

Sun x4 PCIe Quad Gigabit Ethernet ExpressModule

User's Guide



Part No. 820-3084-11
May 2010, Revision A

Copyright © 2007, 2010, Oracle and/or its affiliates. All rights reserved.

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

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

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

U.S. GOVERNMENT RIGHTS. Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

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

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

AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. UNIX is a registered trademark licensed through X/Open Company, Ltd.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Copyright © 2007, 2010, Oracle et/ou ses affiliés. Tous droits réservés.

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

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

Si ce logiciel, ou la documentation qui l'accompagne, est concédé sous licence au Gouvernement des Etats-Unis, ou à toute entité qui délivre la licence de ce logiciel ou l'utilise pour le compte du Gouvernement des Etats-Unis, la notice suivante s'applique :

U.S. GOVERNMENT RIGHTS. Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

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

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

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

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



Contents

Regulatory Compliance Statements ix

Safety Agency Compliance Statement xi

Declaration of Conformity xxiii

Preface xxv

- 1. Sun x4 PCIe Quad Gigabit Ethernet ExpressModule Overview 1-1**
 - 1.1 Shipping Kit Contents 1-1
 - 1.2 Module Hardware Overview 1-1
 - 1.2.1 Module Features 1-2
 - 1.2.2 LED Displays on the Module 1-3
 - 1.2.3 Front Panel LED Displays on the ExpressModule 1-4
 - 1.3 Hardware and Software Requirements 1-5
 - 1.4 Patch Requirements 1-5
 - 1.5 Patches and Updates 1-6
- 2. Installing and Setting Up the Device Driver Software 2-1**
 - 2.1 Verifying the e1000g Driver on a Solaris x86 Platform 2-1
 - ▼ To Check the Driver Version on a Solaris x86 Platform 2
 - 2.2 Downloading and Installing the Driver on a Linux Platform 2-2

	▼ To Download and Install the Driver on a Linux Platform	2
2.3	Setting Up the Driver on a Linux Platform	2–3
	▼ To Set Up the Driver on a Linux Platform	3
	▼ To Remove the Driver From a Linux Platform	6
2.4	Downloading and Installing the Driver on a Microsoft Windows Platform	2–6
	▼ To Download and Install the Driver on a Windows Platform	7
	▼ To Remove the Driver From a Microsoft Windows Platform	8
3.	Installing the Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule	3–1
3.1	Installing the Module in a System	3–1
	▼ To Install the Module	2
3.2	Verifying the Installation	3–4
	▼ To Verify the Installation on Solaris x86 Systems	4
	▼ To Verify the Installation in a Linux System	7
	▼ To Verify the Installation in a Microsoft Windows System	7
4.	Network Configuration	4–1
4.1	Configuring the Network Host Files for Solaris x86 Systems	4–1
	▼ To Configure the Network Host Files	2
4.2	Booting Over the Gigabit Ethernet Network for Solaris x86 and Linux Systems	4–3
	▼ To Boot Over the Network on Solaris x86 and Linux Systems	3
4.3	Installing the Solaris Operating System Over a Gigabit Ethernet Network	4–4
	▼ To Install the Solaris Operating System Over a Gigabit Ethernet Network	5
5.	Configuring the Driver Parameters	5–1
5.1	Module Parameter Overview	5–1
5.2	Driver Parameters for Solaris x86 Systems	5–2

5.3	Driver Parameters for Linux Systems	5-6
5.4	Setting e1000 Driver Parameters in Linux Systems	5-7
	▼ To Configure Jumbo Frames	7
6.	Configuring Link Aggregation	6-1
6.1	Overview of Link Aggregation	6-1
6.2	Configuring Link Aggregation in a Solaris Environment	6-2
	▼ To Configure Link Aggregation in a Solaris Environment	2
7.	Configuring VLANs	7-1
7.1	VLAN Overview	7-1
7.2	Configuring VLANs	7-4
	▼ To Configure Static VLANs in a Solaris x86 Environment	5
	▼ To Configure VLANs in a Linux Environment	6
	▼ To Configure VLANs in a Microsoft Windows 2003 Environment	6
7.3	Configuring Bonding for Multiple Interfaces	7-7
	▼ To Configure Bonding for Multiple e1000 Interfaces	7
	▼ To Remove Bonding:	8
A.	Sun x4 PCIe Quad Gigabit Ethernet ExpressModule Specifications	A-1
A.1	Connectors	A-2
A.2	Performance Specifications	A-3
A.3	Physical Characteristics	A-3
A.4	Power Requirements	A-4

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.

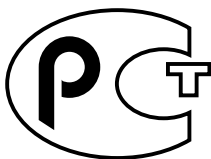
以下声明适用于运往中国且其认证标志上注有 "Class A" 字样的产品。

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。



GOST-R Certification Mark



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. Évitez 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 – Évitez 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.



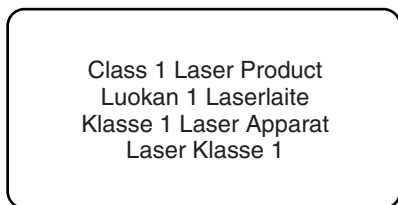
Attention – Pour éviter des températures de fonctionnement extrêmes dans le rack, assurez-vous que la température maximale ne dépasse pas la fourchette de températures ambiantes du produit déterminée par le fabricant.



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.

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

Using This Documentation

The *Sun x4 PCIe Quad Gigabit Ethernet ExpressModule User's Guide* provides installation instructions for both the hardware and software for Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule from Oracle. This document also describes how to configure the driver software for the e1000g driver for 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 ExpressModule 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 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 ExpressModule .

Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Related Documentation

The documents listed as online are available at:

<http://docs.sun.com/apps/docs/prod/net.inter.crds#hic>

Application	Title	Part Number	Format	Location
Release Notes	<i>Sun x4 PCIe Quad Gigabit Ethernet ExpressModule Release Notes</i>	820-3085	PDF HTML	Online
Getting Started	<i>Sun x4 PCIe Quad Gigabit Ethernet Module Getting Started Guide</i>	820-3086	Hardcopy	Ship kit
Safety and compliance	<i>Safety and Compliance Manual</i>	821-1590	PDF HTML	Online

Documentation, Support, and Training

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

Documentation 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 PCIe Quad Gigabit Ethernet ExpressModule User's Guide, part number 820-3084-11.

Sun x4 PCIe Quad Gigabit Ethernet ExpressModule Overview

This chapter describes the Sun x4 PCIe Quad Gigabit Ethernet ExpressModule hardware and software, and includes the following sections:

- [Section 1.1, “Shipping Kit Contents” on page 1-1](#)
- [Section 1.2, “Module Hardware Overview” on page 1-1](#)
- [Section 1.3, “Hardware and Software Requirements” on page 1-5](#)
- [Section 1.4, “Patch Requirements” on page 1-5](#)
- [Section 1.5, “Patches and Updates” on page 1-6](#)

1.1 Shipping Kit Contents

The carton in which your Sun x4 PCIe Quad Gigabit Ethernet ExpressModule was shipped should contain the following items:

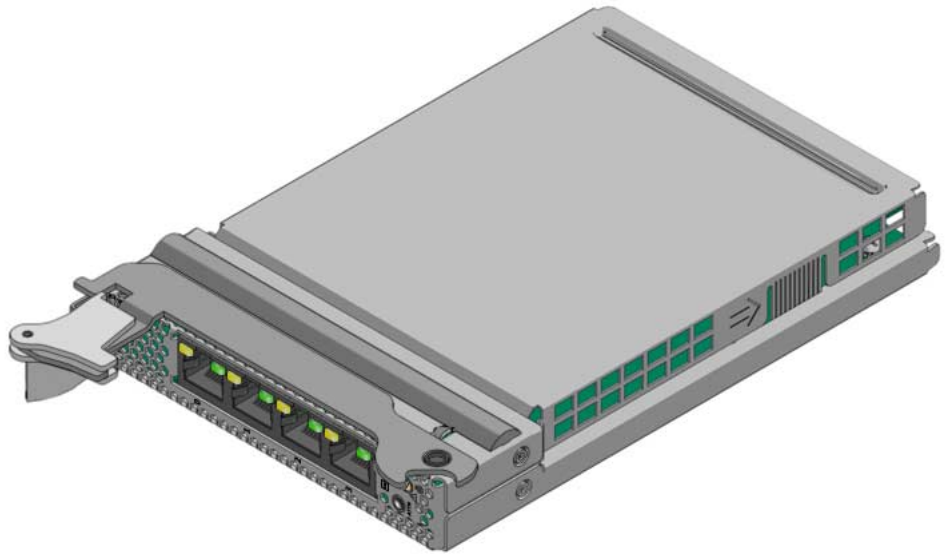
- Sun x4 PCIe Quad Gigabit Ethernet ExpressModule
- *Sun x4 PCIe Quad Gigabit Ethernet Module Getting Started Guide*

1.2 Module Hardware Overview

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

The Sun x4 PCIe Quad Gigabit Ethernet ExpressModule is a four-port gigabit ethernet copper-based x4 PCIe Module. The module 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 PCIe Quad Gigabit Ethernet ExpressModule



1.2.1 Module Features

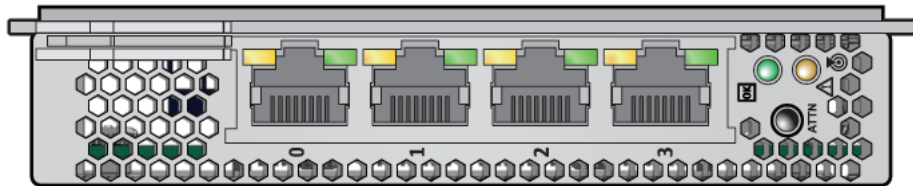
The Sun x4 PCIe Quad Gigabit Ethernet ExpressModule addresses the following requirements, and provides additional features and benefits:

- Provides a high-performance, highly integrated Ethernet LAN module for PCIe systems using x4 PCIe
- 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:
 - Solaris
 - Linux
 - Windows 2003 Server

1.2.2 LED Displays on the Module



FIGURE 1-2 Sun x4 PCIe Quad Gigabit Ethernet ExpressModule Ports



1.2.3 Front Panel LED Displays on the ExpressModule

Two indicators and four sets of LEDs (two for each port) are displayed on the front panel of the Sun x4 PCIe Quad Gigabit Ethernet ExpressModule . [FIGURE 1-2](#) shows the location of the LEDs. [TABLE 1-1](#) describes the meaning of each LED.

TABLE 1-1 Front Panel LEDs for the Sun x4 PCIe Quad Gigabit Ethernet ExpressModule

Label	Meaning if Lit	Color	Description
	Power is OK	Green	Hot plug power OK indicator
	Attention required	Amber	Hot plug ExpressModule attention indicator
ATTN	Attention Switch is a recessed pushbutton	N/A	Hot plug attention switch
LINK 0	Link is up on Port 0	Green	Indicator for GbE
ACT 0	Activity on Port 0	Amber	RX/TX activity indicator
LINK 1	Link is up on Port 1	Green	Indicator for GbE
ACT 1	Activity on Port 1	Amber	RX/TX activity indicator
LINK 2	Link is up on Port 2	Green	Indicator for 1GbE
ACT 2	Activity on Port 2	Amber	RX/TX activity indicator
LINK 3	Link is up on Port 3	Green	Indicator for GbE
ACT 3	Activity on Port 3	Amber	RX/TX activity indicator

1.3 Hardware and Software Requirements

Before using the Sun x4 PCIe Quad Gigabit Ethernet ExpressModule , ensure that your system meets the following hardware and software requirements.

TABLE 1-2 Hardware and Software Requirements

Requirements	Hardware or Software
Hardware	Sun Blade X8420, Sun Blade X6250, Sun Blade X6220, Sun Blade T6300, Sun Blade T6320
Operating System	Oracle Solaris 10/u4 Operating System, or later Rhel4-U5/(64), Rhel5/(64), SuSe10(64) Win2003 Server 32bit and 64bit

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.

1.4 Patch Requirements

The Solaris 10/u4 Operating System does not include the latest driver patch:

- Patch-ID 128029-03, or later

Install the latest version of the driver Patch-ID Number for example, the dash number -03 increases with each new release 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.

1.5 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:

- [Section 2.1, “Verifying the e1000g Driver on a Solaris x86 Platform” on page 2-1](#)
- [Section 2.2, “Downloading and Installing the Driver on a Linux Platform” on page 2-2](#)
- [Section 2.3, “Setting Up the Driver on a Linux Platform” on page 2-3](#)
- [Section 2.4, “Downloading and Installing the Driver on a Microsoft Windows Platform” on page 2-6](#)

2.1 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 ExpressModule 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 5.1.10 or later:

```
modinfo | grep e1000g
140 7b6dc000 234e0 84 1 e1000g (Intel PRO/1000 Ethernet 5.1.10)
```

Note – If the version number is less than 5.1.10, you must install the latest driver patch. See [Section 1.4, “Patch Requirements”](#) on page 1-5.

2.2 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 eth25
driver: e1000
version: 7.6.5.1-NAPI
firmware-version: 5.10-2
bus-info: 0000:06:00.1
```

2.3 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-7.6.5.1-1.src.rpm
```

After the `rpmbuild`, two files should exist:

```
# ls -al
sun-pci-e-dual-gigabit-kernel-7.6.5.1-1.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-7.6.5.1-1.i386.rpm  
sun-pci-e-gigabit-kernel-debuginfo-7.6.5.1-1.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 e1000-7.6.5.1 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:        7.6.5.1-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 ExpressModule :

```
# 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
e1000                 122220  0
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-7.6.5.1-1
```

2.4 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 Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule

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

This chapter contains the following section:

- [Section 3.1, “Installing the Module in a System” on page 3-1](#)
- [Section 3.2, “Verifying the Installation” on page 3-4](#)

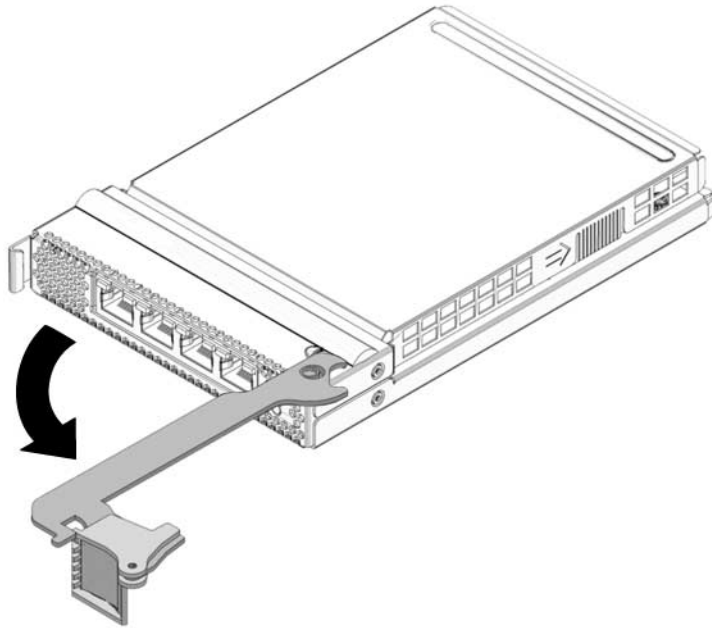
3.1 Installing the Module in a System

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

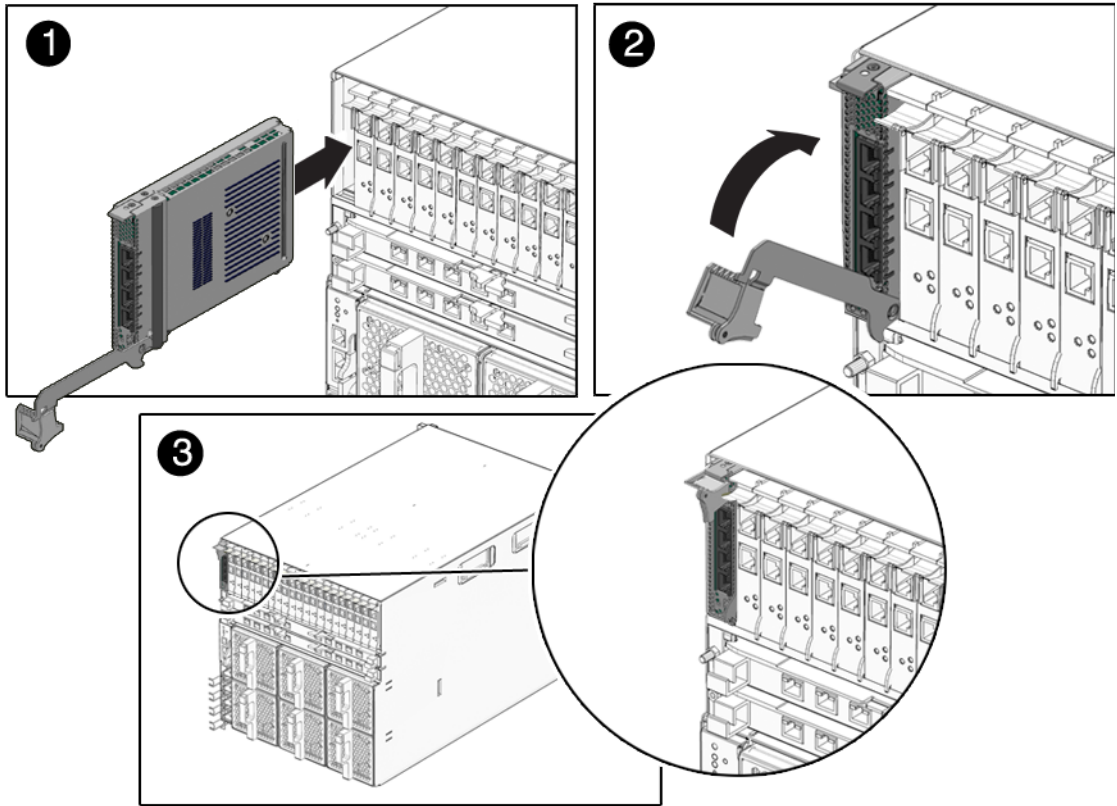
Note – To maintain proper cooling for the module in your chassis, all module slots must be filled with either operating modules or filler panels.

▼ To Install the Module

1. Halt and power off your system.
2. Power off all peripherals connected to your system.
3. 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.
4. Remove the filler panel from the module opening.



5. Open the latch on the module.



6. Align the module with the vacant module slot (1).

Ensure that the module's indicator lights on the front panel are facing toward you and that the module ejector lever on the bottom is fully opened.

7. Slide the module into the vacant module chassis slot until the ejector lever engages and starts to close (2).

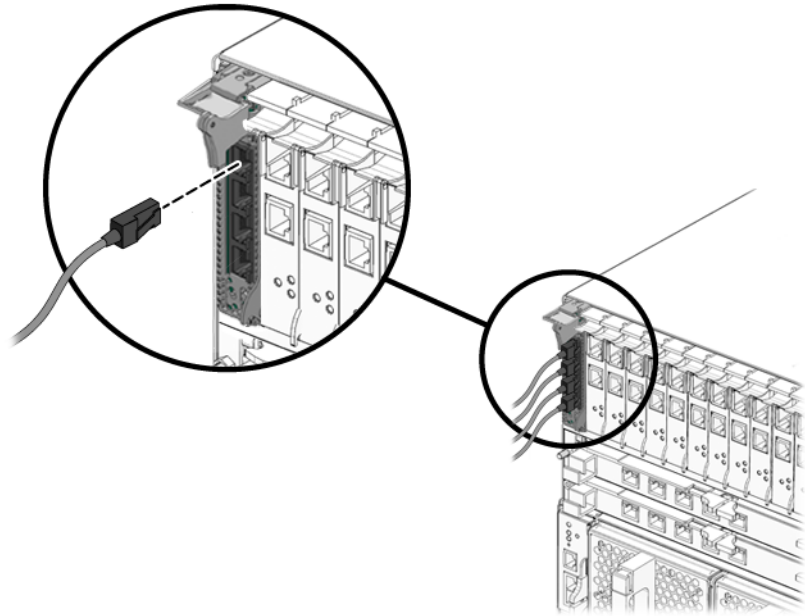
Failure to align the module correctly can result in damage with the module's internal connection to the chassis midplane.

8. Complete the installation by closing the ejector lever until the latch snaps into place (3).



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

9. Detach the wrist strap.



10. Connect the Ethernet cables.

3.2 Verifying the Installation

After you have installed the module, but *before* you boot your system, perform the following tasks to verify the installation. Refer to the your Solaris documentation for detailed instructions.

▼ To Verify the Installation on Solaris x86 Systems

1. Power on the system, and when the banner appears, press the Stop-A key sequence to interrupt the boot process and display the OpenBoot (ok) prompt.

2. List the network devices on your system.

```
{17} ok show-nets
a) /pci@7c0/pci@0/pci@9/pci@0/pci@4/network@0,1
b) /pci@7c0/pci@0/pci@9/pci@0/pci@4/network@0
c) /pci@7c0/pci@0/pci@9/pci@0/pci@2/network@0,1
d) /pci@7c0/pci@0/pci@9/pci@0/pci@2/network@0
e) /pci@780/pci@0/pci@9/pci@0/pci@4/network@0,1
f) /pci@780/pci@0/pci@9/pci@0/pci@4/network@0
g) /pci@780/pci@0/pci@9/pci@0/pci@2/network@0,1
h) /pci@780/pci@0/pci@9/pci@0/pci@2/network@0

{17} ok cd /pci@7c0/pci@0/pci@9/pci@0/pci@4/network@0,1
```

Checking the `.properties` output for each device is the surest way to identify the device. Since the Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule has four ports, the `show-nets` command displays four lines for the ExpressModule, usually `/pci@7c0/pci@0/pci@8` or `/pci@7c0/pci@0/pci@9` correspond to PCIe slots, so look at those devices first.

```
a) /pci@7c0/pci@0/pci@9/pci@0/pci@4/network@0,1
b) /pci@7c0/pci@0/pci@9/pci@0/pci@4/network@0
c) /pci@7c0/pci@0/pci@9/pci@0/pci@2/network@0,1
d) /pci@7c0/pci@0/pci@9/pci@0/pci@2/network@0
```

Note – If you do not see the device listed, check that the ExpressModule is properly seated. If necessary, reinstall the ExpressModule.

3. View the device that you installed.

Using the previous example, type:

```
ok cd /pci@7c0/pci@0/pci@9/pci@0/pci@4/network@0
```

4. View the .properties file for a list of device properties.

The .properties command displays the specific information about the installed ExpressModule. For this ExpressModule, your output will be similar to the following:

```
(17) ok .properties
assigned-addresses      827b0110 00000000 23960000 00000000 00020000
                        827b0114 00000000 23980000 00000000 00020000
                        817b0118 00000000 04002020 00000000 00000020
                        827b0130 00000000 239a0000 00000000 00020000
phy-type                mif
board-model             375-3498
version                 Sun 4x Quad Gigabit Ethernet Express Module FCo
de 1.2 07/01/31
model                  SUNW,pcie-qge-em
compatible              pciex8086,10d5.108e.f1bc.6
                        pciex8086,10d5.108e.f1bc
                        pciex108e,f1bc
                        pciex8086,10d5.6
                        pciex8086,10d5
                        pciexclass,020000
                        pciexclass,0200
reg                    007b0100 00000000 00000000 00000000 00000000
                        027b0110 00000000 00000000 00000000 00020000
                        027b0130 00000000 00000000 00000000 00020000
max-frame-size          00010000
address-bits            00000030
device_type            network
name                   network
local-mac-address       00 1b 21 06 57 d7
fcode-rom-offset        0000e000
interrupts              00000001
cache-line-size         00000010
class-code              00020000
subsystem-id            0000f1bc
subsystem-vendor-id     0000108e
revision-id             00000006
device-id               000010d5
vendor-id               00008086
```

5. Type the following when you finish looking at the `.properties` values:

```
ok device-end
```

6. Reboot the System

After verifying the ExpressModule installation, use the `boot -r` command to perform a reconfiguration boot on your system by typing the following

```
ok boot -r
```

▼ To Verify the Installation in a Linux System

- Verify the new network interface instances corresponding to the Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule :

```
# 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

The module 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.

3. To check the driver version, use the Administration Tool.

4. 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 Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule has been installed on your system. This chapter also describes how to set up a Gigabit Ethernet network on a diskless client and install the Solaris Operating System over a Gigabit Ethernet network. This chapter contains the following sections:

- [Section 4.1, “Configuring the Network Host Files for Solaris x86 Systems” on page 4-1](#)
- [Section 4.2, “Booting Over the Gigabit Ethernet Network for Solaris x86 and Linux Systems” on page 4-3](#)
- [Section 4.3, “Installing the Solaris Operating System Over a Gigabit Ethernet Network” on page 4-4](#)

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.

4.1 Configuring the Network Host Files for Solaris x86 Systems

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

```
nsn102-49# grep e1000g /etc/path_to_inst
"/pci@780/pci@0/pci@9/pci@0/pci@2/network@0" 2 "e1000g"
"/pci@780/pci@0/pci@9/pci@0/pci@2/network@0,1" 3 "e1000g"
"/pci@780/pci@0/pci@9/pci@0/pci@4/network@0" 4 "e1000g"
"/pci@780/pci@0/pci@9/pci@0/pci@4/network@0,1" 5 "e1000g"
"/pci@7c0/pci@0/pci@9/pci@0/pci@2/network@0" 6 "e1000g"
"/pci@7c0/pci@0/pci@9/pci@0/pci@2/network@0,1" 7 "e1000g"
"/pci@7c0/pci@0/pci@9/pci@0/pci@4/network@0" 8 "e1000g"
"/pci@7c0/pci@0/pci@9/pci@0/pci@4/network@0,1" 9 "e1000g"
```

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

Ensure that you write down your device path and instance, for example `"pci@780/pci@0/pci@9/pci@0/pci@2/network@0,1"` 3. 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 2](#).

2. Use the `ifconfig` command to set up the module’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 module’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.

4.2 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 ExpressModule port by checking the label of the module.**

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 module port as the boot interface.**
Only the first port is enabled for booting over the network.
4. **Plug the Ethernet cable to the module 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 module.

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.

4.3 Installing the Solaris Operating System Over a Gigabit Ethernet Network

The *Solaris Advanced Installation Guide* describes the full procedure for installing the Solaris Operating System over the network. The following procedure assumes that you have created an install server, which contains the image of the Solaris CD, and that you have set up the client system to be installed over the network.

Before you can install the Solaris Operating System on a client system with a Gigabit Ethernet ExpressModule, you must first add the Gigabit Ethernet software packages to the install server. See [Chapter 2](#) for the location of these software packages.

Note – Refer to the *Solaris Advanced Installation Guide* for more information about installing the Solaris Operating System over the network.

▼ To Install the Solaris Operating System Over a Gigabit Ethernet Network

1. Prepare the install server and client system to install the Solaris Operating System over the network.

The *Solaris Advanced Installation Guide* describes how to create the install server and set up the client systems.

Note – If you want to install the client system over a network that is not part of the same subnet, you must also create a boot server. The *Solaris Advanced Installation Guide* describes how to create a boot server.

2. Find the root directory of the client system.

The client system's root directory can be found in the install server's `/etc/bootparams` file. Use the `grep` command to search this file for the root directory.

```
# grep client-name /etc/bootparams
client_name root=server-name:/netinstall/Solaris_10/Tools/Boot
install=server-name:/netinstall boottype=:in rootopts=:rsize=32768
```

In this example, the root directory for the Solaris 10 client is `/netinstall`.

Note – If the root directory is not found in the `/etc/bootparams` file, refer to the *Solaris Advanced Installation Guide* for configuration instructions.

3. Install Solaris on the client system, if it's not already there.

To install Solaris 10/u5 or later on the client system, you need to configure the Solaris jumpstart from the install server, for example from `npweb`:

```
# cd to the Solaris 10 install image directory
# cd /images/solaris/nv/combined.nvs_wos/latest/Solaris_10/Tools
# ./addclient -c npweb-102:/dsg-gate/jumpstart -p
npweb-102:/dsg-gate/jumpstart/sysidcfgs/102/10 nsn102-26 sun4v
```

Note – Perform the following steps on the *client* system.

4. Shut down and halt the client system.

Use the shutdown command to obtain the OpenBoot (ok) prompt.

```
# shutdown -i0 -g0 -y
. . .
(shutdown command messages omitted)
. . .
ok
```

5. At the ok prompt, use the show-nets command to find the device path of the Gigabit Ethernet device.

The show-nets command lists the system devices. You should see the full paths and names of the network devices, similar to the example below.

```
ok show-nets
a) /pci@7c0/pci@0/pci@9/network@0,3
b) /pci@7c0/pci@0/pci@9/network@0,2
c) /pci@7c0/pci@0/pci@9/network@0,1
d) /pci@7c0/pci@0/pci@9/network@0
e) /pci@7c0/pci@0/pci@8/network@0,1
f) /pci@7c0/pci@0/pci@8/network@0
g) /pci@7c0/pci@0/pci@2/network@0,1
h) /pci@7c0/pci@0/pci@2/network@0
i) /pci@780/pci@0/pci@1/network@0,1
j) /pci@780/pci@0/pci@1/network@0
m) MORE SELECTIONS
q) NO SELECTION
Enter Selection, q to quit:
```

6. At the ok prompt, boot the client system using the full device path of the Gigabit Ethernet device.

For example:

```
ok boot /pci@7c0/pci@0/pci@9/network@0 - install
```

7. Proceed with the Solaris Operating System installation.

Refer to the *Solaris Advanced Installation Guide* for more information about installing the Solaris Operating System over the network.

8. Confirm that the network host files have been configured correctly during the Solaris installation.

Although the Solaris software installation creates the client's network configuration files, you might need to edit these files to match your specific networking environment. See [“Configuring the Network Host Files for Solaris x86 Systems” on page 1](#) for more information about editing these files.

9. Show configuration information for all data-links or the specified data-link.

By default, the system is configured to have one data-link for each known network device.

```
# dladm show-dev
e1000g0      link: up      speed: 1000  Mbps      duplex: full
e1000g1      link: down    speed: 0     Mbps      duplex: half
e1000g2      link: down    speed: 0     Mbps      duplex: half
e1000g3      link: down    speed: 0     Mbps      duplex: half
```

10. Verify that

```
modinfo | grep e1000g
140 7b6dc000 234e0 84 1 e1000g (Intel PRO/1000 Ethernet 5.1.10)
```


Configuring the Driver Parameters

The `e1000g` (Solaris) and `e1000` (Linux and Windows) device driver controls the Sun x4 PCIe 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.

- [Section 5.1, “Module Parameter Overview” on page 5-1](#)
- [Section 5.2, “Driver Parameters for Solaris x86 Systems” on page 5-2](#)
- [Section 5.3, “Driver Parameters for Linux Systems” on page 5-6](#)
- [Section 5.4, “Setting `e1000` Driver Parameters in Linux Systems” on page 5-7](#)

5.1 Module 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

5.2 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> <table><tr><td>Bit</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> <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	Bit	7	6	5	4	3	2	1	0
Bit	7	6	5	4	3	2	1	0		
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. 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 module 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;
# 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;
# 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.

```

5.3 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 module hardware.</p>

5.4 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:

- [Section 6.1, “Overview of Link Aggregation” on page 6-1](#)
- [Section 6.2, “Configuring Link Aggregation in a Solaris Environment” on page 6-2](#)

6.1 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

6.2 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      ipackets      rbytes      opackets      obytes      %ipkts      %opkts
    Total      380354      25872976      28      2648
    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:

- [Section 7.1, “VLAN Overview” on page 7-1](#)
- [Section 7.2, “Configuring VLANs” on page 7-4](#)
- [Section 7.3, “Configuring Bonding for Multiple Interfaces” on page 7-7](#)

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.

7.1 VLAN Overview

With multiple VLANs on an module, a server with a single module can have a logical presence on multiple IP subnets. By default, 128 VLANs can be defined for each VLAN-aware module 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.

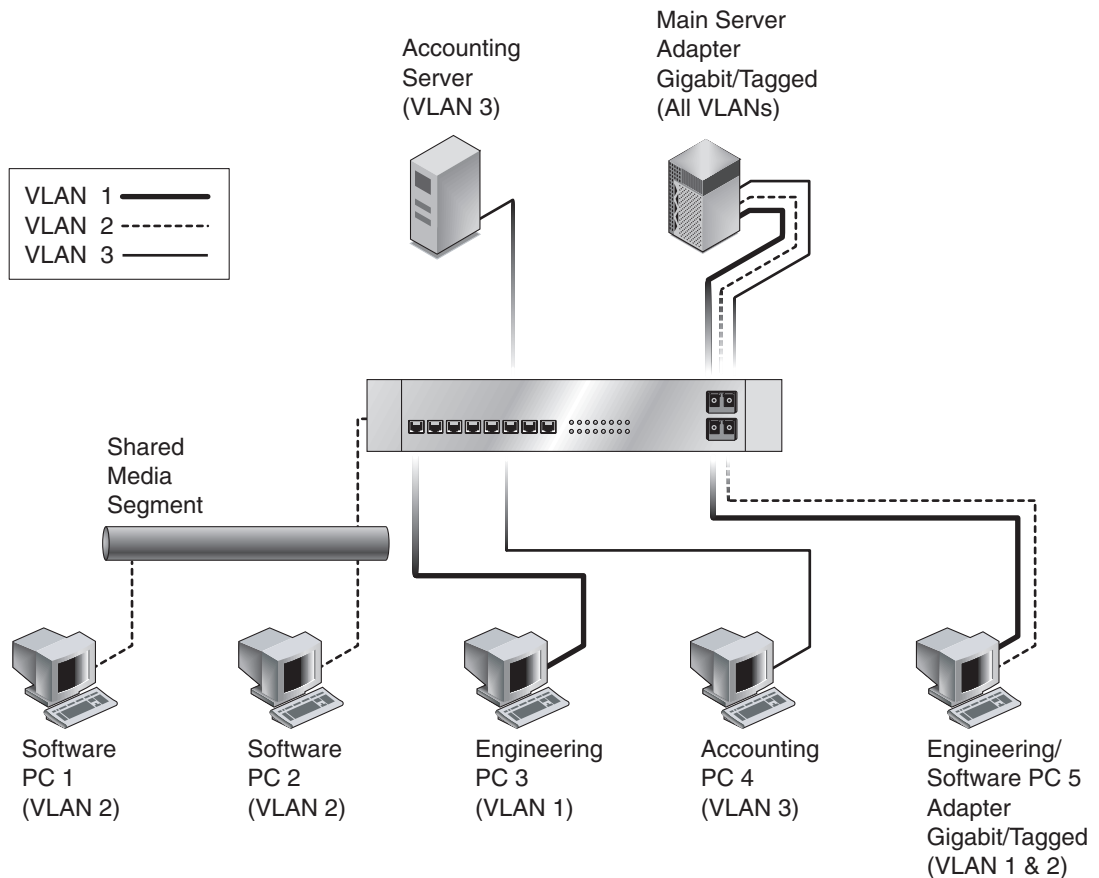
VLANs enable you to split your physical LAN into logical subparts, providing an essential tool for increasing the efficiency and flexibility of your network.

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 Modules



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 ExpressModule installed. All three IP subnets are accessed by means of the single physical module 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 module 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 ExpressModule installed. Client 5 is connected to switch port 10. Both the module and the switch port are configured for VLANs 1 and 2, and have tagging enabled.

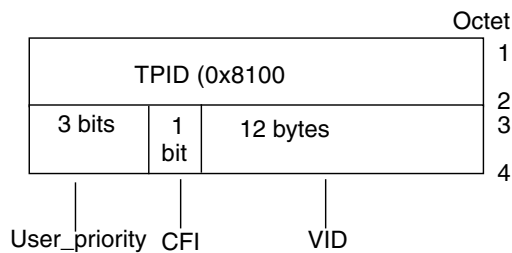
VLAN tagging is only required to be enabled on switch ports that create trunk links to other VLAN-aware Ethernet switches, or on ports connected to tag-capable end-stations, such as servers or workstations with VLAN-aware modules.

7.2 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 module, all traffic sent or received by that module must be in VLAN-tagged format.

▼ To Configure Static VLANs in a Solaris x86 Environment

1. **Create one `hostname.e1000gnumber` file for each VLAN that will be configured for each module 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 ExpressModule having an instance of 0, belonging to a member of two VLANs, with VID 123 and 224, you would use `e1000123000` 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
e1000123000: 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 ExpressModule 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-manuel bar.
4. Right click on the Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule 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.

7.3 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 PCIe Quad Gigabit Ethernet ExpressModule Specifications

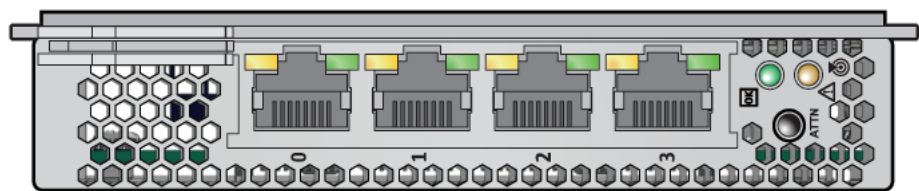
This appendix lists the specifications for the Sun x4 PCIe Quad Gigabit Ethernet ExpressModule . This appendix contains the following sections:

- [Section A.1, “Connectors” on page A-2](#)
- [Section A.2, “Performance Specifications” on page A-3](#)
- [Section A.3, “Physical Characteristics” on page A-3](#)
- [Section A.4, “Power Requirements” on page A-4](#)

A.1 Connectors

FIGURE A-1 shows the connectors for the Sun x4 PCIe Quad Gigabit Ethernet ExpressModule .

FIGURE A-1 Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule Connectors



The green LED indicates the link status and the yellow LED indicates the link activity.

TABLE A-1 lists the characteristics of the connectors used by the Sun x4 PCIe Quad Gigabit Ethernet ExpressModule .

TABLE A-1 Connector Characteristics

Parameter	Description
Connector type	1x4 RJ45
Distance	100 meters

TABLE A-2 lists the characteristics of the Cat-5 connector used by the Sun x4 PCI-Express Quad Gigabit Ethernet ExpressModule.

TABLE A-2 Cat-5 Connect or Link Characteristics

Description	Distance
Operating range	Up 100 meters

TABLE A-3 lists the characteristics of the connector used by the Sun x4 PCIe Quad Gigabit Ethernet ExpressModule .

TABLE A-3 Ethernet Connector Link Characteristics

Description	Distance
Operating range	Up to 100 meters

A.2 Performance Specifications

TABLE A-4 Performance Specifications

Feature	Specification
Bus type	x8 lane PCI Express 1.1
Bus width	x8 lane PCI Express 1.1
Bus speed (x8, encoded rate)	20 Gbit/sec unidirectional; 40 Gbit/sec bidirectional (theoretical)
Maximum Ethernet transfer rate	1 Gbps (full-duplex)

A.3 Physical Characteristics

TABLE A-5 Physical Characteristics

Dimension	Measurement
Length	170 mm (6.69 inches)
Width	21.5 mm (.85 inches)
Height	112 mm (4.41 inches)

A.4 Power Requirements

TABLE A-6 Power Requirements

Specification	Measurement
Power consumption	14.31W RMS typical 17.56 W maximum
Voltage	12V @ 1.460A maximum (1.191A RMS typical) 3.3V @ 0.012A maximum (0.005A RMS typical)

