QNAP

TL-R1220Sep-RP
TL-R1620Sep-RP

12/16-bay 12Gb/s SAS expander JBOD

for Windows Server and NAS capacity expansion

Windows Server 2019 Certified

CLI (Command Line)

TL-R1220Sep-RP
TL-R1620Sep-RP

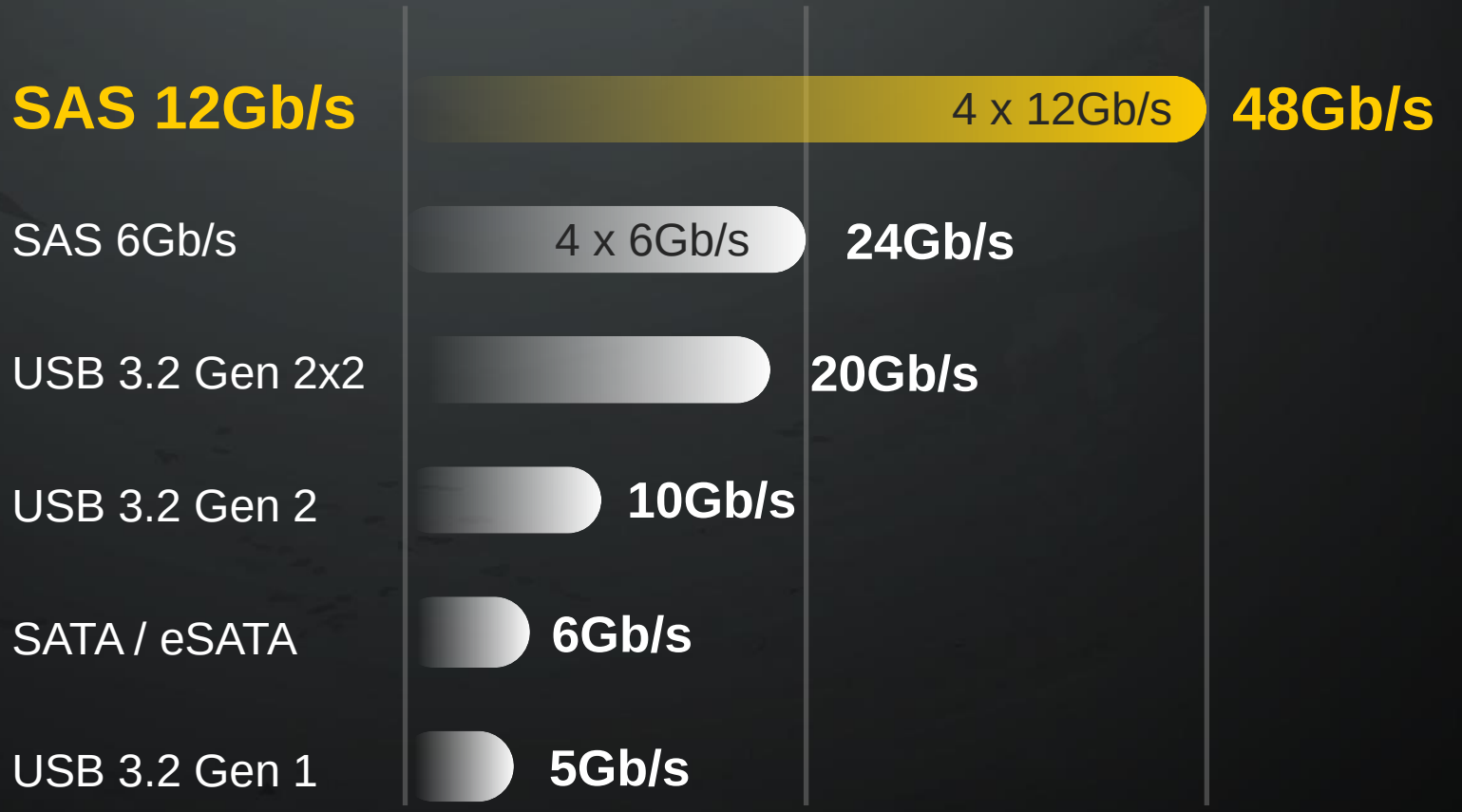
- **Multipurpose enterprise SAS 12Gb/s expander JBOD: for Windows/ Linux server and NAS capacity expansion support (QTS / QuTS hero)**
  - 4 x SAS 12Gb/s SFF-8644 wide ports
  - Windows Server 2019 Cert.
  - QNAP JBOD Manager utility for Windows – status monitoring
  - Command line interface (CLI) - flexible usage
  - Up to sixteen TL-R1620Sep-RP can be connected
- Flexible daisy chaining modes – performance and security

Windows Server 2019

Certified

SAS full-duplex 12Gb/s Mini-SAS HD SFF-8644 for max 48Gb/s performance

Single-cable bandwidth



	Cable	QNAP P/N
	SAS 12Gb/s SFF-8644 Mini-SAS HD cable	CAB-SAS05M-8644 CAB-SAS10M-8644 CAB-SAS20M-8644 CAB-SAS30M-8644
	SAS/ SATA 6Gb/s Mini-SAS SFF-8088 cable	CAB-SAS05M-8088 CAB-SAS10M-8088 CAB-SAS20M-8088 CAB-SAS30M-8088
	USB 3.2 Gen 1 cable (5Gb/s)	**Type A to C:** CAB-U35G02MAC CAB-U35G10MAC
	USB 3.2 Gen 2 cable (10Gb/s)	**Type A to C:** CAB-U310G10MAC **Type C to C:** CAB-U310G10MCC

Higher reliability, faster performance, and better availability for SAS drives

	SAS SSD	SAS HDD	SATA SSD	SATA HDD
Price per TB	$$$$	$$$	$$	$
RPM	---	Up to 15, 000	---	Up to 7, 200
Capacity	Up to 15.36 TB	Up to 18 TB	Up to 4 TB	Up to 18 TB
MTBF	2.5 M hours	2.5 M hours	2 M hours	1.2 M hours
Workload	Process-intensive	Process-intensive	Light to normal	Light to normal
Speed	12 Gb/s	12 Gb/s	6 Gb/s	6 Gb/s
Latency	Lowest	Lower	Lower	Higher
Dual-port	**Supported**	**Supported**	**-**	**-**

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.

12 Bay

TL-R1220Sep-RP

16 Bay

TL-R1620Sep-RP

TL-R1220Sep-RP/ TL-R1620Sep-RP
SAS JBOD front view

Power Button

Status

Connection

Fan Error

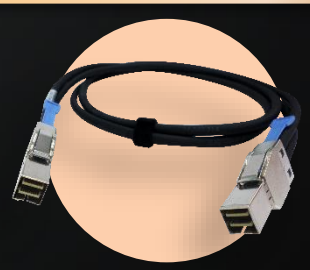
Metal trays w/ lock

Drive status

TL-R1620Sep-RP

TL-R1220Sep-RP

2 keys included

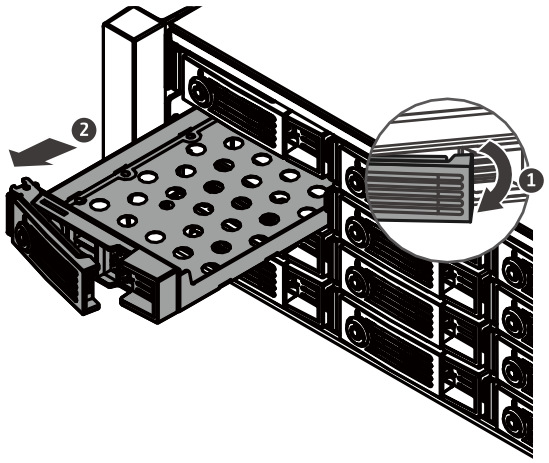


0.5-meter Mini-SAS HD cable included

Bulit-in warning buzzer

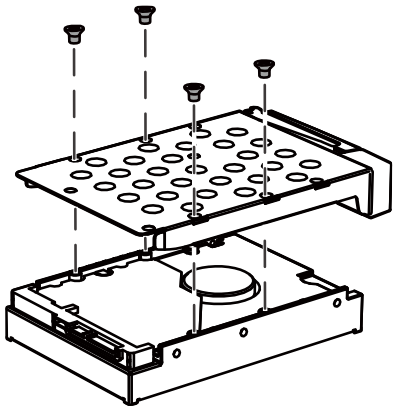
Support 3.5-inch and 2.5-inch SAS & SATA HDD/ SSD

STEP 01

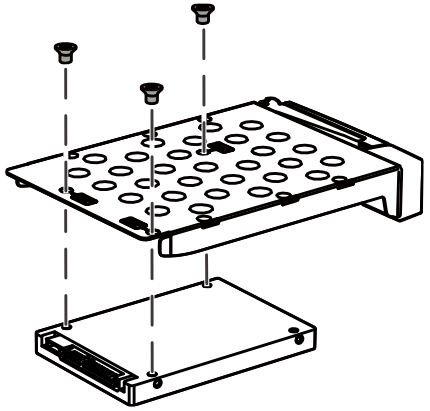


STEP 02

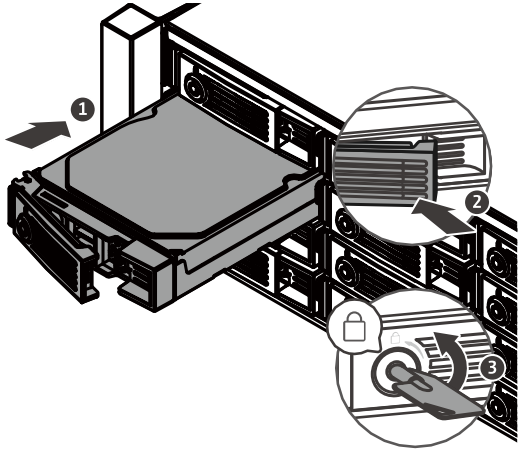
3.5-inch HDD



2.5-inch HDD/ SSD



STEP 03



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

TL-R1620Sep-RP
HxWxD (131.3x482.2x425.3)

TL-R1220Sep-RP
HxWxD (88.65x482.2x423.8)

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 Mini-SAS HD
SFF-8644 SAS Wide-port
4 x 48Gb/s = 192Gb/s

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

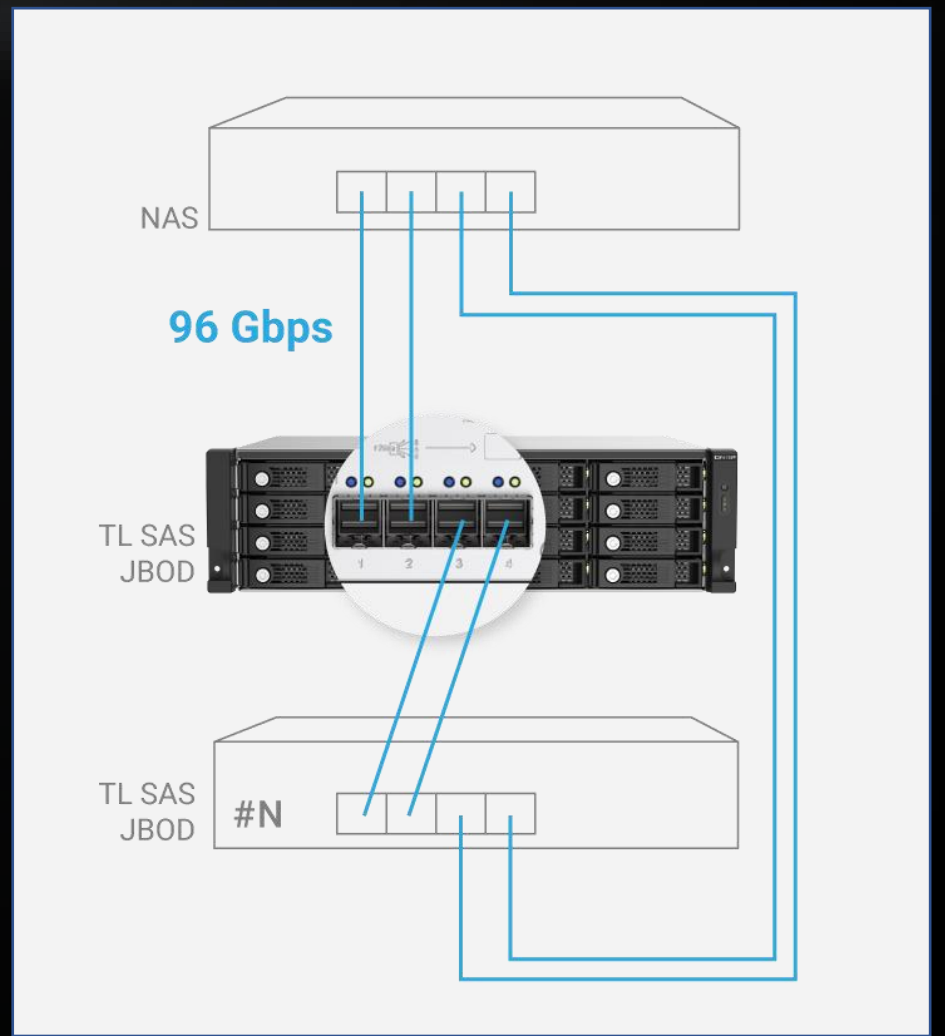
*QTS 4.5.2 / QuTS hero h4.5.2 will support displaying the a to g addresses.

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.



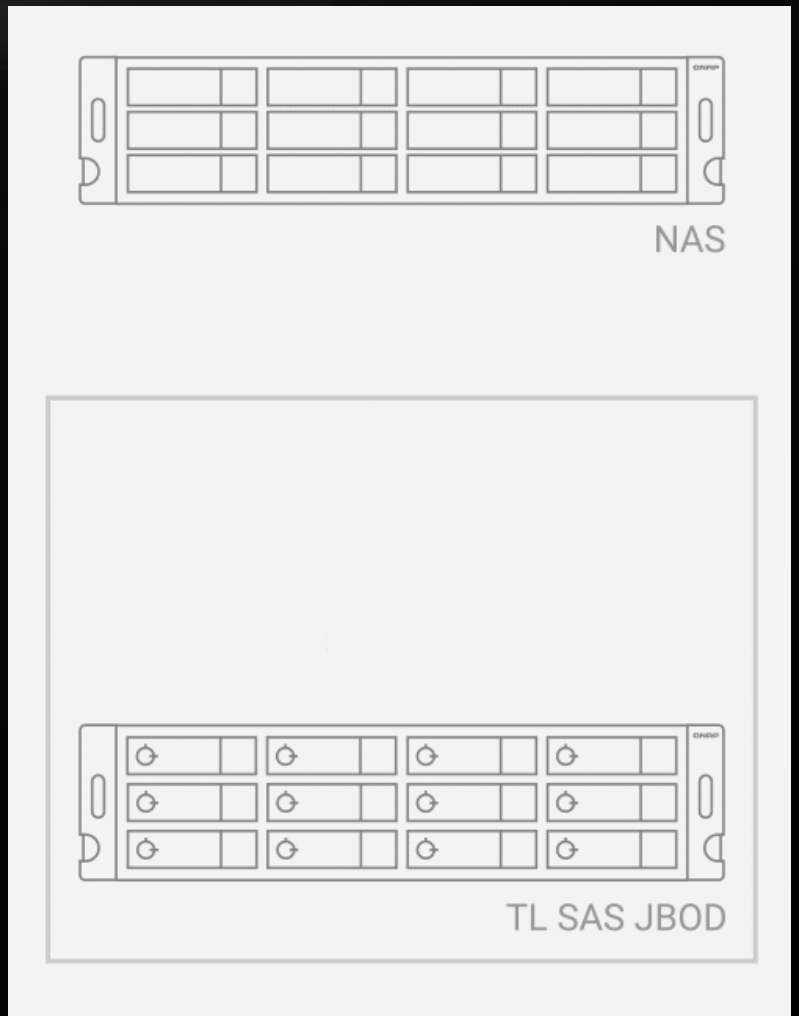
SAS DataBolt™ bandwidth optimizer technology aggregates bandwidth to provide 12Gb/s SAS performance to 6Gbs SSD/HDD

“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.”

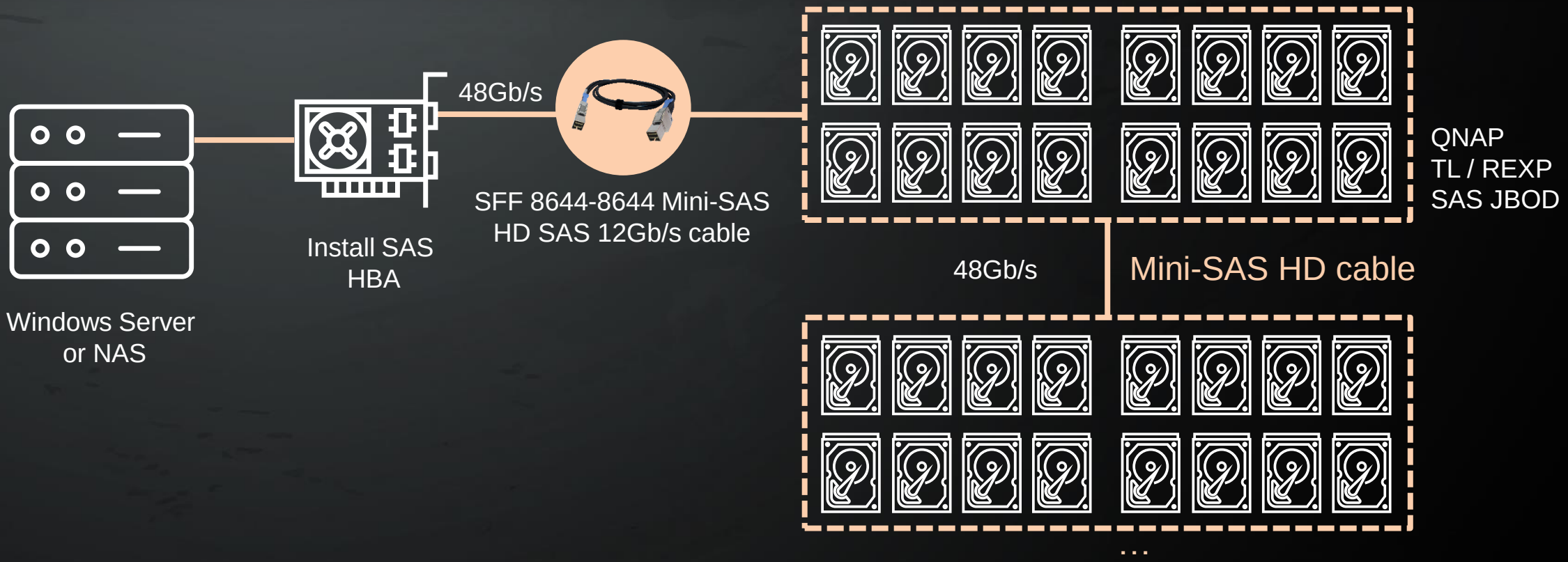
- Broadcom

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.

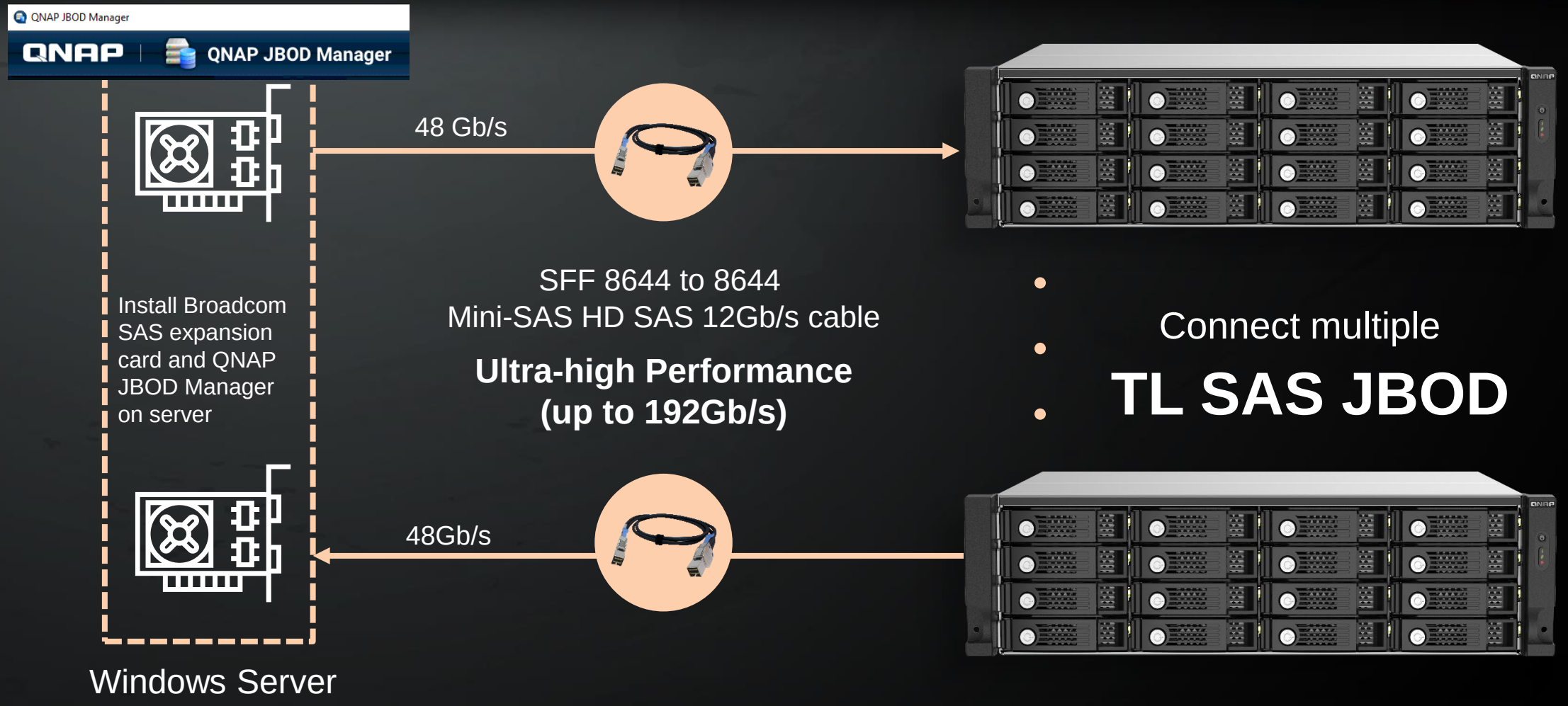
QTS 4.5.1+ /QuTS hero h4.5.1+ up to

16 QNAP SAS JBOD

TL-R1220Sep-RP
TL-R1620Sep-RP

Expand
Windows Server
strorage space

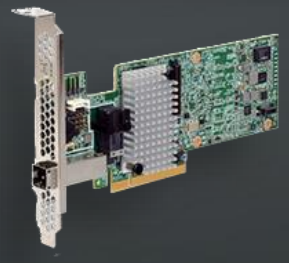
Install Broadcom SAS HBA or SAS RAID card on Windows Server

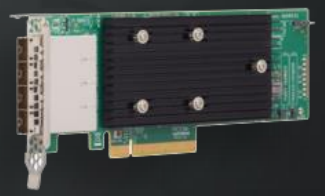


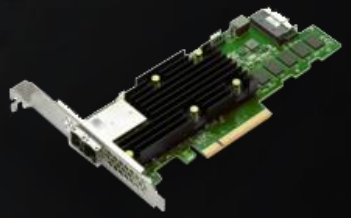
- Maximum number of JBOD a single unit can support depends on OS

Windows Server paired with QNAP JBOD Manager

Widely support Broadcom SAS expansion card and QNAP TL JBOD





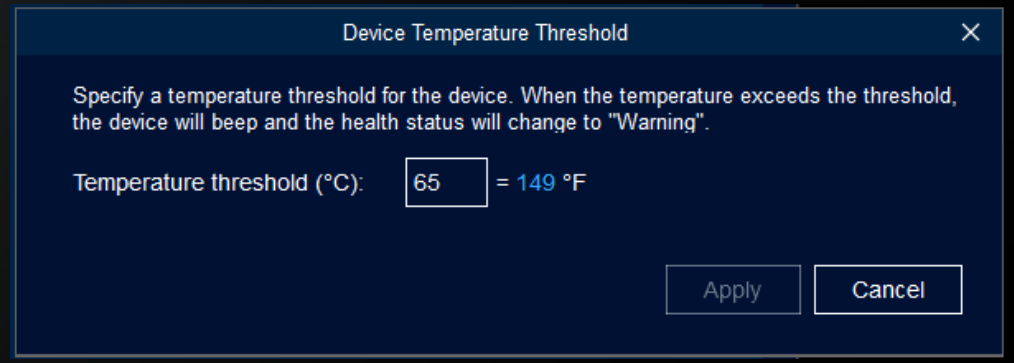


Broadcom model	MegaRAID 9380-4i4e	SAS 9300-8e	SAS 9305-16e	SAS 9500-8e	MegaRAID 9580-8i8e	SAS 9400-8e
RAID support	0, 1, 5, 6, 10, 50, and 60	Non-RAID HBA	Non-RAID HBA	Non-RAID HBA	RAID 0, 1, 5, 6, 10, 50 and 60	Non-RAID HBA
Port	4 + 4 ports (1 x SFF-8644 1 x SFF-8643)	8 ports (2 x SFF-8644)	16 ports (4 x SFF-8644)	8 ports (2 x SFF-8644)	8 + 8 ports (2 x SFF-8644 2 x SFF-8643)	8 ports (2 x SFF-8644)
PCI Express	x8 PCI Express 3.0	x8 PCI Express 3.0	x8 PCI Express 3.0	x8 PCI Express 3.0	x8 PCI Express 4.0	x8 PCI Express 3.1
Manufacturer Information	Site URL	Site URL	Site URL	Site URL	Site URL	Site URL

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

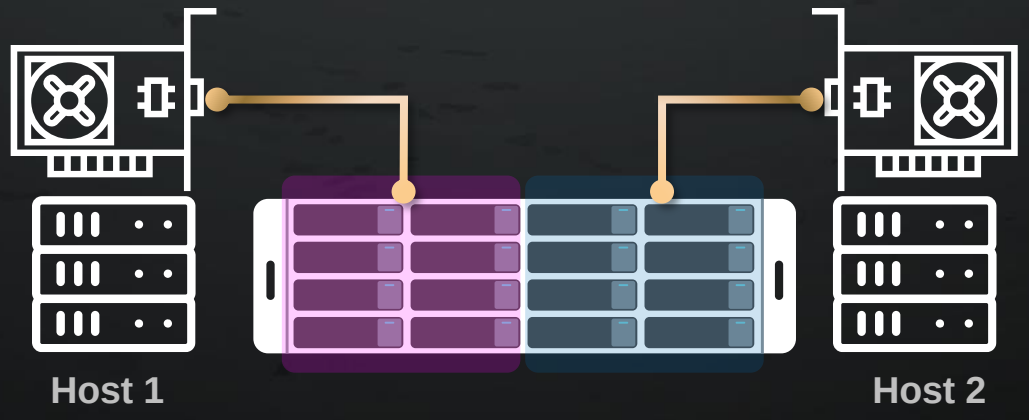


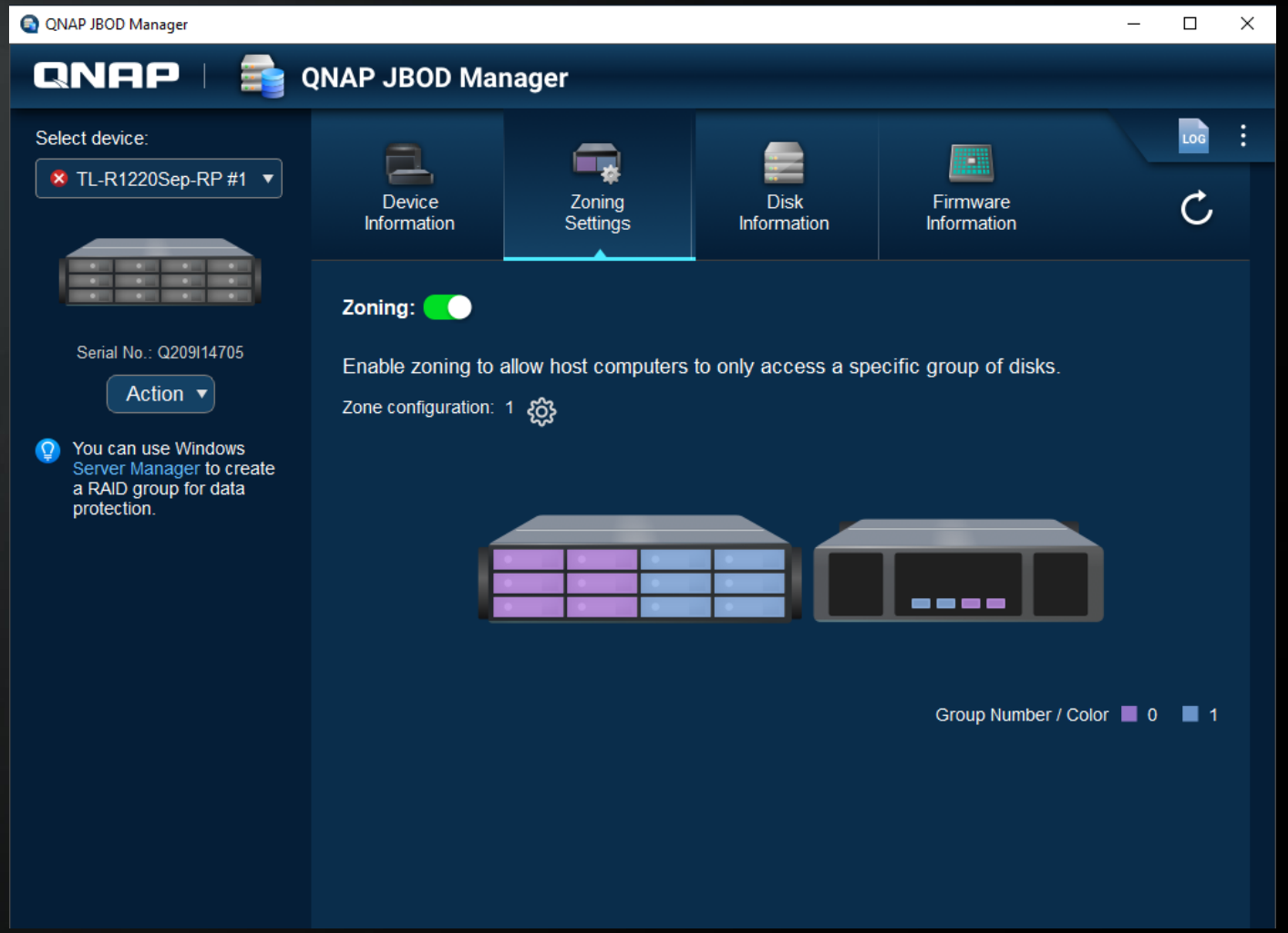
QNAP JBOD Manager support Drive-bay zoning setting - allows single JBOD to serve multiple servers

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

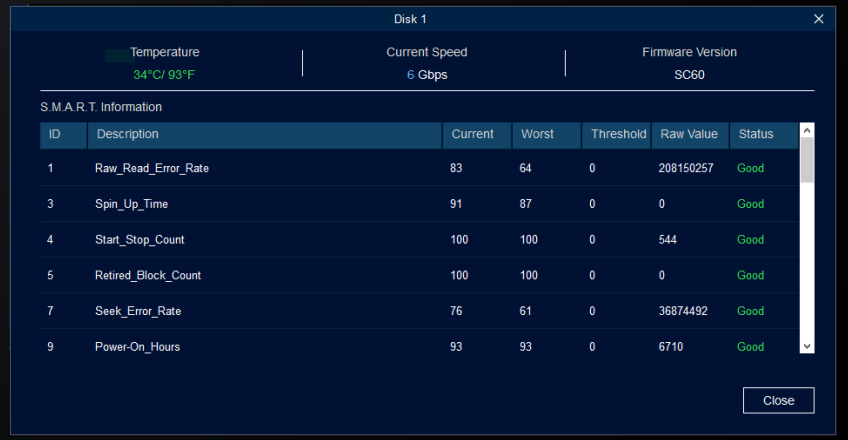




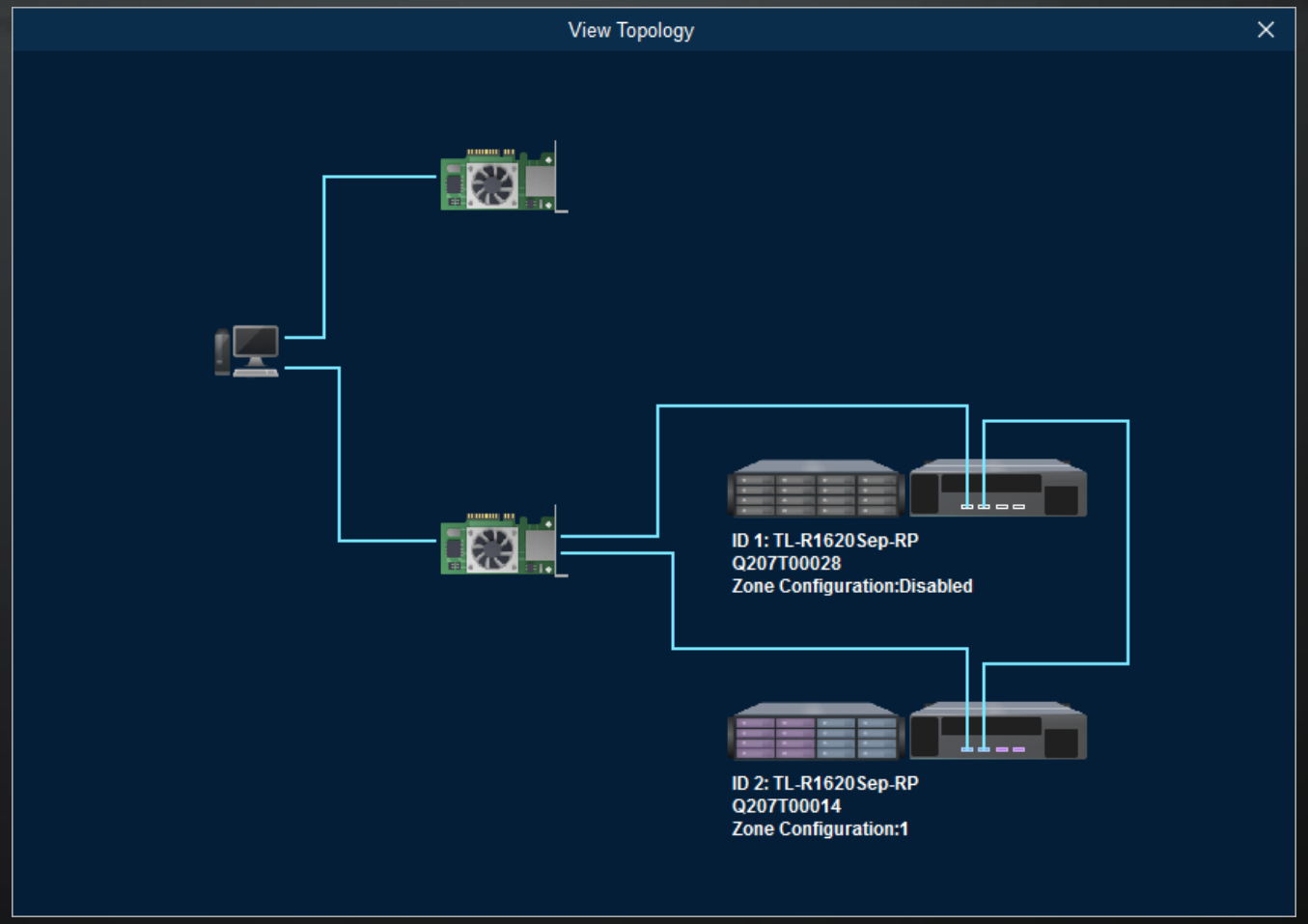
QNAP JBOD Manager Disk Information

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

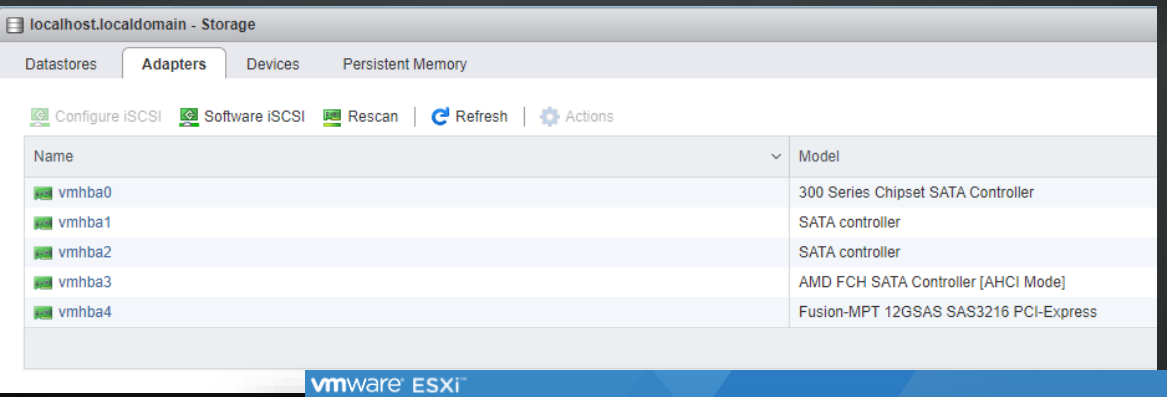


Topology

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

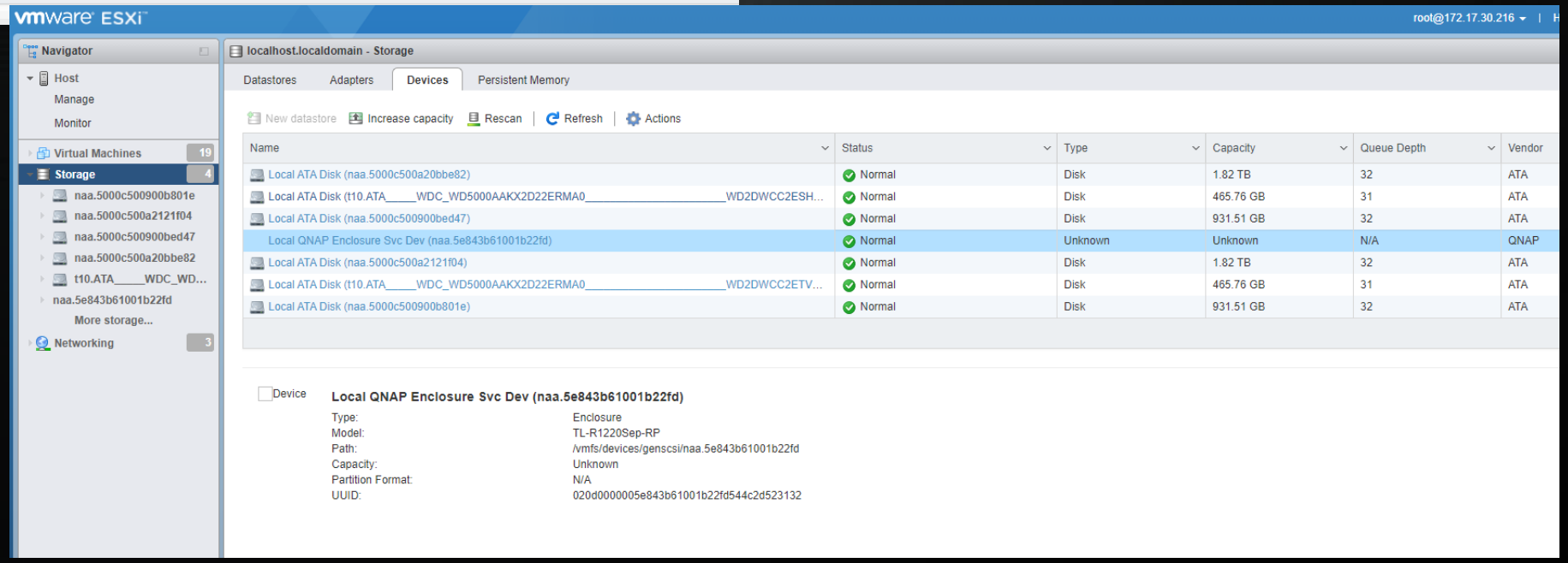
Note: This functoin can only support Broadcom SAS HBA. Broadcom RAID card cannot support topology due to its architecture

Support VMware datastore
Significantly expand capacity



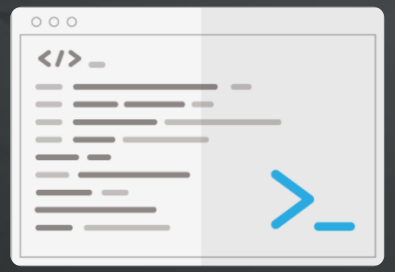
VMware datastore

Through Broadcom LSI SAS HBA, you can easily connect SAS JBOD with VMware server, and expand Vmware capacity through VMFS type



LIVE
DEMO
QNAP
TL-R1220Sep-RP
TL-R1620Sep-RP

Command Line Interface



Command Line Interface

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).

Nickname	[xxx]	Nickname : xxx
Route table read	rtr [d|z|dz]	Default display enabled entries with a nonzero SAS address d include disabled entries z include entries with a zero SAS address dz display all entries"
Display info for all Phy	phyinfo [help|edfb|power] [up|<PhyNum(D)>]	- no arguments displays default output - 'help' displays detailed help information - 'edfb' subcommand displays EDFB info - 'power' subcommand displays power mgmt info - 'up' filters to display connected phys only - 'cable' subcommand displays cable mgmt info - <PhyNum> is a valid phy index and filters the output to display info about that phy
Display or reset all phy counters	counters [config|event|reset]	- no arguments displays phy error counters and generic broadcast counters - 'config' subcommand displays phy event configuration - 'event' subcommand displays phy event counters - 'reset' subcommand resets all phy counters

TL-R1220Sep-RP
TL-R1620Sep-RP

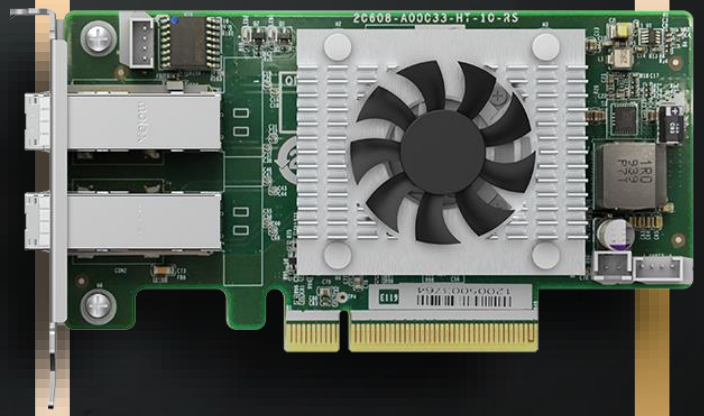
Expand
QNAP NAS
storage space

QNAP dual-port/quad-port SAS 12Gb/s expansion cards

BROADCOM®

Broadcom®
SAS controller

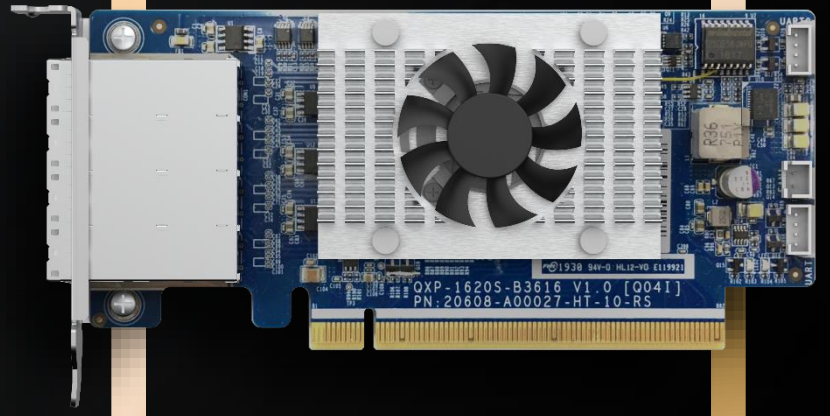
Dual-port SAS 12Gb/s



QXP-820S-B3408

PCIe Gen3 x8

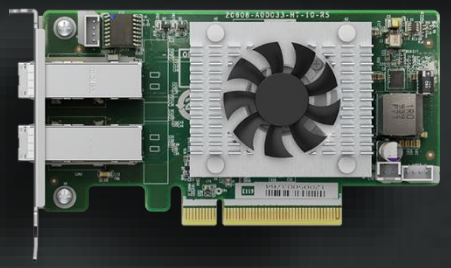
Quad-port SAS 12Gb/s

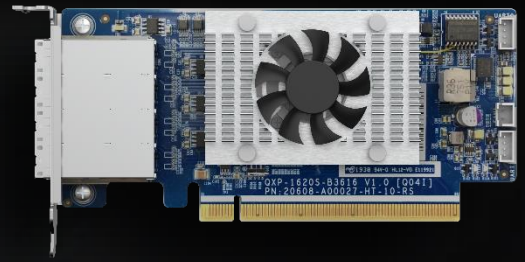


QXP-1620S-B3616W

PCIe Gen3 x16

Dual/Quad-port SAS-3 12Gb/s expansion card specfications





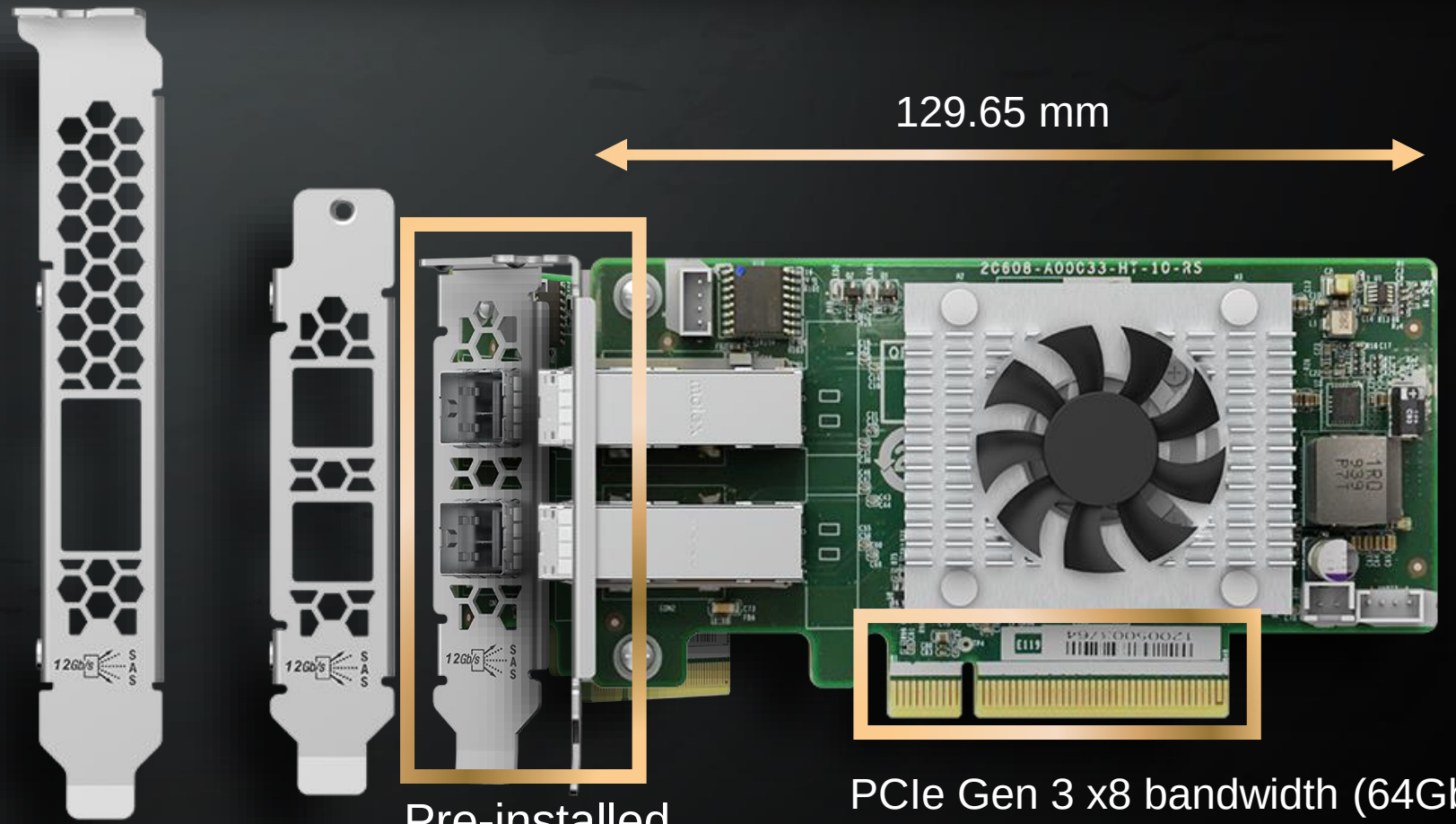
	QXP-820S-B3408	QXP-1620S-B3616W
SAS Controller	Broadcom SAS3408	Broadcom SAS3616W Tri-mode
Drive interface	12Gb/s SAS, 6Gb/s SATA up to 8.0 GT/s	
SAS bandwidth	2 x external Mini-SAS HD	4 x external Mini-SAS HD
Connector interface	SFF-8644	SFF-8644
Host PCIe band-width	PCIe Gen 3 x8	PCIe Gen 3 x16
Dimensions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

*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



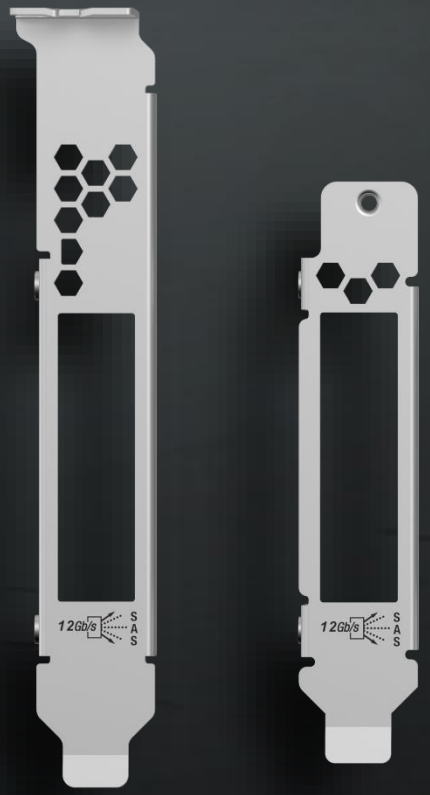
Pre-installed half-height bracket

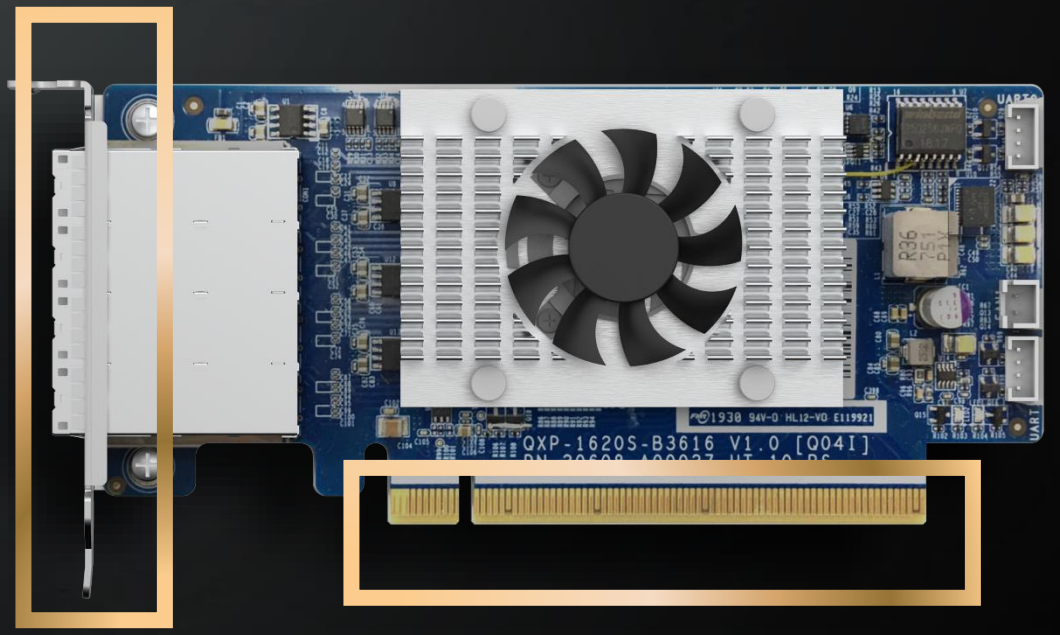
PCIe Gen 3 x8 bandwidth (64Gbps)

Low-profile design for various QNAP NAS models

QXP-1620S-B3616W

Additional brackets are included for various NAS models





Pre-installed half-height bracket

PCIe Gen 3 x16 bandwidth (128Gbps)

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

	New! TL-R1620Sep-RP	REXP-1620U-RP	REXP-1610U-RP	New! TL-R1220Sep-RP	REXP-1220U-RP	REXP-1210U-RP
# of bays	16	16	16	12	12	12
Drive interface	2.5“/3.5” SAS 12Gbps, SAS/SATA 6Gbps	2.5“/3.5” SAS 12Gbps, SAS/SATA 6Gbps	2.5“/3.5” SATA 6Gbps	2.5“/3.5” SAS 12Gbps, SAS/SATA 6Gbps	2.5“/3.5” SAS 12Gbps, SAS/SATA 6Gbps	2.5“/3.5” SATA 6Gbps
SAS ports	**4** x SAS 12Gbps wide ports (Mini-SAS HD SFF-8644)	3 x SAS 12Gbps wide ports (Mini-SAS HD SFF-8644)	3 x SAS 6Gbps wide ports (Mini-SAS HD SFF-8644)	**4** x SAS 12Gbps wide ports (Mini-SAS HD SFF-8644)	3 x SAS 12Gbps wide ports (Mini-SAS HD SFF-8644)	3 x SAS 6Gbps wide ports (Mini-SAS HD SFF-8644)
Dimension (HxWxD)	3RU, 131.3 x 482.2 x 425.3 mm	3RU, 130 × 442.4 × 528.3 mm	3RU, 130 × 442.4 × 528.3 mm	2RU, 88.65 x 482.2 x 423.8 mm	2RU, 88 x 439 x 520 mm	2RU, 88 x 439 x 520 mm
Key-lock tray	Key lock	Click latch	Click latch	Key lock	Click latch	Click latch
Optional rail kit	RAIL-B02	RAIL-A03-57	RAIL-A03-57	RAIL-B02	RAIL-A03-57	RAIL-A03-57

QTS 4.5.1/ QuTS hero h4.5.1 are required for NAS to support TL SAS JBOD

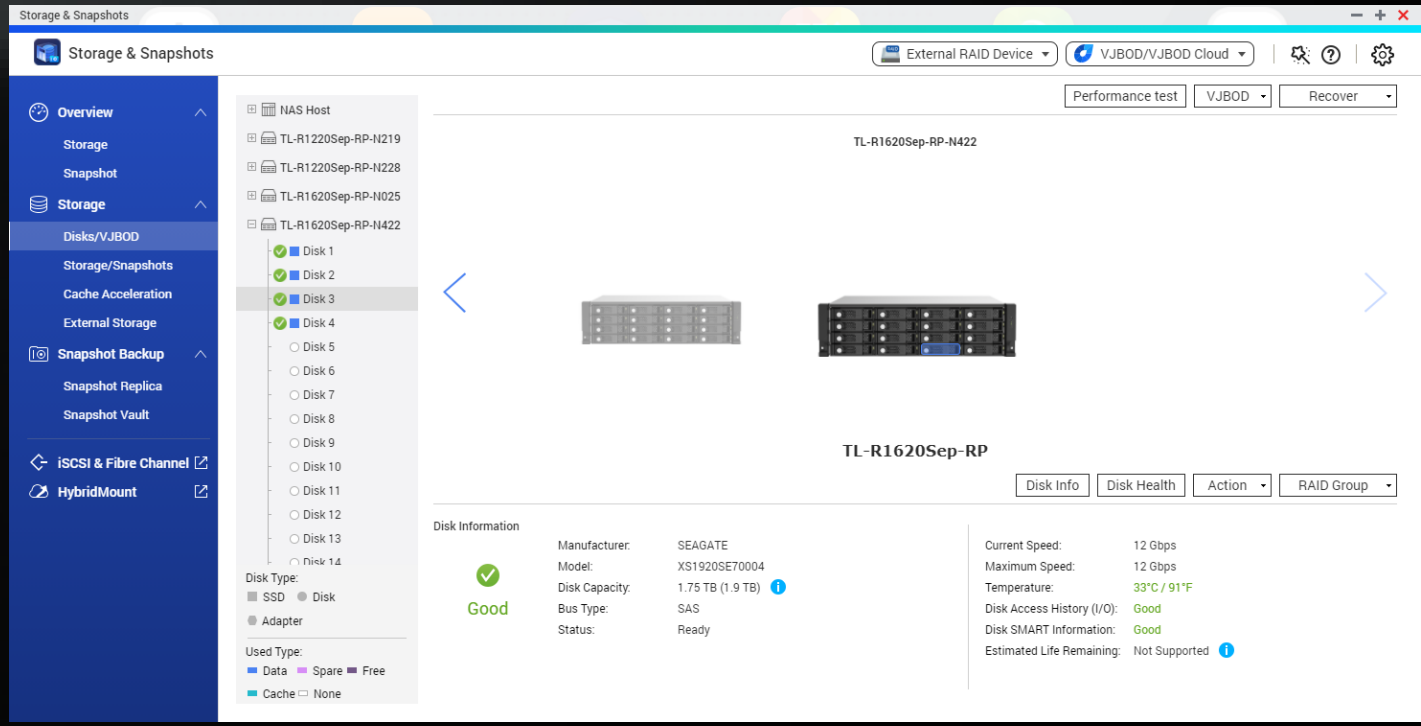
TL SAS JBOD can be monitored and managed in the Storage & Snapshots manager.

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

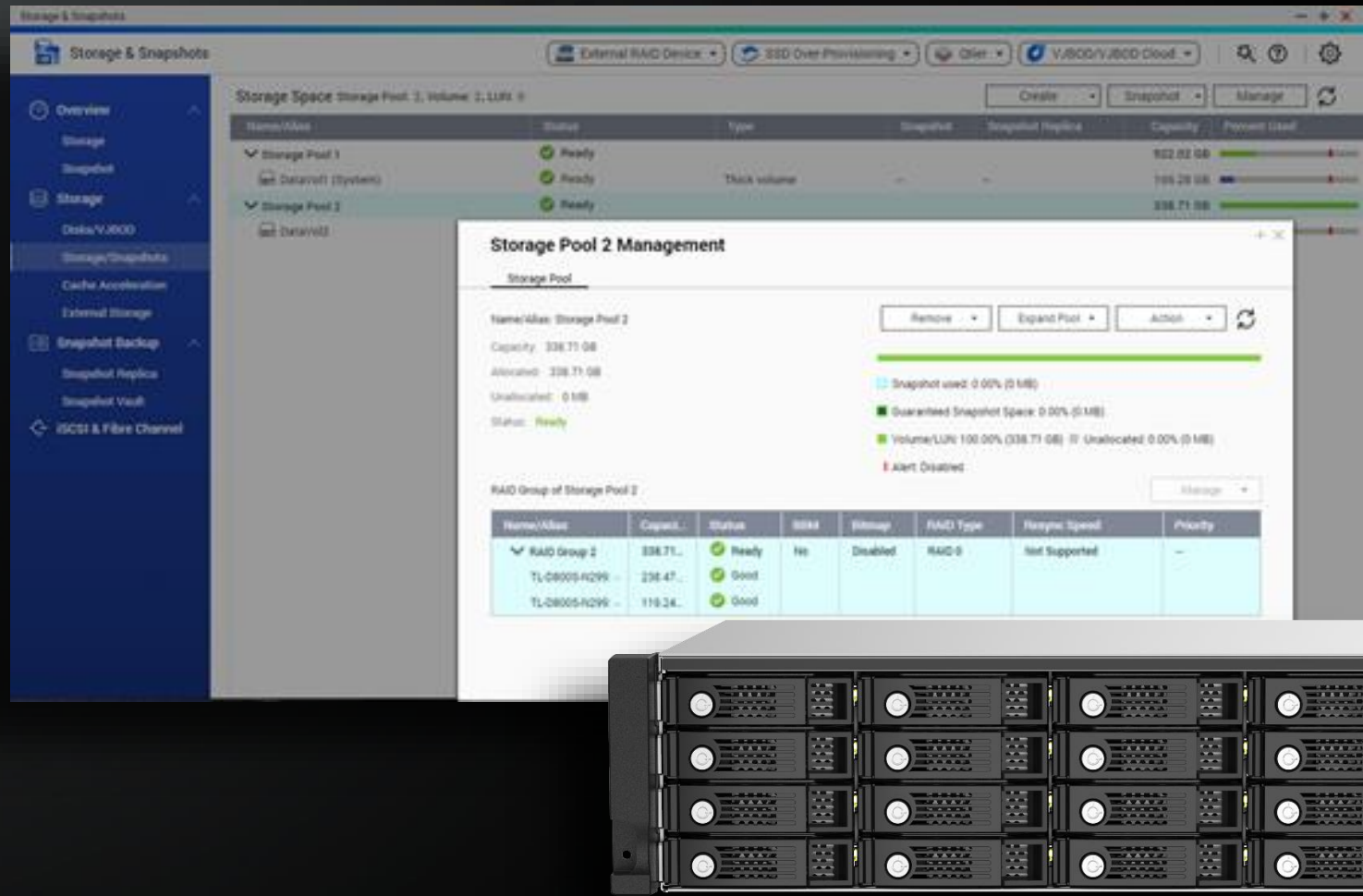


Connect up to 16 JBOD to NAS
For expanding storage pool capacity

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

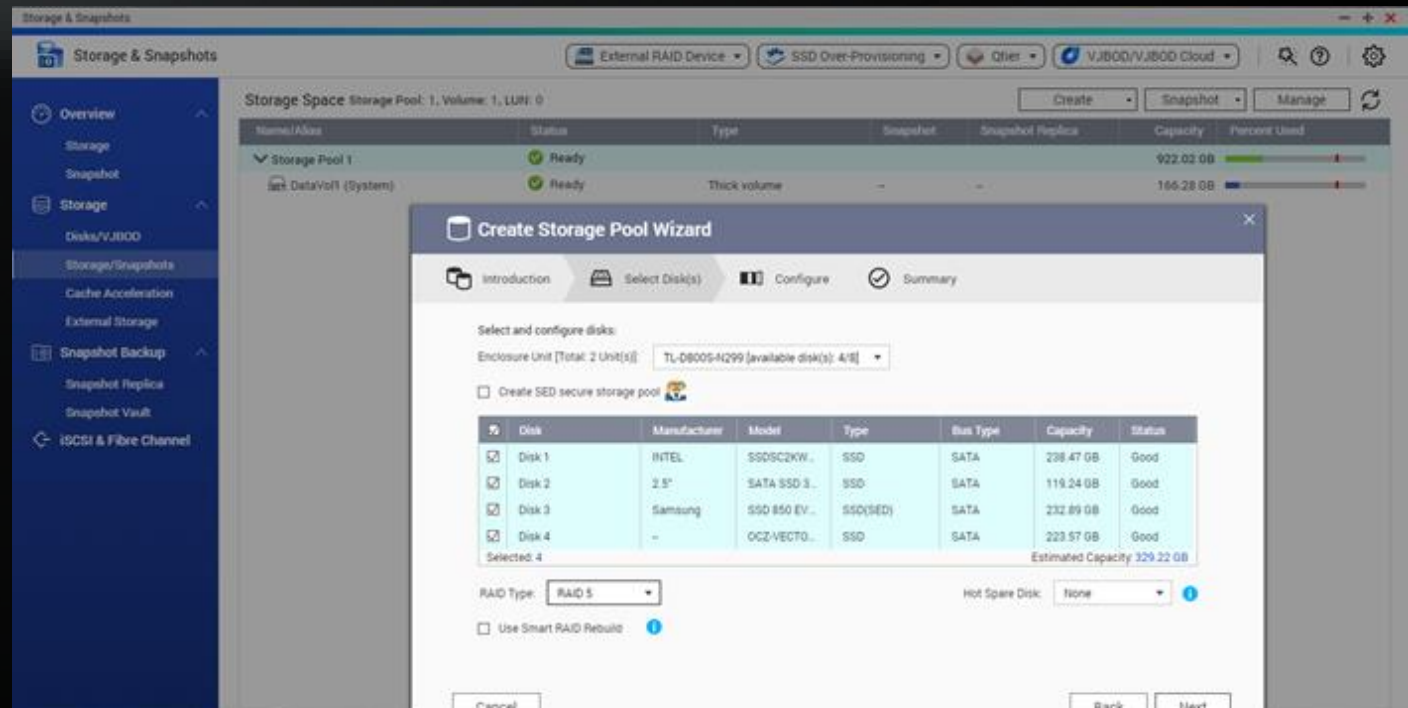
Different from the TR USB RAID series, TL SAS JBOD series is based on QNAP software RAID: supports all local RAID operations as well as RAID migration and RAID expansion. TL-R1220Sep-RP/TL-R1620Sep-RP can even be configured as RAID 50 / 60.

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.

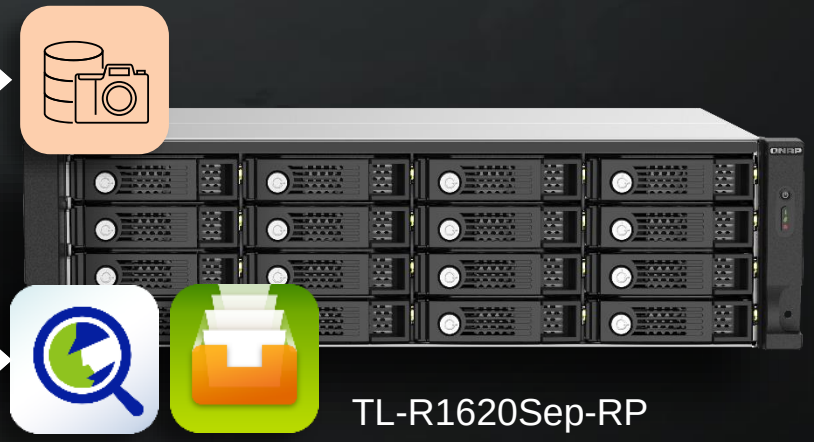


Flexibly expand NAS storage, or use it to store backups

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



TL-R1620Sep-RP

TS-h1683XU-RP

LIVE
DEMO
QNAP
TL-R1220Sep-RP
TL-R1620Sep-RP

TL-R1220Sep-RP
TL-R1620Sep-RP

Cabling Suggestion

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

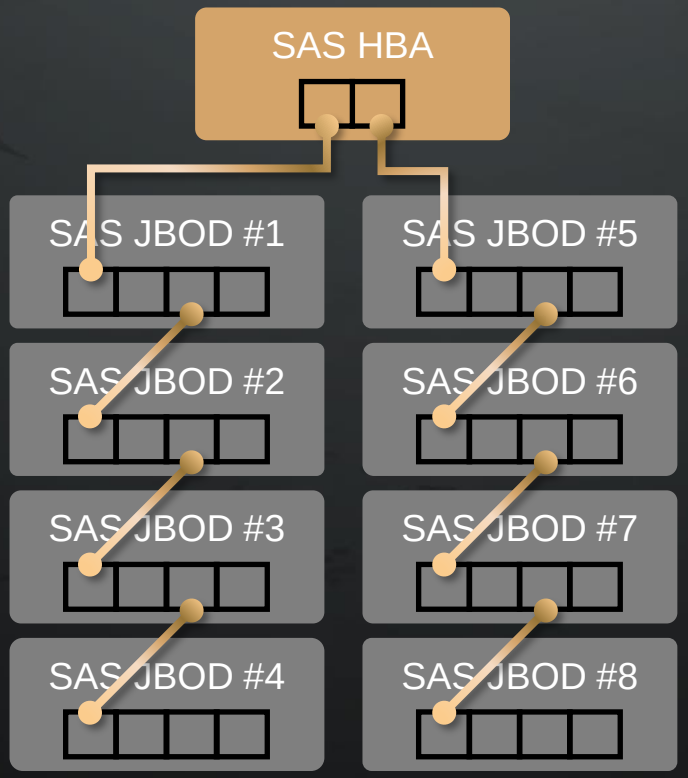
- SFF 8644-8644
- 2 meters
- SAS 12Gb/s

CAB-SAS30M-8644

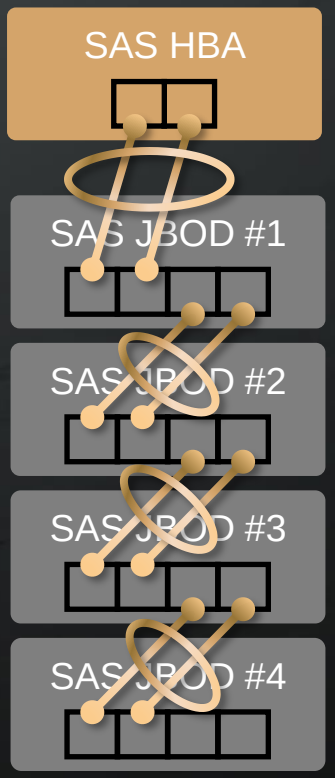
- SFF 8644-8644
- 3 meters
- SAS 12Gb/s

TL SAS JBOD with 2 wide-port SAS-12G2E expansion cabling suggestion for multi-path & aggregation

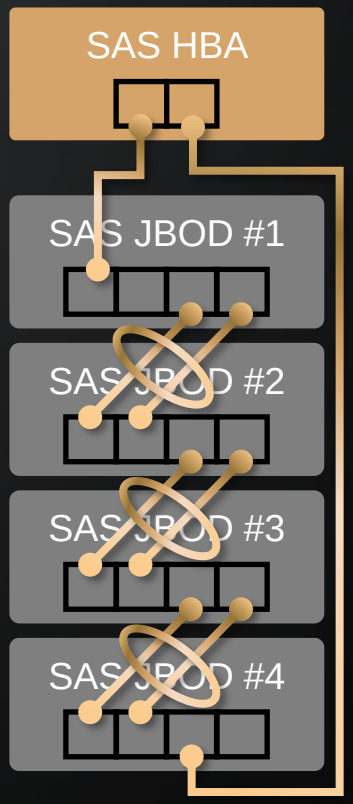
X Multi-path
X Aggregation



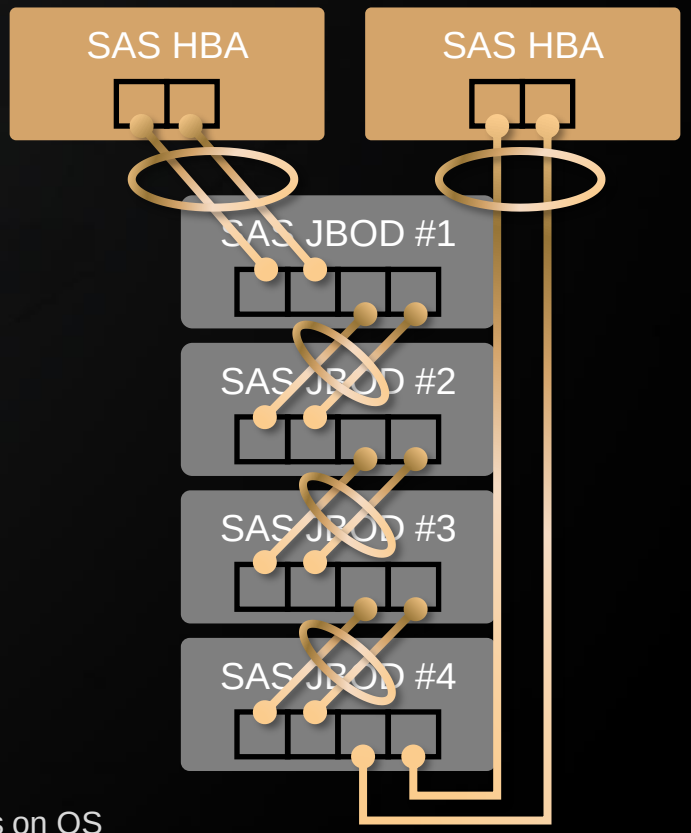
X Multi-path
V Aggregation



V Multi-path
V Aggregation

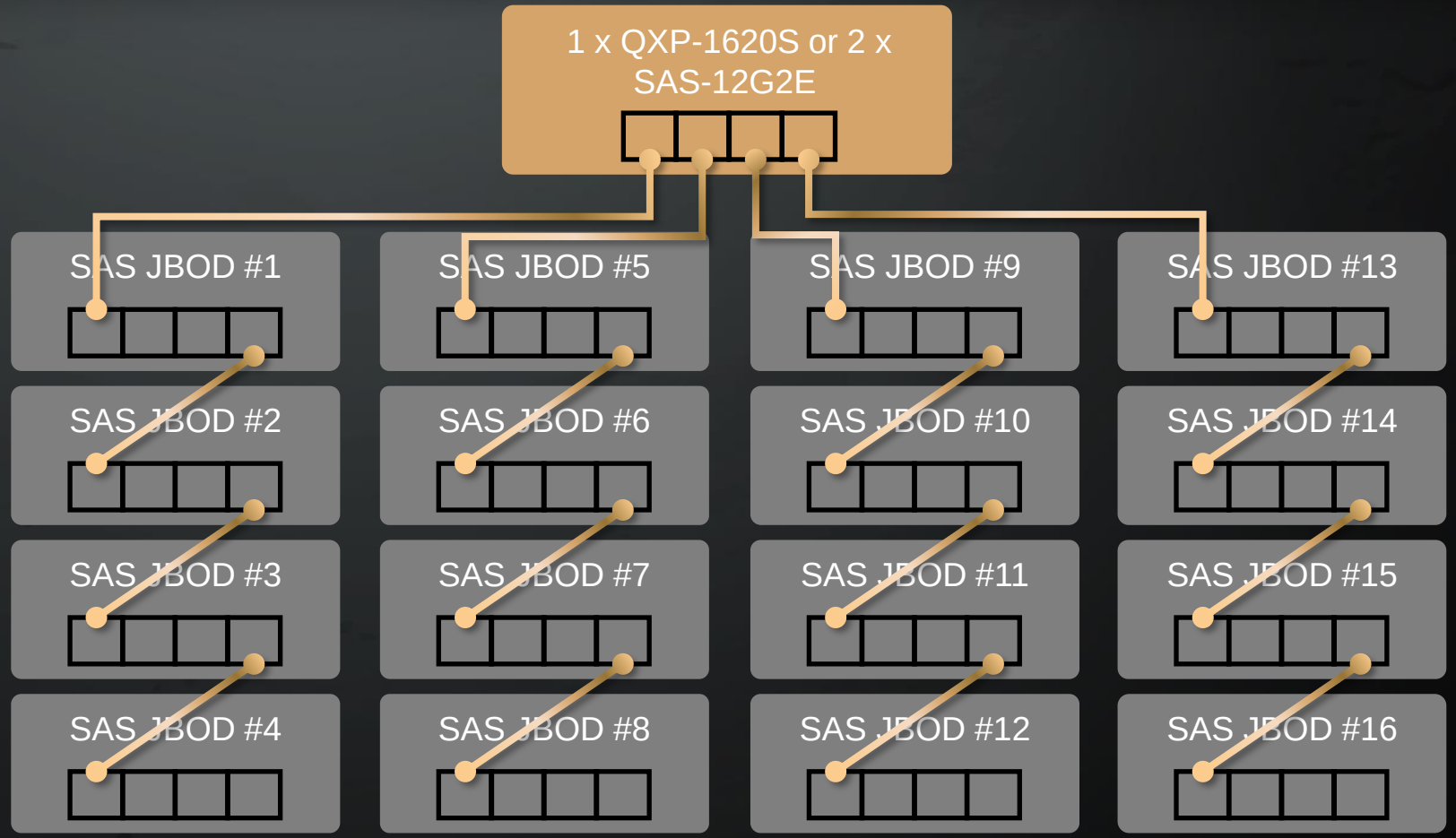


V Multi-path
V Aggregation



- *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



X Multi-path
X Aggregation

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

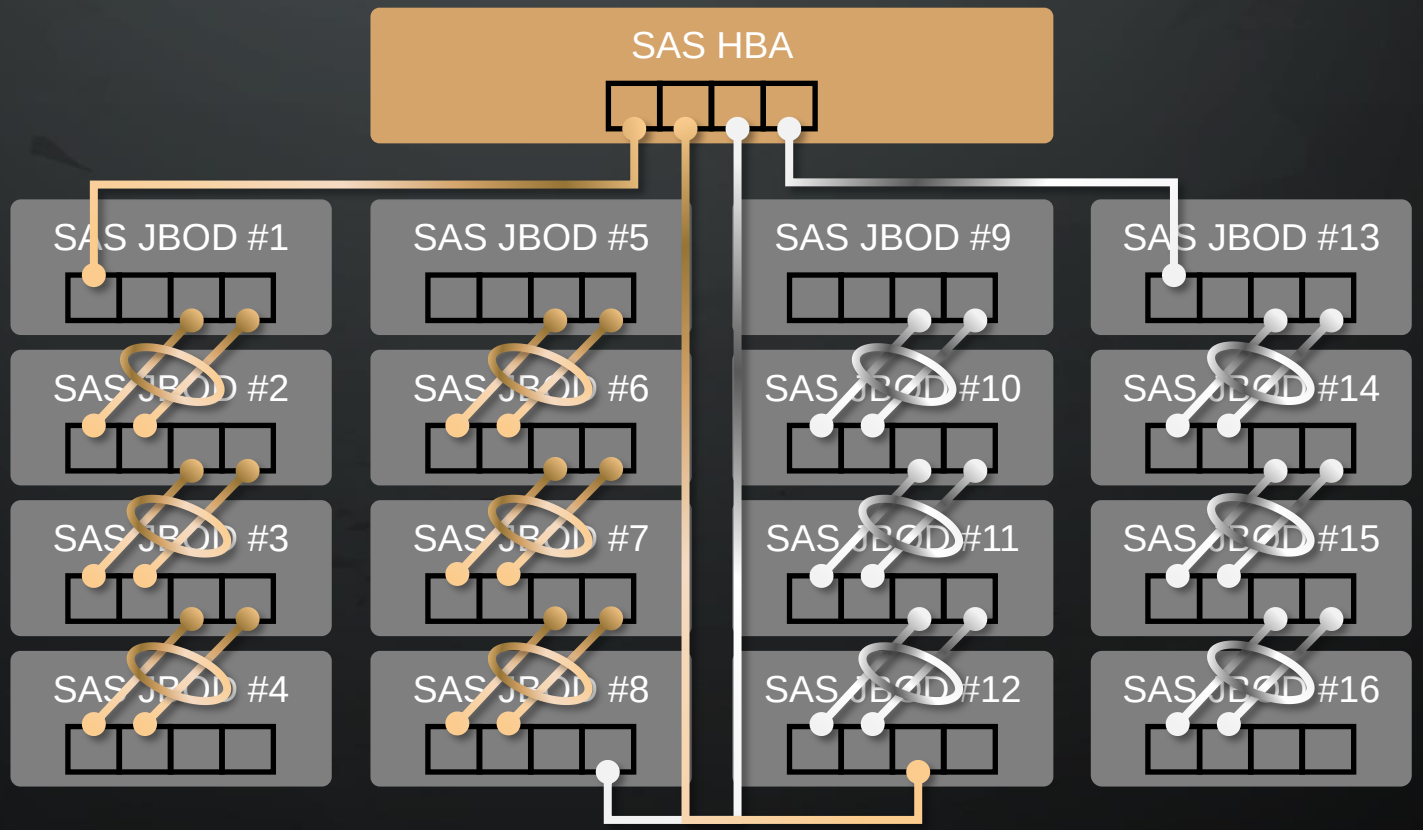
*raw capacity is calculated with 18TB x 16JBOD x 16bay = 4.6PB

- *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

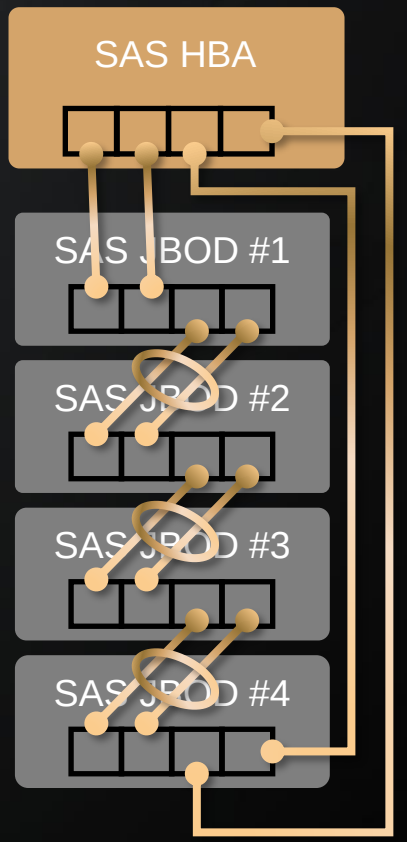
expansion cabling suggestion for multi-path & aggregation

V Multi-Path
V Aggregation

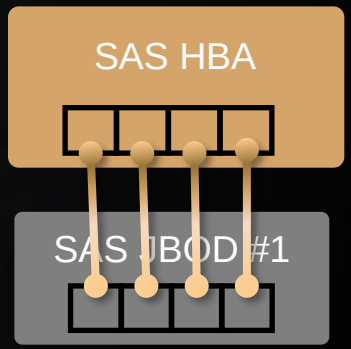


- *QTS/QuTS hero only support maximum 4-layer vertically.

V Multi-Path
V Aggregation



V Multi-Path
V Aggregation



Maxium Band-width
4 x 48Gb/s
=192Gb/s

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

TL-R1220Sep-RP
TL-R1620Sep-RP

5-year standard warranty included!

QNAP STANDARD WARRANTY 5 YEAR

5-Year Standard Warranty

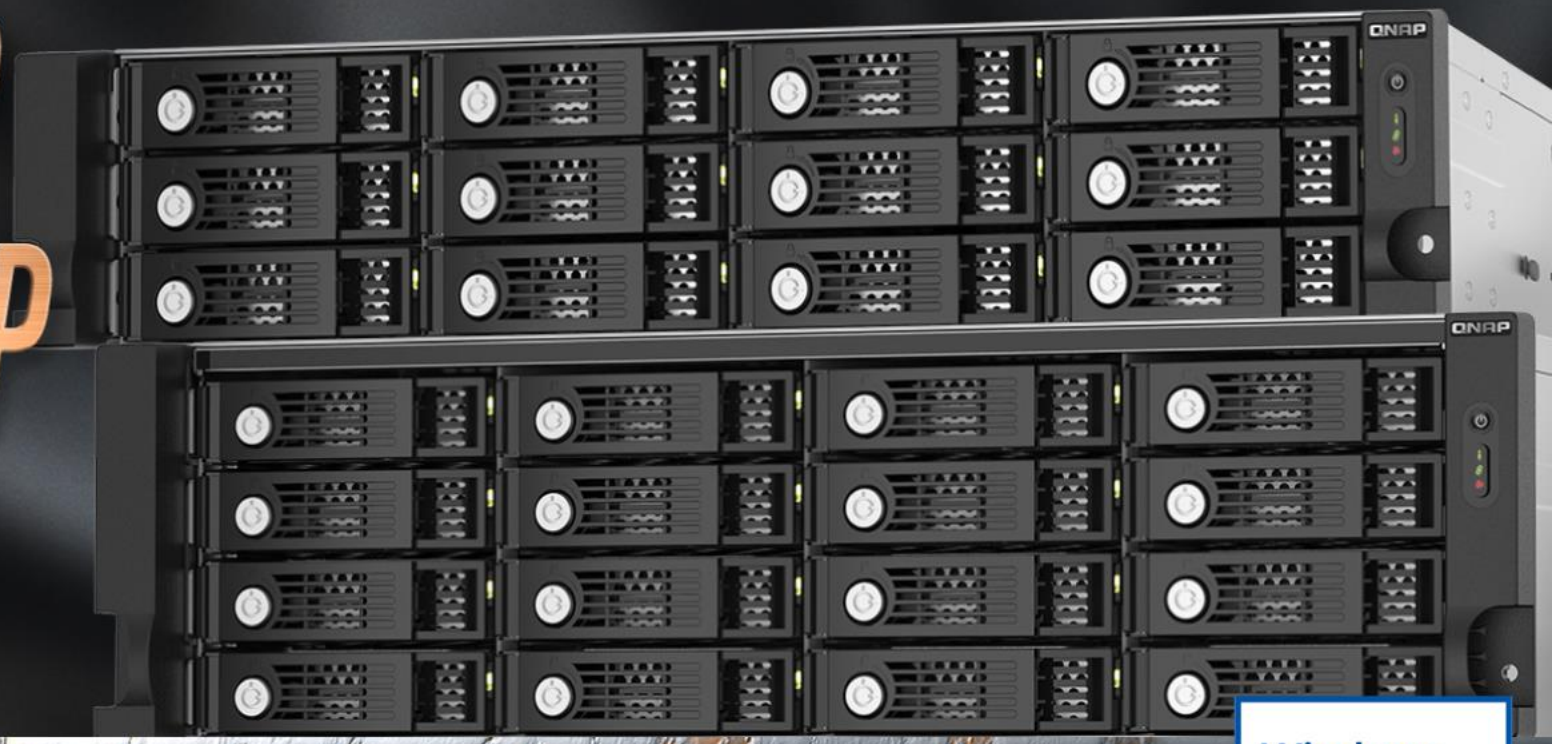
- TL-R1220Sep-RP & TL-R1620Sep-RP include 5-Year Standard warranty.
- Warranty service that comes in effect at the time of purchase.
- Free repair and part replacement for products under normal use during warranty period. (Spare parts and consumables are excluded)

QNAP

SAS JBOD

TL-R1220Sep-RP
TL-R1620Sep-RP

Expand NAS capacity flexibly with ease.



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Windows Server 2019 Certified