAL (QNAP SSD Antiwear Leveling)—providing a storage solution that meets business requirements for file servers, virtualization servers, VDI, and backup/restore.

## Hardware Specifications



### Warning

- If your QNAP product has hardware defects, return the product to QNAP or a QNAP-authorized service center for maintenance or replacement. Any attempt to repair or perform maintenance procedures on the product by you or an unauthorized third party invalidates the warranty.
- QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.
- This QNAP device is warranted against defects in materials and workmanship for a period of three (3) years. For details, see the [QNAP Warranty Terms and Conditions](#).









### Tip

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

Ordering P/N	CPU	Memory
TS-h1887XU-RP-E2334-16G	Intel® Xeon® E-2334	16 GB
TS-h1887XU-RP-E2336-32G	Intel® Xeon® E-2336	32 GB
TS-h2287XU-RP-E2336-32G	Intel® Xeon® E-2336	32 GB
TS-h2287XU-RP-E2378-64G	Intel® Xeon® E-2378	64 GB

Component	TS-h1887XU-RP	TS-h2287XU-RP
Processor		
CPU	<ul style="list-style-type: none"> <li>• TS-h1887XU-RP-E2334-16G: Intel® Xeon® E-2334</li> <li>• TS-h1887XU-RP-E2336-32G: Intel® Xeon® E-2336</li> </ul>	<ul style="list-style-type: none"> <li>• TS-h2287XU-RP-E2336-32G: Intel® Xeon® E-2336</li> <li>• TS-h2287XU-RP-E2378-64G: Intel® Xeon® E-2378</li> </ul>
Frequency	<ul style="list-style-type: none"> <li>• TS-h1887XU-RP-E2334-16G: 4-core/8-thread 3.4 GHz base/4.8 GHz turbo</li> <li>• TS-h1887XU-RP-E2336-32G: 6-core/12-thread 2.9 GHz base/4.8 GHz turbo</li> </ul>	<ul style="list-style-type: none"> <li>• TS-h2287XU-RP-E2336-32G: 6-core/12-thread 2.9 GHz base/4.8 GHz turbo</li> <li>• TS-h2287XU-RP-E2378-64G: 8-core/16-thread 2.6 GHz base/4.8 GHz turbo</li> </ul>

Component	TS-h1887XU-RP	TS-h2287XU-RP
Architecture	x86 64-bit	
Encryption engine	AES-NI	
Memory		
Pre-installed memory	<ul style="list-style-type: none"> <li>• TS-h1887XU-RP-E2334-16G: 16 GB RAM: 1 x 16 GB DDR4 ECC UDIMM</li> <li>• TS-h1887XU-RP-E2336-32G: 32 GB RAM: 2 x 16 GB DDR4 ECC UDIMM</li> </ul>	<ul style="list-style-type: none"> <li>• TS-h2287XU-RP-E2336-32G: 32 GB RAM: 2 x 16 GB DDR4 ECC UDIMM</li> <li>• TS-h2287XU-RP-E2378-64G: 64 GB RAM: 4 x 16 GB DDR4 ECC UDIMM</li> </ul>
Memory slots	4 x UDIMM DDR4 <div style="margin-top: 10px;">  <b>Important</b> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Using unsupported modules may degrade performance, cause errors, or prevent the operating system from starting.</li> <li>• This device supports ECC memory modules.</li> </ul> </div>	
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"> <li>• 12 x 3.5-inch SATA</li> <li>• 6 x 2.5-inch SATA</li> </ul>	<ul style="list-style-type: none"> <li>• 16 x 3.5-inch SATA</li> <li>• 6 x 2.5-inch SATA</li> </ul>
Drive compatibility	2.5-inch bays: <ul style="list-style-type: none"> <li>• 2.5-inch SATA solid-state drives</li> </ul> 3.5-inch bays: <ul style="list-style-type: none"> <li>• 3.5-inch SATA hard disk drives</li> <li>• 2.5-inch SATA solid-state drives</li> </ul> <div style="margin-top: 10px;">  <b>Tip</b> <ul style="list-style-type: none"> <li>• For the list of compatible drive models, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>.</li> <li>• The drive bays are backward compatible with SATA 3 Gbps drives.</li> </ul> </div>	
SSD cache acceleration support	This device supports SSD cache acceleration for all drives.	
Hot-swapping	This device supports hot-swapping for all drives.	
Network		

Component	TS-h1887XU-RP	TS-h2287XU-RP
2.5 Gigabit network interface	2 x 2.5 GbE (RJ45)  <b>Note</b> The 2.5 Gigabit Ethernet RJ45 ports support the following network connectivity speeds: 2.5 GbE, 1 GbE, 100 Mbps, and 10 Mbps.	
10 Gigabit network interface	2 x 10GBASE-T (RJ45)  <b>Note</b> The 10GBASE-T RJ45 ports support the following network connectivity speeds: 10 GbE, 5 GbE, 2.5 GbE, 1 GbE, 100 Mbps, and 10 Mbps.	
External I/O Ports & Expansion Slots		
PCIe slots	<ul style="list-style-type: none"> <li>• 2 x PCIe Gen 4.0 x4</li> <li>• 1 x PCIe Gen 4.0 x8</li> </ul>  <b>Tip</b> For the list of compatible drive models and expansion cards, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a> .	
USB ports	4 x USB 3.2 Gen 2 Type-A	
Interface		
Buttons	<ul style="list-style-type: none"> <li>• Power</li> <li>• Reset</li> </ul>	
Dimensions		
Form factor	2U Rackmount	3U Rackmount
Dimensions (H x W x D)	88 x 483 x 630 mm (3.46 x 19.01 x 24.80 in)	133 x 483 x 630 mm (5.23 x 19.01 x 24.80 in)
Net weight	13 kg (28.66 lbs)	15.64 kg (34.48 lbs)
Others		
Power supply unit	2 x 550W, 100-240V	
System battery	CR2032 lithium battery (3V, 225 mAh)  <b>Warning</b> <ul style="list-style-type: none"> <li>• This battery is a button battery. If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours. Keep batteries out of reach of children.</li> <li>• 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.</li> </ul>	
Fans	4 x 60 mm, 12V DC	<ul style="list-style-type: none"> <li>• 3 x 60mm, 12V DC</li> <li>• 1 x 80mm, 12V DC</li> </ul>
Operating temperature	0°C to 40°C (32°F to 104°F)	
Relative humidity	<ul style="list-style-type: none"> <li>• Non-condensing relative humidity: 5% to 95%</li> <li>• Wet-bulb temperature: 27°C (80.6°F)</li> </ul>	

**Tip**

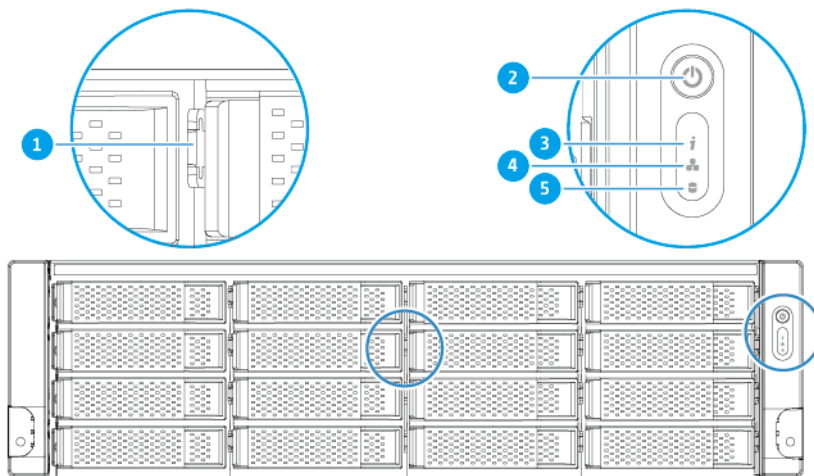
Model specifications are subject to change without prior notice. To see the latest specifications, go to <https://www.qnap.com>.

**Package Contents**

Item	Quantity
TS-hx87XU-RP	1
Drive trays	<ul style="list-style-type: none"> <li>• TS-h1887XU-RP               <ul style="list-style-type: none"> <li>• 2.5-inch drive trays: 6</li> <li>• 3.5-inch drive trays: 12</li> </ul> </li> <li>• TS-h2287XU-RP               <ul style="list-style-type: none"> <li>• 2.5-inch drive trays: 6</li> <li>• 3.5-inch drive trays: 16</li> </ul> </li> </ul>
Power cord	2
Screws for 2.5-inch drives	<ul style="list-style-type: none"> <li>• TS-h1887XU-RP: 60 screws</li> <li>• TS-h2287XU-RP: 72 screws</li> </ul>
Screws for 3.5-inch drives	<ul style="list-style-type: none"> <li>• TS-h1887XU-RP: 48 screws</li> <li>• TS-h2287XU-RP: 64 screws</li> </ul>
Quick Installation Guide (QIG)	1
Ethernet cable	1 x 10 GbE Cat6A Ethernet cable

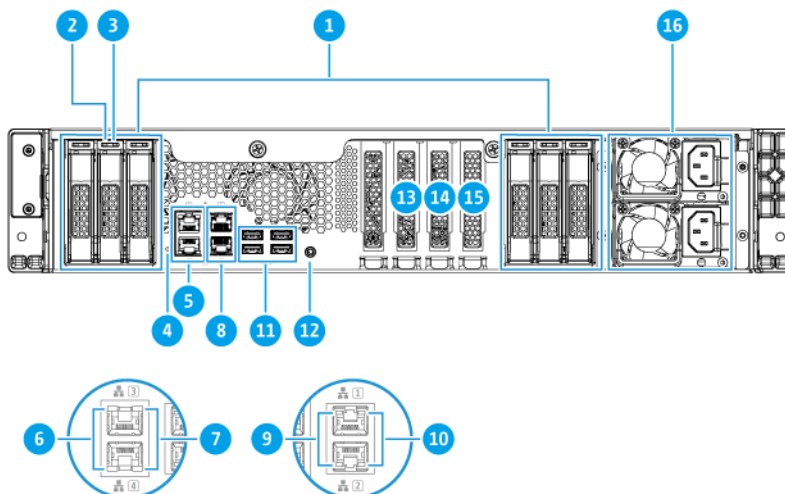
**Components**

## Front Panel



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


## Rear Panel

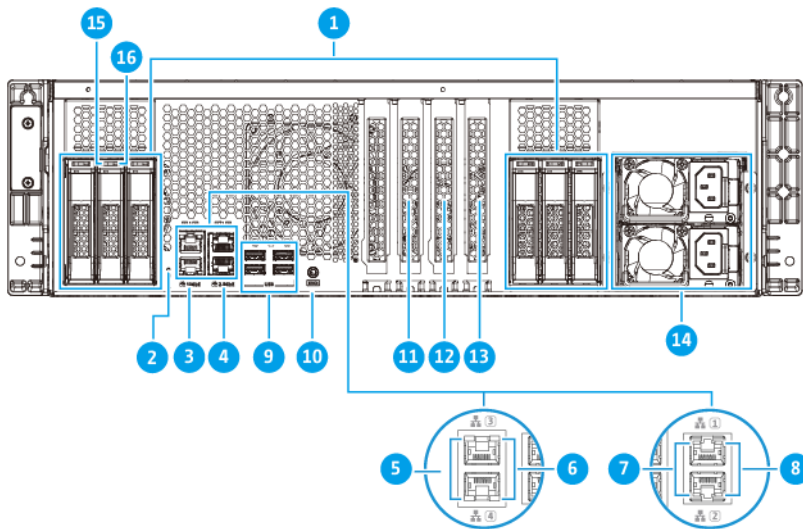


### TS-h1887XU-RP


No.	Component	No.	Component
1	2.5-inch SATA drive bays	9	2.5 Gigabit Ethernet speed LEDs



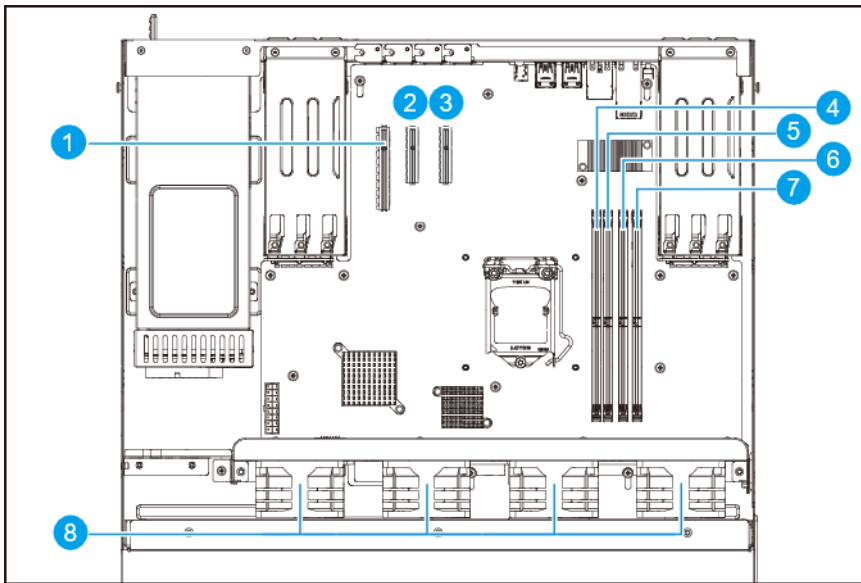
No.	Component	No.	Component
2	Drive activity LED	10	2.5 Gigabit Ethernet activity LEDs
3	Drive status LED	11	USB 3.2 Gen 2 Type-A ports
4	Reset button	12	Console port
			 <b>Note</b> This port is only for engineering purposes.
5	10GBASE-T ports (RJ45)	13	PCIe slot 3 cover
6	10 Gigabit Ethernet speed LEDs	14	PCIe slot 2 cover
7	10 Gigabit Ethernet activity LEDs	15	PCIe slot 1 cover
8	2.5 Gigabit Ethernet ports (RJ45)	16	Power supply units



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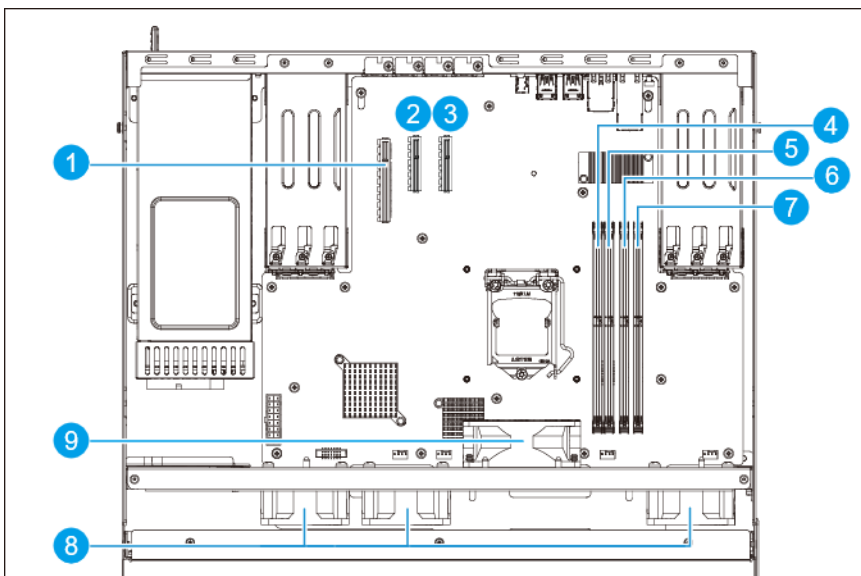
No.	Component	No.	Component
1	2.5-inch SATA drive bays	9	USB 3.2 Gen 2 Type-A ports
2	Reset button	10	Console port
			 <b>Note</b> This port is only for engineering purposes.
3	10GBASE-T ports (RJ45)	11	PCIe slot 3 cover
4	2.5 Gigabit Ethernet ports (RJ45)	12	PCIe slot 2 cover
5	10 Gigabit Ethernet speed LEDs	13	PCIe slot 1 cover
6	10 Gigabit Ethernet activity LEDs	14	Power supply units
7	2.5 Gigabit Ethernet speed LEDs	15	Drive activity LED
8	2.5 Gigabit Ethernet activity LEDs	16	Drive status LED

## System Board



**TS-h1887XU-RP**

No.	Component	No.	Component
1	PCIe slot 1 (PCIe Gen 4.0 x8)	5	Memory slot 2 (Channel A, DIMM 2, blue)
2	PCIe slot 2 (PCIe Gen 4.0 x4)	6	Memory slot 3 (Channel B, DIMM 1, black)
3	PCIe slot 3 (PCIe Gen 4.0 x4)	7	Memory slot 4 (Channel B, DIMM 2, blue)
4	Memory slot 1 (Channel A, DIMM 1, black)	8	System fans

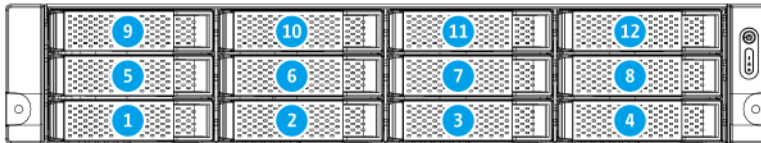


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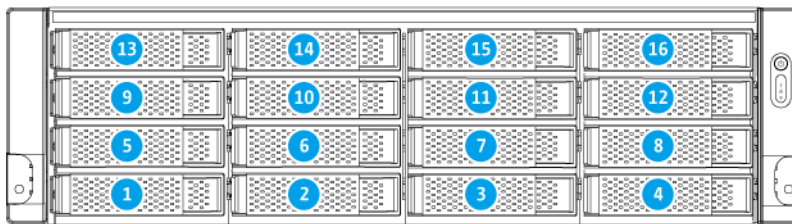
No.	Component	No.	Component
1	PCIe slot 1 (PCIe Gen 4.0 x8)	6	Memory slot 3 (Channel B, DIMM 1, black)

No.	Component	No.	Component
2	PCIe slot 2 (PCIe Gen 4.0 x4)	7	Memory slot 4 (Channel B, DIMM 2, blue)
3	PCIe slot 3 (PCIe Gen 4.0 x4)	8	System fans
4	Memory slot 1 (Channel A, DIMM 1, black)	9	CPU fan
5	Memory slot 2 (Channel A, DIMM 2, blue)	-	-

### Front Drive Numbering (3.5-inch Drive Bays)

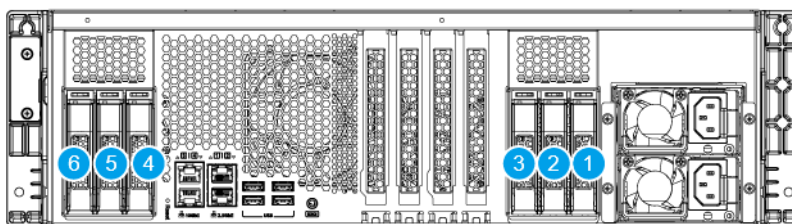


**TS-h1887XU-RP**

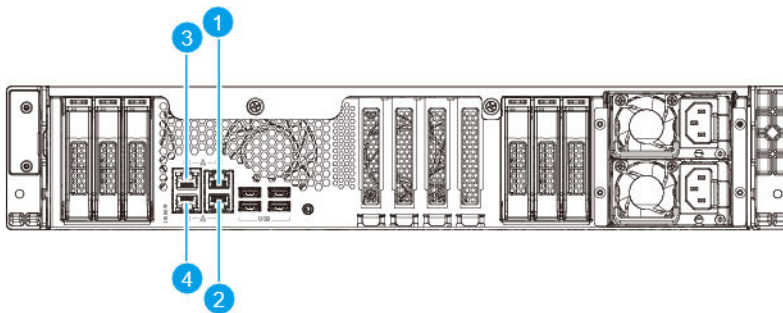


**TS-h2287XU-RP**

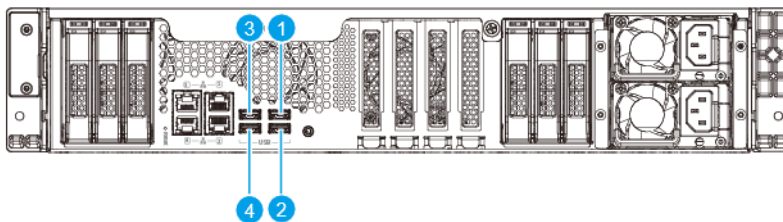
### Rear Drive Numbering (2.5-inch Drive Bays)



## Network Port Numbering



## USB Port Numbering



## Safety Information

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

### 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

- This product contains a button battery.
- If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours.
- Keep batteries out of reach of children.
- If you think batteries may have been swallowed or placed inside any part of the body, seek immediate medical attention.
- 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.

- The device is not suitable for use in locations where children are likely to be present.

### Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> <li>• Room temperature: 0°C to 40°C (32°F to 104°F)</li> <li>• Non-condensing relative humidity: 5% to 95%</li> <li>• Wet-bulb temperature: 27°C (80.6°F)</li> <li>• Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals</li> <li>• Free from objects that may obstruct device ventilation or apply pressure to the device or power cord</li> </ul>
Hardware and peripherals	<ul style="list-style-type: none"> <li>• Storage drives For the list of compatible drive models, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>.</li> <li>• Network cable</li> </ul>

Category	Item
Tools	<ul style="list-style-type: none"> <li>• Phillips #1 or #2 screwdriver</li> <li>• Anti-static wrist strap</li> </ul>

## 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 or install additional memory modules.  
For details, see [Replacing Memory Modules](#).
3. Optional: Install expansion cards.  
For details, see [Installing Expansion Cards](#).
4. Optional: Connect expansion units.  
For details, see [Expansion Unit Installation](#).
5. Install drives.  
For details, see the following topics:
  - [Installing 3.5-inch Hard Drives on 3.5-inch Trays](#)
  - [Installing 2.5-inch Solid-State Drives on 3.5-inch Trays](#)
  - [Installing 2.5-inch Solid-State Drives on 2.5-inch Trays](#)
6. Connect the power cords and all applicable cables.



### Note

To set up redundant power supply, connect power cords to both power supply units.

7. Power on the NAS.
8. Install QuTS hero.  
For details, see [QuTS hero Installation](#).
9. Log on to QuTS hero.

## 2. Installation and Configuration

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

### Hardware Installaion

This section provides information on installing or replacing drives, memory modules, expansion cards, redundant power supply units, fans, rail kits, and expansion units.

### Attaching the Case Cover



#### Warning

- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

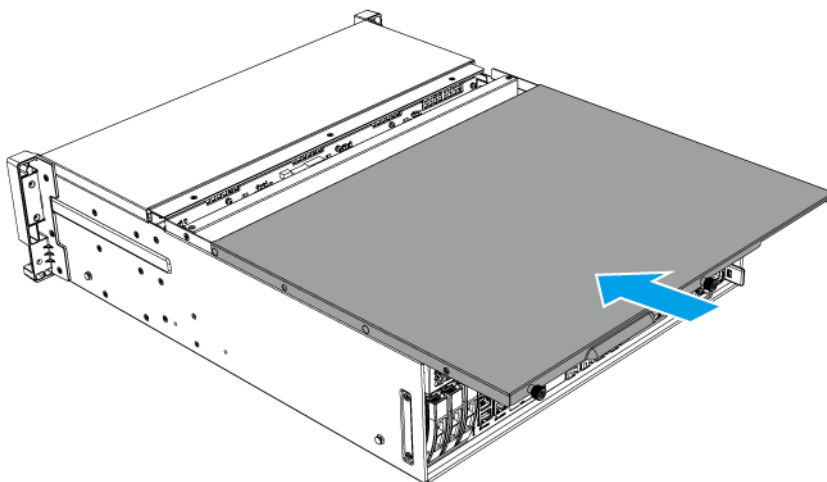


**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

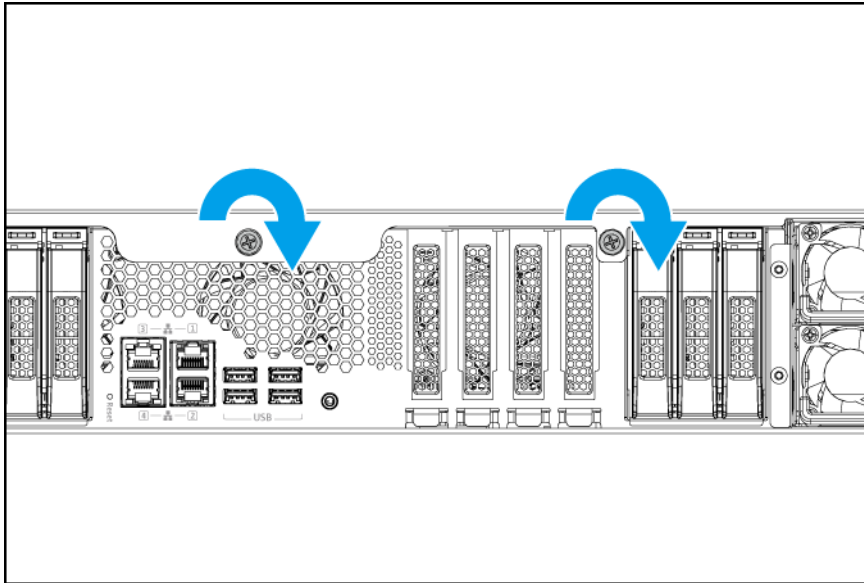


**Other moving components:** Keep your hands and other body parts away from other moving components.

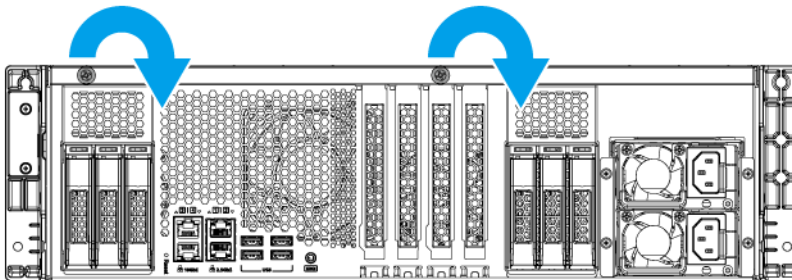
1. Place the cover on the device.
2. Slide the cover forward.



### 3. Tighten the screws.



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## Removing the Case Cover



### Warning

- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.



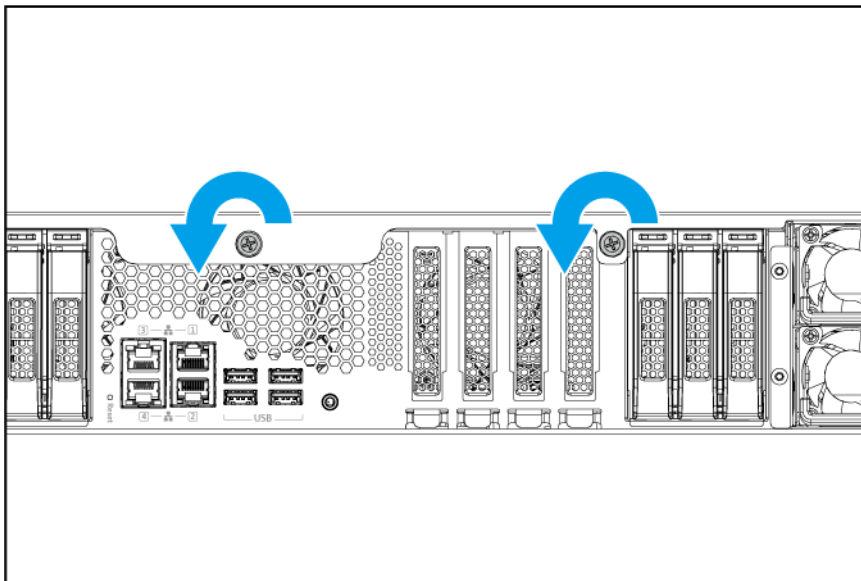


**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

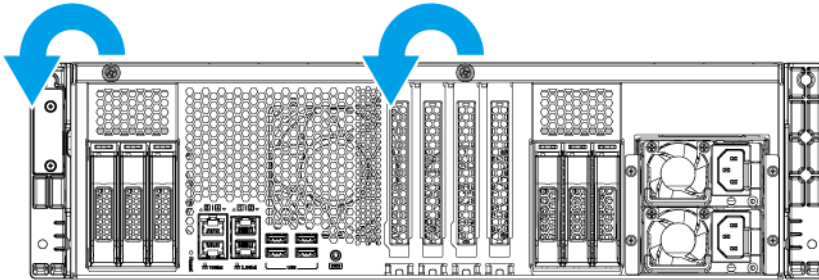


**Other moving components:** Keep your hands and other body parts away from other moving components.

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

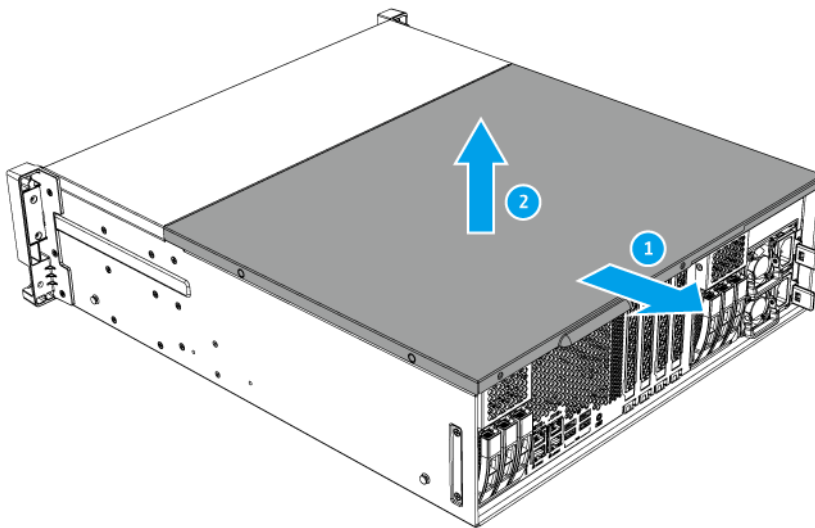


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### TS-h2287XU-RP

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



## Drive Installation

The TS-hx87XU-RP is compatible with 3.5-inch hard drives and 2.5-inch solid-state drives.

### Installing 3.5-inch Hard Drives on 3.5-inch Trays

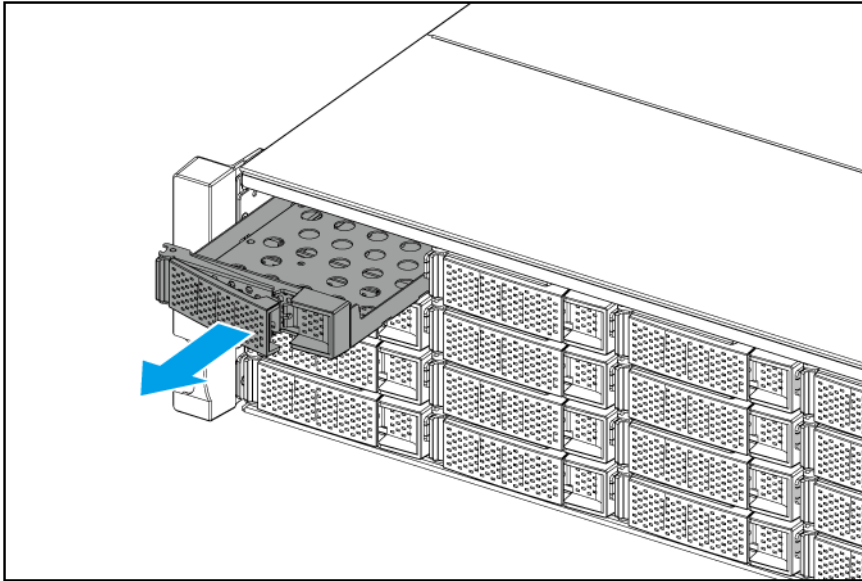
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.



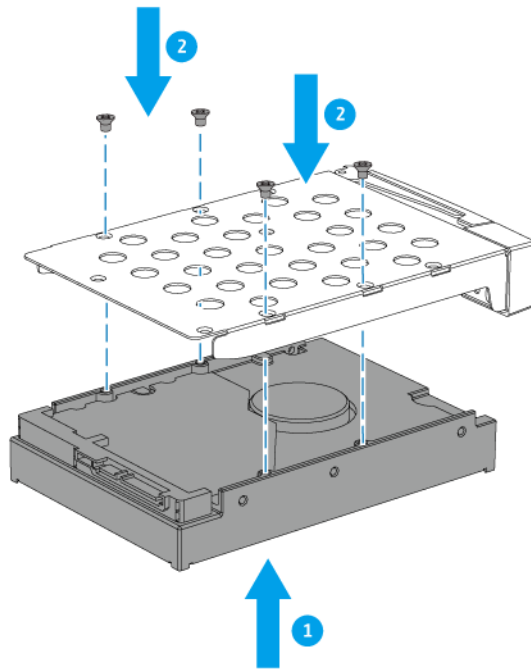
**Warning**

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

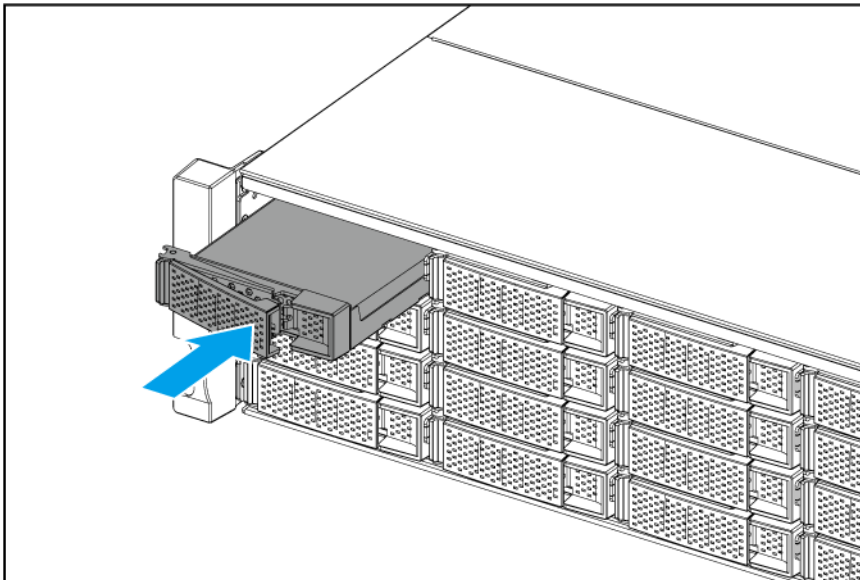
1. Power off the NAS.
2. Remove the drive tray.
  - a. Pull the handle to release the tray.
  - b. Pull the tray out.



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 3.5-inch Trays

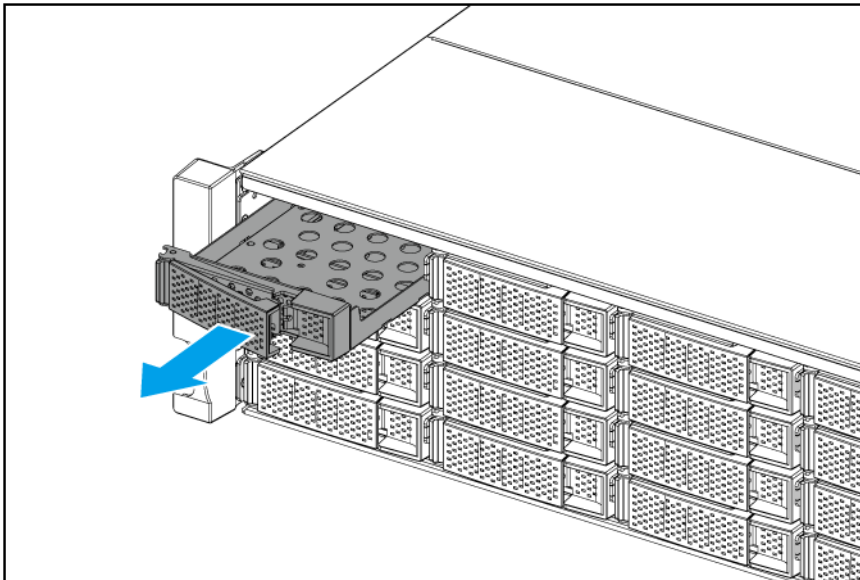
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.



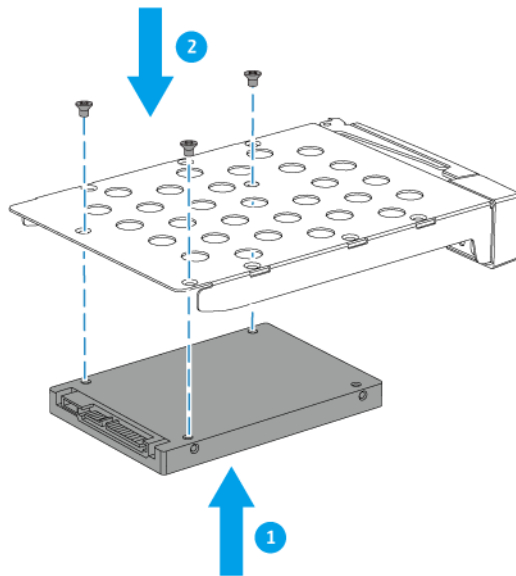
### Warning

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

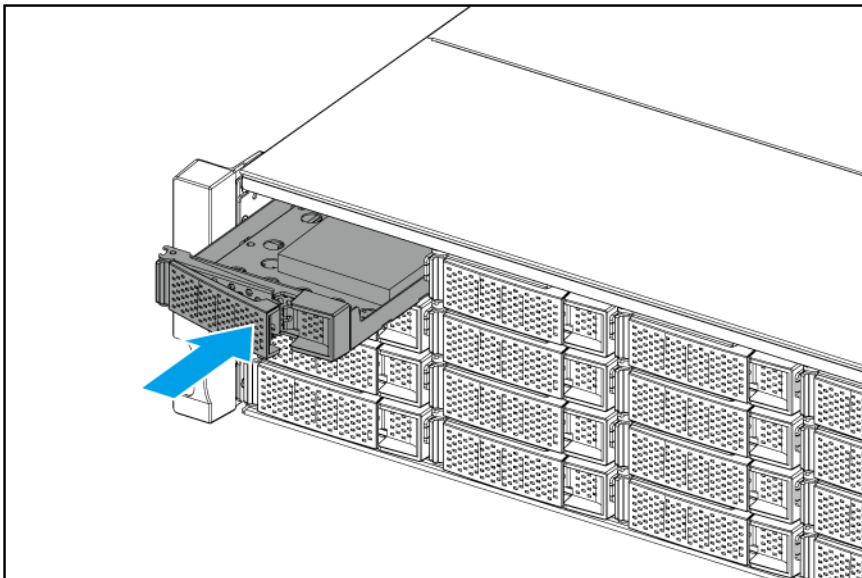
1. Power off the NAS.
2. Remove the drive tray.
  - a. Pull the handle to release the tray.
  - b. Pull the tray out.



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

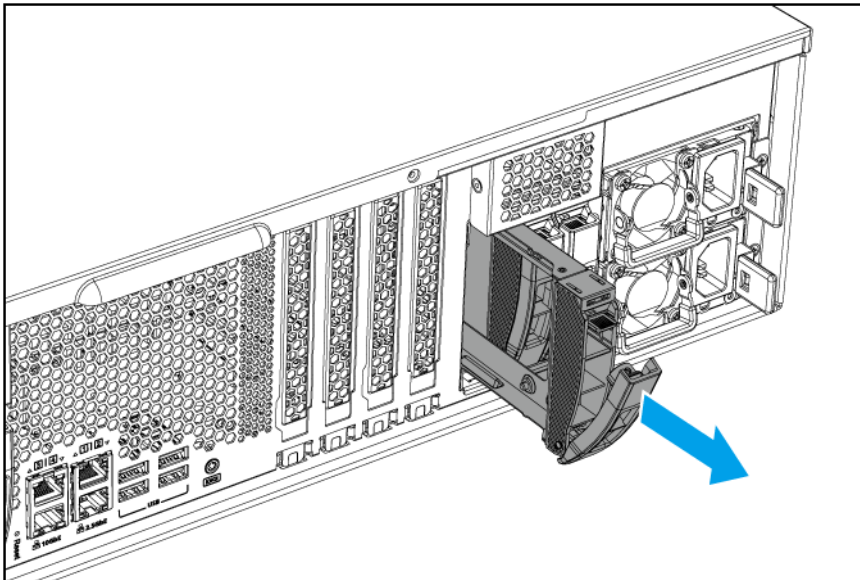
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.



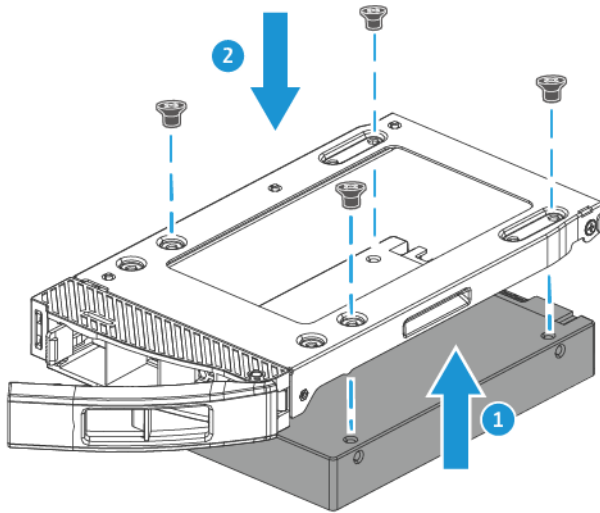
### Warning

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

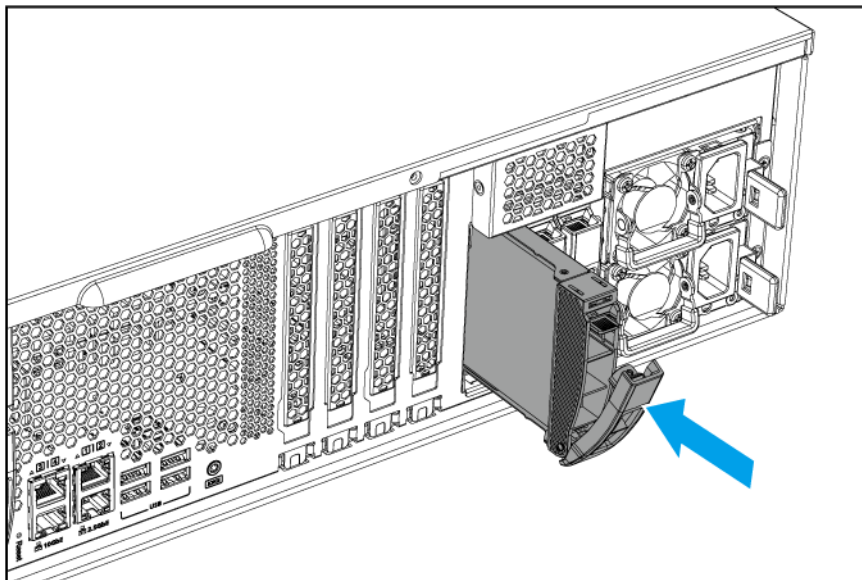
1. Power off the NAS.
2. Remove the drive tray.
  - a. Pull the handle to release the tray.
  - b. Pull the tray out.



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.

## Replacing Memory Modules

The NAS has four memory slots. You can increase the memory capacity of the NAS by upgrading the memory modules.

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.



**Important**

Ensure the following when replacing memory modules:

- When installing only one module, use slot 4.
- When installing two modules, use slots 2 and 4. Ensure that the modules are identical.
- When installing four modules, use slots 2 and 4 for the first pair, and slots 1 and 3 for the second pair. Ensure that each pair uses identical modules.

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

**Warning**

- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

- 



**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 cords from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.  
For details, see [Removing the Case Cover](#).

**Warning**

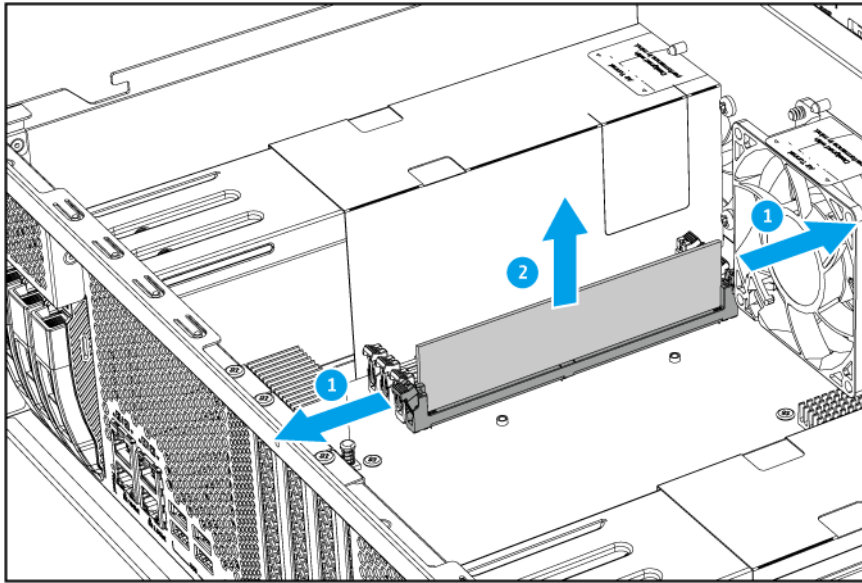
To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.

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

**Warning**

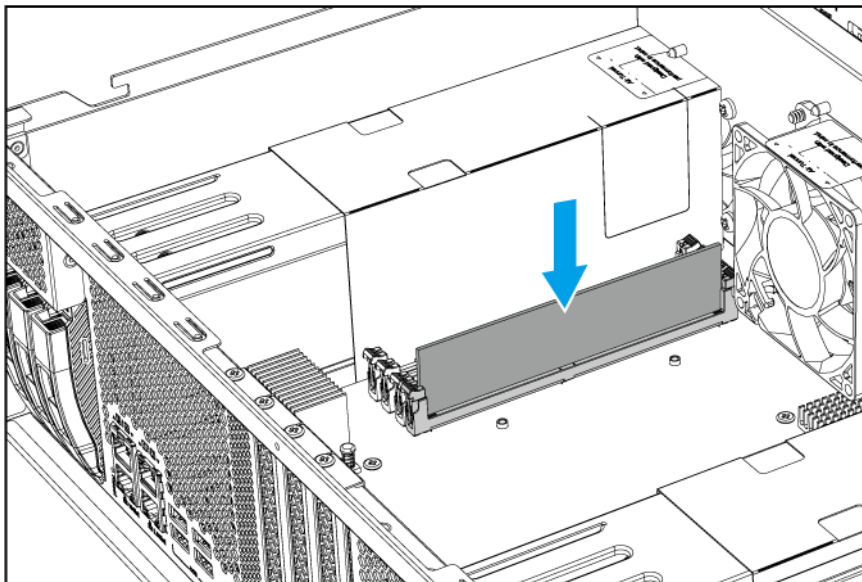
Attempting to remove a module that is not completely released may damage the module and the system board.

- 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.**  
For details, see [Attaching the Case Cover](#).
- 8. Connect all cables and external attachments.**
- 9. Connect the power cords to the electrical outlet.**

10. Power on the device.
11. 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**.

## Installing Expansion Cards

The NAS 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.



### Warning

- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

•



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

•



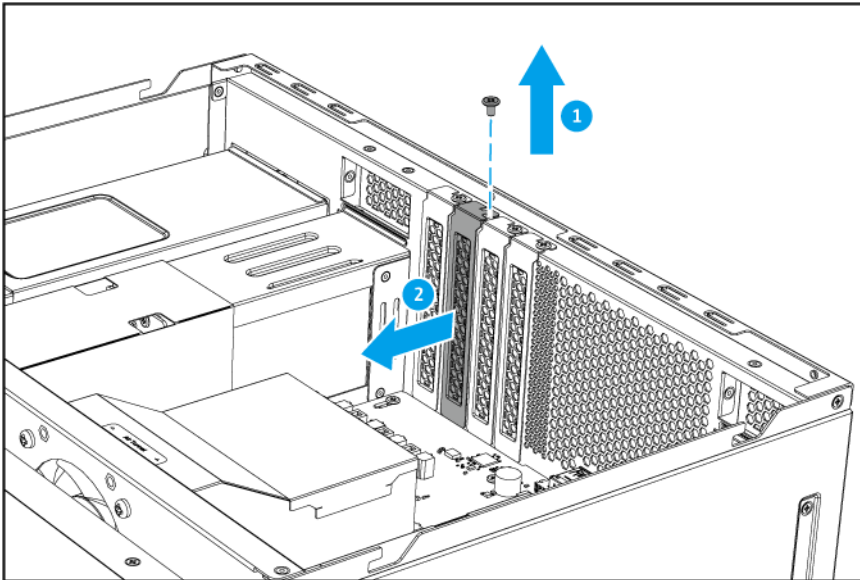
**Other moving components:** Keep your hands and other body parts away from other moving components.

1. Check the expansion cards and brackets supported by your model on the QNAP website.
  - a. Go to [www.qnap.com/compatibility](http://www.qnap.com/compatibility).
  - b. Click **Search by NAS**.
  - c. Specify the number of bays and the specific model of your NAS.
  - d. Under **Category**, select the component or device type.
  - e. Locate a specific component or device model in the list.
  - f. Optional: Click the corresponding **Note** icon to view more information.
2. Power off the device.
3. Disconnect the power cords from the electrical outlet.
4. Disconnect all cables and external attachments.
5. Remove the case cover.  
For details, see [Removing the Case Cover](#).

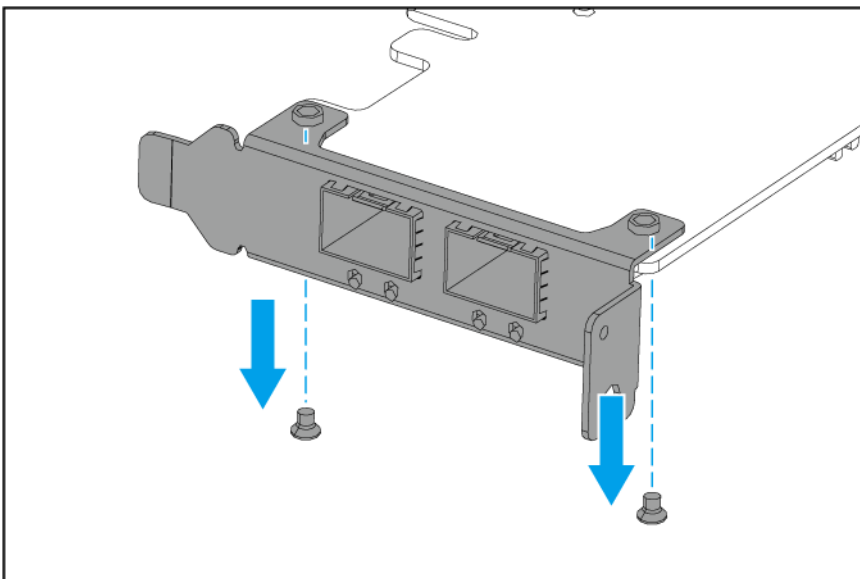
**Warning**

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

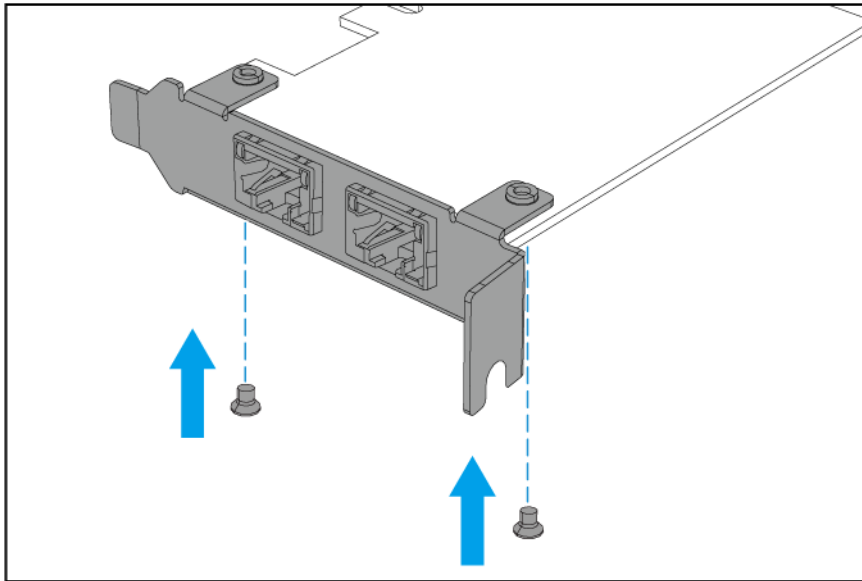
6. Remove the PCIe cover.
  - a. Remove the screw that secures the cover to the bracket.
  - b. Pull the cover away from the slot.



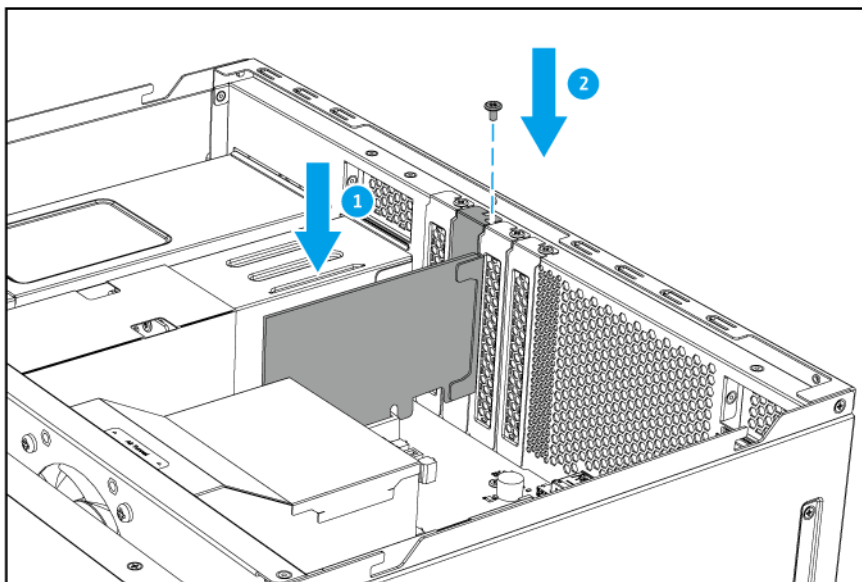
7. Optional: Attach the QNAP bracket to the expansion card.
  - a. Remove all screws of the existing bracket.



- b. Carefully pull the bracket away from the card.
  - c. Attach the QNAP bracket to the card using the same screws.



- d. Verify that the bracket does not move.
8. Install the expansion card.
    - a. Hold the card by the edges.
    - b. Insert the card into the slot.
    - c. Attach the screw.



9. Attach the case cover.  
For details, see [Attaching the Case Cover](#).
10. Connect all cables and external attachments.
11. Connect the power cords to the electrical outlet.

12. Power on the device.

## Hot-Swapping Redundant Power Supplies

NAS devices with redundant power supply units (PSUs) support hot-swapping.



### Warning

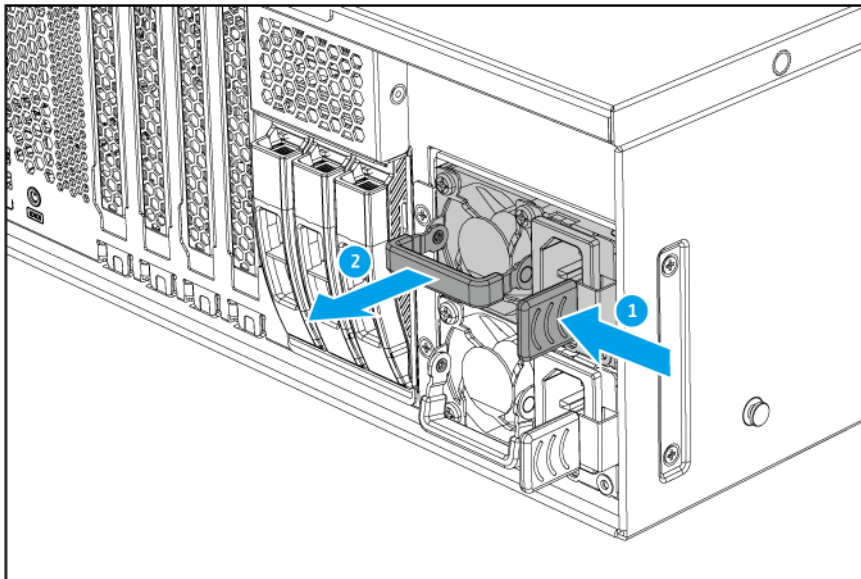
Electric shock hazard.



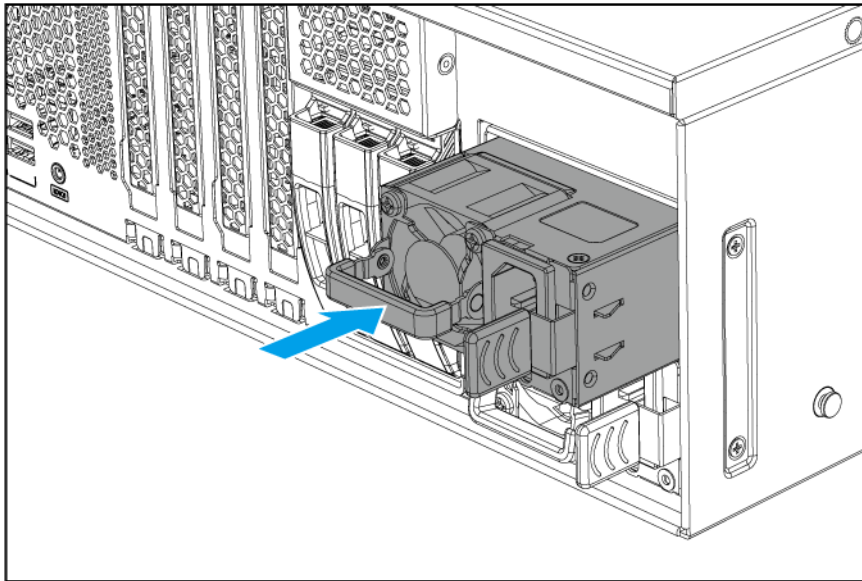
### Tip

By default, the NAS issues audio alerts and desktop notifications in case of redundant PSU failures. Redundant PSU failures include when the NAS is operating on a single healthy PSU only. In this case, if you want to stop receiving redundant PSU failure alerts and notifications, go to **Control Panel > System > Hardware > General** and deselect **Enable redundant power supply mode**.

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



3. Insert the new PSU.



4. Connect the power cord to the PSU and the electrical outlet.

## Replacing Fans on the TS-h1887XU-RP



### Warning

- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

- 



**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 cords from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.  
For details, see [Removing the Case Cover](#).

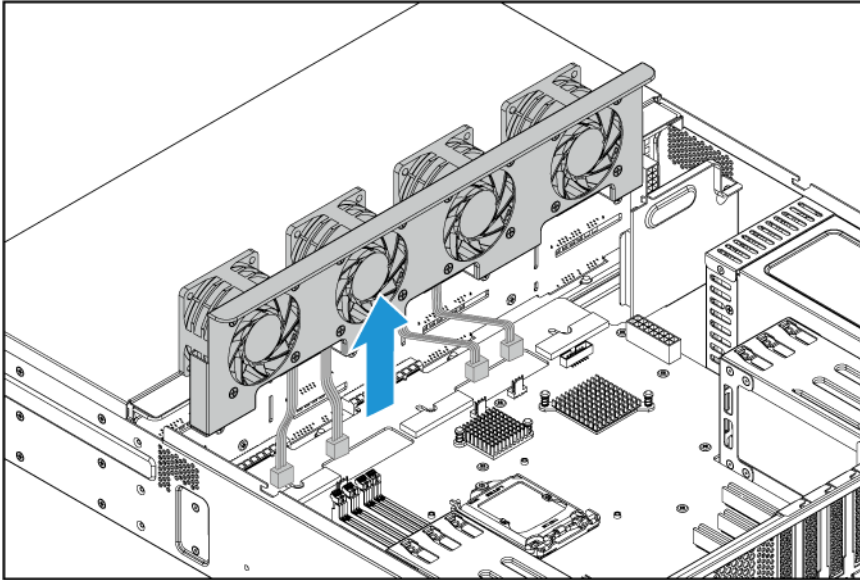


### Warning

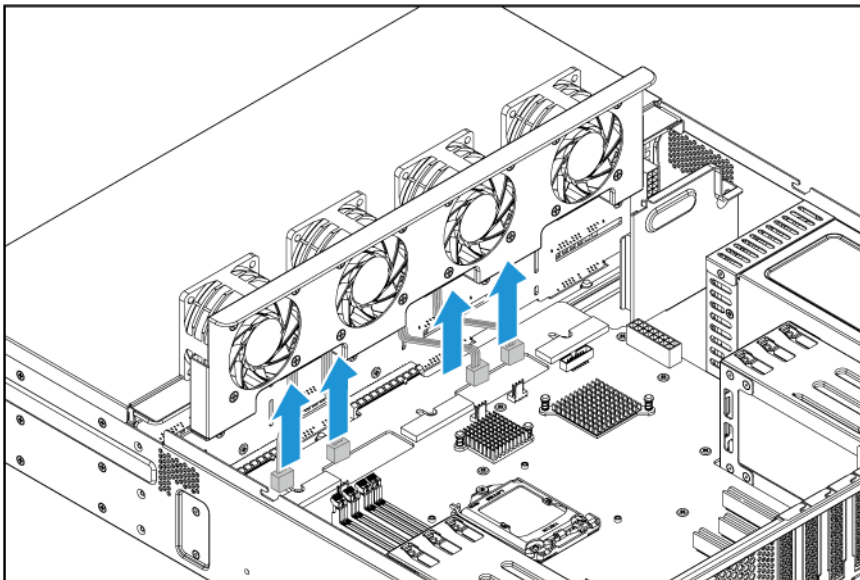
To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.

**5.** Remove the fan unit from the chassis.

**a.** Lift the fan unit up.



**b.** Disconnect the power connectors of all fans from the system board.

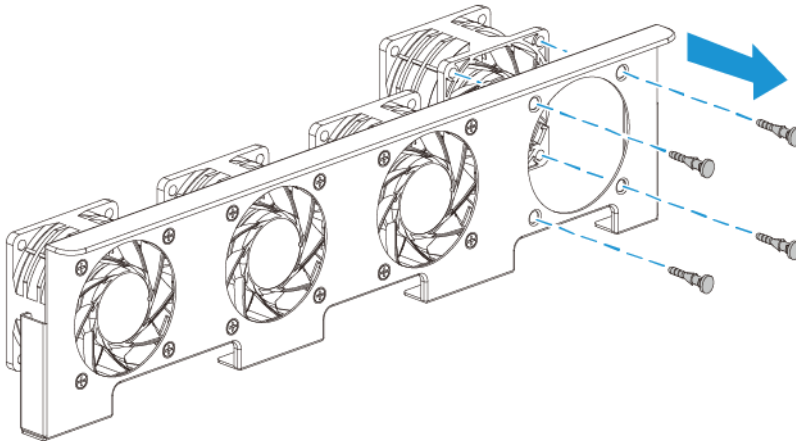


**c.** Lift the fan unit out of the chassis.

**6.** Remove the fan.

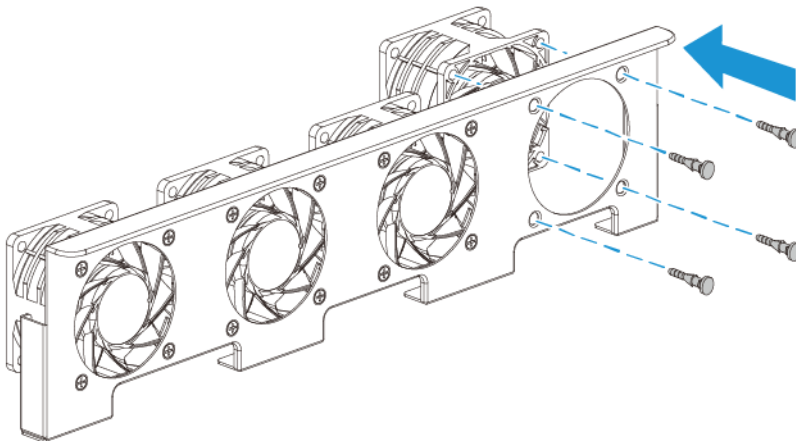
**a.** Remove the rubber pins that secure the fan to the fan unit.





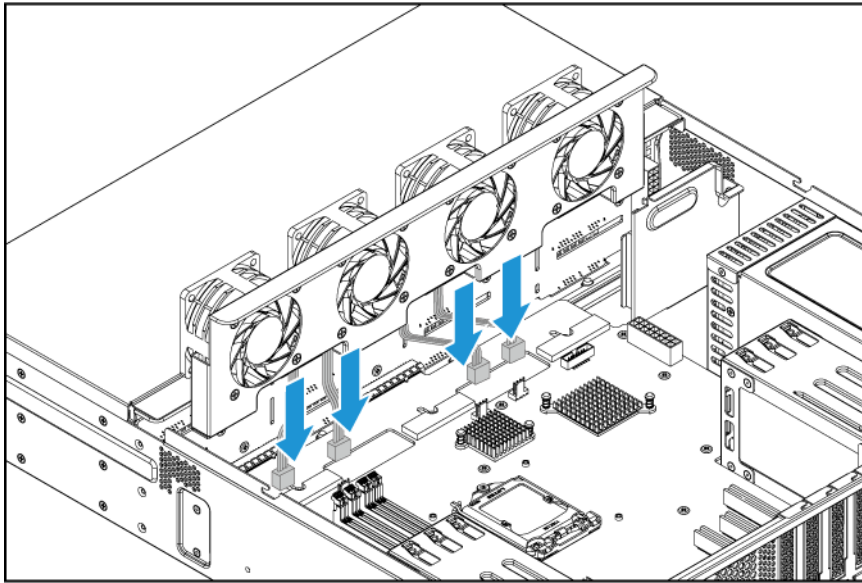
**7.** Install a new fan.

- a.** Align the fan to the screw holes on the fan unit.
- b.** Attach the rubber pins that secure the fan to the fan unit.

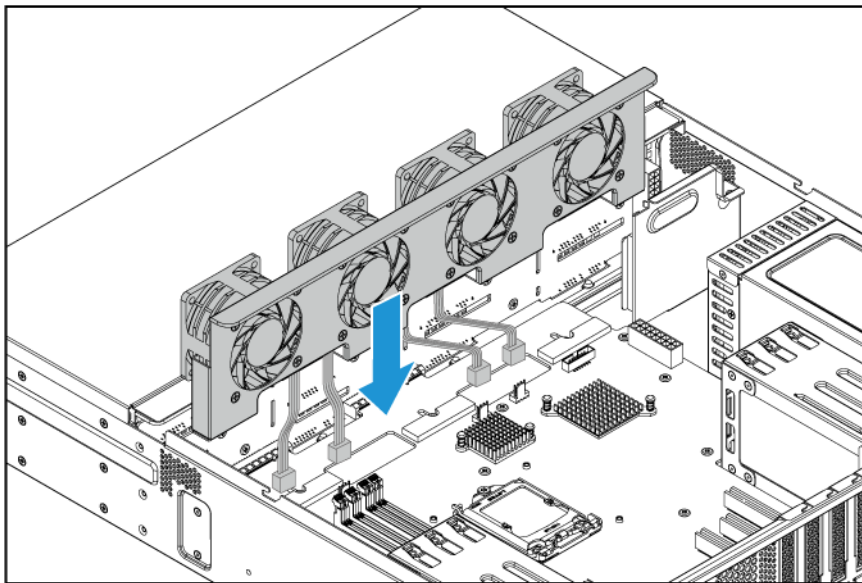


**8.** Install the fan unit.

- a.** Connect the power connectors of all fans to the system board.



**b.** Insert the fan unit.



9. Attach the case cover.  
For details, see [Attaching the Case Cover](#).
10. Connect all cables and external attachments.
11. Connect the power cords to the electrical outlet.
12. Power on the device.

## Replacing Fans on the TS-h2287XU-RP



**Warning**

- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.



**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.



#### Tip

This device has transparent plastic fan ducts pre-installed on some system fans. These fan ducts help maintain ideal operating temperatures for components. QNAP does not recommend operating this device without these fan ducts installed.

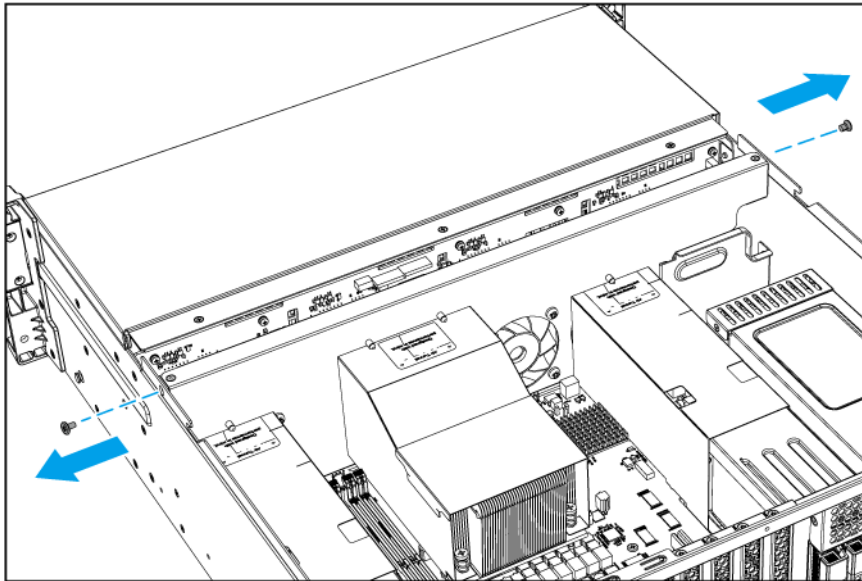
1. Power off the device.
2. Disconnect the power cords from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.  
For details, see [Removing the Case Cover](#).



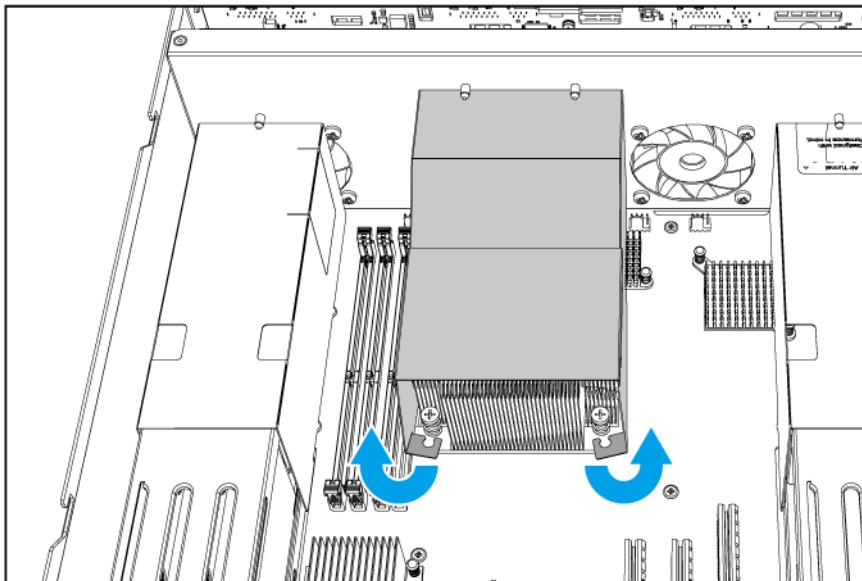
#### Warning

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 fan unit from the chassis.
  - a. Remove the screws that secure the fan unit to the chassis.



b. Detach the bottom hooks of the CPU fan duct from the CPU heatsink screws.

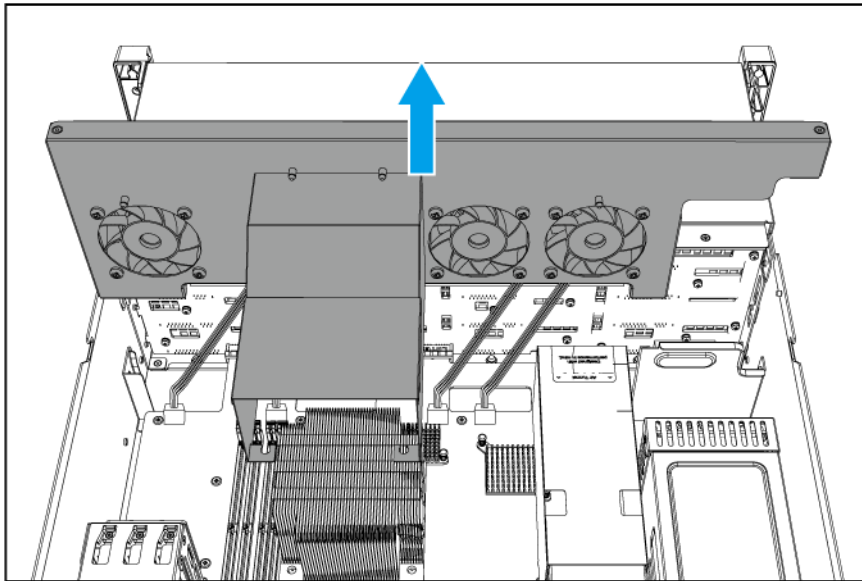


c. Lift the fan unit up.



**Note**

This image does not include the left 2.5-inch drive bay fan duct.

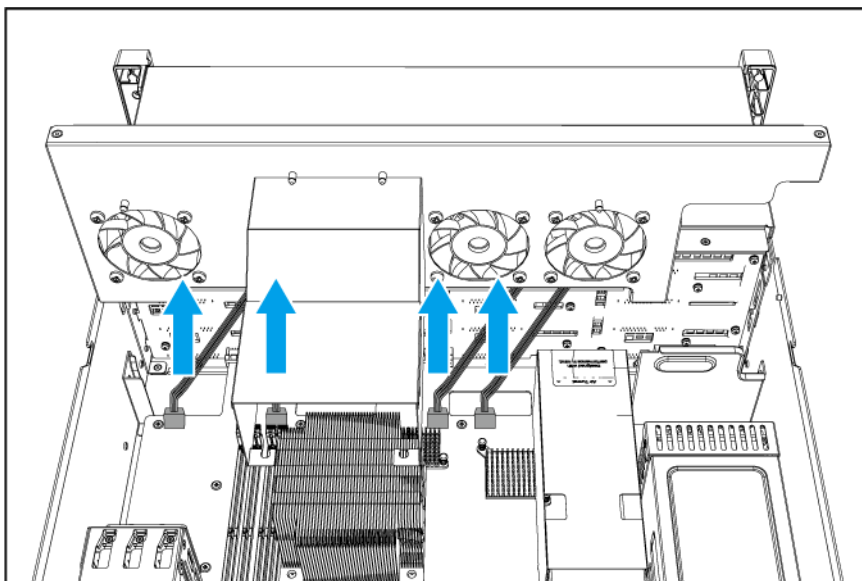


- d. Disconnect the power connectors of all fans from the system board.

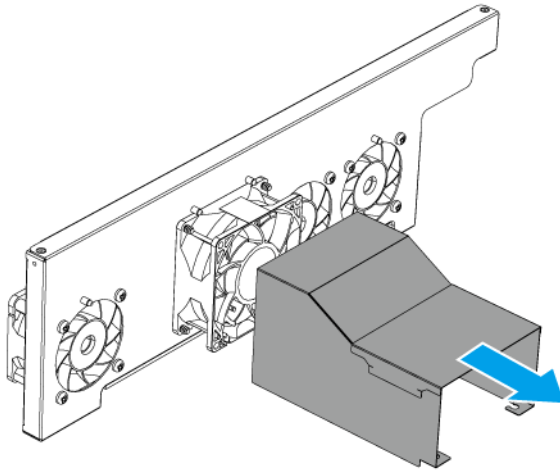


**Note**

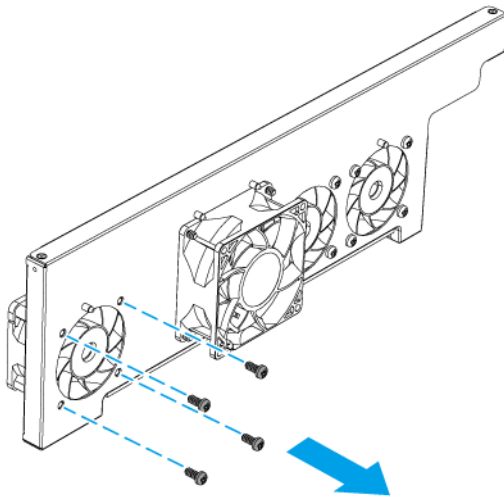
This image does not include the left 2.5-inch drive bay fan duct.



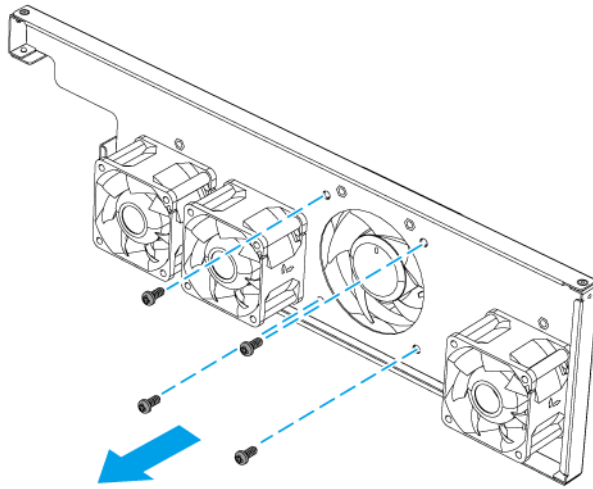
- e. Lift the fan unit out of the chassis.
6. Remove the fan.
- a. Detach the CPU fan duct from the CPU fan.



**b.** Remove the screws that secure the fan to the fan unit.

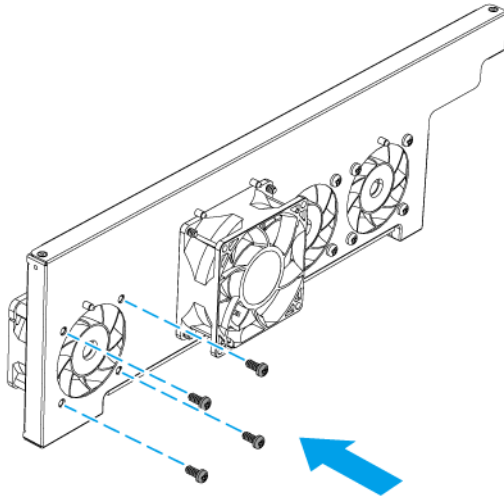


### System Fan

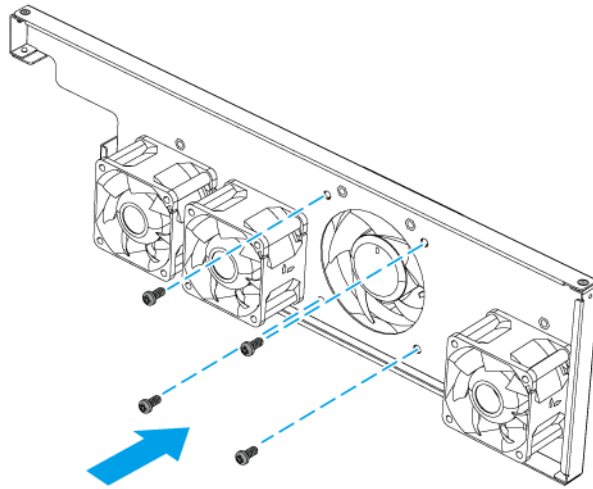


### CPU Fan

7. Install a new fan.
  - a. Align the fan to the screw holes on the fan unit.
  - b. Attach the screws that secure the fan to the fan unit.

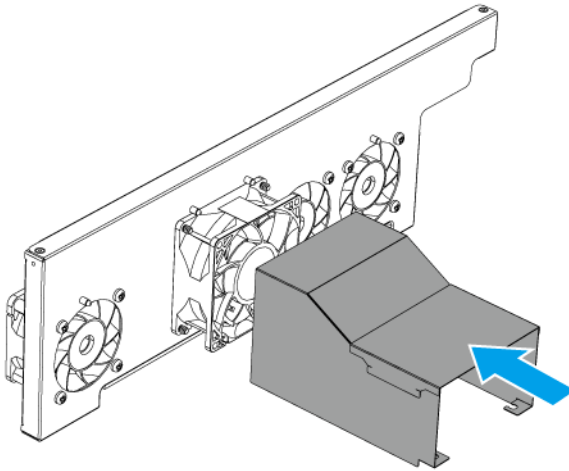


### System Fan



### CPU Fan

- c. Optional: Attach the CPU fan duct to the CPU fan.



### 8. Install the fan unit.

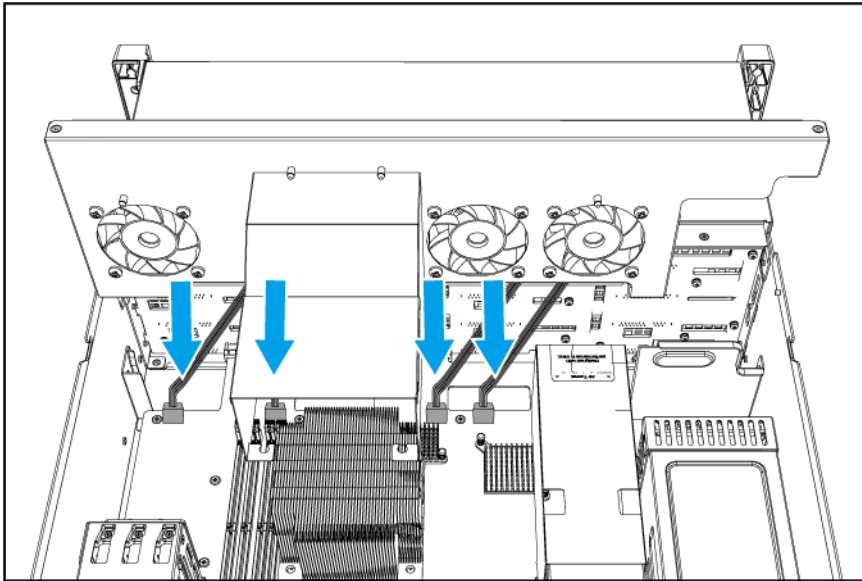
- a. Connect the power connectors of all fans to the system board.



#### Note

This image does not include the left 2.5-inch drive bay fan duct.



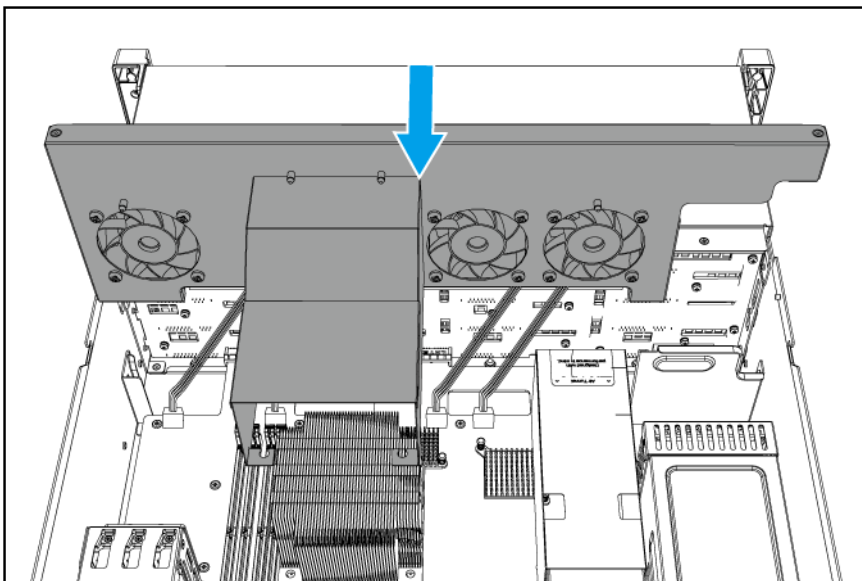


b. Insert the fan unit.

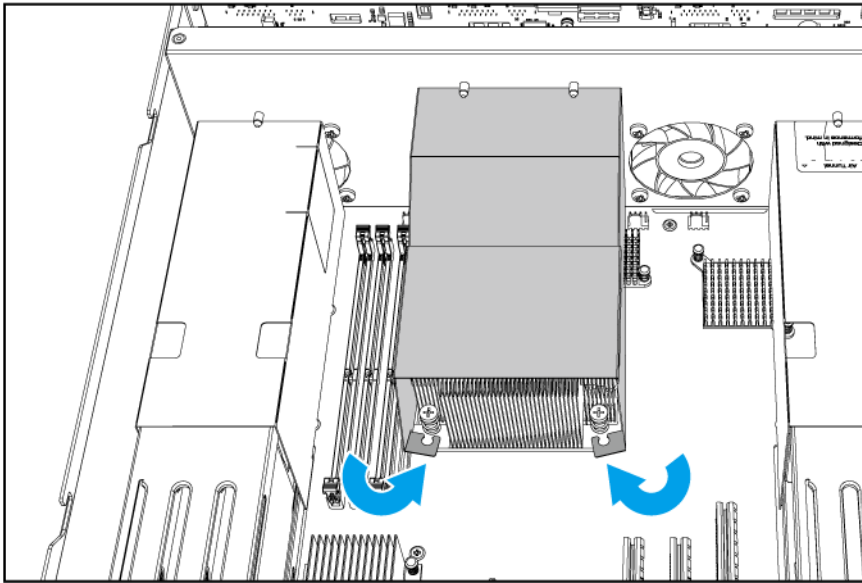


**Note**

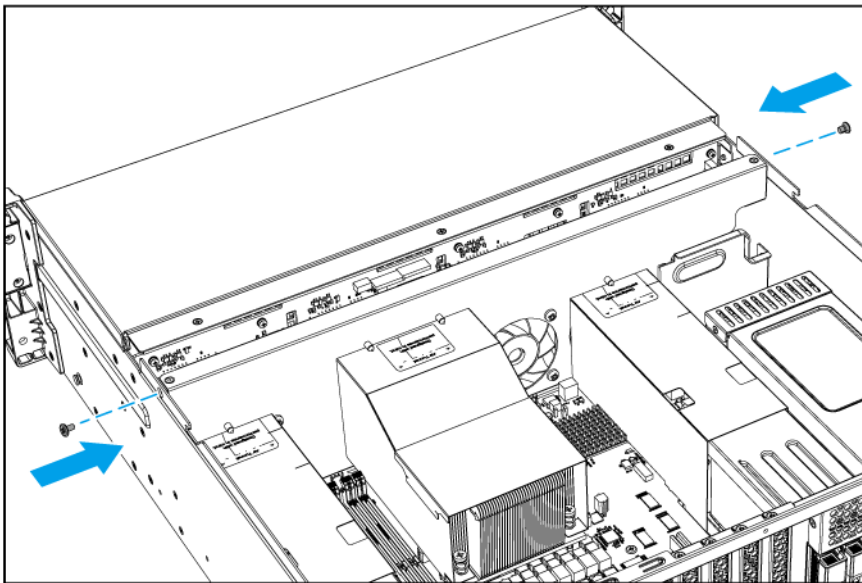
This image does not include the left 2.5-inch drive bay fan duct.



c. Attach the bottom hooks of the CPU fan duct to the CPU heatsink screws.



9. Attach the screws that secure the fan unit to the chassis.



10. Attach the case cover.  
For details, see [Attaching the Case Cover](#).
11. Connect all cables and external attachments.
12. Connect the power cords to the electrical outlet.
13. Power on the device.

## 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-hx87XU-RP is compatible with the following rail kit models:

Model	Compatible Rail Kit
TS-h1887XU-RP	RAIL-B02
TS-h2287XU-RP	RAIL-B02

You can find installation information in the rail kit package.

## Expansion Unit Installation

The TS-hx87XU-RP supports SAS, SATA JBOD, and USB expansion units. For details, see the 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 <https://www.qnap.com/go/compatibility-expansion>.

Expansion Unit Model	Description	Required Accessories
TL-R1620Sep-RP	<ul style="list-style-type: none"> <li>• Uses a SAS 12 Gbps (SFF-8644) interface</li> <li>• Supports SAS/SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• One of the following storage expansion cards: <ul style="list-style-type: none"> <li>• QXP-820S-B3408</li> <li>• QXP-1620S-B3616W</li> </ul> </li> <li>• mini-SAS SFF-8644 cable</li> <li>• RAIL-B02</li> </ul>
TL-R1220Sep-RP	<ul style="list-style-type: none"> <li>• Uses a SAS 12 Gbps (SFF-8644) interface</li> <li>• Supports SAS/SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• One of the following storage expansion cards: <ul style="list-style-type: none"> <li>• QXP-820S-B3408</li> <li>• QXP-1620S-B3616W</li> </ul> </li> <li>• mini-SAS SFF-8644 cable</li> <li>• RAIL-B02</li> </ul>
TR-002	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> </ul>
TR-004	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 1 Type-A to Type-C cable</li> </ul>
TR-004U	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 1 Type-A to Type-C cable</li> <li>• RAIL-B02</li> </ul>
TL-D800C	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> </ul>

Expansion Unit Model	Description	Required Accessories
TL-R1200C-RP	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> <li>• RAIL-B02</li> </ul>
TL-D400S	<ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x SFF-8088 connector cable</li> <li>• QXP-400eS-A1164 host bus adapter</li> </ul>
TL-D800S	<ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 2 x SFF-8088 connector cables</li> <li>• QXP-800eS-A1164 host bus adapter</li> </ul>
TL-D1600S	<ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 4 x SFF-8088 to SFF-8644 connector cables</li> <li>• QXP-1600eS-A1164 host bus adapter</li> </ul>
TL-R1200S-RP	<ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 3 x SFF-8088 to SFF-8644 connector cables</li> <li>• QXP-1600eS-A1164 host bus adapter</li> <li>• RAIL-B02</li> </ul>
TL-R400S	<ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x SFF-8088 connector cable</li> <li>• QXP-400eS-A1164 host bus adapter</li> <li>• RAIL-B02</li> </ul>

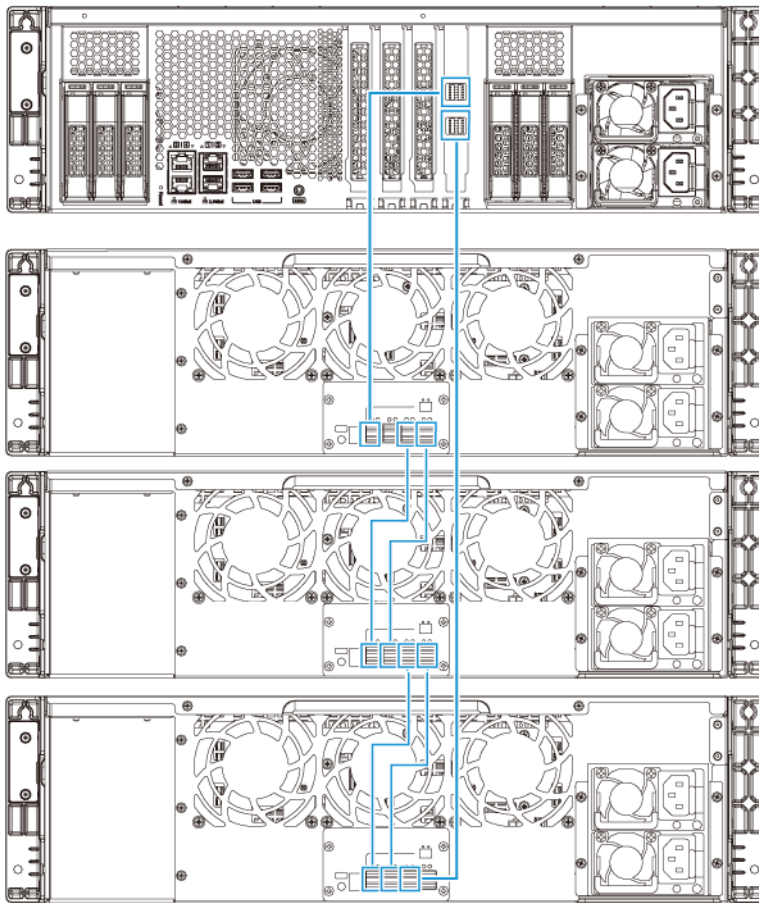
## Connecting SAS Expansion Units

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 [Installing Expansion Cards](#).

2. Connect the expansion units to the device using the following topology.



QNAP recommends always using dual-path configuration to prevent storage downtime due to expansion unit failure or cable disconnection. Single-path configuration should be used only in a situation where it is not possible to use dual-path configuration.

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

The TS-hx87XU-RP series supports connecting one SATA JBOD expansion unit. For required accessories details, see [Expansion Unit Installation](#).

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

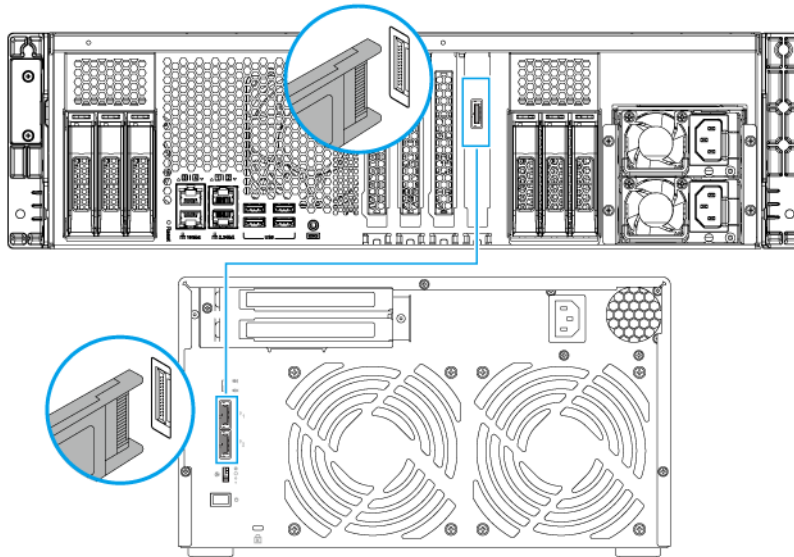
For details, see [Installing Expansion Cards](#).



**Note**

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.

3. Connect the expansion unit to the NAS.

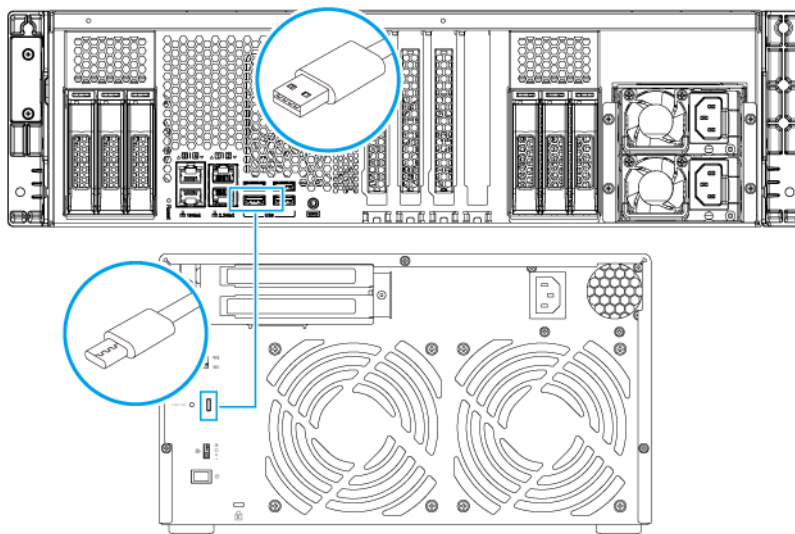


4. Power on the SATA JBOD expansion unit.
5. Power on the NAS.
6. Verify that the expansion unit is recognized by the NAS.
  - a. Log on to QuTS hero as administrator.
  - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
  - c. Verify that the expansion unit is listed.

### Connecting USB Expansion Units

To connect the TS-hx87XU-RP to USB expansion units, a USB Type-A to USB Type-C cable is 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 unit.
3. Verify that the expansion unit is 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 unit is listed.

### QuTS hero Installation

The TS-hx87XU-RP uses the QNAP QuTS hero operating system. You can install QuTS hero using any of the following methods.

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 <https://download.qnap.com>.



**Warning**

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

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"> <li>• Locate the NAS using Qfinder Pro.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul> <p>For details, see <a href="#">Initializing QuTS hero Using Qfinder Pro</a>.</p>	<ul style="list-style-type: none"> <li>• Computer</li> <li>• Network cable</li> <li>• Qfinder Pro installer</li> </ul>

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"> <li>• Scan the QR code on the NAS.</li> <li>• Log into your myQNAPcloud account.</li> <li>• Use myQNAPcloud Link to remotely access your NAS.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul> <p>For details, see <a href="#">Initializing QuTS hero Using the Cloud Installation Website</a>.</p>	<ul style="list-style-type: none"> <li>• Computer or mobile device</li> <li>• Network cable</li> <li>• myQNAPcloud account</li> <li>• Cloud Key</li> </ul>

## Initializing QuTS hero Using Qfinder Pro

You can initialize QuTS hero using Qfinder Pro, which is an utility designed to help you locate and manage QNAP devices on your network.



### 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. If the screen shows a different operating system, click **QuTS hero**.



### Note

This step is only required if the NAS supports installing more than one operating system and the default operating system for installation is not QuTS hero.

The NAS restarts and the smart installation screen shows QuTS hero as the operating system to install.

6. Click **Start Smart Installation Guide**. The **Install Firmware** window appears.
7. Install firmware using any of the following methods:

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



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

### 8. 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.
- **Username:** Specify an administrator username that contains 1 to 32 characters. The name can contain letters (A to Z, a to z), numbers (0 to 9), and hyphens (-), multi-byte Chinese, Japanese, Korean, and Russian characters.  
The username cannot contain the following special characters: grave accent (`), asterisk (\*), equal sign (=), plus sign (+), square brackets ([ ]), curly brackets ({}), slash (\), vertical bar (|), semicolon (;), colon (:), apostrophe ('), quotation mark ("), comma (,), less than sign (<), greater than sign (>), backslash (/), question mark (?), percent sign (%), dollar sign (\$), and the space character.



#### Important

To protect your NAS from brute force attacks, create a new system administrator account during QuTS hero initialization to disable the default "admin" account.

- **Password:** Specify an administrator password with 1 to 64 characters. The password supports all ASCII characters.

### 9. Click **Next**.

### 10. 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.

### 11. Click **Next**.

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

### 12. Select **Obtain an IP address automatically (DHCP)**.

### 13. Click **Next**.

### 14. Review the settings.

### 15. Click **Apply**.

A confirmation message appears.



#### Warning

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

### 16. Click **Initialize**.

QuTS hero initialization starts. It may take a few minutes to complete the process. After the initialization, you can click **Go to NAS Management** to start using QuTS hero and configuring other settings.

## Initializing QuTS hero Using the Cloud Installation Website

You can initialize QuTS hero on the cloud installation website, which is designed to help you set up QNAP devices.



### Warning

Initializing 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 website using one of the following methods:
  - On your computer, go to the website dedicated to your region.
    - Global: <https://install.qnap.com>
    - China: <https://install.qnap.com.cn>
  - Or 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. Find your NAS from the list and then click **Initialize**.



### Tip

If your NAS is connected to the Internet, you can also go to <https://install.qnap.com/set> to enter the Cloud Key printed on the NAS. This allows you to initialize the NAS even if your NAS and your computer are not on the same network.

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**.
- If the screen shows a different operating system, click **QuTS hero**.  
The NAS restarts and the smart installation screen shows QuTS hero as the operating system to install.

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 <b>Start</b> . Automatically searches for available firmware updates and installs firmware.
Manual installation	<p><b>a.</b> Click <b>Manual Installation</b>. The <b>Install Firmware</b> window appears.</p> <p><b>b.</b> Click <b>Browse</b>. The upload file window appears.</p> <p><b>c.</b> Select file.</p> <p><b>d.</b> Click <b>Open</b>. Starts firmware installation.</p>
Skip	Click <b>Skip</b> . 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.
- **Username:** Specify an administrator username that contains 1 to 32 characters. The name can contain letters (A to Z, a to z), numbers (0 to 9), and hyphens (-), multi-byte Chinese, Japanese, Korean, and Russian characters.  
The username cannot contain the following special characters: grave accent (`), asterisk (\*), equal sign (=), plus sign (+), square brackets ([ ]), curly brackets ({}), slash (/), vertical bar (|), semicolon (;), colon (:), apostrophe ('), quotation mark ("), comma (,), less than sign (<), greater than sign (>), backslash (\), question mark (?), percent sign (%), dollar sign (\$), and the space character.



### Important

To protect your NAS from brute force attacks, create a new system administrator account during QuTS hero initialization to disable the default "admin" account.

- **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**.
17. Review the settings.
18. Click **Apply**.  
A confirmation message appears.

**Warning**


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

19. Click **Initialize**.  
QuTS hero initialization starts. It may take a few minutes to complete the process.  
After the initialization, you can click **Go to NAS Management** to start using QuTS hero and configuring other settings.


## 3. 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.   <b>Important</b> 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"> <li>• The admin account is automatically enabled.</li> <li>• 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 would be 00089BF61575.</li> </ul> <p> <b>Note</b> You can find the first MAC address with Qfinder Pro or attached to a label on the device listed as MAC1.</p> <ul style="list-style-type: none"> <li>• TCP/IP configuration: <ul style="list-style-type: none"> <li>• Obtain IP address settings automatically via DHCP</li> <li>• Disable jumbo frames</li> <li>• If port trunking is enabled (multi-LAN models only), the port trunking mode is reset to "Active Backup (Failover)".</li> </ul> </li> <li>• System port: 8080 (system service port)</li> <li>• Security level: Low (Allow all connections)</li> <li>• VLAN: Disabled</li> </ul>
Advanced system reset	Press and hold the button for 10 seconds.	<p>The default factory settings are restored.</p> <ul style="list-style-type: none"> <li>• To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.</li> </ul>

## 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 [Components](#).

### System Status LED

Status	Description
Flashes green and red alternately every 0.5 seconds	<ul style="list-style-type: none"> <li>A drive is being formatted.</li> <li>The device is being initialized.</li> <li>The operating system is being updated.</li> <li>RAID rebuilding is in progress.</li> <li>Online RAID Capacity Expansion is in progress.</li> <li>Online RAID Level Migration is in progress.</li> <li>The firmware is being updated.</li> </ul> <p> <b>Important</b> 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"> <li>A drive is invalid.</li> <li>A shared folder has reached its full capacity.</li> <li>A shared folder is about to reach its full capacity.</li> <li>A system fan is not functioning.</li> <li>An error occurred when accessing (read/write) the data.</li> <li>A bad sector is detected on the hard drive.</li> <li>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).</li> <li>A hardware self-test error occurred.</li> </ul>
Flashes red every 0.5 seconds	The device is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).
Green	The device is ready.
Flashes green every 0.5 seconds	<ul style="list-style-type: none"> <li>The device is not configured.</li> <li>A drive is not formatted.</li> </ul>
Off	<ul style="list-style-type: none"> <li>All drives are in standby mode.</li> <li>The device is powered off.</li> </ul>

**Drive LED**

Status	Description
Flashes red	Data is being accessed, and during the process a drive read/write error occurred.
Red	A drive read/write error occurred.
Flashes green	Data is being accessed.
Green	The drive is ready.
Off	No drive was detected.

**Drive Status LED**

Status	Description
Green	The drive is ready.
Red	A drive read/write error occurred.
Flashes red 5 times per second	The drive is being located in the operating system.
Off	No drive was detected.

**Drive Activity LED**

Status	Description
Green	The drive is ready.
Flashes green	The drive is being accessed.
Off	No drive was detected.

**LAN LED**

Status	Description
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.

**2.5 Gigabit Ethernet Speed LED**

Status	Description
Green	The network connection is operating at 2.5 Gbps.
Orange	The network connection is operating at 1 Gbps or 100 Mbps.
Off	<ul style="list-style-type: none"> <li>• The network connection is operating at 10 Mbps.</li> <li>• There is no network connection.</li> </ul>

**2.5 Gigabit Ethernet Activity LED**

Status	Description
Orange	A network connection has been established.
Flashes orange	The device is being accessed from the network.
Off	There is no network connection.

**10GBASE-T Ethernet Speed LED**

Status	Description
Green	The network connection is operating at 10 Gbps.
Orange	The network connection is operating at 5 Gbps, 2.5 Gbps, 1 Gbps, 100 Mbps, or 10 Mbps.
Off	There is no network connection.

**10GBASE-T Ethernet Activity LED**

Status	Description
Orange	A network connection has been established.
Flashes orange	Data is being transmitted.
Off	There is no network connection.

**Expansion LED**

Status	Description
Blue	<ul style="list-style-type: none"> <li>A USB JBOD expansion unit has been detected.</li> <li>A SAS JBOD expansion unit has been detected.</li> <li>An expansion unit is connected.</li> </ul>
Off	<ul style="list-style-type: none"> <li>No JBOD expansion unit has been detected.</li> <li>No expansion unit has been detected.</li> </ul>

**Audio Alerts**

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> <li>The NAS is starting up.</li> <li>When the reset button is pressed for 3 seconds, the NAS resets configurations.</li> <li>When the reset button is pressed for 10 seconds, the NAS resets configurations and reboots.</li> </ul>
	3	<ul style="list-style-type: none"> <li>The NAS data cannot be copied to the external storage device connected to the USB One Touch Copy port.</li> <li>The operating system was updated.</li> </ul>



Duration	Frequency	Description
Long beep (1.5 seconds)	3 (every 5 minutes)	<ul style="list-style-type: none"> <li>• A power error occurred.</li> <li>• A system fan is not functioning.</li> <li>• A fan module has been removed.</li> </ul>
	2	<ul style="list-style-type: none"> <li>• A storage pool is about to reach full capacity.</li> <li>• A storage pool has reached full capacity.</li> <li>• A storage pool status error occurred.</li> <li>• A shared folder is about to reach its full capacity.</li> <li>• A shared folder has reached its full capacity.</li> <li>• A shared folder status error occurred.</li> <li>• A drive is plugged in or out.</li> </ul>
	1	<ul style="list-style-type: none"> <li>• The NAS is powering off.</li> <li>• The NAS was powered on successfully and is ready.</li> </ul>
Long and short beeps	1 long and 2 short beeps	The JBOD expansion unit has been removed.

## 4. NAS Migration

You can migrate data and settings from your current NAS to another NAS model with minimal disruptions by installing all the hard drives from the source NAS to the destination NAS. RAID configuration and other settings are retained on the destination NAS after migration.

### NAS Migration Requirements

You can only migrate drives and system settings to specific NAS models, depending on your source NAS. For the list of NAS models compatible with direct NAS migration, see <https://www.qnap.com/en/nas-migration>.

Your device must meet the following requirements:

- The destination NAS must run on the same QuTS hero version as the source NAS (or later).



#### Important

Due to incompatibilities in file system, system migration between QTS NAS and QuTS hero NAS is not supported.



#### Warning




Migrating drives between QTS NAS and QuTS hero NAS can cause data corruption.


- The destination NAS must have sufficient free drive bays to accommodate all the drives that you are migrating from the source NAS.

For NAS models that do not support NAS migration, see [How to Migrate Data and Folder Permissions between QTS and QuTS hero with HBS3](#).

### Status and Setting Changes After NAS Migration

The status of NAS data and settings varies after migration.

Data and Settings	After NAS Migration
Registered myQNAPcloud name	Your registered myQNAPcloud name is not migrated.
Encrypted shared folders	<p>If the NAS does not support file system encryption, encrypted shared folders are not migrated.</p> <p> <b>Warning</b> To prevent data loss, back up and save the encryption keys of encrypted shared folders in a safe place. You can also choose to decrypt shared folders before migration.</p>
Shared folders	<p>All shared folders and the downloaded files stored in them are retained.</p> <p> <b>Warning</b> To prevent data loss, back up and save encryption keys or passwords of encrypted shared folders in a safe place before migration.</p> <p> <b>Important</b> Folder permissions on the destination NAS must be reconfigured after migration.</p>

Data and Settings	After NAS Migration
Network	If the number of network ports or network port specifications on the destination NAS is different from the source NAS, the following network and virtual settings may change and require reconfiguration: port trunking, virtual machines, Thunderbolt, and more.
Windows AD configuration	Windows AD configurations must be reconfigured.
Licenses	Licenses are not migrated.   <b>Warning</b> To prevent losing all your software licenses, QNAP recommends deactivating licenses on the source NAS before data migration.
Applications	If the destination NAS has less RAM than the source NAS, the following features and applications might not function: Virtualization Station, Qsirch, and Snapshots.
Services	Only services supported by the destination NAS are available.
Multimedia features	Some multimedia features are disabled by default.

## Migrating a NAS



### Important

Before performing NAS migration, ensure that you understand all requirements and possible changes after migration. For details see the following topics:

- [NAS Migration Requirements](#)
- [Status and Setting Changes After NAS Migration](#)

1. Power off the source NAS and the destination NAS.
2. Remove the drives.



### Important

QNAP recommends following the source NAS drive order when installing the drives. Take note of the drive tray order when removing the drives.

- a. Remove the drives from the source NAS.
- b. Remove the drive trays from the destination NAS.
3. Install the drives.
  - a. Install source NAS drives onto the destination NAS drive trays.
  - b. Insert the drive trays into the destination NAS.
4. Power on the destination NAS.
5. Log on to QuTS hero as an administrator on the destination NAS. The destination NAS automatically checks for the latest firmware update.

## 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	$\geq 3$	One member drive fails.
RAID 6	$\geq 4$	One or two member drives fail.
RAID 10	$\geq 4$ (Must be an even number)	One or two member drives in two different pairs fail.
RAID 50	$\geq 6$	One disk per subgroup fails.
RAID 60	$\geq 8$	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	$\geq 5$	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 > Storage/Snapshots** .

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

## Recovering Unintentionally Removed Healthy Drives

The NAS supports exclusive RAID recovery technology to recover failed RAID groups from unintentional disconnection or removal of drives. Users can recover an inactive RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, RAID 60, triple mirror, and RAID-TP group from degraded mode.

RAID Type	RAID Recovery Support	Number of Disks	Disk Failure Tolerance
RAID 0	Yes	$\geq 2$	N/A
RAID 1	Yes	2	1
RAID 5	Yes	$\geq 3$	1
RAID 6	Yes	$\geq 4$	2
RAID 10	Yes	$\geq 4$ (Must be an even number)	One disk per subgroup fails.
RAID 50	Yes	$\geq 6$	One disk per subgroup fails.
RAID 60	Yes	$\geq 8$	Two disks per subgroup fail.
Triple Mirror	Yes	Multiple of 3. (For example, 3, 6, 9, 12 disks and so forth.)	2
RAID-TP	Yes	$\geq 5$	3

## Support and Other Resources

QNAP provides the following resources:

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

## 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

### **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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Back up the system periodically to avoid any potential data loss is recommended. QNAP disclaims any responsibility of all sorts of data loss or recovery.

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Version 3, 29 June 2007

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“This License” refers to version 3 of the GNU General Public License.



“Copyright” also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

“The Program” refers to any copyrightable work licensed under this License. Each licensee is addressed as “you”. “Licensees” and “recipients” may be individuals or organizations.

To “modify” a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a “modified version” of the earlier work or a work “based on” the earlier work.

A “covered work” means either the unmodified Program or a work based on the Program.

To “propagate” a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To “convey” a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays “Appropriate Legal Notices” to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

## 2. Source Code.

The “source code” for a work means the preferred form of the work for making modifications to it.

“Object code” means any non-source form of a work.

A “Standard Interface” means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The “System Libraries” of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A “Major Component”, in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The “Corresponding Source” for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work’s System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

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You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

- a. The work must carry prominent notices stating that you modified it, and giving a relevant date.
- b. The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to "keep intact all notices".
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A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an "aggregate" if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

**7. Conveying Non-Source Forms.**

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

- a. Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.
- b. Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.
- c. Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.
- 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 the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.
- e. Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

A "User Product" is either (1) a "consumer product", which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, "normally used" refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

"Installation Information" for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

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END OF TERMS AND CONDITIONS

### CE Notice



This device complies with CE Compliance Class A.

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### FCC Notice

#### FCC Class A Notice



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

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## SJ/T 11364-2006



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壳体	0	0	0	0	0	0
显示	0	0	0	0	0	0
印刷电路板	0	0	0	0	0	0
金属螺帽	0	0	0	0	0	0
电缆组装	0	0	0	0	0	0
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