

**Oracle® Dual Port 25/100 Gb Ethernet
Adapter User's Guide, Mellanox**

ORACLE®

Part No: F42362-02
June 2022

Part No: F42362-02

Copyright © 2021,2022, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Référence: F42362-02

Copyright © 2021,2022, Oracle et/ou ses affiliés. Tous droits réservés.

Ce logiciel et la documentation qui l'accompagne sont protégés par les lois sur la propriété intellectuelle. Ils sont concédés sous licence et soumis à des restrictions d'utilisation et de divulgation. Sauf stipulation expresse de votre contrat de licence ou de la loi, vous ne pouvez pas copier, reproduire, traduire, diffuser, modifier, accorder de licence, transmettre, distribuer, exposer, exécuter, publier ou afficher le logiciel, même partiellement, sous quelque forme et par quelque procédé que ce soit. Par ailleurs, il est interdit de procéder à toute ingénierie inverse du logiciel, de le désassembler ou de le décompiler, excepté à des fins d'interopérabilité avec des logiciels tiers ou tel que prescrit par la loi.

Les informations fournies dans ce document sont susceptibles de modification sans préavis. Par ailleurs, Oracle Corporation ne garantit pas qu'elles soient exemptes d'erreurs et vous invite, le cas échéant, à lui en faire part par écrit.

Si ce logiciel, ou la documentation qui l'accompagne, est livré sous licence au Gouvernement des Etats-Unis, ou à quiconque qui aurait souscrit la licence de ce logiciel pour le compte du Gouvernement des Etats-Unis, la notice suivante s'applique :

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

Ce logiciel ou matériel a été développé pour un usage général dans le cadre d'applications de gestion des informations. Ce logiciel ou matériel n'est pas conçu ni n'est destiné à être utilisé dans des applications à risque, notamment dans des applications pouvant causer un risque de dommages corporels. Si vous utilisez ce logiciel ou ce matériel dans le cadre d'applications dangereuses, il est de votre responsabilité de prendre toutes les mesures de secours, de sauvegarde, de redondance et autres mesures nécessaires à son utilisation dans des conditions optimales de sécurité. Oracle Corporation et ses affiliés déclinent toute responsabilité quant aux dommages causés par l'utilisation de ce logiciel ou matériel pour des applications dangereuses.

Oracle et Java sont des marques déposées d'Oracle Corporation et/ou de ses affiliés. Tout autre nom mentionné peut correspondre à des marques appartenant à d'autres propriétaires qu'Oracle.

Intel et Intel Xeon sont des marques ou des marques déposées d'Intel Corporation. Toutes les marques SPARC sont utilisées sous licence et sont des marques ou des marques déposées de SPARC International, Inc. AMD, Opteron, le logo AMD et le logo AMD Opteron sont des marques ou des marques déposées d'Advanced Micro Devices. UNIX est une marque déposée de The Open Group.

Ce logiciel ou matériel et la documentation qui l'accompagne peuvent fournir des informations ou des liens donnant accès à des contenus, des produits et des services émanant de tiers. Oracle Corporation et ses affiliés déclinent toute responsabilité ou garantie expresse quant aux contenus, produits ou services émanant de tiers, sauf mention contraire stipulée dans un contrat entre vous et Oracle. En aucun cas, Oracle Corporation et ses affiliés ne sauraient être tenus pour responsables des pertes subies, des coûts occasionnés ou des dommages causés par l'accès à des contenus, produits ou services tiers, ou à leur utilisation, sauf mention contraire stipulée dans un contrat entre vous et Oracle.

Accès aux services de support Oracle

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.

Contents

Using This Documentation	9
Product Documentation Library	9
Understanding the Installation Process	11
Installation Task Overview (Oracle Solaris x86/64)	11
Installation Task Overview (Linux)	12
Installation Task Overview (Windows)	12
Understanding the Adapter	15
Shipping Kit Contents	15
Adapter Overview	16
Front Panel Connectors and LEDs	17
Confirming Specifications and Requirements	19
Physical Specifications	19
Electrical Specifications	20
Environmental Specifications	21
Hardware and Software Requirements	22
Updating Software and Firmware	23
x86 Systems: Firmware Update Tool Overview	23
Related Information	24
SPARC Systems: Solaris Image	24
Verifying the Mellanox Network Driver	25
▼ View the mLnne Driver (Oracle Solaris x86/64)	25
▼ View the Linux mLnne Network Driver	26

▼ Verify the Windows mlxne Network Driver	27
Installing the Adapter	29
Adapter Description	29
Related Information	30
Cable and Transceiver Overview	30
Cable Cautions	31
Related Information	32
▼ Install the Adapter	32
▼ Verify the Adapter Installation (Linux)	34
▼ Verify the Adapter Installation (Windows)	35
▼ Verify the Adapter Installation (Oracle Solaris x86/64)	35
Configuring the Network	37
▼ Configure the Network Interface (Windows)	38
▼ Configure the Network Interface (Oracle Solaris x86/64)	38
Boot Options	39
▼ Boot Over the Network (PXE)	39
▼ Boot Over a 10GbE Network (Oracle Solaris x86/64 and Linux)	40
Installing RoCE	46
▼ Install RoCE (Linux)	46
▼ Install RoCE in Windows Kernel Mode	46
▼ Install RoCE in Windows User Mode	47
▼ Install RoCE in VMware ESXi	47
Verifying RoCE	48
▼ Verify RoCE in Windows	48
Configuring Jumbo Frames	51
Configure Jumbo Frames (Linux)	51
▼ Configure Jumbo Frames (Windows)	52
▼ Change the MTU Permanently (Oracle Solaris x86/64)	52
▼ Change the MTU Temporarily (Oracle Solaris X86/64)	52
Configuring a Link Aggregation (Oracle Solaris x86/64)	55
▼ Configure a Link Aggregation (Oracle Solaris x86/64)	55
▼ Display Information About a Link Aggregation (Oracle Solaris x86/64)	56

▼ Delete a Link Aggregation (Oracle Solaris x86/64)	56
Configuring VLANs	57
VLANs Overview	57
Configure VLANs (Linux)	58
Configure VLANs (Oracle SPARC)	58
▼ Configure VLANs (Windows)	58
▼ Configure VLANs (Oracle Solaris x86)	59
▼ Configure VXLANs (Oracle Solaris x86)	60
Removing the Driver	61
▼ Remove the mlxne Driver (Linux)	61
▼ Remove the mlxne Driver (Windows)	61
▼ Remove the mlxne Driver (Oracle Solaris x86/64)	62
Upgrading the Adapter (Linux)	63
▼ Install the Upgrade Package	63
▼ Verify the Upgrade	64
Troubleshooting the Adapter (Oracle Solaris x86/64)	67
▼ Analyze Why the Device Link Is Missing (Oracle Solaris x86/64)	67
▼ Recover From a Port Hang (Oracle Solaris x86/64)	68
▼ Analyze Slow Network Performance (Oracle Solaris x86/64)	69
▼ Analyze Why the Link Is Not Up After Back-To-Back Cable Connection (Oracle Solaris x86/64)	71
▼ Analyze Why Changing the MTU Does Not Correctly Set the Link Property (Oracle Solaris x86/64)	71
Glossary	73
Index	77

Using This Documentation

- **Overview** – Provides specifications and describes how to install and administer the Oracle Dual Port 25/100 Gb Mellanox Ethernet 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 25/100 Gb Mellanox Ethernet Adapter, the term “x86” refers to 64-bit and 32-bit systems manufactured using processors compatible with the AMD64, Intel Xeon, or Intel Pentium product families, the term SPARC refers to 64 bit systems such as T8-1, T8-2, T8-4 and M8-8 servers, and the term “Oracle Solaris” refers to latest software version (i.e. Oracle Solaris 11.4) supported on x86 and SPARC server systems.

The Oracle Dual Port 25/100 Gb Mellanox Ethernet adapter cards are based on the Mellanox ConnectX®-5 integrated circuit devices.

Product Documentation Library

Documentation and resources for this product and related products are available at <https://docs.oracle.com/en/servers/management.html>.

Understanding the Installation Process

The following topic(s) provide an overview of the installation process for the Oracle Dual Port 25/100 Gb Mellanox Ethernet Adapter:

- [“Installation Task Overview \(Oracle Solaris x86/64\)” on page 11](#)
- [“Installation Task Overview \(Linux\)” on page 12](#)
- [“Installation Task Overview \(Windows\)” on page 12](#)

Related Information

- [“Understanding the Adapter” on page 15](#)
- [“Confirming Specifications and Requirements” on page 19](#)
- [“Updating Software and Firmware” on page 23](#)
- [“Verifying the Mellanox Network Driver” on page 25](#)
- [“Installing the Adapter” on page 29](#)

Installation Task Overview (Oracle Solaris x86/64)

Step	Description	Links
1.	Understand the adapter.	“Understanding the Adapter” on page 15
2.	Confirm the adapter specifications and technical requirements.	“Confirming Specifications and Requirements” on page 19
3.	Ensure that the minimum required Oracle Solaris software version is installed.	“Hardware and Software Requirements” on page 22
4.	Verify that the driver bundled in the Oracle Solaris software is loaded.	“View the mlxne Driver (Oracle Solaris x86/64)” on page 25
5.	Install and verify the adapter.	“Install the Adapter” on page 32
6.	Boot over the network.	“Configuring the Network” on page 37
7.	(Optional) Configure Jumbo Frames	“Configuring Jumbo Frames ” on page 51
8.	(Optional) Configure VLANs.	“Configuring VLANs” on page 57

Step	Description	Links
9.	(Optional) If required, remove the driver.	“Remove the mlxne Driver (Oracle Solaris x86/64)” on page 62
10.	(Optional) Configure a link aggregation in an Oracle Solaris x86 environment.	“Configuring a Link Aggregation (Oracle Solaris x86/64)” on page 55
11.	If required, troubleshoot adapter issues in an Oracle Solaris X86 environment.	“Troubleshooting the Adapter (Oracle Solaris x86/64)” on page 67

Installation Task Overview (Linux)

Step	Description	Links
1.	Understand the adapter.	“Understanding the Adapter” on page 15
2.	Confirm the adapter specifications and technical requirements.	“Confirming Specifications and Requirements” on page 19
3.	Ensure that the minimum required Oracle Solaris software version is installed.	“Hardware and Software Requirements” on page 22
4.	Verify that the driver bundled in the Oracle Solaris software is loaded.	“View the Linux mlxne Network Driver” on page 26
5.	Install and verify the adapter.	“Install the Adapter” on page 32 “Verify the Adapter Installation (Linux)” on page 34
6.	Boot over the network.	“Configuring the Network” on page 37
7.	(Optional) Configure jumbo frames.	“Configuring Jumbo Frames ” on page 51
8.	(Optional) Configure VLANs.	“Configuring VLANs” on page 57
9.	(Optional) If required, remove the driver.	“Remove the mlxne Driver (Linux)” on page 61
10.	Upgrade the adapter.	“Install the Upgrade Package” on page 63

Related Information

- [“Installation Task Overview \(Windows\)” on page 12](#)

Installation Task Overview (Windows)

Step	Description	Links
1.	Understand the adapter.	“Understanding the Adapter” on page 15

Step	Description	Links
2.	Confirm the adapter specifications and technical requirements.	“Confirming Specifications and Requirements” on page 19
3.	Ensure that the minimum required Oracle Solaris software version is installed.	“Hardware and Software Requirements” on page 22
4.	Verify that the driver bundled in the Oracle Solaris software is loaded.	“Verify the Windows mlxne Network Driver ” on page 27
5.	Install the adapter and verify the installation.	“Install the Adapter” on page 32 “Verify the Adapter Installation (Windows)” on page 35
6.	Boot over the network.	“Configure the Network Interface (Windows)” on page 38
7.	(Optional) Configure jumbo frames.	“Configure Jumbo Frames (Windows)” on page 52
8.	(Optional) Configure a VLAN.	“Configure VLANs (Windows)” on page 58
9.	(Optional) If required, remove the driver.	“Remove the mlxne Driver (Windows)” on page 61
10.	Upgrade the adapter.	“Install the Upgrade Package” on page 63

Related Information

- [“Installation Task Overview \(Linux\)” on page 12](#)
- [“Understanding the Adapter” on page 15](#)

Understanding the Adapter

These topics provide an overview of the adapter:

- [“Shipping Kit Contents” on page 15](#)
- [“Adapter Overview” on page 16](#)
- [“Front Panel Connectors and LEDs” on page 17](#)

Related Information

- [“Understanding the Installation Process” on page 11](#)
- [“Confirming Specifications and Requirements” on page 19](#)
- [“Updating Software and Firmware” on page 23](#)
- [“Verifying the Mellanox Network Driver” on page 25](#)
- [“Installing the Adapter” on page 29](#)
- [“Configuring the Network” on page 37](#)
- [“Configuring Jumbo Frames ” on page 51](#)
- [“Configuring VLANs” on page 57](#)
- [“Removing the Driver” on page 61](#)

Shipping Kit Contents

The carton in which the adapter was shipped contains these items:

- Adapter with a low-profile bracket attached
- *Dual Port Ethernet Adapter Where To Find* documentation

Related Information

- [“Adapter Overview” on page 16](#)
- [“Front Panel Connectors and LEDs” on page 17](#)

Adapter Overview

The content in this document applies to the following Oracle Dual Port 25/100 Gb Mellanox Ethernet Adapters:

- Oracle Dual Port 25 Gb Ethernet Adapter, Mellanox
- Oracle Dual Port 100 Gb Ethernet Adapter, Mellanox

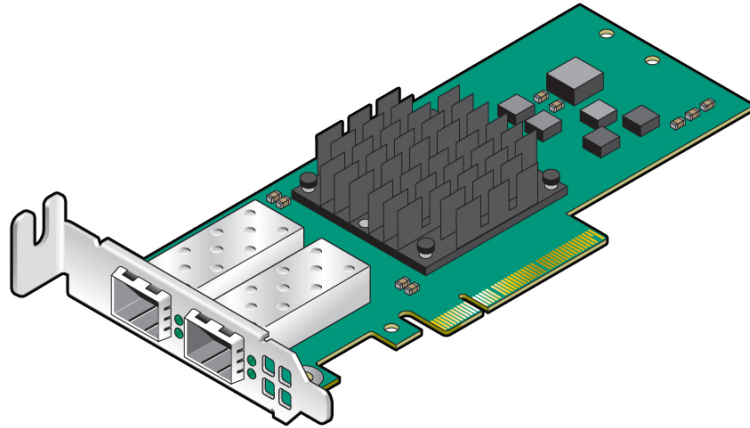
Note - Performance may be limited depending on the server configuration in which the 100 GbE Adapter Card is being used. Maximum performance of the 100 GbE Adapter Card can only be achieved on systems supporting PCIe 4.0 with 16 data lanes.

- Oracle Dual Port 100 Gb Ethernet Adapter, Mellanox for Mezzanine form factor (for factory installation) (X86 Server Support Only).

Note - The Dual Port 25/100 Gb Mellanox Ethernet Adapters are based on the Mellanox ConnectX®-5 integrated circuit devices.

TABLE 1 Performance Specifications - Oracle Dual Port 25/100 Gb Mellanox Ethernet

Feature	Specification
Data rate	<ul style="list-style-type: none"> ■ 25 GbE Adapter: 1/10/25 Gb/s Ethernet ■ 100 GbE Adapter: 10/25/40/100 Gb/s Ethernet ■ 100 GbE Adapter, Mezzanine Form Factor: 10/25/40/100 Gb/s Ethernet (x86 Server Support Only)
Bus type	<ul style="list-style-type: none"> ■ 25 GbE Adapter: PCIe 4.0: SERDES @ 8.0GT/s, 8 lanes (2.0 and 1.1 compatible) ■ 100 GbE Adapter: PCIe 4.0: SERDES @ 8.0GT/s, 16 lanes (2.0 and 1.1 compatible) ■ 100 GbE Adapter, Mezzanine Form Factor: PCIe 4.0: SERDES @ 8.0GT/s x16 lanes (2.0 and 1.1 compatible) (X86 Server Support Only)
Bus width	<ul style="list-style-type: none"> ■ 25 GbE Adapter: 8-lane PCIe bus connector ■ 100 GbE Adapter: PCIe 4.0 x16 bus can supply a maximum bandwidth of 128Gb/s only (=16 * 8GT/s, including overhead),and therefore cannot support 200Gb/s when both network ports of MCX556A-ECAT run at 100Gb/s.
Conforms to Ethernet standard	802.3
PreBoot Drivers	<p>Mellanox provided PreBoot drivers are a multiprotocol remote boot technology that support remote Boot over InfiniBand (BoIB) and over Ethernet</p> <p>Using Mellanox Virtual Protocol Interconnect (VPI) technologies available in ConnectX® adapters, PreBoot drivers give IT Managers' the choice to boot from a remote storage target (iSCSI target) or a LAN target (Ethernet Remote Boot Server) using a single ROM image on Mellanox ConnectX products. FlexBoot is based on the open source project iPX.</p>

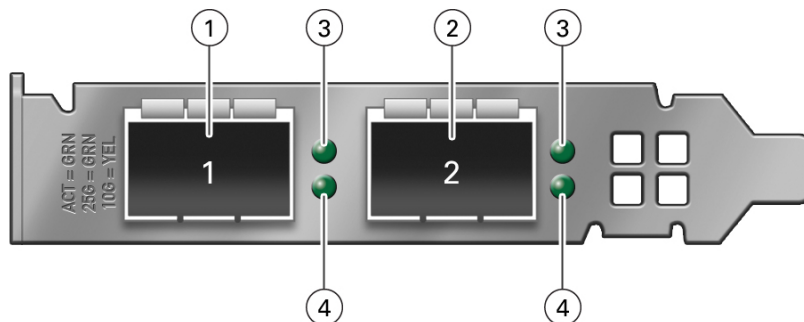


Related Information

- [“Shipping Kit Contents” on page 15](#)
- [“Front Panel Connectors and LEDs” on page 17](#)

Front Panel Connectors and LEDs

On the front panel, two LEDs display the port speed and activity for each port. Both ports operate at the same speed. This figure and the table explain the meaning of the LEDs for ports 1 and 2. The LEDs are the same for a full panel and a half-height panel.



Note - If your adapter is installed horizontally, the ports are numbered 1 and 2, left to right. In a vertical orientation, the ports are numbered 1-2 bottom to top.

No.	Description	Device	Mbit
1	Port 1		
2	Port 2		
3	Activity LED	Off	No activity
		Blinking Green	Traffic flowing activity
4	Link LED	Off	No link
		Solid Green	Linked at 25 Gbps
		Solid Yellow	Linked at 1 Gbps or 10 Gbps

Related Information

- [“Shipping Kit Contents” on page 15](#)
- [“Adapter Overview” on page 16](#)
- [“Confirming Specifications and Requirements” on page 19](#)

Confirming Specifications and Requirements

These topics provide technical information and airflow precautions you need to understand before installing the adapter:

- [“Physical Specifications” on page 19](#)
- [“Electrical Specifications” on page 20](#)
- [“Environmental Specifications” on page 21](#)
- [“Hardware and Software Requirements” on page 22](#)

Related Information

- [“Understanding the Installation Process” on page 11](#)
- [“Understanding the Adapter” on page 15](#)
- [“Updating Software and Firmware” on page 23](#)
- [“Verifying the Mellanox Network Driver” on page 25](#)
- [“Installing the Adapter” on page 29](#)
- [“Configuring the Network” on page 37](#)
- [“Configuring Jumbo Frames ” on page 51](#)
- [“Configuring VLANs” on page 57](#)
- [“Removing the Driver” on page 61](#)

Physical Specifications

Adapter Type	Physical Specifications
25 Gb	Size: 2.71 in. x 5.6 in. (68.90mm x 142.24 mm) Low profile; Connector: Dual SFP28 Ethernet (copper and optical)
100 Gb	Size: 2.71 in. x 5.6 in. (68.90mm x 142.24 mm)

Adapter Type	Physical Specifications
	Low profile; Connector: Dual QSFP28 InfiniBand and Ethernet (copper and optical)
100 Gb Mezzanine Form Factor (X86 Server Support Only)	Size: 4.52in. x 2.99in. (115mm x 76mm); Connector: Dual QSFP28 Ethernet (copper and optical)

Related Information

- [“Electrical Specifications” on page 20](#)
- [“Environmental Specifications” on page 21](#)
- [“Hardware and Software Requirements” on page 22](#)

Electrical Specifications

Adapter Type	Power and Cable Support
25 Gb	Voltage: 12V <ul style="list-style-type: none"> ■ Typical Power: Passive Cable 9.5W ■ Maximum Power: Passive Cable 11.8W ■ Maximum Power: 1.5W Active Cable 15.1W
100 Gb	Voltage: 12V <ul style="list-style-type: none"> ■ Typical Power: Passive Cable 16.2W ■ Typical Power: Passive Cable 19.0W ■ Maximum Power: 1.5 Active Cables 22.3W ■ Maximum Power: 2.5W Active Cables 24.6W <p>Note - Typical power is for ATIS traffic load.</p> <p>Maximum power available through QSFP28 port: 5W</p>
100 Gb Mezzanine Form Factor (X86 Server Support Only)	Voltage: 12V <p>Typical Power:</p> <p>Note - Typical power is for ATIS traffic load.</p> <ul style="list-style-type: none"> ■ 12V_Edge: Passive Cables, 16.5W ■ 12V_Edge: 2.2W Active Cables, 21.7 ■ 3.3V Edge: Passive Cables: 0.33W ■ 2.2W Active Cables: 0.33W <p>Note - 12V and 3.3V Edge Standby and Maximum power for Passive and Active Cables = TBD</p> <p>Maximum Power:</p>

Adapter Type	Power and Cable Support
	<ul style="list-style-type: none"> ■ 12V_Edge: Passive Cables, 19.3 W ■ 12V_Edge: 2.2W Active Cables, 24.5 ■ 3.3V Edge: Passive Cables: 0.33W ■ 2.2W Active Cables: 0.33W <p>Maximum power available through QSFP28 port: 2.2W</p>

Related Information

- [“Physical Specifications” on page 19](#)
- [“Environmental Specifications” on page 21](#)
- [“Hardware and Software Requirements” on page 22](#)

Environmental Specifications

Adapter	Environmental Specifications
25 Gb	<p>Temperature:</p> <ul style="list-style-type: none"> ■ Operational: 0°C to 55°C ■ Non-operational: -40°C to 70°C <p>Altitude (Operational): 3050m</p> <p>Humidity: 90% relative humidity</p> <p>Airflow: Mellanox Airflow Specifications</p>
100 Gb	<p>Temperature:</p> <ul style="list-style-type: none"> ■ Operational: 0°C to 55°C ■ Non-operational: -40°C to 70°C <p>Humidity (Operational and Non-operational): 90% relative humidity</p> <p>Altitude (Operational): 3050m</p> <p>Airflow: Mellanox Airflow Specifications</p>
100 Gb Mezzanine Form Factor (X86 Server Support Only)	<p>Temperature:</p> <ul style="list-style-type: none"> ■ Operational: 0°C to 55°C ■ Non-operational: -40°C to 70°C <p>Humidity (Operational and Non-operational): 90% relative humidity</p>

Adapter	Environmental Specifications
	Altitude (Operational): 3050m Airflow: Cable Type: Passive and Active (2.2W Active Cable (85°C cage limit)) <ul style="list-style-type: none"> ■ Active Mode @55C (HSK to Port): 300LFM ■ Standby Mode @45C (HSK to Port): 100LFM ■ Active and Standby Cold Aisle @35C (Port to HSK): NA

Related Information

- [“Physical Specifications” on page 19](#)
- [“Electrical Specifications” on page 20](#)
- [“Hardware and Software Requirements” on page 22](#)

Hardware and Software Requirements

Hardware and software support changes over time. For the latest information concerning I/O options that are supported by your server, refer to the [Product Page](#).

For the latest list of supported platforms and operating systems, refer to the [“Servers and Operating Systems Supported” in Product Notes for Mellanox Connect ®-5 Ex Ethernet PCIe Adapter Cards for Oracle x86 Server](#)

For Oracle Solaris OS systems, the minimum supported version is required, which is Oracle Solaris 11.4 SRU33.

Related Information

- [“Physical Specifications” on page 19](#)
- [“Electrical Specifications” on page 20](#)
- [“Environmental Specifications” on page 21](#)
- [“Updating Software and Firmware” on page 23](#)

Updating Software and Firmware

This topic provides information on updating the adapter software and firmware:

- [“x86 Systems: Firmware Update Tool Overview ” on page 23](#)
- [“SPARC Systems: Solaris Image” on page 24](#)

Note - For the latest list of supported platforms and operating systems, see [“Hardware and Software Requirements” on page 22.](#)

Related Information

- [“Understanding the Installation Process” on page 11](#)
- [“Understanding the Adapter” on page 15](#)
- [“Confirming Specifications and Requirements” on page 19](#)
- [“Verifying the Mellanox Network Driver” on page 25](#)
- [“Installing the Adapter” on page 29](#)
- [“Configuring the Network” on page 37](#)
- [“Configuring Jumbo Frames ” on page 51](#)
- [“Configuring VLANs” on page 57](#)
- [“Removing the Driver” on page 61](#)

x86 Systems: Firmware Update Tool Overview

For Oracle x86 servers, use one of the following firmware tools to update the firmware.

- Oracle System Assistant (OSA), a built-in tool on x86 servers or a USB thumb drive shipped with the server, which contains the firmware update tool. Refer to the text files in OSA for instructions on updating your firmware.
- Hardware Management Pack (HMP), which includes the firmware update tool. Refer to the text files in HMP for instructions on updating your firmware.

- The fwupdate Automatic Mode command. For more information on this command, refer to the [Hardware Management Pack 2.3.x Documentation \(http://docs.oracle.com/cd/E52095_01/index.html\)](http://docs.oracle.com/cd/E52095_01/index.html).

Related Information

- “x86 Systems: Firmware Update Tool Overview ” on page 23
- “Verifying the Mellanox Network Driver” on page 25

SPARC Systems: Solaris Image

Oracle Solaris 11.4 SU33 is the minimum software version required for Oracle SPARC servers.

To update the Solaris OS image on a SPARC system, use the Oracle Solaris 11.4 Image Packing System . For more details, see [Adding and Updating Software in Oracle® Solaris 11.4 \(https://docs.oracle.com/cd/E53394_01/html/E54739/index.html\)](https://docs.oracle.com/cd/E53394_01/html/E54739/index.html)

Verifying the Mellanox Network Driver

These topics instruct how to view the verify the installation of the Mellanox Network Driver.

Description	Links
Verify the driver is present on an Oracle Solaris x86 platform.	“View the mlxne Driver (Oracle Solaris x86/64)” on page 25
View the mlx5 network driver installed on a Linux platform.	“View the Linux mlxne Network Driver” on page 26
Load the mlx5 network driver on a Windows platform.	“Verify the Windows mlxne Network Driver ” on page 27

Note - For a list of supported operating systems and Oracle servers, see [“Servers and Operating Systems Supported” in Product Notes for Mellanox Connect ®-5 Ex Ethernet PCIe Adapter Cards for Oracle x86 Server](#)

Related Information

- [“Understanding the Installation Process” on page 11](#)
- [“Updating Software and Firmware” on page 23](#)
- [“Installing the Adapter” on page 29](#)

▼ View the mlxne Driver (Oracle Solaris x86/64)

The mlxne driver comes bundled in the Oracle Solaris software.

Note - The Oracle Solaris 11.4 SU33 is the first release to support this adapter. You can install or upgrade to this release, but the version of the driver must be the same on both the client and the server.

1. Check the version of the Oracle Solaris SRU.

You must have at least Oracle Solaris 11.4 SU33 installed. For example:

```
$ pkg info entire
Name: entire
  Summary: entire incorporation including Support Repository Update
           (Oracle Solaris 11.4.22.4.0).
  ...
  <output omitted>
  ...
Version: 0.5.22 (Oracle Solaris 11.4.22.4.0)
```

See [“Hardware and Software Requirements” on page 22](#) for more information.

2. Check the version of the mlnxe driver.

```
# pkg info mlnxe
```

▼ View the Linux mlnxe Network Driver

The mlnxe driver for the Oracle Dual 25/100 Port Ethernet Adapter (Mellanox CX Adapter) is bundled in with the Oracle Linux operating system currently installed on your Oracle server. Use the following steps to view the installed version of the mlnxe network driver.

1. To check the version of the mlnxe driver installed, type:

```
# modinfo mlnxe
```

The output should be similar to this:

```
filename:      /lib/modules/4.14.35-1902.3.2.el7uek.x86_64/kernel/drivers/net/ethernet/
mellanox/mlx5/core/mlnx5/mlnx5.ko.xz
version:       5.0-0
license:       Dual BSD/GPL
description:   Mellanox Connect-IB, ConnectX-4 core driver
author:        Eli Cohen <eli@mellanox.com>
srcversion:    986DA10F36F7BD4395E5964
alias:         pci:v000015B3d0000A2D3sv*sd*bc*sc*i*
alias:         pci:v000015B3d0000A2D2sv*sd*bc*sc*i*
alias:         pci:v000015B3d0000101Csv*sd*bc*sc*i*
alias:         pci:v000015B3d0000101Bsv*sd*bc*sc*i*
alias:         pci:v000015B3d0000101Asv*sd*bc*sc*i*
alias:         pci:v000015B3d00001019sv*sd*bc*sc*i*
alias:         pci:v000015B3d00001018sv*sd*bc*sc*i*
alias:         pci:v000015B3d00001017sv*sd*bc*sc*i*
alias:         pci:v000015B3d00001016sv*sd*bc*sc*i*
```

```

alias:          pci:v000015B3d00001015sv*sd*bc*sc*i*
alias:          pci:v000015B3d00001014sv*sd*bc*sc*i*
alias:          pci:v000015B3d00001013sv*sd*bc*sc*i*
alias:          pci:v000015B3d00001012sv*sd*bc*sc*i*
alias:          pci:v000015B3d00001011sv*sd*bc*sc*i*
depends:         ptp,mlxfw
retpoline:      Y
intree:         Y
name:           mlxne
vermagic:       4.14.35-1902.3.2.el7uek.x86_64 SMP mod_unload modversions

```

2. To view additional information about the driver, type:

```
# ethtool -i enp59s0f0
```

The output should be similar to this:

```

driver: mlxne
version: 5.0-0
firmware-version: 16.29.1414 (ORC0000000003)
expansion-rom-version:
bus-info: 0000:3b:00.0
supports-statistics: yes
supports-test: yes
supports-EEPROM-access: no
supports-register-dump: no
supports-priv-flags: yes

```

Related Information

- [“Verify the Windows mlxne Network Driver” on page 27](#)

▼ Verify the Windows mlxne Network Driver

If the server uses Windows10, Windows8, Windows7, or Windows Vista XP, perform this procedure to verify the mlxne network driver.

1. **Log in to the server as the administrator.**
2. **Open the Microsoft Device Manager and locate the ORACLE_SSM flash drive.**
The ORACLE_SSM flash drive contains the mlxne driver.
3. **Right-click the mlxne network driver and choose Update Driver.**
4. **Choose the Broadcom NIC driver for your OS.**

5. **Reboot the server.**
6. **Verify that the driver is installed.**
See [“Verify the Adapter Installation \(Windows\)”](#) on page 35.

Related Information

- [“View the Linux mLnne Network Driver”](#) on page 26
- [“Installing the Adapter”](#) on page 29

Installing the Adapter

These topics describe how to install the adapter:

Description	Links
Order additional hardware.	“Adapter Description” on page 29
	“Cable and Transceiver Overview” on page 30
Follow cable cautions.	“Cable Cautions” on page 31
Understand the connectors.	“Front Panel Connectors and LEDs” on page 17
Install the adapter and transceivers.	“Install the Adapter” on page 32
Verify the adapter installation.	“Verify the Adapter Installation (Linux)” on page 34
	“Verify the Adapter Installation (Windows)” on page 35
	“Verify the Adapter Installation (Oracle Solaris x86/64)” on page 35

Related Information

- [“Understanding the Adapter” on page 15](#)
- [“Confirming Specifications and Requirements” on page 19](#)
- [“Updating Software and Firmware” on page 23](#)
- [“Verifying the Mellanox Network Driver” on page 25](#)
- [“Configuring the Network” on page 37](#)

Adapter Description

The Oracle Dual Port 25/100 Gb Mellanox Ethernet Adapter card comes with the factory default mode of 25 or 100 and supports direct attach cables or transceiver.

Adapter Type	Part Number
Oracle Dual Port 25 Gb Mellanox Ethernet Adapter	<ul style="list-style-type: none"> ■ 7603662, factory installed ■ 7603663, Xoption
Oracle Dual Port 100 Gb Mellanox Ethernet Adapter	<ul style="list-style-type: none"> ■ 7603322, factory installed ■ 7603661, Xoption
Oracle Dual Port 100 Gb Mellanox Ethernet Adapter, Mezzanine form factor (X86 Server Support Only)	<ul style="list-style-type: none"> ■ 7603323, factory installed

Related Information

- [“Cable Cautions” on page 31](#)
- [“Install the Adapter” on page 32](#)
- [“Verify the Adapter Installation \(Linux\)” on page 34](#)
- [“Verify the Adapter Installation \(Windows\)” on page 35](#)

Cable and Transceiver Overview

The Oracle Dual Port 25 /100 Gb Mellanox Ethernet Adapter card comes with a factory default port mode of 2x25Gb/e (25 Gb) or 2X100Gb/e (100 Gb) or 2x100 Gb/e (Mezzanine 100 Gb for x86 Server Support only). The adapter card supports the following cabling option solutions:




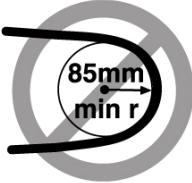

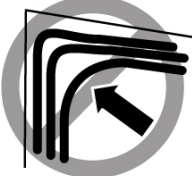
Note - Check the adapter product page for available transceivers and cables at <https://www.oracle.com/networking/index.html>.

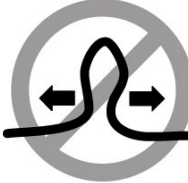


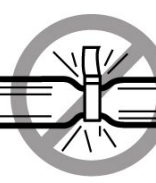
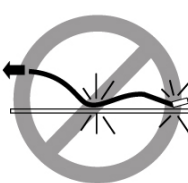

- Copper:
 - 25 GbE Adapter: The direct attach copper (DAC) solution has the SFP28 transceiver attached.
 - The straight through SFP28 to SPF28 passive copper cable is available in 1, 2, 3, or 5 meters.
 - The splitter QSFP28 to 4 SFP28 direct-attach copper cable is available in 1, 2, 3, or 5 meters. The QSFP28 end of the direct-attached copper splitter cable connects to switch port and the two pigtailed connect to the SFP28 ports 1 and 2 on the adapter.
 - 100 GbE Adapter: The direct attach copper (DAC) solution has the QSFP28 transceiver attached.
 - The straight through QSFP28 to QSPF28 passive copper cable is available in 1, 2, 3, or 5 meters.

- Fiber Optical:
 - 25 GbE Adapter: A SFP28 25GBase-SR or SFP28 25GBase-LR transceiver connects to the adapter's port.
 - The straight through Duplex LC Terminated Multi-mode fiber cable, which is available maximum lengths of 70 meters (multi mode OM3), 100 meters (multi-mode OM4), and 10 kilometers (single mode OS1). One end of the fiber optical cable connects to the SFP transceiver on the adapter, while the other end connects to a SFP transceiver in a switch or other device that is configured for 25 GbE speed.
 - 100 GbE Adapter: A QSFP28 transceiver connects to the adapter's port.
 - The straight through fiber optical cable is available is available in 10, 20, 50, or 100 meters. One end of the fiber optical cable connects to the QSFP transceiver on the adapter, while the other end connects to a QSFP transceiver in a switch or other device that is configured for 100 GbE speed.

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>

Related Information

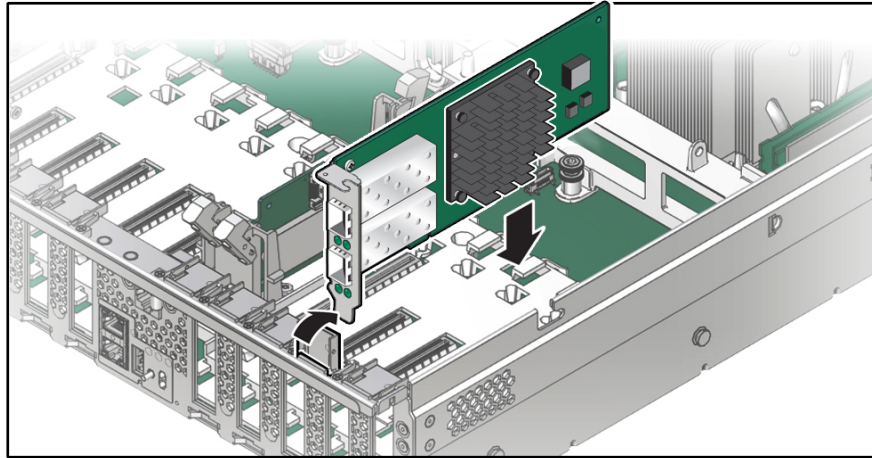
- [“Adapter Description” on page 29](#)
- [“Install the Adapter” on page 32](#)

▼ Install the Adapter

These instructions describe the basic tasks required to install the adapter. Refer to the server's installation or service manual for specific [PCIe](#) installation instructions.

1. **Halt and power off the server.**
2. **Power off all of the peripherals connected to the server.**
3. **Open the server chassis.**
4. **Attach an antistatic wrist strap to the server chassis.**
5. **Remove the slot cover from the chassis.**

6. **Holding the adapter by the edges, align the card edge connector with the PCIe slot.**



7. **Slide the adapter face plate into the small slot at the end of the PCIe opening.**
8. **Applying even pressure at both corners of the adapter, push the adapter until it is firmly seated in the slot.**



Caution - Do not use excessive force when installing the adapter into the PCIe slot. You might damage the adapter's PCIe connector. If the adapter does not seat properly when you apply even pressure, remove the adapter, and carefully reinstall it.

9. **Detach the wrist strap and close the server.**
10. **Verify the installation.**

Follow the instructions in the appropriate section:

- [“Verify the Adapter Installation \(Linux\)” on page 34](#)
- [“Verify the Adapter Installation \(Windows\)” on page 35](#)

Related Information

- [“Adapter Description” on page 29](#)
- [“Cable Cautions” on page 31](#)

▼ Verify the Adapter Installation (Linux)

- To verify the new network interface instances for the adapter, use the following Linux commands: `nmcli`, `ip`, and `ethtool`. For example:

- To use the `nmcli` command, type:

```
# nmcli | grep -i mel -A 1 -B 1
```

The output should be similar to this:

```
enp59s0f0: unmanaged
          "Mellanox MT28800"
          ethernet (mlx5_core), EC:0D:9A:D4:29:2C, hw, mtu 4500
--
enp59s0f1: unmanaged
          "Mellanox MT28800"
          ethernet (mlx5_core), EC:0D:9A:D4:29:2D, hw, mtu 4500
```

- To use the `ip` and `ethtool` commands, type:

```
# ip link show
```

The output should be similar to this:

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT
    group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: eno2: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc mq state DOWN mode
    DEFAULT group default qlen 1000
    link/ether 00:10:e0:db:12:9f brd ff:ff:ff:ff:ff:ff
5: enp59s0f0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 4500 qdisc mq state DOWN mode
    DEFAULT group default qlen 1000
    link/ether ec:0d:9a:d4:29:2c brd ff:ff:ff:ff:ff:ff
6: enp59s0f1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 4500 qdisc mq state UP mode
    DEFAULT group default qlen 1000
    link/ether ec:0d:9a:d4:29:2d brd ff:ff:ff:ff:ff:ff

[root@nsn159-108 ~]# ethtool -i enp59s0f0
driver: mlx5_core
version: 5.0-0
firmware-version: 16.29.1414 (ORC0000000003)
expansion-rom-version:
bus-info: 0000:3b:00.0
```

```

supports-statistics: yes
supports-test: yes
supports-EEPROM-access: no
supports-register-dump: no
supports-priv-flags: yes

```

Related Information

- [“Adapter Description” on page 29](#)
- [“Install the Adapter” on page 32](#)
- [“Verify the Adapter Installation \(Windows\)” on page 35](#)

▼ Verify the Adapter Installation (Windows)

1. **Click Control Panel.**
2. **Click Network Connection.**
If the driver is installed correctly, the adapter name *Oracle Dual Port 25/100 Gb Ethernet Adapter* is displayed in the Network Adapters folder.
3. **In the Administration tool, click Computer Management → Device Manager → Network Adapter.**
4. **Check the driver version.**
For example, the driver version for Microsoft Windows 12/16 is v20.6.123.0.

Related Information

- [“Install the Adapter” on page 32](#)
- [“Configuring the Network” on page 37](#)

▼ Verify the Adapter Installation (Oracle Solaris x86/64)

1. **Power on the server, and then boot the server.**
2. **Check the version of the Oracle Solaris SRU.**
You must have at least Oracle Solaris 11.4 SRU33 installed. For example:

```

$ pkg info entire
Name: entire

```

```
Summary: entire incorporation including Support Repository Update  
        (Oracle Solaris 11.4.33.1.0).
```

```
...
```

```
<output omitted>
```

```
...
```

```
Version: 0.5.23 (Oracle Solaris 11.4.33.1.0)
```

See [“Hardware and Software Requirements” on page 22](#) for more information.

3. Verify that the adapter is properly installed and recognized by the OS.

```
# grep mlxne /etc/path_to_inst
```

If the adapter is properly installed, you should see output similar to this:

```
grep mlxne /etc/path_to_inst  
"/pci@2,0/pci8086,2f08@3/pci108e,3044@0" 0 "mlxne"  
"/pci@2,0/pci8086,2f08@3/pci108e,3044@0,1" 1 "mlxne"
```

Related Information

- [“Install the Adapter” on page 32](#)
- [“Configuring the Network” on page 37](#)

Configuring the Network

These topics describe how to configure the network for the Ethernet adapter:

Description	Links
Configure the network interface.	“Configure the Network Interface (Windows)” on page 38 “Configure the Network Interface (Oracle Solaris x86/64)” on page 38
Boot over the network.	“Boot Options” on page 39 “Boot Over the Network (PXE)” on page 39 “Boot Over a 10GbE Network (Oracle Solaris x86/64 and Linux)” on page 40
Install and Verify RDMA on Converged Ethernet.	“Install RoCE (Linux)” on page 46 “Install RoCE in Windows Kernel Mode” on page 46 “Install RoCE in Windows User Mode” on page 47 “Install RoCE in VMware ESXi” on page 47 “Verify RoCE in Windows” on page 48

Related Information

- [“Updating Software and Firmware” on page 23](#)
- [“Verifying the Mellanox Network Driver” on page 25](#)
- [“Installing the Adapter” on page 29](#)
- [“Configuring Jumbo Frames ” on page 51](#)
- [“Configuring VLANs” on page 57](#)

▼ Configure the Network Interface (Windows)

Use the Network and Sharing Center to configure the network settings for the `m1x5_core` adapter. These steps are for Microsoft Windows7.

1. **Ensure that the adapter is installed.**
2. **Click Start > Control Panel > Network and Sharing Center > Change Adapter Settings.**
3. **Select Oracle Dual Port 25/100 Gb Ethernet Adapter and click Change Settings of This Connection.**

Related Information

- [“Boot Options” on page 39](#)
- [“Installing RoCE” on page 46](#)

▼ Configure the Network Interface (Oracle Solaris x86/64)

1. **Display the `m1xne` instances.**

```
# dladm show-phys
```

For more information, refer to the Oracle Solaris `dladm` man page.

The output should be similar to this:

LINK	MEDIA	STATE	SPEED	DUPLEX	DEVICE
net9	Ethernet	up	25000	full	m1xne1
net8	Ethernet	up	25000	full	m1xne0

2. **Set up the `m1xne` interfaces.**

For more information, refer to the Oracle Solaris `ipadm` man page. Your `ipadm` command might look similar to this:

```
#ipadm create-ip net4
# ipadm create-addr -T static -a local=10.2.3.4/24 net4/v4
```

This command creates another address `10.2.3.5/24` on interface `net1`, but marks the address down until explicitly marked up:

```
#ipadm create-addr -T static -d -a 10.2.3.5/24 net4/v4
```

This command marks the address object net4/v4a up that was previously marked down.

```
#ipadm up-addr net4/v4a
```

Boot Options

The adapter supports these boot options:

- UEFI with PXE with option ROM (Oracle x86/64)
- UEFI with iSCSI with option ROM (Oracle SPARC and Oracle x86/x64)

Note - For systems supporting Oracle Solaris, see the *Oracle Solaris Advanced Installation Guide* for information about boot options and instructions on how to create a boot server.

Related Information

- “Boot Over the Network (PXE)” on page 39
- “Boot Over a 10GbE Network (Oracle Solaris x86/64 and Linux)” on page 40

▼ Boot Over the Network (PXE)

PXE network boot is an environment for booting computers using a network interface independently of available data storage devices (such as hard disks) or installed OS. No boot media is required on the client system. With PXE, you can install an OS on an x86-based client over the network by using [DHCP](#).

- **Boot over the network using PXE.**

Note - For systems supporting Oracle Solaris, see the booting / PXE instructions in the *Oracle Solaris 11 Installation Guide: Network-Based Installations* at: http://docs.oracle.com/cd/E23823_01/index.html

Related Information

- “Boot Over a 10GbE Network (Oracle Solaris x86/64 and Linux)” on page 40

- [“Installing RoCE” on page 46](#)

▼ **Boot Over a 10GbE Network (Oracle Solaris x86/64 and Linux)**

1. **Obtain the **MAC** address of the first adapter port by checking the label of the adapter.**

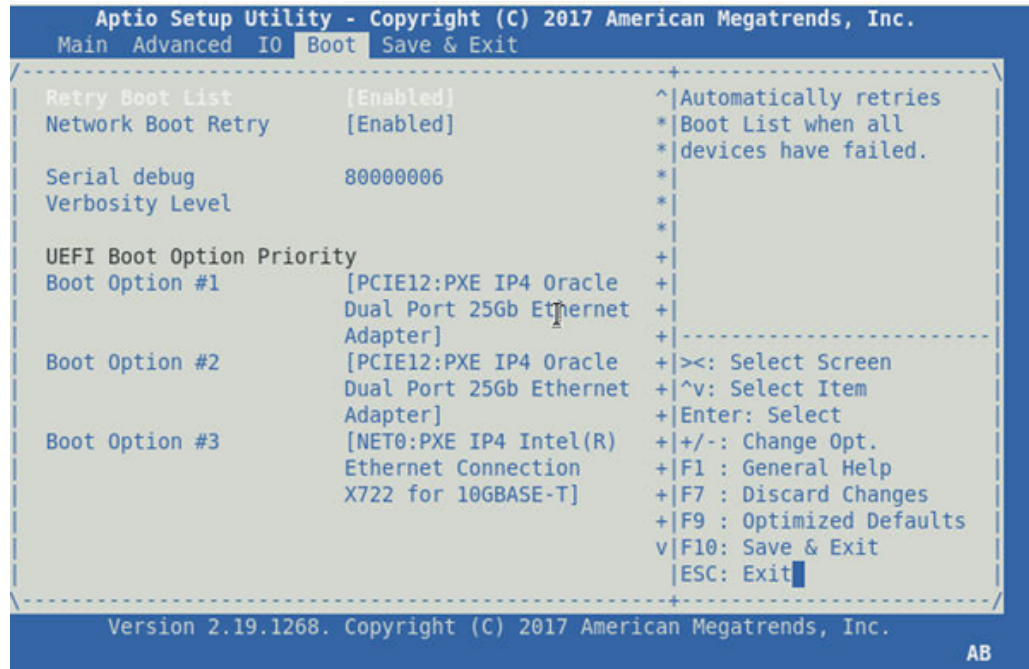
On the adapter, the MAC address on the label is for the first port. The second port's MAC address is the MAC address from the label, plus 1.

Note -Auto negotiation is not supported when booting with Linux over the network.

2. **Set up the PXE boot server with the MAC addresses.**
3. **Plug the Ethernet cable into the adapter's port.**
4. **Power on the server.**
5. **Press the F2 key or the Control-E keys to go to the BIOS menu.**
6. **Go to the Boot - Boot Device Priority screen and ensure that the boot order of the network devices is higher than the hard drive.**
7. **Press F10 to save the boot configuration changes and exit BIOS.**
8. **On Oracle platforms, press F12 to install the OS from the network.**

If the cable is connected to the correct port, you should see the MAC address that you assigned to your PXE server displayed by BIOS. If your platform does not support the F12 key, you might need to boot from the BIOS.

- Choose a boot option from the Setup Utility screen, for example:



- Press F10 to save and exit.

The host will perform a PXE boot from the Oracle Dual Port (25 Gb or 100 Gb) Ethernet adapter port, DHCP, and the UEFI PXE boot server response. This screen appears.

```
>>Checking Media Presence.....
>>Media Present.....
  Downloading NBP file...

  Succeed to download NBP file.
iPXE initialising devices...ok

iPXE 1.0.0+ -- Open Source Network Boot Firmware -- http://ipxe.org
Features: HTTP DNS TFTP EFI Menu

net0: 00:0a:f7:b6:c8:c0 using <NULL> on EFI SNP (open)
  [Link:up, TX:0 TXE:0 RX:0 RXE:0]
DHCP (net0 00:0a:f7:b6:c8:c0)..... ok
net0: 10.129.231.87/255.255.255.0 gw 10.129.231.1
Next server: 10.134.204.29
Filename: http://10.134.204.29/menu.php
http://10.134.204.29/menu.php..... ok
```

11. Choose the UEFI PXE boot server using TFTP protocol, for example:

```

Select an OS install server
QA Automation
Vanquish grub2.efi tftp
Vanquish grub2.efi http
Vanquish grub.efi
Solerator
Windows - read http://installerator/windows.php
VMware vSphere 6.0
VMware vSphere 6.0 (115.2K serial auto)
VMware vSphere 6.5 (TEST 115.2K serial auto)
VMware vSphere 6.5U1 (BETA VGA manual)
HMP (for Casey)
OVM 3.4 TEST
OVM 3.4.2 (UEFI)
t
u
v

```

12. Select Oracle Linux OS from the UEFI PXE boot server for the OS installation, for example:

```

GNU GRUB version 2.02~beta3

|-----|
| devel 4.12 Not ready yet serial |
| devel 4.11 serial               |
| devel 4.1 serial                |
| *ol 7.3 serial                  |
| ol 6.9 serial                   |
| ol 6.8 serial                   |
| ol 7.2 serial                   |
| ol 6.7 serial                   |
| ol 7.1 serial                   |
| ol 6.6 serial                   |
| ol 7.0 serial                   |
| rhel 7.1 serial                 |
|-----| v

Use the ^ and v keys to select which entry is highlighted.
Press enter to boot the selected OS, `e' to edit the commands
before booting or `c' for a command-line. ESC to return previous
menu.

```

13. Ensure that the OS installation begins on the Oracle Dual Port (25 Gb or 100 Gb) Ethernet adapter, for example:

```
Starting installer, one moment...
anaconda 21.48.22.93-1 for Oracle Linux 7.3 started.
* installation log files are stored in /tmp during the installation
* shell is available on TTY2
* when reporting a bug add logs from /tmp as separate text/plain attachments
08:26:56 Not asking for VNC because of an automated install
08:26:56 Not asking for VNC because text mode was explicitly asked for in kickstart

[anaconda] 1:main* 2:shell 3:log 4:storage-lo> Switch tab: Alt+Tab | Help: F1
```

14. Ensure that the OS installer completes and begins the post-installation steps, for example:

```
Installing iwl5000-firmware (508/528)
Installing iwl3945-firmware (509/528)
Installing iwl100-firmware (510/528)
Installing ivtv-firmware (511/528)
Installing iwl3160-firmware (512/528)
Installing iwl6000-firmware (513/528)
Installing iwl7260-firmware (514/528)
Installing iwl6050-firmware (515/528)
Installing iwl7265-firmware (516/528)
Installing iwl2030-firmware (517/528)
Installing iwl1000-firmware (518/528)
Installing iwl5150-firmware (519/528)
Installing man-pages (520/528)
Installing iwl2000-firmware (521/528)
Installing iwl135-firmware (522/528)
Installing iwl4965-firmware (523/528)
Installing iwl6000g2a-firmware (524/528)
Installing NetworkManager-config-server (525/528)
Installing iwl6000g2b-firmware (526/528)
Installing iwl105-firmware (527/528)
Installing words (528/528)
Performing post-installation setup tasks
[anaconda] 1:main* 2:shell 3:log 4:storage-lo> Switch tab: Alt+Tab | Help: F1
```

15. After the OS installation completes, change the boot device priority to boot from hard disk to boot up the newly installed OS. For further details, see [Modifying Boot Behavior in the Oracle Solaris Administrative Guide](#) or [Modify the Boot Order \(BIOS\) in the Oracle x9 Server Administration Guide](#).

Unless you change the boot device priority, the OS installation process repeats.

Related Information

- [“Boot Over the Network \(PXE\)” on page 39](#)
- [“Installing RoCE” on page 46](#)

Installing RoCE

The [RDMA](#) software allows computers in a network to exchange data in main memory without involving the processor, cache, or OS of either computer. RDMA can improve throughput and performance because it frees up resources, and it can also facilitate a faster data transfer rate. RDMA over Converged Ethernet (RoCE) is the network protocol that allows RDMA over an Ethernet network.

RoCE functionality is available in user mode and kernel mode application for Windows. RoCE [PF](#) and SRIOV [VF](#) are available in single function mode and in multifunction mode (NIC Partitioning mode). You can install and configure RoCE in Windows, Linux, and VMWare.

Refer to these site(s) for more information on supporting RoCE:

- Windows – [https://technet.microsoft.com/en-us/library/jj134210\(v=ws.11\).aspx](https://technet.microsoft.com/en-us/library/jj134210(v=ws.11).aspx)
- VMware – Refer to the VMware web site for RoCE support information.

▼ Install RoCE (Linux)

- **Install the Oracle RDMA meta RPM from the Oracle public yum repository to retrieve the RoCE stack. For example:**

- a. **Point your yum repository to:**

```
#yum install
```

The `yum install` command installs all the RPMs needed for the RoCE stack to function properly.

▼ Install RoCE in Windows Kernel Mode

RoCE functionality is available in user mode and kernel mode application. Starting with the Windows Server 2012 release, the RDMA capability in the NIC for SMB file traffic is enabled if both ends are enabled for RDMA. Broadcom NDIS miniport `mlxnend.sys` starting with version 20.6.2 supports RoCEv1 and RoCEv2 with the NDKPI interface. The default setting is RoCEv1.

1. **Upgrade the NIC NVRAM using the appropriate board packages. In CCM or in UEFI HII, enable support for RDMA.**

2. **Enable each miniport.**

You can go to the adapter's Advanced Properties page and set Network Direct Functionality to Enabled for each BCM5741X miniport.

You can also run this command in the PowerShell window:

```
Set-NetAdapterAdvancedProperty -RegistryKeyword *NetworkDirect -RegistryValue 1
```

3. **Verify that RDMA is enabled.**

These PowerShell commands return `true` if Network Direct is enabled.

- a. `Get-NetOffLoadGlobalSetting`
- b. `Get-NetAdapterRDMA`

▼ Install RoCE in Windows User Mode

RoCE functionality is available in user mode and kernel mode application. Perform this procedure before you run a user mode application that writes to NDSPI.

1. **Copy the `bxndspi.dll` user mode driver file to the `C:\Windows\System32` directory.**
2. **Install the driver.**

```
rundll32.exe .\bxndspi.dll,Config install|more
```

▼ Install RoCE in VMware ESXi

Before You Begin You must have at least ESXi-6.5.0 GA build 4564106 installed before you perform this procedure.

You must also have at least ESX6.5 L2 driver version 20.6.9.0 (RoCE supported L2 driver) installed.

1. **Ensure that the MLXNET L2 driver is installed with the `disable_roce=0` module parameter.**

If the driver is not already installed with the parameter, set the module parameter:

```
# esxcfg-module -s "disable_roce=0" mlxnet
```

2. **Copy the *mlxneroce-driver version.vib* file in the */var/log/vmware* directory.**

```
$ esxcli software vib install --no-sig-check -v mlxneroce-driver version.vib
```

3. **Reboot the machine.**
4. **Verify that the drivers are installed correctly.**

```
# esxcli software vib list | grep mlxneroce
```

Tip - By default, ECN is disabled for RoCE traffic. To disable RoCE traffic, use the `tos_ecn=0` module parameter for `mlxneroce`.

Verifying RoCE

▼ Verify RoCE in Windows

1. **Create a file share on the remote system and open that share.**

Open that share with Windows Explorer or the `net use` command. To avoid a speed bottleneck when the hard disk is reading or writing, use a RAM disk as the network share.

2. **Run these commands from the PowerShell.**

```
Get-SmbMultichannelConnection | fl *RDMA*
ClientRdmaCapable : True
ServerRdmaCapable : True
```

If both Client and Server are True, any file transfers over this SMB connection use SMB.

3. **Enable or disable SMB Multichannel support.**

On the Server side:

```
Enable: Set-SmbServerConfiguration -EnableMultiChannel $true
Disable: Set-SmbServerConfiguration -EnableMultiChannel $false
```

On the Client side:

```
Enable: Set-SmbClientConfiguration -EnableMultiChannel $true
```



```
Disable: Set-SmbClientConfiguration -EnableMultiChannel $false
```

Note - By default, the driver sets up two RDMA connections for each network share per IP address (on a unique subnet). You can increase the number of RDMA connections by adding multiple IP addresses, each with different a subnet, for the same physical port under test. Multiple network shares can be created and mapped to each link partner using the unique IP addresses that you created.

Configuring Jumbo Frames

Jumbo frames can support up to 9500 MTU. The default value is 1500 MTU.

These topics describe how to configure jumbo frames:

- “Configure Jumbo Frames (Linux)” on page 51
- “Configure Jumbo Frames (Windows)” on page 52
- “Change the MTU Permanently (Oracle Solaris x86/64)” on page 52
- “Change the MTU Temporarily (Oracle Solaris X86/64)” on page 52

Related Information

- “Understanding the Installation Process” on page 11
- “Verifying the Mellanox Network Driver” on page 25
- “Installing the Adapter” on page 29
- “Configuring the Network” on page 37
- “Configuring VLANs” on page 57

Configure Jumbo Frames (Linux)

To configure jumbo frames on network interfaces such as the Oracle Dual Port 25/100 Ethernet Adapter, see *Oracle Linux 7 Setting Up Networking* (<https://docs.oracle.com/en/operating-systems/oracle-linux/7/network/>).

Note - The maximum supported MTU on the Oracle Dual Port 25/100 Ethernet Adapter (Mellanox CX Adapter) is 9179.

▼ Configure Jumbo Frames (Windows)

1. Click Control Panel.
2. Click Device Manager and open the Network Adapters folder.
3. Right-click the Oracle Dual 25G Ethernet Adapter and choose Properties.
4. Click Configure.
5. Highlight the jumbo frames item and select the desired setting.
6. Click Apply for each port.

Related Information

- [“Configure Jumbo Frames \(Linux\)”](#) on page 51
- [“Configuring VLANs”](#) on page 57

▼ Change the MTU Permanently (Oracle Solaris x86/64)

- Perform one of these actions to permanently change the MTU.
 - Add this line in the `/etc/driver/drv/mlxne.conf` file and reboot the server.

```
default_mtu = desired-frame-size;
```

where the *desired-frame-size* value can range from 1500 to 9500.

Note - For additional information, see: [Enabling Support for Jumbo Frames \(https://docs.oracle.com/cd/E36784_01/html/E37475/ggtwf.html\)](https://docs.oracle.com/cd/E36784_01/html/E37475/ggtwf.html)

- Type:

```
# dladm set-linkprop -p mtu=9500 net0
```

▼ Change the MTU Temporarily (Oracle Solaris X86/64)

- Change the MTU temporarily with the `dladm(1M)` command.

For example, where the device name is `xnet0`, this command increases MTUs to the maximum:

```
# dladm set-linkprop [-t] -p mtu=9500 net0
```

The temporary setting lasts only until the next reboot of the server.

Configuring a Link Aggregation (Oracle Solaris x86/64)

These topics describe how to configure [link aggregation](#) using the Oracle Solaris x86 OS:

- “[Configure a Link Aggregation \(Oracle Solaris x86/64\)](#)” on page 55
- “[Display Information About a Link Aggregation \(Oracle Solaris x86/64\)](#)” on page 56
- “[Delete a Link Aggregation \(Oracle Solaris x86/64\)](#)” on page 56

▼ Configure a Link Aggregation (Oracle Solaris x86/64)

The example in this procedure aggregates sample interfaces `mlxne0`, `mlxne1`, `mlxne2`, and `mlxne3`. Arbitrary key numbers (1 and 2) are used for each aggregation.

Note - This procedure changes the contents of the `/etc/aggregation.conf` file.

- **Configure the link aggregation containing the `mlxne` interfaces in the default mode.**

For example:

```
# dladm create-aggr -l net5 -l net6 aggr1
# dladm show-aggr
# ipadm create-ip aggr1
# ipadm create-addr -a 192.1.1.14/24 aggr1
```

For additional information, refer to these topics:

- [Managing Network Datalinks in Oracle® Solaris 11 \(https://docs.oracle.com/cd/E53394_01/html/E54788/index.html\)](https://docs.oracle.com/cd/E53394_01/html/E54788/index.html)
- Oracle Solaris `ifconfig 1 M` and `dladm(5)` man pages in the *Oracle man pages section 1M: System Administration Commands* (https://docs.oracle.com/cd/E26502_01/html/E29031/intro-1m.html#scrolltoc).

▼ Display Information About a Link Aggregation (Oracle Solaris x86/64)

The `ipadm` and `dladm` commands provide different details about link aggregations, as shown in these examples.

- Use the appropriate command to obtain the desired results.
 - Use the `ifconfig` command to examine the details about a link aggregation.

```
# ifconfig aggr1
aggr1: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 32
  inet 192.2.2.84 netmask ffffffff broadcast 192.2.2.255
  ether 0:15:17:75:ff:81

# ifconfig aggr2
aggr2: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500
  index 33
  inet 193.2.2.84 netmask ffffffff broadcast 193.2.2.255
  ether 0:15:17:75:ff:83
```

- Use the `dladm show-aggr` command to show link aggregation status.

For more information, refer to: [Managing Network Datalinks in Oracle® Solaris 11 \(https://docs.oracle.com/cd/E53394_01/html/E54788/index.html\)](https://docs.oracle.com/cd/E53394_01/html/E54788/index.html).

▼ Delete a Link Aggregation (Oracle Solaris x86/64)

1. Delete the IP interface that is configured over the link aggregation.

For example: type:

```
# ipadm delete-ip ip-aggr1
```

where `ip-aggr1` is the IP interface over the link aggregation.

2. Delete each unwanted link aggregation.

For example:

```
# dladm delete-aggr aggr2
# dladm delete-aggr aggr2
```


Configuring VLANs

These topics explain how to configure VLANs:

- [“VLANs Overview” on page 57](#)
- [“Configure VLANs \(Linux\)” on page 58](#)
- [“Configure VLANs \(Oracle SPARC\)” on page 58](#)
- [“Configure VLANs \(Windows\)” on page 58](#)
- [“Configure VLANs \(Oracle Solaris x86\)” on page 59](#)
- [“Configure VXLANS \(Oracle Solaris x86\)” on page 60](#)

Related Information

- [“Understanding the Installation Process” on page 11](#)
- [“Configuring the Network” on page 37](#)
- [“Removing the Driver” on page 61](#)

VLANs Overview

Virtual LANs enable you to divide the network into subnetworks without having to add to the physical network environment. The subnetworks are virtual and use the same physical network resources. VLANs facilitate network administrations because the smaller groups are easier to maintain.

You can create VLANs according to various criteria, but each VLAN must be assigned a VLAN tag or VLAN ID (VID). The VID is a 12-bit identifier between 1 and 4094 that identifies a unique VLAN.

Note - If you configure a VLAN virtual device for an Ethernet adapter, all traffic sent or received by that Ethernet adapter must be in VLAN-tagged format.

Related Information

- “Configure VLANs (Linux)” on page 58
- “Configure VLANs (Windows)” on page 58

Configure VLANs (Linux)

To configure VLANs on network interfaces such as the Oracle Dual Port 25/100 Ethernet Adapter, see *Oracle Linux 7 Setting Up Networking* (<https://docs.oracle.com/en/operating-systems/oracle-linux/7/network/>).

Configure VLANs (Oracle SPARC)

To configure VLANs on network interfaces such as the Oracle Dual Port 25/100 Ethernet Adapter, see *Oracle® VM Server for SPARC 3.6 Administration Guide* https://docs.oracle.com/cd/E93612_01/html/E93617/assigningusingvlans.html.

▼ Configure VLANs (Windows)

1. Click Control Panel.
2. Click Network Connection.
3. Click the folder icon from the sub-manual bar.
4. Right-click the Oracle Dual Port 25/100 Gb Mellanox Ethernet Adapter port, then select Properties.
5. Click Configure.
6. Click VLAN, then click New.
7. Type VLAN and the *ID* (for example, type VLAN10).
8. Click OK.

9. Open the **Local Connections for VLAN** window from the **Network Connections** window (**Control Panel** → **Network Internet** → **Network Connections**).
10. Right-click the **Properties** button, and select the **TCP/IPv4** port in the list.
11. Click the **Properties** button, and fill in the desired **IP address**.
12. Click **Subnet Mask**.
The value `255.255.255.0` is displayed.
13. Click **OK**.
14. Repeat [Step 3](#) through [Step 10](#) until all the network ports are VLAN configured.

Note - Ensure that the firewall is configured to allow VLAN traffic. Otherwise, the VLAN might not operate properly.

Related Information

- [“Configure VLANs \(Linux\)” on page 58](#)

▼ Configure VLANs (Oracle Solaris x86)

1. Determine the types of links that are used in the server.

```
# dladm show-phys
LINK          MEDIA          STATE    SPEED  DUPLEX  DEVICE
net15         Ethernet       up       10000  full    mlxne1
net14         Ethernet       up       10000  full    mlxne0
```

2. Create a VLAN link over a datalink.

```
# dladm create-vlan -l link -v vid vlan-link
```

where *link* specifies the link where the VLAN interface is being created, *vid* indicates the VLAN ID number, and *vlan-link* specifies the name of the VLAN, which can also be an administratively-chosen name.

3. Verify the VLAN configuration.

```
# dladm show-vlan
```

4. Create an IP interface over the VLAN.

```
# ipadm create-ip interface
```

where *interface* uses the VLAN name.

▼ Configure VXLANs (Oracle Solaris x86)

VXLAN is a Layer 2 technology that enables you to create a Layer 2 network on top of a Layer 3 network, thereby providing further network isolation. VXLAN provides a virtual Layer 2 network that stretches over multiple physical Layer 2 networks. Provisioning resources in a cloud environment is not restricted to a single physical Layer 2 network. Physical servers can be a part of an VXLAN network, as long as they are connected by IPv4 or IPv6 networks.

1. Determine the types of links that are used in the system.

```
# dladm show-phys
```

LINK	MEDIA	STATE	SPEED	DUPLEX	DEVICE
net15	Ethernet	up	10000	full	mlxne1
net14	Ethernet	up	10000	full	mlxne0

2. Create an IP interface over the VXLAN.

```
# dladm create-vxlan -p addr=10.10.10.1,vni=100 vxlan1
# dladm create-vxlan -p addr=10.10.10.1,vni=101 vxlan2
```

3. Verify the VXLAN configuration.

```
# dladm show-vxlan
```

LINK	ADDR	VNI	MGROUP
vxlan1	10.10.10.1	100	224.0.0.1
vxlan2	10.10.10.1	101	224.0.0.1

Removing the Driver

It is not necessary to remove a driver when its associated device is removed from a server. However, if you want to clean up your file systems or conserve space, you can easily remove a driver.

The following topic(s) explain how to remove the mlxne device driver:

Description	Links
Remove the driver on a Linux system.	“Remove the mlxne Driver (Linux)” on page 61
Remove the driver on a Windows system.	“Remove the mlxne Driver (Windows)” on page 61
Remove the driver on an Oracle Solaris system.	“Remove the mlxne Driver (Oracle Solaris x86/64)” on page 62

Related Information

- [“Verifying the Mellanox Network Driver” on page 25](#)

▼ Remove the mlxne Driver (Linux)

- Type:

```
#rmmod mlxne_core
```

Related Information

- [“Remove the mlxne Driver \(Windows\)” on page 61](#)
- [“Remove the mlxne Driver \(Linux\)” on page 61](#)

▼ Remove the mlxne Driver (Windows)

1. Click Control Panel.

2. **Click Device Manager and open the Network Adapters folder.**
3. **Right-click the Oracle Dual 25/100 Gb Ethernet Adapter and choose Uninstall.**
4. **Click OK.**

Related Information

- [“Remove the mlxne Driver \(Linux\)” on page 61](#)
- [“Upgrading the Adapter \(Linux\)” on page 63](#)

▼ **Remove the mlxne Driver (Oracle Solaris x86/64)**

To remove a driver from an Oracle Solaris system environment, use the `rem_drv(1M)` command, and then delete the driver module and configuration file from the module path. A driver cannot be used again until that driver is reinstalled with `add_drv(1M)`.

For additional information, see the Oracle Solaris `rem-drv(1M)` man page at https://docs.oracle.com/cd/E36784_01/html/E36871/rem-drv-1m.html#REFMAN1Mrem-drv-1m

● **Remove the mlxne driver.**

For example:

```
#rem_drv mlxne
```

Upgrading the Adapter (Linux)

These topics explain how to upgrade the firmware on the Oracle Dual Port 25/100 Gb Mellanox Ethernet Adapter and verify the upgrade.

The upgrade command compares the package version against the currently installed package version to determine if an upgrade should be performed. The command does not check the versions of the individual components in the NVM against those within the specified package file. Therefore, it is important that package files from the same source with the same versioning scheme or format are used for a specific controller.

These topics describe how to upgrade the adapter:

- [“Install the Upgrade Package” on page 63](#)
- [“Verify the Upgrade” on page 64](#)

▼ Install the Upgrade Package

Use the `bnxtnvm` utility to install the NVM upgrade package file.

1. **Log in to your server.**
2. **Determine the version and description of the package file that is currently installed.**

For example:

```
$ bnxtnvm pkgver filename.pkg -v
Package File: filename.pkg
Package version: 1.0.0
```

3. **Change to the `NVRAM_Images` directory.**
4. **Determine how you want to install the package.**

a. Install a package file.

```
$ bnxtnvm install filename.pkg
```

Replace the *filename* with the package name.

b. Install multiple packages for multiple controller types.

```
$ bnxtnvm install *.pkg
```

This command installs multiple packages for multiple controller types by using a wildcard in the *filename* argument. The correct packages are automatically installed into the supported controller devices based on PCI Device-IDs.

c. Install a package that is newer than the one you have.

```
$ bnxtnvm upgrade *.pkg
```

This command checks the discovered and supported devices.

For more information on the packages, refer to the `readme.txt` file in the `bnxtnvm` directory of the firmware package.

5. Verify the upgrade.

See [“Verify the Upgrade” on page 64](#).

▼ Verify the Upgrade

For more information on the packages, refer to the `readme.txt` file in the `bnxtnvm` directory of the firmware package.

- 1. Log in to your server.**
- 2. Determine which version of the package is installed.**

For example:

```
$ bnxtnvm pkgver
Device: ens2f1d1
Package version: 20.06.04.01
```

To display more details about the device and the currently installed package, use the `-v` option to enable maximum verbosity.

Related Information

- [“Installing the Adapter” on page 29](#)

Troubleshooting the Adapter (Oracle Solaris x86/64)

These topics describe how to troubleshoot the installation and operation of the Oracle Dual Port 25/100 Gb Mellanox Ethernet Adapter on an Oracle SPARC or x86 server running the Oracle Solaris 11.4 OS. These topics cover basic installation issues and are not intended to be comprehensive.

- [“Analyze Why the Device Link Is Missing \(Oracle Solaris x86/64\)” on page 67](#)
- [“Recover From a Port Hang \(Oracle Solaris x86/64\)” on page 68](#)
- [“Analyze Slow Network Performance \(Oracle Solaris x86/64\)” on page 69](#)
- [“Analyze Why the Link Is Not Up After Back-To-Back Cable Connection \(Oracle Solaris x86/64\)” on page 71](#)
- [“Analyze Why Changing the MTU Does Not Correctly Set the Link Property \(Oracle Solaris x86/64\)” on page 71](#)

Related Information

- [“Updating Software and Firmware” on page 23](#)
- [“Verifying the Mellanox Network Driver” on page 25](#)
- [“Installing the Adapter” on page 29](#)
- [“Removing the Driver” on page 61](#)

▼ **Analyze Why the Device Link Is Missing (Oracle Solaris x86/64)**

When you use the `ifconfig` or `ipadm` commands and you see an error message similar to the one below, perform these steps.

```
...
cannot open mlxne0; link doesn't exist
...
```

1. Check the OS.

To plumb the driver, refer to the Oracle Solaris `ipadm` (1M) man page. For information on the network interface parameters, refer to the Oracle Solaris `ifconfig` (1M) man page (https://docs.oracle.com/cd/E36784_01/html/E36871/makehtml-id-7.html#scrolltoc).

2. Check that the adapter is seated properly in its slot, that the cables are properly attached, and that the LEDs are functioning.

3. Ensure that the device is installed.

Use the `prtconf` or the `scanpci` command to verify that the device is installed. For more information, refer to the Oracle Solaris `prtconf` (1M) man page or the `scanpci` man page (https://docs.oracle.com/cd/E36784_01/html/E36871/makehtml-id-7.html#scrolltoc).

4. If the device exists, check the `/etc/driver_aliases` file to ensure that the file contains a `mlxne` entry that corresponds to the name for the device.

5. If the entry exists, check the `/etc/path_to_inst` file to ensure that the file contains a `mlxne` entry.

Removing a device and reseating it in another slot does not always clean up the device tree. If this occurs, you must remove the device tree and reboot the server. For more information, refer to [Managing Network Virtualization and Network Resources in Oracle® Solaris 11.2](https://docs.oracle.com/cd/E36784_01/html/E36813/index.html) (https://docs.oracle.com/cd/E36784_01/html/E36813/index.html).

Related Information

- [“Recover From a Port Hang \(Oracle Solaris x86/64\)” on page 68](#)
- [“Analyze Slow Network Performance \(Oracle Solaris x86/64\)” on page 69](#)
- [“Analyze Why the Link Is Not Up After Back-To-Back Cable Connection \(Oracle Solaris x86/64\)” on page 71](#)
- [“Analyze Why Changing the MTU Does Not Correctly Set the Link Property \(Oracle Solaris x86/64\)” on page 71](#)

▼ Recover From a Port Hang (Oracle Solaris x86/64)

1. Perform one of these actions.

- If the interface encounters a soft hang, replumb the device. For instructions, refer to the Oracle Solaris `ipadm` (1M) man page (https://docs.oracle.com/cd/E36784_01/html/E36871/makehtml-id-7.html#scrolltoc).
- If the interface encounters a hard hang, reboot the server.

- If the interface encounters an additional hard hang, capture the trace information by using the `dtrace` command.

For example:

```
# dtrace -F -m 'mlxne{trace(timestamp)}'
>/tmp/dtrace.out
```

For more information, refer to the Oracle Solaris `dtrace(1M)` man page (https://docs.oracle.com/cd/E36784_01/html/E36871/makehtml-id-7.html#scrolltoc).

- If the server is panicked, retrieve the crash dump in `/var/crash`.
- If the interface encountered a hard hang or a panic, file a CR at [My Oracle Support](#). Attach the last page of the `dtrace` command output or the crash dump file to the CR.

2. **Check the driver statistics. Refer to the Oracle Solaris man pages for details.**
3. **Use these parameters for performance tuning in the `mlxne.conf` file.**

Parameters	Description
<code>rx_itr</code>	Interval of receive interrupts 0 to 4080, 25 (50 usec) by default.
<code>tx_itr</code>	Interval of transmit interrupts 0 to 4080, 25 (50 usec) by default.
<code>rx_limit_per_intr</code>	Maximum number of packet to receive per interrupt 16 ~ 4096, 1024 by default.
<code>rx_copy_threshold</code>	Packet size to determine bcopy or not during receive 0 ~ 9216, 128 by default.
<code>tx_copy_threshold</code>	Packet size to determine bcopy or not during transmit 0 ~ 9216, 128 by default.

Related Information

- [“Analyze Why the Device Link Is Missing \(Oracle Solaris x86/64\)” on page 67](#)
- [“Analyze Slow Network Performance \(Oracle Solaris x86/64\)” on page 69](#)
- [“Analyze Why the Link Is Not Up After Back-To-Back Cable Connection \(Oracle Solaris x86/64\)” on page 71](#)
- [“Analyze Why Changing the MTU Does Not Correctly Set the Link Property \(Oracle Solaris x86/64\)” on page 71](#)

▼ Analyze Slow Network Performance (Oracle Solaris x86/64)

The adapter supports several driver parameters that affect the performance of the ports.

1. View the network performance.

```
# truss -p PID
```

2. Look for NIS, DNS, and network routing outages.

If you find any issues, fix them before proceeding.

3. View the I/O statistics to ensure that there are no bottlenecks on the disk.

```
# iostat -xcn 5
```

If you discover a bottleneck, set the logging to dump to the /tmp directory. Then retest to ensure that the new configuration improved performance.

4. Use the vmstat and the mpstat commands to check that none of these conditions exist:

- CPU is pegged.
- CPU is receiving too many interrupts.
- Memory is low.
- Page faults are occurring.
- Contention for resources causes too many spins on mutex (smtx).

For more information, refer to the Oracle Solaris vmstat (1M) man page or the mpstate (1M) man page (https://docs.oracle.com/cd/E36784_01/html/E36871/makehtml-id-7.html#scrolltoc).

If the performance issue points to the driver, profile the call stack for mlxne by using the DTtrace script. For more information about the DTtrace script, go to [My Oracle Support](#).

Related Information

- [“Analyze Why the Device Link Is Missing \(Oracle Solaris x86/64\)” on page 67](#)
- [“Recover From a Port Hang \(Oracle Solaris x86/64\)” on page 68](#)
- [“Analyze Why the Link Is Not Up After Back-To-Back Cable Connection \(Oracle Solaris x86/64\)” on page 71](#)
- [“Analyze Why Changing the MTU Does Not Correctly Set the Link Property \(Oracle Solaris x86/64\)” on page 71](#)

▼ Analyze Why the Link Is Not Up After Back-To-Back Cable Connection (Oracle Solaris x86/64)

1. **Ensure that the correct cable type is being used.**
See [“Adapter Description” on page 29](#).
2. **Check that the switch ports have been configured to operate in the mode in which the adapter is running.**

Related Information

- [“Analyze Why the Device Link Is Missing \(Oracle Solaris x86/64\)” on page 67](#)
- [“Recover From a Port Hang \(Oracle Solaris x86/64\)” on page 68](#)
- [“Analyze Slow Network Performance \(Oracle Solaris x86/64\)” on page 69](#)
- [“Analyze Why Changing the MTU Does Not Correctly Set the Link Property \(Oracle Solaris x86/64\)” on page 71](#)

▼ Analyze Why Changing the MTU Does Not Correctly Set the Link Property (Oracle Solaris x86/64)

The `dladm` command might display this message:

```
# dladm: warning: cannot set link property 'mtu' on 'net0': link busy
```

It is possible that some objects defined on the link need to be removed or plumbed down.

- **Remove and retry the command.**

```
# dladm set-linkprop -p mtu=9500 net0
```

For more information, refer to the Oracle Solaris `dladm (1M)` man page (https://docs.oracle.com/cd/E36784_01/html/E36871/makehtml-id-7.html#scrolltoc).

Related Information

- [“Analyze Why the Device Link Is Missing \(Oracle Solaris x86/64\)” on page 67](#)
- [“Recover From a Port Hang \(Oracle Solaris x86/64\)” on page 68](#)
- [“Analyze Slow Network Performance \(Oracle Solaris x86/64\)” on page 69](#)
- [“Analyze Why the Link Is Not Up After Back-To-Back Cable Connection \(Oracle Solaris x86/64\)” on page 71](#)

Glossary

A

adapter The Oracle Dual Port 25/100 Gb Mellanox Ethernet Adapter.

D

DAC Direct attached cables.

DHCP Dynamic Host Configuration Protocol. Part of the application layer in the Internet protocol suite.

DNS Domain name system. Translates human-readable domain names into numerical identifiers.

E

EEPROM Electronically erasable programmable read-only memory.

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

G

Gb Gigabyte.

GbE Gigabit Ethernet.

Gbps Gigabits-per-second.

GT Gigabit-transfer.
GTps Gigatransfers per second.

L

LC/LC Little Connector fiber optic cable that connects the [transceiver](#) to the adapter. This LC connector is on a small form-factor pluggable transceiver. LC connectors have replaced SC connectors in corporate networking environments because of their smaller size.

LFM Linear Feet per minute.

link aggregation Link aggregation enables several physical ports to be bundled into a single logical channel.

LOM LAN-on-motherboard. A LAN design.

M

MAC Media access control. Enables the use of a unique address for each device on a network.

Mb Megabit.

MTU Maximum transmission unit. The MTU (payload without the Ethernet header) affects how jumbo frames function.

N

NIS Network Information Service. Originally known as Yellow Pages, NIS is a protocol for distributed system configuration data.

P

PCIe Peripheral Component Interconnect Express.

PF Physical function.

PXE Preboot execution environment. Enables clients to boot over a network interface, independent of the OS or other devices.

R

RDMA Remote Direct Memory Access. Allows computers in a network to exchange data in main memory without involving the processor, cache, or OS of either computer.

RX Response. The automatic response mechanism used by Ethernet PAUSE frames.

S

SPI Serial peripheral interface. A type of flash memory.

SRC Source code. The SRC RPM is used in Linux to build the driver kernel files.

T

TCP Transmission Control Protocol. Part of the transport layer of the Internet protocol suite.

transceiver The 25GbE SFP28 optical transceiver that both ports in the adapter use to transmit data.

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

U

UDP User Datagram Protocol. Part of the transport layer of the Internet protocol suite.

UEFI Unified Extensible Firmware Interface. Manages the operations between hardware firmware and the OS during the boot time.

V

VF Virtual function.

- VID** VLAN identifier. A 12-bit identifier in an Ethernet header.
- VLAN** Virtual LAN. Splits the physical LAN into logical subparts. Multiple VLANs are supported on a single port, enabling a server with a single adapter to have a logical presence on multiple IP subnets.
- VXLAN** Virtual eXtensive LAN. A tunneling mechanism for providing isolated virtual Layer 2 (L2) segments that can span multiple physical L2 segments.

Index

A

adapter

- description, 29
 - front panel, 17
 - installing, 29
 - LEDs, 17
 - overview of upgrading (Linux), 63
 - part numbers, 29
 - upgrading (Linux), 63
 - verifying installation (Oracle Solaris 86), 35
 - verifying installation (Windows), 35
- auto negotiation, not supported for a Linux boot, 40

B

boot

- options, 39
- booting over a 10GbE network
- Linux OS, 40
- booting over the network
- using PXE, 39
 - with DHCP, 39
- bottlenecks, 69

C

cable

- cautions, 31
 - copper, 30
 - optical, 30
 - overview, 30
- configuring
- jumbo frames, 51

- link aggregation (Oracle Solaris x86), 55
 - network, 37
 - VLANs (Linux), 58
 - VLANs (Oracle Solaris SPARC), 58
 - VLANs (Oracle Solaris x86), 59
 - VLANs (Windows), 58
 - VXLANs, 60
- copper cable, 30
- CPU
- troubleshooting interrupts, 69
 - troubleshooting pegging, 69
- crash dump, 68

D

deleting

- link aggregation (Oracle Solaris x86), 56
- device link, missing, 67
- device tree, cleaning, 68
- driver
- removing (Linux), 61
 - removing (Oracle Solaris), 62
 - removing (Windows), 61
- DTrace, 68

E

- electrical specifications, 20
- environmental specifications, 21

F

- firmware update tool, 23

upgrading adapter (Linux), 63

H

hard port hang, troubleshooting, 68
hardware and software requirements, 22
hardware components, 15

I

I/O statistics, 69
installation
 tasks (Linux), 11, 12
 tasks (Windows), 12
 verifying (Oracle Solaris x86), 35
 verifying (Windows), 35
installing
 adapter, 29, 32
 driver, 25
 driver (Oracle Solaris x86), 25
interface for Windows
 configuring, 38

J

jumbo frames
 changing the MTU permanently (Oracle Solaris), 52
 changing the MTU temporarily (Oracle Solaris), 52
 configuring (Oracle Solaris), 52
 configuring (Windows), 52

L

link aggregation
 configuring (Oracle Solaris x86), 55
 deleting (Oracle Solaris x86), 56
 displaying information (Oracle Solaris x86), 56
Linux
 boot over a 10GbE network, 40

 configure VLANs, 58
 configuring jumbo frames, 51
 remove the mlxne driver, 61
 task overview, 11, 12
 verifying installation, 34

M

memory outages, 69
mlxne
 installing the driver (Oracle Solaris x86), 25

N

network
 configuration, 37
 configuring the interface (Windows), 38
 performance, 69
 routing outages, 69
 task overview, 37
network interface
 configuring (Oracle Solaris x86), 38
 configuring (Windows), 38

O

optical cable, 30
Oracle Dual Port 25/100 Gb Mellanox Adapter
 description, 29
Oracle Solaris
 remove the mlxne driver, 62
Oracle Solaris x86, 59
 configure VLANs, 59
 configure VXLANS, 60
 configuring a link aggregation, 55, 55
 downloading and installing driver, 25
 troubleshooting adapter, 67
 verifying adapter installation, 35

P

page faults, 70

panic, system, 68
performance
 bottlenecks, 69
 network, 69
physical specifications, 19
port hang
 troubleshooting, 68

R

RDMA over Converged Ethernet *See* RoCE
removing the driver
 Linux, 61
 Oracle Solaris , 62
 Windows, 61
resource convention, 70
RoCE *See* installing (Linux) *See* installing on VMware
ESXi *See* installing on Windows User Mode *See*
installing on Windows, Kernel Mode
 list of supported OS, 46
 supported feature combinations, 46

S

SFP28 transceivers
 overview, 30
shipping kit contents, 15
soft port hang, troubleshooting, 68
SPARC
 configure VLANs, 58
specifications
 electrical, 20
 environmental, 21
 physical, 19
statistics, 69
system panic, 68

T

trace information, 68
troubleshooting
 adapter on Oracle Solaris x86, 67

CPU interrupts, 69
CPU pegging, 69
crash dump, 68
device links, 67
device tree, 68
DTrace, 68
memory outages, 70
page faults, 70
port hang, 68
resource contention, 70

U

update tool overview, firmware, 23
upgrading
 adapter (Linux), 63

V

verifying
 adapter upgrade (Linux), 64
 mlxne_driver (Oracle Solaris x86), 25
viewing
 link aggregation information (Oracle Solaris
 x86), 56
VLANs
 configuring, 59
 Linux, 58
 Windows, 58
 ID, 57
VXLANS, configuring, 60

W

Windows
 configure VLANs, 58
 configuring jumbo frames, 52
 remove the mlxne driver, 61
 task overview, 12
 verifying adapter installation, 35
Windows kernel mode *See* installing RoCE driver
Windows user mode *See* installing RoCE driver

