



QNAP

TS-328

TS-328

User Guide

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1. Preface





About This Guide

This guide provides information on the QNAP TS-328 NAS 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 a task or configuring settings.
	Warnings provide information, that when ignored, may result to potential loss, injury, or even death.

2. Product Overview

This chapter provides basic information about the QNAP TS-328 NAS.

About the TS-328



The TS-328 is an easy-to-use, lightweight NAS designed for backup, synchronization, remote access, and home entertainment. Powered by a Realtek RTD 1296 quad-core ARM Cortex A53 processor with 2 GB DDR4 memory, the TS-328 offers smooth and seamless data transmission for multiple users. Its tower design makes it an ideal NAS for homes and small offices.



Hardware Specifications



Important

Modifying the hardware or software of your QNAP product invalidates the warranty. QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.

Component	TS-328
SKU	
Ordering P/N	TS-328
Processor	
CPU	Realtek RTD 1296 quad-core ARM Cortex A53, 1.4 GHz
Architecture	64-bit
Memory	
Maximum memory	System: 2 GB DDR4  Note A small portion of the system memory is reserved for transcoding. Flash: 4 GB eMMC
Storage	
Drive bays	3 x SATA 6 Gbps
Drive compatibility	<ul style="list-style-type: none"> • 3.5-inch SATA hard disk drives • 2.5-inch SATA hard disk drives • 2.5-inch SATA solid state drives  Tip The TS-328 comes with 1 drive tray base for 2.5-inch SATA hard disk and solid state drives. You can purchase additional drive tray bases from QNAP or an authorized reseller. For details, go to https://shop.qnap.com/ .
Network	
Gigabit Ethernet ports	2 x RJ45
External I/O Ports & Expansion Slots	

Component	TS-328
USB ports	<ul style="list-style-type: none"> • Front: 1 x USB 3.0 Type-A <div style="display: flex; align-items: center;">  <div> <p>Note You can use the One Touch Copy button with this port.</p> </div> </div> <ul style="list-style-type: none"> • Back: 1 x USB 2.0 Type-A • Back: 1 x USB 3.0 Type-A
Interface	
Buttons	<ul style="list-style-type: none"> • Power • USB One Touch Copy • Reset
Maintenance port	1 x 3.5 mm maintenance port
Dimensions	
Form factor	Tower
Dimensions (H x W x D)	142 x 150 x 260.1 mm 5.59 x 5.9 x 10.24 in
Net weight	1.64 kg (3.62 lbs)
Other	
Power supply unit	65W, 100-240V AC, 50/60 Hz
Smart fan	10 x 90 mm, 12V DC
Sound level	16.5 dBA
	<div style="display: flex; align-items: center;">  <div> <p>Note The sound levels were tested at a bystander position, which is within one meter from the NAS. The test NAS operated at low speed with the maximum number of drives installed.</p> </div> </div>
Operating temperature	0 to 40°C (32 to 104°F)
Relative humidity	<ul style="list-style-type: none"> • Non-condensing relative humidity: 5 to 95% • Wet-bulb temperature: 27°C (80.6°F)
Security slot	Kensington security slot



Important

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

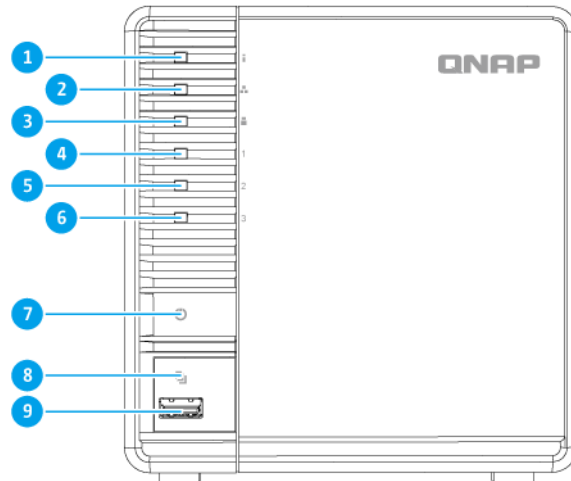
Package Contents

Item	Quantity
TS-328 NAS	1
2.5-inch drive tray base	1
Drive tray caddy pins	3
AC power adapter	1
Power cord	1

Item	Quantity
Ethernet cable	1
Quick Installation Guide (QIG)	1

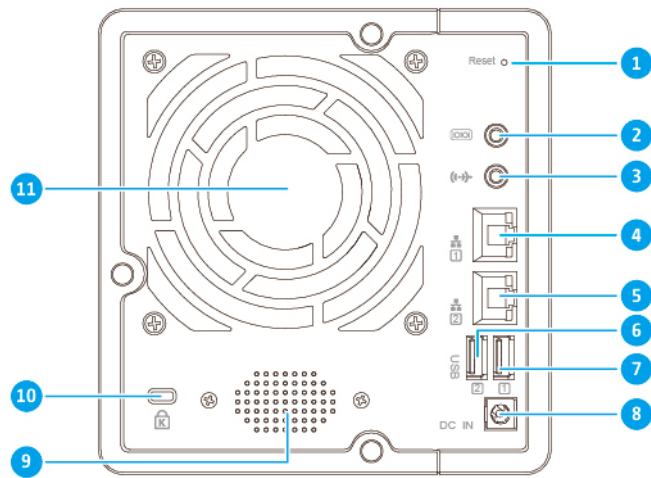
Components

Front Panel



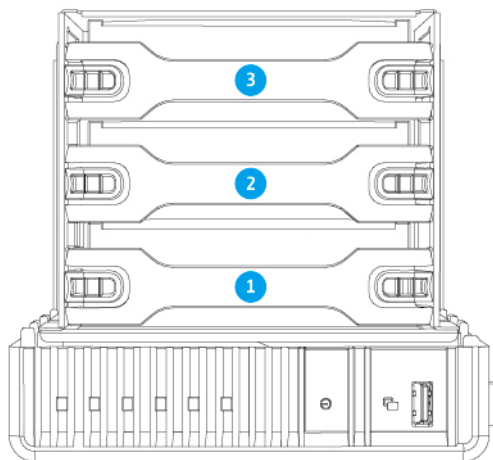
No.	Component	No.	Component
1	Status LED	6	Drive 3 LED
2	LAN LED	7	Power button
3	USB LED	8	USB One Touch Copy button
4	Drive 1 LED	9	USB 3.0 One Touch Copy port
5	Drive 2 LED	-	-

Rear Panel



No.	Component	No.	Component
1	Reset button	7	USB 3.0 port
2	Maintenance port	8	Power input
3	3.5 mm speaker port	9	Built-in speaker
4	Gigabit Ethernet RJ45 port 1	10	Kensington security slot
5	Gigabit Ethernet RJ45 port 2	11	Smart fan
6	USB 2.0 port	-	-

Front Drive Numbering



**Note**

The image shows the NAS laid on its left side.

Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> • Room temperature: 0 to 40°C (32 to 104°F) • Non-condensing relative humidity: 5 to 95% • Wet-bulb temperature: 27°C (80.6°F) • Flat, anti-static surface with no exposure to direct sunlight, liquids, and chemicals
Hardware and peripherals	<ul style="list-style-type: none"> • Storage drives • Network cable
Tools	<ul style="list-style-type: none"> • Flat head screwdriver • Anti-static wrist strap

Setting Up the NAS

1. Place your NAS device in an environment that meets the requirements.
2. Install the drives.
For details, see the following topics:
 - [Installing 3.5-inch Hard Drives](#)
 - [Installing 2.5-inch Hard Drives or Solid State Drives](#)
3. Connect the power cord and all applicable cables.
4. Power on the NAS.
5. Install QTS.
For details, see [QTS Installation](#).
6. Log on to QTS.

3. Installation and Configuration

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

Drive Installation

Installing 3.5-inch Hard Drives

The TS-328 comes with 1 drive tray that supports 2.5-inch hard drives or solid state drives. This tray is in drive bay 3. For details, see [Front Drive Numbering](#).

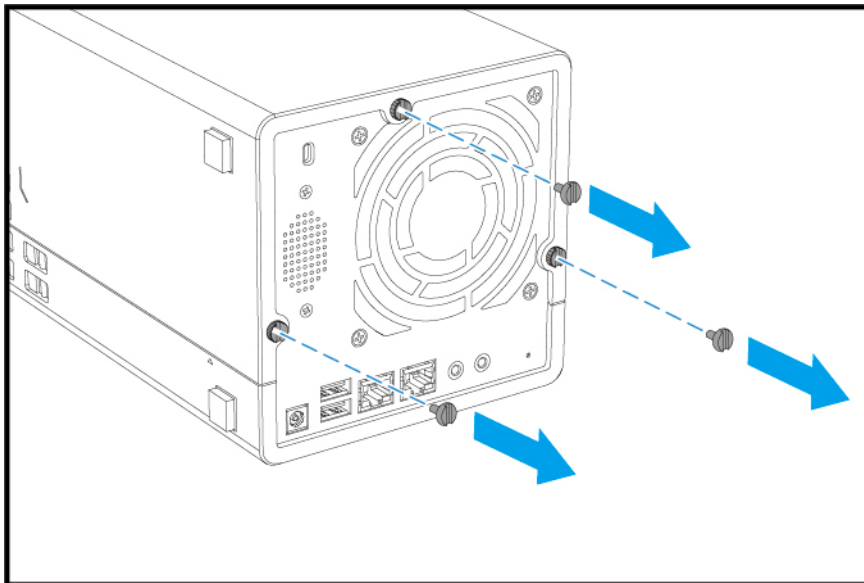
You can disassemble this tray so it can be used for a 3.5-inch hard drive. For details, see [Removing the 2.5-inch Hard Drive or Solid State Drive Tray Base](#).



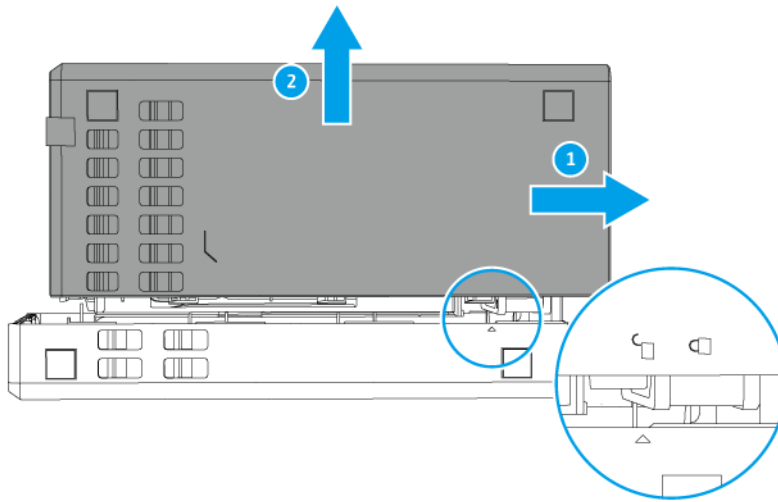
Warning

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

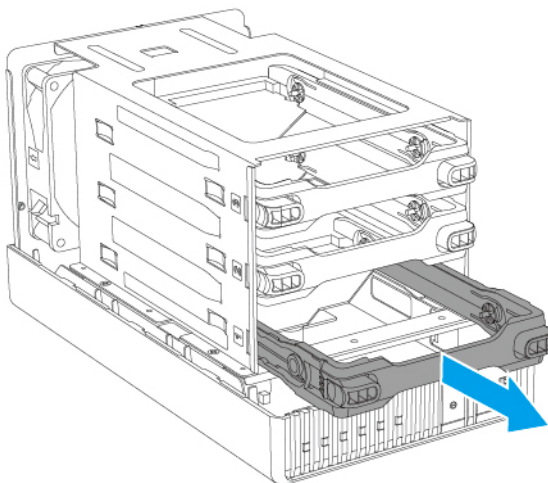
1. Power off the NAS.
2. Remove the cover.
 - a. Lay the NAS on its left side.
 - b. Remove the screws from the back of the NAS.



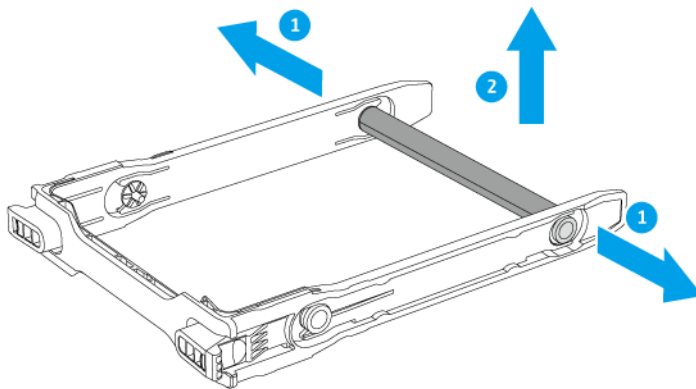
- c. Slide the cover backward to unlock it.
- d. Lift the cover off the NAS.



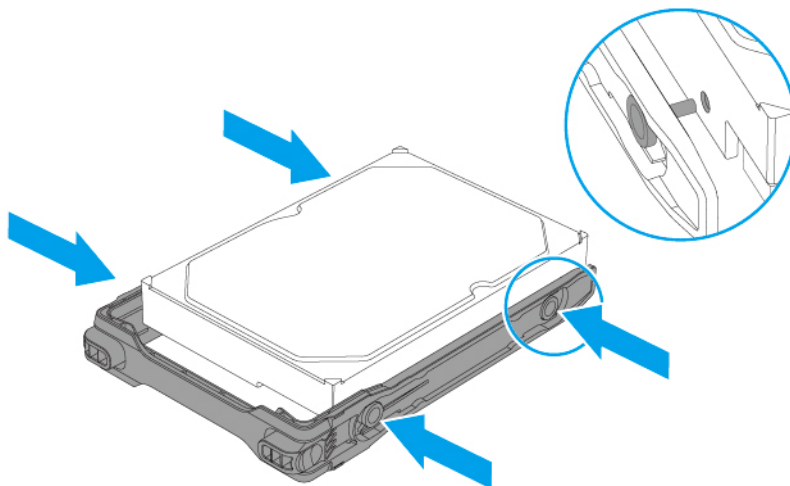
3. Squeeze the drive tray caddy clips and then pull the caddy out of the drive bay.



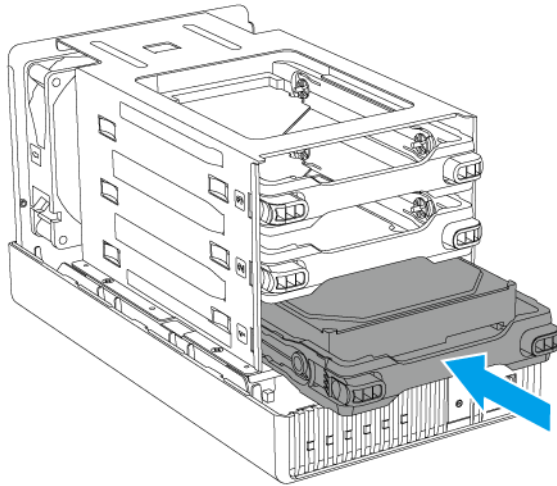
4. Install the drive on the caddy.
 - a. Gently pull the sides of the caddy to remove the drive tray caddy rod.



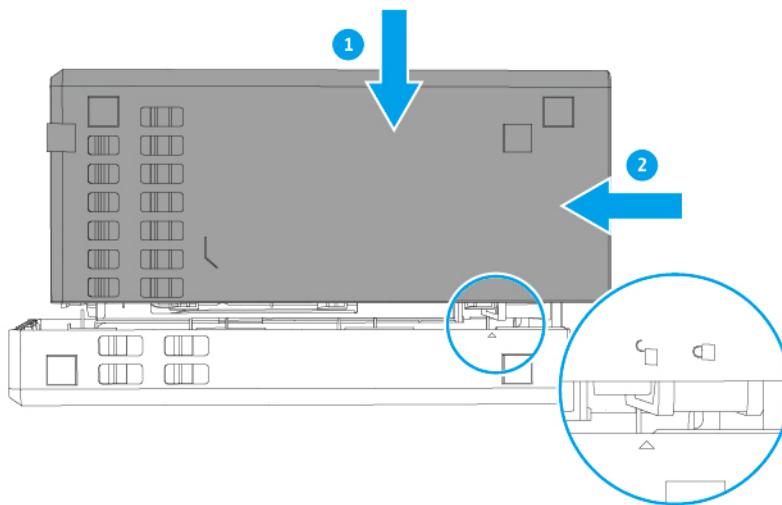
b. Align the holes of the drive and the caddy, and then insert the caddy pins.



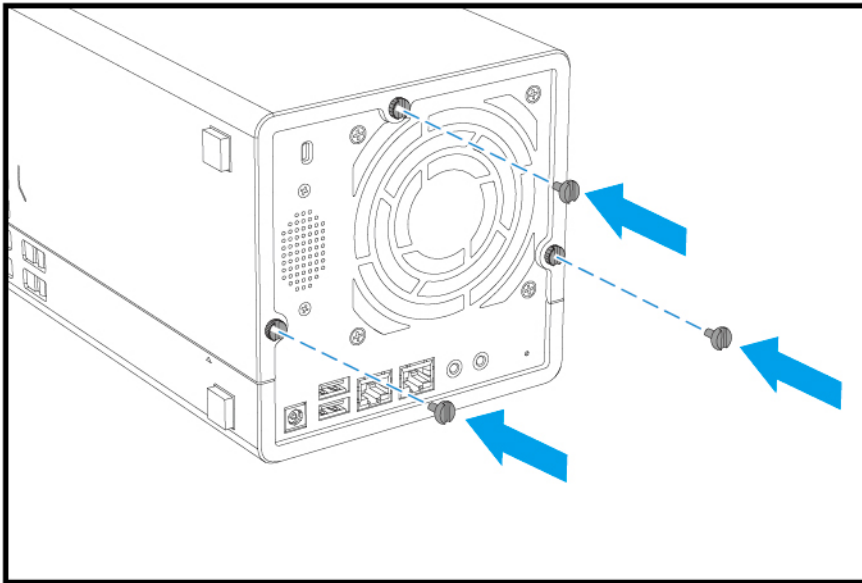
5. Slide the caddy into the bay until the clips lock in place.



6. Attach the cover.
 - a. Align the front cover with the grooves on the chassis.
 - b. Push the cover forward to lock it.



- c. Attach the screws to the back of the NAS.



d. Place the NAS in its normal upright position.

7. Power on the NAS.

Installing 2.5-inch Hard Drives or Solid State Drives

The TS-328 comes with 1 drive tray base that supports 2.5-inch hard drives or solid state drives. This tray base is pre-installed in drive bay 3. For details, see [Front Drive Numbering](#).

You can assemble additional 2.5-inch hard drive or solid state drive trays using the available drive tray caddies and additional drive tray bases. For details, see [Attaching the 2.5-inch Hard Drive or Solid State Drive Tray Base](#).

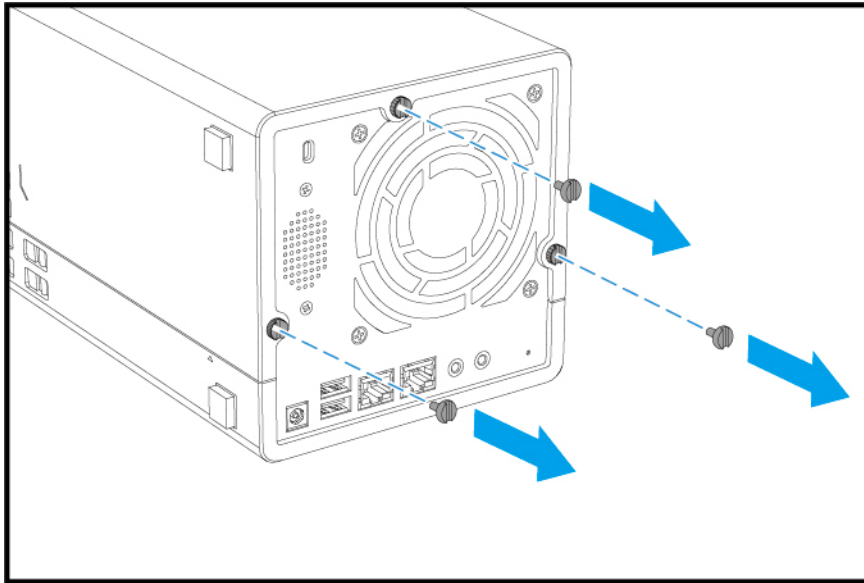
You can purchase drive tray bases from QNAP or an authorized reseller. For details, go to <https://shop.qnap.com/>.



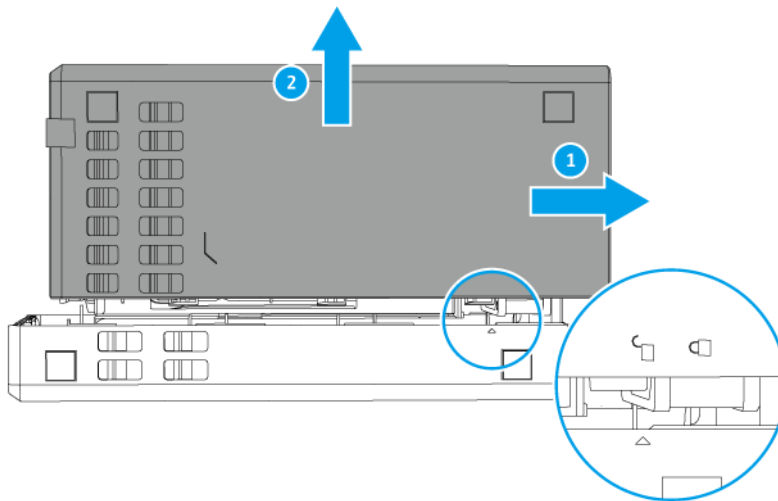
Warning

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

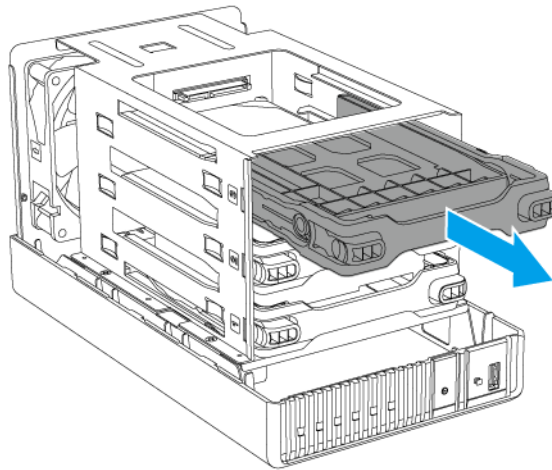
1. Power off the NAS.
2. Remove the NAS cover.
 - a. Lay the NAS on its left side.
 - b. Remove the screws from the back of the NAS.



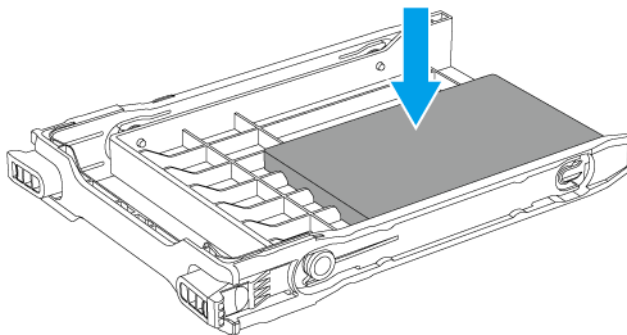
- c. Slide the cover backwards to unlock it.
- d. Lift the cover off the NAS.



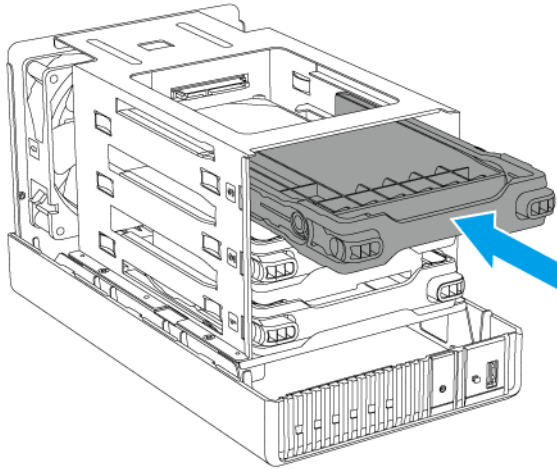
- 3. Squeeze the drive tray clips and then pull the tray out of the drive bay.



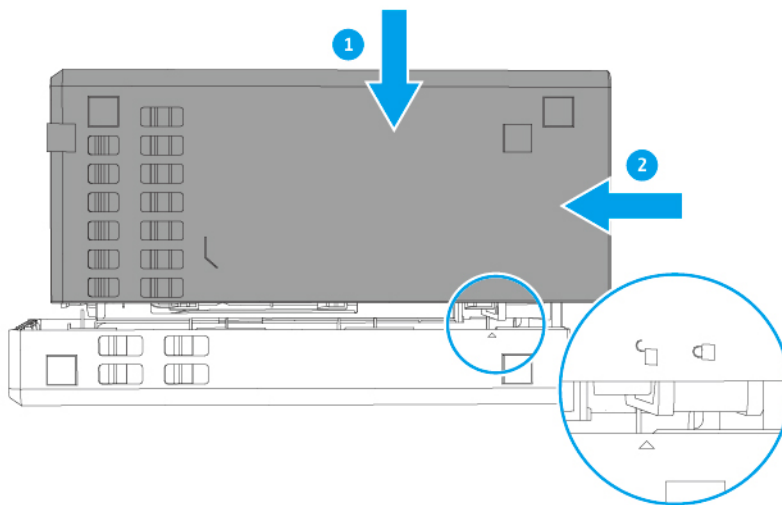
4. Install the drive on the tray.



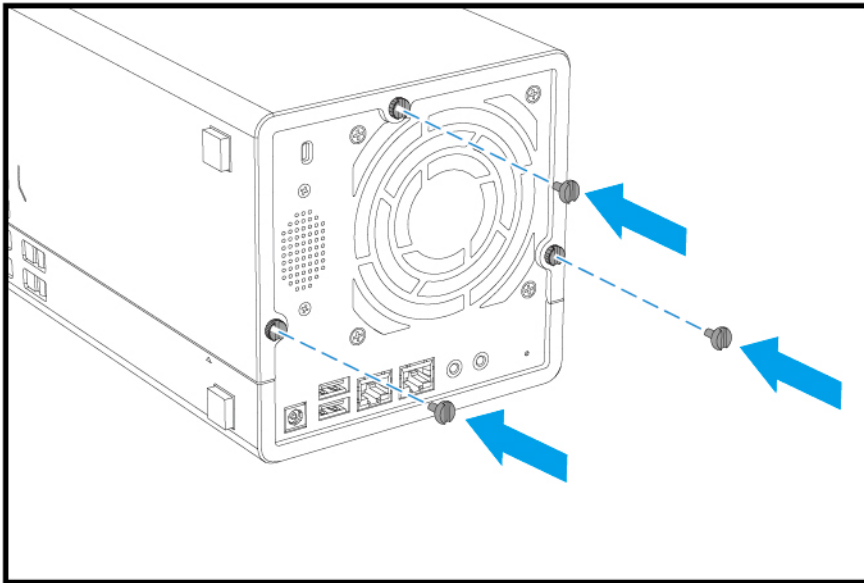
5. Slide the tray into the bay until the clips lock in place.



6. Attach the cover.
 - a. Align the front cover with the grooves on the chassis.
 - b. Push the cover forward to lock it.



- c. Attach the screws to the back of the NAS.

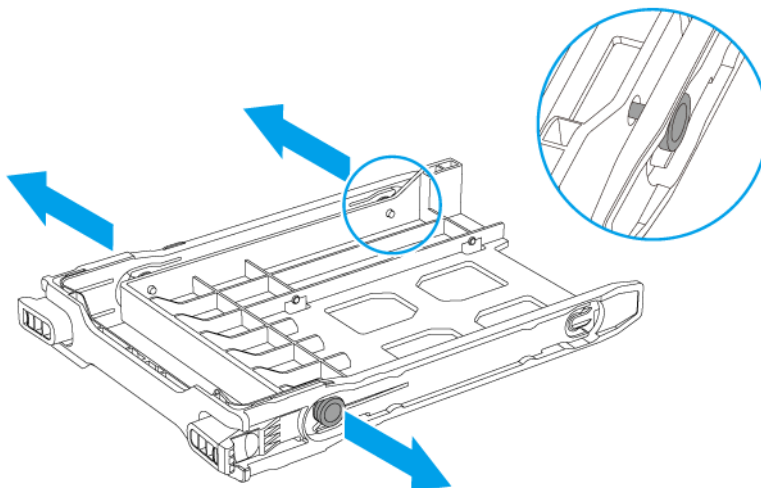


d. Place the NAS in its normal upright position.

7. Power on the NAS.

Removing the 2.5-inch Hard Drive or Solid State Drive Tray Base

1. Gently pull the sides of the drive tray caddy to remove the pins from the drive tray base.

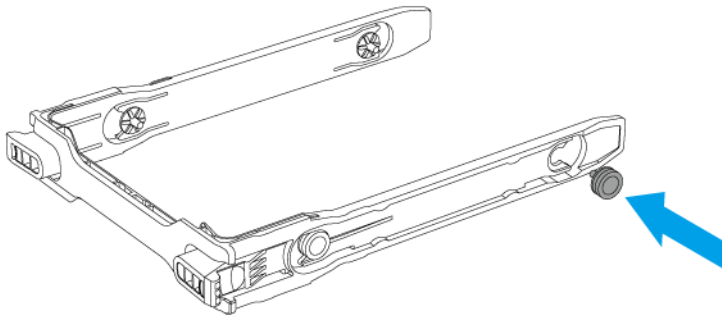


2. Insert the rear right pin of the caddy.



Tip

You can find extra caddy pins in the NAS package.

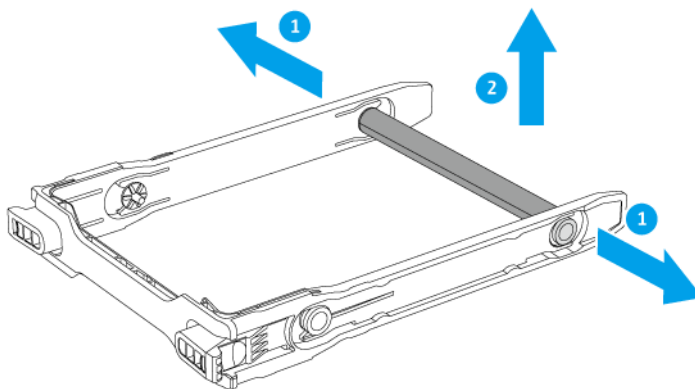


Attaching the 2.5-inch Hard Drive or Solid State Drive Tray Base

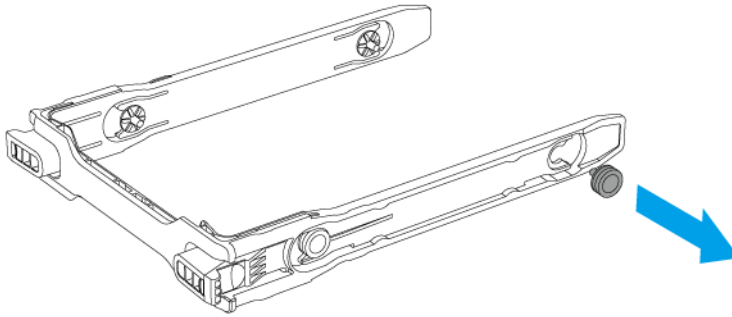
The TS-328 comes with 3 drive tray caddies and 1 drive tray base for 2.5-inch hard drives or solid state drives.

You can purchase additional drive tray bases from QNAP or an authorized reseller. For details, go to <https://shop.qnap.com/>.

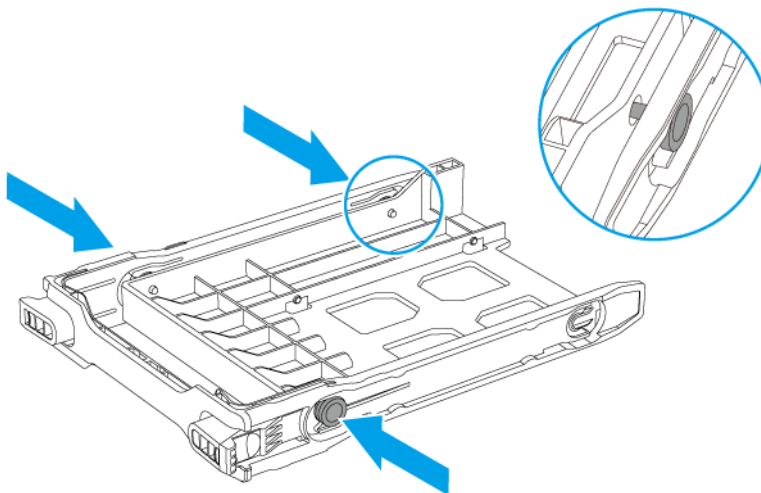
1. Gently pull the sides of the drive tray caddy to release the drive tray caddy rod



2. Remove the rear right pin from the caddy.



3. Align the holes of the drive tray base and the caddy, and then insert the caddy pins.



QTS Installation

The TS-328 uses the QNAP QTS operating system. You can install QTS using any of the following methods.

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

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.
5. 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**.
6. Click **Start Smart Installation Guide**.
7. Specify the following information.

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

8. Click **Next**.

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



Tip

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

10. Click **Next**.

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

12. Click **Next**.

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

14. Click **Next**.

15. Configure the disk settings.

- Select a volume type.
- Select the disks that you want to use to create a RAID group.
- Optional: Select a RAID type.



Note

The **Smart Installation Guide** automatically selects the optimal RAID type based on the number of the selected disks.

- Optional: Select **Encrypted Disk Volume** and **Bad Block Scan**.

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 the Cloud Key



Warning

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

- Power on the NAS.
- 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.

7. Optional: Select **CloudLink**.



Note

- CloudLink allows you to remotely access the NAS without having to configure port forwarding on your router. You can remotely access the NAS by logging into QTS or by using mobile apps.
- You can also enable CloudLink by installing the CloudLink app on the NAS.

8. Click **Next**.

9. 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**.

10. Click **Start Smart Installation Guide**.

11. Specify the following information.

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

12. Click **Next**.

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

**Tip**

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

14. Click **Next**.

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

16. Click **Next**.

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

18. Click **Next**.

19. Configure the disk settings.

a. Select a volume type.

b. Select the disks that you want to use to create a RAID group.

c. Optional: Select a RAID type.

**Note**

The **Smart Installation Guide** automatically selects the optimal RAID type based on the number of the selected disks.

d. Optional: Select **Encrypted Disk Volume** and **Bad Block Scan**.

20. Click **Next**.

21. Review the settings.

22. Click **Apply**.

A confirmation message appears.

**Warning**

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


23. Click **Confirm**.

QTS is installed.

4. Basic Operations

This chapter describes basic NAS operations.

Power Button

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

Reset Button

Operation	User Action	Result
Basic system reset	Press and hold the button for 3 seconds.	The following settings are reset to default: <ul style="list-style-type: none"> • System administrator password: admin • TCP/IP configuration: <ul style="list-style-type: none"> • Obtain IP address settings automatically via DHCP • Disable jumbo frames • If port trunking is enabled (multi-LAN models only), the port trunking mode is reset to “Active Backup (Failover)”. • System port: 8080 (system service port) • Security level: Low (Allow all connections) • LCD panel password: (blank) • VLAN: Disabled
Advanced system reset	Press and hold the button for 15 seconds.	The default factory settings are restored. <ul style="list-style-type: none"> • To retrieve old data after an advanced system reset, recreate the previous folder structure on the NAS.

USB One Touch Copy Button

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

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

For details on configuring USB One Touch Copy, see the QTS User Guide.

LEDs

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

For details on the location of the LEDs, see [Components](#).

LED	Status	Description
System Status	Flashes green and red alternately every 0.5 seconds	<ul style="list-style-type: none"> The drive is being formatted. The NAS 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.
	Red	<ul style="list-style-type: none"> The drive is invalid. The disk volume has reached its full capacity. The disk volume is about to reach its full capacity. The system fan is not functioning. An error occurred when accessing (read/write) the data. A bad sector is detected on the hard drive. The NAS is in degraded read-only mode (two member drives failed in RAID 5 or RAID 6 but the data can still be read). Hardware self-test error
	Flashes red every 0.5 seconds	The NAS is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).
	Flashes green every 0.5 seconds	<ul style="list-style-type: none"> The NAS is starting up. The NAS is not configured. A drive is not formatted.
	Flashes green every 2 seconds	The NAS is in S3 sleep mode.
	Green	The NAS is ready.
	Off	All drives are in standby mode.
LAN	Orange	A read/write error occurred while another device is accessing data.
	Flashes orange	The NAS is being accessed from the network.

LED	Status	Description
Drive	Flashes red	The data is being accessed and a read/write error occurs during the process.
	Red	A drive read/write error occurred.
	Flashes green	The data is being accessed.
	Green	The drive can be accessed.
USB	Flashes blue every 0.5 sec	<ul style="list-style-type: none"> • A USB device (connected to the front USB port) is detected. • A USB device (connected to the front USB port) is being removed from the NAS. • A USB device (connected to the front USB port of the NAS) is being accessed. • Data is being copied to or from a USB or eSATA device.
	Blue	A USB device is detected in the front USB port.
	Off	<ul style="list-style-type: none"> • No USB device is detected. • The NAS has finished copying data to or from the USB device connected to the front USB port.

Beep Alarm

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> • The NAS is starting up. • The NAS is shutting down (software shutdown). • The user pressed the Reset button. • The operating system was updated.
	3	The user tried to copy the NAS data to the external storage device from the front USB port, but the data cannot be copied.
Long beep (1.5 seconds)	3 (every 5 minutes)	The system fan is not functioning.
	2	<ul style="list-style-type: none"> • The disk volume is about to reach its full capacity. • The disk volume has reached its full capacity. • The drives are in degraded mode. • The user started the drive rebuilding process. • A drive is plugged in or out.
	1	<ul style="list-style-type: none"> • The NAS was powered off by force shutdown (hardware shutdown). • The NAS was powered on successfully and is ready.

5. 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.

Support and Other Resources

QNAP provides the following resources:

Resource	URL
Documentation	http://docs.qnap.com
Helpdesk	http://helpdesk.qnap.com
Downloads	http://download.qnap.com
Community Forum	http://forum.qnap.com

6. Glossary

CloudKey

Unique 8-digit code assigned to each NAS device

CloudLink

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 CloudLink

myQNAPcloud ID

Email address that was used to register for a myQNAPcloud account

Qfinder Pro

Enables you to locate and access the QNAP NAS devices in your local area network

QTS

QNAP NAS operating system

7. 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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END OF TERMS AND CONDITIONS

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

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



Important

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CE Notice



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SJ/T 11364-2006



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壳体	0	0	0	0	0	0
显示	0	0	0	0	0	0
印刷电路板	0	0	0	0	0	0
金属螺帽	0	0	0	0	0	0
电缆组装	0	0	0	0	0	0
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