# Sun Dual Port 4x QDR IB Host Channel Adapter PCIe

User's Guide

Part No. 820-6536-13
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# Contents

# Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

## Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

### Symbols

The following symbols may appear in this book:

**Caution –** There is a risk of personal injury and equipment damage. Follow the instructions.

**Caution –** Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.

**Caution –** Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

Depending on the type of power switch your device has, one of the following symbols may be used:

**On –** Applies AC power to the system.

**Off –** Removes AC power from the system.

**Standby –** The On/Standby switch is in the standby position.

### Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

### Placement of a Sun Product

**Caution –** Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

### System Unit Cover

You must remove the cover of your Sun computer system unit to add cards, memory, or internal storage devices. Be sure to replace the cover before powering on your computer system.

**Caution –** Do not operate Sun products without the cover in place. Failure to take this precaution may result in personal injury and system damage.

# Conformité aux normes de sécurité

Veuillez lire attentivement cette section avant de commencer. Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

## Mesures de sécurité

Pour votre sécurité, nous vous recommandons de suivre scrupuleusement les mesures de sécurité ci-dessous lorsque vous installez votre matériel:

- Suivez tous les avertissements et toutes les instructions inscrites sur le matériel.
- Assurez-vous que la tension et la fréquence de votre source d'alimentation correspondent à la tension et à la fréquence indiquées sur l'étiquette de la tension électrique nominale du matériel
- N'introduisez jamais d'objets quels qu'ils soient dans les ouvertures de l'équipement. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet étranger conducteur risque de produire un court-circuit pouvant présenter un risque d'incendie ou de décharge électrique, ou susceptible d'endommager le matériel.

## Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés:

**Attention –** Vous risquez d'endommager le matériel ou de vous blesser. Veuillez suivre les instructions.

**Attention –** Surfaces brûlantes. Evitez tout contact. Les surfaces sont brûlantes. Vous risquez de vous blesser si vous les touchez.

**Attention –** Tensions dangereuses. Pour réduire les risques de décharge électrique et de danger physique, observez les consignes indiquées.

Selon le type d'interrupteur marche/arrêt dont votre appareil est équipé, l'un des symboles suivants sera utilisé:

**Marche –** Met le système sous tension alternative.

**Arret –** Met le système hors tension alternative.

**Veilleuse –** L'interrupteur Marche/Veille est sur la position de veille.

## Modification du matériel

N'apportez aucune modification mécanique ou électrique au matériel. Sun Microsystems décline toute responsabilité quant à la non-conformité éventuelle d'un produit Sun modifié.

## Positionnement d'un produit Sun

**Attention –** Evitez d'obstruer ou de recouvrir les orifices de votre produit Sun. N'installez jamais un produit Sun près d'un radiateur ou d'une source de chaleur. Si vous ne respectez pas ces consignes, votre produit Sun risque de surchauffer et son fonctionnement en sera altéré.

## Couvercle de l'unité

Pour ajouter des cartes, de la mémoire ou des périphériques de stockage internes, vous devez retirer le couvercle de votre système Sun. Remettez le couvercle supérieur en place avant de mettre votre système sous tension.

**Attention –** Ne mettez jamais des produits Sun sous tension si leur couvercle supérieur n'est pas mis en place. Si vous ne prenez pas ces précautions, vous risquez de vous blesser ou d'endommager le système.

# Einhaltung sicherheitsbehördlicher Vorschriften

Lesen Sie vor dem Ausführen von Arbeiten diesen Abschnitt. Im folgenden Text werden Sicherheitsvorkehrungen beschrieben, die Sie bei der Installation eines Sun Microsystems-Produkts beachten müssen.

## Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz bei der Installation des Geräts die folgenden Sicherheitsvorkehrungen:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Stellen Sie sicher, dass Spannung und Frequenz der Stromversorgung den Nennleistungen auf dem am Gerät angebrachten Etikett entsprechen.
- Führen Sie niemals Fremdobjekte in die Öffnungen am Gerät ein. Es können gefährliche Spannungen anliegen. Leitfähige Fremdobjekte können einen Kurzschluss verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

## Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:

**Achtung –** Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.

**Achtung –** Heiße Oberfläche. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

**Achtung –** Gefährliche Spannungen. Befolgen Sie die Anweisungen, um Stromschläge und Verletzungen zu vermeiden.

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole verwendet werden:

**Ein –** Versorgt das System mit Wechselstrom.

**Aus–** Unterbricht die Wechselstromzufuhr zum Gerät.

**Wartezustand –** Der Ein-/Standby-Netzschalter befindet sich in der Standby-Position.

## Modifikationen des Geräts

Nehmen Sie keine elektrischen oder mechanischen Gerätemodifikationen vor. Sun Microsystems ist für die Einhaltung der Sicherheitsvorschriften von modifizierten Sun-Produkten nicht haftbar.

## Gehäuseabdeckung

Sie müssen die Abdeckung Ihres Sun-Computersystems entfernen, um Karten, Speicher oder interne Speichergeräte hinzuzufügen. Bringen Sie vor dem Einschalten des Systems die Gehäuseabdeckung wieder an.

**Achtung –** Nehmen Sie Sun-Geräte nicht ohne Abdeckung in Betrieb. Die Nichtbeachtung dieses Warnhinweises kann Verletzungen oder Geräteschaden zur Folge haben.

# Normativas de seguridad

Lea esta sección antes de realizar cualquier operación. En ella se explican las medidas de seguridad que debe tomar al instalar un producto de Sun Microsystems.

## Medidas de seguridad

Para su protección, tome las medidas de seguridad siguientes durante la instalación del equipo:

- Siga todos los avisos e instrucciones indicados en el equipo.
- Asegúrese de que el voltaje y frecuencia de la fuente de alimentación coincidan con el voltaje y frecuencia indicados en la etiqueta de clasificación eléctrica del equipo.
- No introduzca objetos de ningún tipo por las rejillas del equipo, ya que puede quedar expuesto a voltajes peligrosos. Los objetos conductores extraños pueden producir cortocircuitos y, en consecuencia, incendios, descargas eléctricas o daños en el equipo.

## Símbolos

En este documento aparecen los siguientes símbolos:

**Precaución –** Existe el riesgo de que se produzcan lesiones personales y daños en el equipo. Siga las instrucciones.

**Precaución –** Superficie caliente. Evite todo contacto. Las superficies están calientes y pueden causar lesiones personales si se tocan.

**Precaución –** Voltaje peligroso. Para reducir el riesgo de descargas eléctricas y lesiones personales, siga las instrucciones.

En función del tipo de interruptor de alimentación del que disponga el dispositivo, se utilizará uno de los símbolos siguientes:

**Encendido –** Suministra alimentación de CA al sistema.

**Apagado –** Corta la alimentación de CA del sistema.

**Espera –** El interruptor de encendido/espera está en la posición de espera.

## Modificaciones en el equipo

No realice modificaciones de tipo mecánico ni eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de normativas en caso de que un producto Sun se haya modificado.

## Colocación de un producto Sun

**Precaución –** No obstruya ni tape las rejillas del producto Sun. Nunca coloque un producto Sun cerca de radiadores ni fuentes de calor. Si no sigue estas indicaciones, el producto Sun podría sobrecalentarse y la fiabilidad de su funcionamiento se vería afectada.

# Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Industry Canada Equipment Standard for Digital Equipment (ICES-003) — Canada
- Voluntary Control Council for Interference (VCCI) — Japan
- Bureau of Standards Metrology and Inspection (BSMI) — Taiwan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

## FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

**Modifications:** Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

## ICES-003 Class A Notice - Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

## VCCI 基準について

### クラス A VCCI 基準について

クラス A VCCI の表示があるワークステーションおよびオプション製品は、クラス A 情報技術装置です。これらの製品には、下記の項目が該当します。

この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

## BSMI Class A Notice

The following statement is applicable to products shipped to Taiwan and marked as Class A on the product compliance label.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用
時，可能會造成射頻 干擾，在這種情況下，
使用者 會被要求採取某些適當的對策。

## CCC Class A Notice

The following statement is applicable to products shipped to China and marked with “Class A” on the product’s compliance label.

以下声明适用于运往中国且其认证标志上注有 "Class A" 字样的产品。

声明
此为A级产品，在生活环境中，该产品可能会造成无线电干扰。
在这种情况下，可能需要用户 对其干扰采取切实可行的措施。

# Declaration of Conformity

To receive a copy of the latest Declaration of Conformity (DoC) for the product, either contact your local Sun sales representative, or create an online request at:

(https://www2.sun.de/dct/forms/reg_us_1607_755_0.jsp)

# Preface

This guide provides an overview, installation instructions, and specifications of the Sun Dual Port 4x DDR IB Host Channel Adapter PCIe low-profile card. The instructions in this guide are designed for system administrators with experience installing network hardware and software.

**Note –** The Sun Dual Port 4x DDR IB Host Channel Adapter PCIe is based on Mellanox Technologies' MT26428 ConnectX IB adapter (HCA) device.

## Related Documentation

The following table lists the documentation for this product. The online documentation is available at:

http://docs.sun.com/app/docs/prod/qdr.pcie

| Application | Title | Part Number | Format | Location |
|---|---|---|---|---|
| Unpacking the product | *Sun Dual Port 4x QDR IB Host Channel Adapter PCIe Getting Started Guide* | 820-6538 | Printed<br>PDF | Shipping kit<br>Online |
| Installation and use | *Sun Dual Port 4x QDR IB Host Channel Adapter PCIe User's Guide* (this document) | 820-6536 | PDF<br>HTML | Online |
| Latest Information | *Sun Dual Port 4x QDR IB Host Channel Adapter PCIe Product Notes* | 820-6537 | PDF<br>HTML | Online |
| Solaris support | Solaris 10 Operating System documentation collection<br>http://docs.sun.com/app/docs/prod/solaris.10 | | PDF<br>HTML | Online |

If you download software from Mellanox Technologies, as described in this manual, you might also need documentation that is available at:

http://www.mellanox.com

Details on locating specific manuals at this web site are provided in Chapter 3.

| Application | Title | Format | Location |
|---|---|---|---|
| Installing Linux support software | *Mellanox OFED for Linux Installation Guide* | PDF | Online |
| Use of Linux support software and IPoIB features | *Mellanox OFED Stack for Linux User's Manual* | PDF | Online |
| Latest information on Linux support software | *Mellanox OFED for Linux Release Notes* | Text file | Online |
| Use of BoIB features | *Boot over IB (BoIB) User's Manual* | PDF | Online |
| Latest information on BoIB | *Mellanox Boot over IB (BoIB) in "Mellanox OFED for Linux" Release Notes* | Text file | Online |

# Documentation, Support, and Training

| Sun Function | URL |
|---|---|
| Documentation | http://docs.sun.com |
| Support | http://www.sun.com/support/ |
| Training | http://www.sun.com/training/ |

# Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or

resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

| Information | URL |
|---|---|
| PCI Express specifications | http://www.pcisig.com |
| Mellanox Technologies HCA information, firmware downloads, and Linux software downloads | http://www.mellanox.com |
| OFED information | http://www.openfabrics.org |
| InfiniBand Specifications | http://infinibandta.org/ |

# Documentation Feedback

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

http://www.sun.com/hwdocs/feedback

Please include the title and part number of your document with your feedback:

*Sun Dual Port 4x QDR IB Host Channel Adapter PCIe User's Guide*, part number *820-6536-13*.

CHAPTER 1

# Overview

This chapter includes:



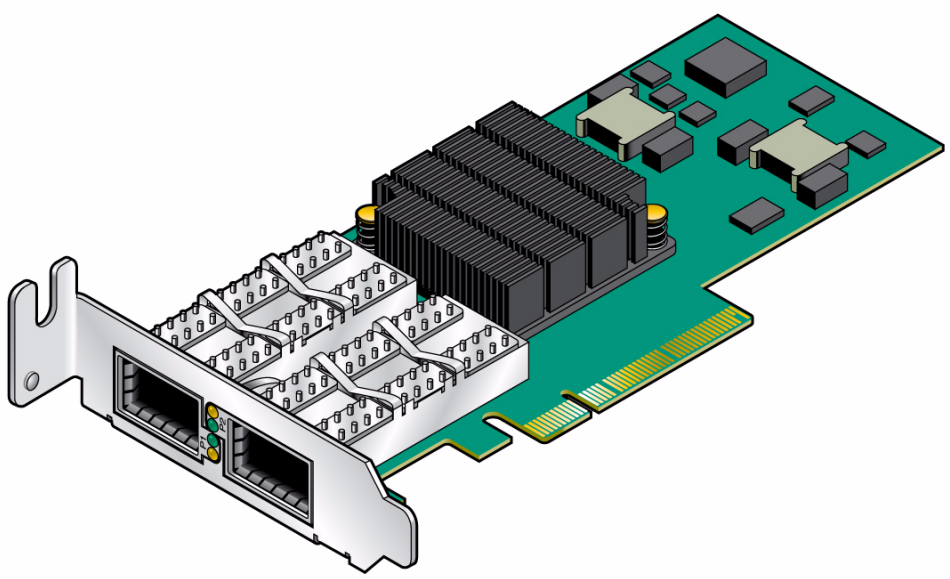
## Adapter Hardware Overview

The main features of the Sun Dual Port 4x QDR IB Host Channel Adapter PCIe low-profile card are as follows:

- IBTA (InfiniBand Trade Association) v1.2 compliant
- Two 4x InfiniBand copper ports for connecting InfiniBand traffic (4x IB connectors)
- PCIe 2.0 card
- PCI Express expansion board with an x8 edge connector compatible to the PCI Express 1.0a specification
- Media detect circuit, which supports external InfiniBand fiber solutions
- European Union Restriction of Hazardous Substances (RoHS) compliant
- 4x IB port speed support: 10 Gbps, 20 Gbps, or 40 Gbps (QDR - Quad data rate)
- Short mounting bracket (an alternative tall bracket is supplied along with the card)

# IB-HCA Card

**FIGURE 1-1** Sun Dual Port 4x QDR IB Host Channel Adapter PCIe With Short Bracket



# I/O Interfaces

Each IB-HCA card includes the following interfaces:

- Two 4x InfiniBand QSFP connectors
- PCI Express x8 edge connector
- I/O panel LEDs

## InfiniBand Interface

The Sun Dual Port 4x QDR IB Host Channel Adapter PCIe is compliant with the *InfiniBand Architecture Specification, Release 1.2.* The device has two compliant 4x InfiniBand ports, called 1 and 2. The IB-HCA card provides access to these ports by means of two 4x InfiniBand connectors for external InfiniBand copper cables. These cables must be compliant with the *InfiniBand Architecture Specification, Release 1.2*. Connector 1 connects to Port 1 of the device, while connector 2 connects to Port 2.

The IB-HCA card is embedded with a media detect circuit, which supports external InfiniBand fiber solutions. These external devices are connected to the InfiniBand port connectors using active media converters, such as the Emcore QTR3400 Smart Module or the Fujitsu FPD-010R008-0E o-microGiGaCN.

## PCI Express Interface

The Sun Dual Port 4x QDR IB Host Channel Adapter PCIe has eight Tx/Rx pairs of SerDes providing for a PCI Express x8 interface, version 1.0a compatible. The adapter can be either a master initiating the PCI Express bus operations or a slave responding to PCI bus operations. The PCI Express bus can connect to either a host CPU in an IB-HCA application or to an I/O device (such as Gigabit Ethernet) when used as a target channel adapter (TCA).

## LED Assignment

The board has four LEDs located on the I/O panel. Two LEDs are assigned to each 4X port. See FIGURE 1-2.

**FIGURE 1-2** I/O Panel With Dual Ports and LEDs (Tall Bracket)

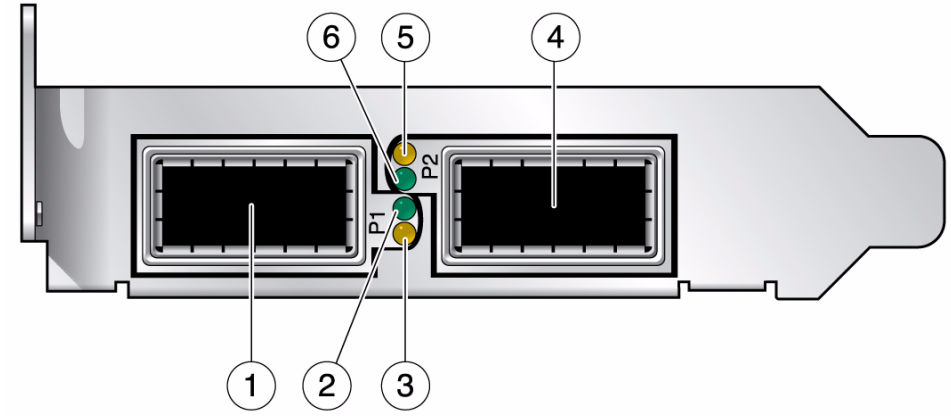



**Figure Legend**

| | |
|---|---|
| **1** | InfiniBand Port 1 |
| **2** | Green LED for Port 1 (Physical Link) |
| **3** | Amber LED for Port 1 (Data Activity Link) |

| Figure Legend | |
|---|---|
| 4 | InfiniBand Port 2 |
| 5 | Amber LED for Port 2 (Data Activity Link) |
| 6 | Green LED for Port 2 (Physical Link) |

The same port names and LED footprints apply when a tall bracket is installed on the card. To install the supplied tall bracket, see Appendix B.

The pair of LEDs for each port have the meanings described in TABLE 1-1.

**TABLE 1-1** LED Meanings

| LED Color | LED Name | LED State | Meaning |
|---|---|---|---|
| Green | Physical Link | Lit | The link bringup process has successfully completed and the link width, link speed, link polarity, and link reversal have been negotiated with the neighbor port on the other end of the cable. |
| | | Unlit | A physical connection has not been established. |
| Amber | Data Activity | Steady light | Infiniband is discovered over the physical link, but no data is being passed. |
| | | Blinking light | Data is being passed. |
| | | Unlit | A physical or logical connection (or both) has not been established. |

# $I^2C$ Compatible Interface

A three-pin header, designated with reference name J5 on the IB-HCA card, is provided as the $I^2C$ compatible interface.

# Power

The adapter card receives power from the PCI Express edge connector. All other required power voltages are generated by on-board switch mode regulators. For details on power consumption, see Appendix A.

## Node GUID

A label on the back of the Sun Dual Port 4x QDR IB Host Channel Adapter PCIe card displays the 64-bit GUID. This GUID uniquely identifies this device in the server and on the IB fabric.

# Hardware and Software Requirements

For the latest list of supported platforms and operating systems, refer to the *Sun Dual Port 4x QDR IB Host Channel Adapter PCIe Product Notes*, part number 820-6537. This document is available at http://docs.sun.com.

CHAPTER 2

# IB-HCA Card Installation

The IB-HCA card is a standard PCI Express (PCIe) x8 card with a standard x8 edge connector. Consult the server documentation for instructions on how to install a PCI Express card into that system.

This chapter includes:



## Installing the IB-HCA Card

**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 the electronic equipment. When installing the IB-HCA card in a system, use antistatic grounding straps and antistatic mats to help prevent damage due to electrostatic discharge.

### ▼ Install the Adapter

Refer to your system installation or service manual for detailed instructions for the following steps:

1. **Check that the bracket on the IB-HCA card is the correct size for your system.**

   An alternative longer bracket is supplied with the card. If you need to use a different bracket, perform the instructions in Appendix B.

2. **Power off your server, using the standard shutdown procedures described in your system service manual.**

   Product documentation for Sun servers is available at `http://docs.sun.com`.

3. **Remove the cover from the system to access the card slots and connectors.**

4. **Select an available PCIe x8 slot and remove the blank front panel for that slot.**

   Or, if you are replacing an existing card in that slot, remove the card.

5. **Install the IB-HCA card into the slot, pushing the card's edge connector into the connector on the chassis.**

   Ensure that the front plate on the IB-HCA card mounts flush with the chassis panel opening.

6. **If applicable, install the screw in the front plate to secure the IB-HCA card into the chassis.**

7. **Attach the 4x end of each InfiniBand I/O cable to an IB-HCA port connector.**

   Ensure that the connectors are properly engaged.

**Caution –** Avoid putting unnecessary stress on the connection. Do not bend or twist the cable near the connectors and avoid cable bends of more than 90 degrees.

8. **Replace the cover on the unit.**

9. **If not already connected, connect the other end of the InfiniBand I/O cables to the appropriate ports on the switch or switches.**

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

10. **Turn on power to the system and allow the server to reboot.**

    This step completes the hardware installation. Proceed to the verification instructions in "Verify the Installation With the Solaris 10 OS" on page 11 or "Verifying the Installation With Linux" on page 16.

CHAPTER 3

# InfiniBand Software on the Solaris Operating System and Linux

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

This chapter provides an overview of installing and using the InfiniBand software stack for the Solaris OS and Linux operating system.

Consult the product notes for your server for recent information about supported operating systems, firmware and software updates, and other issues not covered in the main product documentation.

This chapter includes:

# InfiniBand Software on the Solaris Operating System

InfiniBand software is bundled with the Solaris 10 OS. The package containing the device driver for the Sun Dual Port 4x QDR IB Host Channel Adapter is `SUNWhermon`. The driver name is `hermon`.

## InfiniBand Software for Solaris 10

For details about InfiniBand software supported in Solaris 10 Update releases, refer to the following documents in the *Solaris 10 Release and Installation Collection* available at `http://docs.sun.com`:

- *Solaris 10 What's New*
- *Solaris 10 Release Notes*
- *Solaris 10 Package List*

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**Note –** The `SUNWhermon` package that is available in the Solaris 10 10/09 OS and subsequent Solaris Update releases must be used with this IB-HCA PCIe.

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The InfiniBand software stack, consisting of the upper layer protocols and transport framework, is included in all of the Solaris software groups described in the *Solaris Installation Guide*. The `SUNWhermon` package is included in the Entire+OEM, Entire, and Developer software groups. If you are not using any of these groups, you must explicitly add the `SUNWhermon` package during initial installation. If you are not doing a software install, use the `pkgadd`(1) utility to add the package prior to using the Sun Dual Port 4x QDR IB Host Channel Adapter PCIe.

## Sun Firmware Flash Update Tool for IB-HCAs

The Sun Firmware Flash Update tool in the Solaris 10 OS does not support the Sun Dual Port 4x QDR IB Host Channel Adapter PCIe. You must download a separate package containing that tool from the Oracle Download Webpage at: `http://www.sun.com/download/index.jsp`.

Go to the Download A-Z tab and search for the "Sun Firmware Flash Utility." Refer to the installation instructions in the package README file.

To check that the correct version is installed, type:

```
# firmwareflash -v

firmwareflash: version v1.9
```

**Note –** This command must display version number 1.9 or higher.

## ▼ Verify the Installation With the Solaris 10 OS

Before you can verify the installation, you must install the adapter in the chassis, power on the server, and cable the server to an operational InfiniBand switch. Afterward, perform the following steps:

1. **Ensure that the cables are connected to the adapter and switches.**
2. **Verify that the IB Subnet Manager is running on the IB switch or on a host within the subnet.**

   Refer to the manual for the IB Subnet Manager for more information.
3. **Check that the green LED is illuminated for each port that is connected to the switch.**

   If the green LED is not on, check the cable connections at the adapter and at the switch.
4. **Check that the amber LED is illuminated for each port that is connected to the switch.**
5. **Verify that the IB-HCA ports are up and the driver is attached.**

   a. **Use the `cfgadm`(1m) command to obtain the state of the device installed.**

```
# cfgadm -als "cols=ap_id:condition" hca
Ap_Id                          Condition
hca:2C90109763F70              ok
```

If more than one IB-HCA 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 IB-HCA card. See "Node GUID" on page 5.

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

**b. Use the `cfgadm`(1m) command to obtain port GUIDs for each port on the IB-HCA card.**

```
# cfgadm -als "cols=ap_id:info" hca
Ap_Id                          Information
hca:2C90109763F70              VID: 0x15b3, PID: 0x5a44,
#ports: 0x2, port1 GUID: 0x2C90109763F71, port2 GUID:
0x2C90109763F72
```

If more than one IB-HCA 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 IB-HCA card. See "Node GUID" on page 5.

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

**c. Use the `cfgadm`(1m) command to verify that the IB ports and partitions are configured by the Subnet Manager.**

```
# cfgadm -als "select=type(IB-VPPA),cols=ap_id"
Ap_Id
ib::2C90109763F71,ffff,ipib
ib::2C90109763F72,ffff,ipib
```

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 previous command 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.

# Sun Firmware Version for IB-HCAs on the Solaris OS

To use this adapter with the Solaris OS, the minimum firmware version must be 2.7.000. Use the `firmwareflash` command to display the revision level of your IB-HCA card.

```
# firmwareflash -l -c IB
```

Look for the revision number that appears after the `Firmware revision` string. If more than one HCA device is displayed, look for the `Node Image` GUID that matches the GUID displayed on the physical GUID label of the IB-HCA card being installed. See "Node GUID" on page 5.

If the firmware version is not at 2.7.000 or higher, update the firmware. Only update the firmware on your IB-HCA card with files specifically approved for the Oracle product. Select and download approved firmware files from:

http://www.mellanox.com/support/firmware_table_Sun.php

After obtaining a firmware image, use the `firmwareflash` command to install the firmware. Once installed, reboot the system to enable the new firmware.

## Using InfiniBand Devices on the Solaris 10 OS

For details about InfiniBand software stack configurations in a Solaris 10 Update release, refer to the *System Administration Guide: Devices and File Systems* document in the *Solaris 10 System Administrator Collection* available at `http://docs.sun.com`.

Section 9 of this guide titled *Using InfiniBand Devices (Overview/Tasks)* describes how to set up upper layer protocols such as IPoIB and uDAPL.

## Troubleshooting

Check the *Sun Dual Port 4x QDR IB Host Channel Adapter PCIe Product Notes* (820-6537) for information about known issues discovered using the Solaris 10 OS with your IB-HCA card.

When using IPoIB, verify that the `broadcast` group is configured by the Subnet Manager in the partition where the IPoIB link will be used.

# InfiniBand Support Software for Linux

With most supported Linux releases, you must also install the `MLNX_OFED` software stack. This software is the Mellanox OpenFabrics Enterprise Distribution (OFED) for Linux. Refer to your Linux vendor for software installation recommendations and support.

## ▼ Download the MLNX_OFED Software and Documentation

1. **Go to the Mellanox Technologies web site:**

   http://www.mellanox.com

2. **Select the Products tab.**

3. **Select InfiniBand SW/Drivers from the menu for Products.**

4. **Select Linux SW/Drivers from the menu for InfiniBand SW/Drivers.**

5. **Select the download that corresponds to your operating system.**

   Follow those instructions to complete the download.

6. **Select and download the related documentation for** MLNX_OFED**.**

   At minimum, download copies of these manuals that are offered on the Linux SW/Drivers page:

   - Installation Guide
   - Linux User's Manual
   - Release Notes

## ▼ Install the MLNX_OFED Software on a Sun Server

1. **Refer to the** *Mellanox OFED for Linux Installation Guide* **you downloaded from the Mellanox web site.**

   The instructions in that document are correct for installation on a Sun server except for a difference explained in the next step.

2. **Whenever a procedure in the Mellanox guide calls for running the** mlnxofedinstall **script, always include the** --without-fw-update **option.**

   This option prevents the MLNX_OFED installation process from automatically updating the firmware on your Sun HCA. Only update the firmware on that device using files specifically approved for Sun product. You can select and download approved firmware files from:

   http://www.mellanox.com/support/firmware_table_Sun.php

# Internet Protocol Over InfiniBand on Linux

Support for Internet Protocol Over InfiniBand (IPoIB) is included in the `MLNX_OFED` software distribution. Details on using IPoIB are included in the *Mellanox OFED Stack for Linux User's Manual*.

# Boot Over InfiniBand on Linux

Software to enable Boot Over InfiniBand (BoIB) on Linux is available from the Mellanox Technologies web site.

## ▼ Download the Boot Over IB Software and Documentation

1. **Go to the Mellanox Technologies web site:**

   `http://www.mellanox.com`

2. **Select the Products tab.**
3. **Select Boot Over IB from the menu for Products.**
4. **Select Linux SW/Drivers from the menu for InfiniBand SW/Drivers.**
5. **Select Download.**

   Follow the instructions provided on the web page to complete the download.

6. **Select and download the related documentation for BoIB.**

   At minimum, download copies of these manuals that are offered on the Boot Over IB page:

   - User's manual
   - Release notes

# Verifying the Installation With Linux

Before you can verify the installation, you must install the adapter in the chassis, power the server, and cable it to an operational InfiniBand switch. The InfiniBand switch should automatically recognize InfiniBand servers when they are connected to the fabric.

## ▼ Verify the Installation With Linux

The InfiniBand switch should automatically recognize the IB-HCA card when it is connected to the fabric if the IB Subnet Manager is running on the switch, or on a host within the subnet.

1. **Ensure that the cables are connected to the adapter and switches.**
2. **Verify that the IB Subnet Manager is running on the IB switch or on a host within the subnet.**

   Refer to the manual for the IB Subnet Manager for more information.
3. **Check that the green LED is illuminated for each port that is connected to the switch.**

   If the green LED is not on, check the cable connections at the adapter and at the switch.
4. **Check that the amber LED is illuminated for each port that is connected to the switch.**
5. **Verify that the IB-HCA ports are up and the driver is attached:**

```
# ibstat
```

   The output shows system diagnostic messages that have the string `mlx4` 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.

# Additional InfiniBand Software for Linux

As the popularity of InfiniBand technology increases, the number of Linux distributions and open source organizations producing drivers and tools will increase. For up-to-date information, check with open source organizations (such as http://OpenFabrics.org) and your current vendors.

The OpenFabrics organization is the Open Software solution in the InfiniBand software space. The OpenFabrics Enterprise Distribution (OFED) is the InfiniBand suite of software produced by this organization. Various vendors contribute their drivers (and other software components) to OFED.

APPENDIX **A**

# Product Specifications

This appendix includes:



## Adapter Specifications

TABLE A-1 lists the specifications for the IB-HCA card.

**TABLE A-1** Specifications for the Dual Port 4x QDR IB Host Channel Adapter PCIe

| | |
|---|---|
| **Physical** | |
| Size | 2.54 in. x 5.37 in. (64.4 mm x 136.47 cm) |
| Air flow | 200 LFM @ 55°C |
| 4x 10Gbps connector | InfiniBand (copper, current rating: 0.5A max) with active media adapter support |
| **Protocol Support** | |
| InfiniBand | IBTA v1.2, auto-negotiation<br>40 Gbps, 5 Gbps<br>20 Gbps, 5 Gbps<br>10 Gbps, 2.5 Gbps |
| QoS | 8 InfiniBand virtual lanes for each port |
| RDMA support | All ports |
| PCI Express | 2.0 SERDES @ 5.0 GT/s |
| **Power and Environmental** | |
| Voltage | 12 V, 3.3 V |
| Typical Power | 12.23 W |

**TABLE A-1** Specifications for the Dual Port 4x QDR IB Host Channel Adapter PCIe

| | |
|---|---|
| Maximum Power | 14.32 W |
| Temperature | 0°C to 55°C |
| **Regulatory** | |
| Safety | IEC/EN 60950-1:2001, ETSI EN 300 019-2-2 |
| Environmental | IEC 60068-2- 64, 29, 32 |
| RoHS | RoHS-R5 |

APPENDIX **B**

# Replacing a Short Bracket With a Tall Bracket on an IB-HCA Card

By default, the Dual Port 4x QDR IB PCIe Host Channel Adapter has a short bracket. A tall bracket is also provided to accomodate systems that require the longer bracket.

This chapter includes:



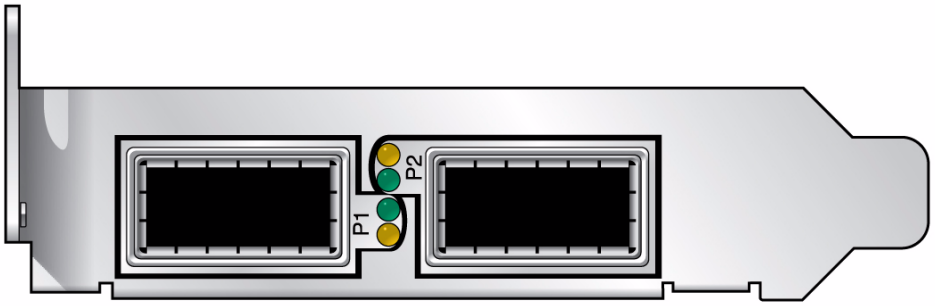
## Short Bracket Replacement

Topics include:



FIGURE B-1 shows the bracket-side view of a dual-port IB-HCA card.

**FIGURE B-1** Short Bracket of the Sun Dual Port 4x QDR IB Host Channel Adapter PCIe

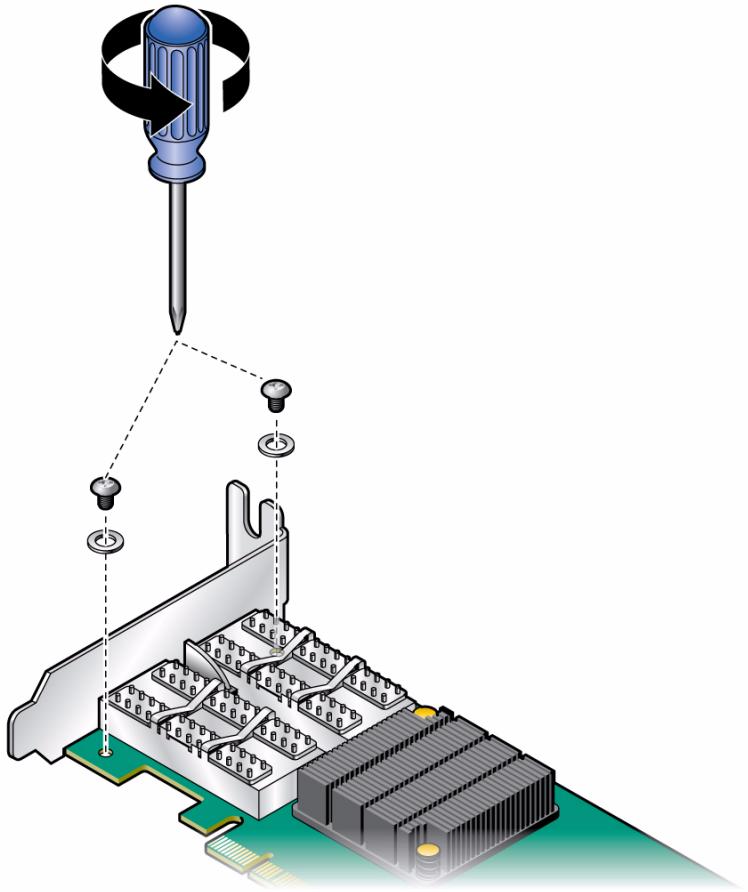



## ▼ Remove the Short Bracket From the Adapter

1. **Remove the bracket screws and washers.**

   Unscrew both screws from the card using a torque screwdriver (see FIGURE B-2).

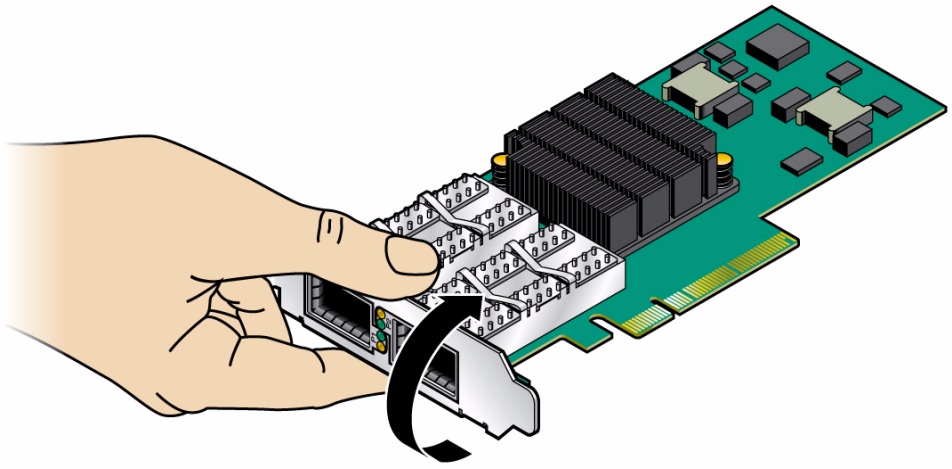
**FIGURE B-2** Unscrewing the Short Bracket Screws



2. **Detach the bracket.**

   a. **Grip the bracket as shown in** FIGURE B-3**, placing your thumb on the LED component.**

**FIGURE B-3** Detaching the Short Bracket



   b. **In a rotating move toward the component side of the card, slide the bracket out of the connectors.**

   c. **Gently hold your thumb on the LED component, as shown in** FIGURE B-3**. At the same time extract the bracket, while making sure to protect the LEDs.**

   d. **Make a rotating move to detach the short bracket, as shown in** FIGURE B-3**.**

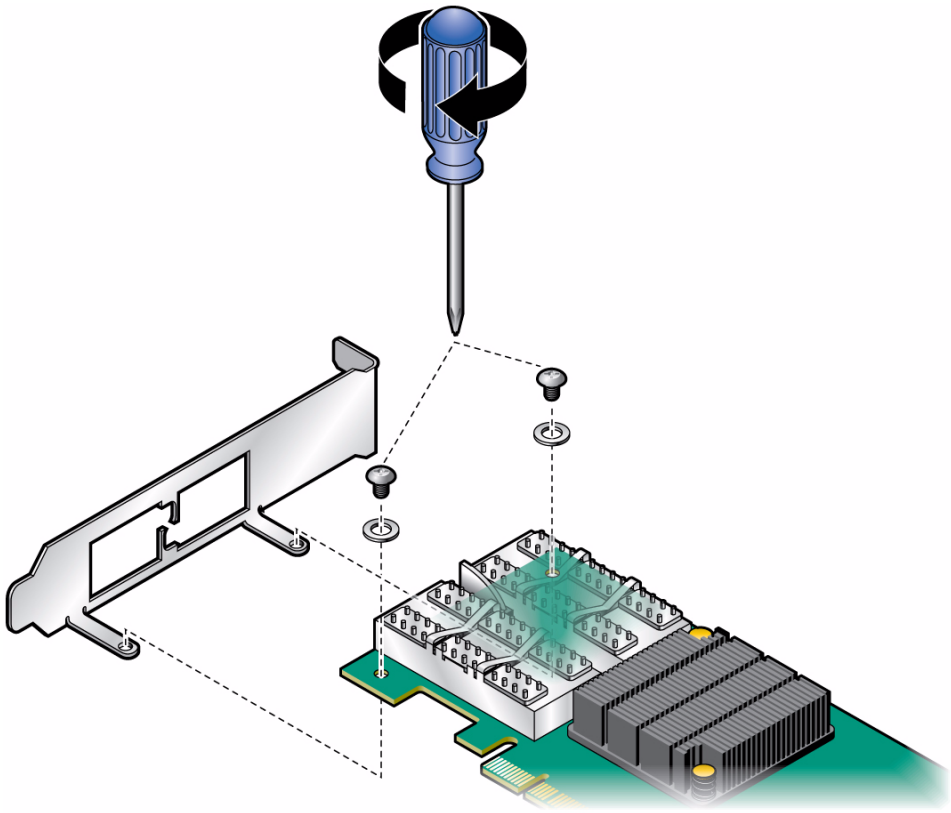
## ▼ Assemble and Install a Tall Bracket

1. **Place the tall bracket onto the card, as shown in** FIGURE B-4.

   a. **Gently fit the connectors through the bracket connector holes.**

   b. **Ensure that the LEDs are aligned into their intended bracket holes.**

**FIGURE B-4** Placing the Tall Bracket Onto the Card and Tightening the Screws



2. **Secure the tall bracket to the card with screws.**

   a. **Insert a screw along with a washer into each of the two holes on the card intended for holding the bracket as shown in** FIGURE B-4**.**

      Use a torque screwdriver to apply up to 2 lbs per inch torque on each screw.

# Index