



# TVS-882BRT3

## User Guide

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# 1. Preface





## About This Guide

This guide provides information on the QNAP TVS-882BRT3 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 TVS-882BRT3 NAS.

### About the TVS-882BRT3

The TVS-882BRT3 is powered by 7th generation Intel® quad-core processors and dual-channel DDR4 RAM.

The NAS includes one 5.25-inch SATA drive bay for Blu-ray disc drive installation and four Thunderbolt™ 3 ports for high-speed data transmission. The TVS-882BRT3 also has two M.2 SSD slots for cache acceleration and three HDMI ports for media applications.



### 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	TVS-882BRT3	
Ordering P/N	<ul style="list-style-type: none"><li>• TVS-882BRT3-i5-16G</li><li>• TVS-882BRT3-ODD-i5-16G</li></ul>	<ul style="list-style-type: none"><li>• TVS-882BRT3-i7-32G</li><li>• TVS-882BRT3-ODD-i7-32G</li></ul>
Processor		
CPU	Intel® Core™ i5-7500 quad-core 3.4 GHz, burst up to 3.8 GHz	Intel® Core™ i7-7700 quad-core 3.6 GHz, burst up to 4.2 GHz
Architecture	64-bit	
Graphics	9th generation Intel® HD Graphics	
Memory		
Pre-installed memory	16 GB (2 x 8 GB) of DDR4 UDIMM	32 GB (4 x 8 GB) of DDR4 UDIMM
Total memory slots	4	
Maximum memory	64 GB (4 x 16 GB)	
Storage		
Drive bays	8 x SATA 6 Gbps	
Drive compatibility	<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>	
M.2 SSD interface type	2 x SATA 6 Gbps	
M.2 SSD compatibility	<ul style="list-style-type: none"><li>• 2242</li><li>• 2260</li><li>• 2280</li><li>• 22110</li></ul>	


Component	TVS-882BRT3
SSD cache acceleration support	<ul style="list-style-type: none"> <li>• Drives 1 to 8</li> <li>• M.2 SSDs 1 to 2</li> </ul>
Hot-swappable	<p>Yes</p> <div>  <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• SSD cache drives are not hot-swappable.</li> <li>• M.2 SSDs are not hot-swappable.</li> </ul> </div>
<b>Optical Storage</b>	
Optical drive bay	1 x 5.25-inch SATA
Optical drive type	<ul style="list-style-type: none"> <li>• 1 x 5.25-inch Blu-ray Disc drive</li> <li>• 2 x Slim optical drives</li> </ul> <div>  <p><b>Note</b></p> <p>The TVS-882BRT3-ODD-i5-16G and TVS-882BRT3-ODD-i7-32G include a pre-installed 5.25-inch Blu-ray Disc writer. For other NAS models, optical drives must be purchased separately.</p> </div>
<b>RAID</b>	
RAID types	<ul style="list-style-type: none"> <li>• Single</li> <li>• JBOD</li> <li>• RAID 0</li> <li>• RAID 1</li> <li>• RAID 5</li> <li>• RAID 6</li> <li>• RAID 10</li> </ul>
RAID Migration	<ul style="list-style-type: none"> <li>• Single to RAID 1</li> <li>• Single to RAID 5</li> <li>• RAID 1 to RAID 5</li> <li>• RAID 5 to RAID 6</li> </ul>
<b>Network</b>	
10 Gigabit Ethernet ports	Optional: 10GbE port through a PCIe expansion card
Gigabit Ethernet ports	4 x RJ45
<b>Expansion</b>	
USB ports	<ul style="list-style-type: none"> <li>• Front: 1 x USB 3.0</li> <li>• Rear: 4 x USB 3.0</li> </ul>
Thunderbolt™	4 x Thunderbolt™ 3 ports

Component	TVS-882BRT3
PCIe slots	<ul style="list-style-type: none"> <li>1 x PCIe 3.0 x8</li> </ul> <div>  <b>Note</b>            QNAP dual-port Thunderbolt™ expansion cards are pre-installed on the two PCIe 3.0 x4 slots.         </div>
<b>Audiovisual</b>	
LCD Panel	Monochrome LCD with <b>Enter &amp; Select</b> buttons
HDMI outputs	3 x HDMI v1.4b ports (up to 3840 x 2160 @ 30 Hz resolution)
Audio	<ul style="list-style-type: none"> <li>2 x 6.3 mm microphone jacks</li> <li>1 x 3.5 mm line-out jack</li> <li>2 x built-in speakers</li> </ul>
<b>Interface</b>	
Buttons	<ul style="list-style-type: none"> <li>Power</li> <li>USB One Touch Copy</li> <li>Reset</li> </ul>
LED indicators	<ul style="list-style-type: none"> <li>Status</li> <li>Drives 1 to 8</li> <li>M.2 SSDs 1-2</li> </ul>
IR sensor	QNAP RM-IR004 remote control (MCE compatible)
<b>Dimensions</b>	
Dimensions (H x W x D)	234.6 x 369.9 x 319.8 mm 9.23 x 14.56 x 12.59 in
Net weight	<ul style="list-style-type: none"> <li>NAS: 11.55 kg (25.46 lbs)</li> <li>5.25-inch optical drive: 0.63kg (1.39 lbs)</li> </ul>
Form factor	Tower
<b>Other</b>	
Flash memory	512 MB DOM
Power supply unit	ATX 100-240 V, 3-1.5 V Output 250 W
Fans	<ul style="list-style-type: none"> <li>System: 3 x 80 mm</li> <li>CPU: 1 x 90 mm</li> </ul>
Sound level	Sound pressure (LpAm) (bystander position): 21.6 dB (with 8 x Seagate ST2000VN000-1HJ164 hard drive installed)
Operating temperature	0 to 40°C (32 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>

**Note**

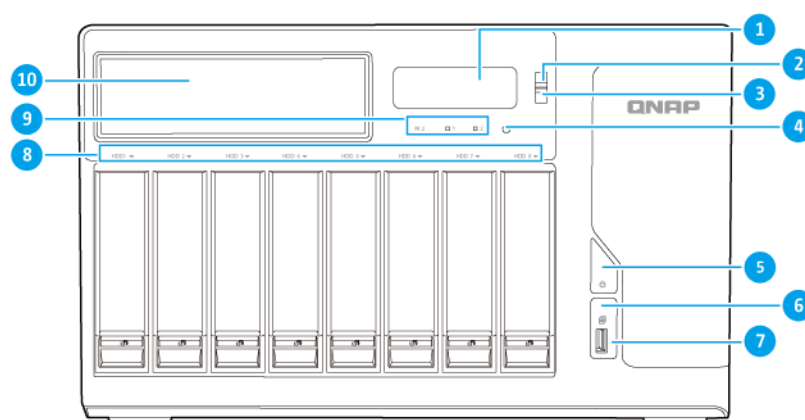
Model specifications are subject to change without prior notice. To see the latest specifications, go to <https://www.qnap.com>.

## Package Contents

Item	Quantity
TVS-882BRT3 NAS	1
5.25-inch Blu-ray Disc drive	1
<div>  <b>Note</b>            The TVS-882BRT3-ODD-i5-16G and TVS-882BRT3-ODD-i7-32G include a pre-installed 5.25-inch Blu-ray Disc writer.         </div>	
Power cord	1
Ethernet cables	4
RM-IR004 infrared (IR) remote control	1
Screws for 3.5-inch drives	32
Screws for 2.5-inch drives	24
Screws for M.2 solid state drives	<ul style="list-style-type: none"> <li>• 2 x flat head screws</li> <li>• 2 x riser screws</li> </ul>
M.2 SSD heatsinks	2
Quick Installation Guide (QIG)	1

## Components

### Front Panel

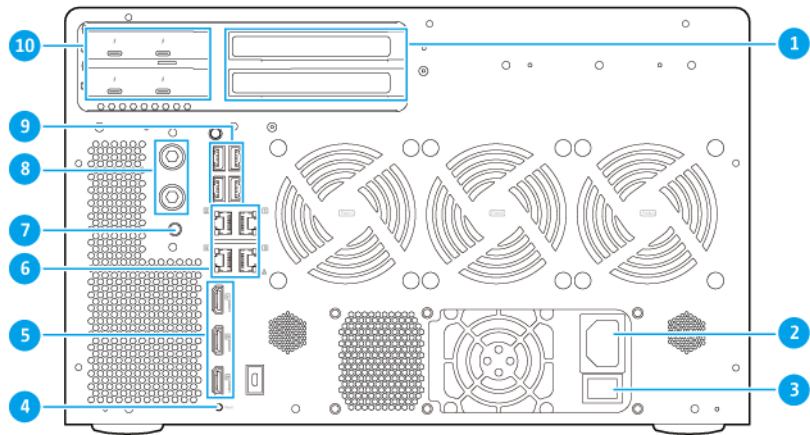


No.	Component	No.	Component
1	LCD panel	6	USB One Touch Copy button
2	Enter button	7	USB 3.0 One Touch Copy port
3	Select button	8	Drive LEDs



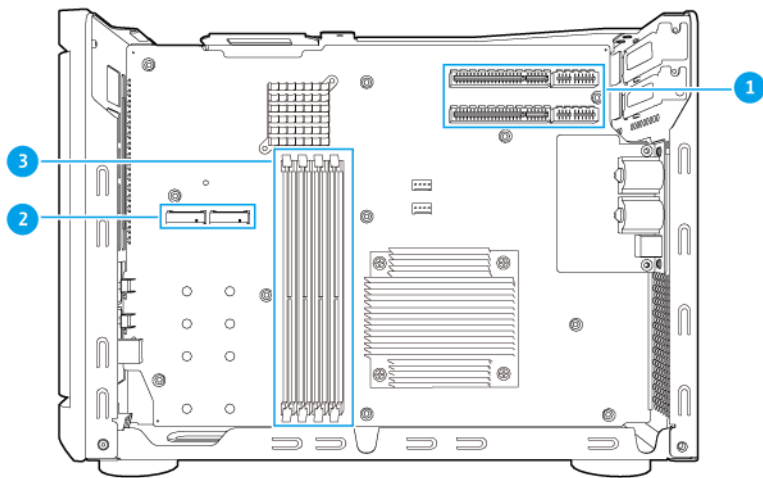
No.	Component	No.	Component
4	Status LED	9	M.2 LEDs
5	Power button	10	Optical drive bay


Back Panel




No.	Component	No.	Component
1	PCIe 3.0 x8 cover	6	Gigabit RJ45 Ethernet ports
2	Power port	7	3.5 mm speaker jack
3	Power switch	8	6.3 mm microphone jacks
4	Reset button	9	USB 3.0 ports
5	HDMI ports	10	Thunderbolt™ 3 ports

Right Panel

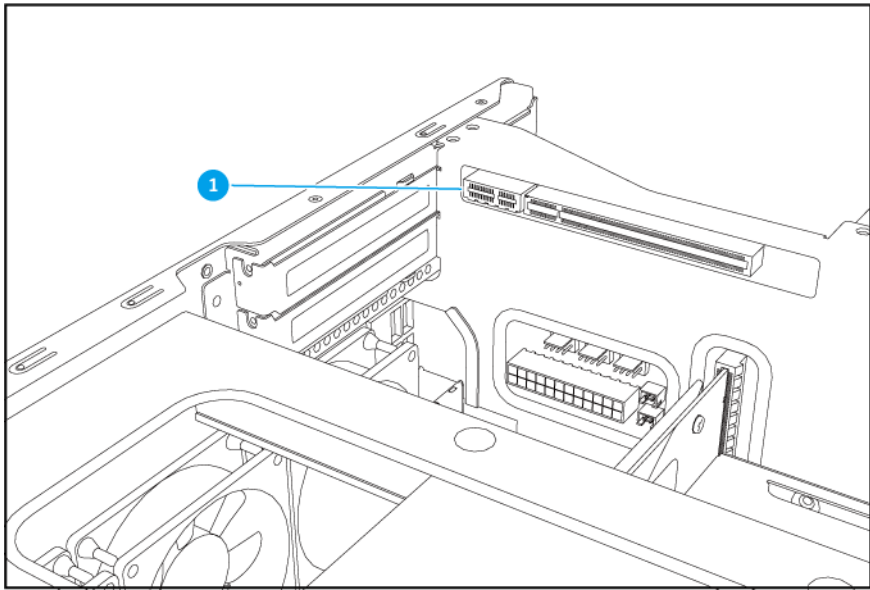



 **Note**  
The image does not include the case cover.

No.	Component	No.	Component
1	PCIe 3.0 x4 slots	3	Memory slots
2	M.2 SSD slots	-	-

 **Note**  
QNAP dual-port Thunderbolt™ expansion cards are pre-installed on the two PCIe 3.0 x4 slots.

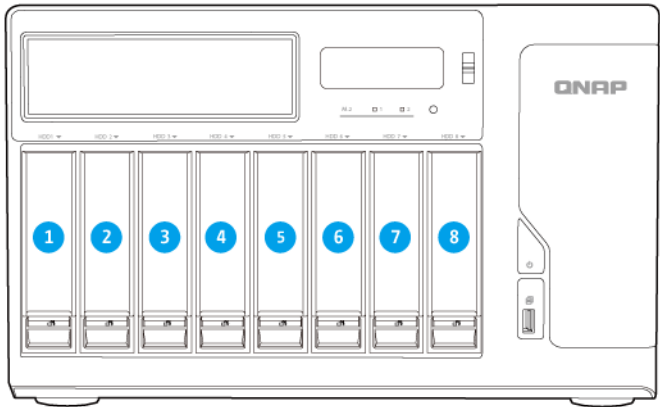
Left Panel



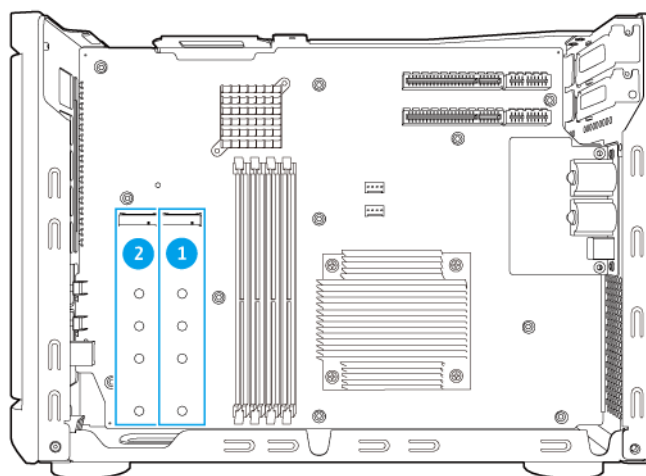
 **Note**  
The image does not include the case cover.

No.	Component	No.	Component
1	PCIe 3.0 x8 slot	-	-

Drive Numbering



## M.2 Solid State Drive Numbering



### Note

The image does not include the case cover.

## Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> <li>Room temperature: 0 to 40°C (32 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 with no exposure to direct sunlight, liquids, and chemicals</li> </ul>
Hardware and peripherals	<ul style="list-style-type: none"> <li>Storage drives For details on compatible drives, 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

1. Place your NAS device in an environment that meets the requirements.  
For details, see [Installation Requirements](#).
2. Verify that the intake vents on the bottom of the case are unobstructed.
3. Install the drives.

For details, see [Installing 3.5-inch Hard Drives](#), [Installing 2.5-inch Hard Drives or Solid State Drives](#), and [Installing M.2 Solid State Drives](#)

4. Optional: Install the optical disc drive.  
For details, see [Installing 5.25-inch Optical Drives](#) and [Installing Slim Optical Drives](#).
5. Connect the power cord and all applicable cables.
6. Power on the NAS.
7. Install QTS.  
For details, see [QTS Installation](#).
8. Log on to QTS.

## 3. Installation and Configuration

This chapter provides specific hardware and operating system installation and configuration steps.

### Hardware Installation

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

### Drive Installation

The TVS-882BRT3 is compatible with 3.5-inch and 2.5-inch hard drives, 2.5-inch solid state drives, and M.2 solid state drives.

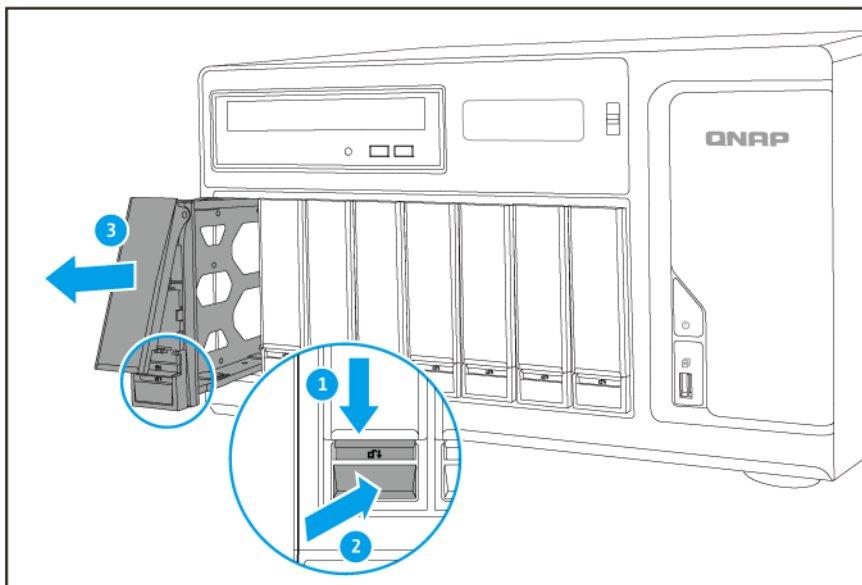
#### Installing 3.5-inch Hard Drives



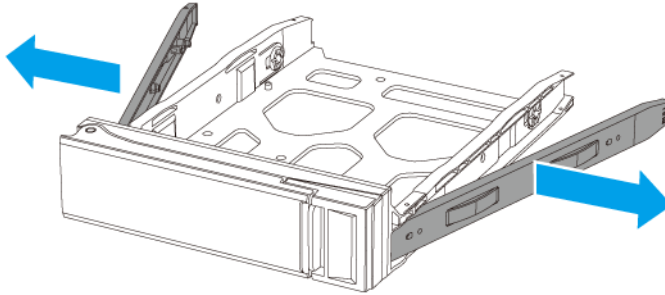
#### Warning

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

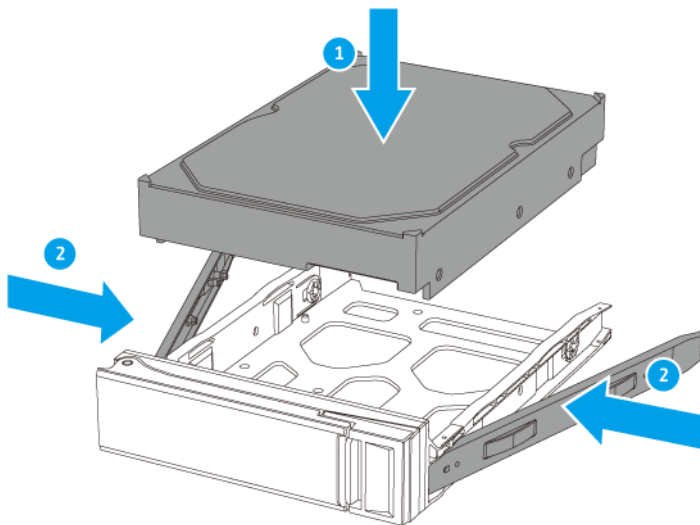
1. Power off the NAS.
2. Remove the drive tray.
  - a. Slide the lock down.
  - b. Push the button to release the tray handle.
  - c. Pull the tray out.



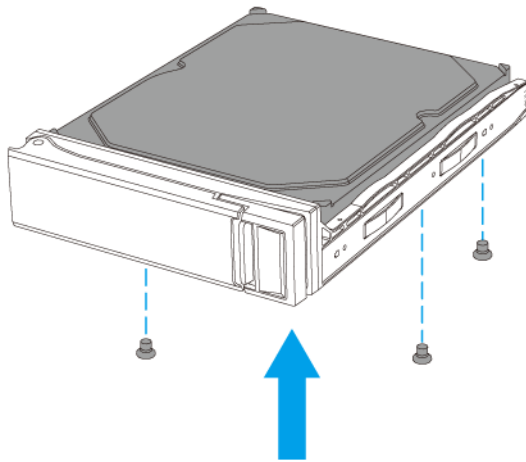
3. Install a drive on the tray.
  - a. Remove the fastening panels from the sides of the drive tray.



- 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.

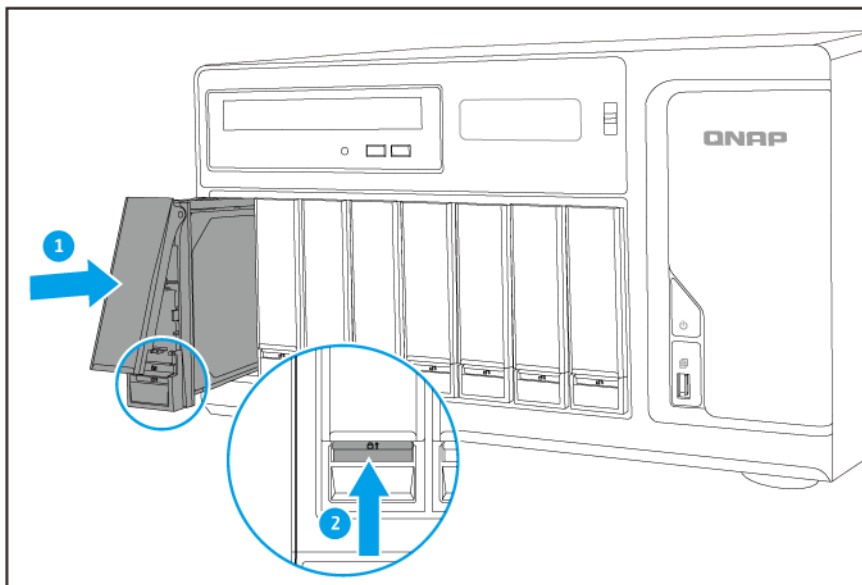


- d.** Optional: Attach the screws to lock the drive to the tray.

**Note**

Attaching screws provides further security and stability for the drives.

4. Load the tray into the bay.
  - a. Slide the tray into the drive bay.
  - b. Push the handle.
  - c. Slide the lock up.



5. Power on the NAS.



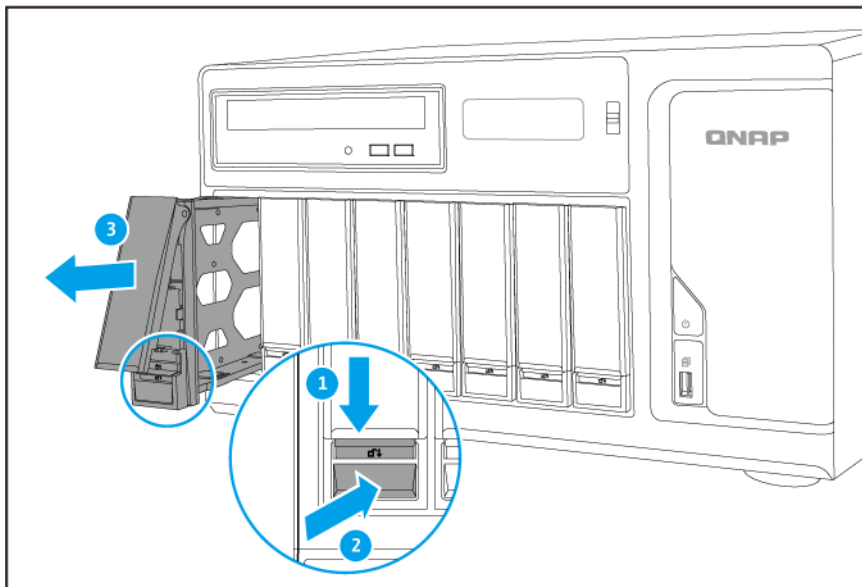
## Installing 2.5-inch Hard Drives or Solid State Drives



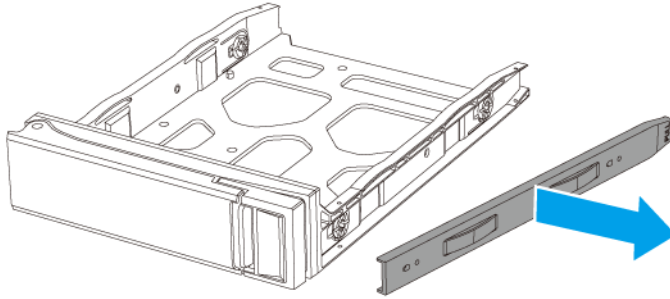
### Warning

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

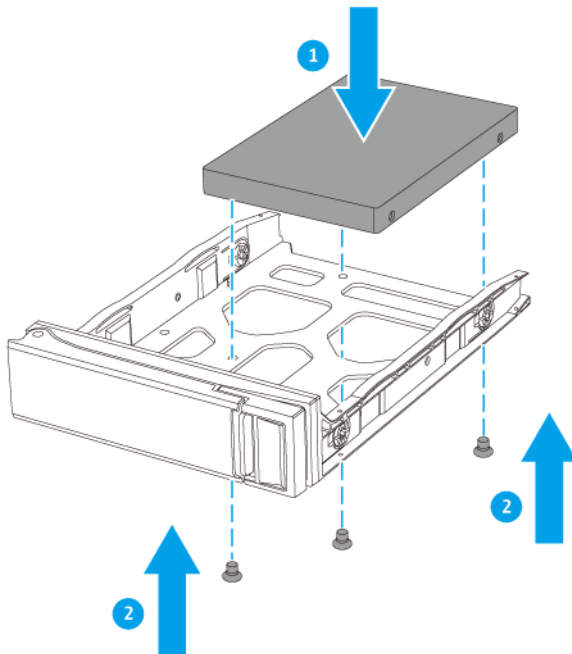
1. Power off the NAS.
2. Remove the drive tray.
  - a. Slide the lock down.
  - b. Push the button to release the tray handle.
  - c. Pull the tray out.



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

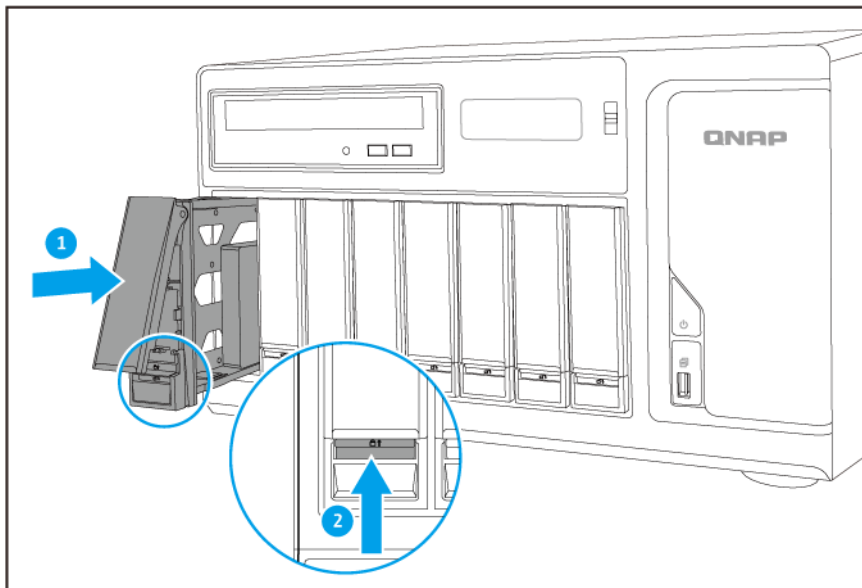


- b.** Place the drive on the tray so that the holes on the sides of the drive are aligned with the holes on the sides of the tray.
- c.** Attach the screws to lock the drive to the tray.



- 4.** Load the tray into the bay.
  - a.** Slide the tray into the drive bay.

- b. Push the handle.
- c. Slide the lock up.



5. Power on the NAS.

## Installing M.2 Solid State Drives



### Warning

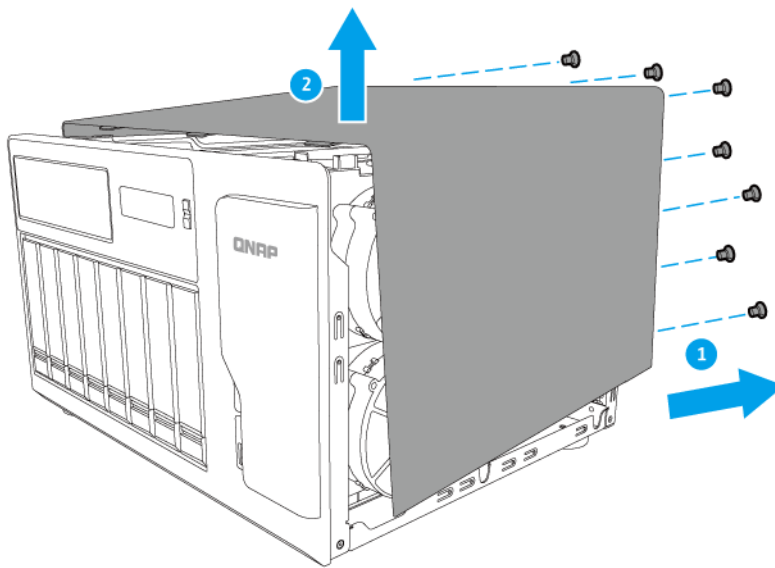
- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.



### Note

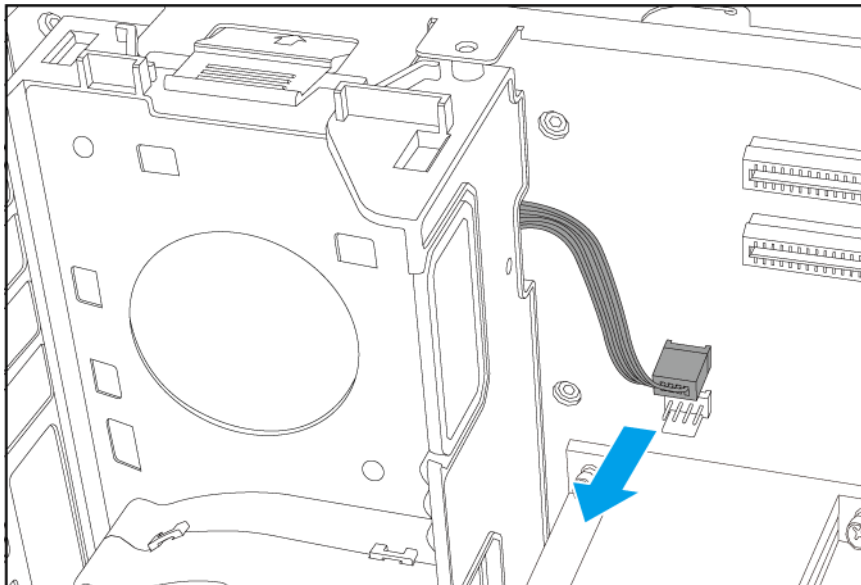
QNAP recommends installing heatsinks onto the M.2 SSD controllers to enhance cooling efficiency and to ensure consistent performance.

1. Power off the NAS.
2. Unplug the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Remove the screws that secure the case cover to the chassis.
  - b. Slide the case cover back.
  - c. Pull the case cover up until it completely detaches from the chassis.

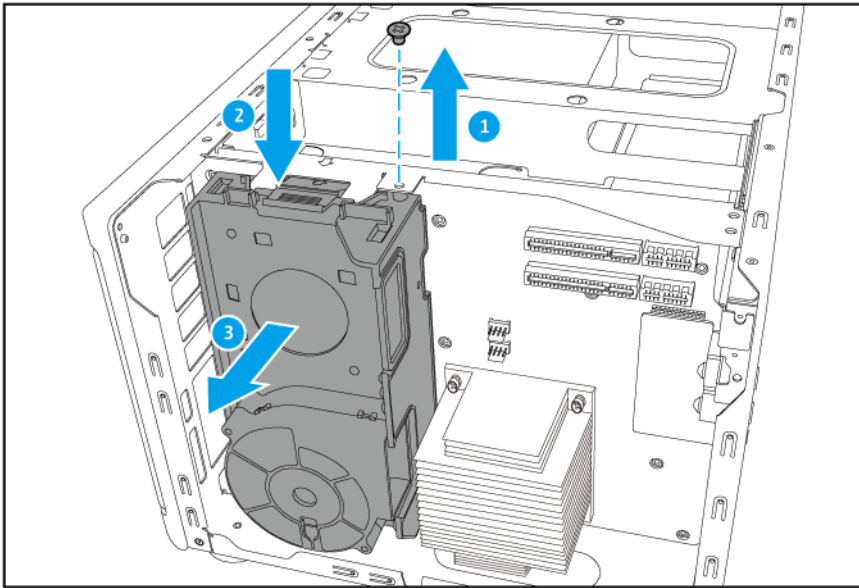


**5. Remove the fan module.**

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



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



**6. Install a heatsink onto the M.2 SSD.**

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



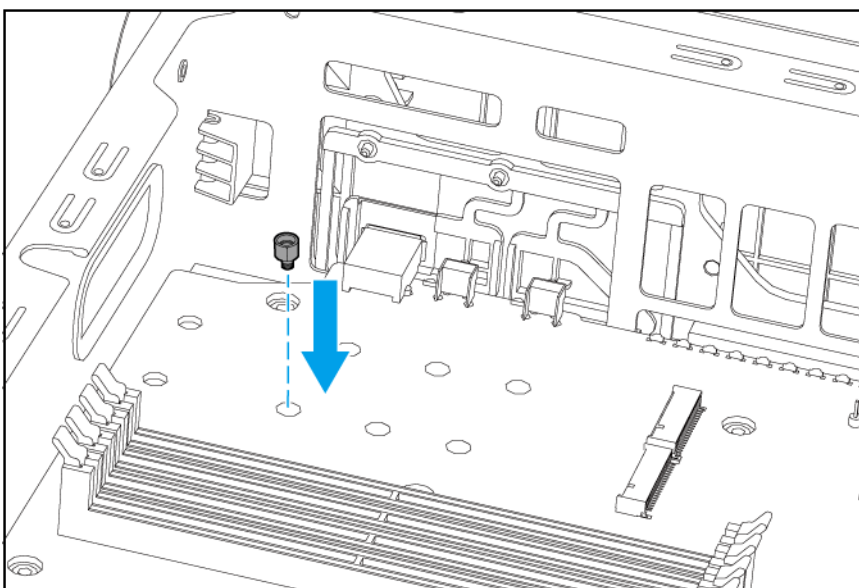
**Note**

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

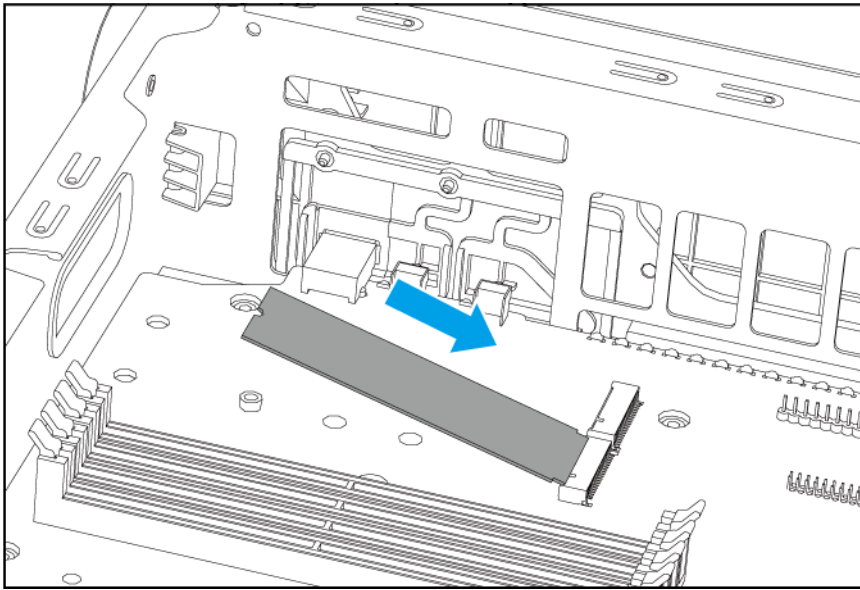
- b. Remove the release liner from the bottom of the heatsink.
- c. Install the heatsink onto the controller.

**7. Install the M.2 SSD.**

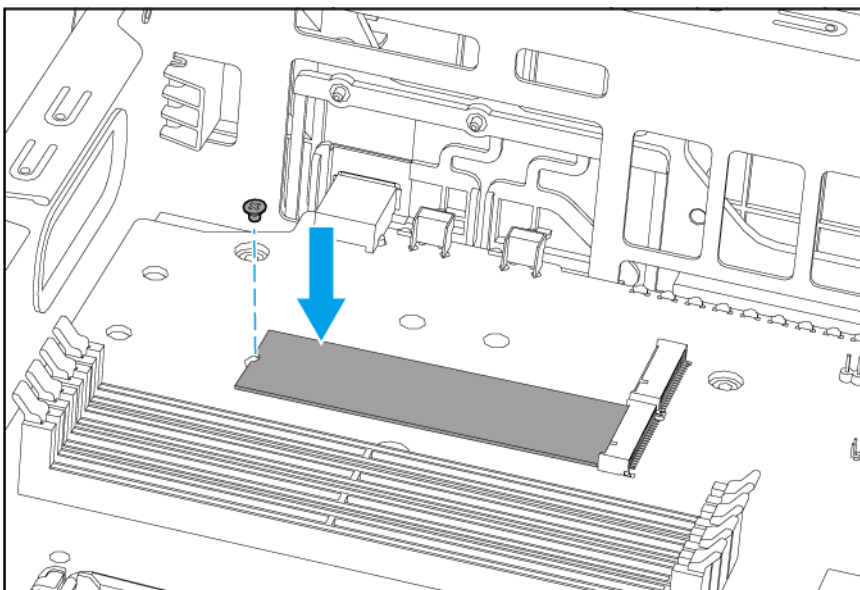
- a. Attach the riser screw to the appropriate location based on the size of your M.2 SSD.



- b.** Insert the M.2 SSD into the slot.

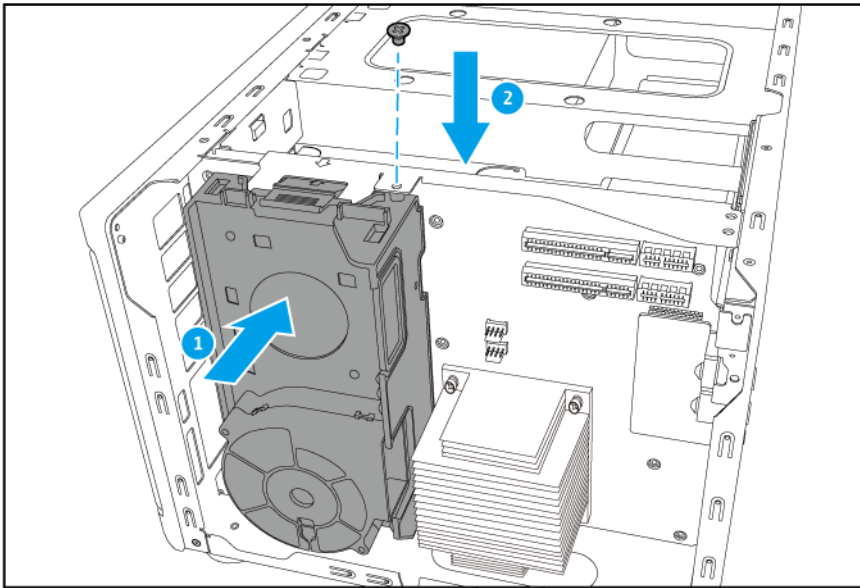


- c.** Attach the flat head screw to the riser screw.

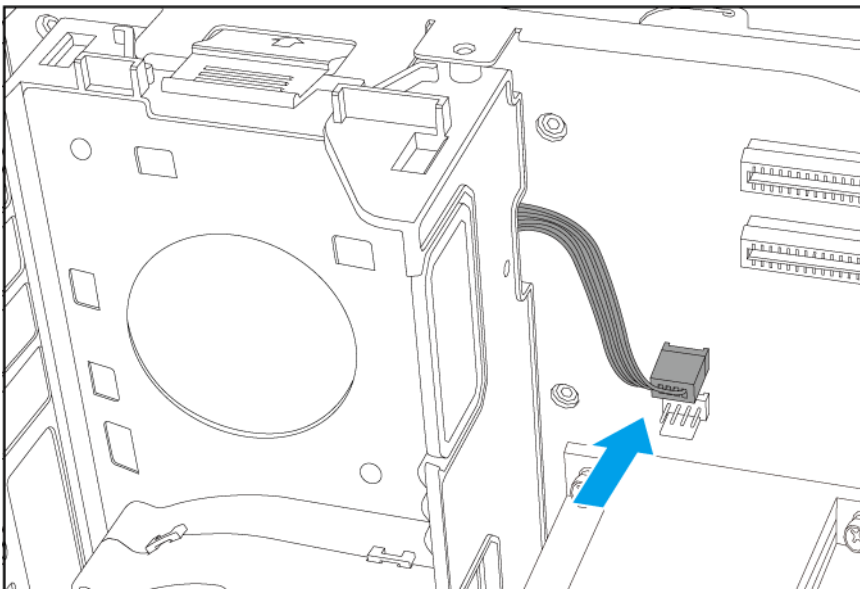


**8.** Attach the fan module.

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

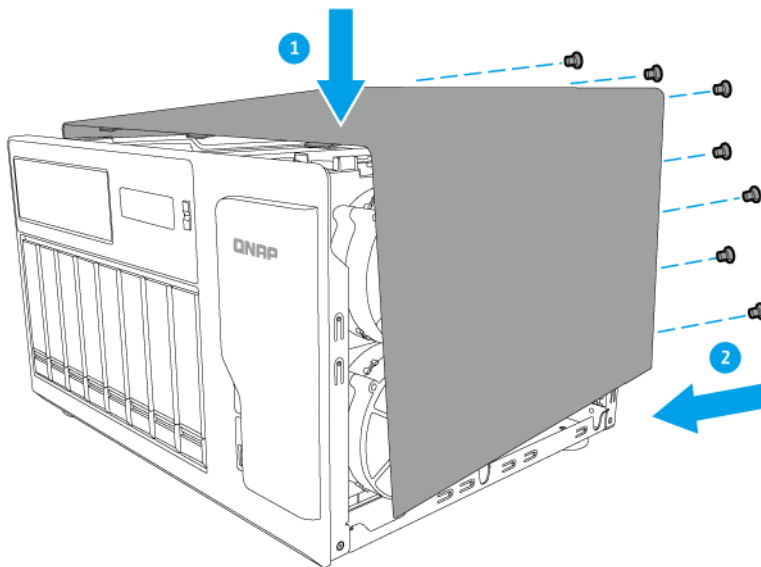


d. Connect the fan cable to the system board.



**9. Attach the case cover.**

- a. Slide the case cover down until it completely connects with the chassis.
- b. Slide the case cover forward.
- c. Attach the screws to the back side of the case.



10. Connect all cables and external attachments.
11. Plug the power cord.
12. Power on the NAS.

## Optical Drive Installation

The TVS-882BRT3 is compatible with 5.25-inch optical drives and slim optical drives. You can install either one 5.25-inch or two slim optical drives in the SATA optical drive bay.



### Note

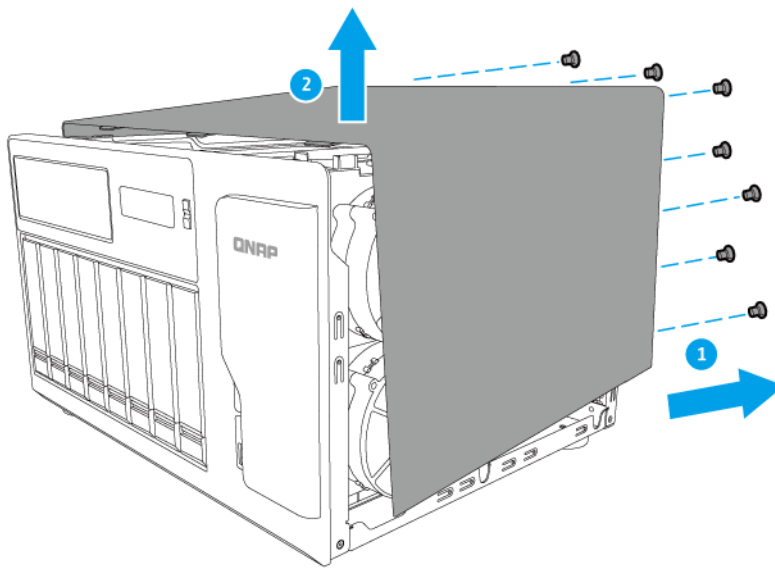
The TVS-882BRT3-ODD-i5-16G and TVS-882BRT3-ODD-i7-32G include a pre-installed 5.25-inch Blu-ray Disc writer. For other NAS models, optical drives must be purchased separately.

## Installing 5.25-inch Optical Drives

The TVS-882BRT3 supports reading from and writing to optical discs, including DVD and Blu-ray discs.

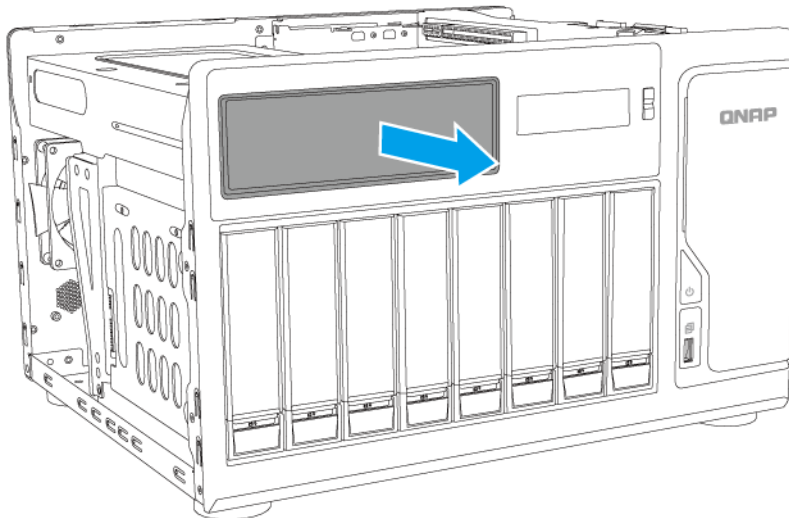
1. Power off the NAS.
2. Unplug the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Remove the screws that secure the case cover to the chassis.
  - b. Slide the case cover back.
  - c. Pull the case cover up until it completely detaches from the chassis.



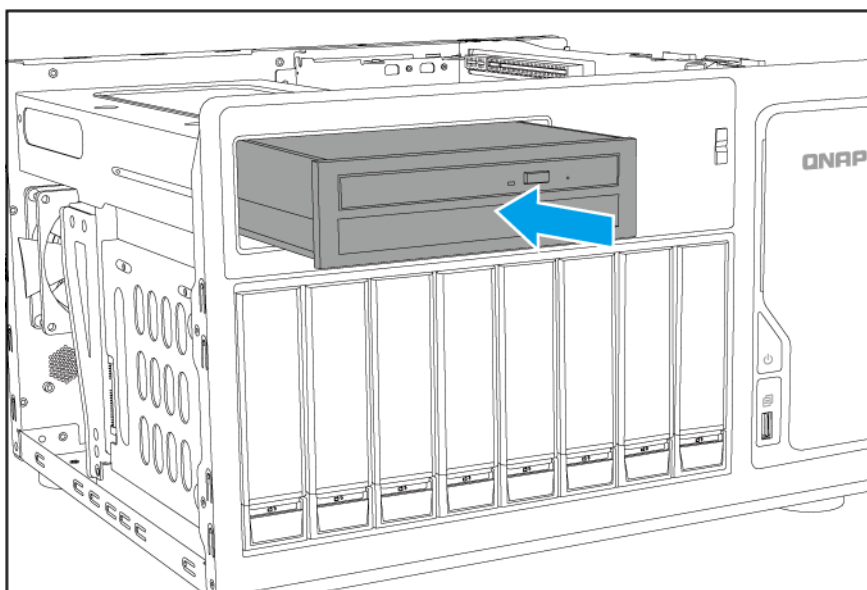


**5. Install a 5.25-inch optical drive.**

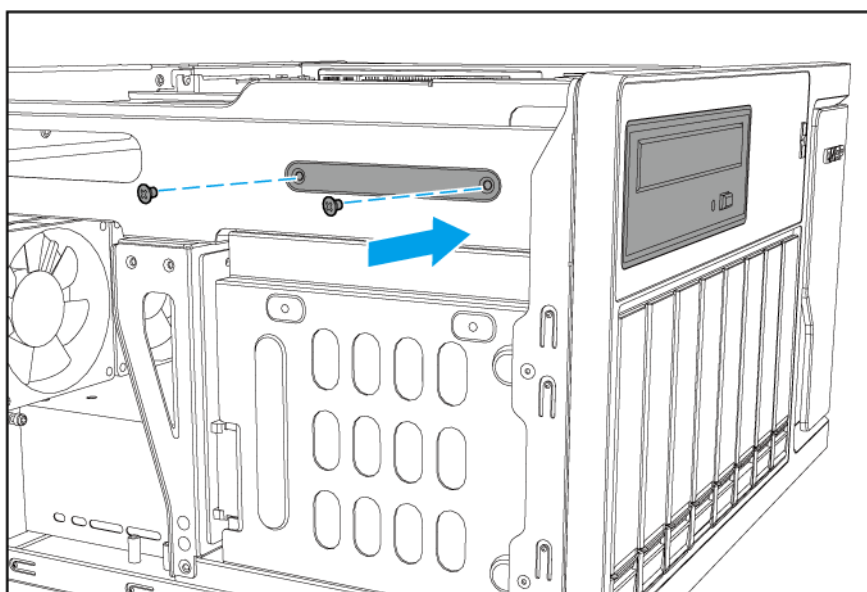
- a. Push the drive bay cover from the back to remove it from the chassis.**



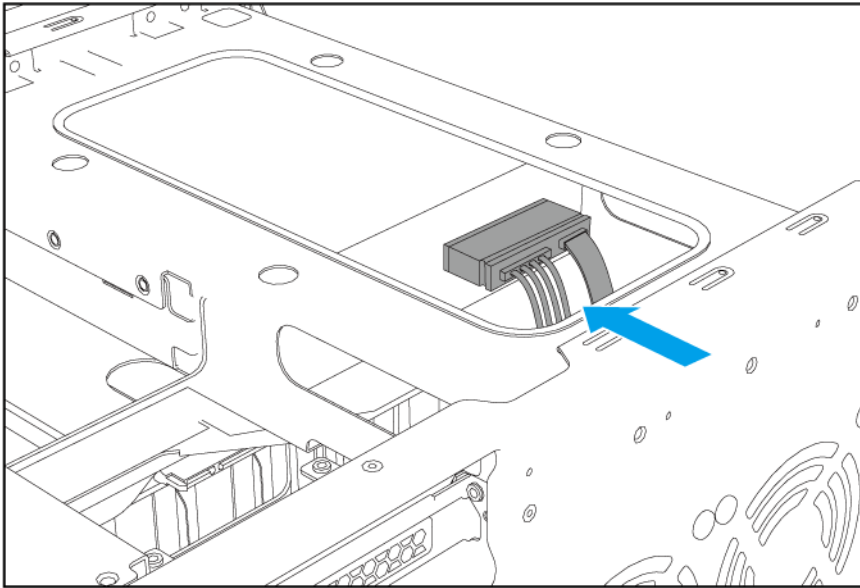
- b. Slide the drive into the drive bay.**



6. Attach screws to secure the left side of the optical drive to the chassis.



7. Insert the SATA connector to the SATA port on the drive.

**Note**

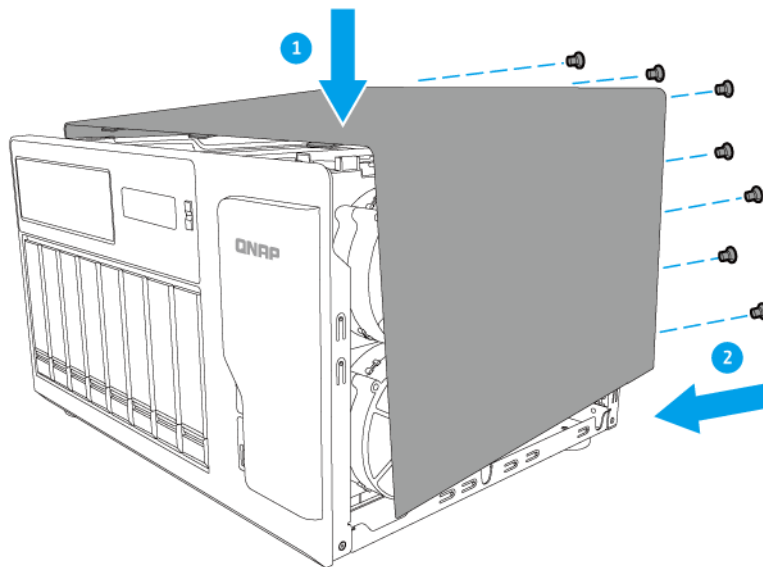
Depending on the hardware configuration, you may need to remove an existing SATA cable.

8. Verify that the other SATA connector is inserted to the on-board SATA port below the drive bay.

**Note**

The TVS-882BRT3-i5-16G and TVS-882BRT3-i7-32G include a SATA cable pre-attached to the chassis.

9. Attach the case cover.
  - a. Slide the case cover down until it completely connects with the chassis.
  - b. Slide the case cover forward.
  - c. Attach the screws to the back side of the case.



10. Connect all cables and external attachments.
11. Plug the power cord.
12. Power on the NAS.

### Installing Slim Optical Drives

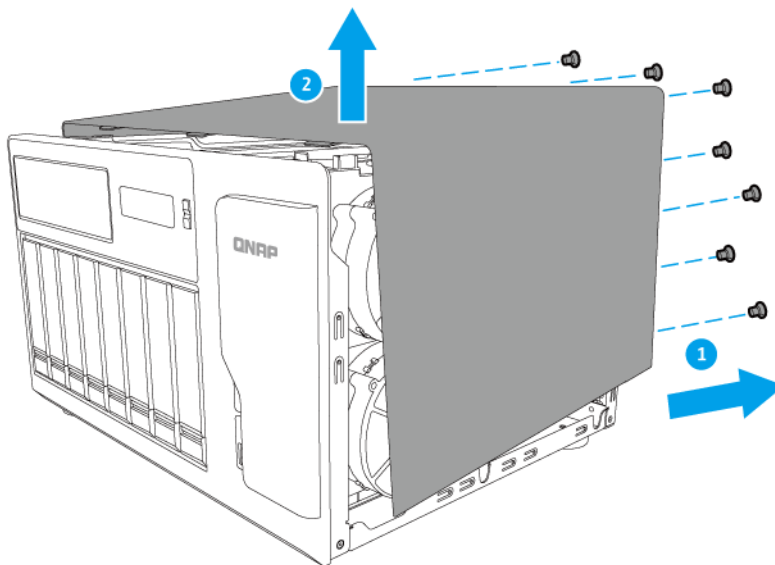
The TVS-882BRT3 supports reading from and writing to optical discs, including DVD and Blu-ray discs.



#### Note

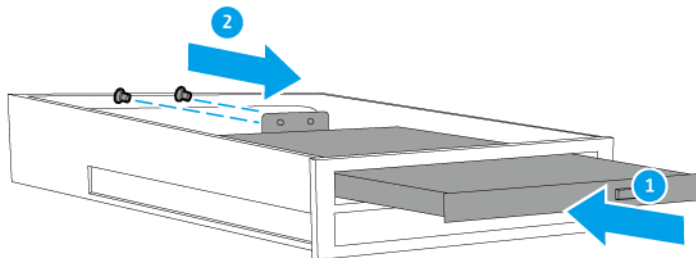
Slim optical drive kits must be purchased separately. Every kit includes screws and a SATA-to-mini-SATA cable.

1. Power off the NAS.
2. Unplug the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Remove the screws that secure the case cover to the chassis.
  - b. Slide the case cover back.
  - c. Pull the case cover up until it completely detaches from the chassis.



**5. Install a slim optical drive.**

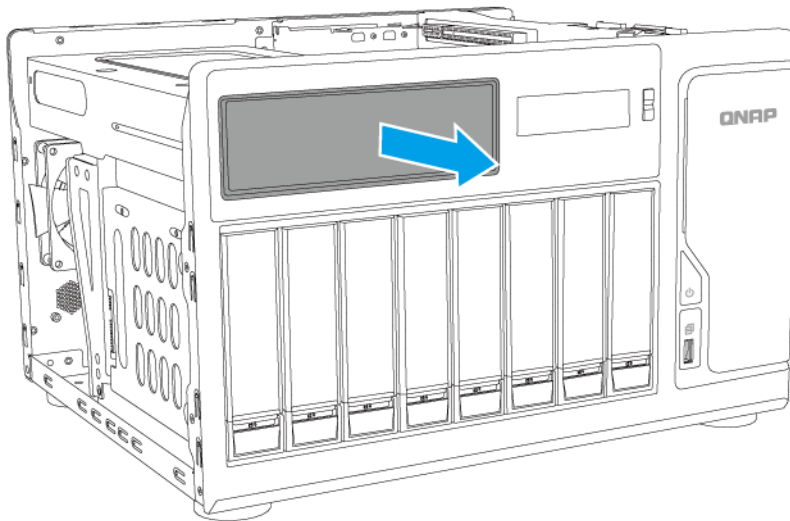
- a. Insert a slim optical drive into the slim optical drive kit.
- b. Attach the screws to secure the slim optical drive to the slim optical drive kit.



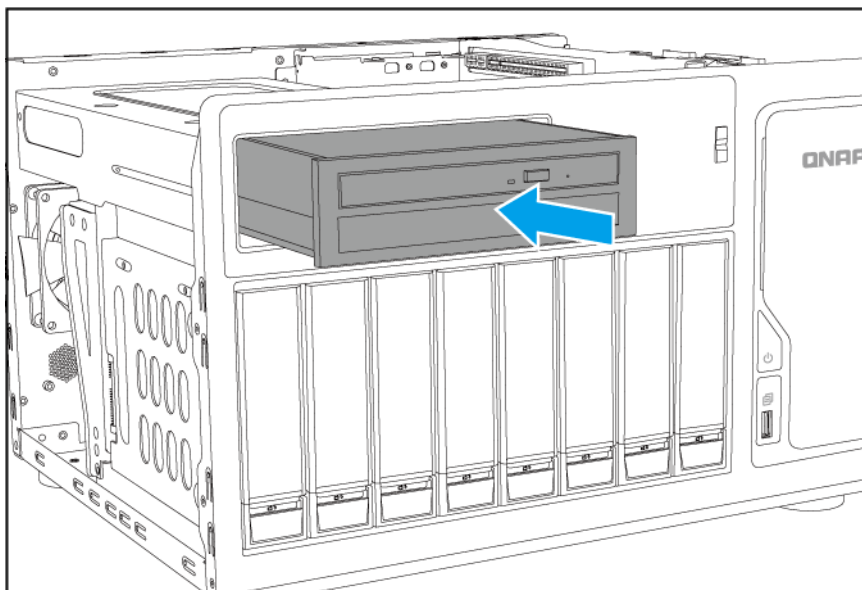
**6. Optional: Install a second slim optical drive.**

**7. Insert the slim optical drive kit into the NAS.**

- a. Push the drive bay cover from the back to remove it from the chassis.



- b.** Slide the drive kit into the drive bay.



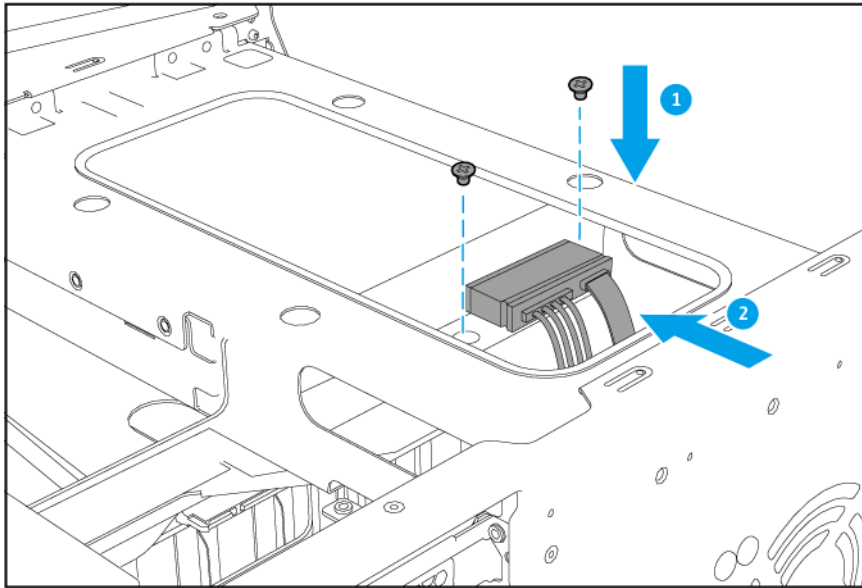
- c.** Attach the screws to secure the slim optical drive kit to the chassis.  
**d.** Optional: Remove the existing SATA cable from the chassis.



**Note**

The TVS-882BRT3-i5-16G and TVS-882BRT3-i7-32G include a SATA cable pre-attached to the chassis. Depending on the hardware configuration, you may need to remove an existing SATA cable.

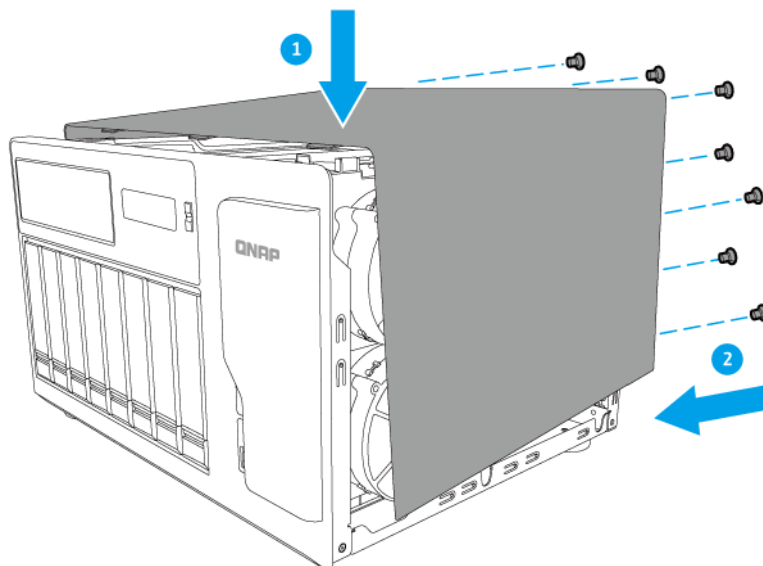
- e.** Find the SATA-to-mini SATA cable included with the slim optical drive kit.  
**f.** Insert the mini-SATA connector to the mini-SATA port on the slim optical drive.



**g.** Insert the SATA connector to the on-board SATA port below the drive bay.

**8.** Attach the case cover.

- a.** Slide the case cover down until it completely connects with the chassis.
- b.** Slide the case cover forward.
- c.** Attach the screws to the back side of the case.



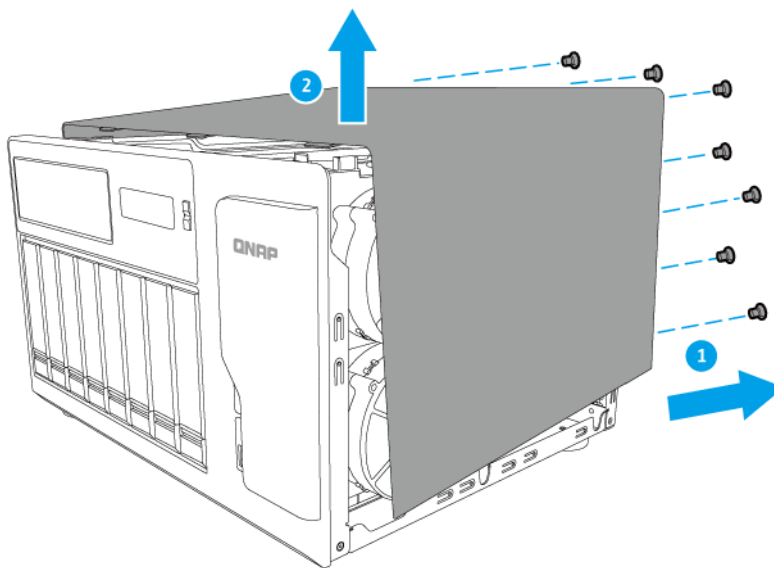
**9.** Connect all cables and external attachments.

**10.** Plug the power cord.

**11.** Power on the NAS.

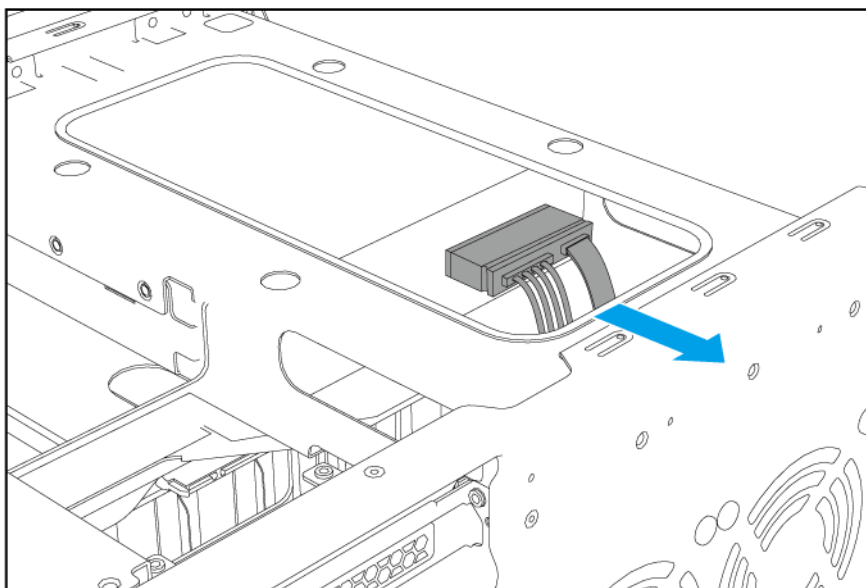
## Removing 5.25-inch Optical Drives

1. Power off the NAS.
2. Unplug the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Remove the screws that secure the case cover to the chassis.
  - b. Slide the case cover back.
  - c. Pull the case cover up until it completely detaches from the chassis.

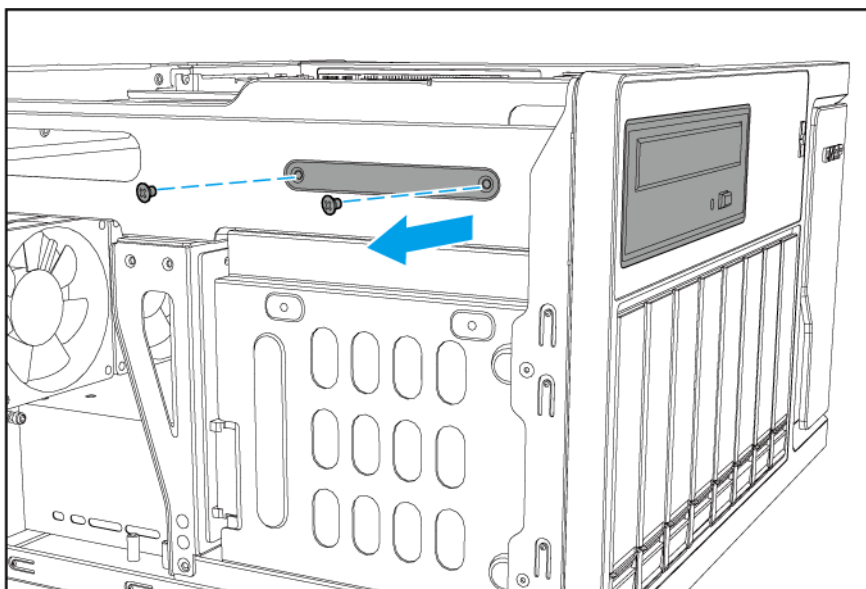


5. Remove a 5.25-inch optical drive.
  - a. Remove the SATA connector from the SATA port on the optical drive.

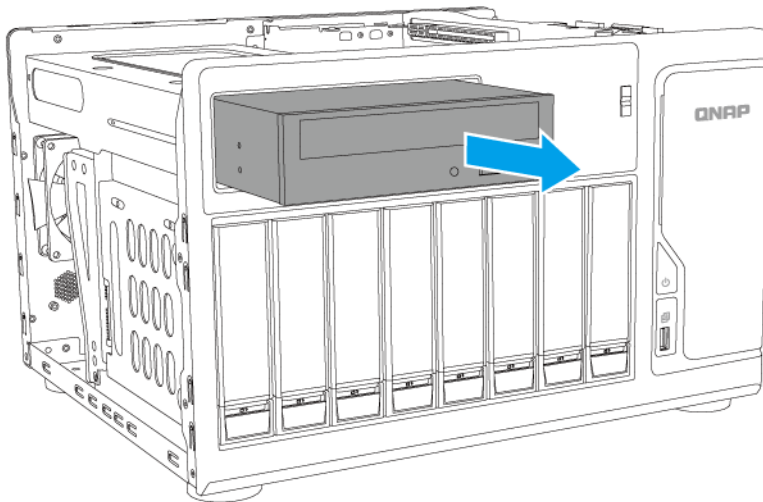




- b.** Optional: Remove the other SATA connector from the on-board SATA port below the drive bay.
- c.** Remove the screws that secure the left side of the optical drive to the chassis.

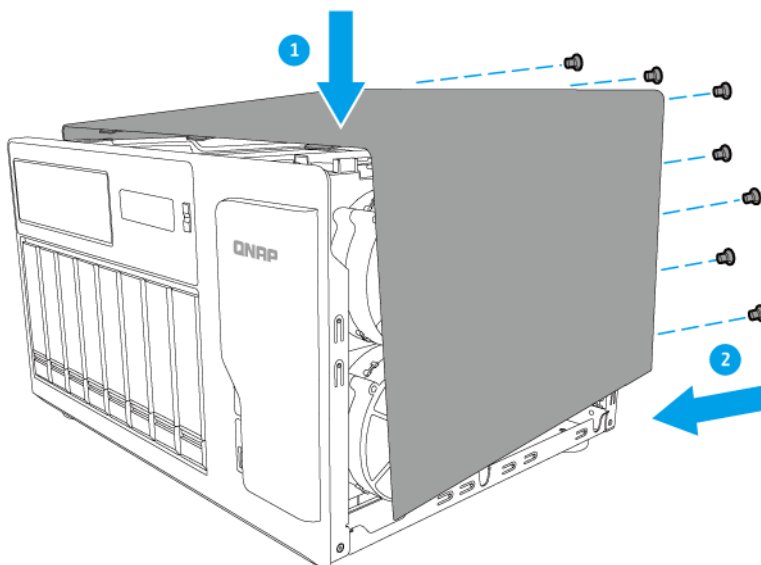


- d.** Push the optical drive from the back until it completely detaches from the drive bay.



**6. Attach the case cover.**

- a. Slide the case cover down until it completely connects with the chassis.
- b. Slide the case cover forward.
- c. Attach the screws to the back side of the case.

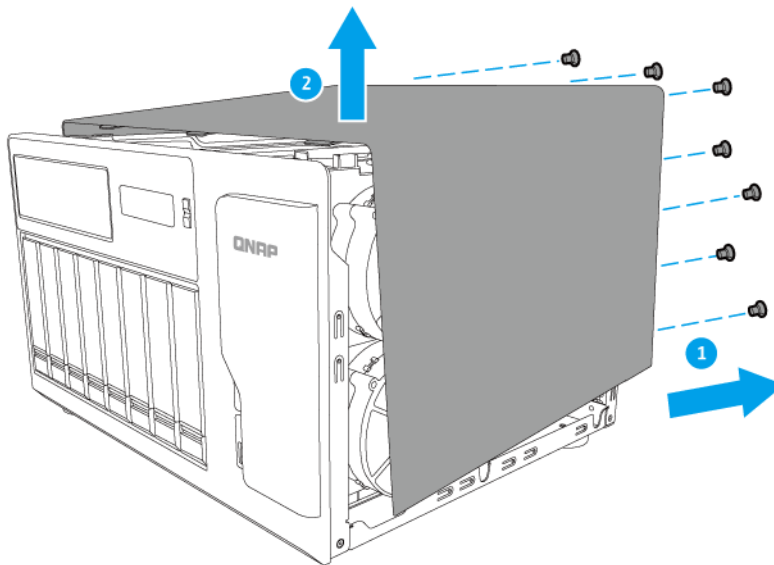


### Removing Slim Optical Drives

1. Power off the NAS.
2. Unplug the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.

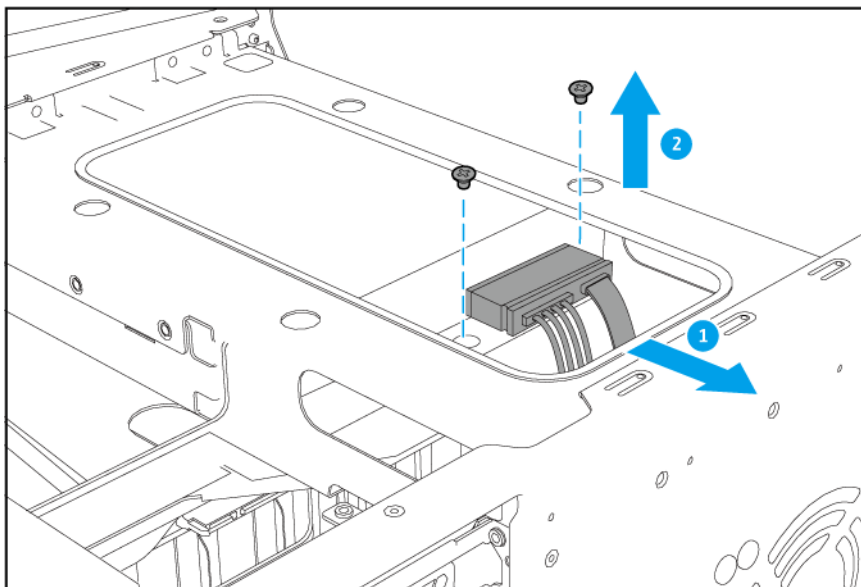
**4. Remove the case cover.**

- a. Remove the screws that secure the case cover to the chassis.
- b. Slide the case cover back.
- c. Pull the case cover up until it completely detaches from the chassis.

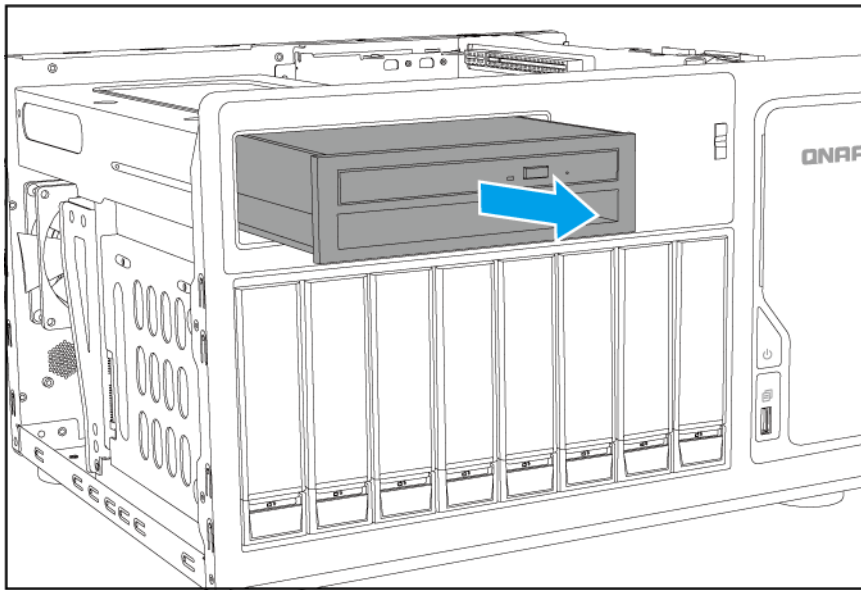


**5. Remove a slim optical drive.**

- a. Remove the mini-SATA connector from the mini-SATA port on the slim optical drive.
- b. Remove the screws that secure the slim optical drive kit to the chassis.

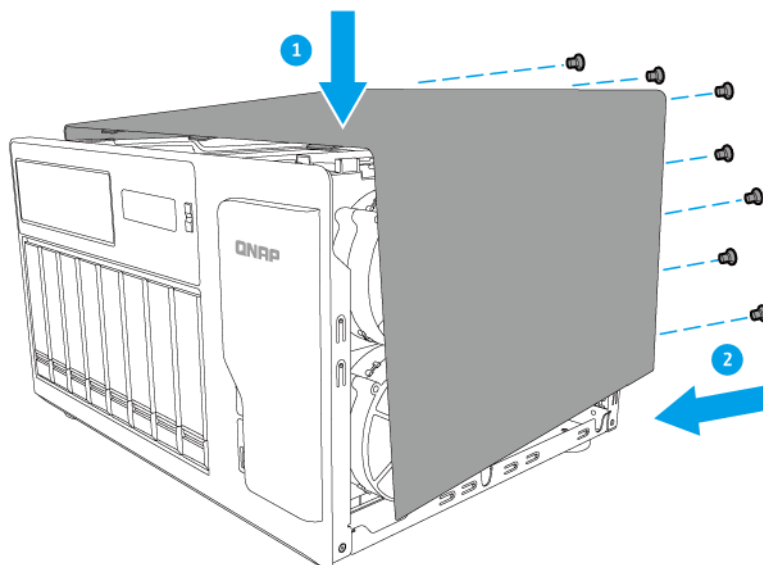


- c. Optional: Remove the SATA connector from the on-board SATA port below the drive tray.
- d. Push the slim optical drive kit from the back until it completely detaches from the drive bay.



## 6. Attach the case cover.

- a. Slide the case cover down until it completely connects with the chassis.
- b. Slide the case cover forward.
- c. Attach the screws to the back side of the case.



## Installing Expansion Cards

The NAS supports selected expansion cards, some of which require QNAP PCIe brackets. QNAP-branded expansion cards purchased from the company website are shipped with the brackets necessary to fit all QNAP NAS models.

For details on supported expansion cards and brackets, go to [www.qnap.com/compatibility](http://www.qnap.com/compatibility).



#### Note

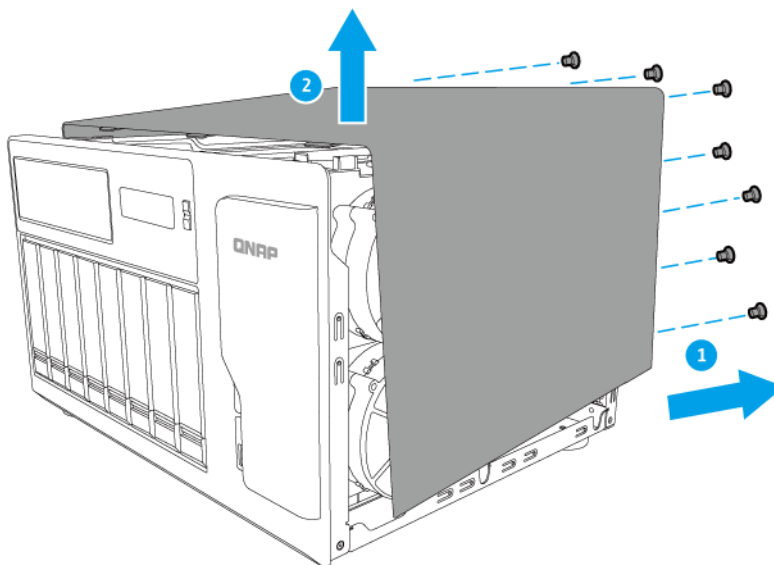
QNAP dual-port Thunderbolt™ expansion cards are pre-installed on the two PCIe 3.0 x4 slots.



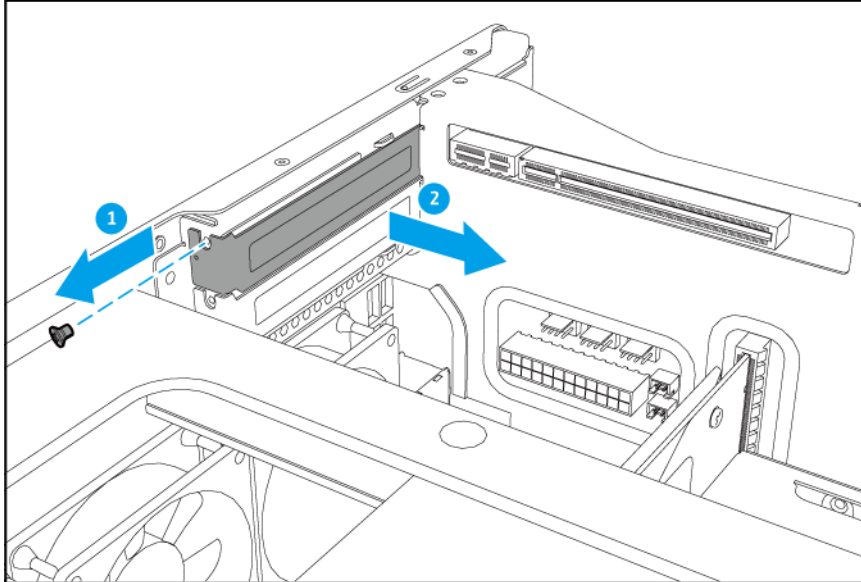
#### Warning

- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

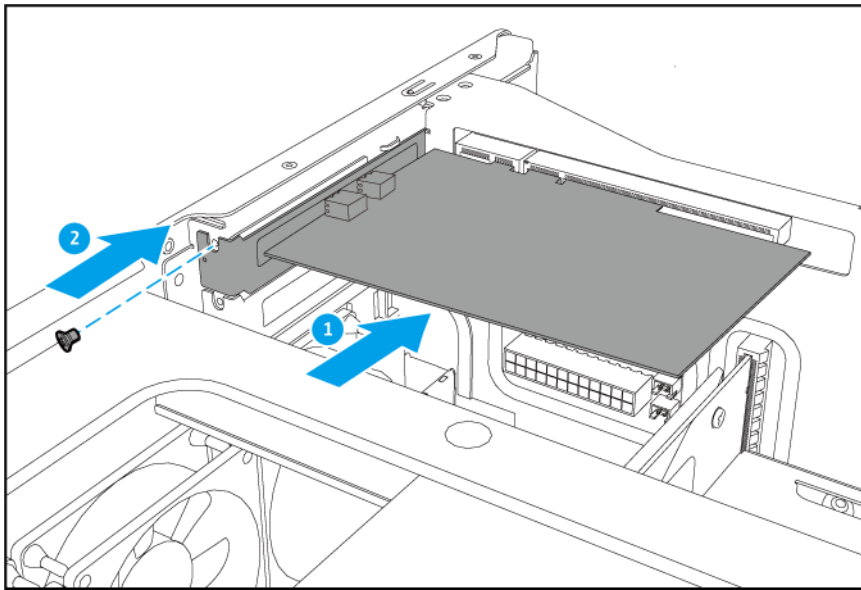
1. Check the expansion cards and brackets supported by your model on the QNAP website.
  - a. Go to [www.qnap.com/compatibility](http://www.qnap.com/compatibility).
  - b. Click **Search by NAS**.
  - c. Specify the number of bays and the specific model of your NAS.
  - d. Under **Category**, select **Expansion Card**.
  - e. Locate the expansion card model in the list and then click the corresponding **Note** icon.
2. Power off the NAS.
3. Unplug the power cord from the electrical outlet.
4. Disconnect all cables and external attachments.
5. Remove the case cover.
  - a. Remove the screws that secure the case cover to the chassis.
  - b. Slide the case cover back.
  - c. Pull the case cover up until it completely detaches from the chassis.



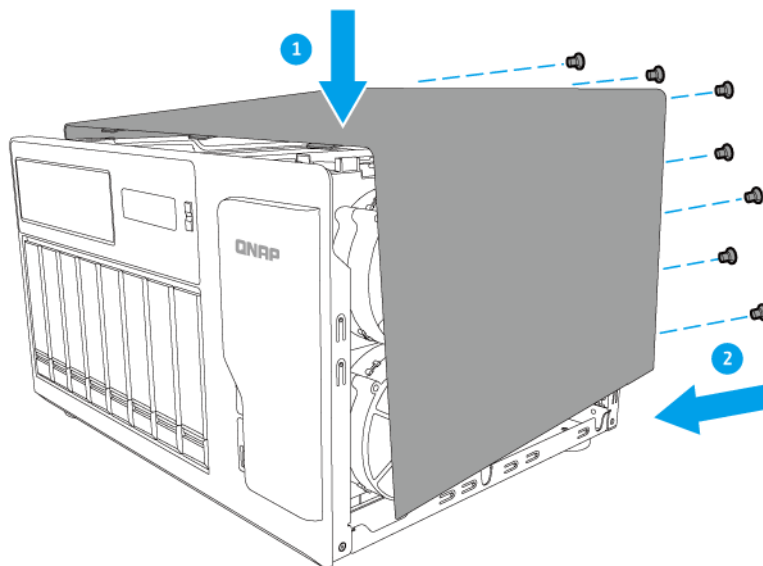
6. Remove the PCIe cover.
  - a. Remove the screw from the PCIe cover.
  - b. Pull the cover off.

**PCIe 3.0 x8**

7. Optional: Attach the QNAP bracket to the expansion card.
  - a. Remove all screws of the existing bracket.
  - b. Carefully pull the bracket away from the card.
  - c. Attach the QNAP bracket to the card using the same screws.
  - d. Verify that the bracket does not move.
8. Install the expansion card.
  - a. Hold the expansion card by the edges.
  - b. Insert the card into the slot.
  - c. Attach the screw.

**PCIe 3.0 x8****9. Attach the case cover.**

- a. Slide the case cover down until it completely connects with the chassis.
- b. Slide the case cover forward.
- c. Attach the screws to the back side of the case.

**10. Connect all cables and external attachments.****11. Plug the power cord.****12. Power on the NAS.**

## Replacing Memory Modules

The NAS has four memory slots. Depending on the model, you can increase the memory capacity of the NAS by upgrading one or all modules.

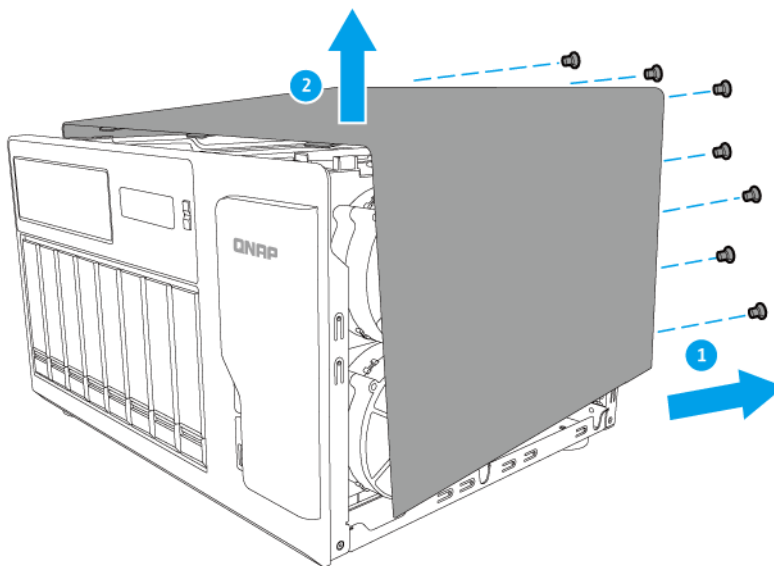
Use only QNAP modules of the same type and capacity to maintain system performance and stability. You can purchase QNAP memory modules from authorized resellers.



### Warning

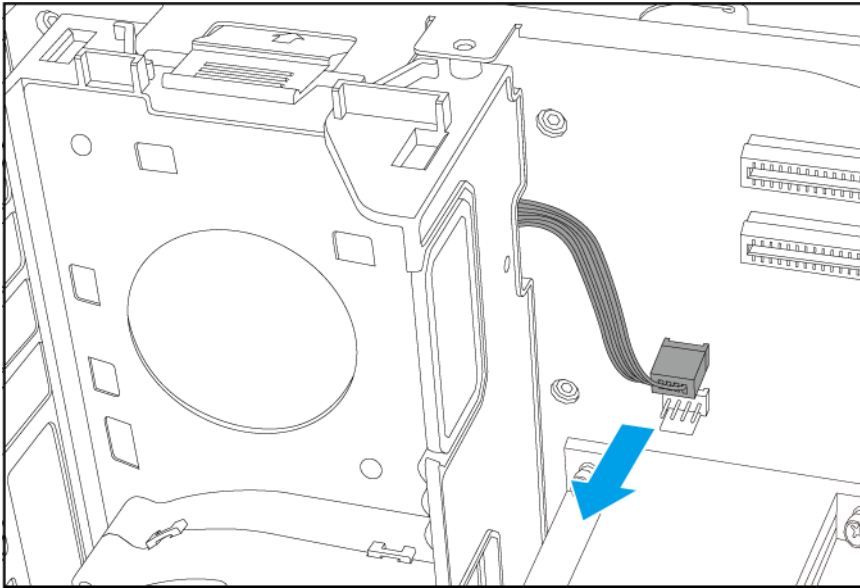
- Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

1. Power off the NAS.
2. Unplug the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Remove the screws that secure the case cover to the chassis.
  - b. Slide the case cover back.
  - c. Pull the case cover up until it completely detaches from the chassis.

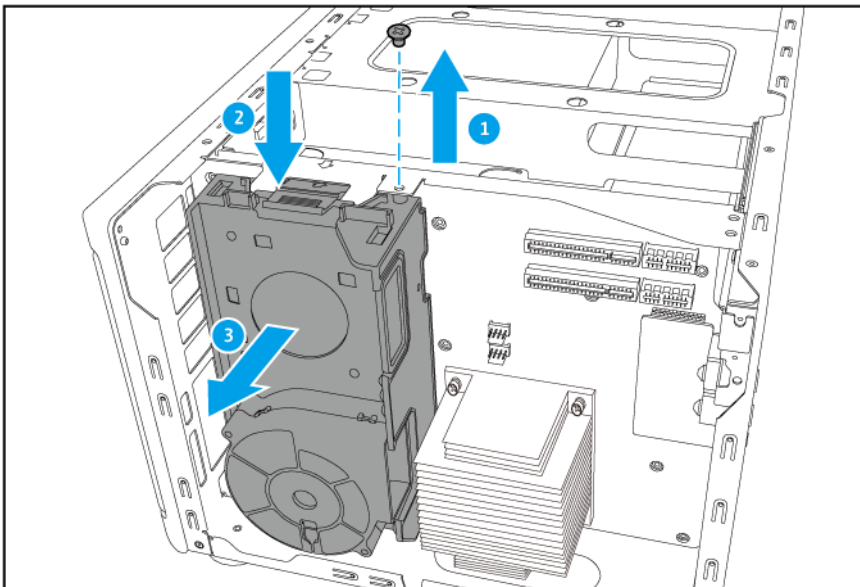


5. Remove the fan module.
  - a. Disconnect the fan cable from the system board.





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

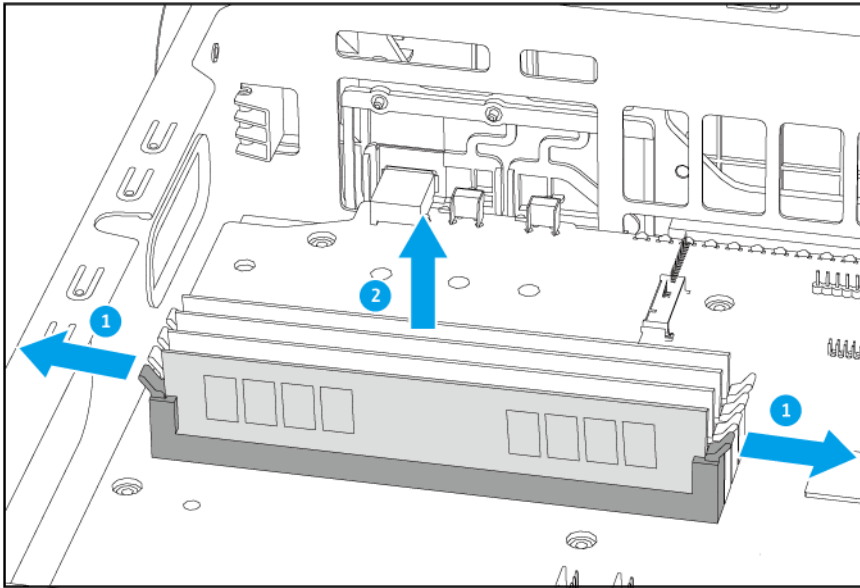


6. Remove an existing module.
  - a. Push the retention clips outward simultaneously to release the module.
  - b. Hold the module by the edges and then carefully slide it out of the slot.



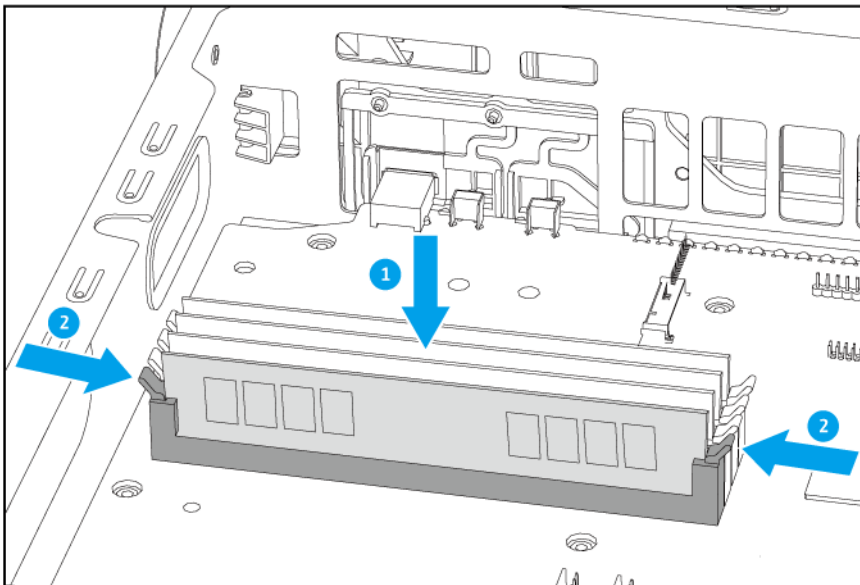
#### Warning

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



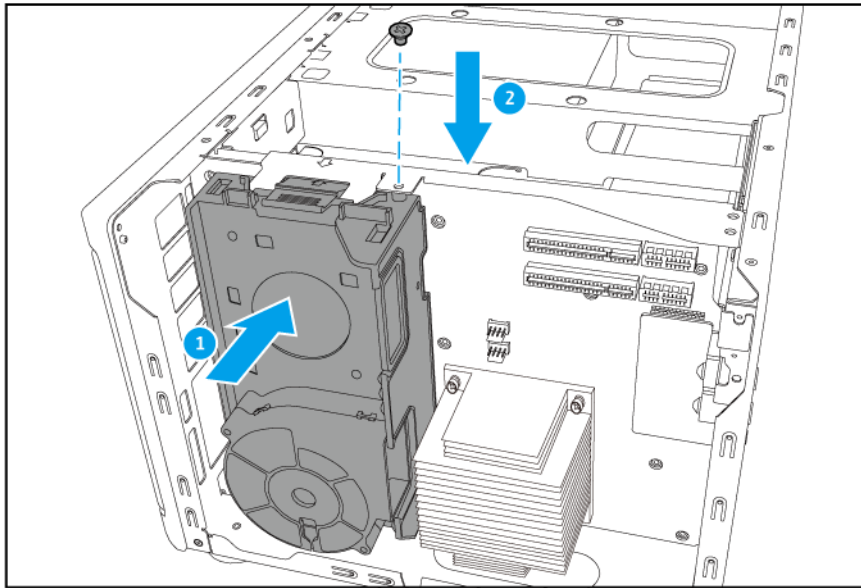
**7. Install a new module.**

- 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.

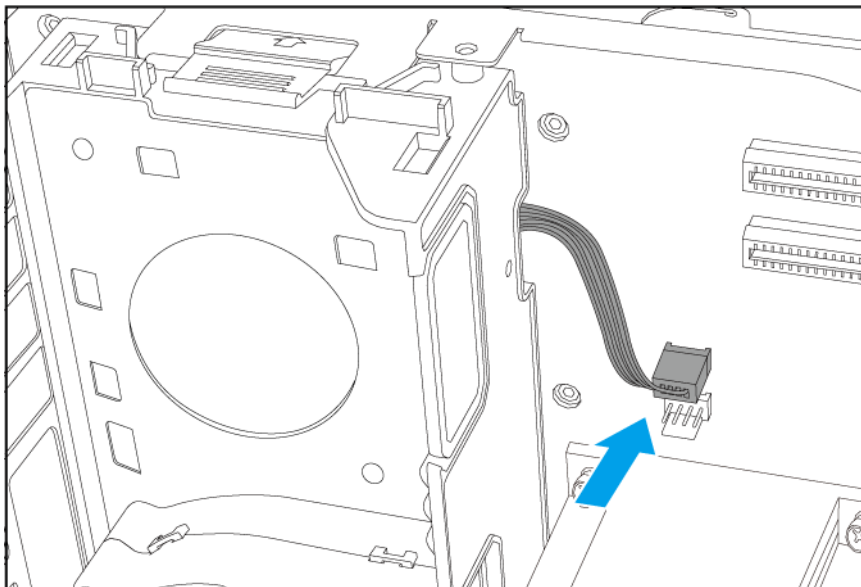


**8. Attach the fan module.**

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

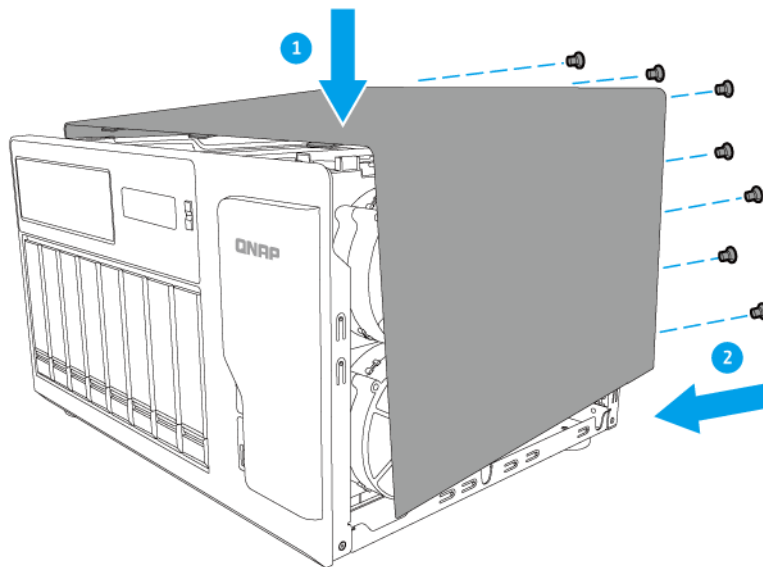


d. Connect the fan cable to the system board.



**9. Attach the case cover.**

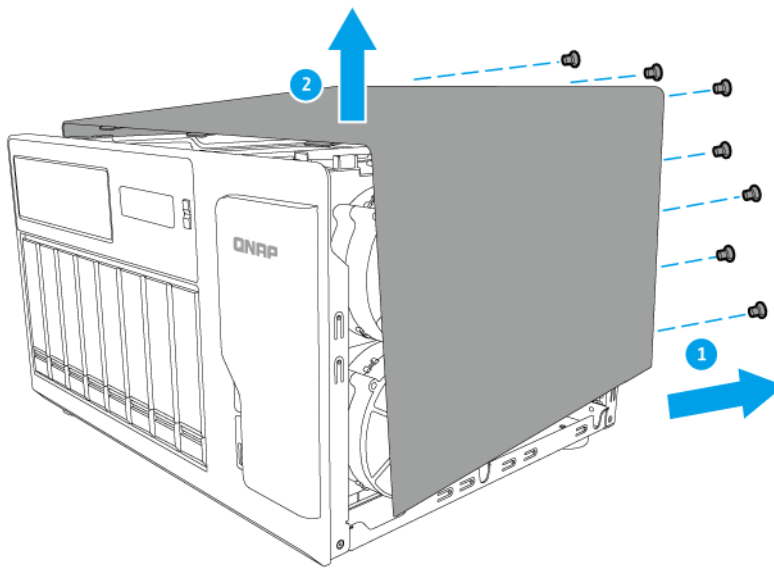
- a. Slide the case cover down until it completely connects with the chassis.
- b. Slide the case cover forward.
- c. Attach the screws to the back side of the case.



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

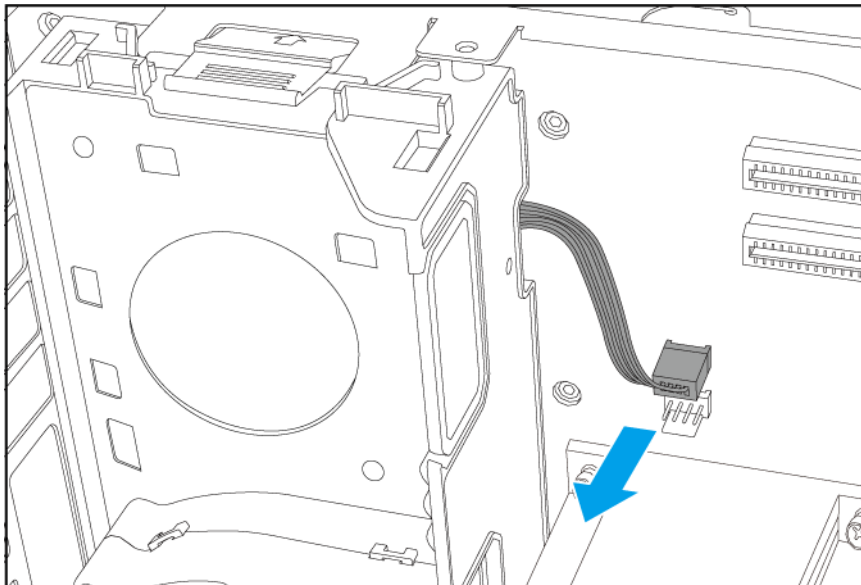
## Replacing CPU Fans

1. Power off the NAS.
2. Unplug the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the case cover.
  - a. Remove the screws that secure the case cover to the chassis.
  - b. Slide the case cover back.
  - c. Pull the case cover up until it completely detaches from the chassis.

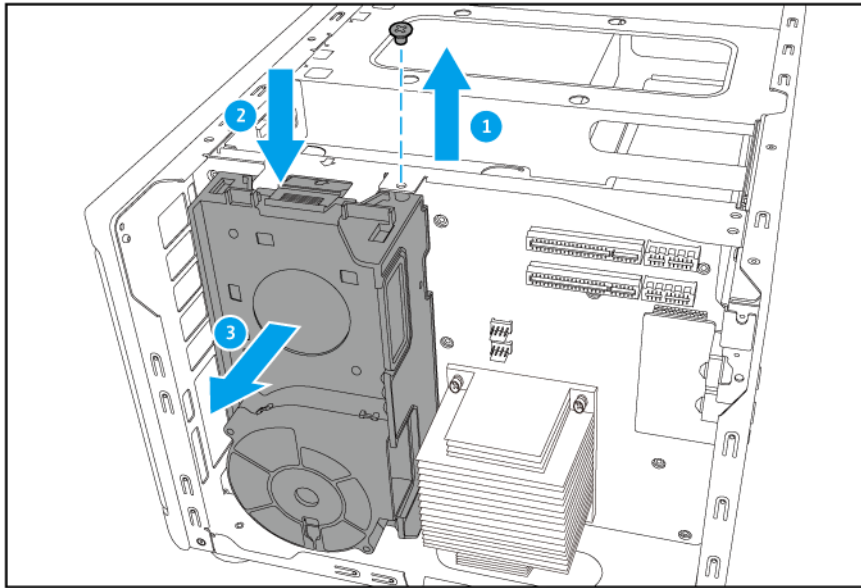


**5. Remove the fan module.**

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

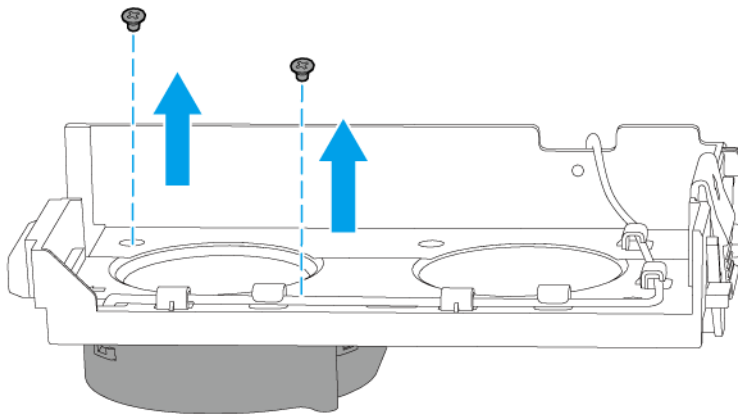


- b. Remove the screw that secures the fan module to the chassis.**
- c. Press the clip and then pull the fan module away from the system board.**

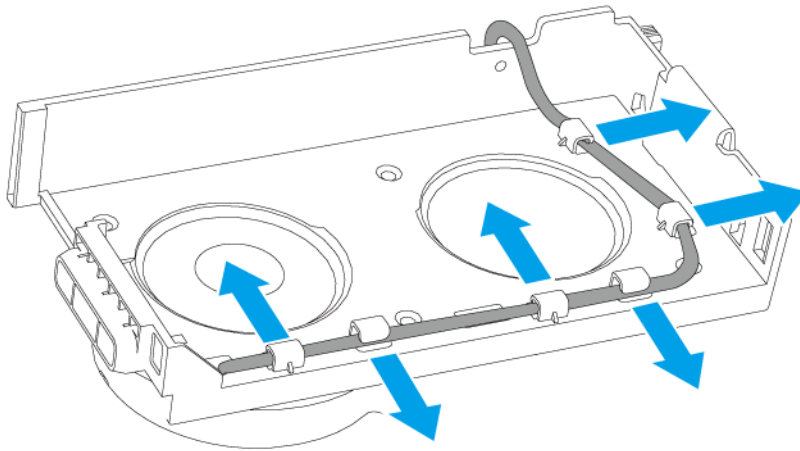


**6. Remove an existing fan.**

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



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



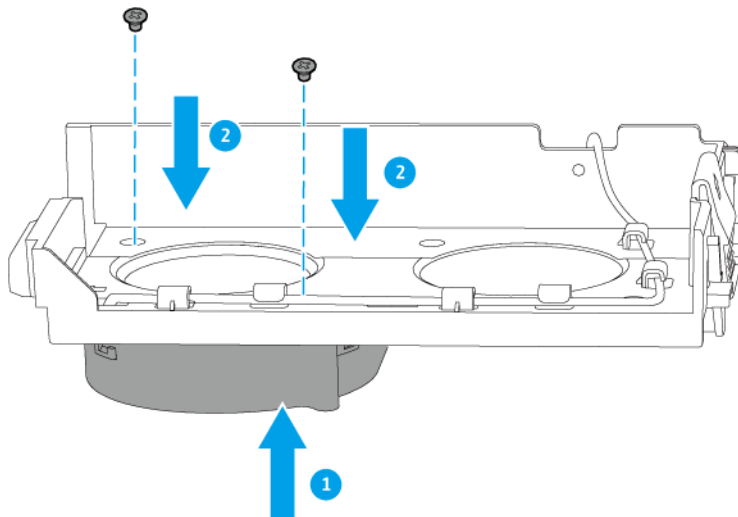
c. Detach the fan from the fan chassis.

**7. Install a new fan in the same location.**

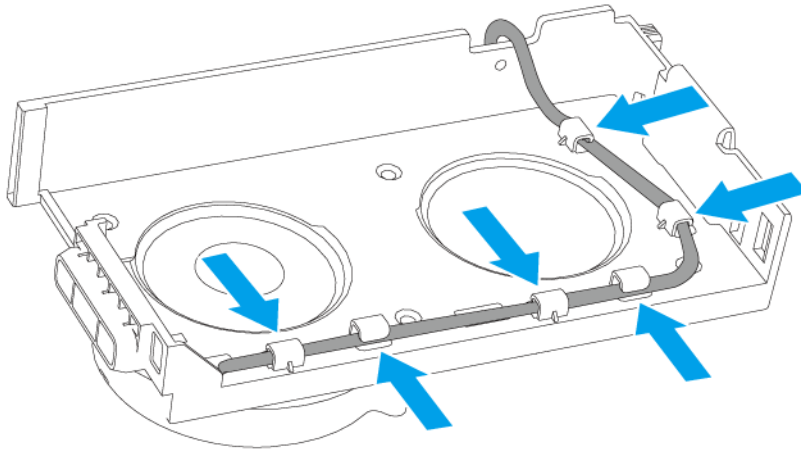
a. Position the fan chassis so that the cable clips face upward.

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

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

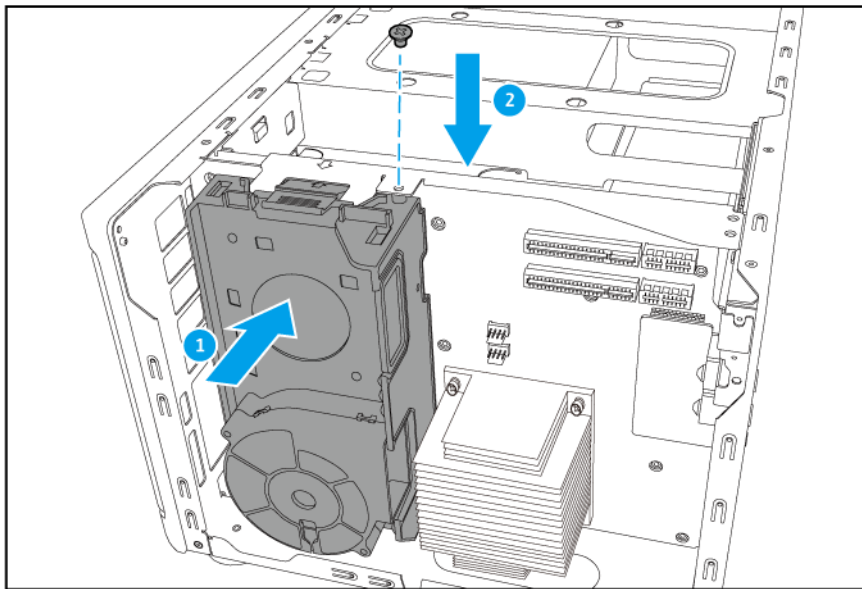


d. Attach the fan cable to openings of the cable clips on the fan chassis.



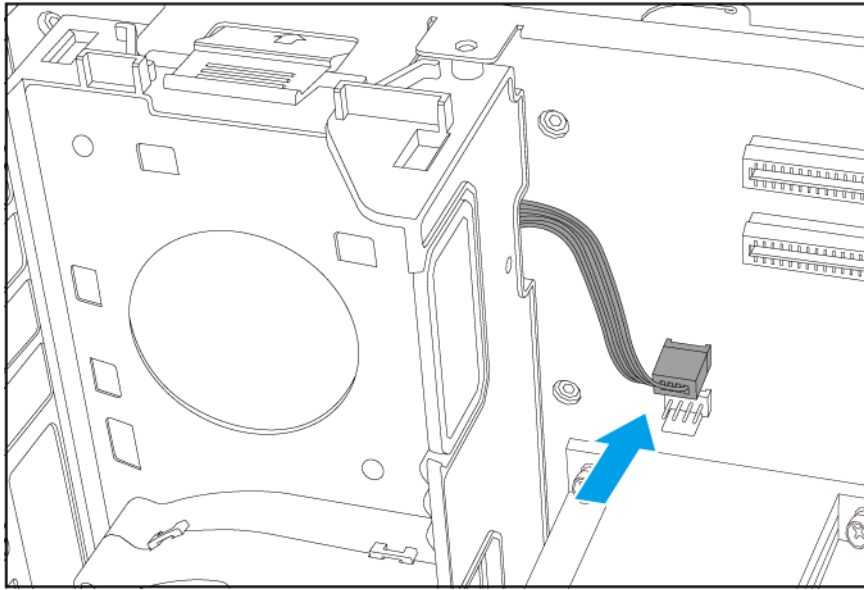
**8. Attach the fan module.**

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



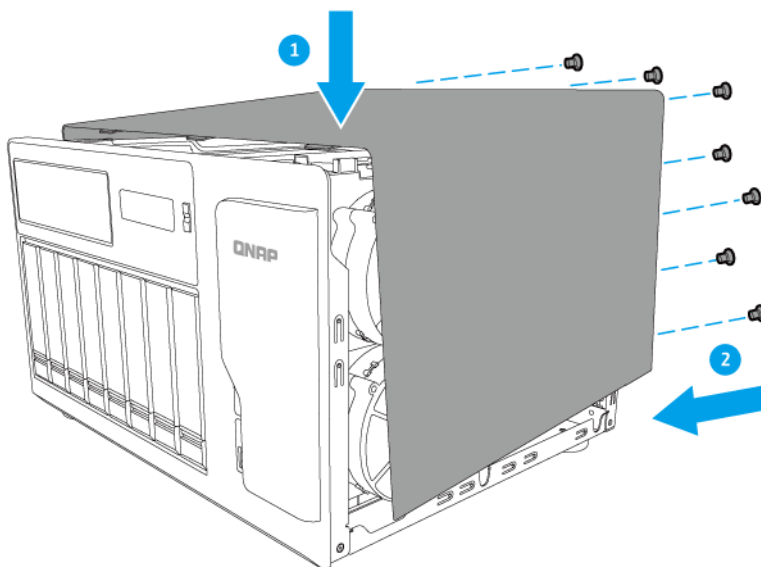
- d. Connect the fan cable to the system board.





**9. Attach the case cover.**

- a. Slide the case cover down until it completely connects with the chassis.
- b. Slide the case cover forward.
- c. Attach the screws to the back side of the case.



- 10. Connect all cables and external attachments.**
- 11. Plug the power cord.**
- 12. Power on the NAS.**

## QTS Installation

The TVS-882BRT3 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"> <li>• Locate the NAS using Qfinder Pro.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul> <p>For details, see <a href="#">Installing QTS Using Qfinder Pro</a>.</p>	<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>• Log into your myQNAPcloud account.</li> <li>• Use CloudLink to remotely access your NAS.</li> <li>• Complete the steps in the Smart Installation Guide wizard.</li> </ul> <p>For details, see <a href="#">Installing QTS Using the Cloud Key</a>.</p>	<ul style="list-style-type: none"> <li>• Computer or mobile device</li> <li>• Network cable</li> <li>• myQNAPcloud account</li> <li>• CloudKey</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> <p>For details, see <a href="#">Installing QTS Using an HDMI Connection</a>.</p>	<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.  
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 QTS Installation Wizard page loads in the default web browser.

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

The **Enter the NAS name and administrator's password** screen appears.

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**.

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

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**.

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

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

11. Click **Next**.

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

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

13. Click **Next**.

The **Select the disk configuration** screen appears.

14. Select **Configure disks later**.

For details on configuring disks, see the Storage Manager section of the QTS User Guide.

15. Click **Next**.

The **Enable multimedia functions** screen appears.

16. Select **No**.

Enabling the multimedia functions allows you to install multimedia applications after configuring the disks in Storage Manager.

For details on enabling multimedia functions on QTS, see the System Administration section of the QTS User Guide.

17. Click **Next**.

The **Summary** screen appears.

18. Review the settings.

19. Click **Apply**.

A confirmation message appears.



**Warning**

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

20. Click **Confirm**.

QTS is installed.

## 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.
4. Specify the Cloud Key on the NAS.
5. Create an account or log in to myQNAPcloud.
6. Specify the myQNAPcloud name for the NAS.  
The myQNAPcloud name is used when remotely accessing the NAS.
7. Optional: Select **CloudLink**.  
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**.  
The **Smart Installation Guide** appears.
9. Click **Start Smart Installation Guide**.  
The **Enter the NAS name and administrator's password** screen appears.
10. 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.
11. Click **Next**.  
The **Set the date and time** screen appears.
12. 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.

13. Click **Next**.  
The **Configure the network settings** screen appears.
14. Select **Obtain an IP address automatically (DHCP)**.
15. Click **Next**.  
The **Cross-platform file transfer service** screen appears.
16. Select the types of devices that you will use to access shared folders on the NAS.

17. Click **Next**.  
The **Select the disk configuration** screen appears.
18. Select **Configure disks later**.  
For details on configuring disks, see the Storage Manager section of the QTS User Guide.
19. Click **Next**.  
The **Enable multimedia functions** screen appears.
20. Select **No**.  
Enabling the multimedia functions allows you to install multimedia applications after configuring the disks in Storage Manager.  
For details on enabling multimedia functions on QTS, see the System Administration section of the QTS User Guide.
21. Click **Next**.  
The **Summary** screen appears.
22. Review the settings.
23. Click **Apply**.  
A confirmation message appears.

**Warning**

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

24. 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 monitor 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**.  
The **Enable the multimedia features** screen appears.
5. Select **No, skip this process**.  
Enabling the multimedia functions allows you to install multimedia applications after configuring the disks in Storage Manager.  
For details on enabling multimedia functions on QTS, see the System Administration section of the QTS User Guide.  
The **Select the disk configuration** screen appears.
6. Select **Configure later**.  
For details on configuring disks, see the Storage Manager section of the QTS User Guide.  
The first **Summary** screen appears.
7. Review the settings.

8. Click **Next**.  
The second **Summary** screen appears.
9. Review the settings.
10. Click **Next**.  
The **Confirm** screen appears.

**Warning**


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

11. Click **Next**.  
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.   <b>Important</b> 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"> <li>• System administrator password: admin</li> <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>• LCD panel password: (blank)</li> <li>• VLAN: Disabled</li> </ul>
Advanced system reset	Press and hold the button for 10 seconds.	The default factory settings are restored. <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 an external USB device to the NAS or from the NAS to an external 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.

## LCD Panel

The LCD panel allows you to perform the following operations:

- Restart and power off the NAS
- Configure or change the LCD panel password
- View and configure network settings
- View information on the system, physical disks, and volumes

## Viewing TCP/IP Settings

You can view the following settings for each network adapter on the NAS:

- IP address
  - Subnet mask
  - Default gateway
  - Primary DNS
  - Secondary DNS
1. Press **Enter** or **Select**.  
The panel displays the NAS name and QTS version.
  2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
  3. Press and hold **Enter**.  
The panel displays the IP address of the first network adapter.
  4. Press and hold **Select** to view the next TCP/IP screen.
  5. Optional: Repeat step 4 as necessary.

## Configuring TCP/IP Settings

You can configure the following settings for each network adapter on the NAS:

- IP address
  - Subnet mask
  - Default gateway
  - Primary DNS
  - Secondary DNS
1. Press **Enter** or **Select**.



The panel displays the NAS name and QTS version.

2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press and hold **Enter**.  
The panel displays the IP address of the first network adapter.
4. Press **Select** repeatedly until the panel displays `Enter Network Settings`.
5. Press and hold **Enter**.  
The panel displays the configurable network settings.
6. Press **Select** and **Enter** to configure the settings.

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

## Viewing Drive Information

The LCD panel can display the temperature and capacity of each drive installed in the NAS. To go to drive information:

1. Press **Enter** or **Select** to turn on the screen.  
The panel displays the NAS name and QTS version.
2. Press and hold the **Enter** button for 2 seconds to enter the `Main Menu`.  
The panel displays `Main Menu 1. TCP/IP`.
3. Repeatedly press and hold the **Enter** button until `Main Menu 2. Physical disk` appears.
4. Press and hold the **Enter** button. The panel displays the temperature and capacity of the drive in slot 1.
5. Press and hold the **Select** button to view information of the next drive. The panel displays the temperature and capacity of the next drive.
6. Optional: Repeat step 5 as needed.

## Viewing Volume Information

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

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QTS version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Enter** repeatedly until the panel displays `Main Menu 3. Volume`.
4. Press and hold **Enter**.  
The panel displays the name and capacity of the first volume.

5. Press and hold **Select**.  
The panel displays the name and capacity of the next volume.
6. Optional: Repeat step 5 as necessary.

## Viewing System Information

The LCD panel can display the CPU temperature, system temperature, and system fan speed.

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QTS version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Enter** repeatedly until the panel displays `Main Menu 4. System`.
4. Press and hold **Enter**.  
The panel displays the CPU and system temperature.
5. Press and hold **Select**.  
The panel displays the system fan speed.

## Powering Off the NAS

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QTS version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Enter** repeatedly until the panel displays `Main Menu 5. Shut down`.
4. Press and hold **Enter**.  
The NAS powers off.

## Restarting the NAS

1. Press **Enter** or **Select**.  
The panel displays the NAS name and QTS version.
2. Press and hold **Enter** for two seconds.  
The panel displays `Main Menu 1. TCP/IP`.
3. Press **Enter** repeatedly until the panel displays `Main Menu 6. Reboot`.
4. Press and hold **Enter**.  
The NAS restarts.

## Changing the LCD Password

The LCD panel can have a password set to protect it from unauthorized use. To go to change password screen:

1. Press **Enter** or **Select** to turn on the screen.  
The panel displays the NAS name and QTS version.
2. Press and hold the **Enter** button for 2 seconds to enter the **Main Menu**.

The panel displays `Main Menu 1. TCP/IP`.

3. Repeatedly press and hold the **Enter** button until `Main Menu 7. Password` appears.
4. Press and hold the **Enter** button. The change password screen appears.
5. Select **Yes** by pressing and holding the **Enter** button. The `New Password` screen appears.
6. Use the **Select** and **Enter** buttons to set the new password.
  - Specify a password with 1 to 8 characters. The password can only contain numbers (0 to 9).
  - To remove a password, set the new password to blank.

Button	Usage
<b>Enter</b>	Move to the next item in the <code>New Password</code> .
<b>Select</b>	Change a number in the <code>New Password</code> and <code>Verify Password</code> screens.

7. Press **Enter** after you set the password.

## LCD Error Messages

System Message	Description
Sys. Fan Failed	The system fan failed.
Sys. Overheat	The system overheated.
HDD Overheat	The drive overheated.
CPU Overheat	The CPU overheated.
Network Lost	LAN 1, LAN 2, LAN3, and LAN 4 are disconnected in failover or are in load-balancing mode.
LAN1 Lost	LAN 1 is disconnected.
LAN2 Lost	LAN 2 is disconnected.
LAN3 Lost	LAN 3 is disconnected.
LAN4 Lost	LAN 4 is disconnected.
HDD Failure	The drive failed.
Vol1 Full	The volume is full.
HDD Ejected	The drive was ejected.
Vol1 Degraded	The volume is in degraded mode.
Vol1 Unmounted	The volume is unmounted.
Vol1 Nonactivate	The volume is not activated.

## 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"> <li>• The drive is being formatted.</li> <li>• The NAS 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> </ul>
	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 NAS 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>• Hardware self-test error</li> </ul>
	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"> <li>• The NAS is starting up.</li> <li>• The NAS is not configured.</li> <li>• A drive is not formatted.</li> </ul>
	Flashes green every 2 seconds	The NAS is in S3 sleep mode.
	Green	The NAS is ready.
	Off	All drives are in standby mode.
Drive	Flashes red	The drive is being located.
	Red	A drive read/write error has occurred.
	Flashes green	The data is being accessed.
	Green	The drive can be accessed.
	Off	No drive is detected.
M.2 SSD	Flashes red	The drive is being located.
	Red	A drive read/write error has occurred.
	Flashes green	The data is being accessed.
	Green	The drive can be accessed.
	Off	No drive is detected.

## Beep Alarm

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> <li>The NAS is starting up.</li> <li>The NAS is shutting down (software shutdown).</li> <li>The user pressed the Reset button.</li> <li>The operating system was updated.</li> </ul>
	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"> <li>The disk volume is about to reach its full capacity.</li> <li>The disk volume has reached its full capacity.</li> <li>The drives are in degraded mode.</li> <li>The user started the drive rebuilding process.</li> <li>A drive is plugged in or out.</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>

## 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 QTS installation.

### Hot-Swapping Failed Drives

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

- RAID 1: One member drive fails
- RAID 5: One member drive fails
- RAID 6: One or two member drives fail

1. Log on to QTS.
2. Go to **Main Menu > Storage Manager > 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 NAS.
6. Wait for 20 seconds or until the NAS 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 Manager > 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, or RAID 6 volume to degraded mode, or an inactive RAID 0 and JBOD configuration to normal.

Disk Volume	RAID Recovery Support	Maximum Number of Removed Drives
Single	No	N/A
JBOD	Yes	1
RAID 0	Yes	1
RAID 1	Yes	1
RAID 5	Yes	2
RAID 6	Yes	3
RAID 10	No	N/A

## Support and Other Resources

QNAP provides the following resources:

Resource	URL
Documentation	<a href="http://docs.qnap.com">http://docs.qnap.com</a>
Help Desk	<a href="http://helpdesk.qnap.com">http://helpdesk.qnap.com</a>
Downloads	<a href="http://download.qnap.com">http://download.qnap.com</a>
Community Forum	<a href="http://forum.qnap.com">http://forum.qnap.com</a>

## 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



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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**

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.

**CE Notice**

This QNAP NAS complies with CE Compliance Class B.

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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电池	0	0	0	0	0	0
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