



TS-h966TX

User Guide

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1. Important Information

Original Packaging

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

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

Hardware Defects

If your QNAP product has hardware defects, return the product to QNAP or a QNAP-authorized service center for maintenance or replacement. Any attempt to repair or perform maintenance procedures on the product by you or an unauthorized third party invalidates the warranty.

QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.

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

Safety information

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

General Instructions

WARNING



- To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.
- Always ensure that all drive trays, including empty ones, are properly installed in the device. Missing trays can alter the intended airflow, potentially causing internal components to overheat.



Observe electrostatic discharge (ESD) procedures to avoid potential injury or damage to components.

Power

WARNING



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



To avoid serious injuries, a trained service technician must disconnect all PSU cords from the device before installing or replacing system components.

Moving Parts

WARNING



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



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

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

System Battery

WARNING



INGESTION HAZARD

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

- To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.
- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

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

2. Product Overview

This chapter provides basic information about your QNAP device.

About the TS-h966TX

The TS-h966TX is designed for small and medium-sized businesses requiring cost-effective storage, backup, and data recovery. The NAS is equipped with one 10 Gigabit and one 2.5 Gigabit Ethernet port, and houses nine drive bays, five of which support SATA drives that enable caching for boosting IOPS-intensive applications, and four of which support U.2 NVMe solid-state drives. The NAS runs on the QuTS hero operating system, along with a ZFS file system, up to 65536 snapshots, and real-time SnapSync. The TS-h966TX can accommodate a wide range of business applications and be expanded to fit future data storage requirements.

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>.

Component	TS-h966TX-8G
Processor	
CPU	Intel® Core™ i3 processor
Architecture	x86 64-bit
Encryption engine	AES-NI
Memory	
Pre-installed memory	8 GB RAM: DDR5 SODIMM

Component	TS-h966TX-8G
Memory slots	2 x DDR5 SODIMM Important • 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	64 GB RAM: 2 x 32 GB
Storage	
Drive bays	• 5 x 3.5-inch SATA 6 Gbps (hot-swappable) • 4 x 2.5-inch U.2 PCIe NVMe (hot-swappable)
Drive compatibility	3.5-inch bays: • 3.5-inch SATA hard disk drives • 2.5-inch SATA solid-state drives 2.5-inch bays: • 2.5-inch U.2 NVMe solid-state drives Warning Installing U.2 NVMe solid-state drives in incompatible bays will damage the drive connectors.
Network	
10 Gigabit Ethernet port	1 x 10GBASE-T RJ45 (10GbE/5GbE/2.5GbE/1GbE/100MbE)
2.5 Gigabit network interface	1 x 2.5 GbE RJ45 (2.5GbE/1GbE/100MbE/10MbE)
External I/O Ports & Expansion Slots	

Component	TS-h966TX-8G
Thunderbolt™ ports	Rear: 2 x Thunderbolt 4, Type-C
USB ports	Front: 1 x USB 3.2 Gen 2, Type-A Note This USB port supports One Touch Copy. Rear: • 1 x USB 3.2 Gen 2, Type-A • 1 x USB 2.0, Type-A
HDMI ports	1 x HDMI® Connector (up to 4K@60Hz)
Interface	
Buttons	• Power • Reset • USB One Touch Copy
Dimensions	
Form factor	Tower
Dimensions (H x W x D)	182.7 x 224.6 x 223.6 mm (7.19 x 8.84 x 8.80 in)
Net weight	3.57 kg (7.7 lbs)
Others	
Power supply unit	150W adapter, 100-240V AC, 50/60 Hz
System battery	CR2032 lithium battery (3V, 225 mAh)
Fan	System: 1 x 140 mm, 12V DC fan
Operating temperature	0°C to 40°C (32°F to 104°F)

Component	TS-h966TX-8G
Relative humidity	• Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F)
Security slot	Kensington security slot

Tip

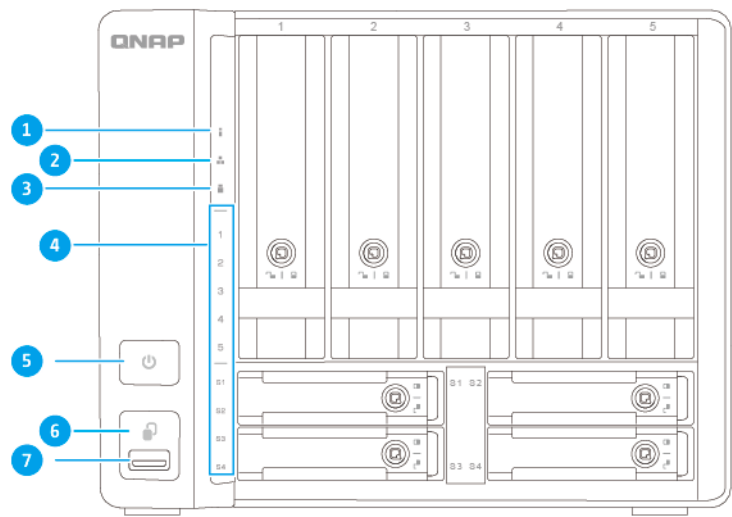
For the list of compatible drive models and expansion cards, go to <https://www.qnap.com/compatibility>.

Package Contents

Item	Quantity
TS-h966TX	1
AC power adapter	1
Power cord	1
Ethernet cables	1 x Cat6a
Drive tray keys	2
Screws for 3.5-inch drives	20
Screws for 2.5-inch drives	15
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Components

Front Panel

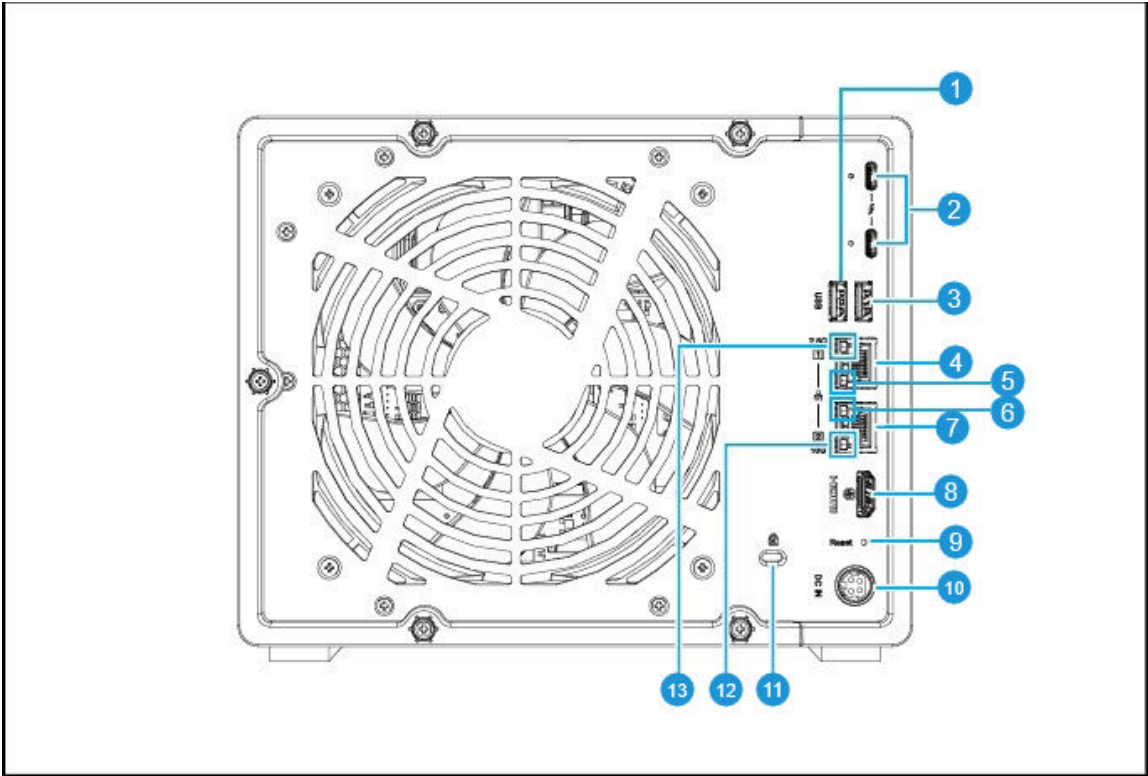


No.	Component	No.	Component
1	Status LED	5	Power button
2	LAN LED	6	USB One Touch Copy button
3	USB One Touch Copy LED	7	USB 3.2 Gen 2 One Touch Copy Type-A port
4	Drive LEDs	-	-

Important

If the USB connection speed appears abnormal, replug the USB connector all the way in to the USB port in one smooth action.

Rear Panel

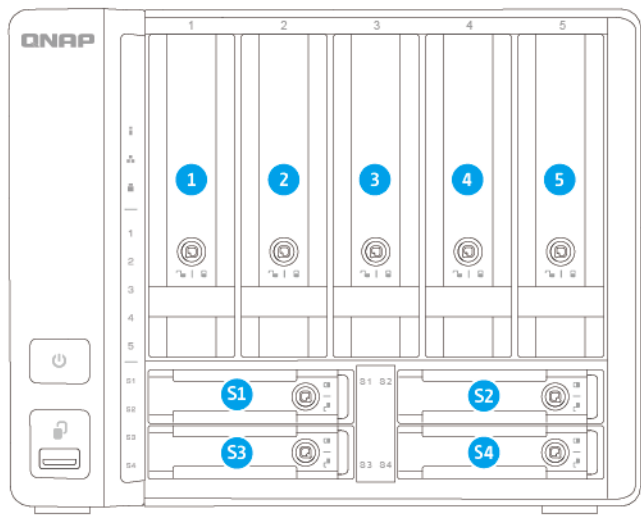


No.	Component	No.	Component
1	USB 2.0 Type-A port	8	HDMI® Connector (up to 4K@60Hz)
2	Thunderbolt™ 4 ports	9	Reset button
3	USB 3.2 Gen 2 Type-A port	10	Power input
4	2.5 Gigabit Ethernet port	11	Kensington security slot
5	2.5 Gigabit Ethernet speed LED	12	10 Gigabit Ethernet speed LED
6	10 Gigabit Ethernet activity LED	13	2.5 Gigabit Ethernet activity LED
7	10 Gigabit Ethernet port	-	-

Important

- QNAP USB expansion units only support connections to USB ports on the rear panel.
- If the USB connection speed appears abnormal, see the final optional step in [Connecting USB Expansion Units](#) for instructions on how to fix this problem.

Drive Numbering



Drive Label	Drive Type	Compatible Drives
1 to 5	3.5-inch SATA	3.5-inch SATA hard disk drives 2.5-inch SATA solid-state drives
S1 to S4	2.5-inch U.2 NVMe	2.5-inch U.2 NVMe solid-state drives Warning Installing U.2 NVMe solid-state drives in incompatible bays will damage the drive connectors.

Installation requirements

Category	Item
Environment	- 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

Category	Item
Hardware and peripherals	- Storage drives For the list of compatible drive models, go to https://www.qnap.com/compatibility. - Network cable
Tools	- 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 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 2.5-inch Hard Drives or Solid-State Drives on 2.5-inch Trays](#)
3. Optional: Replace the memory modules.
For details, see [Replacing Memory Modules](#)
4. Optional: Connect expansion units.
For details, see [Connecting USB Expansion Units](#)
5. Connect the power cord and all applicable cables.
6. Power on the NAS.
7. Install QuTS hero.
For details, see [QuTS hero Installation](#).
8. Log on to QuTS hero.

3. Installation and Configuration

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

Warning

Always ensure that all drive trays, including empty ones, are properly installed in the device. Missing trays can alter the intended airflow, potentially causing internal components to overheat.

Hardware installation

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

Drive Installation

The TS-h966TX is 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.



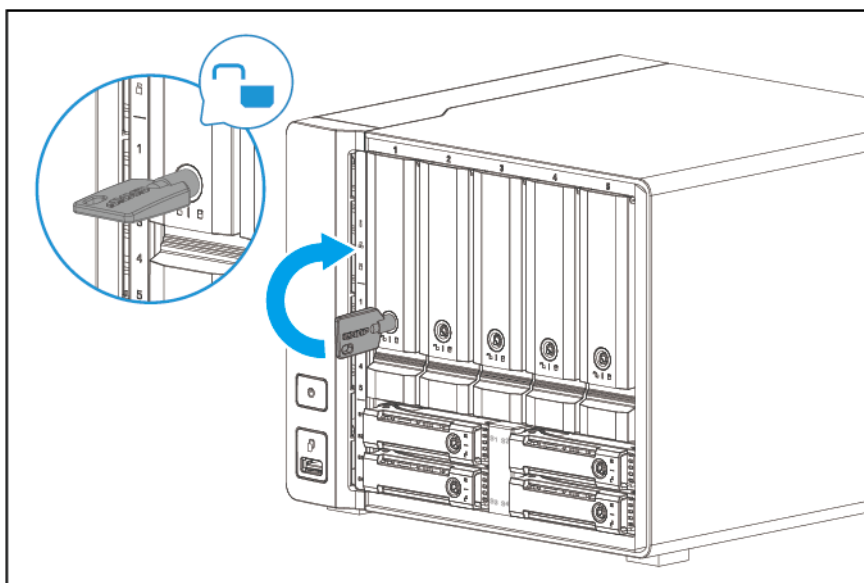
Moving fan blades: Keep your hands and other body parts away from moving fan blades.



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

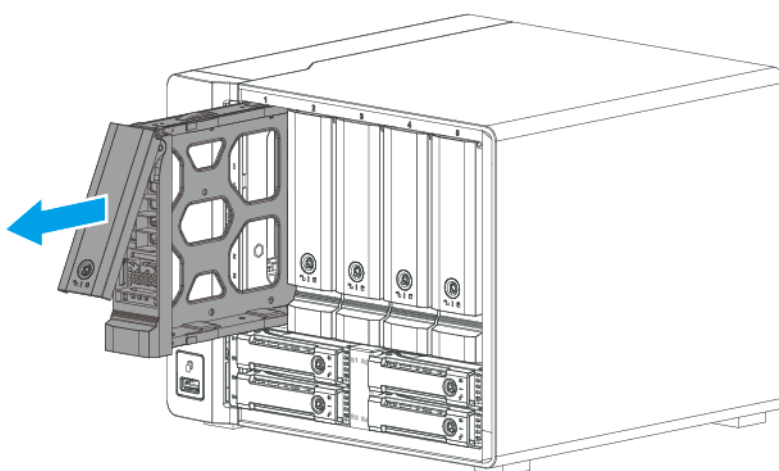
1. Power off the NAS.

2. Optional: Unlock the tray.



3. Remove the drive tray.

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



Note

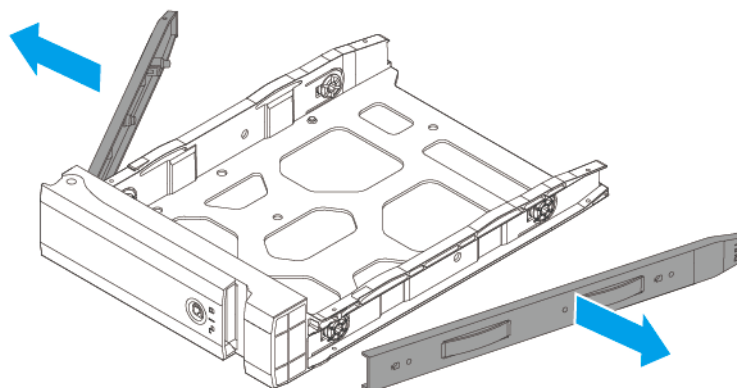
The preinstalled drive trays come unlocked.

Important

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

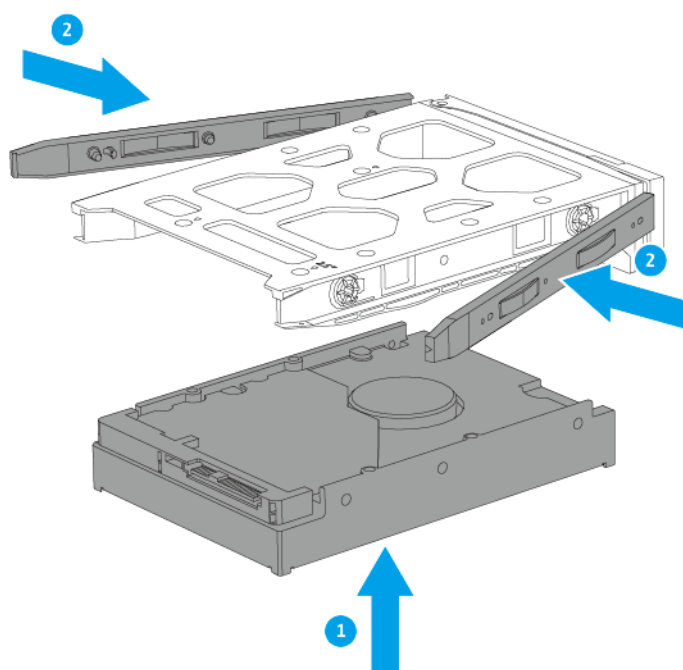
4. Install a drive on the tray.

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



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

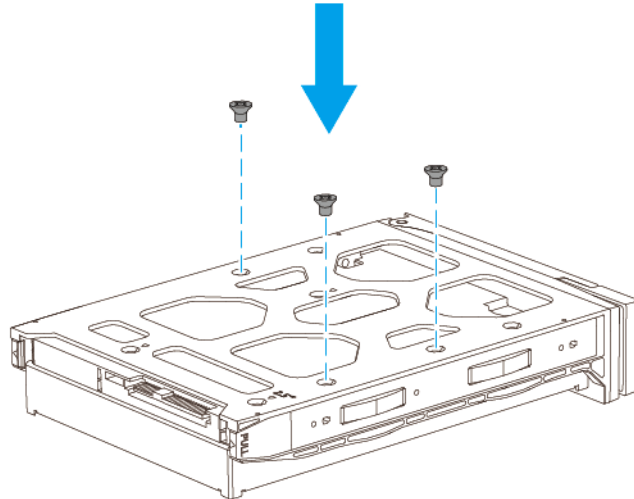
- c.** Attach the fastening panels to lock the drive to the tray.



- d. Optional: Attach the screws.

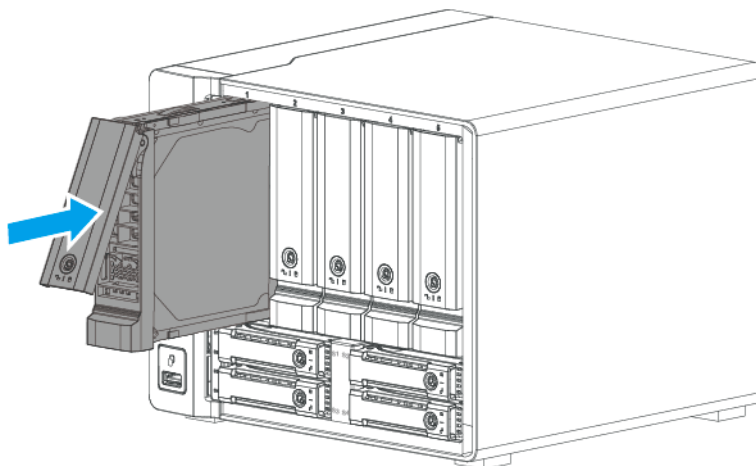
Note

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

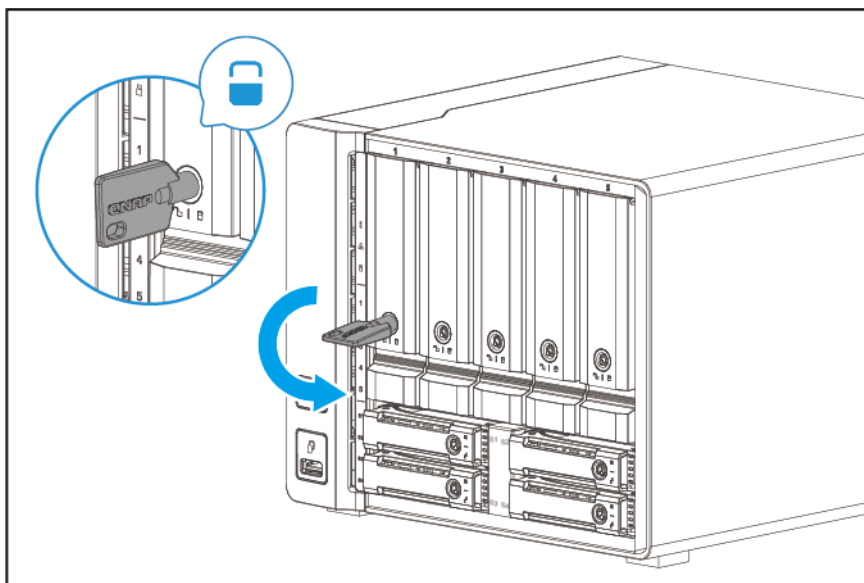


5. Load the tray into the bay.

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



- c. Lock the tray.



6. 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.
- Installing U.2 NVMe solid-state drives in incompatible bays will damage the drive connectors.
Only install U.2 NVMe solid-state drives in bays S1 and S2. For details, see [Drive Numbering](#).
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.



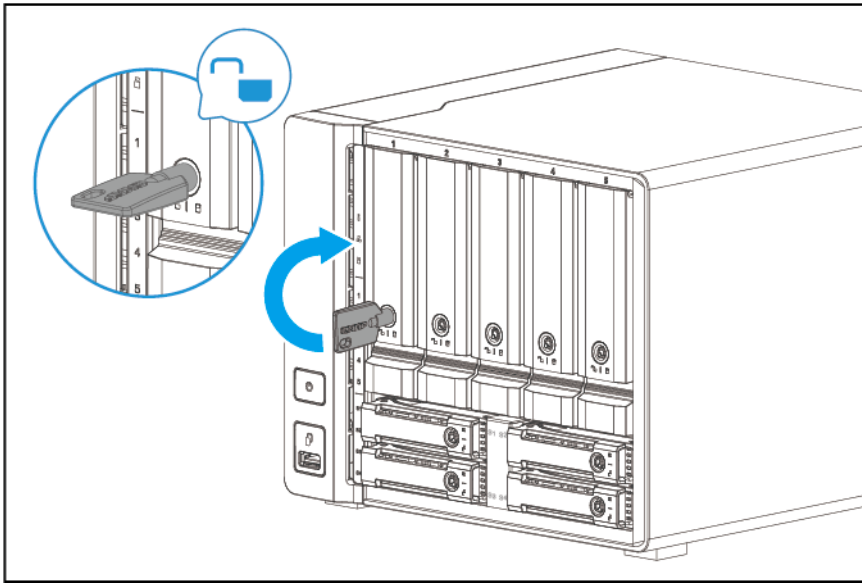
Moving fan blades: Keep your hands and other body parts away from moving fan blades.



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

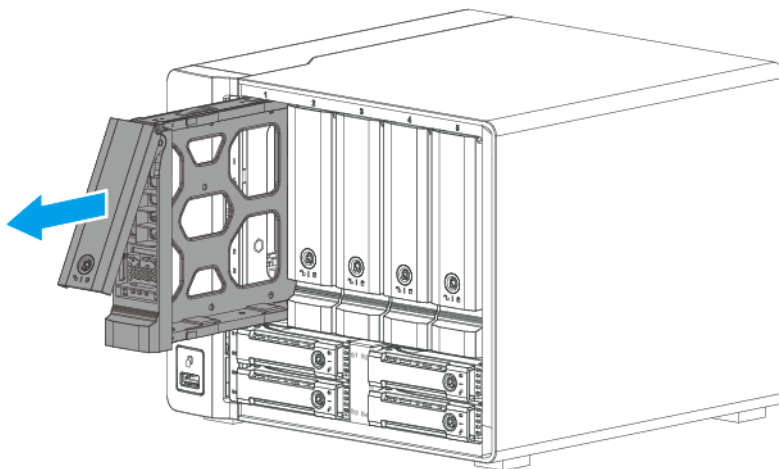
1. Power off the NAS.

2. Optional: Unlock the tray.



3. Remove the drive tray.

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



Note

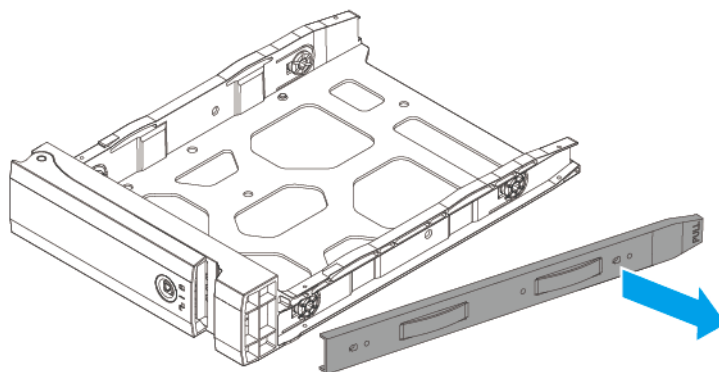
The preinstalled drive trays come unlocked.

Important

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

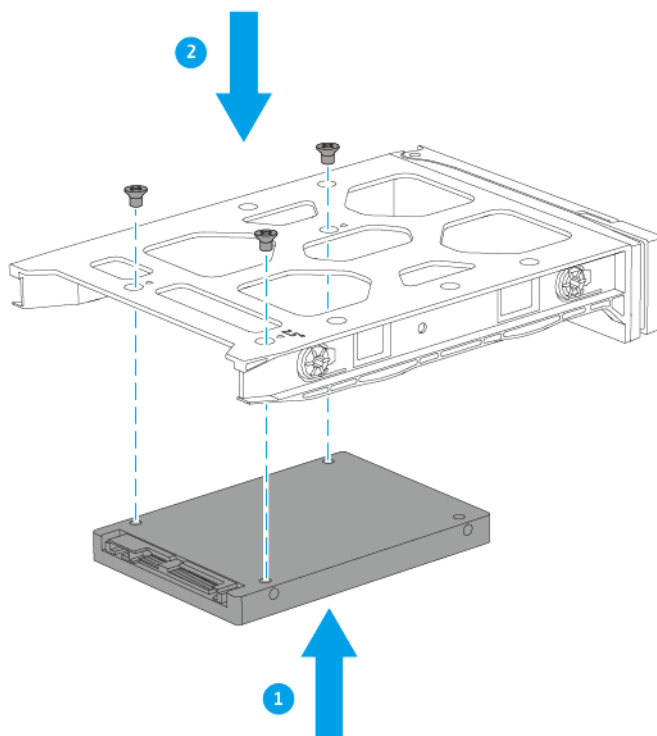
4. Install a drive on the tray.

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



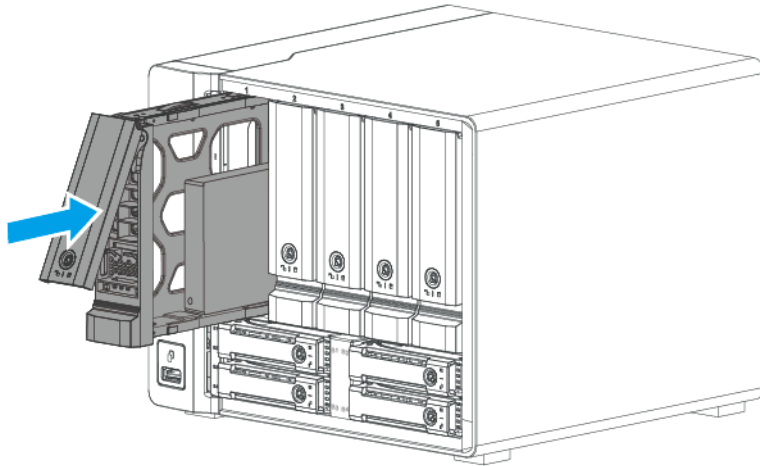
- b.** Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.

- c.** Attach the screws.

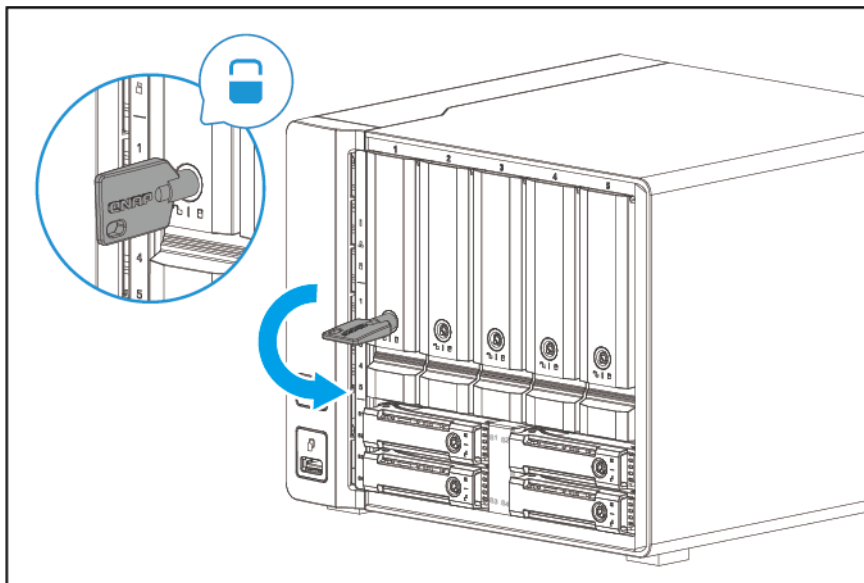
**5. Load the tray into the bay.**

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

- b.** Push the handle.



- c.** Lock the tray.



- 6.** Power on the NAS.

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

Warning

- Installing a drive deletes all data on the drive.
- Installing U.2 NVMe solid-state drives in incompatible bays will damage the drive connectors.
Only install U.2 NVMe solid-state drives in bays S1 and S2. For details, see [Drive Numbering](#).
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

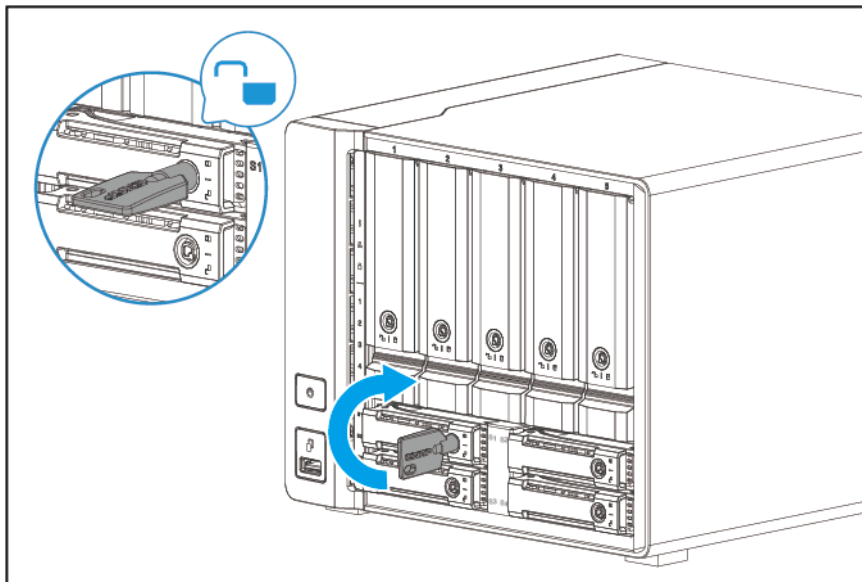


Moving fan blades: Keep your hands and other body parts away from moving fan blades.



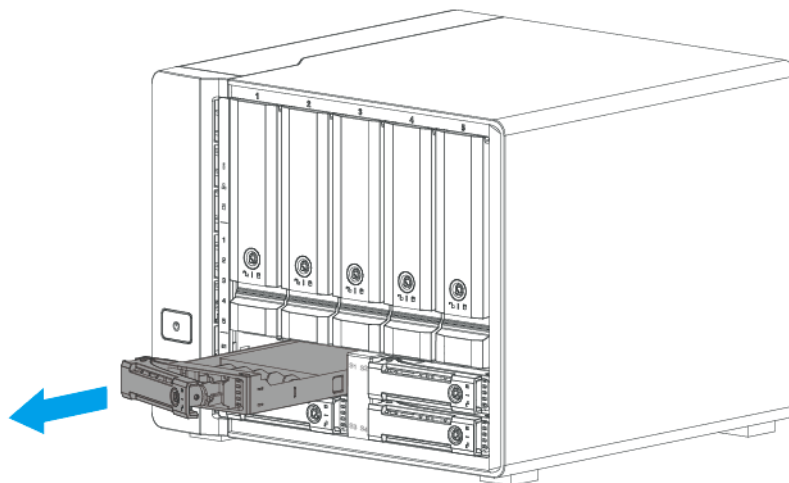
Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the NAS.
2. Optional: Unlock the tray.



3. Remove the drive tray.
 - a. Pull the handle to release the tray.

- b.** Pull the tray out.

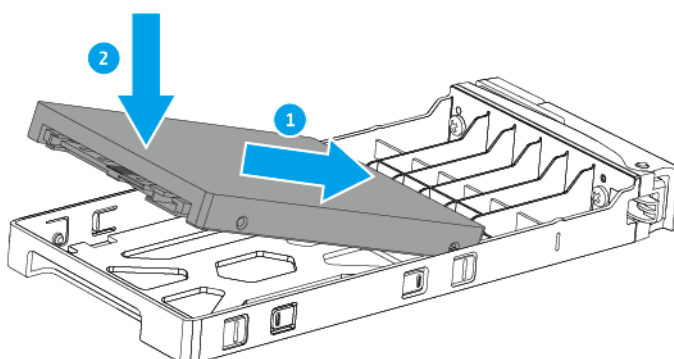
**Note**

The preinstalled drive trays come unlocked.

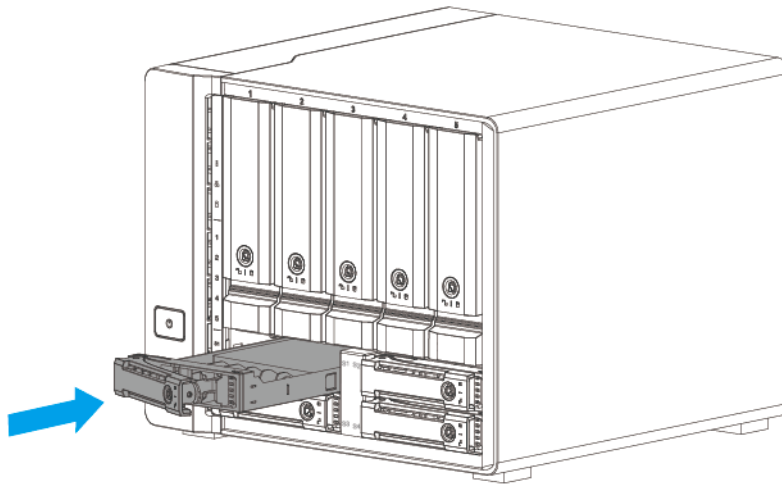
Important

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

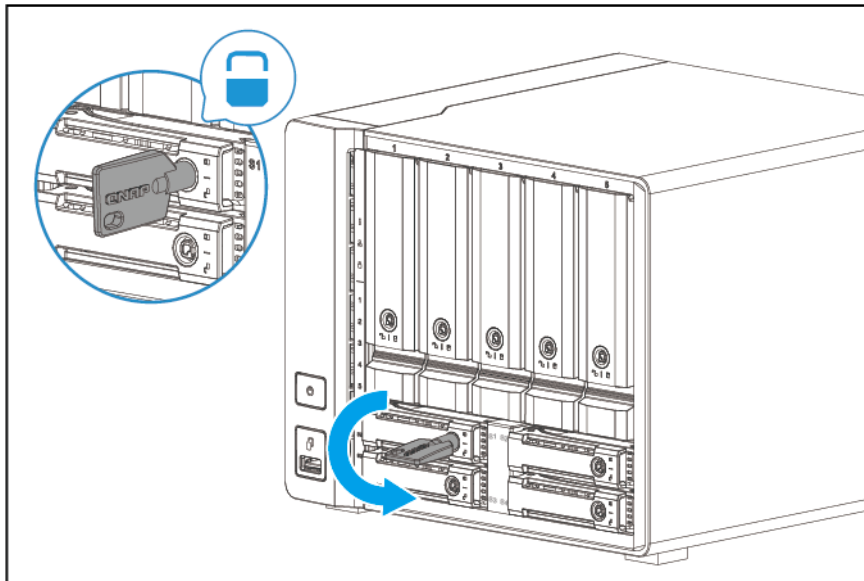
- 4.** Install a drive on the tray.
 - a.** Align the connector on the drive with the opening at the end of the tray.
 - b.** Place the drive on the tray.



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



- c. Lock the tray.



6. Power on the NAS.

Replacing Memory Modules

The TS-h966TX has two memory slots. You can increase the memory capacity of the NAS by upgrading memory modules. This NAS also comes preinstalled with one or two non-ECC memory modules. To provide extra protection from undetected data corruption, you can upgrade to ECC memory modules.

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

Important

Use only all ECC memory modules, or all non-ECC memory modules. Installing both types of memory modules will cause the ECC modules to perform as non-ECC modules.

Warning

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



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



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

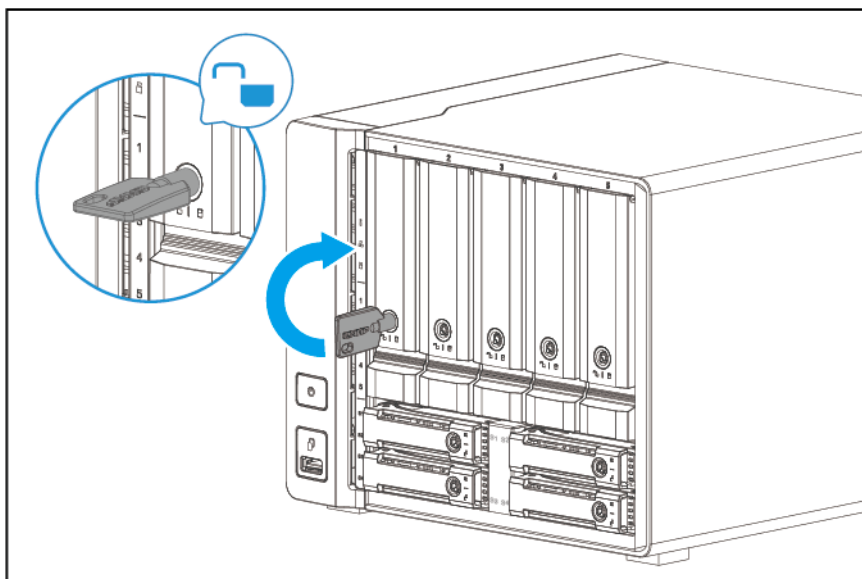
1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove each drive tray in bays 1 to 5.

Important

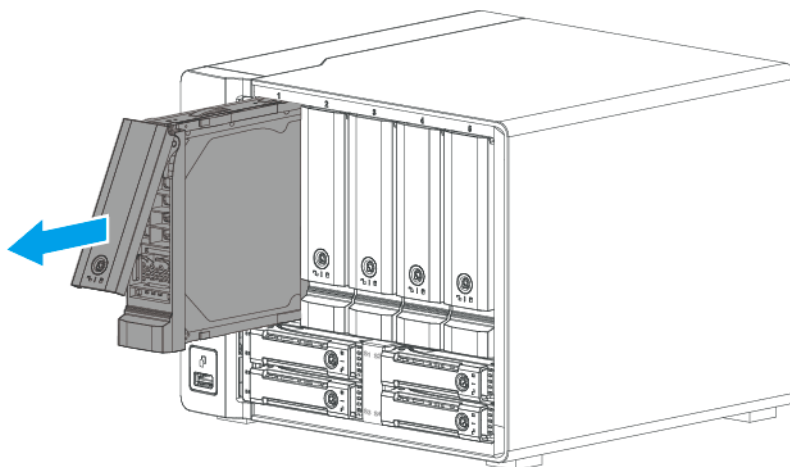
Remember the number of each drive. The drive trays will need to be returned to their original bays.

For details, see [Drive Numbering](#).

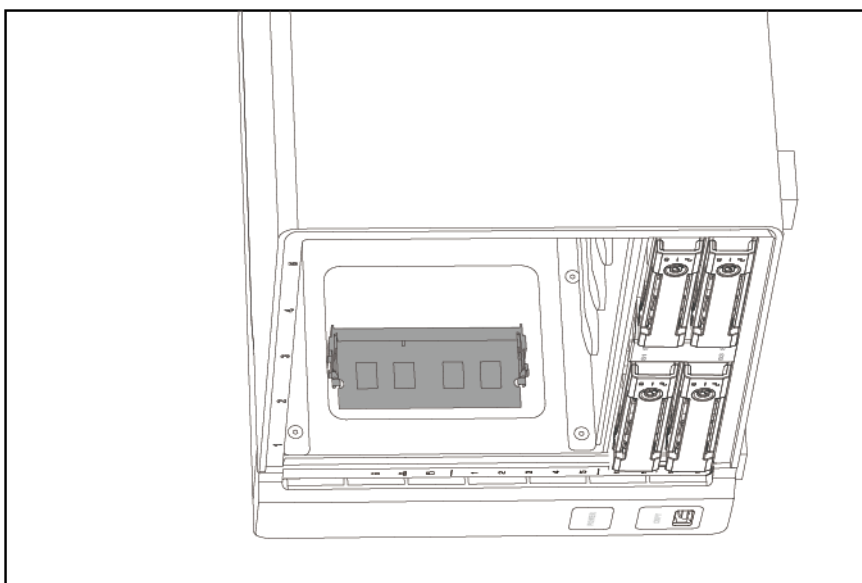
- a. Optional: Unlock the tray.



- b.** Pull the tray handle outward.
- c.** Pull the tray out.

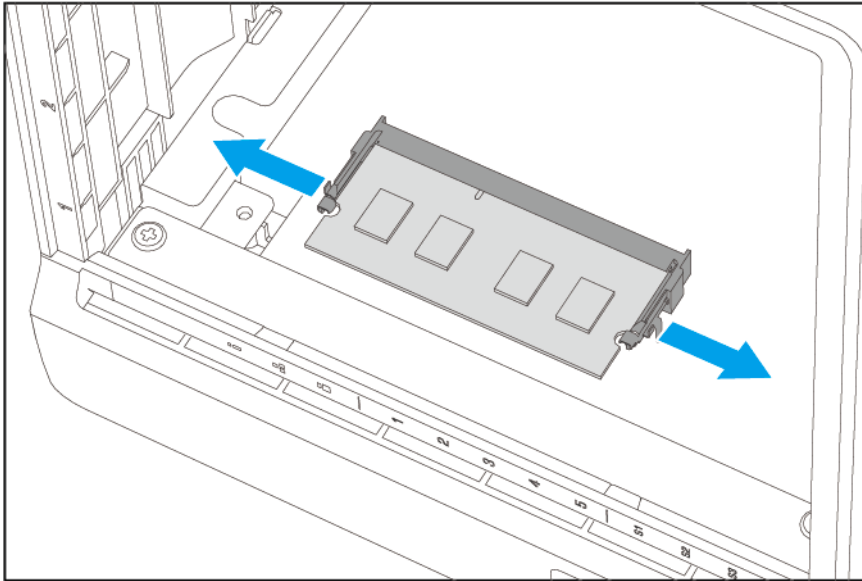


- 5.** Place the device on its left side.



6. Optional: Remove an existing module.

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



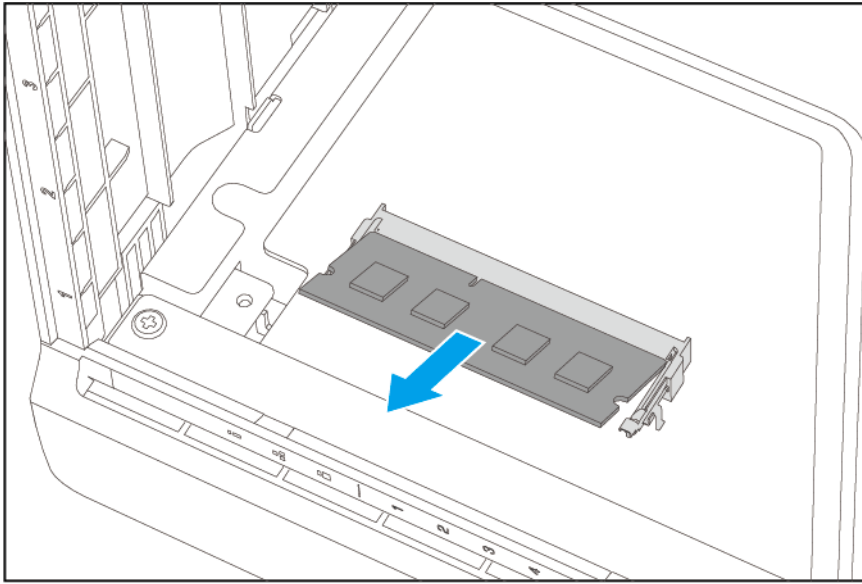
- b.** Verify that the module has tilted upward and is completely released from the slot.

Warning

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

- c.** Hold the module by the edges.

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

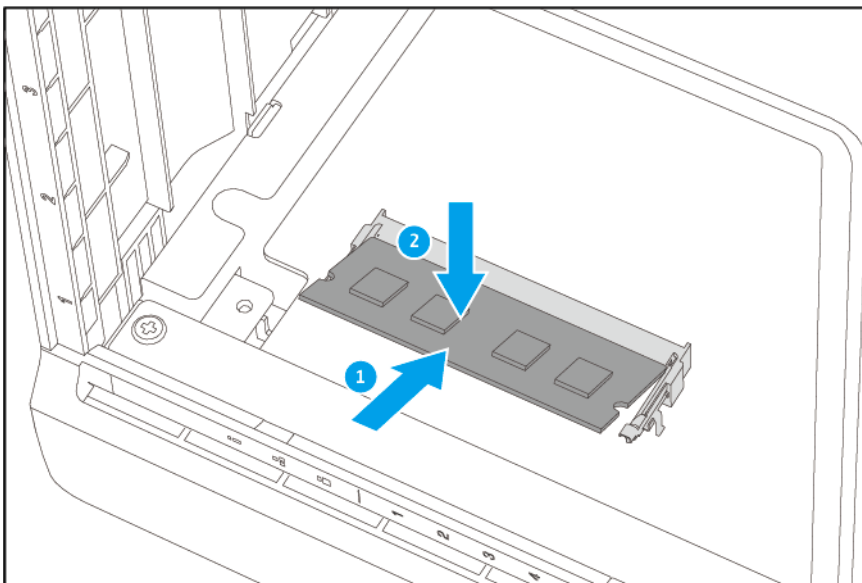


Warning

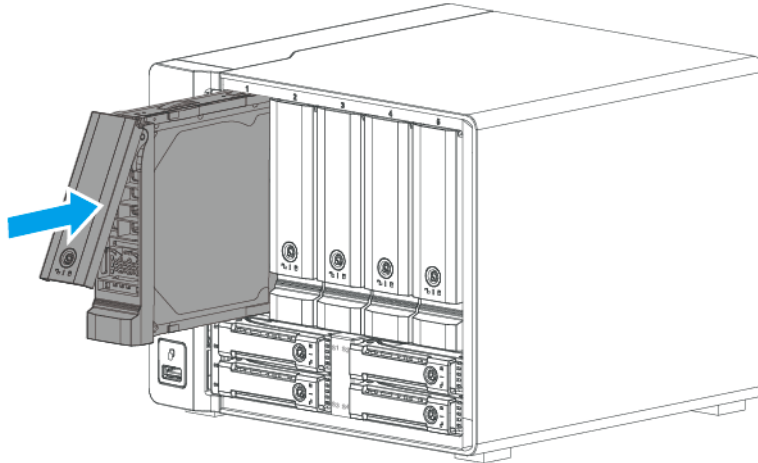
- Do not touch the internal components, particularly the metal connectors.
- Do not bend the module.

7. Install a new module.

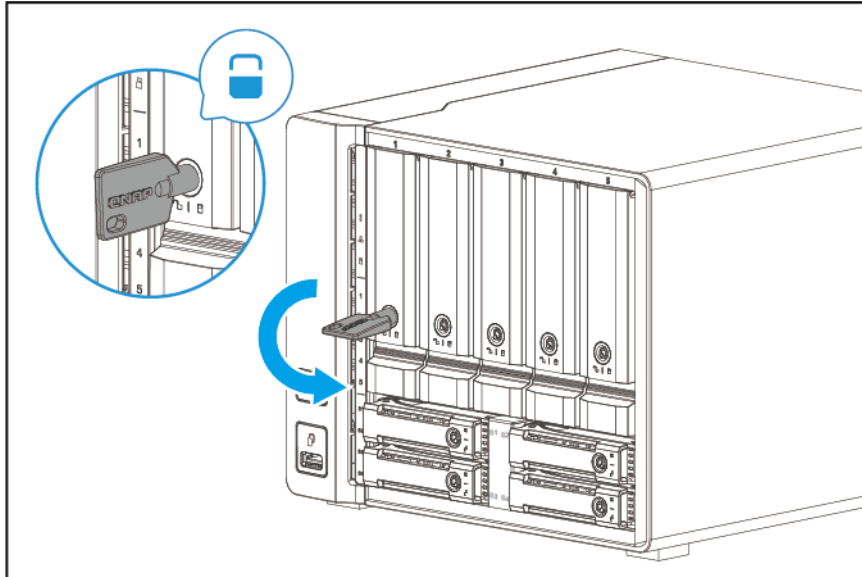
- a. Align the notch with the ridge in the slot.
- b. Insert the module into the slot.
- c. Verify that the metal connectors are completely inserted into the slot.
- d. Carefully press down on the module until the retention clips lock the module into place.



8. Place the device in its normal upright position.
9. Return drive trays into their original bays.
 - a. Slide the drive tray into the drive bay.
 - b. Push in the handle.



- c. Lock the tray.



10. Connect all cables and external attachments.
11. Power on the device.
12. Verify that the module is recognized by the device.
 - a. Log on to QuTS hero as an administrator.

- b.** Go to **Control Panel > System > System Status > Hardware Information**.
- c.** Check the value for **Total memory**.

Connecting USB Expansion Units

The device supports 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	• Uses a USB 3.2 Gen 2 Type-C interface • Supports SATA HDD/SSD	• USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TR-004	• Uses a USB 3.2 Gen 1 Type-C interface • Supports SATA HDD/SSD	• USB 3.2 Gen 2 Type-A to Type-C cable • USB 3.2 Gen 2 Type-C to Type-C cable
TL-D810TC4	• Uses a USB4 Type-C interface • Supports SATA HDD/SSD	• QXP-40G2UC host bus adapter • USB4 Type-C to Type-C cable

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.

- 1.** Verify that the NAS is powered off.
- 2.** 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 or USB Type-C port on the NAS.
- 3.** Power on the expansion units.
- 4.** Power on the NAS.
- 5.** Verify that the expansion units are recognized by the NAS.
 - a.** Log on to QuTS hero as an administrator.

- b.** Go to **Storage & Snapshots > Overview > System**.
 - c.** Verify that the expansion units are listed.
- 6.** Optional: Troubleshoot abnormal USB connection speed.
- a.** Power off the NAS.
 - b.** Power off the expansion units.
 - c.** Disconnect all USB cables.
 - d.** Wait 10 seconds.
 - e.** Replug the USB connectors.

Important

- Plug each connector all the way in to its corresponding USB port in one smooth action.
- Follow the previous steps to reconnect the expansion units to the NAS.

QuTS hero Installation

Method	Description	Requirements
Qfinder Pro installation (Recommended)	If the NAS is connected to your local area network, you can do the following: • Locate the NAS using Qfinder Pro. • Complete the steps in the Smart Installation Guide wizard. For details, see Initializing QuTS hero using Qfinder Pro	• Computer • Network cable • Qfinder Pro installer

Method	Description	Requirements
Cloud installation	If the NAS is connected to the internet, you can do the following: • 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. For details, see Initializing QuTS hero using the cloud installation website	• Computer or mobile device • myQNAPcloud account • Cloud Key

Initializing QuTS hero using Qfinder Pro

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

Warning

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

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

Note

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

4. Locate the NAS in the list and then double-click the name or IP address.
The **Smart Installation Guide** opens in the default web browser.
5. If the screen shows a different operating system, click **QuTS hero**.

Note

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

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

6. Click **Start Smart Installation Guide**.

The **Install Firmware** window appears.

7. Install firmware using any of the following methods:

Installation methods	Steps
Automatic	Click Start . Automatically searches for available firmware updates and installs firmware.
Manual installation	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.

8. Specify the following information

- **NAS name:** Specify a name with 1 to 14 characters. The name supports letters (A to Z, a to z), numbers (0 to 9), and hyphens (-), but cannot end with a hyphen.
- **Username:** Specify an administrator username that contains 1 to 32 characters. The name can contain letters (A to Z, a to z), numbers (0 to 9), and hyphens (-), multi-byte Chinese, Japanese, Korean, and Russian characters.
The username cannot contain the following special characters: grave accent (`), asterisk (*), equal sign (=), plus sign (+), square brackets ([]), curly brackets ({}), slash (/), vertical bar (|), semicolon (;), colon (:), apostrophe ('), quotation mark ("), comma (,), less than sign (<), greater than sign (>), backslash (\), question mark (?), percent sign (%), dollar sign (\$), and the space character.

Important

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

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

9. Click **Next**.

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

Tip

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

11. Click **Next**.
The **Configure the network settings** screen appears.
12. Select **Obtain an IP address automatically (DHCP)**.
13. Click **Next**.
14. Review the settings.
15. Click **Apply**.
A confirmation message appears.

Warning

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

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

Initializing QuTS hero using the cloud installation website

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

Warning

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

1. Power on the device.
2. Connect the device to the internet.
3. Go to the QNAP Cloud Installation website using one of the following methods:
 - On your computer, go to the website dedicated to your region.
 - Global: <https://install.qnap.com>
 - China: <https://install.qnap.com.cn>
 - Or scan the QR code on the NAS using a mobile device.

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

4. Find your NAS from the list and then click **Initialize**.

Tip

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

The installation wizard opens in the default web browser.

5. Create an account or sign in to myQNAPcloud.

Note

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

6. Specify the myQNAPcloud device name for the NAS.

Note

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

7. Click **Next**.

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

8. Perform any of the following actions.

- To check for the latest available version, click **Start**.
The wizard downloads the latest available version, and then the NAS restarts after the download is complete. If a newer version is not available, the wizard automatically displays the **Smart Installation Guide**.
- To install the out-of-the-box version, click **Skip**.
- If the screen shows a different operating system, click **QuTS hero**.
The NAS restarts and the smart installation screen shows QuTS hero as the operating system to install.

9. Click **Start Smart Installation Guide**.

The **Install Firmware** window appears.

10. Install firmware using any of the following methods:

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

Important

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

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

12. Click **Next.**

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

Tip

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

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

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

16. Click **Next**.

17. Review the settings.

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

Warning

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

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

4. Basic Operations

This chapter describes basic NAS operations.

Power button

Operation	User Action	Result
Power on	Press the button once.	The device powers on.
Power off	Press and hold the button for 1.5 seconds.	The device powers off.
Force power off	Press and hold the button for 5 seconds.	The device powers off. 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: • System administrator password: For details on the default password, see this FAQ. • TCP/IP configuration: • 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

Operation	User Action	Result
Advanced system reset	Press and hold the button for 10 seconds.	The default factory settings are restored. 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 QNAP device or from the QNAP device to a USB device.

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

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

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	- A drive is being formatted. - The device is being initialized. - The operating system is being updated. - RAID rebuilding is in progress. - Online RAID Capacity Expansion is in progress. - Online RAID Level Migration is in progress. - The firmware is being updated. Important When updating the firmware, do not remove the power cord or USB cable, and do not force-exit the application.

LED	Status	Description
System Status	Red	• A drive is invalid. • A shared folder has reached its full capacity. • A shared folder is about to reach its full capacity. • A system fan is not functioning. • An error occurred when accessing (read/write) the data. • A bad sector is detected on a drive. • The device is in degraded read-only mode (two member drives failed in RAID 5 or RAID 6 but the data can still be read). • A hardware self-test error occurred.
	Flashes red every 0.5 seconds	The device is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).
	Green	The device is ready.
	Flashes green every 0.5 seconds	• The device is not configured. • A drive is not formatted.
	Off	• All drives are in standby mode. • The device is powered off.
Drive	Flashes red	Data is being accessed, and during the process a drive read/write error occurred.
	Red	A drive read/write error occurred.
	Flashes green	Data is being accessed.
	Green	The drive is ready.
	Off	No drive was detected.

LED	Status	Description
LAN	Orange	The network connection is operating. Note The LAN LED can only detect the device's in-built Ethernet port connections. It cannot detect network expansion cards' Ethernet port connection status.
	Flashes orange	The device is being accessed from the network.
	Off	The device is not connected to a network.
10 Gigabit Ethernet (RJ45) speed	Green	A 10 GbE network connection has been established.
	Orange	The network connection is operating below 10 Gbps.
	Off	There is no network connection.
10 Gigabit Ethernet (RJ45) activity	Orange	A network connection is established.
	Flashes orange	Data is being transmitted.
	Off	There is no network connection.
2.5 Gigabit Ethernet speed	Green	The network connection is operating at 2.5 Gbps.
	Orange	The network connection is operating at 1 Gbps or 100 Mbps.
	Off	- The network connection is operating at 10 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.
USB	Blue	A USB device connected to the USB One Touch Copy port is detected.
	Off	No USB expansion unit has been detected.

Audio Alert

Duration	Frequency	Description
Short beep (0.5 seconds)	1	- The NAS is starting up. - The NAS is shutting down. - When the reset button is pressed for 3 seconds, the NAS resets configurations. - When the reset button is pressed for 10 seconds, the NAS resets configurations and reboots.
	3	- The NAS data cannot be copied to the external storage device connected to the USB One Touch Copy port. - The NAS has completed a firmware update.
Long beep (1.5 seconds)	3 (every 5 minutes)	A system fan is not functioning.
	2	- A shared folder is about to reach its full capacity. - A shared folder has reached its full capacity. - The hard drives on the NAS are in degraded mode. - The hard drives have started rebuilding. - A drive is plugged in or out.
	1	- The NAS was powered off by force shutdown (hardware shutdown). - The NAS was powered on successfully and is ready.

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.

QTS NAS 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).

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, 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	If the NAS does not support file system encryption, encrypted disk volumes are not migrated. 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.
Shared folders	All shared folders and the downloaded files stored in them are retained. Warning To prevent data loss, back up and save encryption keys or passwords of encrypted shared folders in a safe place before migration. Important Folder permissions on the destination NAS must be reconfigured after migration.
Network	• If the number of network ports or network port specifications on the destination NAS is different from the source NAS, the following network and virtual settings may change and require reconfiguration: port trunking, virtual machines, Thunderbolt, 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	Licenses are not migrated. Warning To prevent losing all your software licenses, QNAP recommends deactivating licenses on the source NAS before data migration.

Data and Settings	After NAS Migration
Applications	If the destination NAS has less RAM than the source NAS, the following features and applications might not function: Virtualization Station, Qsirch, and Snapshots.
Services	Only services supported by the destination NAS are available.
Multimedia features	Some multimedia features are disabled by default.

Migrating a NAS

Important

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

For details see the following topics:

- [NAS migration requirements](#)
- [Status and setting changes after NAS migration](#)

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

Important

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

- a. Remove the drives from the source NAS.
 - b. Remove the drive trays from the destination NAS.
3. Install the drives.
 - a. Install source NAS drives onto the destination NAS drive trays.
 - b. Insert the drive trays into the destination NAS.
 4. Power on the destination NAS.
 5. Log on to 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: • 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.

QuTS hero NAS 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	If the NAS does not support file system encryption, encrypted shared folders are not migrated. 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.
Shared folders	All shared folders and the downloaded files stored in them are retained. Warning To prevent data loss, back up and save encryption keys or passwords of encrypted shared folders in a safe place before migration. Important Folder permissions on the destination NAS must be reconfigured after migration.
Network	If the number of network ports or network port specifications on the destination NAS is different from the source NAS, the following network and virtual settings may change and require reconfiguration: port trunking, virtual machines, Thunderbolt, and more.
Windows AD configuration	Windows AD configurations must be reconfigured.
Licenses	Licenses are not migrated. Warning To prevent losing all your software licenses, QNAP recommends deactivating licenses on the source NAS before data migration.
Applications	If the destination NAS has less RAM than the source NAS, the following features and applications might not function: Virtualization Station, Qsirch, and Snapshots.

Data and Settings	After NAS Migration
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 drive with a capacity that is the same as or larger than the failed drive.
5. Remove the failed drive from the device.
6. Wait for 20 seconds or until the device beeps twice.
7. Remove the failed drive from the drive tray.
8. Insert the new drive into the drive tray.
9. Install the new drive.
The NAS beeps twice.
10. Go to **Main Menu > Storage & Snapshots > Storage > Storage/Snapshots**.
11. Locate the storage pool that contains the new drive and then verify that the status is Rebuilding.

Recovering Unintentionally Removed Healthy Drives

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

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

Support and other resources

QNAP provides the following resources:

Resource	URL
Documentation	https://www.qnap.com/download
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/status
Downloads	https://www.qnap.com/download
QNAP Community	https://community.qnap.com
QNAP Accessories Store	https://accessory.qnap.com

7. Glossary

Cloud Key

Unique 8-digit code assigned to each NAS device

myQNAPcloud Link

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

myQNAPcloud

Provides various remote access services such as DDNS and myQNAPcloud Link

Qfinder Pro

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

QTS

QNAP NAS operating system

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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- 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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