NS388P-S4

2U 24-Bay NVMe JBOF (1×4 Backplane)

User Manual

First edition, Feb. 2025

1. Package Checklist

Before the installation of the enclosure, verify that the items below are included in the package:

- A. NS388P enclosure × 1
- B. U.2 SSD drive tray (already installed in NS388P) × 24
- C. U.2 SSD mounting screw × 96
- D. Key for U.2 SSD drive tray × 2
- E. Power cords × 2

Optional: (number of host cards and cables will depend on which mode to be used; see section 4)

- F. NP980A-G4 host card
- G. HD mini-SAS (SFF-8644) to HD mini-SAS (SFF-8644) data cables

* Please check the requirements in **Section 4.**

2. Panel Layout

Front panel

2. U.2 SSD presence LED

- White – Power on
- Flashing white – Drive present, but power is disabled

1. Activity indicator LED

- Flashing blue – Access
- Red – U.2 SSD fails

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Rear panel

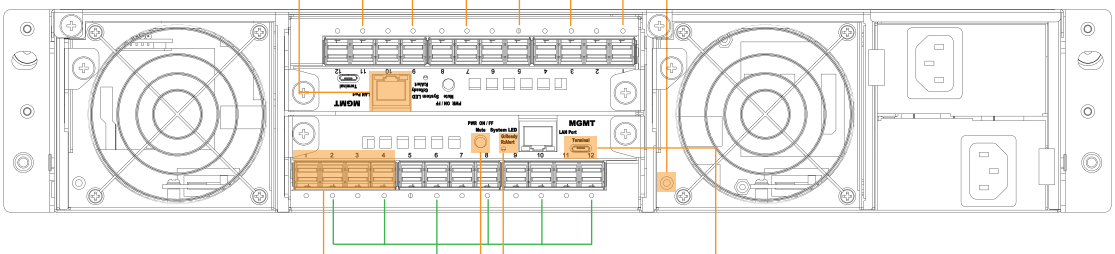
3. Link width indicator LED

- Solid red – Link width does not match with configured link width
- No light – Link width matches with configured link width

6. RJ-45 LAN port for CLI configuration

1. Fan status LED

- Normal – No light
- Failure – Red



4. Quad port HD mini-SAS (SFF-8674) connectors

5. USB Type-C port for CLI configuration

2. Upstream/downstream port indicator LED

- Solid blue – upstream port
- Flashing blue – downstream port

7. System status LED

- Green – normal
- Red – failure event occurs

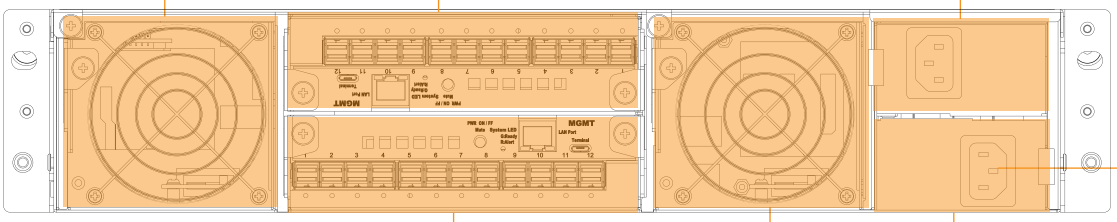
8. Mute button

- To mute buzzer beeping inside the enclosure
- Power on – Press over 2 seconds
- Power off – Press over 5 seconds

10. PCIe switch board B

14. PSU 2

11. Hot-swappable fan 1



9. PCIe switch board A

13. PSU 1

12. Hot-swappable fan 2

15. Power cord receptacles

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2.1 Alarm Mute

As any of the followings **(a)** through **(e)** occurs,

(a) rear cooling fan failure

(b) over-temperature within the enclosure

(c) voltage abnormal

(d) electric current abnormal

(e) power supply unit failure

the buzzer on the switch board inside NS388P enclosure will beep. There are two ways to mute the buzzer beeping; either of the two approaches below can be applied to silence the beeping sound:

[1] press PCIe switch board A or B's mute button at rear of the enclosure.

[2] use the 'buz off' command at CLI (see page 21)

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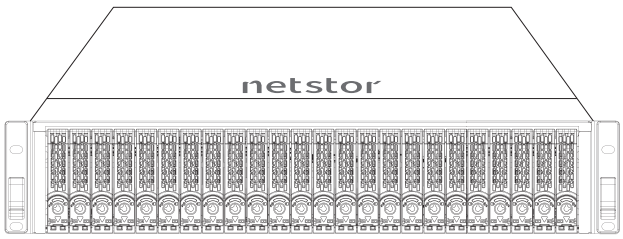
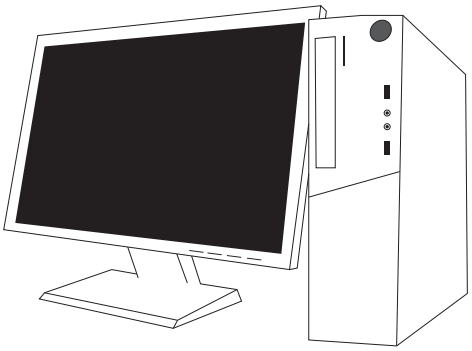
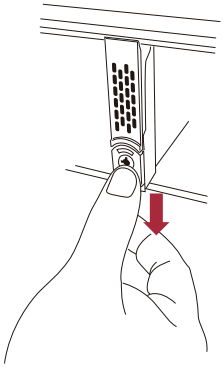
3. Enclosure Installation

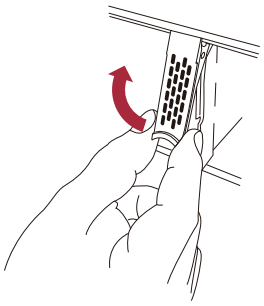
1. Remove the Netstor NS388P enclosure from its packaging, and place the enclosure next to computer, server, or workstation.

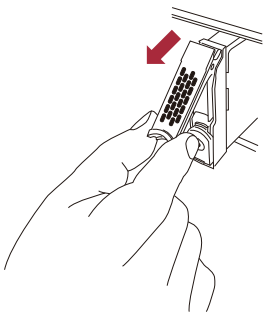




2. Hold one of the U.2 drive trays from the enclosure and push its button downward for the release of the lever until the lever pops out.







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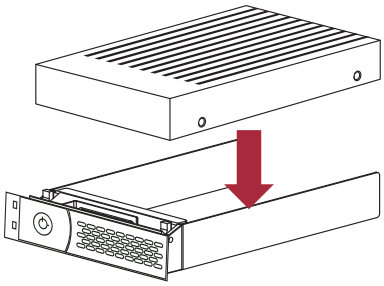
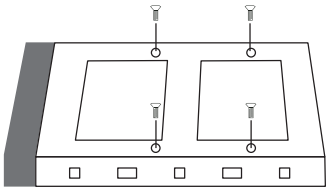
3. Place a U.2 drive tray on a flat, level surface, and then attach the 2.5” U.2 NVMe SSD into the tray.

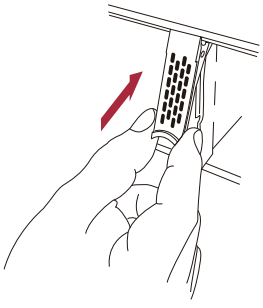


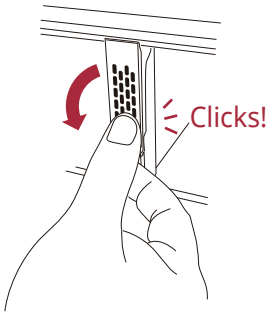
4. Adopt four of the screws provided, and fasten the U.2 NVMe SSD on the tray. Tighten each screw to fasten the U.2 NVMe SSD snugly to the drive tray. Do not tighten the screws overly.



※ You must verify the heads of the four screws are level with the U.2 drive tray while the 2.5” U.2 NVMe SSD is attached to the tray; otherwise, a screw may take hold of the tray from the bottom side and prevent you to pull the tray out of the enclosure.

5. Insert the U.2 drive module into the NS388P enclosure correctly until its lever appears to shut, and then press the lever to close until it clicks to ensure that the U.2 drive module is completely within the enclosure.

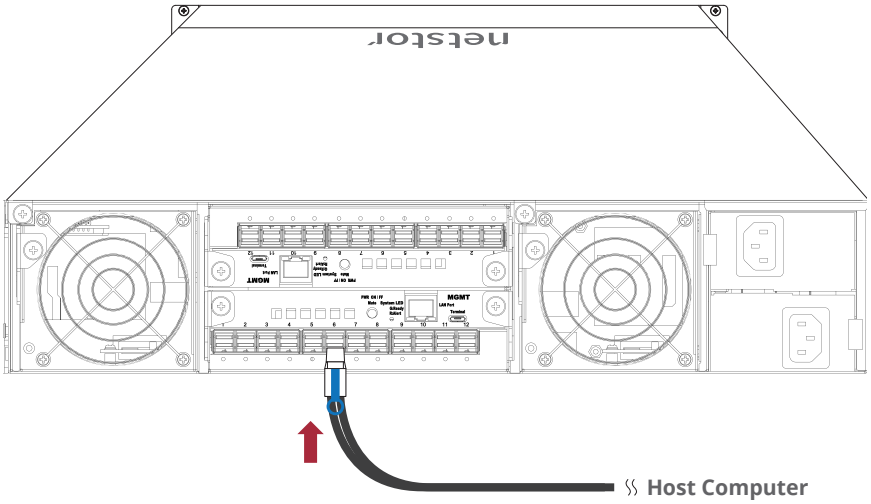




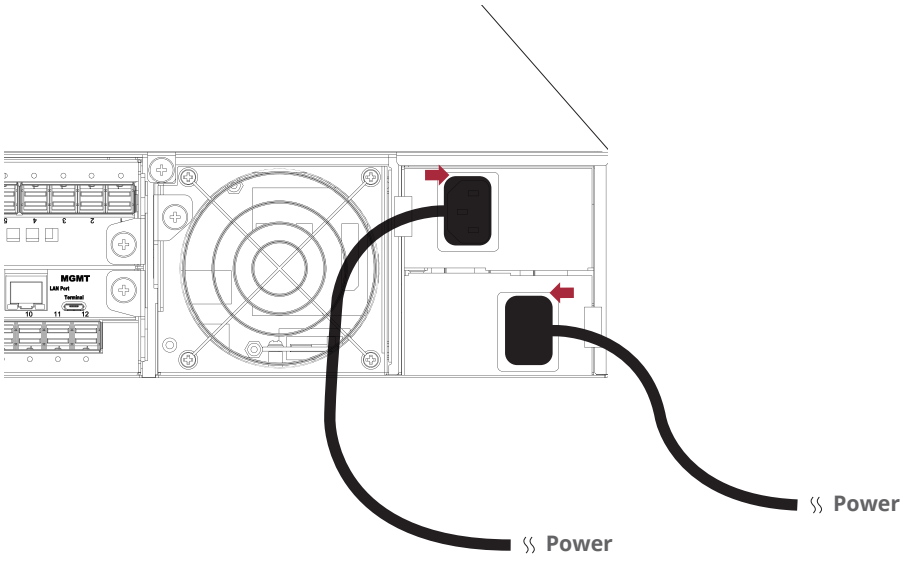
※ Do not force the levers to close while you insert U.2 drive modules into the enclosure. If a lever does not close smoothly, draw out and insert the U.2 drive module again, and then press the lever to close.

6. Repeat steps 2 to 5 for further U.2 NVMe SSD drives.

7. Connect NS388P enclosure to NP980A-G4 host card which is installed in server by HD mini-SAS (SFF-8644) to HD mini-SAS (SFF-8644) data cables. Connection types between NS388P and server are shown at **section 4** of the user's manual.



8. NS388P enclosure is built with redundant PSU, so connect one end of the two power cords to the two power receptacles at rear of NS388P chassis, and then connect the other end of the two power cords to the power outlets.



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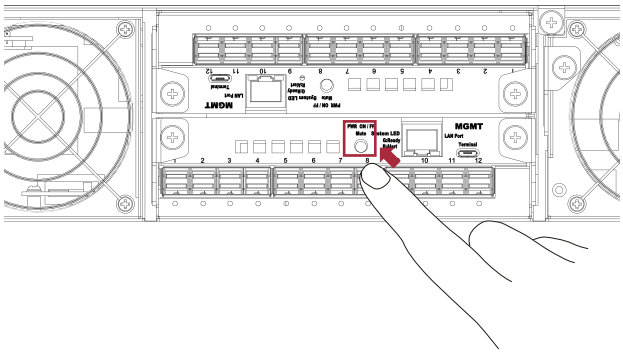
9. After the two power cords are connected properly, you can then press the power button for over two seconds at rear of NS388P to power on the Netstor unit, and then power on the server/workstation.



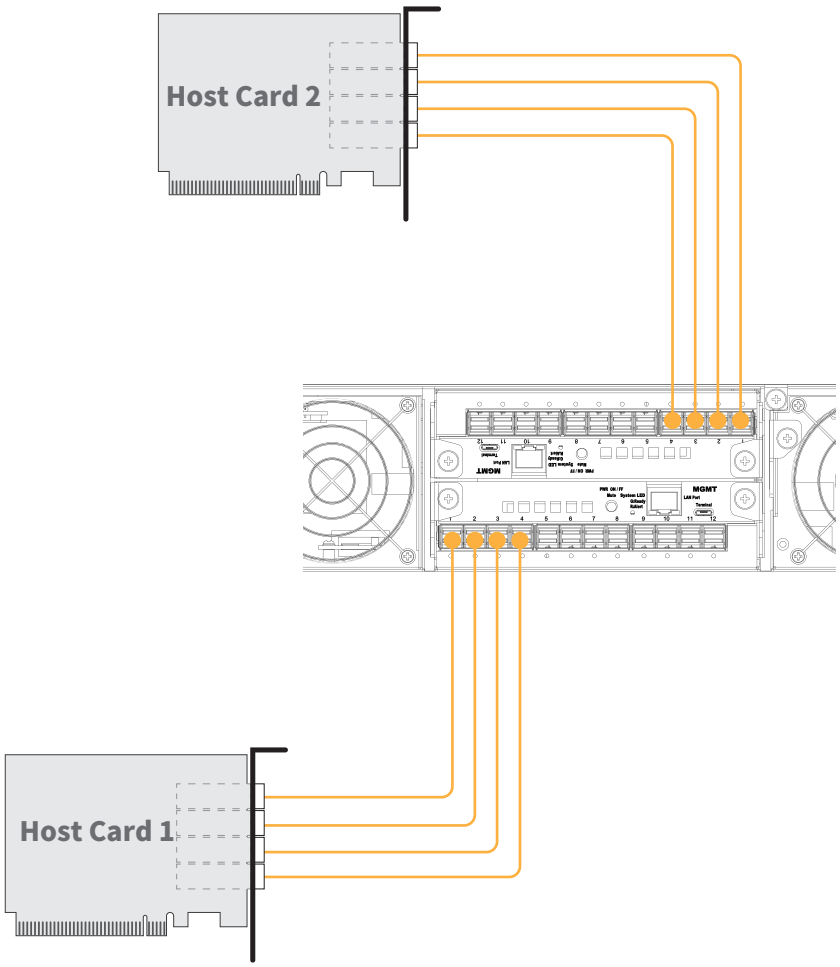
4. Switch Mode

Users can use CLI command to set the switch mode. Netstor NS388P NVMe JBOF storage provides 3 modes for selection and application.

1. Mode 4

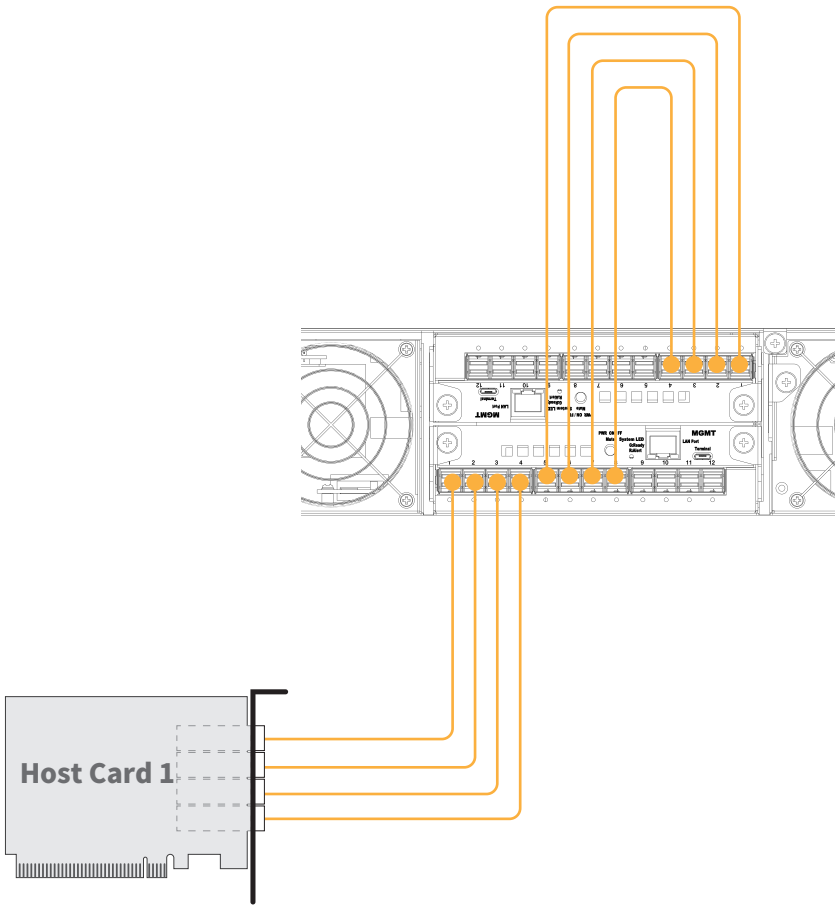
Connection Type A :

Requirement	Host card ×2, cables ×8
Bandwidth	PCIe 4.0 ×16, 256 Gbps (per PCIe switch board)
U.2 SSDs	(1) Host card 1 can access ×4 single port U.2 drives from slot 1 to slot 12 (2) Host card 2 can access ×4 single port U.2 drives from slot 13 to slot 24



Connection Type B :

Requirement	Host card ×1, cables ×8
Bandwidth	PCIe 4.0 ×16, 256 Gbps (PCIe switch board A + B)
U.2 SSDs	Host card 1 can access ×4 single port U.2 drives from slot 1 to slot 24



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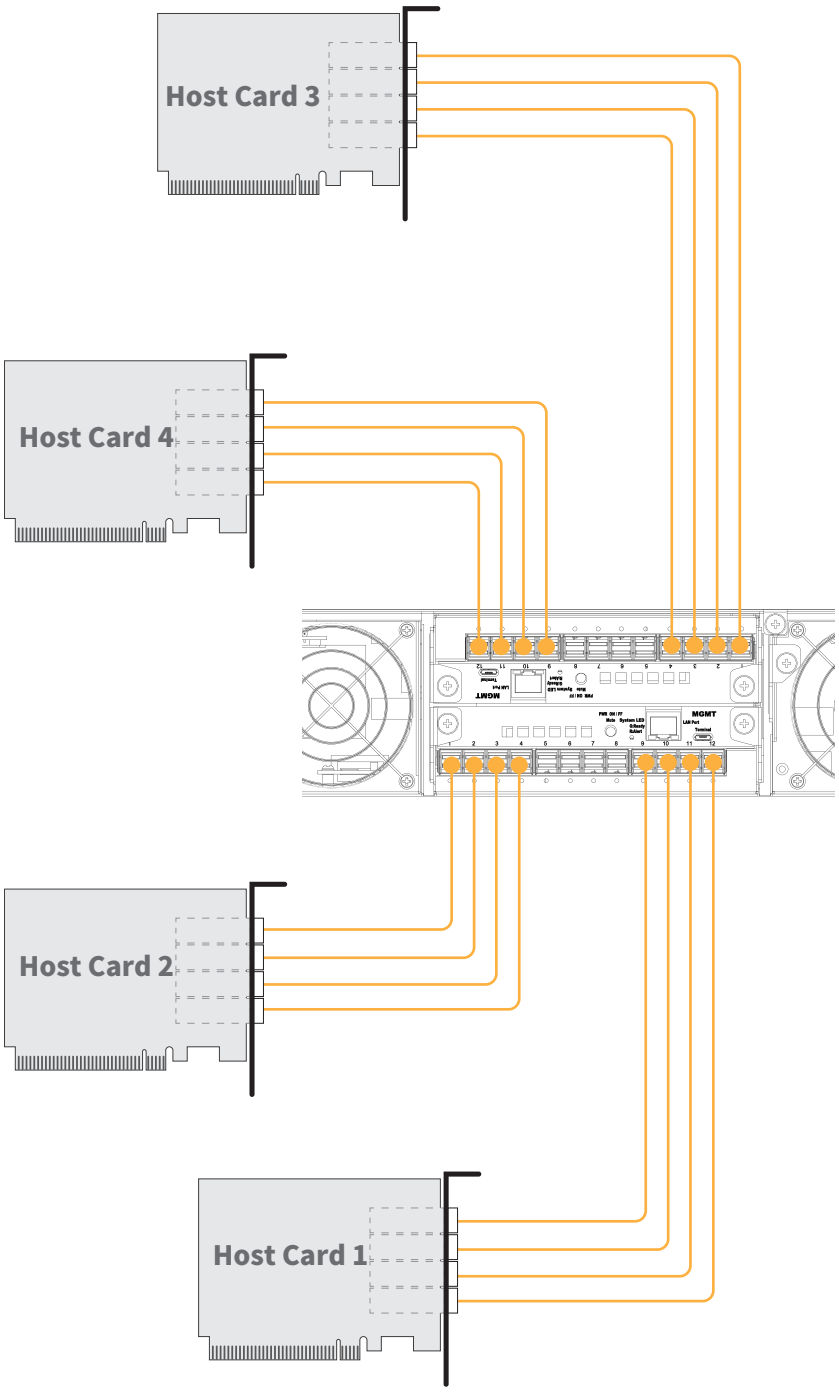
2. Mode 5

Requirement	Host card ×4, cables ×16
Bandwidth	PCIe 4.0 ×32, 512 Gbps (per PCIe switch board)
U.2 SSDs	(1) Host card 1 can access ×4 single port U.2 drives from slot 1 to slot 6 (2) Host card 2 can access ×4 single port U.2 drives from slot 7 to slot 12 (3) Host card 3 can access ×4 single port U.2 drives from slot 13 to slot 18 (4) Host card 4 can access ×4 single port U.2 drives from slot 19 to slot 24



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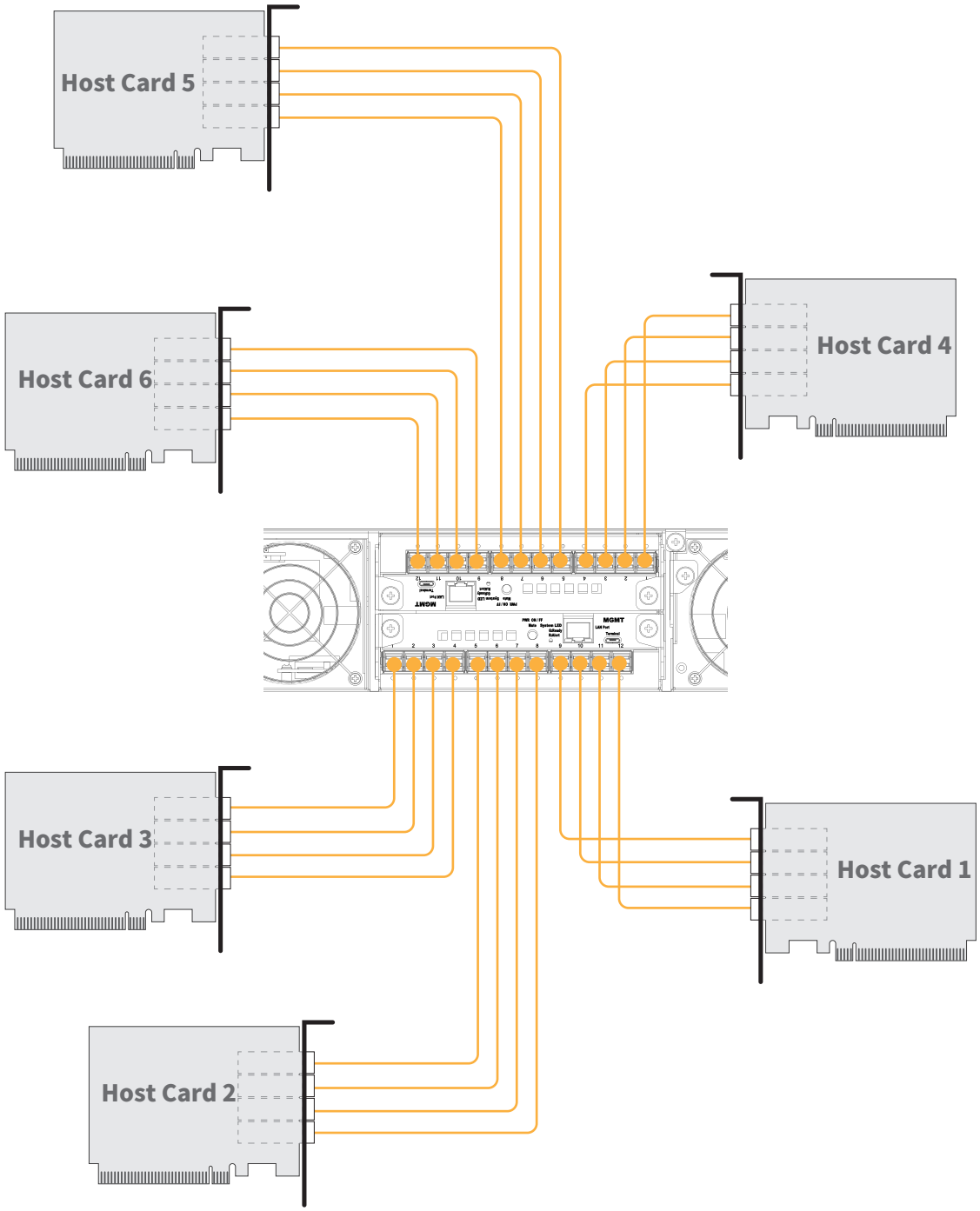
3. Mode 6

Requirement	Host card ×6, cables ×24
Bandwidth	PCIe 4.0 ×48, 768 Gbps (per PCIe switch board)
U.2 SSDs	(1) Host card 1 can access ×4 single port U.2 drives from slot 1 to slot 4 (2) Host card 2 can access ×4 single port U.2 drives from slot 5 to slot 8 (3) Host card 3 can access ×4 single port U.2 drives from slot 9 to slot 12 (4) Host card 4 can access ×4 single port U.2 drives from slot 13 to slot 16 (5) Host card 5 can access ×4 single port U.2 drives from slot 17 to slot 20 (6) Host card 6 can access ×4 single port U.2 drives from slot 21 to slot 24



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5. CLI Manager

Users can use the Command Line Interface (CLI) to manage the NVMe controller functions. The CLI is useful in environment where a graphical user interface (GUI) is not available.

NS388P NVMe JBOF enclosure uses USB Type-C port as the serial port interface. Please use USB Type-A to USB Type-C cable to connect between NS388P's switch controller board and server; the operation system will detect a new USB-to-Serial COM Port. And use this serial port to configure the switch controller.

Windows 10 & later versions, and Linux operating systems have already integrated the driver for the USB port at NS388P.

USB port location :

Establish the Connection by USB Port

The CLI function can be managed by using an ANSI/VT-100 compatible terminal emulation program. The program installation procedure must be done before proceeding to the CLI function. Whichever terminal emulation program is used, it must support the XMODEM file transfer protocol.

Start up VT100 Screen

By connecting a VT100 compatible terminal or a computer operating in an equivalent terminal emulation mode, all CLI administration functions can be executed by the VT100 terminal.

There are a wide variety of Terminal Emulation packages; most of them are very similar. The following setup procedure is an example from VT100 Terminal in Windows 10 operating system using the Tera Term tool.

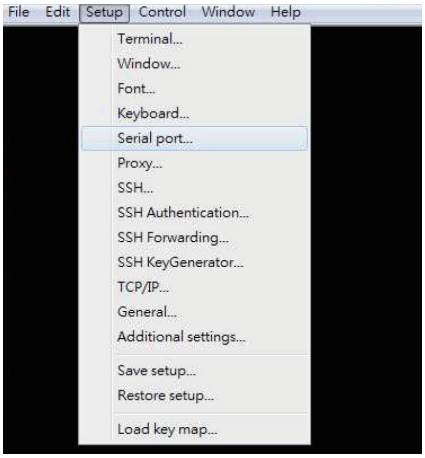
※ **Notice :** Tera Term is a VT100 Terminal Emulation program which is an open-source, free, software implemented, Terminal Emulator tool.

The Tera Term needs to be downloaded; here is the reference site:

https://tera-term.en.lo4d.com/

Step 1. Install and launch Tera Term program.

Step 2. To ensure proper communication between NS388P NVMe JBOF switch controller and the VT100 Terminal emulation, please configure the VT100 Terminal emulation settings to the values as below:



For "**Port**", select **COM3**.

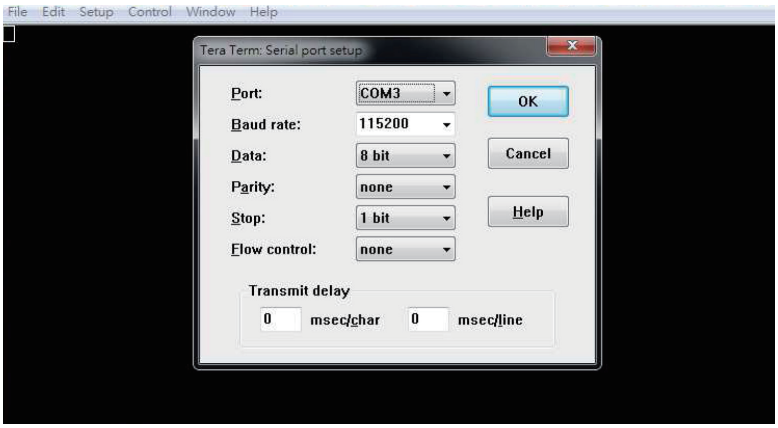
(COM3 is the example; actual COM number will depend on the COM port that is used on the host computer)

For "**Baud rate**", select **115200**.

For "**Data**", select **8 bit**. For "**Parity**", select **none**.

For "**Stop**", select **1 bit**. For "**Flow control**", select **none**.

Click **OK** when the selection is finished.



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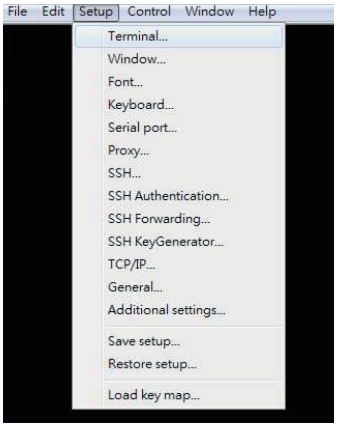
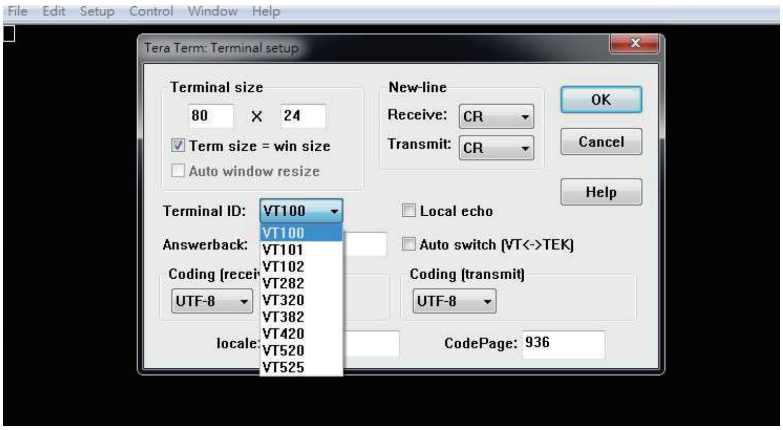
Step 3. Select the Terminal emulation type, please go to the Terminal section as shown below:



For "**Terminal ID**", select **VT100**.

Click **OK** when the selection is finished.



By RJ-45 LAN Ethernet port

The RJ-45 LAN Ethernet port at rear of NS388P is another way to be used as the serial port interface. Use an Ethernet cable to connect between the RJ-45 port at NS388P and the RJ-45 port at server.

Step 1. Click on "**File**" at the top menu bar at Tera Term, and then select "**New connection**".

Step 2. For the item of Host, please key in the default IP address: 192.168.100.20. And for the item of Service, please check "**Telnet**", and then click on "**OK**" to create the Telnet connection.

CLI Command

This section provides detailed information about NS388P NVMe JBOF enclosure's CLI function. For all the commands, please type in lower case.

Function	Command	Syntax
Show list of commands	help	help [enter]
Ethernet IP configuration	eth	eth [enter]
Set Ethernet MAC address	setmac	setmac [enter]
Update controller board PCIe switch's firmware	fdl	fdl [fw / mcu] [enter]
Show environmental info (temp, fan, voltage) on NS388P NVMe JBOF enclosure	lsd	lsd [enter]
NS388P enclosure power on/off	syspwr	syspwr [on] / [off] [enter]
Control the buzzer on switch controller board	buz	buz [en] / [dis] / [on] / [off] [enter]
Control the power of each U.2 NVMe drive slot	ssdpwr	ssdpwr [Slot No.] [on or off] [enter]
To reset each U.2 NVMe SSD	ssdrst	ssdrst [Slot No.] [enter]
Ethernet DHCP function	dhcp	dhcp [on] / [off] [enter]
Set PWRDIS for slot's pin3 level to high or low	pwrdis	pwrdis [Slot No.] [h / l] [enter]
Set configuration mode for switch controller board	setmode	setmode [Mode No.] [enter]
Show configuration mode for each switch controller board	showmode	showmode [enter]
Show controller firmware version on switch controller board	ver	ver [enter]
Reset switch controller board	reset	reset [enter]
Dump NVMe JBOF enclosure information	sysinfo	sysinfo [enter]
Show link status for USP/DSP and slot	showport	showport [enter]

help command

The command provides a list of all commands the user can use for NS388P, also giving a brief description of the supported commands.

The help command can be used to get the detailed information about the CLI commands' summary. Both switch controller boards will show the same list result.

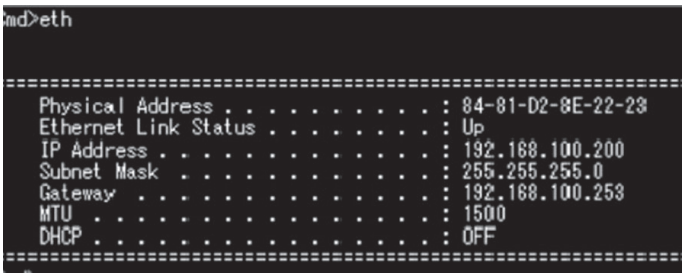
Syntax: JBOF > help [enter]

↳ CLI Command List

eth command

Ethernet IP configuration.

Syntax: JBOF > eth [enter]

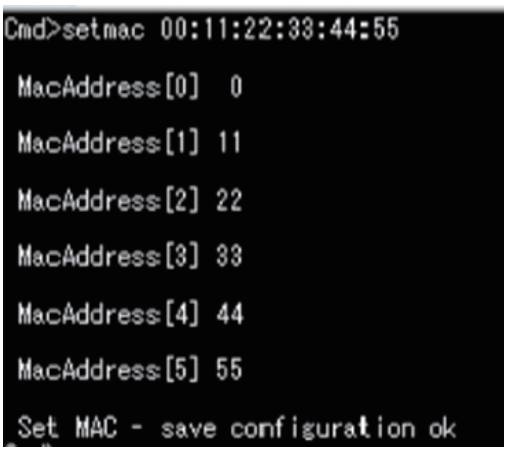


↳ CLI Command List

setmac command

Set Ethernet MAC (Media Access Control) address.

Syntax: JBOF > setmac [enter]



↳ CLI Command List

fdl command

Update switch controller board's PCIe switch configuration firmware or MCU firmware.

Syntax: JBOF > fdl sw [enter]

or

Syntax: JBOF > fdl mcu [enter]

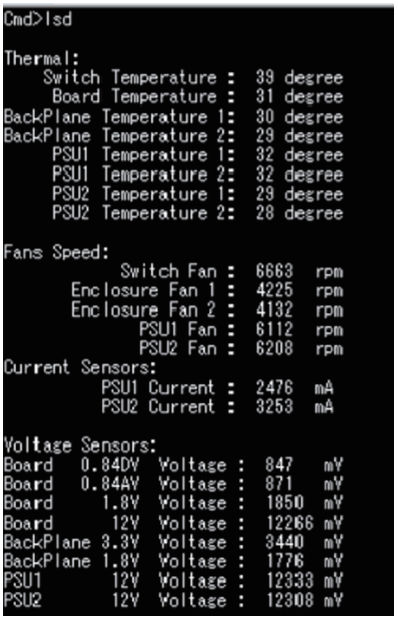
After executing the fdl sw command, click **File** on Tera Term's top menu, select **Transfer**, select **XMODEM**, and select **Send**. Browse to the PCIe switch firmware file, and click OK to proceed and complete the firmware update.

↳ CLI Command List

lsd command

The command shows environmental information (temperature, fan, voltage) on NS388P NVMe JBOF system.

Syntax: JBOF > lsd [enter]



↳ CLI Command List

syspwr command

NS388P enclosure power on & power off.

Syntax: JBOF > syspwr [on] / [off] [enter]

↳ CLI Command List

buz Command

The command is for controlling the buzzer on switch controller board.

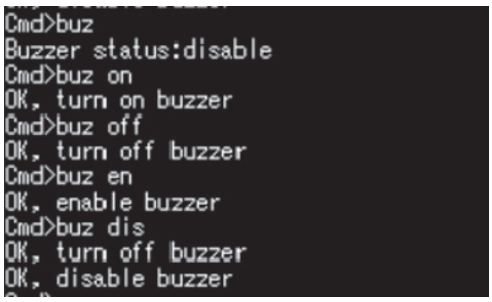
Syntax: JBOF > buz [en] / [dis] / [on] / [off] [enter]

[en]: enable the buzzer function for all time

[dis]: disable the buzzer function for all time

[on]: allow buzzer to beep for one time

[off]: mute the buzzer beeping



↳ CLI Command List

ssdpwr command

The command is for controlling the power of each U.2 NVMe drive slot.

Syntax: JBOF > ssdpwr [Slot No.] [on or off] [enter]

↳ CLI Command List

ssdrst command

Reset each U.2 NVMe SSD.

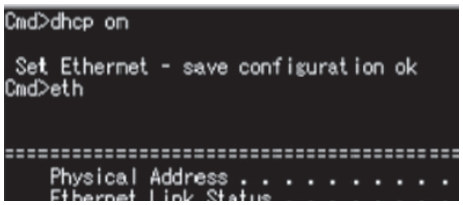
Syntax: JBOF > ssdrst [Slot No.] [enter]

↳ CLI Command List

dhcp command

Ethernet DHCP function.

Syntax: JBOF > dhcp [on] / [off] [enter]



CLI Command List

pwrdis command

Set PWRDIS for U.2 drive slot's pin3 level to high or low.

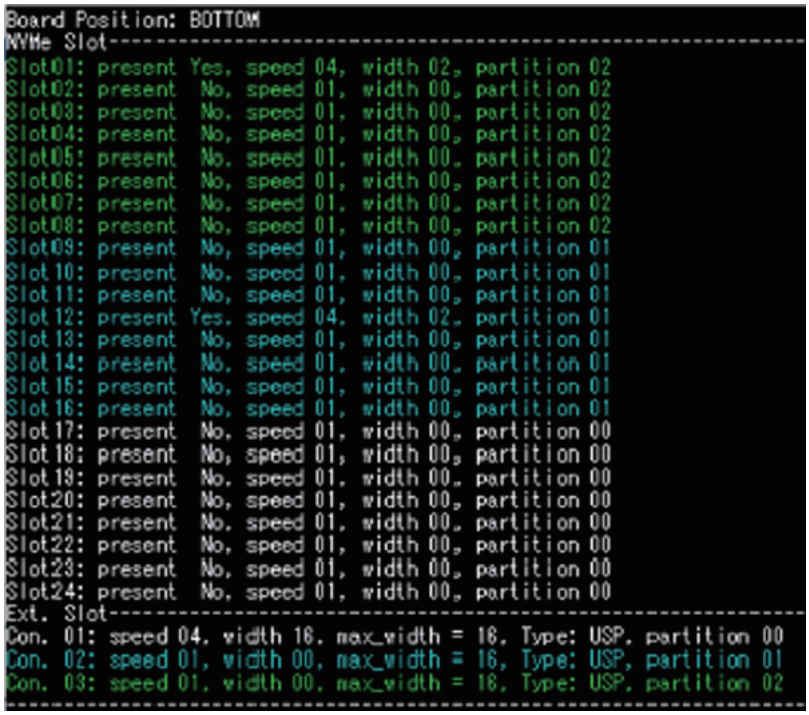
Syntax: JBOF > pwrdis [Slot No.] [h/l] [enter]

CLI Command List

showport command

The command shows link speed and link width information on all U.2 NVMe drive slots.

Syntax: JBOF > showport [enter]



↳ CLI Command List

setmode command

The command is for setting configuration mode for switch controller board.

Syntax: JBOF > setmode [1] / [2] / [3] / [4] / [5] / [6] [enter]

[1]: set for mode 1

[2]: set for mode 2

[3]: set for mode 3

[4]: set for mode 4

[5]: set for mode 5

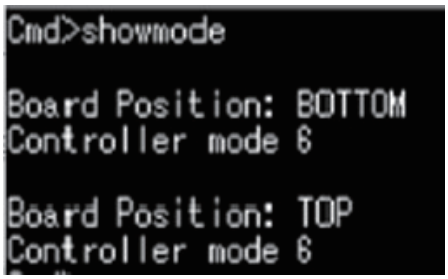
[6]: set for mode 6

↳ CLI Command List

showmode command

The command shows configuration mode for each switch controller board.

Syntax: JBOF > showmode [enter]

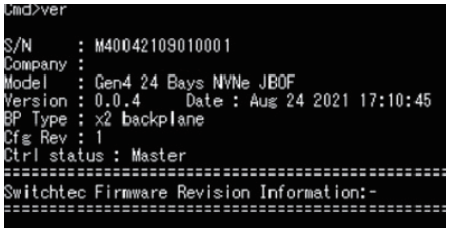


↳ CLI Command List

ver command

The command shows controller firmware version on switch controller board.

Syntax: JBOF > ver [enter]



↳ CLI Command List

reset command

Reset the switch controller board.

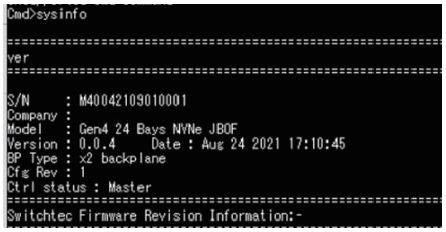
Syntax: JBOF > reset [enter]

↳ CLI Command List

sysinfo command

Show NVMe JBOF enclosure information.

Syntax: JBOF > sysinfo [enter]



CLI Command List

If you have any questions, please contact your regional distributor,
or Netstor Technology, Taiwan.

Netstor Technology Co. Ltd.

6F, No. 1, Alley 16, Lane 235, Baoqiao Rd., Xindian District,
New Taipei City 231-45, Taiwan, R.O.C.

www.netstor.com.tw

sales@netstor.com.tw

+886 2 2917 1500