

The QNAP logo is displayed in white, bold, uppercase letters within a blue rounded rectangular box in the top-left corner of the page. The background of the entire page is a light blue gradient with a network of white and blue dots connected by thin lines, creating a digital or data network aesthetic.

QNAP

4U 60-Bay SAS / SATA JBOD Enclosure

TL-R6020Sep-RP

User Guide

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1. Important Information

Original Packaging

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

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

Hardware Defects

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

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

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

Safety information

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

General Instructions

- 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.

Warning

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

Power

- 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.

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.

2. Product Overview

This chapter provides basic information about your QNAP JBOD enclosure.

About the TL-R6020Sep-RP JBOD

The QNAP TL-R6020Sep-RP JBOD enclosure is designed to accommodate diverse corporations and enterprises that pursue flexibility, easy control, and density in external or backup storage. It increases the capacity and utility of your NAS, providing a wide range of storage applications and offering high performance with high scalability. You can manage installed drives independently or configure them as software RAID groups using the host NAS.

Hardware specifications

Tip

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

Component	TL-R6020Sep-RP
Storage	
Drive bays	60 x 3.5-inch SAS 12 Gbps/SATA 6 Gbps <div style="margin-top: 10px;"> <p>Tip</p> <p>The drive bays are backward compatible with SAS 6 Gbps drives. The drive bays are backward compatible with SATA 3 Gbps drives.</p> </div> <div style="margin-top: 10px;"> <p>Note</p> <p>You can purchase tray bases from QNAP or an authorized reseller. For details, go to https://shop.qnap.com/.</p> </div>
Drive compatibility	3.5-inch bays: <ul style="list-style-type: none"> • 3.5-inch SATA hard disk drives • 3.5-inch SAS hard disk drives
Hot-swapping	This device supports hot-swapping for all drives.
Interface	
Buttons	Power

Component	TL-R6020Sep-RP
LEDs	
System	<ul style="list-style-type: none"> • Power status • Power failure • Temperature • Fan error
HDD status for 60 drives	
Form factor	4U Rackmount
Dimensions (H x W x D)	176 x 434 x 750 mm (6.9 x 17.1 x 29.5 in)
Gross weight	With PSU, rail, and pallet; Without disks: 58.2 kg (128.3 lb)
Net weight	With PSU, without rail: 24.2 kg (53.36 lbs)
Others	
Hot-plugging	This device supports hot-plugging on a QNAP NAS. For details, see Hot-plugging the JBOD enclosure on a NAS .
Rail compatibility	RAIL-H01
Power supply unit	2 x 1300W, 100-240V AC, 50/60 Hz
Fans	6 x 120 mm fans
Operating temperature	0°C to 40°C (32°F to 104°F)
Relative humidity	<ul style="list-style-type: none"> • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F)

Tip

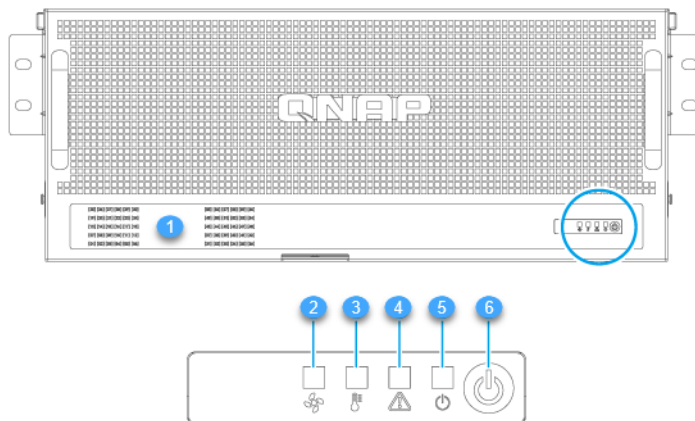
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.

Package contents

Item	Quantity
JBOD enclosure	1
Power cord	2
Drive trays	60
Rail kit	1
Quick Installation Guide (QIG)	1

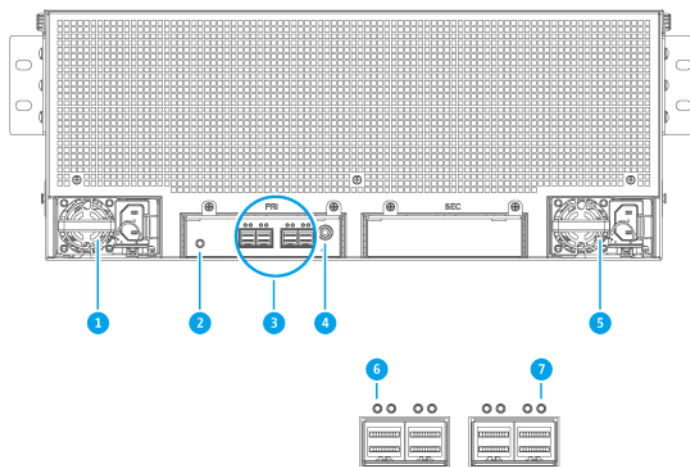
Components

Front panel



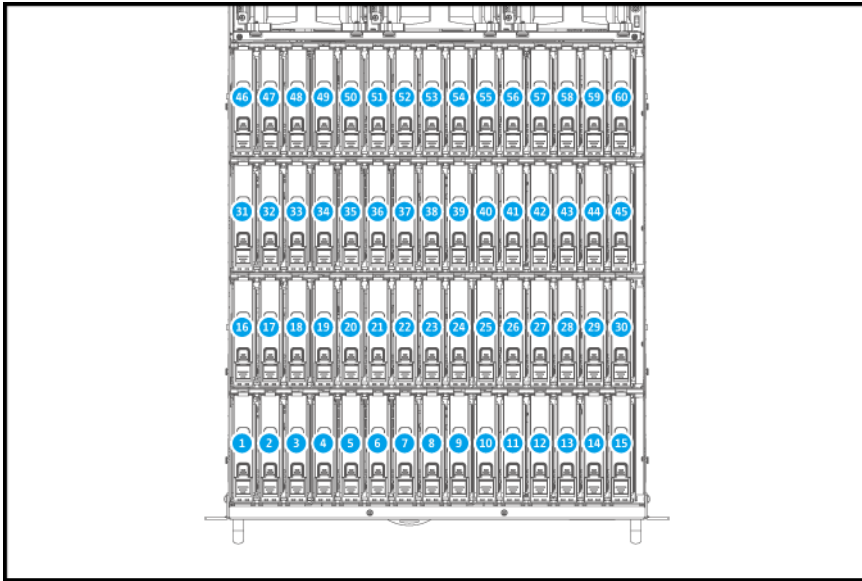
No.	Component	No.	Component
1	Drive status LED	4	Power failure LED
2	Fan error LED	5	Power status LED
3	Temperature LED	-	Power button

Rear panel



No.	Component	No.	Component
1	1300 W Titanium PSU 1	5	1300 W Titanium PSU 2
2	BMC console port (dedicated to manufacturing)	6	Mini-SAS UP / DOWN link status LEDs (blue)
3	SFF-8644 Mini-SAS ports	7	Mini-SAS UP / DOWN link status LEDs (red)
4	Expander console port (dedicated to manufacturing)	-	-

Drive numbering



Installation requirements

Category	Item
Environment	<ul style="list-style-type: none"> Room temperature: 0°C to 40°C (32°F to 104°F) Non-condensing relative humidity: 5% to 95% Wet-bulb temperature: 27°C (80.6°F) Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals
	<p>Restricted access</p> <ul style="list-style-type: none"> 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, trained, and authorized device administrators with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the device.

Category	Item
Hardware and peripherals	<ul style="list-style-type: none"> <li data-bbox="456 286 533 315">• NAS <div data-bbox="485 349 1385 629" style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> <p data-bbox="517 371 580 400">Note</p> <ul style="list-style-type: none"> <li data-bbox="536 439 1350 544">• For details on compatible NAS models, maximum number of JBOD enclosures supported by each NAS model, and applicable PCIe slots, go to https://www.qnap.com/go/compatibility-expansion/. <li data-bbox="536 573 1102 602">• The NAS must run QuTS hero h5.2.0 (or later). </div> <ul style="list-style-type: none"> <li data-bbox="456 663 655 692">• Storage drives <div data-bbox="485 719 1385 887" style="background-color: #e6f2ff; padding: 10px; margin: 10px 0;"> <p data-bbox="517 741 580 770">Note</p> <p data-bbox="517 786 1334 853">For the list of compatible drive models, go to https://www.qnap.com/compatibility.</p> </div> <ul style="list-style-type: none"> <li data-bbox="456 909 956 938">• One or more SFF-8644 connector cables

Setting up the JBOD enclosure

Important

Read all safety requirements and information in [Safety information](#) carefully before setting up the JBOD enclosure or installing JBOD enclosure components.

1. Place the JBOD enclosure in an environment that meets the requirements.
For details, see [Installation requirements](#).
2. Install the JBOD enclosure on a rack.
For details, see [Installing rail kits](#).
3. Install the drives.
For details, see [Installing 3.5-inch hard drives](#).
4. Connect the power cord.
5. Connect the JBOD enclosure to your NAS.
For details, see [Connecting the JBOD enclosure to a NAS](#).
6. Host-based power management will wake up the JBOD enclosure.

3. Hardware Installation

This section provides information on installing drives, connecting and disconnecting the JBOD enclosure from a NAS, hot-swapping redundant power supply units, and rail kits.

Warning

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

Installing 3.5-inch hard drives

Warning

- Installing a drive deletes all data on the drive.



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

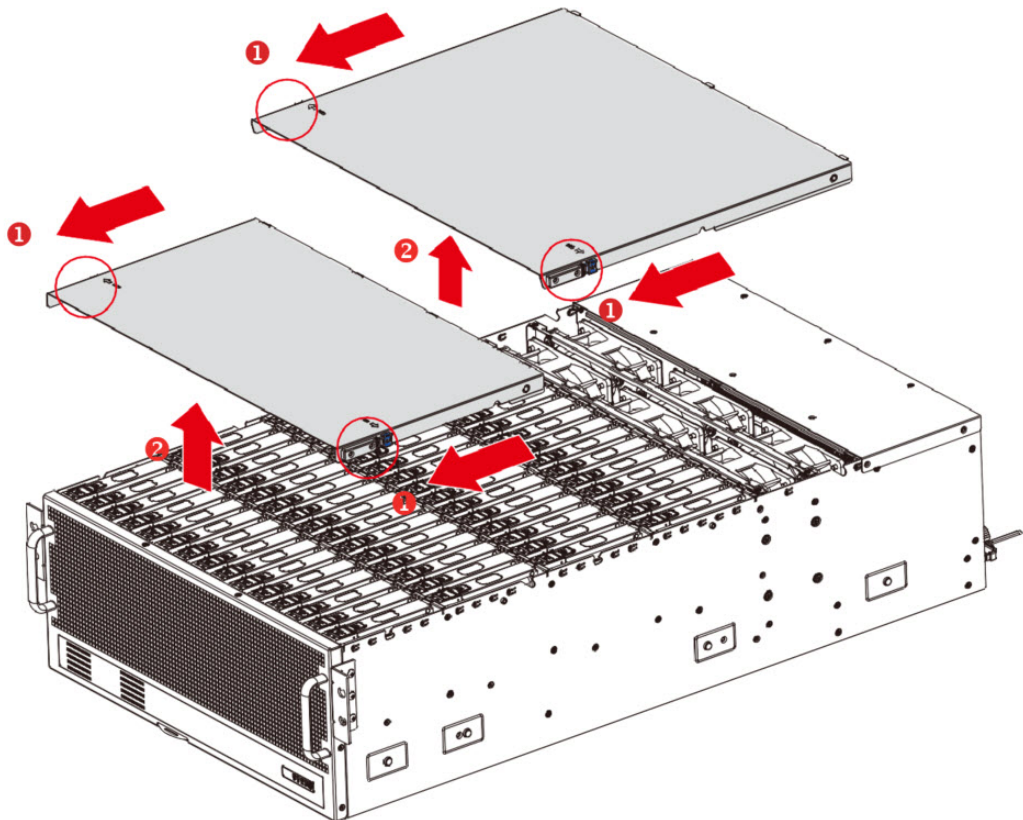


Other moving components: Keep your hands and other body parts away from other moving components.

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

1. Power off the NAS.
2. Remove the top cover.
 - a. Press the release button on both sides of the top cover and push the cover towards the front panel.

- b.** Lift the cover off the JBOD.

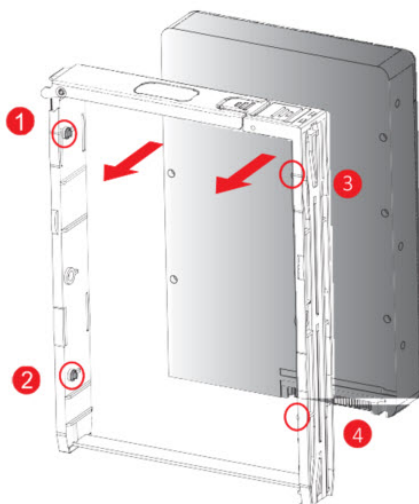


- 3.** Remove the drive tray.

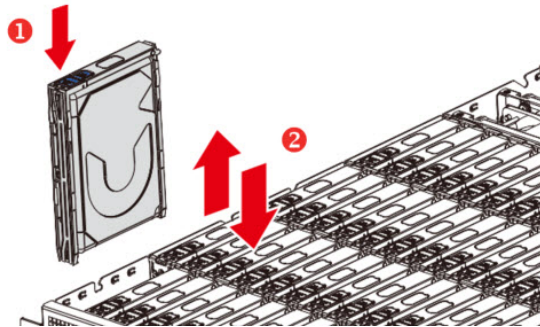
- a.** Push the button to release the tray handle.
b. Pull the tray out.

- 4.** Install a drive on the tray.

- a.** Place the drive on the tray so that the nodules on the sides of the drive are aligned with the indentations on the sides of the tray.



5. Load the tray into the bay.
 - a. Insert the tray into the bay.



6. Attach the top cover.
7. Power on the NAS.
8. Host-based power management will wake the JBOD enclosure.

Note

The JBOD enclosure may take up to 30 seconds to detect the new device.

Connecting and disconnecting the JBOD enclosure

The TL-R6020Sep-RP supports connecting to a QNAP NAS for storage expansion. Additionally, the JBOD enclosure supports hot-plugging and cascade configuration.

Hot-plugging the JBOD enclosure on a NAS

The TL-R6020Sep-RP supports hot-plugging on a QNAP NAS. You can connect or disconnect the JBOD enclosure from a NAS while the NAS is powered on, with the following restrictions and precautions:

- Hot-plugging is only supported when creating a storage pool on the JBOD enclosure using only disks installed on the JBOD enclosure.
- Hot-plugging is not supported when expanding a storage pool on the NAS with disks on the JBOD enclosure.
- To prevent data loss or other damages, do not hot-disconnect the JBOD enclosure if a storage pool or RAID group has been created on the JBOD enclosure. If you must disconnect the JBOD enclosure under this circumstance, contact an authorized administrator to perform this action.
- When disconnecting the JBOD enclosure from a NAS, always safely detach the JBOD enclosure from the NAS operating system before disconnecting any cables. For details, see [Disconnecting the JBOD enclosure from a NAS](#).

Connecting the JBOD enclosure to a NAS

To connect the JBOD enclosure to a NAS, you must use a compatible NAS model with a recommended QNAP operating system version and the latest BIOS firmware version. Depending on the PCIe slot on the NAS, you must also install a compatible host bus adapter on the NAS and use a compatible connector cable.

NAS Requirements

Requirement	Description
NAS model	Ensure your QNAP NAS is compatible with the JBOD enclosure. For the list of compatible NAS models, go to https://www.qnap.com/go/compatibility-expansion/ .
NAS operating system	QuTS hero h5.2.0 or later For the latest QNAP operating system for your NAS model, go to https://download.qnap.com/ .
NAS BIOS	The NAS must be installed with the latest BIOS firmware version. For the latest BIOS firmware for your NAS model, go to https://download.qnap.com/ .

Note

QuTS hero currently does not support hardware information for power supply temperature and fan speed.

Host Bus Adapter and Cable Requirements

NAS PCIe slot	Host Bus Adapter and Cable
PCIe x8 slot	<ul style="list-style-type: none"> Host bus adapter Cable Up to 64 Gbps (with PCIe Gen 3 or higher)

Note

- The host bus adapter has two ports supporting up to two JBOD connections. You can connect additional JBOD enclosures using a cascade configuration.
- For the maximum number of expansion cards and JBOD enclosures supported by your NAS model, go to <https://www.qnap.com/go/compatibility-expansion/>.
- You can purchase QNAP expansion cards and cables from <https://shop.qnap.com/> or an authorized reseller.

1. Ensure the NAS is powered off.
Skip this step if you are hot-connecting the JBOD enclosure to the NAS. For details, see [Hot-plugging the JBOD enclosure on a NAS](#).
2. Install the host bus adapter on the NAS.
Refer to the hardware installation section of the NAS user guide for instructions on installing expansion cards.
3. Prepare SFF-8644 connector cables.
4. Connect the JBOD enclosure to the NAS.

Important

- When connecting the cable, ensure you insert the cable plug into the port in one quick action. Do not wiggle the plug or insert too slowly, otherwise protection mode will be activated and the connection speed will be reduced.
 - When protection mode is activated, the connector link LEDs on both ends of the connection flash orange. To reestablish a normal connection, safely detach the JBOD enclosure from QuTS hero, disconnect the connector cable, restart the NAS, and then reconnect the JBOD enclosure.
- a. Connect a SFF-8644 connector cable to the SFF-8644 port on the host bus adapter (HBA) installed on the NAS.

Note

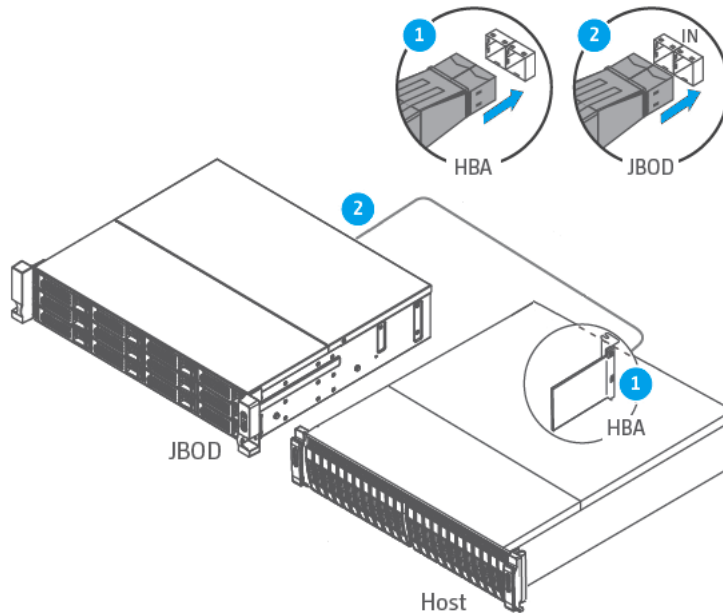
To connect a cable to a host bus adapter, you must insert the cable plug into the A1 port or B1 port of the adapter, and the connection speed will be limited to a maximum of 32 Gbps. Do not insert the cable plug into the A2 port or B2 port of the adapter.

For the location of the adapter ports, check the labels on the adapter.

- b. Connect a SFF-8644 connector cable to the port on the JBOD enclosure.

Note

- When using the cable, connect to the left side of the port.

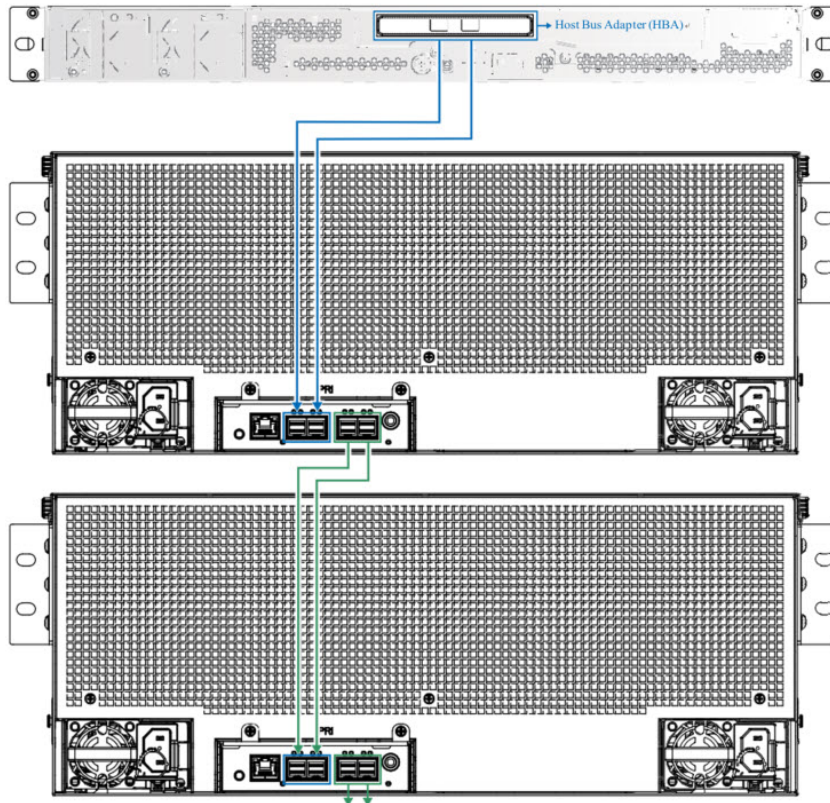


5. Optional: Connect additional JBOD enclosures to the NAS.

Important

When connecting multiple JBOD enclosures, make sure both the power cable and connector cables are properly connected to the first JBOD, and then make your way down the rest of the JBOD enclosures.

Depending on the host bus adapter, use one of the following topologies when connecting multiple JBOD enclosures to the NAS.



Note

- When using the connector cable, always connect to the left side of the port.
- When both ports of the host bus adapter are connected, the total bandwidth of the PCIe slot on the NAS is shared between the two connections.

6. Power on the NAS.

As the TL-R6020Sep-RP has a large number of drives installed, we recommend to first power on the JBOD and connect the cables, and then power on the NAS.

7. Host-based power management will wake the JBOD enclosure.

8. Verify that the JBOD enclosures are recognized by the NAS.

- a. Log on to QuTS hero as an administrator.

- b. Go to **Main Menu > Storage & Snapshots > Overview > Storage**.
- c. Verify that the JBOD enclosures are listed.

Note

- The NAS may take up to 30 seconds to detect the JBOD enclosures and the installed drives.
- The higher the number of connected enclosures and installed drives, the longer it may take the NAS to detect them.
- Before the NAS detects a JBOD enclosure, the status LED on the JBOD enclosure displays orange, indicating standby mode. When the JBOD enclosure is in standby mode, the fans and drive LEDs on the enclosure remain turned off.

Disconnecting the JBOD enclosure from a NAS

When disconnecting (including hot-disconnecting) the JBOD enclosure from a NAS, always safely detach the JBOD enclosure from the NAS operating system before disconnecting any cables.

Disconnecting the cables without safely detaching the JBOD enclosure can cause data loss or other damages.

Warning

Do not hot-disconnect the JBOD enclosure if a storage pool or RAID group has been created on the JBOD enclosure. If you must disconnect the JBOD enclosure under this circumstance, contact an authorized administrator to perform this action.

1. Log in to QuTS hero on the NAS.
2. Go to **Storage & Snapshots > Storage > Disks/VJBOD > NAS and Enclosure**.
3. Select the JBOD enclosure.
4. Click **Action**, and then select **Safely Detach**.
The JBOD enclosure is safely detached.
5. Disconnect the connector cable from the NAS.

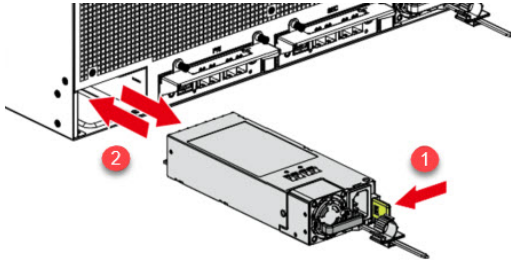
Important

When disconnecting multiple JBOD enclosures, make sure to start from the last JBOD and properly disconnect both cables, and then make your way up the rest of the JBOD enclosures.

Hot-swapping redundant power supply units

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.

Installing rail kits

This section provides a basic instruction for mounting the slide rail onto the system. Tool-less rails vary per order. Rails in this manual may not exactly match the rail for your system. For details, refer to the specifications or quick installation guide that came with your purchased product.

Warning

Only qualified personnel should perform the following steps. Failure to follow instructions can result in serious injury or death.

⚠ WARNING

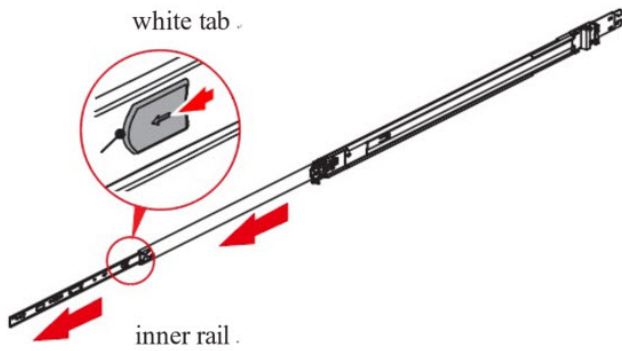
The rack may tilt and fall due to incorrect installation or placed on uneven grounds. Place the rack on a flat surface before you slide the system in for service.

Model	Compatible Rail Kit
TL-R6020Sep-RP	RAIL-H01

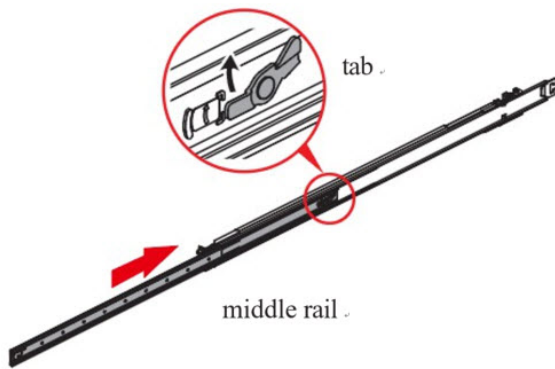
Length	Elongation Length	Available Cabinet Rack (without CMA)
932.8 mm	611.8 mm	1000 mm

1. Pull the inner rail out of the slide rail until it clicks.

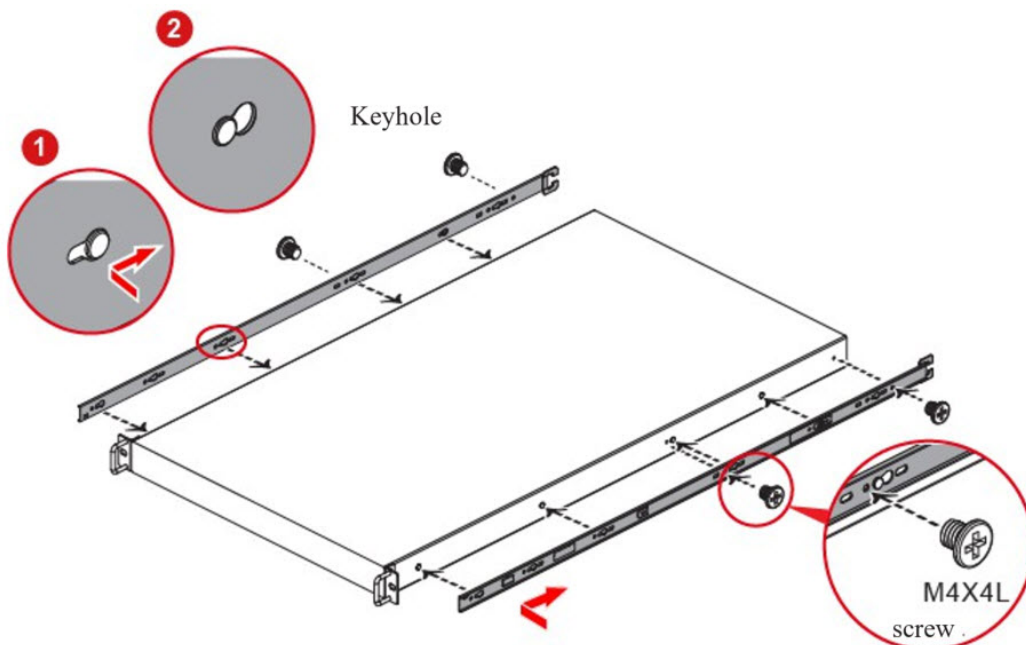
2. Pull the white tab forward to detach the inner rail from the slide rail.



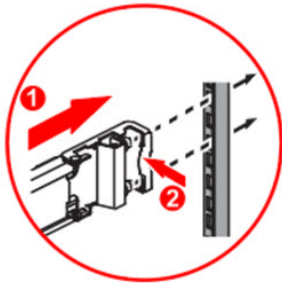
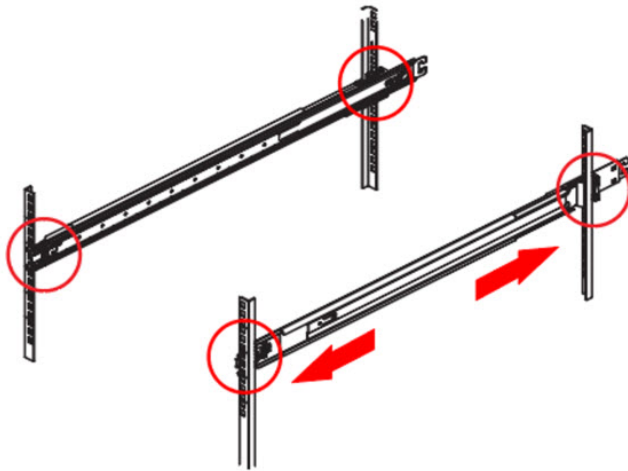
3. Push the middle rail back to its original position.



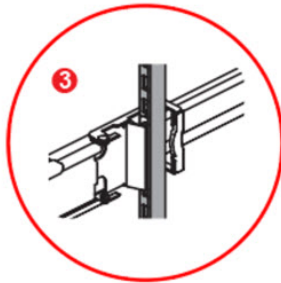
4. Install the inner rail on the system. Lock the keyholes and attach the screws on both sides of the system.



5. Install the outer rail bracket to the mounting frame. Attach the outer rail to the frame and press the bracket to form a rack on both ends.



Attach and press bracket.

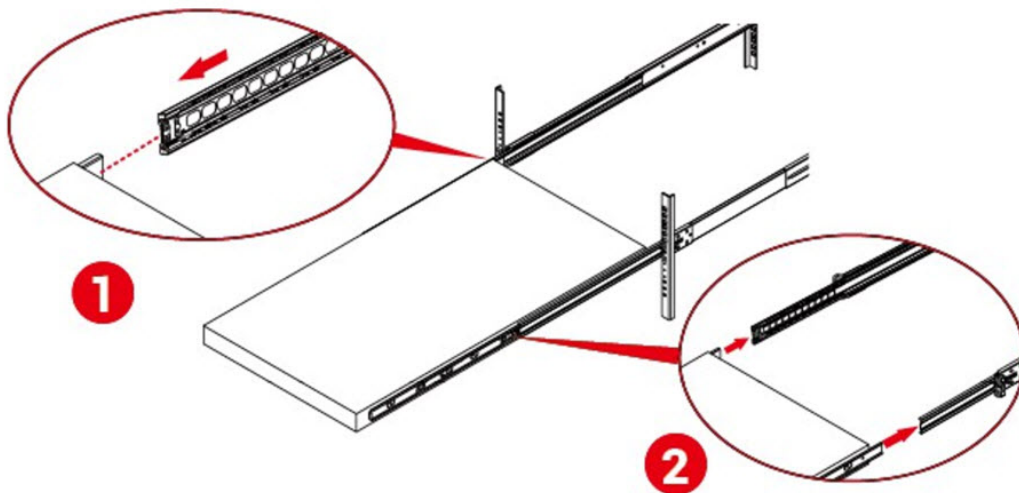


bracket secured.

6. Pull out the middle channel.

Note

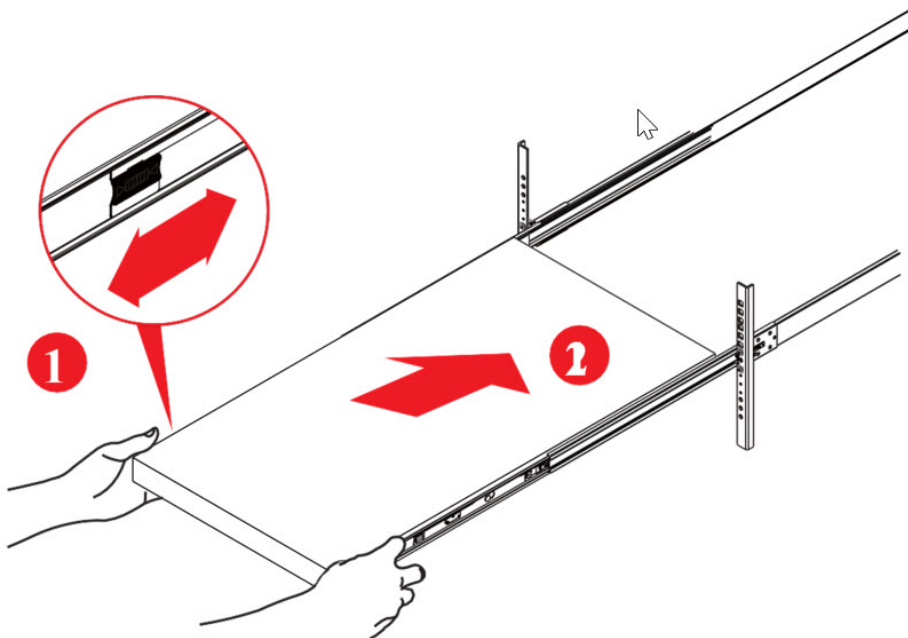
Make sure the ball bearing retainer is locked forward.



7. Push the release tab and slide the device into the rack.

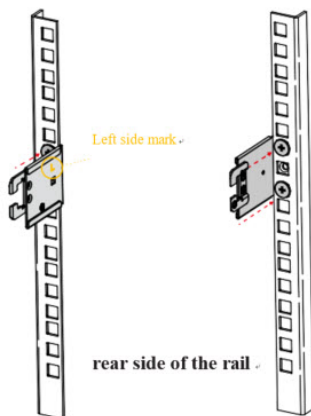
Note

Make sure the device is completely installed in the rack.

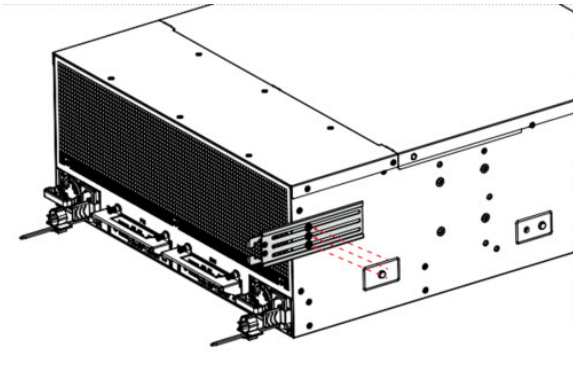


Installing the cable management kit (optional)

1. Attach the outer track bracket onto the rack frame and secure the screws.



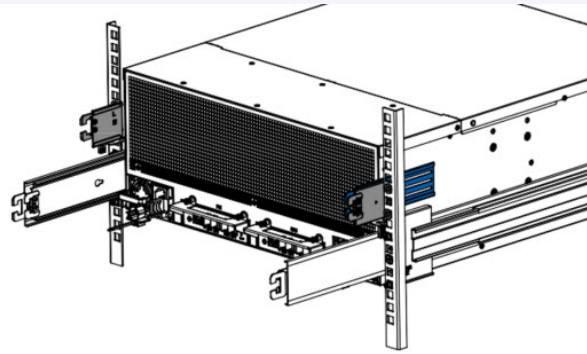
2. Attach the inner track bracket onto the rear side of the chassis and secure the screws.



3. Slide the chassis into the rack.

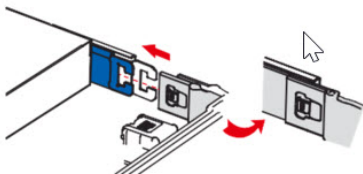
Note

Make sure the chassis is completely installed onto the rack.

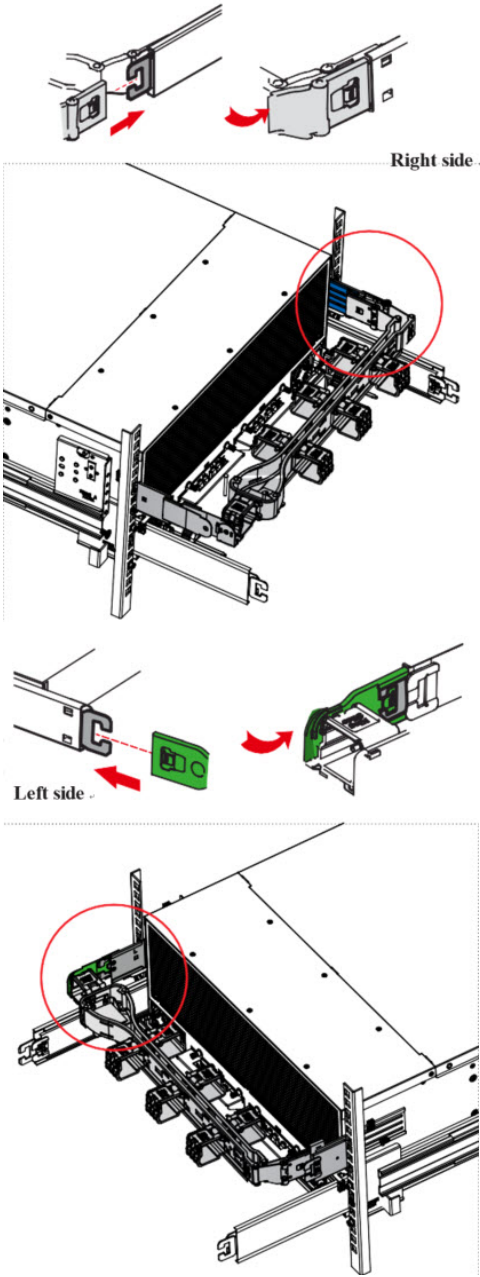


4. Insert the cable arms into the outer rail.

- a. Lock the inner member.



b. Lock the outer members.



4. Basic Operations

This chapter describes basic operations of the JBOD enclosure.

Power button

The TL-R6020Sep-RP will automatically wake up or stand by when users power on or off the NAS.

Operation	User Action	Result
Force power off	Press and hold the button for 3 seconds.	The device powers off. <div style="border: 1px solid #ccc; background-color: #f0f8ff; padding: 10px; margin-top: 10px;"> <p>Note</p> <ul style="list-style-type: none"> Use this method only when the device is unresponsive. </div>

LEDs

System Power LED

Status	Description
Blue	The device is powered on.
Off	The device is powered off.

Power Error LED

Status	Description
Red	A power supply error has occurred.
Off	The system power is normal.

Temperature LED

Status	Description
Red	The system has overheated.
Off	The system is operating under normal temperature.

Fan Error LED

Status	Description
Red	The system fan is not functioning.
Off	The system fan is functioning normally.

5. Troubleshooting

This chapter describes basic troubleshooting information.

Forcing Storage & Snapshots to recognize the JBOD enclosure

If Storage & Snapshots is unable to locate the JBOD enclosure during operation, the drives or data on the JBOD enclosure may be faulty.

1. Power off the NAS.
2. Disconnect the JBOD enclosure from the NAS.
3. Remove all drives from the JBOD enclosure.
4. Reconnect the JBOD enclosure to the NAS.
5. Power on the NAS.
6. Host-based power management will wake the JBOD enclosure.
7. Locate the JBOD enclosure using Storage & Snapshots.
8. Reinsert the drives.
9. Continue with operation.

Hot-swapping failed drives

When connected to a QuTS hero NAS, the JBOD enclosure supports hot-swapping drives in the following situations:

RAID Type	Number of Disks	Situation
QuTS hero		
RAID 1	2	One member drive fails.
RAID 5	≥ 3	One member drive fails.
RAID 6	≥ 4	One or two member drives fail.
RAID 10	≥ 4 (Must be an even number)	One or two member drives in two different pairs fail. <ul style="list-style-type: none"> • One member drive fails. • Two member drives in two different pairs fail.

RAID Type	Number of Disks	Situation
RAID 50	≥ 6	One disk per subgroup fails.
RAID 60	≥ 8	Two disks per subgroup fail.
Triple Mirror	Multiple of 3. (For example, 3, 6, 9, 12 disks and so forth.)	One or two member drives fail.
RAID-TP	≥ 5	One, two, or three member drives fail.

1. Log on to QuTS hero.
2. Go to **Main Menu > Storage & Snapshots > Storage > Disks/VJBOD**.
3. Locate the failed drive.
4. Prepare a new drive with a capacity that is the same as or larger than the failed drive.
5. Remove the failed drive from the JBOD enclosure.
6. Wait for 30 seconds or until the JBOD enclosure 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 JBOD enclosure beeps twice.
10. Wait for 30 seconds or until the JBOD enclosure beeps twice.
11. Go to **Main Menu > Storage & Snapshots > Storage > Storage/Snapshots**.
12. Locate the storage pool that contains the new drive and then verify that the status is `Rebuilding`.

Support and other resources

QNAP provides the following resources:

Resource	URL
Documentation	https://download.qnap.com
Compatibility List	https://www.qnap.com/compatibility
NAS Migration Compatibility	https://www.qnap.com/go/nas-migration
Expansion Unit Compatibility	https://www.qnap.com/go/compatibility-expansion

Resource	URL
Service Portal	https://service.qnap.com
Product Support Status	https://www.qnap.com/go/product/eol.php
Downloads	https://download.qnap.com
QNAP Community	https://community.qnap.com
QNAP Accessories Store	https://shop.qnap.com

6. Glossary

QuTS hero

QNAP NAS operating system featuring ZFS file system

Storage & Snapshots

QuTS hero utility that allows you to view and configure QNAP JBOD enclosures connected to a QNAP NAS

7. Notices

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Version 3, 29 June 2007

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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
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。						