

Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile Adapter

User's Guide



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Contents

**Regulatory Compliance Statements and
Declaration of Conformity** vii

Safety Agency Compliance Statement xi

Preface xxiii

1. Sun x4 PCI-Express Quad Gigabit Ethernet Adapter Overview 1

Shipping Kit Contents 1

Adapter Hardware Overview 1

 Adapter Features 2

 LED Displays on the Adapter 3

Hardware and Software Requirements 4

Patch Requirements 4

Patches and Updates 5

2. Installing and Setting Up the Device Driver Software 7

Verifying the e1000g Driver on a Solaris x86 Platform 7

 ▼ To Check the Driver Version on a Solaris x86 Platform 8

Downloading and Installing the Driver on a Linux Platform 8

 ▼ To Download and Install the Driver on a Linux Platform 8

Setting Up the Driver on a Linux Platform 9

▼ To Set Up the Driver on a Linux Platform	9
▼ To Remove the Driver From a Linux Platform	12
Downloading and Installing the Driver on a Microsoft Windows Platform	13
▼ To Download and Install the Driver on a Windows Platform	13
▼ To Remove the Driver From a Microsoft Windows Platform	13
3. Installing the Adapter	15
Installing the Adapter in a System	15
▼ To Install the Adapter	15
Verifying the Installation	16
▼ To Verify the Installation on Solaris x86 Systems	16
▼ To Verify the Installation in a Linux System	17
▼ To Verify the Installation in a Microsoft Windows System	17
4. Network Configuration	19
Configuring the Network Host Files for Solaris x86 Systems	19
▼ To Configure the Network Host Files	20
Booting Over the Gigabit Ethernet Network for Solaris x86 and Linux Systems	21
▼ To Boot Over the Network on Solaris x86 and Linux Systems	21
5. Configuring the Driver Parameters	23
Adapter Parameter Overview	23
Driver Parameters for Solaris x86 Systems	24
Driver Parameters for Linux Systems	28
Setting e1000 Driver Parameters in Linux Systems	29
▼ To Configure Jumbo Frames	29
6. Configuring Link Aggregation	31
Overview of Link Aggregation	31
Configuring Link Aggregation in a Solaris Environment	32

▼ To Configure Link Aggregation in a Solaris Environment	32
7. Configuring VLANs	35
VLAN Overview	35
Configuring VLANs	38
▼ To Configure Static VLANs in the Oracle Solaris x86 Environment	39
▼ To Configure VLANs in a Linux Environment	40
▼ To Configure VLANs in a Microsoft Windows 2003 Environment	40
Configuring Bonding for Multiple Interfaces	41
▼ To Configure Bonding for Multiple e1000 Interfaces	41
▼ To Remove Bonding:	42
A. Sun x4 PCI-Express Quad Gigabit Ethernet Specifications	43
Connectors	43
Performance Specifications	45
Physical Characteristics	45
Power Requirements	46
Index	47

Regulatory Compliance Statements and Declaration of Conformity

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。

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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.

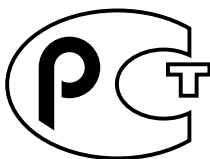
以下声明适用于运往中国且其认证标志上注有 "Class A" 字样的产品。

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。



GOST-R Certification Mark



Declaration of Conformity

Compliance Model Number: D61407-002
Product Family Name: Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile Adaptor (x4446A-Z)

EMC

USA—FCC Class A

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

1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.

European Union

This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

As Information Technology Equipment (ITE) Class A per (as applicable):

EN 55022:1994 +A1:1995 +A2:1997	Class A
EN 61000-3-2:2000	Pass
EN 61000-3-3:1995 +A1:2001	Pass
EN 55024:1998 +A1:2001 +A2:2003	Required Limits:
IEC61000-4-2	4 kV (Direct), 8 kV (Air)
IEC61000-4-3	3 V/m
IEC61000-4-4	1 kV AC Power Lines, 0.5 kV Signal and DC Power Lines
IEC61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines
IEC61000-4-6	3 V
IEC61000-4-8	1 A/m
IEC61000-4-11	Pass

Safety

This equipment complies with the following requirements of the Low Voltage Directive 73/23/EEC:

EC Type Examination Certificates:

EN 60950-1:2001, 1st Edition	
IEC 60950-1:2001, 1st Edition	CB Scheme Certificate No. 404734
Evaluated to all CB Countries	
UL and cUL/CSA 60950-1:2001, CSA C22.2 No. 60950-03 File: E1397619	
FDA DHHS Accession Number (Monitors Only) (Accession Number):	

Supplementary Information

This product was tested and complies with all the requirements for the CE Mark. This equipment complies with the Restriction of Hazardous Substances (RoHS) directive 2002/95/EC.

/S/ Dennis P. Symanski Worldwide Compliance Office Sun Microsystems, Inc. 4150 Network Circle, MPK15-102 Santa Clara, CA 95054 U.S.A. Tel: 650-786-3255 Fax: 650-786-3723	DATE
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/S/ Donald Cameron Program Manager/Quality Systems Sun Microsystems Scotland, Limited Blackness Road, Phase I, Main Bldg. Springfield, EH49 7LR Scotland, United Kingdom Tel: +44 1 506 672 539 Fax: +44 1 506 670 011	DATE
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Safety Agency Compliance Statement

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.

SELV Compliance

Safety status of I/O connections comply to SELV requirements.

Power Cord Connection



Caution – Sun products are designed to work with power systems having a grounded neutral (grounded return for DC-powered products). To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.



Caution – Not all power cords have the same current ratings. Do not use the power cord provided with your equipment for any other products or use. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.



注意 – 添付の電源コードを他の装置や用途に使用しない
添付の電源コードは本装置に接続し、使用することを目的として設計され、その安全性が確認されているものです。決して他の装置や用途に使用しないでください。火災や感電の原因となる恐れがあります。

The following caution applies only to devices with a Standby power switch:



Caution – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

The following caution applies only to devices with multiple power cords:



Caution – For products with multiple power cords, all power cords must be disconnected to completely remove power from the system.

Battery Warning



Caution – There is danger of explosion if batteries are mishandled or incorrectly replaced. On systems with replaceable batteries, replace only with the same manufacturer and type or equivalent type recommended by the manufacturer per the

instructions provided in the product service manual. Do not disassemble batteries or attempt to recharge them outside the system. Do not dispose of batteries in fire. Dispose of batteries properly in accordance with the manufacturer's instructions and local regulations. Note that on Sun CPU boards, there is a lithium battery molded into the real-time clock. These batteries are not customer replaceable parts.

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.

Rack System Warning

The following warnings apply to Racks and Rack Mounted systems.



Caution – For safety, equipment should always be loaded from the bottom up. That is, install the equipment that will be mounted in the lowest part of the rack first, then the next higher systems, etc.



Caution – To prevent the rack from tipping during equipment installation, the anti-tilt bar on the rack must be deployed.



Caution – To prevent extreme operating temperature within the rack insure that the maximum temperature does not exceed the product's ambient rated temperatures.



Caution – To prevent extreme operating temperatures due to reduced airflow consideration should be made to the amount of air flow that is required for a safe operation of the equipment.

Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

Class 1 Laser Product
Luokan 1 Laserlaitte
Klasse 1 Laser Apparat
Laser Klasse 1

- 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.

CD and DVD Devices

The following caution applies to CD, DVD, and other optical devices.



Caution – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

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.

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.



Arrêt – 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.

Conformité SELV

Le niveau de sécurité des connexions E/S est conforme aux normes SELV.

Connexion du cordon d'alimentation



Attention – Les produits Sun sont conçus pour fonctionner avec des systèmes d'alimentation équipés d'un conducteur neutre relié à la terre (conducteur neutre pour produits alimentés en CC). Pour réduire les risques de décharge électrique, ne branchez jamais les produits Sun sur une source d'alimentation d'un autre type. Contactez le gérant de votre bâtiment ou un électricien agréé si vous avez le moindre doute quant au type d'alimentation fourni dans votre bâtiment.



Attention – Tous les cordons d'alimentation ne présentent pas les mêmes caractéristiques électriques. Les cordons d'alimentation à usage domestique ne sont pas protégés contre les surtensions et ne sont pas conçus pour être utilisés avec des ordinateurs. N'utilisez jamais de cordon d'alimentation à usage domestique avec les produits Sun.

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur Veille:



Attention – L'interrupteur d'alimentation de ce produit fonctionne uniquement comme un dispositif de mise en veille. Le cordon d'alimentation constitue le moyen principal de déconnexion de l'alimentation pour le système. Assurez-vous de le brancher dans une prise d'alimentation mise à la terre près du système et facile d'accès. Ne le branchez pas lorsque l'alimentation électrique ne se trouve pas dans le châssis du système.

L'avertissement suivant s'applique uniquement aux systèmes équipés de plusieurs cordons d'alimentation:



Attention – Pour mettre un système équipé de plusieurs cordons d'alimentation hors tension, il est nécessaire de débrancher tous les cordons d'alimentation.

Mise en garde relative aux batteries



Attention – Les batteries risquent d'exploser en cas de manipulation maladroite ou de remplacement incorrect. Pour les systèmes dont les batteries sont remplaçables, effectuez les remplacements uniquement selon le modèle du fabricant ou un modèle équivalent recommandé par le fabricant, conformément aux instructions fournies dans le manuel de service du système. N'essayez en aucun cas de démonter les batteries, ni de les recharger hors du système. Ne les jetez pas au feu. Mettez-les au rebut selon les instructions du fabricant et conformément à la législation locale en vigueur. Notez que sur les cartes processeur de Sun, une batterie au lithium a été moulée dans l'horloge temps réel. Les batteries ne sont pas des pièces remplaçables par le client.

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.

Mise en garde relative au système en rack

La mise en garde suivante s'applique aux racks et aux systèmes montés en rack.



Attention – Pour des raisons de sécurité, le matériel doit toujours être chargé du bas vers le haut. En d'autres termes, vous devez installer, en premier, le matériel qui doit se trouver dans la partie la plus inférieure du rack, puis installer le matériel sur le niveau suivant, etc.



Attention – Afin d'éviter que le rack ne penche pendant l'installation du matériel, tirez la barre anti-basculement du rack.



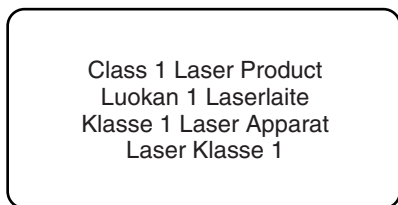
Attention – Pour éviter des températures de fonctionnement extrêmes dans le rack, assurez-vous que la température maximale ne dépasse pas la fourchette de températures ambiantes du produit déterminée par le fabricant.



Attention – Afin d'empêcher des températures de fonctionnement extrêmes provoquées par une aération insuffisante, assurez-vous de fournir une aération appropriée pour un fonctionnement du matériel en toute sécurité

Avis de conformité des appareils laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.



Périphériques CD et DVD

L'avertissement suivant s'applique aux périphériques CD, DVD et autres périphériques optiques:



Attention – L'utilisation de contrôles et de réglages ou l'application de procédures autres que ceux spécifiés dans le présent document peuvent entraîner une exposition à des radiations dangereuses.

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.

Aufstellung von Sun-Geräten



Achtung – Geräteöffnungen Ihres Sun-Produkts dürfen nicht blockiert oder abgedeckt werden. Sun-Geräte sollten niemals in der Nähe von Heizkörpern oder Heißluftklappen aufgestellt werden. Die Nichtbeachtung dieser Richtlinien kann Überhitzung verursachen und die Zuverlässigkeit Ihres Sun-Geräts beeinträchtigen.

SELV-Konformität

Der Sicherheitsstatus der E/A-Verbindungen entspricht den SELV-Anforderungen.

Anschluss des Netzkabels



Achtung – Sun-Geräte sind für Stromversorgungssysteme mit einem geerdeten neutralen Leiter (geerdeter Rückleiter bei gleichstrombetriebenen Geräten) ausgelegt. Um die Gefahr von Stromschlägen zu vermeiden, schließen Sie das Gerät niemals an andere Stromversorgungssysteme an. Wenden Sie sich an den zuständigen Gebäudeverwalter oder an einen qualifizierten Elektriker, wenn Sie nicht sicher wissen, an welche Art von Stromversorgungssystem Ihr Gebäude angeschlossen ist.



Achtung – Nicht alle Netzkabel verfügen über die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastschutz und sind daher für Computersysteme nicht geeignet. Verwenden Sie bei Ihrem Sun-Produkt keine Haushalts-Verlängerungskabel.

Die folgende Warnung gilt nur für Geräte mit Standby-Netzschalter:



Achtung – Beim Netzschalter dieses Geräts handelt es sich nur um einen Ein/Standby-Schalter. Zum völligen Abtrennen des Systems von der Stromversorgung dient hauptsächlich das Netzkabel. Stellen Sie sicher, dass das

Netzkabel an eine frei zugängliche geerdete Steckdose in der Nähe des Systems angeschlossen ist. Schließen Sie das Stromkabel nicht an, wenn die Stromversorgung vom Systemchassis entfernt wurde.

Die folgende Warnung gilt nur für Geräte mit mehreren Netzkabeln:



Achtung – Bei Produkten mit mehreren Netzkabeln müssen alle Netzkabel abgetrennt werden, um das System völlig von der Stromversorgung zu trennen.

Warnung bezüglich Batterien



Achtung – Bei unsachgemäßer Handhabung oder nicht fachgerechtem Austausch der Batterien besteht Explosionsgefahr. Verwenden Sie bei Systemen mit austauschbaren Batterien ausschließlich Ersatzbatterien desselben Typs und Herstellers bzw. einen entsprechenden, vom Hersteller gemäß den Anweisungen im Service-Handbuch des Produkts empfohlenen Batterietyp. Versuchen Sie nicht, die Batterien auszubauen oder außerhalb des Systems wiederaufzuladen. Werfen Sie die Batterien nicht ins Feuer. Entsorgen Sie die Batterien entsprechend den Anweisungen des Herstellers und den vor Ort geltenden Vorschriften. CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie. Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgetauscht werden.

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.

Warnungen bezüglich in Racks eingebauter Systeme

Die folgenden Warnungen gelten für Racks und in Racks eingebaute Systeme:



Achtung – Aus Sicherheitsgründen sollten sämtliche Geräte von unten nach oben in Racks eingebaut werden. Installieren Sie also zuerst die Geräte, die an der untersten Position im Rack eingebaut werden, gefolgt von den Systemen, die an nächsthöherer Stelle eingebaut werden, usw.



Achtung – Verwenden Sie beim Einbau den Kippschutz am Rack, um ein Umkippen zu vermeiden.



Achtung – Um extreme Betriebstemperaturen im Rack zu vermeiden, stellen Sie sicher, dass die Maximaltemperatur die Nennleistung der Umgebungstemperatur für das Produkt nicht überschreitet



Achtung – Um extreme Betriebstemperaturen durch verringerte Luftzirkulation zu vermeiden, sollte die für den sicheren Betrieb des Geräts erforderliche Luftzirkulation eingesetzt werden.

Hinweis zur Laser-Konformität

Sun-Produkte, die die Laser-Technologie verwenden, entsprechen den Laser-Anforderungen der Klasse 1.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1

CD- und DVD-Geräte

Die folgende Warnung gilt für CD-, DVD- und andere optische Geräte:



Achtung – Die hier nicht aufgeführte Verwendung von Steuerelementen, Anpassungen oder Ausführung von Vorgängen kann eine gefährliche Strahlenbelastung verursachen.

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.

Cumplimiento de la normativa para instalaciones SELV

Las condiciones de seguridad de las conexiones de entrada y salida cumplen los requisitos para instalaciones SELV (del inglés *Safe Extra Low Voltage*, voltaje bajo y seguro).

Conexión del cable de alimentación



Precaución – Los productos Sun se han diseñado para funcionar con sistemas de alimentación que cuenten con un conductor neutro a tierra (con conexión a tierra de regreso para los productos con alimentación de CC). Para reducir el riesgo de descargas eléctricas, no conecte ningún producto Sun a otro tipo de sistema de alimentación. Póngase en contacto con el encargado de las instalaciones de su empresa o con un electricista cualificado en caso de que no esté seguro del tipo de alimentación del que se dispone en el edificio.



Precaución – No todos los cables de alimentación tienen la misma clasificación eléctrica. Los alargadores de uso doméstico no cuentan con protección frente a sobrecargas y no están diseñados para su utilización con sistemas informáticos. No utilice alargadores de uso doméstico con el producto Sun.

La siguiente medida solamente se aplica a aquellos dispositivos que dispongan de un interruptor de alimentación de espera:



Precaución – El interruptor de alimentación de este producto funciona solamente como un dispositivo de espera. El cable de alimentación

hace las veces de dispositivo de desconexión principal del sistema. Asegúrese de que conecta el cable de alimentación a una toma de tierra situada cerca del sistema y de fácil acceso. No conecte el cable de alimentación si la unidad de alimentación no se encuentra en el bastidor del sistema.



Precaución – No ponga en funcionamiento los productos Sun que no tengan colocada la cubierta. De lo contrario, puede sufrir lesiones personales y ocasionar daños en el sistema.

La siguiente medida solamente se aplica a aquellos dispositivos que dispongan de varios cables de alimentación:



Precaución – En los productos que cuentan con varios cables de alimentación, debe desconectar todos los cables de alimentación para cortar por completo la alimentación eléctrica del sistema.

Advertencia sobre las baterías



Precaución – Si las baterías no se manipulan o reemplazan correctamente, se corre el riesgo de que estallen. En los sistemas que cuentan con baterías reemplazables, reemplácelas sólo con baterías del mismo fabricante y el mismo tipo, o un tipo equivalente recomendado por el fabricante, de acuerdo con las instrucciones descritas en el manual de servicio del producto. No desmonte las baterías ni intente recargarlas fuera del sistema. No intente deshacerse de las baterías echándolas al fuego. Deshágase de las baterías correctamente de acuerdo con las instrucciones del fabricante y las normas locales. Tenga en cuenta que en las placas CPU de Sun, hay una batería de litio incorporada en el reloj en tiempo real. Los usuarios no deben reemplazar este tipo de baterías.



Precaución – Por seguridad, siempre deben montarse los equipos de abajo arriba. A saber, primero debe instalarse el equipo que se situará en el bastidor inferior; a continuación, el que se situará en el siguiente nivel, etc.



Precaución – Para evitar que el bastidor se vuelque durante la instalación del equipo, debe extenderse la barra antivolcado del bastidor.



Precaución – Para evitar que se alcance una temperatura de funcionamiento extrema en el bastidor, asegúrese de que la temperatura máxima no sea superior a la temperatura ambiente establecida como adecuada para el producto.



Precaución – Para evitar que se alcance una temperatura de funcionamiento extrema debido a una circulación de aire reducida, debe considerarse la magnitud de la circulación de aire requerida para que el equipo funcione de forma segura.

Cubierta de la unidad del sistema

Debe extraer la cubierta de la unidad del sistema informático Sun para instalar tarjetas, memoria o dispositivos de almacenamiento internos. Vuelva a colocar la cubierta antes de encender el sistema informático.

Aviso de cumplimiento de la normativa para la utilización de láser

Los productos Sun que utilizan tecnología láser cumplen los requisitos establecidos para los productos láser de clase 1.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1

Dispositivos de CD y DVD

La siguiente medida se aplica a los dispositivos de CD y DVD, así como a otros dispositivos ópticos:



Precaución – La utilización de controles, ajustes o procedimientos distintos a los aquí especificados puede dar lugar a niveles de radiación peligrosos.

Nordic Lithium Battery Cautions

Norge



Advarsel – Litiumbatteri — Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

Sverige



Varning – Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Danmark



Advarsel! – Litiumbatteri — Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

Suomi



Varoitus – Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

Preface

This guide provides installation instructions for both the hardware and software for the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter from Oracle®. This document also describes how to configure the driver software for the e1000g driver for the Oracle Solaris x86 Operating Systems and the e1000 driver for Linux operating systems and Microsoft Windows Server 2003.

These instructions are designed for enterprise system administrators with experience installing network hardware and software.

Note – In this document the term x86 refers to 64-bit and 32-bit systems manufactured using processors compatible with the AMD64 or Intel Xeon/Pentium product families.

How This Document Is Organized

[Chapter 1](#) describes the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter hardware and software.

[Chapter 2](#) explains how to verify the e1000g device driver software on Solaris x86 systems and how to install the e1000 device driver software on Linux and Microsoft Windows systems.

[Chapter 3](#) describes how to install the adapter in your system and verify that it has been installed correctly.

[Chapter 4](#) describes how to edit the network host files after the adapter has been installed on your system.

[Chapter 5](#) describes how to configure the driver parameters.

Chapter 6 describes how to configure link aggregation.

Chapter 7 explains virtual local area networks (VLANs), and provides configuration instructions and examples.

Appendix A lists the specifications for the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter .

Related Documentation

The documents listed as online are available at:

<http://docs.sun.com/app/docs/prod/x4quad.giga.utp#hic>

Application	Title	Part Number	Format	Location
Getting Started	<i>Sun x4 PCI-Express Quad Gigabit Ethernet Low Profile Adapter Getting Started Guide</i>	819-7575	Hard copy	Ship kit
Safety and compliance	<i>Safety and Compliance Manual</i>	816-7190 or 821-1590	PDF HTML	Online

Documentation, Support, and Training

These web sites provide additional resources: **Documentation**

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

Feedback

Submit comments about this document by clicking the Feedback[+] link at <http://docs.sun.com>. Include the title and part number of your document with your feedback:

Sun x4 PCI-Express Quad Gigabit Ethernet UTP Adapter User's Guide, part number 819-7573-13.

Sun x4 PCI-Express Quad Gigabit Ethernet Adapter Overview

This chapter describes the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter hardware and software, and includes the following sections:

- [“Shipping Kit Contents” on page 1](#)
- [“Adapter Hardware Overview” on page 1](#)
- [“Hardware and Software Requirements” on page 4](#)
- [“Patches and Updates” on page 5](#)

Shipping Kit Contents

The carton in which your Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter was shipped should contain the following items:

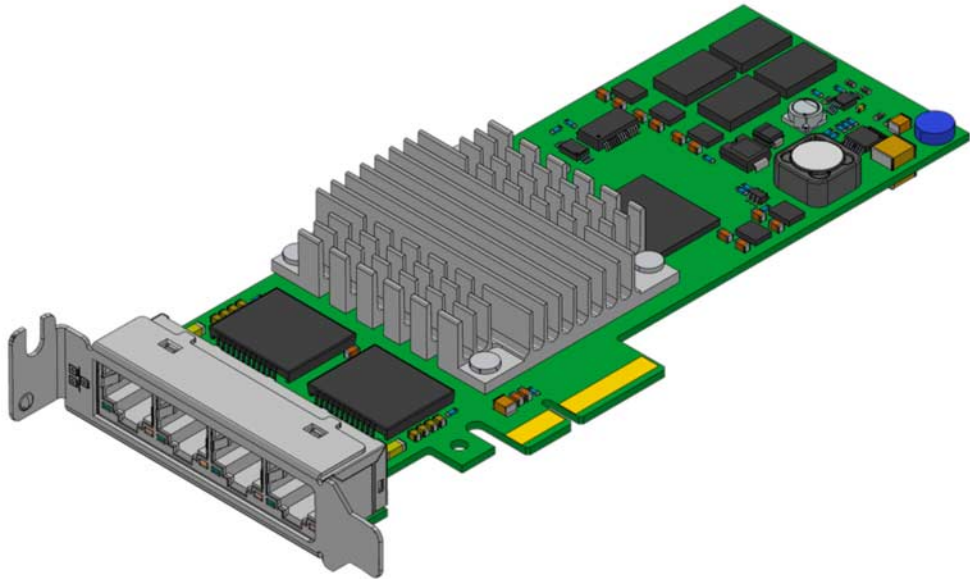
- Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter
- *Sun x4 PCI-Express Quad Gigabit Ethernet Low Profile Adapter Getting Started Guide*

Adapter Hardware Overview

The adapter provides a high-performance, highly integrated Ethernet LAN adapter for PCI-Express systems using x4 PCI-E.

The Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter is a low-profile, four-port gigabit Ethernet copper-based PCI-Express adapter. The adapter can be configured to operate in 10, 100, or 1000 Mbits/sec Ethernet networks. At 10 or 100 Mbits/sec, the adapter can be set to either half- or full-duplex. At 1000 Mbits/sec, the adapter must operate at full-duplex.

FIGURE 1-1 Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile Adapter



Adapter Features

The Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter addresses the following requirements, and provides additional features and benefits:

- Provides a high-performance, highly integrated Ethernet LAN adapter for PCI-Express systems using x4 PCI-E
- Provides four 1 Gbps Ethernet Ports
 - Four RJ45 connectors including LEDs
 - Link and Activity LEDs for each port
- Based on the Intel 82571EB 10/100/1000 Mbit/sec Ethernet controller
- Provides diagnostics tool(s), firmware drivers (FCode and PXE) for booting the system over the network, and power on selftest (POST) resources
 - EEPROM, AT25128A, 16 Kbyte, connected to I82571 SPI (serial EEPROM) bus

- FLASH, AT25F1024AN, 128 Kbyte, connected to I82571 SPI (serial Flash) bus to support PXE and Sun Netboot code
- Provides PCIe 4x backplane connections
- Complies with RoHS-6 standards
- Supports the following operating systems:
 - Linux
 - Windows

LED Displays on the Adapter

Four LEDs are displayed on the front panel of the adapter. The LEDs are labeled on the front panel as shown in [TABLE 1-1](#).

TABLE 1-1 Front Panel Display LEDs for the UTP Low Profile Adapter

Label	Meaning if Lit	Color	Description
ACT(3)	Port 4 connected to LP* Activity on Port 4	Steady Green	Connection with LP
		Blinking Green	RX/TX activity indicator
LINK(3)	Link speed on Port 4	Green	100 Mbps connection
		Amber	1000 Mbps connection
ACT(2)	Port 3 connected to LP Activity on Port 3	Steady Green	Connection with LP
		Blinking Green	RX/TX activity indicator
LINK(2)	Link speed on Port 3	Green	100 Mbps connection
		Amber	1000 Mbps connection
ACT(1)	Port 2 connected to LP Activity on Port 2	Steady Green	Connection with LP
		Blinking Green	RX/TX activity indicator
LINK(1)	Link speed on Port 2	Green	100 Mbps connection
		Amber	1000 Mbps connection
ACT(0)	Port 1 connected to LP Activity on Port 1	Steady Green	Connection with LP
		Blinking Green	RX/TX activity indicator
LINK(0)	Link speed on Port 1	Green	100 Mbps connection
		Amber	1000 Mbps connection

*Link Partner (LP)

Hardware and Software Requirements

Before using the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter , ensure that your system meets the following hardware and software requirements.

TABLE 1-2 Hardware and Software Requirements

Requirements	Hardware or Software
Hardware	Sun Fire X4100, Sun Fire X4200, Sun Fire X4600
Operating System	Solaris 10 11/06 x86 Operating System Rhel4-U4(32/64), Rhel3-U8(64), SuSe9(64), SuSe10(32/64) Win2003/(32/64)

Note – The preceding information is up-to-date at the time this manual was written. Go to <http://www.sun.com/> for the latest information. Subsequent versions of this document have a higher number following the final dash. That is 819-7373-11, becomes 819-7373-12.

Patch Requirements

The Solaris 10 01/07 Operating System does not include the latest driver patch:

- Patch-ID 125121-03

Install the *latest* version of the driver Patch-ID Number for example, the dash number -03 becomes higher with each new version of the patch.

You must install the latest version of the patch from the following web site:

<http://sunsolve.sun.com>

If the patch is not available on SunSolve, contact your local sales or service representative.

Patches and Updates

Check the Sun Update Connection to ensure that you have the latest recommended patch clusters and security patches. You can download the latest recommended patch clusters and security patches at:

<http://sunsolve.sun.com/pub-cgi/show.pl?target=patchpage>

Installing and Setting Up the Device Driver Software

The e1000g device driver software comes bundled with the Solaris 10 11/06 Operating System and later compatible versions. This chapter explains how to verify the e1000g device driver software on Solaris x86 systems and how to install the e1000 driver on Linux and Microsoft Windows systems. This chapter contains the following sections:

- [“Verifying the e1000g Driver on a Solaris x86 Platform” on page 7](#)
- [“Downloading and Installing the Driver on a Linux Platform” on page 8](#)
- [“Setting Up the Driver on a Linux Platform” on page 9](#)
- [“Downloading and Installing the Driver on a Microsoft Windows Platform” on page 13](#)

Verifying the e1000g Driver on a Solaris x86 Platform

If your system uses the Solaris x86 operating system you might want to check the version of the driver and ensure the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter is properly loaded and is recognized by the Solaris x86 Operating System.

▼ To Check the Driver Version on a Solaris x86 Platform

- Check that the version of the e1000g driver is 5.0.14 or later:

```
modinfo | grep e1000g
127 ffffffffefc42000 189f0 8 1 e1000g (Intel PRO/1000 Ethernet 5.0.14)
```

Note – If the version number is 5.0.11, you must install the latest driver patch. See “Patch Requirements” on page 4.

Downloading and Installing the Driver on a Linux Platform

If your system uses the RedHat or SuSe Linux operating system you must download the e1000 device driver to install it.

▼ To Download and Install the Driver on a Linux Platform

1. Login to your system.
2. Download the driver RPM for your operating system:

<http://www.sun.com/download/>

```
sun-pci-e-gigabit-kernel-7.4.27-1.src.rpm
```

3. Use the rpm tool to install the driver on SuSe and RedHat Linux.

```
# rpm -ivh /tmp/RHEL4U4-large/RPMS/x86_64/e1000-1.0-1.x86_64.rpm
Preparing... #####
1:e1000 #####
```

4. Use the `ethtool` command to check the version of the `e1000` driver, for example:

```
# ethtool -i eth4
driver: e1000
version: 7.4.27-NAPI
firmware-version: 4.3-2
bus-info: 0000:83:00.0
```

Setting Up the Driver on a Linux Platform

If your system uses the Linux operating system you will need to perform the following procedure to be sure the `e1000` device driver is properly installed and loaded.

▼ To Set Up the Driver on a Linux Platform

1. Build the `e1000` device driver:

```
# rpmbuild --rebuild sun-pci-e-gigabit-kernel-7.4.27-1.src.rpm
```

After the `rpmbuild`, two files should exist:

```
# ls -al
sun-pci-e-dual-gigabit-kernel-7.4.27-1.i386.rpm
sun-pci-e-dual-gigabit-kernel-ls
```

2. Use the `uname -p` command to discover your architecture.

For example:

```
# cd /usr/src/packages/RPMS/(`uname -p`)
x86_64
```

In this example, the architecture is `x86`. Your architecture might be `i386`, `i586`, or `x86_64`.

Note – Output shown in this procedure are examples *only*. Your output may be different, but it will be similar to the examples.

3. Change to the rpm directory:

- For RedHat, use the following command:

```
# cd /usr/src/redhat/RPMS/i386/  
sun-pci-e-gigabit-kernel-7.4.27-1.i386.rpm  
sun-pci-e-gigabit-kernel-debuginfo-7.4.27-1.i386.rpm
```

- For SuSe, use the following command:

```
# cd /usr/src/packages/RPMS/i586
```

4. Install the e1000 driver rpms.

- For both RedHat and SuSe:

```
rpm -ivh *
```

Reboot the system after running `rpm -ivh *` command to ensure that the `e1000-7.4.27` driver is successfully installed and loaded to the system after the driver installation.

5. Verify the version of the e1000 driver:

```
modinfo e1000 | grep ver  
  
filename:          /lib/modules/2.6.16.21-0.8-  
smp/kernel/drivers/net/e1000/e1000.ko  
description:       Intel(R) PRO/1000 Network Driver  
version:           7.4.27-NAPI  
vermagic:          2.6.16.21-0.8-smp SMP 586 REGPARM gcc-4.1  
srcversion:        1AF927CC4BA42E4CF1D1CEE  
parm:              AutoNeg:Advertised auto-negotiation setting (array  
of int)
```

6. Use the depmod command to register the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter :

```
# depmod
```

7. Load e1000 driver for all instances:

```
# modprobe e1000
```

8. Verify that the driver is loaded.

In the following example, the e1000 driver is shown in ***bold italic***. On your system the driver will be indistinguishable from the other modules.

```
# lsmod
```

Module	Size	Used by
nfs	261833	0
lockd	81905	1 nfs
parport_pc	29569	0
lp	15281	0
parport	47437	2 parport_pc,lp
autofs4	29129	2
i2c_dev	14145	0
i2c_core	27841	1 i2c_dev
sunrpc	199993	3 nfs,lockd
ds	20681	0
yenta_socket	22209	0
pcmcia_core	69585	2 ds,yenta_socket
button	8161	0
battery	10313	0
ac	5833	0
md5	4801	1
ipv6	289313	8
joydev	11073	0
ohci_hcd	26193	0
ehci_hcd	36805	0
<i>e1000</i>	<i>122220</i>	<i>0</i>
forcedeth	23105	0
tg3	100165	0
dm_snapshot	17705	0
dm_zero	2753	0
dm_mirror	25977	0
ext3	139473	2
jbd	86897	1 ext3
dm_mod	67369	6 dm_snapshot,dm_zero,dm_mirror
sata_nv	10949	2
libata	53769	1 sata_nv
sd_mod	19265	3
scsi_mod	150577	2 libata,sd_mod

9. Run the `dmesg` command to see which devices the `e1000` driver was mapped to:

```
# dmesg
divert: allocating divert_blk for eth6
e1000: eth3: e1000_probe: Intel(R) PRO/1000 Network Connection
e1000: eth2: e1000_watchdog: NIC Link is Up 1000 Mbps Full Duplex
e1000: eth3: e1000_watchdog: NIC Link is Up 1000 Mbps Full Duplex
```

10. Use the `ethtool` command to check the parameter configuration for a specific port.

For example:

```
# ethtool eth6
Settings for eth6:
    Supported ports: [ TP ]
    Supported link modes:   10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
                           1000baseT/Full
    Supports auto-negotiation: Yes
    Advertised link modes:  10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
                           1000baseT/Full
    Advertised auto-negotiation: Yes
    Speed: 1000Mb/s
    Duplex: Full
    Port: Twisted Pair
    PHYAD: 1
    Transceiver: internal
    Auto-negotiation: on
    Supports Wake-on: umbg
    Wake-on: d
    Current message level: 0x00000007 (7)
    Link detected: yes
```

▼ To Remove the Driver From a Linux Platform

- To remove the driver packages from a Linux Platform use the `rpm -e` command:

```
# rpm -e sun-pci-e-gigabit-kernel-7.4.27-1
```

Downloading and Installing the Driver on a Microsoft Windows Platform

If your system uses the Microsoft Windows Server 2003 you must download and install the e1000 device driver to install it.

▼ To Download and Install the Driver on a Windows Platform

1. Login to your system.

2. Download the driver from one of the following web site:

http://downloadcenter.intel.com/Product_Filter.aspx?ProductID=2255&lang=eng

3. Click on the following exe files to install the driver:

- For Win2003(32bits)

PRO2KXP.exe

- For Win2003(64bits)

PROEM64T.exe

4. Follow the instructions in the install wizard.

5. If the Found New Hardware Wizard screen is displayed, click Cancel.

The autorun automatically runs after you have extracted the files.

▼ To Remove the Driver From a Microsoft Windows Platform

1. From the Control Panel, double-click Add/Remove Programs.

2. Select Intel® PRO Network Connections Drivers.

3. Click Add/Remove.

4. When the confirmation dialog displays, click OK

Installing the Adapter

This chapter describes how to install the adapter in your system and verify that the adapter is properly loaded and is recognized by the operating system.

This chapter contains the following section:

- [“Installing the Adapter in a System” on page 15](#)

Installing the Adapter in a System

The following instructions describe the basic tasks required to install the adapter. Refer to your system installation or service manual for detailed PCI-Express adapter installation instructions.

▼ To Install the Adapter

1. Halt and power off your system.
2. Power off all of the peripherals connected to your system.
3. Open the system unit.
4. Attach the adhesive copper strip of the antistatic wrist strap to the metal casing of the power supply. Wrap the other end twice around your wrist, with the adhesive side against your skin.
5. Holding the adapter by the edges, align the adapter edge connector with the PCI-E slot.
6. Slide the adapter face plate into the small slot at the end of the PCI-E opening.

7. Applying even pressure at both corners of the adapter, push the PCI-E adapter until it is firmly seated in the slot.



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

8. Detach the wrist strap and close the system unit.
9. Connect the cables.
10. Power on the system.

Verifying the Installation

After you have installed the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter , perform the following tasks to verify the installation.

▼ To Verify the Installation on Solaris x86 Systems

1. Power on the system.
2. Check the driver version on your system.

```
ok modinfo|grep e1000g
127 ffffffffefc42000 189f0 8 1 e1000g (Intel PRO/1000 Ethernet 5.0.14)
```

3. Check to see if the adapter is properly installed and recognized by the OS:

```
grep e1000g /etc/path_to_inst
```

If the adapter is properly installed, you will see output similar to the following:

```
"/pci@7b,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@2/pci108e,11bc@0" 0
"e1000g"
"/pci@7b,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@2/pci108e,11bc@0,1" 1
"e1000g"
"/pci@7b,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@4/pci108e,11bc@0" 2
"e1000g"
"/pci@7b,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@4/pci108e,11bc@0,1" 3
"e1000g"
```

▼ To Verify the Installation in a Linux System

- Verify the new network interface instances corresponding to the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter :

```
# ifconfig -a | grep eth

eth6      Link encap:Ethernet  HWaddr 00:15:17:2C:9D:D5
eth7      Link encap:Ethernet  HWaddr 00:15:17:2C:9D:D4
eth8      Link encap:Ethernet  HWaddr 00:15:17:2C:9D:D7
eth9      Link encap:Ethernet  HWaddr 00:15:17:2C:9D:D6
```

▼ To Verify the Installation in a Microsoft Windows System

1. Click on Control Panel.
2. Click on Network Connection
3. The adapter interfaces labeled as Intel® PRO/1000 PT Quad Port LP Server Adapter # will show up at the Network Connection window screen, if the driver is installed successfully.
4. To check the driver version, use the Administration Tool.
5. In the Administration Tool click on Computer Management, Device Manager, and Network Adapter.

Network Configuration

This chapter describes how to edit the network host files after the adapter has been installed on your system. This chapter contains the following sections:

- [“Configuring the Network Host Files for Solaris x86 Systems” on page 19](#)
- [“Booting Over the Gigabit Ethernet Network for Solaris x86 and Linux Systems” on page 21](#)

Note – To do PXE boot (or netboot) you *must* use the topmost RJ-45 port. That is the logical Port 0, and has the lowest MAC address.

Configuring the Network Host Files for Solaris x86 Systems

After installing the driver software, you must create a `hostname.e1000gnumber` file for the adapter’s Ethernet interface. You must also create both an IP address and a host name for the adapter’s Ethernet interface in the `/etc/hosts` file.

▼ To Configure the Network Host Files

1. At the command line, use the `grep` command to search the `/etc/path_to_inst` file for `e1000g` interfaces.

```
grep e1000g /etc/path_to_inst
"/pci@0,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@2/pci108e,11bc@0" 12
"e1000g" "/pci@0,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@2/pci108e,11bc@0,1"
13 "e1000g"
"/pci@0,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@4/pci108e,11bc@0" 14
"e1000g" "/pci@0,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@4/pci108e,11bc@0,1"
15 "e1000g"
"/pci@0,0/pci10de,5d@e/pci8086,125e@0" 10 "e1000g"
"/pci@0,0/pci10de,5d@e/pci8086,125e@0,1" 11 "e1000g"
"/pci@78,0/pci1022,7458@10/pci8086,118a@1" 2 "e1000g"
"/pci@78,0/pci1022,7458@10/pci8086,118a@1,1" 3 "e1000g"
"/pci@78,0/pci1022,7458@11/pci8086,1011@1" 4 "e1000g"
"/pci@78,0/pci1022,7458@11/pci8086,1011@1,1" 5 "e1000g"
"/pci@78,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@2/pci108e,11bc@0" 6
"e1000g" "/pci@78,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@2/pci108e,11bc@0,7
"e1000g"
"/pci@78,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@4/pci108e,11bc@0" 8
"e1000g" "/pci@78,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@4/pci108e,11bc@0,9
"e1000g"
"/pci@78,0/pci10de,5d@e/pci108e,115f@0" 0 "e1000g"
"/pci@78,0/pci10de,5d@e/pci108e,115f@0,1" 1 "e1000g"
```

In this example, the device instances are from two Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter s installed. For clarity, the instance number is in ***bold italics***.

Ensure that you write down your device path and instance, for example

"pci@78,0/pci10de,5d@d/pci111d,8018@0/pci111d,8018@2/pci108e,11bc@"

8. Your device path and instance will be similar. You need this information to make changes to the `e1000g.conf` file. See [“Driver Parameters for Solaris x86 Systems” on page 24](#).

2. Use the `ifconfig` command to set up the adapter's `e1000g` interface.

Use the `ifconfig` command to assign an IP address to the network interface. Type the following at the command line, replacing *ip-address* with the adapter's IP address:

```
ifconfig e1000g plumb ip-address up
```

Refer to the `ifconfig(1M)` man page and the Solaris documentation for more information.

- If you want a setup that remains the same after you reboot, create an `/etc/hostname.e1000gnumber` file, where *number* corresponds to the instance number of the `e1000g` interface you plan to use.

Booting Over the Gigabit Ethernet Network for Solaris x86 and Linux Systems

▼ To Boot Over the Network on Solaris x86 and Linux Systems

1. Obtain the MAC address of the first Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter port by checking the label of the adapter.

The Mac address of the first port should be (Mac address from the label + 1).

2. Set up the PXE boot server with the MAC addresses.

3. Use the first adapter port as the boot interface.

Only the first port is enabled for booting over the network.

4. Plug the Ethernet cable to the adapter port.

5. Power on the system.

6. Press the F2 key or the Control-E keys to go to the BIOS.

7. Check and make sure the boot order of the network devices is higher than the hard drive.

8. Press the F10 key to save the boot configuration changes and exit.

The system should reboot after saving the boot configuration.

9. Press the F12 key 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.

```
image : pxe-mac-addr
PXE-E61: Media test failure, check cable
PXE-MOF: Exiting Intel Boot Agent.

NVIDIA Boot Agent 217.0513
Copyright (C) 2001-2005) NVIDIA Corporation
Copyright (C) 1997-2000) NVIDIA Corporation
PXE-E61: Media test failure, check cable
PXE-MOF: Exiting Intel Boot Agent.

NVIDIA Boot Agent 217.0513
Copyright (C) 2001-2005) NVIDIA Corporation
Copyright (C) 1997-2000) NVIDIA Corporation
PXE-E61: Media test failure, check cable
PXE-MOF: Exiting Intel Boot Agent.

Intel (R) Boot Agent GE v1.2.43 Beta-1
Copyright (C) 1997-2006) Intel Corporation

CLIENT MAC ADDR; 00 15 17 13 90 00 GUID: 00000000 0000 0000 0000
00144F26E0B7
```

10. You can now install the e1000 driver and configure the adapter.

11. After the Linux OS install completes, use the BIOS to change the boot device priority to Boot from Hard Disk to boot up the newly installed OS.

Unless the boot device priority is changed, the OS install process will repeat.

Configuring the Driver Parameters

The `e1000g` (Solaris) and `e1000` (Linux and Windows) device driver controls the Sun x4 PCI-Express Quad Gigabit Ethernet interfaces. You can manually set the `e1000g` or `e1000` device driver parameters to customize each device in your system.

This chapter lists the available device driver parameters and describes how you can set these parameters.

- [“Adapter Parameter Overview” on page 23](#)
- [“Driver Parameters for Solaris x86 Systems” on page 24](#)
- [“Driver Parameters for Linux Systems” on page 28](#)
- [“Setting `e1000` Driver Parameters in Linux Systems” on page 29](#)

Adapter Parameter Overview

Each of the four `e1000` channels provides 10BASE-T, 100BASE-T, or 1000BASE-T networking interfaces. The device driver automatically sets the link speed to 10, 100, or 1000 Mbit/sec and conforms to the IEEE 802.3 Ethernet standard. The single MAC/PHY chip provides the PCI-E interface and media access control (MAC) functions.

The `e1000` driver is capable of the following operating speeds and modes:

- 1000 Mbit/sec, full-duplex
- 1000 Mbit/sec, half-duplex (not supported)
- 100 Mbit/sec, full-duplex
- 100 Mbit/sec, half-duplex
- 10 Mbit/sec, full-duplex
- 10 Mbit/sec, half-duplex

Driver Parameters for Solaris x86 Systems

TABLE 5-1 describes the functions of the e1000g driver parameters.

TABLE 5-1 e1000g Driver Parameters

Keyword	Description
AutoNegAdvertised	<p>Valid Range: 0, 1, 2, 3, 4, 8, 12, 32, 47</p> <p>Default Value: 0</p> <p>Determines the speed/duplex options that will be advertised during auto-negotiation.</p> <p>This is a bitmap with the following settings.</p> <p>Bit 7 6 5 4 3 2 1 0</p> <p>Setting: N/A N/A 1000F N/A 100F 100H 10F 10H</p> <p>The values are:</p> <ul style="list-style-type: none">• 1 = 10 Half only AutoNegAdvertised• 2 = 10 Full only AutoNegAdvertised• 3 = 10 Half/Full AutoNegAdvertised• 4 = 100 Half only AutoNegAdvertised• 8 = 100 Full only AutoNegAdvertised• 12 = 100 Half/Full AutoNegAdvertised• 32 = 1000 Full only AutoNegAdvertised• 47 = All speeds AutoNegAdvertised
ForceSpeedDuplex	<p>Valid Range: 1, 2, 3, 4, 7</p> <p>Default Value: 7</p> <p>Specifies the speed and duplex mode for each instance.</p> <p>If you set ForceSpeedDuplex=7,4, e1000g0 is set to autonegotiate and e1000g1 is set to 100 Mbps, full-duplex.</p> <p>The values are:</p> <ul style="list-style-type: none">• 1 = 10 Mbps speed and Half Duplex mode.• 2 = 10 Mbps speed and Full Duplex mode.• 3 = 100 Mbps speed and half Duplex mode.• 4 = 100 Mbps speed and Full Duplex mode.• 7 = Autonegotiate speed and duplex. This is the default

TABLE 5-1 e1000g Driver Parameters (*Continued*)

Keyword	Description
MaxFrameSize	<p>Valid Range: 0, 1, 2, 3 Default Value: 0</p> <p>These are maximum frame limits, not the actual ethernet frame size. Your actual ethernet frame size is determined by protocol stack configuration (Refer to the ndd man pages for more information.)</p> <ul style="list-style-type: none"> • 0 = Normal ethernet frames. • 1 = Maximum 4k size frames. • 2 = Maximum 8k size frames. • 3 = Maximum 9k size frames.
FlowControl	<p>Valid Range: 0, 1, 2, 3, 4 Default Value: 3</p> <p>These are maximum frame limits, not the actual ethernet frame size. Your actual ethernet frame size is determined by protocol stack configuration (Refer to the ndd man pages for more information.)</p> <ul style="list-style-type: none"> • 0 = Flow control is completely disabled • 1 = Rx flow control is enabled • 2 = Tx flow control is enabled. • 3 = Both Rx and TX flow control (symmetric) is enabled. • 4 = No software override. The flow control configuration in the EEPROM is used.
TbiCompatibilityEnable	<p>Valid Range: 0, 1 Default Value: 1</p> <p>Some switches as Cisco 6500/Foundary still operate in TBI mode.</p> <p>This setting will fix the problems seen with odd byte packets. This setting is valid only for 82543GC based copper adapters.</p> <ul style="list-style-type: none"> • 0 turns off the parameter. • 1 turns on the parameter.
SetMasterSlave	<p>Valid Range: 0, 1, 2, 3 Default Value: 0</p> <p>This setting controls the PHY master/slave setting. Manually forcing master or slave can help reduce time to link with some switches (Planex 08TX and IO Data switches). It is best for this setting remain at the hardware default.</p> <ul style="list-style-type: none"> • 0 sets to hardware default • 1 forces master • 2 forces slave • 3 forces auto

You can view the driver parameter settings by using the e1000g.conf file:

```
"@(#)e1000g.conf1.406/03/06 SMI"
ForceSpeedDuplex=7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7;
# This will force Speed and Duplex for following settings for a
# typical instance.
# 1 will set the
# 2 will set the 10 Mbps speed and Full Duplex mode.
# 3 will set the 100 Mbps speed and half Duplex mode.
# 4 will set the 100 Mbps speed and Full Duplex mode.
# 7 will let adapter autonegotiate.

AutoNegAdvertised=0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0;
# This parameter determines the speed/duplex options that will be
# advertised during auto-negotiation. This is a bitmap with the
# following settings.
# Bit      | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0
# Setting  | N/A | N/A | 1000F | N/A | 100F | 100H | 10F | 10H

#

# For example:

# To advertise 10 Half only AutoNegAdvertised    = 1
# To advertise 10 Full only AutoNegAdvertised     = 2
# To advertise 10 Half/Full AutoNegAdvertised     = 3
# To advertise 100 Half only AutoNegAdvertised    = 4
# To advertise 100 Full only AutoNegAdvertised    = 8
# To advertise 100 Half/Full AutoNegAdvertised    = 12
# To advertise 1000 Full only AutoNegAdvertised   = 32
# To advertise all speeds AutoNegAdvertised       = 47

MaxFrameSize=0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0;
# 0 is for normal ethernet frames.
# 1 is for upto 4k size frames.
# 2 is for upto 8k size frames.
# 3 is for upto 9k size frames.
# These are maximum frame limits, not the actual ethernet frame
# size. Your actual ethernet frame size would be determined by
# protocol stack configuration (please refer to ndd command man
# pages)
# For Jumbo Frame Support (9k ethernet packet)
# use 3 (upto 9k size frames)

FlowControl=3,3,3,3,3,3,3,3,3,3,3,3,3,3,3,3;
```

```

# 0: Flow control is completely disabled
# 1: Rx flow control is enabled (we can receive pause frames
#    but not send pause frames).
# 2: Tx flow control is enabled (we can send pause frames
#    but we do not receiving pause frames).
# 3: Both Rx and TX flow control (symmetric) is enabled.
# 4: No software override. The flow control configuration
#    in the EEPROM is used.

TbiCompatibilityEnable=1,1,1,1,1,1,1,1,1,1,1,1,1,1,1;
# 1 turns it on and 0 turns it off.
# Some switches as Cisco 6500/Foundary still operate in TBI mode.
# This setting will fix the problems seen with odd byte packets.
# This setting is valid only for 82543GC based copper adapters.

SetMasterSlave=0,0,0,0,0,0,0,0,0,0,0,0,0,0,0;
# 0 sets to hardware default
# 1 forces master
# 2 forces slave
# 3 forces auto
# This setting controls the PHY master/slave setting. Manually
forcing master or slave can help reduce time to link with some
switches# (Planex 08TX and IO Data switches). It is recommended
that this # setting remain at the hardware default.

```

Driver Parameters for Linux Systems

TABLE 5-2 lists the tunable e1000 driver parameters for Linux operating systems, and describes their function.

TABLE 5-2 Tunable e1000 Driver Parameters for Linux Operating Systems

Keyword	Description
FlowControl	<p>Valid range: 0-3 (0=none, 1=Rx only, 2=Tx only, 3=Rx&Tx)</p> <p>Default value: Read from the EEPROM</p> <p>If EEPROM is not detected, default is 3.</p> <p>This parameter controls the automatic generation (Tx) and response (Rx) to Ethernet PAUSE frames.</p>
RxDescriptors	<p>Valid range: 80-4096</p> <p>Default value: 256</p> <p>This value is the number of receive descriptors allocated by the driver. Increasing this value allows the driver to buffer more incoming packets. Each descriptor is 16 bytes. A receive buffer is also allocated for each descriptor and can be either 2048, 4056, 8192, or 16384 bytes, depending on the MTU setting. When the MTU size is 1500 or less, the receive buffer size is 2048 bytes. When the MTU is greater than 1500 the receive buffer size will be either 4056, 8192, or 16384 bytes. The maximum MTU size is 16114.</p>
RxIntDelay	<p>Valid range: 0-65535 (0=off)</p> <p>Default value: 128</p> <p>This value delays the generation of receive interrupts in units of 0.8192 microseconds. Receive interrupt reduction can improve CPU efficiency if properly tuned for specific network traffic. Increasing this value adds extra latency to frame reception and can end up decreasing the throughput of TCP traffic. If the system is reporting dropped receives, this value might be set too high, causing the driver to run out of available receive descriptors.</p>
TxDescriptors	<p>Valid range: 80-4096</p> <p>Default value: 256</p> <p>This value is the number of transmit descriptors allocated by the driver. Increasing this value allows the driver to queue more transmits. Each descriptor is 16 bytes.</p>
XsumRX	<p>Valid range: 0-1</p> <p>Default value: 1</p> <p>A value of 1 indicates that the driver should enable IP checksum offload for received packets (both UDP and TCP) to the adapter hardware.</p>

Setting e1000 Driver Parameters in Linux Systems

In a Linux operating system, the driver parameters can only be set at the time the driver is loaded. If you have already loaded the driver and have not set the parameters at the same time, remove the driver and reinstall it.

- **Use `ethtool` to change operating speeds and modes.**

For example:

```
ethtool -s eth14 speed 1000 duplex full autoneg on
ethtool -s eth15 speed 100 duplex full autoneg on
ethtool -s eth16 speed 100 duplex half autoneg on
ethtool -s eth17 speed 10 duplex full autoneg on
```

▼ To Configure Jumbo Frames

- **Use the `ifconfig` command to increase MTUs to allow transmission of Jumbo Frames.**

For example:

```
ifconfig eth4 192.1.1.45 mtu 8000 up
ifconfig eth5 194.1.1.45 mtu 4000 up
```


Configuring Link Aggregation

This chapter describes how to configure link aggregation. It contains the following sections:

- [“Overview of Link Aggregation” on page 31](#)
- [“Configuring Link Aggregation in a Solaris Environment” on page 32](#)

Overview of Link Aggregation

Link Aggregation enables one or more network links to be aggregated together to form a link aggregation group. This link aggregation group appears to MAC clients as a regular link. Link aggregation is defined by IEEE 802.3ad and it provides the following benefits:

- Increased bandwidth
- Linearly incremental bandwidth
- Load sharing
- Automatic configuration
- Rapid configuration and reconfiguration
- Deterministic behavior
- Low risk of duplication or misordering
- Support of existing IEEE 802.3ad MAC clients

Configuring Link Aggregation in a Solaris Environment

This section explains how to configure link aggregation in a Solaris environment.

▼ To Configure Link Aggregation in a Solaris Environment

1. **Aggregate e1000g0, e1000g1, e1000g2, and e1000g3 to form an aggregation and a random number as key, for example 33.**

- a. Unplumb the interfaces to be aggregated:

```
# ifconfig down unplumb e1000g0
# ifconfig down unplumb e1000g1
# ifconfig down unplumb e1000g2
# ifconfig down unplumb e1000g3
```

- b. Create a link-aggregation group with key 33 without specifying mode:

```
# dladm create-aggr -d e1000g0 -d e1000g1 -d e1000g2 -d e1000g3 33
```

As the command returns, one line appears in the `/etc/aggregation.conf` file and indicates that the default mode is off, as shown in the following example:

```
# tail -1 /etc/aggregation.conf
# Use is subject to license terms.
#
# ident "@(#)aggregation.conf 1.1 05/09/01 SMI"
#
# DO NOT EDIT OR PARSE THIS FILE!
#
# Use the dladm(1m) command to change the contents of this file.

33      L4      2      e1000g4/0,e1000g5/0 auto      off      short
# dladm show-link aggr33
aggr33      type: non-vlan mtu: 1500      aggregation: key 33
```

2. Plumb up the interface *aggrkey*, which is *aggr33* is this case:

```
# ifconfig aggr33 plumb
# ifconfig aggr33
aggr33: flags=1000842<BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 8
    inet 0.0.0.0 netmask 0
    ether 0:3:ba:d8:9d:e8

# ifconfig aggr33 192.168.1.1/24 broadcast + up

# ifconfig aggr33
aggr33: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 8
    inet 192.168.1.1 netmask ffffffff broadcast 192.168.1.255
    ether 0:3:ba:d8:9d:e8
```

3. Show link aggregation status again.

Now the state should become attached:

```
# dladm show-aggr
key: 33 (0x0021)      policy: L4      address: 0:14:4f:6c:11:8 (auto)
    device      address      speed      duplex  link  state
    e1000g0      0:14:4f:6c:11:8  1000 Mbps  full    up    attached
    e1000g1      0:14:4f:6c:11:9  1000 Mbps  full    up    attached
    e1000g2      0:14:4f:6c:11:a  1000 Mbps  full    up    attached
    e1000g3      0:14:4f:6c:11:b  1000 Mbps  full    up    attached
```

4. Use the `dladm show-aggr -s` command to display statistics:

```
# dladm show-aggr -s
key: 33
    Total      ipackets  rbytes      opackets  obytes      %ipkts      %opkts
    e1000g0      95089      6468278      7          662          25.0        25.0
    e1000g1      95089      6468278      7          662          25.0        25.0
    e1000g2      95089      6468278      7          662          25.0        25.0
    e1000g3      95087      6468142      7          662          25.0        25.0
```

5. Use the `dladm show-aggr -L` command to display LACP specific information:

# dladm show-aggr -L								
key: 33 (0x0021)			policy: L4		address: 0:14:4f:6c:11:8 (auto)			
			LACP mode: off		LACP timer: short			
device	activity	timeout	aggregatable	sync	coll	dist	defaulted	expired
e1000g0	passive	short	yes	no	no	no	no	no
e1000g1	passive	short	yes	no	no	no	no	no
e1000g2	passive	short	yes	no	no	no	no	no
e1000g3	passive	short	yes	no	no	no	no	no

For more information refer to the man pages for `dladm`, `man dladm`.

Configuring VLANs

This chapter describes how to configure VLANs.

This chapter contains the following sections:

- [“VLAN Overview” on page 35](#)
- [“Configuring VLANs” on page 38](#)
- [“Configuring Bonding for Multiple Interfaces” on page 41](#)

Note – If you change any of the VLAN configuration parameters, you must reboot the system before the changes take effect. If you make changes and do not reboot, you might experience configuration problems.

VLAN Overview

With multiple VLANs on an adapter, a server with a single adapter can have a logical presence on multiple IP subnets. By default, 128 VLANs can be defined for each VLAN-aware adapter on your server. However, this number can be increased by changing the system parameters.

If your network does not require multiple VLANs, you can use the default configuration, in which case no further configuration is necessary.

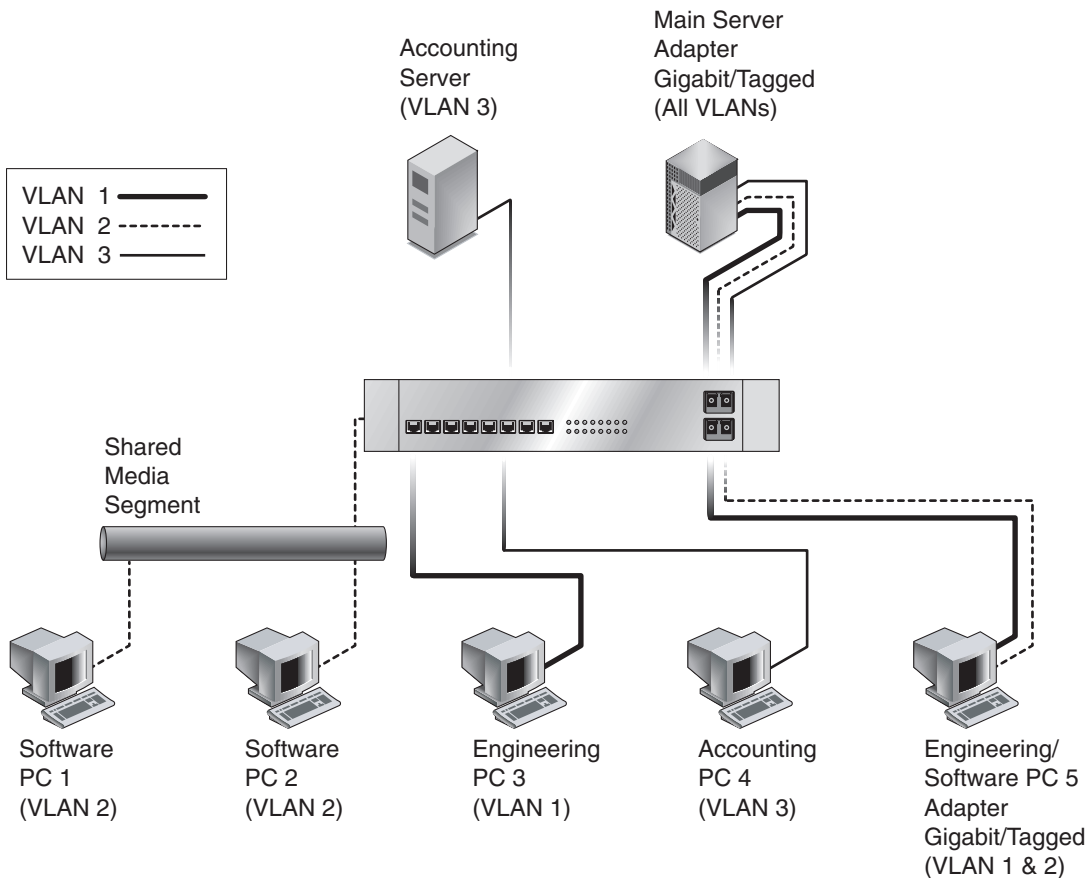
VLANs enable you to split your physical LAN into logical subparts, providing an essential tool for increasing the efficiency and flexibility of your network.

VLANs are commonly used to separate groups of network users into manageable broadcast domains, to create logical segmentation of workgroups, and to enforce security policies among each logical segment. Each defined VLAN behaves as its own separate network, with its traffic and broadcasts isolated from the others, increasing the bandwidth efficiency within each logical group.

Although VLANs are commonly used to create individual broadcast domains or separate IP subnets, it can be useful for a server to have a presence on more than one VLAN simultaneously. Several Sun products support multiple VLANs on a per-port or per-interface basis, allowing very flexible network configurations.

FIGURE 7-1 shows an example network that uses VLANs.

FIGURE 7-1 Example of Servers Supporting Multiple VLANs With Tagging Adapters



The example network has the following features:

The physical LAN network consists of a switch, two servers, and five clients. The LAN is logically organized into three different VLANs, each representing a different IP subnet.

- VLAN 1 is an IP subnet consisting of the Main Server, Client 3, and Client 5. This represents an engineering group.
- VLAN 2 includes the Main Server, Clients 1 and 2 by means of a shared media segment, and Client 5. This is a software development group.
- VLAN 3 includes the Main Server, the Accounting Server, and Client 4. This is an accounting group.

The Main Server is a high-use server that needs to be accessed from all VLANs and IP subnets. The server has a Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter installed. All three IP subnets are accessed by means of the single physical adapter interface. The server is attached to one of the switch's Gigabit Ethernet ports, which is configured for VLANs 1, 2, and 3. Both the adapter and the connected switch port have tagging turned on. Because of the tagging VLAN capabilities of both devices, the server is able to communicate on all three IP subnets in this network, but continues to maintain broadcast separation between all of those subnets. The following list describes the components of this network:

- The Accounting Server is available to only VLAN 3. The Accounting Server is isolated from all traffic on VLANs 1 and 2. The switch port connected to the server has tagging turned off.
- Clients 1 and 2 are attached to a shared media hub that is then connected to the switch. Clients 1 and 2 belong only to VLAN 2, and are logically in the same IP subnet as the Main Server and Client 5. The switch port connected to this segment has tagging turned off.
- Client 3 is a member of VLAN 1, and can communicate only with the Main Server and Client 5. Tagging is not enabled on Client 3's switch port.
- Client 4 is a member of VLAN 3, and can communicate only with the servers. Tagging is not enabled on Client 4's switch port.
- Client 5 is a member of both VLANs 1 and 2, and has a Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter installed. Client 5 is connected to switch port 10. Both the adapter and the switch port are configured for VLANs 1 and 2, and have tagging enabled.

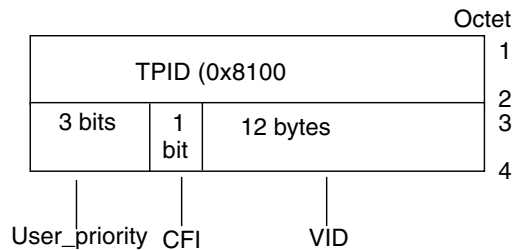
VLAN tagging is only required to be enabled on switch ports that create trunk links to other VLAN-aware Ethernet switches, or on ports connected to tag-capable end-stations, such as servers or workstations with VLAN-aware adapters.

Configuring VLANs

VLANs can be created 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. For each network interface (e1000g0, e1000g1, e1000g2, and so on), 4094 possible VLAN IDs can be selected for each port.

Tagging an Ethernet frame requires the addition of a tag header to the frame. The header is inserted immediately following the destination MAC address and the source MAC address. The tag header consists of two bytes of Ethernet Tag Protocol identifier (TPID, 0x8100) and two bytes of tag control information (TCI). [FIGURE 7-2](#) shows the Ethernet tag header format.

FIGURE 7-2 Ethernet Tag Header Format



By default a single VLAN is configured for every port, which groups all ports into the same broadcast domain, just as if there were no VLANs at all. This means that VLAN tagging for the switch port is turned off.

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

▼ To Configure Static VLANs in the Oracle Solaris x86 Environment

1. **Create one `hostname.e1000gnumber` file for each VLAN that will be configured for each adapter on the server.**

Use the following naming format, which includes both the VID and the physical point of attachment (PPA):

VLAN logical PPA = $1000 * VID + Device PPA$

$123000 = 1000 * 123 + 0$

So the VLAN interface will be `e1000g123000`.

This format limits the maximum number of PPAs (instances) you can configure to 1000 in the `/etc/path_to_inst` file.

For example, on a server with the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter having an instance of 0, belonging to a member of two VLANs, with VID 123 and 224, you would use `e1000g123000` and `e1000g224000`, respectively, as the two VLAN PPAs.

2. **Use the `ifconfig(1M)` to configure a VLAN virtual device, for example:**

```
# ifconfig e1000g123000 plumb up
# ifconfig e1000g224000 plumb up
```

The output of `ifconfig -a` on a system having VLAN devices `e1000g123000` and `e1000g224000`:

```
# ifconfig -a
e1000g224000: flags=201000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4,CoS> mtu 1500
index 5
    inet 0.0.0.0 netmask ff000000
    ether 0:3:ba:d8:d3:a6
e1000g123000: flags=201000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4,CoS> mtu 1500
index 4
    inet 0.0.0.0 netmask ff000000
    ether 0:3:ba:d8:d3:a6
```

3. **On the switch, set VLAN tagging and set VLAN ports to coincide with the VLANs you have set up on the server.**

Using the examples in [Step 2](#), you would set up VLAN ports 123 and 224 on the switch.

Refer to the documentation that came with your switch for specific instructions for setting VLAN tagging and ports.

▼ To Configure VLANs in a Linux Environment

1. Ensure that the e1000g module is loaded:

```
modprobe e1000g
```

2. Plumb the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter interface:

```
ifconfig eth6 xxx.xxx.xx.xxx up
```

where xxx.xxx.xx.xxx = the IP address of the interface.

3. Add the VLAN instance (VID).

For example:

```
vconfig add eth6 5
```

where eth6 is the interface and 5 is the VID.

Note – In Linux system, you can use any single digit as the VID.

4. Configure the e1000 VLAN (eth2 in this example):

```
# ifconfig eth6.5 xxx.xxx.xx.xxx up
```

where xxx.xxx.xx.xxx = the IP address of the interface.

▼ To Configure VLANs in a Microsoft Windows 2003 Environment

1. Click on Control Panel.
2. Click on Network Connection.
3. Click on the folder icon from the sub-manual bar.
4. Right click on the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter port, then select Properties.

5. Click on **Configure**.
6. Click on **VLAN**, then click on **New**.
7. Enter the **VLAN with ID**, for example **Vlan10**
8. Click on **Internet Protocol (TCP/IP)**.
9. Click on **Use the following IP address**.
10. Enter the **IP address**.
11. Click on **Subnet Mask** and **255.255.255.0** will show up.
12. Click on **OK**.
13. Repeat [Step 3](#) through [Step 10](#) until all the network ports are VLAN configured.

Note – Ensure that the firewall is turned off, or VLAN will not work.

Configuring Bonding for Multiple Interfaces

▼ To Configure Bonding for Multiple e1000 Interfaces

1. Use the `modprobe` command to configure the mode:

```
modprobe bonding mode=balance-rr miimon=100 max_bonds=1
```

where:

- `max_bonds` is the number of bond interfaces to be created.
- `mode` specifies the bonding policy. (This example uses `balance-rr`.)

2. Use the `ifconfig` command to create the bond:

```
ifconfig bond0 192.2.2.4 netmask 255.255.255.0 broadcast  
192.2.2.255
```

where:

- bond0 is the bonding device.

3. Configure the bond0 interface.

In this example, bond0 is the master of two slaves:.

```
ifenslave bond0 eth6 eth7 eth8 eth9
ifconfig bond0:1 193.2.2.4 netmask 255.255.255.0 broadcast
193.2.2.255
ifconfig bond0:2 194.2.2.4 netmask 255.255.255.0 broadcast
194.2.2.255
```

Refer to Linux documentation for more information.

▼ To Remove Bonding:

- Use the `rmmmod` command to remove bonding:

```
rmmmod bonding
```

Sun x4 PCI-Express Quad Gigabit Ethernet Specifications

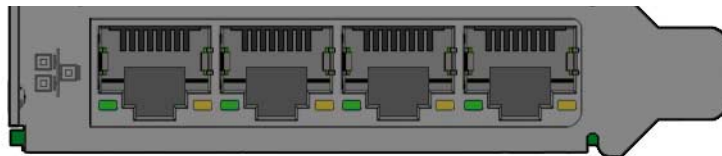
This appendix lists the specifications for the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter from Oracle. This appendix contains the following sections:

- [“Connectors” on page 43](#)
 - [“Performance Specifications” on page 45](#)
 - [“Physical Characteristics” on page 45](#)
 - [“Power Requirements” on page 46](#)
-

Connectors

[FIGURE A-1](#) shows the connectors for the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter .

FIGURE A-1 Sun PCI-Express x4 Quad Gigabit Ethernet UTP Low-Profile Adapter Connector



[TABLE A-1](#) lists the characteristics of the Cat-5 connector used by the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low-Profile adapter.

TABLE A-1 Cat-5 Connect or Link Characteristics

Description	Distance
Operating range	Up 100 meters

TABLE A-2 lists the characteristics of the connector used by the Sun x4 PCI-Express Quad Gigabit Ethernet UTP Low Profile adapter .

TABLE A-2 Ethernet Connector Link Characteristics

Description	Distance
Operating range	Up to 100 meters

Performance Specifications

TABLE A-3 Performance Specifications

Feature	Specification
Bus type	PCI-Express 1.0a
Bus width	x4 lane PCI-Express, operable in x4, x8, x16 slots
Bus speed (x4, encoded rate)	10 Gbit/sec uni-directional; 20 Gbit/sec bidirectional
1 Gbit/sec, 850 nm (MMF)	1000 Mbit/sec (full-duplex)
1 Gbit/sec (UTP)	10/100/1000 Mbit/sec (half-duplex or full-duplex)

Physical Characteristics

TABLE A-4 Physical Characteristics

Dimension	Measurement
Length	5.1 inches (12.95 cm)
Width	2.7126 inches (6.89 cm)
Height of full-height end bracket	4.725 inches (12.0 cm)
Height of low-profile end bracket	3.118 inches (7.92 cm)

Power Requirements

TABLE A-5 Adapter Power Requirements

Specification	Measurement
Typical power consumption	4.95 W (3.3 V @ 1.5 A)

Index

A

- adapter features, 2
- adapter overview, 2
- assigning an IP address, 21

B

- booting over the network on Linux systems, 21

C

- configuring the network host files, 19
- configuring VLANs, 38
 - in Linux environments, 40
- connectors, 43

D

- driver parameters
 - tunable for Linux OS, 28

E

- editing the network host files, xxiii, 19

H

- hardware
 - components, 1
- hardware and software requirements, 4

I

- ifconfig -a, 39
- ifconfig command, 21
- installing the adapter, 15
- installing the driver

- on Microsoft Windows platforms, 13
- on Linux platforms, 8

J

- Jumbo Frames, 29

L

- LED displays, 3
- link aggregation
 - overview, 31
 - to configure in a Solaris OS, 32
 - to show status, 33
- link speed, 23

N

- networking interfaces, 23

P

- patches
 - recommended patch clusters, 5
 - recommended security, 5
- patches and updates, 5
- power requirements, 46

R

- removing the driver
 - from Linux platforms, 12

S

- setting e1000 driver parameters, 23
- setting up the driver
 - on Linux platforms, 9

- shipping kit contents, 1
- specifications, 43
- Sun x4 PCI-Express Quad Gigabit Ethernet
 - interfaces, 23
- supported operating systems, 3

V

- verify the installation, 16
- virtual device, 39
- VLAN ID, 38
- VLAN naming format, 39