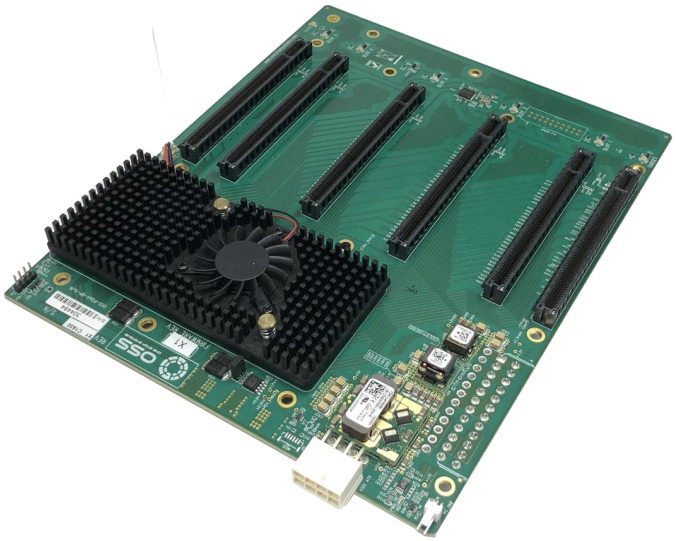
OSS-PCIe4-BP-5X16

Gen 4 Expansion Backplane, 5 PCIe x16 slots (522)



INSTALLATION GUIDE

SKU: OSS-BP-522

ONE STOP SYSTEMS

www.onestopsystems.com

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1 Getting Started

This installation guide tells you step by step how to install the backplane. You will find instructions for the following procedures:

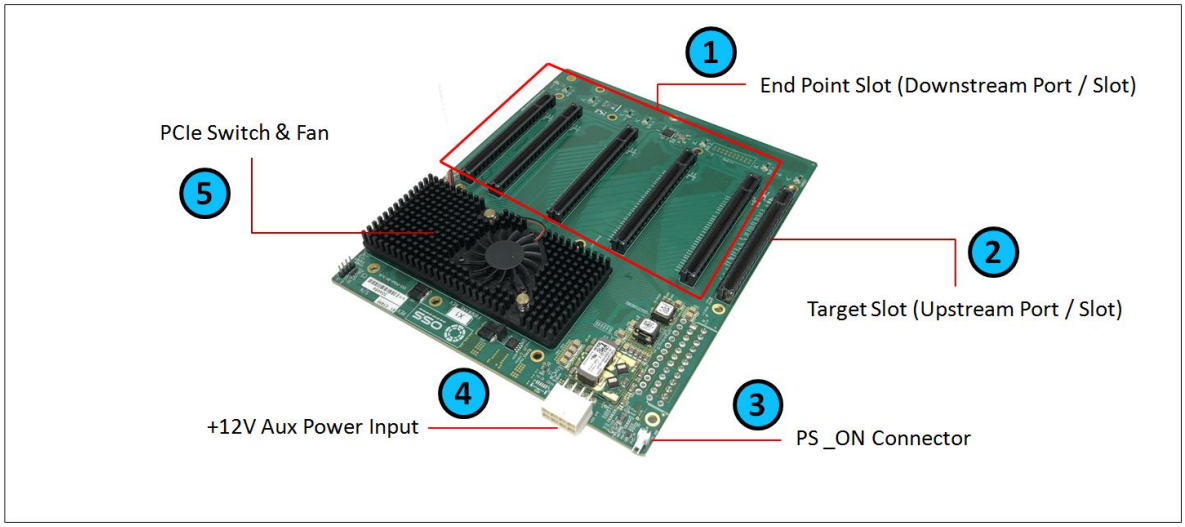
- Unpacking
- Description of Parts
- Hardware Requirements
- Backplane Installation
- Cable Adapter Card Installation
- Link Cable Installation
- Powering Up the unit / system
- Board LED Indicator
- Verify Device Installation

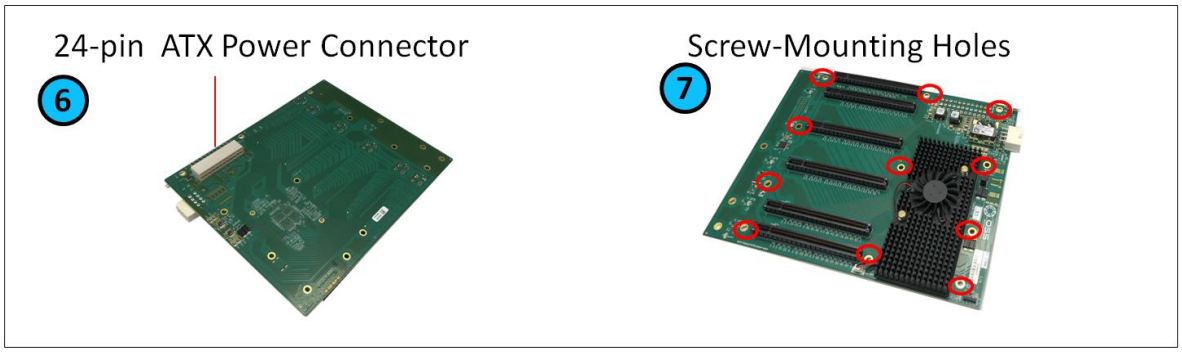
2 Unpacking

Check and identify the standard supplied item. Inspect the backplane to make sure it is free from physical defects and damages.

3 Description of Parts

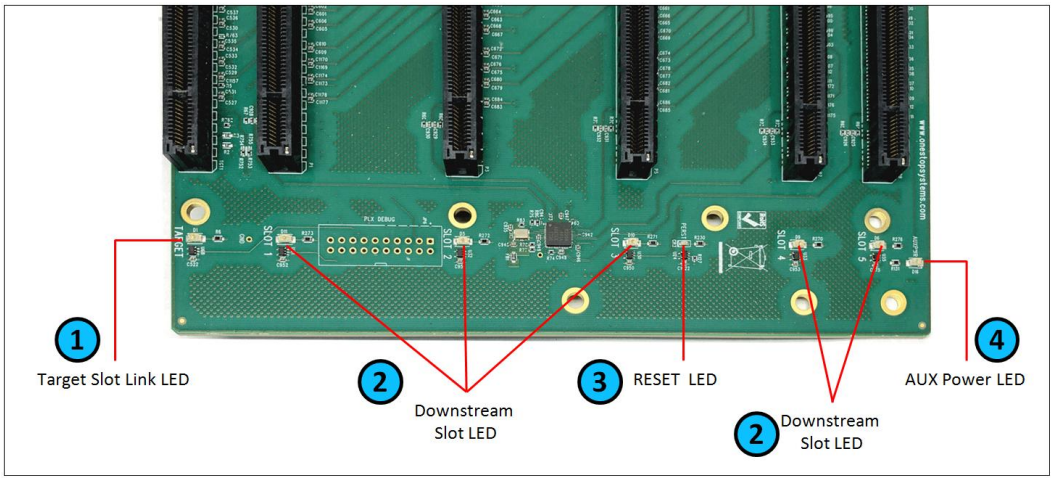
3.1 Backplane



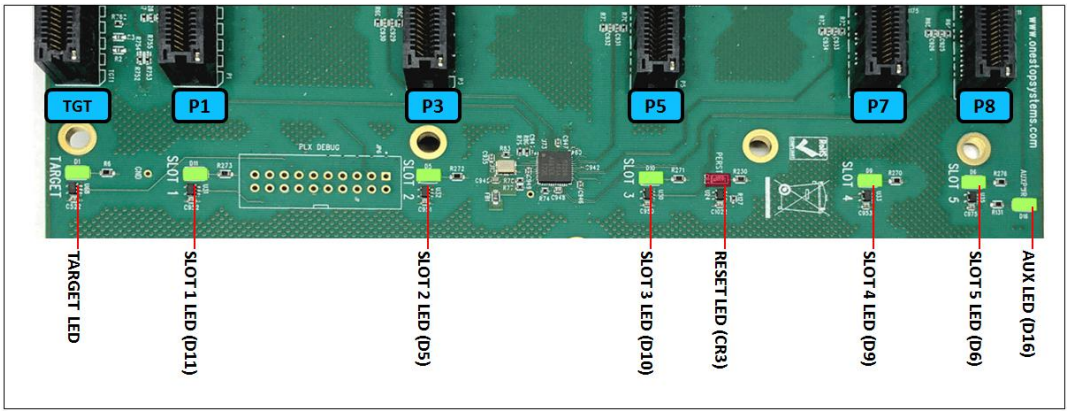


Item	Name	Description
1	PCIe Slot	Downstream Slot: This is where the 3rd party PCIe card is plugged-in
2	Target Slot	Upstream Slot: Designated slot for Target card
3	PS_ON Connector	Enable to force power ON the backplane by placing a jumper on the connector
4	+12v AUX	12V input power for the 522 board. Not to be used for external GPU aux.
5	PCIe Switch & Fan	PLX PCIe Switch and Heat sink / Fan
6	24-pin ATX Power Connector	Use for ATX Power Supply to provide power to the board
7	Screw-Mounting Holes	For securing the board

3.2 Board LEDs



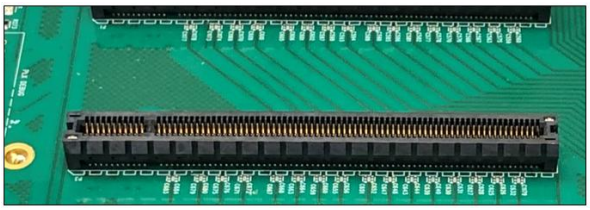
Item	Name	Description	When Lit (Solid Green or Blinking)	When Off
1	Target Slot Link LED	Upstream Slot LINK LED	Solid = Gen4 Link	OFF - Not Linked / No Card present in the slot
			Blink 2Hz = Gen3 Link	
			Blink 1Hz = Gen2 Link	
			Blink 0.5Hz = Gen1 Link (Slow Blinking)	
2	Downstream Link LED	PCIe slot LINK LEDs	Solid = Gen4 Link	OFF - Not Linked / No Card present in the slot
			Blink 2Hz = Gen3 Link	
			Blink 1Hz = Gen2 Link	
			Blink 0.5Hz = Gen1 Link (Slow Blinking)	
3	Reset LED	Board Reset LED	This is RED, when this LED is lit; the PE_RST from the target card is low.	The target card signal is good
4	Aux Power LED	Auxiliary Board power LED	This is GREEN, denotes existence of auxiliary power +5VAUX	Board is at fault / error



LED Name	Target LED	SLOT 1	SLOT 2	SLOT 3	Reset	Slot 4	Slot 5	Aux
LED Component	D1	D11	D5	D10	CR3	D9	D6	D16
PCIe Connector	TGT	P1	P3	P5	-	P7	P8	

3.3 Slot Type

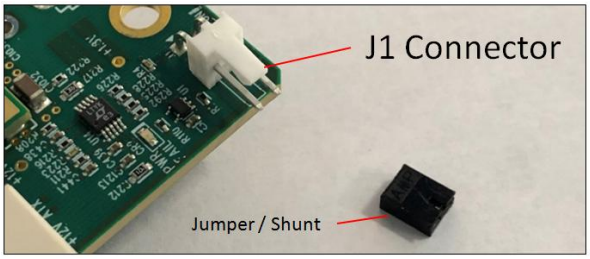
Slot Type: Closed-ended PCIe slot / connector, x16 mechanical and x16 electrical Gen 4.

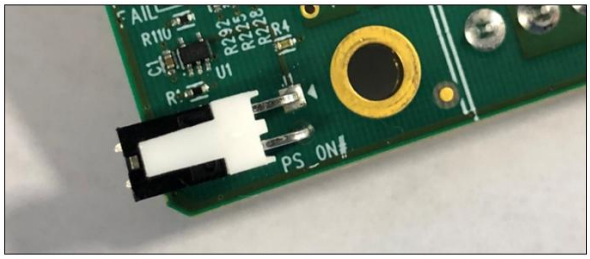


- Closed-ended PCIe slot / connector
- x16 Mechanical , x16 Electrical

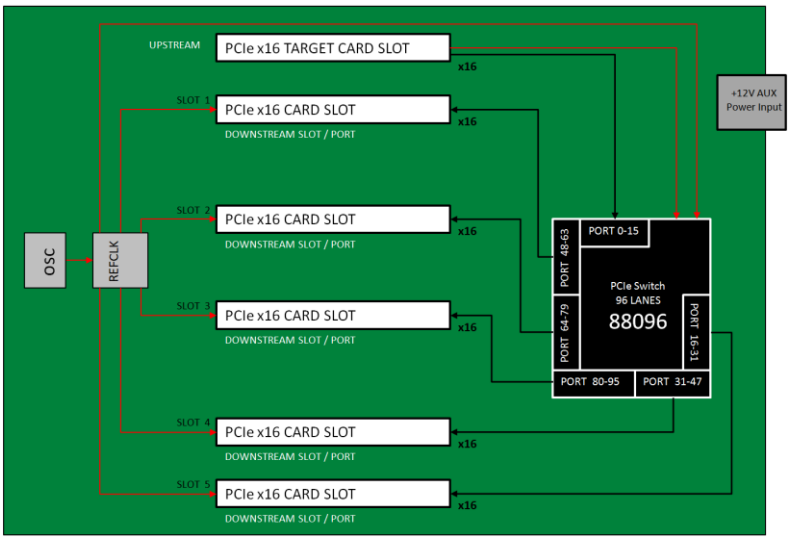
3.4 Force Power ON

The board has a connector for a shunt / jumper, which allows the backplane to force the ATX supply to power on. See photos below for the location of the J1 connector on the backplane.

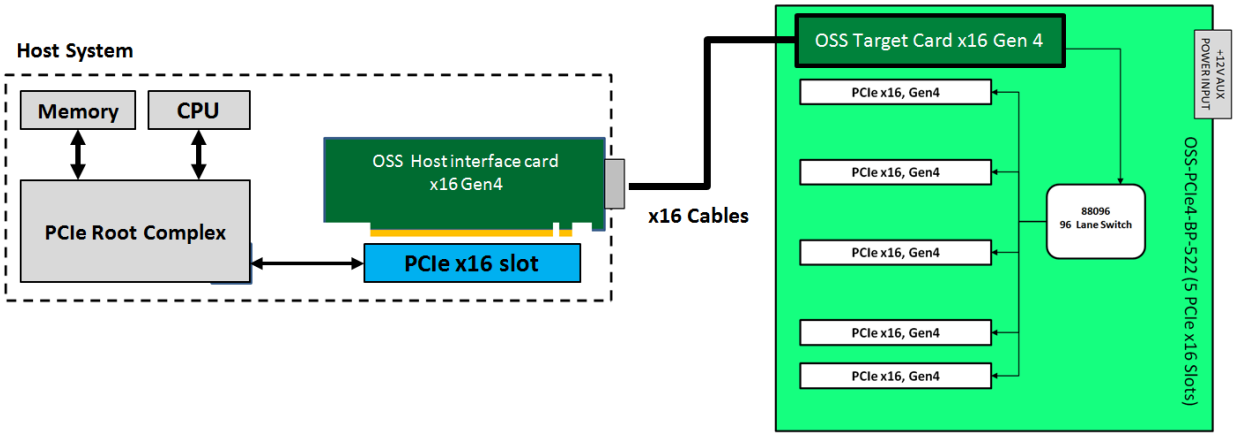




3.5 Block Diagram



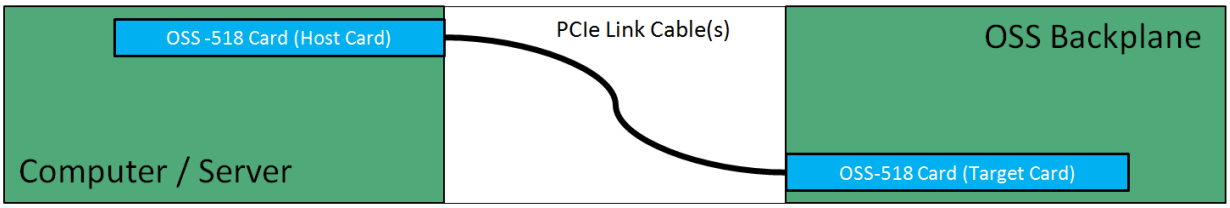
3.6. Host and OSS backplane



3.7 Supported Setup

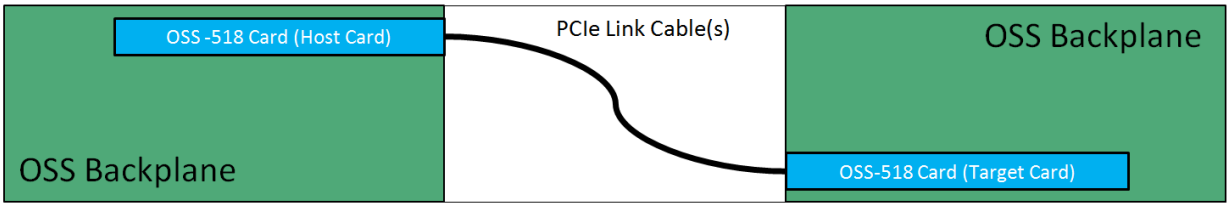
This is a validated /supported setup for using the backplane with a host computer and HIB adapter cards.

- Using a set of OSS-PCIe-HIB616-x16 card (Target and Host cards),
- OSS Gen4 backplane
- PCIe Gen4 cables.



3.8 Not Supported Setup

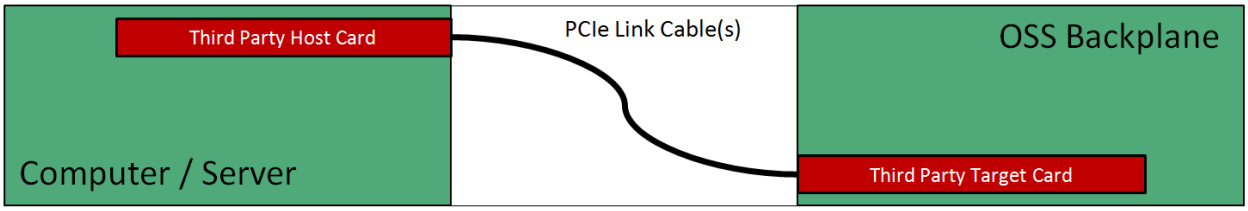
Backplane to Backplane, not a supported setup. It will not work.



Third Party HIB Cable Adapter cards

Using a non OSS HIB cable adapter cards with the backplane is not supported.

- Customer is solely responsible for troubleshooting their non OSS HIB cable adapter cards when problem arises upon using it with the 2 backplane.
- Damaging the backplane by using a non validated HIB cable adapter cards will not be covered under warranty.



4 Hardware Requirements

1. OSS-PCIe-HIB616-x16 card as Host
2. OSS-PCIe-HIB616-x16-T card as Target
3. Gen 4 PCIe x4 cable
    a. x16 Configuration: Four PCIe Gen4 cables
    b. X8 Configuration: Two PCIe Gen4 cables
    c. X4 Configuration: One PCIe Gen4 cable
4. Gen4 x16 PCIe slot (computer motherboard)
5. OSS Expansion Chassis / OSS Gen4 Backplane

4.1 OSS-PCIe-HIB616-x16 card

A pair of HIB616-x16 cards, one as host card and the other as target card

4.2 SFF-8644 Gen4 x4 Cable

Use Gen 4 PCI Express (PCIe) rated cables. This passive copper cable mates to the SFF-8644 connectors on the HIB6xx family of OSS host interface board.

- Tested and validate with 1m, 2m and 3m lengths
- Single or multiple cables can form larger PCIe links
    - x4 (1 cable)
    - x8 (2 cables)
    - X16 (4 cables)

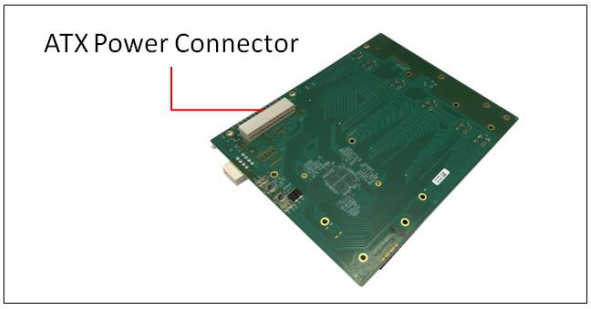
The cable that we qualified is the PCIe Gen 4 x4 (with BLUE, GREEN and BLACK tab), see photo below. The FPGA in the HIB616-x16 card does not support CMI operations.

4.3 Expansion Chassis / Gen4 Backplane

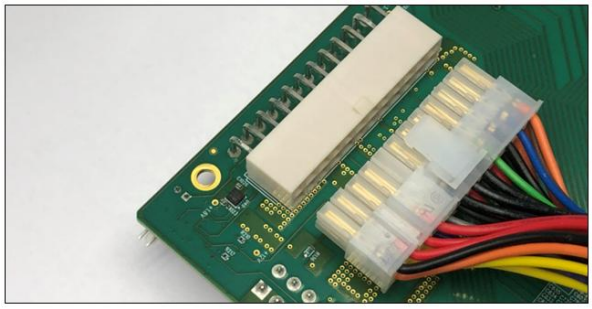
5 Backplane Installation

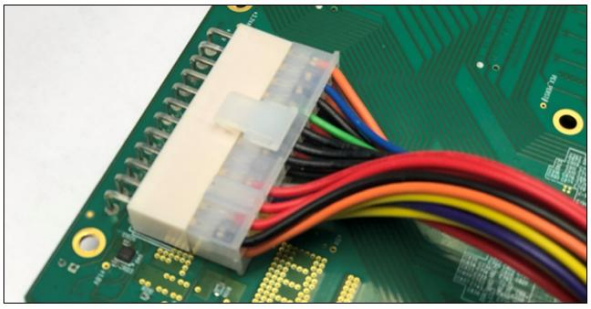
1. Turn the chassis off and unplug the chassis from AC power.
2. Before mounting the backplane, inspect the chassis to ensure there aren't any protruding metals.

Turn the backplane over to access the onboard 24-PIN ATX Power Connector.

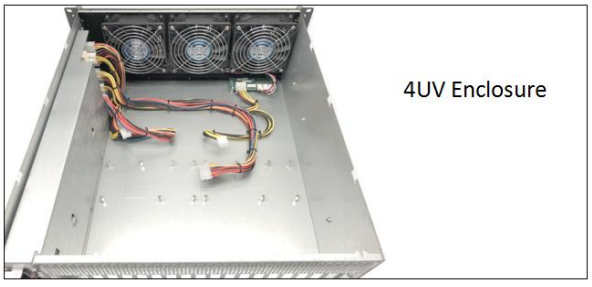


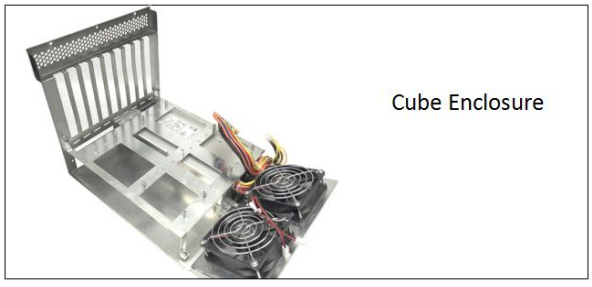
Connect the ATX power cable to the onboard 24-PIN ATX Power Connector as shown from the photos below.



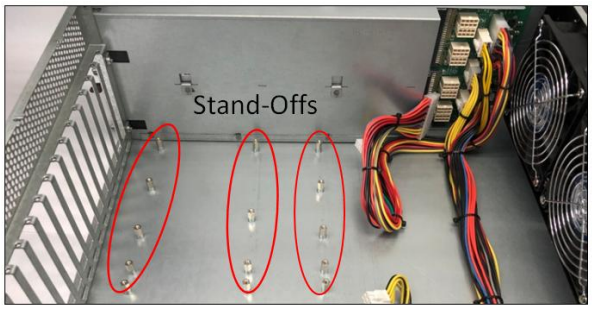


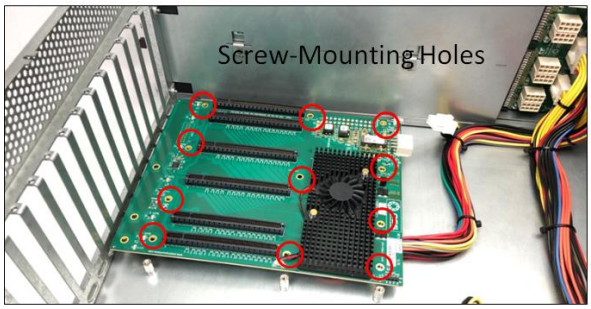
Install the board in the chassis / enclosure. The photos below are two available enclosures for the OSS-522 backplane.

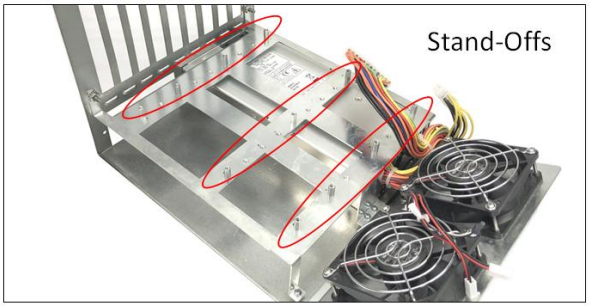


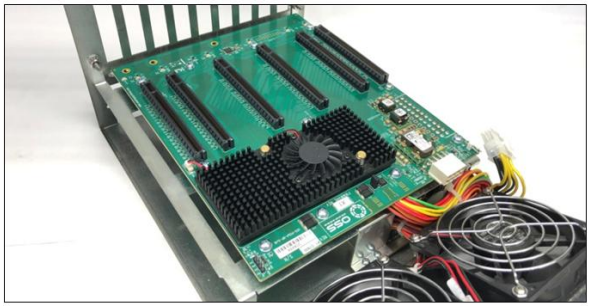


Place the OSS-522 backplane on top of the stand-offs and align the screw-mounting holes.

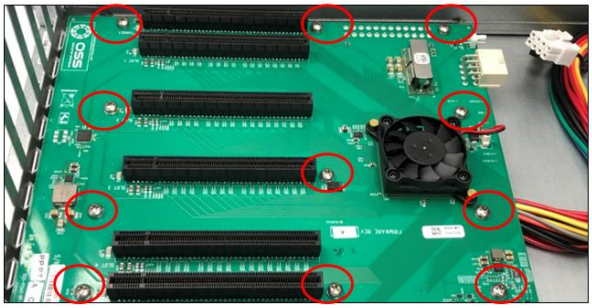








Secure the backplane with the screws.



6 Cable Adapter Card Installation

To operate the backplane you need a set of “HIB Cable Adapter Card”. Use a compatible Gen4 x16 PCIe Host / Target cable adapter cards.

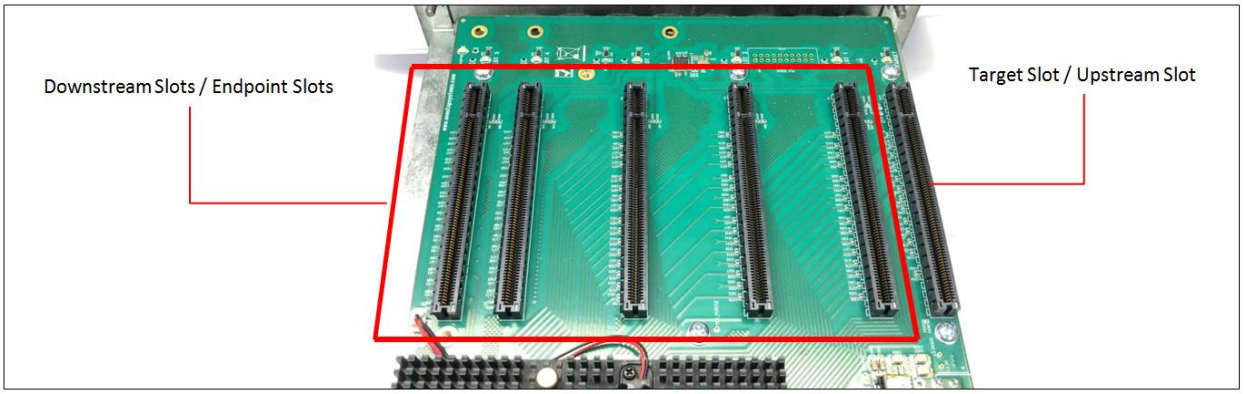
- Target card: Installed directly on the OSS backplane’s target slot
- Host Card: Installed in the host computer motherboard’s PCIe slot.

For more details on OSS-PCIe-HIB616-x16 card (Host / Target card) please refer to the OSS-PCIe-HIB616-x16installation guide.

https://www.onestopsystems.com/product/pcie-x16-gen-4-cable-adapter

6.1 Target Card Installation

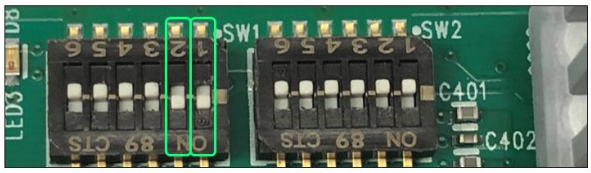
Use the designated Target Slot / Upstream Slot when installing the card. The Target card will only operate in the target slot / upstream slot. See photos below for the correct location of the Target slot (also known as Upstream Slot).

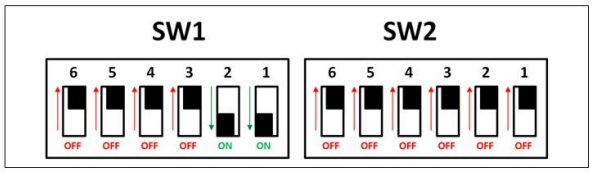


6.1.1 Target Card Switch Settings

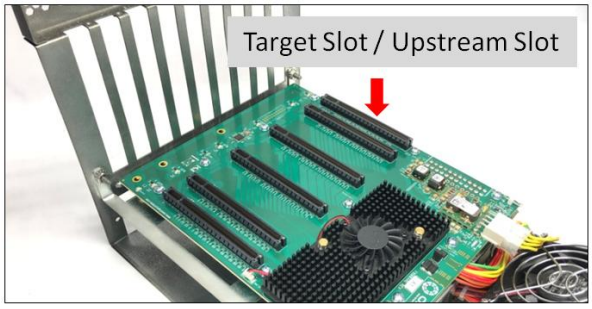
Check and verify the switches are set to target mode before installing the card. See photos below for Target card switch settings. If the switches are set incorrectly, the card will not link up with the host.

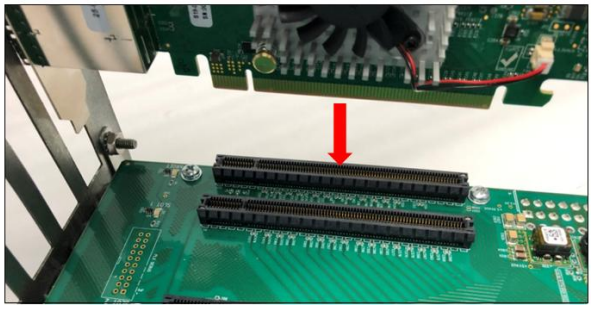
- SW1 #1 = ON; SW1 #2= ON
- SW2 = All OFF



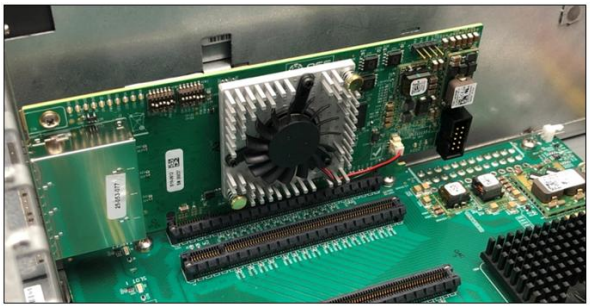


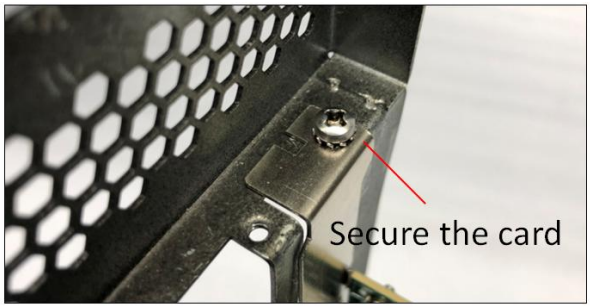
Warning: Only use the Upstream slot for the Target card. Do not plug-in the Target card in the downstream PCIe slot.





Make sure the card is firmly and fully seated in the slot. Secure the card.





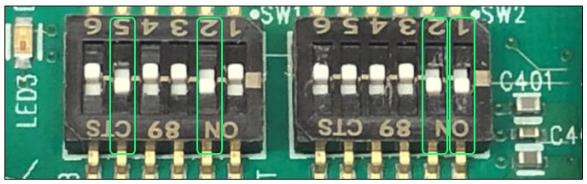
6.2 Host Card Installation

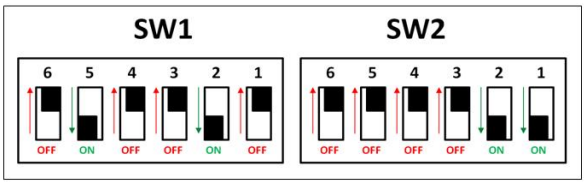
The host card can only be installed in the computer motherboard's PCIe slot. Install the Host card in a x16 Gen4 PCIe slot. Check the PCIe slot, make sure it is to Gen4 x16 (electrical).

- Check the PCIe slot for any foreign debris as this can damage the card during installation.
- Make sure the dipswitches on the card are set to host mode before you plug in the card.
- Photos below are x16 dipswitches settings for host mode.

6.2.1 Host Card Dipswitch Settings (x16 Configuration)

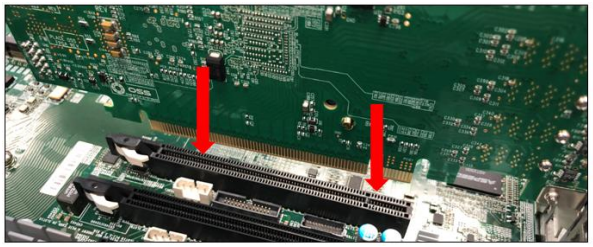
- SW1 #2 = ON; #5 =ON.
- SW2 #1 = ON; #2 = ON

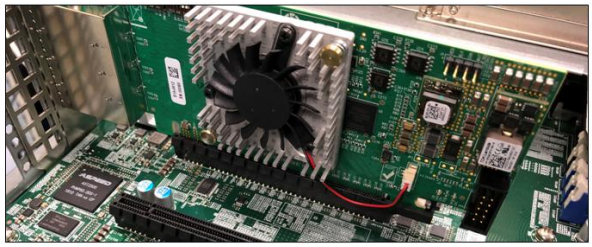




Note: For more information on different host card dipswitch settings / configurations please check the OSS-PCIe-HIB616-x16 installation guide.

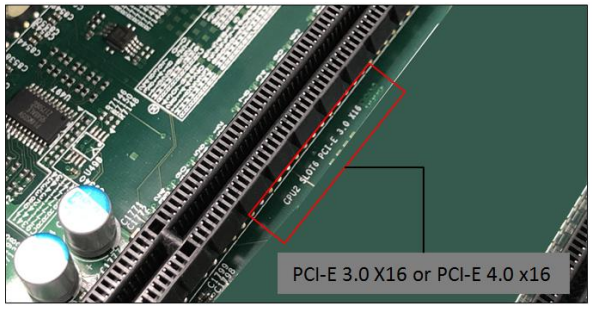
- Align the host card PCIe connector on top of the PCIe slot. Carefully push the card down until it is firmly seated and secure it.





The photos below are example of x16 PCIe slot.

- You can easily identify the specification of the PCIe slot by reading the silk-screen next to it.



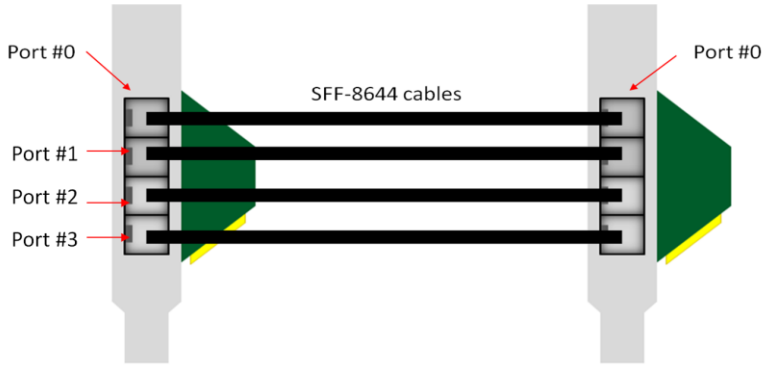
7 Cable Installation

7.1 Connecting the Link Cables

x16 configuration: FOUR cables

Note: Make sure the HIB616-x16 host card is set to x16 configuration, see x16 switch settings. Refer to the OSS-PCIe-HIB616-x16installation guide.

- Plug-in the 1st cable to Port#0 (Top port) on both Target and Host cards
- Plug-in the 2nd cable to Port#1 on both Target and Host cards
- Plug-in the 3rd cable to Port#2 on both Target and Host cards
- Plug-in the 4th cable to Port#3 (Bottom port) on both Target and Host cards



For more details on different cable configurations please refer to the OSS-PCIe-HIB616-x16 installation guide.

https://www.onestopsystems.com/product/pcie-x16-gen-4-cable-adapter

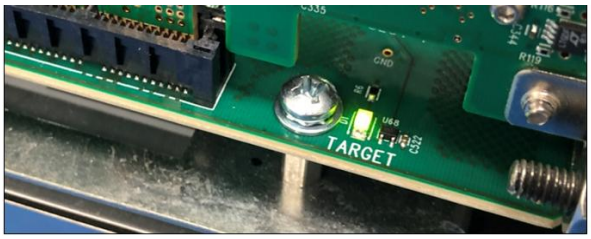
8 Powering UP the unit

- Plug in power to the expansion unit.
- Plug in power to the host computer
- Flip the power supply switch to ON position on the expansion unit
- Press the main power switch on the host computer.

9 Board LED Indicator

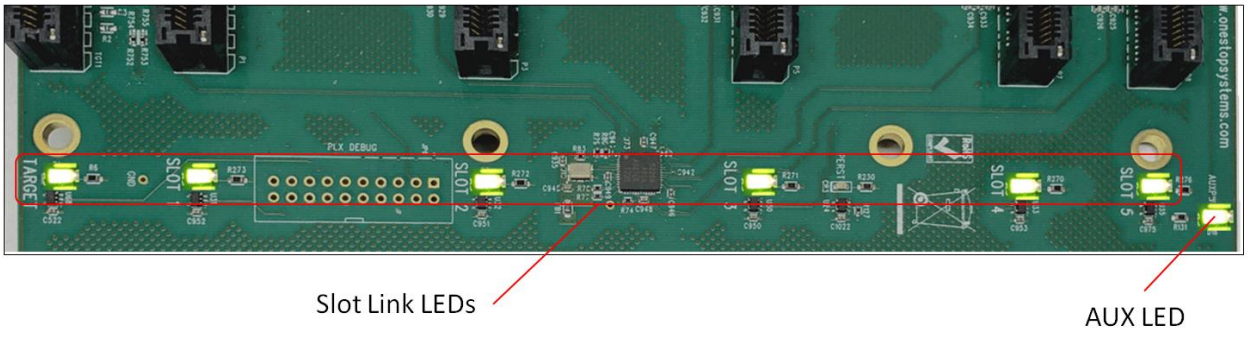
- After the host computer is powered UP, the Target LED on the backplane will come up as solid green.

9.1 Target SLOT LINK LED



9.2 Slot LINK LEDs and AUX LED

- The SLOT Link LED will come ON if a PCIe card is occupying the slot.
- The AUX LED will be lit as solid green



8 Verify Device Installation

8.1 Linux

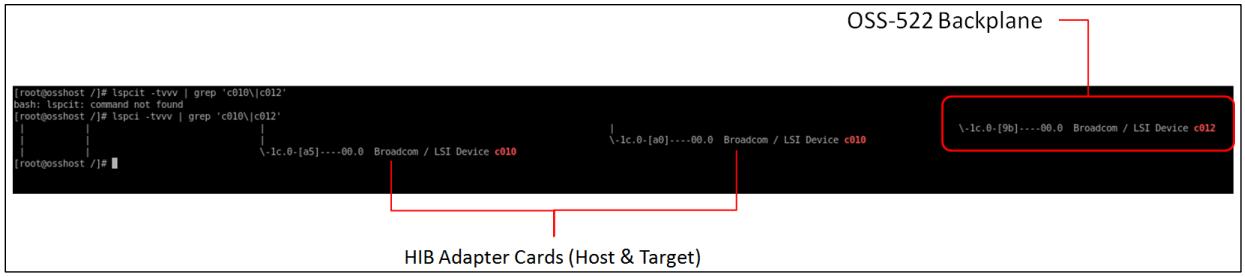
On Linux operating system, to verify or check if the board is detected or not, type the command below on the terminal window.

$lspci –vvv | grep c012, see output below:

```
[root@osshost oss]# lspci -vvv | grep c012
8a:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:04.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:08.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:0c.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:1c.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8c:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8d:10.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8f:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
90:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
90:10.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
93:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
94:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
94:10.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
97:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
98:14.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
98:15.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
9b:00.0 Mass storage controller: Broadcom / LSI Device c012 (rev a0)
```

$lspci –tvvv | grep LSI, see output below

```
[root@osshost /]# lspcit -tvvv | grep 'c010\|c012'
bash: lspcit: command not found
[root@osshost /]# lspci -tvvv | grep 'c010\|c012'
 |           |                           |                                                                                                  \-1c.0-[9b]----00.0  Broadcom / LSI Device c012
 |           |                           \-1c.0-[a0]----00.0  Broadcom / LSI Device c010
 |           |
 |           \-1c.0-[a5]----00.0  Broadcom / LSI Device c010
[root@osshost /]#
```

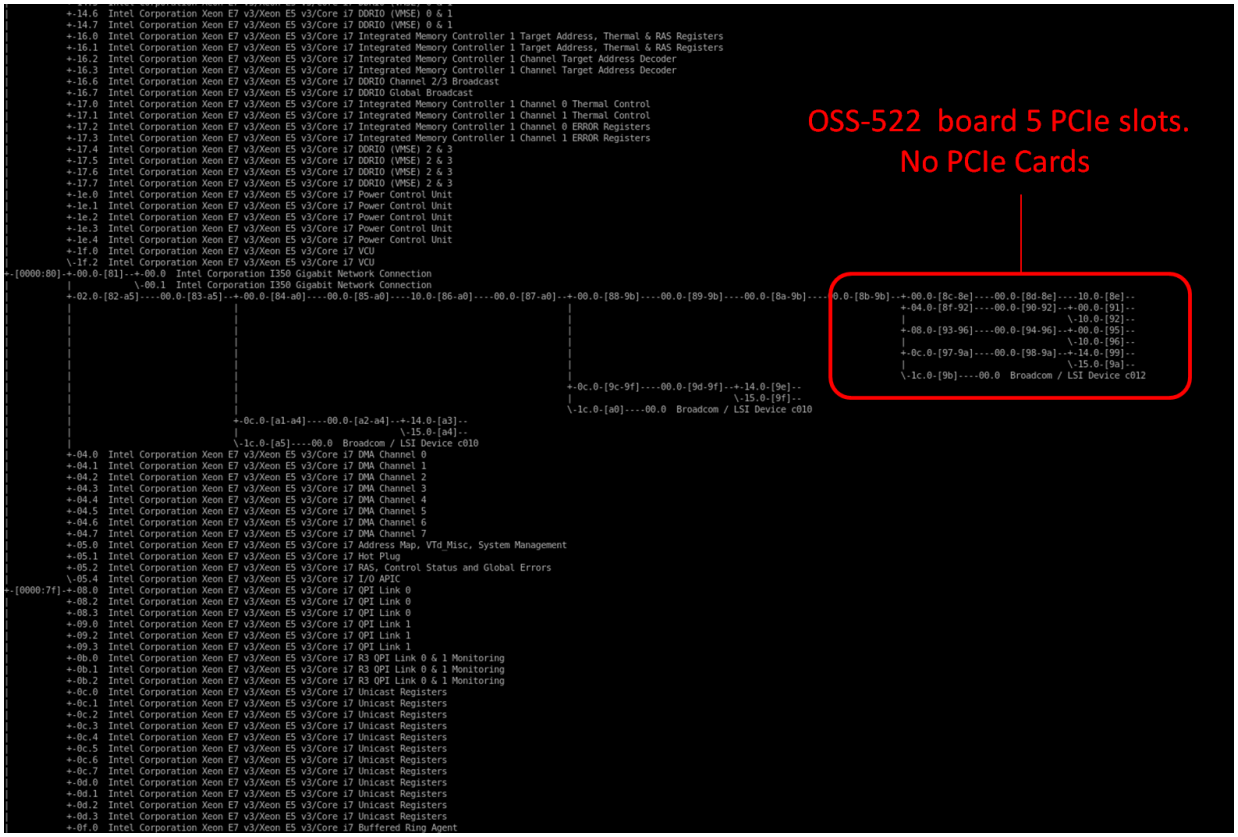


$lspci –m | grep 00b2, see output below.

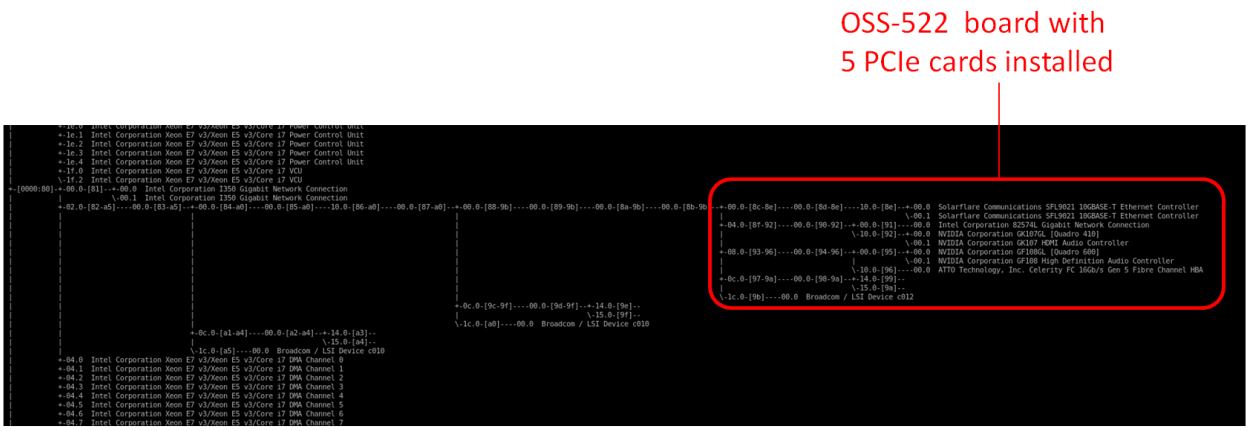
```
[root@osshost oss]# lspci -m | grep 00b2
9b:00.0 "Mass storage controller" "Broadcom / LSI" "Device c012" -ra0 "Broadcom / LSI" "Device 00b2"
a0:00.0 "Mass storage controller" "Broadcom / LSI" "Device c010" -rb0 "Broadcom / LSI" "Device 00b2"
a5:00.0 "Mass storage controller" "Broadcom / LSI" "Device c010" -rb0 "Broadcom / LSI" "Device 00b2"
[root@osshost oss]#
```

$lspci –vvvvt, this will give you the entire devices in a tree format.

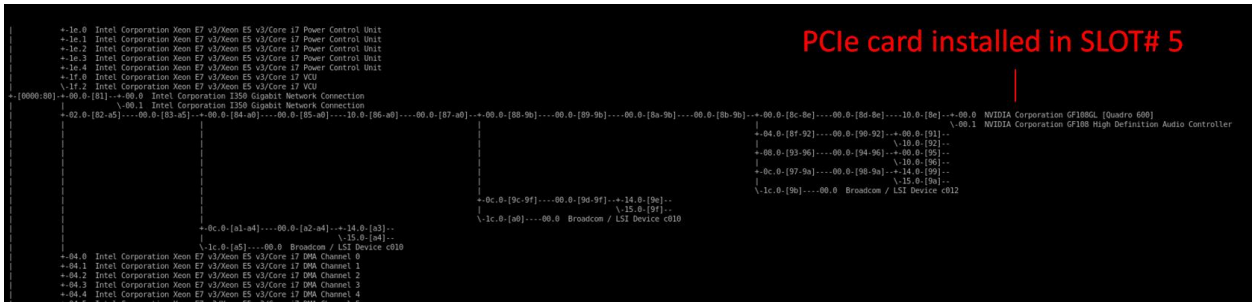
Output below is a cropped screenshot of the lspci –tvvv showing the OSS-522 backplane with no PCIe cards installed.



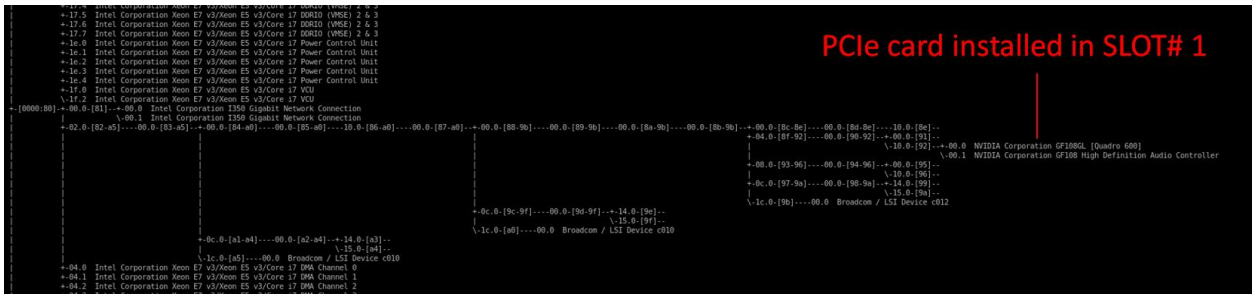
Output below is a cropped screenshot of the “lspci –tvvv” showing the OSS-522 backplane with five cards installed.



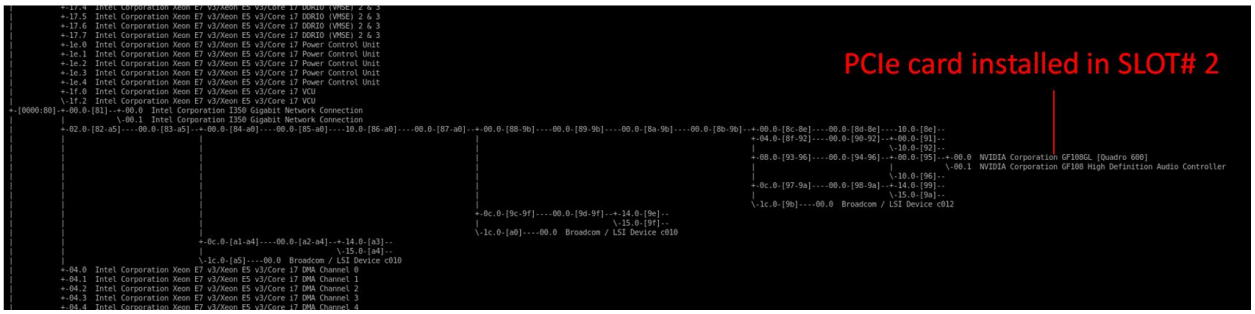
Output below is a cropped screenshot of the “lspci –tvvv” showing the OSS-522 backplane with a single card installed in SLOT# 5



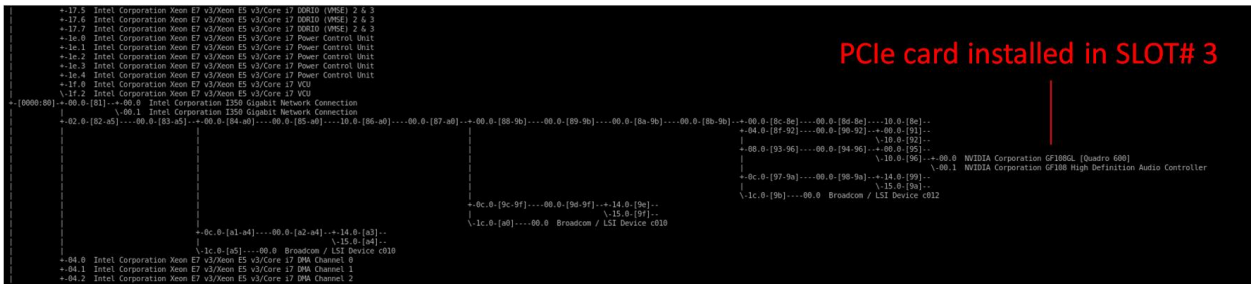
Output below is a cropped screenshot of the “lspci –tvvv” showing the OSS-522 backplane with a single card installed in SLOT# 1



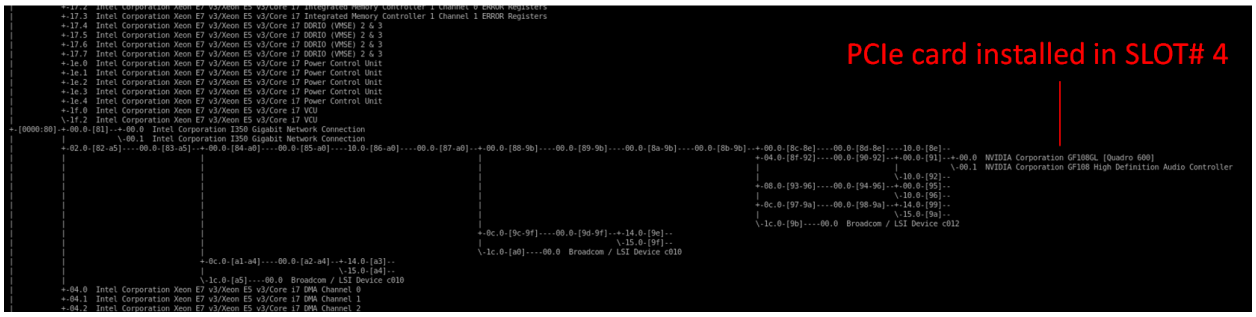
Output below is a cropped screenshot of the “lspci –tvvv” showing the OSS-522 backplane with a single card installed in SLOT# 2.



Output below is a cropped screenshot of the “lspci –tvvv” showing the OSS-522 backplane with a single card installed in SLOT# 3.



Output below is a cropped screenshot of the “lspci –tvvv” showing the OSS-522 backplane with a single card installed in SLOT# 4.



8.2 Windows

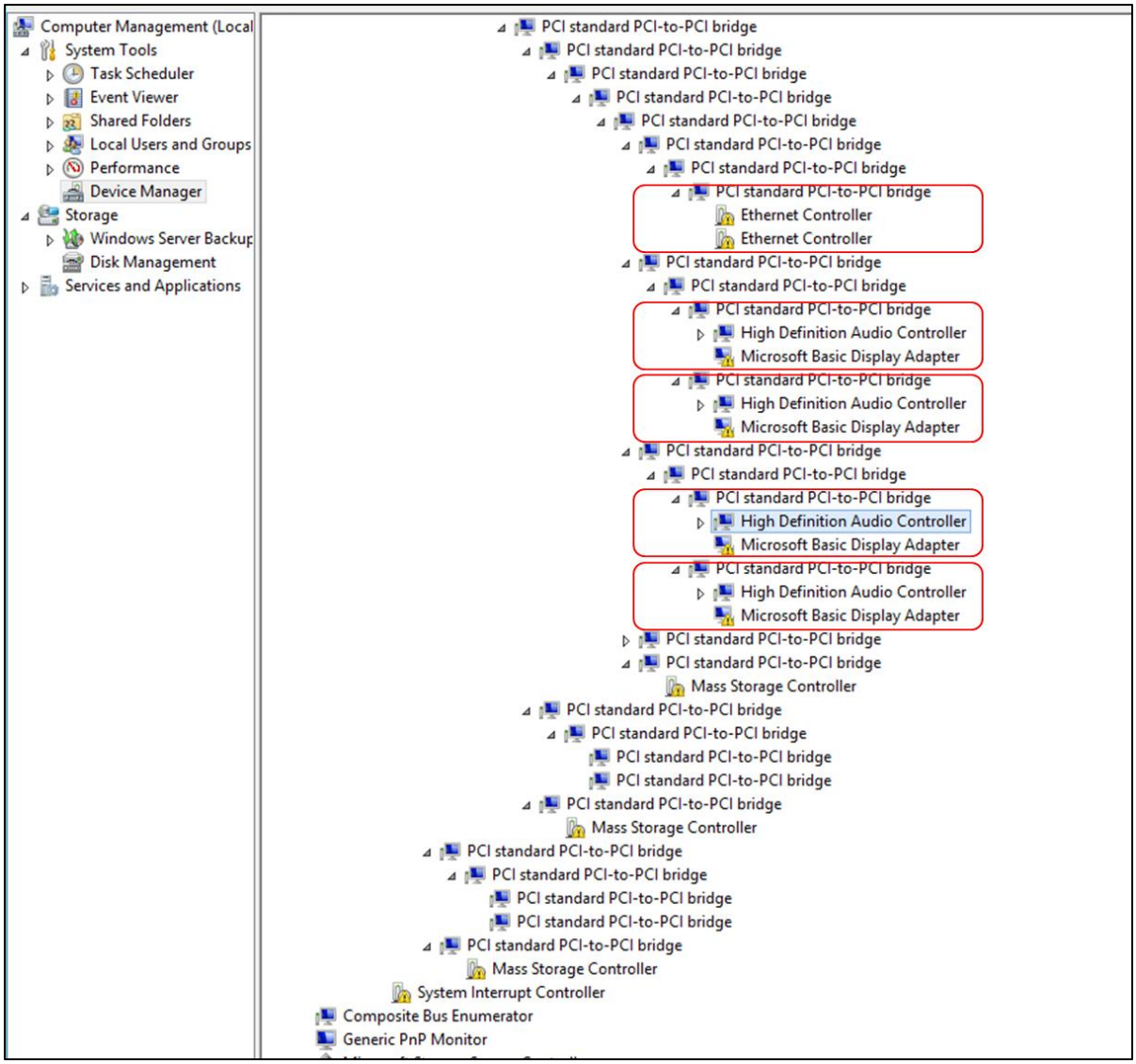
Verify hardware device in Windows Operating System. As your Windows computer starts up, you will see a small message box pop-up in the lower-right corner of the screen to alert you that Windows has found new hardware.

Find the 'My Computer' icon and "right-click" on it. Then select 'Manage' from the pop-up menu.

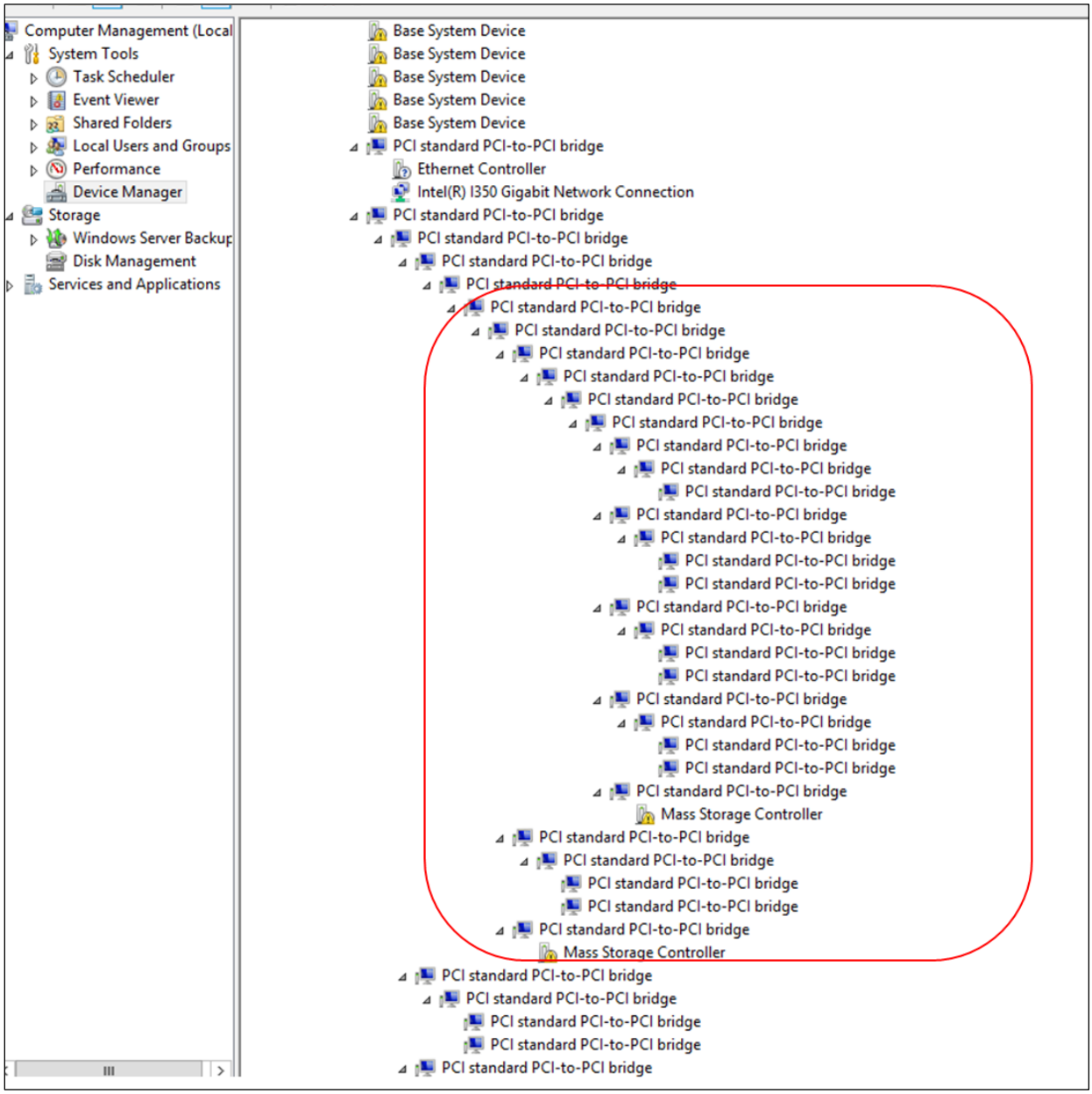
- Next, click on 'Device Manager' in the left most Computer Management window.
- Finally, click on the View Menu and select View Devices by Connection
- Open ACPI (BIOS) → Open PCI Bus→ Click the '+' or '>" sign several times until you reach a PCI Express Root Port Complex.
- Then click or collapse all the '+' or '>' until you see multiple subsets of PCI standard PCI-to-PCI bridge. See screenshot below.

Collapse or click the '+' or '>' sign next to PCI standard PCI-to-PCI bridge and you will find all the PCIe devices that are detected.

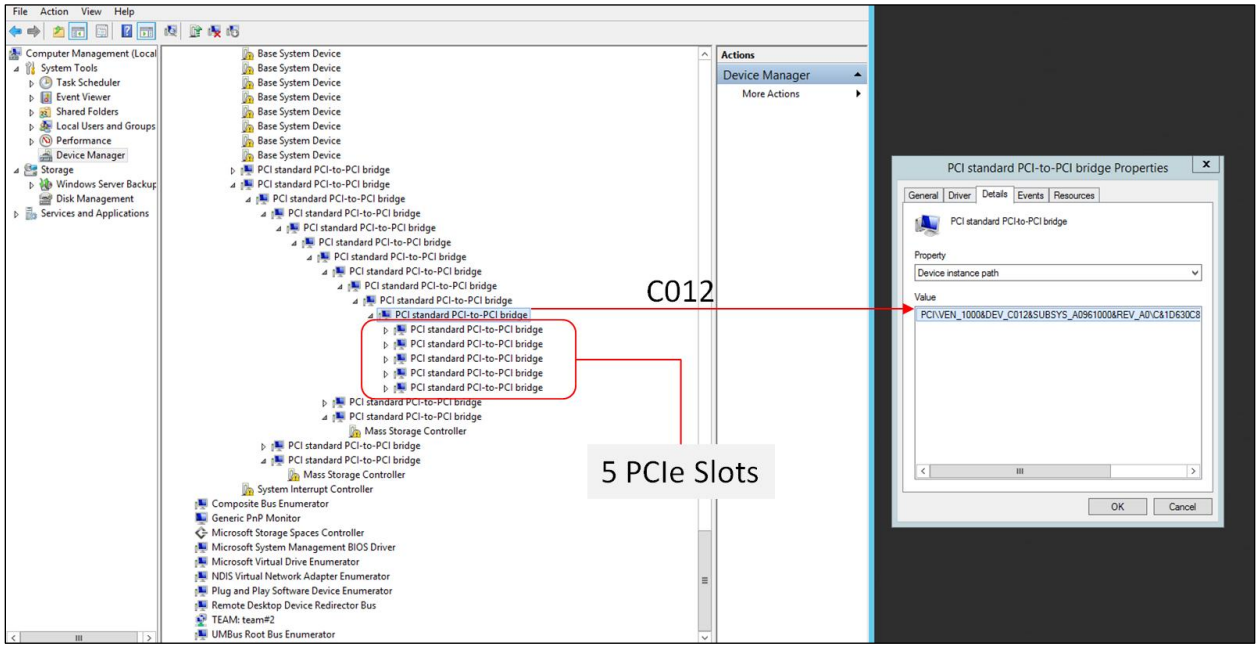
The screenshot below shows five PCIe devices that are detected but showing a yellow exclamation mark next to it, which means the driver is not loaded.



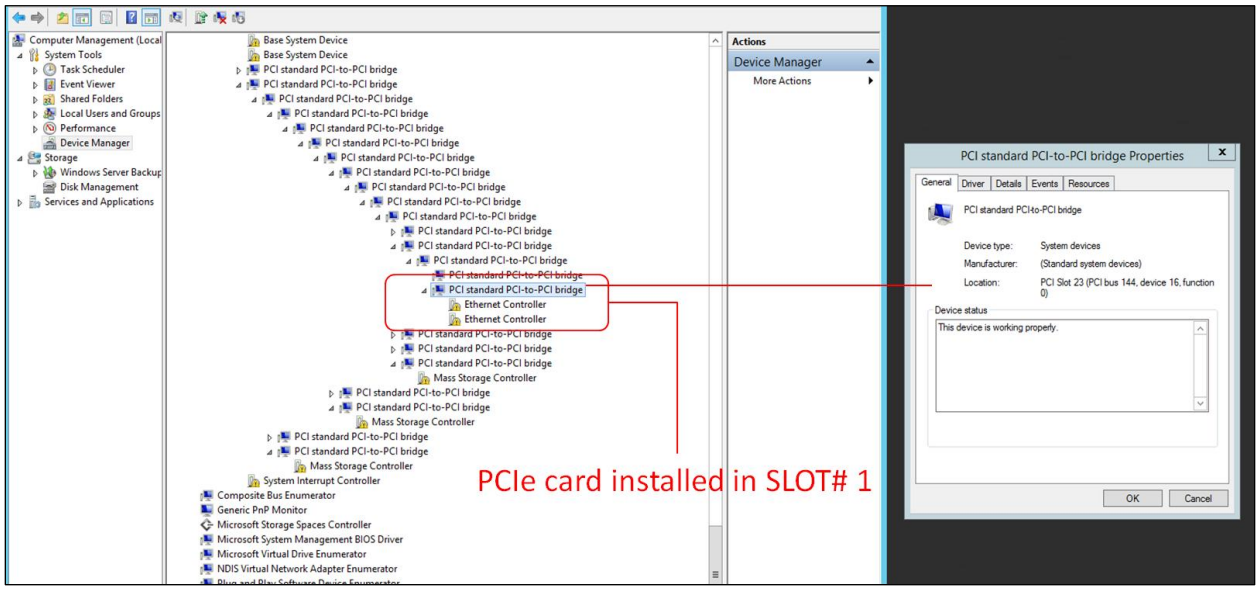
The screenshot below shows NO PCIe cards are installed on the OSS-522 backplane.


Computer Management (Local
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Windows Server Backup
Disk Management
Services and Applications
Base System Device
Base System Device
Base System Device
Base System Device
Base System Device
PCI standard PCI-to-PCI bridge
Ethernet Controller
Intel(R) I350 Gigabit Network Connection
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge
PCI standard PCI-to-PCI bridge

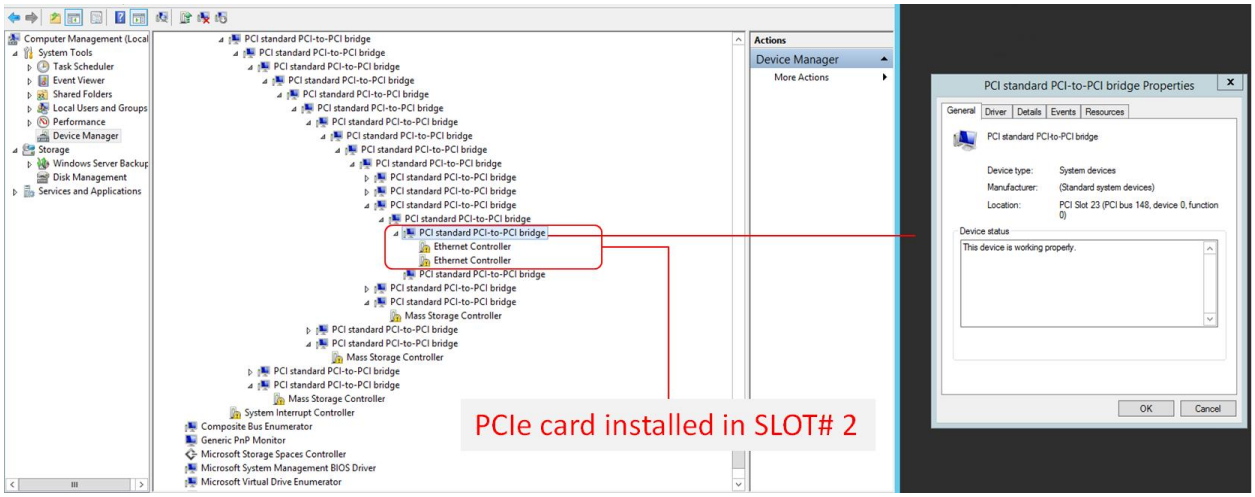
The screenshot below shows the 5 PCIe slots on OSS-522 backplane.



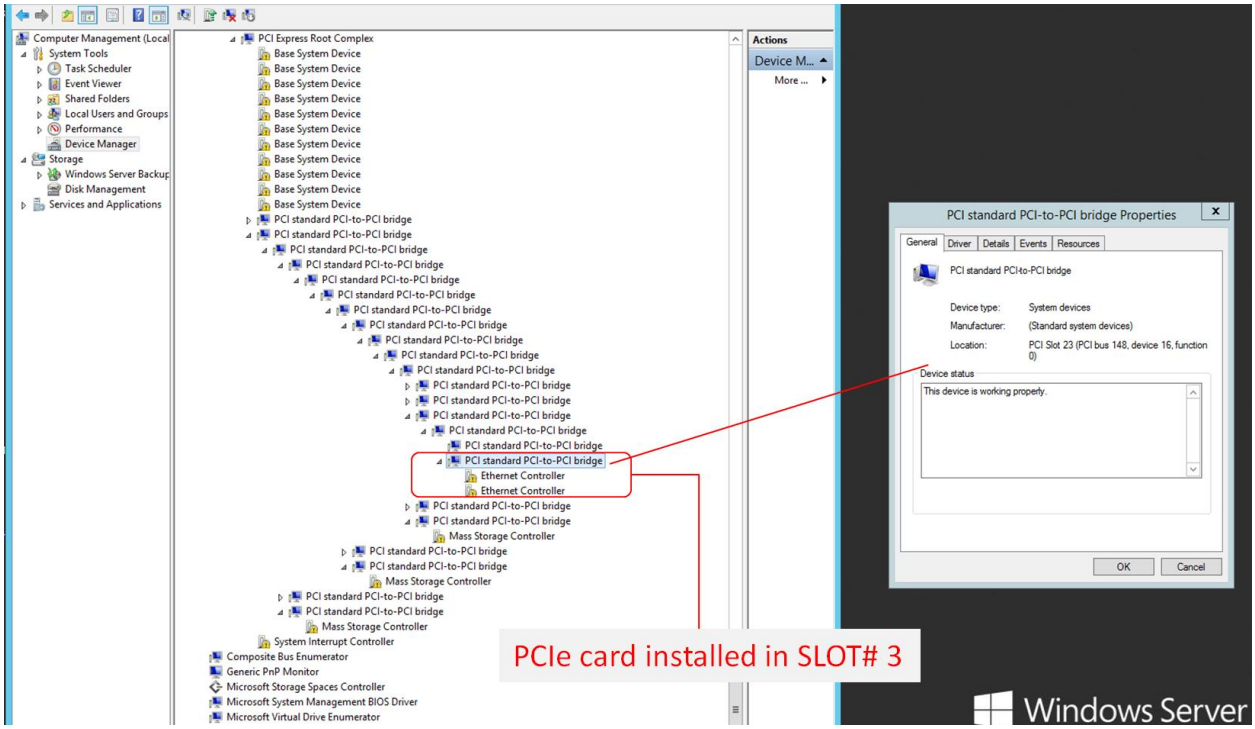
Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 1



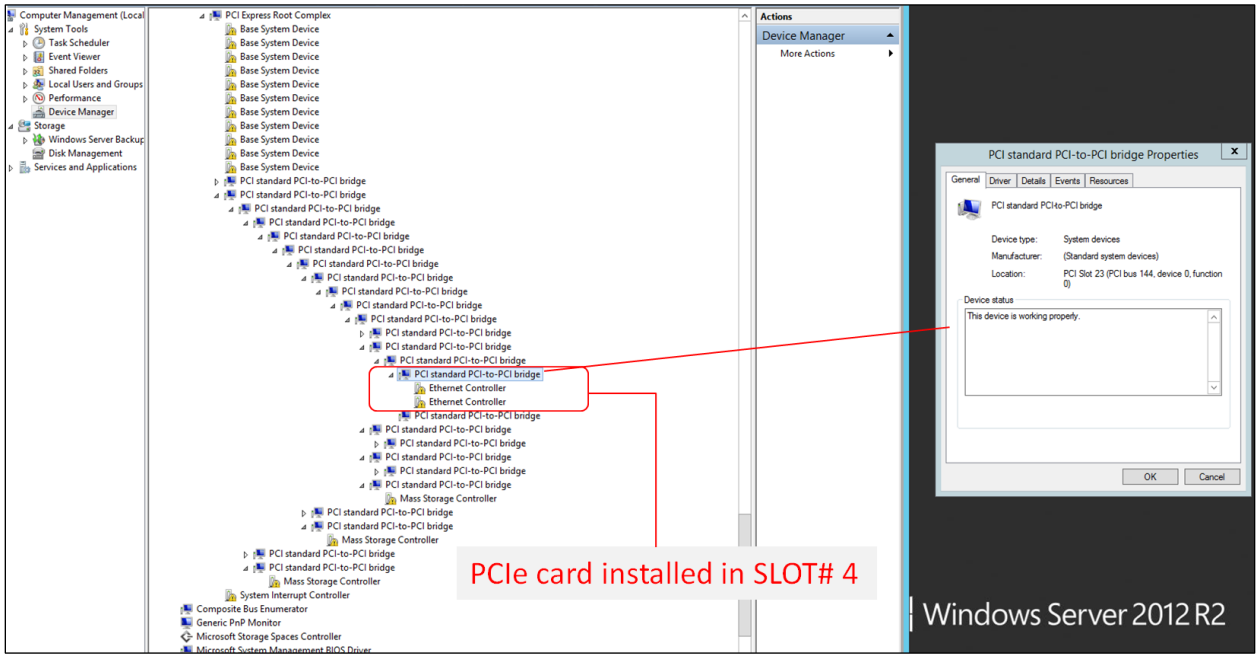
Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 2



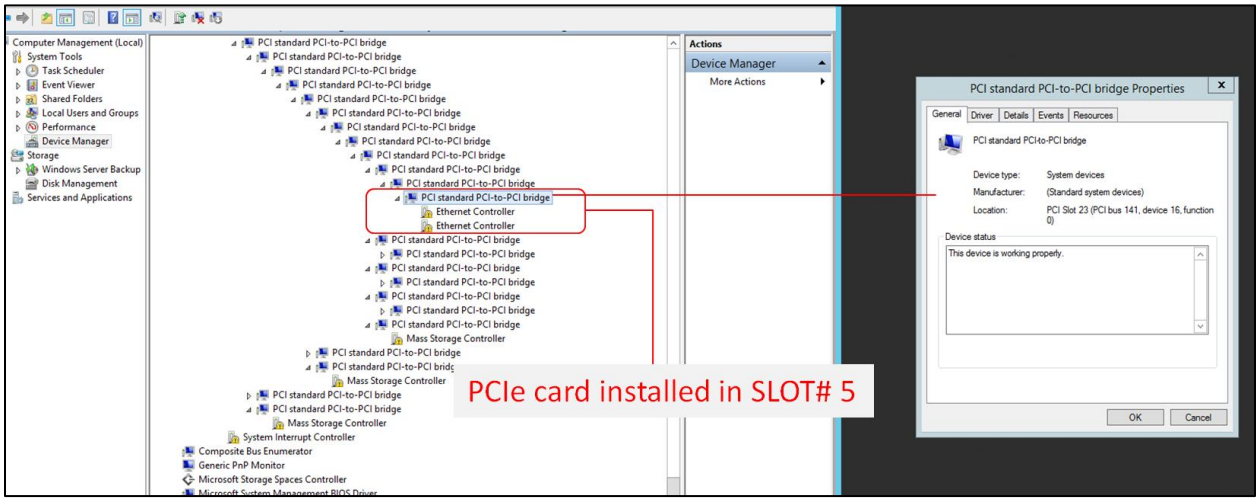
Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 3



Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 4



Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 5



9 Troubleshooting

9.1 Device is not detected or recognized

1. Shutdown the system
2. Disconnect the cables
3. Disconnect the power from the unit
4. Remove the HIB card from the unit and host computer
5. Re-insert the HIB card
6. Reconnect the cables
7. Turn ON the unit

9.2 My PCIe devices are showing UP with a Yellow Exclamation mark

1. Obtain the software / driver from the 3rd party vendor.
2. Install or re-install the driver
3. Reboot the system after installing the driver

9.3 No link between host and target cards

1. Check the dipswitches on each card. Make sure the Target card is set to target mode and Host card is set to host mode.
2. Check the Target card is installed in the target slot / upstream slot.
3. Use a validated / certified OSS HIB Cable adapter Gen4 cards
4. Reseat the Cables. Makes sure you are using a Gen4 cables.
5. Swap or replace the host card, target card and Link cables.
6. If you are still having the same issue after replacing the host card, target card and cables, your next step is to replace the backplane with a known good board or contact Technical Support for assistance.

9.4 Broken OSS-522 board

1. If you received a brand new DOA (Dead on Arrival) board, please contact OSS to RMA board and request for a replacement.
2. If you have an out of warranty board, please contact OSS Sales team and buy a new replacement board.
    - Standard warranty is 1 year, unless you have an SLA or extended warranty coverage.
3. If you purchased a second-hand / used board and it is broken, please contact OSS Sales team to buy a replacement.
    - Note: Purchasing a second-hand / used product is not covered under warranty.

10 Contacting Technical Support

Our support department can be by phone at 1 (760) 745-9883. Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting One Stop Systems Technical Support, please be sure to include the following information:

1) Name
2) Company Name
3) Phone Number
4) Fax Number
5) Email Address
6) Model Number
7) Serial Number
8) Computer Make
9) Computer Model
10) Operating System and Version
11) Make/Model of accessories attached to the tablet
12) Detailed description of the problem

- You can also visit our web site at: www.onestopsystems/support/
- OSS Sales Contact: sales@onestopsystems.com
- OSS Support Contact: support@onestopsystems.com

For a quick response, use the Technical Support and RMA Request Form available in the Support Section of the website. Simply complete the form with all required information. Please make sure that your problem description is sufficiently detailed to help us understand your problem.

For example: Don't say "Won't boot up." Do say "Tried all the steps in the Troubleshooting Section and it still won't boot up."

For faster diagnosis of your problem, please run the two utility programs described in the following sections and include the diagnostic files they generate with your email.

10.1 Returning Merchandise to One Stop Systems

If factory service is required, you must contact OSS Service Representative to obtain a Return Merchandise Authorization (RMA) number. Put this number and your return address on the shipping label when you return the item(s) for service. **One Stop Systems will return any product that is not accompanied by an RMA number**. Please note that One Stop Systems WILL NOT accept COD packages, so be sure to return the product freight and duties-paid.

Ship the well-packaged product to the address below:

RMA # _____

One Stop Systems

2235 Enterprise Street, Suite#110 92029

USA

It is not required, though highly recommended, that you keep the packaging from the original shipment of your One Stop Systems product. However, if you return a product to One Stop Systems for warranty repair/ replacement or take advantage of the 30-day money back guarantee, you will need to package the product in a manner similar to the manner in which it was received from our plant. One Stop Systems cannot be responsible for any physical damage to the product or component pieces of the product (such as the host or expansion interfaces for the PCIe expansion chassis) that are damaged due to inadequate packing. Physical damage sustained in such a situation will be repaired at the owner's expense in accordance with Out of Warranty Procedures. Please, protect your investment, a bit more padding in a good box will go a long way to insuring the device is returned to use in the same condition you shipped it in. Please call for an RMA number first.

2235 Enterprise Street, Suite#110, Escondido CA 92029

Toll-Free : +1(800)285-8900 US • Main: +1 (760) 745-9883 • Fax: +1 (760) 745-9824

www.onestopsystems.com