

Oracle® Dual Port EDR InfiniBand Adapter User's Guide

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Les clients Oracle qui ont souscrit un contrat de support ont accès au support électronique via My Oracle Support. Pour plus d'informations, visitez le site <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> ou le site <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> si vous êtes malentendant.

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Using This Documentation

- **Overview** – Describes how to install and administer the Oracle Dual Port EDR InfiniBand Adapter.
- **Audience** – Technicians, system administrators, and authorized service providers.
- **Required knowledge** – Advanced experience troubleshooting and replacing hardware.

In this document, the term “adapter” refers to the Oracle Dual Port EDR InfiniBand Adapter.

Product Documentation Library

Documentation and resources for this product and related products are available at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

Feedback

Provide feedback about this documentation at <http://www.oracle.com/goto/docfeedback>.

Understanding the Installation Process

These topics provide an overview of the installation process for the adapter:

- [“Installation Task Overview \(Oracle Solaris\)” on page 9](#)
- [“Installation Task Overview \(Oracle Linux\)” on page 10](#)

Installation Task Overview (Oracle Solaris)

Step	Description	Links
1.	Understand the adapter.	“Understanding the Adapter” on page 11
2.	Confirm the adapter specifications and technical requirements.	“Confirming Specifications and Requirements” on page 17
3.	Install the adapter and verify the installation.	“Installing the Adapter” on page 21
4.	Enable Ethernet and verify IB support.	“IB Overview (Oracle Solaris)” on page 36 “Enable Virtualization (Oracle Solaris)” on page 37 “Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)” on page 39 “Disable Ethernet Over IB For the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)” on page 40 “Verify IB Connectivity (Oracle Solaris)” on page 41
5.	If your OS is out of date, update the entire OS image, or download and apply the latest OS patch. If necessary, update the firmware.	“Update the OS (Oracle Solaris)” on page 51 “Update the Firmware (Oracle Solaris)” on page 53

Related Information

- [“Understanding the Adapter” on page 11](#)
- [“Confirming Specifications and Requirements” on page 17](#)
- [“Installing the Adapter” on page 21](#)
- [“Enabling IB on the Adapter” on page 35](#)

- [“Updating Software and Firmware” on page 51](#)

Installation Task Overview (Oracle Linux)

Follow these steps to install the adapter on a Linux platform.

Step	Description	Links
1.	Understand the adapter.	“Understanding the Adapter” on page 11
2.	Confirm the adapter specifications and technical requirements.	“Confirming Specifications and Requirements” on page 17
3.	Install the adapter and verify the installation.	“Installing the Adapter” on page 21
4.	Enable Ethernet and verify IB support.	“IB Overview (Oracle Linux)” on page 43 “Prepare to Enable Virtualization (Oracle Linux)” on page 43 “Enable Virtualization (Oracle Linux)” on page 44 “Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Linux)” on page 45 “Disable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Linux)” on page 47
5.	If necessary, update the firmware.	“Verify IB Connectivity (Oracle Linux)” on page 47 “Update the OS (Oracle Linux)” on page 52 “Update the Firmware (Oracle Linux)” on page 54

Related Information

- [“Understanding the Adapter” on page 11](#)
- [“Confirming Specifications and Requirements” on page 17](#)
- [“Installing the Adapter” on page 21](#)
- [“Enabling IB on the Adapter” on page 35](#)
- [“Updating Software and Firmware” on page 51](#)

Understanding the Adapter

These topics provide an overview of this InfiniBand Host Channel Adapter (IB-HCA).

- [“Shipping Kit Contents” on page 11](#)
- [“Adapter Overview” on page 12](#)
- [“Front Panel Connectors and LEDs” on page 13](#)
- [“Rear Panel” on page 14](#)

Related Information

- [“Understanding the Installation Process” on page 9](#)
- [“Confirming Specifications and Requirements” on page 17](#)
- [“Installing the Adapter” on page 21](#)
- [“Enabling IB on the Adapter” on page 35](#)
- [“Updating Software and Firmware” on page 51](#)

Shipping Kit Contents

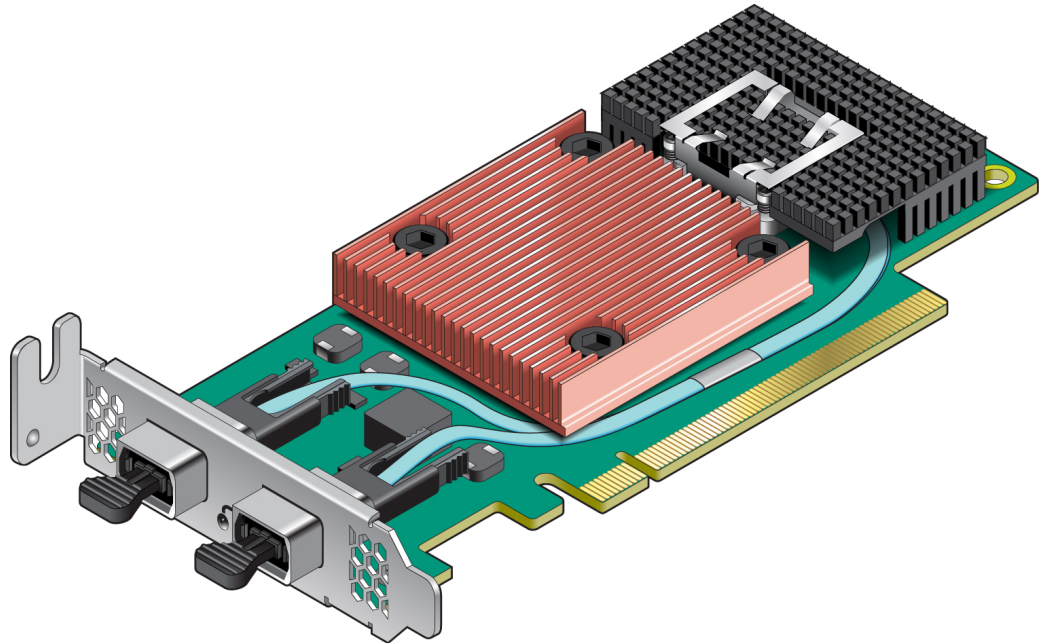
The carton in which the adapter was shipped should contain these items:

- Adapter with short mounting bracket attached
- *Oracle Dual Port EDR InfiniBand Adapter Where To Find Documentation*

Related Information

- [“Adapter Overview” on page 12](#)
- [“Front Panel Connectors and LEDs” on page 13](#)
- [“Rear Panel” on page 14](#)

Adapter Overview



Feature	Description
Data rate supported per port	2 IB 4x ports, speed support: 10 Gbps, 20 Gbps, 40 Gbps, 56 Gbps, or 100 Gbps
IB	<p>IBTA v1.3 compliant</p> <p>SDR, DDR, QDR, FDR, and EDR:</p> <ul style="list-style-type: none"> Compliant with the <i>InfiniBand Architecture Specification, Release 1.3</i>. The adapter has two compliant 4x IB ports, labeled 1 and 2. The adapter provides access to these ports by means of two 4x PrizmMT MPO optical adapters for use with external optical cables. <p>IB Virtualization: supports up to 32 virtual HCAs, plus one switch per physical port</p>
Connector	PrizmMT MPO
QoS	8 IB virtual lanes for each port
RDMA support	All ports
Bus width	x16, x8, x4, x1 lane PCIe
Boot ROM	4 Mb SPI Flash
EMI	FCC Class A

Feature	Description
Safety	IEC/EN 60950-1:2006, ETSI EN 300 019-2-2
Environmental	IEC 60068-2- 64, 29, 32
RoHS	RoHS-R6
PCIe interface	<ul style="list-style-type: none"> ■ Standard low-profile PCIe form factor ■ PCIe Base 3.0 compliant, 1.1 and 2.0 compatible ■ 2.5 GT/sec. 5.0 GT/sec or 8.0 GT/s link x16 (to 256 GT/s bidirectional)

Note - Laser Compliance Notice: Your Oracle product might contain Class 1M Laser Transceivers or a Class 1 Laser, as defined by IEC 60825-1.

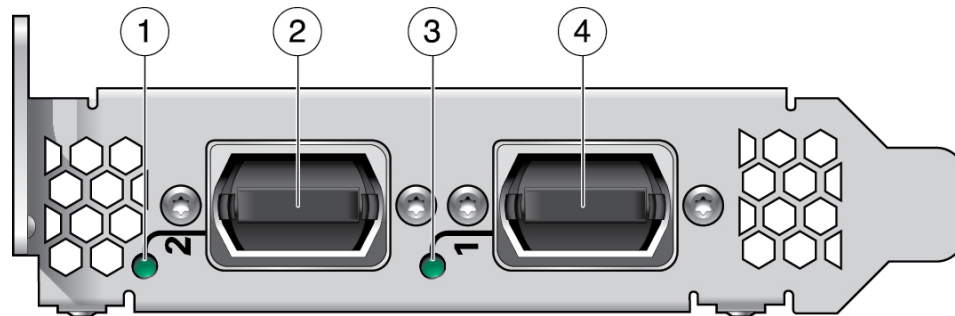
Related Information

- [“Shipping Kit Contents” on page 11](#)
- [“Front Panel Connectors and LEDs” on page 13](#)
- [“Rear Panel” on page 14](#)

Front Panel Connectors and LEDs

On the front panel near the two ports, two LEDs reflect the state of the physical link.

Note - LEDs are visible through the PCIe bracket by means of light pipes.



No.	Name	Description
1	Port 2 Green LED	Port 2, Physical Link

No.	Name	Description
2	Port 2	IB Port 2 (PrizmMT MPO)
3	Port 1 Green LED	Port 1, Physical Link
4	Port 1	IB Port 1 (PrizmMT MPO)

The LEDs for each port has the meanings described in this table.

LED Name	LED State	Meaning
Physical Link	Lit	The link bringup process has successfully completed, and the width, speed, polarity, and reversal have been negotiated with the neighbor port on the other end of the cable.
	Unlit	A physical connection has not been established.

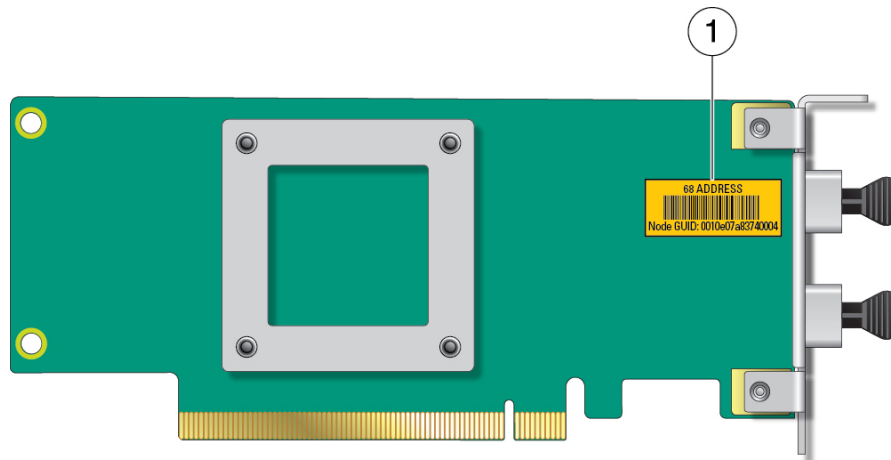
Related Information

- [“Shipping Kit Contents” on page 11](#)
- [“Adapter Overview” on page 12](#)
- [“Rear Panel” on page 14](#)

Rear Panel

A label on the back of the adapter displays the 64-bit GUID. This GUID uniquely identifies this adapter in the server and on the IB fabric.

Note - For accurate IB device information, such as GUID identification in a server with more than one IB device, use the `ibstat` command. See [“Verify IB Connectivity \(Oracle Linux\)” on page 47](#).



No.	Description
1	Label showing node GUID location on the rear panel.

Related Information

- [“Shipping Kit Contents” on page 11](#)
- [“Adapter Overview” on page 12](#)
- [“Front Panel Connectors and LEDs” on page 13](#)

Confirming Specifications and Requirements

These topics provide technical information that you need to understand before installing the adapter.

- [“Physical Specifications” on page 17](#)
- [“Electrical Specifications” on page 18](#)
- [“Environmental Specifications” on page 18](#)
- [“Hardware and Software Requirements” on page 19](#)

Related Information

- [“Understanding the Installation Process” on page 9](#)
- [“Understanding the Adapter” on page 11](#)
- [“Installing the Adapter” on page 21](#)
- [“Enabling IB on the Adapter” on page 35](#)
- [“Updating Software and Firmware” on page 51](#)

Physical Specifications

Description	Metric	U.S.
Length	167.64 mm	6.60 in.
Height	63.50 mm	2.50 in.
Weight	0.30 kg	0.66 lb

Related Information

- [“Electrical Specifications” on page 18](#)
- [“Environmental Specifications” on page 18](#)
- [“Hardware and Software Requirements” on page 19](#)

Electrical Specifications

Description	Value
Maximum power consumption	23.8W
Typical power consumption	20W
Operating voltage	12V

Related Information

- [“Physical Specifications” on page 17](#)
- [“Environmental Specifications” on page 18](#)
- [“Hardware and Software Requirements” on page 19](#)

Environmental Specifications

Specification	Operation	Storage
Temperature [†]	0°C to 55°C (32°C to 131°F), noncondensing	-40°C to 70°C (-40°F to 158°F), noncondensing
Humidity	10% to 90% noncondensing relative humidity at 27°C (80.6°F) maximum wet bulb	93% noncondensing relative humidity at 38°C (100.4°F) maximum wet bulb
Altitude	1,829 (6,000 feet) at 45°C (113°F) ambient 1,219 (4,000 feet) at 35°C (95°F) ambient	12,000 meters (39,370.1 feet)
Vibration	0.20 G in all axes (20-500 Hz sine)	1.0 G in all axes (20-500 Hz sine)
Shock	1.75g, 32 seconds (VERTEQII -Zone 4 waveform) 40 m/s ² 22 ms shock type L	100 m/s ² (11 ms half-sine)
Airflow	100 LFM (min) at 25°C (77°F) local ambient temperature 700 LFM (min) at 55°C (131°F) local ambient temperature	

[†]Temperature listed is for the server that the adapter is installed in. The actual internal ambient temperature inside the server local to the adapter might be higher.

Related Information

- [“Physical Specifications” on page 17](#)
- [“Electrical Specifications” on page 18](#)

- [“Hardware and Software Requirements” on page 19](#)

Hardware and Software Requirements

For the latest list of supported platforms and operating systems, refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes* at http://www.oracle.com/goto/dual_port_edr_infiniband/docs

For Oracle Solaris OS systems, Oracle Solaris 11.3 SRU9 or newer is required.

For Oracle Linux systems, these versions are supported with UEK4:

- Oracle Linux 6.7 and newer
- Oracle Linux 7.1 and newer
- OVM 3.4.1

For more information on updating software and firmware, see [“Updating Software and Firmware” on page 51](#).

Related Information

- [“Physical Specifications” on page 17](#)
- [“Electrical Specifications” on page 18](#)
- [“Environmental Specifications” on page 18](#)

Installing the Adapter

These topics describe how to install the adapter and verify its installation.

- [“ESD Precautions” on page 21](#)
- [“Order Additional Hardware” on page 22](#)
- [“Cable Cautions” on page 22](#)
- [“Install the Adapter” on page 24](#)
- [“Standard MT and PrizmMT MPO Cables” on page 27](#)
- [“Install a PrizmMT Cable” on page 29](#)
- [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Solaris\)” on page 31](#)
- [“Verify the Adapter Installation \(Oracle Linux\)” on page 31](#)
- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

Related Information

- [“Understanding the Installation Process” on page 9](#)
- [“Understanding the Adapter” on page 11](#)
- [“Confirming Specifications and Requirements” on page 17](#)
- [“Enabling IB on the Adapter” on page 35](#)
- [“Updating Software and Firmware” on page 51](#)

ESD Precautions

When installing the module, follow antistatic precautions:

- Use an antistatic mat as a work surface.
- Wear an antistatic wrist strap that is attached to either the mat or a metal portion of the switch chassis.

Related Information

- [“Order Additional Hardware” on page 22](#)
- [“Cable Cautions” on page 22](#)
- [“Install the Adapter” on page 24](#)
- [“Standard MT and PrizmMT MPO Cables” on page 27](#)
- [“Install a PrizmMT Cable” on page 29](#)
- [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Solaris\)” on page 31](#)
- [“Verify the Adapter Installation \(Oracle Linux\)” on page 31](#)
- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

▼ Order Additional Hardware

- **Ensure that you have the appropriate cables.**

Check the product web page for available cables at:

<http://www.oracle.com/technetwork/server-storage/networking/documentation/index.html>.

Related Information

- [“ESD Precautions” on page 21](#)
- [“Cable Cautions” on page 22](#)
- [“Install the Adapter” on page 24](#)
- [“Standard MT and PrizmMT MPO Cables” on page 27](#)
- [“Install a PrizmMT Cable” on page 29](#)
- [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Solaris\)” on page 31](#)
- [“Verify the Adapter Installation \(Oracle Linux\)” on page 31](#)
- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

Cable Cautions

To prevent data cable damage, you must follow these cautions.

	<p>Do not uncoil the cable, as a kink might occur. Hold the coil closed as you unroll the cable, pausing to allow the cable to relax as it is unrolled.</p>		<p>Do not step on the cable or connectors. Plan cable paths away from foot traffic or rolling loads.</p>
	<p>Do not pull the cable out of the shipping box, through any opening, or around any corners. Unroll the cable as you lay it down and move it through turns.</p>		<p>Do not bend the cables to a radius tighter than 85 mm (3.4 inches). Ensure that cable turns are as wide as possible.</p>
	<p>Do not twist the cable to open a kink. If it is not severe, open the kink by unlooping the cable.</p>		<p>Do not pack the cable to fit a tight space. Use an alternative cable route.</p>
	<p>Do not straighten the cable to correct a bend that is too tight. Leave the cable bend as is.</p>		<p>Do not hang the cable for a length more than 2 meters (7 feet). Minimize the hanging weight with intermediate retention points.</p>
	<p>Do not drop the cable or connectors from any height. Gently set the cable down, resting the cable connectors on a stable surface.</p>		<p>Do not cinch the cable with hard fasteners or cable ties. Use soft hook-and-loop fastener for bundling and securing cables.</p>
	<p>Do not drag the cable or its connectors over any surface. Carry the entire cable to and from the points of connection.</p>		<p>Do not force the cable connector into the receptacle by pushing on the cable. Apply connection or disconnection forces at the connector only.</p>

Note - Unplugged fiber cable ends should be covered with dust caps whenever possible to increase protection against damage or contamination.

Related Information

- “ESD Precautions” on page 21
- “Order Additional Hardware” on page 22
- “Install the Adapter” on page 24
- “Standard MT and PrizmMT MPO Cables” on page 27
- “Install a PrizmMT Cable” on page 29
- “Clean The PrizmMT Receptacle or Connector Ferrule” on page 29
- “Verify the Adapter Installation (Oracle Solaris)” on page 31
- “Verify the Adapter Installation (Oracle Linux)” on page 31
- “Remove the Adapter” on page 32
- “Remove a PrizmMT Cable” on page 33

▼ Install the Adapter

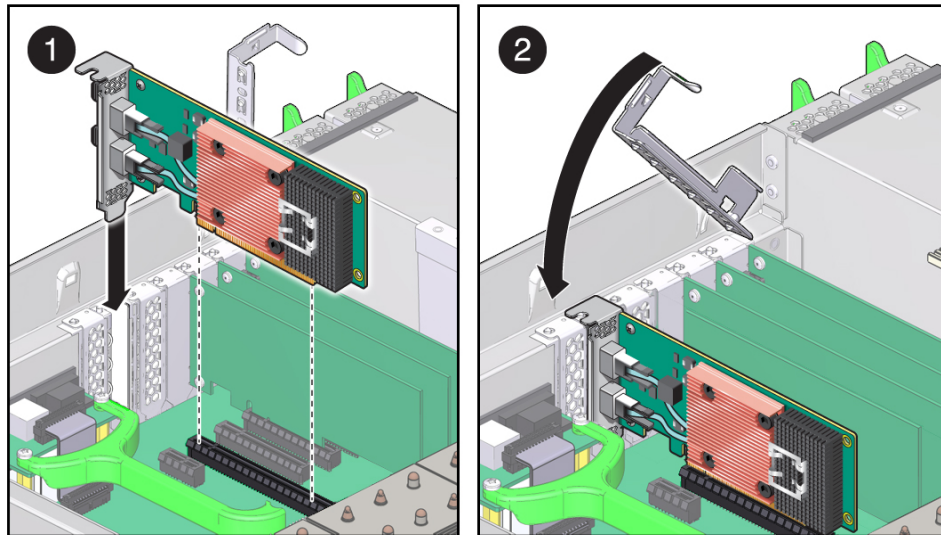
Refer to the server's installation guide or service manual for detailed instructions for this procedure.



Caution - Electronic components on printed circuit boards are extremely sensitive to static electricity. Ordinary amounts of static electricity generated by your clothing or work environment can damage electronic equipment. When installing the adapter in a server, use antistatic grounding straps and antistatic mats to help prevent damage due to electrostatic discharge.

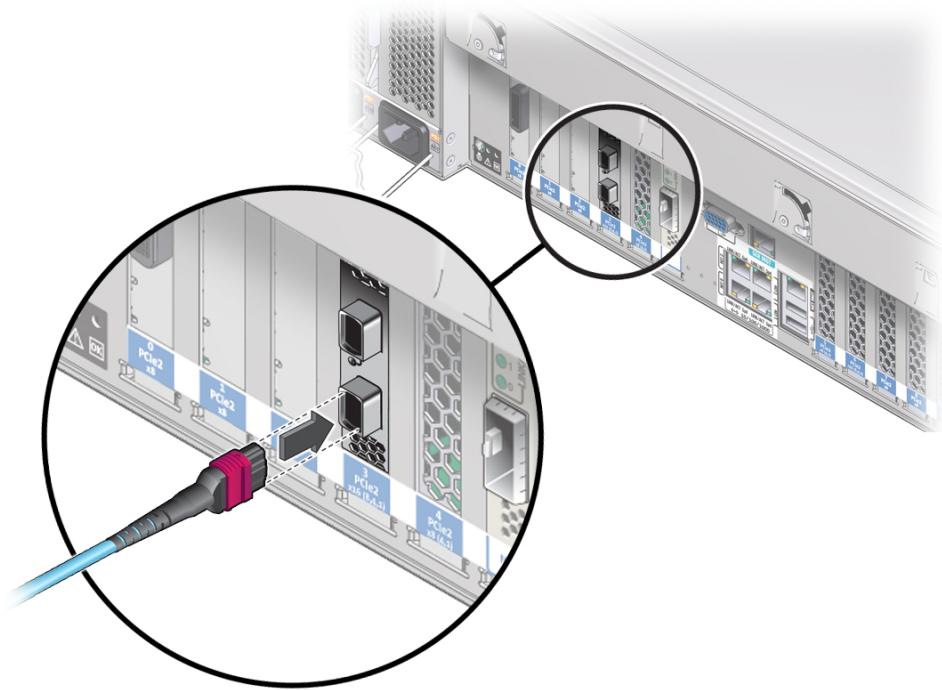
1. **Attach an antistatic wrist strap to your wrist and to the server.**
2. **If applicable, power off the server using the standard shutdown procedures described in the server's service manual.**
Product documentation for Oracle servers is available at <http://docs.oracle.com>.
3. **If applicable, remove the cover from the server to access the adapter slots and connectors.**
Product documentation for Oracle servers is available at <http://docs.oracle.com>.
4. **Select an available PCIe x16 slot.**
Remove the blank filler panel for that slot. If you are replacing an existing adapter in that slot, remove the adapter.

5. Install the adapter into the slot, pushing the adapter's edge connector into the connector on the server.



6. Ensure that the front panel on the adapter mounts flush with the server panel opening.
7. If applicable, install the screw in the front panel to secure the adapter into the server.
8. If applicable, replace the cover on the chassis.
9. Prior to attaching the IB cable to a port connector, ensure that the cable receptacle and cable connectors are clean.
See [“Clean The PrizmMT Receptacle or Connector Ferrule”](#) on page 29.
10. Attach the 4x end of each IB cable to an adapter port connector.

See “Install a PrizmMT Cable” on page 29.



11. Ensure that the connectors are properly engaged.

12. If not already connected, connect the other end of the IB I/O cables to the appropriate ports on the IB switches.

The adapter ports can be connected to different ports on the same IB switch or to a port on different IB switches.

Refer to the *Oracle® InfiniBand Switch IS2-46 Service Manual* at <http://www.oracle.com/goto/is2-46/docs>.

13. If applicable, power on the server and allow the server to reboot.

Product documentation for Oracle servers is available at <http://docs.oracle.com>.

This step completes the hardware installation.

14. Verify the installation.

See “Verify the Adapter Installation (Oracle Solaris)” on page 31 or “Verify the Adapter Installation (Oracle Linux)” on page 31.

Related Information

- [“ESD Precautions” on page 21](#)
- [“Order Additional Hardware” on page 22](#)
- [“Cable Cautions” on page 22](#)
- [“Standard MT and PrizmMT MPO Cables” on page 27](#)
- [“Install a PrizmMT Cable” on page 29](#)
- [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Solaris\)” on page 31](#)
- [“Verify the Adapter Installation \(Oracle Linux\)” on page 31](#)
- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

Standard MT and PrizmMT MPO Cables

The most common connector for EDR is the 4x PrizmMT (PMT) MPO cable. Unlike the standard MT ferrules found in traditional MPO cables, which are black in color and function by way of physical contact between fiber tips, the new PrizmMT ferrules in these new PrizmMT MPO cables use clear plastic molded lenses to transmit laser light between fibers across small air gaps.



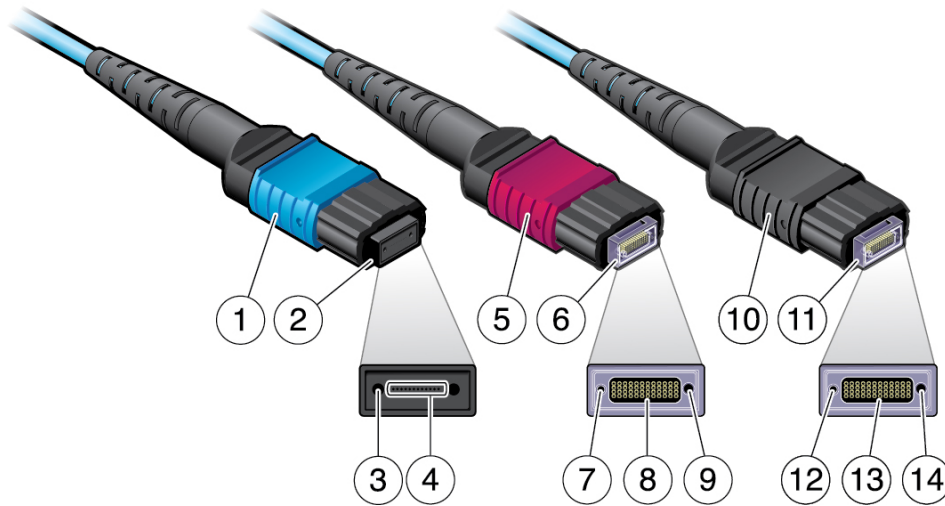
Caution - Connecting a PrizmMT MPO cable to a standard MT MPO cable or port, such as on a QSFP transceiver, will damage the PrizmMT ferrule and render the cable unusable.

This table identifies PrizmMT MPO cable end types by the features of ferrule type, shell color, alignment method, and describes what that cable end type connects with.

Technology	Ferrule	Shell Color	Alignment Method	Connects With
4x PrizmMT MPO optical cable	PrizmMT (clear with lenses)	Magenta	Post and hole	EDR 4x Ports (for example, Oracle Dual Port EDR InfiniBand Adapter ports)
12x PrizmMT MPO optical cable	PrizmMT (clear with lenses)	Black	Post and hole	EDR 12x Ports (for example, Oracle EDR switch 12x ports)

Note - Some supported cables have a PrizmMT MPO connector on one end, and a Standard MT connector on the other. Pay close attention when connecting this cable, to identify which connector is which, and not confuse the two.

Visually comparing the design of the three cables, note the differences between the Standard MT MPO cable on the left, with the PrizmMT MPO cables in the middle and on the right.



No.	Description
1	Aqua colored shell (Standard MT MPO)
2	Standard ferrule (Standard MT MPO)
3	Alignment pin holes (Standard MT MPO)
4	Contact type optical fibers (Standard MT MPO)
5, 10	Magenta and black colored shell (PrizmMT MPO)
6, 11	Prizm ferrule (PrizmMT MPO)
7, 12	Alignment post (PrizmMT MPO)
8, 13	Focused optical fiber array (PrizmMT MPO)
9, 14	Alignment hole (PrizmMT MPO)

Related Information

- [“ESD Precautions” on page 21](#)
- [“Order Additional Hardware” on page 22](#)
- [“Cable Cautions” on page 22](#)
- [“Install the Adapter” on page 24](#)
- [“Install a PrizmMT Cable” on page 29](#)
- [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Solaris\)” on page 31](#)

- [“Verify the Adapter Installation \(Oracle Linux\)” on page 31](#)
- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

▼ Install a PrizmMT Cable

1. **Remove any filler plug (if installed) from the PrizmMT receptacle where you are installing the cable and visually inspect the receptacle.**
The receptacle should be clean and free of dirt or debris. If the receptacle is dirty, clean it.
See [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#).
2. **Remove the protective cap from the cable connector and visually inspect the connector.**
The connector should be clean and free of dirt or debris. If the connector is dirty, clean it.
See [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#).
3. **Align the PrizmMT connector to where it will connect.**
4. **Firmly press the PrizmMT connector into the receptacle until you feel a detent.**
5. **Continue installing the adapter.**
See [“Install the Adapter” on page 24](#).

Related Information

- [“ESD Precautions” on page 21](#)
- [“Order Additional Hardware” on page 22](#)
- [“Cable Cautions” on page 22](#)
- [“Install the Adapter” on page 24](#)
- [“Standard MT and PrizmMT MPO Cables” on page 27](#)
- [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Solaris\)” on page 31](#)
- [“Verify the Adapter Installation \(Oracle Linux\)” on page 31](#)
- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

▼ Clean The PrizmMT Receptacle or Connector Ferrule

Perform this procedure when you install a PrizmMT cable.

1. **Determine your first step.**
 - If you are cleaning a receptacle, go to step 2.
 - If you are cleaning a connector, go to step 9.
2. **Remove the adapter from the end of the PrizmMT cleaner.**
3. **Insert the cleaner tip into the receptacle.**
4. **Pump the cleaner into the receptacle, advancing the cleaning cloth inside.**
5. **Remove the cleaner from the receptacle and verify cleanliness.**
6. **Repeat from step 3 if the fibers are still dirty.**
7. **Replace the adapter onto the end of the PrizmMT cleaner.**
8. **Return to [“Install a PrizmMT Cable” on page 29.](#)**
9. **Open the lid of the adapter on the end of the PrizmMT cleaner.**
10. **Insert the connector into the adapter.**
11. **Press the connector against the adapter, thereby pumping the cleaner, and advancing the cleaning cloth inside.**
12. **Remove the connector from the adapter and verify cleanliness.**
13. **Repeat from step 10 if the fibers are still dirty.**
14. **Close the lid of the adapter on the end of the PrizmMT cleaner.**
15. **Return to [“Install a PrizmMT Cable” on page 29.](#)**

Related Information

- [“ESD Precautions” on page 21](#)
- [“Order Additional Hardware” on page 22](#)
- [“Cable Cautions” on page 22](#)
- [“Install the Adapter” on page 24](#)
- [“Standard MT and PrizmMT MPO Cables” on page 27](#)
- [“Install a PrizmMT Cable” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Solaris\)” on page 31](#)
- [“Verify the Adapter Installation \(Oracle Linux\)” on page 31](#)

- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

▼ Verify the Adapter Installation (Oracle Solaris)

1. **Install the adapter in the server.**
See [“Install the Adapter” on page 24](#).
2. **Verify that the adapter is viewed through the PCIe interface.**

```
# scanpci|grep -i 2088
pci bus 0x0004 cardnum 0x00 function 0x00: vendor 0x108e device 0x2088
```

Related Information

- [“ESD Precautions” on page 21](#)
- [“Order Additional Hardware” on page 22](#)
- [“Cable Cautions” on page 22](#)
- [“Install the Adapter” on page 24](#)
- [“Standard MT and PrizmMT MPO Cables” on page 27](#)
- [“Install a PrizmMT Cable” on page 29](#)
- [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Linux\)” on page 31](#)
- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

▼ Verify the Adapter Installation (Oracle Linux)

1. **Install the adapter in the server.**
See [“Install the Adapter” on page 24](#).
2. **Verify that the adapter is viewed through the PCIe interface and determine the adapter type.**

```
# lspci -d :2088 -v
13:00.0 Infiniband controller: Oracle/SUN Device 2088 (rev 03)
  Subsystem: Oracle/SUN Device 6279
  Physical Slot: 4
  Flags: bus master, fast devsel, latency 0
  Memory at 383ff8104000 (64-bit, prefetchable) [size=16K]
  Memory at 383ff0000000 (64-bit, prefetchable) [size=128M]
```

```
Memory at 383ff8100000 (64-bit, prefetchable) [size=16K]
Expansion ROM at c7100000 [disabled] [size=1M]
Capabilities: [40] Power Management version 3
Capabilities: [70] Express Endpoint, MSI 00
Capabilities: [b0] MSI-X: Enable+ Count=48 Masked-
Capabilities: [100] Advanced Error Reporting
Capabilities: [148] Alternative Routing-ID Interpretation (ARI)
Capabilities: [158] #19
Capabilities: [188] Single Root I/O Virtualization (SR-IOV)
Capabilities: [1c8] Transaction Processing Hints
Capabilities: [298] Address Translation Service (ATS)
Kernel driver in use: sif
```

Related Information

- [“ESD Precautions” on page 21](#)
- [“Order Additional Hardware” on page 22](#)
- [“Cable Cautions” on page 22](#)
- [“Install the Adapter” on page 24](#)
- [“Standard MT and PrizmMT MPO Cables” on page 27](#)
- [“Install a PrizmMT Cable” on page 29](#)
- [“Clean The PrizmMT Receptacle or Connector Ferrule” on page 29](#)
- [“Verify the Adapter Installation \(Oracle Solaris\)” on page 31](#)
- [“Remove the Adapter” on page 32](#)
- [“Remove a PrizmMT Cable” on page 33](#)

▼ Remove the Adapter

1. **Attach an antistatic wrist strap to your wrist and to the server.**
2. **If applicable, power off the server before you remove the adapter.**
3. **Disconnect all IB cables from the adapter port connector.**
See [“Remove a PrizmMT Cable” on page 33](#).
4. **If applicable, remove the cover on the chassis.**
5. **If applicable, remove the screw in the front panel that secures the adapter into the server.**
6. **Using two fingers at the top front and rear of the adapter, carefully lift the adapter from the server slot connector.**
7. **Install the replacement adapter.**

See [“Install the Adapter”](#) on page 24.

Related Information

- [“ESD Precautions”](#) on page 21
- [“Order Additional Hardware”](#) on page 22
- [“Cable Cautions”](#) on page 22
- [“Install the Adapter”](#) on page 24
- [“Standard MT and PrizmMT MPO Cables”](#) on page 27
- [“Install a PrizmMT Cable”](#) on page 29
- [“Clean The PrizmMT Receptacle or Connector Ferrule”](#) on page 29
- [“Verify the Adapter Installation \(Oracle Solaris\)”](#) on page 31
- [“Verify the Adapter Installation \(Oracle Linux\)”](#) on page 31
- [“Remove a PrizmMT Cable”](#) on page 33

▼ Remove a PrizmMT Cable

1. **Pinch the PrizmMT cable connector housing between your thumb and forefinger.**
The housing is either magenta or black.
2. **With a steady force, pull the PrizmMT connector straight out of the receptacle.**

Related Information

- [“ESD Precautions”](#) on page 21
- [“Order Additional Hardware”](#) on page 22
- [“Cable Cautions”](#) on page 22
- [“Install the Adapter”](#) on page 24
- [“Standard MT and PrizmMT MPO Cables”](#) on page 27
- [“Install a PrizmMT Cable”](#) on page 29
- [“Clean The PrizmMT Receptacle or Connector Ferrule”](#) on page 29
- [“Verify the Adapter Installation \(Oracle Solaris\)”](#) on page 31
- [“Verify the Adapter Installation \(Oracle Linux\)”](#) on page 31
- [“Remove the Adapter”](#) on page 32

Enabling IB on the Adapter

These topics describe how to enable and verify IB for the adapter.

Description	Links
Enable IB on an adapter on an Oracle Solaris server.	“IB Overview (Oracle Solaris)” on page 36 “Prepare to Enable Virtualization (Oracle Solaris)” on page 37 “Enable Virtualization (Oracle Solaris)” on page 37 “Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)” on page 39 “Disable Ethernet Over IB For the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)” on page 40 “Verify IB Connectivity (Oracle Solaris)” on page 41
Enable IB on an adapter on an Oracle Linux server.	“IB Overview (Oracle Linux)” on page 43 “Prepare to Enable Virtualization (Oracle Linux)” on page 43 “Enable Virtualization (Oracle Linux)” on page 44 “Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Linux)” on page 45 “Disable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Linux)” on page 47 “Verify IB Connectivity (Oracle Linux)” on page 47

Related Information

- [“Understanding the Installation Process” on page 9](#)
- [“Understanding the Adapter” on page 11](#)
- [“Confirming Specifications and Requirements” on page 17](#)
- [“Installing the Adapter” on page 21](#)
- [“Updating Software and Firmware” on page 51](#)

IB Overview (Oracle Solaris)

IB is a network architecture for the large-scale interconnection of computing and I/O nodes through a high-speed switched fabric. To operate IB on an Oracle server, you need an IB HCA (the adapter) and an IB software stack.

IB software is bundled with the Oracle Solaris OS. For Oracle Solaris 11.3, The package containing the device driver for the adapter is `driver/infiniband/sif`.

Note - You must use the `driver/infiniband/sif` package that is available in Oracle Solaris 11.3 and newer releases.

If you don't have the package on the system or your system is running an older release of Oracle Solaris, you must use the `pkg install/update` utility to add or update the package prior to using the adapter.

For details about IB software supported in Oracle Solaris OS releases, refer to these documents in the Oracle Solaris OS Release and Installation Collection at <http://www.oracle.com/goto/Solaris11/docs>:

- *Oracle Solaris 11 What's New*
- *Oracle Solaris 11 Release Notes*
- *Oracle Solaris 11 Package List*

The IB software stack, consisting of the upper-layer protocols and transport framework, is included in all of the Oracle Solaris software groups described in the *Oracle Solaris Installation Guide*.

For details about IB software stack configurations in an Oracle Solaris OS update release, refer to the *System Administration Guide: Devices and File Systems* document in the *Solaris 11 System Administrator Collection* at <http://www.oracle.com/goto/Solaris11/docs>.

Related Information

- [“Prepare to Enable Virtualization \(Oracle Solaris\)” on page 37](#)
- [“Enable Virtualization \(Oracle Solaris\)” on page 37](#)
- [“Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Solaris\)” on page 39](#)
- [“Disable Ethernet Over IB For the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Solaris\)” on page 40](#)
- [“Verify IB Connectivity \(Oracle Solaris\)” on page 41](#)

Prepare to Enable Virtualization (Oracle Solaris)

SRIOV is automatically enabled by the driver. The driver configures the hardware for 16 VFs by default.

- [“IB Overview \(Oracle Solaris\)” on page 36](#)
- [“Enable Virtualization \(Oracle Solaris\)” on page 37](#)
- [“Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Solaris\)” on page 39](#)
- [“Disable Ethernet Over IB For the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Solaris\)” on page 40](#)
- [“Verify IB Connectivity \(Oracle Solaris\)” on page 41](#)

▼ Enable Virtualization (Oracle Solaris)

1. List the devices on the server.

```
# ldm ls-io -l

NAME                                     TYPE  BUS    DOMAIN  STATUS
----                                     -
pci_1                                    BUS   pci_1  primary IOV
[pci@340]
pci_0                                    BUS   pci_0  primary
[pci@300]
pci_3                                    BUS   pci_3  primary
[pci@3c0]
pci_2                                    BUS   pci_2  primary IOV
[pci@380]
/SYS/MB/PCIE5                            PCIE  pci_1  primary OCC
[pci@340/pci@1/pci@0/pci@4]
  pciex108e,2088@0/ibport@1,0,ipib
  pciex108e,2088@0/ibport@2,0,ipib
[pci@380/pci@1/pci@0/pci@6]
/SYS/MB/PCIE4                            PCIE  pci_2  primary OCC
[pci@380/pci@1/pci@0/pci@7]
  pciex108e,2088@0/ibport@1,0,ipib
  pciex108e,2088@0/ibport@2,0,ipib
  pciex108e,2089@0,1
  pciex108e,2089@0,2
  pciex108e,2089@0,3
  pciex108e,2089@0,4
/SYS/MB/PCIE5/IOVGEN.PF0                 PF    pci_1  primary
[pci@340/pci@1/pci@0/pci@4/pciex108e,2088@0]
  maxvfs = 32
```

```

/SYS/MB/NET0/IOVNET.PF0          PF    pci_0    primary
[pci@300/pci@1/pci@0/pci@1/network@0]
    maxvfs = 63
/SYS/MB/NET0/IOVNET.PF1          PF    pci_0    primary
[pci@300/pci@1/pci@0/pci@1/network@0,1]
    maxvfs = 63
/SYS/MB/NET2/IOVNET.PF0          PF    pci_3    primary
[pci@3c0/pci@1/pci@0/pci@1/network@0]
    maxvfs = 63
/SYS/MB/NET2/IOVNET.PF1          PF    pci_3    primary
[pci@3c0/pci@1/pci@0/pci@1/network@0,1]
    maxvfs = 63
/SYS/MB/PCIE4/IOVGEN.PF0         PF    pci_2    primary
[pci@380/pci@1/pci@0/pci@7/pciex108e,2088@0]
    maxvfs = 32

```

2. Verify the device ID from the output in Step 1.

```

/SYS/MB/PCIE5/IOVGEN.PF0          PF    pci_1    primary
[pci@340/pci@1/pci@0/pci@4/pciex108e,2088@0]

```

where 2088 is the device ID.

3. Initiate a delayed reconfiguration operation on the primary domain.

All configuration changes for other domains are disabled until the primary domain reboots, at which time the new configuration for the primary domain will also take effect.

```
#ldm start-reconf primary
```

4. Create VFs on the PFs.

```
#ldm create-vf /SYS/MB/PCIE4/IOVGEN.PF0
```

5. Reboot the server.

6. Add the VFs to the LDOM.

```
#ldm add-io /SYS/MB/PCIE4/IOVGEN.PF0.VF0 ldom
```

Note - While adding VF to LDOM, LDOM should be in bound/inactive state.

For additional information on VFs, refer to the *Oracle VM Server for SPARC 3.3 Administration Guide* at <http://www.oracle.com/technetwork/documentation/vm-sparc-194287.html>.

Related Information

- “IB Overview (Oracle Solaris)” on page 36

- “Prepare to Enable Virtualization (Oracle Solaris)” on page 37
- “Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)” on page 39
- “Disable Ethernet Over IB For the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)” on page 40
- “Verify IB Connectivity (Oracle Solaris)” on page 41

▼ Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)

1. **Ensure that the VNIC has been created on the switch.**

For information on creating VNICs on the switch, refer to [“Configuring a VNIC” in Oracle Fabric OS 1.0 Administration Guide](#).

2. **On the server, log in to the Oracle Solaris host to ensure that the VNIC has been successfully created.**

```
# prtconf -D | grep xs
ibport, instance #0 (driver name: xstn)
vnic0, instance #4 (driver name: xsvnic)
```

where vnic0 is the VNIC name.

3. **Display the corresponding interface.**

```
# dladm show-phys
LINK          MEDIA          STATE    SPEED  DUPLEX  DEVICE
net4          Infiniband    up       32000 unknown ibp0
net0          Ethernet      up       1000   full    ixgbe0
net2          Ethernet      unknown  0      unknown ixgbe2
net6          Ethernet      up       10     full    usbemc2
net3          Ethernet      unknown  0      unknown ixgbe3
net1          Ethernet      unknown  0      unknown ixgbe1
net5          Infiniband    down     0      unknown ibp1
net9          Infiniband    down     0      unknown ibp3
net10         Infiniband    down     0      unknown ibp2
net11         Ethernet      unknown  0      unknown xsvnic4
```

Where the interface for VNIC is net11.

4. **Manually configure the IP address for the VNIC.**

```
# ipadm create-ip net11
# ipadm create-addr -T static -a 7.7.7.56/24 net11net11/v4
# ipadm
```

NAME	CLASS/TYPE	STATE	UNDER	ADDR
lo0	loopback	ok	--	--
lo0/v4	static	ok	--	127.0.0.1/8
lo0/v6	static	ok	--	::1/128
net0	ip	ok	--	--
net0/v4	static	ok	--	10.129.87.58/24
net0/v6	addrconf	ok	--	fe80::210:e0ff:fe58:3cd4/10
net0/v6	addrconf	ok	--	2606:b400:418:17a9:210:e0ff:fe58:3cd4/64
net6	ip	ok	--	--
net6/v4	static	ok	--	169.254.182.77/24
net11	ip	ok	--	--
net11/v4	static	ok	--	7.7.7.56/24

Related Information

- [“IB Overview \(Oracle Solaris\)” on page 36](#)
- [“Prepare to Enable Virtualization \(Oracle Solaris\)” on page 37](#)
- [“Enable Virtualization \(Oracle Solaris\)” on page 37](#)
- [“Disable Ethernet Over IB For the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Solaris\)” on page 40](#)
- [“Verify IB Connectivity \(Oracle Solaris\)” on page 41](#)

▼ Disable Ethernet Over IB For the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)

1. On the Oracle Solaris host, delete the interface created on that host.

```
# ipadm delete-ip interface-created-on-solaris-host
```

2. On the switch, remove the VNIC you created.

```
# remove vnic vnic-name
```

For information on VNICs on the switch, refer to [“Configuring a VNIC” in Oracle Fabric OS 1.0 Administration Guide](#).

Related Information

- “IB Overview (Oracle Solaris)” on page 36
- “Prepare to Enable Virtualization (Oracle Solaris)” on page 37
- “Enable Virtualization (Oracle Solaris)” on page 37
- “Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Solaris)” on page 39
- “Verify IB Connectivity (Oracle Solaris)” on page 41

▼ Verify IB Connectivity (Oracle Solaris)

1. **Ensure that the adapter is properly installed in the server.**
See “Install the Adapter” on page 24.
2. **Power on the server and cable the server to an operational IB switch.**
Refer to the documentation for the server.
3. **Ensure that the cables are connected to the adapter and IB switch.**
4. **Verify that the IB switch is in operation on the network.**
Refer to the documentation for your network hardware for more information at <http://www.oracle.com/us/products/networking/overview/index.html>.
5. **Check that the green LED is lit for each port that is connected to the IB switch.**
If the green LED is not on, check the cable connections at the adapter and the IB switch.
6. **Ensure that the required OS has been installed.**
See “IB Overview (Oracle Solaris)” on page 36.
7. **Verify that the adapter ports are up and the driver is attached.**
 - a. **Obtain the state of the installed device.**

```
# cfgadm -als "cols=ap_id:condition" hca
Ap_Id                               Condition
hca:10E07A83740004                  ok
```

If more than one device is installed in the server, a row is displayed for each. Look for the row displaying `hca:GUID` where `GUID` is the 64-bit number from the physical label on the adapter. See “Rear Panel” on page 14.

The Condition column must display ok to indicate that the driver has discovered the hardware and is bound to it. Refer to the `cfgadm_ib(1m)` man page for details about the IB-specific extensions.

b. Obtain port GUIDs for each port on the adapter.

```
# cfgadm -als "cols=ap_id:info" hca
Ap_Id                               Information
hca:10E07A83740004                 VID: 0x108e, PID: 0x2088,
#ports: 0x2, port1 GUID: 0x10E07A83740005, port2 GUID: 0x10E07A83740006
```

If more than one IB HCA device is installed in the server, a row is displayed for each device. Look for the row displaying `hca:GUID`, where *GUID* is the 64-bit number from the physical label on the adapter. See [“Rear Panel” on page 14](#).

Use the port number and GUID displayed by this command for your IB HCA device in the following step.

c. Verify that the IB ports and partitions are configured by the Subnet Manager.

```
# dladm show-ib
LINK HCAGUID          PORTGUID          PORT STATE GWNAME GWPORT  PKEYS
net7 10E07A83740004   10E07A83740005   1   up    --    --    8002,8005,FFFF
net8 10E07A83740004   10E07A83740006   2   up    --    --    8002,8005,FFFF
```

The command displays the `AP_ID` column, where each row has the format of `ib:Port GUID,P_Key, ipib`. Match the Port GUIDs from the command in Step 7b with these port GUIDs. There must be one row corresponding to the port and *P_Key* setup by the Subnet Manager. If an entry is missing, check the Subnet Manager configuration.

```
# dladm show-part
LINK      PKEY OVER          STATE  FLAGS
ibd0      FFFF net7           up     ----
ibd1      FFFF net8           up     ----
```

Related Information

- [“IB Overview \(Oracle Solaris\)” on page 36](#)
- [“Prepare to Enable Virtualization \(Oracle Solaris\)” on page 37](#)
- [“Enable Virtualization \(Oracle Solaris\)” on page 37](#)
- [“Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Solaris\)” on page 39](#)
- [“Disable Ethernet Over IB For the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Solaris\)” on page 40](#)

IB Overview (Oracle Linux)

IB is a network architecture for the large-scale interconnection of computing and I/O nodes through a high-speed switched fabric. To operate IB on an Oracle server, you need an IB HCA (the adapter) and an IB software stack.

Note - An IB software stack is part of the Oracle Linux OS distribution.

These Linux versions are supported with UEK4:

- Oracle Linux 6.7 and newer
- Oracle Linux 7.1 and newer
- OVM 3.4.1

For the latest information on UEK4, refer to the *Oracle Linux Release Notes for Unbreakable Enterprise Kernel Release 4* at https://docs.oracle.com/cd/E52668_01/E69348/html/index.html.

For the latest list of supported platforms and operating systems, refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes*. This document is available at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

Related Information

- “Prepare to Enable Virtualization (Oracle Linux)” on page 43
- “Enable Virtualization (Oracle Linux)” on page 44
- “Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Linux)” on page 45
- “Disable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Linux)” on page 47
- “Verify IB Connectivity (Oracle Linux)” on page 47

▼ Prepare to Enable Virtualization (Oracle Linux)

1. **Prepare the adapter to configure the firmware for virtualization and run in an Oracle Virtual Server with OVM 3.4.1 using UEK4.**
2. **Enable the number of VFs in the VMs, using the `pf1ash` command.**

`pf1ash` is the name of the firmware update tool. See “Update the Firmware (Oracle Linux)” on page 54 for more information.

```
pflash -d device-path num_vfs 4
```

where *device-path* is the path to flash device, in [domain:]<bus>:<slot>.<func> format. . The sample output above displays the value `num_vfs 4` which enables four VFs. Valid `num_vfs` include 0, 1, 2, 4, 8, 16, or 32 to show or configure supported number of VFs.

The value 0 reverts back to a nonvirtualized mode or PF. This setting is persistent with reboots.

3. Reboot the server to verify the new configuration.

```
pflash -d device-path num_vfs
```

4. Enable virtualization.

See [“Enable Virtualization \(Oracle Linux\)”](#) on page 44.

Related Information

- [“IB Overview \(Oracle Linux\)”](#) on page 43
- [“Enable Virtualization \(Oracle Linux\)”](#) on page 44
- [“Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Linux\)”](#) on page 45
- [“Disable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Linux\)”](#) on page 47
- [“Verify IB Connectivity \(Oracle Linux\)”](#) on page 47

▼ Enable Virtualization (Oracle Linux)

1. Locate the device(s) on the server.

```
# lspci -d :2088
a0:00.0 Infiniband controller: Oracle/SUN Device 2088 (rev 03)
```

where 2088 is the vendor ID.

2. Find the directory to set the number of VFs using the device ID from Step 2.

```
# find /sys/devices | egrep "a0:00.0" | head -1
/sys/devices/pci0000:80/0000:80:03.0/0000:a0:00.0
```

3. Change to the directory.

```
# cd /sys/devices/pci0000:80/0000:80:03.0/0000:a0:00.0
```

4. Type the number of VFs into the directory `sriov_numvfs`.

```
# echo 4 > sriov_numvfs
```

where 4 is the sample number of VFs.

5. Change to the directory.

```
# cd /sys/bus/pci/drivers/pci-stub/
```

6. Type the device ID to the `new_id` file.

```
# echo "108e 2089" > /sys/bus/pci/drivers/pci-stub/new_id
```

Repeat Steps 3 to Step 6 after each server reboot.

Related Information

- [“IB Overview \(Oracle Linux\)” on page 43](#)
- [“Prepare to Enable Virtualization \(Oracle Linux\)” on page 43](#)
- [“Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Linux\)” on page 45](#)
- [“Disable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Linux\)” on page 47](#)
- [“Verify IB Connectivity \(Oracle Linux\)” on page 47](#)

▼ **Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Linux)**

1. Ensure that the VNIC has been created on the switch.

```
# admin@nsn156-46.us.oracle.com[0F05] show physical-server
-----
name   nsn156-32      guid          10e07a850c0005
descr  port          nsn156-46.us.oracle.com:ServerPort19
os      Linux/4.1.12-32.el6uek.x86_64/x86_64
version 0.58.0/3.0.0/xg-6.0.8020  server-profile nsn156-32
-----
```

```
name      nsn156-32      guid      10e07a850c0006
descr    port      nsn156-46.us.oracle.com:ServerPort18
os       Linux/4.1.12-32.el6uek.x86_64/x86_64
version  0.58.0/3.0.0/xg-6.0.8020      server-profile
```

For more information on creating VNICs on the switch, refer to *Configuring a VNIC* in the *Oracle Fabric OS 1.0 Administration Guide*.

2. **On the server, log in to the Oracle Solaris host to ensure that the VNIC has been successfully created.**

```
# prtconf -D | grep xs
ibport, instance #0 (driver name: xstn)
vnic0, instance #4 (driver name: xsvnic)
```

where vnic0 is the VNIC name.

3. **Display the corresponding interface.**

```
# dladm show-phys
LINK      MEDIA          STATE  SPEED  DUPLEX  DEVICE
net4      Infiniband    up     32000  unknown ibp0
net0      Ethernet      up     1000   full    ixgbe0
net2      Ethernet      unknown 0      unknown ixgbe2
net6      Ethernet      up     10     full    usbecm2
net3      Ethernet      unknown 0      unknown ixgbe3
net1      Ethernet      unknown 0      unknown ixgbe1
net5      Infiniband    down   0      unknown ibp1
net9      Infiniband    down   0      unknown ibp3
net10     Infiniband    down   0      unknown ibp2
net11     Ethernet      unknown 0      unknown xsvnic4
```

Where the interface for VNIC is net11.

4. **Manually configure the IP address for the VNIC.**

Example output:

```
# ipadm create-ip net11
# ipadm create-addr -T static -a 7.7.7.56/24 net11net11/v4
# ipadm

NAME      CLASS/TYPE STATE  UNDER  ADDR
lo0      loopback  ok     --      --
lo0/v4   static    ok     --      123.0.0.1/8
lo0/v6   static    ok     --      ::1/128
net0     ip        ok     --      --
net0/v4  static    ok     --      12.329.87.58/24
```

```
net0/v6  addrconf  ok      --      fe80::210:e0ff:fe58:3cd4/10
net0/v6  addrconf  ok      --      1234:b400:418:17a9:210:e0ff:fe58:3cd4/64
net6     ip         ok      --      --
net6/v4  static    ok      --      123.254.182.77/24
net11    ip         ok      --      --
net11/v4 static    ok      --      7.7.7.56/24
```

Related Information

- [“IB Overview \(Oracle Linux\)” on page 43](#)
- [“Prepare to Enable Virtualization \(Oracle Linux\)” on page 43](#)
- [“Enable Virtualization \(Oracle Linux\)” on page 44](#)
- [“Disable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Linux\)” on page 47](#)
- [“Verify IB Connectivity \(Oracle Linux\)” on page 47](#)

▼ Disable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 (Oracle Linux)

- Remove the VNIC from the switch.

```
# remove vnic vnic-name
```

For information on VNICs on the switch, refer to [“Configuring a VNIC” in Oracle Fabric OS 1.0 Administration Guide](#).

Related Information

- [“IB Overview \(Oracle Linux\)” on page 43](#)
- [“Prepare to Enable Virtualization \(Oracle Linux\)” on page 43](#)
- [“Enable Virtualization \(Oracle Linux\)” on page 44](#)
- [“Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Linux\)” on page 45](#)
- [“Verify IB Connectivity \(Oracle Linux\)” on page 47](#)

▼ Verify IB Connectivity (Oracle Linux)

1. Ensure that the adapter is properly installed in the server.
See [“Install the Adapter” on page 24](#).

2. Power on the server and cable it to an operational peer IB switch.

Refer to the documentation for your network hardware for more information at http://docs.oracle.com/cd/E36265_01/index.html or http://docs.oracle.com/cd/E36256_01/index.html.

3. Ensure that the cables are connected to the adapter and IB switches.

4. Verify that the Subnet Manager is running on the IB switch or a host within the subnet.

Refer to the documentation for your network hardware for more information at http://docs.oracle.com/cd/E36265_01/index.html or http://docs.oracle.com/cd/E36256_01/index.html.

5. Check that the green LED is lit for each port that is connected to the switch.

If the green LED is not on, check the cable connections at the adapter and the IB switch.

6. Ensure that the required OS has been installed.

See “[IB Overview \(Oracle Linux\)](#)” on page 43.

7. Verify that the ports are up and the driver is attached.

```
# ibstat
CA 'sif0'
  CA type: PSIF
  Number of ports: 2
  Firmware version: 0.53.0
  Hardware version: 0
  Node GUID: 0x0010e07abcd40004
  System image GUID: 0x0010e07abcd40007
  Port 1:
    State: Active
    Physical state: LinkUp
    Rate: 40
    Base lid: 22
    LMC: 0
    SM lid: 14
    Capability mask: 0x02014008
    Port GUID: 0x0010e07abcd40005
    Link layer: InfiniBand
  Port 2:
    State: Active
    Physical state: LinkUp
    Rate: 40
    Base lid: 24
    LMC: 0
    SM lid: 14
    Capability mask: 0x02014008
```


Port GUID: 0x0010e07abcd40006
Link layer: InfiniBand

The output shows system diagnostic messages that have the string `sif` in the message (the name of the Linux driver). Included in the output is a message that indicates whether the port is up or down.

Note - For accurate IB device information, such as GUID identification in a server with more than one IB device, use the `ibstat` command.

Related Information

- [“IB Overview \(Oracle Linux\)” on page 43](#)
- [“Prepare to Enable Virtualization \(Oracle Linux\)” on page 43](#)
- [“Enable Virtualization \(Oracle Linux\)” on page 44](#)
- [“Enable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Linux\)” on page 45](#)
- [“Disable Ethernet Over IB for the Oracle IB Switch IS2-46 or Oracle IB Switch IS2-254 \(Oracle Linux\)” on page 47](#)

Updating Software and Firmware

These topics provide information on updating the adapter software and firmware.

- “Update the OS (Oracle Solaris)” on page 51
- “Update the OS (Oracle Linux)” on page 52
- “Update the Firmware (Oracle Solaris)” on page 53
- “Update the Firmware (Oracle Linux)” on page 54

Related Information

- “Understanding the Installation Process” on page 9
- “Understanding the Adapter” on page 11
- “Confirming Specifications and Requirements” on page 17
- “Installing the Adapter” on page 21
- “Enabling IB on the Adapter” on page 35

▼ Update the OS (Oracle Solaris)

1. Take one of these actions.

- Update the entire OS image on the server.
- If you cannot update the entire OS image, download the latest patch that contains the software driver at <http://support.oracle.com>.

For instructions on installing the latest SIF Package, refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes*. This document is available at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

2. Verify that these packages are installed on the server.

```
# pkg info -r sif
# pkg info network/open-fabrics
# pkg contents siftools
```

```
# pkginfo SUNWstc-infiniband-ofuv
```

Related Information

- [“Update the Firmware \(Oracle Solaris\)” on page 53](#)

▼ Update the OS (Oracle Linux)

For the latest list of supported platforms and operating systems, refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes* at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

These Linux versions are supported with UEK4:

- Oracle Linux 6.7 and newer
- Oracle Linux 7.1 and newer
- OVM 3.4.1

For the latest information on UEK4, refer to the *Oracle Linux Release Notes for Unbreakable Enterprise Kernel Release 4* at https://docs.oracle.com/cd/E52668_01/E69348/html/index.html.

1. Install and upgrade to the latest Oracle Linux.

- a. For Oracle Linux 6, refer to the *Oracle Linux Installation Guide for Release 6* at <http://www.oracle.com/technetwork/server-storage/linux/documentation/index.html>.
- b. For Oracle Linux 7, refer to *Oracle Linux Installation Guide for Release 7* at <http://www.oracle.com/technetwork/server-storage/linux/documentation/index.html>.

2. Install and upgrade to the latest UEK4 release.

Refer to the *Oracle® Linux Release Notes for Unbreakable Enterprise Kernel Release 4* at <http://www.oracle.com/technetwork/server-storage/linux/documentation/index.html>.

3. Ensure that the correct IB stack (OFED stack) for UEK4 is installed.

Refer to Chapter 3.5 in https://docs.oracle.com/cd/E52668_01/E69348/E69348.pdf or <http://www.oracle.com/technetwork/server-storage/linux/documentation/index.html>.

4. Add the `psif` driver and `libsif` library.

For the latest driver version, refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes* at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

Related Information

- [“Update the Firmware \(Oracle Solaris\)” on page 53](#)

▼ Update the Firmware (Oracle Solaris)

To use this adapter with the Oracle Solaris OS, use the minimum supported firmware version. Refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes* at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

1. Display the revision level of the adapter.

```
# fwflash -l
List of available devices:
Device[0] /devices/pci@340/pci@1/pci@0/pci@4/pciex108e,2088@0:devctl
Driver psif
Class [IB]
      GUID : System Image          - 0010e07a982c0007
      Node Image                   - 0010e07ab4980004 <===== Node
GUID
      Port 1                       - 0010e07ab4980005
      Port 2                       - 0010e07ab4980006
Firmware Revision   EPSC Active   : 0.065 Thu Jun  2 22:57:10 2016 <===== Firmware version
Firmware Revision   Bootloader    : 0.036 Wed Feb 10 22:01:34 2016
Vendor Id           : ORACLE
HW Revision         : 3
Device Id           : 2088
Description         : Titan Infiniband HCA
```

Look for the revision number that appears after the `Firmware revision` string. If more than one device is displayed, look for the `Node Image GUID` that matches the GUID displayed on the physical GUID label of the adapter being installed. See [“Rear Panel” on page 14](#).

To display all firmware details, set the `export SIF_FW_ALL_SHOW=1` environment variable.

2. Select and download the approved firmware tool and firmware version from My Oracle Support at <https://support.oracle.com/>.

For the latest list of supported platforms and operating systems, and the latest software and firmware versions, refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes*. This document is available at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

3. Install the firmware.

```
# fwflash -f firmware-image-file -d device-path-of-IB-adapter
```

Sample output:

```
# fwflash -f titan-psif-epsc-0.064.bin -d /devices/pci@340/pci@1/pci@0/pci@4/pciex108e,2088@0:devctl
The current HCA firmware version is :0.065
Will be updated to HCA firmwarever of :0.064
About to update firmware on /devices/pci@340/pci@1/pci@0/pci@4/pciex108e,2088@0:devctl with file titan-
psif-epsc-0.064.bin.
Do you want to continue? (Y/N): y

fwflash: New firmware will be activated after you reboot
#
```

4. **Reboot the server to enable the new firmware.**
5. **Verify the firmware.**

```
# fwflash -d device-path-of-IB-adapter -r firmware-image-file
```

Related Information

- [“Update the OS \(Oracle Solaris\)” on page 51](#)

▼ Update the Firmware (Oracle Linux)

To use this adapter with Oracle Linux, the minimum firmware version must be used. Refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes* at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

1. **Display the *device-path* of the IB adapter, using device ID 2088.**

```
# lspci | grep 2088
90:00.0 Infiniband controller: Oracle/SUN Device 2088 (rev 03)
```

2. **Determine the type of adapter.**

```
# lspci -v -d :2088 | grep -i subsystem
Subsystem: Oracle/SUN Device 6279
Subsystem: Oracle/SUN Device 6279
```

3. **Select and download the firmware update tool and latest firmware from My Oracle Support at <https://support.oracle.com/>.**

For the latest list of supported platforms and operating systems, and the latest software and firmware versions, refer to the *Oracle Dual Port EDR InfiniBand Adapter Product Notes*. This document is available at http://www.oracle.com/goto/dual_port_edr_infiniband/docs.

4. Install the firmware.

```
# pflash -d device-path -i firmware-image-file b[urn]
```

where `pflash` is the name of the firmware update tool.

where `device-path` is the path to flash device (in [domain:]<bus>:<slot>.<func> format) obtained in [Step 1](#).

For example, type:

```
# pflash -d 90:00.0 -i /lib/firmware/titan-psif-epsc-0.053.bin burn
Flash burn start
.....
Flash burn end
```

5. Reboot the server.

6. Check if the IB adapter is up with the firmware version used.

```
# pflash -d dev-id q [uery]
```

Related Information

- [“Update the OS \(Oracle Linux\)” on page 52](#)

Glossary

A

adapter Oracle Dual Port EDR InfiniBand Adapter from Oracle.

B

BDF Bus: Device: Function. Used to succinctly describe PCI and PCIe devices.

D

DDR Dual Data Rate, 5.0 Gb/s line rate.

DMA Direct memory access.

E

EDR Enhanced Data Rate, 25.78125 Gb/s line rate.

EMI Electromagnetic interference. The interference caused by the magnetic fields of electronic components.

F

FDR Fourteen Data Rate, 14.0625 Gb/s line rate.

G

Gb Gigabyte.

GbE	Gigabit Ethernet.
Gbps	Gigabits per second.
GT	Gigabit transfer.
GTPs	GTs-per-second.
GUID	Globally Unique Identifier.

H

HCA	Host channel adapter. A server card that provides a node for IB network connection.
------------	---

I

IB	InfiniBand. A type of communications link for data flow between processors and I/O devices. IB is used in high-performance computing, which features very high throughput and very low latency.
IPoIB	Internet Protocol over IB.

L

LAN	Local area network. Two or more devices connected to each other either physically or logically.
LFM	Linear feet per minute.

M

MAC	Media access control. Enables the use of a unique address for each device on a network.
MPO	Multi-Fiber Push-On connector system for MT-compatible ferrules, push-pull design.

N

NIC	Network interface card. Connects clients and servers to a LAN, WAN, or VLAN.
------------	--

P

PCI Peripheral Component Interconnect.

PCIe PCI Express.

Q

QDR Quad Data Rate, 10.0 Gb/s line rate.

QSFP Quad Small Form-factor Pluggable.

R

RDMA Remote Direct Memory Access.

S

SDR Single Data Rate, 2.5 Gb/s line rate.

SPI Serial peripheral interface. A type of flash memory.

T

TX Generation. The automatic generation mechanism used by the Ethernet PAUSE frames.

V

VID VLAN identifier. A 12-bit identifier in an Ethernet header.

VNIC Virtualized network interface card.

PrizmMT MPO MPO cables which use clear plastic molded lenses to transmit laser light between fibers across small air gaps.

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