



**QNAP**

# **TS-hx90FU**

**TS-h1090FU**  
**TS-h2490FU**

**User Guide**

# Contents

## 1. Product Overview

|                                |    |
|--------------------------------|----|
| About the TS-hx90FU.....       | 3  |
| Hardware Specifications.....   | 3  |
| Package Contents.....          | 6  |
| Components.....                | 7  |
| Front Panel.....               | 7  |
| Rear Panel.....                | 8  |
| System Board.....              | 10 |
| Drive Numbering.....           | 13 |
| Safety Information.....        | 13 |
| Installation Requirements..... | 15 |
| Setting Up the NAS.....        | 15 |

## 2. Installation and Configuration

|   |    |
|---|----|
| Hardware Installation.....                                    | 17 |
| Installing 2.5-inch Solid-state Drives on 2.5-inch Trays..... | 17 |
| Replacing Memory Modules on the TS-h2490FU.....               | 21 |
| Replacing Memory Modules on the TS-h1090FU.....               | 26 |
| Replacing Expansion Cards on the TS-h2490FU.....              | 30 |
| Installing Expansion Cards on the TS-h1090FU.....             | 34 |
| Hot-Swapping Redundant Power Supply Units.....                | 40 |
| Expansion Unit Installation.....                              | 42 |
| Installing Handles.....                                       | 46 |
| Rail Kits.....  | 48 |
| QuTS hero Installation.....                                   | 48 |
| Installing QuTS hero Using Qfinder Pro.....                   | 48 |
| Installing QuTS hero Using the Cloud Key.....                 | 50 |

## 3. Basic Operations

|                   |    |
|-------------------|----|
| Power Button..... | 53 |
| Reset Button..... | 54 |
| LEDs.....         | 54 |
| Audio Alert.....  | 56 |

## 4. NAS Migration

|   |    |
|---|----|
| NAS Migration Requirements.....                     | 58 |
| Status and Setting Changes After NAS Migration..... | 58 |
| Migrating a NAS.....                                | 59 |

## 5. Troubleshooting

|   |    |
|---|----|
| Forcing Qfinder Pro or myQNAPcloud to Locate the NAS..... | 61 |
| Hot-swapping Failed Drives.....                           | 61 |
| Recovering Unintentionally Removed Healthy Drives.....    | 62 |
| Support and Other Resources.....                          | 62 |

## 6. Glossary

|                       |    |
|-----------------------|----|
| Cloud Key.....        | 63 |
| myQNAPcloud.....      | 63 |
| myQNAPcloud Link..... | 63 |
| Qfinder Pro.....      | 63 |

QuTS hero..... 63

**7. Notices**

Limited Warranty..... 64  
Disclaimer..... 64  
GNU Public License..... 64  
CE Notice..... 72  
UKCA Notice..... 72  
FCC Notice..... 72  
VCCI Notice..... 73  
BSMI Notice..... 73  
SJ/T 11364-2006..... 73

# 1. Product Overview

This chapter provides basic information about the QNAP device.

## About the TS-hx90FU

Powered by 2nd Gen AMD EPYC™ processors, the all-flash TS-hx90FU series is designed to deliver a scalable platform for enterprise-level solutions. The U.2 NVMe solid-state drives can deliver excellent random read/write IOPS with ultra-low latency. This ZFS NAS comes with utmost reliability and supports inline data deduplication and compression, up to 65536 snapshots, and real-time SnapSync. The TS-hx90FU series is ideal for I/O-intensive and latency-sensitive applications, eliminating productivity bottlenecks in data centers, virtualization, and mission-critical tasks.

## Hardware Specifications



### Warning

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









### Tip




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

| Ordering P/N          | CPU             | Memory | Power supply |
|-----------------------|-----------------|--------|--------------|
| TS-h1090FU-7232P-64G  | AMD EPYC™ 7232P | 64 GB  | Redundant    |
| TS-h1090FU-7302P-128G | AMD EPYC™ 7302P | 128 GB | Redundant    |
| TS-h1090FU-7302P-256G | AMD EPYC™ 7302P | 256 GB | Redundant    |
| TS-h2490FU-7232P-64G  | AMD EPYC™ 7232P | 64 GB  | Redundant    |
| TS-h2490FU-7302P-128G | AMD EPYC™ 7302P | 128 GB | Redundant    |
| TS-h2490FU-7302P-256G | AMD EPYC™ 7302P | 256 GB | Redundant    |

| Component | TS-h2490FU-7232P-64G<br>TS-h2490FU-7302P-128G<br>TS-h2490FU-7302P-256G  | TS-h1090FU-7232P-64G<br>TS-h1090FU-7302P-128G<br>TS-h1090FU-7302P-256G  |
|-----------|---|---|
| Processor |   |   |
| CPU       | <ul style="list-style-type: none"> <li>• TS-h2490FU-7232P-64G: AMD EPYC™ 7232P</li> <li>• TS-h2490FU-7302P-128G: AMD EPYC™ 7302P</li> <li>• TS-h2490FU-7302P-256G: AMD EPYC™ 7302P</li> </ul> | <ul style="list-style-type: none"> <li>• TS-h1090FU-7232P-64G: AMD EPYC™ 7232P</li> <li>• TS-h1090FU-7302P-128G: AMD EPYC™ 7302P</li> <li>• TS-h1090FU-7302P-256G: AMD EPYC™ 7302P</li> </ul> |

| Component   | TS-h2490FU-7232P-64G<br>TS-h2490FU-7302P-128G<br>TS-h2490FU-7302P-256G   | TS-h1090FU-7232P-64G<br>TS-h1090FU-7302P-128G<br>TS-h1090FU-7302P-256G   |
|---|--|--|
| Frequency   | <ul style="list-style-type: none"> <li>• TS-h2490FU-7232P-64G: 8-core/16-thread up to 3.2 GHz</li> <li>• TS-h2490FU-7302P-128G: 16-core/32-thread up to 3.3 GHz</li> <li>• TS-h2490FU-7302P-256G: 16-core/32-thread up to 3.3 GHz</li> </ul>               | <ul style="list-style-type: none"> <li>• TS-h1090FU-7232P-64G: 8-core/16-thread up to 3.2 GHz</li> <li>• TS-h1090FU-7302P-128G: 16-core/32-thread up to 3.3 GHz</li> <li>• TS-h1090FU-7302P-256G: 16-core/32-thread up to 3.3 GHz</li> </ul>               |
| Architecture  | x86 64-bit   |  |
| Encryption engine   | AES-NI   |  |
| Memory  |  |  |
| Pre-installed memory  | <ul style="list-style-type: none"> <li>• TS-h2490FU-7232P-64G: 64 GB RAM: 8 x 8 GB RDIMM DDR4 ECC</li> <li>• TS-h2490FU-7302P-128G: 128 GB RAM: 8 x 16 GB RDIMM DDR4 ECC</li> <li>• TS-h2490FU-7302P-256G: 256 GB RAM: 8 x 32 GB RDIMM DDR4 ECC</li> </ul> | <ul style="list-style-type: none"> <li>• TS-h1090FU-7232P-64G: 64 GB RAM: 8 x 8 GB RDIMM DDR4 ECC</li> <li>• TS-h1090FU-7302P-128G: 128 GB RAM: 8 x 16 GB RDIMM DDR4 ECC</li> <li>• TS-h1090FU-7302P-256G: 256 GB RAM: 8 x 32 GB RDIMM DDR4 ECC</li> </ul> |
| Memory slots  | 16 x DDR4 RDIMM  | 12 x DDR4 RDIMM  |
| <div style="border-left: 2px solid red; padding-left: 10px;">  <b>Important</b> <ul style="list-style-type: none"> <li>• Use only QNAP memory modules to maintain system performance and stability. For NAS devices with more than one memory slot, use QNAP modules with identical specifications.</li> <li>• Using unsupported modules may degrade performance, cause errors, or prevent the operating system from starting.</li> <li>• You can only use one type of dual in-line memory module (DIMM) at a time. Do not mix registered DIMM (RDIMM) with load-reduction DIMM (LRDIMM) memory.</li> </ul> </div> |  |  |
| Maximum memory  | 4 TB RAM: 16 x 256 GB  | 1 TB RAM: 12 x 128 GB  |
| Flash memory  | 5 GB (dual-boot OS protection)   |  |
| Storage   |  |  |
| Drive bays  | 24 x 2.5-inch U.2 PCIe NVMe  | 10 x 2.5-inch U.2 PCIe NVMe / SATA 6Gbps   |

| Component                            | TS-h2490FU-7232P-64G<br>TS-h2490FU-7302P-128G<br>TS-h2490FU-7302P-256G  | TS-h1090FU-7232P-64G<br>TS-h1090FU-7302P-128G<br>TS-h1090FU-7302P-256G  |
|--------------------------------------|---|---|
| Drive compatibility                  | 2.5-inch U.2/U.3 NVMe PCIe Gen4/Gen3 x4 solid-state drives<br><br> <b>Note</b><br>Gen4 solid-state drives will run at Gen3 speeds.   | <ul style="list-style-type: none"> <li>2.5-inch U.2/U.3 NVMe PCIe Gen4/Gen3 x4 solid-state drives</li> <li>2.5-inch SATA solid-state drives</li> </ul>  |
|                                      |  <b>Tip</b><br><ul style="list-style-type: none"> <li>For the list of compatible drive models, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>.</li> </ul> |   |
| Hot-swapping                         | This device supports hot-swapping for all drives.   |   |
| Network                              |   |   |
| 25 Gigabit Ethernet ports            | <ul style="list-style-type: none"> <li>TS-h2490FU-7232P-64G: 2 x 25 GbE SmartNIC SFP28</li> <li>TS-h2490FU-7302P-128G: 4 x 25 GbE SmartNIC SFP28</li> <li>TS-h2490FU-7302P-256G: 4 x 25 GbE SmartNIC SFP28</li> </ul>   | <ul style="list-style-type: none"> <li>TS-h1090FU-7232P-64G: 2 x 25 GbE SmartNIC SFP28</li> <li>TS-h1090FU-7302P-128G: 2 x 25 GbE SmartNIC SFP28</li> <li>TS-h1090FU-7302P-256G: 2 x 25 GbE SmartNIC SFP28</li> </ul> |
|                                      |  <b>Note</b><br>The 25 Gigabit Ethernet port is also compatible with 10 GbE SFP+.  |   |
| 2.5 Gigabit network interface        | 2 x 2.5 GbE RJ45<br><br> <b>Note</b><br>The 2.5 Gigabit Ethernet ports support the following network connectivity speeds: 2.5 GbE, 1 GbE, 100 Mb, and 10 Mb.                                       |   |
| External I/O Ports & Expansion Slots |   |   |
| PCIe slots                           | <ul style="list-style-type: none"> <li>2 x PCIe 4.0 x4</li> <li>2 x PCIe 4.0 x8</li> <li>1 x PCIe 4.0 x16</li> </ul>  | 2 x PCIe 4.0 x16  |
|                                      |  <b>Tip</b><br>For the list of compatible drive models and expansion cards, go to <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a> .                            |   |
| USB ports                            | 2 x USB 3.2 Gen 1 Type-A  | 3 x USB 3.2 Gen 1 Type-A  |
| Interface                            |   |   |
| Buttons                              | <ul style="list-style-type: none"> <li>Power</li> <li>Reset</li> </ul>  |   |
| Dimensions                           |   |   |
| Form factor                          | 2U Rackmount  | 1U Rackmount  |
| Dimensions (H x W x D)               | 88.3 x 481 x 510.2 mm<br>(3.48 x 18.93 x 20.09 in)  | 44 x 430 x 580<br>(1.73 x 16.93 x 22.83 in)   |

| Component             | TS-h2490FU-7232P-64G<br>TS-h2490FU-7302P-128G<br>TS-h2490FU-7302P-256G   | TS-h1090FU-7232P-64G<br>TS-h1090FU-7302P-128G<br>TS-h1090FU-7302P-256G |
|-----------------------|--|--|
| Net weight            | 15.2 kg (33.51 lbs)  | 10.3 kg (22.71 lbs)  |
| Other                 |  |  |
| Rail compatibility    | RAIL-A03-57  | RAIL-B02   |
|                       |  <b>Note</b> <ul style="list-style-type: none"> <li>• Rail kits are not included with the NAS and must be purchased separately. For details, contact an authorized reseller or go to <a href="https://shop.qnap.com">https://shop.qnap.com</a>.</li> <li>• Information on rail kit installation can be found in the installation guide included in the rail kit package. For details, go to <a href="https://www.qnap.com/go/product/rail-kit">https://www.qnap.com/go/product/rail-kit</a>.</li> </ul> |  |
| Power supply unit     | 2 x 1100W, 100-240V AC, 50/60 Hz   | 2 x 550W, 100-240V AC, 50/60 Hz  |
| System battery        | CR2032 lithium battery (3V, 225 mAh)   |  |
|                       |  <b>Warning</b> <ul style="list-style-type: none"> <li>• This battery is a button battery. If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours. Keep batteries out of reach of children.</li> <li>• To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.</li> </ul>   |  |
|                       |  <b>Important</b> <p>Dispose of used batteries according to local regulations or the instructions of the battery manufacturer.</p>  |  |
| Fans                  | System: 4 x 60 mm, 12V DC fans   | System: 5 x 60 mm, 12V DC fans   |
| Operating temperature | 0°C to 40°C (32°F to 104°F)  |  |
| Relative humidity     | <ul style="list-style-type: none"> <li>• Non-condensing relative humidity: 5% to 95%</li> <li>• Wet-bulb temperature: 27°C (80.6°F)</li> </ul>   |  |

**Tip**

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

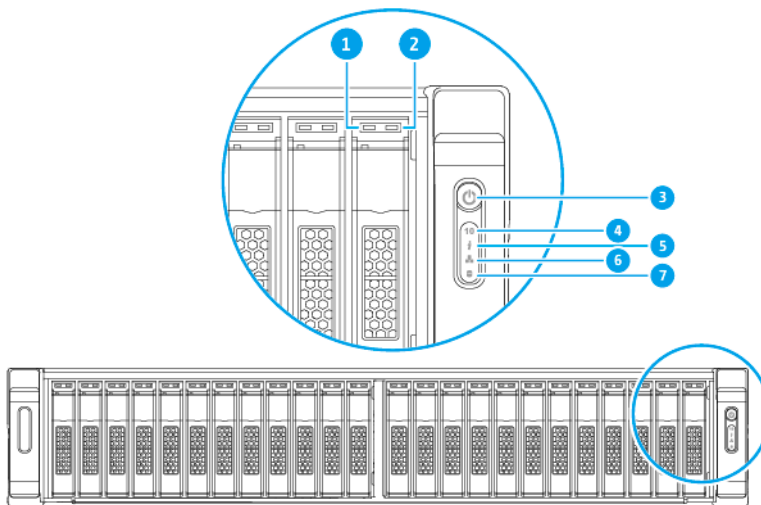
## Package Contents

| Item       | Quantity |
|------------|----------|
| TS-hx90FU  | 1        |
| Power cord | 2        |

| Item                           | Quantity   |
|--------------------------------|--|
| Ethernet cable                 | 1 x Cat 5e   |
| Drive tray keys                | TS-h1090FU: 2  |
| Screws for 2.5-inch drives     | <ul style="list-style-type: none"> <li>• TS-h2490FU: 96</li> <li>• TS-h1090FU: 40</li> </ul> |
| Quick Installation Guide (QIG) | 1  |

## Components

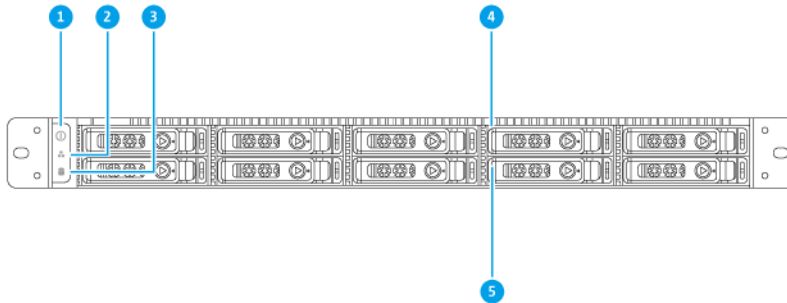
### Front Panel



#### TS-h2490FU

| No. | Component               | No. | Component          |
|-----|-------------------------|-----|--------------------|
| 1   | Drive activity LED      | 5   | System status LED  |
| 2   | Drive status LED        | 6   | LAN LED            |
| 3   | Power button            | 7   | Expansion unit LED |
| 4   | 10 Gigabit Ethernet LED | -   | -                  |

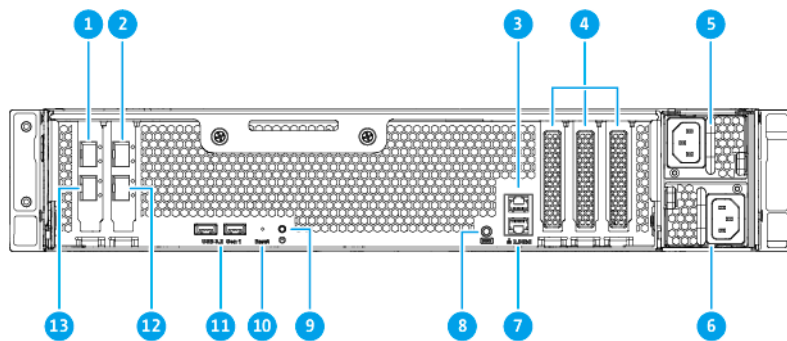





**TS-h1090FU**

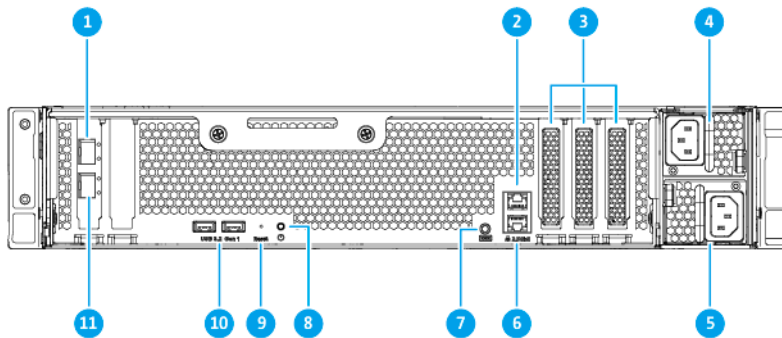
| No. | Component          | No. | Component          |
|-----|--------------------|-----|--------------------|
| 1   | Power button       | 4   | Drive activity LED |
| 2   | LAN LED            | 5   | Drive status LED   |
| 3   | Expansion unit LED | -   | -                  |

**Rear Panel**




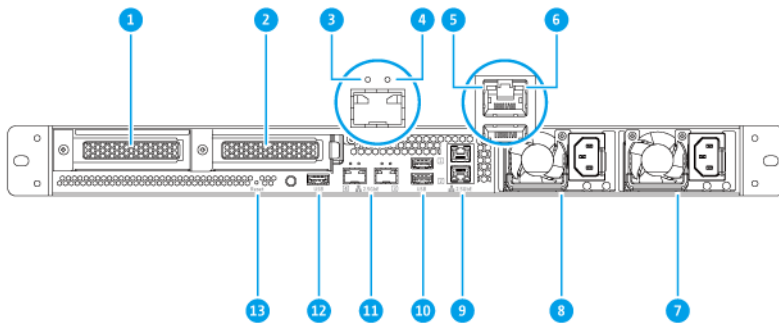
**TS-h2490FU-7302P-128G, TS-h2490FU-7302P-256G**

| No. | Component                      | No. | Component  |
|-----|--------------------------------|-----|--|
| 1   | Ethernet port 1 (25 GbE SFP28) | 8   | COM port<br><br> <b>Note</b><br>This port is only for engineering purposes. |
| 2   | Ethernet port 3 (25 GbE SFP28) | 9   | Power button   |
| 3   | Ethernet port 5 (2.5 GbE RJ45) | 10  | Reset button   |
| 4   | PCIe low-profile covers        | 11  | USB 3.2 Gen 1 Type-A ports   |
| 5   | Power supply unit 1            | 12  | Ethernet port 4 (25 GbE SFP28)   |
| 6   | Power supply unit 2            | 13  | Ethernet port 2 (25 GbE SFP28)   |
| 7   | Ethernet port 6 (2.5 GbE RJ45) | -   | -  |



**TS-h2490FU-7232P-64G**

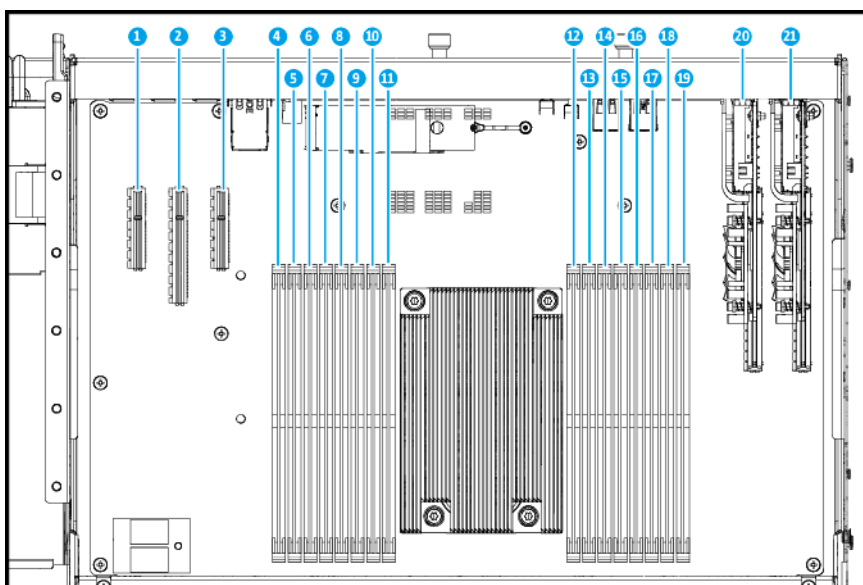
| No. | Component                      | No. | Component  |
|-----|--------------------------------|-----|--|
| 1   | Ethernet port 1 (25 GbE SFP28) | 7   | COM port<br><br> <b>Note</b><br>This port is only for engineering purposes. |
| 2   | Ethernet port 3 (2.5 GbE RJ45) | 8   | Power button   |
| 3   | PCIe low-profile covers        | 9   | Reset button   |
| 4   | Power supply unit 1            | 10  | USB 3.2 Gen 1 Type-A ports   |
| 5   | Power supply unit 2            | 11  | Ethernet port 2 (25 GbE SFP28)   |
| 6   | Ethernet port 4 (2.5 GbE RJ45) | -   | -  |





**TS-h1090FU**

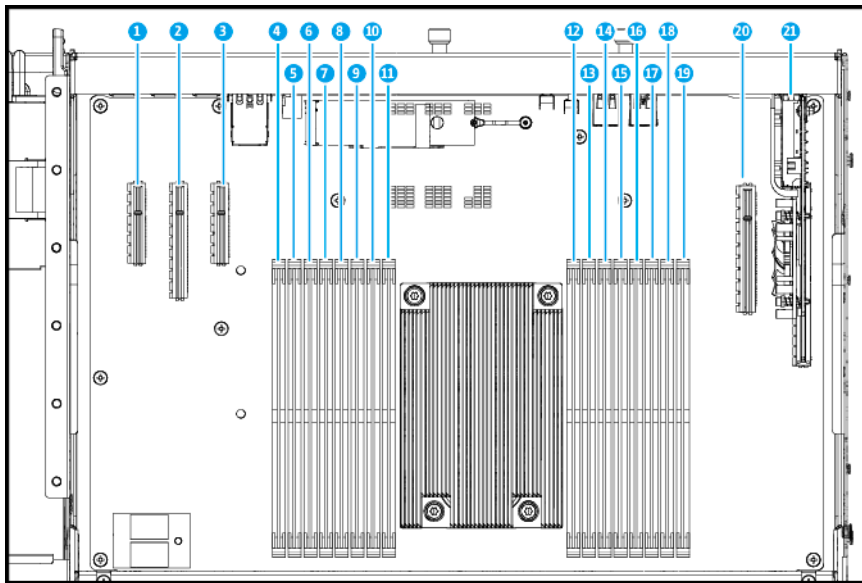
| No. | Component                         | No. | Component                         |
|-----|-----------------------------------|-----|-----------------------------------|
| 1   | PCIe low-profile cover            | 8   | Power supply unit 1               |
| 2   | PCIe low-profile cover            | 9   | 2.5 Gigabit Ethernet ports (RJ45) |
| 3   | 25 Gigabit Ethernet speed LED     | 10  | USB 3.2 Gen 1 Type-A ports        |
| 4   | 25 Gigabit Ethernet activity LED  | 11  | 25 Gigabit Ethernet ports (SFP28) |
| 5   | 2.5 Gigabit Ethernet speed LED    | 12  | USB 3.2 Gen 1 Type-A port         |
| 6   | 2.5 Gigabit Ethernet activity LED | 13  | Reset button                      |
| 7   | Power supply unit 2               | -   | -                                 |

**System Board**




**TS-h2490FU-7302P-128G**

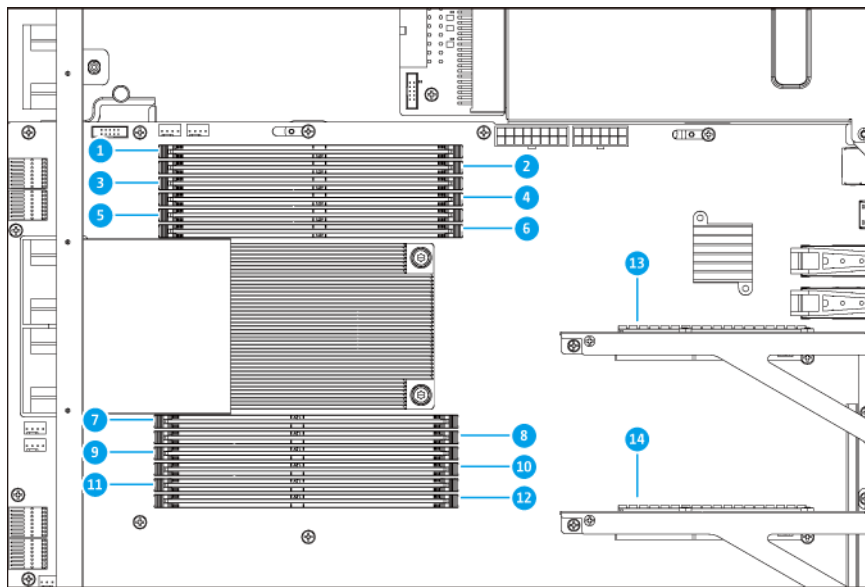
| No. | Component                         | No. | Component   |
|-----|-----------------------------------|-----|---|
| 1   | PCIe slot 1 (PCIe 4.0 x4)         | 12  | Memory slot 9 (Channel E, DIMM 1)   |
| 2   | PCIe slot 2 (PCIe 4.0 x8)         | 13  | Memory slot 10 (Channel E, DIMM 2)  |
| 3   | PCIe slot 3 (PCIe 4.0 x4)         | 14  | Memory slot 11 (Channel F, DIMM 1)  |
| 4   | Memory slot 1 (Channel D, DIMM 2) | 15  | Memory slot 12 (Channel F, DIMM 2)  |
| 5   | Memory slot 2 (Channel D, DIMM 1) | 16  | Memory slot 13 (Channel G, DIMM 1)  |
| 6   | Memory slot 3 (Channel C, DIMM 2) | 17  | Memory slot 14 (Channel G, DIMM 2)  |
| 7   | Memory slot 4 (Channel C, DIMM 1) | 18  | Memory slot 15 (Channel H, DIMM 1)  |
| 8   | Memory slot 5 (Channel B, DIMM 2) | 19  | Memory slot 16 (Channel H, DIMM 2)  |
| 9   | Memory slot 6 (Channel B, DIMM 1) | 20  | PCIe slot 4 (PCIe 4.0 x8)<br><br><div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"></div> <div> <p><b>Note</b><br/>This slot is preinstalled with a 25 GbE SFP28 network card.</p> </div> </div>  |
| 10  | Memory slot 7 (Channel A, DIMM 2) | 21  | PCIe slot 5 (PCIe 4.0 x16)<br><br><div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"></div> <div> <p><b>Note</b><br/>This slot is preinstalled with a 25 GbE SFP28 network card.</p> </div> </div> |
| 11  | Memory slot 8 (Channel A, DIMM 1) | -   | -   |





**TS-h2490FU-7232P-64G**

| No. | Component                         | No. | Component                          |
|-----|-----------------------------------|-----|------------------------------------|
| 1   | PCIe slot 1 (PCIe 4.0 x4)         | 12  | Memory slot 9 (Channel E, DIMM 1)  |
| 2   | PCIe slot 2 (PCIe 4.0 x8)         | 13  | Memory slot 10 (Channel E, DIMM 2) |
| 3   | PCIe slot 3 (PCIe 4.0 x4)         | 14  | Memory slot 11 (Channel F, DIMM 1) |
| 4   | Memory slot 1 (Channel D, DIMM 2) | 15  | Memory slot 12 (Channel F, DIMM 2) |
| 5   | Memory slot 2 (Channel D, DIMM 1) | 16  | Memory slot 13 (Channel G, DIMM 1) |
| 6   | Memory slot 3 (Channel C, DIMM 2) | 17  | Memory slot 14 (Channel G, DIMM 2) |

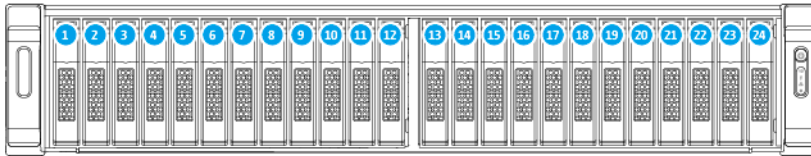
| No. | Component                         | No. | Component  |
|-----|-----------------------------------|-----|--|
| 7   | Memory slot 4 (Channel C, DIMM 1) | 18  | Memory slot 15 (Channel H, DIMM 1)   |
| 8   | Memory slot 5 (Channel B, DIMM 2) | 19  | Memory slot 16 (Channel H, DIMM 2)   |
| 9   | Memory slot 6 (Channel B, DIMM 1) | 20  | PCIe slot 4 (PCIe 4.0 x8)  |
| 10  | Memory slot 7 (Channel A, DIMM 2) | 21  | PCIe slot 5 (PCIe 4.0 x16)   |
|     |                                   |     |  <b>Note</b><br>This slot is preinstalled with a 25 GbE SFP28 network card. |
| 11  | Memory slot 8 (Channel A, DIMM 1) | -   | -  |



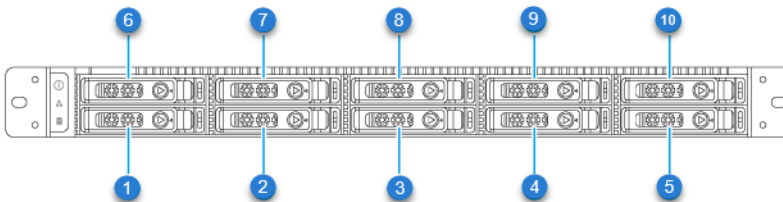
**TS-h1090FU**

| No. | Component                 | No. | Component   |
|-----|---------------------------|-----|---|
| 1   | Memory slot 1 DIMM 1 (H1) | 8   | Memory slot 8 DIMM 8 (B1)   |
| 2   | Memory slot 2 DIMM 2 (G2) | 9   | Memory slot 9 DIMM 9 (B2)   |
| 3   | Memory slot 3 DIMM 3 (G1) | 10  | Memory slot 10 DIMM 10 (C1)   |
| 4   | Memory slot 4 DIMM 4 (F1) | 11  | Memory slot 11 DIMM 11 (D1)   |
| 5   | Memory slot 5 DIMM 5 (E2) | 12  | Memory slot 12 DIMM 12 (D2)   |
| 6   | Memory slot 6 DIMM 6 (E1) | 13  | PCIe slot 2 (PCIe 4.0 x16)  |
|     |                           |     |  <b>Note</b><br>This slot is preinstalled with a riser card. |
| 7   | Memory slot 7 DIMM 7 (A1) | 14  | PCIe slot 1 (PCIe 4.0 x16)  |
|     |                           |     |  <b>Note</b><br>This slot is preinstalled with a riser card. |

## Drive Numbering



### TS-h2490FU



### TS-h1090FU

## Safety Information

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

### General Instructions

- The device should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.
- Only qualified, skilled, and authorized persons with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the device.

- To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.
- Observe electrostatic discharge (ESD) procedures to avoid potential injury or damage to components.

### Power

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



Devices with redundant power supply may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords from the device before installing or replacing system components.

### System Battery

- This product contains a button battery.
- If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours.
- Keep batteries out of reach of children.
- If you think batteries may have been swallowed or placed inside any part of the body, seek immediate medical attention.
- To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.
- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

### Moving Parts



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



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

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

## Installation Requirements

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

## Setting Up the NAS



### Important

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

- Place your NAS device in an environment that meets the requirements.  
For details, see [Installation Requirements](#).
- Install drives.  
For details, see [Installing 2.5-inch Solid-state Drives on 2.5-inch Trays](#).  
For a list of compatible drives and expansion cards, go to <http://www.qnap.com/compatibility>.
- Optional: Install expansion cards.  
For details, see the following topics:
  - [Replacing Expansion Cards on the TS-h2490FU](#)
  - [Installing Expansion Cards on the TS-h1090FU](#)
- Optional: Connect expansion units.  
For details, see the following topics:
  - [Connecting SAS Expansion Units](#).
  - [Connecting USB Expansion Units](#).
- Connect the power cord and all applicable cables.
- Power on the NAS.  
For details, see [Front Panel](#).
- Install QuTS hero.  
For details, see [QuTS hero Installation](#).



8. Log on to QuTS hero.  
If QuTS hero finds unused disks in your NAS, it will ask you to initialize these disks. Click **Initialize** to start the process.

## 2. Installation and Configuration

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

### Hardware Installation

This section provides information on installing drives, memory modules, expansion cards, power supply units, expansion units, handles, and rail kits.

#### Installing 2.5-inch Solid-state Drives on 2.5-inch Trays



##### Warning

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

- 



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

- 



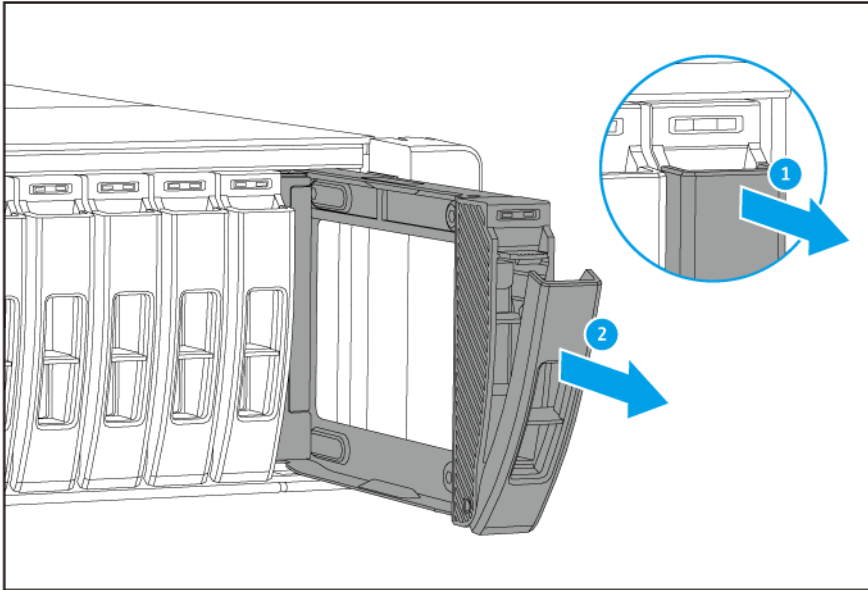
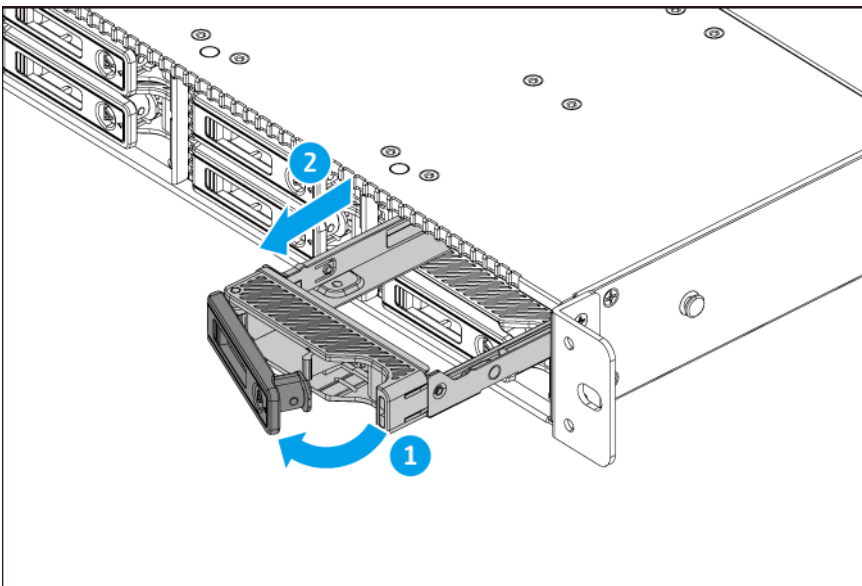
**Other moving components:** Keep your hands and other body parts away from other moving components.



##### Note

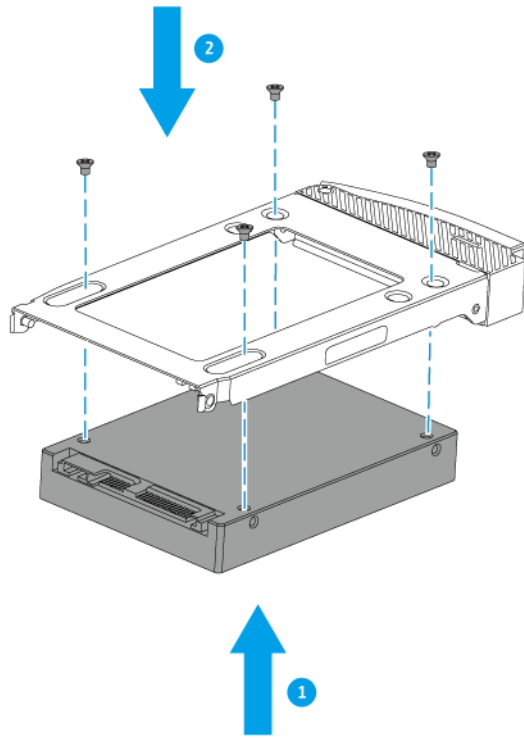
The TS-h2490FU is compatible with 2.5-inch U.2 NVMe PCIe solid-state drives, and the TS-h1090FU is compatible with 2.5-inch U.2 NVMe PCIe solid-state drives and SATA 6 Gbps solid-state drives.

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

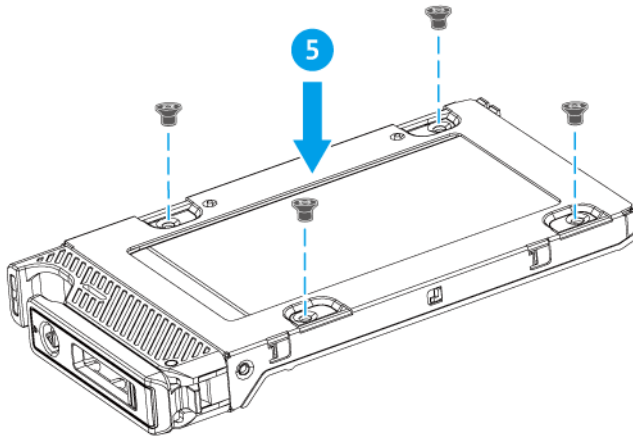
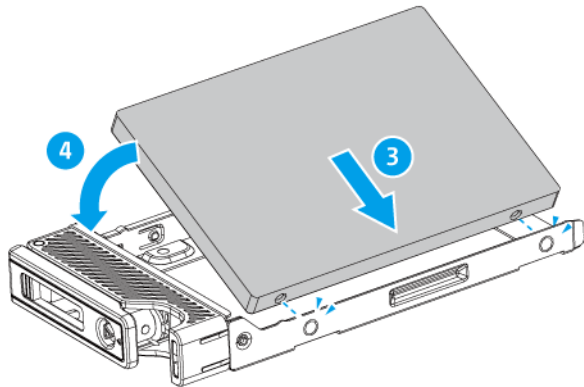
**TS-h2490FU****TS-h1090FU**

**3.** Install a drive on the tray.

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

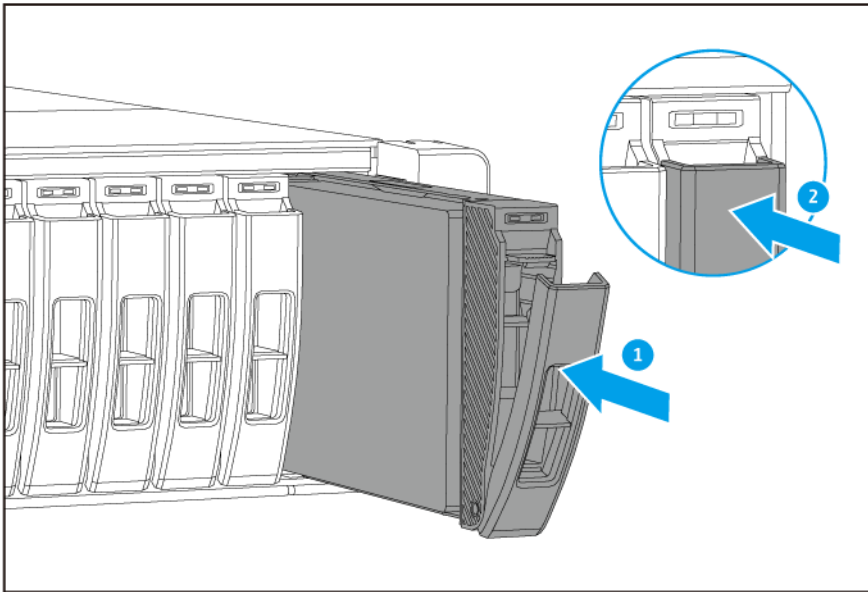
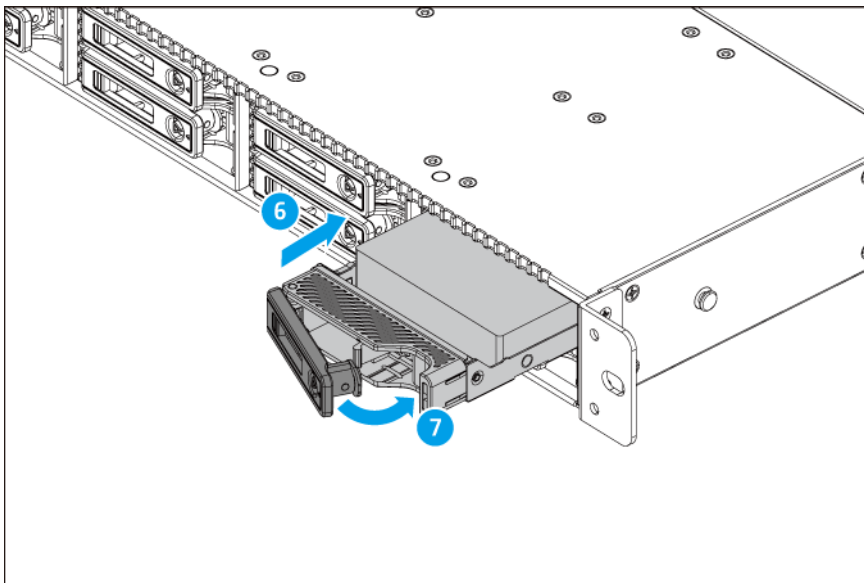


**TS-h2490FU**



### TS-h1090FU

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

**TS-h2490FU****TS-h1090FU**

c. Optional: Lock the tray.

5. Power on the NAS.

## Replacing Memory Modules on the TS-h2490FU

The TS-h2490FU has 16 memory slots. You can increase the memory capacity of the NAS by upgrading memory modules. For optimal performance, replace memory modules in all eight slots at the same time.

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

**Important**

QNAP recommends installing modules in groups of eight.

- Ensure that all eight modules are identical.
- Install the groups in sequence and follow the assigned slots for each group.
- Install memory modules in groups of eight or sixteen. When installing eight memory modules, install the memory in slots 1, 3, 5, 7, 10, 12, 14, and 16.

For details on slot order, see the table below.

| Module Group | Slot Number                          |
|--------------|--------------------------------------|
| First group  | Slots 1, 3, 5, 7, 10, 12, 14, and 16 |
| Second group | Slots 2, 4, 6, 8, 9, 11, 13, and 15  |

**Warning**

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

- 



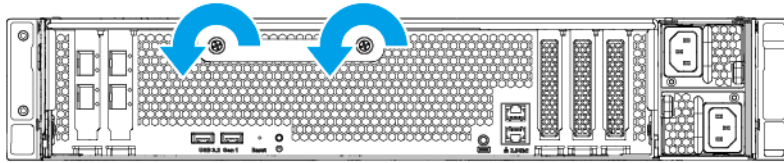
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

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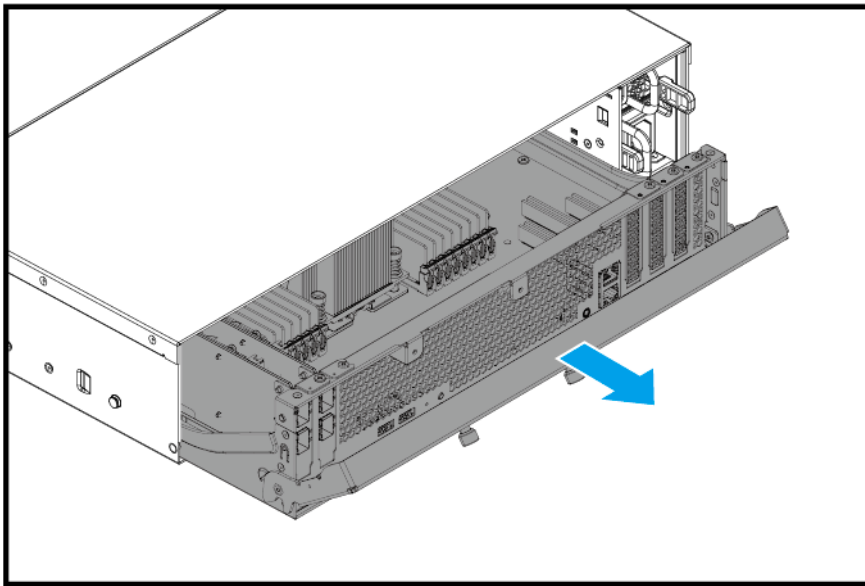


**Other moving components:** Keep your hands and other body parts away from other moving components.

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



- b. Pull the controller out of the chassis.



5. Remove an existing module.

- a. Push the retention clips outward simultaneously to release the module.
- b. Verify that the module has tilted upward and is completely released from the slot.

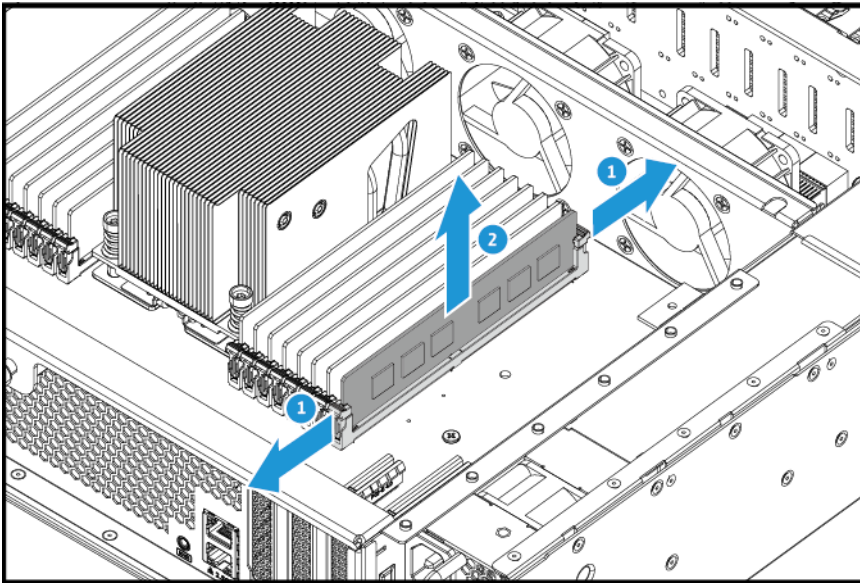


**Warning**

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

- c. Hold the module by the edges.
- d. Carefully slide the module out of the slot.

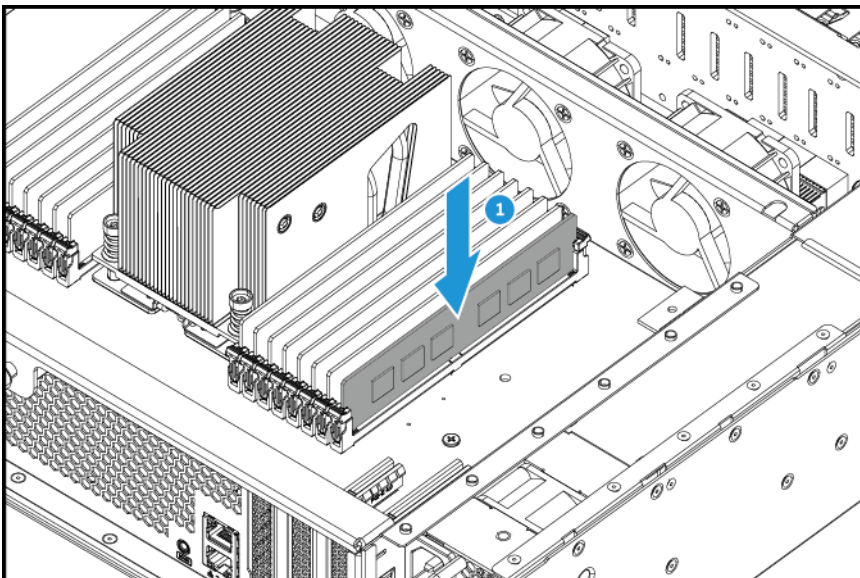




### Warning

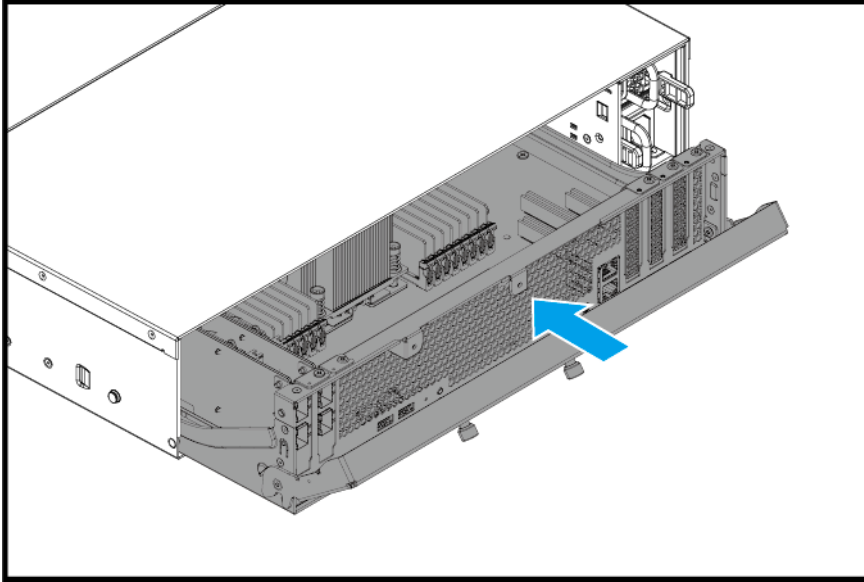
- Do not touch the internal components, particularly the metal connectors.
- Do not bend the module.

6. Install a new module.
  - a. Align the notch with the ridge in the slot.
  - b. Insert the module into the slot.

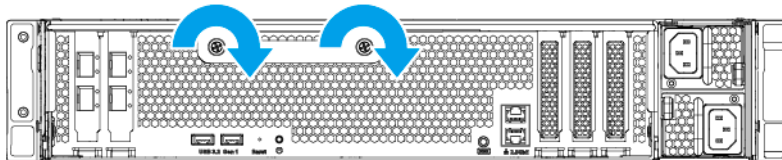


- c. Verify that the metal connectors are completely inserted into the slot.
  - d. Carefully press down on the module until the retention clips lock the module into place.

7. Attach the case cover.
  - a. Place the cover on the device.
  - b. Push the device into the chassis.



- c. Tighten the screws.



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

- c. Check the value for **Total memory**.

## Replacing Memory Modules on the TS-h1090FU

The TS-h1090FU has 12 memory slots. You can increase the memory capacity of the NAS by upgrading memory modules. For optimal performance, replace memory modules in all slots at the same time.

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



### Important

- Ensure that all modules are identical.
- Install memory modules in the blue slots first. When installing eight memory modules, install the memory in slots 1, 2, 4, 5, 7, 9, 10, and 12.

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



### Warning

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

- 



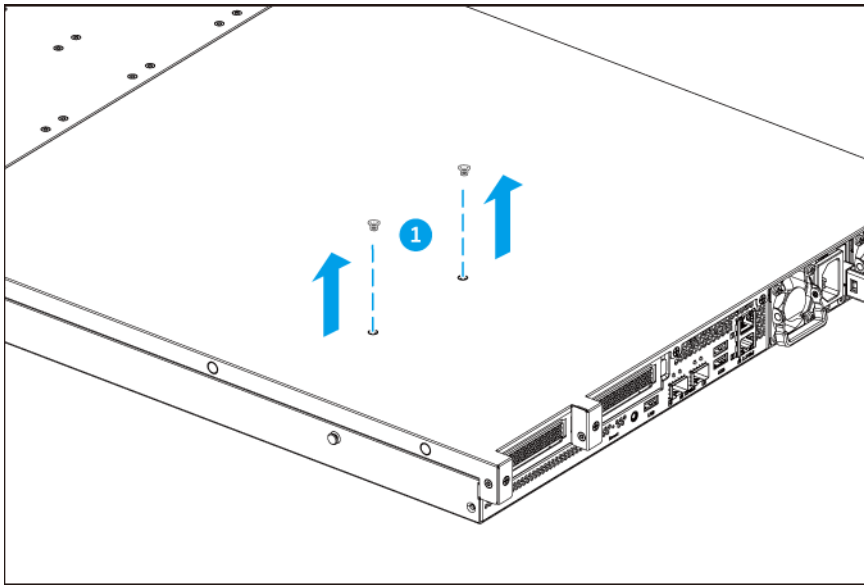
**Moving fan blades:** Keep your hands and other body parts away from moving fan blades.

- 

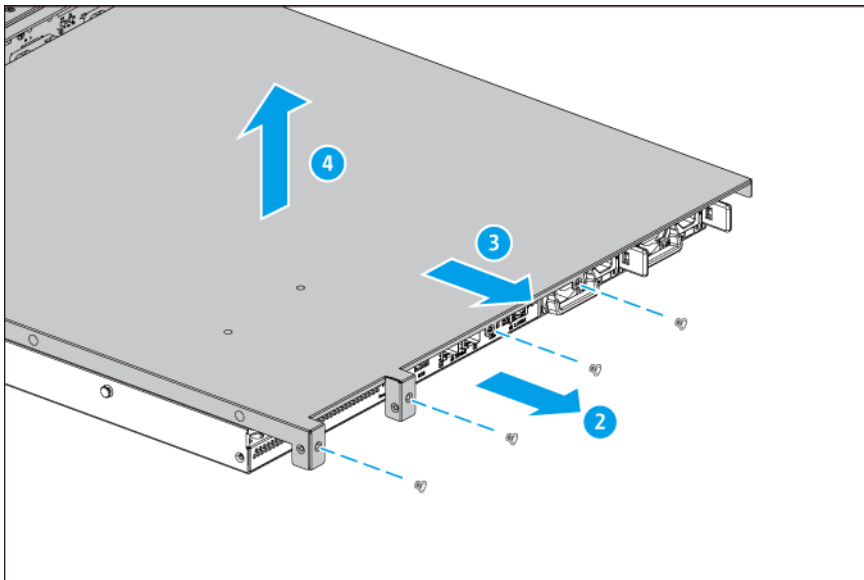


**Other moving components:** Keep your hands and other body parts away from other moving components.

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



- b. Remove the screws on the rear panel.
- c. Slide the cover back.
- d. Lift the cover off the device.



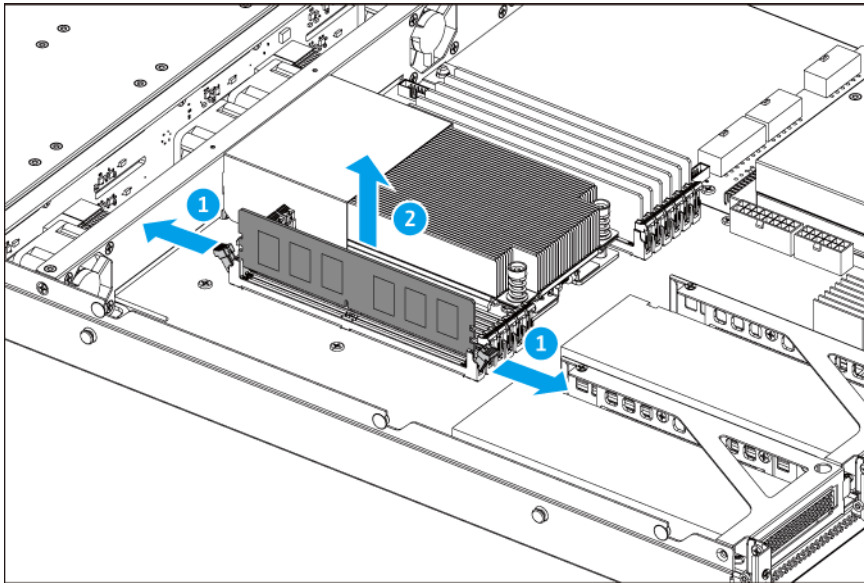
- 5. Remove an existing module.
  - a. Push the retention clips outward simultaneously to release the module.
  - b. Verify that the module has tilted upward and is completely released from the slot.



**Warning**

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

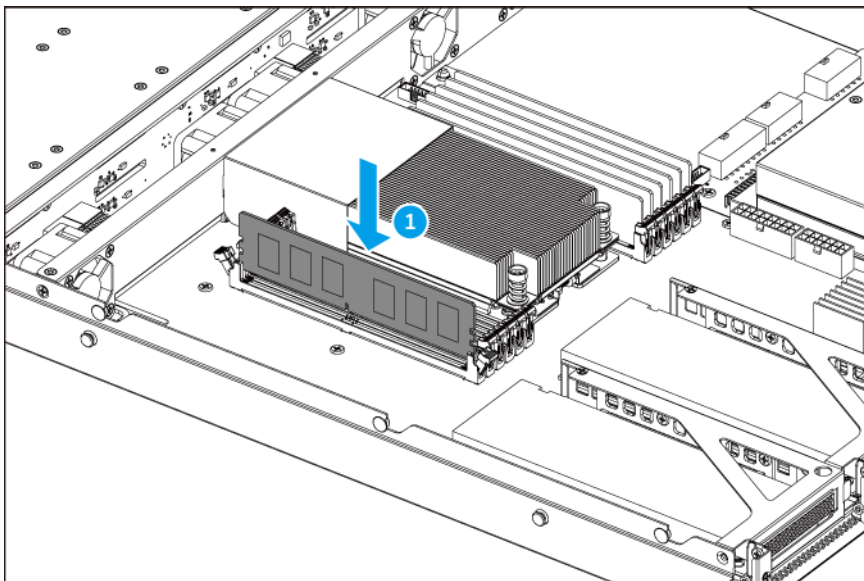
- c. Hold the module by the edges.
- d. Carefully slide the module out of the slot.



### Warning

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

6. Install a new module.
  - 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.



- a. Log on to QuTS hero as administrator.
- b. Go to **Control Panel > System > System Status > Hardware Information** .
- c. Check the value for **Total memory**.

## Replacing Expansion Cards on the TS-h2490FU

The TS-h2490FU supports selected expansion cards, some of which require QNAP PCIe brackets. QNAP-branded expansion cards purchased from the company website are shipped with the brackets necessary to fit the TS-h2490FU.



### 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.

•



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

•



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

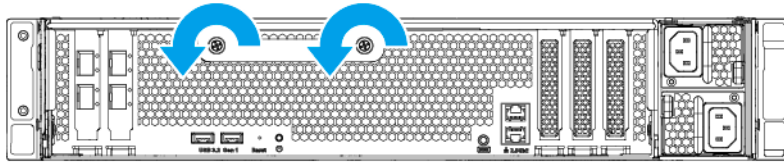


### Important

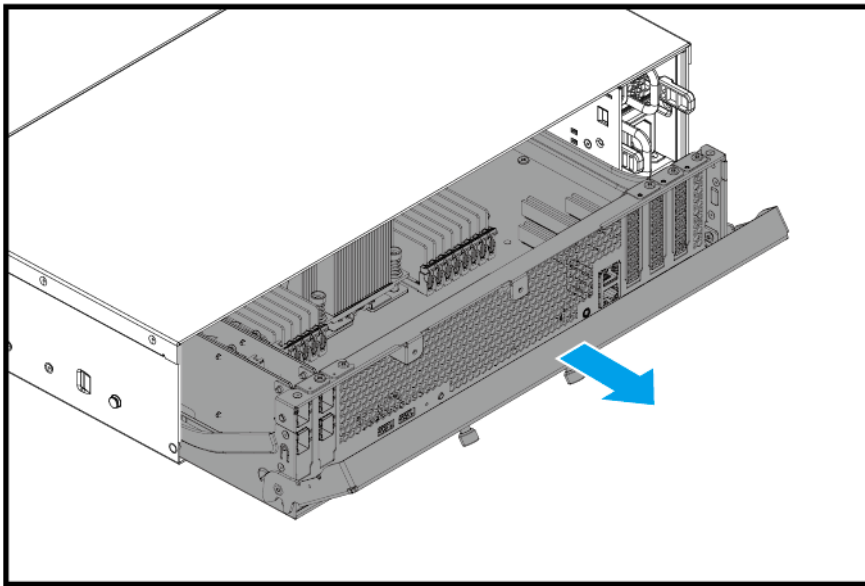
- Two dual-port 25GbE SFP28 network expansion cards are pre-installed in PCIe Gen 4.0 x8 slots 4 and 5 on the TS-h2490FU-7302P-128G.
- One dual-port 25GbE SFP28 network expansion card is pre-installed in PCIe Gen 4.0 x16 slot 5 on the TS-h2490FU-7232P-64G.
- Slot 2 will reduce its speed from x8 to x4 if an expansion card is installed in slot 3.
- Slot 5 will reduce its speed from x16 to x8 if an expansion card is installed in slot 4.
- For expansion card slot numbering, see [System Board](#).

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



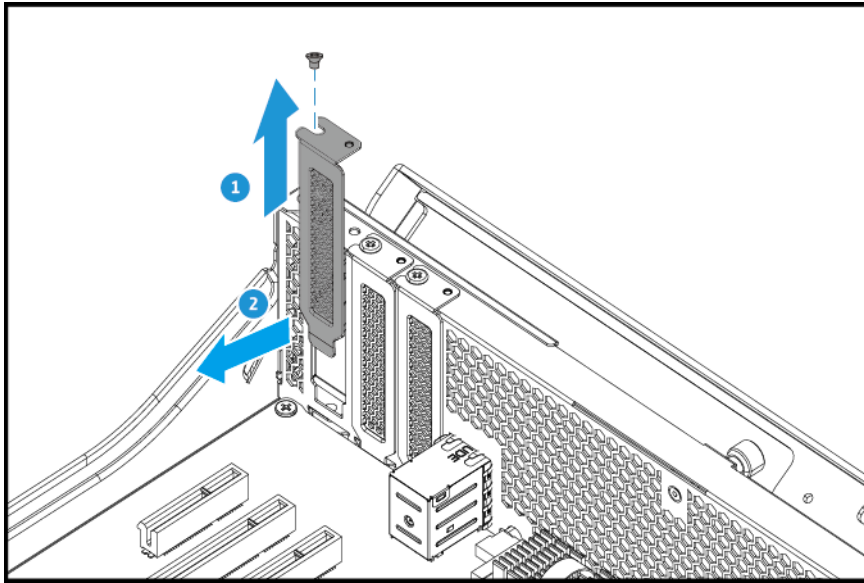


- b.** Pull the controller out of the chassis.

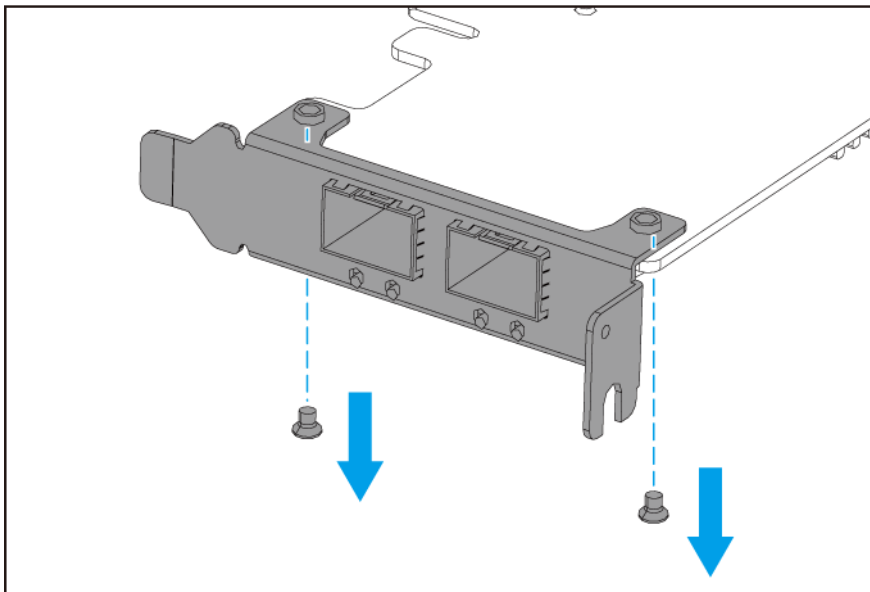


- 5.** Remove the PCIe cover.
  - a.** Remove the screw that secures the cover to the chassis.
  - b.** Pull the cover away from the slot.

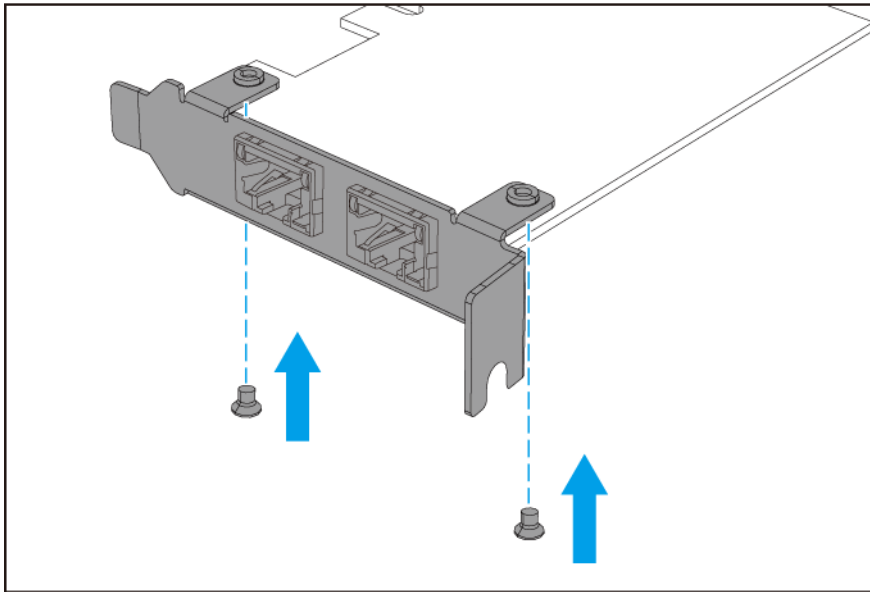




6. Optional: Attach the QNAP bracket to the expansion card.
- a. Remove all screws of the existing bracket.



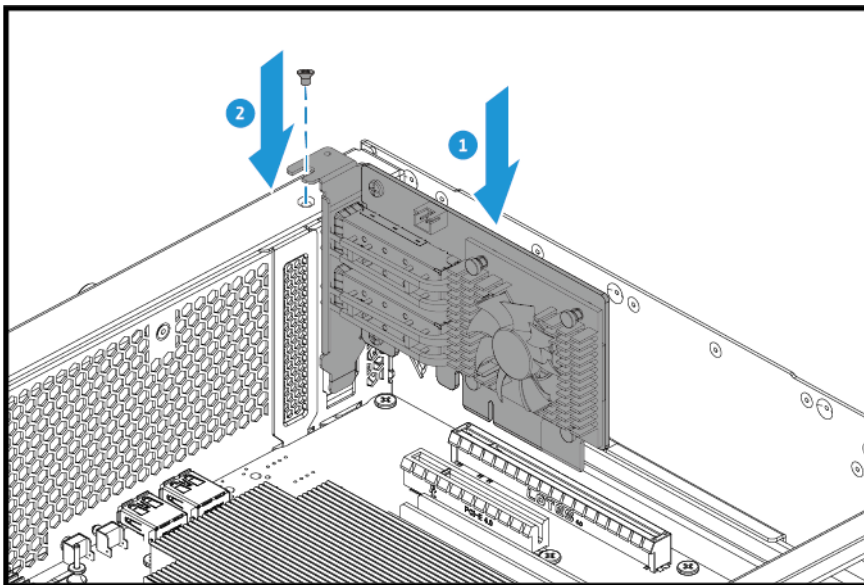
- b. Carefully pull the bracket away from the card.
- c. Attach the QNAP bracket to the card using the same screws.



d. Verify that the bracket does not move.

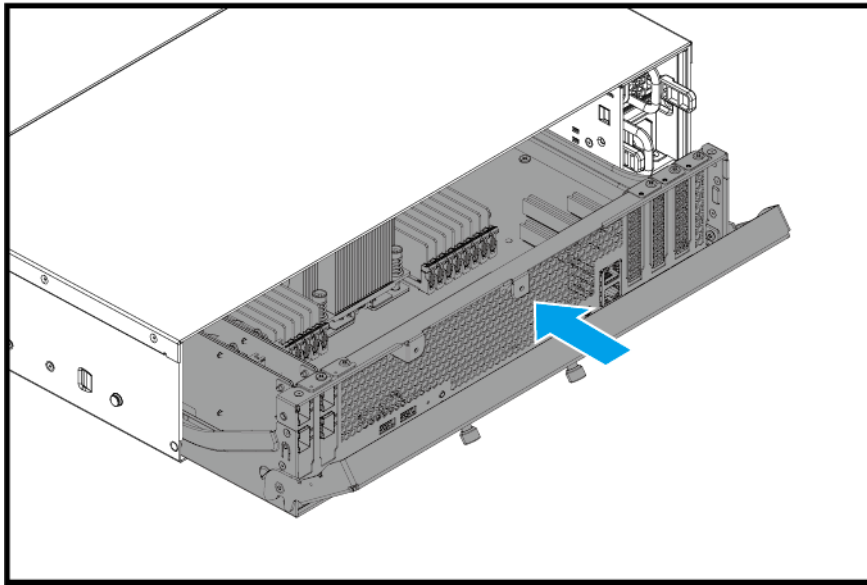
**7.** Install the expansion card.

- a. Hold the card by the edges.
- b. Insert the card into the slot.
- c. Attach the screw.

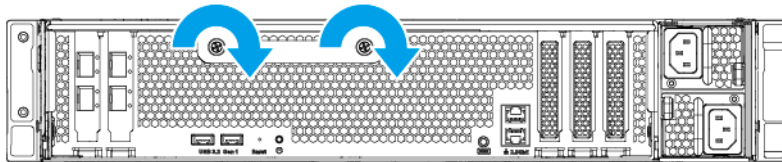


**8.** Attach the case cover.

- a. Place the cover on the device.
- b. Push the device into the chassis.



c. Tighten the screws.



9. Connect all cables and external attachments.
10. Connect the power cord to the electrical outlet.
11. Power on the NAS.

### Installing Expansion Cards on the TS-h1090FU

The TS-h1090FU supports selected expansion cards, some of which require QNAP PCIe brackets. QNAP-branded expansion cards purchased from the company website are shipped with the brackets necessary to fit the TS-h1090FU.



### 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.



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



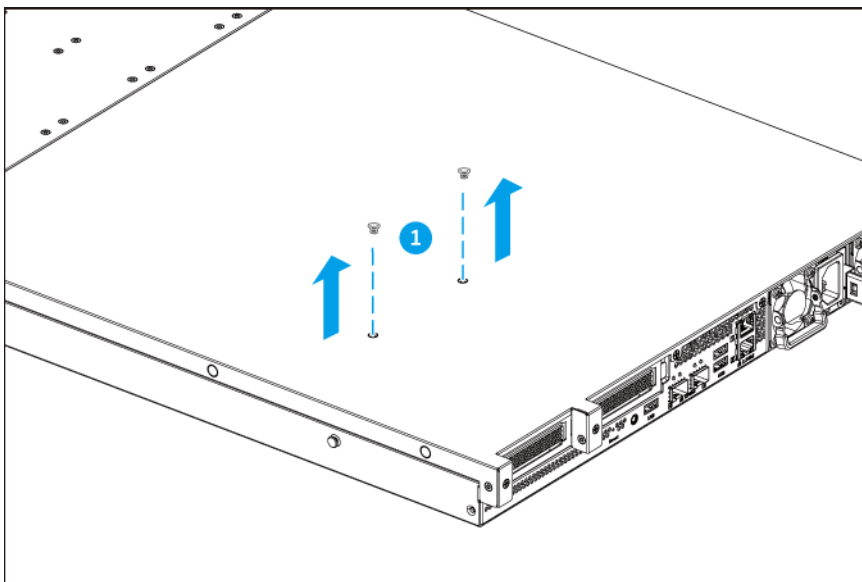
**Other moving components:** Keep your hands and other body parts away from other moving components.



### Note

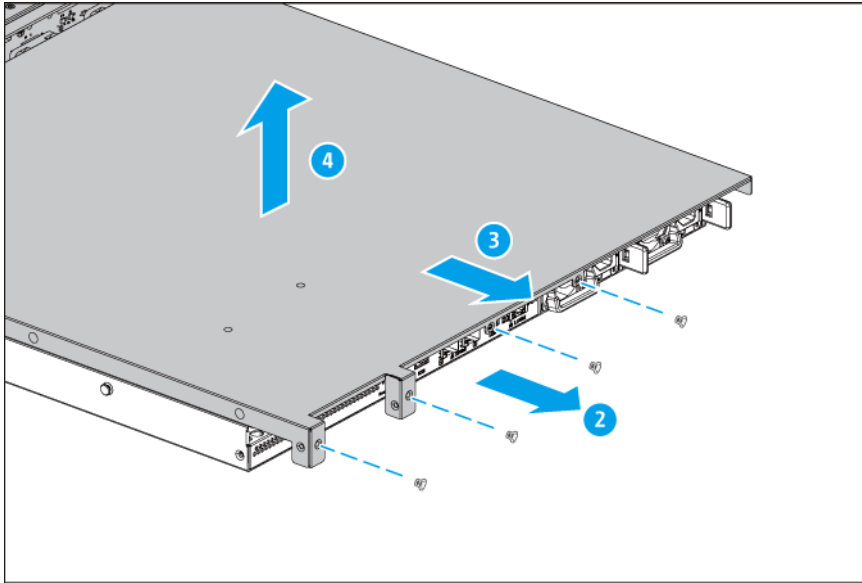
For expansion card slot numbering, see [System Board](#).

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



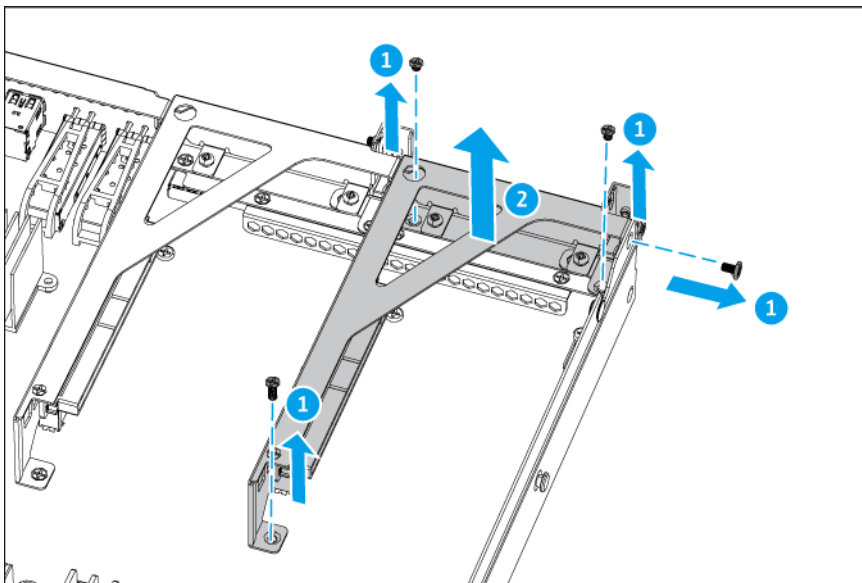
- b. Remove the screws on the rear panel.
- c. Slide the cover back.

- d. Lift the cover off the device.

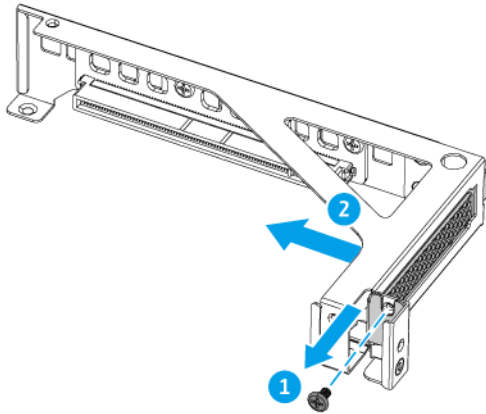


5. Remove the PCIe cover.

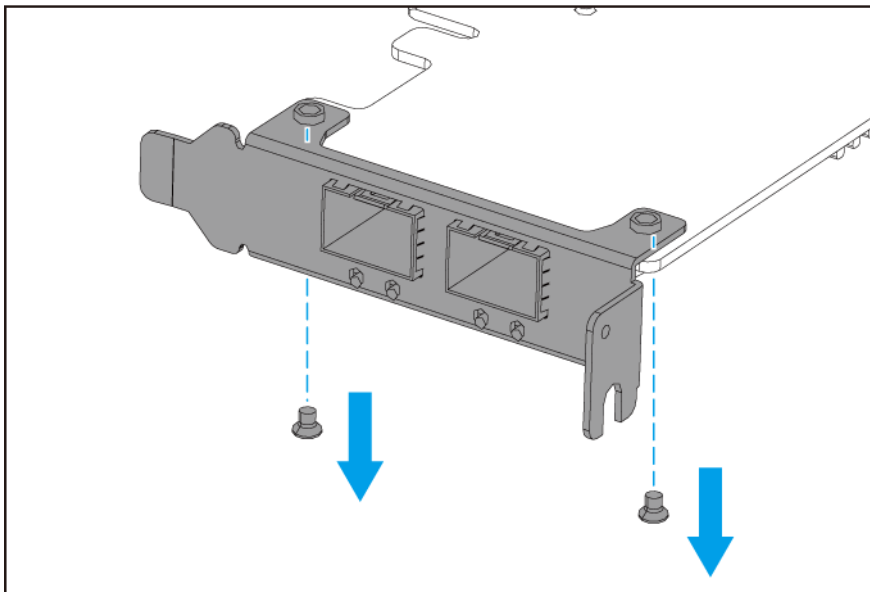
- a. Remove the screws that secure the expansion card module to the chassis.
- b. Remove the expansion card module.



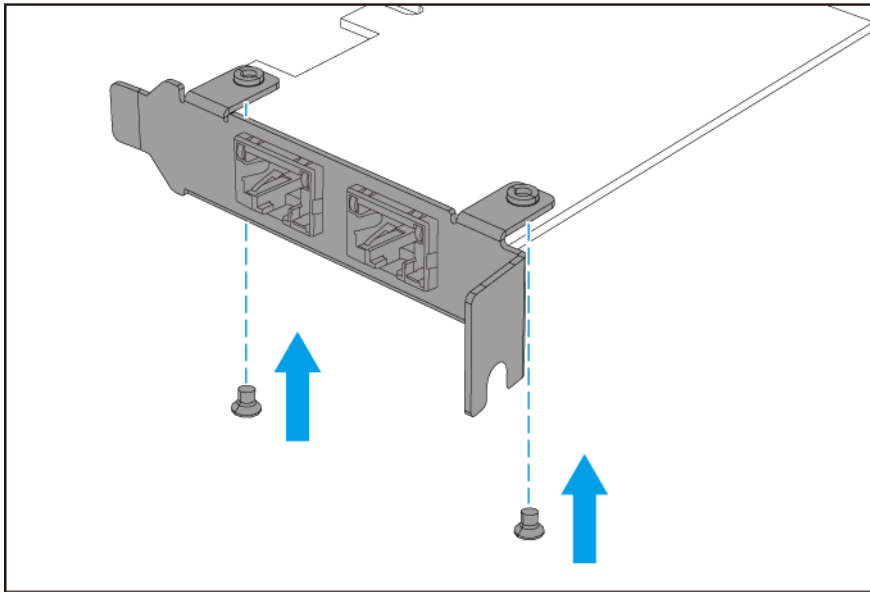
- c. Remove the screw that secures the cover to the expansion card module.
- d. Pull the cover away from the slot.



6. Optional: Attach the QNAP bracket to the expansion card.
- a. Remove all screws of the existing bracket.



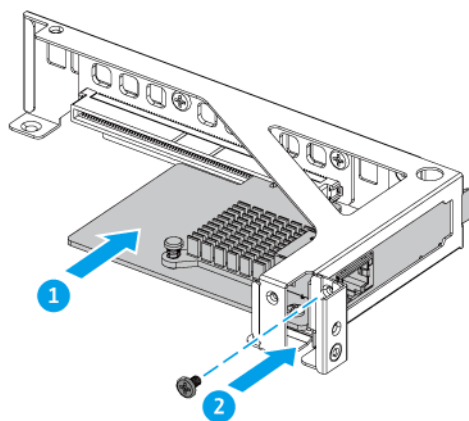
- b. Carefully pull the bracket away from the card.
- c. Attach the QNAP bracket to the card using the same screws.



d. Verify that the bracket does not move.

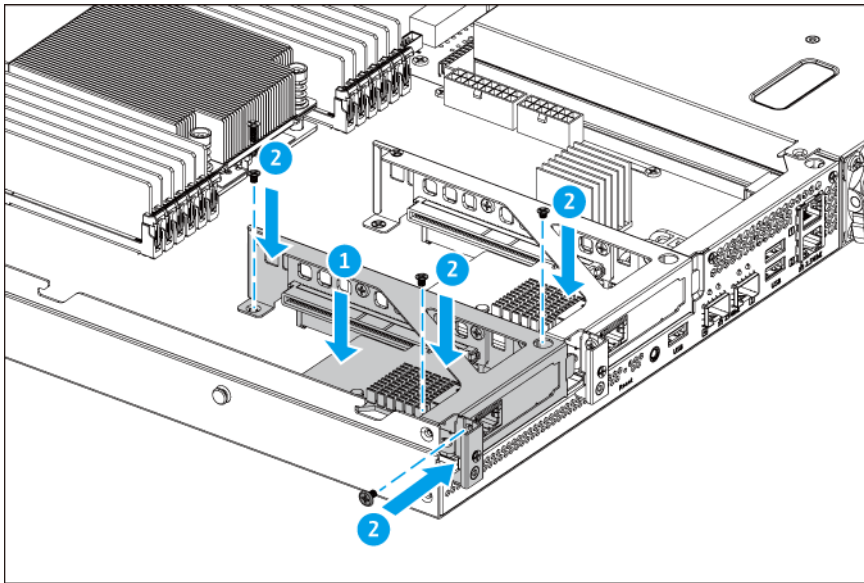
7. Install the expansion card.

- a. Hold the card by the edges.
- b. Insert the card into the slot.
- c. Attach the screw.

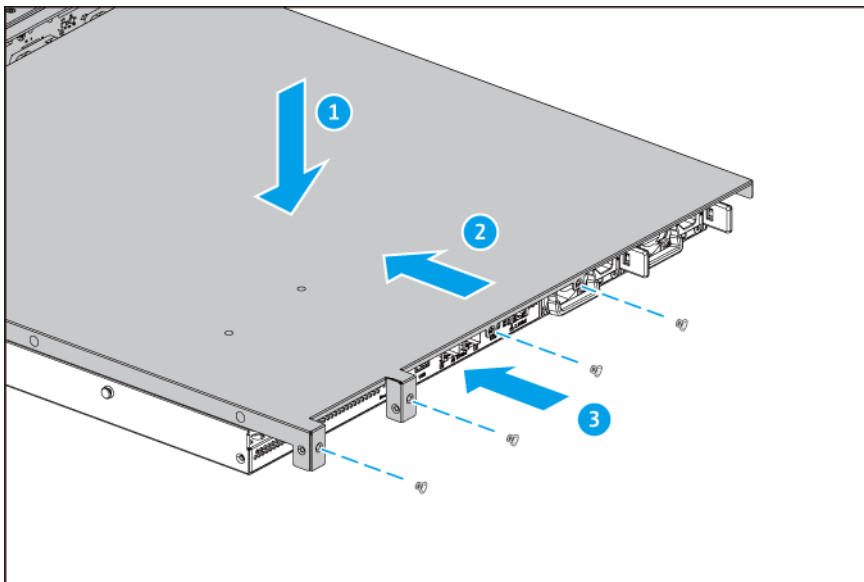


8. Attach the expansion card module.

- a. Insert the module into the chassis.
- b. Attach the screws that secure the module to the chassis.

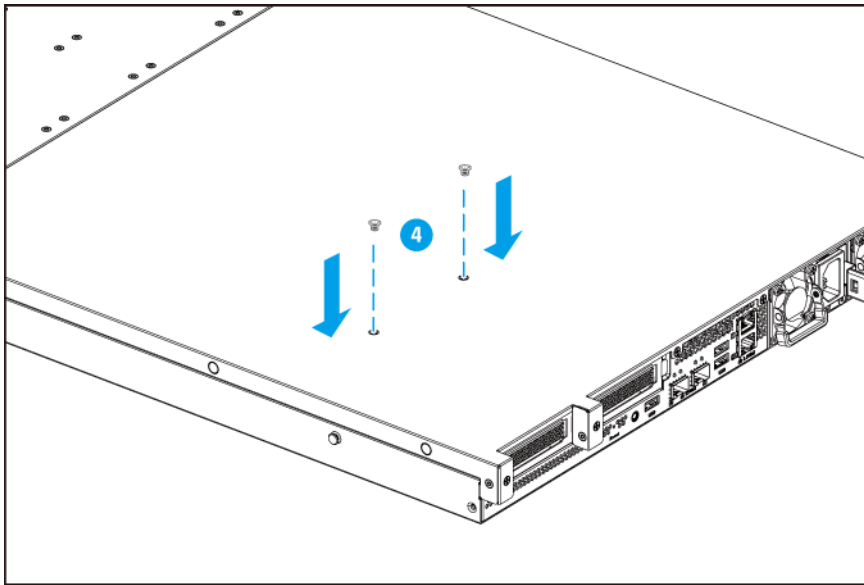


9. Attach the case cover.
  - a. Place the cover on the device.
  - b. Slide the cover forward.
  - c. Attach the screws on the rear panel.



- d. Attach the top screws.





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

## Hot-Swapping Redundant Power Supply Units

NAS devices with redundant power supply units (PSUs) support hot-swapping.



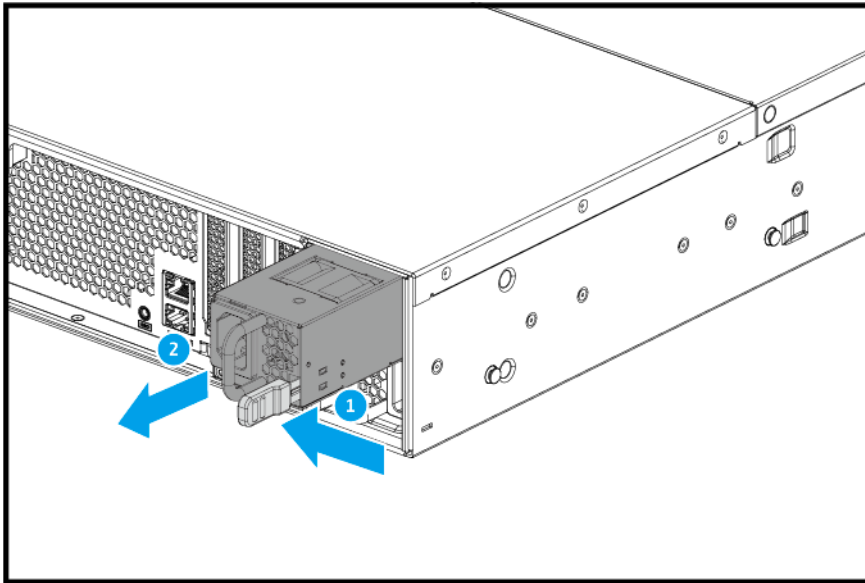
### Warning

- Electric shock hazard.
- 

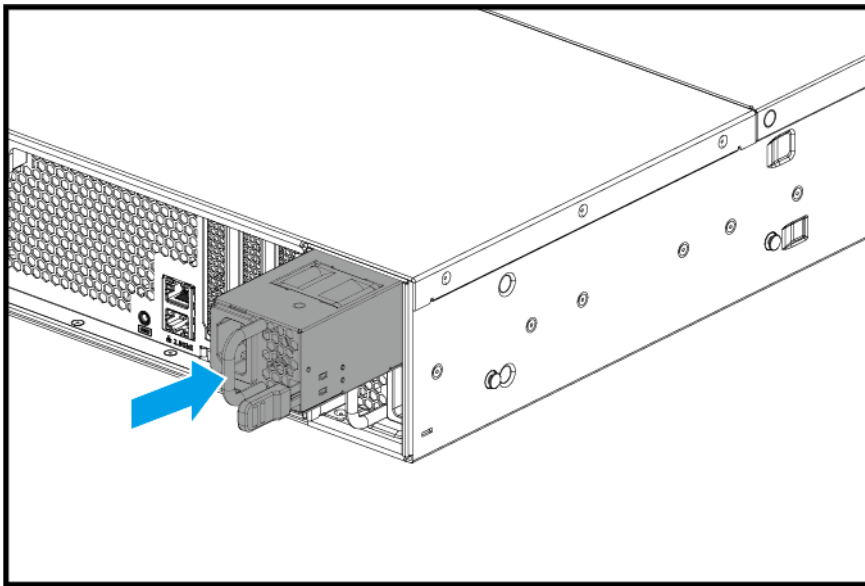


The NAS may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords before installing or replacing system components.

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



3. Insert the new PSU.



4. Connect the power cord to the PSU and the electrical outlet.
5. Enable alerts for PSU failures.
  - a. Log on to QuTS hero as administrator.
  - b. Go to **Control Panel > System > Hardware > General**.
  - c. Select **Enable Redundant Power Supply Mode**.
  - d. Click **Apply**.

## Expansion Unit Installation

The TS-hx90FU supports SAS expansion units and USB expansion units. For details, see the table below.

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

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

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

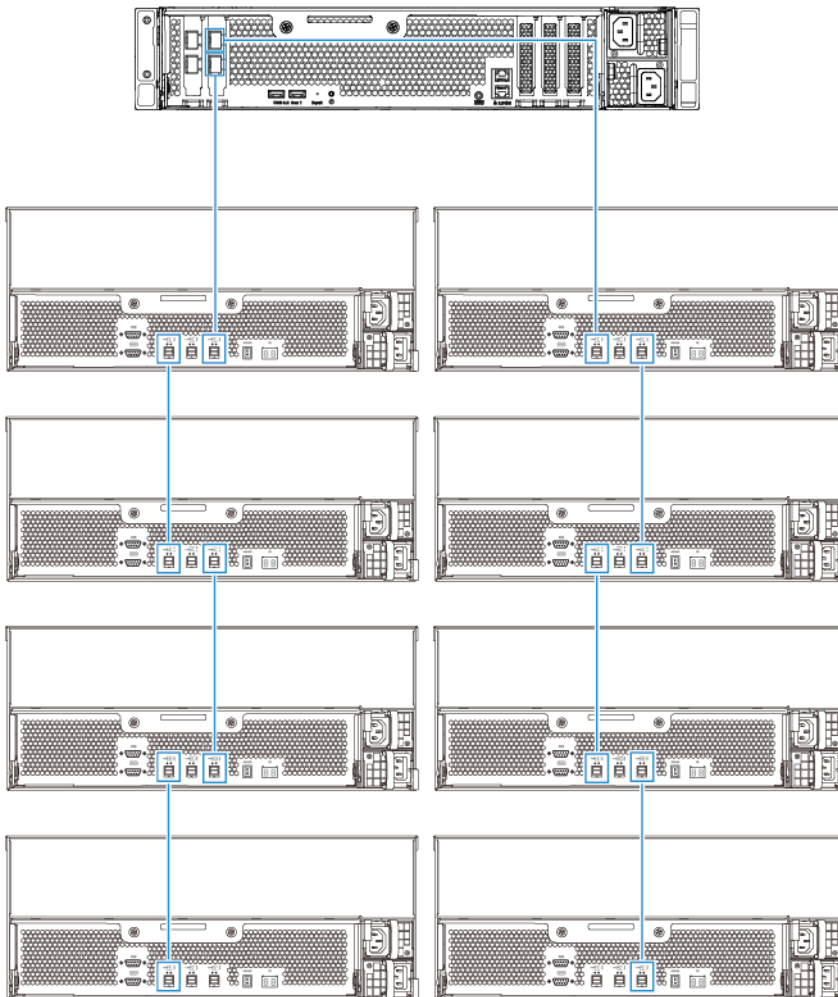
| Expansion Unit Model | Description  | Required Accessories   |
|----------------------|--|--|
| TL-D400S             | <ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul> | <ul style="list-style-type: none"> <li>• 1 x SFF-8088 connector cable</li> <li>• QXP-400eS-A1164 host bus adapter</li> </ul>                                   |
| TL-D800S             | <ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul> | <ul style="list-style-type: none"> <li>• 2 x SFF-8088 connector cables</li> <li>• QXP-800eS-A1164 host bus adapter</li> </ul>                                  |
| TL-D1600S            | <ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul> | <ul style="list-style-type: none"> <li>• 4 x SFF-8088 to SFF-8644 connector cables</li> <li>• QXP-1600eS-A1164 host bus adapter</li> </ul>                     |
| TL-R400S             | <ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul> | <ul style="list-style-type: none"> <li>• 1 x SFF-8088 connector cable</li> <li>• QXP-400eS-A1164 host bus adapter</li> <li>• RAIL-B02</li> </ul>               |
| TL-R1200S-RP         | <ul style="list-style-type: none"> <li>• Uses a SATA 6 Gbps (SFF-8088) interface</li> <li>• Supports SATA HDD/SSD</li> </ul> | <ul style="list-style-type: none"> <li>• 3 x SFF-8088 to SFF-8644 connector cables</li> <li>• QXP-1600eS-A1164 host bus adapter</li> <li>• RAIL-B02</li> </ul> |
| TR-002               | <ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA HDD/SDD</li> </ul>   | <ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> </ul>   |
| TR-004               | <ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA HDD/SDD</li> </ul>   | <ul style="list-style-type: none"> <li>• USB 3.2 Gen 1 Type-A to Type-C cable</li> </ul>   |
| TR-004U              | <ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 1 Type-C interface</li> <li>• Supports SATA HDD/SDD</li> </ul>   | <ul style="list-style-type: none"> <li>• USB 3.2 Gen 1 Type-A to Type-C cable</li> <li>• RAIL-B02</li> </ul>   |
| TL-D800C             | <ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA HDD/SDD</li> </ul>   | <ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> </ul>   |
| TL-R1200C-RP         | <ul style="list-style-type: none"> <li>• Uses a USB 3.2 Gen 2 Type-C interface</li> <li>• Supports SATA HDD/SDD</li> </ul>   | <ul style="list-style-type: none"> <li>• USB 3.2 Gen 2 Type-A to Type-C cable</li> <li>• RAIL-B02</li> </ul>   |

## Connecting SAS Expansion Units

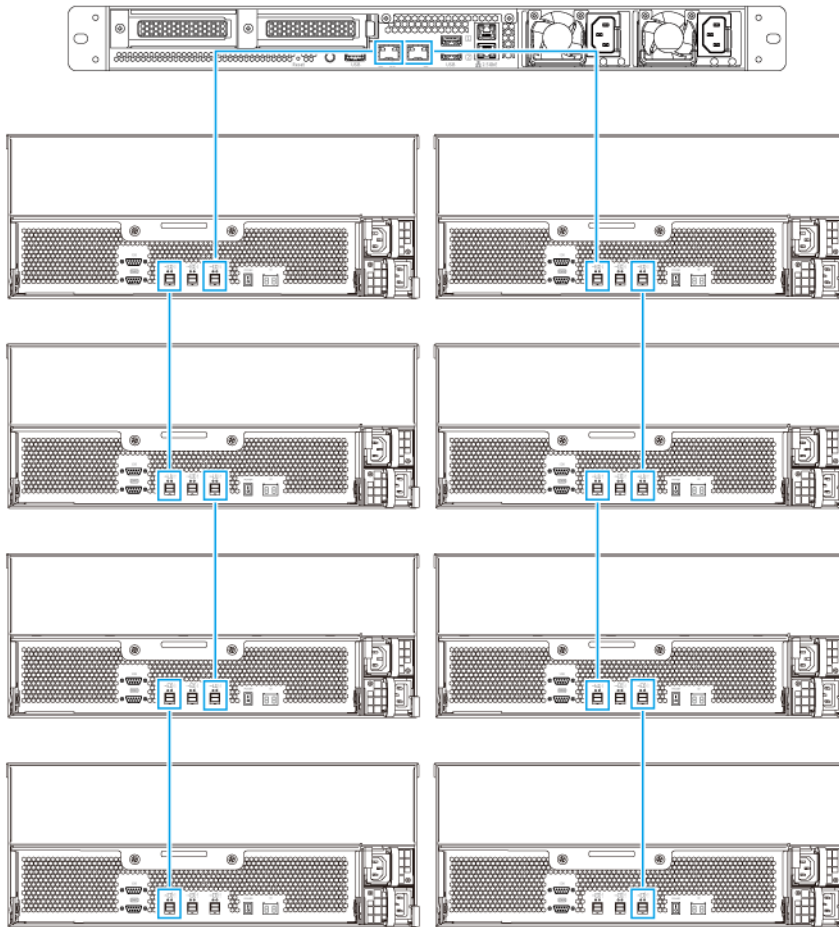
To connect the device to SAS expansion units, a storage expansion card must be installed in the device.

For required accessories details, see [Expansion Unit Installation](#).

1. Install a storage expansion card on the PCIe slot.  
For details, see the following topics:
  - [Replacing Expansion Cards on the TS-h2490FU](#)
  - [Installing Expansion Cards on the TS-h1090FU](#)
2. Connect the expansion units to the device using the following topology.



**TS-h2490FU**



### TS-h1090FU

QNAP recommends always using dual-path configuration to prevent storage downtime due to expansion unit failure or cable disconnection. Single-path configuration should be used only in a situation where it is not possible to use dual-path configuration.

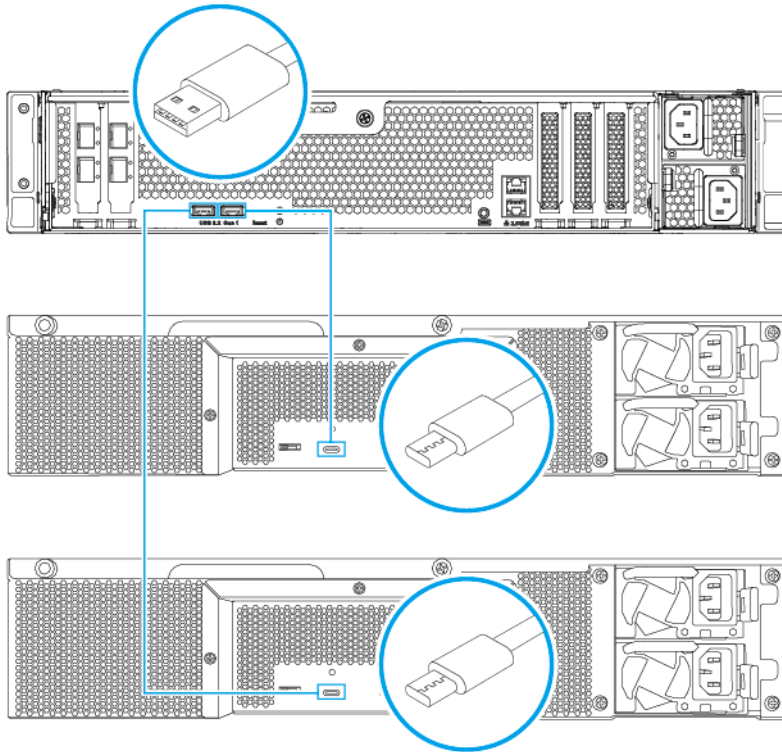
3. Power on the expansion units.
4. Verify that the expansion units are recognized by the device.
  - a. Log on to QuTS hero as administrator.
  - b. Go to **Main Menu > Storage & Snapshots > Overview > System** .
  - c. Verify that the expansion units are listed.

### Connecting USB Expansion Units

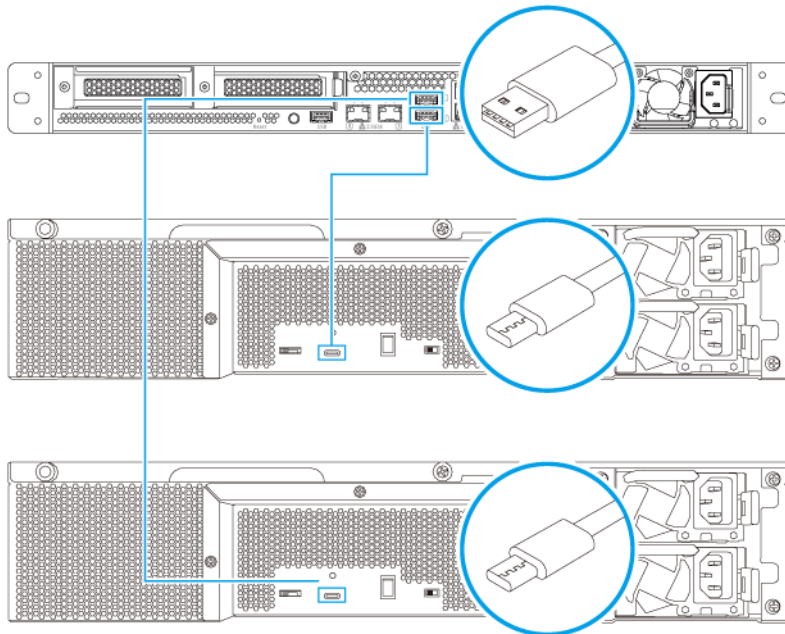
To connect the TS-hx90FU to USB expansion units, USB Type-A to USB Type-C cables are required. For required accessories details, see [Expansion Unit Installation](#).

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

- b. Connect the USB cable to a USB 3.2 Gen 2 Type-A port on the NAS.



## TS-h2490FU



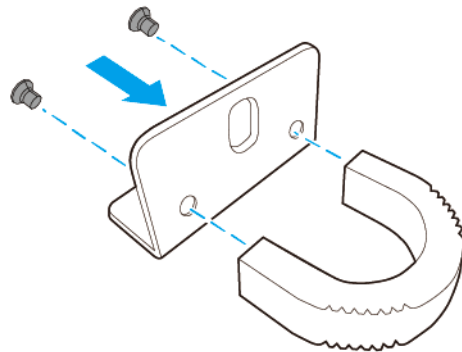
### TS-h1090FU

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

### Installing Handles

Installing handles enables you to better grip and secure the device on a rack.

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

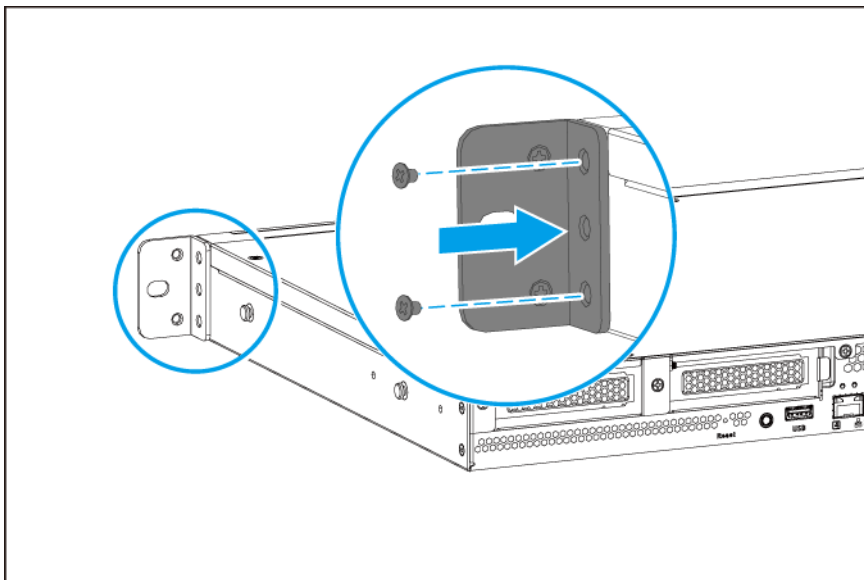


3. Install the angle bracket on the device.
  - a. Align the holes on the angle bracket with the holes on the chassis.

**Note**

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

- b. Attach the screws.



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



## Rail Kits

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

| Model      | Compatible Rail Kit |
|------------|---------------------|
| TS-h2490FU | RAIL-A03-57         |
| TS-h1090FU | RAIL-B02            |

You can find installation information in the rail kit package.

## QuTS hero Installation

The TS-hx90FU uses the QNAP QuTS hero operating system. You can install QuTS hero 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 QuTS hero 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 myQNAPcloud Link 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 QuTS hero 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>• Cloud Key</li> </ul> |

## Installing QuTS hero Using Qfinder Pro



### Warning

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

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

**Note**

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

4. Locate the NAS in the list and then double-click the name or IP address.  
The **Smart Installation Guide** opens in the default web browser.
5. Click **Start Smart Installation Guide**.  
The **Install Firmware** window appears.
6. Install firmware using any of the following methods:

| Installation methods | Steps   |
|----------------------|---|
| Automatic            | Click <b>Start</b> .<br>Automatically searches for available firmware updates and installs firmware.  |
| Manual installation  | <ol style="list-style-type: none"> <li>a. Click <b>Manual Installation</b>.<br/>The <b>Install Firmware</b> window appears.</li> <li>b. Click <b>Browse</b>.<br/>The upload file window appears.</li> <li>c. Select file.</li> <li>d. Click <b>Open</b>.<br/>Starts firmware installation.</li> </ol> |
| Skip                 | <ol style="list-style-type: none"> <li>a. Click <b>Skip</b>.<br/>Skips firmware installation.</li> </ol>  |

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

A confirmation message appears.



### Warning

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

17. Click **Yes**.

- The **QuTS hero** installation progress bar appears.
- **QuTS hero** is installed.



### Note

It may take a couple of minutes to complete QuTS hero installation.

18. Optional: Click **Go to NAS Management**.



### Tip

Click **Go to NAS Management** to set more advanced QuTS hero configurations and settings. For details, see QuTS hero User Guide.

## Installing QuTS hero Using the Cloud Key



### Warning

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

1. Power on the device.
2. Connect the device to the internet.
3. Go to the QNAP Cloud Installation page using one of the following methods:
  - On your computer, go to <https://install.qnap.com/>.
  - Scan the QR code on the NAS using a mobile device.

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

4. Locate the NAS in the list and then click **Initialize**.



### Note

If your NAS is not listed, follow the instructions on the web page to specify the Cloud Key on the NAS.

The installation wizard opens in the default web browser.

5. Create an account or sign in to myQNAPcloud.



### Note

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

6. Specify the myQNAPcloud device name for the NAS.



### Note

- The myQNAPcloud device name is used when remotely accessing the NAS.

- For security purposes, the myQNAPCloud Link remote connection service will be disabled on your NAS after initialization. You can enable it by connecting to QuTS hero through LAN and then installing myQNAPCloud Link.

**7. Click **Next**.**

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

**8. Perform any of the following actions.**

- To check for the latest available version, click **Start**.  
The wizard downloads the latest available version, and then the NAS restarts after the download is complete. If a newer version is not available, the wizard automatically displays the **Smart Installation Guide**.
- To install the out-of-the-box version, click **Skip**.

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

The **Install Firmware** window appears.

**10. Install firmware using any of the following methods:**

| Installation methods | Steps  |
|----------------------|--|
| Automatic            | Click <b>Start</b> .<br>Automatically searches for available firmware updates and installs firmware.   |
| Manual installation  | <p><b>a. Click <b>Manual Installation</b>.</b><br/>The <b>Install Firmware</b> window appears.</p> <p><b>b. Click <b>Browse</b>.</b><br/>The upload file window appears.</p> <p><b>c. Select file.</b></p> <p><b>d. Click <b>Open</b>.</b><br/>Starts firmware installation.</p> |
| Skip                 | Click <b>Skip</b> .<br>Skips firmware installation.  |

**11. Specify the following information**

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

**12. Click **Next**.**

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



**Tip**

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

**14. Click **Next**.**

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

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

16. Click **Next**.  
The **Cross-platform file transfer service** screen appears.
17. Select the types of devices that you will use to access shared folders on the NAS.
18. Click **Next**.
19. Review the settings.
20. Click **Apply**.  
A confirmation message appears.

**Warning**

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

21. Click **Confirm**.  
QuTS hero is installed.
22. Optional: Click **Go to NAS Management**.



**Tip**

Click **Go to NAS Management** to set more advanced QuTS hero configurations and settings.  
For details, see QuTS hero User Guide.


### 3. Basic Operations

This chapter describes basic NAS operations.

#### Power Button

| Operation       | User Action                                | Result   |
|-----------------|--|--|
| Power on        | Press the button once.                     | The device powers on.  |
| Power off       | Press and hold the button for 1.5 seconds. | The device powers off.   |
| Force power off | Press and hold the button for 10 seconds.  | <p>The device powers off.</p> <p> <b>Important</b><br/>Use this method only when the device is unresponsive.</p> <p> <b>Note</b><br/>After forcing the device to power off, the fans will spin very fast for about 3 seconds. This is normal and to be expected.</p> |

## Reset Button

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

## LEDs


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



### Note

The 10 GbE LED only works when a 10 GbE network expansion card is installed.

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>• A drive is being formatted.</li> <li>• The device is being initialized.</li> <li>• The operating system is being updated.</li> <li>• RAID rebuilding is in progress.</li> <li>• Online RAID Capacity Expansion is in progress.</li> <li>• Online RAID Level Migration is in progress.</li> <li>• The firmware is being updated.</li> </ul> <p> <b>Important</b><br/>When updating the firmware, do not remove the power cord or USB cable, and do not force-exit the application.</p> |
|                | Red   | <ul style="list-style-type: none"> <li>• A drive is invalid.</li> <li>• A shared folder has reached its full capacity.</li> <li>• A shared folder is about to reach its full capacity.</li> <li>• A system fan is not functioning.</li> <li>• An error occurred when accessing (read/write) the data.</li> <li>• A bad sector is detected on the hard drive.</li> <li>• The device is in degraded read-only mode (two member drives failed in RAID 5 or RAID 6 but the data can still be read).</li> <li>• A hardware self-test error occurred.</li> </ul>  |
|                | Flashes red every 0.5 seconds                       | The device is in degraded mode (one member drive failed in RAID 1, RAID 5, or RAID 6).  |
|                | Green   | The device is ready.  |
|                | Flashes green every 0.5 seconds                     | <ul style="list-style-type: none"> <li>• The device is not configured.</li> <li>• A drive is not formatted.</li> </ul>  |
|                | Off   | <ul style="list-style-type: none"> <li>• All drives are in standby mode.</li> <li>• The device is powered off.</li> </ul>   |
| Drive activity | Flashes red   | Data is being accessed, and during the process a drive read/write error occurred.   |
|                | Red   | A drive read/write error occurred.  |
|                | Flashes green                                       | Data is being accessed.   |
|                | Green   | The drive is ready.   |
|                | Off   | No drive was detected.  |



| LED                           | Status                         | Description  |
|-------------------------------|--------------------------------|--|
| Drive status                  | Green                          | The drive is ready.  |
|                               | Red                            | A drive read/write error occurred.   |
|                               | Flashes red 5 times per second | The drive is being located in the operating system.  |
|                               | Off                            | No drive was detected.   |
| LAN                           | Orange                         | The network connection is operating.   |
|                               | Flashes orange                 | The device is being accessed from the network.   |
|                               | Off                            | The device is not connected to a network.  |
| 2.5 Gigabit Ethernet speed    | Green                          | The network connection is operating at 2.5 Gbps.   |
|                               | Orange                         | The network connection is operating at 1 Gbps.   |
|                               | Off                            | <ul style="list-style-type: none"> <li>The network connection is operating at 10 Mbps.</li> <li>There is no network connection.</li> </ul> |
| 2.5 Gigabit Ethernet activity | Orange                         | A network connection has been established.   |
|                               | Flashes orange                 | The device is being accessed from the network.   |
|                               | Off                            | There is no network connection.  |
| 10 Gigabit Ethernet           | Green                          | The network connection is operating at 10 Gbps.  |
|                               | Flashes green                  | The device is being accessed from a 10 GbE network.  |
|                               | Off                            | The device is not connected to a 10 GbE network.   |
| 25 Gigabit Ethernet speed     | Green                          | The network connection is operating at 25 Gbps.  |
|                               | Orange                         | The network connection is operating at 10 Gbps or 1 Gbps.  |
|                               | Off                            | There is no network connection.  |
| 25 Gigabit Ethernet activity  | Orange                         | A network connection has been established.   |
|                               | Flashes orange                 | Data is being transmitted.   |
|                               | Off                            | There is no network connection.  |
| Expansion                     | Orange                         | An expansion unit is connected.  |
|                               | Off                            | No expansion unit has been detected.   |

## Audio Alert

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

| Duration                | Frequency                | Description  |
|-------------------------|--------------------------|--|
| Long beep (1.5 seconds) | 3 (every 5 minutes)      | <ul style="list-style-type: none"> <li>• A power error occurred.</li> <li>• The system fan is not functioning.</li> <li>• The fan module has been removed.</li> <li>• The NAS data cannot be copied to the external storage device connected to the front USB port.</li> </ul>   |
|                         | 2                        | <ul style="list-style-type: none"> <li>• The storage pool is about to reach full capacity.</li> <li>• The storage pool has reached full capacity.</li> <li>• A storage pool status error occurred.</li> <li>• The shared folder is about to reach its full capacity.</li> <li>• The shared folder has reached its full capacity.</li> <li>• A shared folder status error occurred.</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>  |
| Long and short beeps    | 1 long and 2 short beeps | The JBOD expansion unit has been removed.  |

## 4. NAS Migration

You can migrate data and settings from your current NAS to another NAS model with minimal disruptions by installing all the hard drives from the source NAS to the destination NAS. RAID configuration and other settings are retained on the destination NAS after migration.

### NAS Migration Requirements

You can only migrate drives and system settings to specific NAS models, depending on your source NAS. For the list of NAS models compatible with direct NAS migration, see <https://www.qnap.com/en/nas-migration>.

Your device must meet the following requirements:

- The destination NAS must run on the same QuTS hero version as the source NAS (or later).



#### Important

Due to incompatibilities in file system, system migration between QTS NAS and QuTS hero NAS is not supported.



#### Warning


Migrating drives between QTS NAS and QuTS hero NAS can cause data corruption.




- The destination NAS must have sufficient free drive bays to accommodate all the drives that you are migrating from the source NAS.

For NAS models that do not support NAS migration, see [How to Migrate Data and Folder Permissions between QTS and QuTS hero with HBS3](#).

### Status and Setting Changes After NAS Migration

The status of NAS data and settings varies after migration.

| Data and Settings           | After NAS Migration   |
|-----------------------------|---|
| Registered myQNAPcloud name | Your registered myQNAPcloud name is not migrated.   |
| Encrypted shared folders    | <p>If the NAS does not support file system encryption, encrypted shared folders are not migrated.</p> <p> <b>Warning</b><br/>To prevent data loss, back up and save the encryption keys of encrypted shared folders in a safe place. You can also choose to decrypt shared folders before migration.</p> |

| Data and Settings        | After NAS Migration   |
|--------------------------|---|
| Shared folders           | <p>All shared folders and the downloaded files stored in them are retained.</p> <p> <b>Warning</b><br/>To prevent data loss, back up and save encryption keys or passwords of encrypted shared folders in a safe place before migration.</p> <p> <b>Important</b><br/>Folder permissions on the destination NAS must be reconfigured after migration.</p> |
| Network                  | <p>If the number of network ports or network port specifications on the destination NAS is different from the source NAS, the following network and virtual settings may change and require reconfiguration: port trunking, virtual machines, Thunderbolt, and more.</p>  |
| Windows AD configuration | <p>Windows AD configurations must be reconfigured.</p>  |
| Licenses                 | <p>Licenses are not migrated.</p> <p> <b>Warning</b><br/>QNAP recommends deactivating licenses on the source NAS before data migration.</p>  |
| Applications             | <p>If the destination NAS has less RAM than the source NAS, the following features and applications might not function: Virtualization Station, Qsirch, and Snapshots.</p>  |
| Services                 | <p>Only services supported by the destination NAS are available.</p>  |
| Multimedia features      | <p>Some multimedia features are disabled by default.</p>  |

## Migrating a NAS



### Important

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

For details see the following topics:

- [NAS Migration Requirements](#)
- [Status and Setting Changes After NAS Migration](#)

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



### Important

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

- a.** Remove the drives from the source NAS.
  - b.** Remove the drive trays from the destination NAS.
- 3.** Install the drives.
  - a.** Install source NAS drives onto the destination NAS drive trays.
  - b.** Insert the drive trays into the destination NAS.
- 4.** Power on the destination NAS.
- 5.** Log on to QuTS hero as an administrator on the destination NAS.  
The destination NAS automatically checks for the latest firmware update.

## 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 QuTS hero installation, the drives or data may be faulty.

1. Power off the NAS.
2. Remove all drives.
3. Power on the NAS.
4. Locate the NAS using Qfinder Pro or myQNAPcloud.
5. Reinsert the drives.
6. Continue with the QuTS hero installation.

### Hot-swapping Failed Drives

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

| RAID Type     | Number of Disks   | Situation   |
|---------------|---|---|
| RAID 1        | 2   | One member drive fails                                |
| RAID 5        | $\geq 3$  | One member drive fails                                |
| RAID 6        | $\geq 4$  | One or two member drives fail                         |
| RAID 10       | $\geq 4$ (Must be an even number)                             | One or two member drives in two different pairs fail. |
| RAID 50       | $\geq 6$  | One disk per subgroup fails.                          |
| RAID 60       | $\geq 8$  | Two disks per subgroup fail.                          |
| Triple Mirror | Multiple of 3. (For example, 3, 6, 9, 12 disks and so forth.) | One or two member drives fail.                        |
| RAID-TP       | $\geq 5$  | One, two, or three member drives fail.                |

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

10. Go to **Main Menu > Storage & Snapshots > Storage Space** .

11. Locate the shared folder that contains the new drive and then verify that the status is `Rebuilding`.

## Recovering Unintentionally Removed Healthy Drives

The NAS supports exclusive RAID recovery technology to recover failed RAID disk volumes from unintentional disconnection or removal of drives. Users can recover an inactive RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, RAID 60, triple mirror, and RAID-TP volume from degraded mode.

| Disk Volume   | RAID Recovery Support | Number of Disks   | Maximum Number of Removed Drives                      |
|---------------|-----------------------|---|---|
| RAID 0        | Yes                   | $\geq 2$  | N/A   |
| RAID 1        | Yes                   | 2   | 1   |
| RAID 5        | Yes                   | $\geq 3$  | 1   |
| RAID 6        | Yes                   | $\geq 4$  | 2   |
| RAID 10       | No                    | $\geq 4$ (Must be an even number)                             | One or two member drives in two different pairs fail. |
| RAID 50       | Yes                   | $\geq 6$  | One disk per subgroup fails.                          |
| RAID 60       | Yes                   | $\geq 8$  | Two disks per subgroup fail.                          |
| Triple Mirror | Yes                   | Multiple of 3. (For example, 3, 6, 9, 12 disks and so forth.) | 2   |
| RAID-TP       | Yes                   | $\geq 5$  | 3   |

## Support and Other Resources

QNAP provides the following resources:

| Resource                     | URL   |
|------------------------------|---|
| Documentation                | <a href="https://download.qnap.com">https://download.qnap.com</a>   |
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| Service Portal               | <a href="https://service.qnap.com">https://service.qnap.com</a>   |
| Product Support Status       | <a href="https://www.qnap.com/go/product/eol.php">https://www.qnap.com/go/product/eol.php</a>                 |
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| Community Forum              | <a href="https://forum.qnap.com">https://forum.qnap.com</a>   |
| QNAP Accessories Store       | <a href="https://shop.qnap.com">https://shop.qnap.com</a>   |

## 6. Glossary

### **Cloud Key**

Unique 8-digit code assigned to each NAS device

### **myQNAPcloud**

Provides various remote access services such as DDNS and myQNAPcloud Link

### **myQNAPcloud Link**

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

### **Qfinder Pro**

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

### **QuTS hero**

QNAP NAS operating system featuring ZFS file system



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## SJ/T 11364-2006



本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

| 部件名称  | 有毒有害物质或元素 |        |        |              |            |              |
|-------|-----------|--------|--------|--------------|------------|--------------|
|       | 铅 (Pb)    | 汞 (Hg) | 镉 (Cd) | 六价铬 (CR(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 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            |

| 部件名称  | 有毒有害物质或元素 |           |           |                 |               |                 |
|---|-----------|-----------|-----------|-----------------|---------------|-----------------|
|   | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(CR(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 风扇组装  | 0         | 0         | 0         | 0               | 0             | 0               |
| 电力供应组装  | 0         | 0         | 0         | 0               | 0             | 0               |
| 电池  | 0         | 0         | 0         | 0               | 0             | 0               |
| O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。  |           |           |           |                 |               |                 |
| X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。 |           |           |           |                 |               |                 |