



# TVS-AIh1688ATX

TVS-AIh1688ATX

## 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.



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 your QNAP device.

### About the TVS-AIh1688ATX

The TVS-AIh1688ATX runs on the ZFS-based QuTS hero operating system and is powered by an Intel® Core™ Ultra series processor. The TVS-AIh1688ATX features a Gen 4x16 PCIe slot and two Gen 4x4 PCIe slots, allowing you to extend device functionality with PCIe expansion cards. The NAS is also equipped with an HDMI 2.1 port to enhance multimedia functionality. With dual 10 Gigabit Ethernet and 2.5 Gigabit Ethernet ports, the NAS supports port trunking and can efficiently perform failover to meet bandwidth-demanding business applications..

### 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.
- 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
TVS-AIh1688ATX-U7-32G	Intel® Core™ Ultra 7	32 GB
TVS-AIh1688ATX-U9-48G	Intel® Core™ Ultra 9	48 GB

Component	TVS-AIh1688ATX-U7-32G	TVS-AIh1688ATX-U9-48G
Processor		
CPU	Intel® Core™ Ultra 7	Intel® Core™ Ultra 9
Frequency	20-core/20-thread up to 5.3 GHz	24-core/24-thread up to 5.6 GHz



Component	TVS-AIh1688ATX-U7-32G	TVS-AIh1688ATX-U9-48G
Architecture	x86 64-bit	
Encryption engine	AES-NI	
Memory		
Pre-installed memory	32 GB RAM: 2 x 16 GB DDR5 UDIMM	48 GB RAM: 1 x 48 GB DDR5 UDIMM
Memory slots	4 x DDR5 UDIMM <div><b>Note</b> 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.</div> <div><b>Note</b> For dual-DIMM configurations, use identical DDR5 modules.</div>	
Maximum memory	192 GB RAM: 4 x 48 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 6 Gbps bays</li></ul> <div><b>Note</b> The SATA 6 Gbps bays are backward compatible with SATA 3 Gbps drives.</div> <ul style="list-style-type: none"><li>4 x 2.5-inch U.2 PCIe Gen 4 NVMe bays</li></ul> <p>The U.2 PCIe Gen 4 NVMe bays are backward compatible with U.2 PCIe Gen 3 drives.</p>	



Component	TVS-AIh1688ATX-U7-32G	TVS-AIh1688ATX-U9-48G
Drive compatibility	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> 2.5-inch bays: <ul style="list-style-type: none"><li>• 2.5-inch U.2 NVMe solid-state drives</li></ul>	
SSD cache acceleration support	This device supports SSD cache acceleration for all drives.	
Hot-swapping	This device supports hot-swapping for all drives.	
Network		
10 Gigabit network interface	2 x 10GBASE-T RJ45 <div><b>Note</b> The 10GBASE-T port RJ45 supports the following network connectivity speeds: 10 GbE, 5 GbE, 2.5 GbE, 1 GbE, 100 Mbps, and 10 Mbps.</div>	
2.5 Gigabit network interface	2 x 2.5 GbE RJ45 <div><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.</div>	
External I/O Ports & Expansion Slots		
PCIe slots	<ul style="list-style-type: none"><li>• 1 x PCIe Gen 4x16</li><li>• 2 x PCIe Gen 4x4</li></ul>	

Component	TVS-AIh1688ATX-U7-32G	TVS-AIh1688ATX-U9-48G
USB ports	<div>Front:</div> <div>1 x USB 3.2 Gen 2 Type-A</div> <div><div>Note</div><div>This USB port supports One Touch Copy.</div></div> <div>Rear:</div> <div><div>• 2 x USB 3.2 Gen 2 Type-C</div><div>• 2 x USB 3.2 Gen 2 Type-A</div><div>• 2 x USB4 Type-C</div></div>	
HDMI ports	1 x HDMI 2.1 (up to 4096 x 2160 resolution at 60 Hz)	
Interface		
Display panel	Monochrome backlit LCD display	
Buttons	<div><div>• Power</div><div>• Reset</div><div>• LCD enter</div><div>• LCD select</div></div>	
LEDs		
System	<div><div>• LCD panel</div><div>• Drive LEDs</div><div>• SSD LEDs</div></div>	
Network ports	<div><div>• Speed</div><div>• Activity</div></div>	
Dimensions		
Form factor	Tower	
Dimensions (H x W x D)	294.3 x 369.89 x 319.8 mm (11.59 x 14.56 x 12.59 in)	
Net weight	13.8 kg (30.42 lbs)	

Component	TVS-AIh1688ATX-U7-32G	TVS-AIh1688ATX-U9-48G
Others		
Power supply unit	550W, 100-240V AC, 50/60 Hz	
System battery	CR2032 lithium battery 3V  <div> <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> </div> <div> <b>Important</b> <p>Dispose of used batteries according to local regulations or the instructions of the battery manufacturer.</p> </div>	
Fans	System: 3 x 80 mm, 12V DC fan CPU: 2 x 97 mm fan	System: 3 x 92 mm, 12V DC fan CPU: 2 x 97 mm fan
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>	
Security slot	Kensington security slot	

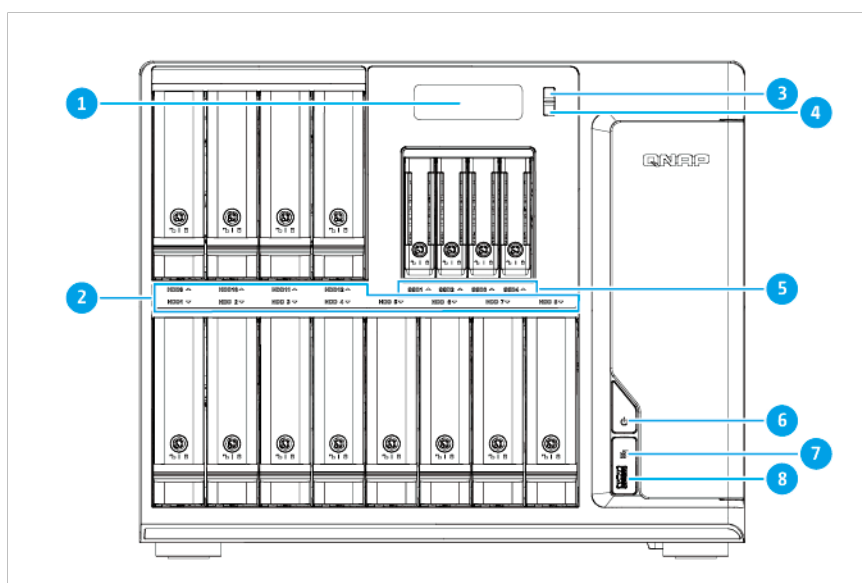
## Package contents

Item	Quantity
TVS-AIh1688ATX	1
Power cord	1
Ethernet cable	1 x Cat 6A

Item	Quantity
Drive tray keys	2
Screws for 3.5-inch drives	3 x 12 = 36
Quick Installation Guide (QIG)	1

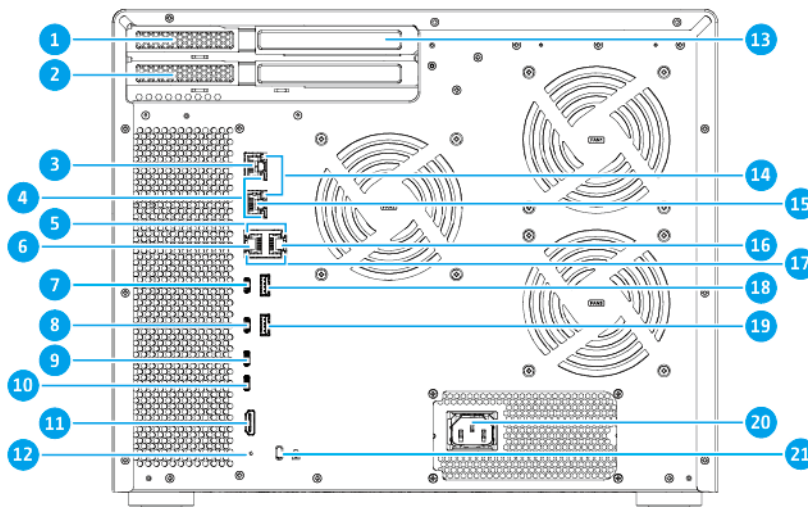
## Components

### Front panel



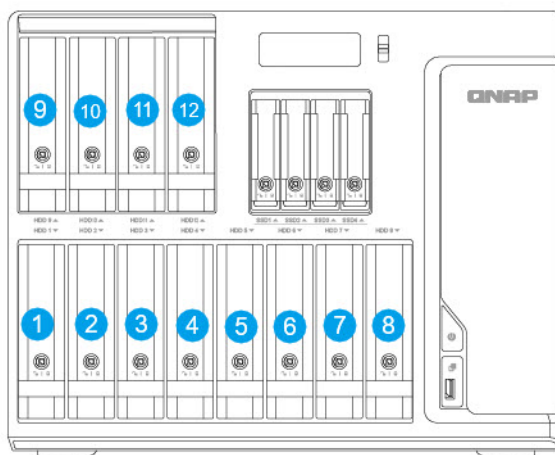
No.	Component	No.	Component
1	LCD panel	5	SSD LEDs
2	Drive LEDs	6	Power button
3	LCD enter button	7	USB One Touch Copy button
4	LCD select button	8	UBS port 1: USB 3.2 Gen 2 Type-A

## Rear panel

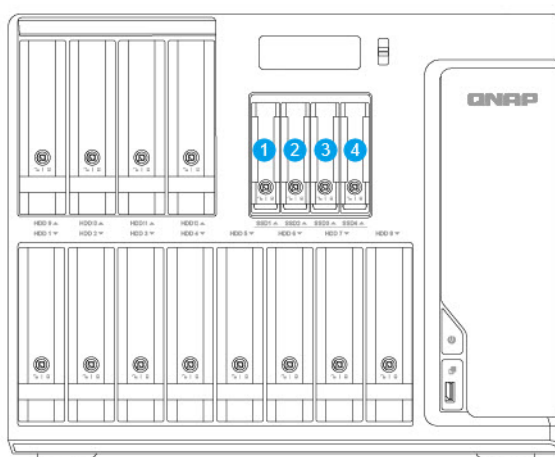


No.	Component	No.	Component
1	PCIe slot 2: PCIe Gen 4x4	12	Reset button
2	PCIe slot 3: PCIe Gen 4x4	13	PCIe slot 1: PCIe Gen 4x16
3	10GBASE-T (RJ45) port 1	14	10 Gigabit Ethernet speed LEDs
4	10 Gigabit Ethernet activity LEDs	15	10GBASE-T (RJ45) port 2
5	2.5 Gigabit Ethernet speed LEDs	16	2.5 GbE (RJ45) port 2
6	2.5 GbE (RJ45) port 1	17	2.5 Gigabit Ethernet activity LEDs
7	USB port 3: USB 3.2 Gen 2 Type-C	18	USB port 2: USB 3.2 Gen 2 Type-A
8	USB port 5: USB 3.2 Gen 2 Type-C	19	USB port 4: USB 3.2 Gen 2 Type-A
9	USB port 6: USB4 Type-C	20	Power input
10	USB port 7: USB4 Type-C	21	Kensington security slot
11	HDMI 2.1 port	-	-

## Drive numbering

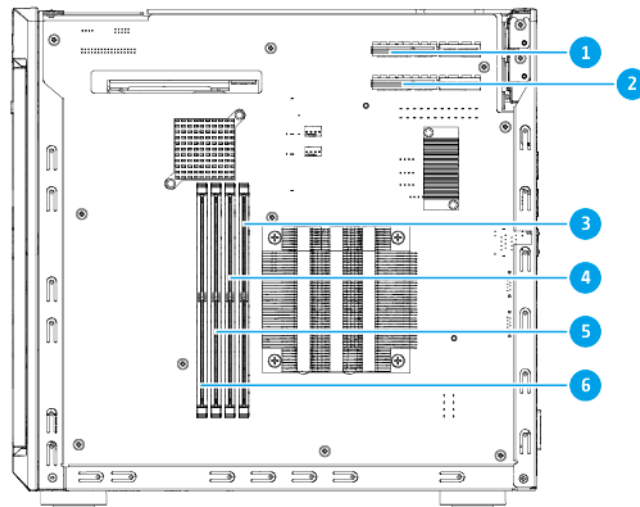


**3.5-inch SATA drive bays**

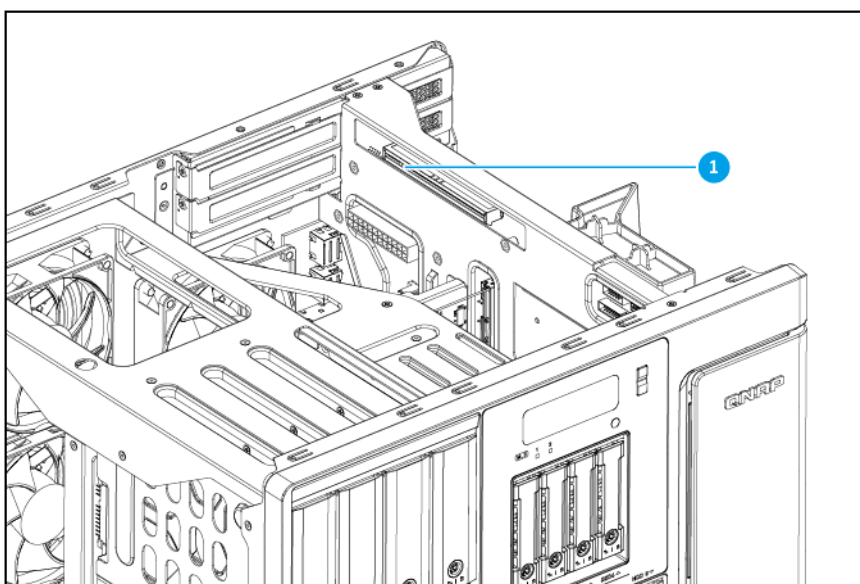


**2.5-inch U.2 PCIe drive bays**

## System board



No.	Component	No.	Component
1	PCIe slot 2: PCIe Gen 4x4	4	Memory slot 2 (Channel B, DIMM 2, blue)
2	PCIe slot 3: PCIe Gen 4x4	5	Memory slot 3 (Channel A, DIMM 1, black)
3	Memory slot 1 (Channel B, DIMM 1, black)	6	Memory slot 4 (Channel A, DIMM 2, blue)





No.	Component	No.	Component
1	PCIe slot 1: PCIe Gen 4x16	-	-

## 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</li> </ul> <div style="background-color: #fff9c4; padding: 10px; margin: 10px 0;"> <p><b>Tip</b></p> <p>For the list of compatible drive models, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>.</p> </div> <ul style="list-style-type: none"> <li>Network cable</li> </ul>
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. 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](#)
3. Optional: Install expansion cards.  
For details, see [Installing expansion cards](#)
  4. Optional: Replace memory modules.  
For details, see [Replacing memory modules](#)
  5. Optional: Connect expansion units.  
For details, see [Connecting expansion units](#)
  6. Connect the power cord and all applicable cables.
  7. Power on the NAS.
  8. Install QuTS hero.  
For details, see [QuTS hero installation](#)
  9. Log on to QuTS hero.

## 3. Installation and Configuration

This chapter provides specific hardware and operating system installation and configuration steps.

### Hardware installation

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

### Drive installation

The TVS-AIh1688ATX 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

#### Warning

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



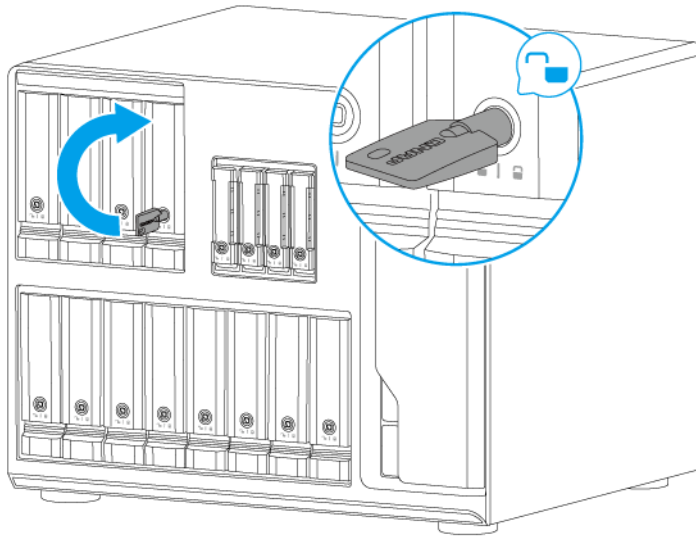
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.



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

1. Power off the NAS.

2. Remove the drive tray.
  - a. Optional: Unlock the tray.

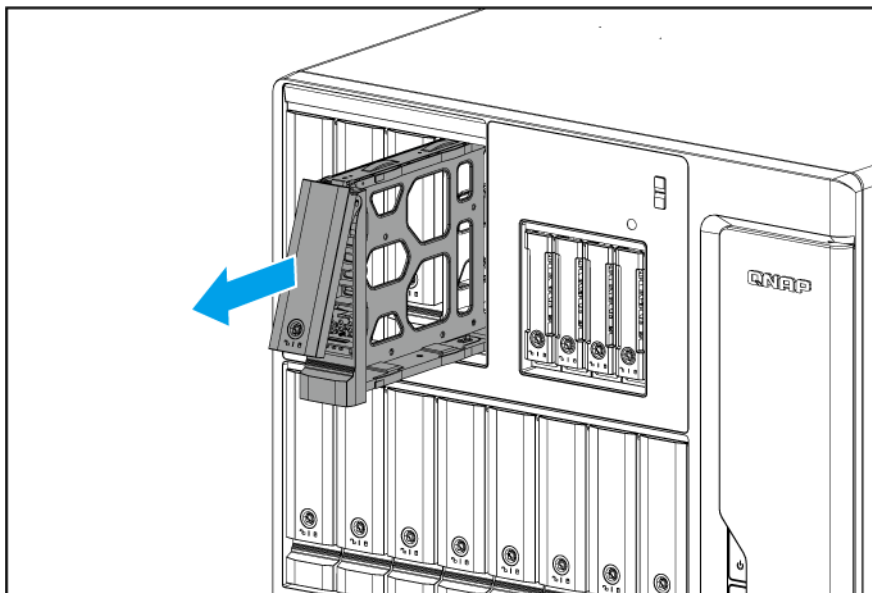
**Note**

The preinstalled drive trays come unlocked.

**Important**

Ensure the drive tray keys are stored in a safe place.

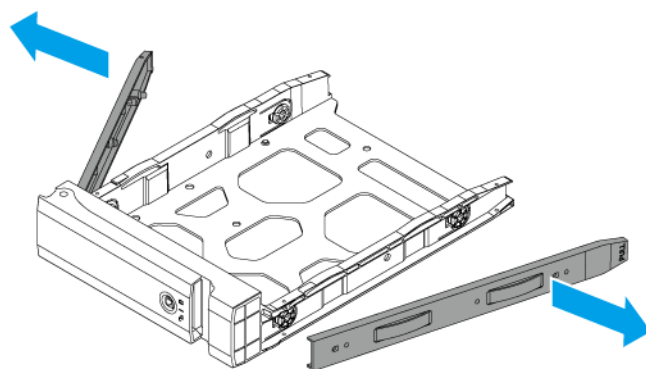
- b. Pull the handle to release the tray.



- c. Pull the tray out.

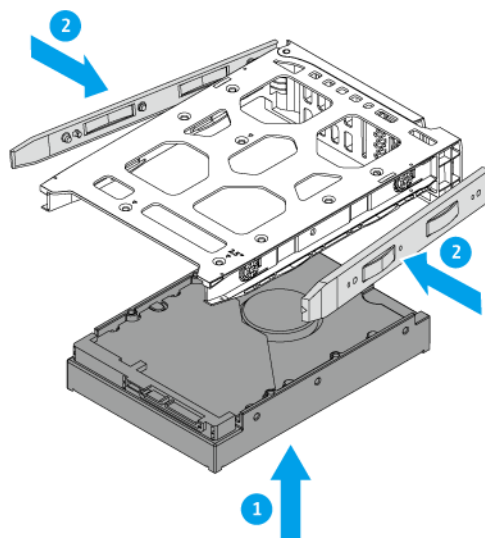
**3. Install a drive on the tray.**

- a.** Remove the fastening panels from the sides of the drive tray.

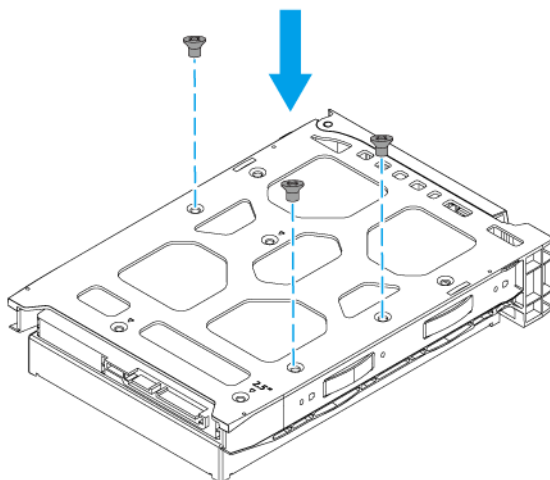


- b.** Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides of the tray.

- c.** Attach the fastening panels to lock the drive to the tray.



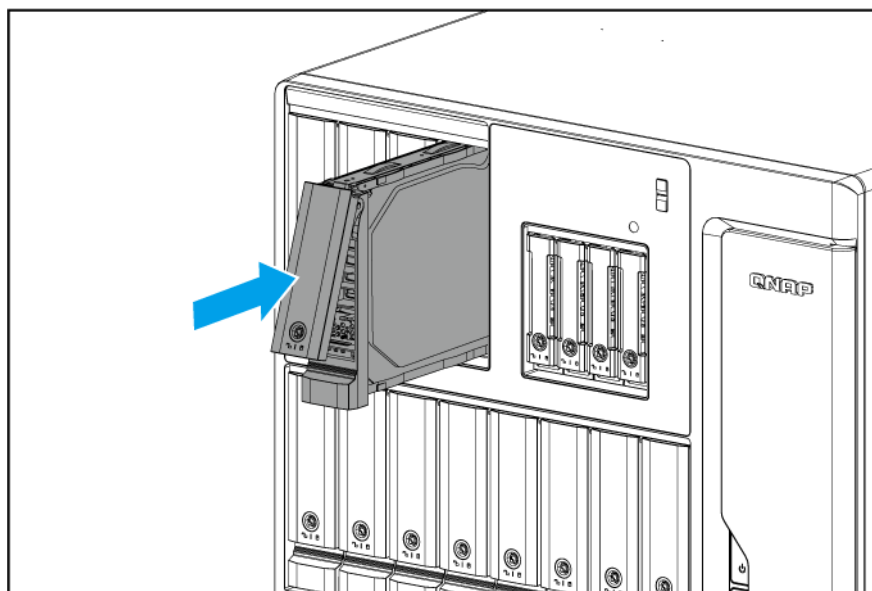
- d. Optional: Attach the screws to lock the drive to the tray.



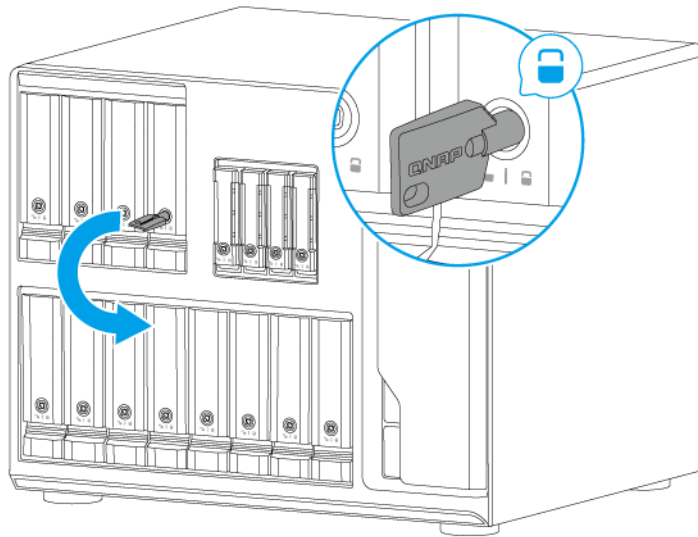
**Note**

To protect drives from damage during transportation of the NAS, QNAP recommends attaching screws to secure the drives.

4. Load the tray into the bay.
- a. Insert the tray into the bay.
  - b. Push the handle.



- c. Lock the tray.



5. Power on the NAS.

## Installing 2.5-inch solid-state drives on 3.5-inch trays

### Warning

- Installing a drive deletes all data on the drive.
- 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.

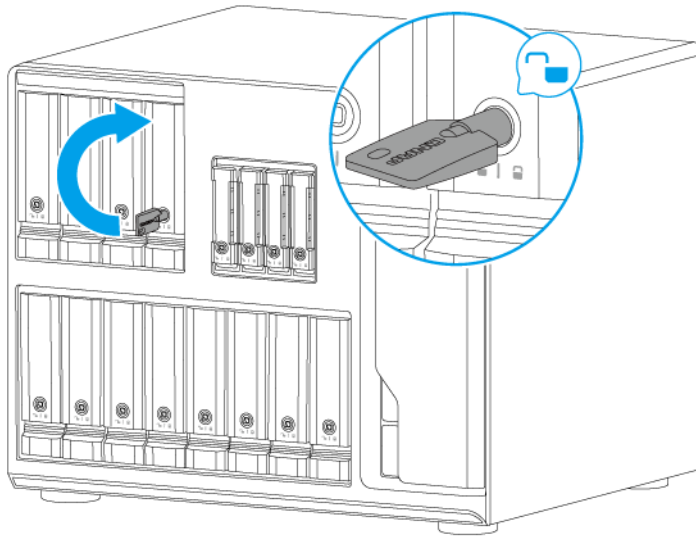


**Other moving components:** Keep your hands and other body parts away from other moving components.

1. Power off the NAS.



2. Remove the drive tray.
  - a. Optional: Unlock the tray.

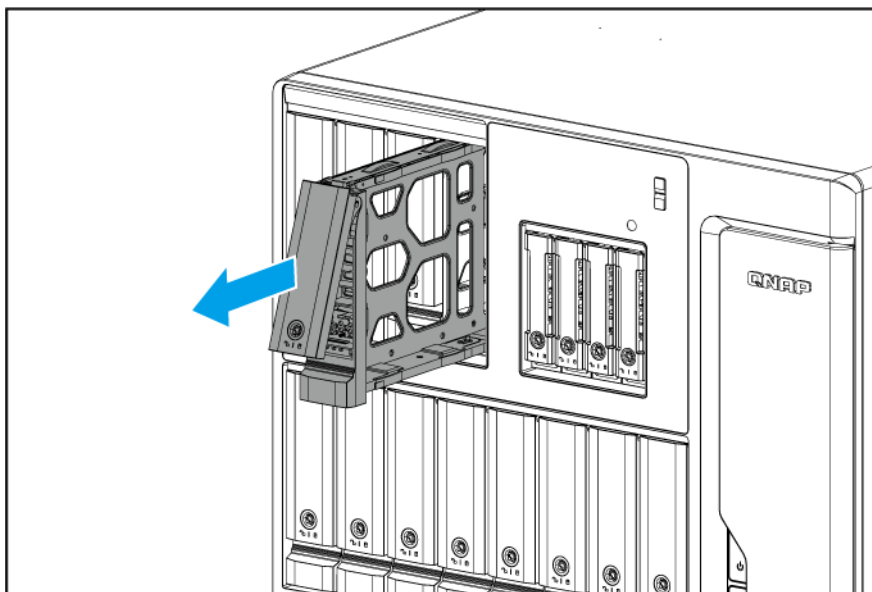
**Note**

The preinstalled drive trays come unlocked.

**Important**

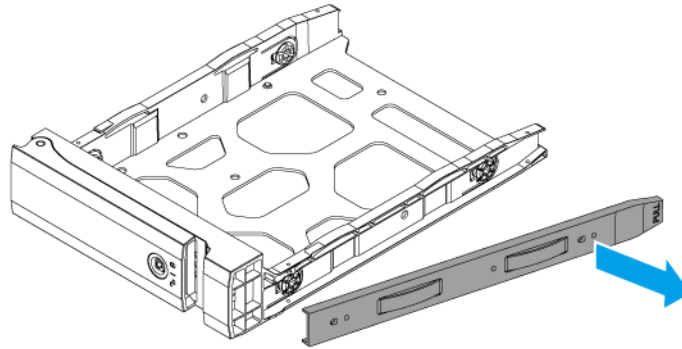
Ensure the drive tray keys are stored in a safe place.

- b. Pull the handle to release the tray.
  - c. Pull the tray out.

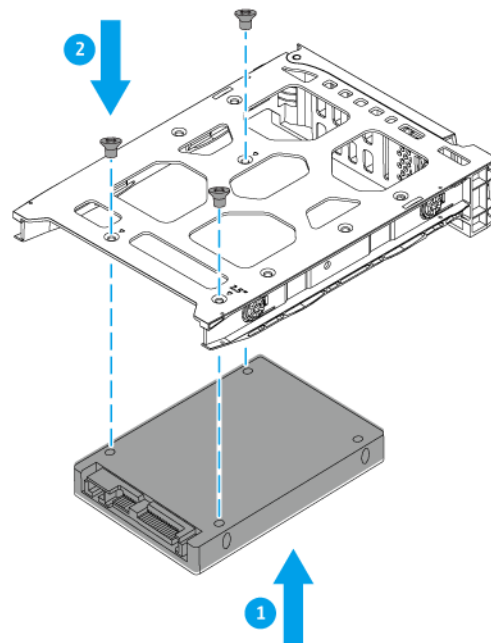


**3. Install a drive on the tray.**

- a.** Remove the right fastening panel from the drive tray.

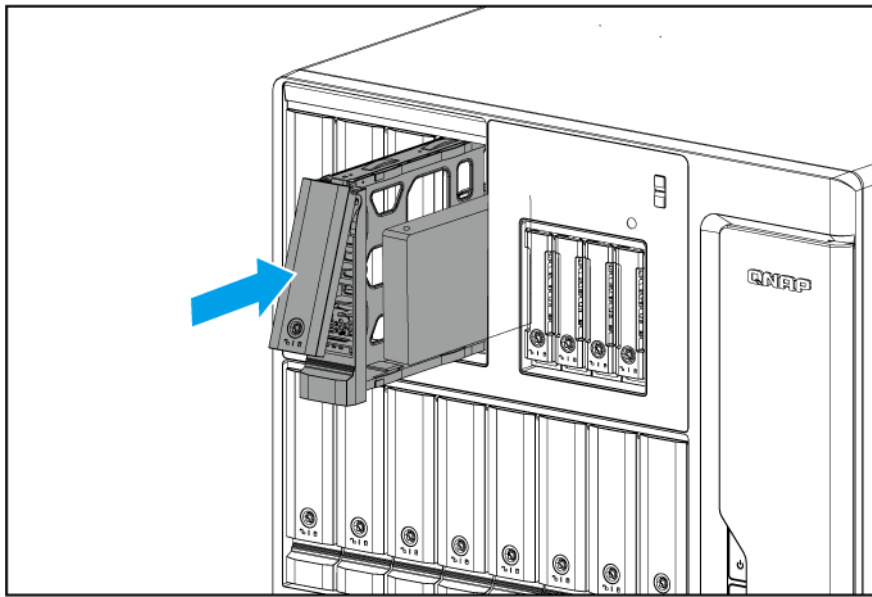


- b.** Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides of the tray.
- c.** Attach the screws.

**4. Load the tray into the bay.**

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

- b. Push the handle.



- c. Lock the tray.

5. Power on the NAS.

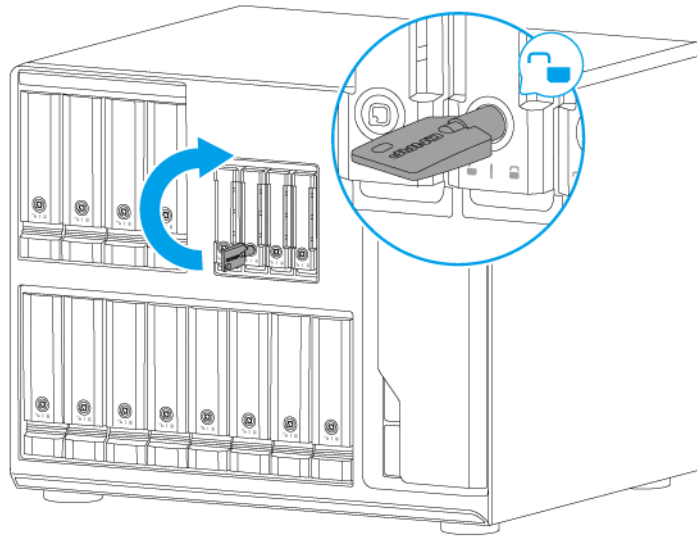
## Installing 2.5-inch solid-state drives on 2.5-inch trays

### 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. Optional: Unlock the tray.

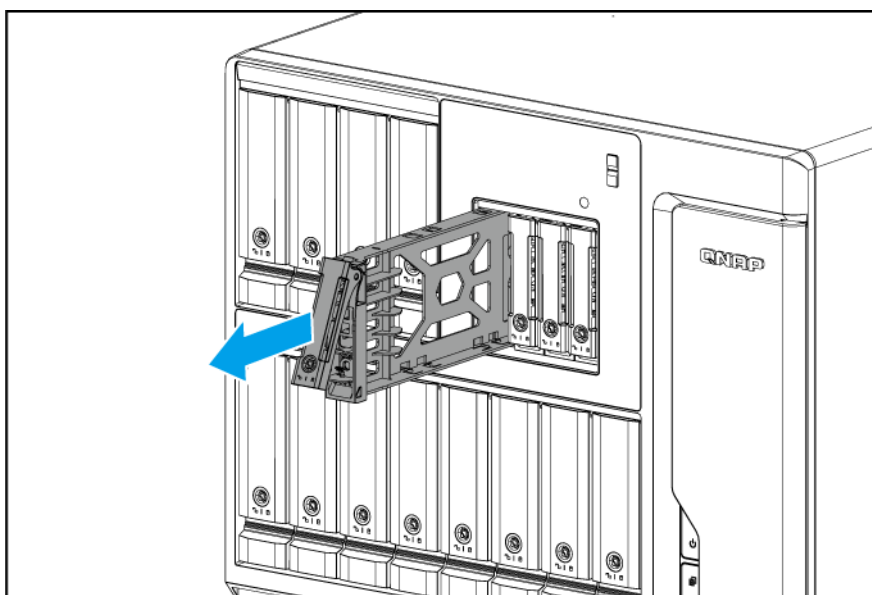
**Note**

The preinstalled drive trays come unlocked.

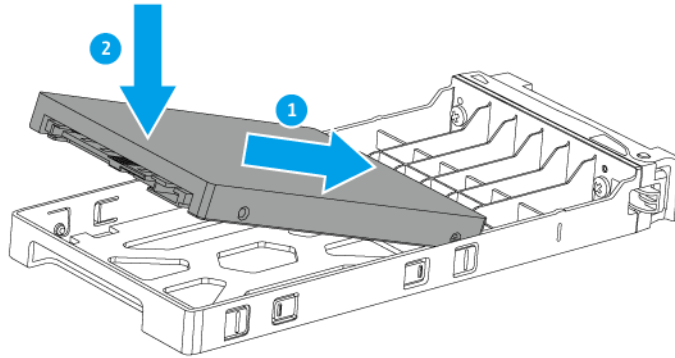
**Important**

Ensure the drive tray keys are stored in a safe place.

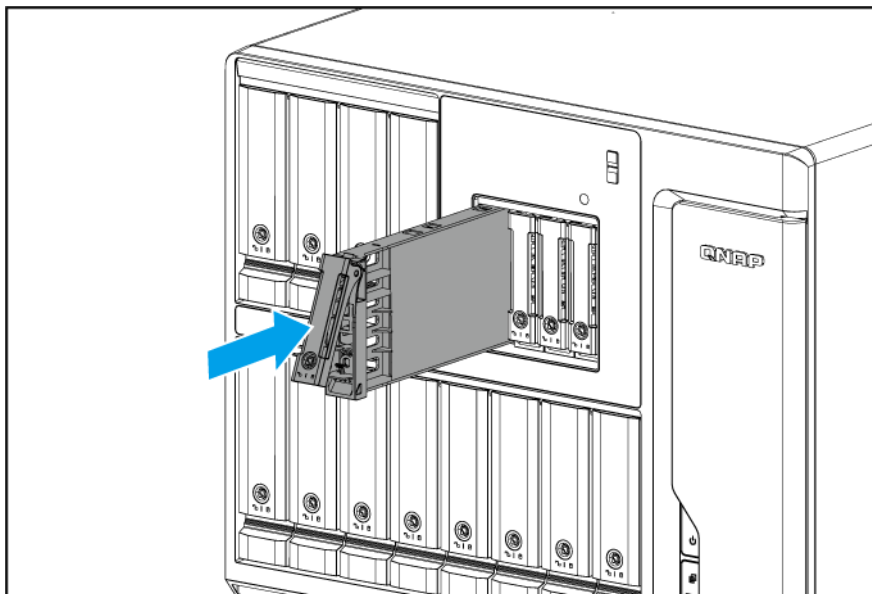
- b. Pull the handle to release the tray.
  - c. Pull the tray out.



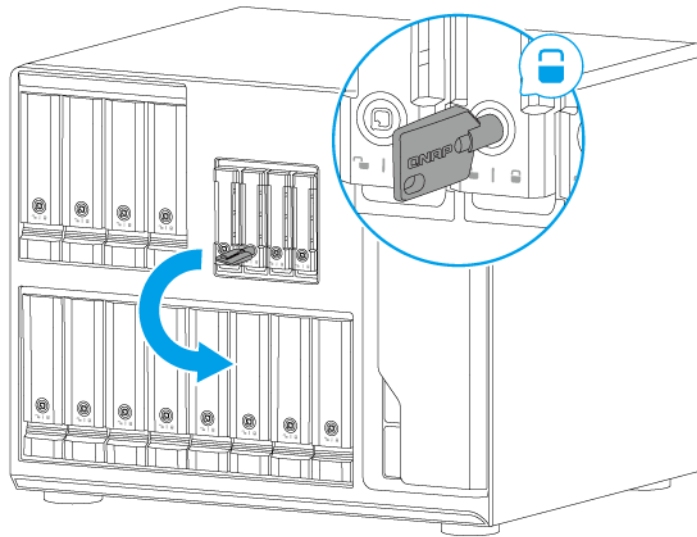
3. Install a drive on the tray.
  - a. Align the SATA connector on the drive with the opening at the end of the tray.
  - b. Place the drive on the tray.



4. Load the tray into the bay.
  - a. Insert the tray into the bay.
  - b. Push the handle.



- c. Lock the tray.



5. Power on the NAS.

## Installing expansion cards

The device 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 the device.

### Warning



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

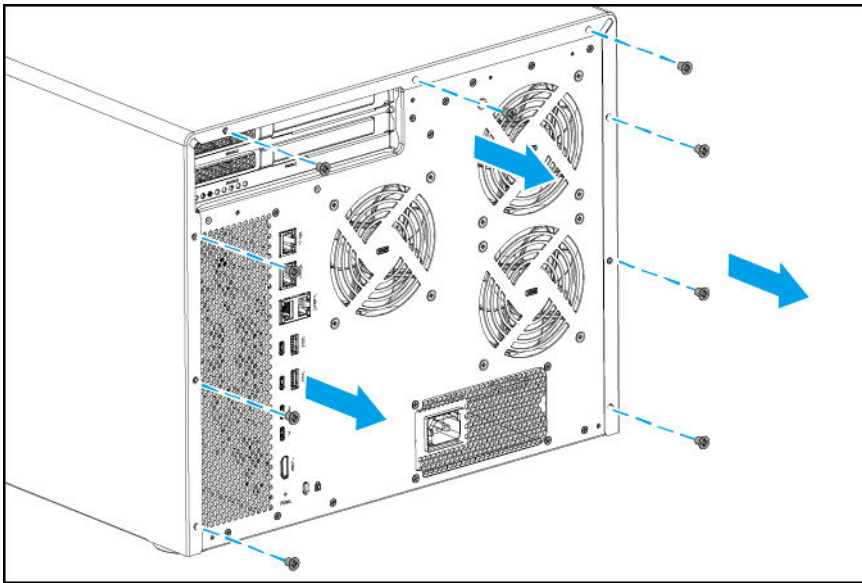


**Other moving components:** Keep your hands and other body parts away from other moving components.

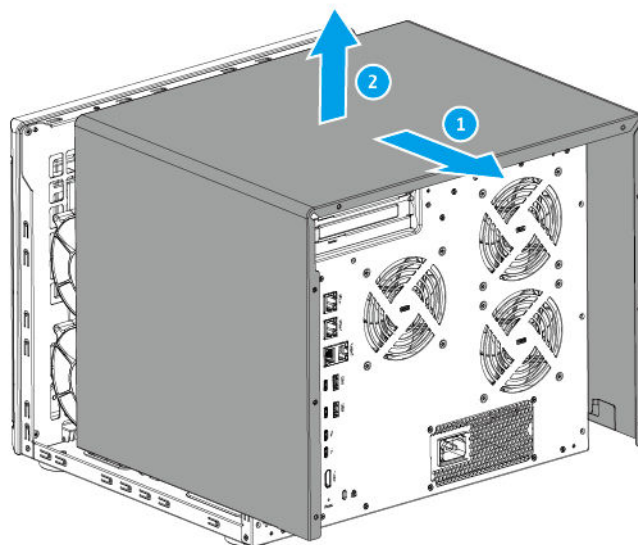
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

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 cord from the electrical outlet.
  4. Disconnect all cables and external attachments.
  5. Remove the case cover.
    - a. Remove the screws that secure the cover to the chassis.

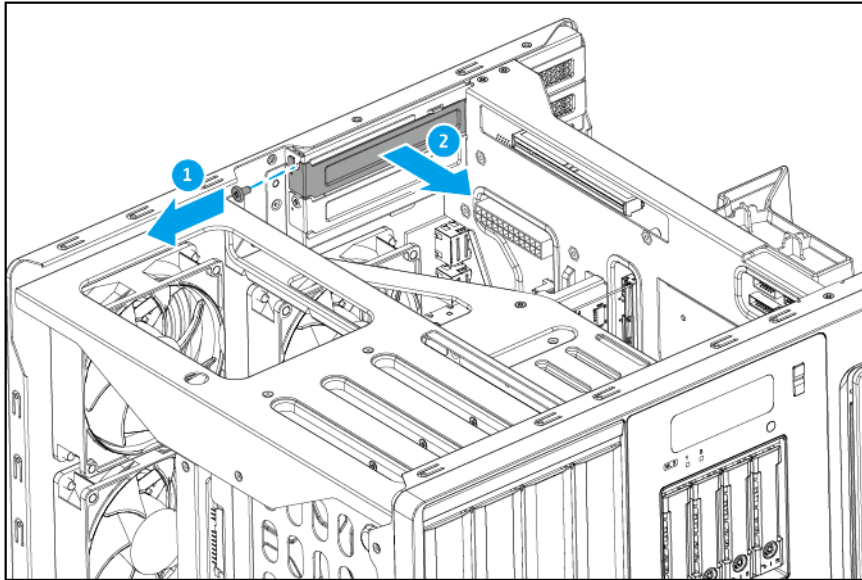
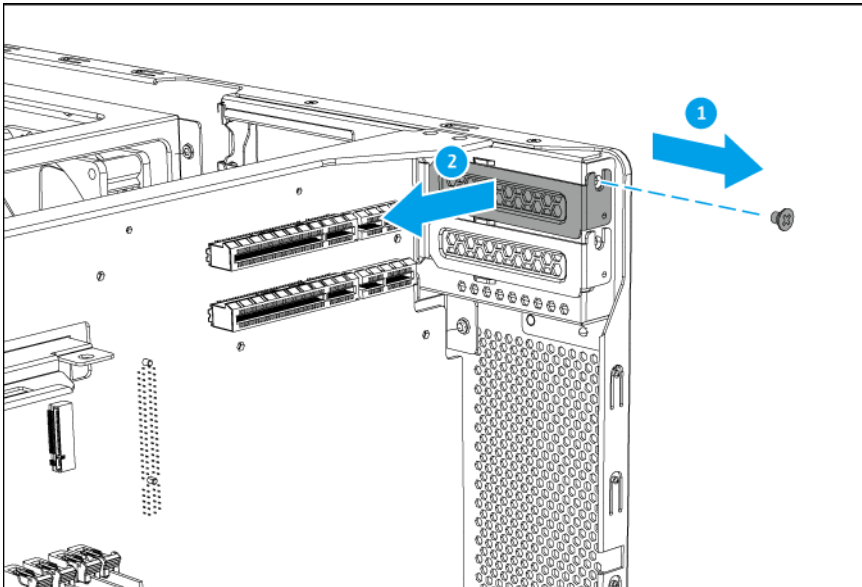


- b. Slide the cover back.
- c. Lift the cover off the device.





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

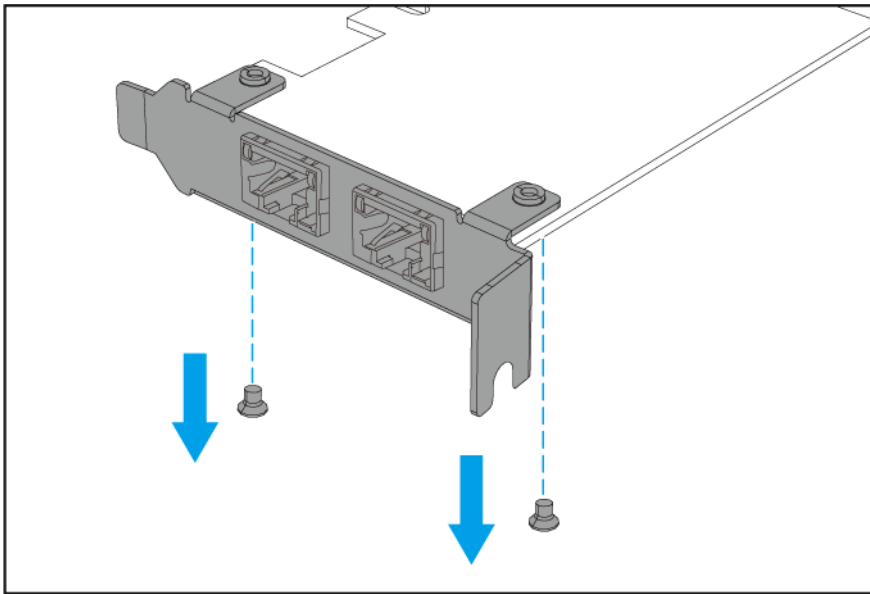
**PCIe slot 1****PCIe slots 2 and 3**

7. Optional: Attach the QNAP bracket to the expansion card.

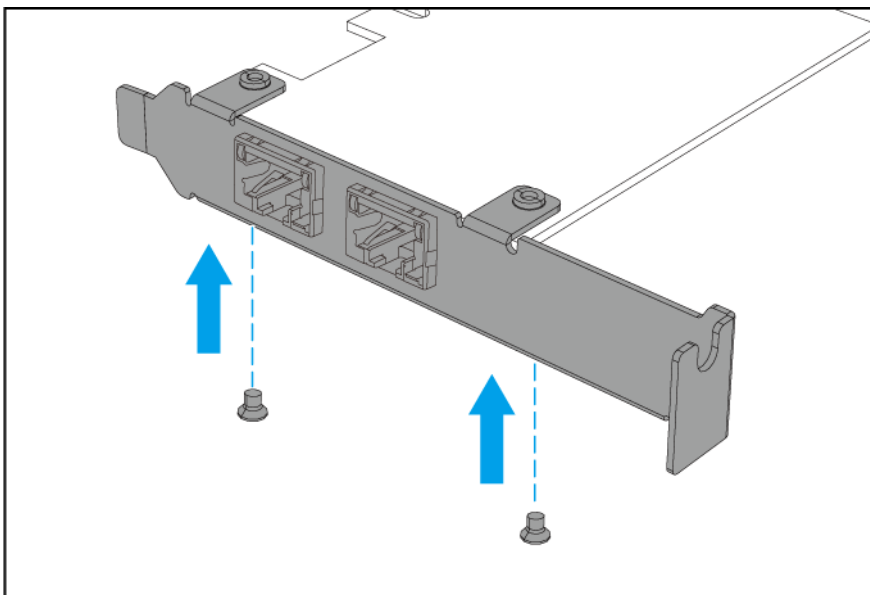
**Note**

To install a 10 GbE card in the Gen 4x4 slot, purchase a bracket kit and replace the original bracket with a half-height bracket. For details, go to <https://shop.qnap.com/>.

- a.** Remove all screws of the existing bracket.

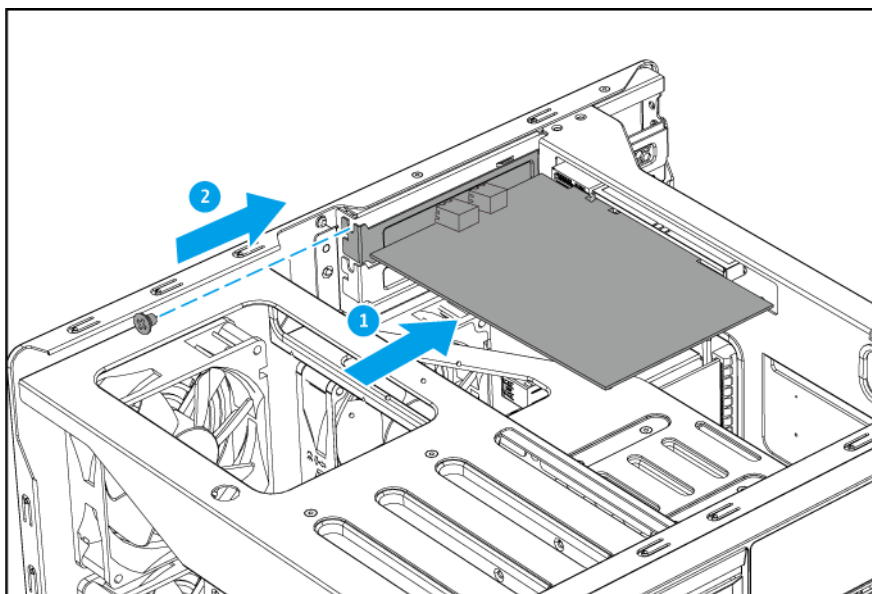


- b.** Carefully pull the bracket away from the card.  
**c.** Attach the QNAP bracket to the card using the same screws.

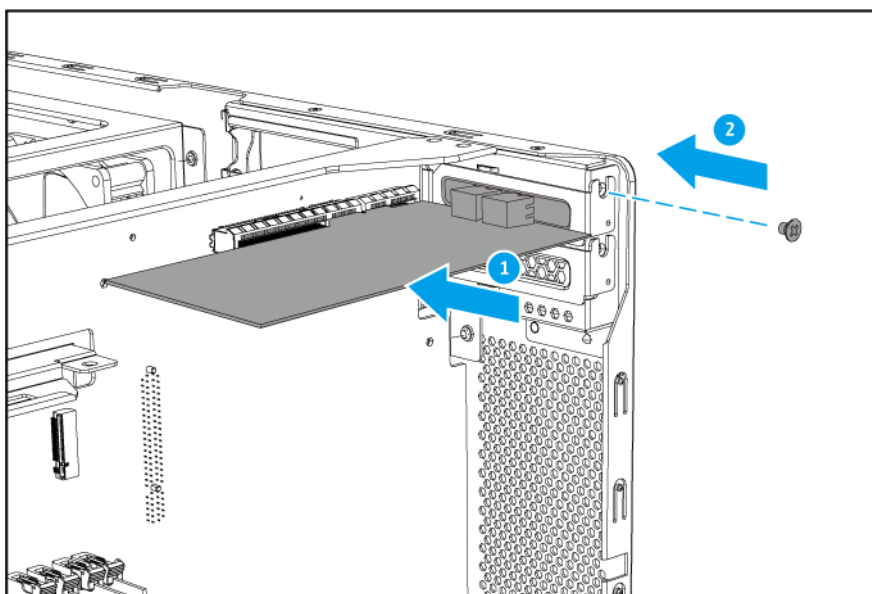


- d.** Verify that the bracket is secured to the card.
- 8.** Install the expansion card.
- a.** Hold the card by the edges.
- b.** Insert the card into the slot.

c. Attach the screw.

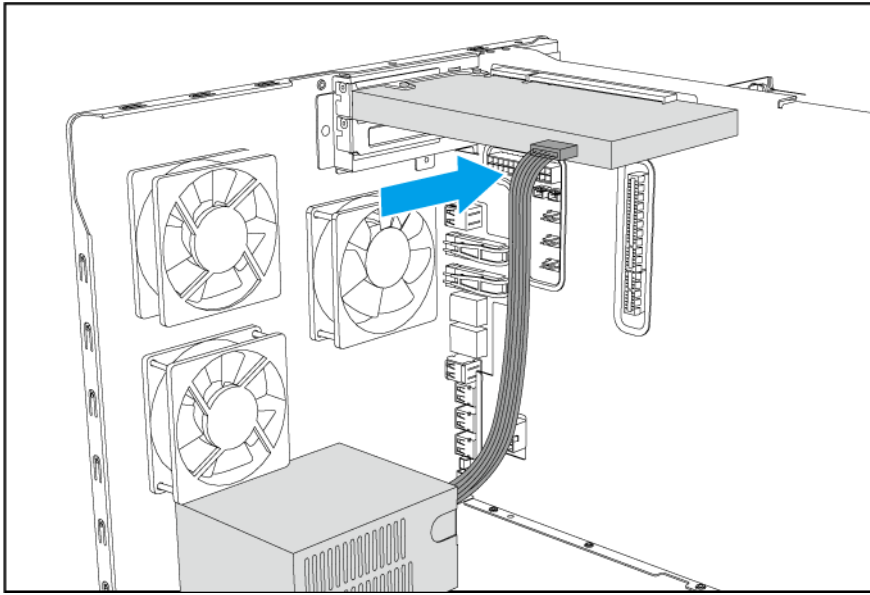


**PCIe slot 1**



**PCIe slots 2 and 3**

- d.** Optional: Attach the PCIe power connector to the expansion card.

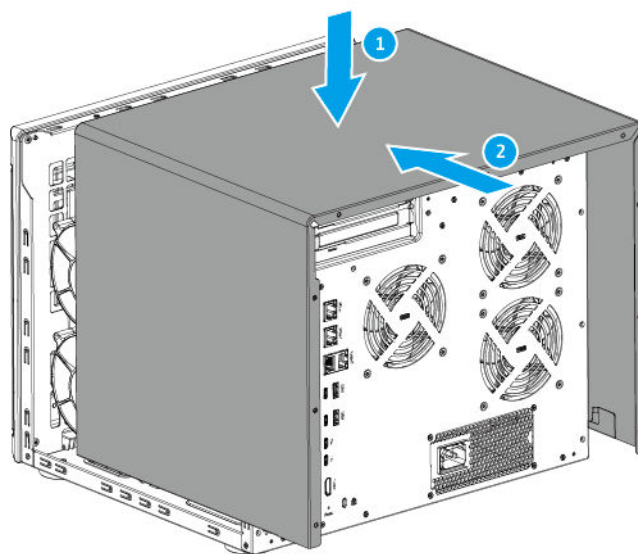


**Note**

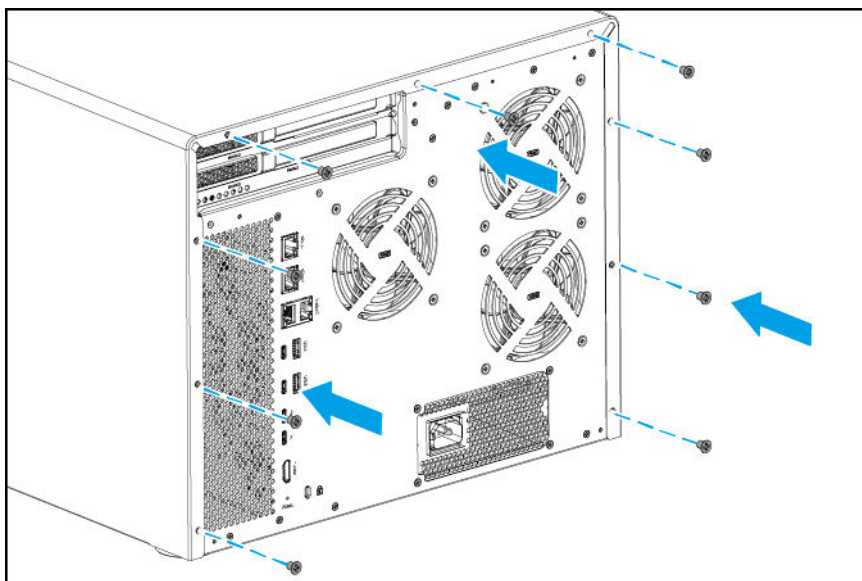
- Larger expansion cards may require you to attach the PCIe power connector before inserting the card into the slot.
- The PCIe power connector can only attach to PCIe slot 1 (PCIe Gen 4x16).

- 9.** Attach the case cover.

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



- c. Attach the screws that secure the cover to the chassis.



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

## Replacing memory modules

Use only QNAP memory modules to maintain system performance and stability. You can purchase QNAP memory modules from authorized resellers.

### Important

- QNAP recommends installing modules in pairs to run dual-channel mode.
- Ensure that each pair uses identical modules.
- Always install a single module in slot 1.

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

Module Pair	Slot Number
First pair	Slots 1 and 3
Second pair	Slots 2 and 4

**Warning**

- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

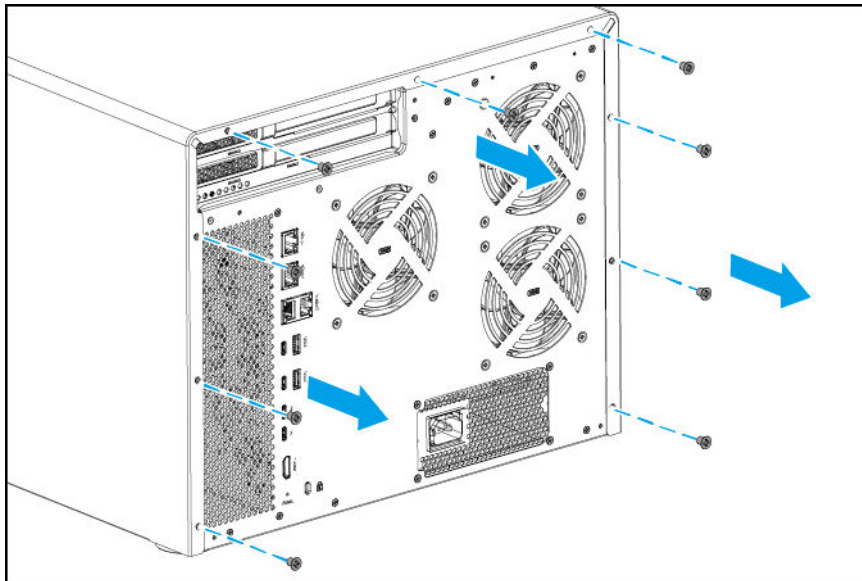


**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.



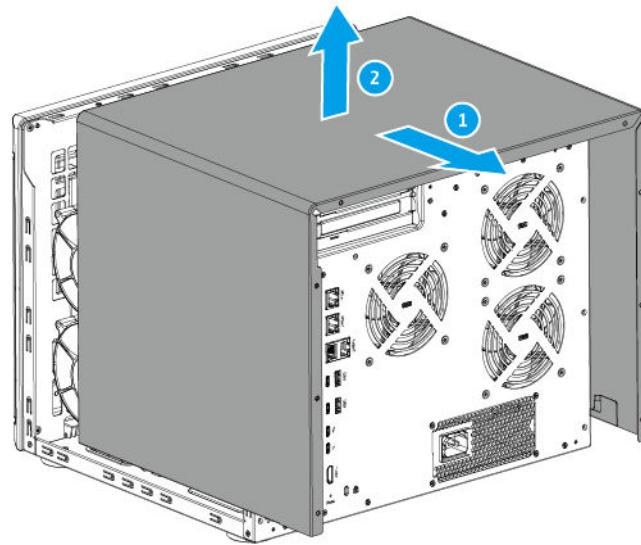
**Other moving components:** Keep your hands and other body parts away from other moving components.

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



- b. Slide the cover back.

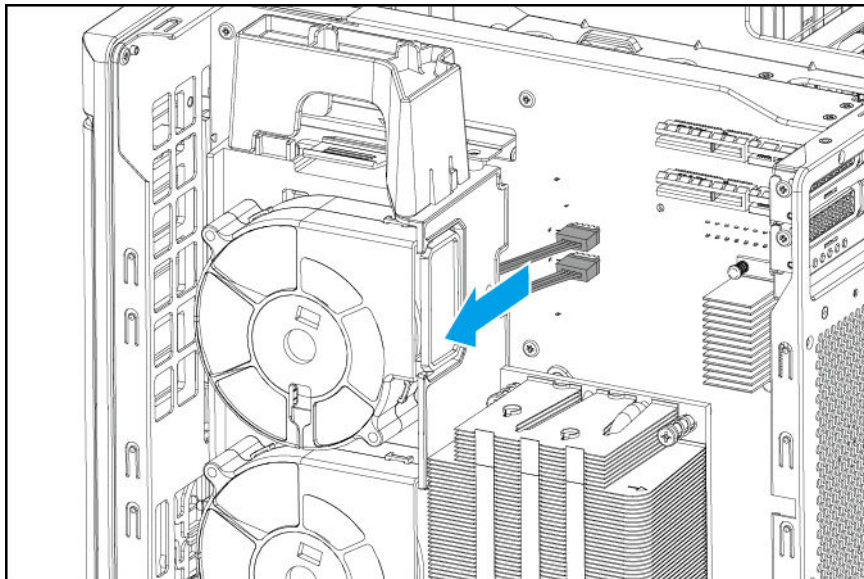
- c.** Lift the cover off the device.



- 5.** Place the device on its left side.

- 6.** Remove the fan tray.

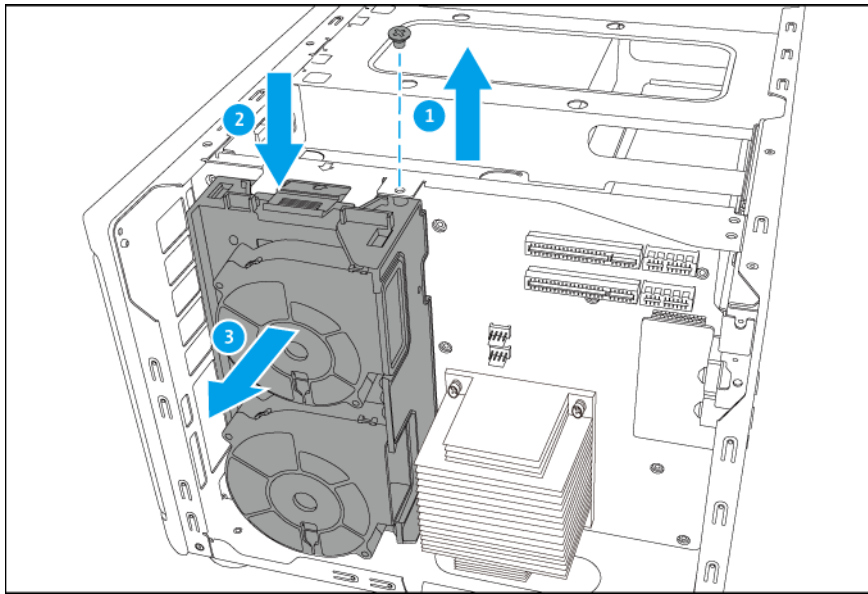
- a.** Disconnect the fan cables from the system board.



- b.** Remove the screw that secures the fan tray to the chassis.



- c. Press the clip and then pull the fan tray away from the system board.



**7. Optional: Remove an existing module.**

- a. Push the retention clips outward simultaneously to release the module.
- b. Verify that the module has tilted upward and is completely released from the slot.

**Warning**

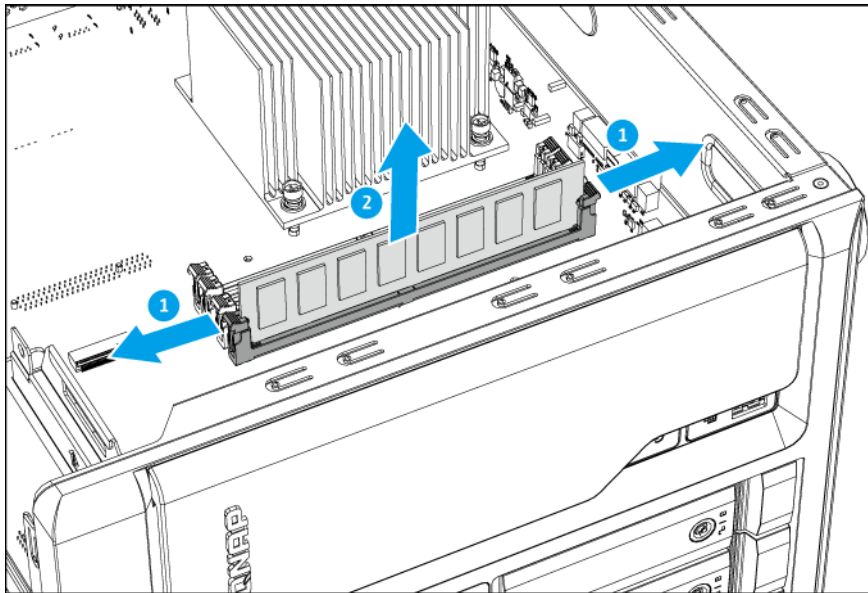
Attempting to remove a module that is not completely released may damage the module and the system board.

- c. Hold the module by the edges.

- d. Carefully slide the module out of the slot.

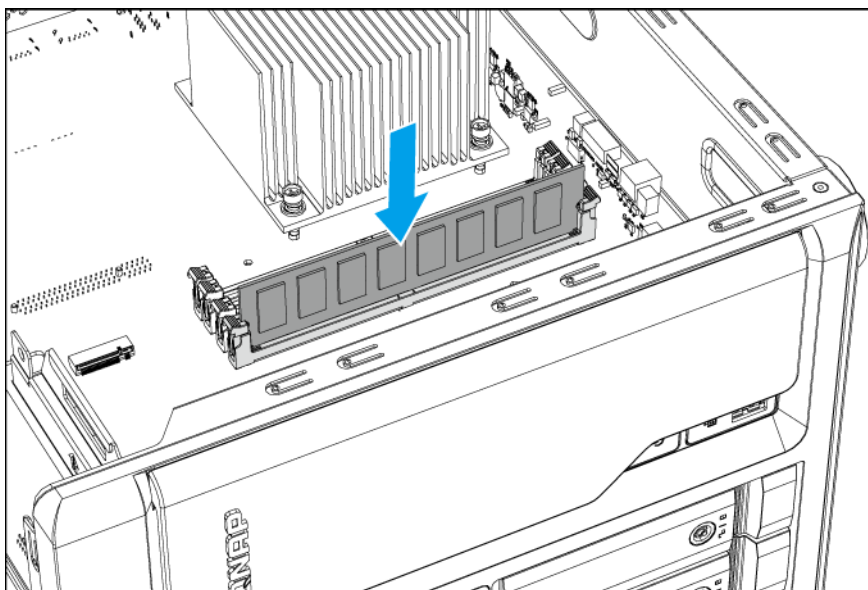
**Warning**

- Do not touch the internal components, particularly the metal connectors.
- Do not bend the module.



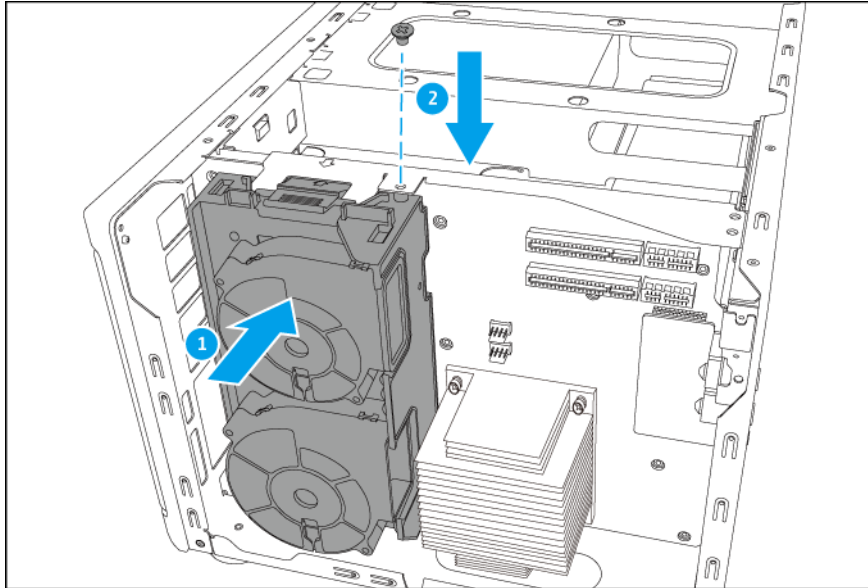
8. Install a new module.

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

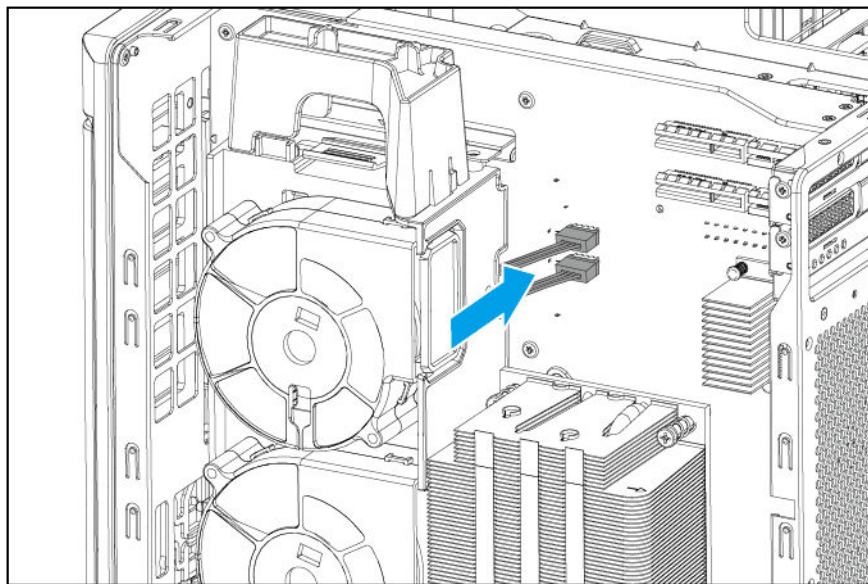


**9. Attach the fan tray.**

- a.** Insert the protruding part of the fan tray into the hole at the bottom of the chassis.
- b.** Push the fan tray toward the system board until the clip locks the fan tray into place.
- c.** Attach the screw that secures the fan tray to the chassis.



- d.** Connect the fan cables to the system board.

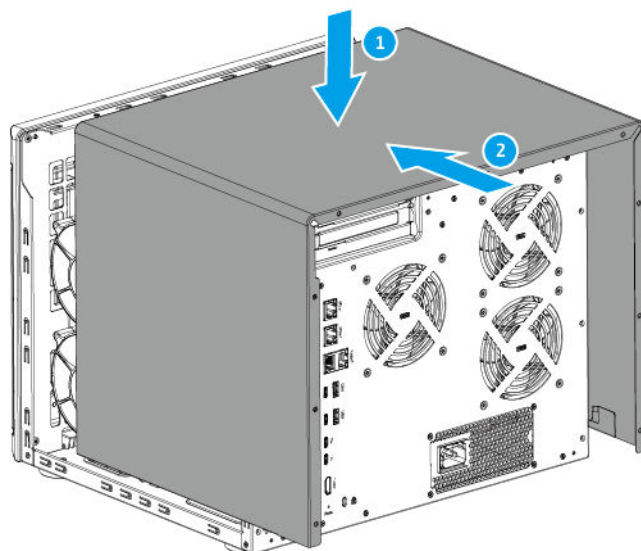


**10. Place the device in its normal upright position.**

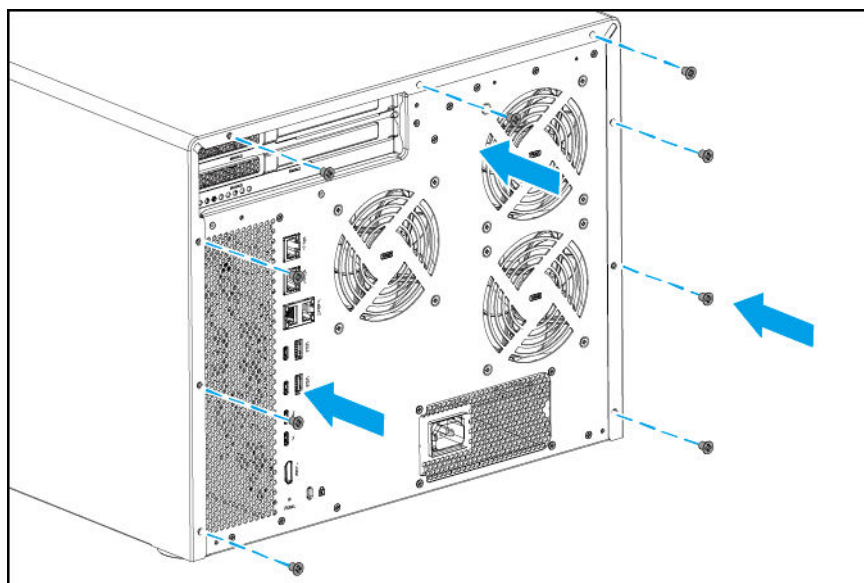
**11. Attach the case cover.**

- a.** Place the cover on the device.

- b.** Slide the cover forward.



- c.** Attach the screws that secure the cover to the chassis.



- 12.** Connect all cables and external attachments.
- 13.** Connect the power cord to the electrical outlet.
- 14.** Power on the device.

## Replacing CPU fans

### Warning

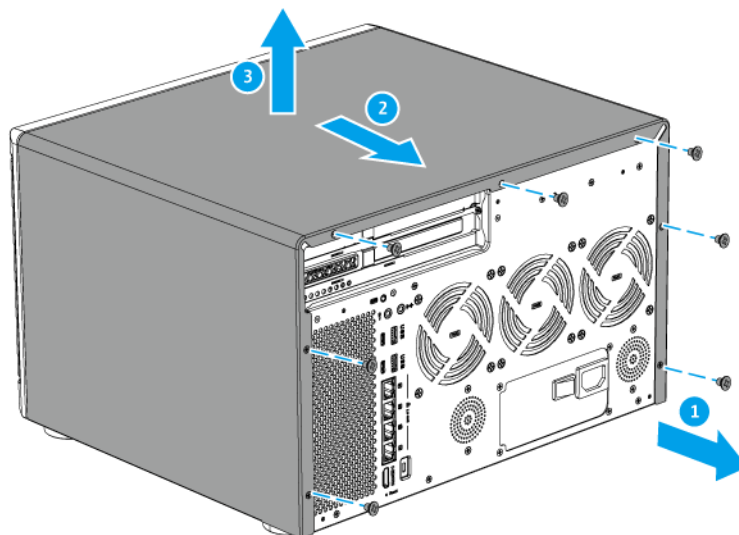


**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.



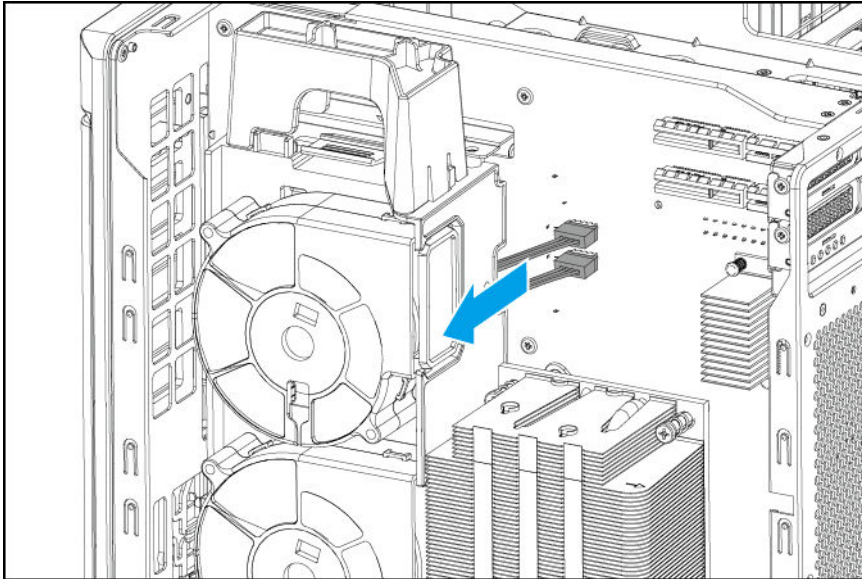
**Other moving components:** Keep your hands and other body parts away from other moving components.

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



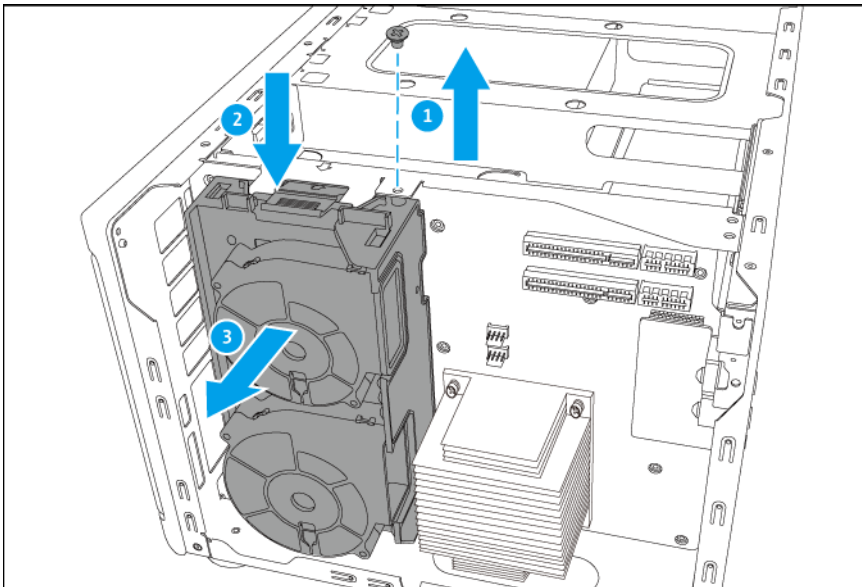
**5. Remove the fan tray.**

- a.** Disconnect the fan cables from the system board.



- b.** Remove the screw that secures the fan tray to the chassis.

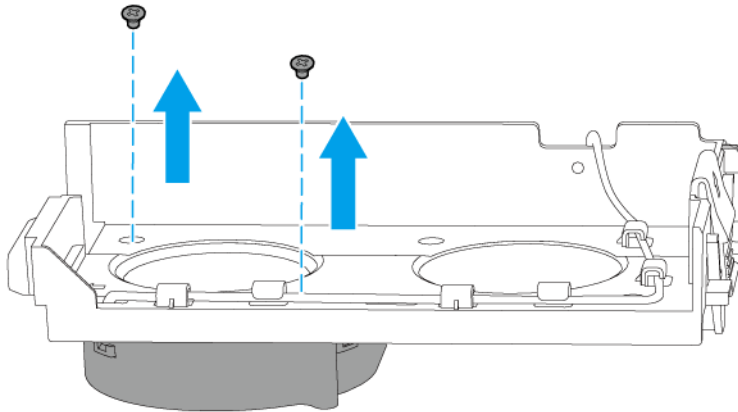
- c.** Press the clip and then pull the fan tray away from the system board.



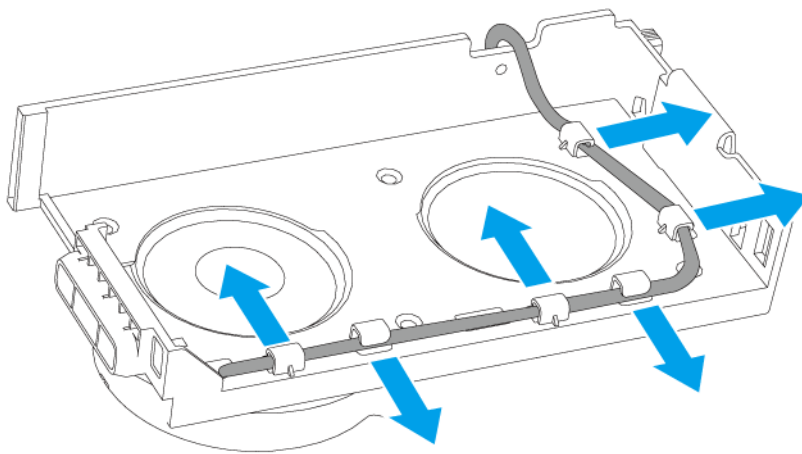


**6. Remove an existing fan.**

- a.** Remove the screws that secure the fan to the fan tray.



- b.** Remove the fan cable from the cable clips on the fan tray.

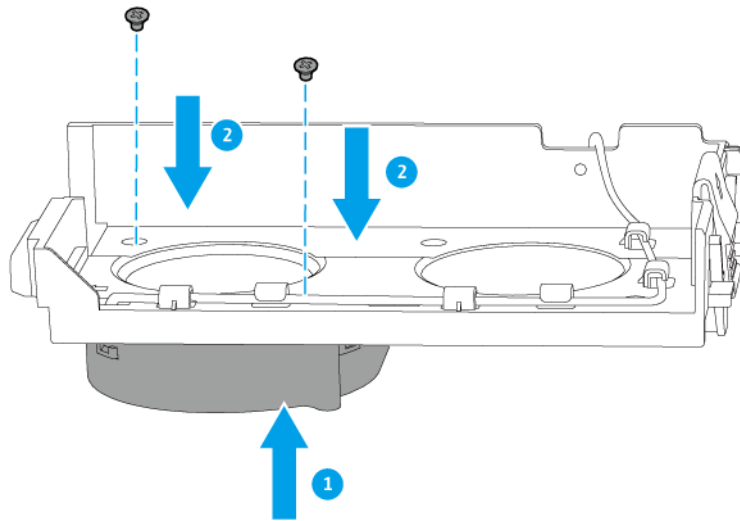


- c.** Detach the fan from the fan tray.

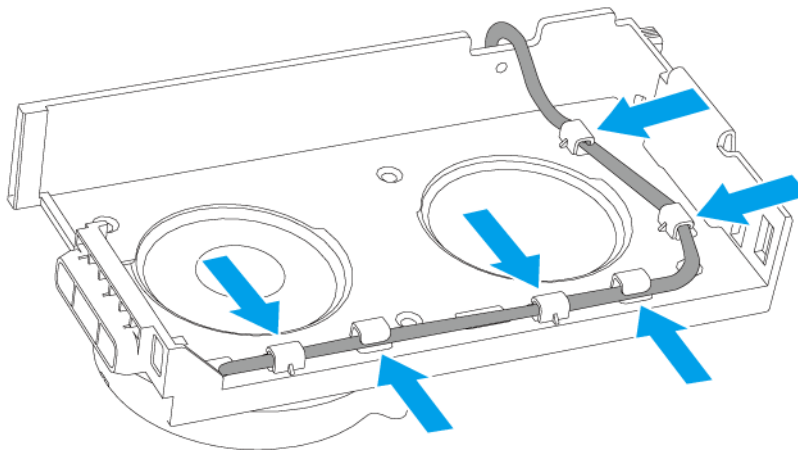
**7. Install a new fan in the same location.**

- a.** Position the fan tray so that the cable clips face upward.  
**b.** Align the holes on the fan with those on the fan tray.

- c.** Attach the screws to secure the fan to the fan tray.



- d.** Attach the fan cable to the cable clips on the fan tray.

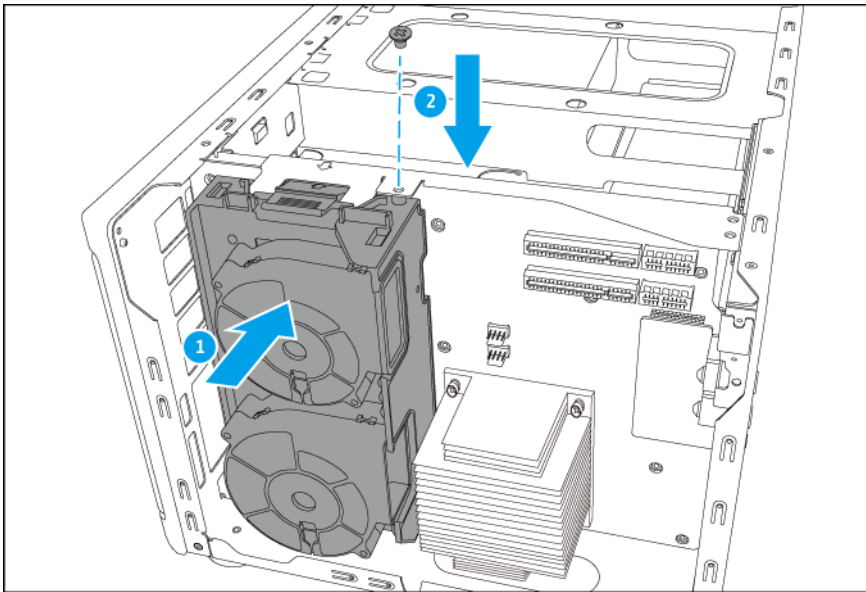


- 8.** Attach the fan tray.

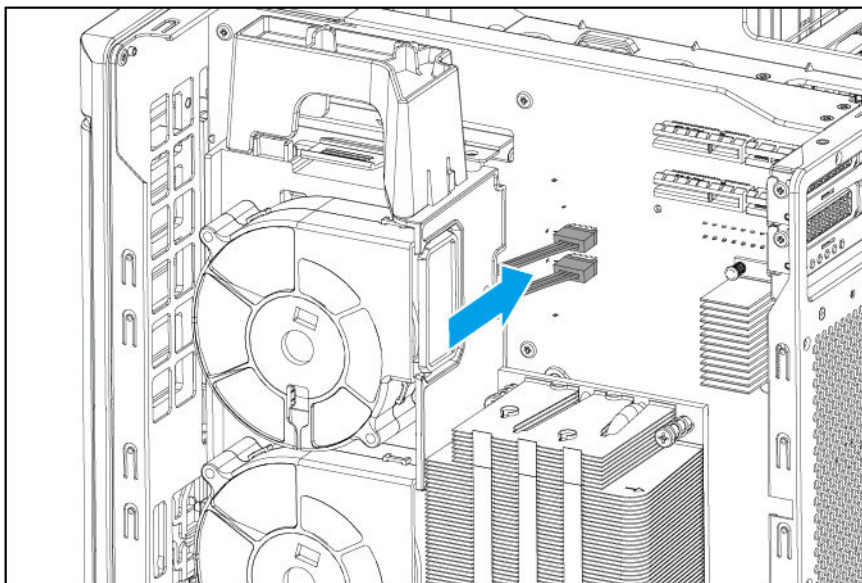
- a.** Insert the protruding part of the fan tray into the hole at the bottom of the chassis.
- b.** Push the fan tray toward the system board until the clip locks the fan tray into place.



- c.** Attach the screw that secures the fan tray to the chassis.



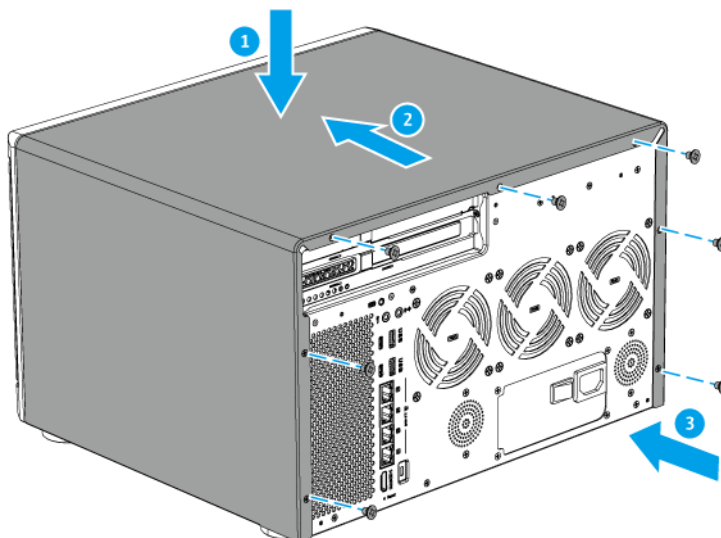
- d.** Connect the fan cables to the system board.



- 9.** Attach the case cover.

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

- c. Attach the screws that secure the cover to the chassis.



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

## Connecting expansion units

The device supports SATA, SAS, and USB expansion units. For details, please see table below.

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

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

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

Expansion Unit Model	Description	Required Accessories
SATA expansion units		
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>

Expansion Unit Model	Description	Required Accessories
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-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>
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>
SAS expansion units		
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>• SAS-12G2E or QXP-1620S-B3616W storage expansion card</li> <li>• SFF-8644 mini SAS cable</li> <li>• RAIL-B02</li> </ul>
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>• SAS-12G2E or QXP-1620S-B3616W storage expansion card</li> <li>• SFF-8644 mini SAS cable</li> <li>• RAIL-B02</li> </ul>
USB expansion units		
TR-002	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA HDD/SDD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> <li>• USB 3.2 Gen 2 Type-C 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/SDD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> <li>• USB 3.2 Gen 2 Type-C to Type-C cable</li> </ul>

Expansion Unit Model	Description	Required Accessories
TR-004U	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA HDD/SDD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> <li>• USB 3.2 Gen 2 Type-C 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/SDD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> <li>• USB 3.2 Gen 2 Type-C to Type-C cable</li> </ul>
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/SDD</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> <li>• USB 3.2 Gen 2 Type-C to Type-C cable</li> <li>• RAIL-B02</li> </ul>

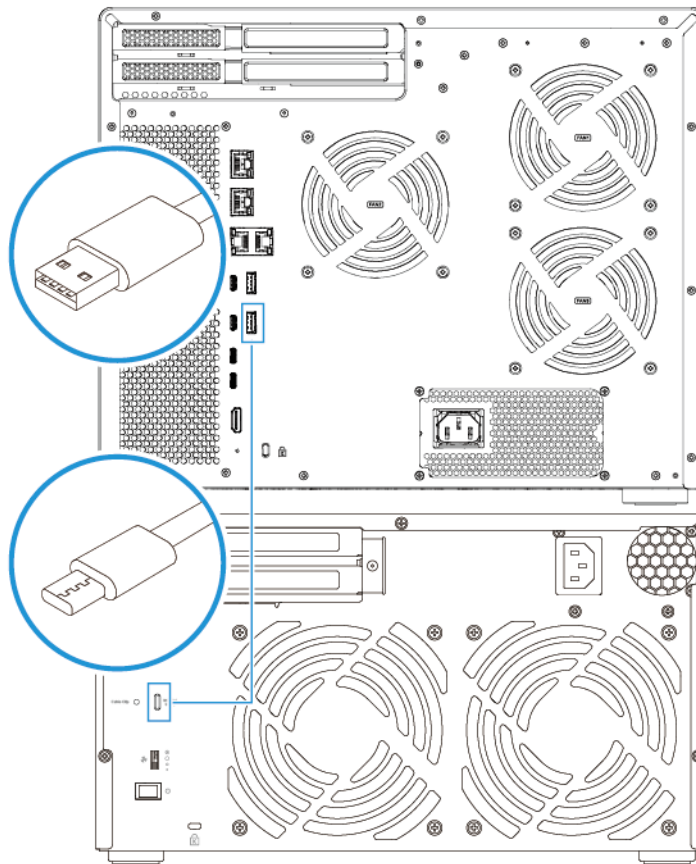
## Connecting USB expansion units

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

For required accessories, see [Connecting expansion units](#).

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 Type-A or Type-C port on the NAS.



#### Note

This image shows connecting a USB expansion unit to the NAS using a Type-C to Type-A USB cable.

2. Optional: Connect another expansion unit to the NAS.
3. Power on the expansion units.
4. Verify that the expansion units are recognized by the NAS.
  - a. Log on to QuTS hero as an administrator.
  - b. Go to **Storage Manager > External Storage**.
  - c. Verify that the expansion units are listed.

## Connecting SATA expansion units

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

For required accessories, see [Connecting expansion units](#).

1. Power off the NAS.

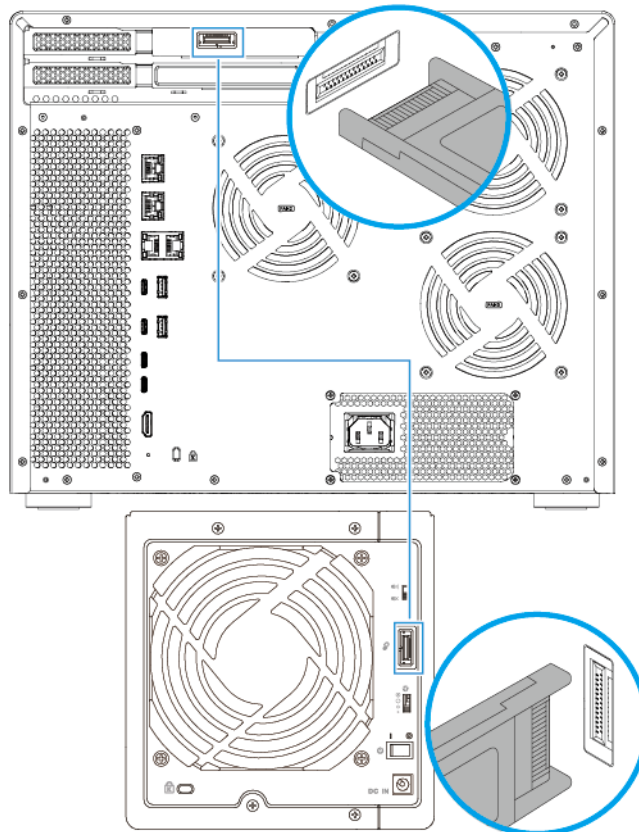
2. Install a host bus adapter on the PCIe slot.

**Note**

A QNAP QXP host bus adapter is required for connecting SATA expansion units to a host device. Third-party host bus adapters are not compatible with QNAP expansion units.

For details, see [Installing expansion cards](#).

3. Connect the expansion unit to the NAS.



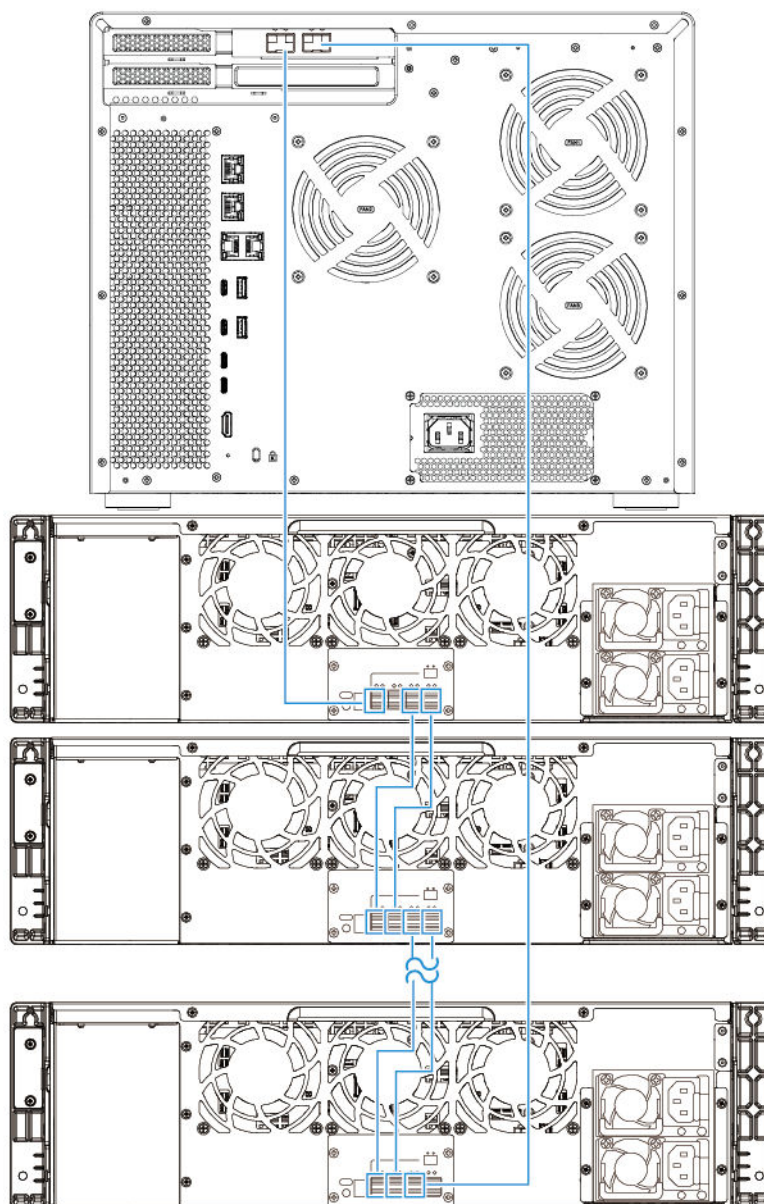
4. Optional: Connect another expansion unit to the NAS.
5. Power on the expansion units.
6. Power on the NAS.
7. Verify that the expansion units are recognized by the NAS.
  - a. Log on to QuTS hero as an administrator.
  - b. Go to **Storage Manager > External Storage**.
  - c. Verify that the expansion units are listed.

## Connecting SAS expansion units

To use SAS expansion units, an SAS-12G2E storage expansion card must be installed on the NAS and connected to the expansion units using mini-SAS SFF-8644 cables. You can purchase storage expansion accessories from QNAP or an authorized reseller.

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

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.





3. Power on the expansion units.
4. Verify that the expansion units are recognized by the device.
  - a. Log on to QuTS hero as an administrator.
  - b. Go to **Storage Manager > External Storage**.
  - c. Verify that the expansion units are listed.

## QuTS hero installation

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>	<ul style="list-style-type: none"> <li>• Computer</li> <li>• Network cable</li> <li>• Qfinder Pro installer</li> </ul>
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>• Specify the Cloud Key.</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>	<ul style="list-style-type: none"> <li>• Computer or mobile device</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 a 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.
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	Click <b>Skip</b> . 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 <b>Start</b> . Automatically searches for available firmware updates and installs firmware.
Manual installation	<p><b>a. Click <b>Manual Installation</b>.</b> The <b>Install Firmware</b> window appears.</p> <p><b>b. Click <b>Browse</b>.</b> The upload file window appears.</p> <p><b>c. Select file.</b></p> <p><b>d. Click <b>Open</b>.</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.

## 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 10 seconds.	<p>The device powers off.</p> <div> <p><b>Important</b></p> <p>Use this method only when the device is unresponsive.</p> </div> <div> <p><b>Note</b></p> <p>After forcing the device to power off, the fans will spin very fast for about 3 seconds. This is normal and to be expected.</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"> <li>• The <code>admin</code> account is automatically enabled.</li> <li>• System administrator password: For details on the default password, see <a href="#">this FAQ</a>.</li> <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>• LCD panel password: (blank)</li> <li>• VLAN: Disabled</li> </ul>
Advanced system reset	Press and hold the button for 15 seconds.	<p>The default factory settings are restored. To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.</p>

## USB One Touch Copy button

The USB One Touch Copy button allows you to copy data backups from a USB device to the QNAP device or from the QNAP device to a USB device.

This feature supports incremental backups. The QNAP device only copies files that were modified or added after the last backup.

To configure the behavior of the button when an external device is connected to the button's USB port, install and use Hybrid Backup Sync on your QNAP operating system. For details, see the [Hybrid Backup Sync](#) documentation.

## LCD panel

The LCD panel allows you to perform the following operations:

- Restart and power off the device
- Configure or change the LCD panel password
- View and configure network settings

- View information on the system, physical disks, and storage

## LCD panel buttons

Button	Usage
<b>Enter</b>	<ul style="list-style-type: none"> <li>• Display a configuration screen.</li> <li>• Move to the next item on the configuration screen.</li> </ul>
<b>Select</b>	<ul style="list-style-type: none"> <li>• Move to the next item on a menu.</li> <li>• Modify a value on a configuration screen.</li> </ul>

## Viewing TCP/IP settings

You can view the following settings for each network adapter on the NAS.

- IP address
- Subnet mask
- Default gateway
- Primary DNS
- Secondary DNS

**1. Press **Enter** or **Select**.**

The panel displays the NAS name and QuTS hero version.

**2. Press and hold **Enter** for two seconds.**

The panel displays `Main Menu 1. TCP/IP`.

**3. Press and hold **Enter**.**

The panel displays the IP address of the first network adapter.

**4. Press and hold **Select** to view the next TCP/IP screen.**

Repeat this step as necessary.

## Configuring TCP/IP settings

You can configure the following settings for each network adapter on the device:

- IP address
- Subnet mask
- Default gateway
- Primary DNS
- Secondary DNS



1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press and hold **Enter**.  
The panel displays the IP address of the first network adapter.
4. Press **Select** repeatedly until the panel displays `Enter Network Settings`.
5. Press and hold **Enter**.  
The panel displays the configurable network settings.
6. Press **Select** and then **Enter** to configure the settings.

Button	Usage
<b>Enter</b>	<ul style="list-style-type: none"> <li>• Display a configuration screen.</li> <li>• Move to the next item on a configuration screen.</li> </ul>
<b>Select</b>	<ul style="list-style-type: none"> <li>• Move to the next item on a menu.</li> <li>• Modify a value on a configuration screen.</li> </ul>

7. After configuring the settings, press **Select** repeatedly until the panel displays `Network Restart`.

### Important

If you do not see `Network Restart`, the system will not save the configured settings.

The system saves the settings.

## Viewing drive information

The LCD panel can display the temperature and capacity of each drive installed in the NAS.

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Select** repeatedly until the panel displays `Main Menu 2. Physical disk`.
4. Press and hold **Enter**.  
The panel displays the temperature and capacity of the drive in bay 1.
5. Press and hold **Select**.  
Repeat this step as necessary.  
The panel displays the temperature and capacity of the next drive.

## Viewing shared folder information

The LCD panel can display the name and capacity of each shared folder.

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Select** repeatedly until the panel displays `Main Menu 3. Shared Folders`.
4. Press and hold **Enter**.  
The panel displays the name and capacity of the first shared folder.
5. Press and hold **Select**.  
Repeat this step as necessary.  
The panel displays the name and capacity of the next shared folder.

## Viewing system information

The LCD panel can display the CPU temperature, system temperature, and system fan speed.

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Select** repeatedly until the panel displays `Main Menu 4. System`.
4. Press and hold **Enter**.  
The panel displays the CPU and system temperature.
5. Press and hold **Select**.  
The panel displays the system fan speed.

## Powering off the NAS

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Select** repeatedly until the panel displays `Main Menu 5. Shut down`.
4. Press and hold **Enter**.  
The NAS powers off.

## Restarting the NAS

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Select** repeatedly until the panel displays `Main Menu 6. Reboot`.
4. Press and hold **Enter**.  
The NAS restarts.

## Changing the LCD password

Specifying a password for the LCD panel prevents unauthorized access.

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QuTS hero version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Select** repeatedly until the panel displays `Main Menu 7. Password`.
4. Press and hold **Enter**.  
The `Change Password` screen appears.
5. Select **Yes** by pressing and holding **Enter**.  
The `New Password` screen appears.
6. Press **Select** and **Enter** to specify a new password.
  - Specify a password.
    - Length: 1-8 characters
    - Valid characters: 0-9
  - To delete a password, leave the password field blank.

Button	Usage
<b>Enter</b>	Move to the next item in the <code>New Password</code> screen.
<b>Select</b>	Change a character in the <code>New Password</code> and <code>Verify Password</code> screens.

7. Press **Enter**.  
The NAS saves the password.

## LCD error messages

System Message	Description
Sys. Fan Failed	System fan has failed.
Sys. Overheat	System has overheated.
HDD Overheat	Drive has overheated.
CPU Overheat	CPU has overheated.
Network Lost	LAN 1 and LAN 2 disconnected in failover or load-balancing mode.
LAN [number] Lost	LAN [number] has disconnected.
HDD Failure	Drive has failed.
Shared Folder [number] Full	Shared folder is full.
HDD Ejected	Drive has ejected.
Shared Folder [number] Degraded	Shared folder [number] is in degrade mode.
Shared Folder [number] Unmounted	Shared folder [number] has unmounted.
Shared Folder [number] Inactive	Shared folder [number] is inactive.

## 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](#).

### Drive and SSD LEDs

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.

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

### 10 Gigabit Ethernet (RJ45) Speed LED

Status	Description
Green	A 10 GbE network connection has been established.
Orange	The network connection is operating below 10 Gbps.
Off	There is no network connection.

### 10 Gigabit Ethernet (RJ45) Activity LED

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

### 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.
Off	<ul style="list-style-type: none"> <li>The network connection is operating at 100 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.

## 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> <li>The operating system was updated.</li> <li>The NAS is starting USB One Touch Copy.</li> </ul>
	2	An external storage device has been removed from the USB One Touch Copy port.
	3	Cannot detect installed disk.
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> <li>The NAS data cannot be copied to the external storage device connected to the USB One Touch Copy port.</li> </ul>

Duration	Frequency	Description
Long beep (1.5 seconds)	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>• An external storage device has been removed from the USB One Touch Copy port.</li> <li>• A shared folder status error occurred.</li> <li>• A drive is plugged in or out.</li> <li>• An iSCSI LUN is about to reach full capacity.</li> </ul>
	1	<ul style="list-style-type: none"> <li>• The NAS was powered off by force shutdown (hardware shutdown).</li> <li>• The NAS was powered on successfully and is ready.</li> </ul>
Long and short beeps	1 long and 2 short beeps	A 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> <div data-bbox="507 383 1385 584"> <p><b>Warning</b></p> <p>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> </div>
Shared folders	<p>All shared folders and the downloaded files stored in them are retained.</p> <div data-bbox="507 685 1385 887"> <p><b>Warning</b></p> <p>To prevent data loss, back up and save encryption keys or passwords of encrypted shared folders in a safe place before migration.</p> </div> <div data-bbox="507 913 1385 1077"> <p><b>Important</b></p> <p>Folder permissions on the destination NAS must be reconfigured after migration.</p> </div>
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> <div data-bbox="507 1480 1385 1644"> <p><b>Warning</b></p> <p>To prevent losing all your software licenses, QNAP recommends deactivating licenses on the source NAS before data migration.</p> </div>
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	$\geq 3$	
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 Manager > Disks**.
3. Locate the failed drive.

4. Prepare a new drive with a capacity that is the same as or larger than the failed 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 Manager > Storage Space**.
11. Locate the storage pool 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, or 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>
QNAP Community	<a href="https://community.qnap.com">https://community.qnap.com</a>
QNAP Accessories Store	<a href="https://shop.qnap.com">https://shop.qnap.com</a>

## 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 devices in your local area network

### QNAP ID

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

### QuTS hero

QNAP NAS operating system featuring ZFS file system

## 8. Notices

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Version 3, 29 June 2007

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### FCC Class B Notice



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

**Note**

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

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**VCCI notice**

VCCI-B

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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
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