QNAP

TL-R1220Sep-RP
TL-R1620Sep-RP

12/16-bay 12Gb/s SAS expander JBOD
for Windows Server and NAS capacity expansion
Multipurpose enterprise SAS 12Gb/s expander JBOD: for Windows/ Linux server and NAS capacity expansion support (QTS / QuTS hero )

- 4 x SAS 12Gb/s SFF-8644 wide ports
- QNAP JBOD Manager utility for Windows – status monitoring
- Command line interface (CLI) - flexible usage
- Up to sixteen TL-R1620Sep-RP can be connected

Flexible daisy chaining modes – performance and security
SAS full-duplex 12Gb/s Mini-SAS HD SFF-8644 for max 48Gb/s performance

<table>
<thead>
<tr>
<th>Single-cable bandwidth</th>
<th>Cable</th>
<th>QNAP P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS 12Gb/s</td>
<td>SAS 12Gb/s SFF-8644 Mini-SAS HD cable</td>
<td>CAB-SAS05M-8644</td>
</tr>
<tr>
<td>4 x 12Gb/s</td>
<td></td>
<td>CAB-SAS10M-8644</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CAB-SAS20M-8644</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CAB-SAS30M-8644</td>
</tr>
<tr>
<td>4 x 6Gb/s</td>
<td></td>
<td>CAB-SAS10M-8088</td>
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<td></td>
<td></td>
<td>CAB-SAS20M-8088</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CAB-SAS30M-8088</td>
</tr>
<tr>
<td>USB 3.2 Gen 2x2</td>
<td>USB 3.2 Gen 1 cable (5Gb/s)</td>
<td>Type A to C:</td>
</tr>
<tr>
<td>20Gb/s</td>
<td></td>
<td>CAB-U35G02MAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CAB-U35G10MAC</td>
</tr>
<tr>
<td>USB 3.2 Gen 2</td>
<td>USB 3.2 Gen 2 cable (10Gb/s)</td>
<td>Type A to C:</td>
</tr>
<tr>
<td>10Gb/s</td>
<td></td>
<td>CAB-U310G10MAC</td>
</tr>
<tr>
<td>SATA / eSATA</td>
<td></td>
<td>Type C to C:</td>
</tr>
<tr>
<td>6Gb/s</td>
<td></td>
<td>CAB-U310G10MCC</td>
</tr>
<tr>
<td>USB 3.2 Gen 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5Gb/s</td>
<td></td>
<td></td>
</tr>
</tbody>
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<td></td>
</tr>
<tr>
<td>SAS 6Gb/s</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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<td></td>
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<td>USB 3.2 Gen 2x2</td>
<td>USB 3.2 Gen 1 cable (5Gb/s)</td>
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<td></td>
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<td>USB 3.2 Gen 2 cable (10Gb/s)</td>
<td>Type A to C:</td>
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<td>USB 3.2 Gen 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5Gb/s</td>
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</table>
Higher reliability, faster performance, and better availability for SAS drives

<table>
<thead>
<tr>
<th></th>
<th>SAS SSD</th>
<th>SAS HDD</th>
<th>SATA SSD</th>
<th>SATA HDD</th>
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<tbody>
<tr>
<td>Price per TB</td>
<td>$$$$</td>
<td>$$$</td>
<td>$$</td>
<td>$</td>
</tr>
<tr>
<td>RPM</td>
<td>---</td>
<td>Up to 15,000</td>
<td>---</td>
<td>Up to 7,200</td>
</tr>
<tr>
<td>Capacity</td>
<td>Up to 15.36 TB</td>
<td>Up to 18 TB</td>
<td>Up to 4 TB</td>
<td>Up to 18 TB</td>
</tr>
<tr>
<td>MTBF</td>
<td>2.5 M hours</td>
<td>2.5 M hours</td>
<td>2 M hours</td>
<td>1.2 M hours</td>
</tr>
<tr>
<td>Workload</td>
<td>Process-intensive</td>
<td>Process-intensive</td>
<td>Light to normal</td>
<td>Light to normal</td>
</tr>
<tr>
<td>Speed</td>
<td>12 Gb/s</td>
<td>12 Gb/s</td>
<td>6 Gb/s</td>
<td>6 Gb/s</td>
</tr>
<tr>
<td>Latency</td>
<td>Lowest</td>
<td>Lower</td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>Dual-port</td>
<td>Supported</td>
<td>Supported</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
New generation of 12-bay & 16-bay SAS 12Gb/s JBOD Storage expansion

Built with a Broadcom® SAS expander, capable of connecting many drives with a single SAS cable and SAS JBOD enclosures to expand the NAS storage space.
TL-R1220Sep-RP/ TL-R1620Sep-RP
SAS JBOD front view

- Power Button
- Status
- Connection
- Fan Error
- Metal trays w/ lock
- Drive status
- Built-in warning buzzer
- 2 keys included
- 0.5-meter Mini-SAS HD cable included
Support 3.5-inch and 2.5-inch SAS & SATA HDD/ SSD

STEP 01

STEP 02
3.5-inch HDD  2.5-inch HDD/ SSD

STEP 03
TL-R1220Sep-RP/ TL-R1620Sep-RP
SAS JBOD rear view

8cm Smart Fan
TL-R1620Sep-RP: 3
TL-R1220Sep-RP: 2

Redundant power supplies
TL-R1620Sep-RP: 2 x 550W
TL-R1220Sep-RP: 2 x 300W

4 x 48Gb/s = 192Gb/s

4 x Mini-SAS HD
SFF-8644 SAS Wide-port

JBOD address indicator
(1~9, a~g*)

*QTS 4.5.2 / QuTS hero h4.5.2 will support displaying the a to g addresses.
Up to 192Gbps with 4 Mini-SAS HD ports for intensive workloads in business storage

**TL-R1220S-RP/ TL-R1620Sep-RP**

- Low power Broadcom SAS35x28R SAS Expander IC
- 12 or 16 x 12/6Gbps SAS/SATA HDD or SSD
- 4 x 12 Gb/s SAS 3.0 (x4 Lane) SFF-8644 SAS wide ports, each port maximum 48Gb/s, totaling 192Gbps

Install 1 or more SAS expansion PCIe cards in the NAS and aggregate two ports for connecting multiple TL SAS JBOD units with up to 96Gbps.
SAS DataBolt™ bandwidth optimizer technology aggregates bandwidth to provide 12Gb/s SAS performance to 6Gbs SSD/HDD

“DataBolt bandwidth optimizer technology aggregates bandwidth to provide 12Gb/s SAS performance to the host when using 6Gb/s and 3Gb/s SATA end devices, making it ideal for high-capacity and other storage applications.”
- Broadcom

Broadcom DataBolt™ technology aggregates the performance of two 6Gb/s HDD/SSD and passes the performance back along one 12Gb/s lane.

Note: The QNAP NAS requires QTS 4.5.1 / QuTS hero h4.5.1 (or later) with a PCIe SAS storage expansion card installed.
MiniSAS HD cable 48Gb/s connection, NAS support up to 16 SAS JBOD

*Actual numbers that a system can support depends on OS, cable and JBOD. Please refer to the specifications.
Install Broadcom SAS HBA or SAS RAID card on Windows Server

SFF 8644 to 8644 Mini-SAS HD SAS 12Gb/s cable

Ultra-high Performance (up to 192Gb/s)

Connect multiple TL SAS JBOD

• Maximum number of JBOD a single unit can support depends on OS
Windows Server paired with QNAP JBOD Manager
Widely support Broadcom SAS expansion card and QNAP TL JBOD

<table>
<thead>
<tr>
<th>Broadcom model</th>
<th>MegaRAID 9380-4i4e</th>
<th>SAS 9300-8e</th>
<th>SAS 9305-16e</th>
<th>SAS 9500-8e</th>
<th>MegaRAID 9580-8i8e</th>
<th>SAS 9400-8e</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAID support</td>
<td>0, 1, 5, 6, 10, 50, and 60</td>
<td>Non-RAID HBA</td>
<td>Non-RAID HBA</td>
<td>Non-RAID HBA</td>
<td>RAID 0, 1, 5, 6, 10, 50 and 60</td>
<td>Non-RAID HBA</td>
</tr>
<tr>
<td>Port</td>
<td>4 + 4 ports (1 x SFF-8644 1 x SFF-8643)</td>
<td>8 ports (2 x SFF-8644)</td>
<td>16 ports (4 x SFF-8644)</td>
<td>8 ports (2 x SFF-8644)</td>
<td>8 + 8 ports (2 x SFF-8644 2 x SFF-8643)</td>
<td>8 ports (2 x SFF-8644)</td>
</tr>
<tr>
<td>PCI Express</td>
<td>x8 PCI Express 3.0</td>
<td>x8 PCI Express 3.0</td>
<td>x8 PCI Express 3.0</td>
<td>x8 PCI Express 3.0</td>
<td>x8 PCI Express 4.0</td>
<td>x8 PCI Express 3.1</td>
</tr>
<tr>
<td>Manufacturer Information</td>
<td>Site URL</td>
<td>Site URL</td>
<td>Site URL</td>
<td>Site URL</td>
<td>Site URL</td>
<td>Site URL</td>
</tr>
</tbody>
</table>
Windows Server monitoring management tool: QNAP JBOD Manager

Device status

Get TL-R1220Sep-RP & TL-R1620Sep-RP information in real-time, including device health status, system temperature, system fan speed, connection status, Multipath I/O status and Zone configuration.
QNAP JBOD Manager support Drive-bay zoning setting - allows single JBOD to serve multiple servers

Zone Setting

SAS Zone setting can divide JBOD into multiple Zones and enable host servers to only access specific zone

Note:
(1) The utility can only divide the JBOD into 2 zones. For dividing into 4/8 zones, you need to configure the device via CLI
(2) H/W RAID cannot use zone setting

Host 1  Host 2
QNAP JBOD Manager Disk Information

Disk Information

Provide all disks' model, capacity, basic S.M.A.R.T information and allocation (Flashes for IT to distinguish)
QNAP JBOD Manager View Topology

Topology

It will automatically generate visual topology and let you stay on top of connected devices and status.

Note: This function can only support Broadcom SAS HBA. Broadcom RAID card cannot support topology due to its architecture.
Support VMware datastore
Significantly expand capacity

VMware datastore
Through Broadcom LSI SAS HBA, you can easily connect SAS JBOD with VMware server, and expand VMware capacity through VMFS type
You can connect your computer to the TL-R1220Sep-RP / TL-R1620Sep-RP via the console port, and use the command line interface (CLI) to configure the SAS JBOD (for example: set SAS Zoning to eight zones).

Note: A password is required to use the CLI. The default password is 00000000 (eight zeros).

<table>
<thead>
<tr>
<th>Nickname</th>
<th>[xxx]</th>
<th>Nickname : xxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route table read</td>
<td>rtr [d</td>
<td>z</td>
</tr>
<tr>
<td>Display info for all Phy</td>
<td>phyinfo [help</td>
<td>edfb</td>
</tr>
<tr>
<td>Display or reset all phy counters</td>
<td>counters [config</td>
<td>event</td>
</tr>
</tbody>
</table>
QNAP NAS

TL-R1220Sep-RP
TL-R1620Sep-RP

Expand QNAP NAS storage space
QNAP dual-port/quad-port SAS 12Gb/s expansion cards

Dual-port SAS 12Gb/s

QXP-820S-B3408
PCIe Gen3 x8

Quad-port SAS 12Gb/s

QXP-1620S-B3616W
PCIe Gen3 x16
## Dual/Quad-port SAS-3 12Gb/s expansion card specifications

<table>
<thead>
<tr>
<th></th>
<th>QXP-820S-B3408</th>
<th>QXP-1620S-B3616W</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAS Controller</strong></td>
<td>Broadcom SAS3408</td>
<td>Broadcom SAS3616W Tri-mode</td>
</tr>
<tr>
<td><strong>Drive interface</strong></td>
<td>12Gb/s SAS, 6Gb/s SATA up to 8.0 GT/s</td>
<td></td>
</tr>
<tr>
<td><strong>SAS bandwidth</strong></td>
<td>2 x external Mini-SAS HD</td>
<td>4 x external Mini-SAS HD</td>
</tr>
<tr>
<td><strong>Connector interface</strong></td>
<td>SFF-8644</td>
<td>SFF-8644</td>
</tr>
<tr>
<td><strong>Host PCIe band-width</strong></td>
<td>PCIe Gen 3 x8</td>
<td>PCIe Gen 3 x16</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>129.65 x 68.9 mm; Low-profile</td>
<td>149.65 x 68.9 mm; Low-profile</td>
</tr>
</tbody>
</table>

*SAS connector is a Wide-port, contain four SAS signals **Only been validated with passive cable, we offer different cable optional purchase selection of 0.5M/1M/2M/3M*
Low-profile design for various QNAP NAS models
QXP-820S-B3408

Additional brackets are included for various NAS models

129.65 mm

68.9 mm

Pre-installed half-height bracket

PCIe Gen 3 x8 bandwidth (64Gbps)
Low-profile design for various QNAP NAS models

QXP-1620S-B3616W

Additional brackets are included for various NAS models.

Pre-installed half-height bracket

PCle Gen 3 x16 bandwidth (128Gbps)

Dimensions:
- 149.65 mm
- 68.9 mm
Compatible with QNAP REXP SAS JBOD series

NAS supports connecting multiple TL and REXP SAS JBOD enclosures together

SAS 6Gb/s JBOD enclosures
- REXP-1210U-RP
- REXP-1610U-RP

SAS 12Gb/s JBOD enclosures
- REXP-1220U-RP
- REXP-1620U-RP
Comparing the QNAP SAS JBOD generations

<table>
<thead>
<tr>
<th>Model</th>
<th># of bays</th>
<th>Drive interface</th>
<th>SAS ports</th>
<th>Dimension (HxWxD)</th>
<th>Key-lock tray</th>
<th>Optional rail kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL-R1620Sep-RP</td>
<td>16</td>
<td>2.5”/3.5” SAS 12Gbps, SAS/SATA 6Gbps</td>
<td>4 x SAS 12Gbps wide ports (Mini-SAS HD SFF-8644)</td>
<td>3RU, 131.3 x 482.2 x 425.3 mm</td>
<td>Key lock</td>
<td>RAIL-B02</td>
</tr>
<tr>
<td>REXP-1620U-RP</td>
<td>16</td>
<td>2.5”/3.5” SAS 12Gbps, SAS/SATA 6Gbps</td>
<td>3 x SAS 12Gbps wide ports (Mini-SAS HD SFF-8644)</td>
<td>3RU, 130 x 442.4 x 528.3 mm</td>
<td>Click latch</td>
<td>RAIL-A03-57</td>
</tr>
<tr>
<td>REXP-1610U-RP</td>
<td>16</td>
<td>2.5”/3.5” SATA 6Gbps</td>
<td>3 x SAS 6Gbps wide ports (Mini-SAS HD SFF-8644)</td>
<td>3RU, 130 x 442.4 x 528.3 mm</td>
<td>Click latch</td>
<td>RAIL-A03-57</td>
</tr>
<tr>
<td>TL-R1220Sep-RP</td>
<td>12</td>
<td>2.5”/3.5” SAS 12Gbps, SAS/SATA 6Gbps</td>
<td>4 x SAS 12Gbps wide ports (Mini-SAS HD SFF-8644)</td>
<td>2RU, 88.65 x 482.2 x 423.8 mm</td>
<td>Key lock</td>
<td>RAIL-B02</td>
</tr>
<tr>
<td>REXP-1220U-RP</td>
<td>12</td>
<td>2.5”/3.5” SAS 12Gbps, SAS/SATA 6Gbps</td>
<td>3 x SAS 12Gbps wide ports (Mini-SAS HD SFF-8644)</td>
<td>2RU, 88 x 439 x 520 mm</td>
<td>Click latch</td>
<td>RAIL-A03-57</td>
</tr>
<tr>
<td>REXP-1210U-RP</td>
<td>12</td>
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<td>2RU, 88 x 439 x 520 mm</td>
<td>Click latch</td>
<td>RAIL-A03-57</td>
</tr>
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TL SAS JBOD can be monitored and managed in the Storage & Snapshots manager. Advanced QTS / QuTS hero local disk management features are supported.

**Enclosure & QTS Disk related features:**

- S.M.A.R.T test
- Seagate IHM
- Disk Scan
- Disk Erase
- Disk Performance Test

Compatible NAS for TL SAS JBOD

https://www.qnap.com/compatibility-expansion
Connect up to 16 JBOD to NAS
For expanding storage pool capacity

RAID & Storage Pool

All disks of TL SAS JBOD would be identified by Storage & Snapshots, and then configure as a RAID within a storage pool.

Note: Maximum capacity of single folder is 1PB
Easily create storage in QTS / QuTS hero

Different from the TR USB RAID series, TL SAS JBOD series is based on QNAP software RAID: supports all local RAID operations as well as RAID migration and RAID expansion. TL-R1220Sep-RP/TL-R1620Sep-RP can even be configured as RAID 50 / 60.

01 [Storage & Snapshot Manager] > [Storage / Snapshots]

02 Create or Expand the [Storage Pool]

03 Select TL JBOD and set up the RAID type

⚠️ TL SAS JBOD allows you to create pool across NAS and JBOD.
Flexibly expand NAS storage, or use it to store backups

TL SAS JBOD enclosure series can expand QNAP NAS storage capacity. The JBOD enclosures support either the application data storage or the snapshots storage from volumes and LUNs.

Be the Snapshot Vault

Be the Storage Expansion

TS-h1683XU-RP

TL-R1620Sep-RP
LIVE DEMO

TL-R1220Sep-RP
TL-R1620Sep-RP
Cabling Suggestion

TL-R1220Sep-RP
TL-R1620Sep-RP
Optional QNAP Mini-SAS HD SAS 12Gb/s cables of different lengths

Mini-SAS HD SFF-8644 to 8644 SAS 12Gb/s cable

- **CAB-SAS05M-8644**
  - SFF 8644-8644
  - 0.5 meter
  - SAS 12Gb/s

- **CAB-SAS10M-8644**
  - SFF 8644-8644
  - 1 meter
  - SAS 12Gb/s

- **CAB-SAS20M-8644**
  - SFF 8644-8644
  - 2 meters
  - SAS 12Gb/s

- **CAB-SAS30M-8644**
  - SFF 8644-8644
  - 3 meters
  - SAS 12Gb/s
TL SAS JBOD with 2 wide-port SAS-12G2E expansion cabling suggestion for multi-path & aggregation

X Multi-path
X Aggregation

V Multi-path
V Aggregation

V Multi-path
V Aggregation

SAS HBA

SAS JBOD #1
SAS JBOD #2
SAS JBOD #3
SAS JBOD #4
SAS JBOD #5
SAS JBOD #6
SAS JBOD #7
SAS JBOD #8

• QTS/QuTS hero only support 4-layers vertically
• Maximum number of JBOD a single unit can support depends on OS
With a QXP-1620S or two SAS-12G2E, connect up to 16 JBODs for 4.6 PB raw capacity

QNAP NAS can connect up to 16 JBODs with a QXP-1620S-B3616W or two SAS-12G2E for maximum 4.6 PB of raw capacity

*raw capacity is calculated with 18TB x 16JBOD x 16bay = 4.6PB

• QTS/QuTS hero only support maximum 4-layer vertically.
• Maximum number of JBOD a single unit can support depends on OS
TL SAS JBOD with QNAP SAS HBA
expansion cabling suggestion for multi-path & aggregation

- Maximum Bandwidth
  4 x 48Gb/s = 192Gb/s

- Maximum number of JBOD a single unit can support depends on OS

*QTS/QuTS hero only support maximum 4-layer vertically.
5-year standard warranty included!

5-Year Standard Warranty

• TL-R1220Sep-RP & TL-R1620Sep-RP include 5-Year Standard warranty.
• Warranty service that comes in effect at the time of purchase.
• Free repair and part replacement for products under normal use during warranty period. (Spare parts and consumables are excluded)
QNAP SAS JBOD TL-R1220Sep-RP TL-R1620Sep-RP

Expand NAS capacity flexibly with ease.

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