



**QNAP**

# **TS-451D2**

**TS-451D2-2G**

**TS-451D2-4G**

**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 device.

### About the TS-451D2

The TS-451D2 is powered by an Intel® Celeron® J4025 dual-core 2.0 GHz processor. With high-efficiency file management, data protection, and HDMI output, the TS-451D2 provides high storage potential to store, share, and back up files. Home users can enjoy a multimedia experience with streaming and direct 4K HDMI 2.0 output, while SOHO users can enable multi-user on-premise or remote access to files. The NAS supports up to 8 GB DDR4 memory and features four USB 3.2 Gen 1 ports and two Gigabit Ethernet ports for greater connectivity.

### Hardware Specifications



#### Warning

- If your QNAP product has hardware defects, return the product to QNAP or a QNAP-authorized service center for maintenance or replacement. Any attempt to repair or perform maintenance procedures on the product by you or an unauthorized third-party invalidates the warranty.
- QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.
- For details, see the [QNAP Warranty Terms and Conditions](#).






#### Tip

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

Ordering P/N	CPU	Memory	Power supply
TS-451D2-2G	Intel® Celeron® J4025	2 GB	AC adapter
TS-451D2-4G	Intel® Celeron® J4025	4 GB	AC adapter

Component	TS-451D2-2G	TS-451D2-4G
Processor		
CPU	Intel® Celeron® J4025	
Frequency	Dual-core 2.0 GHz base/2.9 GHz burst	
Architecture	x86 64-bit	
Encryption engine	Supported	
Memory		
Pre-installed memory	2 GB RAM: 1 x 2 GB DDR4 SODIMM	4 GB RAM: 1 x 4 GB DDR4 SODIMM

Component	TS-451D2-2G	TS-451D2-4G
Memory slots	2 x DDR4 SODIMM   <b>Note</b> Use only QNAP memory modules to maintain system performance and stability. For NAS devices with more than one memory slot, use QNAP modules with identical specifications. Using unsupported modules may degrade performance, cause errors, or prevent the operating system from starting.	
Maximum memory	8 GB RAM: 2 x 4 GB	
Flash memory	4 GB (dual-boot OS protection)	
Storage		
Drive bays	4 x 3.5-inch SATA 6 Gbps   <b>Note</b> The NAS is also backward compatible with 3 Gbps.	
Drive compatibility	3.5-inch bays: <ul style="list-style-type: none"> <li>• 3.5-inch SATA hard disk drives</li> <li>• 2.5-inch SATA hard disk drives</li> <li>• 2.5-inch SATA solid-state drives</li> </ul>	
SSD cache acceleration support	Supported	
Hot-swapping	Supported	
Network		
Gigabit Ethernet ports	2 x GbE RJ45	
Wake-on-LAN	Yes (GbE RJ45)	
External I/O Ports & Expansion Slots		
USB ports	Front: 1 x USB 3.2 Gen 1 Rear: 3 x USB 3.2 Gen 1	
HDMI ports	1 x HDMI 2.0 (up to 4096 x 2160 resolution at 60 Hz)	
Interface		
Buttons	<ul style="list-style-type: none"> <li>• Power</li> <li>• USB One Touch Copy</li> <li>• Reset</li> </ul>	
Dimensions		
Form factor	Tower	
Dimensions (H x W x D)	165.3 x 160 x 219.4 mm (6.50 x 6.29 x 8.63 in)	
Net weight	2.09 kg (4.60 lbs)	
Others		
Power supply unit	90W, 100-240V AC, 50/60 Hz	

Component	TS-451D2-2G	TS-451D2-4G
System battery	CR2032 lithium battery 3V	
Sound level	18.5 dB(A)	
	 <b>Note</b> The sound level was tested at a bystander position, which is within one meter of the NAS. The test NAS operated at low speed with the maximum number of drives installed.	
Fans	System: 1 x 120mmV DC	
Operating temperature	0°C to 40°C (32°F to 104°F)	
Relative humidity	<ul style="list-style-type: none"> <li>• Non-condensing relative humidity: 5% to 95%</li> <li>• Wet-bulb temperature: 27°C (80.6°F)</li> </ul>	
Security slot	Kensington security slot	

**Tip**

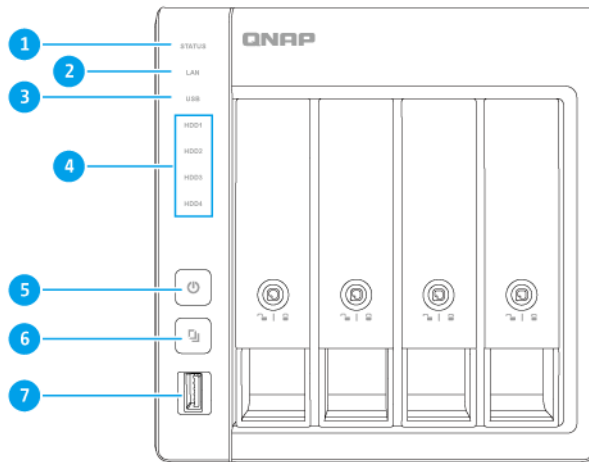
For the list of compatible drive models and expansion cards, go to <https://www.qnap.com/compatibility>.

## Package Contents

Item	Quantity
TS-451D2	1
AC power adapter	1
Power cord	1
Ethernet cable	1 x CAT5e
Drive tray keys	2
Screws for 3.5-inch drives	8
Screws for 2.5-inch drives	6
Quick Installation Guide (QIG)	1

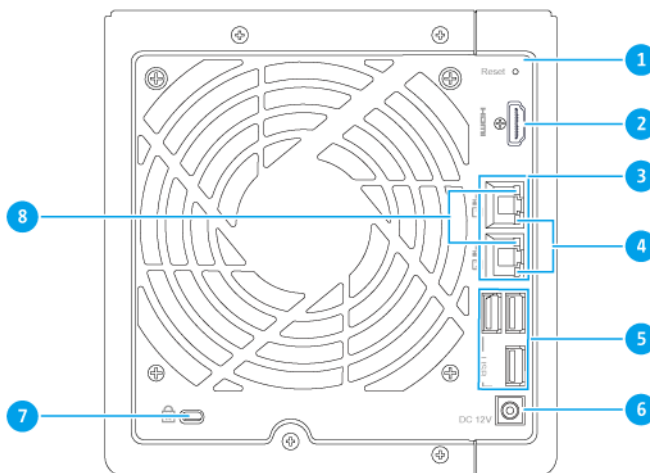
## Components

## Front Panel



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

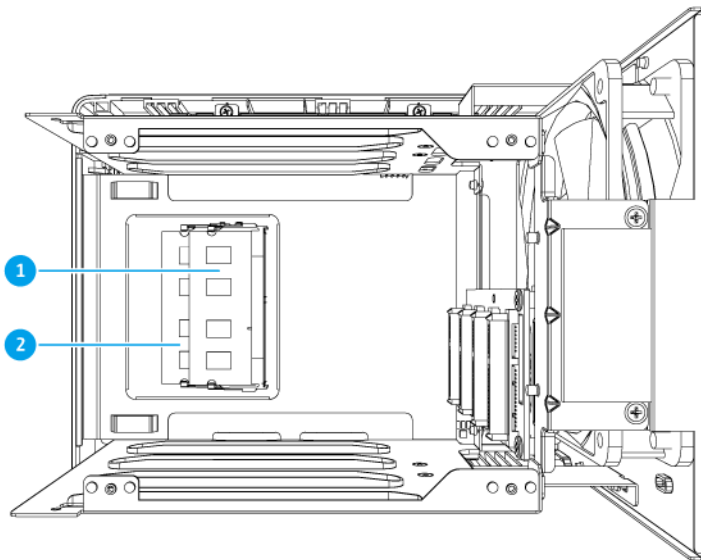
## Rear Panel



No.	Component	No.	Component
1	Reset button	5	USB 3.2 Gen 1 Type-A ports

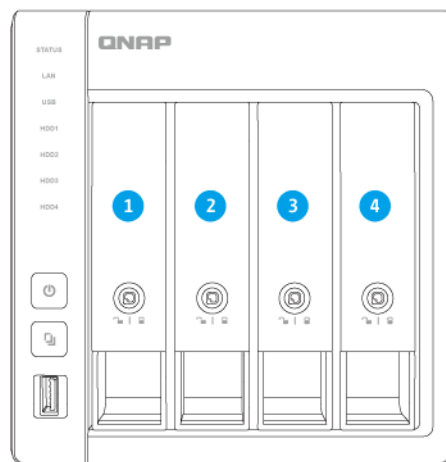
No.	Component	No.	Component
2	HDMI 2.0 port	6	Power port
3	Gigabit Ethernet ports	7	Kensington security slot
4	Gigabit Ethernet speed LEDs	8	Gigabit Ethernet activity LEDs

## Left Panel



No.	Component	No.	Component
1	Memory slot 1	2	Memory slot 2

## Drive Numbering



## Safety Information

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

### 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.

## Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> <li>• Room temperature: 0°C to 40°C (32°F to 104°F)</li> <li>• Non-condensing relative humidity: 5% to 95%</li> <li>• Wet-bulb temperature: 27°C (80.6°F)</li> <li>• Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals</li> <li>• Free from objects that may obstruct NAS ventilation or apply pressure to the NAS or power cord</li> </ul>
Hardware and peripherals	<ul style="list-style-type: none"> <li>• Storage drives For the list of compatible drive models, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>.</li> <li>• Network cable</li> </ul>
Tools	<ul style="list-style-type: none"> <li>• Phillips #1 or #2 screwdriver</li> <li>• Anti-static wrist strap</li> </ul>

## Setting Up the NAS



### Important

Read all safety requirements and information in [Safety 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](#)
3. Optional: Replace the memory modules.
4. Connect the power cord and all applicable cables.
5. Power on the NAS.
6. Install QTS.  
For details, see [QTS Installation](#).
7. Log on to QTS.

## 3. Hardware Installation

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

### Drive Installation

The TS-451D2 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.
- 



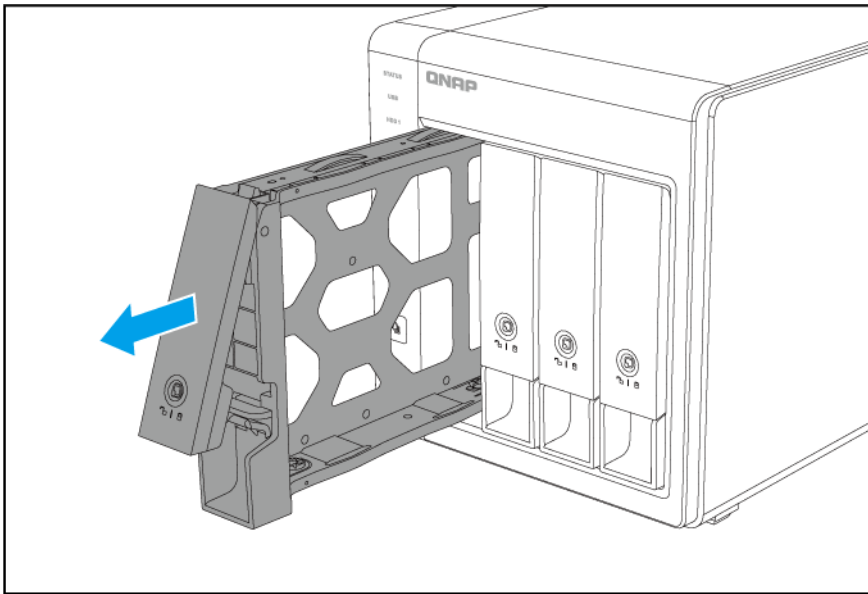
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

- 



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

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

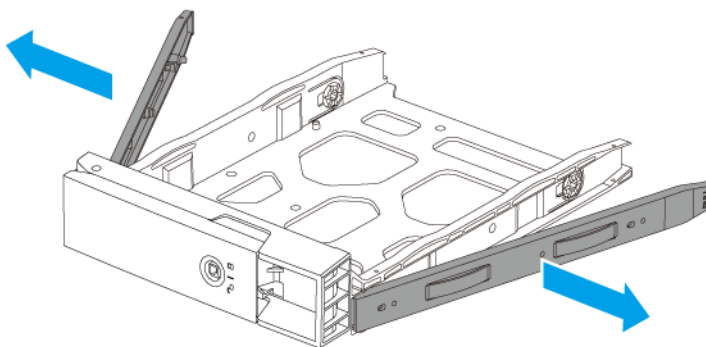
**Note**

The preinstalled drive trays come unlocked.

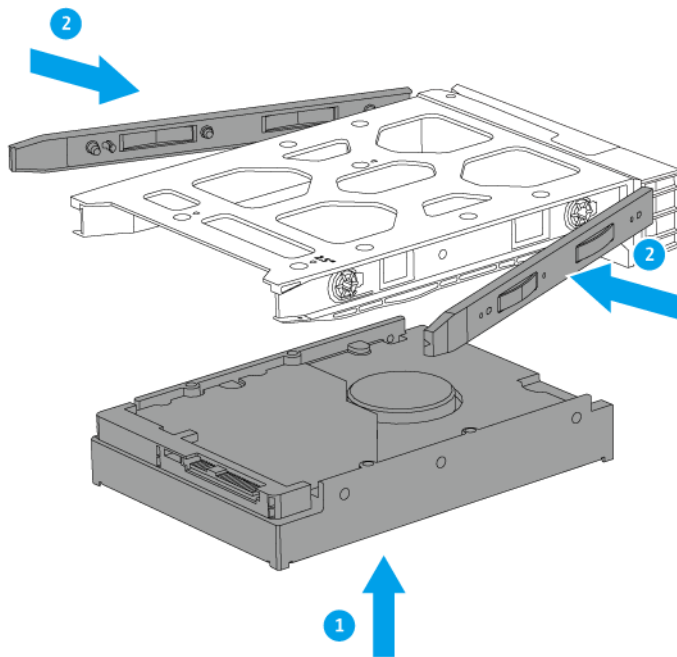
**Important**

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

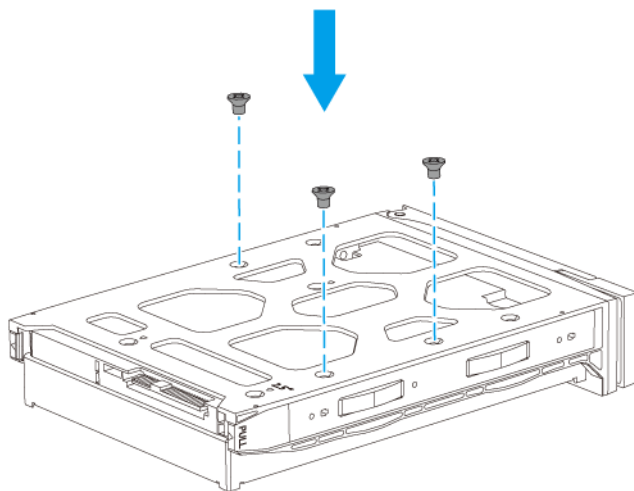
3. Install a drive on the tray.
  - a. Remove the fastening panels from the sides of the drive tray.



- b. Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides of the tray.
    - c. Attach the fastening panels to lock the drive to the tray.

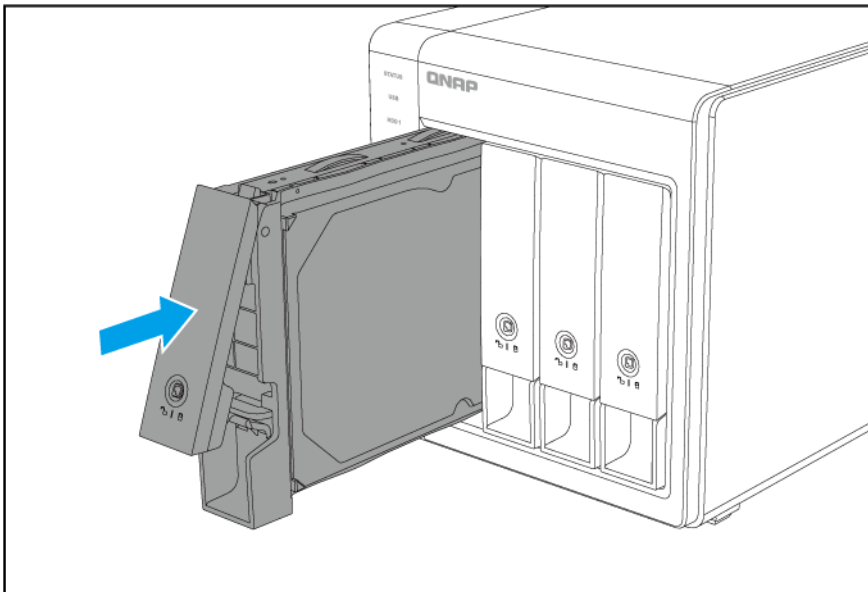


d. Attach the screws.

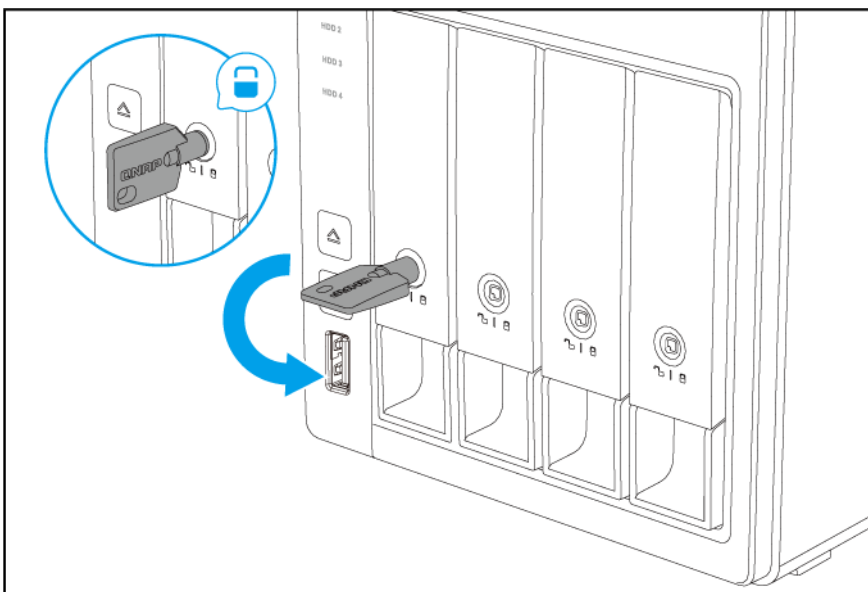


4. Load the tray into the bay.

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



c. Lock the tray.



5. Power on the NAS.

## Installing 2.5-inch Hard Drives 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.

•



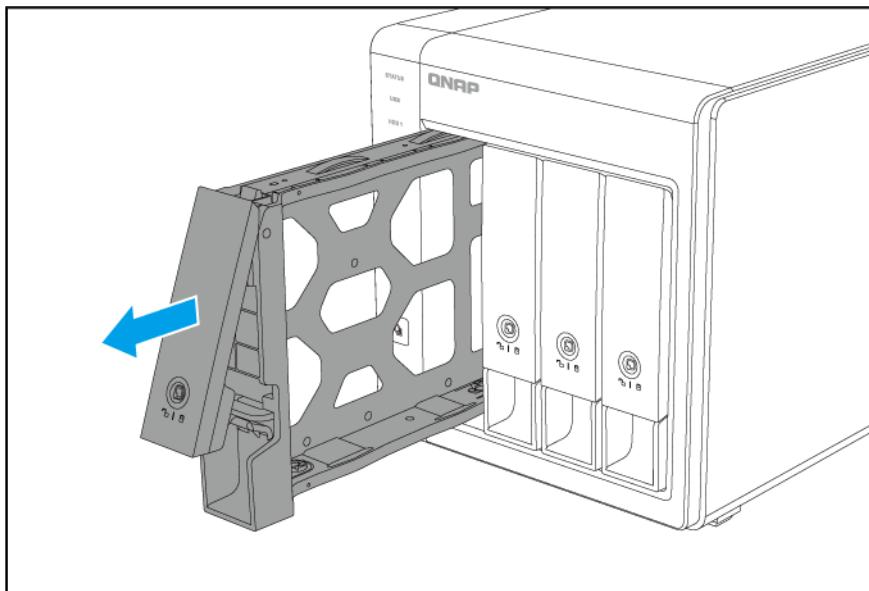
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

•



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

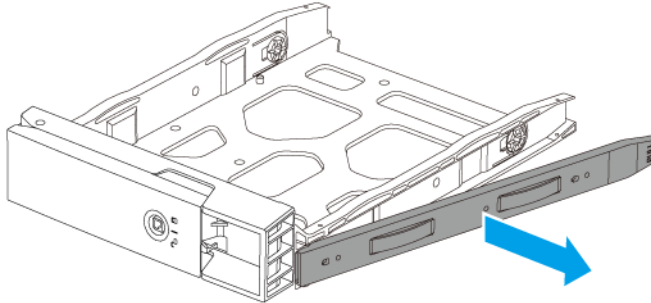
**Note**

The preinstalled drive trays come unlocked.

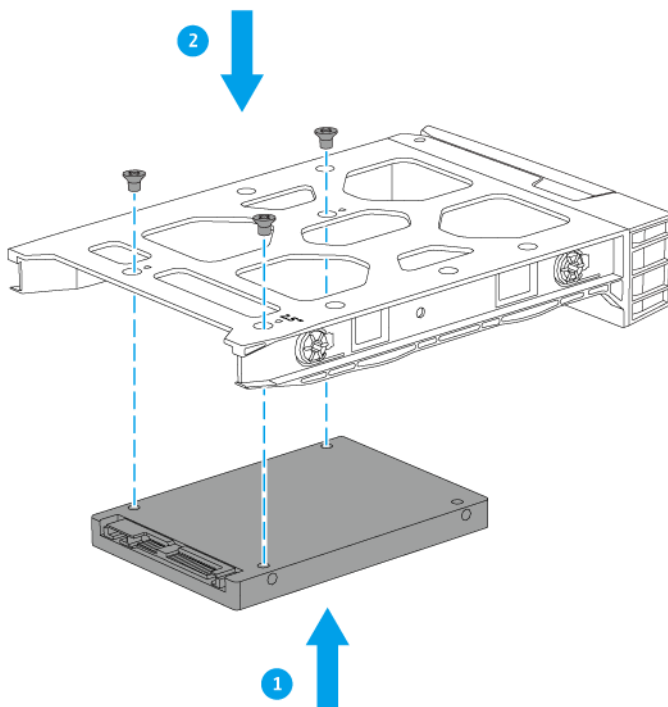
**Important**

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

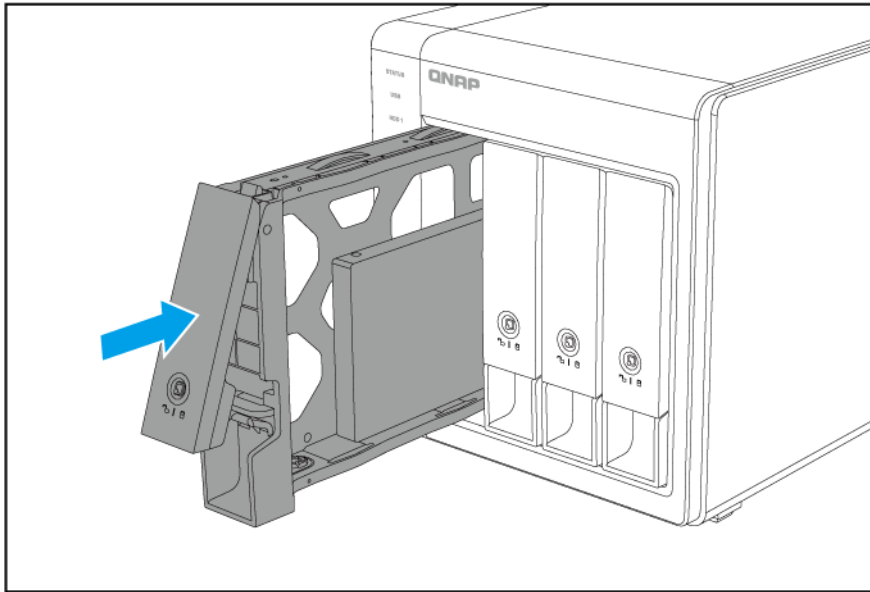
3. Install a drive on the tray.
  - a. Remove the right fastening panel from the drive tray.



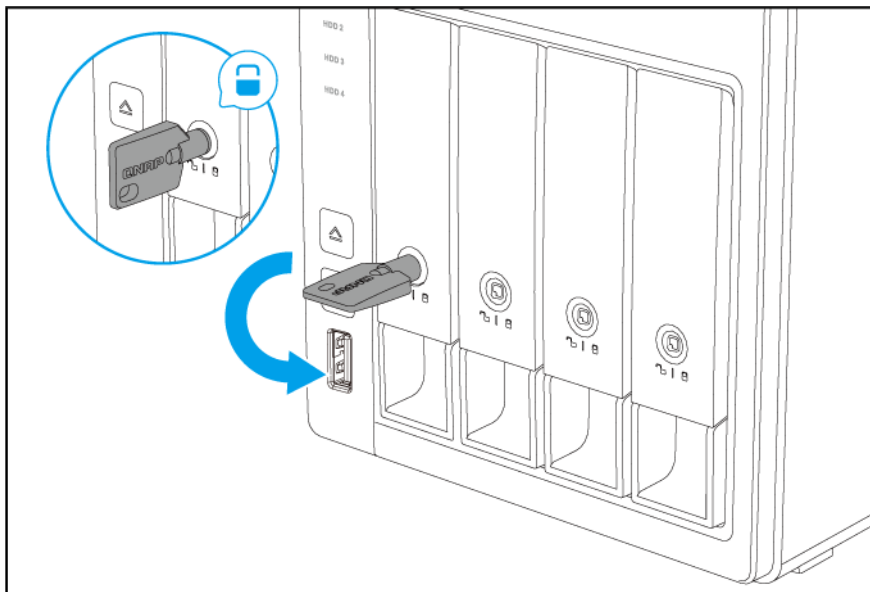
- b.** Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
- c.** Attach the screws.



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



c. Lock the tray.



5. Power on the NAS.

## Installing Expansion Units

The TS-451D2 supports USB expansion units. For details, see table below.

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

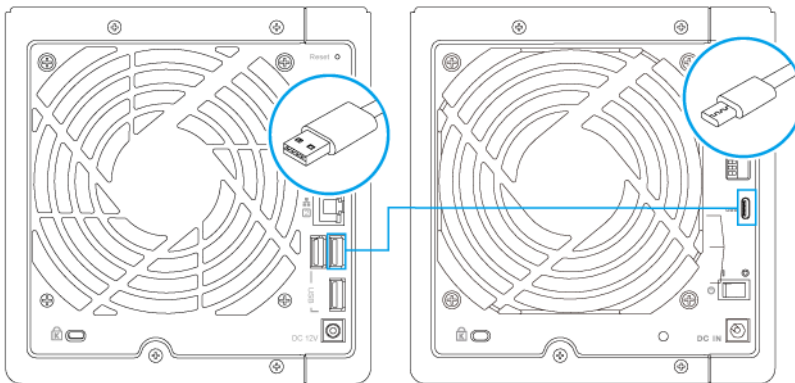
You can purchase storage expansion accessories from QNAP or an authorized reseller.

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

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

Expansion Unit Model	Description	Required Accessories
TR-002	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	USB 3.2 Gen 2 Type-A to Type-C cable
TR-004	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	USB 3.2 Gen 1 Type-A to Type-C cable
TR-004U	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	<ul style="list-style-type: none"> <li>• USB 3.2 Gen 1 Type-A to Type-C cable</li> <li>• RAIL-B02</li> </ul>
TL-D800C	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	USB 3.2 Gen 2 Type-A to Type-C cable
TL-R1200C-RP	<ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA drives</li> </ul>	USB 3.2 Gen 2 Type-A to Type-C cable

1. Connect the expansion unit to the NAS.
  - a. Connect the USB cable to the USB Type-C port on the expansion unit.
  - b. Connect the USB cable to a USB 3.2 Gen 1 Type-A port on the NAS.



#### Note

If the NAS has a USB Type-C port, you can use an optional Type-C to Type-C cable.

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.

## Replacing Memory Modules

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



### Warning

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

- 



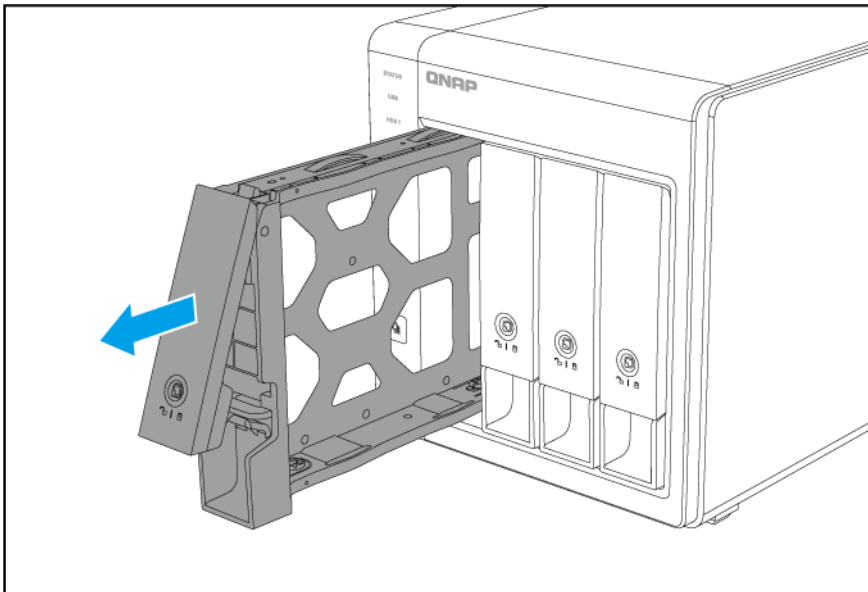
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

- 



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

1. Power off the device.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the drive tray.
  - a. Pull the handle to release the tray.
  - b. Pull the tray out.

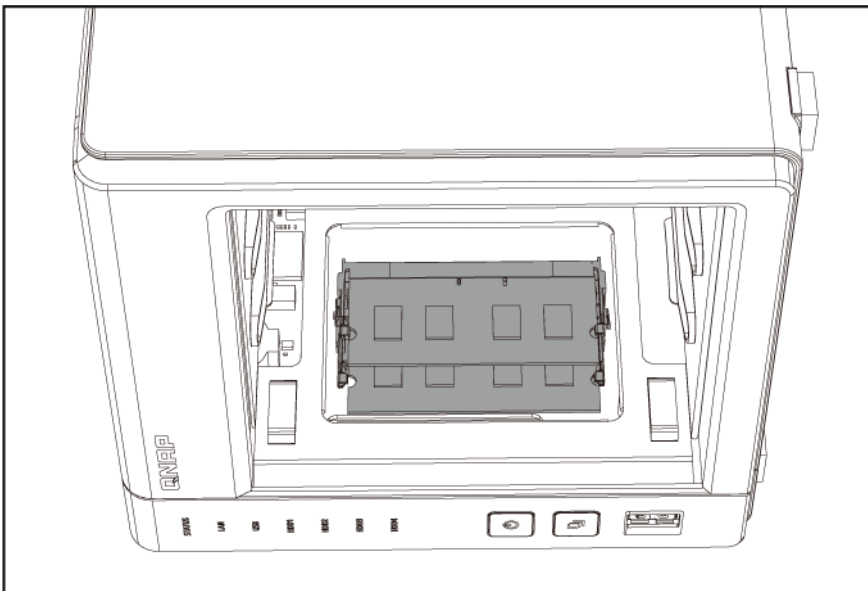


### Important

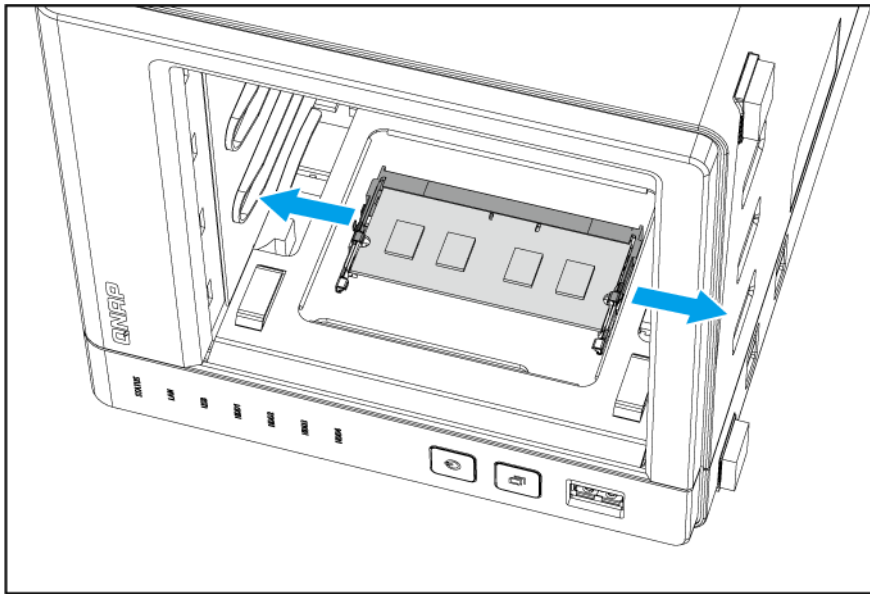
Remember the number of each drive. The drive trays will need to be returned to their original bays.

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

5. Place the device on its left side.



6. Remove an existing module.
  - a. Push the retention clips outward simultaneously to release the module.



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

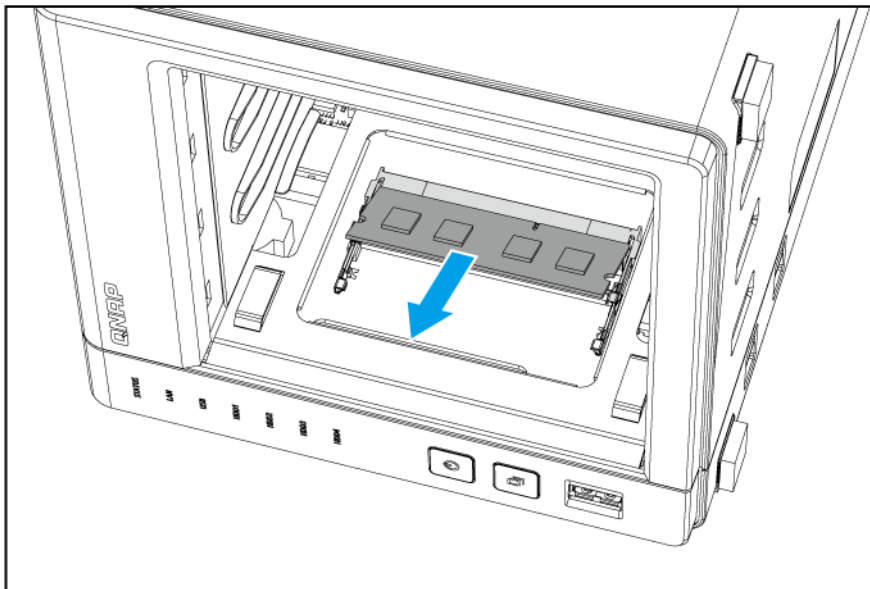


**Warning**

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

c. Hold the module by the edges.

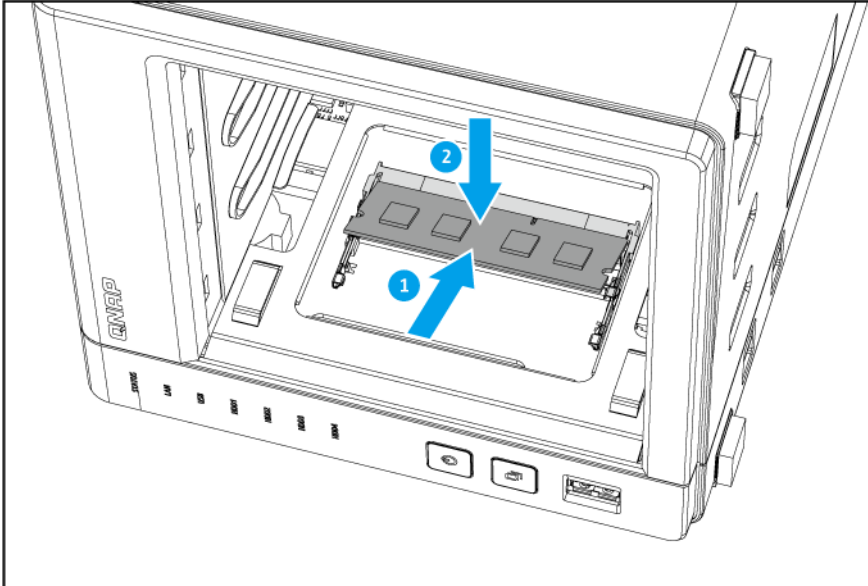
d. Carefully slide the module out of the slot.



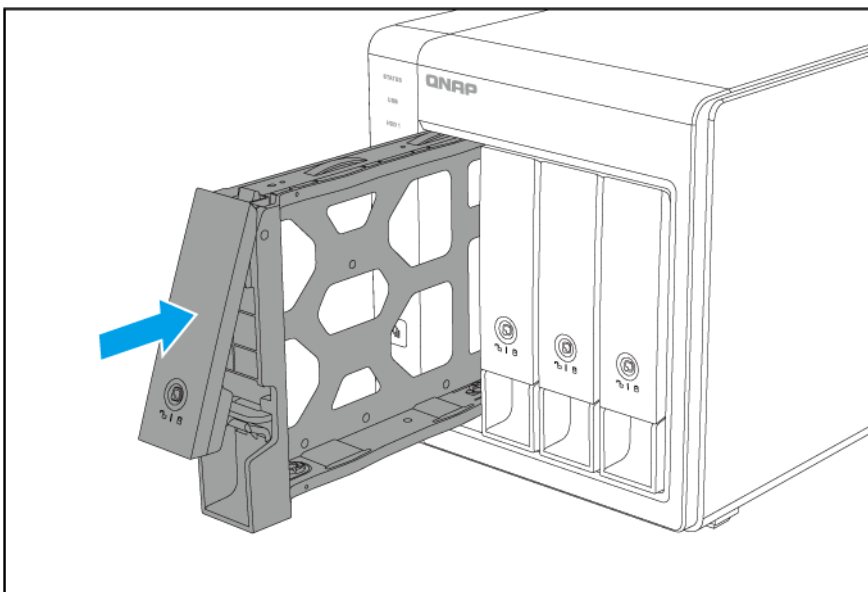
**Warning**

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

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.



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

## 4. QTS Installation

Method	Description	Requirements
Qfinder Pro installation (Recommended)	<p>If the NAS is connected to your local area network, you can do the following:</p> <ul style="list-style-type: none"> <li>• Locate the NAS using Qfinder Pro.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul>	<ul style="list-style-type: none"> <li>• Computer</li> <li>• Network cable</li> <li>• Qfinder Pro installer</li> </ul>
Cloud installation	<p>If the NAS is connected to the internet, you can do the following:</p> <ul style="list-style-type: none"> <li>• Scan the QR code on the NAS.</li> <li>• Specify the Cloud Key.</li> <li>• Log into your myQNAPcloud account.</li> <li>• Use myQNAPcloud Link to remotely access your NAS.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul>	<ul style="list-style-type: none"> <li>• Computer or mobile device</li> <li>• myQNAPcloud account</li> <li>• Cloud Key</li> </ul>
Local installation	<p>If the NAS supports HDMI output, you can do the following:</p> <ul style="list-style-type: none"> <li>• Connect the NAS to the required hardware.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor</li> <li>• HDMI cable</li> <li>• USB keyboard or Remote control (not available on all models)</li> </ul>

### Installing QTS Using Qfinder Pro



#### Warning

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

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. Locate the NAS in the list and then double-click the name or IP address.

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

5. Click **Start Smart Installation Guide**.

6. Specify the following information.

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

7. Click **Next**.

8. 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.

9. Click **Next**.

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

11. Click **Next**.

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

13. Click **Next**.

14. Review the settings.

15. Click **Apply**.

A confirmation message appears.



#### Warning

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

16. 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.

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 <http://install.qnap.com/>.
- Scan the QR code on the NAS using a mobile device.

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

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

8. Click **Start Smart Installation Guide**.

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

10. Click **Next**.

11. 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.

12. Click **Next**.

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

14. Click **Next**.

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

16. Click **Next**.

17. Review the settings.

18. Click **Apply**.

A confirmation message appears.

**Warning**

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

19. Click **Confirm**.  
QTS is installed.

## Installing QTS Using an HDMI Connection



### Warning

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

1. Connect an HDMI display to the NAS.
2. Connect a USB keyboard to the NAS or prepare the QNAP IR remote control (not available on all models).
3. Power on the NAS.  
The **Welcome** screen of the Smart Installation Guide appears.
4. Select **Start Smart Installation Guide**.
5. Select **No, skip this process**.  
Enabling the multimedia functions allows you to install multimedia applications after configuring the disks in Storage & Snapshots.  
For details on enabling multimedia functions on QTS, see the System Administration section of the QTS User Guide.
6. Select **Configure later**.  
For details on configuring disks, see the Storage & Snapshots section of the QTS User Guide.
7. Review the settings.
8. Click **Next**.
9. Review the settings.
10. Click **Next**.  
The **Confirm** screen appears.



### Warning


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

11. Click **Next**.  
QTS is installed.


## 5. 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.   <b>Important</b> 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.	<p>The following settings are reset to default:</p> <ul style="list-style-type: none"> <li>• 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 will be 00089BF61575.</li> </ul> <p> <b>Tip</b> You can find the first MAC address using Qfinder Pro. A label attached to the device also lists the address as MAC1.</p> <ul style="list-style-type: none"> <li>• TCP/IP configuration: <ul style="list-style-type: none"> <li>• Obtain IP address settings automatically via DHCP</li> <li>• Disable jumbo frames</li> <li>• If port trunking is enabled (multi-LAN models only), the port trunking mode is reset to “Active Backup (Failover)”.</li> </ul> </li> <li>• System port: 8080 (system service port)</li> <li>• Security level: Low (Allow all connections)</li> <li>• VLAN: Disabled</li> </ul>
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"> <li>• To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.</li> </ul>

## USB One Touch Copy Button


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

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

## 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"> <li>The drive is being formatted.</li> <li>The device is being initialized.</li> <li>The operating system is being updated.</li> <li>RAID rebuilding is in progress.</li> <li>Online RAID Capacity Expansion is in progress.</li> <li>Online RAID Level Migration is in progress.</li> <li>The firmware is being updated.</li> </ul> <p> <b>Note</b> 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"> <li>The drive is invalid.</li> <li>The disk volume has reached its full capacity.</li> <li>The disk volume is about to reach its full capacity.</li> <li>The system fan is not functioning.</li> <li>An error occurred when accessing (read/write) the data.</li> <li>A bad sector is detected on the hard drive.</li> <li>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).</li> <li>A hardware self-test error occurred.</li> </ul>
	Flashes red every 0.5 seconds	The device is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).
	Flashes red once	The device has received a command from the remote control.
	Green	The device is ready.
	Flashes green every 0.5 seconds	<ul style="list-style-type: none"> <li>The device is not configured.</li> <li>A drive is not formatted.</li> </ul>
	Off	<ul style="list-style-type: none"> <li>All drives are in standby mode.</li> <li>The device is powered off.</li> </ul>
Drive	Flashes red	The data is being accessed and a read/write error occurs during the process.
	Red	A drive read/write error occurred.
	Flashes green	Data is being accessed.
	Green	The drive is ready.
	Off	No drive was detected.

LED	Status	Description
LAN	Orange	The network connection is operating at 1 Gbps.
	Flashes orange	The device is being accessed from the network.
	Off	The device is not connected to a network.
1 Gigabit Ethernet speed	Green	The network connection is operating at 1 Gbps.
	Orange	The network connection is operating at 100 Mbps.
	Off	<ul style="list-style-type: none"> <li>The network connection is operating at 10 Mbps.</li> <li>There is no network connection.</li> </ul>
1 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	<ul style="list-style-type: none"> <li>The NAS is starting up.</li> <li>When the reset button is pressed for 3 seconds, the NAS resets configurations.</li> <li>When the reset button is pressed for 10 seconds, the NAS resets configurations and reboots.</li> <li>The operating system was updated.</li> <li>The device is starting USB One-Touch Copy.</li> </ul>
	2	The USB device has been removed (USB One Touch copy button).
	3	<ul style="list-style-type: none"> <li>Cannot detect installed disk.</li> <li>The NAS data cannot be copied to the external storage device connected to the front USB port.</li> </ul>

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

## 6. 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/en/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. For details, see [Copying NAS Data Using HBS](#).

### 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> <p> <b>Warning</b> 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>

Data and Settings	After NAS Migration
Shared folders	<p>All shared folders and the downloaded files stored in them are retained.</p> <p> <b>Warning</b> To prevent data loss, back up and save encryption keys or passwords of encrypted shared folders in a safe place before migration.</p> <p> <b>Important</b> Folder permissions on the destination NAS must be reconfigured after migration.</p>
Network	<ul style="list-style-type: none"> <li>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.</li> <li>You must reconfigure network settings when the source NAS is running on QTS 4.3.5 or earlier versions.</li> </ul>
Windows AD configuration	Windows AD configurations must be reconfigured.
Licenses	<p>Licenses are not migrated.</p> <p> <b>Warning</b> 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

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 > Services** .
  - 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"> <li>• Letters: A to Z, a to z</li> <li>• Numbers: 0 to 9</li> <li>• Special characters: . - _ ~ ! @ # \$ % ^ &amp; ( ) { }</li> <li>• Does not start or end with a space.</li> </ul>
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**.  
The **Create a Storage Space** window appears.
5. 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 host name used to access the storage space   <b>Tip</b> Click  to scan for available devices.
Port	The port number used to access the storage space This value must be between 1 - 65535.
Password	The password used to access the storage space
Use SSL connection	Requires SSL connection when accessing the remote NAS

6. 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.

7. Click **Create**.

8. Click **Select**.
9. 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**. The dialog box closes.
  - g. Optional: Add more paired folders if necessary.



### Tip

- Click to edit an existing folder.
- Click to delete an existing pair.

10. Click **Next**. The **Scheduling** window appears.
11. Select **Sync Now**.
12. Click **Next**.
13. Review the job summary.
14. 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. Click **Import/Export Users**.  
The **Import/Export Users** window appears.
        - c. Select **Export user and user group settings**.
        - d. 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 **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.  
For details, see [Back up the source NAS users or group settings](#).  
The source NAS user settings file is imported to the destination NAS.

## 7. 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 Space** .
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	
RAID 0	Yes	≥ 2	
RAID 1	Yes	2	1
RAID 5	Yes	≥ 3	2
RAID 6	Yes	≥ 4	
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	<a href="https://docs.qnap.com">https://docs.qnap.com</a>
Compatibility List	<a href="https://www.qnap.com/compatibility/">https://www.qnap.com/compatibility/</a>
NAS Migration Compatibility	<a href="https://www.qnap.com/en/nas-migration">https://www.qnap.com/en/nas-migration</a>
Expansion Unit Compatibility	<a href="http://www.qnap.com/go/compatibility-expansion">http://www.qnap.com/go/compatibility-expansion</a>
Service Portal	<a href="https://service.qnap.com">https://service.qnap.com</a>
Product Support Status	<a href="https://www.qnap.com/product/eol.php">https://www.qnap.com/product/eol.php</a>
Downloads	<a href="https://download.qnap.com">https://download.qnap.com</a>
Community Forum	<a href="https://forum.qnap.com">https://forum.qnap.com</a>
QNAP Accessories Store	<a href="https://shop.qnap.com/">https://shop.qnap.com/</a>

## 8. Glossary

### **Cloud Key**

Unique 8-digit code assigned to each NAS device

### **myQNAPcloud Link**

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

### **myQNAPcloud**

Provides various remote access services such as DDNS and myQNAPcloud Link

### **QNAP ID**

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

### **Qfinder Pro**

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

### **QTS**

QNAP NAS operating system

## 9. Notices

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

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Version 3, 29 June 2007

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## 2. Source Code.

The “source code” for a work means the preferred form of the work for making modifications to it.

“Object code” means any non-source form of a work.

A “Standard Interface” means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The “System Libraries” of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A “Major Component”, in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The “Corresponding Source” for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

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## END OF TERMS AND CONDITIONS

### CE Notice



This QNAP NAS complies with CE Compliance Class B.

### FCC Notice

#### FCC Class B Notice



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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



#### Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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



#### Important

Any modifications made to this device that are not approved by QNAP Systems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

## VCCI Notice



VCCI-B

## BSMI Notice



## SJ/T 11364-2006



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