



QNAP

JBOD Enclosure

**TL-R1220Sep-RP
TL-R1620Sep-RP**

User Guide

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1. Preface

About This Guide

This guide provides information on the QNAP TL-R1220Sep-RP and TL-R1620Sep-RP SAS JBOD enclosures and step-by-step instructions on installing the hardware. It also provides instructions on basic operations and troubleshooting information.

Audience

This document is intended for consumers and storage administrators. This guide assumes that the user has a basic understanding of storage and backup concepts.

Document Conventions

Symbol	Description
	Notes provide default configuration settings and other supplementary information.
	Important notes provide information on required configuration settings and other critical information.
	Tips provide recommendations or alternative methods of performing tasks or configuring settings.
	Warnings provide information that, when ignored, may result in potential loss, injury, or even death.

2. Product Overview

This chapter provides basic information about the QNAP JBOD Expansion Unit JBOD enclosure.

About QNAP JBOD Enclosures

QNAP JBOD enclosures are designed to increase the capacity and utility of your NAS or computer, providing a wide range of storage applications. You can manage installed drives independently or configure them as software RAID groups using the host device. The TL-R1220Sep-RP and TL-R1620Sep-RP feature twelve and sixteen 3.5-inch SATA/SAS 12 Gbps drive bays with four SFF-8644 ports.

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>.

Component	TL-R1220Sep-RP	TL-R1620Sep-RP
Storage		
Drive bays	<ul style="list-style-type: none"> • 12 x 3.5-inch SAS 12 Gbps • 12 x 3.5-inch SAS 6 Gbps • 12 x 3.5-inch SATA 6 Gbps 	<ul style="list-style-type: none"> • 16 x 3.5-inch SAS 12 Gbps • 16 x 3.5-inch SAS 6 Gbps • 16 x 3.5-inch SATA 6 Gbps
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 2.5-inch bays: <ul style="list-style-type: none"> • 2.5-inch SATA hard disk drives • 2.5-inch SAS hard disk drives • 2.5-inch SATA solid-state drives 	
Hot-swapping	Supported	
External I/O Ports & Expansion Slots		
SFF ports	4 x SFF-8644	
Interface		
Buttons	Power	

Component	TL-R1220Sep-RP	TL-R1620Sep-RP
Dimensions		
Form factor	2U Rackmount	3U Rackmount
Dimensions (H x W x D)	88.65 x 482.2 x 423.8 mm (3.49 x 18.98 x 16.68 in)	131.3 x 482.2 x 425.3 mm (5.17 x 18.98 x 16.74 in)
Net weight	9.19 kg (20.26 lbs)	11.48 kg (25.30 lbs)
Others		
Rail compatibility	Rail-B02  Note <ul style="list-style-type: none"> 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. 	
Power supply unit	2 x 300W, 100-240V AC, 50/60 Hz	2 x 550W, 100-240V AC, 50/60 Hz
Sound level	33.9 dB(A)	36 dB(A)
Fans	2 x 80 mm, 12V DC fan	3 x 80 mm, 12V DC fan
Operating temperature	<ul style="list-style-type: none"> Non-condensing relative humidity: 5% to 95% Wet-bulb temperature: 27°C (80.6°F) 	

**Tip**

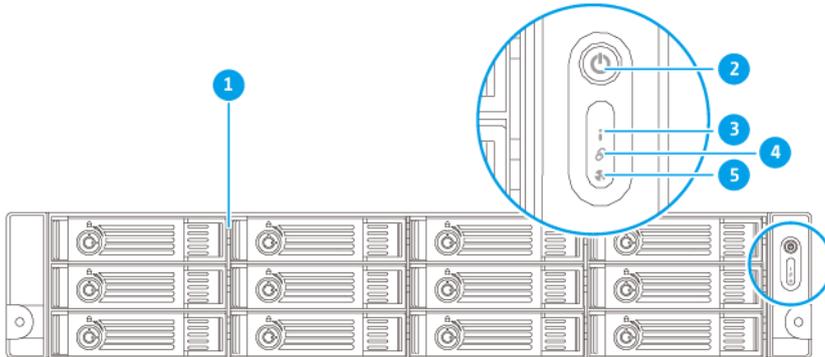
For the list of compatible drive models, go to <https://www.qnap.com/compatibility>.

Package Contents

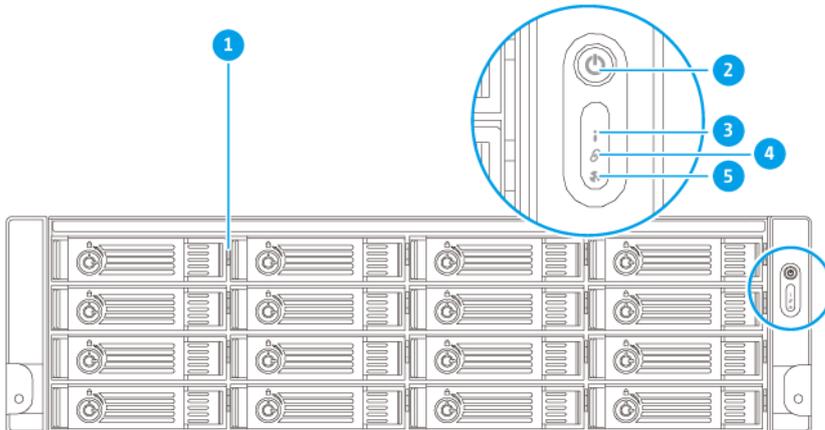
Item	Quantity
JBOD enclosure	1
Power cord	1
SF-8644 connector cable	1
Screws for 3.5-inch drives	<ul style="list-style-type: none"> TL-R1220Sep-RP: 48 TL-R1620Sep-RP: 64
Screws for 2.5-inch drives	<ul style="list-style-type: none"> TL-R1220Sep-RP: 36 TL-R1620Sep-RP: 48
Quick Installation Guide (QIG)	1

Components

Front Panel



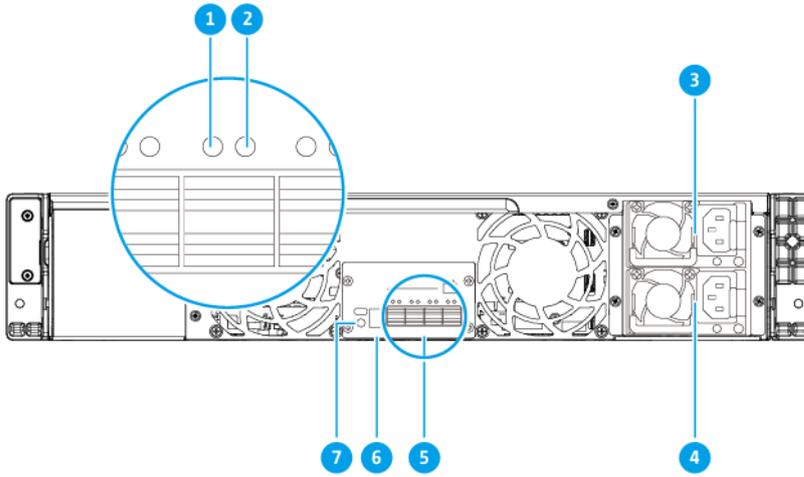
TL-R1220Sep-RP



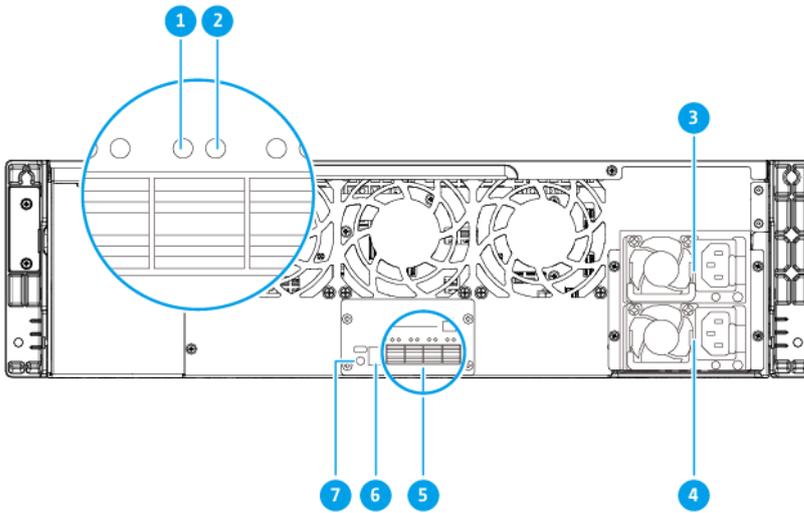
TL-R1620Sep-RP

No.	Component	No.	Component
1	Drive LEDs	4	Link LED
2	Power button	5	Fan error LED
3	Status LED	-	-

Rear Panel



TL-R1220Sep-RP



TL-R1620Sep-RP

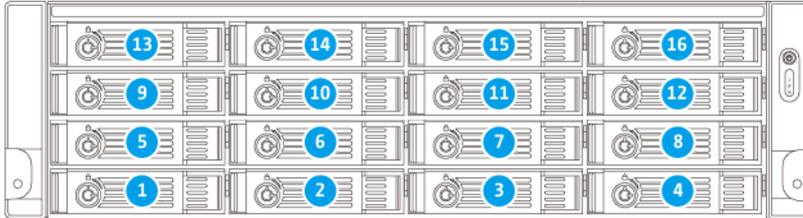
No.	Component	No.	Component
1	SAS access LED	5	SFF-8644 ports

No.	Component	No.	Component
2	SAS link LED	6	Enclosure ID <div style="border-left: 1px solid blue; padding-left: 5px; margin-left: 10px;">  Note When the JBOD connects to the OS, the device assigns the JBOD a number. After 9, the number becomes assigned a letter in alphabetical order: A, b, c, d, E, F, g. </div>
3	Power port 1	7	3.5 mm line-out jack <div style="border-left: 1px solid blue; padding-left: 5px; margin-left: 10px;">  Note This port is for engineering purposes only. </div>
4	Power port 2	-	-

Drive Numbering



TL-R1220Sep-RP



TL-R1620Sep-RP

Safety Information

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

General Instructions

- The device should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.
- Only qualified, skilled, and authorized persons with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the device.
- To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.
- Observe electrostatic discharge (ESD) procedures to avoid potential injury or damage to components.

Power

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



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

System Battery

- To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.

- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

Moving Parts

-



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

-



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

Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> • 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 administrators 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"> • NAS or computer • Storage drives <p> Tip For the list of compatible drive models, go to https://www.qnap.com/compatibility.</p> <ul style="list-style-type: none"> • One or more SF-8644 connector cables • Host bus adapter <p> Important The QXP-820S-B3408, QXP-1620S-B3616W, and SAS-12G2E host bus adapters are required for connecting the JBOD enclosure to a host device. Third-party host bus adapters may not be compatible with QNAP JBOD enclosures.</p>
Tools	<ul style="list-style-type: none"> • Phillips #1 or #2 screwdriver • Anti-static wrist strap

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 [Rail Kits](#).
3. Install the drives.
For details, see the following topics:
 - [Installing 3.5-inch Hard Drives on 3.5-inch Trays](#)
 - [Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays](#)
4. Connect the power cord.
5. Connect the JBOD enclosure to your NAS or server.
For details, see the following topics:
 - [Connecting the JBOD Enclosure to a NAS](#)
 - [Connecting the JBOD Enclosure to a Server](#)
6. Power on the JBOD enclosure.

3. Hardware Installation

This section provides information on installing drives, connecting the JBOD enclosure to a NAS or a server, network configurations, and hot-swapping redundant power supply units.

Installing Drives

QNAP JBOD enclosures are compatible with 3.5-inch hard drives, 2.5-inch hard drives, and 2.5-inch solid-state drives.

Installing 3.5-inch Hard Drives on 3.5-inch Trays



Warning

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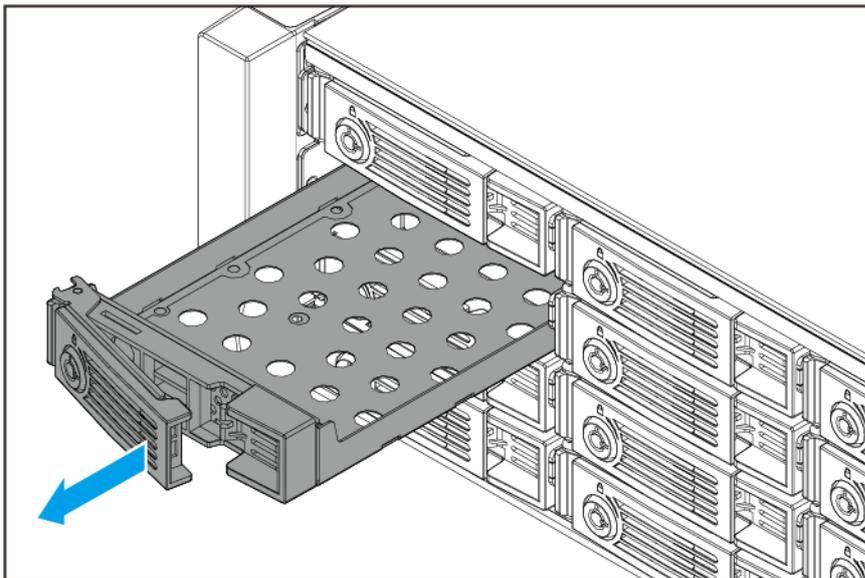
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

-



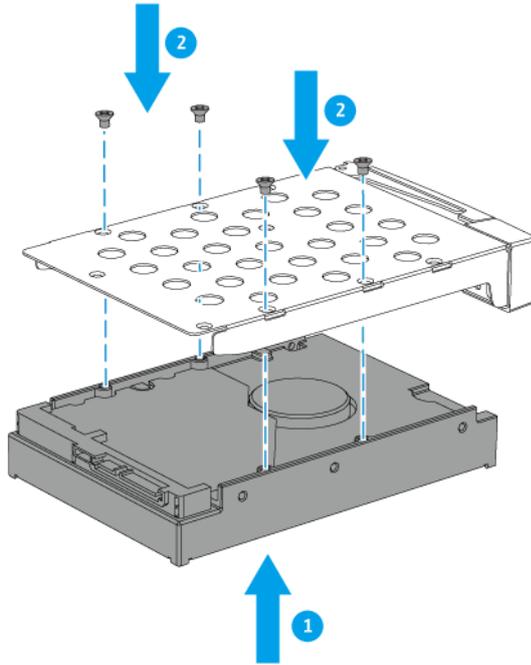
Other moving components: Keep your hands and other body parts away from other moving components.

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

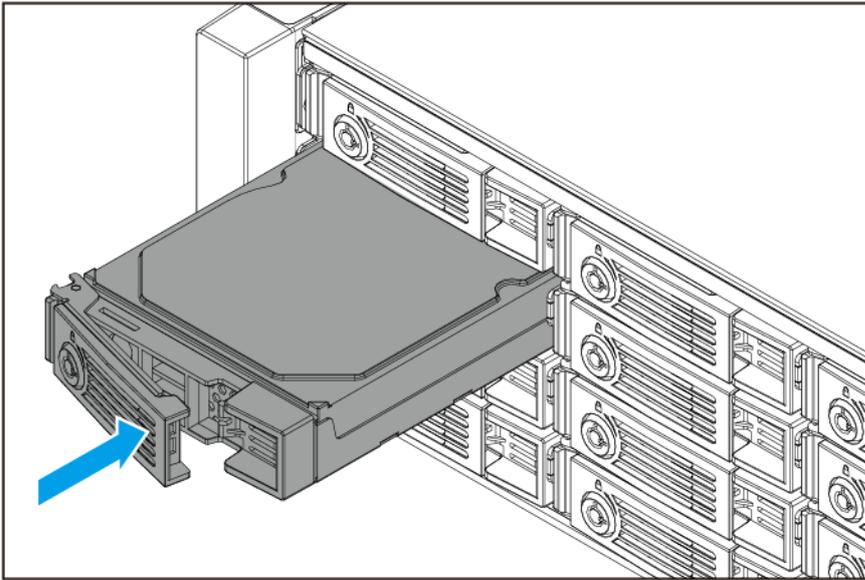


3. Install a drive on the tray.

- 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.

**4. Load the tray into the bay.**

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



5. Power on the JBOD enclosure.



Note

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

Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays



Warning

-



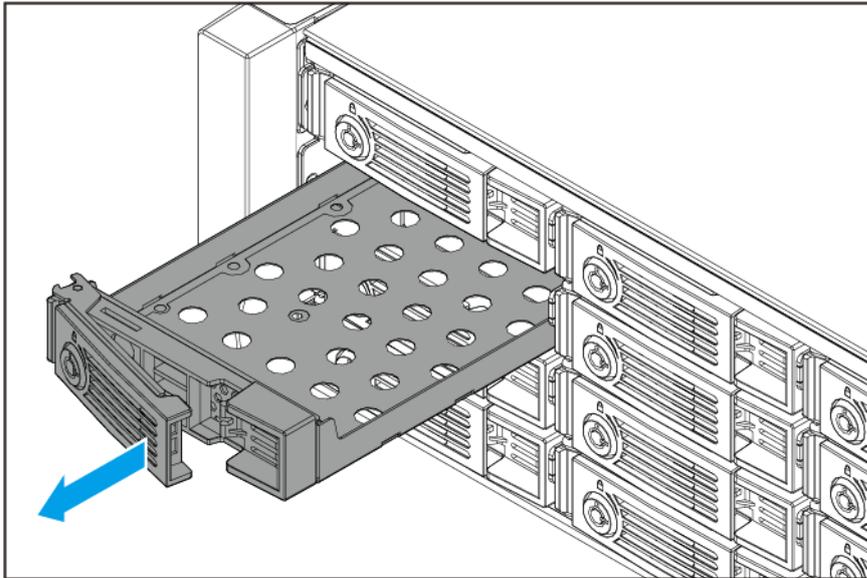
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

-



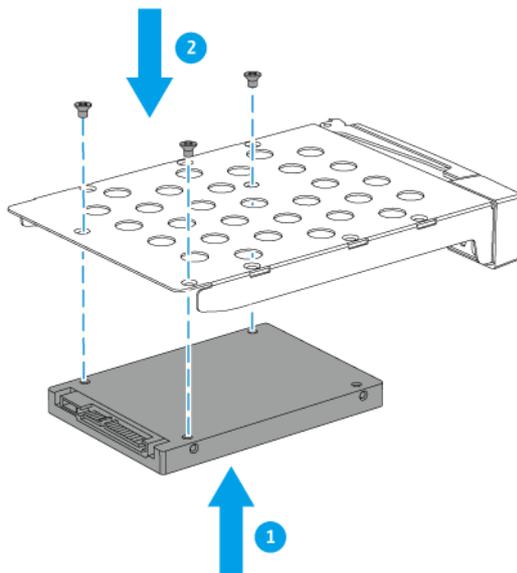
Other moving components: Keep your hands and other body parts away from other moving components.

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



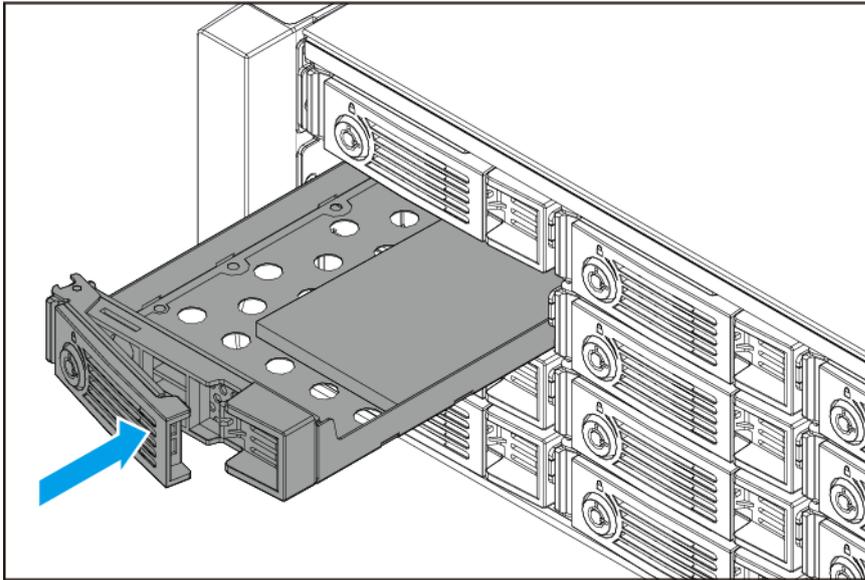
3. Install a drive on the tray.

- 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.



4. Load the tray into the bay.

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



5. Power on the JBOD enclosure.



Note

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

Connecting the JBOD Enclosure to a NAS

QTS can support a maximum of eight JBOD enclosures.

The NAS must run QuTS hero h4.5.1 or QTS 4.5.1 (or later versions).

1. Power off the NAS.
2. Power off the JBOD enclosure.
3. Connect the JBOD enclosure to the NAS.
 - a. Connect one or more SFF-8644 connector cables to the SFF-8644 ports on the JBOD enclosure.
 - b. Connect one or more SFF-8644 connector cables to the SFF-8644 ports on the host bus adapter installed on the NAS.



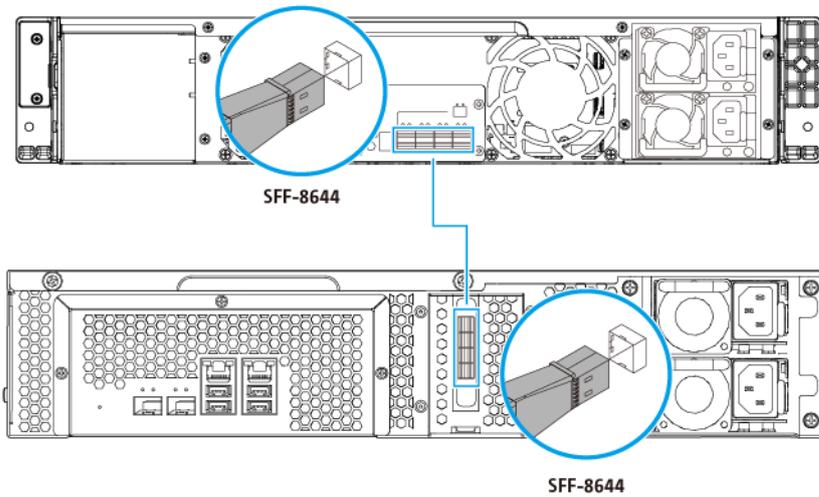
Note

- Refer to the hardware installation section of the NAS user guide for instructions on installing expansion cards.
- The recommended maximum length of the SFF cable is 1 meter. Using a longer cable may degrade the signal or performance.

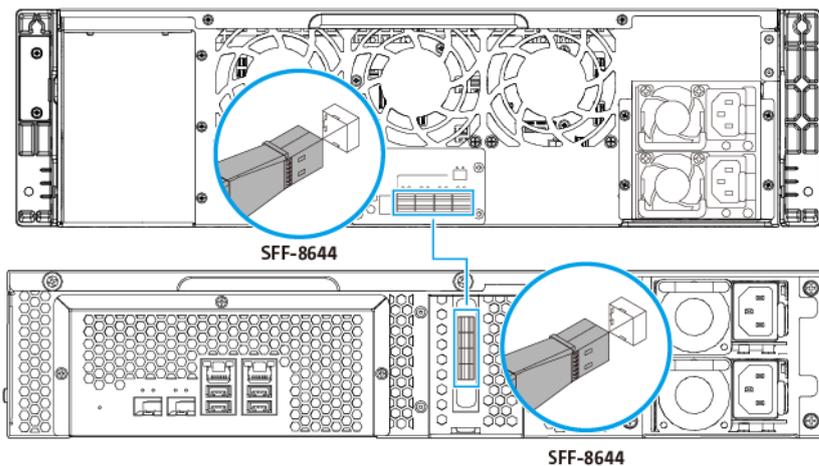


Important

The QNAP QXP-820S-B3408, QXP-1620S-B3616W, and SAS-12G2E host bus adapters are required for connecting the JBOD enclosure to a host device.



TL-R1220Sep-RP



TL-R1620Sep-RP

4. Power on the JBOD enclosures.
5. Power on the NAS.
6. Verify that the JBOD enclosures are recognized by the NAS.
 - a. Log on to QTS as 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 enclosure and the installed drives.

Connecting the JBOD Enclosure to a Server

A Windows or Linux server does not limit the number of JBOD enclosures it can support.

1. Power off the server.
2. Power off the JBOD enclosure.
3. Connect the JBOD enclosure to a server.
 - a. Connect one or more SFF-8644 connector cables to the SFF-8644 ports on the JBOD enclosure.
 - b. Connect one or more SFF-8644 connector cables to the SFF-8644 ports on the host bus adapter installed on the NAS.



Note

- Refer to the hardware installation section of the NAS user guide for instructions on installing expansion cards.
- The recommended maximum length of the SFF cable is 1 meter. Using a longer cable may degrade the signal or performance.



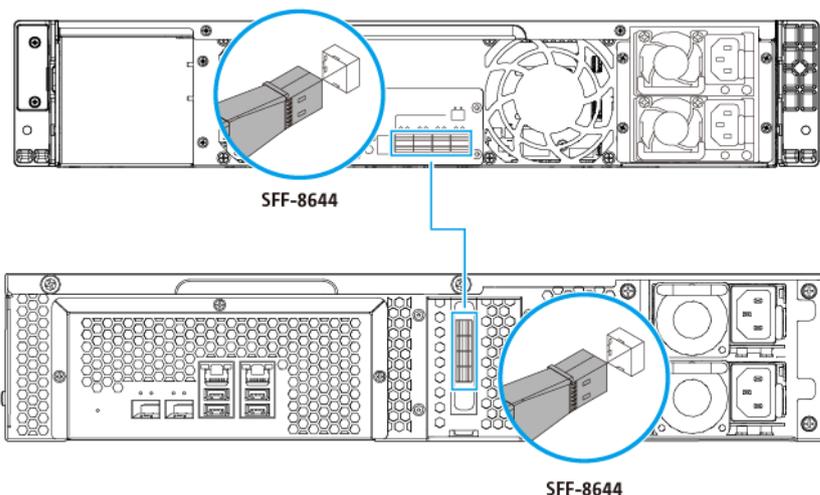
Important

The QNAP QXP-820S-B3408, QXP-1620S-B3616W, and SAS-12G2E host bus adapters are required for connecting the JBOD enclosure to a host device.

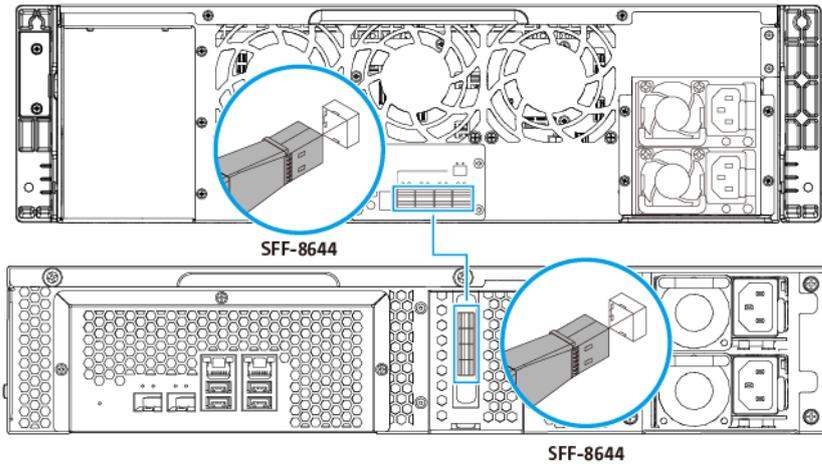


Note

Third-party host bus adapters are compatible with QNAP JBOD enclosures. For details, go to <https://www.qnap.com/en/compatibility/>.



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- c. Connect additional JBOD enclosures to the server.
4. Power on the JBOD enclosures.
5. Power on the server.
6. Verify that the JBOD enclosure is recognized by the server.
 - a. Go to your server's disk management utility or open QNAP External RAID Manager in Windows or Linux.



Note

To download QNAP JBOD Manager, go to <https://download.qnap.com>.

- b. Verify that the JBOD enclosure is listed.

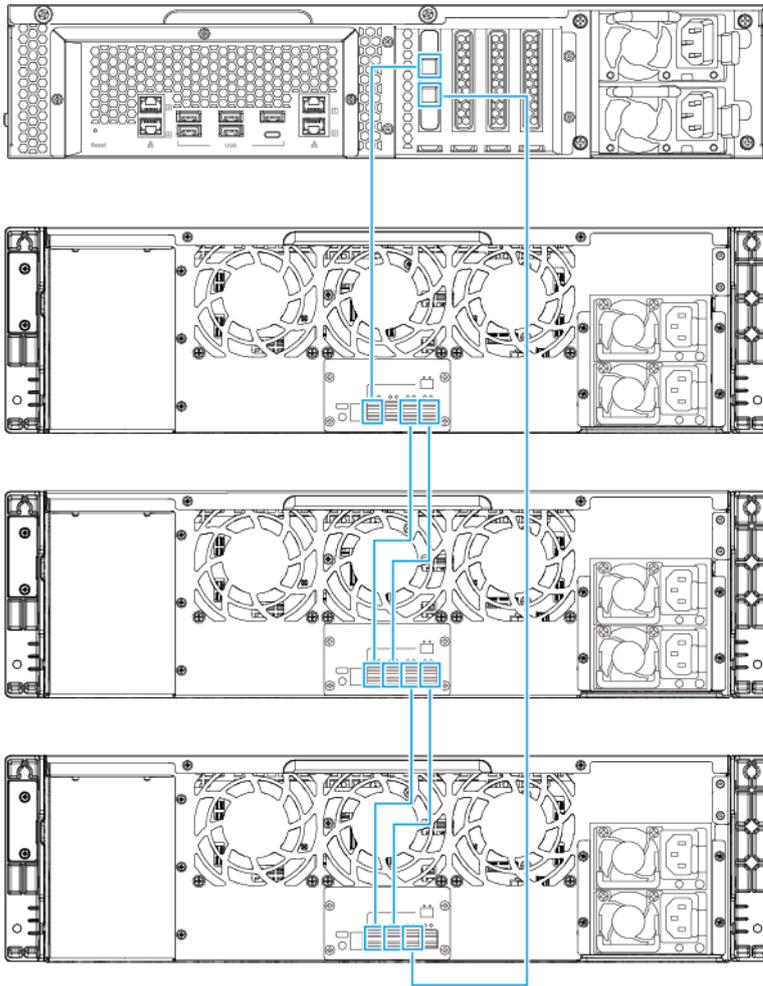
Network Configuration

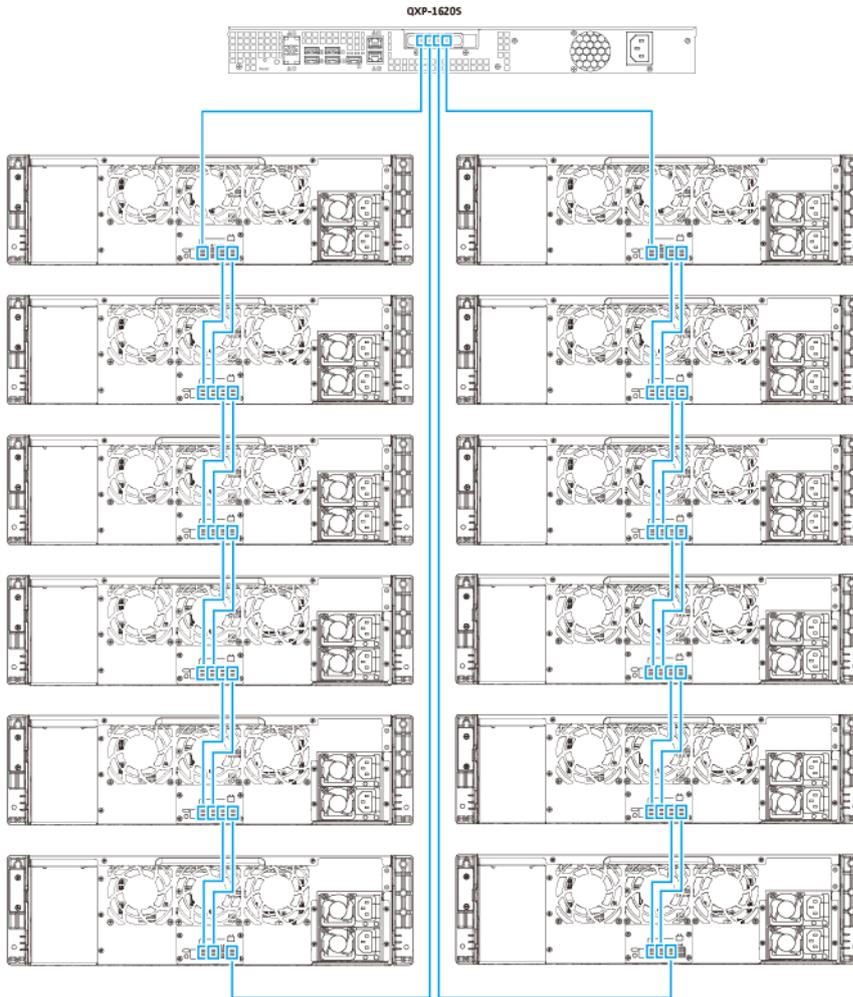
This chapter provides information on the multiple network configurations for the QNAP JBOD enclosure.

Network Configuration for Multipath I/O

Multipath I/O (MPIO) is a fault-tolerance technique where more than one physical network path is created between a server and a storage device such as a NAS. If any one network path goes down due to the failure of a switch, cable, or network card, the server can route I/O through the remaining network paths with no storage downtime. Deploying multipath I/O achieves higher availability.

The following diagrams are examples of how the multipath I/O should be implemented:

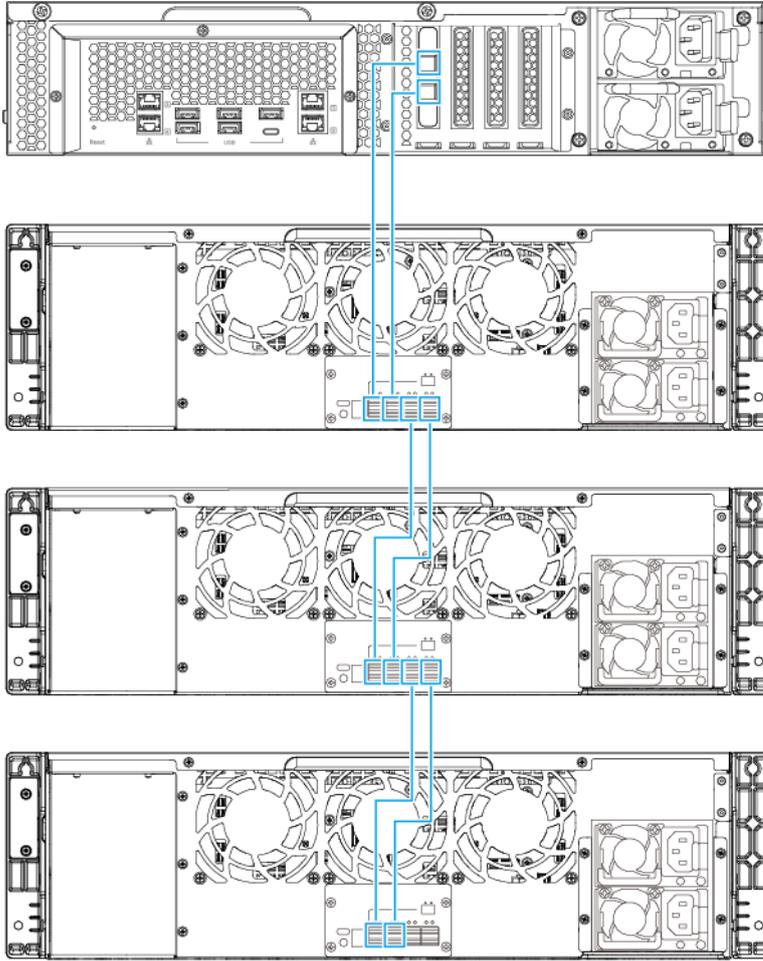


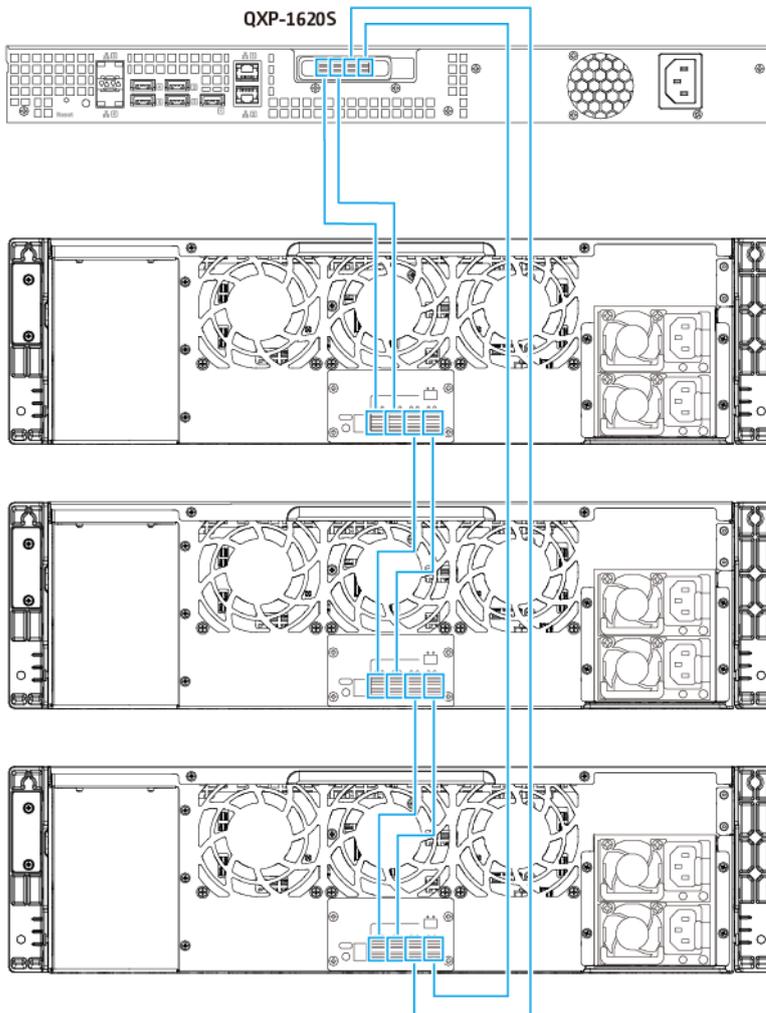


Network Configuration for Link Aggregation Control Protocol

Link Aggregation Control Protocol (LACP) is a fault-tolerance technique where several physical ports are combined together to form a single channel. Using link aggregation provides fast and transparent recovery if one port fails as all I/O traffic continues to operate until all physical ports fail. Deploying link aggregation achieves better network performance.

The following diagrams are examples of how the multipath I/O should be implemented:

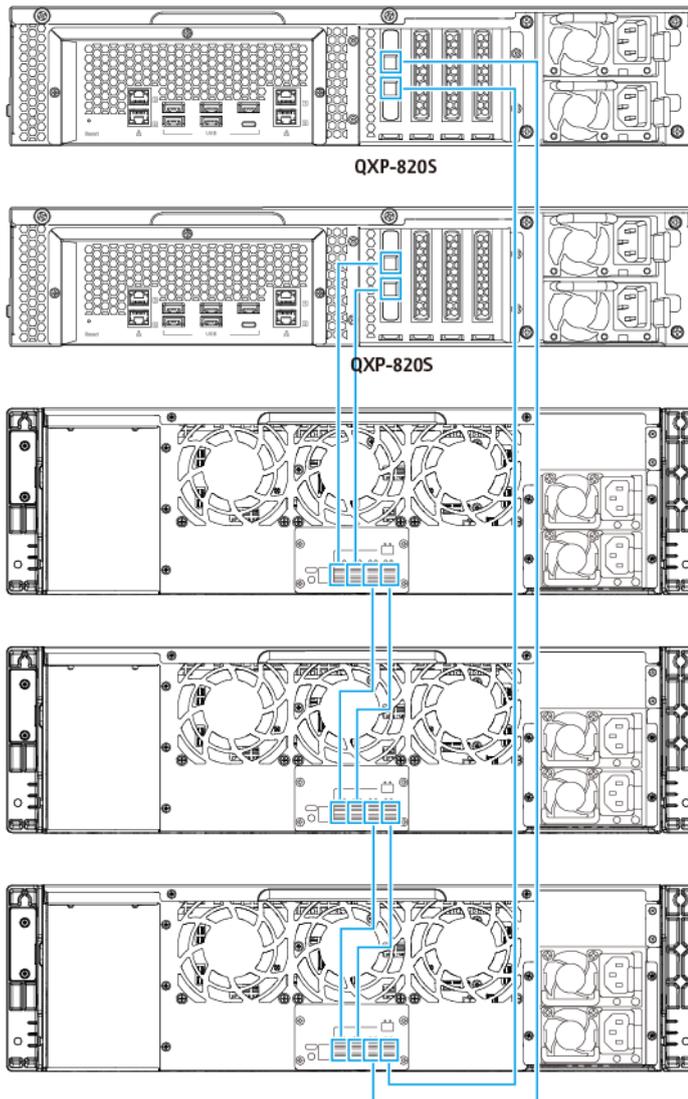




Network Configuration for Multipath I/O and Link Aggregation Control Protocol

Multipath I/O and link aggregation are two different technologies that complement each other. They can be deployed together to achieve the combined benefits of network availability and network performance.

The following diagram is an example of how the multipath I/O and link aggregation should be implemented:



Hot-Swapping Redundant Power Supply Units

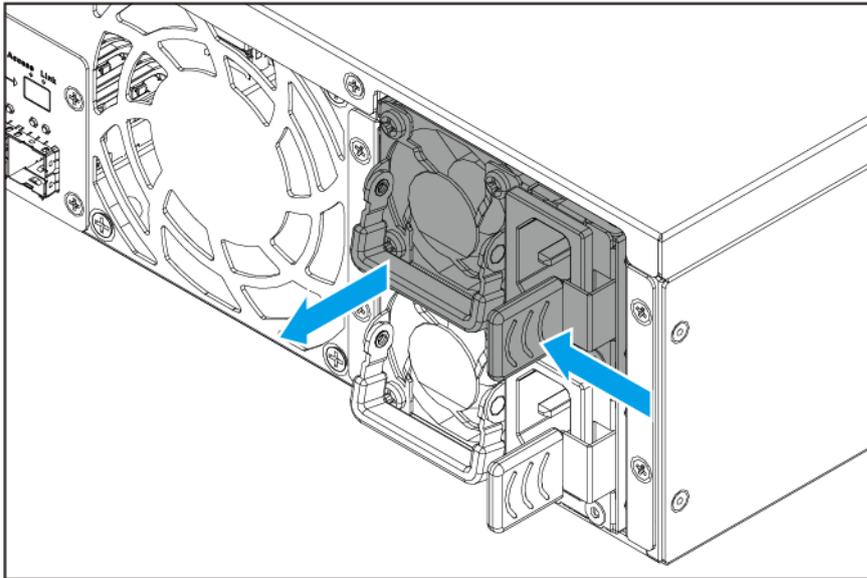


Warning

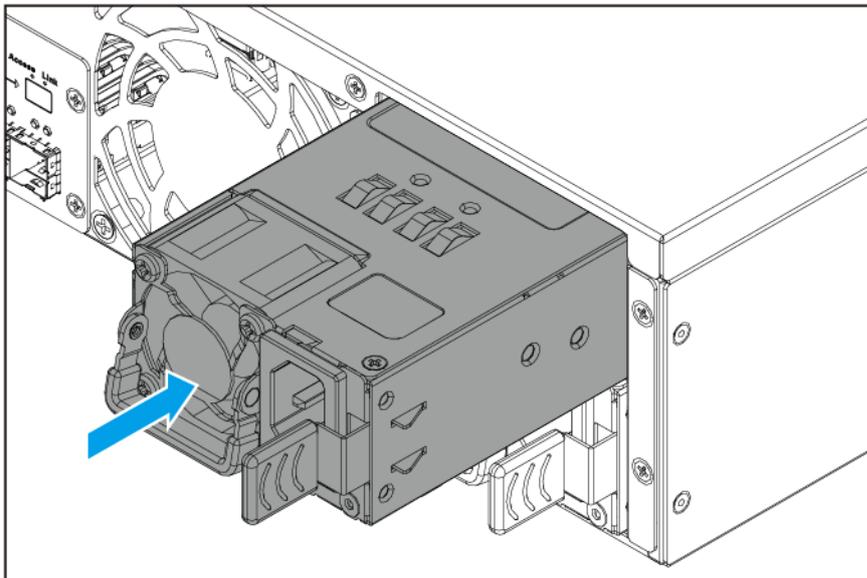


The NAS may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords before installing or replacing system components.

1. Power off the JBOD.
2. Disconnect the power cord from the electrical outlet and the PSU that you are replacing.
3. Firmly press the latch toward the handle and then pull the PSU out.



4. Insert the new PSU.



5. Connect the power cord to the PSU and the electrical outlet.

6. Power on the JBOD.

7. Enable alerts for PSU failures.

a. Log on to QTS as administrator.

b. Go to **Control Panel > System > Hardware > General** .

c. Select **Enable Redundant Power Supply Mode**.

d. Click **Apply**.

Rail Kits

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

Model	Compatible Rail Kit
TL-R1220Sep-RP	RAIL-B02
TL-R1620Sep-RP	

You can find installation information in the rail kit package.

4. Basic Operations

This chapter describes basic operations of the JBOD enclosure.

Power Button

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

LEDs

LED	Status	Description
System Status	Flashes green and red alternately every 0.5 seconds	<ul style="list-style-type: none"> The drive is being formatted. The JBOD is being initialized. The operating system is being updated. RAID rebuilding is in progress. Online RAID Capacity Expansion is in progress. Online RAID Level Migration is in progress.
	Red	<ul style="list-style-type: none"> The drive is invalid. The disk volume has reached its full capacity. The disk volume is about to reach its full capacity. The system fan is not functioning. An error occurred when accessing (read/write) the data. A bad sector is detected on the hard drive. The NAS is in degraded read-only mode (two member drives failed in RAID 5 or RAID 6 but the data can still be read). A hardware self-test error occurred. The system temperature is over 65°C. One or more power supply units are abnormal.
	Flashes red every 2 seconds	The JBOD is in degraded mode (one member drive failed in RAID 1, RAID 5, RAID 6).
	Flashes red once	The JBOD received a command from a remote control.
	Flashes green every 2 seconds	<ul style="list-style-type: none"> The JBOD is not configured. A drive is not formatted.
	Green	The JBOD is ready.
Off	<ul style="list-style-type: none"> All drives are in standby mode. The JBOD is turned off. 	

LED	Status	Description
Drive	Green	<ul style="list-style-type: none"> The JBOD enclosure is powered on. The drive can be accessed.
	Flashes green	The drive is being accessed.
	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 is detected.
Link	Green	The connected ports are fully connected.
	Off	No cable is connected.
SAS connector link	Green	The device is fully connected.
	Orange	The device is not fully connected.
	Off	<ul style="list-style-type: none"> The device is not connected. The device has no cable connection.
SAS connector access	Blue	Data is being accessed.
	Off	<ul style="list-style-type: none"> Data is not being accessed. No drive is linked.
Fan error	Red	The system fan is not functioning.
	Off	The system fan is functioning normally.

Audio Alert

Duration	Frequency	Description
Short beep (0.5 seconds)	1	<ul style="list-style-type: none"> The JBOD drive tray link is connected. The JBOD drive tray link is disconnected.
Long beep (2 seconds)	3 (every 5 minutes)	<ul style="list-style-type: none"> The system fan is not functioning. The system temperature is over the threshold. <p> Note The default temperature warning threshold is 65°C. You can set the threshold to a temperature between 55°C and 69°C using QNAP JBOD Manager.</p>

5. Troubleshooting

This chapter describes basic troubleshooting information.

Forcing Storage & Snapshots or QNAP JBOD Manager to Recognize the JBOD Enclosure

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

1. Power off the JBOD enclosure.
2. Remove all drives.
3. Power on the JBOD enclosure.
4. Locate the JBOD enclosure using Storage & Snapshots or QNAP JBOD Manager.
5. Reinsert the drives.
6. Continue with operation.

Hot-swapping Failed Drives

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

RAID Type	Situation
RAID 1	One member drive fails.
RAID 5	One member drive fails.
RAID 6	One or two member drives fail.
RAID 10	One or two member drives in two different pairs fail.
RAID 50	One disk per subgroup fails.
RAID 60	Two disks per subgroup fail.

1. Log on to QTS.
2. Go to **Main Menu > Storage & Snapshots > Storage > External Storage** .
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 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 volume 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/en/nas-migration
Expansion Unit Compatibility	http://www.qnap.com/go/compatibility-expansion
Service Portal	https://service.qnap.com
Product Support Status	https://www.qnap.com/product/eol.php
Downloads	https://download.qnap.com
Community Forum	https://forum.qnap.com
QNAP Accessories Store	https://shop.qnap.com

6. Glossary

QNAP JBOD Manager

Software utility for Windows, Linux, and macOS that allows you to view and configure QNAP JBOD enclosures

QTS

QNAP NAS operating system

QuTS hero

QNAP NAS operating system featuring ZFS file system

Storage & Snapshots

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

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Version 3, 29 June 2007

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FCC Class A Notice



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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。						