



QNAP

TS-x64eU

TS-464eU

TS-864eU

TS-864eU-RP

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

Document Conventions

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

2. Product Overview

This chapter provides basic information about the QNAP TS-x64eU NAS.

About the TS-x64eU

The TS-x64eU is powered by an Intel® Celeron® N5105/N5095 quad-core 2.9 GHz processor, with up to 16 GB of DDR4 memory. The NAS supports connecting expansion units through two native USB 3.2 Gen 2 Type-A ports. Additionally, the TS-x64eU supports SATA 6 Gbps drives (backward compatible with SATA 3 Gbps), and is equipped with two 2.5 Gigabit Ethernet ports. The TS-864eU models also come with one PCIe Gen 3 x2 slot for various applications and expansion options.

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	Drive bays	Memory	Power supply
TS-464eU-4G	4	4 GB	Single
TS-864eU-4G	8	4 GB	Single
TS-864eU-RP-4G	8	4 GB	Redundant

Component	TS-464eU-4G	TS-864eU-4G	TS-864eU-RP-4G
Processor			
CPU	Intel® Celeron® N5105/N5095		
Frequency	4-core/4-thread 2.9 GHz burst		
Architecture	x86 64-bit		
Encryption engine	AES-NI		
Memory			
Pre-installed memory	4 GB RAM: 1 x 4 DDR4 SODIMM		

Component	TS-464eU-4G	TS-864eU-4G	TS-864eU-RP-4G
Memory slots	2 x SODIMM DDR4  Important <ul style="list-style-type: none"> Use only QNAP memory modules to maintain system performance and stability. For NAS devices with more than one memory slot, use QNAP modules with identical specifications. Using unsupported modules may degrade performance, cause errors, or prevent the operating system from starting.  Note This device supports ECC memory modules.		
Maximum memory	16 GB (2 x 8 GB)		
Flash memory	4 GB (dual-boot OS protection)		
Storage			
Drive bays	4 x 3.5-inch SATA 6 Gbps	8 x 3.5-inch SATA 6 Gbps	8 x 3.5-inch SATA 6 Gbps
	 Tip The SATA 6 Gbps bays are backward compatible with SATA 3 Gbps drives.		
Drive compatibility	3.5-inch bays: <ul style="list-style-type: none"> 3.5-inch SATA hard disk drives 2.5-inch SATA hard disk drives 2.5-inch SATA solid-state drives  Note For the list of compatible drive models and expansion cards, go to https://www.qnap.com/compatibility .		
M.2 SSD slots	2 x PCIe Gen 3 x1 NVMe	-	-
M.2 SSD form factor	2280	-	-
SSD cache acceleration support	This device supports SSD cache acceleration for all drives.		
Hot-swapping	The device supports hot-swapping drives except for the following: <ul style="list-style-type: none"> M.2 SSDs SSD cache drives Optional: M.2 SSDs installed on an M.2 SSD expansion card 		
Network			
2.5 Gigabit network interface	2 x 2.5 GbE RJ45  Note These ports provide 2.5 Gbps, 1 Gbps, 100 Mbps, and 10 Mbps network connection speeds.		
External I/O Ports & Expansion Slots			

Component	TS-464eU-4G	TS-864eU-4G	TS-864eU-RP-4G
PCIe slots	-	1 x PCIe Gen 3 x2	1 x PCIe Gen 3 x2
	 Tip For the list of compatible drive models and expansion cards, go to https://www.qnap.com/compatibility .		
USB ports	<ul style="list-style-type: none"> • 2 x USB 2.0 Type-A • 2 x USB 3.2 Gen 2 Type-A 		
HDMI ports	1 x HDMI		
Interface			
Buttons	<ul style="list-style-type: none"> • Power • Reset 		
Dimensions			
Form factor	1U Rackmount	2U Rackmount	2U Rackmount
Dimensions (H x W x D)	43.3 x 482.6 x 321.33 mm (1.70 x 19.0 x 12.65 in)	88.6 x 482.14 x 318.13 mm (3.49 x 18.98.0 x 12.52 in)	88.6 x 482.14 x 346.43 mm (3.49 x 18.98 x 16.63 in)
Net weight	4.35 kg (9.59 lbs)	6.68 kg (14.73 lbs)	7.9 kg (17.42 lbs)
Others			
Rail compatibility	RAIL-B02  Note <ul style="list-style-type: none"> • Rail kits are not included with the NAS and must be purchased separately. For details, contact an authorized reseller or go to https://shop.qnap.com. • Information on rail kit installation can be found in the installation guide included in the rail kit package. For details, go to https://www.qnap.com/go/product/rail-kit. 		
Power supply unit	1 x 100W, 100-240V AC, 50/60Hz	1 x 300W, 100-240V AC, 50/60Hz	2 x 300W, 100-240V AC, 50/60Hz
System battery	CR2032 lithium battery (3V, 225 mAh)		
Fans	3 x 40 mm, 12V DC fans	2 x 80 mm, 12V DC fans	2 x 80 mm, 12V DC fans
Operating temperature	0°C to 40°C (32°F to 104°F)		
Relative humidity	<ul style="list-style-type: none"> • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F) 		


Tip

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

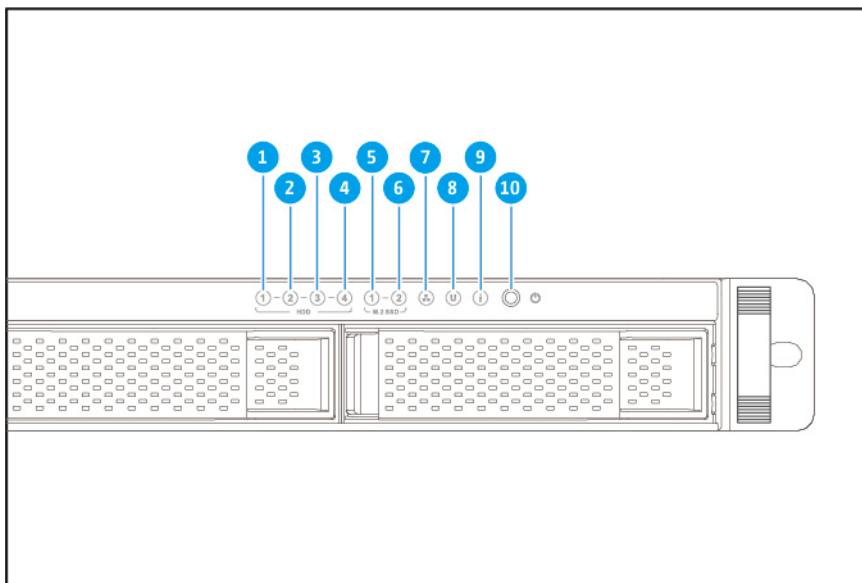
Package Contents

Item	Quantity
TS-x64eU NAS	1

Item	Quantity
Power cord	<ul style="list-style-type: none"> • TS-464eU-4G: 1 • TS-864eU-4G: 1 • TS-864eU-RP-4G: 2
Ethernet cable	1 x Cat5e (RJ45)
Screws for 3.5-inch drives	<ul style="list-style-type: none"> • TS-464eU-4G: 16 • TS-864eU-4G: 32 • TS-864eU-RP-4G: 32
Screws for 2.5-inch drives	<ul style="list-style-type: none"> • TS-464eU-4G: 12 • TS-864eU-4G: 24 • TS-864eU-RP-4G: 24
Quick Installation Guide (QIG)	1

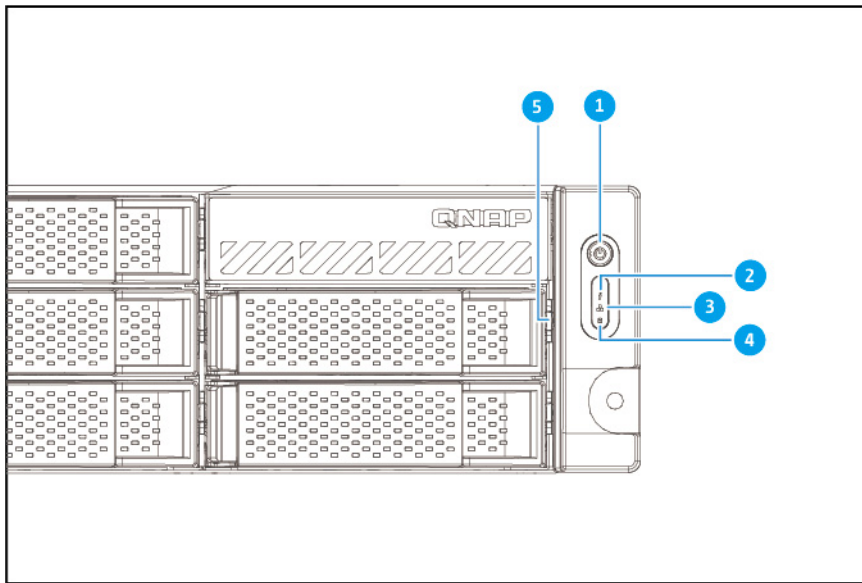
Components

Front Panel



TS-464eU-4G

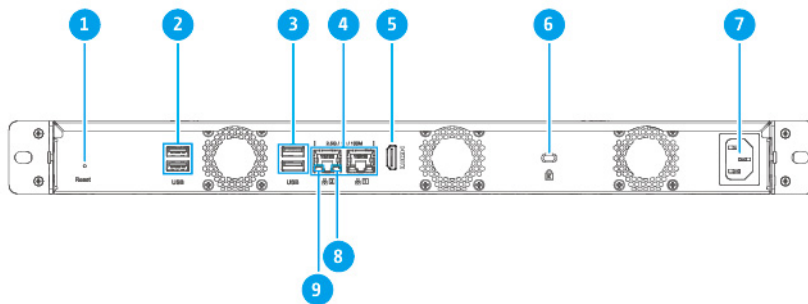
No.	Component	No.	Component
1	Drive 1 LED	6	M.2 SSD 2 LED
2	Drive 2 LED	7	LAN LED
3	Drive 3 LED	8	Expansion unit LED
4	Drive 4 LED	9	Status LED
5	M.2 SSD 1 LED	10	Power button



TS-864eU-4G, TS-864eU-RP-4G

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

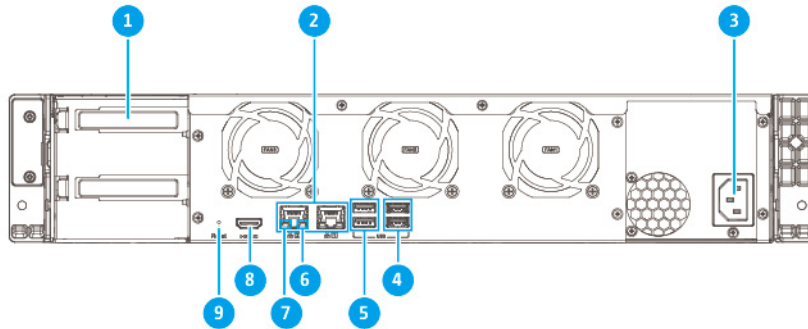
Rear Panel



TS-464eU-4G

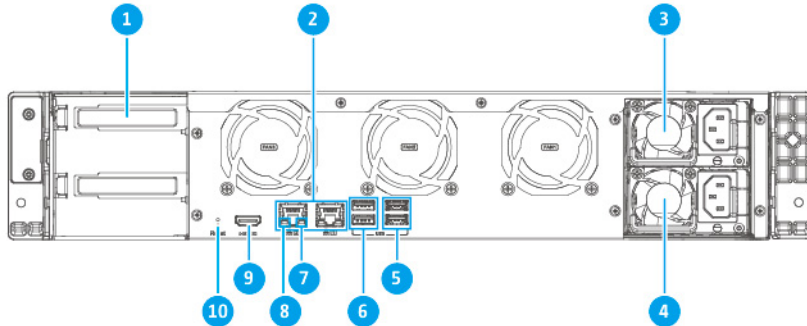
No.	Component	No.	Component
1	Reset button	6	Kensington security slot
2	USB 2.0 Type-A ports	7	Power input

No.	Component	No.	Component
3	USB 3.2 Gen 2 Type-A ports	8	2.5 Gigabit Ethernet activity LED
4	2.5 Gigabit Ethernet ports (RJ45)	9	2.5 Gigabit Ethernet speed LED
5	HDMI port	-	-



TS-864eU-4G

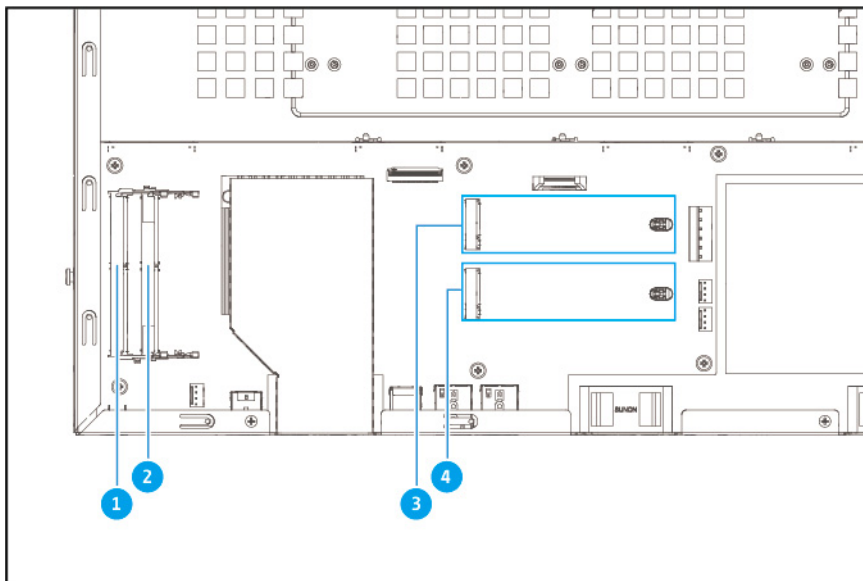
No.	Component	No.	Component
1	PCIe low-profile cover	6	2.5 Gigabit Ethernet activity LED
2	2.5 Gigabit Ethernet ports (RJ45)	7	2.5 Gigabit Ethernet speed LED
3	Power input	8	HDMI port
4	USB 3.2 Gen 2 Type-A ports	9	Reset button
5	USB 2.0 Type-A ports	10	-



TS-864eU-RP-4G

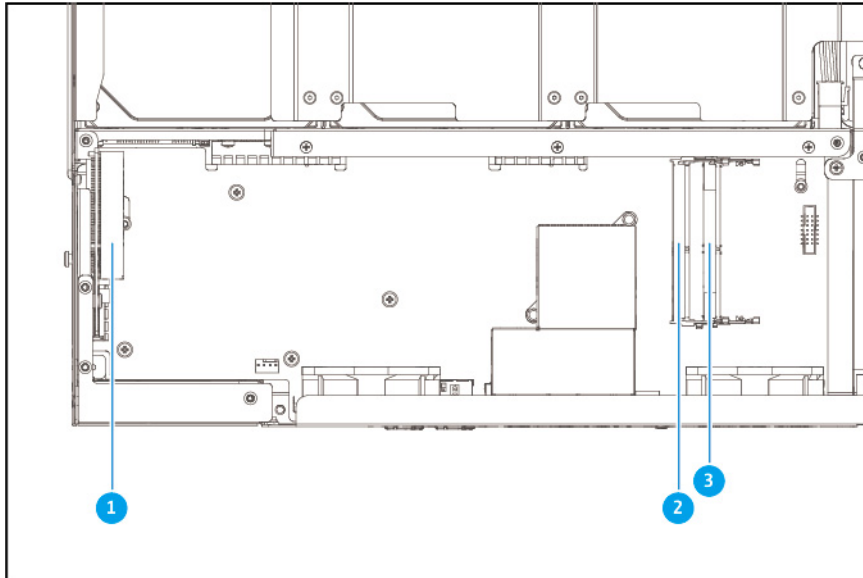
No.	Component	No.	Component
1	PCIe low-profile cover	6	USB 2.0 Type-A ports
2	2.5 Gigabit Ethernet ports (RJ45)	7	2.5 Gigabit Ethernet activity LED
3	Power supply unit 1	8	2.5 Gigabit Ethernet speed LED
4	Power supply unit 2	9	HDMI port
5	USB 3.2 Gen 2 Type-A ports	10	Reset button

System Board



TS-464eU-4G

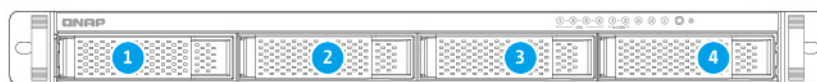
No.	Component	No.	Component
1	Memory slot 2	3	M.2 SSD slot 2
2	Memory slot 1	4	M.2 SSD slot 1



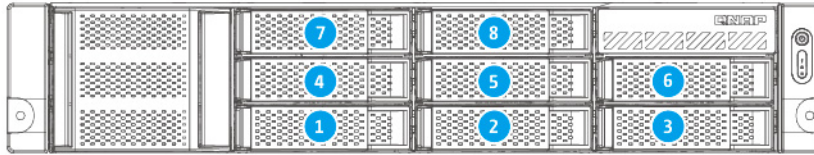
TS-864eU-4G, TS-864eU-RP-4G

No.	Component	No.	Component
1	PCIe slot 1 (PCIe 3.0 x2)	3	Memory slot 2
2	Memory slot 1	-	-

Drive Numbering



TS-464eU-4G



TS-864eU-4G, TS-864eU-RP-4G

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

- 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
Hardware and peripherals	<ul style="list-style-type: none"> • Storage drives For the list of compatible drive models, go to https://www.qnap.com/compatibility. • Network cable
Tools	<ul style="list-style-type: none"> • Phillips #1 or #2 screwdriver • Anti-static wrist strap

Setting Up the NAS



Important

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

1. Place your NAS device in an environment that meets the requirements.
For details, see [Installation Requirements](#).
2. Install the drives.
For details, see the following topics:
 - [Installing 3.5-inch Hard Drives on 3.5-inch Trays](#)
 - [Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays](#)

- [Installing M.2 Solid-State Drives](#)

3. Connect the power cord and all applicable cables.
4. Power on the NAS.
5. Install QTS.
For details, see [QTS Installation](#).
6. Log on to QTS.

3. Installation and Configuration

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

Hardware Installation

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

Drive Installation

The TS-x64eU series is compatible with 3.5-inch and 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.

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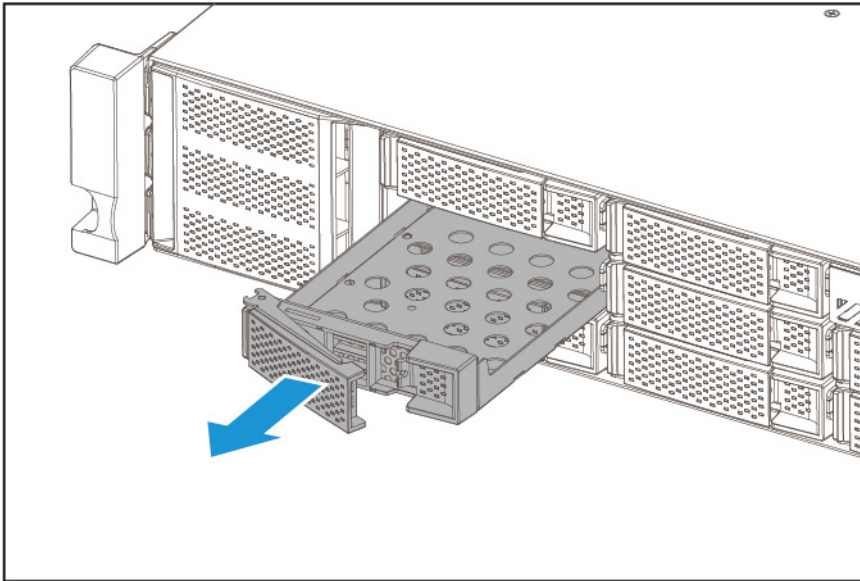
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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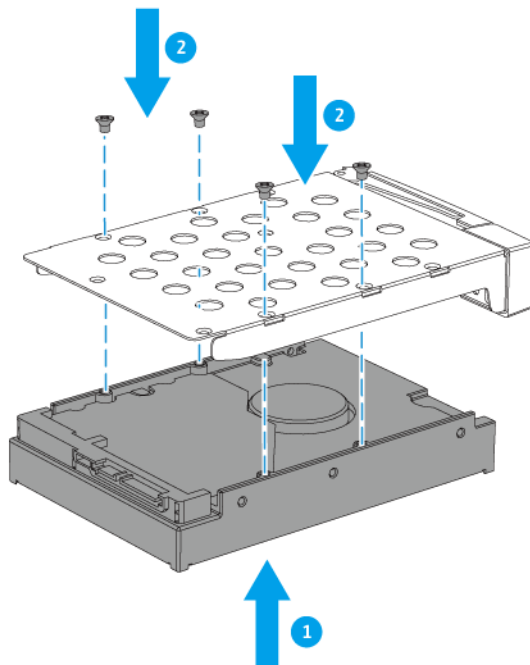
Other moving components: Keep your hands and other body parts away from other moving components.

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



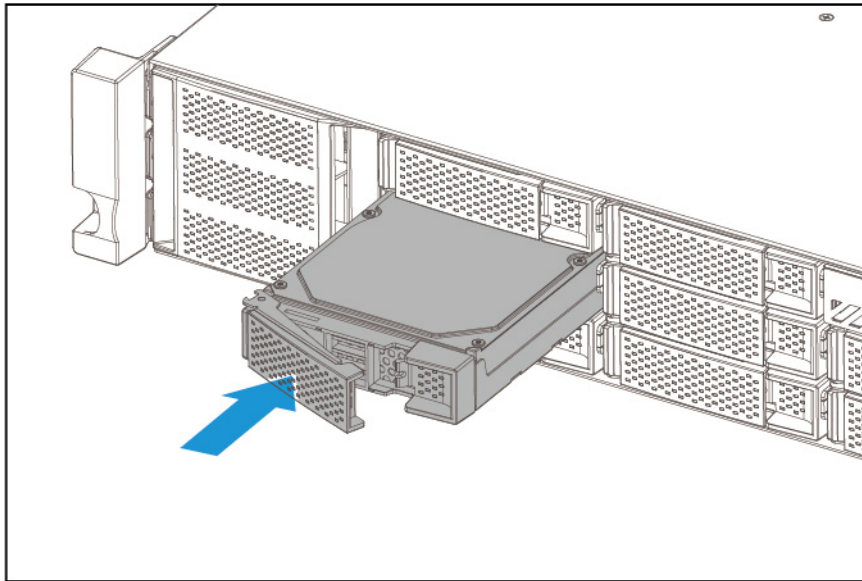
3. Install a drive on the tray.

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



4. Load the tray into the bay.

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



- b. Push the handle.
5. Power on the NAS.

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



Warning

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

•



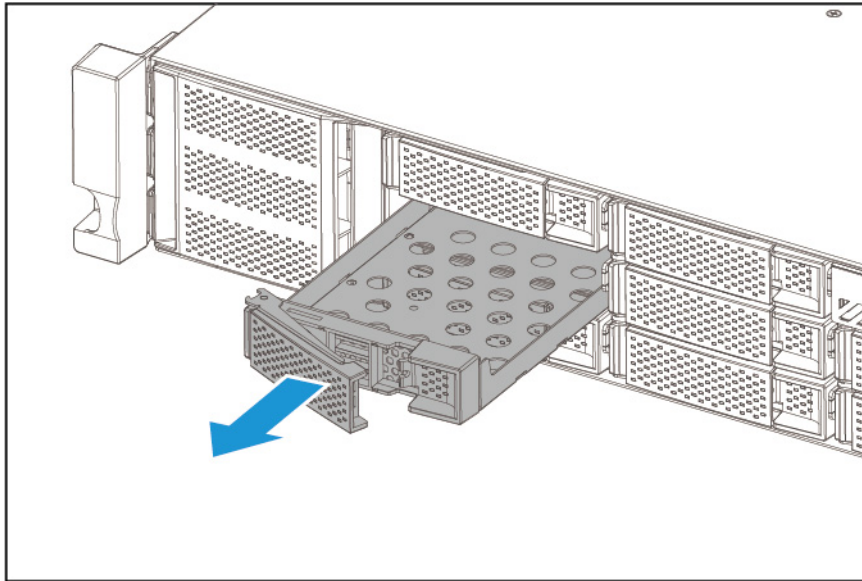
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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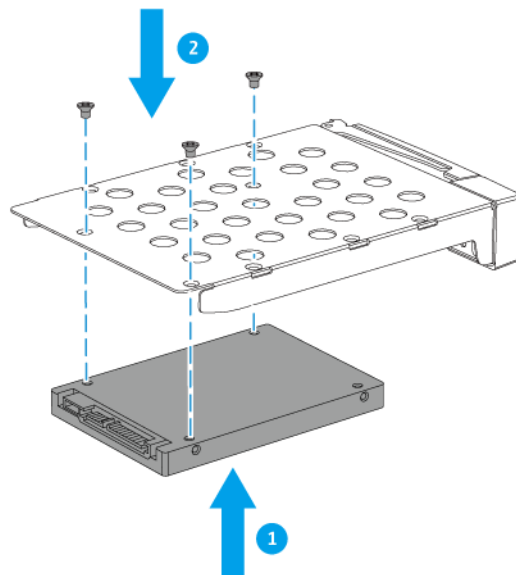


Other moving components: Keep your hands and other body parts away from other moving components.

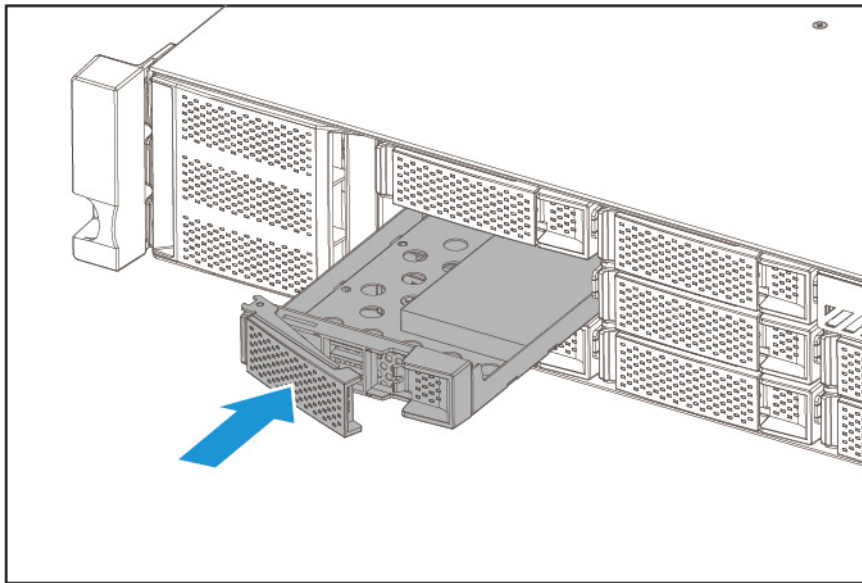
1. Power off the NAS.
2. Remove the drive tray.
 - a. Pull the tray handle outward.
 - b. Pull the tray out.



3. Install a drive on the tray.
 - a. Place the tray on the drive so that the holes on the tray are aligned with those on the drive.
 - b. Attach the screws.



4. Load the tray into the bay.
 - a. Insert the tray into the bay.



b. Push the handle.

5. Power on the NAS.

Installing M.2 Solid-State Drives

The TS-464eU-4G has two M.2 SSD slots on the [System Board](#). For a list of compatible M.2 SSDs, go to <https://www.qnap.com/compatibility>.



Warning

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



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.

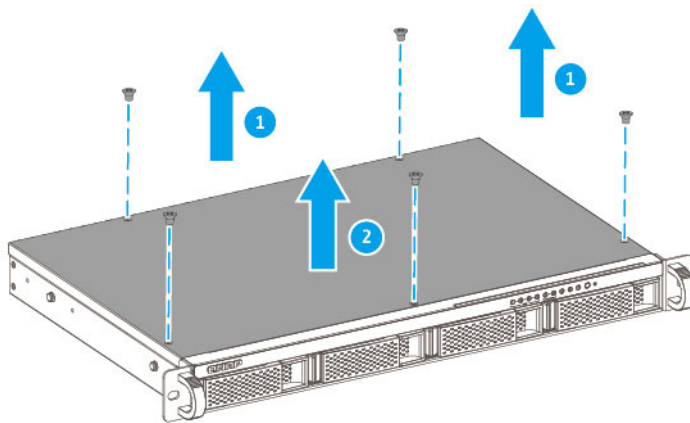


Note

- 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.

- The ordering P/N for QNAP heatsinks is: HS-M2SSD-01.

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

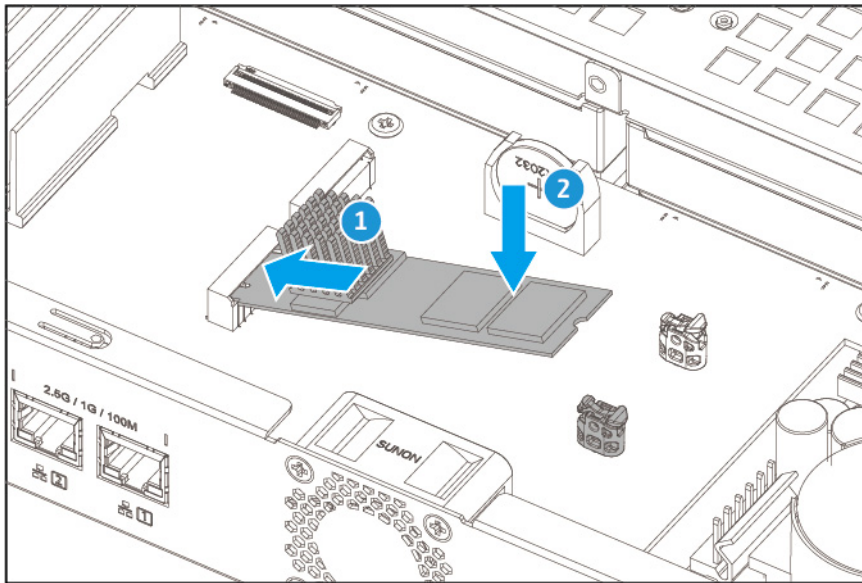


Note

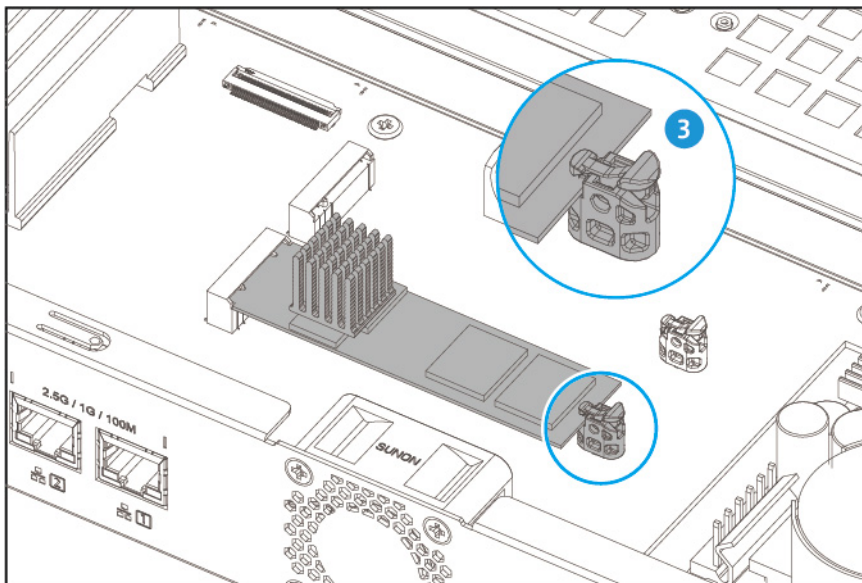
The M.2 SSD heatsink is an optional purchase. For details, see <https://www.qnap.com/go/product/ts-464eu>.

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.

6. Install the M.2 SSD.
 - a. Pull out the pushpin.
 - b. Verify the M.2 SSD connector is aligned with the slot.

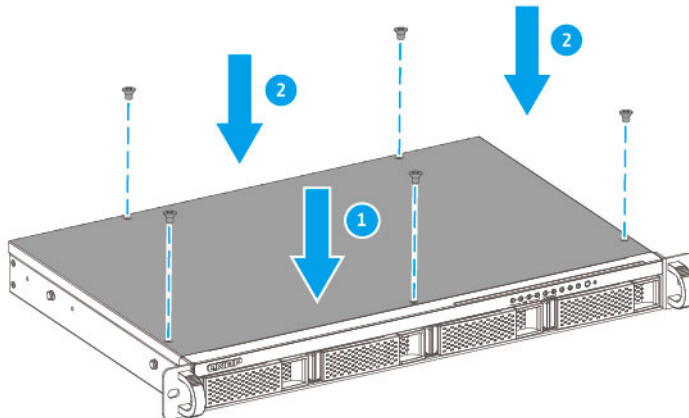


- c. Carefully press down the M.2 SSD until the pushpin locks the drive into place.



7. Attach the case cover.

- a. Place the cover on the device.



- b. Slide the cover forward.
 - c. Tighten the screws.
8. Connect all cables and external attachments.
 9. Connect the power cord to the electrical outlet.
 10. Power on the device.

Replacing Memory Modules

The TS-x64eU series has two memory slots. You can increase the memory capacity of the NAS by upgrading memory modules.

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

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



Warning

-



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

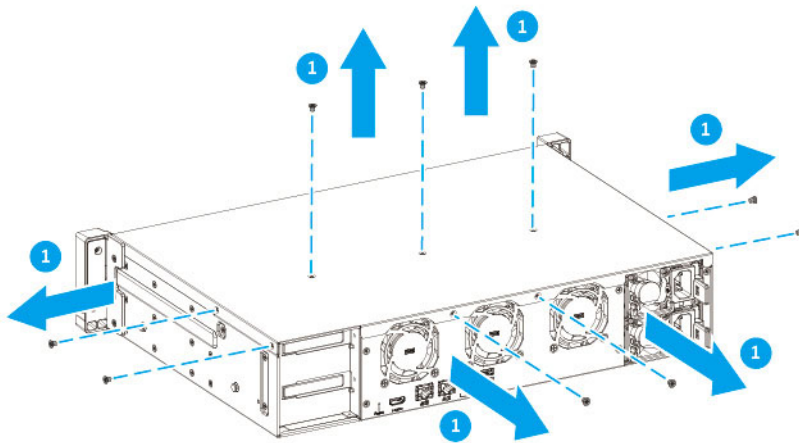
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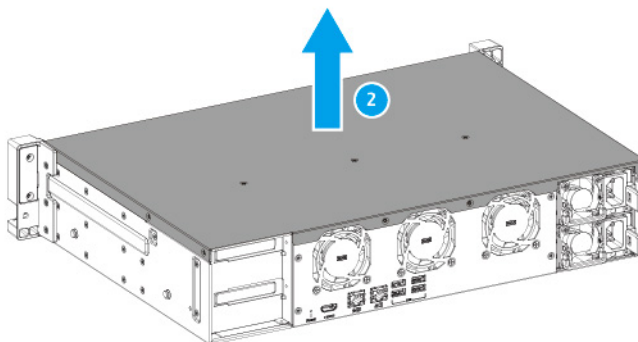
Other moving components: Keep your hands and other body parts away from other moving components.

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

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

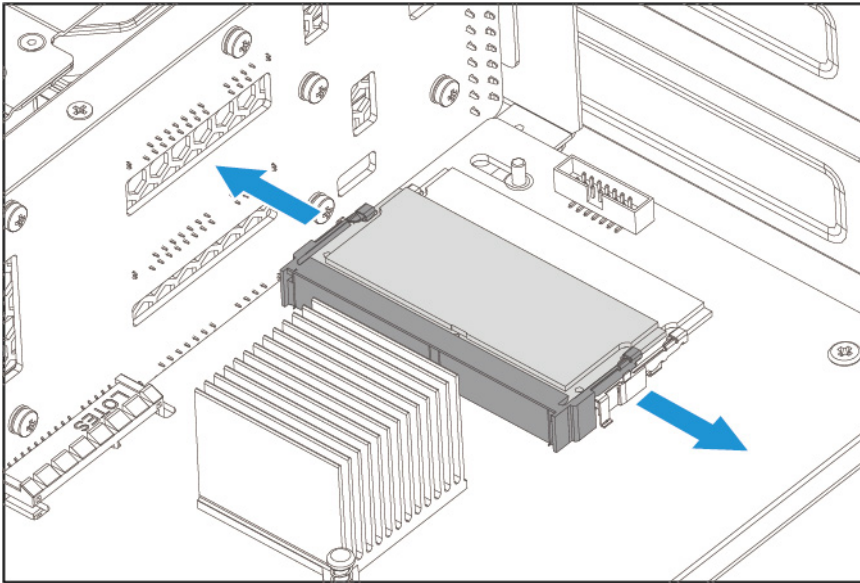


- b. Slide the cover back.
- c. Lift the cover off the device.



5. Remove an existing module.

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

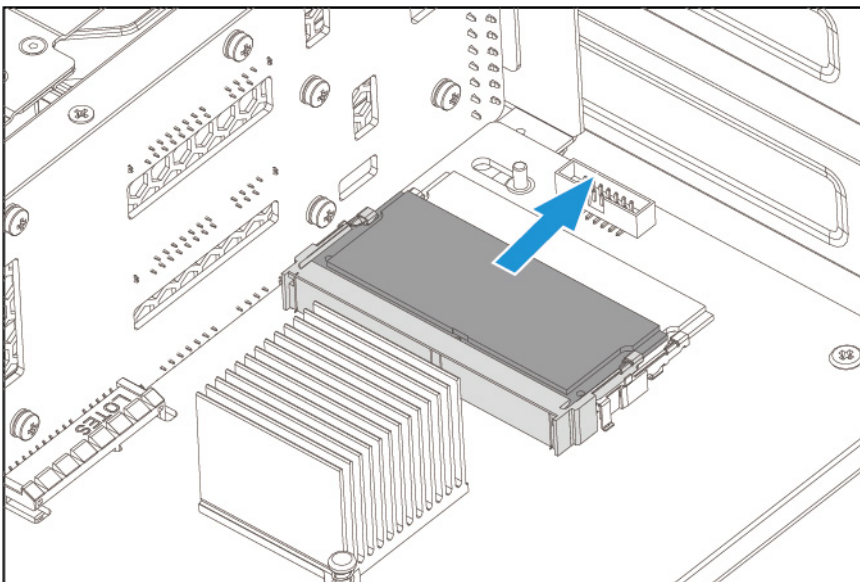


- b. Verify that the module has tilted upward and is completely released from the slot.

**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.

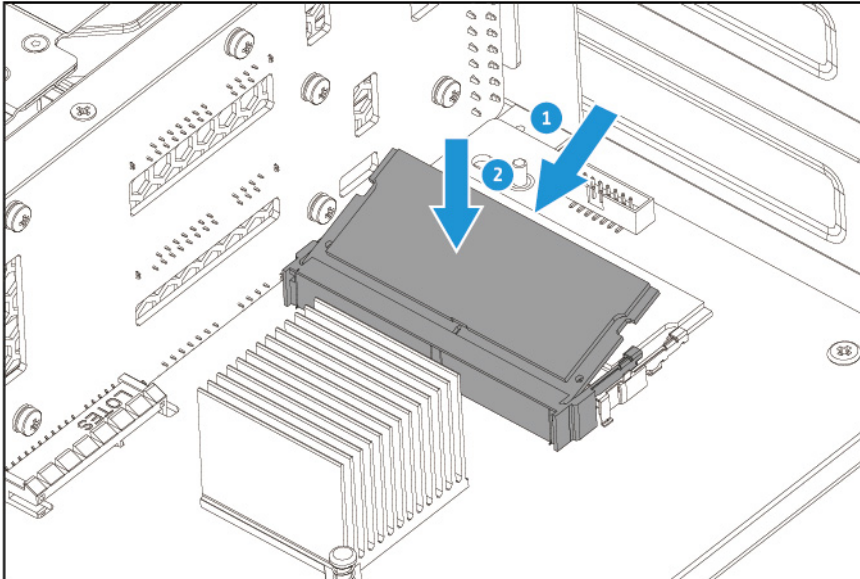
**Warning**

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

- Do not bend the module.

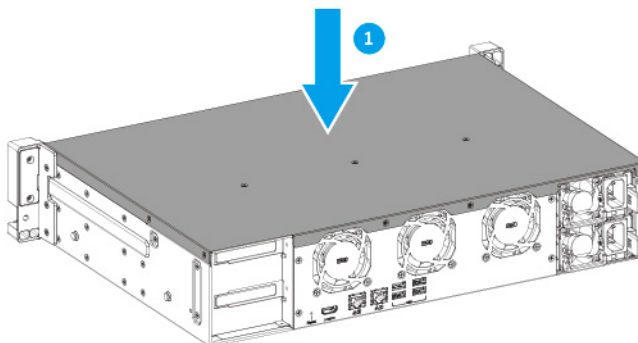
6. Install a new module.

- 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.

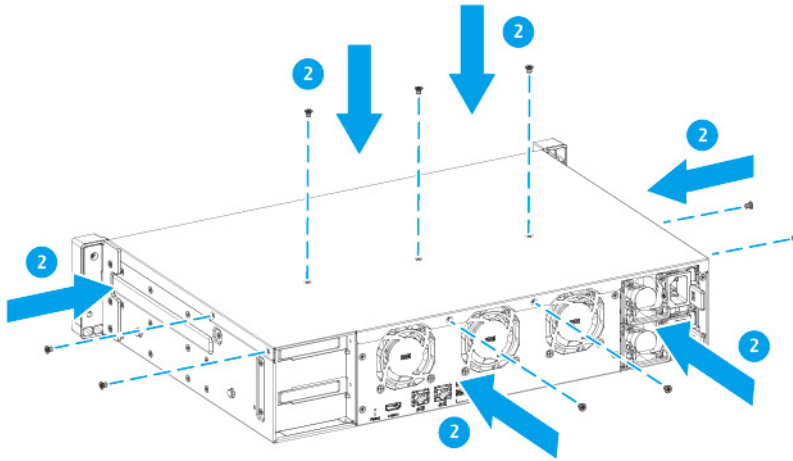


7. Attach the case cover.

- Place the cover on the device.



- b. Slide the cover forward.
- c. Tighten the screws.



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

Installing Expansion Cards

The TS-x64eU series 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 TS-x64eU.



Warning

-



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

-

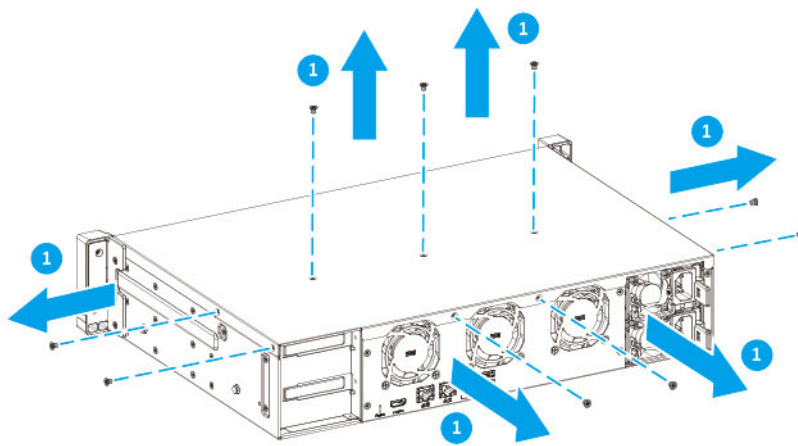


Other moving components: Keep your hands and other body parts away from other moving components.

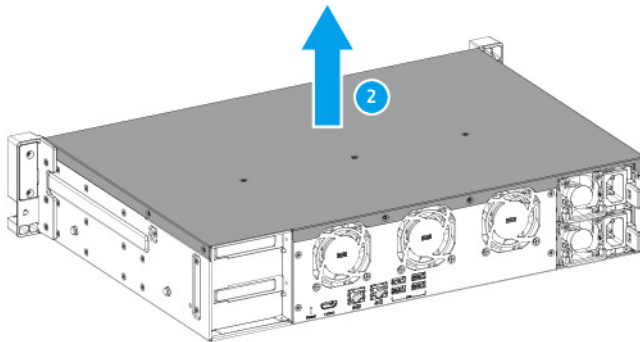
**Note**

Check the expansion card power supply requirements and compatibility list before installation. For more information, see www.qnap.com/compatibility.

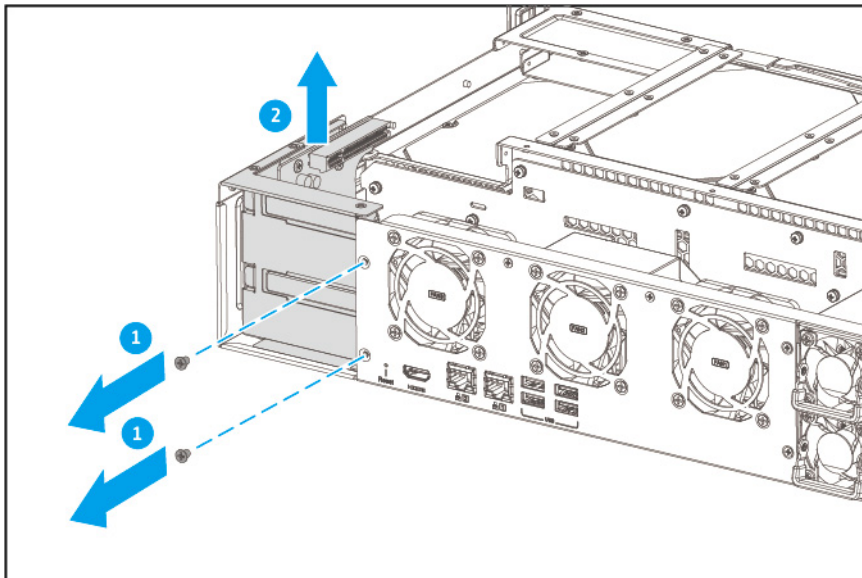
1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
 - a. Loosen the screws.



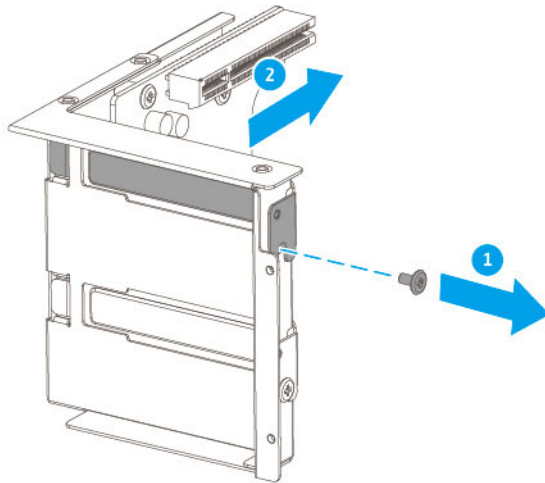
- b. Slide the cover back.
 - c. Lift the cover off the device.



5. Remove the expansion card module.
 - a. Remove the screws that secure the module to the chassis.
 - b. Remove the module from the chassis.

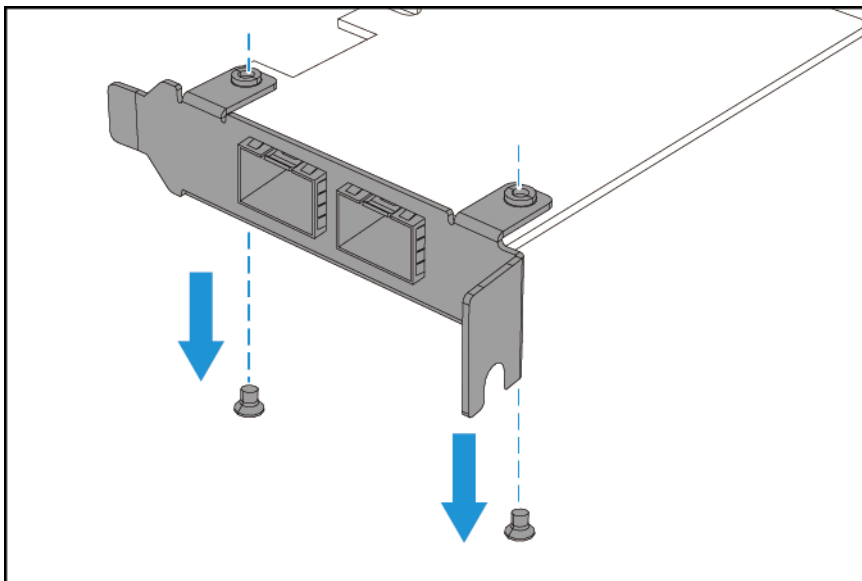


6. Remove the PCIe cover.
 - a. Remove the screw that secures the cover.
 - b. Pull the cover away from the slot.

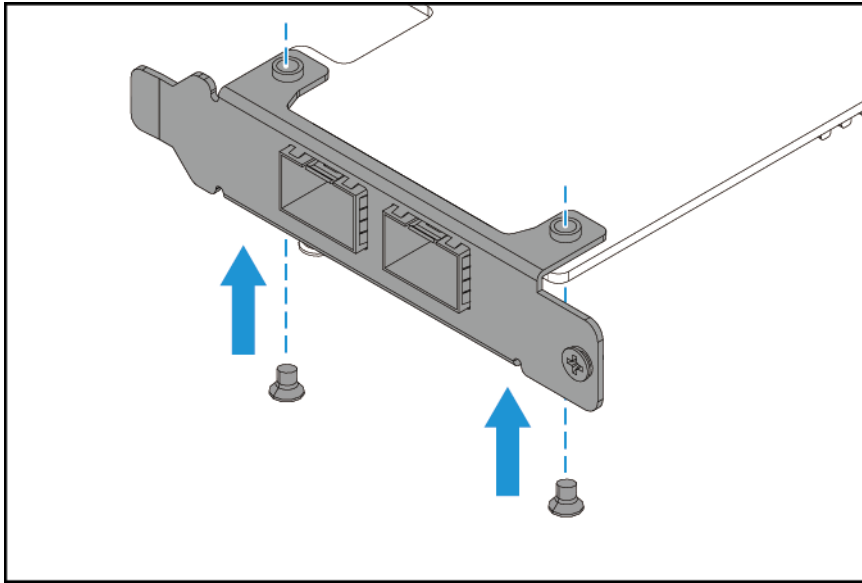


7. Optional: Attach the QNAP bracket to the expansion card.

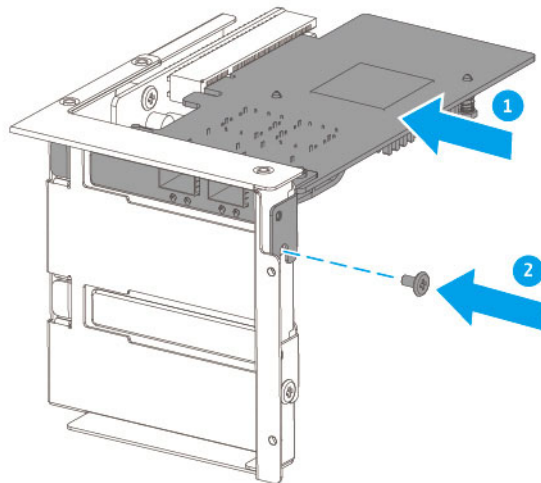
- a.** Remove all screws of the existing bracket.



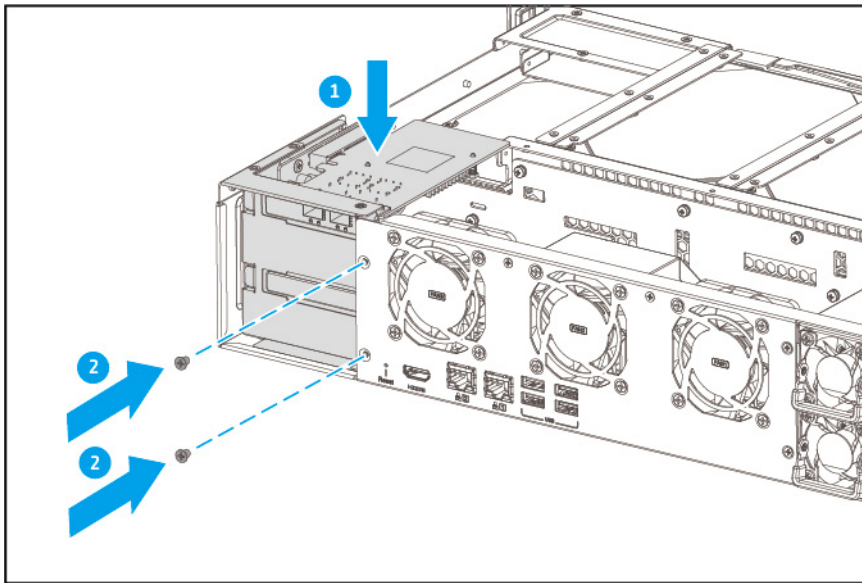
- b.** Carefully pull the bracket away from the card.
c. Attach the QNAP bracket to the card using the same screws.



- d.** Verify that the bracket does not move.
- 8.** Insert the card into the riser card slot.
- 9.** Attach the screw.

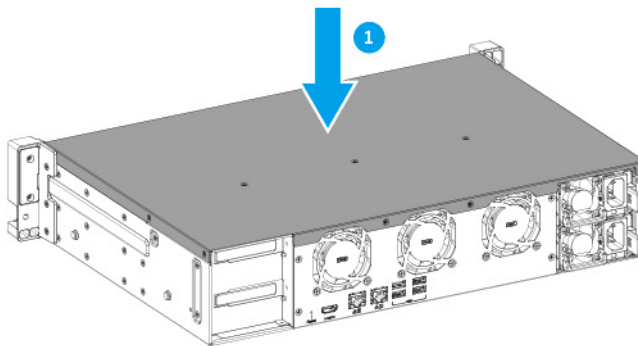


- 10.** Attach the expansion card module.
 - a.** Insert the module into the chassis.
 - b.** Attach the screws that secure the module to the chassis.

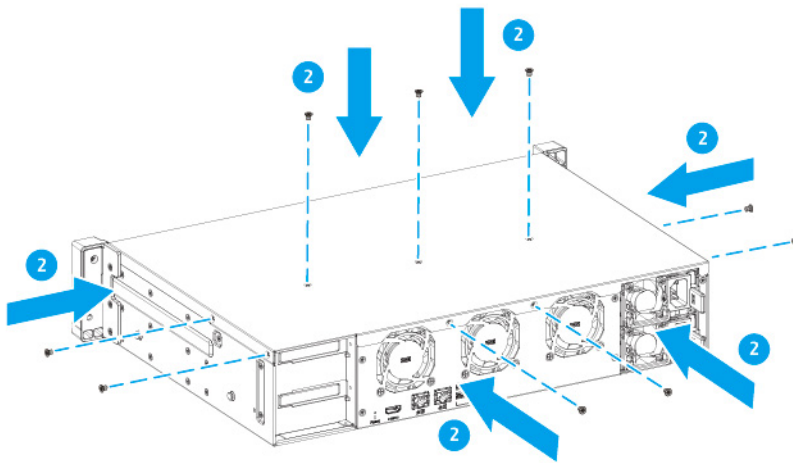


11. Attach the case cover.

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



- b. Slide the cover forward.**
- c. Tighten the screws.**



12. Connect all cables and external attachments.
13. Power on the device.

Hot-Swapping Redundant Power Supply Units

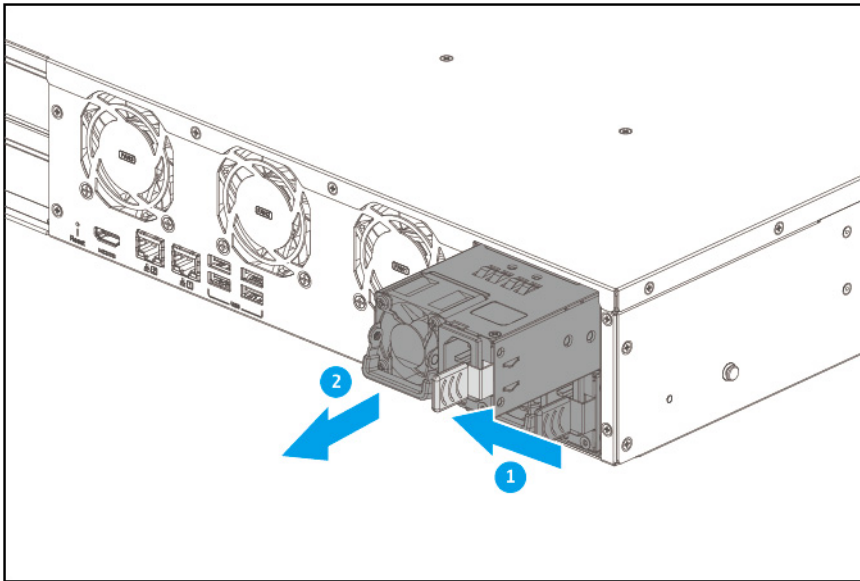


Warning

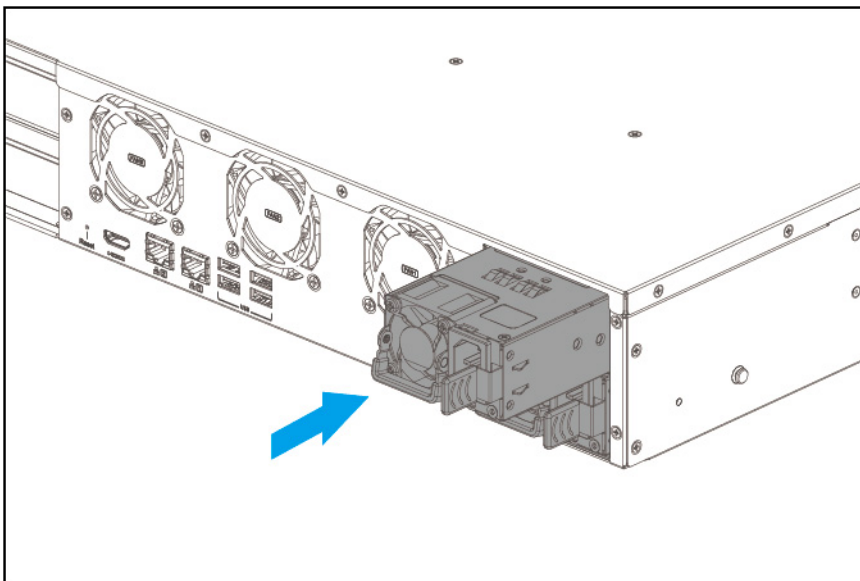


The NAS may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords before installing or replacing system components.

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



4. Insert the new PSU.



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

6. Power on the NAS.

7. Enable alerts for PSU failures.

- a. Log on to QTS as administrator.
- b. Go to **Control Panel > System > Hardware > General** .
- c. Select **Enable Redundant Power Supply Mode**.
- d. Click **Apply All**.

Expansion Unit Installation

The TS-464eU-4G is compatible with USB expansion units, while TS-864eU-4G and TS-864eU-RP-4G are compatible with both SATA 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 <https://www.qnap.com/go/compatibility-expansion>.

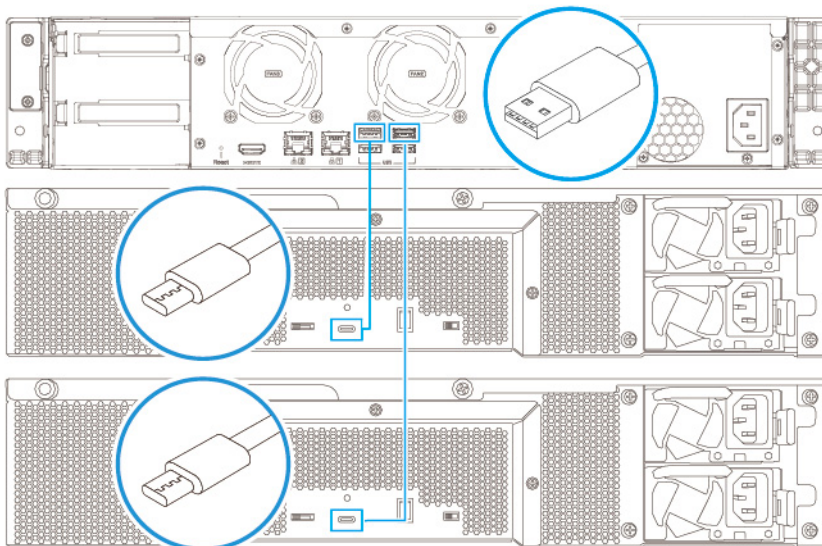
Expansion Unit Model	Description	Required Accessories
TR-002	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA HDD/SDD 	<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TR-004	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA HDD/SDD 	<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TR-004U	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA HDD/SDD 	<ul style="list-style-type: none"> • USB 3.2 Gen 1 Type-A to Type-C cable • RAIL-B02
TL-D800C	<ul style="list-style-type: none"> • Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA HDD/SDD 	<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 HDD/SDD 	<ul style="list-style-type: none"> • USB 3.2 Gen 2 Type-A to Type-C cable • RAIL-B02
TL-D400S	<ul style="list-style-type: none"> • Uses a SATA 6 Gbps (SFF-8088) interface • Supports SATA HDD/SSD 	<ul style="list-style-type: none"> • 1 x SFF-8088 connector cable • QXP-400eS-A1164 host bus adapter
TL-D800S	<ul style="list-style-type: none"> • Uses a SATA 6 Gbps (SFF-8088) interface • Supports SATA HDD/SSD 	<ul style="list-style-type: none"> • 2 x SFF-8088 connector cables • QXP-800eS-A1164 host bus adapter
TL-D1600S	<ul style="list-style-type: none"> • Uses a SATA 6 Gbps (SFF-8088) interface • Supports SATA HDD/SSD 	<ul style="list-style-type: none"> • 4 x SFF-8088 to SFF-8644 connector cables • QXP-1600eS-A1164 host bus adapter
TL-R400S	<ul style="list-style-type: none"> • Uses a SATA 6 Gbps (SFF-8088) interface • Supports SATA HDD/SSD 	<ul style="list-style-type: none"> • 1 x SFF-8088 connector cable • QXP-400eS-A1164 host bus adapter • RAIL-B02

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

Connecting USB Expansion Units

The TS-x64eU supports connecting a maximum of two USB 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 2 Type-A port on the NAS.



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

Connecting SATA JBOD Expansion Units

The TS-864eU-4G and TS-864eU-RP-4G support connecting a maximum of one SATA JBOD expansion unit. To connect SATA JBOD expansion units, a host bus adapter must be installed on the NAS. For details on the required accessories, see [Expansion Unit Installation](#).

1. Power off the NAS.

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



Important

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

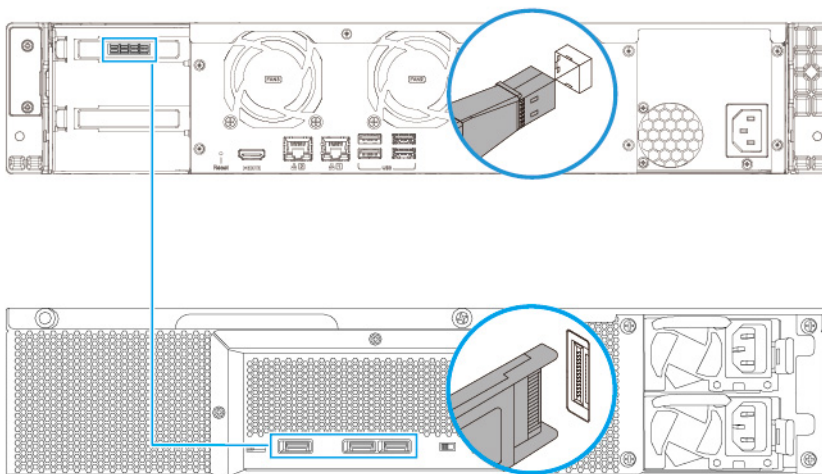
For details, see [Installing Expansion Cards](#).

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



Note

This image shows connecting the NAS to the TL-R1200S-RP JBOD enclosure.

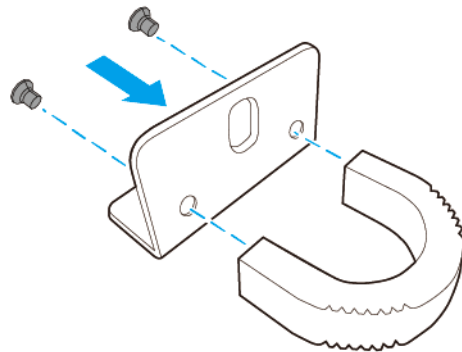


4. Power on the SATA JBOD expansion units.
5. Power on the NAS.
6. Verify that the expansion units are recognized by the NAS.
 - a. Log on to QTS as administrator.
 - b. Go to **Main Menu > Storage & Snapshots > Overview > System**.
 - c. Verify that the expansion units are listed.

Installing Handles

Installing handles enables you to better grip and further secure the NAS on a rack. Handles on the TS-464eU require manual installation.

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



3. Install the angle bracket on the NAS.

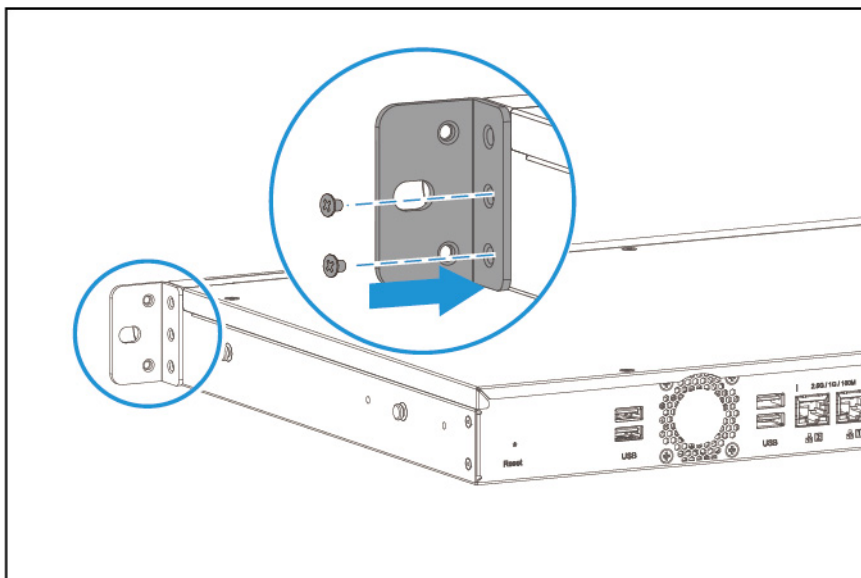
- a.** Align the holes on the angle bracket with the holes on the chassis.



Note

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

- b.** Attach the screws.



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

5. Power on the NAS.

Rail Kits

The TS-x64eU is compatible with the following models:

- RAIL-B02

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

You can find installation information in the rail kit package.

QTS Installation

The TS-x64eU uses the QNAP QTS operating system. You can install QTS using any of the following methods.

Method	Description	Requirements
Qfinder Pro installation (Recommended)	<p>If the NAS is connected to your local area network, you can do the following:</p> <ul style="list-style-type: none"> • Locate the NAS using Qfinder Pro. • Complete the steps in the Smart Installation Guide wizard. <p>For details, see Installing QTS Using Qfinder Pro.</p>	<ul style="list-style-type: none"> • Computer • Network cable • Qfinder Pro installer
Cloud installation	<p>If the NAS is connected to the internet, you can do the following:</p> <ul style="list-style-type: none"> • Scan the QR code on the NAS. • Log into your myQNAPcloud account. • Use myQNAPcloud Link to remotely access your NAS. • Complete the steps in the Smart Installation Guide wizard. <p>For details, see Installing QTS Using the Cloud Key.</p>	<ul style="list-style-type: none"> • Computer or mobile device • Network cable • myQNAPcloud account • Cloud Key

Installing QTS Using Qfinder Pro



Warning

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



Important

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

1. Power on the NAS.
2. Connect the NAS 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. Click **Next**.
The QNAP **Warranty Service** page opens in the default web browser.
5. Click **Check warranty**.
The QNAP **Warranty Service** window opens in a new web page.

**Important**

You can check your device warranty policy or purchase an extended warranty plan at [QNAP Warranty Service](#).

6. Close the warranty page.
The **Smart Installation Guide** opens in the default web browser.
7. Specify a firmware version using any of the following methods.

Methods	User Actions
Current version	Select Current version .
Latest available version	<ol style="list-style-type: none"> a. Select Latest available version. b. Click Next. The system downloads the latest firmware version and restarts the NAS. c. Click Start Smart Installation.
Uploaded version	<ol style="list-style-type: none"> a. Select Uploaded version. b. Click Browse. The file upload window appears. c. Select the firmware file version. d. Click Next. The system downloads the latest firmware version and restarts the NAS. e. Click Start Smart Installation.

8. Click **Next**.
The **Enter the NAS name and administrator's password** screen appears.
9. 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 supports 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 ([]), slash (\), vertical bar (|), semicolon (;), colon (:), apostrophe ('), quotation mark ("), comma (,), less than sign (<), greater than sign (>), backslash (/), question mark (?), percent sign (%)

- **Password:** Specify an administrator password with 1 to 64 characters. The password supports all ASCII characters.
- **Confirm Password:** Enter the new administrator password again.

10. Click Next.

The **Set the date and time** screen appears.

11. Specify the time zone, date, and time using any of the following methods:



Tip

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

Methods	User Actions
Synchronize with computer or device time	Select Same as the computer/device time The NAS time will be the same as your computer or device used to configure the time.
Enter manually	<p>a. Select Input Manually.</p> <p>b. Specify the date and time. The NAS date and time will be the same as the configured time.</p>
Synchronize with an Internet time server automatically	Click Synchronize with an Internet time server automatically. The NAS time will be the same as the NTP server.

12. Click Next.

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

13. Configure the network settings using any of the following methods.

Methods	User Actions
Obtain an IP address automatically (DHCP)	Select Obtain an IP address automatically (DHCP) The system automatically detects and configures the IP address settings.
Use static IP address	<p>a. Select Use static IP address. The IP address configuration page appears.</p> <p>b. Specify the following IP address configurations:</p> <ul style="list-style-type: none"> • Interface • IP Address • Subnet Mask • Default Gateway • Primary DNS server • Secondary DNS server

14. Click Next.

The **Thunderbolt Connection** page appears.

**Note**

This page only appears if your device supports Thunderbolt. You will need to connect your device to a computer using a Thunderbolt cable.

15. Click **Next**.
The **Summary** screen appears.
16. Review the settings.
17. Click **Apply**.
A confirmation message appears.

**Warning**

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

18. Click **Confirm**.
QTS is installed.

Installing QTS Using the Cloud Key

**Warning**

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

**Important**

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

1. Power on the NAS.
2. Connect the NAS to the internet.
3. Go to the QNAP Cloud Installation page using one of the following methods:
 - On your computer, go to your respective region's site to download QTS:
 - China: <https://install.qnap.com.cn>
 - Global: <https://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. Find your NAS from 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 QTS through LAN and then installing myQNAPcloud Link.

7. Click **Next.**

The QNAP **Warranty Service** page opens in the default web browser.

8. Click **Check warranty.**

The QNAP **Warranty Service** window opens in a new web page.

**Important**

You can check your device warranty policy or purchase an extended warranty plan at [QNAP Warranty Service](#).

9. Close the warranty page.

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

10. Specify a firmware version using any of the following methods.

Methods	User Actions
Current version	<p>a. Select Current version.</p> <p>b. Click Next.</p>
Latest available version	<p>a. Select Latest available version.</p> <p>b. Click Next. The system downloads the latest firmware version and restarts the NAS.</p> <p>c. Click Start Smart Installation.</p>
Uploaded version	<p>a. Select Uploaded version.</p> <p>b. Click Browse. The file upload window appears.</p> <p>c. Select the firmware file version.</p> <p>d. Click Next. The system downloads the latest firmware version and restarts the NAS.</p> <p>e. Click Start Smart Installation.</p>

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 supports 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 ([]), slash (\), vertical bar (|), semicolon (;), colon (:),

apostrophe ('), quotation mark ("), comma (,), less than sign (<), greater than sign (>), backslash (/), question mark (?), percent sign (%), or "admin".

- **Password:** Specify an administrator password with 1 to 64 characters. The password supports all ASCII characters.
- **Confirm Password:** Enter the new administrator password again.

12. Click Next.

The **Set the date and time** screen appears.

13. Specify the time zone, date, and time using any of the following methods:



Tip

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

Methods	User Actions
Synchronize with computer or device time	Select Same as the computer/device time The NAS time will be the same as your computer or device used to configure the time.
Enter manually	<p>a. Select Input Manually.</p> <p>b. Specify the date and time. The NAS date and time will be the same as the configured time.</p>
Synchronize with an Internet time server automatically	Click Synchronize with an Internet time server automatically. The NAS time will be the same as the NTP server.

14. Click Next.

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

15. Configure the network settings using any of the following methods.

Methods	User Actions
Obtain an IP address automatically (DHCP)	Select Obtain an IP address automatically (DHCP) The system automatically detects and configures the IP address settings.
Use static IP address	<p>a. Select Use static IP address. The IP address configuration page appears.</p> <p>b. Specify the following IP address configurations:</p> <ul style="list-style-type: none"> • Interface • IP Address • Subnet Mask • Default Gateway • Primary DNS server • Secondary DNS server

16. Click Next.

The **Thunderbolt Connection** page appears.

**Note**

This page only appears if your device supports Thunderbolt. You will need to connect your device to a computer using a Thunderbolt cable.

17. Click **Next**.
The **Summary** screen appears.
18. Review the settings.
19. Click **Apply**.
A confirmation message appears.

**Warning**



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

20. Click **Confirm**.
QTS is installed.


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.	<p>The device powers off.</p> <p> Important Use this method only when the device is unresponsive.</p> <p> Note 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>


Reset Button

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

LEDs

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

For details on the location of the LEDs, see [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. <p> Important When updating the firmware, do not remove the power cord or USB cable, and do not force-exit the application.</p>
	Red	<ul style="list-style-type: none"> The drive is invalid. The 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 green every 0.5 seconds	<ul style="list-style-type: none"> The device is starting up. The device is not configured. A drive is not formatted.
	Green	The device is ready.
	Off	<ul style="list-style-type: none"> All drives are in standby mode. The device is powered off.
LAN	Orange	The network connection is operating.
	Flashes orange	The device is being accessed from the network.
	Off	The device is not connected to a network.
2.5 Gigabit Ethernet speed	Green	The network connection is operating at 2.5 Gbps.
	Orange	<ul style="list-style-type: none"> The network connection is operating at 1 Gbps. The network connection is operating at 100 Mbps.
	Off	The network connection is operating at 10 Mbps.

LED	Status	Description
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.
Drive	Flashes red	The data is being accessed and a read/write error occurs during the process.
	Red	<ul style="list-style-type: none"> A drive read/write error occurred.
	Flashes green	<ul style="list-style-type: none"> Data is being accessed.
	Green	The drive is ready.
	Off	No drive was detected.
Expansion	Blue	A QNAP USB or SATA external storage device is connected.
	Off	No expansion unit has been detected.

Audio Alert

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> The NAS is starting up. When the reset button is pressed for 3 seconds, the NAS resets configurations. When the reset button is pressed for 10 seconds, the NAS resets configurations and reboots. When the reset button is pressed for 15 seconds, the NAS resets configurations and reboots. The operating system was updated.
	3	<ul style="list-style-type: none"> Cannot detect installed disk. The firmware was updated.

Duration	Frequency	Description
Long beep (1.5 seconds)	3 (every 5 minutes)	<ul style="list-style-type: none"> • A power error occurred. • The system fan is not functioning. • The fan module has been removed. • The NAS data cannot be copied to the external storage device connected to the front USB port.
	2	<ul style="list-style-type: none"> • The storage pool is about to reach full capacity. • The storage pool has reached full capacity. • A storage pool status error occurred. • The disk volume is about to reach its full capacity. • The disk volume has reached its full capacity. • The drives are in degraded mode. • The drive is rebuilding. • A volume status error occurred. • A drive is plugged in or out.
	1	<ul style="list-style-type: none"> • The NAS is powering off. • The NAS was powered 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 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/go/nas-migration>.

Your device must meet the following requirements:

- QTS NAS supports several types of NAS migration:
 - ARM NAS to an ARM NAS
 - x86 NAS to an x86 NAS
 - ARM NAS to an x86 NAS



Note


You cannot migrate from an x86 NAS to an ARM NAS.




- The destination NAS must run on the same QTS version as the source NAS (or later).
- 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, you can migrate existing data using HBS 3. For details, see [Migrating NAS Data Using HBS 3](#).

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 disk volumes	<p>If the NAS does not support file system encryption, encrypted disk volumes are not migrated.</p> <div style="border-left: 2px solid red; padding-left: 10px;"> <p> Warning To prevent data loss, back up and save the encryption keys of encrypted disk volumes in a safe place. You can also choose to decrypt disk volumes 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	<ul style="list-style-type: none"> • 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, USB QuickAccess, and more. • You must reconfigure network settings when the source NAS is running on QTS 4.3.5 or earlier versions.
Windows AD configuration	Windows AD configurations must be reconfigured.
Licenses	<p>Licenses are not migrated.</p> <p> Warning To prevent losing all your software licenses, QNAP recommends deactivating licenses on the source NAS before data migration.</p>
Applications	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 QTS as an administrator on the destination NAS.
The destination NAS automatically checks for the latest firmware update.

Migrating NAS Data Using HBS 3

For NAS models that do not support direct migration, you can initialize the destination NAS then copy data from the source NAS to the destination NAS using HBS 3.

Preparing the Destination NAS



1. Log on to QTS.
2. Create one or more storage pools.
For details, see the [Creating a Storage Pool](#) topic in the QTS user guide.
3. Create one or more volumes.
For details, see the [Volume Creation](#) topic in the QTS user guide.
4. Create shared folders on the destination NAS.
For details, see the [Creating a Shared Folder](#) topic in the QTS user guide.
5. Install HBS 3 onto the destination NAS.
 - a. Go to **App Center**.
 - b. Search for HBS 3.
 - c. Click **Install**.
HBS 3 is installed on the destination NAS.
6. Enable the remote server settings on the destination NAS.
 - a. Go to **App Center > HBS 3 > Services > RTRR Server**.
 - b. Click **Enable RTRR Server**.
The RTRR server settings window appears.
 - c. Specify the **RTRR Server** settings.

Setting	Description
Password	Specify a password that contains 1 to 16 characters from any of the following groups: <ul style="list-style-type: none"> • Letters: A to Z, a to z • Numbers: 0 to 9 • Special characters: . - _ ~ ! @ # \$ % ^ & () { } • Does not start or end with a space.
Port	Specify a port number to access the RTRR server.

7. Click **Apply**.
A confirmation window appears.
8. Click **OK**.
The remote server settings are completed.

Creating a One-Way Sync Job

1. On the source NAS, go to **App Center > HBS 3 > Sync**.
2. Click **Sync Now**.
3. Select **One-way Sync Job**.
The **Create a Sync Job** window appears.
4. Click **Remote NAS**.
5. Click **Add New Account**.
The **Create a Storage Space** window appears.
6. Select the destination NAS as the destination storage space and specify the following:

Setting	Description
Name	The name used to identify the storage space.
IP address / Host name	The IP address or hostname used to access the storage space.  Tip Click  to scan for available devices.
Port	The port number used to access the storage space. This value must be between 1 to 65535.
Password	The password used to access the storage space.
Use SSL connection	Requires SSL connection when accessing the remote NAS.

7. Optional: Test the connection.

Test	Description
Detect Server	Tests the accessibility of the selected storage space.
Speed Test	Tests the network connection speed of the selected storage space.

8. Click **Create**.
9. Click **Select**.

10. Select the paired folders.



Important

- All subfolders and files in the selected folder are selected.
- You can only sync up to 16 paired folders per job.

- a. Under the source, click **+**.
A dialog box opens.
- b. Select a folder.
- c. Click **OK**.
The dialog box closes.
- d. Under the destination, click **+**.
A dialog box opens.
- e. Select a folder.
- f. Click **OK**.
- g. Optional: Add more paired folders if necessary.

11. Click **Next**.
The **Schedule** screen appears.

12. Select **Sync now**.

13. Click **Next**.
The **Rules** screen appears.

14. Optional: Configure job rules.

15. Click **Next**.
The **Summary** screen appears.

16. Review the job summary.

17. Click **Create**.
The source NAS runs the created one-way sync job.



Note

It may take several minutes to migrate shared folders from the source NAS to the destination NAS.

Importing Local Users or Group Settings to the Destination NAS

1. Power on the source NAS.
2. Back up the users or group settings from the source NAS.
 - a. Log on to QTS.
 - b. Go to **Control Panel > Privilege > Users**.
 - c. Click **Create**, and then click **Import/Export Users**.
The **Import/Export Users** window appears.

- d. Select **Export user and user group settings**.
 - e. Click **Next**.
The NAS user and user group settings are exported as a file and downloaded onto your computer.
3. Import user settings on the source NAS to the destination NAS.
 - a. On the destination NAS, log on to QTS.
 - b. Go to **Control Panel > Privilege > Users** .
 - c. Click **Create**, and then click **Import/Export Users**.
 - d. Select **Import user and user group settings**.

**Note**

You can select whether to send a notification mail to newly created users or overwrite duplicate users.

- e. On your computer, select the user settings file exported from the source NAS.
The source NAS user settings file is imported to the destination NAS.

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 QTS 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 QTS installation.

Hot-Swapping Failed Drives

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

RAID Type	Number of Disks	Situation
RAID 1	2	One member drive fails.
RAID 5	≥ 3	One member drive fails.
RAID 6	≥ 4	One or two member drives fail.
RAID 10	≥ 4 (Must be an even number)	One or two member drives in two different pairs fail.
RAID 50	≥ 6	One disk per subgroup fails.
RAID 60	≥ 8	Two disks per subgroup fail.

1. Log on to QTS.
2. Go to **Main Menu > Storage & Snapshots > Storage > Disks/VJBOD** .
3. Locate the failed drive.
4. Prepare a new hard drive with a capacity that is the same as or larger than the failed hard drive.
5. Remove the failed drive from the device.
6. Wait for 20 seconds or until the device beeps twice.
7. Remove the failed drive from the drive tray.
8. Insert the new drive into the drive tray.
9. Install the new drive.
The NAS beeps twice.
10. Go to **Main Menu > Storage & Snapshots > Storage > Storage/Snapshots** .
11. Locate the volume 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, or RAID 60 volume from degraded mode.

Disk Volume	RAID Recovery Support	Number of Disks	Maximum Number of Removed Drives
Single	No	1	N/A
JBOD	Yes	≥ 2	N/A
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.

Support and Other Resources

QNAP provides the following resources:

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

7. Glossary

Cloud Key

Unique 8-digit code assigned to each NAS device

myQNAPcloud

Provides various remote access services such as DDNS and myQNAPcloud Link

myQNAPcloud Link

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

Qfinder Pro

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

QNAP ID

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

QTS

QNAP NAS operating system

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FCC Class A Notice



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

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