

The QNAP logo is displayed in white, bold, uppercase letters within a blue rounded rectangular box in the top-left corner of the page. The background of the entire page is a light blue gradient with a network of white and blue dots connected by thin lines, creating a digital or data network aesthetic.

QNAP

TS-hx87XU-RP

TS-h1887XU-RP

TS-h2287XU-RP

User Guide

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1. Important Information

Original Packaging

Please keep the original packaging and packaging materials. If you want to return the product or send it for repairs, please use the original packaging to avoid damage.

QNAP reserves the right not to provide a refund or warranty service for products that are damaged due to improper packaging.

Hardware Defects

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.

For details, see the [QNAP Warranty Terms and Conditions](#).

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.

WARNING



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

WARNING



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.

Moving Parts

WARNING



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



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

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

System Battery

WARNING



INGESTION HAZARD

- This product may contain a button battery.
- Keep batteries out of reach of children.
- If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours.
- 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.
- Even used batteries may cause severe injury or death.
- Call a local poison control center for treatment information.
- For information on the type and voltage of the button battery in your device, please see the hardware specification table.
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, heat, or incinerate. Doing so may result in injury due to venting, leakage, or explosion resulting in chemical burns.
- Ensure the batteries are installed correctly according to polarity (+ and -).
- Do not mix old and new batteries, or different brands or types of batteries, such as alkaline, carbon-zinc, or rechargeable batteries.
- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.
- Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.

Rail Kits

Rackmount models may require rail kits for installation onto a server rack or cabinet.

To ensure equipment and personal safety, please carefully read the installation instructions for your rail kit before you install the rail kit and mount your device.

To check if your device is a rackmount unit, see the hardware specification table.

WARNING

- When the rail kit is installed on the server rack, do not fully extend and unlatch the rails except when mounting or unmounting a device.
- Leaving the rails fully extended out and unlatched may cause heavy equipment to fall. This can cause equipment damage and severe or even fatal injuries.
- Before you prepare the rails for device mounting or unmounting, please carefully read and ensure you understand the installation instructions.
- Do not place any objects or add any extra load onto the device or rails when mounting or unmounting a device.
- When mounting a device, slide the device all the way into the server rack to fully latch the rails and secure the device to the server rack.

2. 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 | | |

| Component | TS-h1887XU-RP | TS-h2287XU-RP |
|----------------------|---|--|
| CPU | <ul style="list-style-type: none"> • TS-h1887XU-RP-E2334-16G: Intel® Xeon® E-2334 • TS-h1887XU-RP-E2336-32G: Intel® Xeon® E-2336 | <ul style="list-style-type: none"> • TS-h2287XU-RP-E2336-32G: Intel® Xeon® E-2336 • TS-h2287XU-RP-E2378-64G: Intel® Xeon® E-2378 |
| Frequency | <ul style="list-style-type: none"> • TS-h1887XU-RP-E2334-16G: 4-core/8-thread 3.4 GHz base/4.8 GHz turbo • TS-h1887XU-RP-E2336-32G: 6-core/12-thread 2.9 GHz base/4.8 GHz turbo | <ul style="list-style-type: none"> • TS-h2287XU-RP-E2336-32G: 6-core/12-thread 2.9 GHz base/4.8 GHz turbo • TS-h2287XU-RP-E2378-64G: 8-core/16-thread 2.6 GHz base/4.8 GHz turbo |
| Architecture | x86 64-bit | |
| Encryption engine | AES-NI | |
| Memory | | |
| Pre-installed memory | <ul style="list-style-type: none"> • TS-h1887XU-RP-E2334-16G: 16 GB RAM: 1 x 16 GB DDR4 ECC UDIMM • TS-h1887XU-RP-E2336-32G: 32 GB RAM: 2 x 16 GB DDR4 ECC UDIMM | <ul style="list-style-type: none"> • TS-h2287XU-RP-E2336-32G: 32 GB RAM: 2 x 16 GB DDR4 ECC UDIMM • TS-h2287XU-RP-E2378-64G: 64 GB RAM: 4 x 16 GB DDR4 ECC UDIMM |
| Memory slots | 4 x UDIMM DDR4 | |
| | <p>Important</p> <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. • This device supports ECC memory modules. | |
| Maximum memory | 128 GB RAM: 4 x 32 GB | |
| Flash memory | 5 GB (dual-boot OS protection) | |
| Storage | | |

| Component | TS-h1887XU-RP | TS-h2287XU-RP |
|--------------------------------------|--|---|
| Drive bays | <ul style="list-style-type: none"> • 12 x 3.5-inch SATA • 6 x 2.5-inch SATA | <ul style="list-style-type: none"> • 16 x 3.5-inch SATA • 6 x 2.5-inch SATA |
| Drive compatibility | <p>2.5-inch bays:</p> <ul style="list-style-type: none"> • 2.5-inch SATA solid-state drives <p>3.5-inch bays:</p> <ul style="list-style-type: none"> • 3.5-inch SATA hard disk drives • 2.5-inch SATA solid-state drives <p>Tip</p> <ul style="list-style-type: none"> • For the list of compatible drive models, go to https://www.qnap.com/compatibility. • The drive bays are backward compatible with SATA 3 Gbps drives. | |
| SSD cache acceleration support | This device supports SSD cache acceleration for all drives. | |
| Hot-swapping | This device supports hot-swapping for all drives. | |
| Network | | |
| 2.5 Gigabit network interface | 2 x 2.5 GbE (RJ45) <p>Note</p> <p>The 2.5 Gigabit Ethernet RJ45 ports support the following network connectivity speeds: 2.5 GbE, 1 GbE, 100 Mbps, and 10 Mbps.</p> | |
| 10 Gigabit network interface | 2 x 10GBASE-T (RJ45) <p>Note</p> <p>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.</p> | |
| External I/O Ports & Expansion Slots | | |

| Component | TS-h1887XU-RP | TS-h2287XU-RP |
|------------------------|--|--|
| PCIe slots | <ul style="list-style-type: none"> • 2 x PCIe Gen 4.0 x4 • 1 x PCIe Gen 4.0 x8 <div style="background-color: #ffffcc; padding: 10px; margin-top: 10px;"> <p>Tip For the list of compatible drive models and expansion cards, go to https://www.qnap.com/compatibility.</p> </div> | |
| USB ports | 4 x USB 3.2 Gen 2 Type-A | |
| Interface | | |
| Buttons | <ul style="list-style-type: none"> • Power • Reset | |
| 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) | |
| | <div style="background-color: #ffe6e6; padding: 10px; margin-top: 10px;"> <p>Warning</p> <ul style="list-style-type: none"> • 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. • 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. </div> | |
| Fans | 4 x 60 mm, 12V DC | <ul style="list-style-type: none"> • 3 x 60mm, 12V DC • 1 x 80mm, 12V DC |

| Component | TS-h1887XU-RP | TS-h2287XU-RP |
|-----------------------|--|---------------|
| 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) | |

Tip

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

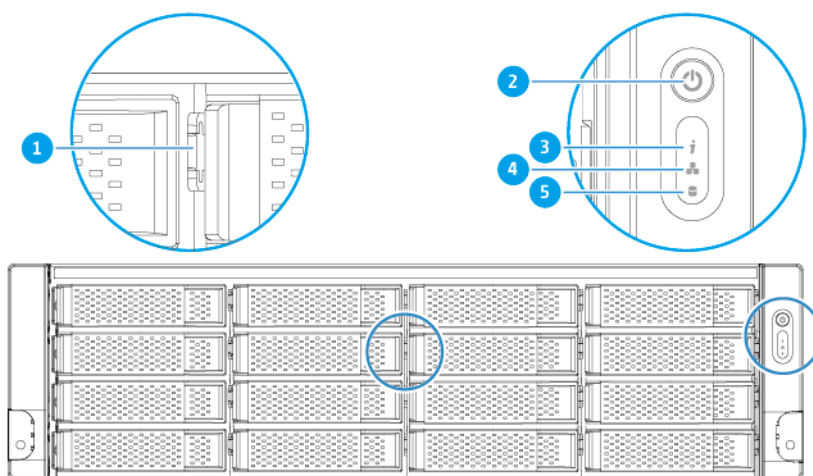
Package Contents

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

| Item | Quantity |
|----------------|---------------------------------|
| Ethernet cable | 1 x 10 GbE Cat6A Ethernet cable |

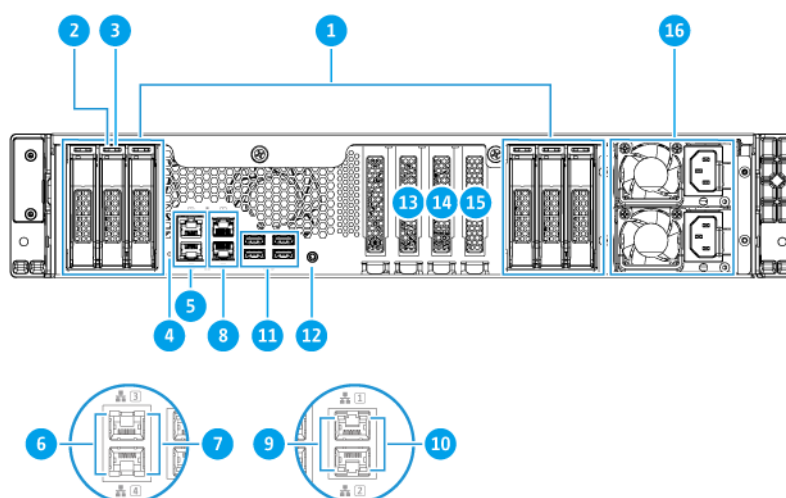
Components

Front Panel



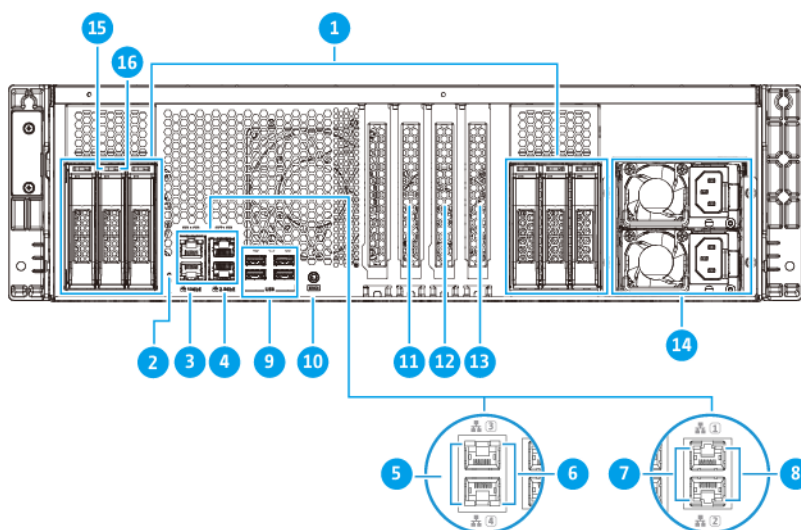
| No. | Component | No. | Component |
|-----|--------------|-----|--------------------|
| 1 | Drive LED | 4 | LAN LED |
| 2 | Power button | 5 | Expansion unit LED |
| 3 | Status LED | - | - |

Rear Panel



TS-h1887XU-RP

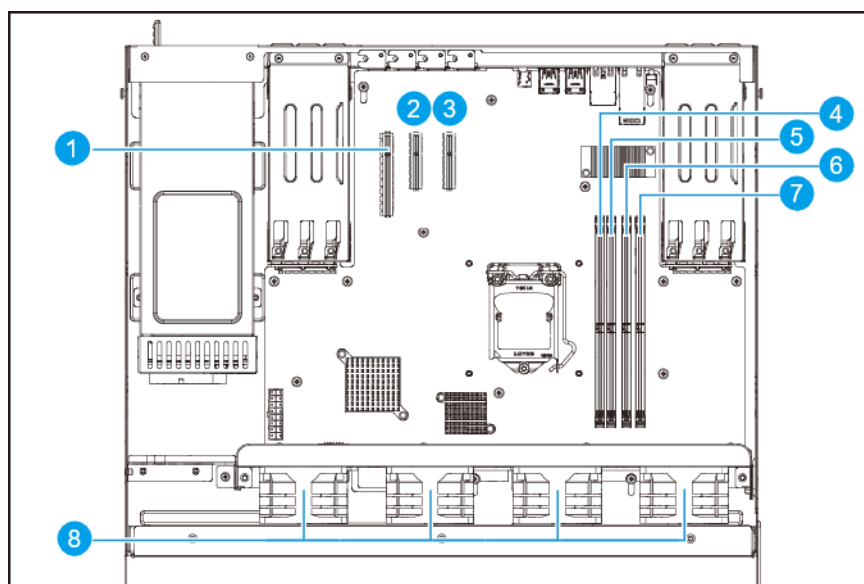
| No. | Component | No. | Component |
|-----|-----------------------------------|-----|---|
| 1 | 2.5-inch SATA drive bays | 9 | 2.5 Gigabit Ethernet speed LEDs |
| 2 | Drive activity LED | 10 | 2.5 Gigabit Ethernet activity LEDs |
| 3 | Drive status LED | 11 | USB 3.2 Gen 2 Type-A ports |
| 4 | Reset button | 12 | Console port |
| | | | <p>Note</p> <p>This port is only for engineering purposes.</p> |
| 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 |



TS-h2287XU-RP

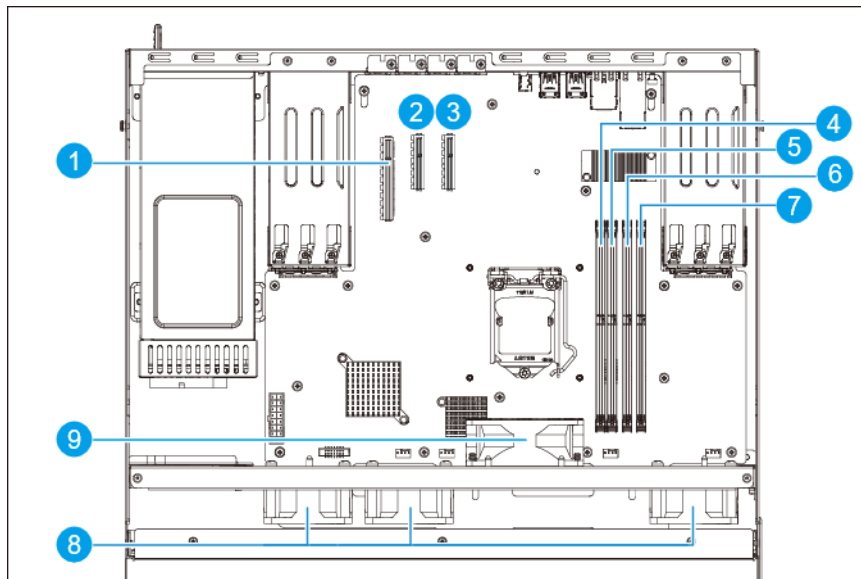
| No. | Component | No. | Component |
|-----|------------------------------------|-----|---|
| 1 | 2.5-inch SATA drive bays | 9 | USB 3.2 Gen 2 Type-A ports |
| 2 | Reset button | 10 | Console port |
| | | | <p>Note</p> <p>This port is only for engineering purposes.</p> |
| 3 | 10GBASE-T ports (RJ45) | 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

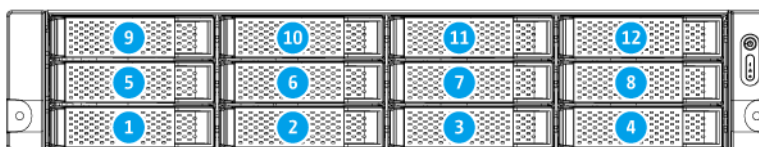
| No. | Component | No. | Component |
|-----|--|-----|--|
| 1 | PCIe slot 1 (PCIe Gen 4.0 x8) | 5 | Memory slot 2 (Channel A, DIMM 2, blue) |
| 2 | PCIe slot 2 (PCIe Gen 4.0 x4) | 6 | Memory slot 3 (Channel B, DIMM 1, black) |
| 3 | PCIe slot 3 (PCIe Gen 4.0 x4) | 7 | Memory slot 4 (Channel B, DIMM 2,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



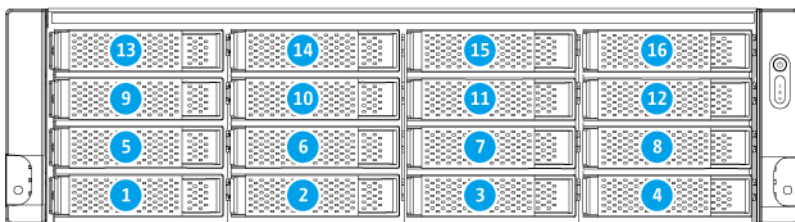
TS-h2287XU-RP

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

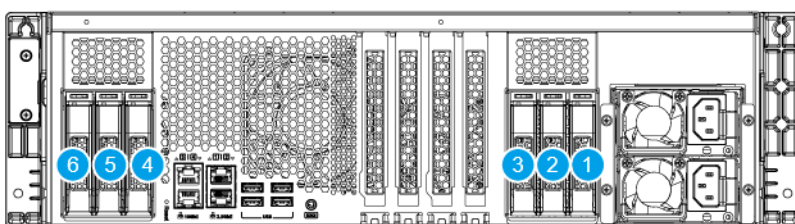


TS-h1887XU-RP

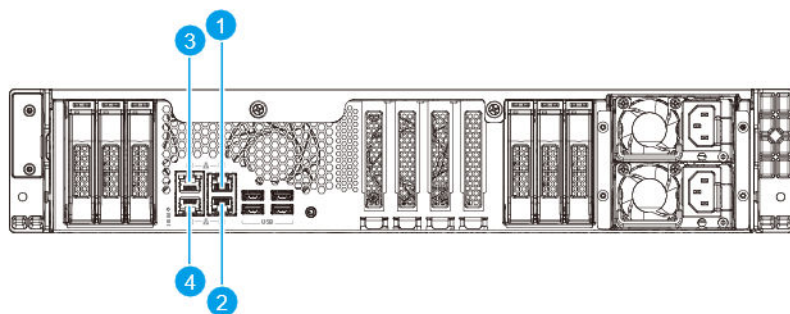


TS-h2287XU-RP

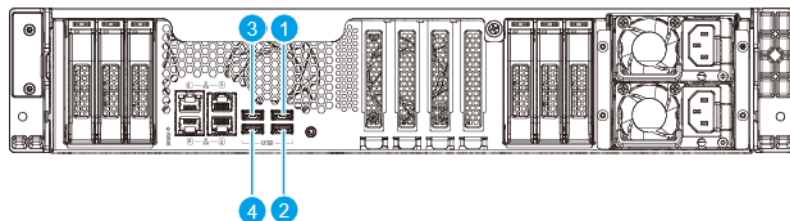
Rear Drive Numbering (2.5-inch Drive Bays)



Network Port Numbering



USB Port Numbering



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 Free from objects that may obstruct device ventilation or apply pressure to the device or power cord |
| 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 |

Setting Up the NAS

Important

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

- Place your NAS device in an environment that meets the requirements.
For details, see [Installation Requirements](#).
- Optional: Replace or install additional memory modules.
For details, see [Replacing Memory Modules](#).
- Optional: Install expansion cards.
For details, see [Installing Expansion Cards](#).
- Optional: Connect expansion units.
For details, see [Expansion Unit Installation](#).
- 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.

3. 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.

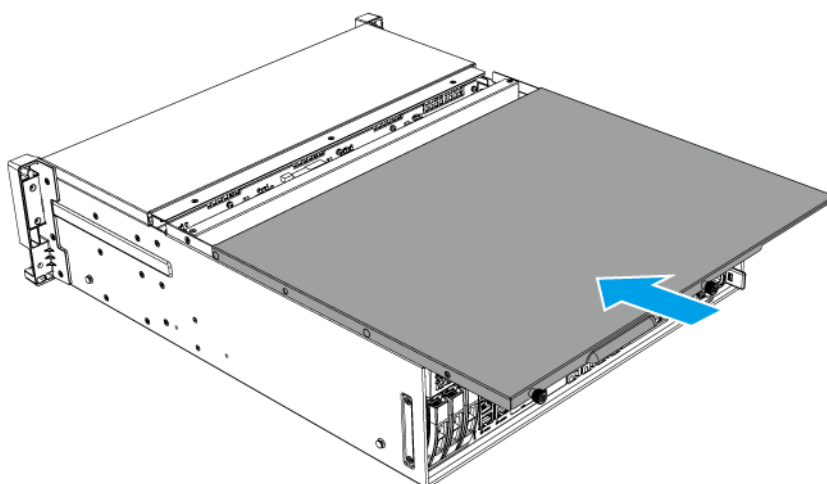


Moving fan blades: Keep your hands and other body parts away from moving fan blades.

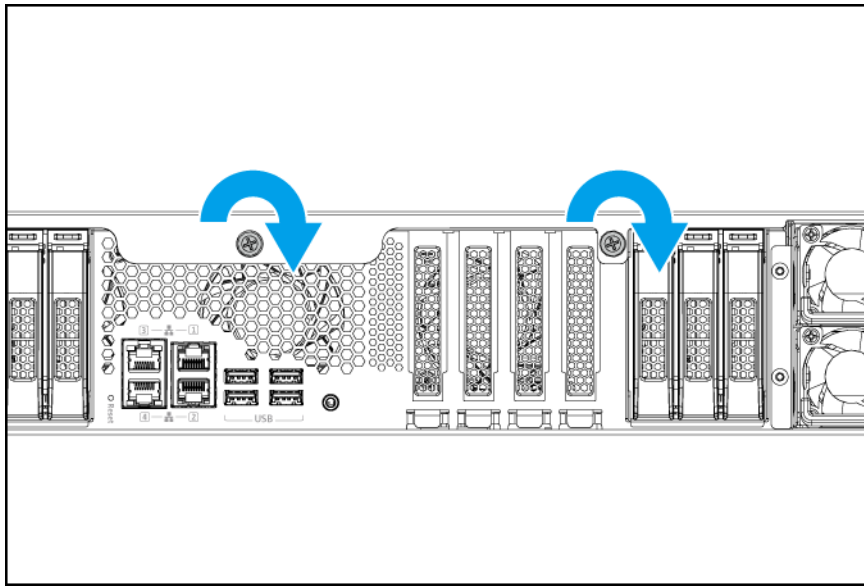


Other moving components: Keep your hands and other body parts away from other moving components.

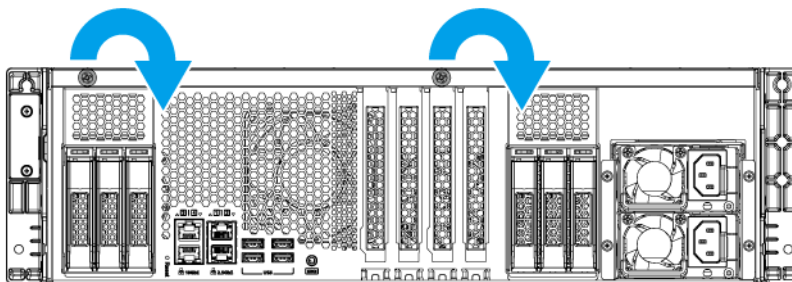
1. Place the cover on the device.
2. Slide the cover forward.



3. Tighten the screws.



TS-h1887XU-RP



TS-h2287XU-RP

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.



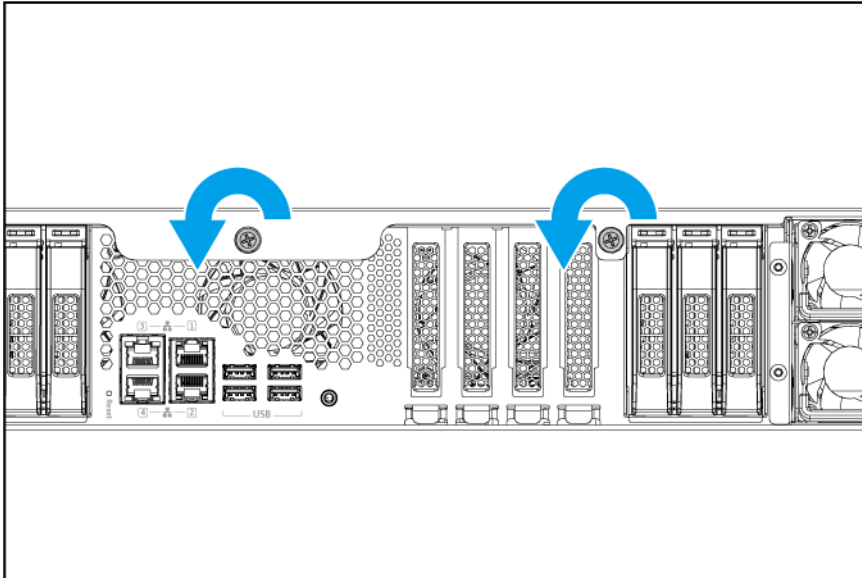
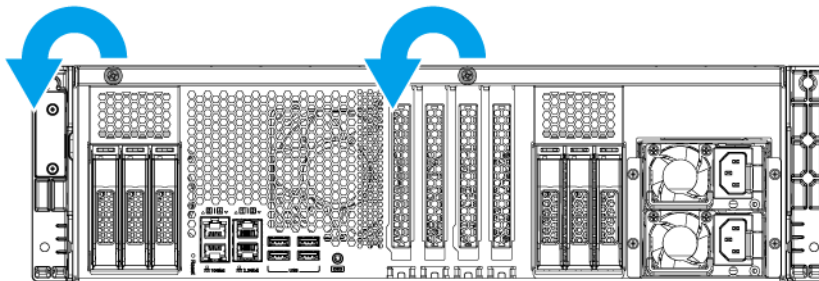
Moving fan blades: Keep your hands and other body parts away from moving fan blades.



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

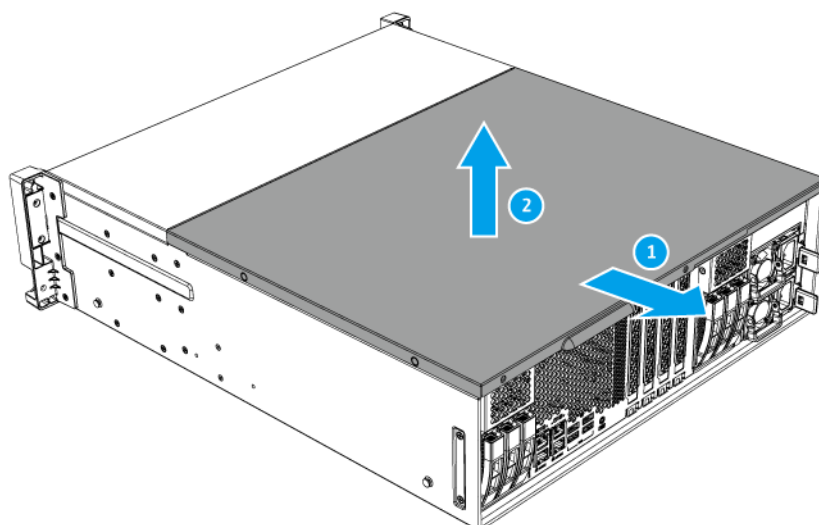
1. Power off the device.
2. Disconnect the power cords from the electrical outlet.

3. Disconnect all cables and external attachments.
4. Remove the case cover.
 - a. Loosen the screws.

**TS-h1887XU-RP****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

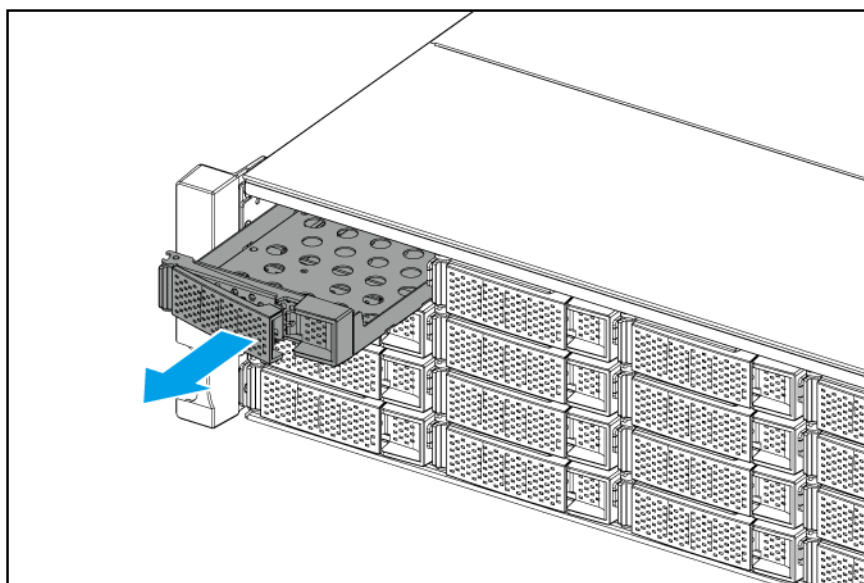
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.

Warning

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

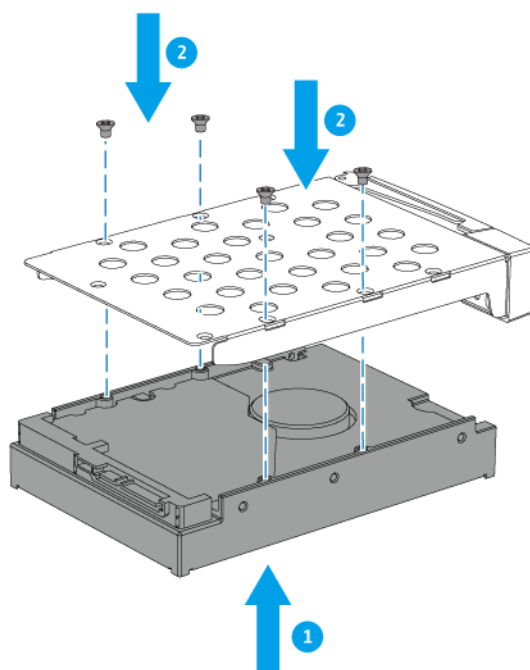
1. Power off the NAS.
2. Remove the drive tray.
 - a. Pull the handle to release the tray.

- b.** Pull the tray out.



- 3.** Install a drive on the tray.

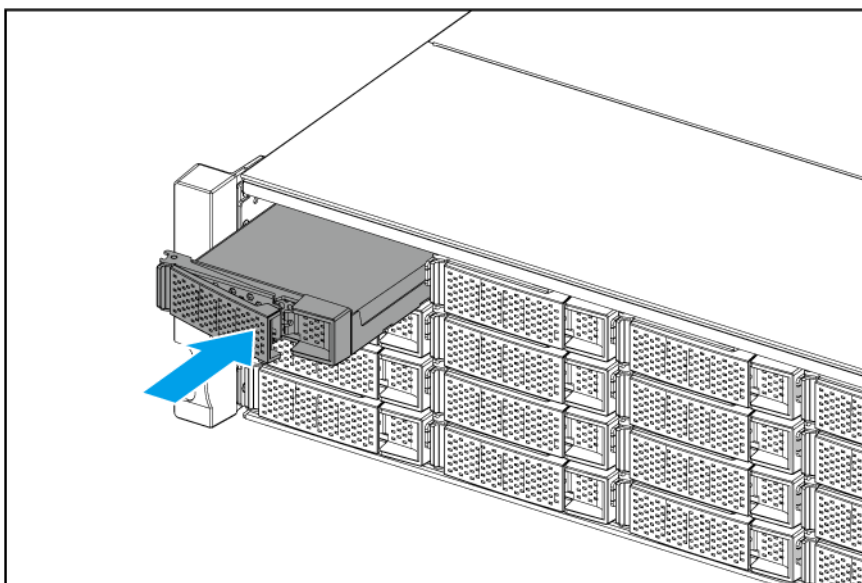
- a.** Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
 - b.** Attach the screws.



- 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

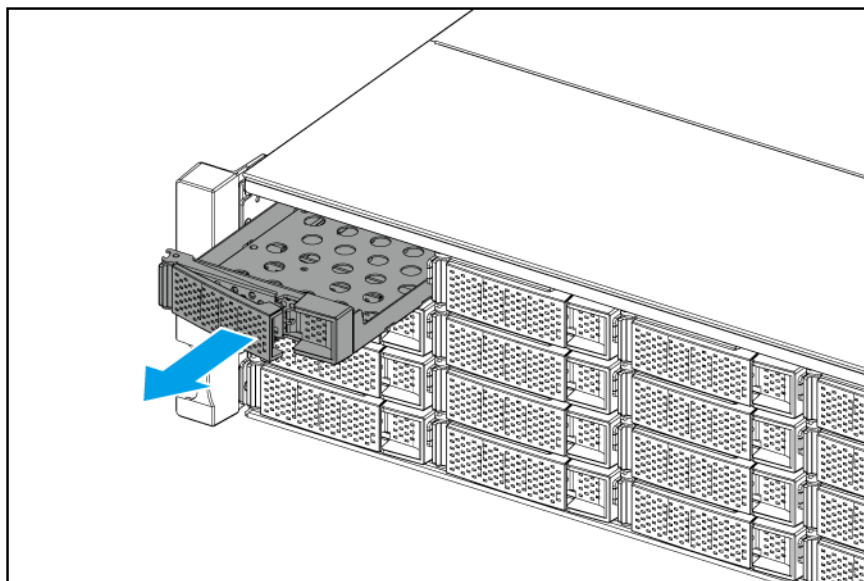
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.

Warning

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

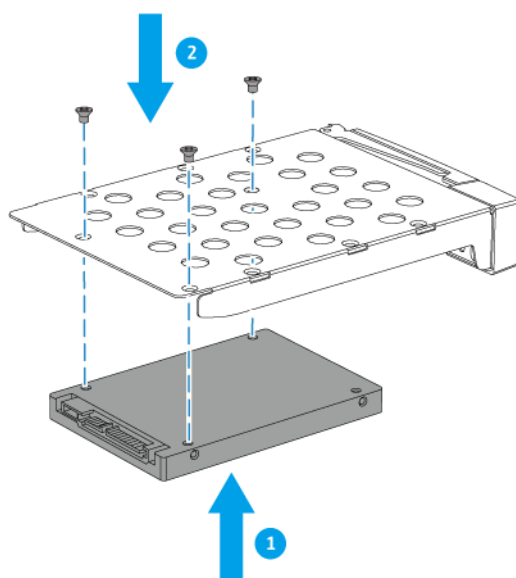
1. Power off the NAS.
2. Remove the drive tray.
 - a. Pull the handle to release the tray.

- b.** Pull the tray out.



- 3.** Install a drive on the tray.

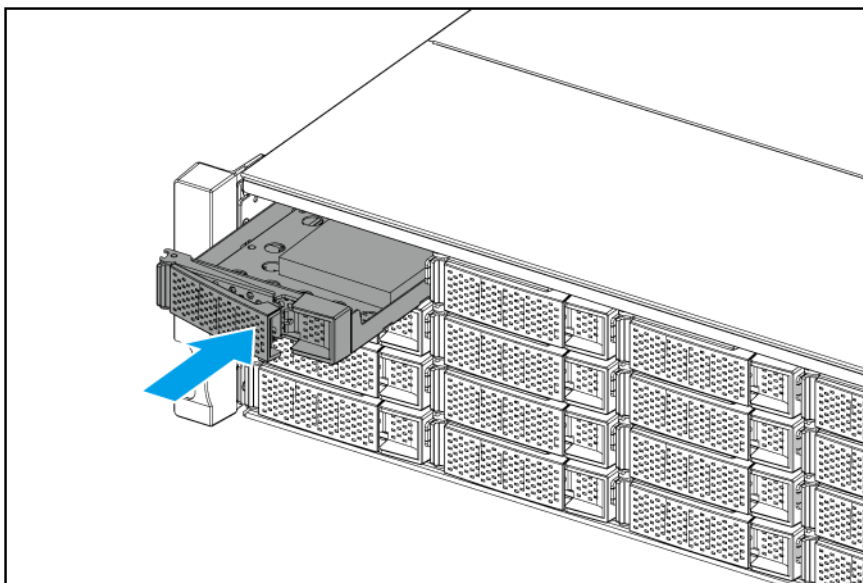
- a.** Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
- b.** Attach the screws.



- 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

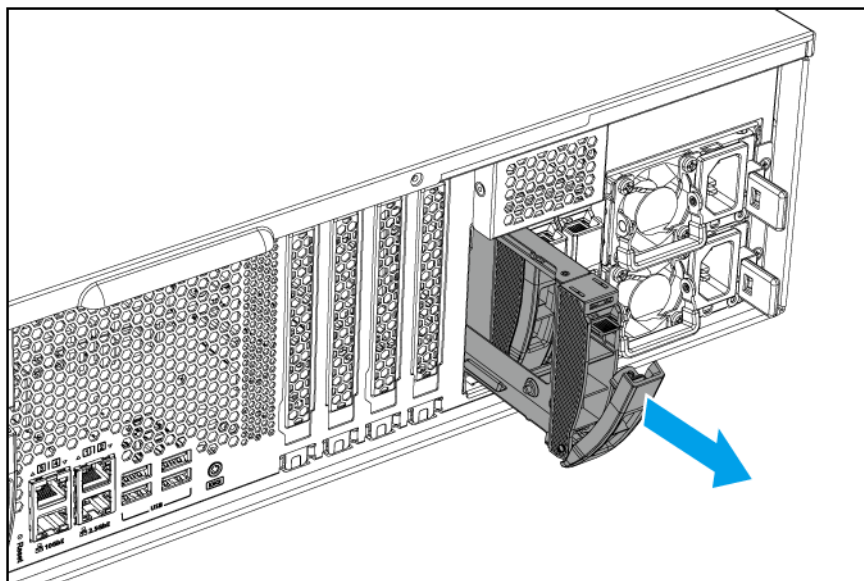
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.

Warning

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

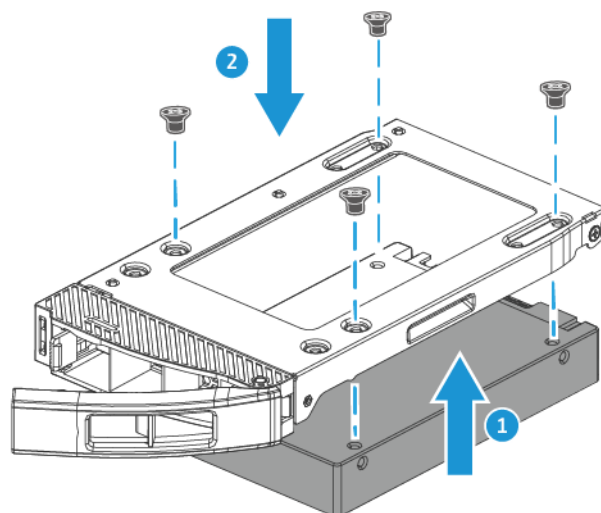
- 1.** Power off the NAS.
- 2.** Remove the drive tray.
 - a.** Pull the handle to release the tray.

- b.** Pull the tray out.



- 3.** Install a drive on the tray.

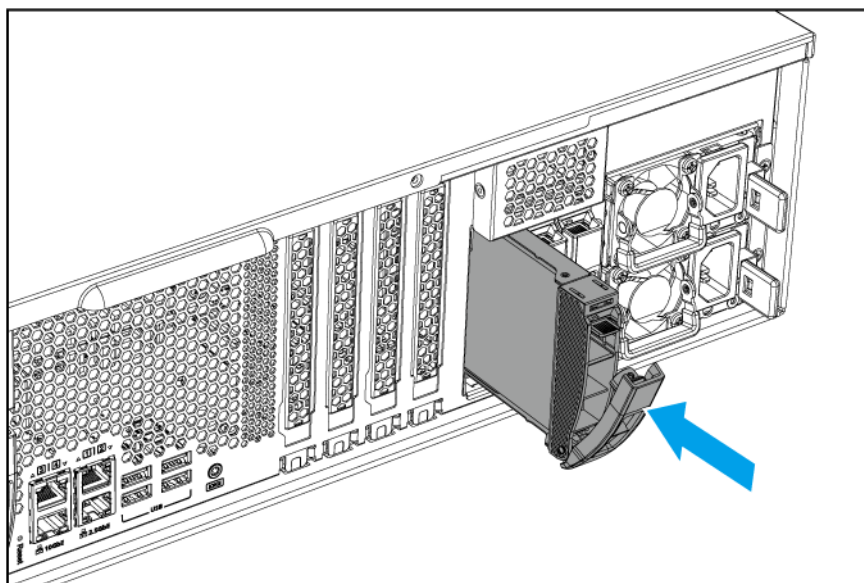
- a.** Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
- b.** Attach the screws.



- 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

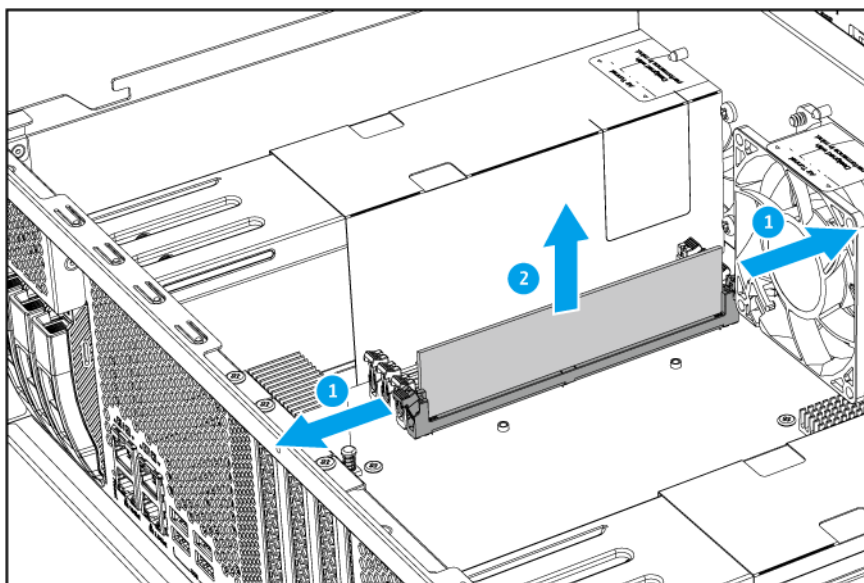
To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.

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

Warning

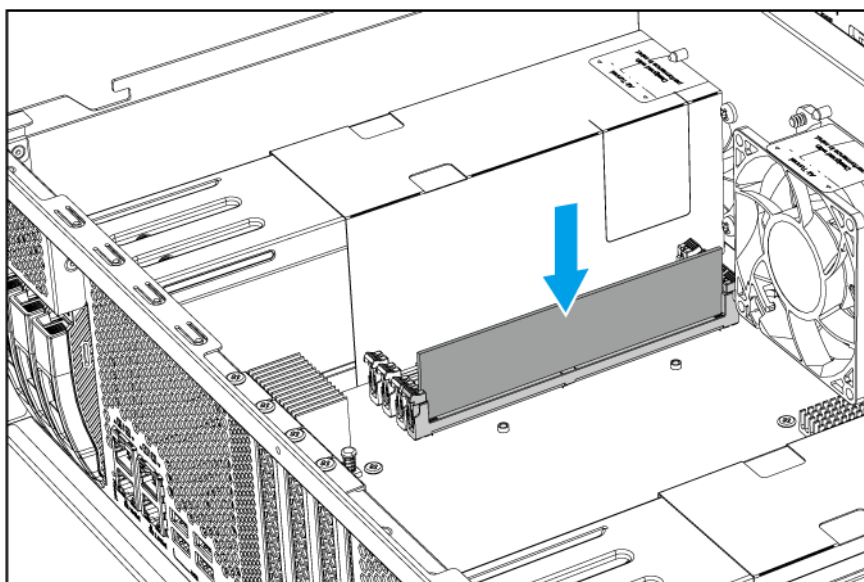
Attempting to remove a module that is not completely released may damage the module and the system board.

- 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.



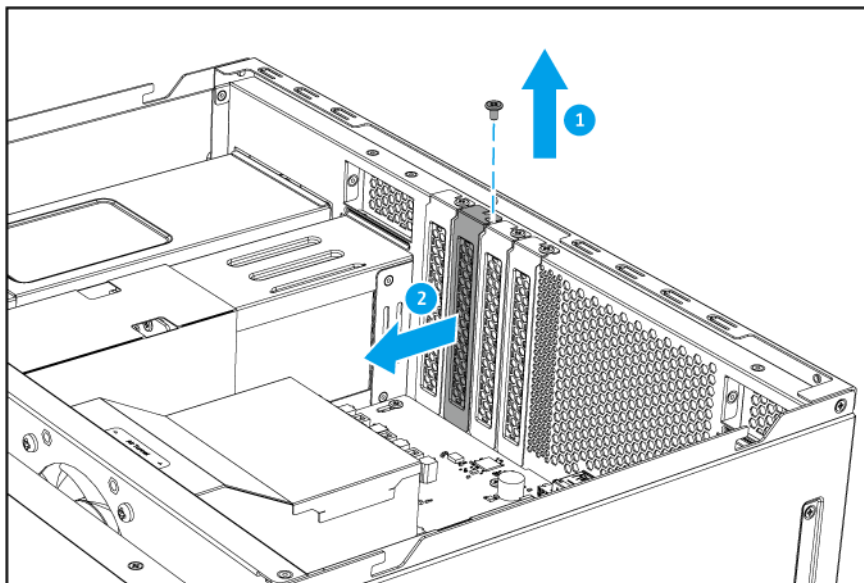
Other moving components: Keep your hands and other body parts away from other moving components.

1. Check the expansion cards and brackets supported by your model on the QNAP website.
 - a. Go to www.qnap.com/compatibility.
 - 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](#).

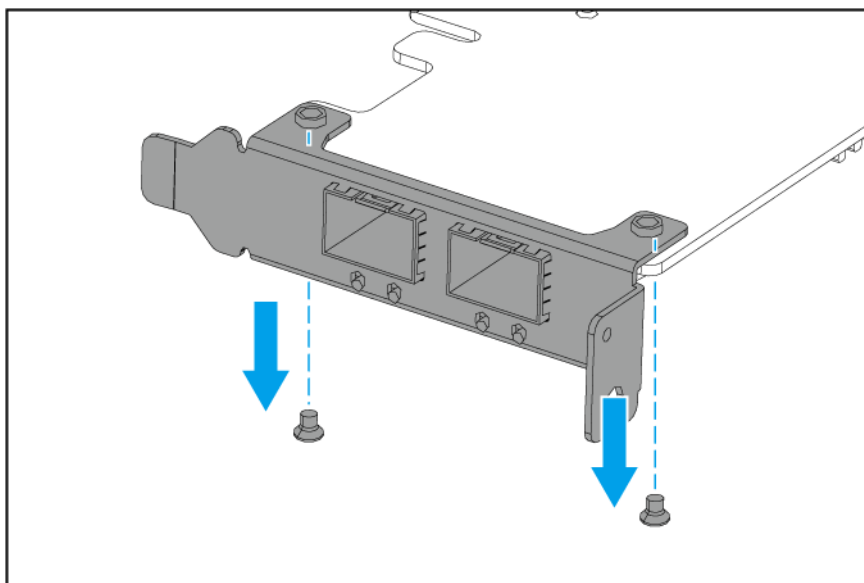
Warning

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.

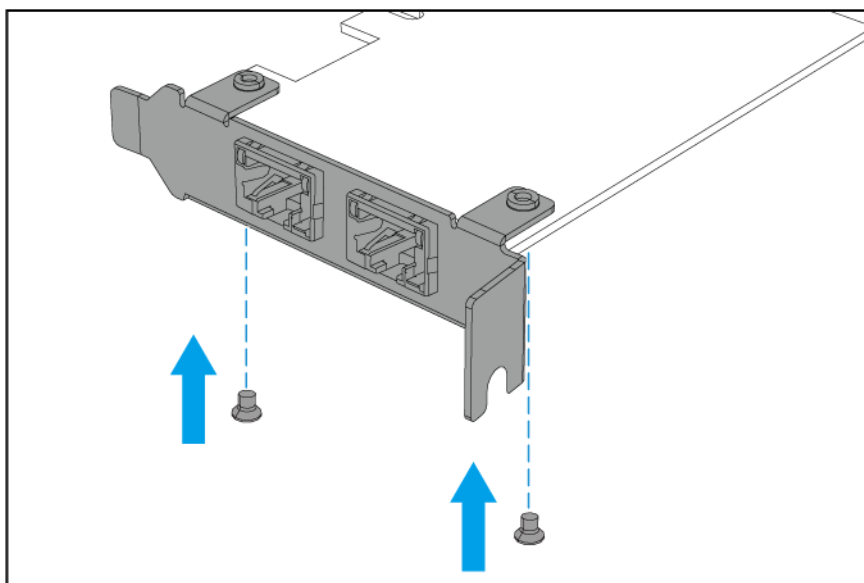


7. Optional: Attach the QNAP bracket to the expansion card.
 - a. Remove all screws of the existing bracket.



- b. Carefully pull the bracket away from the card.

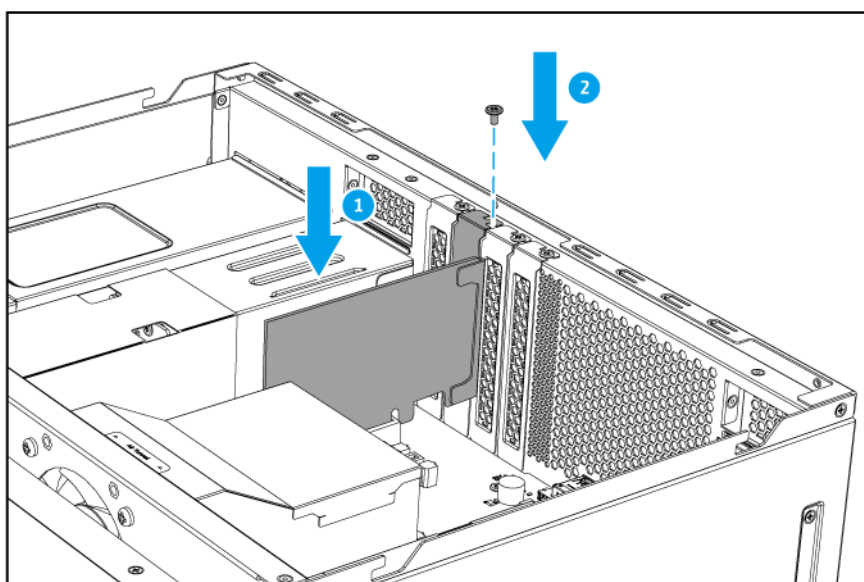
- c. Attach the QNAP bracket to the card using the same screws.



- 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.

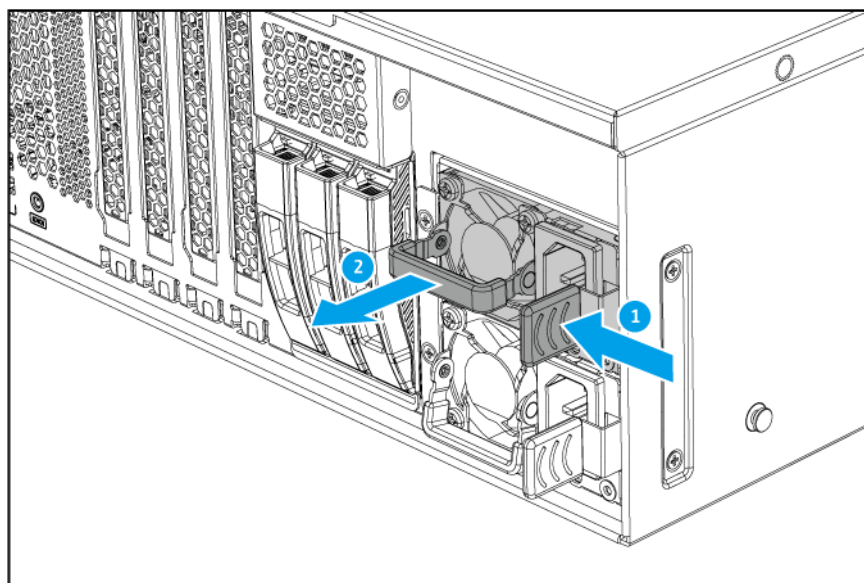
Warning

Electric shock hazard.

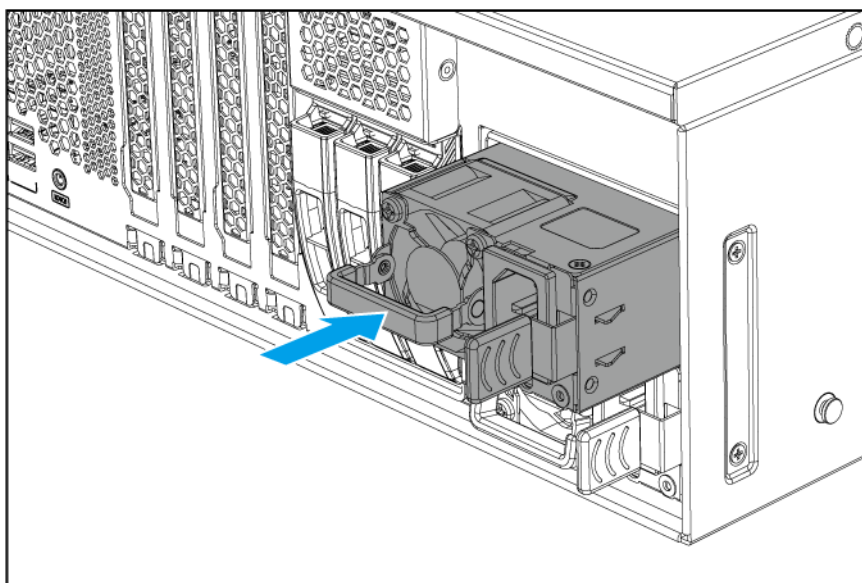
Tip

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.

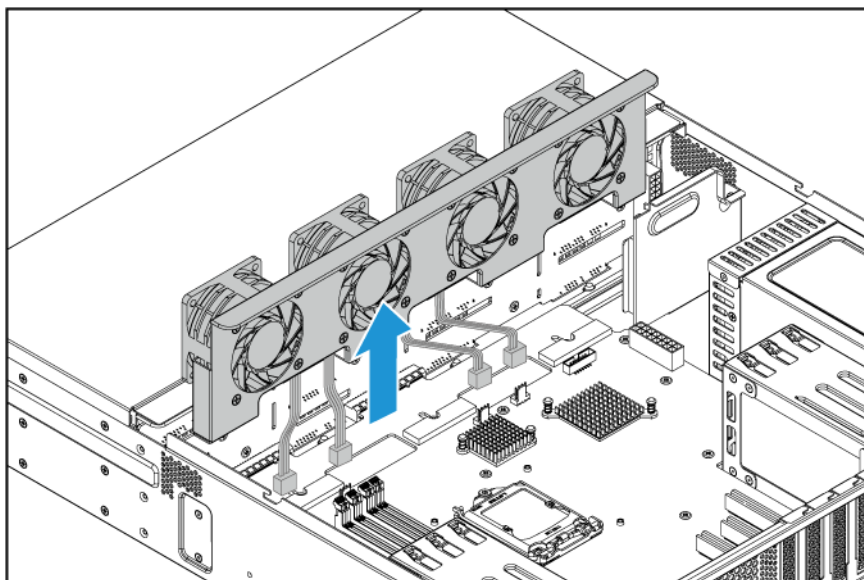
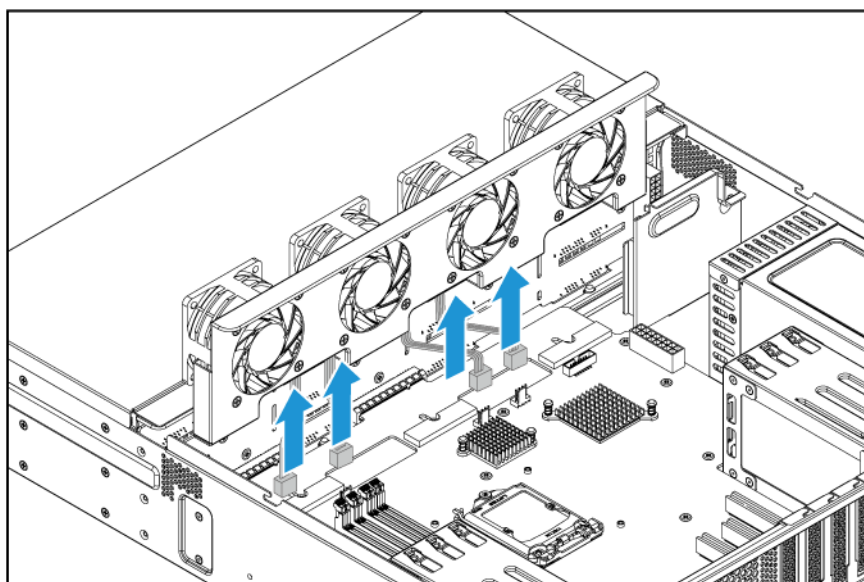


Other moving components: Keep your hands and other body parts away from other moving components.

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](#).

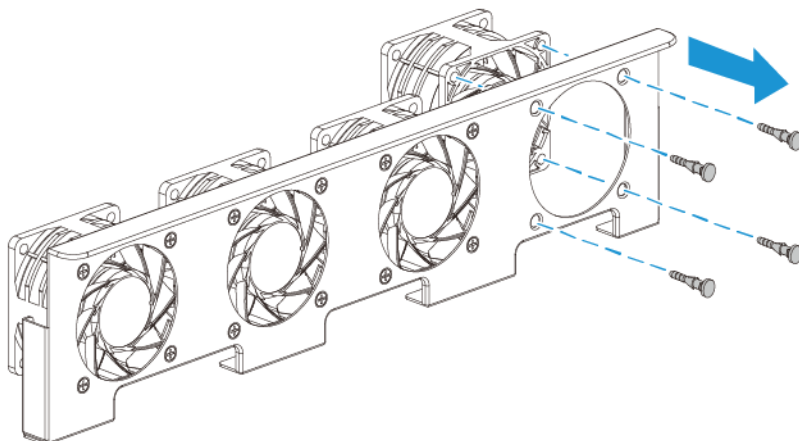
Warning

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.**

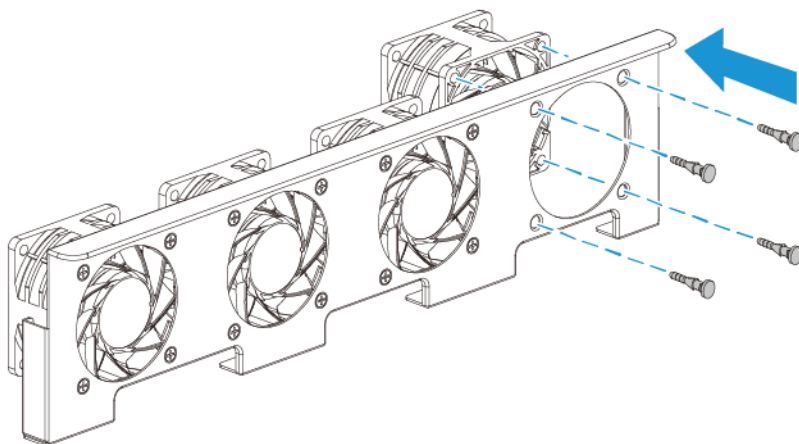
6. Remove the fan.

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

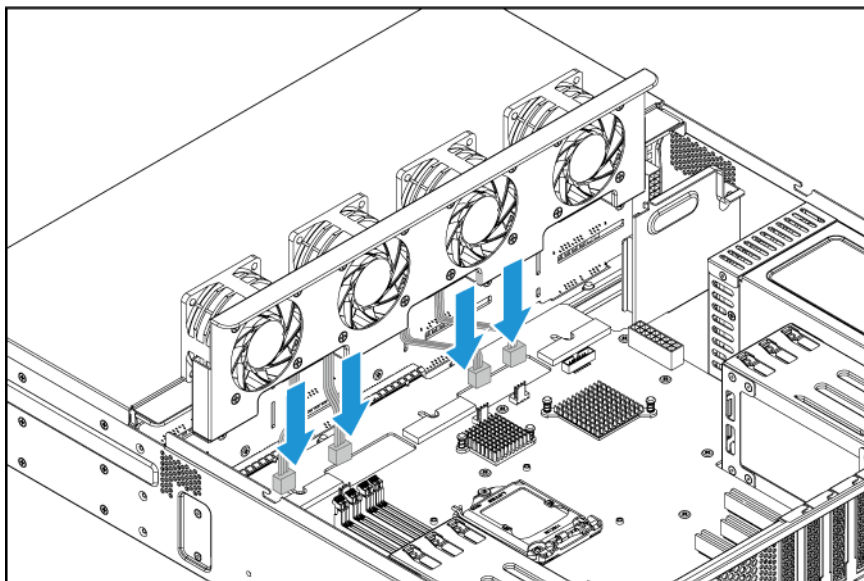


7. Install a new fan.

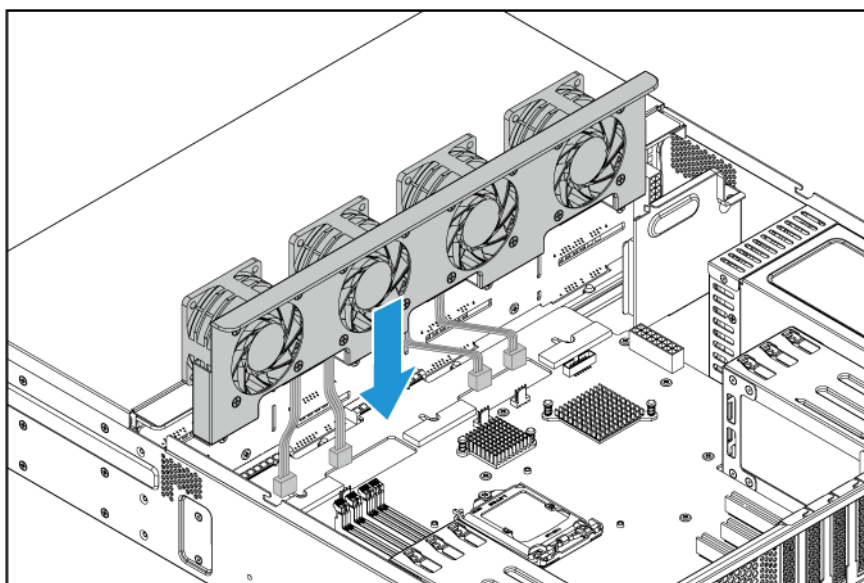
- a. Align the fan to the screw holes on the fan unit.**
- b. Attach the rubber pins that secure the fan to the fan unit.**



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

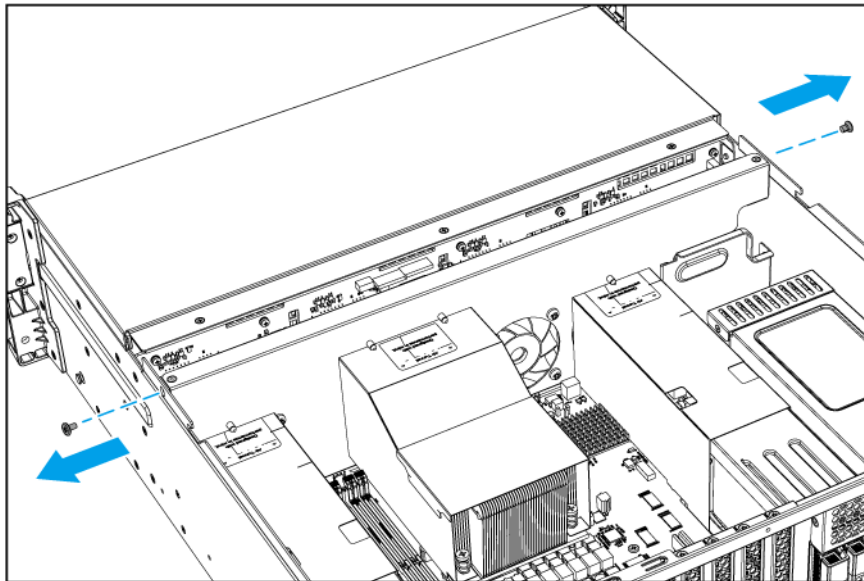
This device has transparent plastic fan ducts pre-installed on some system fans. These fan ducts help maintain ideal operating temperatures for components. QNAP does not recommend operating this device without these fan ducts installed.

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](#).

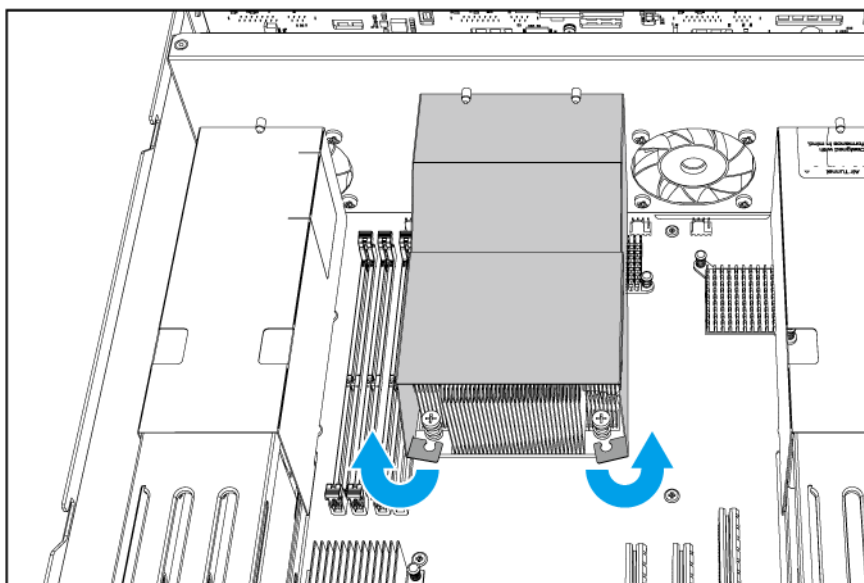
Warning

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.



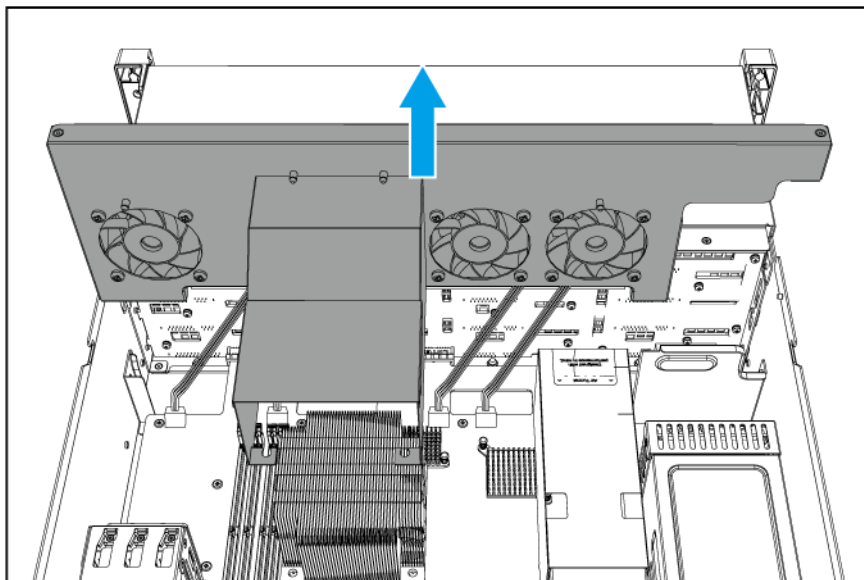
- b. Detach the bottom hooks of the CPU fan duct from the CPU heatsink screws.



- c. Lift the fan unit up.

Note

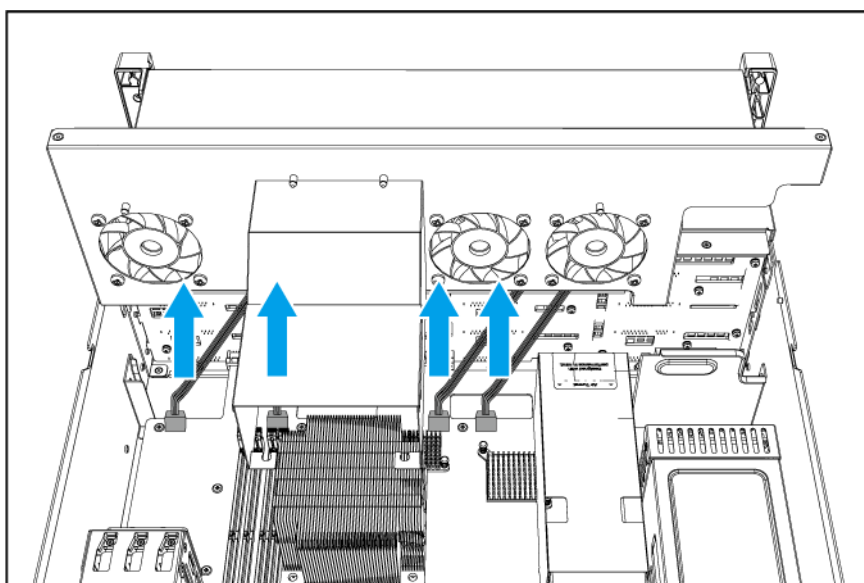
This image does not include the left 2.5-inch drive bay fan duct.



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

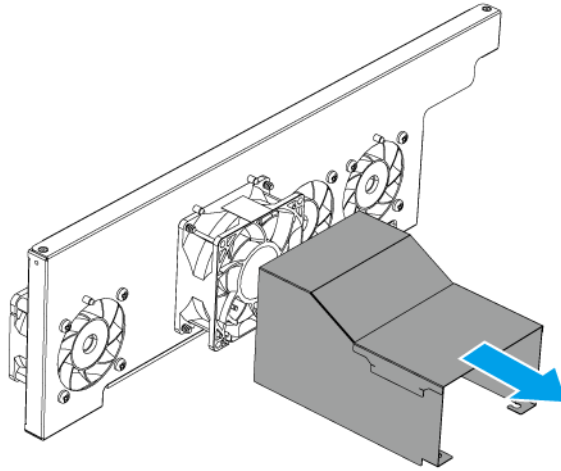
Note

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

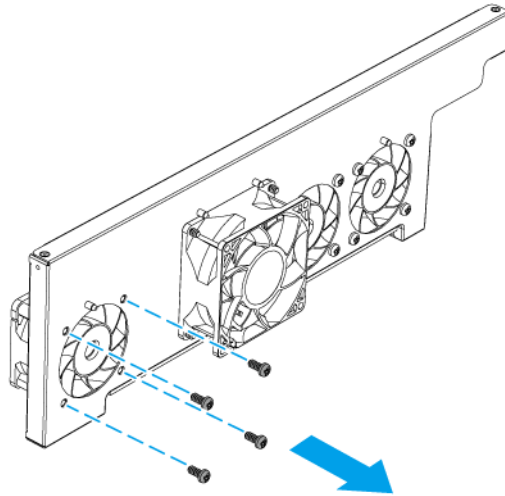


- e. Lift the fan unit out of the chassis.

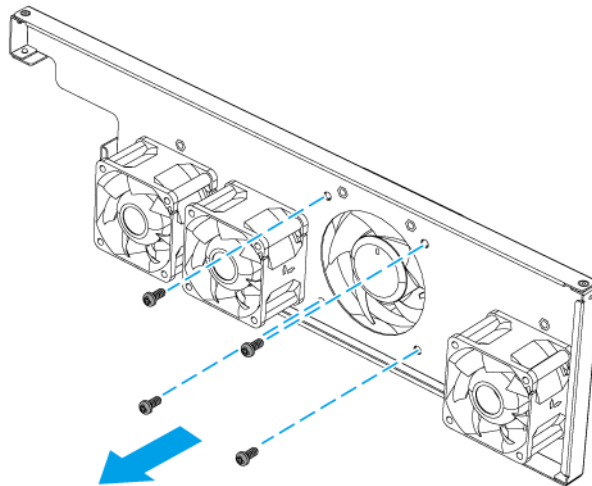
6. Remove the fan.
 - a. Detach the CPU fan duct from the CPU fan.



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



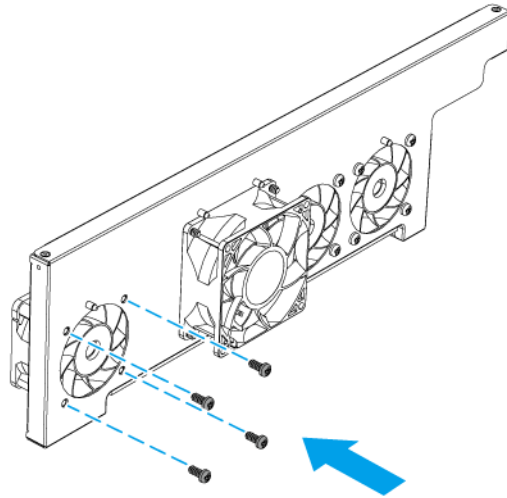
System Fan



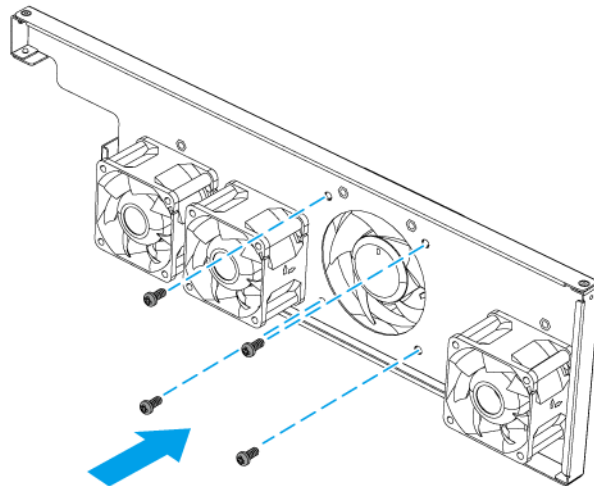
CPU Fan

- 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.

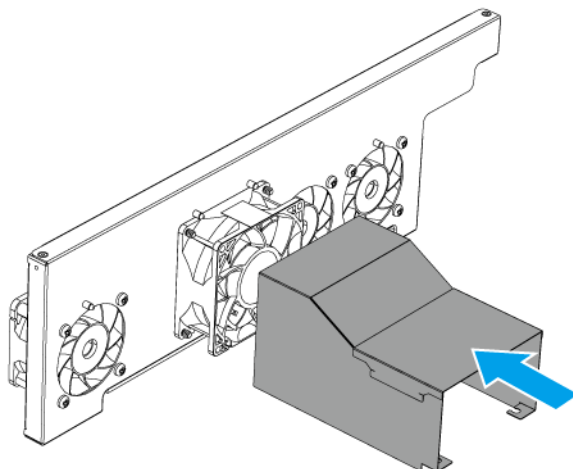


System Fan



CPU Fan

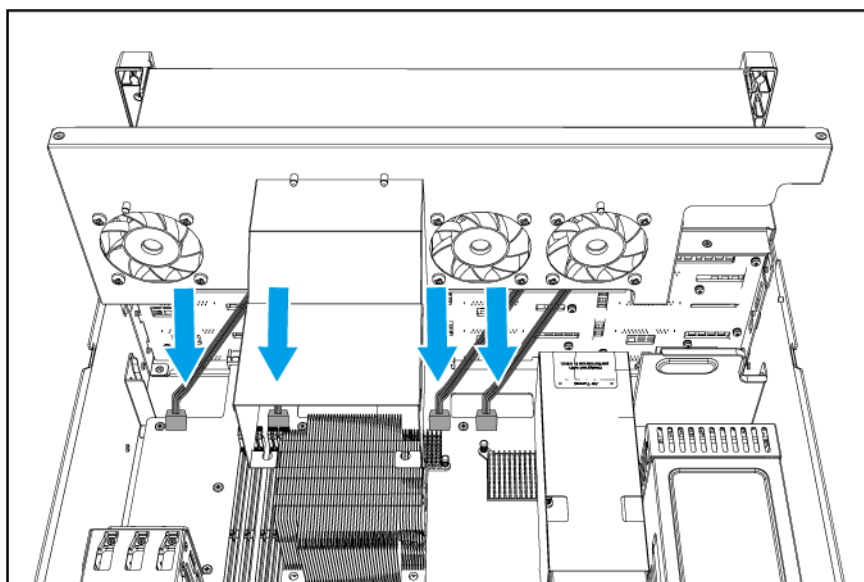
- c. Optional: Attach the CPU fan duct to the CPU fan.



8. Install the fan unit.
 - a. Connect the power connectors of all fans to the system board.

Note

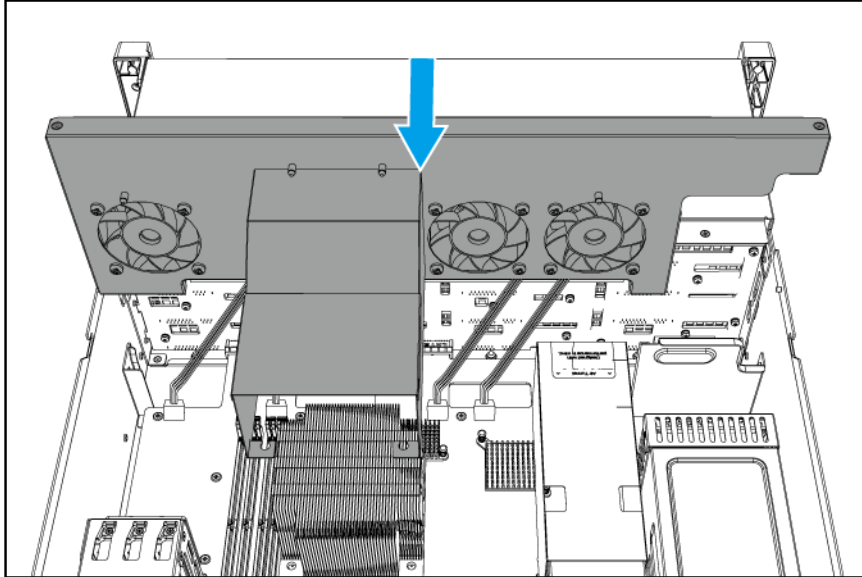
This image does not include the left 2.5-inch drive bay fan duct.



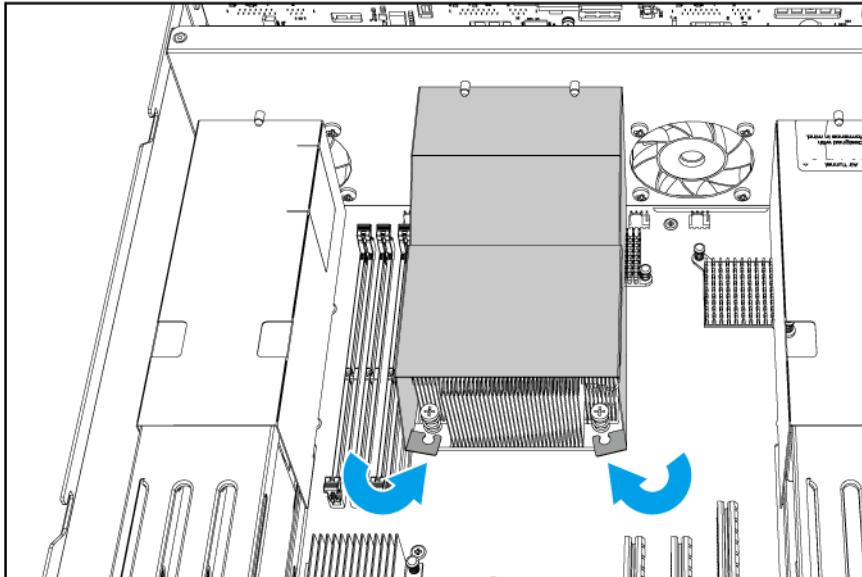
- b. Insert the fan unit.

Note

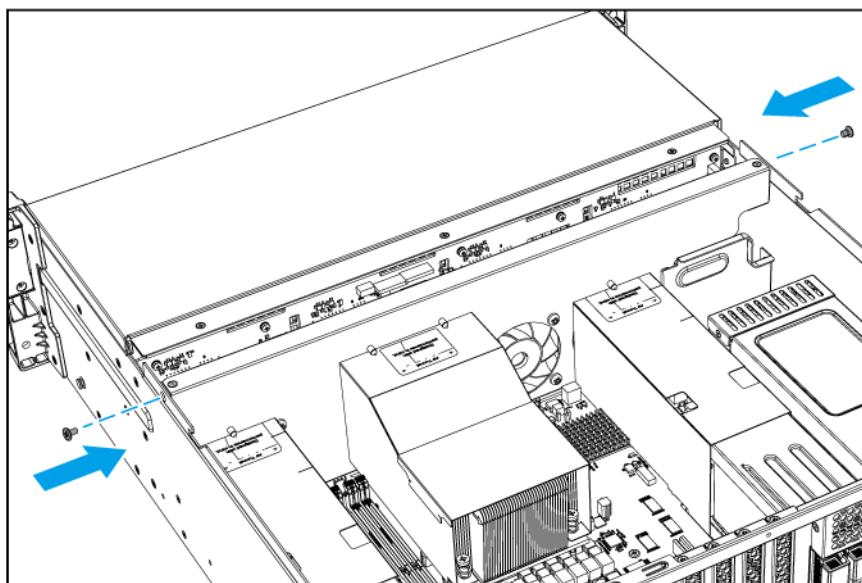
This image does not include the left 2.5-inch drive bay fan duct.



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



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



- Attach the case cover.
For details, see [Attaching the Case Cover](#).
- Connect all cables and external attachments.
- Connect the power cords to the electrical outlet.
- 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"> • 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"> • QXP-820S-B3408 • QXP-1620S-B3616W • mini-SAS SFF-8644 cable • RAIL-B02 |
| TL-R1220Sep-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"> • QXP-820S-B3408 • QXP-1620S-B3616W • mini-SAS SFF-8644 cable • RAIL-B02 |
| TR-002 | <ul style="list-style-type: none"> • Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA HDD/SSD | <ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable |
| TR-004 | <ul style="list-style-type: none"> • Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA HDD/SSD | <ul style="list-style-type: none"> • USB 3.2 Gen 1 Type-A to Type-C cable |
| TR-004U | <ul style="list-style-type: none"> • Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA HDD/SSD | <ul style="list-style-type: none"> • USB 3.2 Gen 1 Type-A 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 HDD/SSD | <ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable |
| TL-R1200C-RP | <ul style="list-style-type: none"> • Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA HDD/SSD | <ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • RAIL-B02 |

| Expansion Unit Model | Description | Required Accessories |
|----------------------|--|--|
| 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"> • Uses a SATA 6 Gbps (SFF-8088) interface • Supports SATA HDD/SSD | <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"> • Uses a SATA 6 Gbps (SFF-8088) interface • Supports SATA HDD/SSD | <ul style="list-style-type: none"> • 4 x SFF-8088 to SFF-8644 connector cables • QXP-1600eS-A1164 host bus adapter |
| TL-R1200S-RP | <ul style="list-style-type: none"> • Uses a SATA 6 Gbps (SFF-8088) interface • Supports SATA HDD/SSD | <ul style="list-style-type: none"> • 3 x SFF-8088 to SFF-8644 connector cables • QXP-1600eS-A1164 host bus adapter • RAIL-B02 |
| TL-R400S | <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 • RAIL-B02 |

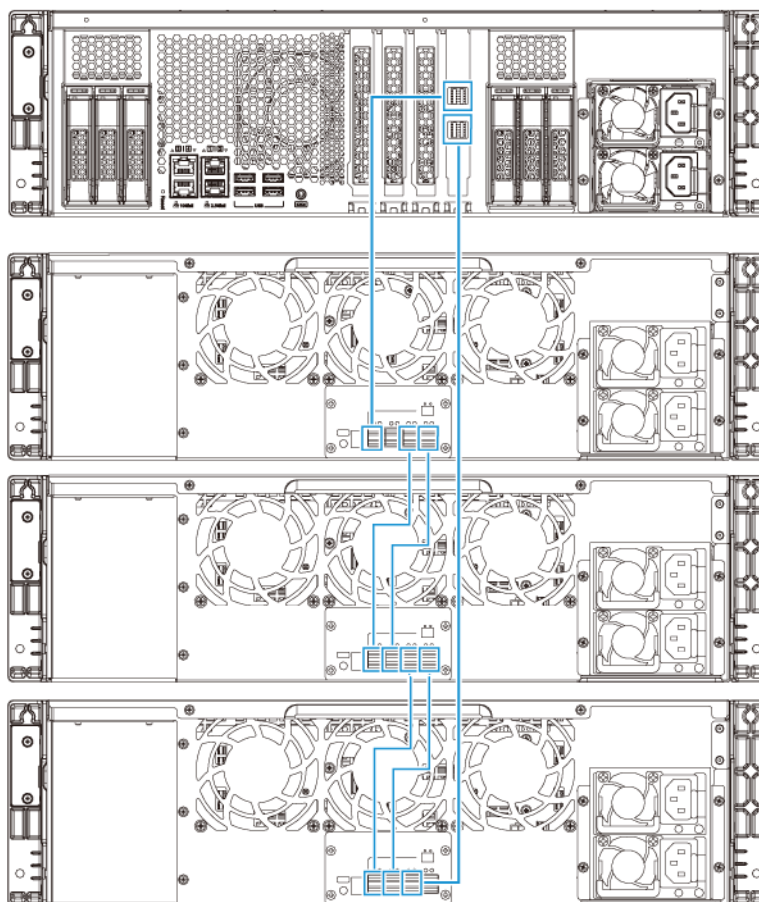
Connecting SAS Expansion Units

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 [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](#).

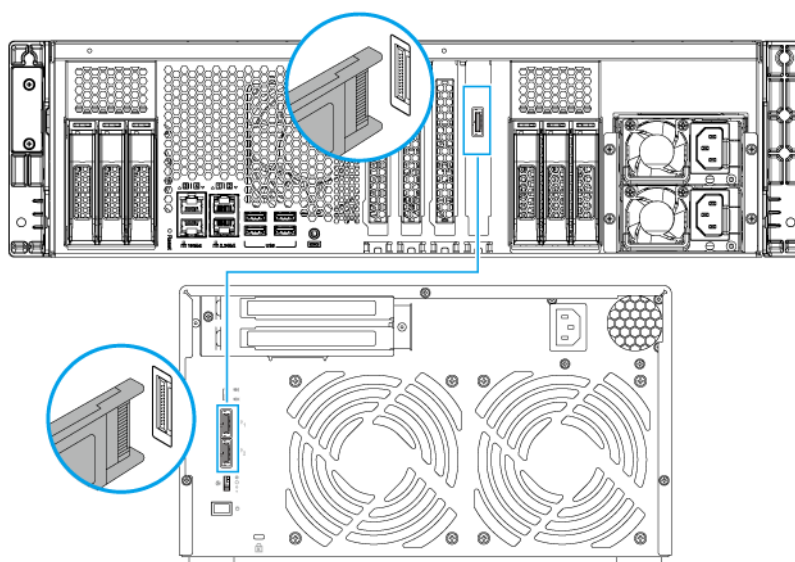
1. Power off the NAS.

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.

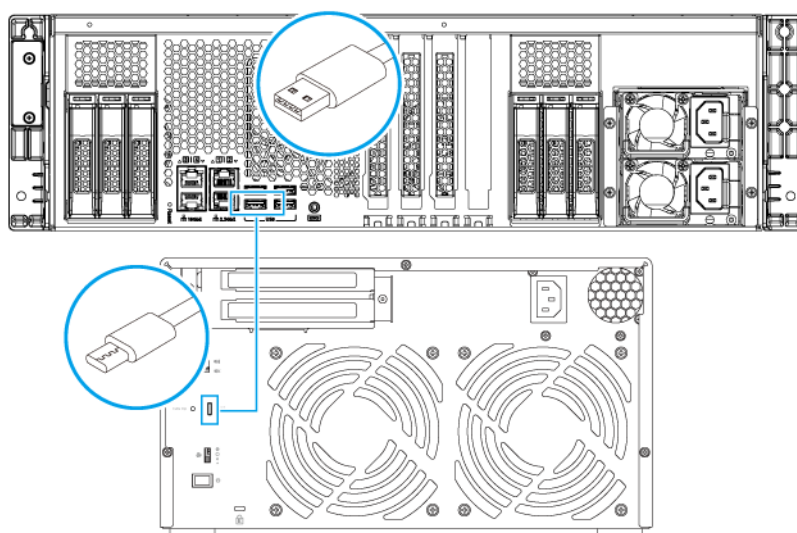


4. Power on the SATA JBOD expansion unit.
5. Power on the NAS.
6. Verify that the expansion unit is recognized by the NAS.
 - a. Log on to QuTS hero as administrator.
 - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
 - c. Verify that the expansion unit is listed.

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"> • Locate the NAS using Qfinder Pro. • Complete the steps in the Smart Installation Guide wizard. <p>For details, see Initializing QuTS hero Using Qfinder Pro.</p> | <ul style="list-style-type: none"> • Computer • Network cable • Qfinder Pro installer |
| 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. • Log into your myQNAPcloud account. • Use myQNAPcloud Link to remotely access your NAS. • Complete the steps in the Smart Installation Guide wizard. <p>For details, see Initializing QuTS hero Using the Cloud Installation Website.</p> | <ul style="list-style-type: none"> • Computer or mobile device • Network cable • myQNAPcloud account • Cloud Key |

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 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 | a. Click Skip . Skips firmware installation. |

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 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.
- **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.

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. <div style="background-color: #fff9c4; padding: 10px; border-radius: 5px;"> <p>Important Use this method only when the device is unresponsive.</p> </div> |

Reset Button

Important

To protect your device from brute force attacks, QNAP recommends disabling the default `admin` account after a system reset. To disable the default `admin` account, you must first create a new administrator account, log out of the `admin` account, and then log in with the new account.

| 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"> • The <code>admin</code> account is automatically enabled. • System administrator password: For details on the default password, see this FAQ. • 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) • VLAN: Disabled |
| 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"> • 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 [Components](#).

System Status LED

| Status | Description |
|---|---|
| Flashes green and red alternately every 0.5 seconds | <ul style="list-style-type: none"> • A 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. <div style="background-color: #fff9c4; padding: 10px; margin-top: 10px;"> <p>Important</p> <p>When updating the firmware, do not remove the power cord or USB cable, and do not force-exit the application.</p> </div> |
| Red | <ul style="list-style-type: none"> • A drive is invalid. • A shared folder has reached its full capacity. • A shared folder is about to reach its full capacity. • A 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). |
| Green | The device is ready. |
| Flashes green every 0.5 seconds | <ul style="list-style-type: none"> • The device is not configured. • A drive is not formatted. |
| Off | <ul style="list-style-type: none"> • All drives are in standby mode. • The device is powered off. |

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. |

| Status | Description |
|--------|---|
| 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"> The network connection is operating at 10 Mbps. There is no network connection. |

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. |

| Status | Description |
|--------|---------------------------------|
| Off | There is no network connection. |

Expansion LED

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

Audio Alerts

| 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. |
| | 3 | <ul style="list-style-type: none"> • The NAS data cannot be copied to the external storage device connected to the USB One Touch Copy port. • The operating system was updated. |
| Long beep (1.5 seconds) | 3 (every 5 minutes) | <ul style="list-style-type: none"> • A power error occurred. • A system fan is not functioning. • A fan module has been removed. |

| Duration | Frequency | Description |
|-------------------------|--------------------------|--|
| Long beep (1.5 seconds) | 2 | <ul style="list-style-type: none"> • A storage pool is about to reach full capacity. • A storage pool has reached full capacity. • A storage pool status error occurred. • A shared folder is about to reach its full capacity. • A shared folder has reached its full capacity. • A shared folder status error occurred. • A drive is plugged in or out. |
| | 1 | <ul style="list-style-type: none"> • The NAS is powering off. • 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. 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. |

| Data and Settings | After NAS Migration |
|--------------------------|---|
| Encrypted shared folders | <p>If the NAS does not support file system encryption, encrypted shared folders are not migrated.</p> <p>Warning 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>Warning To prevent data loss, back up and save encryption keys or passwords of encrypted shared folders in a safe place before migration.</p> <p>Important Folder permissions on the destination NAS must be reconfigured after migration.</p> |
| Network | <p>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.</p> |
| Windows AD configuration | <p>Windows AD configurations must be reconfigured.</p> |
| Licenses | <p>Licenses are not migrated.</p> <p>Warning To prevent losing all your software licenses, QNAP recommends deactivating licenses on the source NAS before data migration.</p> |
| Applications | <p>If the destination NAS has less RAM than the source NAS, the following features and applications might not function: Virtualization Station, Qsirch, and Snapshots.</p> |
| Services | <p>Only services supported by the destination NAS are available.</p> |
| Multimedia features | <p>Some multimedia features are disabled by default.</p> |

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.

6. 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 | ≥ 4 (Must be an even number) | One or two member drives in two different pairs fail. |
| RAID 50 | ≥ 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 > 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 | ≥ 2 | N/A |
| RAID 1 | Yes | 2 | 1 |
| RAID 5 | Yes | ≥ 3 | 1 |
| RAID 6 | Yes | ≥ 4 | 2 |
| RAID 10 | Yes | ≥ 4 (Must be an even number) | One disk per subgroup fails. |
| RAID 50 | Yes | ≥ 6 | One disk per subgroup fails. |
| RAID 60 | Yes | ≥ 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 | ≥ 5 | 3 |

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/go/nas-migration |
| Expansion Unit Compatibility | https://www.qnap.com/go/compatibility-expansion |
| Service Portal | https://service.qnap.com |
| Product Support Status | https://www.qnap.com/go/product/eol.php |
| Downloads | https://download.qnap.com |
| Community Forum | https://forum.qnap.com |
| QNAP Accessories Store | https://shop.qnap.com |

7. 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

8. Notices

This chapter provides information about warranty, disclaimers, licensing, and federal regulations.

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Version 3, 29 June 2007

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