![Sun microsystems logo]

Sun™ Quad GigaSwift Ethernet PCI-X Adapter Installation and User's Guide

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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.

FCC Class B 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 B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

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.

ICES-003 Class B Notice - Avis NMB-003, Classe B

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

Cet appareil numérique de la classe B 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。

クラス B VCCI 基準について

クラス B VCCI の表示 ⟦VCI⟧ 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 B 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 B 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをしてください。

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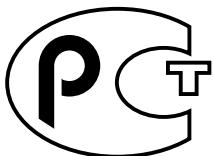
以下声明适用于运往中国且其认证标志上注有 "Class A" 字样的产品。

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 Statements

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

Safety Precautions

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

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

Symbols

The following symbols may appear in this book:

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

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

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

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

On – Applies AC power to the system.

Off – Removes AC power from the system.

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

Modifications to Equipment

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

Placement of a Sun Product

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

Noise Level

In compliance with the requirements defined in DIN 45635 Part 1000, the workplace-dependent noise level of this product is less than 70 db(A).

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 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1

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

Symboles

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

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

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

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

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

Marche – Met le système sous tension alternative.

Arret – Met le système hors tension alternative.

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

Modification du matériel

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

Positionnement d'un produit Sun

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

Niveau de pression acoustique

Le niveau de pression acoustique du lieu de travail définie par la norme DIN 45 635 Part 1000 doit être au maximum de 70 db(A).

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.

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

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:

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

Lautstärke

Gemäß den in DIN 45 635 Teil 1000 definierten Vorschriften beträgt die arbeitsplatzbedingte Lautstärke dieses Produkts weniger als 70 dB(A).

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 ausgewechselt 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.

Nivel de ruido

De conformidad con los requisitos establecidos en el apartado 1000 de la norma DIN 45635, el nivel de ruido en el lugar de trabajo producido por este producto es menor de 70 db(A).

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.

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.

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.

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.

Advertencia sobre el sistema en bastidor

Las advertencias siguientes se aplican a los sistemas montados en bastidor y a los propios bastidores.

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.

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

Compliance Model Number: QGEXPCI
Product Family Name: Sun Quad Gigabit Ethernet PCIX Card (X445A)

EMC

USA—FCC Class A

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

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

European Union

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

EN55022:1998/CISPR22:1997   Class A
EN55024:1998 Required Limits (as applicable):

EN61000-4-2	4 kV (Direct), 8kV (Air)
EN61000-4-3	3 V/m
EN61000-4-4	1 kV AC Power Lines, 0.5 kV Signal and DC Power Lines
EN61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines
EN61000-4-6	3 V
EN61000-4-8	1 A/m
EN61000-4-11	Pass

EN61000-3-2:1995 + A1, A2, A14   Pass
EN61000-3-3:1995   Pass

Safety

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

EC Type Examination Certificates:

EN60950:2000, 3rd Edition	TÜV Rheinland Certificate No. xxxxxxxxxxxx		
IEC 60950:2000, 3rd Edition	CB Scheme Certificate No. xxxxxxxxxxxx		
Evaluated to all CB Countries			
UL 60950, 3rd Edition, CSA C22.2 No. 60950-00	File:	Vol.	Sec.
UL 60950, 3rd Edition, CSA C22.2 No. 950-00	File:	Vol.	Sec.
FDA DHHS Accession Number (Monitors Only)			

Supplementary Information

This product was tested and complies with all the requirements for the CE Mark

/S/
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Preface

The *Sun Quad GigaSwift Ethernet PCI-X Adapter Installation and User's Guide* provides installation instructions for the Sun™ Quad GigaSwift Ethernet adapter. This manual also describes how to configure the driver software.

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

How This Book Is Organized

Chapter 1 provides a description of the adapter, including hardware and software.

Chapter 2 describes how to install the adapter in your system, verify that it is correctly installed, and install the driver software using the automated script.

Chapter 3 describes how to configure files associated with the Sun Quad GigaSwift Ethernet adapter.

Chapter 4 describes how to configure the driver parameters used by the Sun Quad GigaSwift Ethernet PCI-X driver.

Appendix A provides various specifications for the Sun Quad GigaSwift Ethernet PCI-Xadapter.

Appendix B describes how to install the driver software manually.

Appendix C describes how to test the adapter using either the SunVTS™ diagnostic application or the onboard FCode self-test.

Using UNIX Commands

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at:

  `http://docs.sun.com`

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Typographic Conventions

Typeface[*]	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`%` **`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

* The settings on your browser might differ from these settings.

Accessing Sun Documentation

You can view, print, or purchase a broad selection of Sun documentation, including localized versions, at:

`http://www.sun.com/documentation`

Third-Party Web Sites

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Contacting Sun Technical Support

If you have technical questions about this product that are not answered in this document, go to:

`http://www.sun.com/service/contacting`

Sun Welcomes Your Comments

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

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

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

Sun Quad GigaSwift Ethernet PCI-X Adapter Installation and User's Guide, part number 817-7719-10

Product Overview

This chapter contains an overview of the Sun Quad GigaSwift Ethernet adapter adapter, including:

- "Product Description" on page 1
- "Hardware and Software Requirements" on page 2
- "Patch Requirements" on page 3
- "Patches and Updates" on page 4
- "Features" on page 3

Product Description

The Sun Quad GigaSwift Ethernet adapter adapter is a short card with a PCI-X compatible design. The adapter features half and full duplex ports for 10/100 Mbps, and a full duplex port for 1000 Mpbs. Each port has its own unique MAC address.

FIGURE 1-1 and FIGURE 1-2 show views of the adapter.
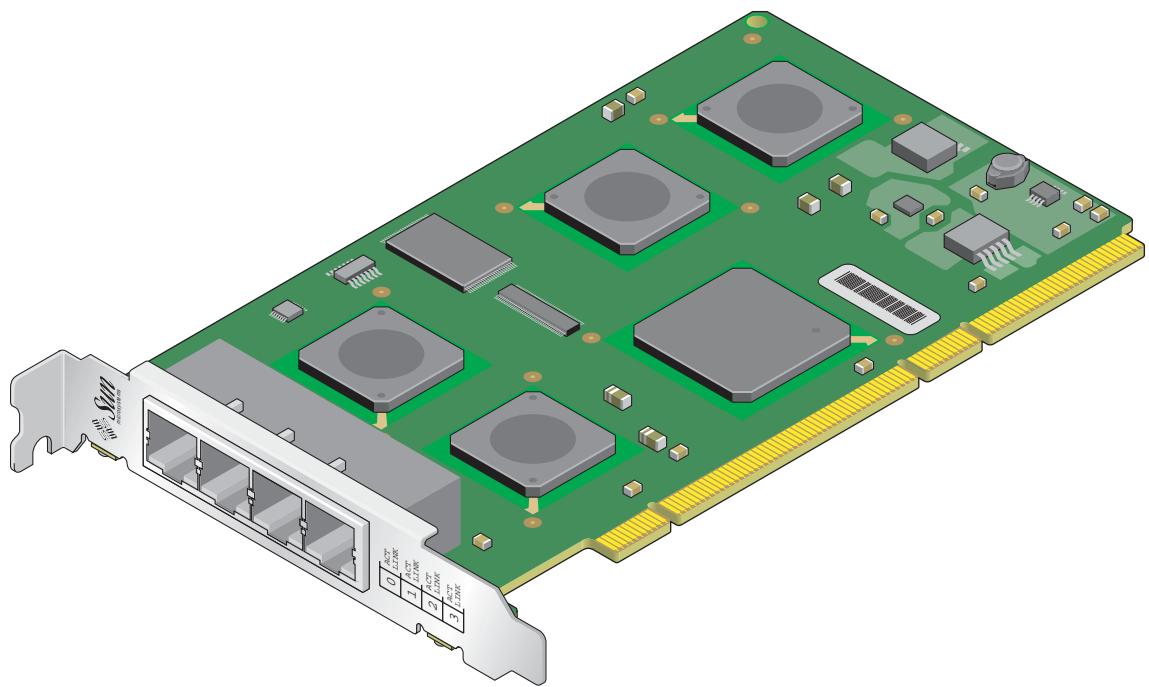
FIGURE 1-1   Sun Quad GigaSwift Ethernet adapter Adapter

Hardware and Software Requirements

Before installing the adapter, make sure your system meets the required hardware and software. TABLE 1-1 lists the supported hardware and software for Sun SPARC® systems.

TABLE 1-1 Hardware and Software Requirements for Sun SPARC Servers

Requirements	Hardware or Software
Hardware	Netra™ 240, Netra 440, Netra 1280, Sun Blade™ 1000, Sun Blade 150, Sun Blade 2000, Sun Blade 2500, Sun Fire™ V210, Sun Fire V240, Sun Fire V250, Sun Fire V440, Sun Fire V440, Sun Fire V490, Sun Fire V890, Sun Fire 20k, Sun Fire 25k, Sun Fire V1280, Sun Fire 2900, Sun Fire 4900, Sun Fire 6900, Sun Ultra 20
Operating System	Solaris 8 SPARC Operating System, Solaris 9, 10, SPARC, and x86 Operating System

Note – The preceeding information is up-to-date as of the printing of this document. Visit Sun on the web at `http://www.sun.com/` for the latest information.
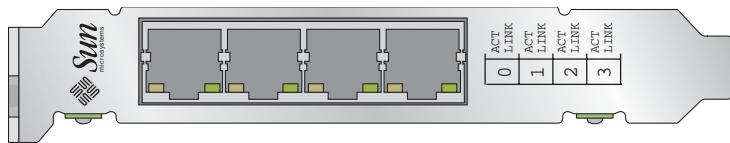
FIGURE 1-2 Sun Quad GigaSwift Ethernet adapter Adapter Ethernet Channels

Patch Requirements

The software driver package provided on the CD-ROM has the following patches preinstalled:
- Solaris 8 SPARC Operating System PatchID Number 111883-31
- Solaris 9 SPARC Operating System PatchID Number 112817-24

- Solaris 9 x86 Operating System PatchID Number 117714-08
- Solaris 10 SPARC Operating System PatchID Number 118777-01
- Solaris 10 x86 Operating System PatchID Number 118778-01

The following driver patch versions were current at the time this document was created:

- PatchID Number 111883-31 for Solaris 8 SPARC Operating System
- PatchID Number 112817-24 for Solaris 9 SPARC Operating System
- PatchID Number 117714-08 for Solaris 9 x86 Operating System
- PatchID Number 118777-01 for Solaris 10 SPARC Operating System
- PatchID Number 118778-01 for Solaris 10 x86 Operating System

Install the *latest* version of the patchID number. For example, the patchID number for the Solaris 9 OS is 112817-24. The dash number -24 becomes higher with each new version of the patch.

If you install Solaris 8 2/02 or any *previous* version of the Solaris Operating System after installing the Sun GigaSwift Ethernet driver software, you must install the latest version of the patch from the following web site:

`http://sunsolve.sun.com`

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

Patches and Updates

Check the Sun Update Connection to ensure that you have the latest recommended Patch Clusters and Security Patches. You can download the latest recommended Patch Clusters and Security Patches from the following web site:

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

Features

The Sun Quad GigaSwift Ethernet adapter adapter addresses the following requirements and provides additional features and benefits:

- Meets short card form factor requirements for platforms such as Sun Fire V1280 and Sun Fire 2900 that require short card.
- Supports PCI and PCI-X interface on Opteron platforms.

- PCI-X -133 compatible.
- Single bridge design reduces the number of bridge chips required, thus shortening bus latency and improving reliability due to fewer components.
- 33/66-MHz, 32- or 64-bit bus master IEEE 802.3x-compatible.
- Supports IPv4 and IPv6 protocols.
- Four ports of IEEE 10BASE-T, 100BASE-TX, 1000BASE-T compliant network interfaces.
- Link integrity and activity LEDs for each channel on the RJ-45 connector
- Supports Trunking 1.3.
- Supports FCode PROM.
- Supports RAS.
- Supports dynamic reconfiguration (DR) and redundancy/failover.
- Supports full flow control support
- Supports jumbo frames up to 9216 bytes, including VLAN Ethernet header and CRC.

Installing the Adapter

This chapter describes how to install the adapter in your system and verify that it has been installed correctly. The chapter then describes how to install the driver software using the automated script.

This chapter contains the following sections:

Note – If you have a Sun Enterprise system that supports dynamic reconfiguration (DR), refer to the *Sun Enterprise Dynamic Reconfiguration User's Guide* and your system's documentation for further information about dynamic reconfiguration.

Installing the Adapter Without Dynamic Reconfiguration

▼ To Install the Adapter

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

1. **Halt and power off your system.**

2. **Power off all of the peripherals connected to your system.**

3. **Open the system unit.**

4. **Attach the antistatic wrist strap to the system and to yourself.**

   Attach the adhesive copper strip of the antistatic wrist strap to the metal casing of the power supply. Wrap the other end twice around your wrist, with the adhesive side against your skin.

5. **Holding the PCI adapter by the edges, unpack it and place it on an antistatic surface.**

6. **Using a No. 1 Phillips screwdriver, remove the PCI filler panel from the slot in which you want to insert the PCI adapter.**

   Save the filler panel screw for Step 9.

7. **Insert the adapter into the PCI slot.**

   Holding the PCI adapter by the edges, align the adapter edge connector with the PCI slot. Slide the adapter face plate into the small slot at the end of the PCI opening.

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

> **Caution –** Do not use excessive force when installing the adapter into the PCI slot. You might damage the adapter's PCI connector. If the adapter does not seat properly when you apply even pressure, remove the adapter and carefully install it again.

9. **Secure the adapter to the PCI slot using the screw you removed in Step 6.**

10. **Detach the wrist strap and close the system unit.**

Connecting the Ethernet Cables

After installing the adapter, attach the Ethernet cables to the four Ethernet ports.

▼ To Connect the Ethernet Cables

1. **Connect one end of the Ethernet cables to the ports on the card.**

2. **Connect the other end of the Ethernet cable to an active Ethernet network.**

3. **Repeat for each Ethernet cable you want to connect.**

Attaching the Adapter to the System

After installing the adapter, you must make the system recognize the new adapter and its Ethernet interfaces.

▼ To Verify the Installation

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

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.**

```
ok show-nets
```

Use the `show-nets` command to list the system devices. You should see the full path name of the `network` devices, similar to the example below.

```
ok show-nets
a) /pci@8,600000/pci@1/network@3
b) /pci@8,600000/pci@1/network@2
c) /pci@8,600000/pci@1/network@1
d) /pci@8,600000/pci@1/network@0
e) /pci@8,700000/network@5,1
q) NO SELECTION
Enter Selection, q to quit: q
```

In the previous example, items a, b, c, and d, are ports on the Sun Quad GigaSwift Ethernet adapter.

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

---

3. **View the device that you installed.**

Using the previous example, type:

```
ok cd /pci@8,600000/pci@1/network@0
```

Ensure that you write down your device path, which in the example is `/pci@9,600000/pci@1/pci@0/network@0`. Your device path will be the same or similar. You need this information to make changes to the `ce.conf` file. See "Setting `ce` Driver Parameters" on page 49.

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

Your output might look different from the following example:

```
ok .properties
assigned-addresses       82010010 00000000 00200000 00000000 00200000
                         82010030 00000000 00100000 00000000 00100000
d-fru-len                00000000
d-fru-off                0000e800
d-fru-dev                eeprom
s-fru-len                00000800
s-fru-off                0000e000
s-fru-dev                eeprom
compatible               pci100b,35.30
                         pci100b,35
                         pciclass,020000
                         pciclass,0200
                         pci108e,abba
reg                      00010000 00000000 00000000 00000000 00000000
                         02010010 00000000 00000000 00000000 00200000
                         02010030 00000000 00000000 00000000 00100000
address-bits             00000030
max-frame-size           00004000
network-interface-type   ethernet
device_type              network
name                     network
local-mac-address        00 03 ba a1 d8 a8
version                  Sun Quad Gigaswift PCI-X adapter FCode 2.13 04/11/09
phy-type                 mif
board-model              501-6738
model                    SUNW,pci-x-qge
fcode-rom-offset         00000000
66mhz-capable
fast-back-to-back
devsel-speed             00000002
class-code               00020000
interrupts               00000001
                         00000002
                         00000003
                         00000004
latency-timer            00000040
cache-line-size          00000010
max-latency              00000040
min-grant                00000040
revision-id              00000030
device-id                00000035
vendor-id                0000100b
```

The assigned value of the `phy-type` is `mif`.

Setting the `local-mac-address?` Variable

Note – Enabling the `local-mac-address?` variable is only required if you boot from the network.

The network interface of the Sun Quad GigaSwift Ethernet adapter has been assigned a unique media access control (MAC) address that represents the 48-bit Ethernet address for that interface. The OpenBoot firmware reports this MAC address via the `local-mac-address?` variable in the device nodes corresponding to the network interface.

A system with a system-wide MAC address does not have to use this assigned MAC address. In such cases, the system-wide MAC address applies to all network interfaces on the system.

The device driver, or any other adapter utility, can use the network device's MAC address (`local-mac-address?`) while configuring the utility. In the Solaris Operating System, you can use the MAC address when booting over the network.

The `mac-address` property of the network device specifies the network address (system-wide or `local-mac-address?`) used for booting the system. To start using the MAC address assigned to the network interface of the Sun Quad GigaSwift Ethernet adapter, set the NVRAM configuration variable `local-mac-address?` to `true`.

```
ok setenv local-mac-address? true
```

▼ To Set the GigaSwift Ethernet Device Primary Boot Device

Use this procedure *only* if you want the GigaSwift Ethernet device to be your primary boot device.

1. **List the network devices on your system:**

```
ok show-nets
a) /pci@8,600000/pci@1/network@3
b) /pci@8,600000/pci@1/network@2
c) /pci@8,600000/pci@1/network@1
d) /pci@8,600000/pci@1/network@0
e) /pci@8,700000/network@5,1
q) NO SELECTION
Enter Selection, q to quit: q
```

2. **Set the Sun Quad GigaSwift Ethernet device to be your default boot device by typing:**

```
ok setenv boot-device /pci@8,600000/pci@1/network@0
```

Note that the correct command has a space rather than an equal sign (=) between
`boot-device` and `/pci@8,600000/pci@1/network@0`.

Rebooting the System

After verifying the adapter installation, use the `boot -r` command to perform a
reconfiguration boot on your system.

```
ok boot -r
```

You can enable verbosity of the boot process with the following command:

```
ok setenv boot -file -v
```

Installing the Adapter With Dynamic Reconfiguration

If you have a Sun Enterprise system that supports dynamic reconfiguration (DR), you do not have to reboot your system after installing the adapter.

The process of adding and configuring an adapter with DR involves connecting the attachment point and configuring its occupant. In most cases, the `cfgadm`(1M) command can perform both steps at once.

▼ To Install an Adapter in a Dynamic Reconfiguration System

1. Verify that the selected board slot is ready for the adapter.

```
# cfgadm

Ap_Id                Type         Receptacle    Occupant      Condition
IO2                  unknown      empty         unconfigured unknown
IO5                  HPCI         disconnected  unconfigured unknown
IO7                  HPCI         disconnected  unconfigured unknown
IO9                  HPCI         connected     configured   ok
IO13                 WPCI         connected     configured   ok
IO14                 HPCI         connected     configured   ok
SB2                  unknown      empty         unconfigured unknown
SB7                  CPU          disconnected  unconfigured unknown
SB9                  CPU          connected     configured   ok
SB13                 CPU          disconnected  unconfigured unknown
SB15                 CPU          connected     configured   ok
SB17                 CPU          disconnected  unconfigured unknown
c0                   fc-private   connected     configured   unknown
c1                   scsi-bus     connected     configured   unknown
c2                   scsi-bus     connected     unconfigured unknown
c3                   fc-private   connected     configured   unknown
c4                   scsi-bus     connected     unconfigured unknown
c5                   scsi-bus     connected     unconfigured unknown
c6                   fc-private   connected     configured   unknown
c7                   fc-private   connected     configured   unknown
c8                   fc-private   connected     configured   unknown
c9                   scsi-bus     connected     unconfigured unknown
pcisch0:e09b1slot1   pci-pci/hp   connected     configured   ok
pcisch1:e09b1slot0   pci-pci/hp   connected     configured   ok
pcisch2:e09b1slot3   pci-pci/hp   connected     configured   ok
pcisch3:e09b1slot2   pci-pci/hp   connected     configured   ok
pcisch4:e14b1slot1   pci-pci/hp   connected     configured   ok
pcisch5:e14b1slot0   pci-pci/hp   connected     configured   ok
pcisch6:e14b1slot3   scsi/hp      connected     configured   ok
pcisch7:e14b1slot2   pci-pci/hp   connected     configured   ok
pcisch8:e13b1slot1   pci-pci/hp   connected     configured   ok
pcisch9:e13b1slot0   pci-pci/hp   connected     configured   ok
```

The states and conditions should be:

```
Receptacle state—Empty
Occupant state—Unconfigured
Condition—Unknown
```

Or:

```
Receptacle state—Disconnected
Occupant state—Unconfigured
Condition—Unknown
```

2. **If the status of the slot is not** empty **or** disconnected, **type:**

```
# cfgadm -c disconnect sysctrl-number:IO-boardslot-number
```

Where:

 sysctrl-number = pcischX and is obtained from Step 1 output

 IO-boardslot-number = available slot number on the IO board for the adapter

For example, if you were installing the adapter into slot number 0 of I/O board 9 on a Sun Fire 15000, you would obtain something like "pcisch1:e09b1slot0" from the Step 1 output. So you would type:

```
# cfgadm -c disconnect pcisch1:e09b1slot0
```

3. **Insert the adapter into the slot and look for an acknowledgement on the console, such as, "***name*** board inserted into slot3."**

After the adapter is inserted, the states and conditions should become:

```
Receptacle state—Disconnected
Occupant state—Unconfigured
Condition—Unknown
```

Any other states or conditions indicate an error.

4. **Connect any peripheral cables and interface modules to the adapter.**

5. **Connect the cables to the card and to an Ethernet network.**

6. **Configure the adapter with the following command:**

```
# cfgadm -v -c configure sysctrl-number:slot-number
```

This command should both connect and configure the receptacle. Verify the condition with the `cfgadm` command.

The states and conditions for a connected and configured attachment point should be:

```
Receptacle state—Connected
Occupant state—Configured
Condition—OK
```

The system is aware of the usable devices that reside on the adapter. All devices can be mounted or configured for use.

If the command fails to connect and configure the adapter and slot, do the connection and configuration as separate steps:

a. **Connect the adapter and slot:**

```
# cfgadm -v -c connect sysctrl-number:slot-number
```

The states and conditions for a connected attachment point should be:

```
Receptacle state—Connected
Occupant state—Unconfigured
Condition—OK
```

The system is aware of the adapter, but not the usable devices that reside on the adapter. The temperature is monitored. Power and cooling affect the attachment point condition.

b. Configure the adapter and slot:

```
# cfgadm -v -c configure sysctrl-number:slot-number
```

The states and conditions for a configured attachment point should be:

```
Receptacle state—Connected
Occupant state—Configured
Condition—OK
```

The system is aware of the usable devices that reside on the adapter. All devices can be mounted or configured for use.

7. Reconfigure the devices on the adapter:

```
# drvconfig; devlinks; disks; ports; tapes;
```

The console should now display a list of devices and their addresses.

Using the Installation Script

The *Sun Quad GigaSwift Ethernet Driver* CD provides automated installation for the Quad GigaSwift Ethernet driver software. In most cases, you can use the following procedure and execute the installation script. If you have any problems, see Appendix B for manual installation procedures.

When you have executed the script, select the interface card that is installed on your system. For this product, select the Quad GigaSwift Ethernet PCI-X Adapter.

The script first checks to ensure that the software driver package has already been installed. If the package is installed, the script verifies the patch level and updates the driver with the updated patch if necessary. If the packages are not installed on Solaris 8 or 9 software, the installation script installs the latest prepatched packages. If the system does not require updating because the patch level is at or beyond the currently installed version, the script exits with an appropriate message.

▼ To Install the Software Using the Installation Script

1. **At the system console, become superuser (root).**

2. **Insert the** *Sun Quad GigaSwift Ethernet Driver CD* **into a CD-ROM drive that is connected to your system.**

   If your system is running Sun Enterprise Volume Manager™, it should automatically mount the CD-ROM to the /cdrom/cdrom0 directory.

   If your system is not running Sun Enterprise Volume Manager, mount the CD-ROM as follows:

   ```
   # mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom
   ```

   Note – If you are installing the software from the download site, follow the online download instructions.

3. **Change to the directory were the installation script resides:**

   ```
   # cd /media_path/
   ```

   Where:

   - *media_path* = /usr/cdrom/cdrom0, if you are installing from the CD-ROM

   Or

   - unzipped *GigaSwift_path*/Sun_Quad_GigaSwift_Ethernet_Driver

4. **Execute the installation script:**

   ```
   # ./install
   ```

   The License Agreement displays.

5. **Answer** ACCEPT **at the end of the agreement to begin the automatic installation.**

   Note – After the installation script runs, you see a summary of the software package or patch that was installed. You can also find a log of the installation in /var/tmp. The log file information is displayed when the installation completes, unless the software meets or exceeds the required package or patch level.

Example 1: All Requirements Met

Following is an example of an installation script output when the driver and patch requirements are met:

```
Copyright 2005 Sun Microsystems, Inc.  All rights reserved.
Use is subject to license terms.

*** Checking for correct version of GigaSwift Ethernet Driver
Packages...
*** Checking for correct version of GigaSwift Ethernet Driver
Patches...

*** Checking for correct version of VLAN Utility Driver Packages..
*** Checking for correct version of VLAN Utility Driver Patches...

The CE/VLAN driver(s) installed on this system for:

        Quad GigaSwift Ethernet PCI-X Adapter Driver

meets or exceeds the required package or patch version. No changes
to the system are required - exiting.
```

Example 2: Updates Required

The following is an example of an installation script output, when the packages are found but patches are required:

CODE EXAMPLE 2-1   Script Output When Packages Require Patches

```
Quad GigaSwift Ethernet PCI-X Adapter Driver for x86 Installation.

Copyright 2005 Sun Microsystems, Inc.  All rights reserved.
Use is subject to license terms.

*** Checking for correct version of GigaSwift Ethernet Driver
Packages...
*** Checking for correct version of GigaSwift Ethernet Driver
Patches...

*** Checking for correct version of VLAN Utility Driver Packages..
*** Checking for correct version of VLAN Utility Driver Patches...

This script is about to take the following actions:
- Install GigaSwift Ethernet Patch: 118778-01.
- Install VLAN Ethernet Utility Patch: 119649-01.
```

CODE EXAMPLE 2-1 Script Output When Packages Require Patches *(Continued)*

```
Press return to continue, or 'Q' followed by a return to quit:

*** Installing patch 118778-01 for Solaris 10...

Checking installed patches...
Verifying sufficient filesystem capacity (dry run method)...
Installing patch packages...

Patch 118778-01 has been successfully installed.
See /var/sadm/patch/118778-01/log for details

Patch packages installed:
  SUNWced
  SUNWcedu

Validating patches...

Loading patches installed on the system...

Done!

Loading patches requested to install.

Done!

Checking patches that you specified for installation.

Done!

Approved patches will be installed in this order:

118778-01

*** Installing patch 119649-01 for Solaris 10...

Checking installed patches...
Verifying sufficient filesystem capacity (dry run method)...
Installing patch packages...

Patch 119649-01 has been successfully installed.
See /var/sadm/patch/119649-01/log for details

Patch packages installed:
  SUNWvld

Validating patches...
```

```
Loading patches installed on the system...

Done!

Loading patches requested to install.

Done!

Checking patches that you specified for installation.

Done!

Approved patches will be installed in this order:

119649-01

Installation completed.

 Quad GigaSwift Ethernet PCI-X Adapter Driver has been updated
using patch
 118778-01. It will be necessary to reboot the system to reload
 the updated driver.

Optional VLAN Utility has been updated using  119649-01. It
 may be necessary to reboot the system to reload the updated
 driver.

A log of this Install can be found at:
    /var/tmp/GigaSwift.install.2005.08.08.1221
```

Example 3: Packages Missing

Following is an example of an installation script output when the package(s) are not found:

CODE EXAMPLE 2-2   Script Output When Packages Are Not Found

```
Quad GigaSwift Ethernet PCI-X Adapter Driver for x86 Installation.

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Use is subject to license terms.
```

CODE EXAMPLE 2-2   Script Output When Packages Are Not Found

```
*** Checking for correct version of GigaSwift Ethernet Driver
Packages...

*** Checking for correct version of VLAN Utility Driver Packages..

The following supporting driver(s) can be used with Quad GigaSwift
Ethernet PCI-X Adapter Driver:

    VLAN Utility Driver software

Install the Optional VLAN Utility Driver Software [y,n,?,q] y

This script is about to take the following actions:
- Install Quad GigaSwift Ethernet PCI-X Adapter Driver packages.
- Optionally Install VLAN Utility Driver Software.

Press return to continue, or 'Q' followed by a return to quit:

*** Installing Sun GigaSwift Ethernet  packages...
Copyright 2004 Sun Microsystems, Inc.  All rights reserved.
Use is subject to license terms.
System configuration files modified but ce driver not loaded or
attached.
chgrp: //dev/ce: No such file or directory

Installation of <SUNWced> was successful.
Copyright 2004 Sun Microsystems, Inc.  All rights reserved.
Use is subject to license terms.

Installation of <SUNWcea> was successful.
Copyright 2004 Sun Microsystems, Inc.  All rights reserved.
Use is subject to license terms.

Installation of <SUNWcedu> was successful.

*** Installing Sun VLAN Utility  packages...
Copyright 2004 Sun Microsystems, Inc.  All rights reserved.
Use is subject to license terms.

Installation of <SUNWvld> was successful.
Copyright 2004 Sun Microsystems, Inc.  All rights reserved.
Use is subject to license terms.

Installation of <SUNWvldu> was successful.

Installation completed.
```

CODE EXAMPLE 2-2 Script Output When Packages Are Not Found

```
 GigaSwift Ethernet Driver packages have been installed.

 Optional VLAN Utility packages have been installed.

A log of this Install can be found at:
    /var/tmp/GigaSwift.install.2005.08.08.1307
```

Configuring Software for the Sun Quad GigaSwift Ethernet PCI-X Adapter

This chapter describes how to configure files associated with the Sun Quad GigaSwift Ethernet adapteradapter. This chapter contains the following sections:

Attaching the Gigabit Ethernet Interfaces to the Network

The adapter's Gigabit Ethernet network interfaces are controlled by the Sun GigaSwift Ethernet ce(1M) device driver. To use the adapter's ce interfaces, you must use the Solaris ifconfig(1M) command to activate the interfaces and to assign them Internet protocol (IP) addresses.

To make the interface changes persist over system reboots, you must create a hostname.ce*instance* file for each Ethernet interface on the adapter that you plan to use. For example, if you plan to use only two of the four Ethernet interfaces on the adapter, you will need to create two hostname.ce*ceinstance* files. You must also add both an IP address and a host name for the new Ethernet interfaces to the /etc/inet/hosts file.

Note – For more information about configuring Solaris networks, refer to the *Solaris System Administration Guide*, volumes 1 through 3. You can view these documents on the http://docs.sun.com web site.

Now check the configuration

```
ifconfig ce0
ce0: flags=1000843<.....> mtu 1500
inet ip-address .......
ether 8:0:20:c4:51:df
ifconfig ce123000
ce123000: flags=1000843<.....> mtu 9194
inet ip-address-vlan-1 ......
ether 8:0:20:c4:51:df
```

▼ To Attach the Gigabit Ethernet Interfaces to the Network

1. **Log in to the server.**

   Refer to your server's documentation for the correct procedure.

2. **At the terminal prompt, use the** `grep` **command to search the**
   `/etc/path_to_inst` **file for** ce **devices.**

```
% grep ce /etc/path_to_inst
"/pci@8,600000/pci@1/network@0" 0 "ce"
"/pci@8,600000/pci@1/network@1" 1 "ce"
"/pci@8,600000/pci@1/network@2" 2 "ce"
"/pci@8,600000/pci@1/network@3" 3 "ce"
```

In the preceding example, the four `network` instances are from a Sun Quad
GigaSwift Ethernet adapteradapter. The `path_to_inst` file contains the full device
path names to the four `network` instances, the instance numbers (shown in bold
type), and the driver names (ce). Refer to the `path_to_inst`(4) man page for more
information about this file.

You need to know the instance numbers when creating the
`/etc/hostname.ce`*instance* files (where *instance* = ce instance number) in Step 3.

Note – Refer to your system's service manual for more information on how the
adapter's device path names correspond to the PCI slot numbers in the system.

---

3. **Create an** `/etc/hostname.ce`*instance* **file for each network interface you plan to
   use.**

For each file, replace *instance* with the instance number you found in Step 2. For
example, if you want to use all of the network interfaces from the example in Step 2,
you must create four files.

File Name	Instance Number	Adapter Ethernet Network Interface
/etc/hostname.ce0	0	0
/etc/hostname.ce1	1	1
/etc/hostname.ce2	2	2
/etc/hostname.ce3	3	3

Follow these rules when creating `/etc/hostname.ce`*instance* files:

- Do not create `/etc/hostname.ce`*instance* files for adapter network interfaces
  you do not plan to use.
- The `/etc/hostname.ce`*instance* file must contain the host name for the
  appropriate network interface.
- The host name must be different from any other host name of any other interface.
  For example: `/etc/hostname.hme0` and `/etc/hostname.ce2` cannot have the
  same host name.

- The `/etc/hosts` file must contain an IP address for the hostname (see Step 4).

Using the instance examples in Step 2, the following example shows the four `/etc/hostname.ce`*instance* files required for a system called `zardoz`, which has a Sun Quad GigaSwift Ethernet adapter (`zardoz-11`, `zardoz-12`, `zardoz-13`, and `zardoz-14`).

```
# cat /etc/hostname.ce0
zardoz-11
# cat /etc/hostname.ce1
zardoz-12
# cat /etc/hostname.ce2
zardoz-13
# cat /etc/hostname.ce3
zardoz-14
```

4. **Create an entry in the** `/etc/inet/hosts` **file for each active** `ce` **network interface.**

   You must create an entry for each `/etc/hostname.ce`*instance* file you created in Step 3.

   Using the examples from Step 3, you would have:

```
# cat /etc/inet/hosts
#
# Internet host table
#
127.0.01local host
129.144.10.57 zardozloghost
129.144.11.57 zardoz-11
129.144.12.57 zardoz-12
129.144.13.57 zardoz-13
129.144.14.57 zardoz-14
```

Refer to the `hosts`(4) man page and the Solaris documentation for more information about this file.

Note – The Internet protocol, version 6 (IPv6), expands the capabilities of IPv4, which is the current and default version. The device driver included in the Solaris Operating System supports both IPv4 and IPv6. IPv4 uses the `/etc/inet/hosts` configuration file, but IPv6 uses different configuration files. To transition to, manage, and implement IPv6, refer to the *Solaris System Administration Guide, Volume 3*.

---

5. **Activate the new** ce **interfaces using the** ifconfig **command.**

   For each adapter interface, type the following at the command line, replacing *instance* with the interface's instance number and *ip-address* with the interface's IP address:

   ```
   # ifconfig ceinstance plumb ip-address up
   ```

   For example, if you wanted to activate all of the sample ce interfaces shown in Step 4, you would type:

   ```
   # ifconfig ce0 plumb 129.144.11.57 up
   # ifconfig ce1 plumb 129.144.12.57 up
   # ifconfig ce2 plumb 129.144.13.57 up
   # ifconfig ce3 plumb 129.144.14.57 up
   ```

Jumbo Frames Capability

The ce driver is capable of accepting jumbo frames. You can enable this capability using the accept-jumbo driver configuration variable. See "Jumbo Frames" on page 48.

With jumbo frames enabled the interface can operate with an ethernet frame size as large as 9216 bytes, which includes the maximum-size Ethernet header for VLAN of 18 bytes and the CRC. Control of the actual MTU the link uses is provided through the ifconfig utility.

Note – Jumbo frames is not supported for 10/100 Mbps environments.

▼ To Enable Jumbo Frames

You can enable jumbo frames in three ways:

● **To set jumbo frames globally on all ce devices, add a line to** ce.conf **file (**accept-jumbo=1**). Note: this enables jumbo frames on** *all* ce **devices.**

- **To set jumbo frames for a specific instance of** `ce`**, add a line into** `ce.conf` **file for that particular instance to be set to** `accept-jumbo`**:**

```
# grep ce /etc/path_to_inst
  "/pci@1f,0/network@a" 0 "ce"
  "/pci@1f,0/network@a" 0 "ce" accept-jumbo=1;
```

- **Use the** `ndd` **command to enable jumbo frames that will not persist when you reboot the system:**

```
# ndd -set /dev/ce instance 0
# ndd -set /dev/ce accept-jumbo 1
```

Note – If you want to use the jumbo frames capability, be sure that jumbo frames is enabled on the link partner. If you are using Sun Trunking 1.3, make sure all members of the trunk have jumbo frames enabled and are using the same MTU.

Managing MTU Using `ifconfig`

The `ifconfig` utility enables you to manage the MTU by lowering it from the maximum value provided by DLPI driver.

The default setting of the MTU as seen by `ifconfig` is defined as the MTU advertised by the driver. For this example, the default setting for the MTU is 9194, and is limited by this value based on `ce` hardware limitation.

Once the `accept-jumbo` property is set to 1, any `ifconfig` on a stream will automatically be set for jumbo frames.

```
ifconfig ce0 plumb ip-address up
ifconfig ce0
ce0: flags=1000843<.....> mtu 9194
inet ip-address netmask ffffff00 broadcast 10.4.127.255
ether 8:0:20:c4:51:df
```

You might want to individually configure the MTU down from the default setting to the regular MTU of Ethernet.

Use the `ifconfig mtu` property to lower the setting:

```
ifconfig ce0 mtu 1500
ifconfig ce0
ce0: flags=1000843<.....> mtu 1500
inet ip-address netmask ffffff00 broadcast 10.4.127.255
ether 8:0:20:c4:51:df
```

The DLPI driver remains in jumbo frames mode, but the upper layer rejects packets greater than 1500.

The following examples illustrate this further.

Example 1

The primary interface is the regular Ethernet MTU, but a network contained in a VLAN with VID 123 would work best with jumbo frames enabled. Set `accept-jumbo` globally.

```
ifconfig ce0 plumb ip-address mtu 1500 up
ifconfig ce123000 plumb ip-address-vlan-1 up
```

Check the configuration.

```
ifconfig ce0
ce0: flags=1000843<.....> mtu 1500
inet ip-address .......
ether 8:0:20:c4:51:df
ifconfig ce123000
ce123000: flags=1000843<.....> mtu 9194
inet ip-address-vlan-1 .......
ether 8:0:20:c4:51:df
```

Example 2

This example is similar to Example 1 with one exception. A new VLAN with VID 124 does not support jumbo frames as part of the configuration. `accept-jumbo` is set globally.

```
ifconfig ce123000 plumb ip-address-vlan-2 mtu 1500 up
```

Check the configuration.

```
ifconfig ce0
ce0: flags=1000843<.....> mtu 1500
inet ip-address .......
ether 8:0:20:c4:51:df
ifconfig ce123000
ce123000: flags=1000843<.....> mtu 9194
inet ip-address-vlan-1 .......
ether 8:0:20:c4:51:df
ifconfig ce124000
ce0: flags=1000843<.....> mtu 1500
inet ip-address-vlan-2 .......
ether 8:0:20:c4:51:df
```

This example can be maintained by a rebooting using the hostname.ce*instance* file. To do so the following host-name files need to be created for the previous examples.

Reboot Persistence

The following examples build on the preceding dynamic configuration to enable the final established configuration to persist through a reboot.

Example 1

```
hostname.ce0
ip-address mtu 1500
hostname.ce123000
ip-address-vlan-1
```


Example 2

Since this builds on the system configured in Example 1, only another host-name file is necessary. In this case, specify the MTU.

```
hostname.ce124000
ip-address-vlan-2 mtu 1500
```

Autonegotiation Protocol

A key feature of the Sun Quad GigaSwift Ethernet adapter adapter is autonegotiation. The *autonegotiation* protocol, as specified by the IEEE 802.3 standard, selects the operation mode (half-duplex or full-duplex), and the auto-sensing protocol selects the speed (10 Mbps, 100 Mbps or 1000Mbps) for the adapter.

The link speed and modes supported by the Sun Quad GigaSwift Ethernet adapter adapter are listed in decreasing order of priority:

■ 1000Mbps full-duplex
■ 1000Mbps half-duplex (not supported)
■ 100 Mbps, full-duplex
■ 100 Mbps, half-duplex
■ 10 Mbps, full-duplex
■ 10 Mbps, half-duplex

When the system is booted, the Sun Quad GigaSwift Ethernet adapteradapter advertises these capabilities to the link partner at the other end of the link (a hub, switch, or another network interface card in a host system). If the link partner also supports autonegotiation, it advertises its capabilities over the link. The highest common priority mode supported by both sides is selected for the link operation.

If the adapter is connected to a remote system or interface that is not capable of autonegotiation, your system automatically selects the speed and half-duplex mode.

If the adapter is connected to a link partner with which the autonegotiation protocol fails to operate successfully, you can configure the device not to use this protocol and force the driver to set up the link in the mode and speed of your choice. See "Setting Parameters Using the `ndd` Utility" on page 50 for more information.

Setting the `local-mac-address?` Variable

Each of the four network interfaces of the adapter has been assigned a unique media access control (MAC) address, which represents the 48-bit Ethernet address for that network interface. The OpenBoot firmware reports this MAC address by means of the `local-mac-address?` variable in the device nodes corresponding to the network interfaces.

A system is not obligated to use this assigned MAC address if it has a system-wide MAC address. In such cases, the system-wide MAC address applies to all network interfaces on the system.

The device driver, or any other adapter utility, can use the network device's MAC address (`local-mac-address?`) while configuring the device. A network interface's MAC address can be used when booting over the network.

The `mac-address` property of the network device specifies the network address (system-wide or `local-mac-address?`) used for booting the system. To start using the MAC addresses assigned to the network interfaces of the adapter, set the NVRAM configuration variable `local-mac-address?` to `true`, as shown in the procedure below.

▼ To Set the `local-mac-address?` Variable to the Network Interfaces

Before starting this procedure, ensure that all network activity over the adapter's network interfaces has stopped.

1. **Log in to the system as superuser.**

   Refer to the system's documentation for the correct procedure.

2. **At a terminal prompt, type the following command to set the property to** `true`**:**

   ```
   % eeprom local-mac-address?=true
   ```

3. **Use the** `ifconfig` **command to stop all network activity traveling over the adapter's Ethernet interfaces.**

   For example, if you were using the adapter's four interfaces, and they were named `ce0`, `ce1`, `ce2`, and `ce3`, you would type:

   ```
   # ifconfig ce0 down unplumb
   # ifconfig ce1 down unplumb
   # ifconfig ce2 down unplumb
   # ifconfig ce3 down unplumb
   ```

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

4. **Disconnect and unconfigure the adapter from the system using the appropriate basic DR command.**

   The command and usage may be unique to different systems, so refer to your system's service manual for the appropriate procedure.

   The following example is for a server with a Sun Quad GigaSwift Ethernet adapter installed in the second PCI slot (with the `pci_pci0:PCI_slot2` attachment point ID.

   ```
   # cfgadm -c unconfigure pci_pci0:PCI_slot2
   # cfgadm -c disconnect pci_pci0:PCI_slot2
   ```

5. **To make the adapter's network interfaces use the local MAC addresses, connect and configure the adapter to the system using the appropriate basic hot plug command.**

   The command and usage might be unique to different systems, so refer to your system's service manual for the appropriate procedure.

   The following example is for a server with a Sun Quad GigaSwift Ethernet adapter installed in the second PCI slot (with the `pci_pci0:PCI_slot2` attachment point ID.

   ```
   # cfgadm -c connect pci_pci0:PCI_slot2
   # cfgadm -c configure pci_pci0:PCI_slot2
   ```

6. **Use the `ifconfig` command to activate the adapter's Ethernet interfaces.**

   For each adapter interface, type the following at the command line, replacing instance with the interface's instance number and ip-address with the interface's IP address:

   ```
   # ifconfig ceinstance plumb ip-address up
   ```

   For example, if you were using the adapter's four interfaces, and they were named `ce0`, `ce1`, `ce2`, and `ce3`, you would type:

   ```
   # ifconfig ce0 plumb ip-address up
   # ifconfig ce1 plumb ip-address up
   # ifconfig ce2 plumb ip-address up
   # ifconfig ce3 plumb ip-address up
   ```

Booting the System Over a Gigabit Ethernet Interface

Perform the following procedure to use a Sun Quad GigaSwift Ethernet adapter adapter Ethernet interface as the boot device.

▼ To Boot the System Over the Network

1. **Before shutting down the OS and halting the system, ensure that all significant application activity on the server has stopped.**

2. **Follow the appropriate procedures, as documented in the system's service manual, to shut down and halt the system.**

   Refer to the system's documentation for the complete power-off procedure.

   After shutting down the system, you should see the OpenBoot PROM `ok` prompt on the system console.

3. **At the `ok` prompt, type `show-nets` to list the network devices on your system.**

   You should see the full path name of the `ce` devices, similar to the following example:

   ```
   ok show-nets
   a) /pci@8,600000/pci@1/network@3
   b) /pci@8,600000/pci@1/network@2
   c) /pci@8,600000/pci@1/network@1
   d) /pci@8,600000/pci@1/network@0
   e) /pci@8,700000/network@5,1
   q) NO SELECTION
   Enter Selection, q to quit:
   ```

4. **Select the** `ce` **device that you want to use as a boot device.**

   Using the `show-nets` command, select the letter of the device you want to use. For example:

   ```
   Enter Selection, q to quit: d
   /pci@8,600000/pci@1/network@0 has been selected.
   Type ^Y ( Control-Y ) to insert it in the command line.
   e.g. ok nvalias mydev ^Y
           for creating devalias mydev for
   /pci@8,600000/pci@1/network@0
   ```

   Note – Select only one of these `ce` devices for booting.

   ---

5. **At the** `ok` **prompt the type the** `boot` **command and press the Control-Y key sequence to paste the full path name of the selected** `ce` **device**

   You can take one of the following actions:

   - Type `boot` and the full path name to the `ce` device.
   - Type `boot` and press the Control-Y key sequence.

   In this example, the Control-Y key sequence is replaced by the full path name of the `ce` device:

   ```
   ok boot /pci@8,600000/pci@1/network@0
   ```

6. **Press the Return key to boot the system over the** `ce` **device.**

Configuring Driver Parameters

The ce(1M) device driver controls the four Sun Quad GigaSwift Ethernet interfaces. You can manually set the ce device driver parameters to customize each device in your system. This chapter lists the available ce device driver parameters and describes how you can set these parameters.

- "Sun Quad GigaSwift Ethernet Device Driver Parameters" on page 39
- "Setting ce Driver Parameters" on page 49
- "Usability Enhancements to the Driver" on page 55
- "GigaSwift Ethernet Driver Operating Statistics" on page 56

Sun Quad GigaSwift Ethernet Device Driver Parameters

This section describes the hardware of the local transceiver used in the adapter and defines the ce device driver parameters.

Hardware and Software Overview

Each of the four ce channels provides 10BASE-T, 100BASE-TX, or 1000BASE-T networking interfaces. The device driver automatically sets the link speed to 10, 100, or 1000 Mbps and conforms to the IEEE 802.3 Ethernet standard. The single MAC/PHY chip provides the PCI interface and media access control (MAC) functions. The local transceiver, which connects to an RJ-45 connector, provides the physical-layer functions.

The local transceiver is capable of all the following operating speeds and modes:

- 1000 Mbps, full-duplex

- 1000 Mbps, half-duplex (not supported)
- 100 Mbps, full-duplex
- 100 Mbps, half-duplex
- 10 Mbps, full-duplex
- 10 Mbps, half-duplex

The Sun Quad GigaSwift Ethernet adapter performs autonegotiation with the remote end of the link (the link partner) to select a common mode of operation.

Sun Quad GigaSwift Ethernet adapter also supports a non-auto-negotiated mode of operation. You can set the speed and mode using the ndd utility, or, to make sure the changes persist after a system reboot, you can create a ce.conf file. See "To Set Driver Parameters Using a ce.conf File" on page 54 for more information about setting driver parameters.

You can manually configure the ce device driver parameters to customize each Sun Quad GigaSwift Ethernet adapter device in your system. This section provides an overview of the capabilities of the GigaSwift Ethernet device used in the adapter, lists the available ce device driver parameters, and describes how to configure these parameters.

The Sun GigaSwift Ethernet UTP PCI adapter is capable of all the operating speeds and modes listed in "Setting the Autonegotiation Mode" on page 52. The ce device performs auto-negotiation with the remote end of the link (link partner) to select a common mode of operation. The ce device also supports Forced mode operation.

GigaSwift Ethernet Device Driver Parameter Values and Definitions

TABLE 4-1 describes the parameters and settings for the ce device driver.

TABLE 4-1   ce Driver Parameter, Status, and Descriptions

Parameter	Status	Description
instance	Read and write	Device instance
adv-autoneg-cap	Read and write	Operational mode parameter
adv-1000fdx-cap	Read and write	Operational mode parameter
adv-1000hdx-cap	Read and write	Operational mode parameter
adv-100T4-cap	Read and write	Operational mode parameter
adv-100fdx-cap	Read and write	Operational mode parameter
adv-100hdx-cap	Read and write	Operational mode parameter

TABLE 4-1   ce Driver Parameter, Status, and Descriptions *(Continued)*

Parameter	Status	Description
adv-10fdx-cap	Read and write	Operational mode parameter
adv-10hdx-cap	Read and write	Operational mode parameter
adv-asmpause-cap	Read and write	Flow control parameter
adv-pause-cap	Read and write	Flow control parameter
master-cfg-enable	Read and write	Gigabit link clock mastership controls
master-cfg-value	Read and write	Gigabit link clock mastership controls
use-int-xcvr	Read only	Use internal transceiver
enable-ipg0	Read and write	Enable additional delay before transmitting a packet
ipg0	Read and write	Additional delay before transmitting a packet
ipg1	Read and write	Interpacket gap parameter
ipg2	Read and write	Interpacket gap parameter
rx-intr-pkts	Read and write	Receive interrupt blanking values
rx-intr-time	Read and write	Receive interrupt blanking values
red-dv4to6k	Read and write	Random early detection and packet drop vectors
red-dv6to8k	Read and write	Random early detection and packet drop vectors
red-dv8to10k	Read and write	Random early detection and packet drop vectors
red-dv10to12k	Read and write	Random early detection and packet drop vectors
tx-dma-weight	Read and write	PCI interface parameter
rx-dma-weight	Read and write	PCI interface parameter
infinite-burst	Read and write	PCI interface parameter
disable-64bit	Read and write	PCI interface parameter
accept-jumbo	Read and write	Enable jumbo frames

Operational Mode Parameters

The following parameters determine the transmit and receive speed and duplexing capability. TABLE 4-2 describes the operational mode parameters and their default values

TABLE 4-2   Operational Mode Parameters

Parameter	Description
adv-autoneg-cap	Local interface capability advertised by the hardware 0 = Forced mode 1 = Autonegotiation (default)
adv-1000fdx-cap	Local interface capability advertised by the hardware 0 = Not 1000 Mbit/sec full-duplex capable 1 = 1000 Mbit/sec full-duplex capable (default)
adv-1000hdx-cap	Local interface capability advertised by the hardware 0 = Not 1000 Mbit/sec half-duplex capable 1 = 1000 Mbit/sec half-duplex capable (default)
adv-100T4-cap	Local interface capability advertised by the hardware 0 = Not 100T4 capable (default) 1 = 100T4 capable
adv-100fdx-cap	Local interface capability advertised by the hardware 0 = Not 100 Mbit/sec full-duplex capable 1 = 100 Mbit/sec full-duplex capable (default)
adv-100hdx-cap	Local interface capability advertised by the hardware 0 = Not 100 Mbit/sec half-duplex capable 1 = 100 Mbit/sec half-duplex capable (default)
adv-10fdx-cap	Local interface capability advertised by the hardware 0 = Not 10 Mbit/sec full-duplex capable 1 = 10 Mbit/sec full-duplex capable (default)
adv-10hdx-cap	Local interface capability advertised by the hardware 0 = Not 10 Mbit/sec half-duplex capable 1 = 10 Mbit/sec half-duplex capable (default)

Note – If a parameter's initial setting is 0, it cannot be changed. If you try to change the setting, it will revert back to 0.

If all these parameters are set to 1, autonegotiation uses the highest speed possible. If all these parameters are set to 0, you receive the following error message:

```
NOTICE: Last setting will leave ce0 with no link capabilities.
WARNING: ce0: Restoring previous setting.
```

Flow Control Parameters

The ce device sources (transmits) and terminates (receives) pause frames conforming to the IEEE 802.3x Frame Based Link Level Flow Control Protocol. In response to received flow control frames, the ce device can slow down its transmit rate. The ce device sources flow control frames by requesting the link partner to slow down, provided that the link partner supports this feature. By default, the driver advertises both transmit and receive pause capability during autonegotiation.

TABLE 4-3 provides flow control keywords and describes their function.

TABLE 4-3   Read-Write Flow Control Keyword Descriptions

Keyword	Description
adv_asmpause_cap	The adapter supports asymmetric pause, which means it can pause only in one direction. 0=Off (default) 1=On
adv_pause_cap	This parameter has two meanings, each depending on the value of adv_asmpause_cap. (Default=0) • If adv_asmpause_cap = 1 while adv_pause_cap = 1, pauses are received. • If adv_asmpause_cap = 1 while adv_pause_cap = 0, pauses are transmitted. • If adv_asmpause_cap = 0 while adv_pause_cap = 1, pauses are sent and received. • If adv_asmpause_cap = 0, then adv_pause_cap determines whether Pause capability is on or off.

Gigabit Link Clock Mastership Controls

Link clock mastership was introduced with gigabit twisted-pair technology. One side of the link is the master that provides the link clock and the other side is the slave that uses the link clock. Once this relationship is established, the link is up, and

data can be communicated. Two physical layer parameters control whether your side is the master or the slave, or whether mastership is negotiated with the link partner.

TABLE 4-4 Forced Mode Parameters

Parameter	Description
master-cfg-enable	Determines whether or not during the autonegotiation process the link clock mastership is setup automatically.
master-cfg-value	• If the master-cfg-enable parameter is set, then the mastership is not set up automatically but depends on the value of master-cfg-value. • If the master-cfg-value is set, then the physical layer expects the local device to be the link master. • If the master-cfg-value is not set, then the parameter expects the link partner to be the master. • If autonegotiation is not enabled, then the value of master-cfg-enable is ignored and the value of master-cfg-value is key to the link clock mastership. • If the master-cfg-value is set, then the physical layer expects the local device to be the link master. • If the master-cfg-value is not set, then the parameter expects the link partner to the master.

⚠ **Caution –** Do not adjust the link clock mastership parameters unless you clearly understand the settings of the link partner. Incorrect link clock mastership configuration results in link-up failure.

Interpacket Gap Parameters

The ce device supports a programmable mode called enable_ipg0.

When an instance receives a packet with enable_ipg0 set (the default), it adds an additional time delay before transmitting the packet. This delay, set by the ipg0 parameter, is in addition to the delay set by the ipg1 and ipg2 parameters. The additional ipg0 delay helps reduce collisions.

If enable_ipg0 is disabled, the value of ipg0 is ignored and no additional delay is set. Only the delays set by ipg1 and ipg2 will be used. Disable enable_ipg0 if other systems keep sending a large number of back-to-back packets. Systems that have enable_ipg0 set might not have enough time on the network.

You can add the additional delay by setting the `ipg0` parameter from 0 to 255, which is the media byte time delay.

TABLE 4-5 defines the `enable_ipg0` and `ipg0` parameters.

TABLE 4-5 Parameters Defining `enable_ipg0` and `ipg0`

Parameter	Values	Description
enable_ipg0	0	enable_ipg0 reset
	1	enable_ipg0 set (Default=8)
ipg0	0 to 255	The additional time delay (or gap) before transmitting a packet (after receiving the packet) (Default=8)

The `ce` device supports the programmable Interpacket Gap (IPG) parameters `ipg1` and `ipg2`. The total IPG is the sum of `ipg1` and `ipg2`. The total IPG is 0.096 microseconds for the link speed of 1000 Mbps.

TABLE 4-6 lists the default values and allowable values for the IPG parameters.

TABLE 4-6 Read-Write Interpacket Gap Parameter Values and Descriptions

Parameter	Values (Byte-time)	Description
ipg1	0 to 255	Interpacket gap 1 (Default = 8)
ipg2	0 to 255	Interpacket gap 2 (Default = 4)

By default, the driver sets `ipg1` to 8-byte time and `ipg2` to 4-byte time, which are the standard values. (Byte time is the time it takes to transmit one byte on the link, with a link speed of 1000 Mbps.)

If your network has systems that use longer IPG (the sum of `ipg1` and `ipg2`), and if those systems seem to be slow in accessing the network, increase the values of `ipg1` and `ipg2` to match the longer IPGs of other machines.

Interrupt Parameters

TABLE 4-7 describes the receive interrupt blanking values.

TABLE 4-7   RX Blanking Register for Alias Read

Field Name	Values	Description
rx_intr_pkts	0 to 511	Interrupt after this number of packets has arrived since the last packet was serviced. A value of zero indicates no packet blanking. (Default=3)
rx_intr_time	0 to 524287	Interrupt after 4.5 US ticks have elapsed since the last packet was serviced. A value of zero indicates no time blanking. (Default=1250)

Random Early Drop Parameters

TABLE 4-8 describes the RX random early detection 8-bit vectors, which enable you to enable random early drop (RED) thresholds. When received packets reach the RED range packets are dropped according to the preset probability. The probability should increase when the FIFO level increases. Control packets are never dropped and are not counted in the statistics.

TABLE 4-8   RX Random Early Detecting 8-Bit Vectors

Field Name	Values	Description
red_dv4to6k	0 to 255	Random early detection and packet drop vectors for when FIFO threshold is greater than 4096 bytes and fewer than 6,144 bytes. Probability of drop can be programmed on a 12.5 percent granularity. For example, if bit 0 is set, the first packet out of every eight will be dropped in this region. (Default=0)

TABLE 4-8   RX Random Early Detecting 8-Bit Vectors

Field Name	Values	Description
red_dv6to8k	0 to 255	Random early detection and packet drop vectors for when FIFO threshold is greater than 6,144 bytes and fewer than 8,192 bytes. Probability of drop can be programmed on a 12.5 percent granularity. For example, if bit 8 is set, the first packet out of every eight will be dropped in this region. (Default=0)
red_dv8to10k	0 to 255	Random early detection and packet drop vectors for when FIFO threshold is greater than 8,192 bytes and fewer than 10,240 bytes. Probability of drop can be programmed on a 12.5 percent granularity. For example, if bit 16 is set, the first packet out of every eight will be dropped in this region. (Default=0)
red_dv10to12k	0 to 255	Random early detection and packet drop vectors for when FIFO threshold is greater than 10,240 bytes and fewer than 12,288 bytes. Probability of drop can be programmed on a 12.5 percent granularity. For example, if bit 24 is set, the first packet out of every eight will be dropped in this region. (Default=0)

PCI Bus Interface Parameters

These parameters allow you to modify PCI interface features to gain better PCI interperformance for a given application.

TABLE 4-9   PCI Bus Interface Parameters

Parameter	Description
tx_dma_weight	Determines the multiplication factor for granting credit to the TX side during a weighted round robin arbitration. Values are 0 to 3. (Default=0) 0 means no extra weighting. The other values are power of 2 extra weighting, on that traffic. For example if tx_dma_weight = 0 and rx_dma_weight = 3, then as long as RX traffic is continuously arriving its priority will be 8 times greater than TX to access the PCI

TABLE 4-9   PCI Bus Interface Parameters

Parameter	Description
rx_dma_weight	Determines the multiplication factor for granting credit to the RX side during a weighted round robin arbitration. Values are 0 to 3. (Default=0)
infinite_burst	Enables the infinite burst capability to be utilized. When this is in effect and the system supports infinite burs, the adapter does not free the bus until complete packets are transferred across the bus. Values are 0 or 1. (Default=0)
disable_64bit	Switches off 64-bit capability of the adapter. Values are 0 or 1. (Default=0, which enables 64 bit capability)

Jumbo Frames

The variable accept-jumbo enables the driver to instruct the upper layers that the driver is operating in Jumbo-frame mode.

TABLE 4-10   accept-jumbo Parameters

Parameter	Values	Description
accept-jumbo	1	Enables jumbo frames mode and sets MTU to greater than 1500.
	0	Jumbo frames is not enabled. MTU is at 1500.

Table lists and describes the values for the jumbo frames parameter.

In the Solaris 8 Operating System, accept-jumbo=1 does not take effect on the next ifconfig. To get the maximum MTU setting use the following command:

```
# ifconfig ce0 mtu 9194
```

In the Solaris 9 Operating System, accept-jumbo=1 takes effect on next ifconfig, and automatically sets the MTU to 9194.

Although jumbo frames is configurable in 10/100 mode, jumbo frames is only supported in the Gigabit (1000 Mbps) mode. Configuring jumbo frames enables the Ethernet interfaces to send and receive packets of up to 9216 bytes. However, the actual transfer size depends on the switch capability.

Refer to the documentation that came with your switch for exact commands to configure jumbo frames support.

Jumbo Frames With Trunking 1.3

When using jumbo frames with Trunking 1.3, you must explicitly enable jumbo frames on each link participating in the trunk.

▼ To Configure Jumbo Frames Using ndd

1. **Shut down and unplumb the interface.**

2. **Set the instance number:**

```
% ndd -set /dev/ce instance 0
```

In this example, the instance number set is 0.

3. **Set the instance to accept jumbo frames:**

```
% ndd -set /dev/ce accept-jumbo 1
```

4. **Plumb the interface up:**

```
% ifconfig ce0 plumb xx.xx.xx.xx up
```

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

Setting ce Driver Parameters

You can set the ce device driver parameters in two ways:

- Using the ndd utility
- Using the ce.conf file

If you use the ndd utility, the parameters are valid only until you reboot the system. This method is good for testing parameter settings.

To set parameters so they remain in effect after you reboot the system, create a /platform/sun4u/kernel/drv/ce.conf file and add parameter values to this file when you need to set a particular parameter for a device in the system.

Setting Parameters Using the ndd Utility

Use the ndd utility to configure parameters that are valid until you reboot the system. The ndd utility supports any networking driver that implements the Data Link Provider Interface (DLPI).

The following sections describe how you can use the ce driver and the ndd utility to modify (with the -set option) or display (without the -set option) the parameters for each ce device.

▼ To Specify Device Instances for the ndd Utility

Before you use the ndd utility to get or set a parameter for a ce device, you must specify the device instance for the utility.

1. **Check the** /etc/path_to_inst **file to identify the instance associated with a particular device.**

```
# grep ce /etc/path_to_inst
"/pci@8,600000/pci@1/network@0" 0 "ce"
"/pci@8,600000/pci@1/network@1" 1 "ce"
"/pci@8,600000/pci@1/network@2" 2 "ce"
"/pci@8,600000/pci@1/network@3" 3 "ce"
```

In this example, the Gigabit Ethernet instance is from the installed adapter. The instance number is in bold italics for clarity.

2. **Use the instance number to select the device.**

```
# ndd -set /dev/ce-instance-number
```

The device remains selected until you change the selection.

Noninteractive and Interactive Modes

You can use the ndd utility in two modes:

- Noninteractive
- Interactive

In noninteractive mode, you invoke the utility to execute a specific command. Once the command is executed, you exit the utility. In interactive mode, you can use the utility to get or set more than one parameter value. Refer to the ndd(1M) man page for more information.

▼ To Use the ndd Utility in Noninteractive Mode

This section describes how to modify and display parameter values.

● **To modify a parameter value, use the -set option.**

If you invoke the ndd utility with the -set option, the utility passes *value*, which must be specified, down to the named /dev/ce driver instance, and assigns the value to the parameter:

```
# ndd -set /dev/ce paramete-value
```

When you change any parameter, a message similar to the following appears:

```
ce0: xcvr addr:0x01 - link up 1000 Mbps full duplex
```

● **To display the value of a parameter, specify the parameter name and omit the value.**

When you omit the -set option, the utility queries the named driver instance, retrieves the value associated with the specified parameter, and prints it:

```
# ndd /dev/ce parameter
```

▼ To Use the ndd Utility in Interactive Mode

● **To modify a parameter value in interactive mode, specify** ndd /dev/ce**:**

```
# ndd /dev/ce
name to get/set? (Enter the parameter name or ? to view all
parameters)
```

After you enter the parameter name, the ndd utility prompts you for the parameter value (see TABLE 4-1 through TABLE 4-12).

● **To list all the parameters supported by the** ce **driver, type** ?**.**

    See TABLE 4-1 through TABLE 4-12 for parameter descriptions.

```
# ndd /dev/ce
name to get/set ? ?
?                              (read only)
instance                       (read and write)
adv_autoneg_cap                (read and write)
adv_1000fdx_cap                (read and write)
adv_1000hdx_cap                (read and write)
adv_100T4_cap                  (read and write)
adv_100fdx_cap                 (read and write)
adv_100hdx_cap                 (read and write)
adv_10fdx_cap                  (read and write)
adv_10hdx_cap                  (read and write)
adv_asmpause_cap               (read and write)
adv_pause_cap                  (read and write)
master_cfg_enable              (read and write)
master_cfg_value               (read and write)
use_int_xcvr                   (read and write)
enable_ipg0                    (read and write)
ipg0                           (read and write)
ipg1                           (read and write)
ipg2                           (read and write)
rx_intr_pkts                   (read and write)
rx_intr_time                   (read and write)
red_dv4to6k                    (read and write)
red_dv6to8k                    (read and write)
red_dv8to10k                   (read and write)
red_dv10to12k                  (read and write)
tx_dma_weight                  (read and write)
rx_dma_weight                  (read and write)
infinite_burst                 (read and write)
disable_64bit                  (read and write)
accept_jumbo                   (read and write)
name to get/set ?
#
```

Setting the Autonegotiation Mode

By default, autonegotiation is set to on. This means that the adapter communicates with its link partner to determine a compatible network speed, duplex mode, and flow control capability.

▼ To Disable Autonegotiation Mode

If your network equipment does not support autonegotiation, or if you want to specify your network speed, you can set autonegotiation to off on the `ce` device.

Note – Disabling autonegotiation mode can cause collisions.

---

1. **Set the following driver parameters to the values that are described in the documentation that shipped with your link partner (for example, a switch):**

   - `adv-1000fdx-cap`
   - `adv-100fdx-cap`
   - `adv-100hdx-cap`
   - `adv-10fdx-cap`
   - `adv-10hdx-cap`
   - `adv-asmpause-cap`
   - `adv-pause-cap`

   See TABLE 4-2 for the descriptions and possible values of these parameters.

Note – According to IEEE 802.3 specifications, when using 1000 Mbps speed over copper media, autonegotiation is not optional. In the absence of autonegotiation, (for example, while using Forced mode), link syncing between link partners may not happen and the link may not come up.

---

2. **Set the** `adv-autoneg-cap` **parameter to** 0.

   ```
   # ndd -set /dev/ce adv-autoneg-cap 0
   ```

   When you change any `ndd` link parameter, a message similar to the following appears:

   ```
   xcvr addr:0x00 - link up 100 Mbps full duplex
   ```

Setting Parameters Using the `ce.conf` File

Specify the driver parameter properties for each device by creating a `ce.conf` file in the `/platform/sun4u/kernel/drv` directory. Use a `ce.conf` file when you need to set a particular parameter for a device in the system. The parameters you can set are the read and write parameters listed in "GigaSwift Ethernet Device Driver Parameter Values and Definitions" on page 40.

Note – Configuring the parameters by putting ndd commands in rcX.d scripts is not supported.

The man pages for prtconf(1M) and driver.conf(4) include additional details. The next procedure shows an example of setting parameters in a ce.conf file.

● **To access any man page, type the** man **command plus the name of the man page.**

For example, to access man pages for prtconf(1M), type:

```
% man prtconf
```

▼ To Set Driver Parameters Using a ce.conf File

1. **Obtain the hardware path names for the** ce **devices in the device tree.**

   a. **Check the** /etc/driver_aliases **file to identify the name associated with a particular device:**

   ```
   # grep ce /etc/driver_aliases
   ce "pci108e,abba"
   ce "pci100b,35"
   ```

   Note – ce "pci100b, 35" is used by the Sun Quad GigaSwoft Ethernet PCI-X adapter.

   b. **Locate the path names and the associated instance numbers in the** /etc/path_to_inst **file.**

   ```
   # grep ce /etc/path_to_inst
   "/pci@8,600000/pci@1/network@0" 0 "ce"
   "/pci@8,600000/pci@1/network@1" 1 "ce"
   "/pci@8,600000/pci@1/network@2" 2 "ce"
   "/pci@8,600000/pci@1/network@3" 3 "ce"
   ```

   ■ In this example:
      ■ The first part within the double quotes specifies the hardware node name in the device tree.
      ■ The number not enclosed in quotes is the instance number (shown in bold italics for emphasis).

- The last part in double quotes is the driver name.
- In the hardware node name, the last component after the last / character and before the @ character is the device name.
- The path name before the last component is the parent name.
- The number after the final @ character within quotes is the unit-address.

To identify a PCI device unambiguously in the ce.conf file, use the name, parent name, and the unit-address for the device. Refer to the pci(4) man page for more information about the PCI device specification.

In this example:
- parent = "/pci@8,600000/pci@1"
- unit-address = "1"

2. **Set the parameters for the ce devices in the /platform/sun4u/kernel/drv/ce.conf file.**

   In the following example, the adv_autoneg_cap and adv_1000fdx_cap parameters are set for all Sun GigaSwift Ethernet devices. See the driver.conf(4) man page for more information.

   ```
   adv-autoneg-cap=0 adv-1000fdx-cap=0;
   ```

   In the following example, the adv-autoneg-cap and adv-1000fdx-cap parameters are set for a single instance of the Sun GigaSwift Ethernet device.

```
name="pci100b,35" parent="/pci@8,600000/pci@1" unit-address="1"
adv-autoneg-cap=0 adv-100hdx-cap=0 adv-100fdx-cap=1 adv-1000fdx-cap=0 adv-
10hdx-cap=0 adv-10fdx-cap=0 adv-1000hdx-cap=0 adv-100T4-cap=0;
```

   Note – If you omit the name=, parent=, and unit-address= definitions, the settings become global to all Sun GigaSwift Ethernet instances.

3. **Save the ce.conf file.**

Usability Enhancements to the Driver

In older Ethernet device drivers, determining the link status for a driver required a two-step process:

First, you had to set the instance:

```
# ndd -set /dev/ce instance 2
```

Then you had to get the link status:

```
# ndd -get /dev/ce link_status
1
```

Starting in the Solaris 9 Operating System, this method of determining the link status is discouraged, and in some cases, it is removed completely as a driver feature.

The new improved approach moves all read-only parameters from the ndd options into kstat. This simplifies getting link status information by allowing you to do it with one simple command.

● **To get the link status of a driver, type the following command:**

```
# kstat ce:# | grep link_up
link_up                          0
```

where # = instance.

For more information about the kstat command, refer to the kstat man page.

GigaSwift Ethernet Driver Operating Statistics

These statistics are part of the statistics presented by the netstat -k command.

TABLE 4-11 describes the read-only Media Independent Interface (MII) capabilities. These parameters define the capabilities of the hardware. The Gigabit Media Independent Interface (GMII) supports all of the following capabilities.

TABLE 4-11   Read-Only `ce` Device Capabilities

Parameter	Description (Local interface Capabilities)
cap_autoneg	0 = Not capable of autonegotiation 1 = Autonegotiation capable
cap_1000fdx	Local interface full-duplex capability 0 = Not 1000 Mbit/sec full-duplex capable 1 = 1000 Mbit/sec full-duplex capable
cap_1000hdx	Local interface half-duplex capability 0 = Not 1000 Mbit/sec half-duplex capable 1 = 1000 Mbit/sec half-duplex capable
cap_100fdx	Local interface full-duplex capability 0 = Not 100 Mbit/sec full-duplex capable 1 = 100 Mbit/sec full-duplex capable
cap_100hdx	Local interface half-duplex capability 0 = Not 100 Mbit/sec half-duplex capable 1 = 100 Mbit/sec half-duplex capable
cap_10fdx	Local interface full-duplex capability 0 = Not 10 Mbit/sec full-duplex capable 1 = 10 Mbit/sec full-duplex capable
cap_10hdx	Local interface half-duplex capability 0 = Not 10 Mbit/sec half-duplex capable 1 = 10 Mbit/sec half-duplex capable
cap_asm_pause	Local interface flow control capability 0 = Not asymmetric pause capable 1 = Asymmetric pause (from the local device) capable
cap_pause	Local interface flow control capability 0 = Not Symmetric pause capable 1 = Symmetric pause capable

Reporting the Link Partner Capabilities

TABLE 4-12 describes the read-only link partner capabilities.

TABLE 4-12   Read-Only Link Partner Capabilities

Parameter	Description
`lp_cap_autoneg`	0 = No autonegotiation 1 = Autonegotiation
`lp_cap_1000fdx`	0 = No 1000 Mbit/sec full-duplex transmission 1 = 1000 Mbit/sec full-duplex
`lp_cap_1000hdx`	0 = No 1000 Mbit/sec half-duplex transmission 1 = 1000 Mbit/sec half-duplex
`lp_cap_100fdx`	0 = No 100 Mbit/sec full-duplex transmission 1 = 100 Mbit/sec full-duplex
`lp_cap_100hdx`	0 = No 100 Mbit/sec half-duplex transmission 1 = 1000 Mbit/sec half-duplex
`lp_cap_10fdx`	0 = No 10 Mbit/sec full-duplex transmission 1 = 10 Mbit/sec full-duplex
`lp_cap_10hdx`	0 = No 10 Mbit/sec half-duplex transmission 1 = 10 Mbit/sec half-duplex
`lp_cap_asm_pause`	0 = Not asymmetric pause capable 1 = Asymmetric pause towards link partner capability
`lp_cap_pause`	0 = Not symmetric pause capable 1 = Symmetric pause capable

If the link partner is *not* capable of autonegotiation (when `lp_autoneg_cap` is 0), the remaining information described in TABLE 4-12 is not relevant and the parameter value = 0.

If the link partner *is* capable of autonegotiation (when `lp_autoneg_cap` is 1), then the speed and mode information is displayed when you use autonegotiation and the link partner capabilities.

TABLE 4-13 describes the `netstat -k` transmit and receive parameters:

TABLE 4-13 Transmit and Receive Parameters

Parameter	Description
xcvr_inits	Number of physical layer re-initializations incremented every time you change link parameters using NDD.
rev_id	Revision ID of the GigaSwift Ethernet device, useful for recognition of device being used in the field.
xcvr_addr	GMII/MII physical layer device address for management interface.
xcvr_id	GMII/MII physical layer device Identification Decimal copy of MII registers 2 and 3.
lb_mode	Copy of the Loopback mode the device is in, if any.
qos_mode	When zero, the TX queues operate in a simple round robin queueing scheme, based on TCP/UDP destination port number. When set, the TX queues operate in a scheme designed to provide VLAN priorities.
tx_starts	Number of times that the driver attempted to transmit a packet.
tx_dma_bind_fail	Number of times a page table entry was not available for enabling the driver to map the kernel memory to device-accessible memory for transmission.
tx_queue0	Number of packets queued for transmission on the first hardware transmit queue.
tx_queue1	Number of packets queued for transmission on the second hardware transmit queue.
tx_queue2	Number of packets queued for transmission on the third hardware transmit queue.
tx_queue3	Number of packets queued for transmission on the fourth hardware transmit queue.
tx_max_pend	Maximum number of transmits pending on any of the four queues.
rx_hdr_pkts	Number of packets received that were less than 256 bytes.
rx_mtu_pkts	Number of packets received that were greater than 256 bytes and less than 1514 bytes.
rx_split_pkts	Number of packets that were split across two pages.
rx_no_comp_wb	Number of times the hardware could not post completion entries for received data.
rx_no_buf	Number of times the hardware could not receive data because there is no more receive buffer space.
rx_new_pages	Number of pages that got replaced during reception.

TABLE 4-13 Transmit and Receive Parameters *(Continued)*

Parameter	Description
rx_new_hdr_pgs	Of those pages that were filled with packets less than 256 bytes, the number of pages that got replaced during reception.
rx_new_mtu_pgs	Of those pages that were filled with packets greater than 256 bytes,s and less than 1514, the number of pages that got replaced during reception.
rx_new_nxt_pgs	Number of pages that contained packets that were split across pages that got replaced during reception.
rx_hdr_drops	Number of times an entire page of packets less than 256 bytes each was dropped because the driver was unable to map a new page to replace it.
rx_mtu_drops	Number of times an entire page of packets greater than 256 bytes and less than 1514 each was dropped because the driver was unable to map a new page to replace it.
rx_nxt_drops	Number of times a page with a split packet was dropped because the driver was unable to map a new one to replace it.
rx_rel_flow	Number of times the driver was told to release a flow.

▼ To Check Link Partner Settings

● **If you are running the Solaris 8 Operating System, type the** `netstat -k`
command as superuser:

```
# netstat -k ce0
ce0:
ipackets 0 ipackets64 0 ierrors 0 opackets 0 opackets64 0
oerrors 0 collisions 0 rbytes 0 rbytes64 0 obytes 0 obytes64 0
multircv 0 multixmt 0 brdcstrcv 0 brdcstxmt 0 norcvbuf 0
noxmtbuf 0 first_collision 0 excessive_collisions 0 late_collisions 0
peak_attempts 0 length_err 0 alignment_err 0 crc_err 0 code_violations 0
ifspeed 1000000000 promisc off rev_id 48 xcvr_inits 1 xcvr_inuse 1
xcvr_addr 1 xcvr_id 536894584 cap_autoneg 1 cap_1000fdx 1 cap_1000hdx 1
cap_100T4 0 cap_100fdx 1 cap_100hdx 1 cap_10fdx 1 cap_10hdx 1
cap_asmpause 0 cap_pause 0 lp_cap_autoneg 1 lp_cap_1000fdx 1
lp_cap_1000hdx 1 lp_cap_100T4 0 lp_cap_100fdx 1 lp_cap_100hdx 1
lp_cap_10fdx 1 lp_cap_10hdx 1 lp_cap_asmpause 0 lp_cap_pause 1
link_T4 0 link_speed 1000 link_duplex 2 link_asmpause 0 link_pause 0
link_up 1 mac_mtu 0 lb_mode 0 qos_mode 0 trunk_mode 0 tx_inits 0
tx_starts 0 tx_nocanput 0 tx_msgdup_fail 0 tx_allocb_fail 0
tx_no_desc 0 tx_dma_bind_fail 0 tx_uflo 0 tx_queue0 0 tx_queue1 0
tx_queue2 0 tx_queue3 0 tx_hdr_pkts 0 tx_ddi_pkts 0 tx_dvma_pkts 0
mdt_reqs 0 mdt_hdr_bufs 0 mdt_pld_bufs 0 mdt_pkts 0 mdt_hdrs 0
mdt_plds 0 mdt_hdr_bind_fail 0 mdt_pld_bind_fail 0 tx_jumbo_pkts 0
tx_max_pend 0 rx_inits 0 rx_jumbo_pkts 0 rx_hdr_pkts 0 rx_mtu_pkts 0
rx_split_pkts 0 rx_no_buf 0 rx_no_comp_wb 0 rx_ov_flow 0
rx_len_mm 0 rx_tag_err 0 rx_nocanput 0 rx_msgdup_fail 0
rx_allocb_fail 0 rx_new_pages 0 rx_new_hdr_pgs 0 rx_new_mtu_pgs 0
rx_new_nxt_pgs 0 rx_hdr_drops 0 rx_mtu_drops 0 rx_nxt_drops 0
rx_rel_flow 0 rx_rel_bit 0 rx_pkts_dropped 0 pci_bus_speed 66
pci_err 0 pci_rta_err 0 pci_rma_err 0 pci_parity_err 0 pci_bad_ack_err 0
pci_drto_err 0 pci_dmawz_err 0 pci_dmarz_err 0 rx_taskq_waits 0
ipackets_cpu00 0 ipackets_cpu01 0 ipackets_cpu02 0 ipackets_cpu03 0
```

● **If you are running the Solaris 9 Operating System, type the** `kstat` **command as**
superuser:

CODE EXAMPLE 4-1   Output from the `kstat` Command

```
# kstat ce:0
module: ce                                    instance: 0
name:   ce0                        class:   net
        alignment_err                        0
        brdcstrcv                            0
        brdcstxmt                            0
        cap_1000fdx                          1
```

CODE EXAMPLE 4-1   Output from the kstat Command *(Continued)*

```
# kstat ce:0
        cap_1000hdx                   1
        cap_100T4                     0
        cap_100fdx                    1
        cap_100hdx                    1
        cap_10fdx                     1
        cap_10hdx                     1
        cap_asmpause                  0
        cap_autoneg                   1
        cap_pause                     0
        code_violations               0
        collisions                    0
        crc_err                       0
        crtime                        2345.407585961
        excessive_collisions          0
        first_collision               0
        ierrors                       0
        ifspeed                       0
        ipackets                      0
        ipackets64                    0
        ipackets_cpu00                0
        ipackets_cpu01                0
        ipackets_cpu02                0
        ipackets_cpu03                0
        late_collisions               0
        lb_mode                       0
        length_err                    0
        link_T4                       0
        link_asmpause                 0
        link_duplex                   0
        link_pause                    0
        link_speed                    0
        link_up                       0
        lp_cap_1000fdx                0
        lp_cap_1000hdx                0
        lp_cap_100T4                  0
        lp_cap_100fdx                 0
        lp_cap_100hdx                 0
        lp_cap_10fdx                  0
        lp_cap_10hdx                  0
        lp_cap_asmpause               0
        lp_cap_autoneg                0
        lp_cap_pause                  0
        multircv                      0
        multixmt                      0
        norcvbuf                      0
        noxmtbuf                      0
```

CODE EXAMPLE 4-1 Output from the kstat Command *(Continued)*

```
# kstat ce:0
        obytes                          0
        obytes64                        0
        oerrors                         0
        opackets                        0
        opackets64                      0
        pci_bad_ack_err                 0
        pci_dmarz_err                   0
        pci_dmawz_err                   0
        pci_drto_err                    0
        pci_err                         0
        pci_parity_err                  0
        pci_rma_err                     0
        pci_rta_err                     0
        peak_attempts                   0
        promisc                         off
        qos_mode                        0
        rbytes                          0
        rbytes64                        0
        rev_id                          1
        rx_allocb_fail                  0
        rx_hdr_drops                    0
        rx_hdr_pkts                     0
        rx_inits                        0
        rx_len_mm                       0
        rx_msgdup_fail                  0
        rx_mtu_drops                    0
        rx_mtu_pkts                     0
        rx_new_hdr_pgs                  0
        rx_new_mtu_pgs                  0
        rx_new_nxt_pgs                  0
        rx_new_pages                    0
        rx_no_buf                       0
        rx_no_comp_wb                   0
        rx_nocanput                     0
        rx_nxt_drops                    0
        rx_ov_flow                      0
        rx_pkts_dropped                 0
        rx_rel_bit                      0
        rx_rel_flow                     0
        rx_split_pkts                   0
        rx_tag_err                      0
        rx_taskq_waits                  0
        snaptime                        2352.506837979
        tx_allocb_fail                  0
        tx_ddi_pkts                     0
        tx_dma_bind_fail                0
```

```
# kstat ce:0
        tx_dma_hdr_bind_fail            0
        tx_dma_pld_bind_fail            0
        tx_dvma_pkts                    0
        tx_hdr_pkts                     0
        tx_inits                        0
        tx_max_desc                     0
        tx_max_pend                     0
        tx_msgdup_fail                  0
        tx_no_desc                      0
        tx_nocanput                     0
        tx_queue0                       3
        tx_queue1                       0
        tx_queue2                       0
        tx_queue3                       0
        tx_starts                       0
        tx_uflo                         0
        xcvr_addr                       1
        xcvr_id                         2121809
        xcvr_inits                      1
        xcvr_inuse                      1
```

▼ To Discover Link Partner Capabilities

● **Use the** kstat **command to discover link partner capabilities.**

```
# kstat ce:0 | grep lp_
lp_cap_1000fdx                  1
lp_cap_1000hdx                  1
lp_cap_100T4                    0
lp_cap_100fdx                   0
lp_cap_100hdx                   0
lp_cap_10fdx                    0
lp_cap_10hdx                    0
lp_cap_asmpause                 0
lp_cap_autoneg                  1
lp_cap_pause                    0
```

▼ To Discover Link Settings

● **Use the** kstat **command to discover link settings.**

```
# kstat ce:0 | grep link
                link_T4                 0
                link_asmpause           0
                link_duplex             2
                link_pause              0
                link_speed              1000
                link_up                 1
```

Configuration Checking

The jumbo frame configuration checking occurs at Layer 2 or Layer 3, depending on the configuration method.

Layer 2 Configuration Checking

You can view the MTU configuration of a ce instance at any time by using the kstat command. The kstat mac_mtu variable represents the complete size of the Ethernet frame, which includes the Ethernet header, maximum payload, and crc. This value is consistent with the definition of MTU presented by switch vendors.

Use the following command to get the information:.

```
# kstat ce:0 | grep mac_mtu
```

Layer 3 Configuration Checking

You can check the Layer 3 configuration by invoking the ifconfig command on a preconfigured interface as shown in the following example:.

```
ifconfig ce123000
ce123000: flags=1000843<.....> mtu 9194
inet ip-address-vlan-1 .......
ether 8:0:20:c4:51:df
```

Specifications

This appendix provides specifications for the Sun Quad GigaSwift Ethernet adapter adapter.

- "Performance Specifications" on page 67
- "Physical Characteristics" on page 68
- "Power Requirements" on page 68
- "Performance Specifications" on page 68
- "Interface Signals" on page 69

Performance Specifications

TABLE A-1 Performance Specifications

Feature	Specification
PCI-X clock	66/133 MHz max
PCI data burst transfer rate	Up to 64-byte bursts
PCI data/address width	32/64 -bit
PCI modes	Master/slave
Ethernet TX rate	10/100/1000 Mbps (full-duplex)

Physical Characteristics

TABLE A-2   Physical Characteristics

Dimension	Measurement
Length	6.6 inches (167.64 mm)
Width	4.2 inches (106.68 mm)
Height	Height on component side: 0.550 inches (13.97 mm) Height on back side :0.092 inches (2.33 mm)

Power Requirements

TABLE A-3   Power Requirements

Specification	Measurement
Maximum power consumption	less than 25 Watts
Voltage	3.3V and 5V

Performance Specifications

TABLE A-4   Performance Specifications

Specification	Performance
Maximum Ethernet transfer rate	10/100/1000 Mbps per channel.
Host interface	421-pin PBGA PCI-X to PCI-X bridge with a 64-bit primary and 64-bit secondary interface. Operates transparently in either 64-bit or 32-bit slots by means of a PCI-specific Universal 64-bit Card Edge. Supports both 3.3v and 5v signaling environments.

TABLE A-4 Performance Specifications *(Continued)*

Network interface	1000BASE-T using Category 5E cable. 100BASE-TX using Category (data-grade) cable. 10BASE-T using Category 3 (voice-grade) cable or better. Single UTP RJ-45 for both 10 and 100 Mbps per channel.
Ethernet version	Conforms to IEEE 802.3x.
PCI-X clock	133 MHz max.
PCI data/address lines	AD63-0.
PCI modes	Master/slave.

Interface Signals

TABLE A-5 Pin Descriptions for the 8-Pin RJ-45 Connectors—Channels 0 - 3

Description	CH0	CH1	CH2	CH3
MX0+	1	1	1	1
MX0-	2	2	2	2
MX1+	3	3	3	3
MX2+	4	4	4	4
MX2-	5	5	5	5
MX1-	6	6	6	6
MX3+	7	7	7	7
MX3-	8	8	8	8

Installing the Software Manually

This appendix describes how to install the driver software manually. It contains the following sections:

- "Installing the Driver Software Manually" on page 71
- "Verifying Patches" on page 75

Installing the Driver Software Manually

The *Sun Quad GigaSwift Ethernet PCI-X Driver* CD contains the driver software required to operate the adapter. Refer to the documentation that shipped with the *Solaris Supplement* CD-ROM for a listing of the available network drivers. Install the Sun Quad GigaSwift Ethernet driver for your version of the Solaris Operating System.

1. **Become superuser.**

2. **Insert the** *Sun Quad GigaSwift Ethernet PCI-X Driver* **CD into a CD-ROM drive that is connected to your system.**

   - If your system is running Sun Enterprise Volume Manager, it should automatically mount the CD-ROM to the `/cdrom/cdrom0` directory.

- If your system is not running Volume Manager, mount the CD-ROM as follows:

```
# mkdir /cdrom
# mkdir /cdrom/cdrom0
# mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom/cdrom0
```

You see the following files and directories in the
/cdrom/Sun_QuadGigaSwift_Ethernet_Driver directory or the
/cdrom/cdrom0 directory, depending on how you mounted the CD-ROM.

TABLE B-1   Files and Directories on the CD-ROM

File or Directory	Contents
Copyright	U.S. copyright file
FR_Copyright	French copyright file
QuadGigaSwiftEthernet /Solaris_*OS-VER*/Packages/	Contains the Sun Quad GigaSwift Ethernet software packages applicable to your version (*OS-VER*) of the Solaris software: • SUNWcea—32-bit adb macros • SUNWceax—64-bit adb macros • SUNWced.u—32-bit adapter driver • SUNWcedx.u—64-bit adapter driver • SUNWcedu—adapter driver headers • SUNWcem—man pages (optional, Solaris 8 only) The optional VLAN packages for Solaris 8 only: • SUNWvld—VLAN utility routines • SUNWvldx—VLAN utility routines (64-bit) • SUNWvldu—VLAN utility headers
QuadGigaSwiftEthernet/Docs/en	Contains PDF copy of the user manual

Note – If you intend to use VLAN, you must install VLAN packages when you install the software packages.

3. **Determine if the** ce **and** vlan **drivers are installed on the system:**

```
#/usr/bin/pkginfo SUNWced SUNWcedx SUNWvld SUNWvldx
system      SUNWced        Sun GigaSwift Ethernet Adapter (32-bit Driver)
system      SUNWcedx       Sun GigaSwift Ethernet Adapter (64-bit Driver)
system      SUNWvld        Sun Ethernet Vlan Utility Routines
system      SUNWvldx       Sun Ethernet Vlan Utility Routines (64-bit)
```

- If the output of the command is similar to the example in Step 3, skip to Step 6.
- If nothing is reported back for SUNWced or SUNWcedx, then follow Step 4 and select SUNWcea, SUNWceax, SUNWced.u, SUNWcedx.u, SUNWcedu, and SUNWcem (if present).
- If nothing is reported back for SUNWvld or SUNWvldx, then follow Step 4 and select SUNWvld, SUNWvldx, SUNWvldu packages.
- If nothing at all is reported back, then follow Step 4 and select "all" packages.

4. Install the software packages by typing the following at the command line, replacing the *OS_VER* with your version (8, or 9) of the Solaris Operating System:

```
# /usr/sbin/pkgadd -d
/cdrom/cdrom0/QuadGigaSwiftEthernet/Solaris_OS_VER/Packages/
```

For example, if your system is running the Solaris 8 Operating Environment, you would type the following:

```
# /usr/sbin/pkgadd -d /cdrom/cdrom0/QuadGigaSwiftEthernet/Solaris_8/Packages/
```

A menu similar to the following displays:

```
The following packages are available:
  1  SUNWcea        Sun Quad GigaSwift Ethernet PCI-X Adapter Driver 32 bit adb
Macros
                     (sparc) 1.0,REV=2001.05.04
  2  SUNWceax       Sun Quad GigaSwift Ethernet Adapter Driver 64 bit adb Macros
                     (sparc) 1.0,REV=2001.05.04
  3  SUNWced.u      Sun Quad GigaSwift Ethernet Adapter (32-bit Driver)
                     (sparc.sun4u) 1.0,REV=2001.05.04
  4  SUNWcedu       Sun Quad GigaSwift Ethernet Adapter Driver Headers
                     (sparc) 1.0,REV=2001.05.04
  5  SUNWcedx.u     Sun Quad GigaSwift Ethernet Adapter (64-bit Driver)
                     (sparc.sun4u) 1.0,REV=2001.05.04
  6  SUNWcem        Sun Quad GigaSwift Ethernet Adapter Driver Man Pages
                     (sparc) 1.0,REV=2001.05.04
  7  SUNWvld        Sun Ethernet Vlan Utility Routines
                     (sparc) 1.0,REV=2001.05.04
  8  SUNWvldu       Sun Ethernet Vlan Utility Headers
                     (sparc) 1.0,REV=2001.05.04
  9  SUNWvldx       Sun Ethernet Vlan Utility Routines (64-bit)
                     (sparc) 1.0,REV=2001.05.04

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:
```

5. Select the packages you want to install:

■ If neither the Quad GigaSwfit Ethernet PCI-X Driver nor VLAN Utility packages are installed, press Return or type **all** to accept the default and install all packages.

■ If you prefer not to install the optional packages, type the numbers of all but the optional packages.

See TABLE B-1 to identify the optional packages.

6. **If the Packages are already installed, verify the patch version.**

See the following section.

Verifying Patches

Verify whether your system has the needed patches for your version of the Solaris Operating System to ensure that you do not need to add patches.

Note – If patches meet the requirements, nothing needs to be installed on the install system.

TABLE B-2 lists and describes the patch versions:

TABLE B-2 Patch Versions

Solaris	Patch Version	Description
8	111883-31	SunOS 5.8: Sun GigaSwift Ethernet 1.0 driver patch
	112119-04	SunOS 5.8: vlan driver patch*
9	112817-24	SunOS 5.9: Sun GigaSwift Ethernet 1.0 driver patch
9x86	117714-08	SunOS 5.9: x86 patch
	114600-02	SunOS 5.9: vlan driver patch*
10	118777-01	SunOS 5.10: Sun GigaSwift Ethernet 1.0 driver patch
10x86	118778-01	SunOS 5.10: Sun GigaSwift Ethernet 1.0 driver patch

* Only required if packages SUNWvld or SUNWvldx is installed.

Note – The patch versions in TABLE B-2 were current at the time this document was created. Install the *latest* version of the patchID number. For example, the patchID number for the Solaris 9 OS is 112817-24. The dash number -24 becomes higher with each new version of the patch.

▼ To Install Patches

1. Determine the version of the Solaris Operating System your system is running:

```
% cat /etc/release
Solaris 9 8/03 s9s_u4wos_08a SPARC
Copyright 2003 Sun Microsystems, Inc.  All Rights Reserved.
                        Use is subject to license terms.
                            Assembled 13 June 2003
```

2. Verify patch versions for the GigaSwift Etnernet driver:

■ To verify patches for Solaris 8 Operating Environments, type the following:

```
# showrev -p | grep 111883
```

The patch version should be -24 or greater.

■ To verify patches for Solaris 9 Operating Environments, type the following:

```
# showrev -p | grep 112817
```

The patch version should be -24 or greater.

3. **If the patch version is not correct, install the correct patch:**

```
# cd /cdrom/cdrom0
# patchadd QuadGigaSwiftEthernet/OS/Patches/patch_id
```

where:

OS =Solaris-8 or Solaris-9

patc-id = 111883-31 for Solaris 8 or 112817-24 for Solaris 9.

For example, using the information shown in Step 1, you would type the following:

```
# /usr/sbin/patchadd QuadGigaSwiftEthernet/Solaris_9/Patches/112817-16
Checking installed patches...
Executing prepatch script...


Verifying sufficient filesystem capacity (dry run method)...
Installing patch packages...

Patch number 112817-24 has been successfully installed.
See /var/sadm/patch/112817-24/log for details

Patch packages installed:
SUNWcea
SUNWceax
SUNWced
SUNWcedu
SUNWcedx
```

▼ To Install a Sun VLAN Utility Patch

Note – The VLAN Utility is only supported in Solaris 8 and Solaris 9 software.

1. **Determine the version of the Solaris Operating System your system is running:**

```
% cat /etc/release
Solaris 9 8/03 s9s_u4wos_08a SPARC
Copyright 2003 Sun Microsystems, Inc.  All Rights Reserved.
                        Use is subject to license terms.
                            Assembled 13 June 2003
```

2. **Verify patch versions for the VLAN utility software:**

    ■   To verify patches for Solaris 8 Operating Systems, type the following:

    ```
    # showrev -p | grep 112119
    ```

    The patch version should be -04 or greater.

    ■   To verify patches for Solaris 9 Operating Systems, type the following:

    ```
    # showrev -p | grep 114600
    ```

    Verify that the patch version is -02 or higher.

3. **If the patch versions are not correct, install the correct patch:**

    ```
    # cd /cdrom/cdrom0
    # patchadd QuadGigaSwiftEthernet/OS/Patches/patch_id
    ```

    where:

    OS = Solaris-8 or Solaris-9

    patch_id = 112119-04 for Solaris 8 or 114600-02 for Solaris 9.

    For example, using the information shown in Step 1, you would type the following:

```
# /usr/sbin/patchadd QuadGigaSwiftEthernet/Solaris_9/Patches/114600-02
Checking installed patches...
Executing prepatch script...


Verifying sufficient filesystem capacity (dry run method)...
Installing patch packages...

Patch number 114600-02 has been successfully installed.
See /var/sadm/patch/114600-02/log for details

Patch packages installed:
SUNWvld
SUNWvldu
SUNWvldx
```

Diagnostic Software and Troubleshooting Issues

This appendix provides an overview of the SunVTS diagnostic application and instructions for testing the adapter using the onboard FCode self-test. There is also a section outlining some common troubleshooting issues. This appendix contains the following sections:

- "SunVTS Diagnostic Software" on page 79
- "Using the SunVTS `netlbtest`" on page 80
- "Using the OpenBoot PROM FCode Self-Test" on page 81
- "Troubleshooting Issues" on page 84
- "Problem With DR Attach on Sun Enterprise Platforms" on page 87

SunVTS Diagnostic Software

The SunVTS software executes multiple diagnostic hardware tests from a single user interface, and is used to verify the configuration and functionality of most hardware controllers and devices. The SunVTS software operates primarily from a graphical user interface, enabling test parameters to be set quickly and easily while a diagnostic test operation is being performed.

The SunVTS `nettest` diagnostic can be used to test all of the networking interfaces on the system, including the interfaces on the adapter.

To use the `nettest` diagnostic, you must have the SunVTS software installed on your system. Refer to the *Solaris on Sun Hardware Platform Guide* for SunVTS installation instructions.

Refer to the SunVTS documentation (listed in TABLE C-1) for instructions on how to run and monitor the `nettest` diagnostic. These SunVTS documents are available online at the following URL:

http://www.sun.com/products-n-solutions/hardware/docs/Software
/system_administration/tools/testing_valid/sunvts/index.html

Select the document for the Solaris release on your system.

TABLE C-1   SunVTS Documentation

Title	Description
SunVTS User's Guide	Describes the SunVTS diagnostic environment.
SunVTS Test Reference Manual	Describes each SunVTS test (including the `nettest`) and describes the various test options and command-line arguments.
SunVTS Quick Reference	Provides an overview of the user interface.

Using the SunVTS `netlbtest`

You must have the Ethernet card and the device driver installed, a loopback connector in place, and Intervention mode enabled before running `netlbtest`. `netlbtest` cannot run if the network interface is connected to a live network, and requires that the Ethernet device be configured offline before running the test. Use the `ifconfig(1M)` command to shut down the Ethernet device before running `netlbtest`.

▼ To Use the `netlbtest`

1. **Ensure that the SunVTS software and the `ce` driver are installed on your system.**

2. **Plug in a loopback cable.**

3. **Unplumb the interface from the system, using the `ifconfig` command:**

   ```
   # ifconfig ceinstance down
   # ifconfig ceinstance unplumb
   ```

   where *instance* is the instance number of the interface.

   Refer to SunVTS documentation for instructions on how to run `netlbtest`.

Using the OpenBoot PROM FCode Self-Test

The Sun Quad GigaSwift Ethernet adapter self-test verifies the correct operation of the adapter and identifies any hardware problems with the adapter. The self-test is a suite of tests that reside in the adapter's FCode PROM.

Note – The OpenBoot PROM FCode self-test is not available in the Solaris x86 Operating System.

You can only invoke the FCode self-test diagnostics using the OpenBoot PROM (OBP) `test` or `test-all` commands. In order to access the OBP, you must shut down and halt your system to display the `ok` prompt.

You can use the adapter's self-test any time you want to determine the status of the hardware. If you encounter an error while running the diagnostic test, the self-test displays appropriate error messages.

Note – Although the self-test does not require the adapter's interface to be connected to an active network, you will see failing error messages if it is not connected.

▼ To Run the FCode Self-Test Diagnostic

For more information about the OpenBoot commands (including `test`) in this section, refer to the *OpenBoot Command Reference* manual.

1. **Before shutting down the OS and halting the system, ensure that all significant application and network activity on the server has stopped.**

2. **Follow the appropriate procedures, as documented in the system's service manual, to shut down and halt the system.**

   Refer to the system's documentation for the complete shutdown procedure.

   After shutting down the system, you should see the OpenBoot PROMs `ok` prompt on the system console.

3. **At the** ok **prompt, set the** auto-boot? **configuration variable to false.**

```
ok setenv auto-boot? false
```

4. **Set the** diag-switch? **parameter to true in order to see the diagnostic power-on self-test (POST) messages.**

```
ok setenv diag-switch? true
```

5. **Reset the system to activate these parameter changes.**

```
ok reset-all
```

6. **Use the** show-nets **command to display the list of network devices on the system.**

   Among the list of devices, you should see the two interfaces specific to the Sun Quad GigaSwift Ethernet adapter you want to test, as shown in the following example.

```
ok show-nets
a) /pci@8,600000/pci@1/network@3
b) /pci@8,600000/pci@1/network@2
c) /pci@8,600000/pci@1/network@1
d) /pci@8,600000/pci@1/network@0
e) /pci@8,700000/network@5,1
q) NO SELECTION
Enter Selection, q to quit:
```

Note – The preceding device paths are examples. The actual device paths on your system might be different from the examples shown here.

---

7. **Use the** test **command and the device paths found in Step 6 to test the adapter when you use the FCode self-test.**

   The structure of the test command line includes the following device parameters:

```
ok test device-path:speed=s,duplex=d,link-clock=c,promiscuous,
```

where:

```
s = 1000, 100, 10, auto
d = half, full, auto
c = master, slave, auto
```

Note – The `speed`, `duplex`, and `link-clock` parameters are optional tests. See
TABLE 4-1 for more information about these parameters.

The following default tests are run when you execute the `test` command:

- MAC internal loopback
- 1000 Mbps PHY loopback
- 100 Mbps PHY loopback
- 10 Mbps PHY loopback

Refer to the appropriate *OpenBoot Command Reference Manual* for more information
about the `test` command.

Note – To test all of the interfaces of the adapter, you need to execute the `test`
command separately for each `SUNW,ce` interface.

If all of the tests pass, you will see these messages:

```
ok test /pci@8,600000/pci@1/network@0
Testing pci@8,600000/pci@1/network@0
Register tests: passed
Internal loopback test: passed
pci@8,600000/pci@1/network@0: 1000 Mbps full duplex link up
ok
```

If the adapter's interface is not connected, you will see the following error message:

```
ok test pci@1e,600000/pci@4/network@1
Testing /pci@1e,600000/pci@4/network@1
Register tests: passed
Internal loopback test: passed
/pci@8,600000/pci@1/network@0: Timed out waiting for Auto-
Negotation to complete
pci@1e,600000/pci@4/network@1: Cannot establish link via Auto-
Negotation
Please check cable and/or connection
pci@1e,600000/pci@4/network@1: link down
ok
```

> **Note –** If the `test` command fails, verify that the adapter hardware is installed correctly and the Ethernet device is connected to an active network. If necessary, replace the adapter or contact your service provider for support.

8. **After testing the adapter, type the following commands to return the OpenBoot PROM to the standard operating mode.**

```
ok setenv diag-switch? false
```

9. **At the** ok **prompt, reset the** auto-boot? **configuration variable to true.**

```
ok setenv auto-boot? true
```

10. **Reset and reboot the system.**

```
ok reset-all
```

Refer to the system's documentation for the correct procedures for bringing up the system.

Troubleshooting Issues

Known Incompatibilities With Pre-IEEE 802.3z Network Switches

You might experience interoperability issues when using the Sun GigaSwift Ethernet adapter with the SunSwitch switch, the Alteon ACE 110 switch, or other pre- or non-IEEE 802.3z standard compliant network equipment. If you experience difficulties with noncompliant equipment, set the adapter and switch autonegotiation properties to `off` and try to configure the interface manually.

▼ To Set Autonegotiation to `off` for a SunSwitch or an Alteon ACE 110 Switch

You can set autonegotiation to off for SunSwitch™ and Alteon ACE 110 switches using the `cgf` program for each switch. Refer to your switch documentation for instructions on how to access and use the `cgf` program.

The following procedure describes how to turn autonegotiation off for one SunSwitch port.

1. **Establish a connection to the switch using either a serial connection or a Telnet connection.**

   Refer to the *SunSwitch 1.1 Installation and Configuration Guide* (805-3743-10) for more information. After connecting to the switch, the main menu prompt (`Main#`) is displayed.

2. **At the `Main#` prompt, type `cfg` to display the Configuration menu and prompt (`Configuration#`).**

   ```
   >> Main# cfg
   [Configuration Menu]
           sys   -  System-wide parameter menu
           port  -  Port configuration menu
           ip    -  IP addressing menu
           vlan  -  VLAN configuration menu
           stp   -  Spanning Tree menu
           snmp  -  SNMP menu
           setup -  Step by step configuration set up
           dump  -  Dump current configuration to script file

   >> Configuration#
   ```

3. **Type the following to disable autonegotiation on a GigaSwift Ethernet port.**

   Replace *portnumber* with the Ethernet port used by the adapter.

   ```
   >> Configuration# /port portnumber/auto off
   ```

4. **Type the following to apply and save your changes.**

   ```
   >> Configuration# apply
   >> Configuration# save
   ```

Refer to the switch documentation for further configuration instructions.

▼ To Set Autonegotiation to off for Other Noncompliant Network Equipment

If your network equipment does not support autonegotiation, you can set autonegotiation to off on the GigaSwift Ethernet (ce) device.

1. **Set the following GigaSwift Ethernet driver parameters to values according to the documentation that shipped with your switch:**

   - `adv-1000fdx-cap`
   - `adv-1000hdx-cap`
   - `adv-ampause-cap`
   - `adv-pause-cap`

2. **Set the `adv-autoneg-cap` parameter to `0`.**

Note – See Chapter 4 for the default values of these parameters and for instructions on how to set these parameters.

Failure to Configure GigaSwift Ethernet Instance

If your machine fails to configure a GigaSwift Ethernet instance, yet `prtconf` indicates the adapter is present, the problem might be due to residue adapter instances in the `path_to_inst` file.

▼ To Clear Residue Adapter Instances in the path_to_inst File

1. **Open the `path_to_inst` file for editing and remove the lines containing `ce` device path.**

2. **Reboot the machine and try to configure it again.**

Nonspecific Issues

TABLE C-2 describes the problems you might encounter in using the GigaSwift Ethernet adapter as well as a solution for them:

TABLE C-2   Troubleshooting the GigaSwift Ethernet Adapter

Problem	Description	Solution
`prtdiag` does not recognize the NIC in slot 0.	If a PCI I/O board in an UltraSPARC® III system is filled with network adapters with an internal bridge (for example, GigaSwift Ethernet or Quad FastEthernet), `prtdiag` displays the card on slot 0. Although the card in slot 1 is not recognized by `prtdiag`, the card is fully operational and appears in the `/etc/path_to_inst` file.	Use `prtconf -pv` instead of `prtdiag`.
VLAN appears to accept VID 0 as end user input.	`ce000000`, `ce00000`, or `ce0000` configured as VID 0 is actually the regular `ce0` interface not VID 0 of the `ce0` interface. VID 0 is not supported as an end user device.	This is normal behavior.

`Inetboot` may require several retries to complete with OBP 4.x	Systems with OBP 4.x (for example, Sun Blade 1000) may automatically retry several times before completing. The message below is displayed for each retry:
	
	`Retrying . . .`
	`Check TFTP server and network setup`
		Ignore these console messages until booting is complete.

Problem With DR Attach on Sun Enterprise Platforms

DR attach does not configure `ce` interfaces on Sun Enterprise 10000 platforms running the Solaris 8 Operating System. To add DR support for ce interfaces on such systems, make the following changes:

1. **Add the following lines to the** `/etc/system` **file:**

```
set dr:detach_safe_list1="ce"
set hswp:suspend_safe_list1="ce"
```

2. Reboot the system.

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