

Sun™ GigabitEthernet PCI Adapter 1.1 User's Guide



THE NETWORK IS THE COMPUTER™

Sun Microsystems Computer Company

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Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Department of Communications (DOC) — Canada
- Voluntary Control Council for Interference (VCCI) — Japan

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 not installed and used in accordance with the instruction manual, 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.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

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.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

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.

DOC Class A Notice - Avis DOC, Classe A

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

DOC Class B Notice - Avis DOC, Classe B

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

VCCI 基準について


第一種VCCI基準について

第一種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、第一種情報装置です。これらの製品には、下記の項目が該当します。

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第二種VCCI基準について

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取り扱い説明書に従って正しくお取り扱いください。

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 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.



On – Applies AC power to the system.

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



Off – Removes AC power from the system.



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

Modifications to Equipment

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

Placement of a Sun Product



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

SELV Compliance

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

European Ergonomics

In order to conform with the German ZH1/618 ergonomic standard, an antiglare treatment to the CRT has been provided. For text processing applications, a positive mode display (black characters on a white background) is required.

Power Cord Connection



Caution – Sun products are designed to work with single-phase power systems having a grounded neutral conductor. 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. 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.



Caution – Your Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.

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.

Lithium Battery



Caution – On Sun CPU boards, there is a lithium battery molded into the real-time clock, SGS No. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, or MK48T08. Batteries are not customer replaceable parts. They may explode if mishandled. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it.

System Unit Cover

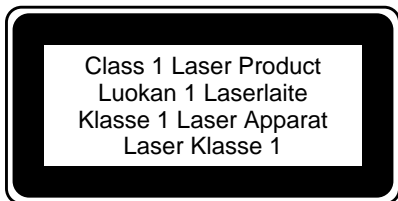
You must remove the cover of your Sun computer system unit in order to add cards, memory, or internal storage devices. Be sure to replace the top cover before powering up your computer system.



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

Laser Compliance Notice

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



CD-ROM



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

Einhaltung sicherheitsbehördlicher Vorschriften

Auf dieser Seite werden Sicherheitsrichtlinien beschrieben, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsvorkehrungen, wenn Sie Ihr Gerät installieren:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.

- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen 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 – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.



Achtung – Gefährliche Spannungen. Anweisungen befolgen, um Stromschläge und Verletzungen zu vermeiden.



Ein – Setzt das System unter Wechselstrom.

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



Aus – Unterbricht die Wechselstromzufuhr zum Gerät.



Wartezustand (Stand-by-Position) - Der Ein-/Wartezustand-Schalter steht auf Wartezustand. Änderungen an Sun-Geräten.

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, übernimmt bei einem Sun-Produkt, das geändert wurde, keine Verantwortung für die Einhaltung behördlicher Vorschriften

Aufstellung von Sun-Geräten



Achtung – Um den zuverlässigen Betrieb Ihres Sun-Geräts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder verdeckt werden. Sun-Produkte sollten niemals in der Nähe von Heizkörpern oder Heizluftklappen aufgestellt werden.

Einhaltung der SELV-Richtlinien

Die Sicherung der I/O-Verbindungen entspricht den Anforderungen der SELV-Spezifikation.

Ergonomie-Richtlinien

Um den Anforderungen der in Deutschland geltenden Ergonomie-Richtlinie ZH1/618 zu entsprechen, wurde der Bildschirm entspiegelt. Für Textverarbeitungsanwendungen wird ein positiver Anzeigemodus (schwarze Zeichen auf weißem Hintergrund) empfohlen.

Anschluß des Netzkabels



Achtung – Sun-Produkte sind für den Betrieb an Einphasen-Stromnetzen mit geerdetem Nulleiter vorgesehen. Um die Stromschlaggefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Stromquellen an. Ihr Betriebsleiter oder ein qualifizierter Elektriker kann Ihnen die Daten zur Stromversorgung in Ihrem Gebäude geben.



Achtung – Nicht alle Netzkabel haben die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastungsschutz und sind daher für Computersysteme nicht geeignet.



Achtung – Ihr Sun-Gerät wird mit einem dreiadrigen Netzkabel für geerdete Netzsteckdosen geliefert. Um die Gefahr eines Stromschlags zu reduzieren, schließen Sie das Kabel nur an eine fachgerecht verlegte, geerdete Steckdose an.

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



Achtung – Der Ein/Aus-Schalter dieses Geräts schaltet nur auf Wartezustand (Stand-By-Modus). Um die Stromzufuhr zum Gerät vollständig zu unterbrechen, müssen Sie das Netzkabel von der Steckdose abziehen. Schließen Sie den Stecker des Netzkabels an eine in der Nähe befindliche, frei zugängliche, geerdete Netzsteckdose an. Schließen Sie das Netzkabel nicht an, wenn das Netzteil aus der Systemeinheit entfernt wurde.

Lithiumbatterie



Achtung – CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie (Teile-Nr. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, oder MK48T08). Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgewechselt werden, da sie bei falscher Handhabung explodieren kann. Werfen Sie die Batterie nicht ins Feuer. Versuchen Sie auf keinen Fall, die Batterie auszubauen oder wiederaufzuladen.

Gehäuseabdeckung

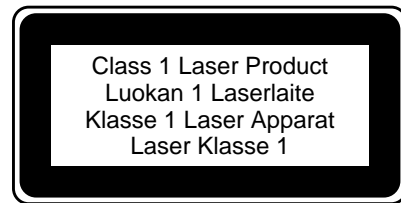
Sie müssen die obere Abdeckung Ihres Sun-Systems entfernen, um interne Komponenten wie Karten, Speicherchips oder Massenspeicher hinzuzufügen. Bringen Sie die obere Gehäuseabdeckung wieder an, bevor Sie Ihr System einschalten.



Achtung – Bei Betrieb des Systems ohne obere Abdeckung besteht die Gefahr von Stromschlag und Systemschäden.

Einhaltung der Richtlinien für Laser

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



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Warnung – Die Verwendung von anderen Steuerungen und Einstellungen oder die Durchführung von Prozeduren, die von den hier beschriebenen abweichen, können gefährliche Strahlungen zur Folge haben.

Conformité aux normes de sécurité

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 protection, veuillez prendre les précautions suivantes pendant l'installation du matériel :

- Suivre tous les avertissements et toutes les instructions inscrites sur le matériel.
- Vérifier que la tension et la fréquence de la source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de classification de l'appareil.
- Ne jamais introduire d'objets quels qu'ils soient dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet conducteur introduit de la sorte pourrait produire un court-circuit qui entraînerait des flammes, des risques d'électrocution ou des dégâts matériels.

Symboles

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



Attention : risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.



Attention : surface à température élevée. Evitez le contact. La température des surfaces est élevée et leur contact peut provoquer des blessures corporelles.



Attention : présence de tensions dangereuses. Pour éviter les risques d'électrocution et de danger pour la santé physique, veuillez suivre les instructions.



MARCHE – Votre système est sous tension (courant alternatif).

Un des symboles suivants sera peut-être utilisé en fonction du type d'interrupteur de votre système:



ARRET – Votre système est hors tension (courant alternatif).



VEILLEUSE – L'interrupteur Marche/Veilleuse est en position « Veilleuse ».

Modification du matériel

Ne pas apporter de modification mécanique ou électrique au matériel. Sun Microsystems n'est pas responsable de la conformité réglementaire d'un produit Sun qui a été modifié.

Positionnement d'un produit Sun



Attention : pour assurer le bon fonctionnement de votre produit Sun et pour l'empêcher de surchauffer, il convient de ne pas obstruer ni recouvrir les ouvertures prévues dans l'appareil. Un produit Sun ne doit jamais être placé à proximité d'un radiateur ou d'une source de chaleur.

Conformité SELV

Sécurité : les raccordements E/S sont conformes aux normes SELV.

Ergonomie européenne

Conformément à la norme d'ergonomie allemande ZH1/618, le CRT a été soumis à un traitement antireflets. Pour le traitement de texte, un affichage en mode positif (c'est-à-dire des caractères noirs sur fond blanc) est nécessaire.

Connexion du cordon d'alimentation



Attention : les produits Sun sont conçus pour fonctionner avec des alimentations monophasées munies d'un conducteur neutre mis à la terre. Pour écarter les risques d'électrocution, ne pas brancher de produit Sun dans un autre type d'alimentation secteur. En cas de doute quant au type d'alimentation électrique du local, veuillez vous adresser au directeur de l'exploitation ou à un électricien qualifié.



Attention : tous les cordons d'alimentation n'ont pas forcément la même puissance nominale en matière de courant. Les rallonges d'usage domestique n'offrent pas de protection contre les surcharges et ne sont pas prévues pour les systèmes d'ordinateurs. Ne pas utiliser de rallonge d'usage domestique avec votre produit Sun.



Attention : votre produit Sun a été livré équipé d'un cordon d'alimentation à trois fils (avec prise de terre). Pour écarter tout risque d'électrocution, branchez toujours ce cordon dans une prise mise à la terre.

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



Attention : le commutateur d'alimentation de ce produit fonctionne comme un dispositif de mise en veille uniquement. C'est la prise d'alimentation qui sert à mettre le produit hors tension. Veuillez donc à installer le produit à proximité d'une prise murale facilement accessible. Ne connectez pas la prise d'alimentation lorsque le châssis du système n'est plus alimenté.

Batterie au lithium



Attention : sur les cartes CPU Sun, une batterie au lithium (référence MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, ou MK48T08.) a été moulée dans l'horloge temps réel SGS. Les batteries ne sont pas des pièces remplaçables par le client. Elles risquent d'exploser en cas de mauvais traitement. Ne pas jeter la batterie au feu. Ne pas la démonter ni tenter de la recharger.

Couvercle

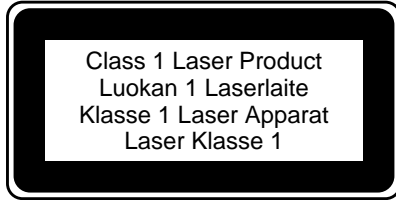
Pour ajouter des cartes, de la mémoire, ou des unités de stockage internes, vous devrez démonter le couvercle de l'unité système Sun. Ne pas oublier de remettre ce couvercle en place avant de mettre le système sous tension.



Attention : il est dangereux de faire fonctionner un produit Sun sans le couvercle en place. Si l'on néglige cette précaution, on encourt des risques de blessures corporelles et de dégâts matériels.

Conformité aux certifications Laser

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



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Attention - L'utilisation de contrôles, de réglages ou de performances de procédures autre que celle spécifiée dans le présent document peut provoquer une exposition à des radiations dangereuses.

Normativas de seguridad

El siguiente texto incluye las medidas de seguridad que se deben seguir cuando se instale algún producto de Sun Microsystems.

Precauciones de seguridad

Para su protección observe las siguientes medidas de seguridad cuando manipule su equipo:

- Siga todas las avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de la red eléctrica concuerdan con las descritas en las etiquetas de especificaciones eléctricas del equipo.
- No introduzca nunca objetos de ningún tipo a través de los orificios del equipo. Pueden haber voltajes peligrosos. Los objetos extraños conductores de la electricidad pueden producir cortocircuitos que provoquen un incendio, descargas eléctricas o daños en el equipo.

Símbolos

En este libro aparecen los siguientes símbolos:



Precaución - Existe el riesgo de lesiones personales y daños al equipo. Siga las instrucciones.



Precaución - Superficie caliente. Evite el contacto. Las superficies están calientes y pueden causar daños personales si se tocan.



Precaución - Voltaje peligroso presente. Para reducir el riesgo de descarga y daños para la salud siga las instrucciones.



Encendido - Aplica la alimentación de CA al sistema.

Según el tipo de interruptor de encendido que su equipo tenga, es posible que se utilice uno de los siguientes símbolos:



Apagado - Elimina la alimentación de CA del sistema.



En espera - El interruptor de Encendido/En espera se ha colocado en la posición de *En espera*.

Modificaciones en el equipo

No realice modificaciones de tipo mecánico o eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de las normativas de seguridad en los equipos Sun modificados.

Ubicación de un producto Sun



Precaución - Para asegurar la fiabilidad de funcionamiento de su producto Sun y para protegerlo de sobrecalentamientos no deben obstruirse o taparse las rejillas del equipo. Los productos Sun nunca deben situarse cerca de radiadores o de fuentes de calor.

Cumplimiento de la normativa SELV

El estado de la seguridad de las conexiones de entrada/salida cumple los requisitos de la normativa SELV.

Normativa ergonómica europea

Para cumplir con el estándar de ergonomía alemán ZH1/618, se ha dotado a la pantalla con un tratamiento antireflectante. Para las aplicaciones de tratamiento de textos, se precisa un modo de visualización positivo (caracteres negros sobre fondo blanco).

Conexión del cable de alimentación eléctrica



Precaución – Los productos Sun están diseñados para trabajar en una red eléctrica monofásica con toma de tierra. Para reducir el riesgo de descarga eléctrica, no conecte los productos Sun a otro tipo de sistema de alimentación eléctrica. Póngase en contacto con el responsable de mantenimiento o con un electricista cualificado si no está seguro del sistema de alimentación eléctrica del que se dispone en su edificio.



Precaución – No todos los cables de alimentación eléctrica tienen la misma capacidad. Los cables de tipo doméstico no están provistos de protecciones contra sobrecargas y por tanto no son apropiados para su uso con computadores. No utilice alargadores de tipo doméstico para conectar sus productos Sun.



Precaución – Con el producto Sun se proporciona un cable de alimentación con toma de tierra. Para reducir el riesgo de descargas eléctricas conéctelo siempre a un enchufe con toma de tierra.

La siguiente advertencia se aplica solamente a equipos con un interruptor de encendido que tenga una posición "En espera":



Precaución – El interruptor de encendido de este producto funciona exclusivamente como un dispositivo de puesta en espera. El enchufe de la fuente de alimentación está diseñado para ser el elemento primario de desconexión del equipo. El equipo debe instalarse cerca del enchufe de forma que este último pueda ser fácil y rápidamente accesible. No conecte el cable de alimentación cuando se ha retirado la fuente de alimentación del chasis del sistema.

Batería de litio



Precaución – En las placas de CPU Sun hay una batería de litio insertada en el reloj de tiempo real, tipo SGS Núm. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, o MK48T08. Las baterías no son elementos reemplazables por el propio cliente. Pueden explotar si se manipulan de forma errónea. No arroje las baterías al fuego. No las abra o intente recargarlas.

Tapa de la unidad del sistema

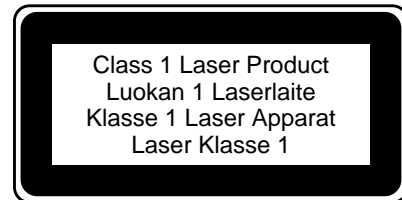
Debe quitar la tapa del sistema cuando sea necesario añadir tarjetas, memoria o dispositivos de almacenamiento internos. Asegúrese de cerrar la tapa superior antes de volver a encender el equipo.



Precaución – Es peligroso hacer funcionar los productos Sun sin la tapa superior colocada. El hecho de no tener en cuenta esta precaución puede ocasionar daños personales o perjudicar el funcionamiento del equipo.

Aviso de cumplimiento con requisitos de láser

Los productos Sun que utilizan la tecnología de láser cumplen con los requisitos de láser de Clase 1.

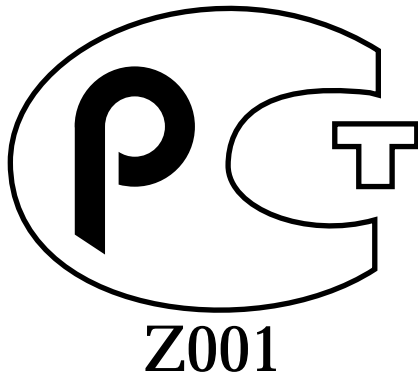


CD-ROM



Precaución – El manejo de los controles, los ajustes o la ejecución de procedimientos distintos a los aquí especificados pueden exponer al usuario a radiaciones peligrosas.

GOST-R Certification Mark



Nordic Lithium Battery Cautions

Norge



A D V A R S E L - Litiumbatteri — Eksplosjonsfare.
Ved utskifting benyttes kun batteri som anbefalt av
apparatfabrikanten. Brukt batteri returneres
apparatleverandøren.

Sverige



WARNING - 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. Udsiftning 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 ID: NIC-PCI

Product Name: Sun GigabitEthernet PCI Adapter 1.1

This product has been tested and complies with the following EMC and Safety standards:

EMC

EC – Europe

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

EN55022 / CISPR22 (1985)	Class A
EN50082-1	IEC801-2 (1991) 4 kV (direct), 8 kV (air)
	IEC801-3 (1984) 3 V/m
	IEC801-4 (1988) 1.0 kV power lines, 0.5 kV signal lines
EN61000-3-2/IEC1000-3-2 (1994)	Pass

Safety

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

- EN60950/IEC950 (1993)

Supplementary Information

This product was tested and complies with all the requirements for the CE Mark when connected to a Sun workstation or server.

/ S /

Dennis P. Symanski Date
Manager, Product Compliance

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Preface

The *Sun GigabitEthernet PCI Adapter 1.1 User's Guide* describes how to install and use the Sun™ GigabitEthernet Peripheral Component Interconnect (PCI) adapter.

The procedures in this manual assume that you are a system or network administrator experienced in installing similar hardware in a Solaris™ operating environment.

UNIX Commands

This document may not include specific software commands or procedures. Instead, it may name software tasks and refer you to operating system documentation or the handbook that was shipped with your new hardware.

See one or more of the following:

- *Solaris 2.x Handbook for SMCC Peripherals* contains Solaris™ 2.x software commands.
- Online AnswerBook™ for the complete set of documentation supporting the Solaris 2.x software environment.
- Other software documentation that you received with your system.

Related Documents

The following documents contain topics that relate to the information in the *Sun GigabitEthernet PCI Adapter 1.1 User's Guide*.

Title	Part Number
<i>Solaris 2.x Handbook for SMCC Peripherals</i>	801-5488
<i>SunVTS 2.0 User's Guide</i>	802-5331

Ordering Sun Documents

The SunDocsSM program provides more than 250 manuals from Sun Microsystems, Inc. If you live in the United States, Canada, Europe, or Japan, you can purchase documentation sets or individual manuals using this program.

For a list of documents and how to order them, see the catalog section of the SunExpressTM Internet site at <http://www.sun.com/sunexpress>.

Accessing Sun Documentation Online

The docs.sun.com Web site enables you to access Sun technical documentation online. You can browse the docs.sun.com archive or search for a specific book title or subject. The URL is <http://docs.sun.com/>.

Typographic Conventions

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output.	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output.	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Command-line variable; replace with a real name or value.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be <i>root</i> to do this. To delete a file, type <code>rm filename</code> .

Shell Prompts

TABLE P-2 Shell Prompts

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

Installing the Sun GigabitEthernet PCI Adapter

The Sun GigabitEthernet PCI adapter incorporates a new technology that transfers data at a rate of one gigabit per second—10 times the rate of a fast Ethernet adapter. The Sun GigabitEthernet PCI adapter targets the increased congestion experienced at the backbone and server levels by today's networks, while providing a future upgrade path for high-end workstations that require more bandwidth than fast Ethernet can provide.

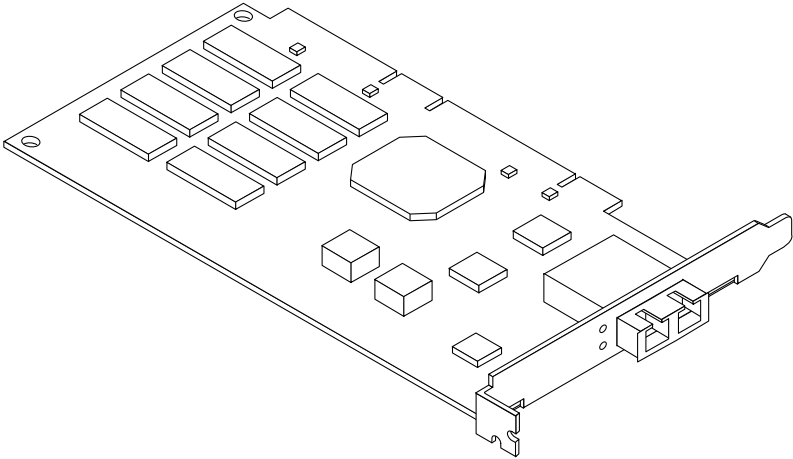


FIGURE 1-1 Sun GigabitEthernet PCI Adapter

Features

The Sun GigabitEthernet PCI adapter features include:

PCI

- Full-duplex gigabit ethernet interface (IEEE P802.3z draft)
- Standard Ethernet frame size (1518 bytes)
- Dual Homing for automatic failover if a port, switch, or adapter is down
- VLANs: up to 64 VLANs using IEEE 802.1Q tagging
- Dual DMA channels
- Adaptive interrupt frequency (maximizes network throughput depending on traffic load)
- ASIC with on-chip MAC and RISC processor
- Memory support
- Duplex SC fiber connector
- 33-MHz, 32- or 64-bit bus master with adaptive DMA
- Universal dual voltage signaling (3.3V and 5V)
- PCI Local Bus Rev 2.1 compliant (6.8-inch x 4.2-inch short card)

Key Protocols and Interfaces

The Sun GigabitEthernet PCI is interoperable with existing Ethernet equipment assuming standard Ethernet minimum and maximum frame size (64 to 1518 bytes), frame format, and compliance with the following standards and protocols:

- Logical Link Control (IEEE 802.2)
- Flow Control (IEEE 802.3x)
- SNMP (limited MIB)
- Gigabit Ethernet (IEEE P802.3z draft)

Diagnostic Support

- RISC runs on-board diagnostic on power-up
- SunVTS™ diagnostic tool

Installing the Adapter

This section describes how to install the adapter in your system and verify the installation.

Note – Refer to your system installation or service manual for more information.

▼ To Install the Adapter

1. Power off your system and open the system unit.
2. Attach the wrist strap's adhesive copper strip to the metal casing of the system. Wrap the other end twice around your wrist, with the adhesive side against your skin.
3. Holding the PCI card by the edges, unpack it and place it on an antistatic surface.
4. Identify the slot number in which you want to insert the Sun GigabitEthernet PCI adapter.
5. Remove the PCI filler panel from the slot that you selected.
6. Holding the PCI card by the edges, align the card edge connector with the PCI slot. Slide the card face plate into the small slot at the end of the PCI opening.
7. Applying even pressure at both corners of the card, push the PCI card until it is firmly seated in the slot.
8. Screw the card in place.
9. Detach the wrist strap and close the system unit.

▼ To Verify the Installation

After you have installed the Sun GigabitEthernet PCI adapter *and before booting the system*, verify the installation by performing the tasks that follow. Refer to the *Solaris 2.x Handbook for SMCC Peripherals* manual or your Solaris documentation for detailed instructions.

1. Power on the system, and when the banner is displayed, press the Stop-A keys to interrupt the boot process and get to the `ok` prompt.

2. Use the `show-devs` command to list the system devices.

`/pci@1f,2000/pci12ae,1@1` identifies the Sun GigabitEthernet PCI adapter.

You should see Sun GigabitEthernet PCI adapter output *similar* to the example below. The example shows the output from a Sun Ultra™ Enterprise™ 3000. If you are using a different system, the output will be different.

```
ok show-devs
/SUNW,ffb@1e,0
/SUNW,UltraSPARC-II@0,0
/pci@1f,2000
/pci@1f,4000
/counter-timer@1f,1c00
/virtual-memory
/memory@0,60000000
/aliases
/options
/openprom
/chosen
/packages
/pci@1f,2000/pci12ae,1@1
/pci@1f,4000/scsi@3
/pci@1f,4000/network@1,1
/pci@1f,4000/ebus@1
/pci@1f,4000/scsi@3/tape
/pci@1f,4000/scsi@3/disk
/pci@1f,4000/ebus@1/SUNW,CS4231@14,200000
....
```

- In the Sun Ultra Enterprise 3000 system, `/pci@1f,2000/pci12ae,1@1` identifies the Sun GigabitEthernet PCI adapter. In the Sun Ultra 450, `/pci@6,2000/ethernet@1` and `/pci@6,4000/ethernet@2` identify the Sun GigabitEthernet PCI adapter instead of `/pci@1f,2000/pci12ae,1@1`.

If the PCI adapter is not listed, check that the card is properly seated and reinstall it if necessary.

Installing the Adapter Software

This section describes how to install the Sun GigabitEthernet PCI adapter software.

Note – You must have the Sun GigabitEthernet PCI Adapter installed in your system *before* you install the software.

▼ To Install the Software

Note – If the CD-ROM drive that you are using for software installation is attached to a remote machine, refer to your Solaris installation guide for remote CD-ROM access.

1. **Become superuser.**
2. **Check for any previously installed Sun GigabitEthernet software packages:**

```
# pkginfo | grep SUNWvge
```

3. **If you find any previously installed packages, remove them:**

```
# pkgrm SUNWvge
```

4. **Place the CD-ROM in its caddy and load the caddy into the CD-ROM drive.**
5. **Mount the CD-ROM on a local directory.**

If Volume Manager (`vold`) is running on your machine, then the CD-ROM is mounted automatically under `/cdrom/sungige_1_1` when it is loaded in the drive.

If Volume Manager (`vold`) is not running on your machine, create a directory called `/cdrom/sungige_1_1` and mount the CD-ROM manually.

```
# mkdir /cdrom/sungige_1_1
# mount -F hsfs -r /dev/sr0 /cdrom/sungige_1_1
```

6. Access the package directory:

```
# cd /cdrom/sungige_1_1/Product
```

7. Check the available packages:

```
# pkgadd -d .
```

The screen displays a list of packages available for installation:

```
The following packages are available:
1 SUNWvge    Sun GigabitEthernet Adapter 1.1
              (sparc) 1.0.0
2 SUNWvts    Online Validation Test Suite 2.0
              (sparc) 2.1, REV=35.97.05.30

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

8. Press Return.

The `pkgadd` command starts the installation script.

9. Respond to the prompts in the script.

Note – `pkgadd` keeps cycling through its script once it has started. Quit the program by typing `q` the second time the list of packages displays.

10. When you have finished loading the software, unmount the CD-ROM directory:

```
# cd /  
# eject /cdrom
```

If the automounter failed to flush a previous mount point, you may see the following directory:

```
/cdrom/sungige_1_1#1
```

If this should happen, remove the empty directory.

```
# rmdir /cdrom/sungige_1_1#1
```

11. Reboot your machine using the following command:

```
# reboot -- -r
```

If the PCI card is not installed, you will see the following messages:

```
drvconfig: Driver (vge) failed to attach  
Warning: Driver (vge) successfully added to system but failed to attach  
pkgadd: ERROR: postinstall script did not complete successfully
```

If this happens, install the card and reboot your machine using the following command:

```
# reboot -- -r
```

▼ To Set the MANPATH Environmental Variable

You must set the MANPATH environmental variable if you want the `/bin/man` command to find the `vge` man page installed by the `SUNWvge` package. The file you edit will depend on the shell you use.

- Using a Bourne or Korn shell, edit the `$HOME/.profile` file by adding the following:

```
MANPATH=/var/opt/SUNWvge/man:$MANPATH
export MANPATH
```

- Using a C shell, edit the `$home/.cshrc` file by adding the following:

```
setenv MANPATH "/var/opt/SUNWvge/man:$MANPATH"
```

LED Indicators

TABLE 2 explains the LED indicators on the adapter.

TABLE 2 Sun GigabitEthernet PCI LEDs

Light	State	Description
Yellow	• Off	• Connection is good
	• On	• Fault condition detected on this port, which could be the result of a bad cable or a bad connector; or no cable is connected to this port
	• Blinking	• Data coming in
Green	• Off	• Port not connected to a device
	• Steady	• Link detected, no data
	• Flickering	• Link detected, data detected
	• Blinking	• Port has been disabled by software

Configuring the Sun GigabitEthernet PCI Adapter

For proper performance, once the Sun GigabitEthernet PCI adapter software is installed on your system, it must be configured.

Perform each of the following tasks to configure the Sun GigabitEthernet PCI adapter.

Note – If you have moved any card from one slot to another, you must remove all `vge` entries from the `/etc/path_to_inst` file before setting or changing any of the configuration settings.

Configuring the Host Files

Each adapter must be assigned a host name and an IP address. If VLANs are to be used, any specific adapter may have one host name and IP address for each VLAN (see “To Configure VLANs” on page 22).

If you are not using multiple VLANs, follow these steps when configuring the host name and IP address for your adapter:

1. **Create the `/etc/hostname.vge<num>` file(s) on the server.**

There can be twice the number of adapters your server normally accommodates if they are configured for dual homing with the extra adapters in stand by mode.

One `hostname.vge<num>` file must be created for each adapter on the server. Create files using the following naming format:

```
/etc/hostname.vge<num>
```

For each file, the number *<num>* in the filename is determined according to TABLE 2-1, which illustrates the concept using four adapters. For example, the first adapter in the server requires a file named `/etc/hostname.vge0`. The second adapter requires a file named `/etc/hostname.vge1`.

TABLE 2-1 Filenames for Adapters

First Adapter	Second Adapter	Third Adapter	Fourth Adapter
<code>/etc/hostname.vge0</code>	<code>/etc/hostname.vge1</code>	<code>/etc/hostname.vge2</code>	<code>/etc/hostname.vge3</code>

2. Place the appropriate adapter host name into the `hostname.vge<num>` file(s).

The `/etc/hostname.vge<num>` file must contain the appropriate host name for the adapter.

The host name should be different from that of any other interface. For example, `/etc/hostname.vge0` and `/etc/hostname.vge1` cannot share the same host name.

The following example depicts the host name files required for a machine called `zardoz`, with four Sun GigabitEthernet adapters known as `zardoz-11`, `zardoz-12`, `zardoz-13`, and `zardoz-14` on the networks connected to the `vge0`, `vge1`, `vge2`, and `vge3` Ethernet devices.

```
zardoz # cat /etc/hostname.vge0
zardoz-11
zardoz # cat /etc/hostname.vge1
zardoz-12
zardoz # cat /etc/hostname.vge2
zardoz-13
zardoz # cat /etc/hostname.vge3
zardoz-14
```

3. For each host name, enter the appropriate IP address in the `/etc/hosts` file.

4. Reboot the system.

```
# reboot -- -r
```

If you make changes and put the system into service before rebooting, you may experience configuration problems.

Configuring Driver Parameters

The `ndd` (1M) utility is useful for changing configuration parameters for the adapter. Alternately, adapter parameters can be changed by manually editing the configuration files (see “Configuring Driver Parameters Manually” on page 17). This section describes the `ndd` utility in detail.

Note – Any changes made with `ndd` are temporary and will be lost when you reboot the system. To make configuration changes survive the reboot process, you will need to store driver settings in the `/etc/rc2.d` file (see “Saving Driver Parameters Beyond Reboot” on page 15).

Available Parameters

To view parameters that you set using the `ndd` command, type:

```
# ndd /dev/vge '?'
```

The system will return the following:

```
?
stat_ticks                (read and write)
send_max_coalesced_bds   (read and write)
recv_max_coalesced_bds   (read and write)
nic_tracing               (read and write)
link_negotiation          (read and write)
dump_nic                  (read and write)
jumbo                     (read and write)
vlan?                     (read and write)
vlan_tag                  (read and write)
vlan_tag_id               (read and write)
redund?                   (read and write)
redund                    (read and write)
fdr_filter                (read and write)
instance                  (read and write)
```

TABLE 2-2 explains the available `ndd` parameters and shows the default value as well as the minimum and maximum allowed values of each.

TABLE 2-2 Explanation of `ndd` Parameters

Parameter	Meaning	Default	Minimum	Maximum
<code>stat_ticks</code>	Minimum number of 100 usec ticks between statistics updates.	100	0	No limit
<code>send_max_coalesced_bds</code>	Number of sends before a send complete event is set.	60	1	127
<code>recv_max_coalesced_bds</code>	Maximum number of receives that can be bundled into an event.	6	1	511
<code>nic_tracing</code>	(not currently available)	0	0	No limit
<code>link_negotiation</code>	Used to set IEEE 802.3z (draft) Link Negotiation to <code>auto</code> or <code>off</code> . (for <code>auto</code>)	1	0 (for off)	1 (for auto)
<code>dump_nic</code>	Takes a dump of adapter memory. A system core dump will then include adapter information.	0	0 (clear NIC dump memory, return it to the system)	1 (dump current adapter information)
<code>jumbo</code>	(not currently available)			
<code>vlan?</code>	(do not use; value is set by startup file)			
<code>vlan_tag</code>	(do not use; value is set by startup file)			
<code>vlan_tag_id</code>	(do not use; value is set by startup file)			
<code>redund?</code>	(do not use; value is set by startup file)			
<code>redund</code>	(do not use; value is set by startup file)			
<code>fdr_filter</code>	Set to on if the adapter is attached to a Full Duplex switch, repeater, or router.	0	0 (for off)	1 (for on)
<code>instance</code>	Used to set the device number from which the previous data is extracted.	0	0	# of adapters in the system

Checking Parameter Settings

To check a current parameter setting, use the following command:

```
# ndd /dev/vge <parameter_name>
```

▼ To Temporarily Change a Parameter

1. Check the `/etc/path_to_inst` file for the instance associated with particular devices.
2. Specify the instance for the adapter you wish to configure:

```
# ndd -set instance <instance number>
```

Any subsequent `ndd` configuration commands will act on the adapter with the selected instance. The adapter remains selected until you specify a different instance.

3. Specify the configuration command using the following format:

```
# ndd -set <parameter> <value>
```

Note – Any changes made with `ndd` will be lost when you reboot the system. To make configuration changes survive the reboot process, you will need to store driver settings in the `/etc/rc2.d` file (see “Saving Driver Parameters Beyond Reboot” on page 15).

Increasing TCP/IP Performance

You can increase the TCP/IP performance of the Sun GigabitEthernet PCI Adapter by changing the TCP/IP `ndd` values as follows:

- As superuser, type:

```
# ndd -set /dev/tcp tcp_recv_hiwat 65535
# ndd -set /dev/tcp tcp_xmit_hiwat 65535
# ndd -set /dev/tcp tcp_cwnd_max 65534
# ndd -set /dev/udp udp_recv_hiwat 65535
# ndd -set /dev/udp udp_xmit_hiwat 65535
```

Note – These changes are global and affect other cards in the system.

The changes will take effect immediately, and they will affect all the networking interfaces in the system. However, the changes will be lost when you reboot your machine.

To avoid losing these settings when you reboot, add your ndd parameter settings to the start-up file as shown in the following section.

Saving Driver Parameters Beyond Reboot

Any parameter changes made using `ndd` will be lost the next time your system is rebooted.

- **To avoid losing the settings, put these parameter changes into a start-up file in `/etc/rc2.d`, similar to the following example:**

```
# !/sbin/sh
# Local kernel modifications
#
case "$1" in
'start')
    echo "Setting local kernel parameters...\c"
    ndd -set /dev/tcp tcp_recv_hiwat 65535
    ndd -set /dev/tcp tcp_xmit_hiwat 65535
    ndd -set /dev/tcp tcp_cwnd_max 65534
    ndd -set /dev/udp udp_recv_hiwat 65535
    ndd -set /dev/udp udp_xmit_hiwat 65535
    echo""
    ..
    "
'stop')
    echo "0: No parameters changed."
*)
    echo "Usage: $0 {start|stop}"
    ..
    "
esac
```

For example, if you need to set Link Negotiation “off” for adapter 2 and increase the TCP/IP values, you could place the following lines in the `/ect/rc2.d` start-up file:

```
# !/sbin/sh
# Local kernel modifications
#
case "$1" in
'start')
    echo "Setting local kernel parameters...\c"
    ndd -set instance 2
    ndd -set link_negotiation 0
    ndd -set /dev/tcp tcp_rcv_hiwat 65535
    ndd -set /dev/tcp tcp_xmit_hiwat 65535
    ndd -set /dev/tcp tcp_cwnd_max 65534
    ndd -set /dev/udp udp_rcv_hiwat 65535
    ndd -set /dev/udp udp_xmit_hiwat 65535
    echo""
    ..
    "
'stop')
    echo "$0: No parameters changed."
*)
    echo "Usage: $0 {start|stop}"
    ..
    "
esac
```

Capturing Dump Information

The `dump_nic` command should be used if an adapter stops operating for any reason. The dump contains internal adapter state information which can be used to troubleshoot problems.

To take a dump of an adapter’s state information, once the adapter has stopped operating:

1. Select the proper adapter instance.

```
# ndd -set /dev/vge instance <value>
```

2. Set the adapter to dump state information in the case of a system core dump.

```
# ndd -set /dev/vge dump_nic 1
```

3. To verify this function, force the system to take a core dump. At the `ok` prompt, type:

```
ok sync
```

This will reboot the system and save the adapter memory information into a file.

4. Go to the `/var/crash/hostname` directory and check for the dump information:

```
% cd /var/crash/<hostname>
% ls
```

The dump information will be under one of the following file names: `bounds`, `unix.0`, or `vmcore.0`.

5. Use a text editor to open the file containing the dump information.

Configuring Driver Parameters Manually

The `vge` device driver controls the `pci12ae,1` Ethernet device.

You can manually configure the `vge` device driver parameters to customize each `pci12ae,1` device in your system:

- Configure the `vge` driver parameters generally for all `pci12ae,1` devices in the system by entering the parameter variables in the `/etc/system` file.
- Set a parameter on a per-device basis by creating the `vge.conf` file in the `/kernel/drv` directory.

Autonegotiation

The default configuration for autonegotiation of the Gigabit Ethernet link is *auto*. With this setting the Sun GigabitEthernet PCI adapter will use IEEE 802.3z (draft) autonegotiation. All Sun GigabitEthernet adapters and SunSwitches have auto negotiation set to *auto* as the default configuration.

If you are connecting the adapter to Gigabit Ethernet equipment that does not support autonegotiation, or if there is a problem establishing a link between the two devices, autonegotiation can be turned off (see TABLE 2-2). Be sure that both devices are set to the same speed and duplex configuration.

Note – Autonegotiation has changed in the most recent version of the IEEE 802.3z (draft). Release 1.0 software for the Sun GigabitEthernet adapters and SunSwitch uses a different version of auto negotiation than Release 1.1. If you are trying to connect a Release 1.0 device to a Release 1.1 device, you can choose to upgrade and run Release 1.1 on both devices or turn autonegotiation off on both devices.

Optional Configurations

Your Sun GigabitEthernet PCI adapter can be configured to support the following options:

- **VLANs:** Virtual Local Area Networks (VLANs) are commonly used to split up groups of network users into manageable broadcast domains, to create logical segmentation of workgroups, and to enforce security policies among each logical segment. With multiple VLANs on an adapter, a server with a single adapter can have a logical presence on multiple IP subnets. Up to 64 VLANs can be defined for each Sun GigabitEthernet PCI adapter on your server.
- **Dual Homing:** Two Sun GigabitEthernet adapters on a server can be paired for redundant operation through the use of the Dual Homing feature. If traffic on a primary connection is lost due to the failure of the adapter, cable, switch port, or switch (when the dual adapters are attached to separate switches), the secondary adapter becomes active and assumes the MAC and IP address of the primary adapter. Network sessions should be maintained after the switch-over, causing the minimum impact to the user.

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

The following sections explain these options in detail, and provide configuration instructions and examples for each.

Note – If you change any of the optional configuration parameters (VLAN or Dual Homing), you must reboot the system before the changes will take effect. If you make changes and do not reboot, you may experience configuration problems.

An Overview of VLANs

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

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

Although VLANs are commonly used to create individual broadcast domains and/or separate IP subnets, it is sometimes useful for a server to have a presence on more than one VLAN simultaneously. Sun GigabitEthernet adapters and SunSwitch products support multiple VLANs on a per port or per interface basis, allowing very flexible network configurations.

FIGURE 3-1 shows an example network that uses VLANs.

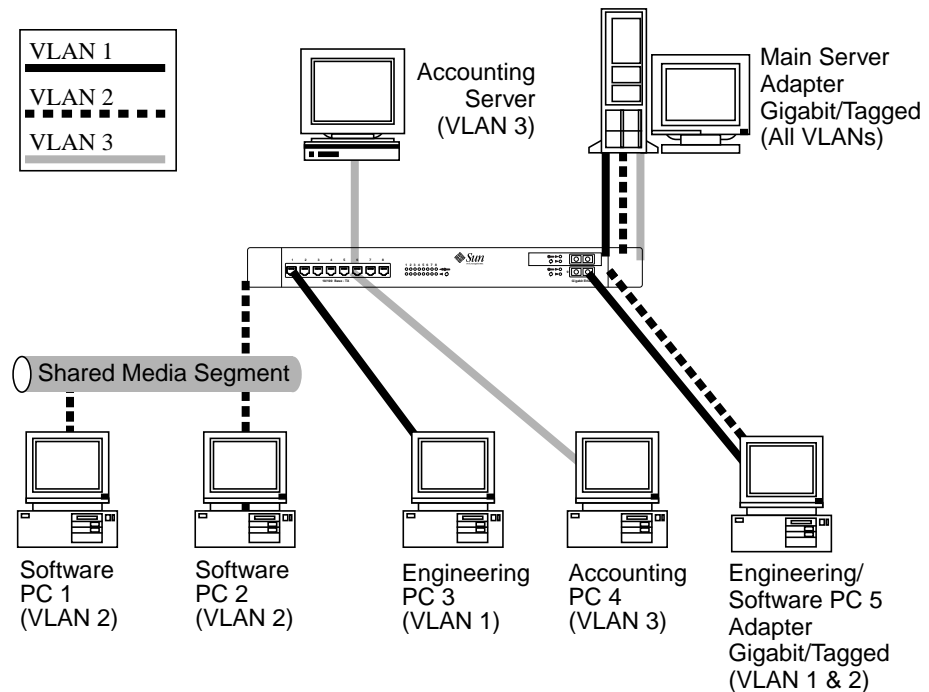


FIGURE 3-1 Example of Servers Supporting Multiple VLANs with Tagging Adapters

The example network has the following features:

- The physical LAN network consists of a switch, two servers, and five clients.
- The LAN is logically organized into three different VLANs, each representing a different IP subnet.
- VLAN 1 is an IP subnet consisting of the Main Server, Client 3, and Client 5. This represents an engineering group.
- VLAN 2 includes the Main Server, Clients 1 and 2 via shared media segment, and Client 5. This is a software development group.
- VLAN 3 includes the Main Server, the Accounting Server and Client 4. This is an accounting group.
- The Main Server is a high-use server that needs to be accessed from all VLANs and IP subnets. The server has a Sun GigabitEthernet adapter installed. All three IP subnets are accessed via the single physical adapter interface. The server is attached to one of the SunSwitch's Gigabit Ethernet ports, which is configured for VLANs 1, 2, and 3. Both the adapter and the connected SunSwitch port have tagging turned on. Because of the tagging VLAN capabilities of both devices, the sever is able to communicate on all three IP subnets in this network, but continues to maintain broadcast separation between all of them.
- The Accounting Server is available to VLAN 3 only. It is isolated from all traffic on VLANs 1 and 2. The switch port connected to the server has tagging turned off.
- Clients 1 and 2 are attached to a shared media hub that is then connected to the switch. They belong to VLAN 2 only, and are logically in the same IP subnet as the Main Server and Client 5. The switch port connected to this segment has tagging turned off.
- Client 3 is a member of VLAN 1, and can communicate only with the Main Server and Client 5. Tagging is not enabled on Client 3's switch port.
- Client 4 is a member of VLAN 3, and can communicate only with the servers. Tagging is not enabled on Client 4's switch port.
- Client 5 is a member of both VLANs 1 and 2, and has a Sun GigabitEthernet adapter installed. It is connected to switch port 10. Both the adapter and the switch port are configured for VLANs 1 and 2 and have tagging enabled.

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

▼ To Configure VLANs

By default, the SunSwitch has a single VLAN configured for every port, which groups all ports into the same broadcast domain, just as if there were no VLANs at all. This default VLAN has an 802.1Q VLAN identification number of [1], with VLAN tagging for the switch port turned off.

Follow these steps when configuring VLANs:

Note – If you configure a VLAN for an adapter, all traffic sent or received by that adapter must be in VLANs.

1. Create the `/etc/hostname.vge` file(s) on the server.

There can be twice the number of adapters your server normally accommodates if they are configured for dual homing and the extra adapters are in stand by mode. You can configure up to 64 VLANs defined for each adapter in active mode.

One `hostname.vge<num>` file must be created for each VLAN which will be configured for each adapter on the server. Create files using the following naming format:

```
/etc/hostname.vge<num>
```

For each file, the number `<num>` in the filename is determined according to TABLE 3-1. For example, the first adapter in the server requires a file named `/etc/hostname.vge0` for its first VLAN, and a file named `/etc/hostname.vge100` for its second VLAN.

TABLE 3-1 Naming Convention for Adapters Configured for VLANs

Up to 64 VLANs per adapter	First Adapter	Second Adapter	Third Adapter	Fourth Adapter
1	<code>/etc/hostname.vge0</code>	<code>/etc/hostname.vge1</code>	<code>/etc/hostname.vge2</code>	<code>/etc/hostname.vge3</code>
2	<code>/etc/hostname.vge100</code>	<code>/etc/hostname.vge101</code>	<code>/etc/hostname.vge102</code>	<code>/etc/hostname.vge103</code>
3	<code>/etc/hostname.vge200</code>	<code>/etc/hostname.vge201</code>	<code>/etc/hostname.vge202</code>	<code>/etc/hostname.vge203</code>
...				
64	<code>/etc/hostname.vge6300</code>	<code>/etc/hostname.vge6301</code>	<code>/etc/hostname.vge6302</code>	<code>/etc/hostname.vge6303</code>

2. Place the appropriate adapter host name into the `hostname.vge` file(s).

The `/etc/hostname.vge<num>` file must contain the appropriate host name for the adapter.

The host name should be different from the host name of any other interface. For example, `/etc/hostname.vge0` and `/etc/hostname.vge1` cannot share the same host name.

The following example depicts the host name files required for a machine called `zardoz`, with four adapters known as `zardoz-11`, `zardoz-12`, `zardoz-13`, and `zardoz-14` on the networks connected to the `vge0`, `vge1`, `vge2`, and `vge3` Ethernet devices.

```
zardoz # cat /etc/hostname.vge0
zardoz-11
zardoz # cat /etc/hostname.vge1
zardoz-12
zardoz # cat /etc/hostname.vge2
zardoz-13
zardoz # cat /etc/hostname.vge3
zardoz-14
```

3. For each host name, enter the appropriate IP address in the `/etc/hosts` file.

4. Create the `/etc/vlan.vge<num>` file(s).

One corresponding `vlan.vge<num>` file is needed for each `/etc/hostname.vge<num>` file created in the previous steps (one for each VLAN being configured for each adapter on the server). Create files using the following naming format:

```
/etc/vlan.vge<num>
```

For each file, the number `<num>` in the filename is determined according to TABLE 3-2. For example, the first adapter requires a file named `/etc/vlan.vge0` for its first VLAN, and a file named `/etc/vlan.vge100` for its second VLAN.

TABLE 3-2 Naming Convention for VLAN Files

Up to 64 VLANs per Adapter	First Adapter	Second Adapter	Third Adapter	Fourth Adapter
1	<code>/etc/vlan.vge0</code>	<code>/etc/vlan.vge1</code>	<code>/etc/vlan.vge2</code>	<code>/etc/vlan.vge3</code>
2	<code>/etc/vlan.vge100</code>	<code>/etc/vlan.vge101</code>	<code>/etc/vlan.vge102</code>	<code>/etc/vlan.vge103</code>

TABLE 3-2 Naming Convention for VLAN Files (*Continued*)

Up to 64 VLANs per Adapter	First Adapter	Second Adapter	Third Adapter	Fourth Adapter
3	/etc/vlan.vge200	/etc/vlan.vge201	/etc/vlan.vge202	/etc/vlan.vge203
...				
64	/etc/vlan.vge6300	/etc/vlan.vge6301	/etc/vlan.vge6302	/etc/vlan.vge6303

5. Place the appropriate VLAN ID tag into the `vlan.vge<num>` file(s).

Each VLAN must be assigned a unique identification number. Even though the maximum number of VLANs that can be configured on each adapter is 64, any particular VLAN can be assigned an identification number between 1 and 4094. The VLAN tagging format follows the guidance provided in IEEE 802.1Q (Draft 5).

The VLAN identifier numbers must be placed into each appropriate `vlan.vge<num>` file to which the adapter is a member.

Example: Consider a server with a single adapter. The server is a member of two VLANs, with VLAN identifiers 383 and 777. The contents of the first file, `/etc/vlan.vge0`, would be 383 and the contents of the second file, `/etc/vlan.vge100`, would be 777.

Use your regular text editor to put the VLAN identifier number into the appropriate `vlan.vge<num>` file. Be certain that there are no spaces, blank lines, or extra characters. The identifier can be entered in decimal (e.g. 383), octal (e.g. 0577), or hexadecimal (e.g. 0x17F) format.

6. If you are finished with all optional configuration, reboot the system.:

```
# reboot -- -r
```

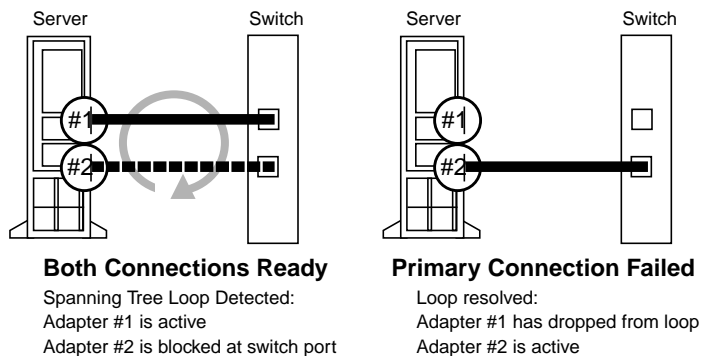
Changes to the optional configuration parameters (VLAN or Dual Homing) do not take effect until you reboot the system. If you will be making changes to the other optional parameters during your configuration session, you may wait to reboot until those changes are complete.

If you make changes and put the system into service before rebooting, you may experience configuration problems.

An Overview of Dual Homing

When two Sun GigabitEthernet adapters are installed in the same server, they can be paired in a Dual Homing configuration. If traffic is not seen over the primary adapter connection due to loss of the adapter, cable, switch port, or switch (where the two adapters are attached to separate switches), the secondary adapter becomes active. When it becomes active, the secondary adapter uses the MAC and IP address originally assigned to the primary adapter. Sessions should be maintained, causing minimum impact to the user.

The Dual Homing feature requires that Spanning Tree Protocol be enabled. Adapters configured for Dual Homing allow Spanning Tree Protocol packets to pass between them. This causes the Spanning Tree Protocol to detect a loop in the network, forcing the switch port connected to one of the adapters to go into blocking mode. The blocked adapter becomes the secondary.



If the primary connection becomes disabled for any reason, the Spanning Tree Protocol will detect the loss of the loop, and will change the switch port connecting the secondary adapter from blocking mode to forwarding mode.

▼ To Configure Dual Homing

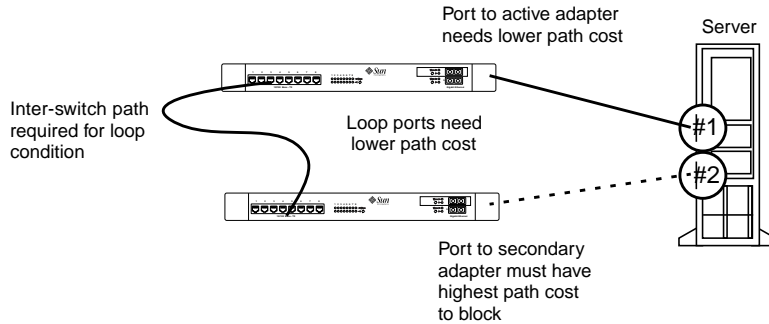
To set up a Dual Homing configuration in a system with two adapters, where adapter `etc/hostname.vge0` is primary and `etc/hostname.vge1` is secondary, enter the following:

1. **Enable Spanning Tree Protocol on the switch connected to your adapters.**

2. The port to which the secondary adapter is connected must be the port that blocks.

If there is more than one switch in the spanning tree, be certain that the secondary adapter is not attached to the root switch of the spanning tree. Also, be sure that the port path cost of the switch port connected to the secondary adapter is higher than the other ports in the loop.

For example, in the following redundant switch configuration, the switch port connected to adapter #2 must have the highest port path cost of any of the four ports in the loop:



3. Create the `/etc/redund.vge1` file.

4. Use your regular text editor to put the number 0, the instance number of the primary adapter, into the file `/etc/redund.vge1`.

Put the number 0 in the file, without spaces or blank lines.

Note – *Do not configure an `/etc/hostname.vge<num>` entry for a redundant adapter. Do not configure VLAN support for the secondary adapter in a Dual Homing configuration. If the secondary adapter becomes primary, it takes on the configuration of the primary adapter. Serious configuration problems will occur if there are VLAN configuration files for the secondary adapter.*

Quick Installation Instructions

This appendix provides an overview of what you must do to install and configure the Sun Gigabit Ethernet PCI Adapter quickly and easily, without VLAN or Dual Homing features. All configurations can be changed at any time.

▼ To Install the Adapter

- 1. Shutdown and power off the system that will receive the adapter(s).**
- 2. Install Gigabit Ethernet adapter into appropriate slot(s) within your system.**
- 3. Power on the system and watch for the Gigabit adapter device information to be displayed on the system console. If you don't see the adapter, you may need to repeat step 1 to ensure that the adapter has been properly seated.**

▼ To Install the Software

1. **Become root.**
2. **Check for any previously installed Sun GigabitEthernet software packages:**

```
# pkginfo | grep SUNWvge
```

3. **If you find any previously installed packages, remove them:**

```
# pkgrm SUNWvge
```

4. **Place the CD-ROM into the CD-ROM drive.**
5. **Mount the CD-ROM on a local directory.**

If the Volume Manager (vold) is running, on your machine, then the CD-ROM is mounted automatically under `/cdrom/sungige_1_1` when it is loaded in the drive

6. **Access the package directory.**

```
# cd /cdrom/sungige_1_1/Product
```

7. **Install the software by entering `pkgadd -d .` (don't forget the dot):**

```
# pkgadd -d .
```

The screen displays a list of packages available for installation:

```
The following packages are available:
1 SUNWvge    Sun GigabitEthernet Adapter 1.1
              (sparc) 1.0.0
2 SUNWvts    Online Validation Test Suite 2.0
              (sparc) 2.1, REV=35.97.05.30

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

8. **Press Return.**
The `pkgadd` command starts the installation script.
9. **Respond to the prompts in the script.**

10. When you have finished loading the software, unmount the CD-ROM directory:

```
# cd /  
# eject /cdrom
```

If the automounter fails to flush a previous mount point, you may see the following directory:

```
/cdrom/sungige_1_1#1
```

If this should happen, remove the empty directory.

```
# rmdir /cdrom/sungige_1_1#1
```

▼ Configure the Host Files

- 1. Enter** `echo <interface-name>/etc/hostname.vge0`.

The variable `<interface-name>` represents the name to be associated with the first gigabit ethernet adapter (for example, `echo myhostname-ge0 /etc/hostname.vge0`)

- 2. Assign the IP address by using `vi` or a similar text editor to edit the `/etc/hosts` file.**

For the example in Step 1, to assign the IP address `192.170.87.32` to the interface `myhostname-ge0`, you would add the following entry to your `/etc/hosts` file:

```
192.170.87.32 myhostname-ge0
```

- 3. Reboot your system.**

```
# reboot -- -r
```


SunVTS Diagnostic Software

This appendix contains an overview of the SunVTS™ diagnostic tool/application.

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

The `nettest` diagnostic test checks all the networking interfaces on a system, including the Sun GigabitEthernet PCI adapter.

To use the `nettest` diagnostic, you must have the SunVTS software installed on your system.

Note – You must have Classical IP up and running on an interface for the `nettest` diagnostic test to work.

Refer to the SunVTS User's Guide for more information on how to run the `nettest` diagnostic test.

The SunVTS documents are listed in TABLE B-1. Refer to them for detailed information about SunVTS. These documents are available on the *Solaris on Sun Hardware AnswerBook*. The *Solaris on Sun Hardware AnswerBook* is provided on the *SMCC Updates* CD for the Solaris release on your system.

TABLE B-1 SunVTS Documentation

Title	Part Number	Description
<i>SunVTS User's Guide</i>	802-5331	Describes the SunVTS environment; starting and controlling various user interfaces
<i>SunVTS Test Reference Manual</i>	802-5330	Describes each SunVTS test; provides various test options and command-line arguments
<i>SunVTS Quick Reference Card</i>	802-5329	Provides overview of <code>vtsui</code> interface features

The main features of the SunVTS environment include:

■ **SunVTS kernel**

The SunVTS kernel (`vtsk`) diagnostic tool controls all testing and operates in the OpenWindows background. When activated, `vtsk` probes the hardware configuration of the system tested and responds to `vtsui`. `vtsk` coordinates execution of individual tests and manages the messages sent by these tests.

■ **SunVTS user interface**

The SunVTS user interface (`vtsui`) diagnostic tool operates in the OpenWindows background. Upon activation, `vtsui` provides `vtsk` control, various user options, tests, and read-log files.

■ **SunVTS TTY**

The `vtstty` diagnostic tool controls the `vtsk` from either a command shell or a terminal attached to a serial port. Most options available in `vtstty` have equivalent options in `vtsui`. `vtstty` is applicable to server configurations only.

Sun GigabitEthernet PCI Adapter Connectors

FIGURE C-1 shows the connector for the Sun GigabitEthernet PCI adapter.

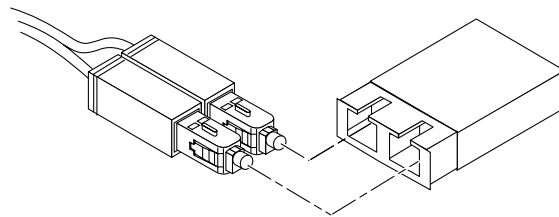


FIGURE C-1 Connector for the Sun GigabitEthernet PCI Adapter

TABLE C-1 lists the characteristics of the 1000 Base-SX link.

TABLE C-1 1000BASE-SX Link Characteristics (IEEE P802.3z draft)

Description	62.5 Micron	50 Micron	Unit
Shortwave (850 nm multimode fiber)			
Operating Range	2 to 260 meters	2 to 550 meters	m

Purchasing Fiber Cables

You can purchase fiber cables directly from Sun Microsystems, Inc. using the following part numbers:

- 2-meter fiber cable X973A
- 15-meter fiber cable X978A

Specifications

Performance Specifications

Feature	Specification
PCI clock	33 MHz max
PCI data burst transfer rate	up to 64-byte bursts
PCI data/address width	64-bit data/32-bit address
PCI modes	Master/slave
1000BASE-SX	1000 Mbps (full duplex)

Physical Characteristics

Dimension	Measurement
Length	6.87 inches
Width	4.25 inches

Power Requirements

Specification	Measurement
Maximum power consumption	7.5 watts
Voltage	5V \pm 5%

Environmental Specifications

Condition	Operating Specification	Storage Specification
Temperature	0° to 55°C (+32 to +131°F)	-40° to +70°C
Relative humidity	5 to 85% non-condensing (40°C, 16 hour dwells at extremes)	5 to 95% non-condensing 10°C/hour
Altitude	up to 10,000 feet	up to 35,000 feet
Shock	10g, 1/2 sine wave, 11 msec	60g, 1/2 sine wave, 11 msec
Vibration, peak-to-peak displacement	0.005 in. max (5 to 32 Hz)	0.1 in. max (5 to 17 Hz)
Vibration, peak acceleration	0.25g (5 to 500 Hz) (sweep rate = 1 octave/min.)	0.25g (5 to 500 Hz) (sweep rate = 1 octave/min.)

