

TVS-hx88X

TVS-h1288X

TVS-h1688X

User Guide

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1. Preface





About This Guide

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

Audience

This document is intended for storage administrators. This guide assumes that the user is knowledgeable and qualified to install, maintain, and troubleshoot issues involving servers, server components, and storage systems. This guide also assumes that the user is trained to recognize hazards, including the appropriate actions the user needs to take to prevent personal injury and damage to data and property.

Document Conventions

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

2. Product Overview

This chapter provides basic information about the QNAP device.

About the TVS-hx88X

The TVS-h1288X and TVS-h1688X run on the ZFS-based QuTS hero operating system and is powered by a 6-core 3.3 GHz processor with a boost of 4.7 GHz. With two M.2 NVMe Gen 3 x4 SSD slots, the NAS delivers high performance within a compact chassis. The TVS-h1288X and TVS-h1688X feature two Gen 3 x4 PCIe slots that support optional Thunderbolt™ 3 expansion cards to perform high-speed video editing and media collaboration. The Gen 3 x8 PCIe slot also comes preinstalled with a 2-port 10 Gigabit Ethernet card. The NAS is also equipped with an HDMI 1.4b port to enhance your multimedia experience. With dual 10 Gigabit Ethernet ports and 2.5 Gigabit Ethernet ports, the NAS supports port trunking and 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	Power supply
TVS-h1288X-W1250-16G	Intel® Xeon® W-1250	16 GB	Single
TVS-h1688X-W1250-32G	Intel® Xeon® W-1250	32 GB	Single

Component	TVS-h1288X-W1250-16G	TVS-h1688X-W1250-32G
Processor		
CPU	Intel® Xeon® W-1250	
Frequency	6-core/12-thread 3.3 GHz base/4.7 GHz boost	
Architecture	x86 64-bit	
Encryption engine	AES-NI	
Memory		
Pre-installed memory	16 GB RAM: 2 x 8 GB DDR4 ECC UDIMM	32 GB RAM: 2 x 16 GB DDR4 ECC UDIMM

Component	TVS-h1288X-W1250-16G	TVS-h1688X-W1250-32G
Memory slots	4 x DDR4 Long-DIMM <div><div></div><div>Note 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> <div><div></div><div>Note For dual-DIMM configurations, use identical DDR4 modules.</div></div>	
Maximum memory	128 GB RAM: 4 x 32 GB	
Flash memory	5 GB (dual-boot OS protection)	
Storage		
Drive bays	<ul style="list-style-type: none">• 8 x 3.5-inch SATA 6 Gbps• 4 x 2.5-inch SATA 6 Gbps	<ul style="list-style-type: none">• 12 x 3.5-inch SATA 6 Gbps• 4 x 2.5-inch SATA 6 Gbps
	<div><div></div><div>Note The drives are backward compatible with 3 Gbps.</div></div>	
Drive compatibility	3.5-inch bays: <ul style="list-style-type: none">• 3.5-inch SATA hard disk drives• 2.5-inch SATA hard disk drives• 2.5-inch SATA solid-state drives 2.5-inch bays: <ul style="list-style-type: none">• 2.5-inch SATA hard disk drives• 2.5-inch SATA solid-state drives	
M.2 SSD slots	2 x M.2 NVMe PCIe Gen 3 x4	
M.2 SSD form factor	<ul style="list-style-type: none">• 2280• 22110	
SSD cache acceleration support	<ul style="list-style-type: none">• 3.5-inch drive bays: 1 to 8• 2.5-inch drive bays: 1 to 4• M.2 SSD slots: 1 to 2	<ul style="list-style-type: none">• 3.5-inch drive bays: 1 to 12• 2.5-inch drive bays: 1 to 4• M.2 SSD slots: 1 to 2
Hot-swapping	Supported	
Network		
10 Gigabit Ethernet ports	2 x 10GBASE-T (10GbE/1GbE)	
2.5 Gigabit Ethernet ports	4 x 2.5 GbE RJ45	
External I/O Ports & Expansion Slots		

Component	TVS-h1288X-W1250-16G	TVS-h1688X-W1250-32G
PCIe slots	<div><div><div></div><div>Note</div></div><div>This slot comes preinstalled with a 10 GbE network expansion card.</div></div> <div><div></div><div>2 x PCIe 3.0 x8</div></div>	
USB ports	<div>Front: 1 x USB 3.2 Gen 2 Type-A</div> <div><div><div></div><div>Note</div></div><div>This USB port supports One Touch Copy.</div></div> <div>Rear:<div><div></div><div>2 x USB 3.2 Gen 2 Type-C</div></div><div><div></div><div>2 x USB 3.2 Gen 2 Type-A</div></div></div> <div>Front: 1 x USB 3.2 Gen 2 Type-A</div> <div><div><div></div><div>Note</div></div><div>This USB port supports One Touch Copy.</div></div> <div>Rear:<div><div></div><div>2 x USB 3.2 Gen 2 Type-C</div></div><div><div></div><div>3 x USB 3.2 Gen 2 Type-A</div></div></div>	
HDMI ports	1 x HDMI 1.4b (up to 4096 x 2160 resolution at 30 Hz)	
Audio ports	<div><div></div><div>1 x 3.5 mm dynamic microphone jacks</div></div> <div><div></div><div>1 x speaker</div></div> <div><div></div><div>1 x 3.5 mm line-out jack</div></div> <div><div><div></div><div>Note</div></div><div>You cannot use speakers and line-out jacks simultaneously.</div></div>	
Interface		
Display panel	Monochrome backlit LCD display	
Buttons	<div><div></div><div>Power</div></div> <div><div></div><div>Reset</div></div> <div><div></div><div>LCD enter</div></div> <div><div></div><div>LCD select</div></div>	
Switches	Power	
Dimensions		
Form factor	Tower	
Dimensions (H x W x D)	234.6 x 369.9 x 319.8 mm (9.2 x 14.6 x 12.6 in)	303.84 x 369.89 x 319.8 mm (11.96 x 14.56 x 12.59 in)
Net weight	11.27 kg (24.85 lbs)	13.41 kg (29.56 lbs)
Others		
Power supply unit	550W, 100-240V AC, 50/60 Hz	
System battery	CR2032 lithium battery 3V	
Sound level	26 db(A)	25.8 db(A)
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

Component	TVS-h1288X-W1250-16G	TVS-h1688X-W1250-32G
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) 	
Security slot	Kensington security slot	

**Tip**

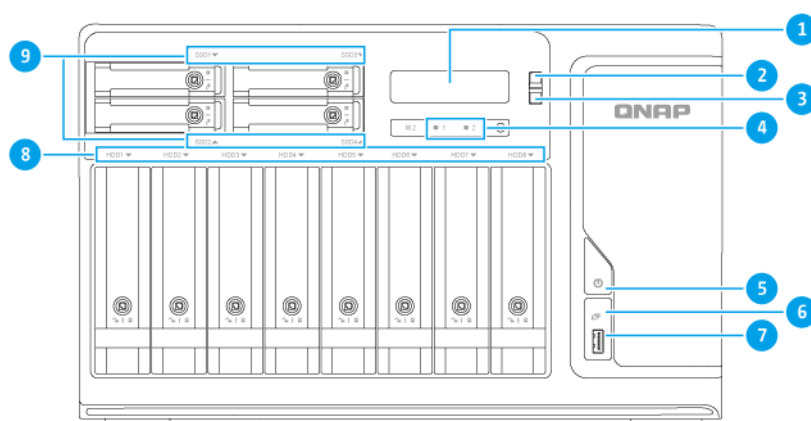
For the list of compatible expansion cards, go to <https://www.qnap.com/compatibility>.

Package Contents

Item	Quantity
TVS-h1288X or TVS-h1688X NAS	1
Power cord	1
Ethernet cable	1 x Cat 6A
Drive tray keys	2
Screws for 3.5-inch drives	TVS-h1288X: 24 TVS-h1688X: 36
Screws for 2.5-inch drives	TVS-h1288X: 24 TVS-h1688X: 36
M.2 SSD heatsinks	2
Quick Installation Guide (QIG)	1

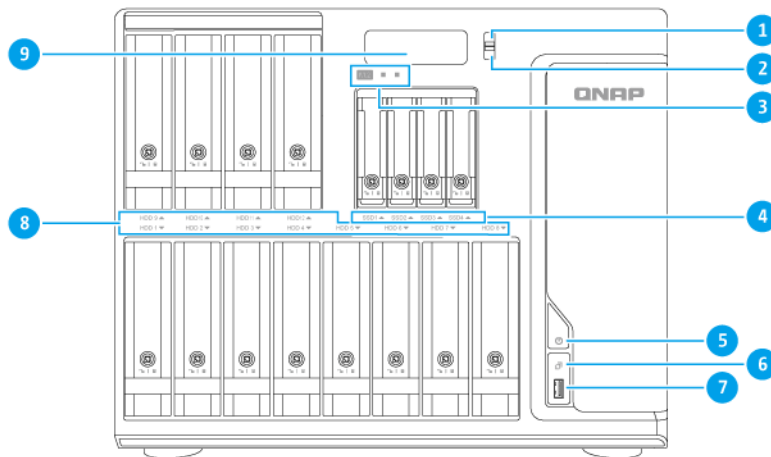
Components

Front Panel



TVS-h1288X

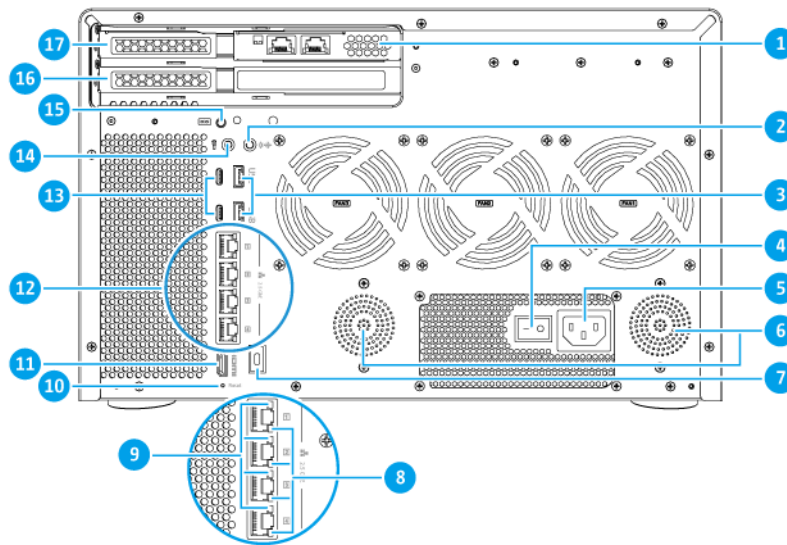
No.	Component	No.	Component
1	LCD panel	6	USB One Touch Copy button
2	Enter button	7	USB 3.2 Gen 2 (10Gbps) Type-A port
3	Select button	8	Drive LEDs
4	M.2 LEDs	9	SSD LEDs
5	Power button	-	-



TVS-h1688X


No.	Component	No.	Component
1	Enter button	6	USB One Touch Copy button
2	Select button	7	USB 3.2 Gen 2 (10Gbps) Type-A port
3	M.2 LEDs	8	Drive LEDs
4	SSD LEDs	9	LCD panel
5	Power button	-	-

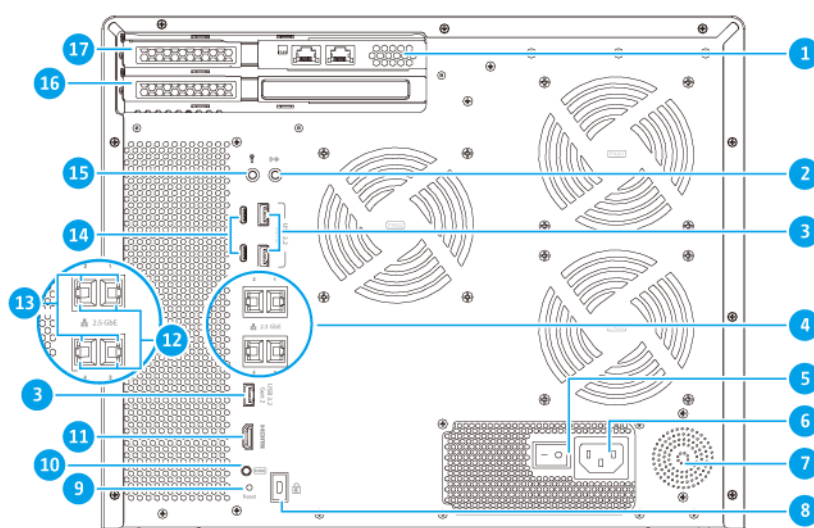
Rear Panel






TVS-h1288X

No.	Component	No.	Component	No.	Component
1	PCIe 3.0 x8 slot 1 Note This slot comes preinstalled with a NIC.	7	Kensington security slot	13	USB 3.2 Gen 2 (10Gbps) Type-C ports
2	3.5 mm line-out jack	8	2.5 Gigabit Ethernet activity LEDs	14	3.5 mm dynamic microphone jack
3	USB 3.2 Gen 2 (10Gbps) Type-A ports	9	2.5 Gigabit Ethernet speed LEDs	15	COM port Note This port is for engineering purposes only.
4	Power switch	10	Reset button	16	PCIe 3.0 x4 slot 3 Note Only the PCIe 3.0 x4 slot supports the QNAP QXP-T32P Thunderbolt 3 expansion card.

No.	Component	No.	Component	No.	Component
5	Power port	11	HDMI 1.4b port	17	PCIe 3.0 x4 slot 2
					 Note Only the PCIe 3.0 x4 slot supports the QNAP QXP-T32P Thunderbolt 3 expansion card.
6	Speakers	12	2.5 Gigabit Ethernet ports	-	-



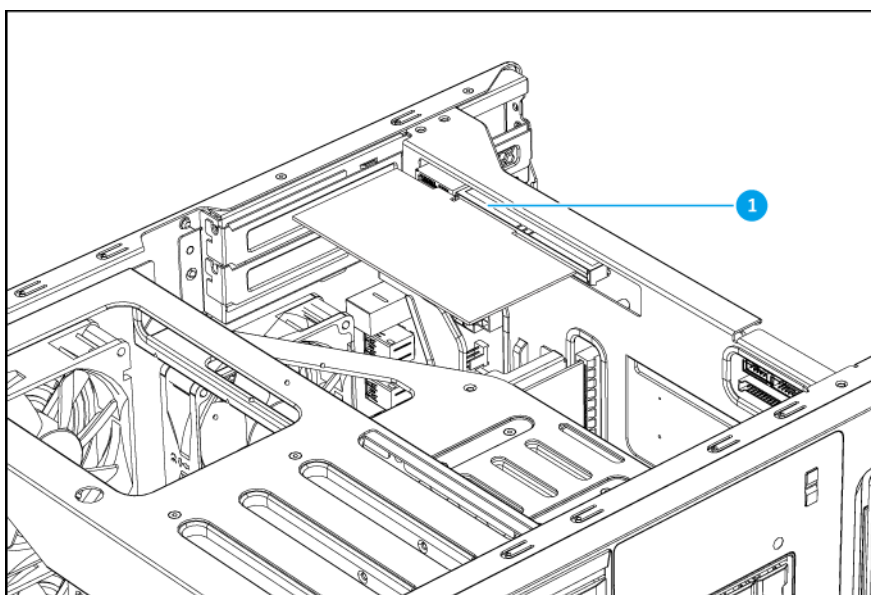
TVS-h1688X

No.	Component	No.	Component	No.	Component
1	PCIe 3.0 x8 slot 1	7	Speaker	13	2.5 Gigabit Ethernet speed LEDs
	 Note This slot comes preinstalled with a NIC.				
2	3.5 mm dynamic microphone jack	8	Kensington security slot	14	USB 3.2 Gen 2 (10Gbps) Type-C ports
3	USB 3.2 Gen 2 (10Gbps) Type-A ports	9	Reset button	15	3.5 mm line-out jack
4	2.5 Gigabit Ethernet ports	10	COM port	16	PCIe 3.0 x4 slot 3
			 Note This port is for engineering purposes only.		 Note Only the PCIe 3.0 x4 slot supports the QNAP QXP-T32P Thunderbolt 3 expansion card.

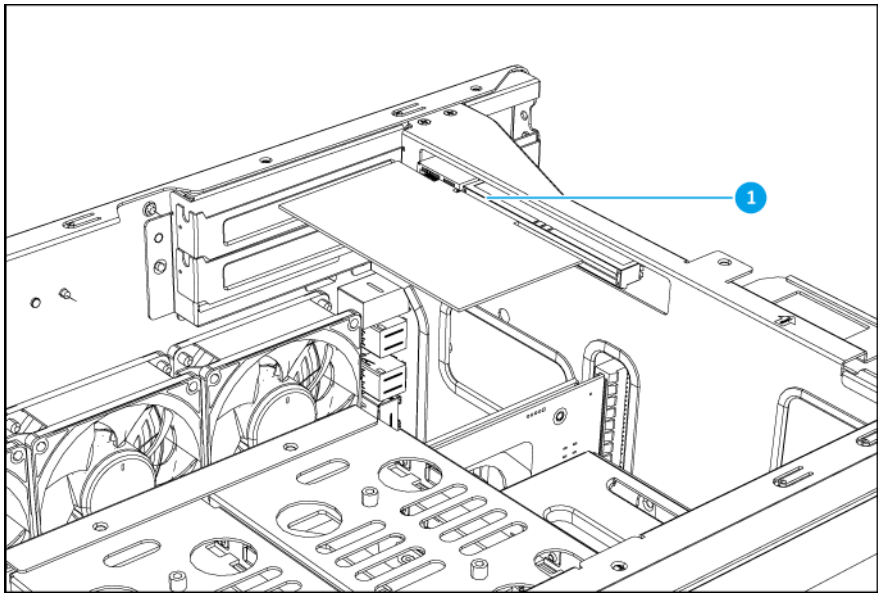
No.	Component	No.	Component	No.	Component
5	Power switch	11	HDMI 1.4b port	17	PCIe 3.0 x4 slot 2
6	Power port	12	2.5 Gigabit Ethernet activity LEDs	-	-

Note
Only the PCIe 3.0 x4 slot supports the QNAP QXP-T32P Thunderbolt 3 expansion card.

Left Panel



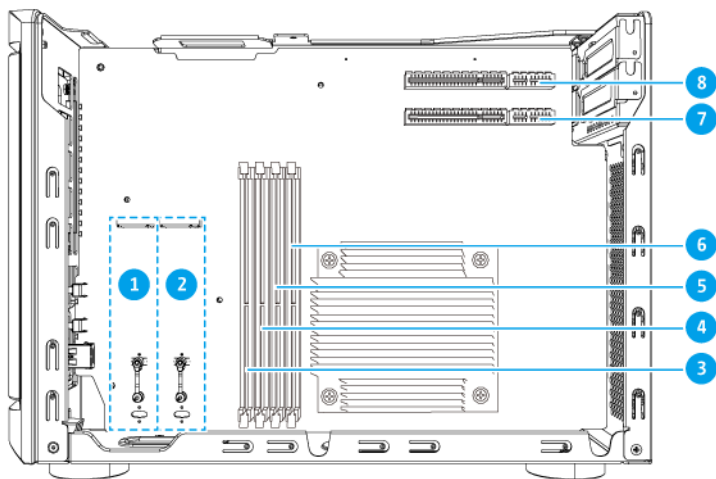
TVS-h1288X



TVS-h1688X

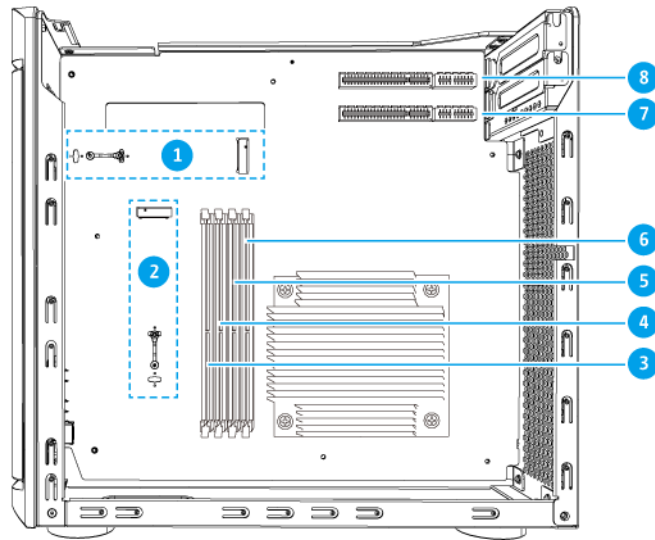
No.	Component	No.	Component
1	PCIe 3.0 x8 slot	-	-
<div><div></div><div>Note This slot comes preinstalled with a NIC.</div></div>			

Right Panel



TVS-h1288X

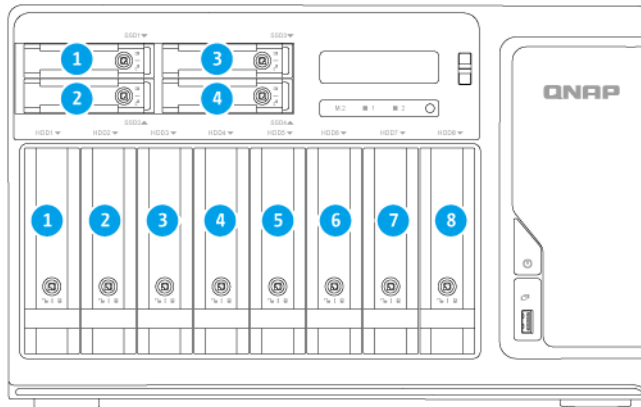
No.	Component	No.	Component
1	M.2 SSD slot 2	5	Memory slot 3
2	M.2 SSD slot 1	6	Memory slot 4
3	Memory slot 1	7	PCIe 3.0 x4 slot 3
4	Memory slot 2	8	PCIe 3.0 x4 slot 2



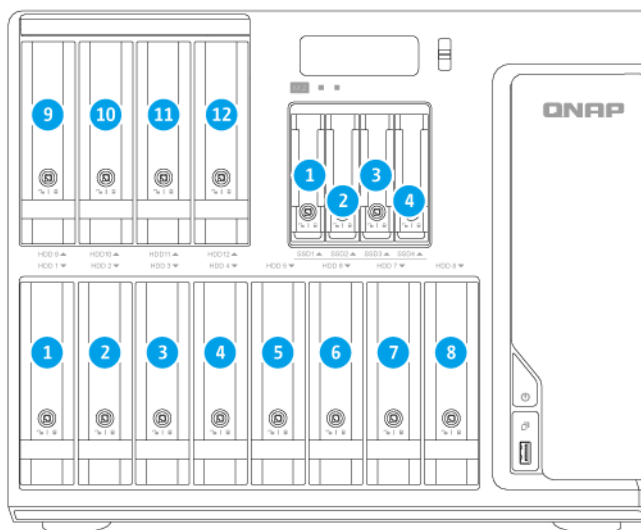
TVS-h1688X

No.	Component	No.	Component
1	M.2 SSD slot 1	5	Memory slot 3
2	M.2 SSD slot 2	6	Memory slot 4
3	Memory slot 1	7	PCIe 3.0 x4 slot 3
4	Memory slot 2	8	PCIe 3.0 x4 slot 2

Drive Numbering



TVS-h1288X



TVS-h1688X

Safety Information

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

General Instructions

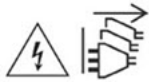
- The device should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.
- Only qualified, skilled, and authorized persons with knowledge of all restrictions, safety precautions, and installation and maintenance procedures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

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

Power

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

•



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

System Battery

- This product contains a button battery.
- If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours.
- Keep batteries out of reach of children.
- If you think batteries may have been swallowed or placed inside any part of the body, seek immediate medical attention.
- To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.
- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

Moving Parts

•



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


•



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

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

Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> 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 NAS ventilation or apply pressure to the NAS or power cord
Hardware and peripherals	<ul style="list-style-type: none"> Storage drives <div>  Tip For the list of compatible drive models, go to https://www.qnap.com/compatibility. </div> <ul style="list-style-type: none"> 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 in [Safety 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](#).
- Install the drives.
For details, see the following topics.
 - [Installing 3.5-inch Hard Drives on 3.5-inch Trays](#)
 - [Installing 2.5-inch or Solid-State Drives on 3.5-inch Trays](#)
 - [Installing 2.5-inch Hard Drives on 2.5-inch Drive Trays](#)
 - [Installing M.2 Solid-State Drives on the Right Panel](#)
- Optional: Install expansion cards.
For details, see [Installing Expansion Cards](#)
- Optional: Replace memory modules.
For details, see [Replacing Memory Modules](#)
- Optional: Connect the expansion units.
For details, see [Installing Expansion Units](#)
- Connect the power cord and all applicable cables.
- 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, memory modules, and expansion cards.

Drive Installation

The TVS-h1288X and the TVS-h1688X are compatible with 3.5-inch hard drives, 2.5-inch hard drives, and 2.5-inch solid-state drives.

Installing 3.5-inch Hard Drives on 3.5-inch Trays



Warning

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

•



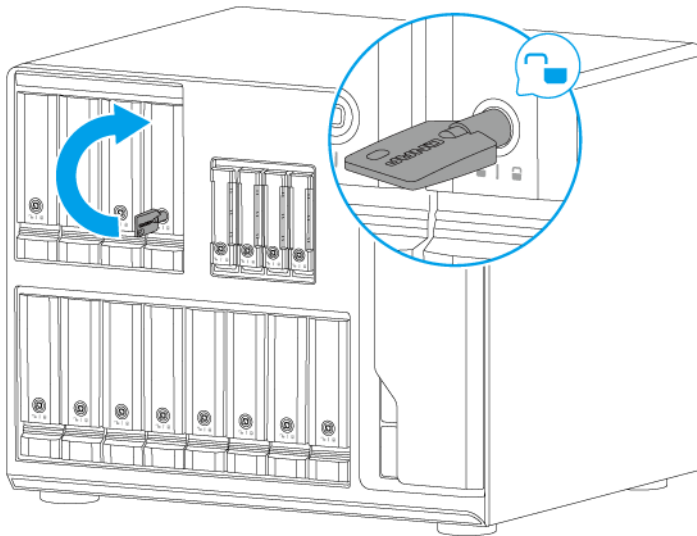
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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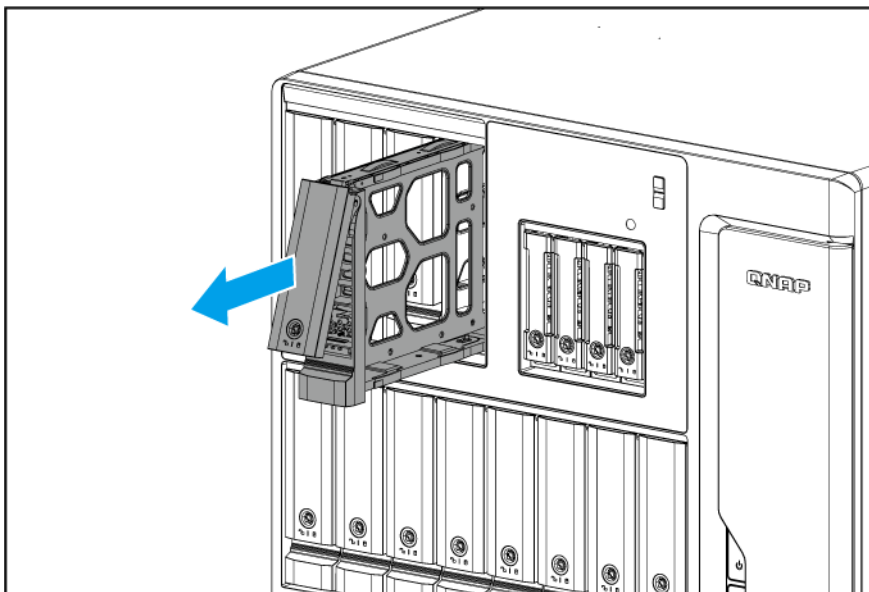


Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
2. Remove the drive tray.
 - a. Optional: Unlock the tray.



- b. Pull the handle to release the tray.



- c. Pull the tray out.



Note

The preinstalled drive trays come unlocked.

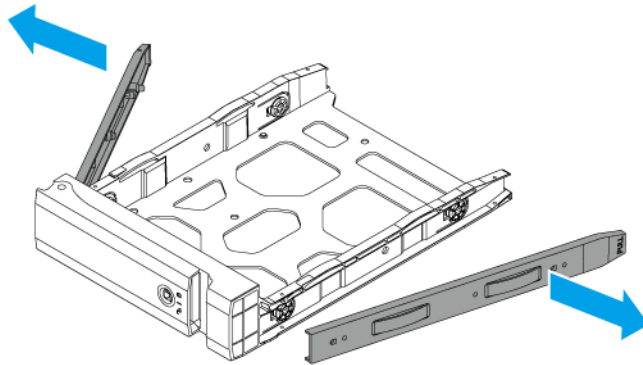


Important

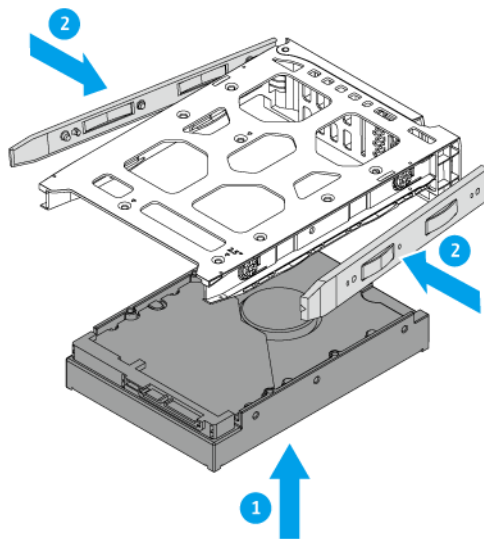
Ensure the drive tray keys are stored in a safe place.

3. Install a drive on the tray.

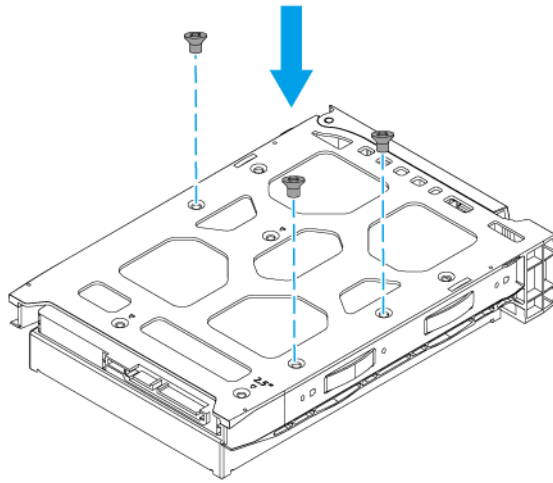
- a. Remove the fastening panels from the sides of the drive tray.



- 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.

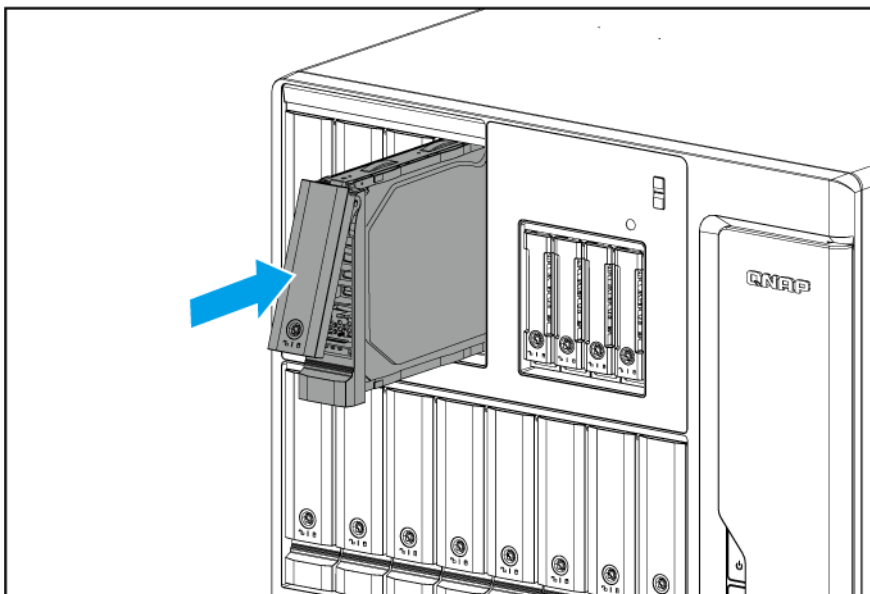


- d.** Attach the screws to lock the drive to the tray.

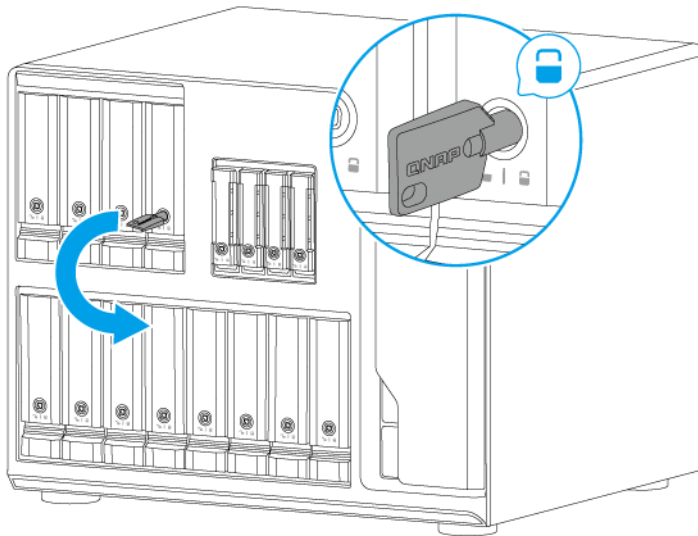
**Note**

Attaching screws provides further security and stability for 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 or 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.

•



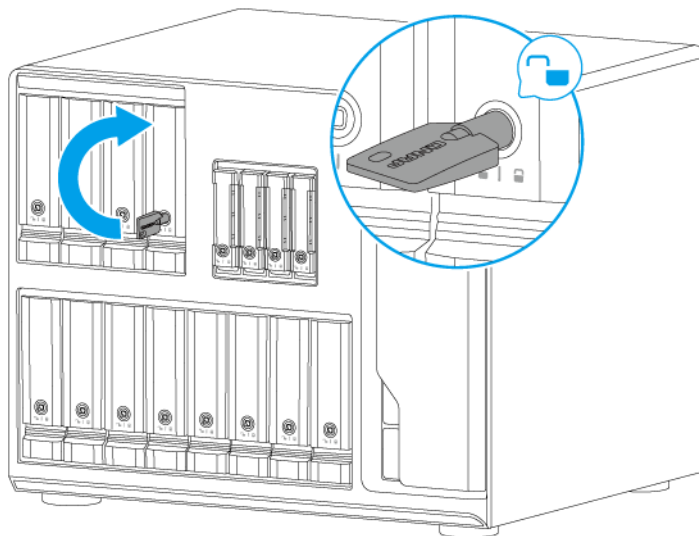
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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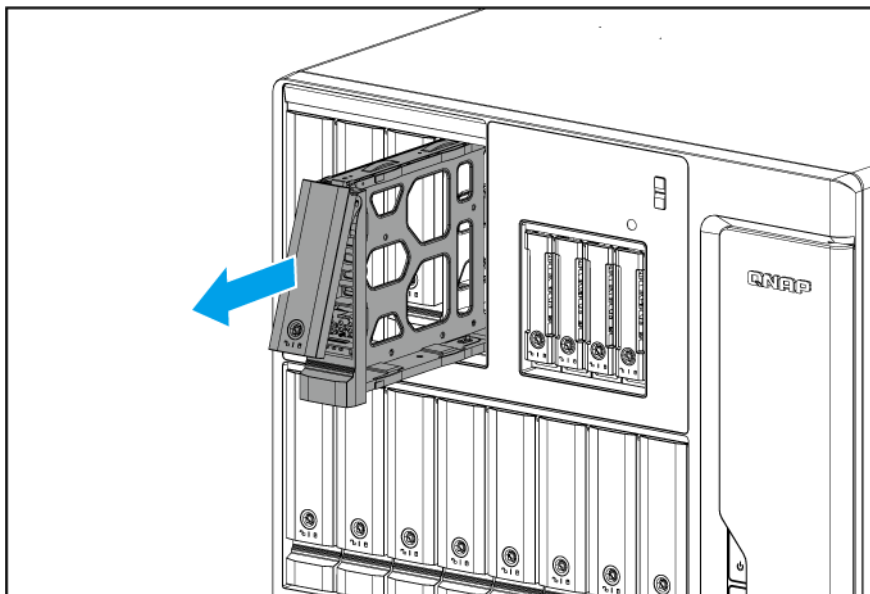


Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
2. Remove the drive tray.
 - a. Unlock the tray.



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

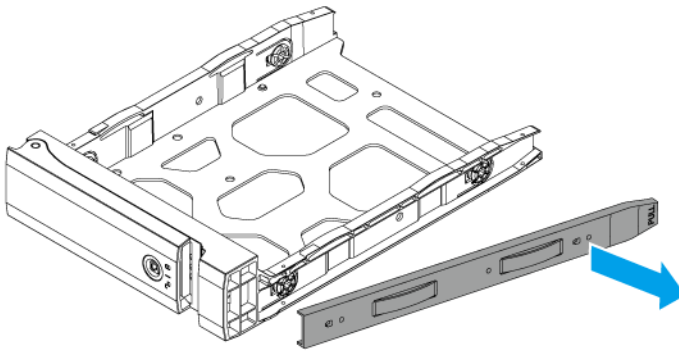

Note

The preinstalled drive trays come unlocked.

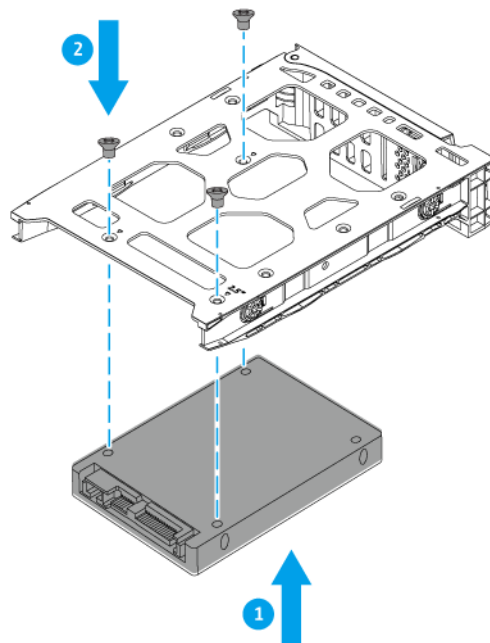

Important

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

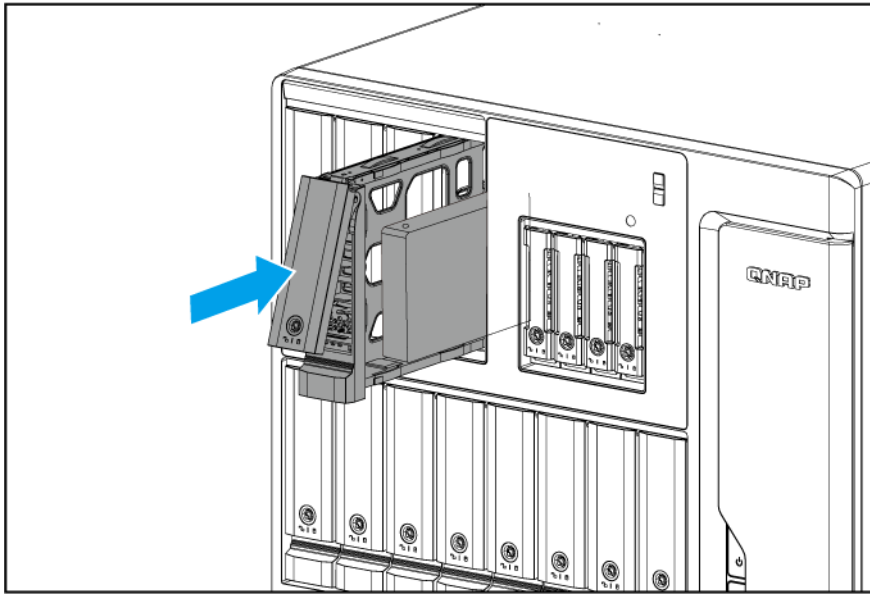
3. Install a drive on the tray.
 - a. Remove the right fastening panel from the drive tray.



- 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 Hard Drives on 2.5-inch Drive Trays



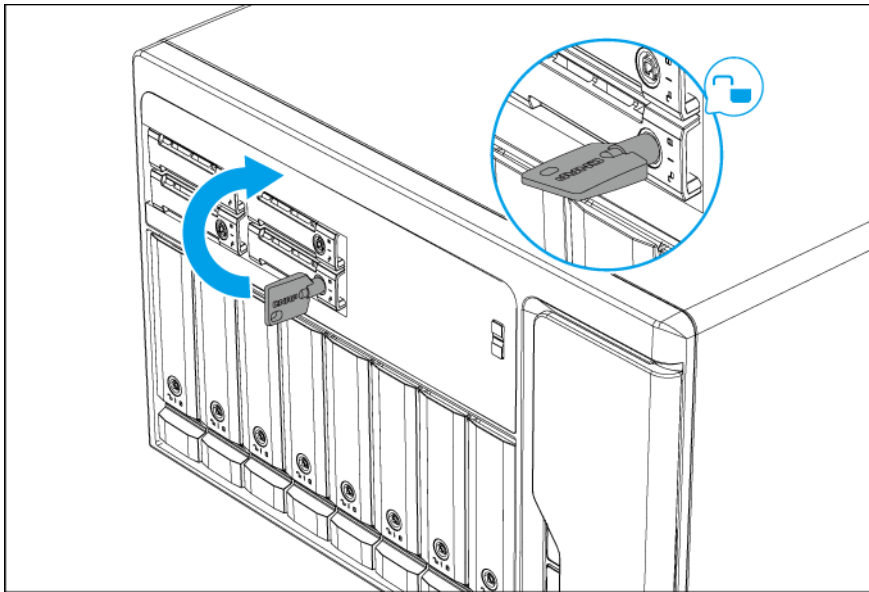
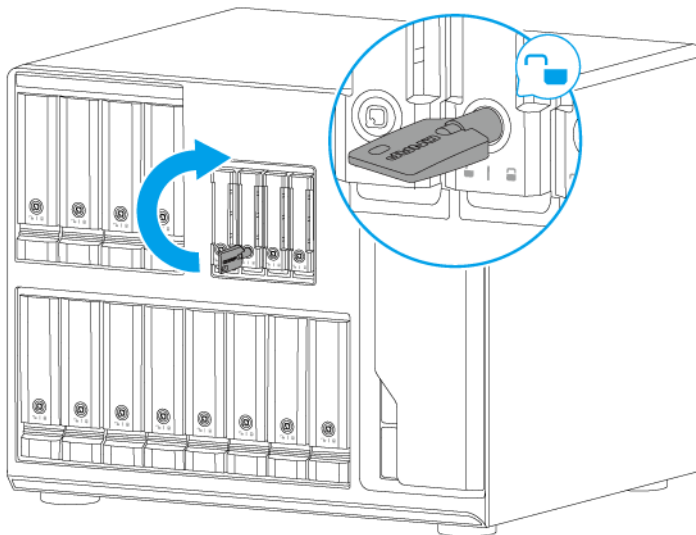
Warning

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

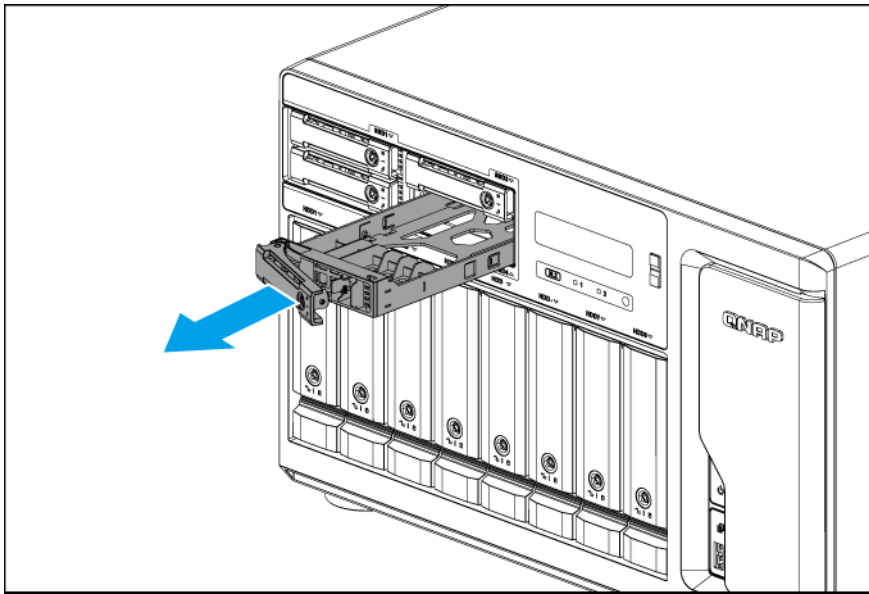
1. Power off the NAS.

2. Remove the drive tray.

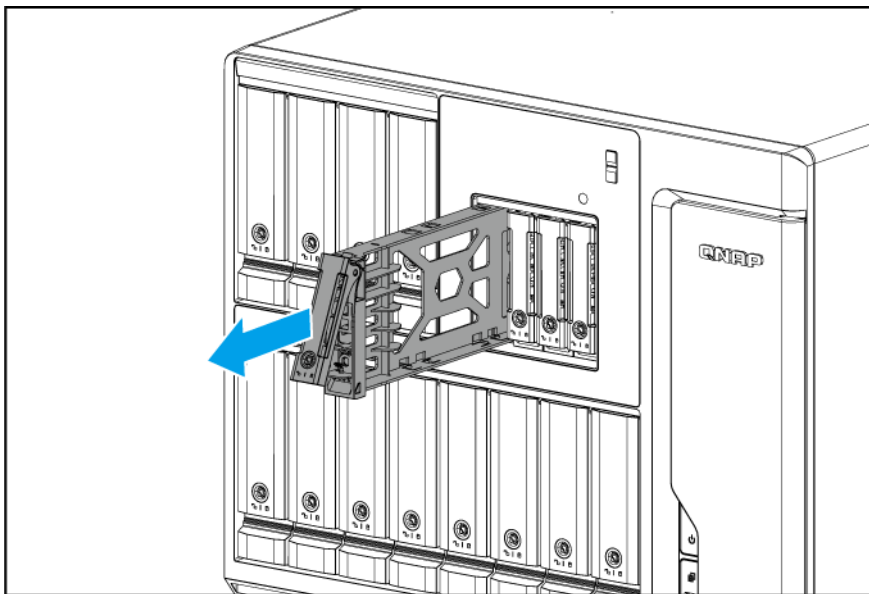
a. Unlock the tray.

**TVS-h1288X****TVS-h1688X**

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



TVS-h1288X



TVS-h1688X

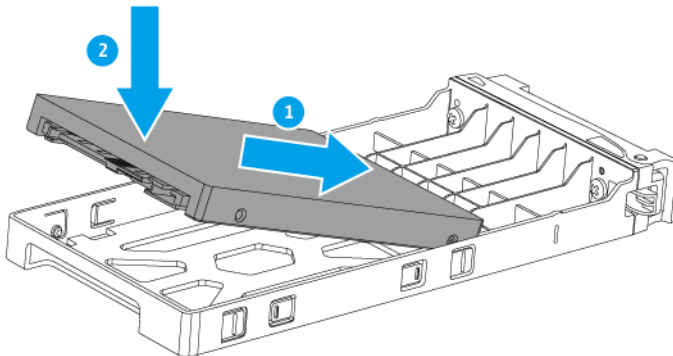
**Note**

The preinstalled drive trays come unlocked.

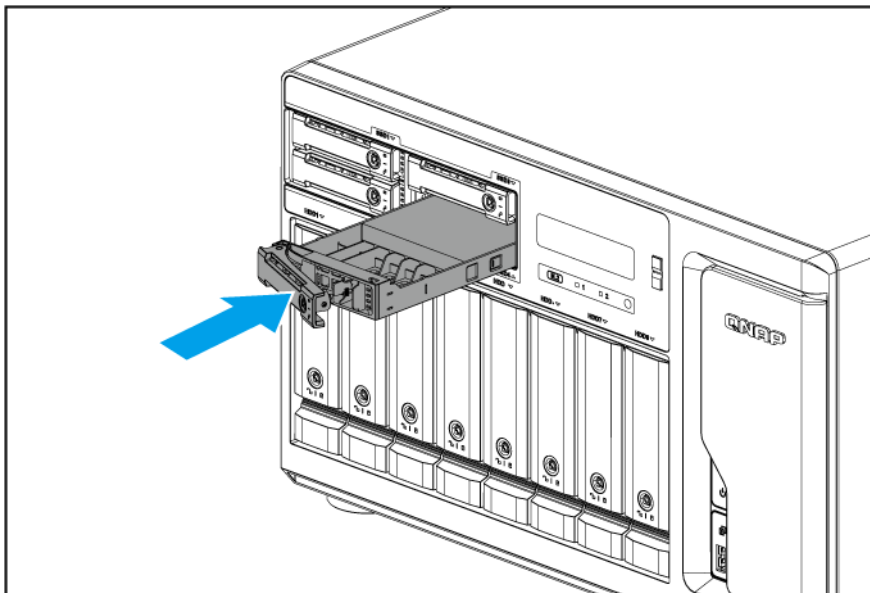
**Important**

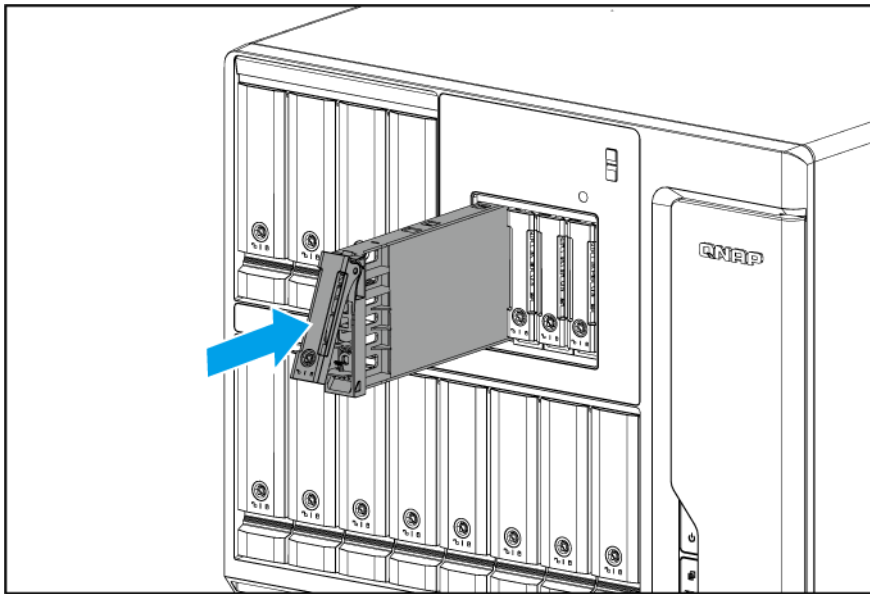
Ensure the drive tray keys are stored in a safe place.

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.

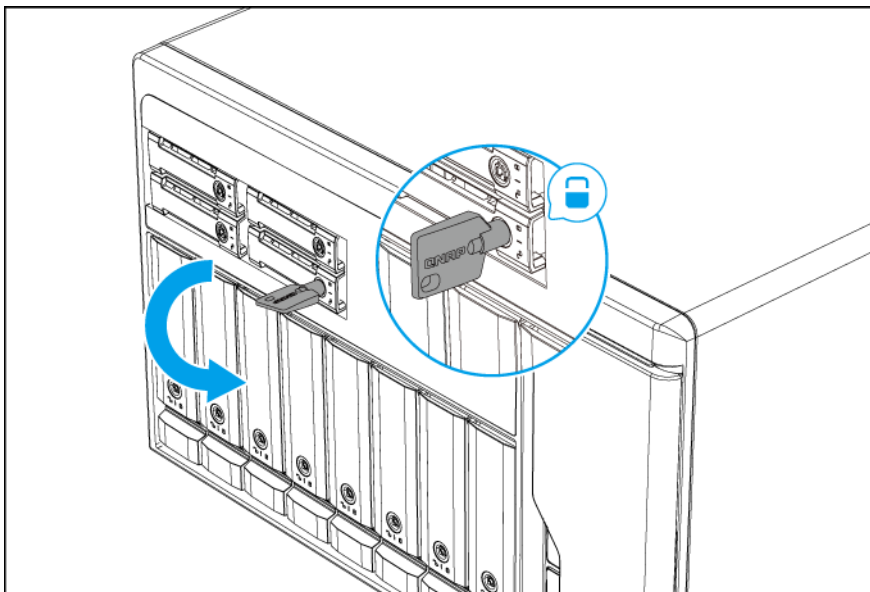


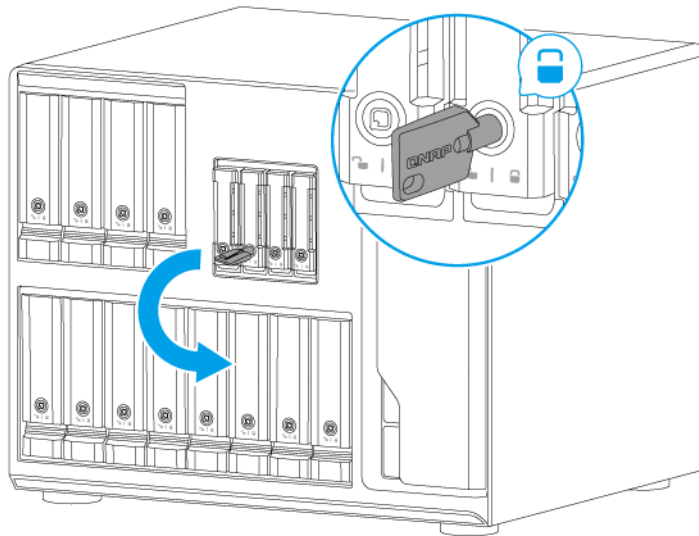
4. Load the tray into the bay.
 - a. Insert the tray into the bay.
 - b. Push the handle.

**TVS-h1288X**

**TVS-h1688X**

c. Lock the tray.

**TVS-h1288X**



TVS-h1688X

5. Power on the NAS.

Installing M.2 Solid-State Drives on the Right Panel

The device has two M.2 NVMe SSD slots on the right panel. For details, see [Right Panel](#).

For a list of compatible M.2 SSDs, go to <http://www.qnap.com/compatibility>.



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.

-



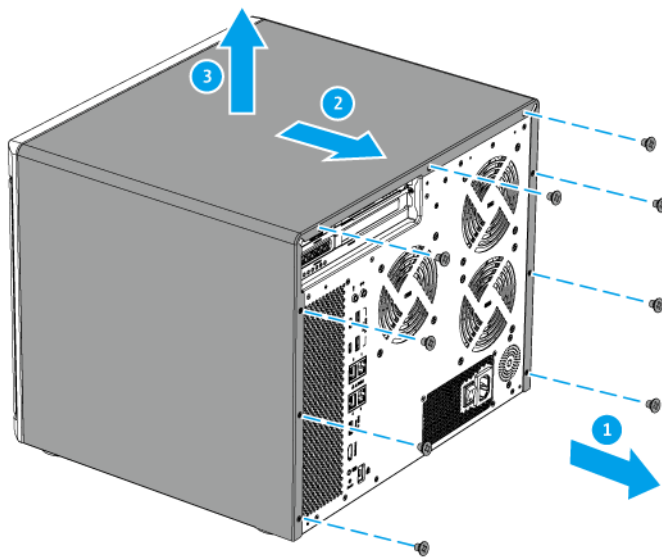
Other moving components: Keep your hands and other body parts away from other moving components.



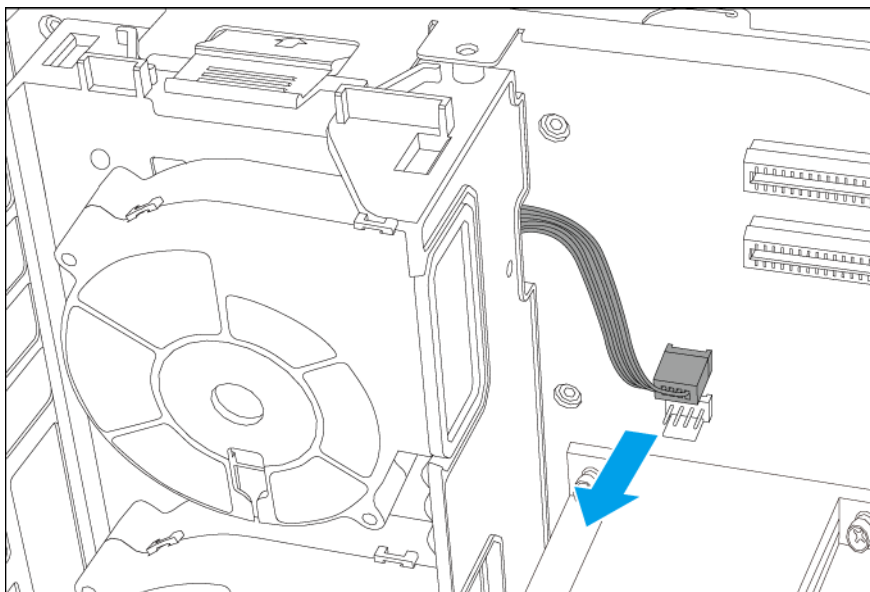
Note

- QNAP recommends installing heatsinks on the M.2 SSD controllers to enhance cooling efficiency and to ensure consistent performance.
- Before installing non-QNAP heatsinks, ensure that they are of the appropriate size and shape.

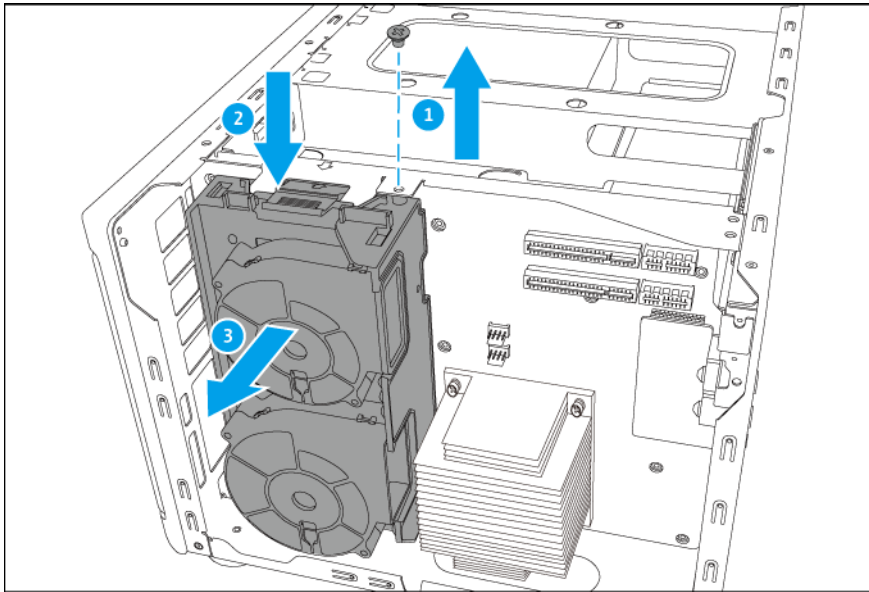
1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
 - a. Loosen the screws.
 - b. Slide the cover back.
 - c. Lift the cover off the device.



5. Remove the fan module.
 - a. Disconnect the fan module from the right panel.



- b. Remove the screw that secures the module to the chassis.
- c. Press the clip and then pull the module away from the system board.



6. Install a heatsink on the M.2 SSD.

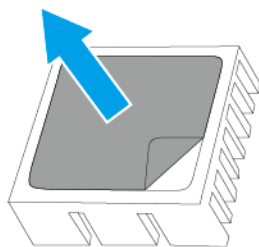
- a. Locate the controller on the M.2 SSD.



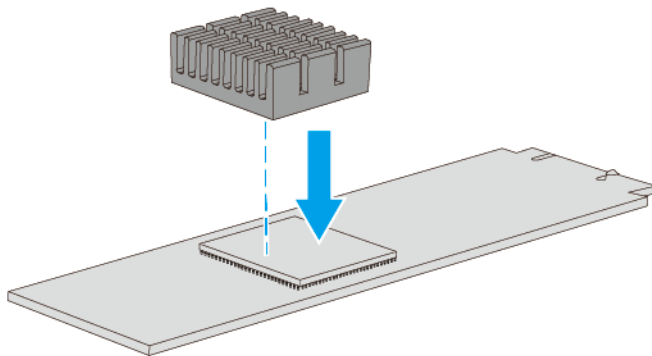
Note

The controller location varies depending on the model and manufacturer of the M.2 SSD. For details, refer to the documentation or contact the manufacturer.

- b. Remove the protective film from the heatsink.

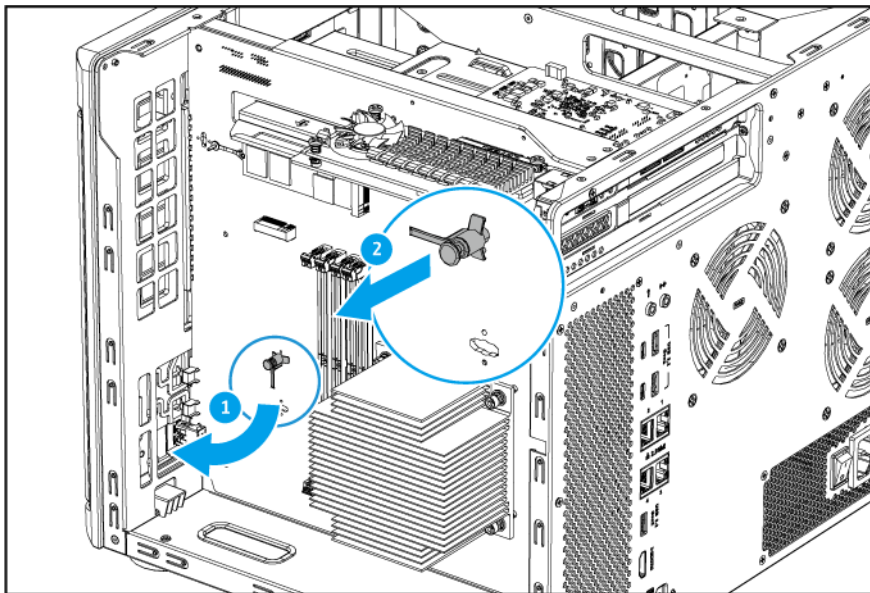


- c. Install the heatsink on the controller.

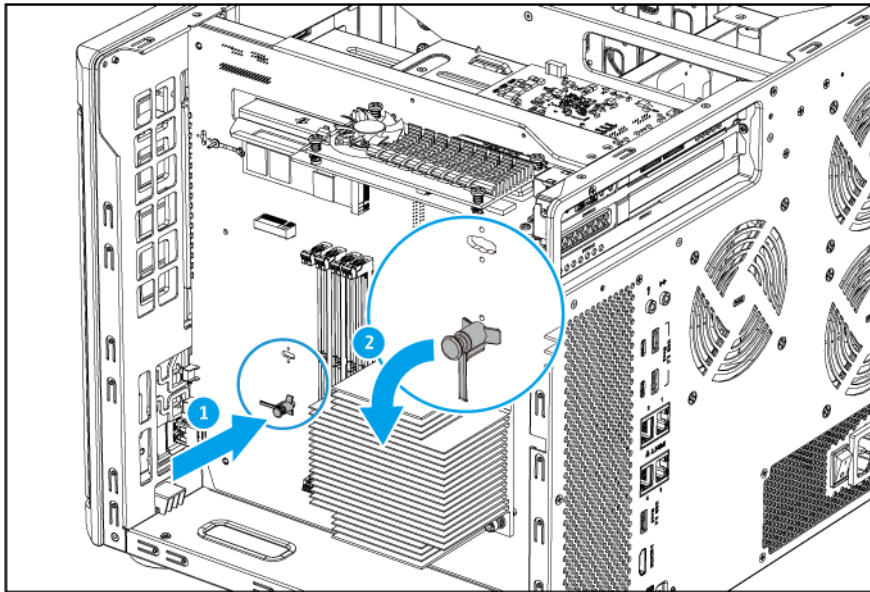


7. Install the M.2 SSD.

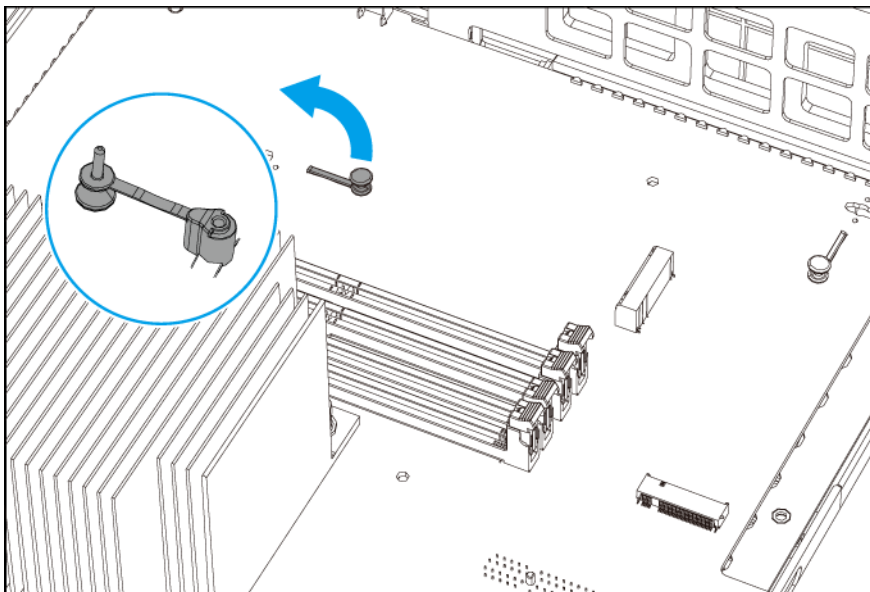
- a. Optional:** To install the M.2 22110, move the pushpin.



M.2 22110

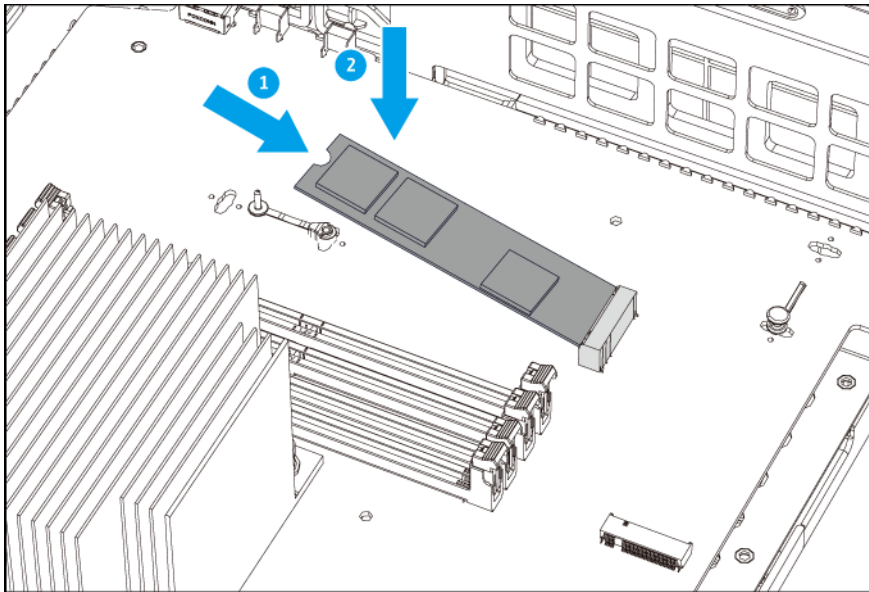


b. Pull out the pushpin.

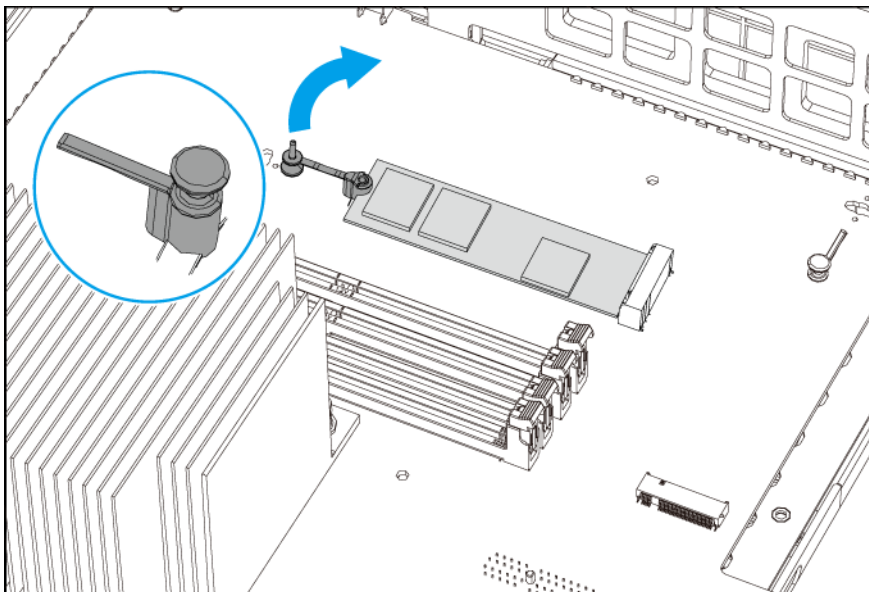


M.2 2280

c. Insert the M.2 SSD into the slot.

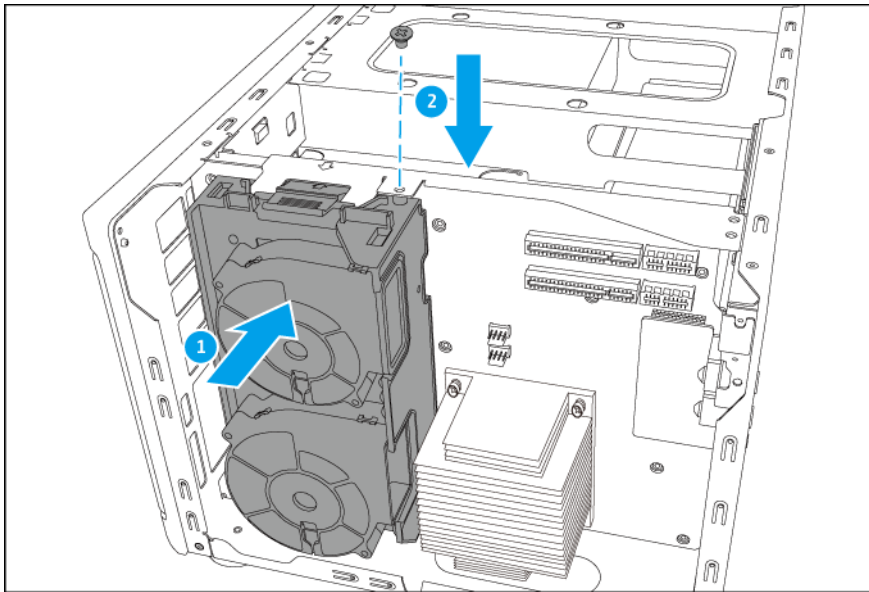


d. Insert the pushpin to secure the drive.

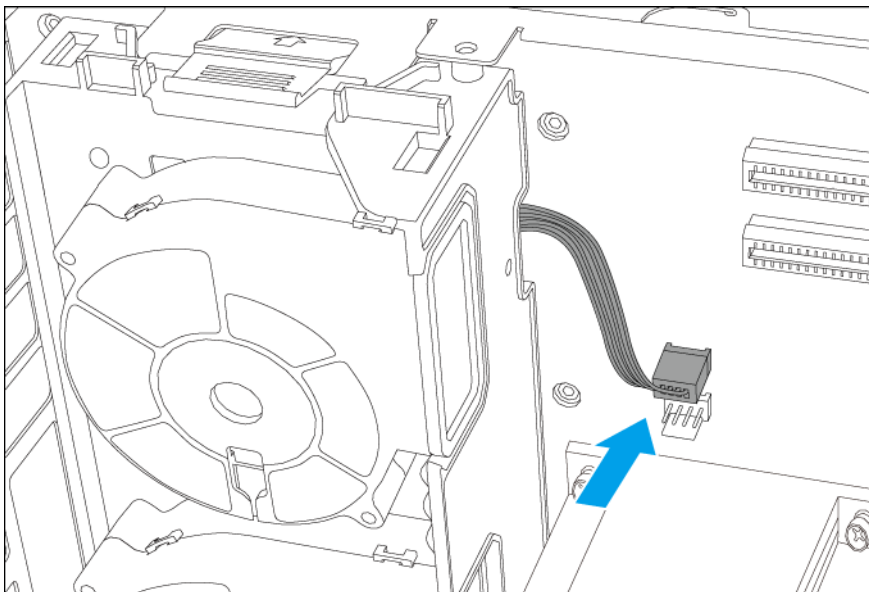


8. Attach the fan module.

- a.** Align the protruding part of the module with the hole on the chassis below the M.2 SSD slot.
- b.** Push the module toward the system board until the clip locks the module into place.
- c.** Attach the screws.

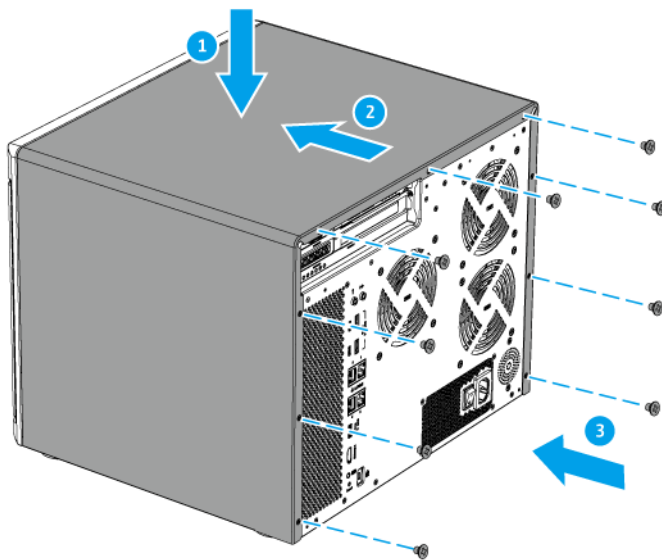


d. Connect the fan cable to the right panel.



9. Attach the case cover.

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



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

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.

-

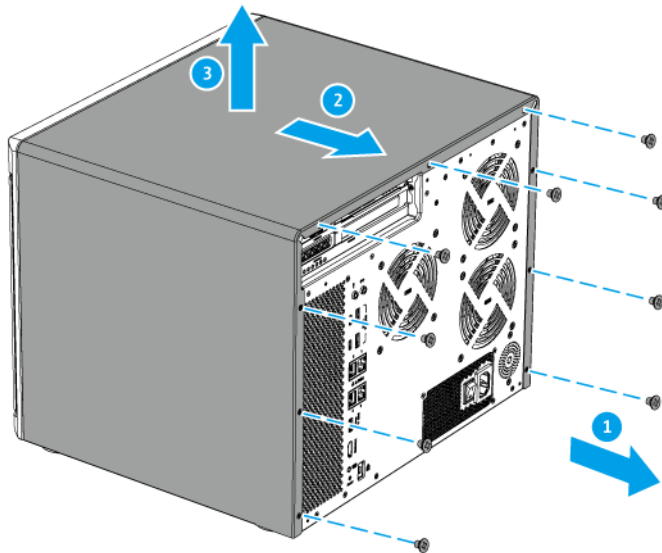


Other moving components: Keep your hands and other body parts away from other moving components.

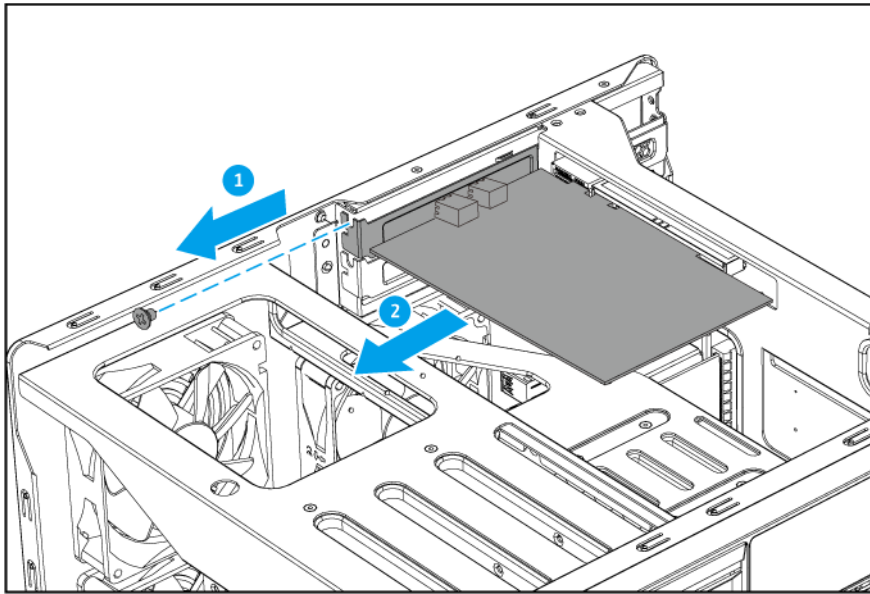
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

1. Check the expansion cards and brackets supported by your model on the QNAP website.
 - a. Go to www.qnap.com/compatibility.
 - 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. 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. Loosen the screws.
 - b. Slide the cover back.
 - c. Lift the cover off the device.

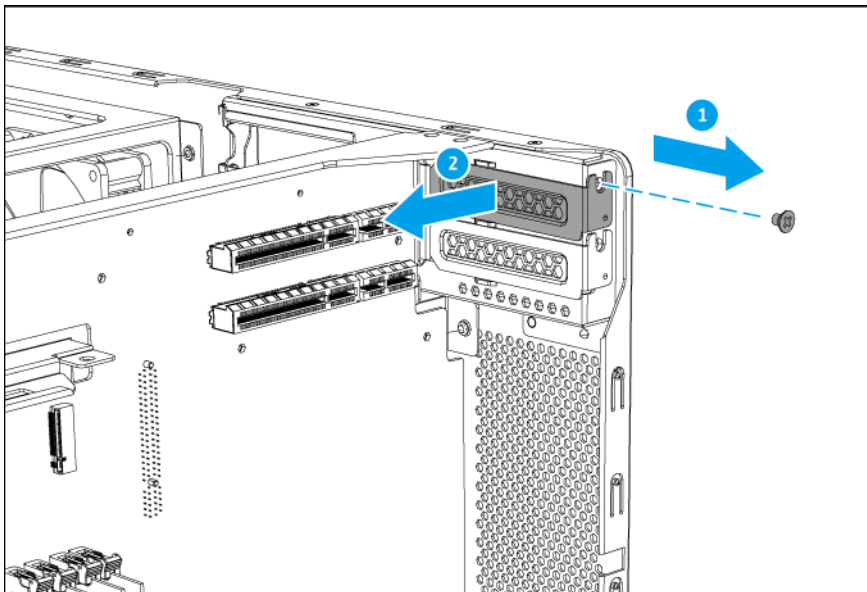


6. Optional: Remove the existing expansion card.
 - a. Remove the screw that secures the cover to the chassis.
 - b. Hold the card by the edges.
 - c. Carefully pull the card out of the slot.



7. Remove the PCIe cover.

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



PCIe 3.0 x4

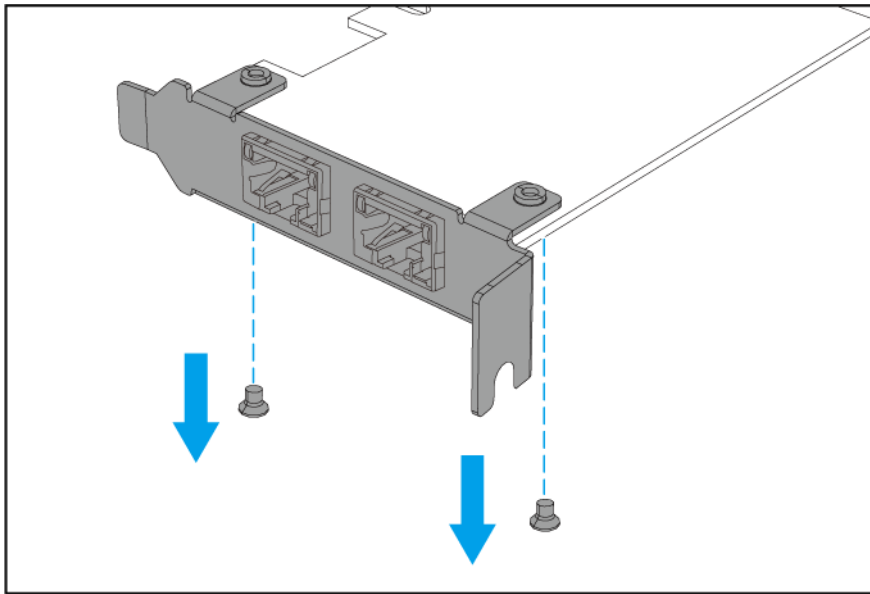
8. Optional: Attach the QNAP bracket to the expansion card.



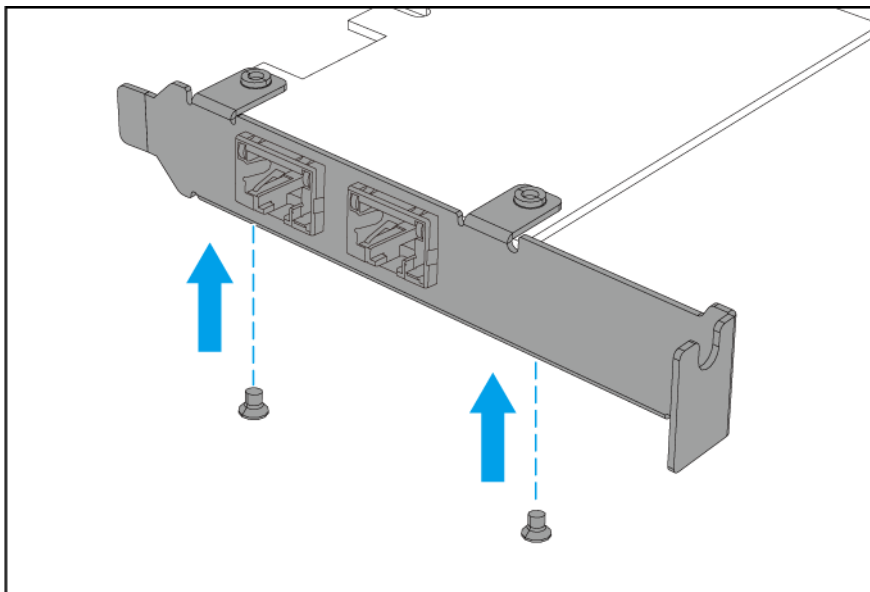
Note

To install a 10 GbE card in the Gen 3 x4 slot, purchase a bracket kit and replace the original bracket with a half-height bracket. For details, go to <https://shop.qnap.com/>.

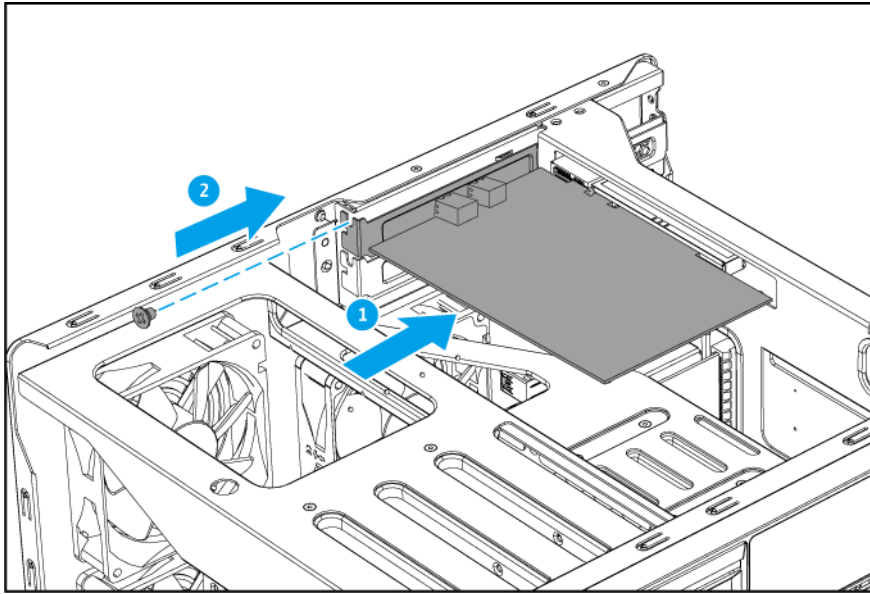
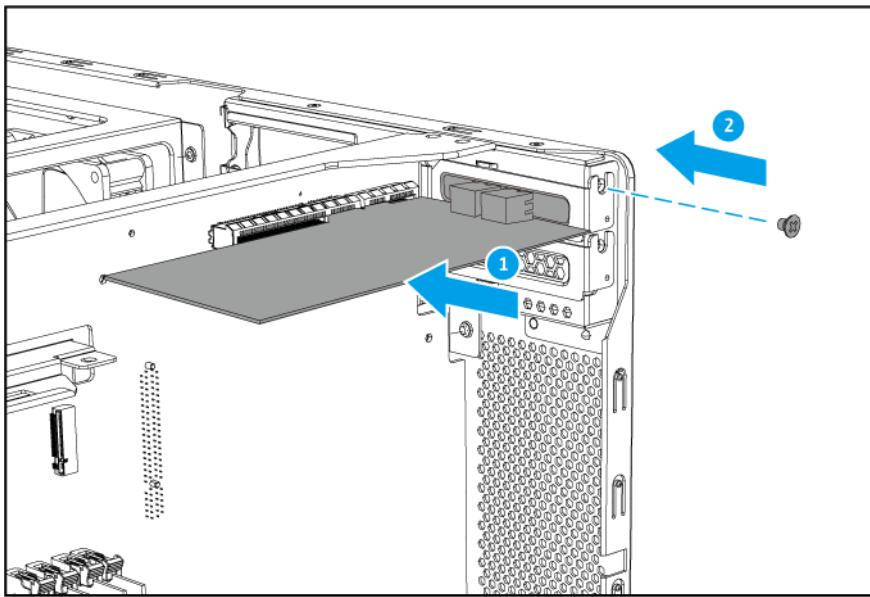
- a.** Remove all screws of the existing bracket.



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

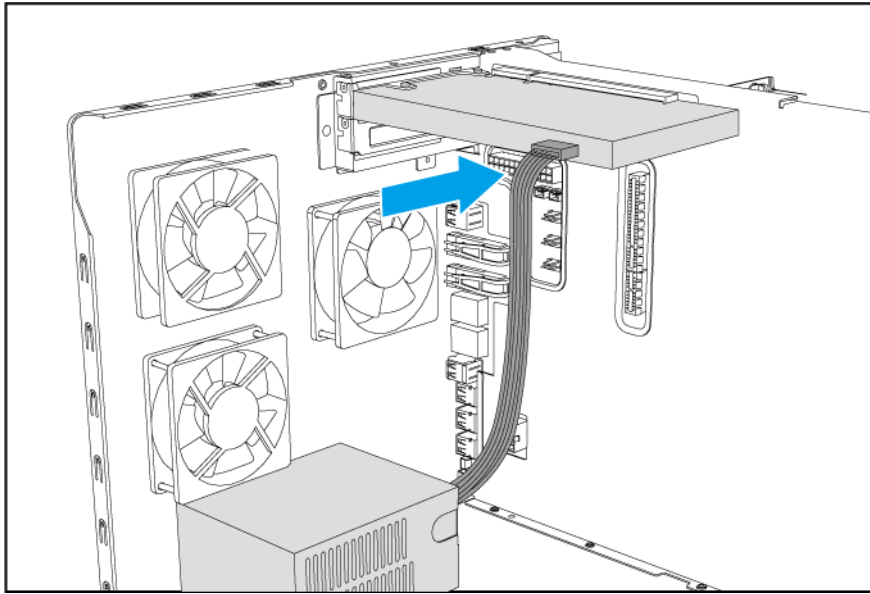


- d.** Verify that the bracket does not move.
- 9.** Install the expansion card.
- a.** Hold the card by the edges.
 - b.** Insert the card into the slot.
 - c.** Attach the screw.

**PCIe 3.0 x8****PCIe 3.0 x4****Note**

Only the PCIe 3.0 x4 slots support the QNAP QXP-T32P Thunderbolt 3 expansion card.

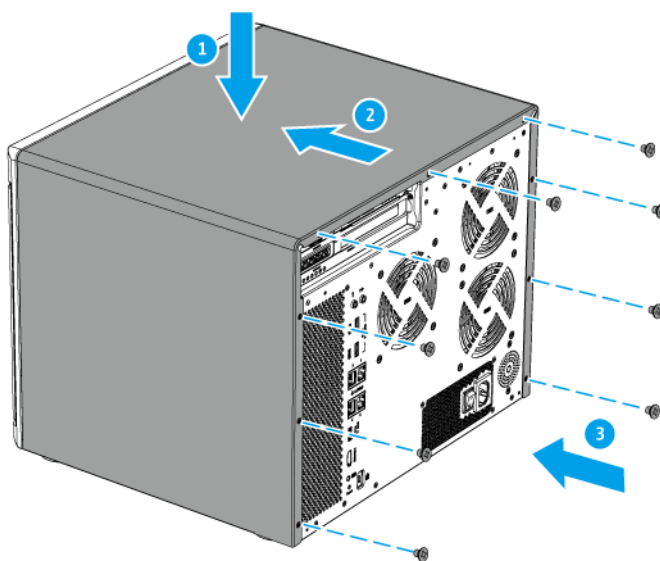
- d. Optional: Attach the PCIe power connector to the expansion card.

**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 the PCIe 3.0 x8 slot.

10. Attach the case cover.

- a. Place the cover on the device.
- b. Slide the cover forward.
- c. Tighten the screws.



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.
- Ensure that each pair uses identical modules.
- Always install a single module in slot 1.

For details on slot numbering, see [Right Panel](#).

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



Warning

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

•



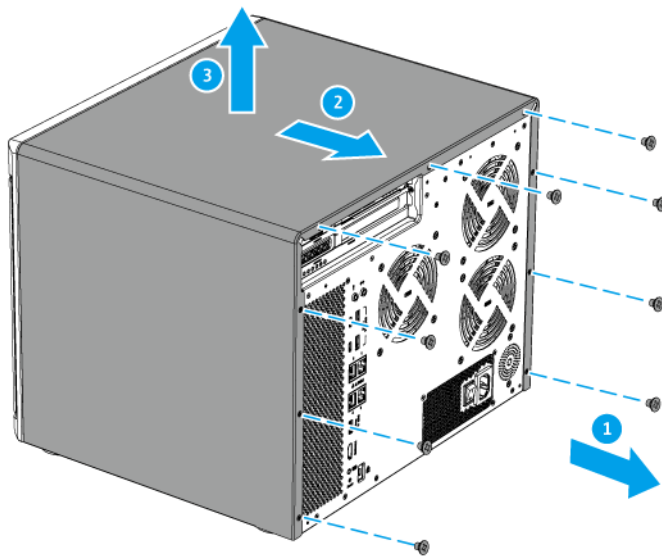
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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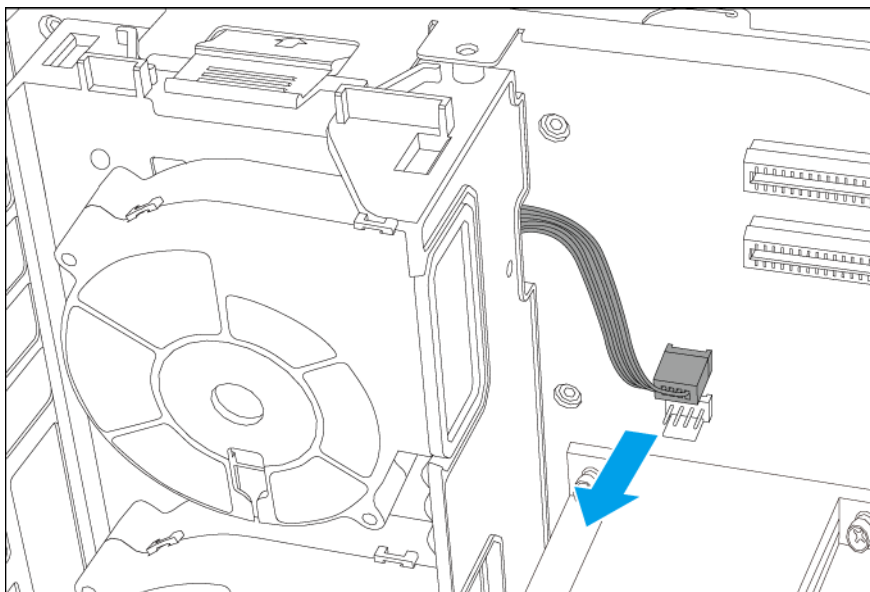


Other moving components: Keep your hands and other body parts away from other moving components.

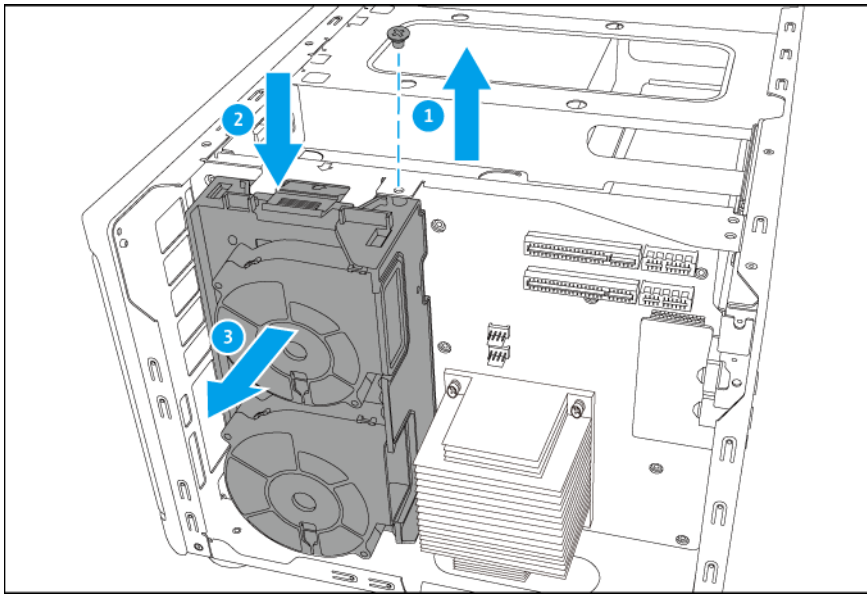
1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
 - a. Loosen the screws.
 - b. Slide the cover back.
 - c. Lift the cover off the device.



5. Place the device on its left side.
6. Remove the fan module.
 - a. Disconnect the fan module from the right panel.



- b. Remove the screw that secures the fan module to the chassis.
 - c. Press the clip and then pull the fan module away from the right panel.



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

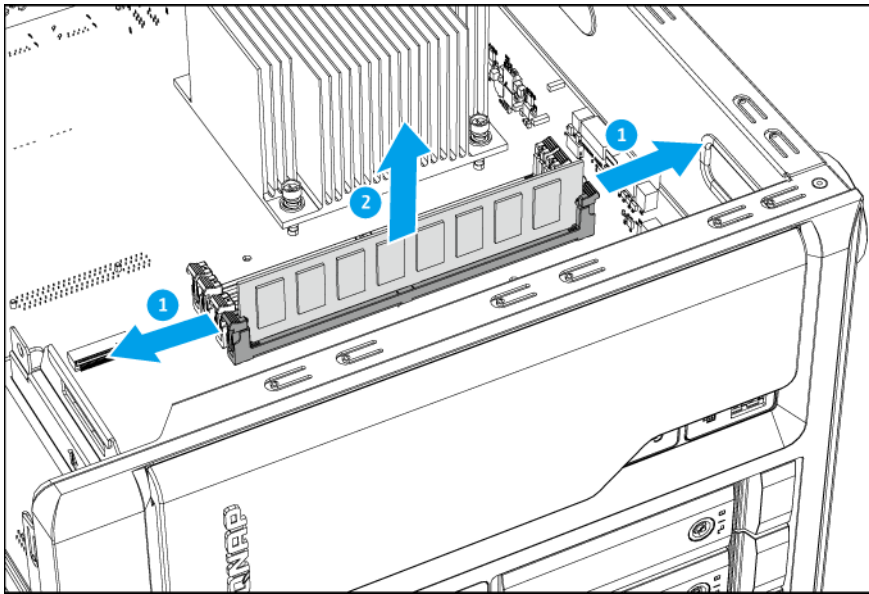
Attempting to remove a module that is not completely released may damage the module and the motherboard.

- c. Hold the module by the edges.
- d. Carefully slide the module out of the slot.



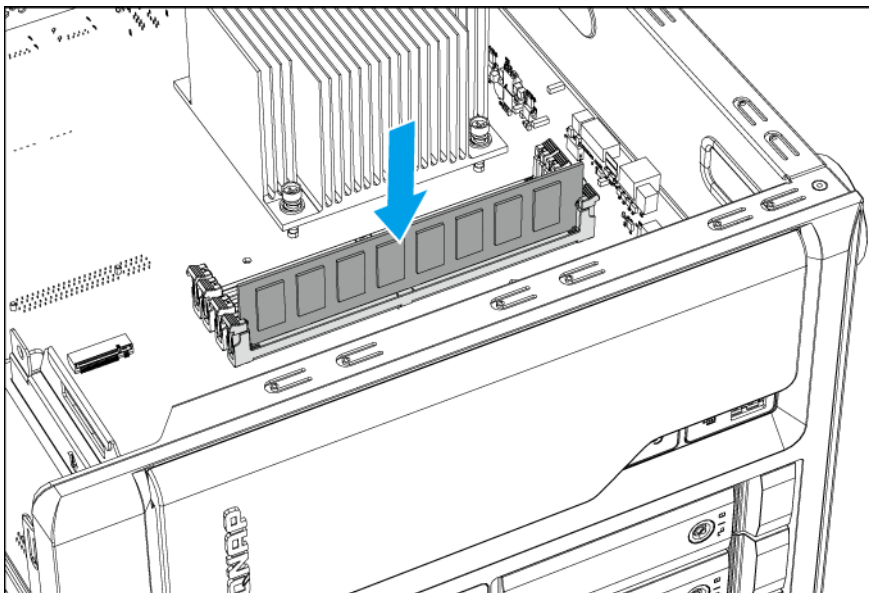
Warning

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



8. Install a new module.

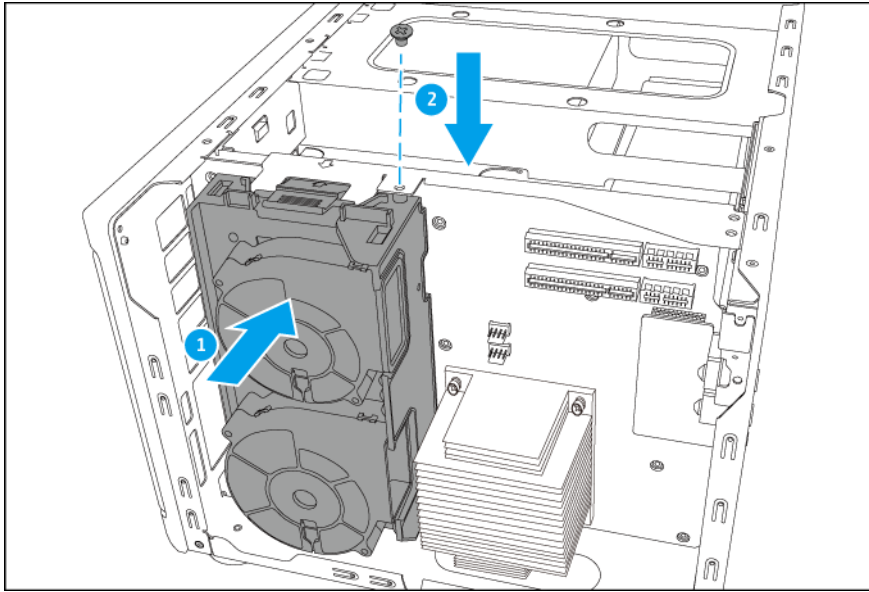
- a. Align the notch with the ridge in the slot.
- b. Insert the module into the slot.
- c. Verify that the metal connectors are completely inserted into the slot.
- d. Carefully press down on the module until the retention clips lock the module into place.



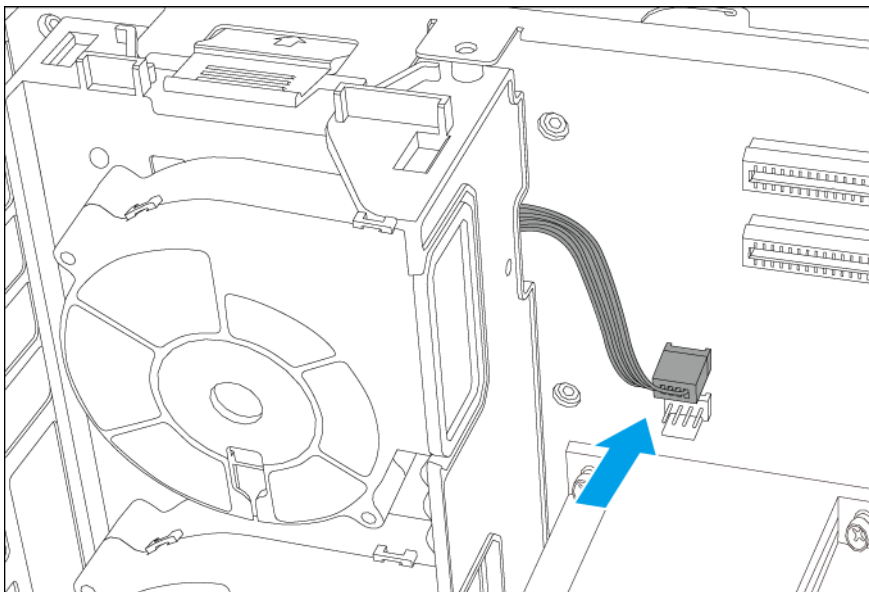
9. Attach the fan module.

- a. Align the protruding part of the fan module with the hole on the chassis below the M.2 SSD slot.
- b. Push the fan module toward the system board until the clip locks the fan module into place.

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



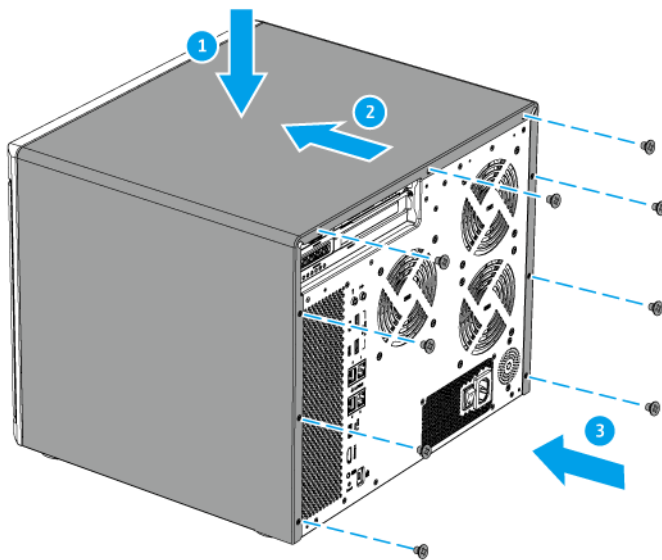
- d.** Connect the fan cable to the right panel.



- 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.** Tighten the screws.



Replacing CPU Fans



Warning

•



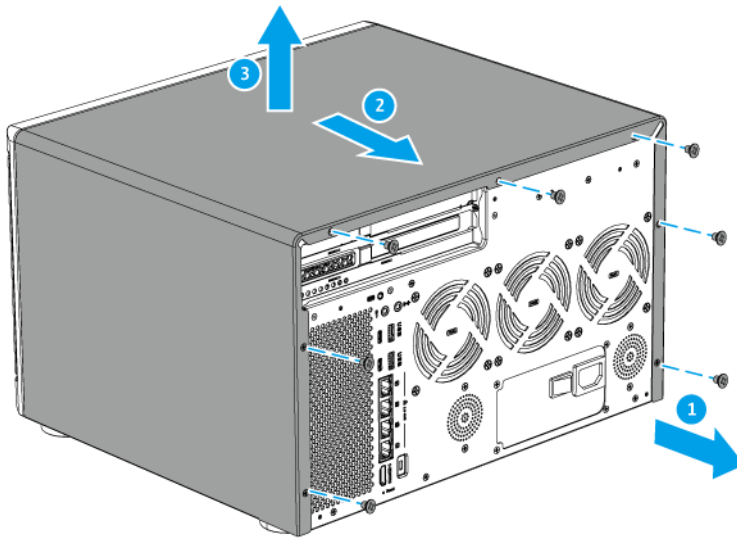
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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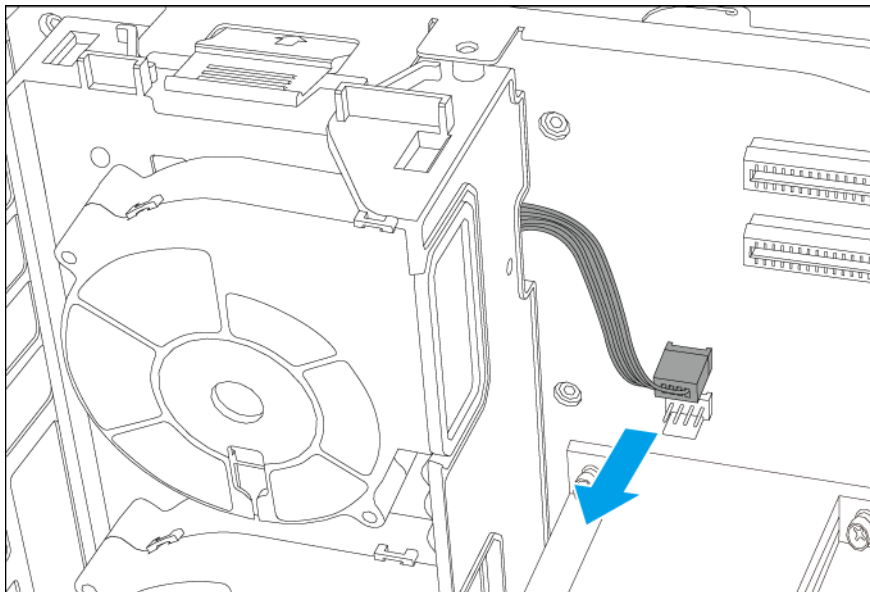
Other moving components: Keep your hands and other body parts away from other moving components.

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



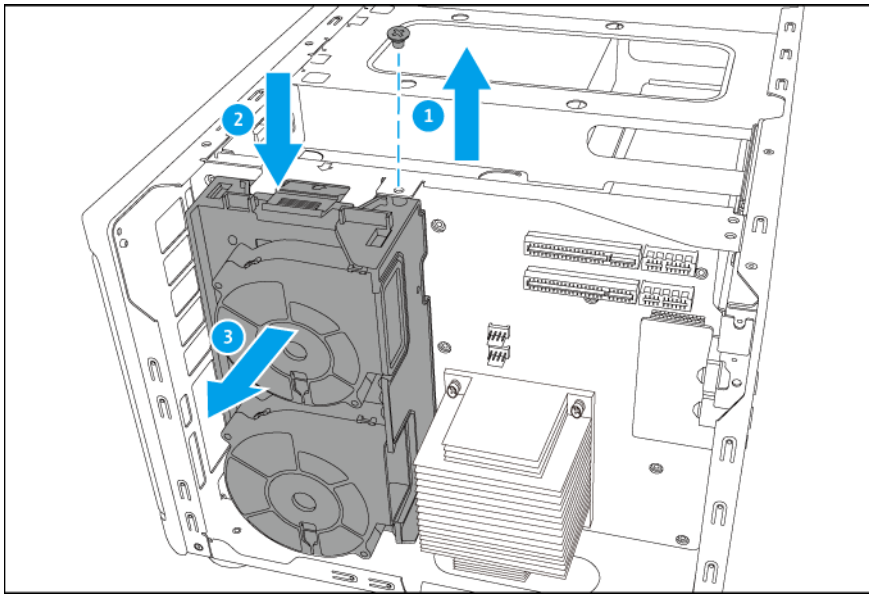
5. Remove the fan module.

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



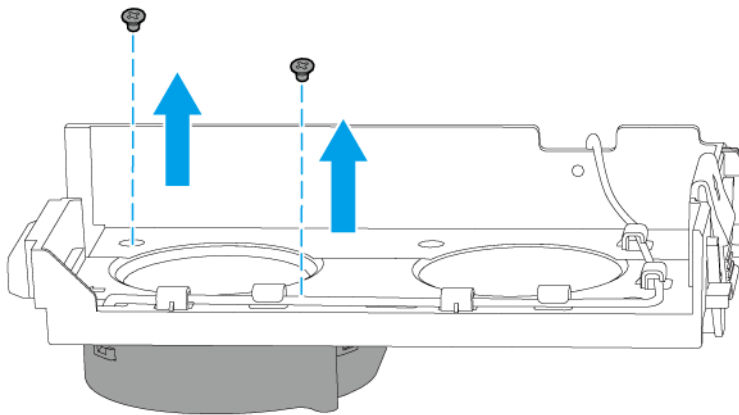
- b. Remove the screw that secures the fan module to the chassis.**

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

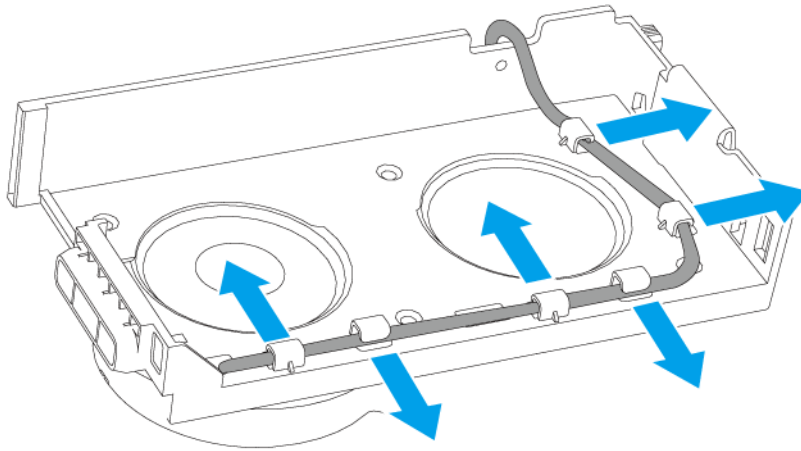


6. Remove an existing fan.

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



- b. Remove the fan cable from the openings of the cable clips on the fan chassis.**



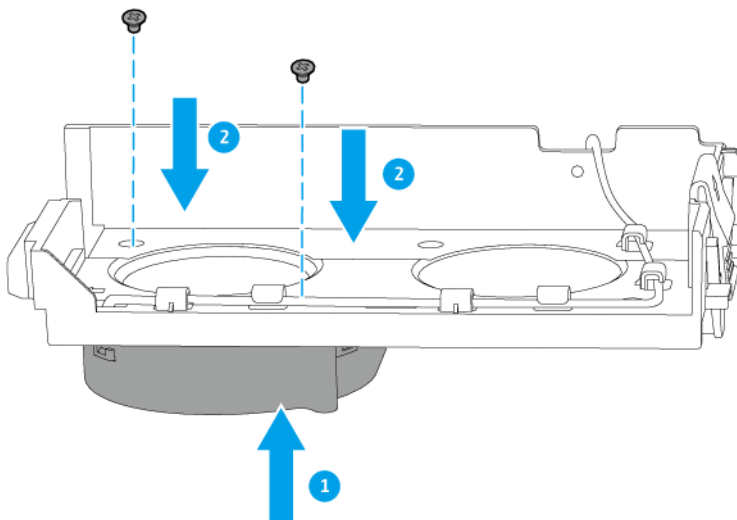
c. Detach the fan from the fan chassis.

7. Install a new fan in the same location.

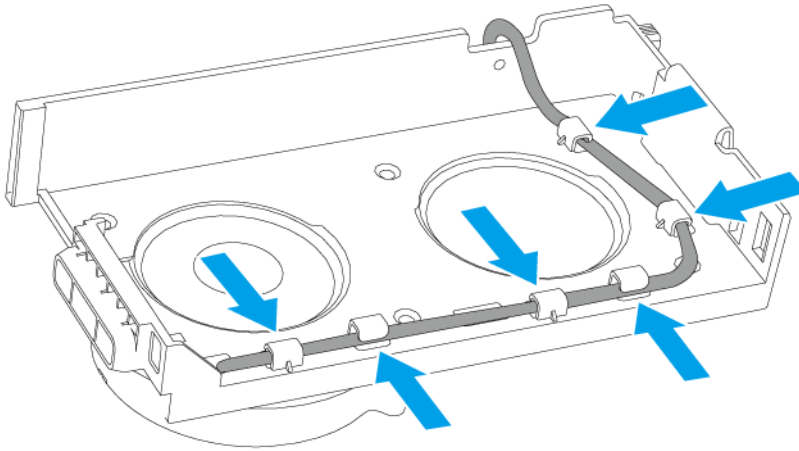
a. Position the fan chassis so that the cable clips face upward.

b. Align the holes on the fan with those on the fan chassis.

c. Attach the screws to secure the fan to the fan chassis.

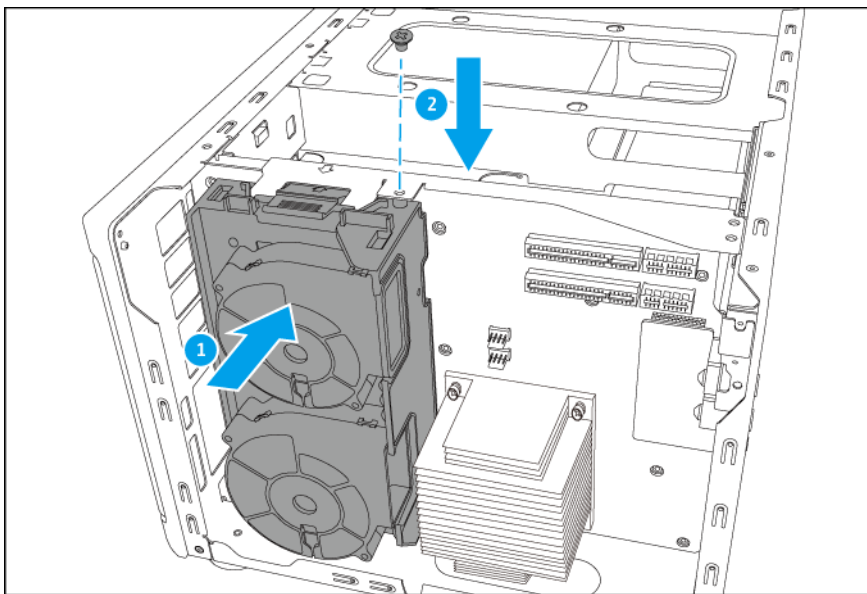


d. Attach the fan cable to openings of the cable clips on the fan chassis.

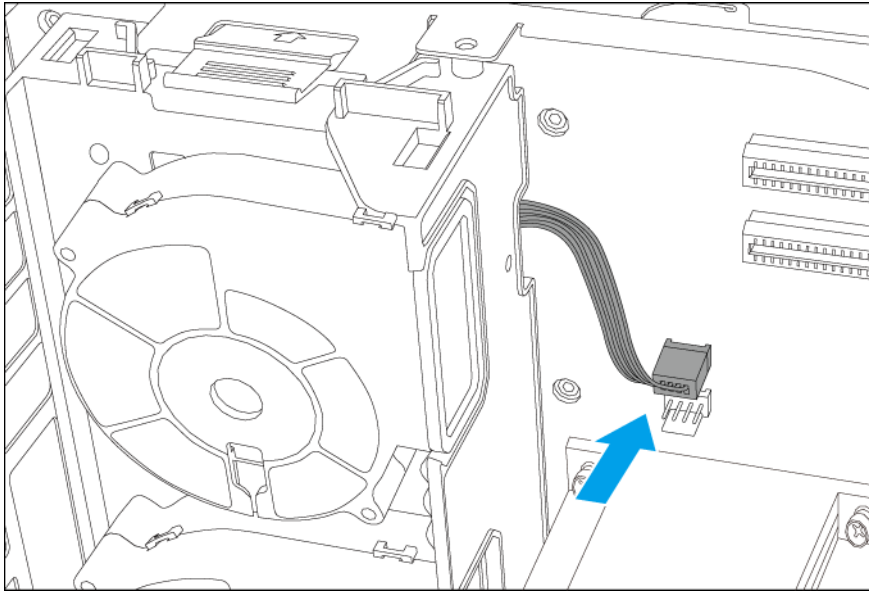


8. Attach the fan module.

- a.** Align the protruding part of the fan module with the hole on the chassis below the M.2 SSD slot.
- b.** Push the fan module toward the system board until the clip locks the fan module into place.
- c.** Attach the screw that secures the fan module to the chassis.

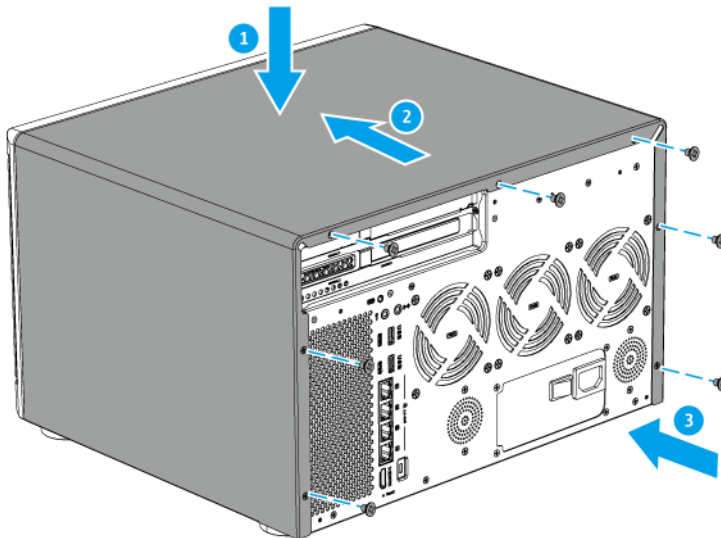


- d.** Connect the fan cable to the system board.



9. Attach the case cover.

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



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

Installing Expansion Units

The device supports SATA JBOD expansion units 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 <http://www.qnap.com/go/compatibility-expansion>.

Expansion Unit Model	Description	Required Accessories
TL-D400S	<ul style="list-style-type: none"> • Uses a SAS 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 SAS 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 SAS 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 host bus adapter
TL-R400S	<ul style="list-style-type: none"> • Uses a SAS 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
TL-R1200S-RP	<ul style="list-style-type: none"> • Uses a SAS 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 host bus adapter • 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"> • SAS-12G2E or QXP-1620S-B3616W storage expansion card • SFF-8644 mini SAS cable • RAIL-B02
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"> • SAS-12G2E or QXP-1620S-B3616W storage expansion card • SFF-8644 mini SAS cable • RAIL-B02
TR-002	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA drives 	<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable

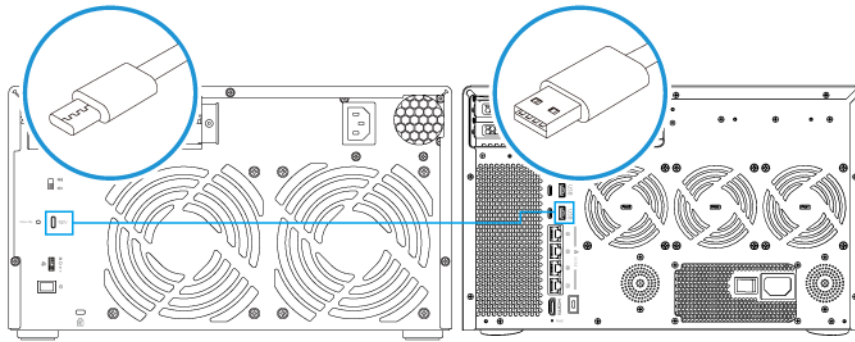
Expansion Unit Model	Description	Required Accessories
TR-004	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA drives 	<ul style="list-style-type: none"> • USB 3.2 Gen 1 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TR-004U	<ul style="list-style-type: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

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 [Installing 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 3.2 Gen 1 Type-A or Type-C on the NAS.



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

Connecting SATA Expansion Units

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

For required accessories, see [Installing Expansion Units](#).

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

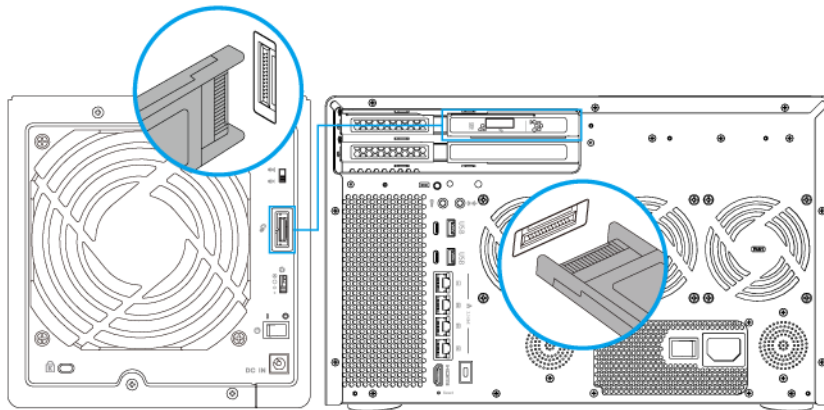


Note

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.

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

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



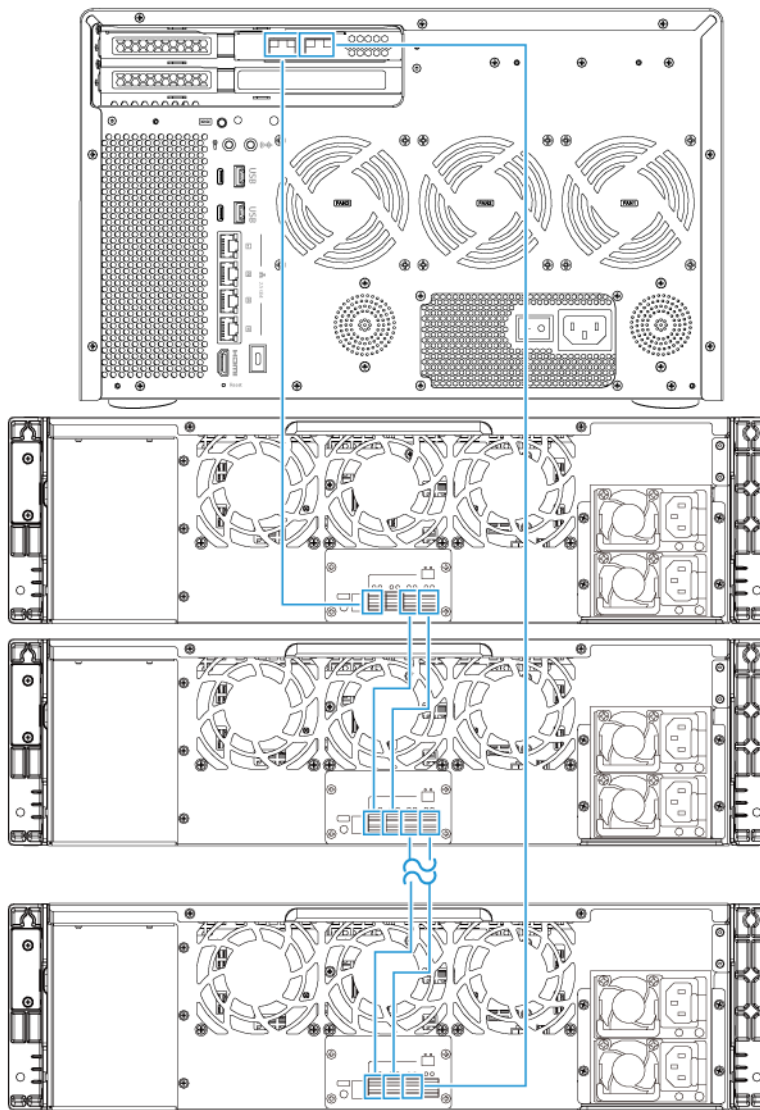
4. Power on the SATA JBOD expansion units.
5. Power on the NAS.
6. Verify that the expansion units are recognized by the NAS.
 - a. Log on to QuTS hero as administrator.
 - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
 - c. Verify that the expansion units are listed.

Connecting 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 administrator.
 - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
 - 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"> • Locate the NAS using Qfinder Pro. • Complete the steps in the Smart Installation Guide wizard. 	<ul style="list-style-type: none"> • Computer • Network cable • Qfinder Pro installer
Cloud installation	<p>If the NAS is connected to the internet, you can do the following:</p> <ul style="list-style-type: none"> • Scan the QR code on the NAS. • Specify the Cloud Key. • Log into your myQNAPcloud account. • Use myQNAPcloud Link to remotely access your NAS. • Complete the steps in the Smart Installation Guide wizard. 	<ul style="list-style-type: none"> • Computer or mobile device • myQNAPcloud account • Cloud Key

Installing QuTS hero Using Qfinder Pro



Warning

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



Note

You can revert to QTS operating system anytime. For details, see QuTS hero user guide.

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



Note

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

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

Installation methods	Steps
Automatic	Click Start . Automatically searches for available firmware updates and installs firmware.
Manual installation	<ol style="list-style-type: none"> Click Manual Installation. The Install Firmware window appears. Click Browse. The upload file window appears. Select file. Click Open. Starts firmware installation.
Skip	<ol style="list-style-type: none"> Click Skip. Skips firmware installation.

7. Specify the following information

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

8. Click **Next**.

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



Tip

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

10. Click **Next**.

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

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

12. Click **Next**.

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

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

14. Click **Next**.

15. Review the settings.

16. Click **Apply**.

A confirmation message appears.



Warning

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

17. Click **Yes**.

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

**Note**

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

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

**Tip**

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

Installing QuTS hero Using the Cloud Key

**Warning**

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

**Note**

You can revert to QTS operating system anytime. For details, see QuTS hero user guide.

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

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

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

**Note**

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

The installation wizard opens in the default web browser.

5. Create an account or sign in to myQNAPcloud.

**Note**

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

6. Specify the myQNAPcloud device name for the NAS.

**Note**

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

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

8. Perform any of the following actions.
 - To check for the latest available version, click **Start**.

The wizard downloads the latest available version, and then the NAS restarts after the download is complete. If a newer version is not available, the wizard automatically displays the **Smart Installation Guide**.

- To install the out-of-the-box version, click **Skip**.

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

10. Install firmware using any of the following methods:

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

11. Specify the following information

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

12. Click **Next**.

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


Tip

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

14. Click **Next**.
The **Configure the network settings** screen appears.

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

16. Click **Next**.
The **Cross-platform file transfer service** screen appears.

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

18. Click **Next**.

19. Review the settings.

20. Click **Apply**.
A confirmation message appears.

**Warning**

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

21. Click **Confirm**.
QuTS hero is installed.

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


**Tip**

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


4. Basic Operations

This chapter describes basic NAS operations.

Power Button

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

Reset Button

Operation	User Action	Result
Basic system reset	Press and hold the button for 3 seconds.	The following settings are reset to default: <ul style="list-style-type: none"> • System administrator password: MAC address of adapter 1 without special characters. For example, if the MAC address of adapter 1 is 11:22:33:44:55:66, then the admin password will be 112233445566. <div>  Tip You can find the MAC address of adapter 1 using Qfinder Pro. A label attached to the device also lists the address as MAC1. </div> <ul style="list-style-type: none"> • TCP/IP configuration: <ul style="list-style-type: none"> • Obtain IP address settings automatically via DHCP • Disable jumbo frames • If port trunking is enabled (multi-LAN models only), the port trunking mode is reset to "Active Backup (Failover)". • System port: 8080 (system service port) • Security level: Low (Allow all connections) • LCD panel password: (blank) • VLAN: Disabled
Advanced system reset	Press and hold the button for 15 seconds.	The default factory settings are restored. <ul style="list-style-type: none"> • To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.

USB One Touch Copy Button

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

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

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 volumes

LCD Panel Buttons

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

Viewing TCIP/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 **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 TCIP/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 QTS 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
Enter	<ul style="list-style-type: none"> • Display a configuration screen. • Move to the next item on a configuration screen.
Select	<ul style="list-style-type: none"> • Move to the next item on a menu. • Modify a value on a configuration screen.

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 **Enter** 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 Volume Information

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

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 **Enter** repeatedly until the panel displays `Main Menu 3. Volume`.
4. Press and hold **Enter**.
The panel displays the name and capacity of the first volume.
5. Press and hold **Select**.
Repeat this step as necessary.
The panel displays the name and capacity of the next volume.

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 **Enter** 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 **Enter** 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 **Enter** 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 **Enter** 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
Enter	Move to the next item in the <code>New Password</code> screen.
Select	Change a number 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.

System Message	Description
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](#).

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

LED	Status	Description
Drive	Flashes red	The data is being accessed and a read/write error occurs during the process.
	Red	A drive read/write error occurred.
	Flashes green	Data is being accessed.
	Green	The drive is ready.
	Off	No drive was detected.
2.5 Gigabit Ethernet speed	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"> • The network connection is operating at 100 Mbps. • There is no network connection.
2.5 Gigabit Ethernet activity	Orange	A network connection has been established.
	Flashes orange	The device is being accessed from the network.
	Off	There is no network connection.
M.2 SSD	Flashes red	The drive is being located.
	Red	A drive read/write error has occurred.
	Flashes green	The data is being accessed.
	Green	The drive can be accessed.
	Off	No drive is detected.

Audio Alert

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

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

5. NAS Migration

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

NAS Migration Requirements

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

Your device must meet the following requirements:

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



Important

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



Warning


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




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

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

Status and Setting Changes After NAS Migration

The status of NAS data and settings varies after migration.

Data and Settings	After NAS Migration
Registered myQNAPcloud name	Your registered myQNAPcloud name is not migrated.
Encrypted shared folders	<p>If the NAS does not support file system encryption, encrypted shared folders are not migrated.</p> <div>  <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> </div>

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

Migrating a NAS



Important

Before performing NAS migration, ensure that you understand all requirements and possible changes after migration.

For details see the following topics:

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

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



Important

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

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

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	
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 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 disk volumes 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 volume from degraded mode.

Disk Volume	RAID Recovery Support	Number of Disks	Maximum Number of Removed Drives
RAID 0	Yes	≥ 2	N/A
RAID 1	Yes	2	1
RAID 5	Yes	≥ 3	1
RAID 6	Yes	≥ 4	2
RAID 10	No	≥ 4 (Must be an even number)	One or two member drives in two different pairs fail.
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://docs.qnap.com
Compatibility List	https://www.qnap.com/compatibility/
NAS Migration Compatibility	https://www.qnap.com/en/nas-migration
Expansion Unit Compatibility	http://www.qnap.com/go/compatibility-expansion
Service Portal	https://service.qnap.com
Product Support Status	https://www.qnap.com/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 Link

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

myQNAPcloud

Provides various remote access services such as DDNS and myQNAPcloud Link

QNAP ID

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

Qfinder Pro

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

QuTS hero

QNAP NAS operating system featuring ZFS file system

8. Notices

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

Limited Warranty

QNAP offers limited warranty service on our products. Your QNAP-branded hardware product is warranted against defects in materials and workmanship for a period of one (1) year or more from the date printed on the invoice. ("Warranty Period"). Please review your statutory rights at www.qnap.com/warranty, which may be amended from time to time by QNAP in its discretion.

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FCC Notice

FCC Class B Notice



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2. This device must accept any interference received, including interference that may cause undesired operation.

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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.
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