



SunPCi™ III 3.1 User's Guide

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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.



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.



Caution – The workplace-dependent noise level defined in DIN 45 635 Part 1000 must be 70Db(A) or less.

SELV Compliance

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

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.

Battery Pack



Caution – There is a sealed lead acid battery in SunPCi units. Portable Energy Products No. TLC02V50. There is danger of explosion if the battery pack is mishandled or incorrectly replaced. Replace only with the same type of Sun Microsystems battery pack. Do not disassemble it or attempt to recharge it

outside the system. Do not dispose of the battery in fire. Dispose of the battery properly in accordance with local regulations.

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 top cover before powering on 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.

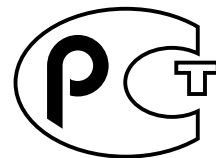
Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1

CD-ROM



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

GOST-R Certification Mark



Conformité aux normes de sécurité

Lisez attentivement la section suivante avant de commencer la procédure. Le document ci-dessous présente les consignes de sécurité à respecter au cours de l'installation d'un produit Sun Microsystems.

Mesures de sécurité

Pour votre protection, observez les mesures de sécurité suivantes lors de l'installation de l'équipement:

- Observez tous les avertissements et consignes indiqués sur l'équipement.
- Assurez-vous que la tension et la fréquence de votre source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de la tension électrique nominale du matériel.
- N'insérez en aucun cas un objet quelconque dans les orifices de l'équipement. Des tensions potentiellement dangereuses risquent d'être présentes dans l'équipement. 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

Les symboles suivants peuvent figurer dans cet ouvrage:



Attention – Vous risquez d'endommager le matériel ou de vous blesser. Observez les consignes indiquées.



Attention – Surface brûlante. Evitez tout contact. Ces 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.



MARCHE – Met le système sous tension alternative.

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



ARRET – Met le système hors tension alternative.



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

Modifications de l'équipement

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

Positionnement d'un produit Sun



Attention – N'obstruez ni ne recouvrez 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.



Attention – Le niveau de bruit inhérent à l'environnement de travail, tel qu'il est défini par la norme DIN 45 635 - section 1000, doit être inférieur ou égal à 70Db(A).

Conformité aux normes SELV

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

Raccordement à la source d'alimentation électrique



Attention – Les produits Sun sont conçus pour fonctionner avec des systèmes d'alimentation électrique monophasés avec prise de terre. 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 n'ont pas la même intensité nominale. 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.



Attention – Votre produit Sun est livré avec un cordon d'alimentation avec raccord à la terre (triphase). Pour réduire les risques de décharge électrique, branchez toujours ce cordon sur une source d'alimentation mise à la terre.

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.

Pile au lithium



Attention – Sur les cartes UC Sun, une batterie au lithium a été moulée dans l'horloge temps réel, de type SGS n° MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ ou MK48T08. Cette batterie ne doit pas être remplacée par le client. Elle risque d'exploser en cas de

mauvaise manipulation. Ne la jetez pas au feu. Ne la démontez pas et ne tentez pas de la recharger.

Bloc-batterie



Attention – Les unités SunPCi contiennent une batterie étanche au plomb. Produits énergétiques portatifs n° TLC02V50. Il existe un risque d'explosion si ce bloc batterie est manipulé ou installé de façon incorrecte. Ne le remplacez que par un bloc batterie Sun Microsystems du même type. Ne le démontez pas et n'essayez pas de le recharger hors du système. Ne le jetez pas au feu. Mettez-le au rebut conformément aux réglementations locales en vigueur.

Couvercle du système

Pour ajouter des cartes, de la mémoire ou des unités de stockage internes, vous devez démonter le couvercle de votre système Sun. N'oubliez pas de le remettre en place avant de mettre le système sous tension.



Attention – Ne travaillez jamais avec un produit Sun dont le couvercle n'est pas installé. Si vous ne respectez pas cette consigne, vous risquez de vous blesser ou d'endommager le système.

Avis de conformité des appareils laser

Les produits Sun faisant appel à la technologie laser sont conformes aux normes de sécurité des appareils laser de classe 1.

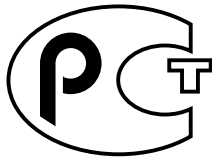
Class 1 Laser Product
Luokan 1 Laserlaitte
Klasse 1 Laser Apparat
Laser Klasse 1

CD-ROM



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.

Notice de qualité GOST-R



Einhaltung sicherheitsbehördlicher Vorschriften

Lesen Sie diesen Abschnitt sorgfältig durch, bevor Sie mit dem Arbeitsablauf beginnen. Der folgende Text beschreibt Sicherheitsmaßnahmen, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsmaßnahmen

Zu Ihrem eigenen Schutz sollten Sie die folgenden Sicherheitsmaßnahmen bei der Installation befolgen :

- Befolgen Sie alle auf die Geräte aufgedruckten Anweisungen und Warnhinweise.
- Beachten Sie die Geräteaufschrift, um sicherzustellen, daß Netzspannung und -frequenz mit der Gerätespannung und -frequenz übereinstimmen.
- Führen Sie niemals Gegenstände in die Geräteöffnungen ein. Es könnten elektrische Spannungsfelder vorhanden sein. Leitende Fremdkörper können Kurzschlüsse, Feuer und elektrische Schläge verursachen oder Ihr Gerät beschädigen.

Symbole

Die folgenden Symbole werden in diesem Handbuch verwendet:



Achtung – Es besteht die Gefahr der Verletzung und der Beschädigung des Geräts. Befolgen Sie die Anweisungen.



Achtung – Heiße Oberfläche. Vermeiden Sie jede Berührung. Diese Oberflächen sind sehr heiß und können Verbrennungen verursachen.



Achtung – Elektrisches Spannungsfeld vorhanden. Befolgen Sie die Anweisungen, um elektrische Schläge und Verletzungen zu vermeiden.



Ein – Das System wird mit Wechselstrom versorgt.

Abhängig von der Art des Stromschalters Ihres Gerätes wird eventuell eines der folgenden Symbole verwendet:



Aus – Das System wird nicht mehr mit Wechselstrom versorgt.



Wartezustand – Der Ein-/Standby-Schalter 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. Nichtbeachtung dieser Richtlinien können

Überhitzung verursachen und die Zuverlässigkeit Ihres Sun-Geräts beeinträchtigen.



Achtung – Der Geräuschpegel, definiert nach DIN 45 635 Part 1000, darf am Arbeitsplatz 70dB(A) nicht überschreiten.

SELV-Richtlinien

Alle Ein-/Ausgänge erfüllen die SELV-Anforderungen.

Netzanschlußkabel



Achtung – Sun-Geräte benötigen ein einphasiges Stromversorgungssystem mit eingebautem Erdleiter. Schließen Sie Sun-Geräte nie an ein anderes Stromversorgungssystem an, um elektrische Schläge zu vermeiden. Falls Sie die Spezifikationen der Gebäudestromversorgung nicht kennen, sollten Sie den Gebäudeverwalter oder einen qualifizierten Elektriker konsultieren.



Achtung – Nicht alle Netzanschlußkabel besitzen die gleiche Stromleitung. Normale Verlängerungskabel besitzen keinen Überspannungsschutz und sind nicht für den Gebrauch mit Computersystemen geeignet. Benutzen Sie keine Haushaltverlängerungskabel für Sun-Geräte.



Achtung – Ihr Sun-Gerät wurde mit einem geerdeten (dreiadrigen) Netzanschlußkabel geliefert. Stecken Sie dieses Kabel immer nur in eine geerdete Netzsteckdose, um Kurzschlüsse zu vermeiden.

Der folgende Hinweis bezieht sich nur auf Geräte mit Standby-Stromschalter:



Achtung – Der Stromschalter dieses Produkts funktioniert nur als Standby-Gerät. Das Netzanschlußkabel dient als

Hauptabschaltgerät für das System. Stellen Sie sicher, daß Sie das Netzanschlußkabel in den geerdeten Stromausgang in der Nähe des Systems einstecken. Schließen Sie das Netzanschlußkabel nicht an, wenn die Stromzufuhr vom Systemgehäuse entfernt wurde.

Lithium-Batterie



Achtung – CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie, Teile-Nr. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ oder MK48T08. Batterien sollten nicht vom Kunden ausgetauscht werden. Sie können bei falscher Handhabung explodieren. Entsorgen Sie die Batterien nicht im Feuer. Entfernen Sie sie nicht und versuchen Sie auch nicht, sie wiederaufzuladen.

Batterien



Achtung – Die Geräte SunPCi enthalten auslaufsichere Bleiakkumulatoren, Produkt-Nr. TLC02V50 für portable Stromversorgung. Wenn die Batterien nicht richtig gehandhabt oder ausgetauscht werden, besteht Explosionsgefahr. Tauschen Sie Batterien nur gegen Batterien gleichen Typs von Sun Microsystems aus. Versuchen Sie nicht, die Batterien zu entfernen oder außerhalb des Geräts wiederaufzuladen. Entsorgen Sie die Batterien nicht im Feuer. Entsorgen Sie die Batterien ordnungsgemäß entsprechend den vor Ort geltenden Vorschriften.

Abdeckung des Systems

Sie müssen die Abdeckung des Sun-Computersystems entfernen, um Karten, Speicher oder interne Speichergeräte hinzuzufügen. Stellen Sie sicher, daß Sie die Abdeckung wieder einsetzen, bevor Sie den Computer einschalten.



Achtung – Sun-Geräte dürfen nicht ohne Abdeckung in Gebrauch genommen werden. Nichtbeachtung dieses Warnhinweises kann Verletzungen oder Systembeschädigungen zur Folge haben.

Laserrichtlinien

Alle Sun-Produkte, die Lasertechnologie nutzen, erfüllen die Laserrichtlinien der Klasse 1.

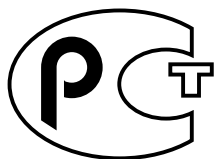
Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1

CD-ROM



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

Verbandsmarke GOST-R



Normativas de seguridad

Lea esta sección antes de llevar a cabo cualquier procedimiento. El texto que aparece a continuación explica las medidas de seguridad que deben tomarse durante la instalación de un producto Sun Microsystems.

Medidas de seguridad

Por su propia seguridad, tome las medidas de seguridad siguientes al instalar el equipo::

- Siga todas los avisos y las instrucciones que aparecen impresas en el equipo.
- Cerciórese de que el voltaje y la frecuencia de la fuente de alimentación coinciden con el voltaje y frecuencia indicados en la etiqueta de clasificación eléctrica del equipo.
- No introduzca objetos de ningún tipo a través de las aberturas del equipo. Dentro pueden darse voltajes peligrosos. Los objetos conductores extraños podrían producir un cortocircuito y, en consecuencia, fuego, descargas eléctricas o daños en el equipo.

Símbolos

Los símbolos siguientes pueden aparecer en este manual:



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 – Riesgo de voltajes peligrosos. Para reducir el riesgo de descargas eléctricas y de daños en la salud de las personas, siga las instrucciones.



Encendido – Proporciona alimentación de CA al sistema.

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



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 mecánicas ni eléctricas en el equipo. Sun Microsystems no se hará responsable del cumplimiento de las normas en el caso de un producto Sun que ha sido modificado.

Lugar y colocación de un producto Sun



Precaución – No obstruya ni tape las rejillas del producto Sun. Nunca coloque un producto Sun cerca de radiadores o fuentes de calor. El incumplimiento de estas directrices puede causar un recalentamiento y repercutir en la fiabilidad del producto Sun.



Precaución – El nivel de ruido en el lugar de trabajo, definido en el apartado 1000 de DIN 45 635, debe ser 70 Db (A) o inferior.

Cumplimiento de la normativa SELV

Las condiciones de seguridad de las conexiones de E/S cumplen las normas SELV.

Conexión del cable de alimentación



Precaución – Los productos Sun han sido diseñados para funcionar con sistemas de alimentación monofásicos que tengan un conductor neutral a tierra. Para reducir el riesgo de descargas eléctricas, no enchufe ningún producto Sun a otro tipo de sistema de alimentación. Si no está seguro del tipo de alimentación del que se dispone en el edificio, póngase en contacto con el encargado de las instalaciones o con un electricista cualificado.



Precaución – No todos los cables de alimentación tienen la misma clasificación de corriente. Los cables de prolongación

domésticos no ofrecen protección frente a sobrecargas y no están diseñados para ser utilizados con sistemas informáticos. No utilice cables de prolongación domésticos con el producto Sun.



Precaución – El producto Sun se suministra con un cable de alimentación (de tres hilos) con conexión a tierra. Para reducir el riesgo de descargas eléctricas, enchufe siempre el cable a una toma de corriente con conexión a tierra.

La precaución siguiente sólo se aplica a aquellos dispositivos que posean un interruptor de alimentación de espera:



Precaución – El interruptor de alimentación del producto funciona como dispositivo de espera solamente. El cable de alimentación actúa como el dispositivo de desconexión primario del sistema. Cerciérese de enchufar el cable de alimentación a una toma de corriente con conexión a tierra situada cerca del sistema y a la que se pueda acceder con facilidad. No conecte el cable de alimentación cuando se haya quitado la fuente de alimentación del bastidor del sistema.

Batería de litio



Precaución – En la placa CPU de los productos Sun, hay una batería de litio incorporada en el reloj en tiempo real, SGS núm. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ o MK48T08. Los usuarios no deben cambiar las baterías. Podrían estallar si no se utilizan adecuadamente. No arroje la batería al fuego. No la desmonte ni intente recargarla.

Paquete de baterías



Precaución – Las unidades SunPCi contienen una batería de plomo sellada, Productos eléctricos portátiles núm. TLC02V50. Existe el

riesgo de explosión si el paquete de baterías no se utiliza correctamente o se sustituye de forma incorrecta. Sustitúyalo sólo por el mismo tipo de paquete de baterías de Sun Microsystems. No lo desmote o intente recargarlo fuera del sistema. No arroje la batería al fuego. Deshágase de las baterías correctamente siguiendo las normas locales vigentes.

Cubierta de la unidad del sistema

Debe retirar la cubierta de la unidad del sistema informático Sun para añadir tarjetas, memoria o dispositivos de almacenamiento internos. Asegúrese de volver a colocar la cubierta superior antes de encender el equipo.



Precaución – No ponga en funcionamiento los productos Sun sin que la cubierta superior se encuentre instalada. De lo contrario, podrían producirse lesiones personales o daños en el sistema.

Aviso de cumplimiento de las normas para láser

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

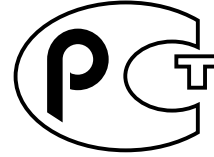
Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1

CD-ROM



Precaución – La utilización de controles, ajustes o la realización de los procedimientos distintos a los especificados en el presente documento podrían provocar la exposición a radiaciones peligrosas.

GOST-R Certification Mark



Nordic Lithium Battery Cautions

Norge



ADVARSEL – Litiumbatteri —
Ekspløsjonsfare. 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 —
Ekspløsjonsfare 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.

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.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables to comply 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.

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  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。

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BSMI Class A Notice

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

警告使用者：

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



Declaration of Conformity

Compliance Model Number: BLPN
Product Name: SunPCi III (2134A, X23.1134A)

EMC

USA—FCC Class B

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

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

European Union

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

As Telecommunication Network Equipment (TNE) in both Telecom Centers and Other Than Telecom Centers per (as applicable):

EN300-386 V.1.3.1 (09-2001)	Required Limits:
EN55022/CISPR22	Class B
EN61000-3-2	Pass
EN61000-3-3	Pass
EN61000-4-2	6 kV (Direct), 8 kV (Air)
EN61000-4-3	3 V/m 80-1000 MHz, 10 V/m 800-960 MHz and 1400-2000 MHz
EN61000-4-4	1 kV AC and DC Power Lines, 0.5 kV Signal Lines,
EN61000-4-5	2 kV AC Line-Gnd, 1 kV AC Line-Line and Outdoor Signal Lines, 0.5 kV Indoor Signal Lines > 10m.
EN61000-4-6	3 V
EN61000-4-11	Pass

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

EN55022:1998/CISPR22:1997	Class B
EN55024:1998 Required Limits:	
EN61000-4-2	4 kV (Direct), 8 kV (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, 2nd Edition, +A1 +A2 +A3 +A4 +A11:1998

EN60950:2000, 3rd Edition,

Evaluated to all CB Countries

UL 60950 3rd Edition: 2000, CSA C22.2 No 60950-00

TÜV Rheinland Certificate No.

CB Scheme Certificate No

File: _____ Vol. _____ Sec. _____

Supplementary Information: This product was tested and complies with all the requirements for the CE Mark.

/S/

/S/

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Preface

The *SunPCi III 3.1 User's Guide* provides setup and operation instructions for the SunPCi™ III software. Use this guide after you have installed your SunPCi III cards and the SunPCi III 3.1 software into your Sun system.

In addition, this guide explains how to install the following Microsoft Windows operating systems for use with your SunPCi III cards:

- Microsoft Windows XP Professional
- Microsoft Windows 2000 Professional
- Microsoft Windows 2000 Server Edition
- Microsoft Windows Server 2003

Refer to the *SunPCi III Quick Start Installation Guide* for more information about installing cards and the SunPCi III 3.1 software.

Who Should Read This Book

This guide is intended for all users of the SunPCi III product. This guide provides the information you need to use the SunPCi III software with Microsoft Windows operating systems.

The topics in this guide are explained with the non-technical user in mind. However, you do need to understand the basics of working with the Solaris™ operating environment, the DOS operating system, and the desired version of Microsoft Windows software.

Note – Installation of Microsoft Windows on your Sun system with the card differs from installation of Microsoft Windows on a PC. Even though you may understand Microsoft Windows installation instructions, it is critical that you follow the instructions in this guide.

How This Book Is Organized

This guide is organized as follows:

Chapter 1 describes the SunPCi III product and introduces its features.

Chapter 2 lists the contents of the SunPCi III package and explains the requirements your system must meet to successfully install and run SunPCi III software.

Chapter 3 explains how to configure and use multiple SunPCi III cards installed in your system.

Chapter 4 explains how to configure and use networking with the SunPCi III product.

Chapter 5 describes how to configure and use Windows XP Professional software.

Chapter 6 explains how to configure and use Windows 2000 Professional and Windows 2000 Server software.

Chapter 7 describes how to configure and use Windows Server 2003.

Chapter 8 discusses installing and configuring server products and SunFSD issues.

Chapter 9 describes how to connect peripheral devices (such as printers, serial devices, and audio devices) to the SunPCi III card.

Chapter 10 outlines how to use aspects of SunPCi III software, including the `sunpci` command and VNC.

Appendix A provides explanations of known problems and troubleshooting solutions.

Appendix B describes how to configure SunPCi III to work with international equipment.

Appendix C describes how to access and use online SunPCi Web sites and resources.

Appendix D includes suggestions and tips to improve SunPCi III performance.

Using UNIX Commands

This guide does not contain information about basic UNIX[®] commands and procedures such as shutting down the system, booting the system, and configuring devices. See one or more of the following for this information:

- Software documentation that you received with your system
- Solaris operating environment documentation, which is located at:
<http://docs.sun.com>

Document Conventions

This guide uses certain document conventions. The following sections explain the conventions and how to interpret them.

Solaris Command Windows

In this guide, you are often instructed to open a command window when performing various tasks. In the Solaris Common Desktop Environment (CDE), these command windows are called Console or Terminal windows. In OpenWindows[™] environments, you can use either a Solaris Command Tool window or Shell Tool window. Command windows are a standard part of the Solaris operating environment where you enter UNIX commands.

Typographic Conventions

Typeface	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	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

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	#

SunPCi III Keyboard Shortcuts

The SunPCi III software provides keyboard shortcuts for the options on the SunPCi III menus. To see these shortcuts, click the left mouse button on the SunPCi III menu until the drop-down menu appears to view the keyboard shortcut.

In CDE, OpenWindows, and GNOME environments, keyboard shortcuts use the Meta key (FIGURE P-1) in combination with another key. The Meta key is located on either side of the spacebar on your keyboard. To use a shortcut, hold down the Meta key and press the second key. For example, the Meta-E key combination means “press both the Meta key and the E key at the same time.”



FIGURE P-1 Sun Keyboard Meta Key

Note – The discussion in this section applies only to the keyboard shortcuts in the SunPCi III software. Keyboard shortcuts for each version of Microsoft Windows are described in each operating system’s documentation.

When running SunPCi III software and Microsoft Windows, to allow Copy and Paste operations, the Find, Undo, Copy, Paste, and Cut keys on your Sun system keyboard are mapped to the appropriate actions in Microsoft Windows.

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>

Related Documentation

For information and help about the version of Microsoft Windows you are using, consult the related Microsoft Windows documentation or your service provider.

The following table describes the related Sun documentation for the SunPCi III product.

Application	Title	Part Number
Installation of the SunPCi III hardware and software	<i>SunPCi III Quick Start Installation Guide</i>	817-0358-10
Important last-minute information and notes about the SunPCi III product	<i>SunPCi III 3.1 Product Notes</i>	817-2968-10
Information about installing additional memory	<i>SunPCi III SODIMM Installation Guide</i>	817-0888-10
Information about installing optional components when SunPCi III is preinstalled	<i>Installing Optional Hardware for the Preinstalled SunPCi III Product</i>	817-3276-10

The following table is an index of the directories containing the translated documentation in the `Docs` directory, which was available with the SunPCi III 3.0.1 release. For information about how to view the documentation, see “Viewing the Documentation PDF Files” on page 6.

Directory Name	Language	Directory Name	Language
c	English	ja	Japanese
de	German	ko	Korean
es	Spanish	sv	Swedish
fr	French	zh	Simplified Chinese
it	Italian	zh_TW_Big5	Traditional Chinese

Note – The SunPCi documentation was not localized for the 3.1 release. The most recent localized documents for SunPCi III were prepared with the SunPCi 3.0.1 release. These localized documents are included on the SunPCi III 3.1 CD.

Accessing Sun Documentation Online

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

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

You can access a variety of online resources and documentation for SunPCi III products. Refer to Appendix C for a listing of SunPCi III online resources.

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:

SunPCi III 3.1 User's Guide, part number 817-2966-10

Introducing SunPCi III 3.1 Hardware and Software

The SunPCi III 3.1 hardware and software create a personal computer (PC) that is integrated into your PCI Sun system, which is running a supported Solaris operating environment. You work on the PC either from a Common Desktop Environment (CDE) X-Window on the Solaris desktop or from a separate monitor connected to the SunPCi III card. With the SunPCi III 3.1 product, you can create emulated drives up to 40 Gbytes in size.

This chapter contains the following topics:

- “Supported Microsoft Windows Operating Systems” on page 1
- “SunPCi III 3.1 Features” on page 2
- “Supported Citrix MetaFrame Software” on page 4
- “Getting Help for SunPCi III Software” on page 5
- “Getting Help for Microsoft Windows Software” on page 6
- “Viewing the Documentation PDF Files” on page 6
- “Removing Microsoft Windows Software” on page 7

This chapter includes instructions for completing the following tasks:

- “How to View Solaris Manual Pages” on page 5

Supported Microsoft Windows Operating Systems

The SunPCi III 3.1 product supports the following Microsoft Windows operating systems and Service Packs:

- Microsoft Windows XP Professional (Windows XP Professional) Service Pack 1a
- Microsoft Windows 2000 Professional (Windows 2000 Professional) Service Pack 3

- Microsoft Windows 2000 Server Edition (Windows 2000 Server) Service Pack 3
- Microsoft Windows Server 2003 (Windows Server 2003) No Service Pack Required

Note – SunPCi III 3.1 does not support Microsoft Windows 95, Windows 98, Microsoft Windows ME, or Microsoft Windows NT. SunPCi III 3.1 does however support the upgrade of Microsoft Windows NT to a supported operating system.

SunPCi III 3.1 Features

The SunPCi III 3.1 product brings the following features to your Solaris desktop.

- **PCs on your Solaris desktop** – For each SunPCi III card installed in your system, you can use its PC applications in a window on your Solaris desktop.
- **Auto-install of Microsoft Windows operating systems** – The Create a New Emulated Drive dialog box enables you to select and install Windows operating system software more easily.
- **Growing an emulated hard disk** – The Grow an Existing Emulated Drive dialog box enables you to grow and increase your hard disk size.
- **Automatic update of Intel drivers** – Since the release of 3.0, the Intel drivers used with SunPCi software prompts you to automatically update after a new version of SunPCi and Solaris drivers are installed.
- **High-resolution VGA display for your Microsoft Windows applications** – SunPCi III software includes two Microsoft Windows super-VGA display drivers. One displays the Microsoft Windows desktop in an X Window on your screen. The other drives the display on an external VGA monitor. You can choose to install either option.
- **Familiar PC peripherals** – The SunPCi III product provides Microsoft mouse and IBM PC keyboard emulation, plus access to external peripherals such as printers and modems. The SunPCi III main card, the optional Serial/Parallel Port Backplate (included) and the optional USB/Firewire Card and Backplate (included), contain the physical connectors for PC peripheral devices, including additional USB connections and a 1394a Firewire connection.
- **LED light** – The main backplate now contains an LED indicator, which indicates the status of the system.
- **Access to network services, files, and printers** – The SunPCi III product enables you to connect to your Ethernet network. It also enables you to access Solaris files and printers on the network through the physical or virtual network connections.

- **Multiple SunPCi III card support** – With multiple cards installed, you can simultaneously access workstation or server PC applications from your Sun system.
- **Large disk support** – SunPCi III 3.1 supports emulated disk drives up to 40 Gbytes in size.
- **Boot@Boot support** – Boot@Boot is feature that you can configure to automatically start the SunPCi III 3.1 software on one or more SunPCi cards when the Solaris server in which the cards are installed boots.
- **Caldera OpenDOS 7.01** – The SunPCi III software package includes the Caldera OpenDOS 7.01 operating system.
- **Power Management** - SunPCi III 3.1 allows you to use the Suspend option to let your Windows system “sleep” when not in use instead of turning off.

Note – You must purchase retail Microsoft Windows operating system software and your PC applications separately.

From a PC User’s Perspective

From the perspective of a PC user, SunPCi III hardware and software include the following PC features:

- Emulated hard drives, which function like local PC hard drives
- Expandable hard drives, which enable you to increase the size of your PC hard drive
- Extended drives, which are similar to networked drives on a PC
- IBM PC and PC keyboard emulation
- Access to serial, parallel, Firewire 1394a, and USB 2.0 peripherals, such as printers, scanners, and digital cameras, using the SunPCi optional Serial/Parallel Port Backplate and the USB/Firewire Backplate.
- 256 Mbytes of SODIMM standard (in one slot), plus a second slot for optional memory up to a total of 2 Gbytes of memory.
- Access to PC-based servers, workstations, and networks, including file and print servers
- Ability to use an optional external VGA monitor
- Physical Ethernet, which uses a separate Ethernet connection; or virtual Ethernet, which uses the Sun system’s networking capabilities (virtual networking is disabled with multiple SunPCi cards)
- PC audio with a stereo speaker or headphone output jack, and a monaural microphone compatible input jack

From a Solaris User's Perspective

From the perspective of an Sun system user, SunPCi III hardware and software include the following features:

- Reliable access to thousands of PC applications
 - Ability to display super-VGA graphics with 16-bit and 24-bit color
 - Ability to share network resources, such as printers and files, between the PC and Solaris environments
 - Ability to copy and paste text between Microsoft Windows and OpenWindows or CDE applications (this feature is not available for Microsoft Windows server products)
 - Access to PC-based networks, including Novel NetWare file and print servers (only physical networking, not virtual networking, is supported with multiple cards)
-

Supported Citrix MetaFrame Software

Citrix MetaFrame software enables Solaris clients to display and use SunPCi III 3.1 software running the Windows 2000 Server operating system on a remote host. Citrix server software must be installed on an emulated drive that contains Windows 2000 Server operating system software and that is attached to a SunPCi III card.

When the server is configured to use Virtual Network Computing (VNC), you can boot SunPCi III software as part of server startup, eliminating the need to specifically start the SunPCi III software before clients can use it.

SunPCi III 3.1 hardware and software support use of the following Citrix MetaFrame products:

- Citrix MetaFrame 1.8 for Microsoft Windows
- Citrix MetaFrame XP for Microsoft Windows

See the following Web site for information about purchasing and using Citrix MetaFrame software:

<http://www.citrix.com>

Getting Help for SunPCi III Software

Help is available online for the SunPCi III commands from Solaris manual pages (also called man pages) and from the documentation PDF files on the SunPCi III 3.1 CD.

▼ How to View Solaris Manual Pages

You can use manual pages to obtain information about the Solaris operating environment itself, or about the commands associated with Solaris software. To view Solaris online manual pages, follow these steps:

1. **Set your `MANPATH` variable as follows:**

```
$MANPATH: /opt/SUNWspci3/man
```

2. **Type the word `man`, followed by the name of the command in which you are interested.**

For example, to get Help on the `sunpci` command, type the following command:

```
% man sunpci
```

or to get Help on the `sunpcidadm` command, type the following command:

```
% man sunpcidadm
```

The system responds `Reformatting page...` wait, and then displays a section of the manual page in the Terminal window. To scroll through the manual page, press any key. To exit the manual page, press Control-C.

For information about how to add the SunPCi III man page directory to your `MANPATH` environment variable, refer to your Solaris documentation.

Getting Help for Microsoft Windows Software

To get help for Microsoft Windows while working in a Microsoft Windows operating system, do one of the following:

- Press F1.
- Click Start and choose Help.

The appropriate operating system Help file then opens.

Note – Microsoft Windows Help does not contain Help for the SunPCi III application. For help with SunPCi III application software, use the Solaris manual pages described in “How to View Solaris Manual Pages” on page 5.

For help with your Microsoft Windows application software, refer to your operating system documentation.

Viewing the Documentation PDF Files

English versions of the documentation are in the `Docs` directory on the SunPCi III 3.1 CD in PDF (Adobe Acrobat) format. The CD includes the following documentation:

- **SunPCi III 3.1 User's Guide** – Describes how to configure the SunPCi III software to use one or more SunPCi III cards, how to install the Microsoft Windows software on a SunPCi card, and how to troubleshoot SunPCi issues.
- **SunPCi III Quick Start Installation Guide** – Describes how to install one or more SunPCi III cards and SunPCi III software.
- **SunPCi III 3.1 Product Notes** – Describes late-breaking issues related to the SunPCi III product.

To view the documentation PDF files, follow these steps:

1. **Insert the SunPCi III 3.1 CD into the system CD-ROM drive.**
A CDE File Manager window opens.
2. **In the File Manager window, double-click the `Docs` directory where the PDF files for your locale are stored on your SunPCi III 3.1 CD.**

3. Double-click the Adobe Acrobat PDF file you want to open.

After a few seconds, the Adobe Acrobat splash screen opens, followed by the Adobe Acrobat program displaying the file you double-clicked.

Note – If needed, you can download Adobe Acrobat Reader for free from the Adobe Web site: <http://www.adobe.com/products/acrobat/alternate.html>

Removing Microsoft Windows Software

To remove Microsoft Windows software from an emulated drive, consult your Microsoft Windows documentation.

Getting Started

This chapter assumes that you have installed the SunPCi III card or cards into your Sun system, and that you have installed the SunPCi III 3.1 software. If you have not completed those tasks, consult the *SunPCi III Quick Start Installation Guide*.

This chapter includes the following topics:

- “System Requirements” on page 10
- “Starting and Stopping the SunPCi III Software” on page 10
- “Emulated Drives and SunPCi III Software” on page 12
- “Creating an Emulated Hard Drive” on page 13
- “Growing an Existing Emulated Hard Drive” on page 18
- “Microsoft Windows Service Packs” on page 21
- “Power Management” on page 21

This chapter includes instructions for completing the following tasks:

- “How to Start the SunPCi III Software” on page 11
- “How to Stop the SunPCi III Software” on page 11
- “How to Create a New Emulated Drive” on page 14
- “How to Attach an Existing Emulated Drive as a C: or D: Drive” on page 17
- “How to Grow an Existing Emulated Hard Drive” on page 18
- “Backing Up an Emulated C: Drive” on page 20

System Requirements

To install and use SunPCi III 3.1 software, you need the following:

- A PCI-based Sun system with one or more SunPCi III cards installed. See the *SunPCi III 3.1 Product Notes* for a complete list of supported systems.
- Solaris 7, Solaris 8, or Solaris 9 operating environment.
- Common Desktop Environment (CDE) X-Window manager.
- A CD-ROM drive, either local (attached to your system), or remote (attached to another system on your network).

Note – You must use a Sun CD-ROM drive during installation of SunPCi III software. You can use third-party CD-ROM drives for other products and applications after SunPCi III installation.

- A hard disk; either local or remote (local preferred), with at least 60 Mbytes of available storage space for the SunPCi III package, and additional storage space of 4096 Mbytes for each operating system.
- The SunPCi III card comes with 256 Mbytes of on-board RAM. To use any of the supported Microsoft Windows operating systems with your SunPCi III system, your SunPCi III card should have installed 256 Mbytes RAM.

Memory requirements for Windows 2000 Server are based on the number and type of users connecting, consult the SunPCi Web site for further information:

<http://www.sun.com/desktop/products/sunpci>

Tip – Information about using multiple SunPCi III cards is available at “Using Multiple SunPCi III Cards” on page 23.

Starting and Stopping the SunPCi III Software

This section provides instructions for starting and stopping the SunPCi software.

▼ How to Start the SunPCi III Software

- To start the SunPCi software, open a Terminal window and type the following command at the Solaris prompt:

```
% /opt/SUNWspci3/bin/sunpci
```

When you start the SunPCi III software for the first time, the software takes a few minutes to create a Solaris directory named `~/pc`, into which several SunPCi III files are installed.

You then see a SunPCi splash screen and the SunPCi window opens.

Note – If you do not want to type the full path of the `sunpci` command every time you run the software, modify the `$path` statement in your `.login` file. For information about customizing the SunPCi path, refer to your Solaris software documentation.

▼ How to Stop the SunPCi III Software

Stopping the SunPCi software involves two steps: closing Microsoft Windows and then closing the SunPCi software.



Caution – Always close Microsoft Windows before exiting from SunPCi software or your files and applications could become corrupted.

See “SunPCi III Menus” on page 111 for descriptions of menu options available.

You have two different options for stopping SunPCi III software gracefully.

▼ Shutting Down SunPCi III Software — Option 1

1. Click **Start** and choose **Shut Down**.

The Shut Down Windows dialog box opens.

2. Click the “Shut down” option.

3. Click **OK**.

Microsoft Windows closes and the SunPCi window remains open, with the SunPCi splash screen saying “You may now exit or reset SunPCi.”

4. From the File menu in SunPCi, choose Exit.

The SunPCi Exit dialog box opens with the choice of Exit, Shutdown Windows and Exit SunPCi, and Cancel.

5. Click Exit.

SunPCi closes.

Note – In Windows XP Professional, the terminology may be different than described above, although the procedure is almost the same.

▼ Shutting Down SunPCi III Software — Option 2

1. From the File menu in SunPCi, choose Exit.

The SunPCi Exit dialog box opens with the choice of Exit, Shutdown Windows and Exit SunPCi, and Cancel.

2. Click Shutdown Windows and Exit SunPCi to exit Microsoft Windows and the SunPCi application.

Both Microsoft Windows and SunPCi close gracefully.

See “SunPCi III Menus” on page 111 for descriptions of menu options available.

Emulated Drives and SunPCi III Software

In order to emulate a PC, SunPCi III software creates a file in Solaris software and configures the file so that OpenDOS and Microsoft Windows see the file as a physical hard drive. This type of file is a SunPCi III emulated hard drive.

After you install the SunPCi III software as detailed in the *SunPCi III Quick Start Installation Guide*, you create a default C: drive and assign it to an emulated drive file. By default, all SunPCi III windows are booted from this drive C: and use the startup files located on the drive.

Note – You can create several C: and D: drive files, each with different applications and configurations, and attach a drive as needed. Only one C: drive and one D: drive can be active at any one time, and a file cannot function as a C: drive and a D: drive at the same time.

Creating an Emulated Hard Drive

The first time you start SunPCi software, a dialog box appears that asks you to create an emulated C: drive. When you click Create, the Create a New Emulated Drive dialog box appears. This dialog box enables you to do the following:

- Select an operating system to auto-install
- Specify a size for the emulated drive
- Specify whether to attach the emulated drive as a C: drive, as a D: drive, or not to attach it
- Specify the directory and name for the emulated drive

Selecting an operating system to auto-install by using this dialog box simplifies Microsoft Windows installation. SunPCi software requires customized installation files, and these files are in different locations for different Windows operating systems. When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box, the software automatically finds and copies setup files, boot files, system files, and drivers appropriate for that operating system. The software also launches Windows Setup when SunPCi reboots.

You can also create additional hard drives to use as C: or D: drives.

The emulated drive is a single file that SunPCi creates in the Solaris environment. By default the file is named `C.<OSNAME>`, and by default it is located in the `~/pc` directory in your home directory.

Because the emulated drive is a file in the Solaris environment, you can selectively attach this emulated drive or drives to any available SunPCi III card. You can install a different Windows operating system on each drive, then attach it and boot from it to run that operating system on your SunPCi III card. A SunPCi III card, like a PC, can run only one Microsoft Windows operating system at a time.

If you have only one SunPCi III card installed, you can accept the default file name for the emulated drive in a standard installation. If you have multiple cards installed, consult the section “Configuring Multiple Cards With SunPCi III Software” on page 25. Establishing a naming convention will ease the management of your configuration files, drive names, and their associated card names.

Because of the inherent limitations of DOS, when you create an emulated drive of up to 40 Gbytes that uses the FAT16 file system, that portion above 2 Gbytes in size is unavailable to DOS. All Microsoft Windows operating systems can use a FAT16 disk, but FAT16 format capacity is restricted to a maximum of 2 Gbytes. You can reformat, convert, and/or repartition the emulated hard drive to access the disk portion beyond 2 Gbytes after you have installed your Microsoft Windows operating system.

Tip – If you choose the automatic installation of a Microsoft Windows operating system using NTFS, you are not constrained by the limitations of DOS.

▼ How to Create a New Emulated Drive

1. **Start the SunPCi III software.**

If you have not created an emulated hard drive previously for the SunPCi III card, the Create a New Emulated Drive dialog box appears automatically. Proceed to Step 2.

2. **From the Options menu in the SunPCi window, choose Create a New Emulated Drive.**

The Create a New Emulated Drive dialog box opens. See FIGURE 2-1.

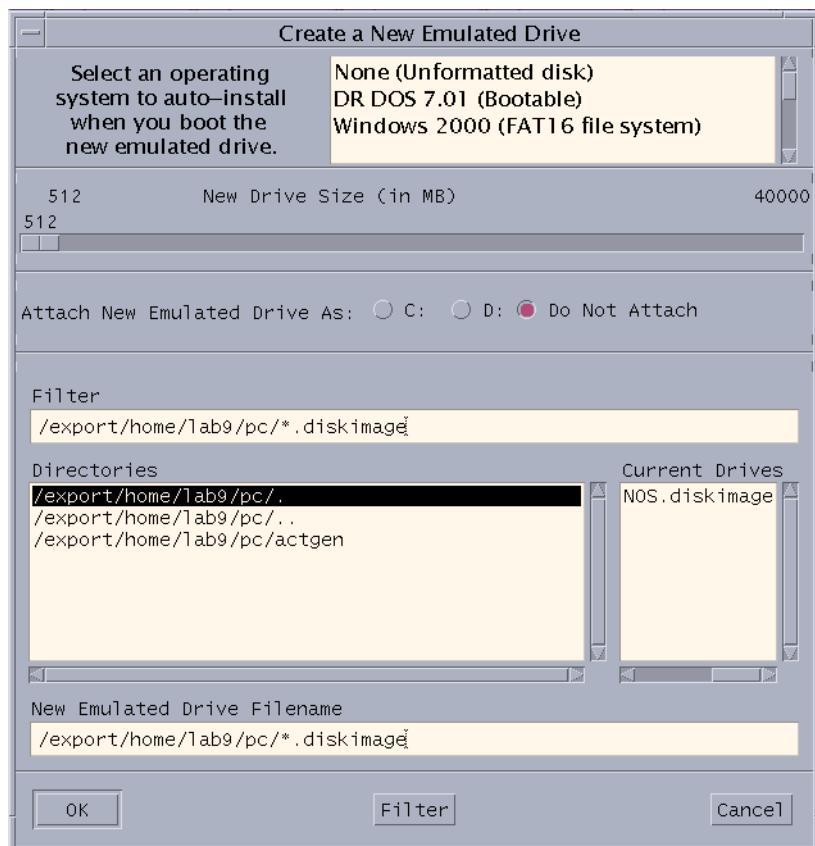


FIGURE 2-1 Create a New Emulated Drive Dialog Box

3. In the top pane of the dialog box, select an operating system to auto-install when the new drive is booted.

- Select None (Unformatted disk) if you want to create a non-bootable drive (a D: drive). Before you can use the drive, you need to format it. See your Microsoft Windows documentation.
- Select DR DOS 7.01 (Bootable) if you plan to do a custom installation of a Microsoft Windows operating system at a later time. To install the operating system, you need to follow instructions in the corresponding chapter in this guide.
- Select one of the Microsoft Windows operating systems from the list box to auto-install.



Caution – When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box and insert the Microsoft Windows CD into your CD-ROM drive, the software automatically finds and copies setup files, boot files, system files, and drivers for that operating system. The software also launches Windows Setup when SunPCi software reboots. Do not perform a custom installation unless you want to use customized installation scripts.

For most operating systems, you can choose between creating the disk with the FAT16 file system or the NTFS file system. You cannot boot to OpenDOS using a C: drive formatted for the NTFS file system. This is a known restriction. See “FAT16 File System Limitation Issue” on page 141 for more information.

4. In the second pane of the dialog box, drag the slider to set the size in Mbytes for the new drive.

The slider automatically sets to the recommended default size. The left end of the scale is restricted to the required minimum drive size for the operating system you selected.

Note – For best performance, install some of your Microsoft Windows applications locally on drive C: or D:.

5. In the third pane of the dialog box, select how to attach the new drive.

If you want to create the drive but not attach it at this time, click the Do Not Attach button. Otherwise, click the radio button next to C: or D:.

6. In the bottom pane of the dialog box, type the path and file name you want to use for the new drive.

Use the Filter field and button to view existing files. You must specify a new name for the emulated drive.

Tip – For best performance, create your emulated drives on a local hard disk on your Sun system. Performance of Microsoft Windows is significantly better on a local hard drive.

7. Click OK.

The Disc Creation Process dialog box opens indicating progress of the disk file creation.

8. If you chose to auto-install an operating system, insert the installation CD for the operating system into your CD-ROM drive and follow the instructions in the SunPCi window.

Note – If you are installing multiple cards into your system, see “Using Multiple SunPCi III Cards” on page 23. Read about configuring multiple cards before continuing the installation. There are significant differences between configuring multiple cards and configuring a single card.

▼ How to Attach an Existing Emulated Drive as a C: or D: Drive

Note – If the drive you want to use is already attached, skip this procedure.

If you want to use an emulated drive as a C: or D: drive that is not attached to your SunPCi card, you need to attach the drive.

To attach an existing emulated drive, perform the following procedure:

- 1. Start the SunPCi III software.**
- 2. From the Options menu, choose Attach an Existing Emulated Drive.**
The SunPCi Attach an Existing Emulated Drive dialog box opens.
- 3. Click the radio button next to C: or D: to specify how to attach the drive.**
- 4. Type the path and file name of the emulated drive file you created in “How to Create a New Emulated Drive” on page 14.**

If you forget the name of the drive file, type the path to the location of the drive file and then click Filter. A list of files appears. Select the desired drive file.

5. Click OK.

The drive is now attached as a C: or D: drive.

A dialog box opens with the message:

In order for the drive mapping to take place, SunPCi must be rebooted.
Reboot now?

6. If Microsoft Windows is running, use the Start menu to shut it down.

7. From the File menu, choose Reset.

The SunPCi Reboot dialog box opens.

8. Click OK.

SunPCi software reboots and uses the newly attached drive.

Growing an Existing Emulated Hard Drive

Disk expansion enables you to expand your Microsoft Windows hard drive to gain more space.

To use this newly added emulated hard drive space, you must either create a new partition and format a new file system within it, or expand an already existing partition into the newly created space. You must complete one of these two options so that Microsoft Windows recognizes the newly added space.

You then format your new space by using the appropriate Windows utility or a third-party software, as described at the end of the next procedure.

▼ How to Grow an Existing Emulated Hard Drive

You can expand the hard drive space by doing the following in the SunPCi window:

1. Start the SunPCi III software.

2. From the Options menu, choose Grow an Existing Emulated Drive.

The Grow an Existing Emulated Drive dialog box opens.

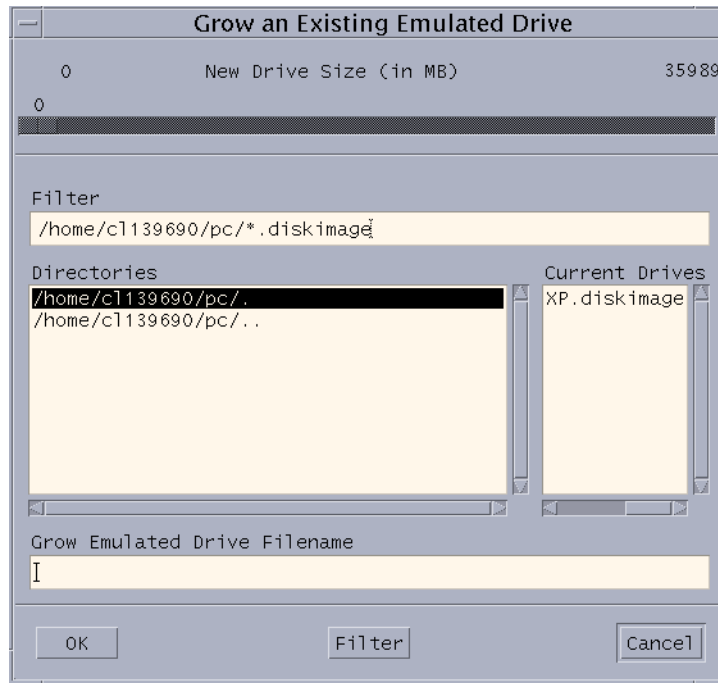


FIGURE 2-2 Grow an Existing Emulated Drive Dialog Box

3. Select the hard drive that you want to expand from the **Current Drives** group box.
4. Move the **New Drive Size (in MB)** horizontal slider to the new size of the hard drive.

Note – The size you choose is the total size of the emulated hard drive, which includes both the original space of the drive and the newly added space, not just the size of the increase of the hard disk.

5. Click **OK**.

A dialog box might open, depending on how you partitioned your new emulated hard drive and how much you increased your hard drive space.

6. Click **OK**.
7. **Restart Microsoft Windows.**



Caution – You will not be able to use the expanded hard drive space you created until you complete the following task.

- 8. After you expand the hard drive, you must perform one of the following options to complete the procedure:**
- Create a new partition in the expanded space by using the DOS `fdisk` utility, and then create a new drive by formatting it using Microsoft Windows Explorer.
 - Use a third-party software, such as PartitionMagic, to expand your current disk drive.

▼ Backing Up an Emulated C: Drive

After you install Microsoft Windows, periodically make a copy of the disk image of your C: drive. This enables you to keep a backup copy of the drive in case you need to recover the contents of the drive at any time.

1. Locate the disk image of your C: drive.

The disk image is located in the directory named `pc` within your home directory on your Sun system. To view the contents of the directory, type the following commands:

```
% cd ~/pc
% cat SunPC.ini (or the name of the particular .ini file for this C: drive)
```

A listing of files opens, including the name you assigned to your C: drive during installation (for example, `C.diskimage`).

2. Make a copy of the file.

Type the following command, substituting the name of your hard disk and the name you want to assign to the copy:

```
% cp C.diskimage C.diskimage.copy
```

Microsoft Windows Service Packs

After installing Microsoft Windows operating system software, you need to install a Microsoft Service Pack.

TABLE 2-1 lists the Service Packs that SunPCi III 3.1 software requires for supported Windows operating systems. You need to install the indicated Service Pack, or a later version.

TABLE 2-1 Microsoft Service Packs Required by SunPCi III 3.1 Software

Windows Operating System	Minimum Service Pack
Windows XP Professional	Service Pack 1a
Windows 2000 Professional	Service Pack 3
Windows 2000 Server	Service Pack 3
Windows Server 2003	No Service Pack Required

For information about installing a Service Pack from either a CD or by downloading from the Microsoft Web site, consult your Microsoft Windows documentation.

Power Management

SunPCi III supports power management capabilities for the supported operating systems: Windows 2000 Professional, Windows 2000 Server, Windows XP Professional, and Windows Server 2003. Power management is automatically installed when you are doing a fresh installation of any of the supported operating systems. Power management enables you to place your Windows operating system in Standby mode to allow it to sleep when not in use.

Note – To wake the system up from Standby, place the mouse over your Microsoft Windows operating system and then press any keyboard key to wake up the system.

To use the Stand By option, choose Start and then Shut Down (or Turn Off Computer). You choose the Stand By option in the dialog box that includes the Restarting and Shut Down/Turn Off options.

Using Multiple SunPCi III Cards

This chapter assumes that you have installed the SunPCi III 3.1 software and all the cards that you will be using concurrently in your Sun system. Also you should have configured the first card following the procedures in Chapter 2. This chapter explains how to configure additional SunPCi III cards.

You can install any of the supported Microsoft Windows operating systems for use on SunPCi III cards. For the list of operating systems, see “Supported Microsoft Windows Operating Systems” on page 1.

This chapter includes the following topics:

- “Multiple Cards Configuration Process” on page 24
- “Advanced Server Support for Configuration Options” on page 24
- “Configuring Multiple Cards With SunPCi III Software” on page 25
- “Using Cards and Emulated Drives” on page 27
- “Starting Specific Disk Image Files” on page 29
- “Updating the SunPCi III Card Configuration” on page 31
- “Rebinding Images and Cards” on page 31
- “Multiple Card Behavior” on page 32

This chapter includes instructions for completing the following tasks:

- “How to Create an .ini File Using the -n Option” on page 26
- “How to Identify Card Names” on page 27
- “How to Start a Specific .ini File” on page 28
- “How to Start a Specific Card” on page 29
- “How to Start a Specific Image and a Specific Card” on page 29
- “How to Specify Title Bar Text for Each Window” on page 30

Multiple Cards Configuration Process

You can install multiple SunPCi III cards into an Sun server or Sun system. To configure multiple cards, follow this sequence:

1. Remove any previous versions of SunPCi cards (version 1.x or 2.x).
2. Remove any previous version of SunPCi software.
3. Install all the SunPCi III cards you plan to use.
4. Install the SunPCi III 3.1 software on your system.
5. Configure one card and its emulated drive software completely.
6. Configure the rest of your SunPCi III cards.

See the *SunPCi III Quick Start Installation Guide* for complete instructions.



Caution – SunPCi III cards cannot coexist with earlier SunPCi cards. Your Sun server or Sun system can only accommodate the same version of SunPCi cards.

Before adding cards into an existing installation, ensure that previous versions of SunPCi software (1.x and 2.x) are removed. You also need to clearly identify configuration files and cards before finalizing your software configuration and starting the software. You should have done this when installing the cards.

Advanced Server Support for Configuration Options

For advanced SunPCi III server support concerning SunPCi III memory, CPUs, and benchmark information, consult the SunPCi Web site:

<http://www.sun.com/desktop/products/sunpci>

Configuring Multiple Cards With SunPCi III Software

The first time the SunPCi III software is started, a default *filename.ini* configuration file is created as `~/pc/SunPC.ini`. This `.ini` file is specified from the `sunpci` command line to start the desired emulated C: or D: drive.

In a multiple card system, an emulated drive can be associated with only one card at a time. By default the drives attach to the next available card, although you can specify a particular card, if needed.

Default `.ini` Configuration File

In order to start an emulated C: or D: drive, that drive's file name must appear in the default `.ini` file named `SunPC.ini`. The drive name insertion is done automatically when you create and attach drives using the SunPCi III software.

Also inserted into the `SunPC.ini` configuration file are the names of PC components and other information. PC components include: the drive image file name or names; the CD-ROM device file name; a diskette device file name; and other devices, for example, printers or other peripherals.

Here is a sample listing of the content of a default `SunPC.ini` file created in a system with one card installed.

```
[Drives]
A drive=/dev/rdiskette
C drive=/home/user/pc/C.diskimage
CD=/vol/dev/aliases/cdrom0
D drive=/net/host/export/SunPCi_III/D.diskimage
```

Naming `.ini` Files When Using Multiple Cards

When you install multiple SunPCi cards into the same system, you need to create multiple `.ini` files and emulated C: or D: drive images, one for each card. Note, however, that a particular card is not necessarily associated with a particular `.ini` file name.

It helps to name files and disk images in a way that clearly identifies the `.ini` file and its associated C: and D: drive images. Up to two drive images are permitted in a single `.ini` file.

One solution is to name the `.ini` file and its disk image using some identifying characteristic, such as the Microsoft Windows operating system installed on the disk image. Note that you can include up to two disk drive images in a `.ini` file. You can only run one C: and one D: drive per card at a time.

TABLE 3-1 Sample File Names in a Multiple Card Configuration

.ini File Names	Disk Image Names Inside Each .ini File
SunPC.ini (default)	C.diskimage D.diskimage
win2k.ini	C.win2k.diskimage

Unless you specify differently, the following convention is the default SunPCi III 3.1 graphical user interface (GUI) behavior when you use the `sunpci` command with the `-n` option. The stem of the specified `.ini` file name, for example `win2k`, is incorporated into the disk image file name as shown in TABLE 3-1. The following procedure illustrates this behavior.

▼ How to Create an `.ini` File Using the `-n` Option

The following procedure assumes that you have installed an additional card or cards into your system. To create a new `.ini` file, follow these steps:

1. **At the Solaris prompt, type the following command:**

```
% /opt/SUNWspci3/bin/sunpci -n filename.ini
```

By default, after creating an `.ini` file (using the `sunpci` command with the `-n`), the emulated drive name will use the `.ini` name as the default name for the emulated drive, such as `c.filename.diskimage`. You can edit the name if needed by using the GUI.

The Create a New Existing Emulated Drive dialog box opens.

2. **Click OK to accept the default disk image name.**

For additional information, refer to “Creating an Emulated Hard Drive” on page 13.

Using Cards and Emulated Drives

Although an emulated drive must run on a SunPCi III card, the SunPCi III emulated drives are not forced to run on any particular card. By default any particular `.ini` file and its associated drive will start on any available card, and it is not possible to predict which card will be used. By default, SunPCi creates the `SunPC.ini` file during installation, which is located in the `/pc` directory on your system.

You can, however, start a drive and a specific card together. To do this, you need to identify the cards that are installed in your system.

▼ How to Identify Card Names

- To identify the name of each installed card, type the following command:

```
% /opt/SUNWspci3/bin/sunpci -l
```

The system displays the following information: the card's name, for example `Card1`; the card's device file name in the `/dev` directory; the card's type; the card's description; and the card's ID or Ethernet (MAC) address.

What follows is sample output from a system with two cards installed.

```
Name = Card1
  Device = /dev/sunpci3drv0
  Type = SunPCi III
  Description = SunPCi III card
  ID = 08:00:20:F9:xx:xx

Name = Card2
  Device = /dev/sunpci3drv3
  Type = SunPCi III
  Description = SunPCi III card
  ID = 08:00:20:E7:xx:xx
```

Note – Instead of the ID message you could get the `Card In Use` message if one of the cards is already running.

▼ How to Start a Specific .ini File

By default, SunPCi software uses the `SunPC.ini` file when you use the `sunpci` command. To start a different emulated drive, which you must do in a multiple card configuration, use the `sunpci` command with the `-p` option. You then must enter the full path of the location of the .ini file.

- To start SunPCi software with a specific file using the `-p` option, type the following command:

```
% /opt/SUNWspci3/bin/sunpci -p pathname.ini
```

Where *pathname* is the full directory path of the .ini file, for example, `/home/my_directory/pc/SunPC.ini`.

The SunPCi III software starts, using the referenced disk image.

If you start an emulated drive with a card on which that drive was not created, you get the following warning dialog box about the Ethernet (MAC) address:

This emulated drive image was created on another SunPCi card. This could cause problems if there was special hardware connected to that card. It could also cause problems if your installed software or configuration makes any assumptions about the MAC address.

Emulated Disk File /pathname/c.diskimage
was created on the card with the MAC address *xx:yy:zz:zz:yy:xx*

If you do not wish to see this message in the future, start `sunpci` with the `-n` option.

If application registration or network configuration setup is affected, you can use the `-n` option, or you can bind the particular image and card by remapping the MAC address to the disk image.

If you want to bind the MAC address to the current disk image, use the `-B` option with the `sunpci` command. See “The `sunpci` Command and Its Options” on page 108 for more details.

▼ How to Start a Specific Card

Sometimes, for configuration reasons, you might need to start a specific card with a specific C: drive. For example, you might want to run on a card with a printer that is attached to a port, or to run on a card that provides better support for a memory intensive application.

- To start the SunPCi III software with a specific card, type the following command:

```
% /opt/SUNWspci3/bin/sunpci -c cardname -p pathname.ini
```

Where *cardname* is one card's name returned by the system, for example, Card1 or Card2.

Starting Specific Disk Image Files

When you want to use the SunPCi software with different Microsoft Windows operating systems on different disk images, you can create additional C: drive image files for as many operating systems as you need to run. To install the operating system, refer to the appropriate chapter in this guide.

When you want to run a different Microsoft Windows operating system, select Shut Down (or Turn Off) from the operating system you are using, and Exit from the SunPCi III GUI. Start the disk image you need using the `sunpci` command with the `-p` option.

▼ How to Start a Specific Image and a Specific Card

By starting a specific image and a specific card, you can link an image and a card to ensure that a particular image is executing on a specific card.

Note – You can only run one operating system at a time per card.

- To start SunPCi software with a specific file and a specific card using the `-p` and `-c` options, type the following command:

```
% /opt/SUNWspci3/bin/sunpci -p pathname.ini -c cardname
```

The SunPCi III software starts, using the referenced disk image and card.

If you start an image with a card on which it was not created, you get a warning dialog box about the Ethernet (MAC) address, see “How to Start a Specific .ini File” on page 28.

To open and run multiple SunPCi III cards on the same system, follow the directions above for opening each particular disk image and card. Although the .ini file is not dedicated to a particular disk image, you need to have an available .ini file for each card you open. Enter the full path location of the .ini file.

▼ How to Specify Title Bar Text for Each Window

When you are running multiple cards in your system, you might find it helpful to identify which operating system and card are running in which Solaris desktop window. You can enter text into the title bar of the SunPCi III window to identify each window.

To specify text in the title bar of the SunPCi window, do the following:

- Use the `sunpci` command and the `-title` option to add a string of text into your SunPCi window title bar.

For example, to specify a title in a `sunpci` command starting a particular .ini with Card2, type:

```
% sunpci -title "Win2k Terminal Server on" -c card2 -p  
~/pc/win2kts.ini
```

The resulting text line at the title bar of the SunPCi Terminal window reads “Win2k Terminal Server on card2.” For more information about using the `-title` option, see “The `sunpci` Command and Its Options” on page 108.

Updating the SunPCi III Card Configuration

Periodically you might need to add, remove, move, or replace a SunPCi III card. After doing this, to update the SunPCi III Solaris drivers on the system.

To update the SunPCi III card configuration, complete the following procedure:

1. **Remove the files `/etc/Master.ini` and `/etc/Master.bak`, if they exist.**
2. **Become superuser and type the following command:**

```
# /opt/SUNWspci3/drivers/solaris/sunpcload
```

3. **Reconfigure any Boot@Boot support if needed as it will be lost. Add and enable VNC and cards using the `sunpcidadm` command with the `-a` and `-e` options.**
See “Configuring and Using Boot@Boot Support” on page 117.
4. **Exit the superuser account and proceed as you would to start the software normally.**

Rebinding Images and Cards

When a *disk.imagefile* file is created, the Ethernet (MAC) address of the card on which the *disk.imagefile* was created is written into its header, binding the card to the *disk.imagefile*. The binding is only informational, and does not interfere with running a C: or a D: drive on a different card. The `sunpci` command `-B` option rewrites the MAC address of the current card into the *disk.imagefile* header.

This switch is rarely used. If you are remapping a C: drive in which the MAC address of the original card has been used by installed applications for registration or network purposes, you risk licensing and networking issues.

Before attempting to reconfigure the binding of any disk image, verify that you have read and understood the `sunpci` and the `sunpciflash` command-line options. For more information, refer to “The `sunpci` Command and Its Options” on page 108.

Multiple Card Behavior

The following sections explain limitations or features of a SunPCi III session when running multiple cards installed in the same system.

Networking With Multiple Cards

Virtual networking is automatically disabled in systems with more than one card installed. Use physical networking with multiple card configurations.

See “Networking With SunPCi III Hardware and Software” on page 33 for more information.

Using the Diskette Drive With Multiple Cards

When multiple cards on a system are running, once the diskette drive is being used by a SunPCi III session, the drive is not available to any other session. When not in use, the diskette drive is locked to the first SunPCi III session started after it becomes available.

Using the CD-ROM Drive With Multiple Cards

When multiple cards on a system are running, they all share the system CD-ROM drive. One unusual, but expected behavior is that when you insert a CD into the drive, the Autorun option starts on all running SunPCi sessions.

Networking With SunPCi III Hardware and Software

This chapter assumes that you have installed the SunPCi III card or cards into your Sun system, that you have installed the SunPCi III software, and that you want to understand what networking options are available with the SunPCi III 3.1 product.

This chapter includes the following topics:

- “Networking With SunPCi III” on page 33
- “Setting Up Networking With SunPCi III Hardware and Software” on page 35

This chapter includes instructions for completing the following tasks:

- “How to Set TCP/IP Properties” on page 35
- “How to Set Up Physical Ethernet Networking” on page 36
- “How to Set Up Virtual Ethernet Networking” on page 36
- “How to Use Power Management With Physical Networking” on page 37

Networking With SunPCi III

There are two ways to connect each SunPCi III card to your network:

- **Physical Ethernet** – Use the external Ethernet connector on the back of the SunPCi III card and connect the card to a second physical Ethernet connection.
- **Virtual Ethernet** – Use the internal networking driver (NDIS driver) in the SunPCi III software and connect through your system’s Ethernet connection.

Note – When more than one SunPCi III card is installed in a system, virtual networking is disabled by the SunPCi III software.

Physical Ethernet networking is faster than virtual Ethernet, but it requires an additional port to connect to your network. This means that you need to have two separate Ethernet connections: one for your Solaris system, and one for your SunPCi III card.

Physical Ethernet networking eliminates the need for routing to a third host in order for the Solaris system and the SunPCi III card to communicate with each other over the Transmission Control Protocol/Internet Protocol (TCP/IP). Once physical Ethernet networking is set up, you can “see” both your SunPCi III card and your workstation in the list of network hosts.

Note – When more than one SunPCi III card is installed in a system, virtual networking is disabled by the SunPCi III software.

Virtual Ethernet networking eliminates the need for a second network port. You share a single Ethernet connection between your system and your SunPCi III card. If you use virtual networking, you are not able to generate a network path between your SunPCi III card and your host Solaris system until you set up network connections. When multiple cards are installed in a system, virtual Ethernet networking is permanently disabled.

If you are performing an upgrade of either Windows 2000 Professional to Windows XP Professional or Windows 2000 Server to Windows Server 2003, you must remove virtual networking if installed and upgrade with physical networking.

For specific instructions on the networking drivers for your version of Microsoft Windows, refer to the corresponding installation chapter.

- To install the Windows XP Professional drivers, refer to Chapter 5.
- To install the Windows 2000 drivers, refer to Chapter 6.
- To install the Windows Server 2003 drivers, Chapter 7.



Caution – When one SunPCi III card is installed with the SunPCi III software, you can use either physical or virtual networking, but not both at once.

Note – When multiple cards are installed in your system, virtual networking is automatically disabled and you need to configure the TCP/IP network protocols for all Microsoft Windows configurations.

Setting Up Networking With SunPCi III Hardware and Software

Setting up networking with SunPCi hardware and software involves setting TCP/IP properties, setting up either physical or virtual Ethernet networking, and setting up network connections between SunPCi III cards and your Sun system.

▼ How to Set TCP/IP Properties

Before you can configure TCP/IP, you need to obtain certain information from the network administrator at your site.

1. Obtain the following information before you begin:

- Your SunPCi III computer name (the name you enter when you install Microsoft Windows)
- If you are not using Dynamic Host Configuration Protocol (DHCP) to obtain an IP address, you also need:
 - The IP address for your SunPCi III card

Note – The IP address for your SunPCi III card must be different from your Sun system's IP address.

- The subnet mask for your site's network
- The IP address for your router or gateway (if used)

Note – If you are using virtual networking, you cannot use DHCP for both your Sun system and the SunPCi III card.

- The host name, domain name, and IP address for each Domain Name Service (DNS) server at your site (if used)

2. To configure TCP/IP, use the Network utility in Control Panel in Microsoft Windows.

Enter the information you obtained into the corresponding fields. For more information, refer to Microsoft Windows documentation.

Note – Microsoft Windows provides a number of different ways to install hardware. Follow the instructions in this section, even if you have installed hardware before.

▼ How to Set Up Physical Ethernet Networking

To configure the physical Ethernet network, perform the following steps:

1. **Connect the RJ-45 connector on the Ethernet cable to the Ethernet port on the back of the SunPCi III card.**
2. **Connect the other end of the cable to the network's Ethernet port.**
3. **Restart Microsoft Windows.**
4. **If you have not already set up TCP/IP, refer to the previous section.**

▼ How to Set Up Virtual Ethernet Networking

Note – When more than one SunPCi III card is installed in a system, virtual networking is disabled by the SunPCi III software.

If you changed networks or network properties, or if you did not set up the network during the installation process, you need to configure TCP/IP to connect to your network. Refer to the documentation that came with your version of Microsoft Windows and to “How to Set TCP/IP Properties” on page 35.

- **To configure virtual networking:**

- In Windows XP Professional, refer to “Configuring Virtual Ethernet Networking for Windows XP Professional” on page 49.
- In Windows 2000, refer to “Configuring Virtual Ethernet Networking for Windows 2000” on page 65.
- In Windows Server 2003, refer to “Configuring Virtual Ethernet Networking for Windows Server 2003” on page 82.

Note – If you are using DHCP with virtual networking, you might observe that the network takes several minutes to start after you configure the network and restart Microsoft Windows. This is normal behavior during the first reboot after you set up the network.

▼ How to Use Power Management With Physical Networking

If you need to “ping” the IP address of the SunPCi III card to bring up the machine when it is in Standby mode while using physical networking, do the following:

1. **Click and highlight My Computer.**
2. **Right-click on My Computer.**
3. **Choose Manage.**
4. **Click Device Manager.**
5. **Click Network adaptors.**
6. **Click VIA RHINE II Fast Ethernet Adaptor Properties.**

The VIA RHINE II Fast Ethernet Adaptor Properties dialog box opens.

7. **Click the Power Management tab.**
8. **Click the “Allow this device to bring the computer out of standby” check box.**
9. **Click OK.**
10. **Close the Computer Management window.**

Using Windows XP Professional

This chapter describes how to install and configure Microsoft Windows XP Professional on your SunPCi III system. It also describes how to upgrade an existing emulated drive to Windows XP Professional.

This chapter includes the following topics:

- “Installing Windows XP Professional” on page 40
- “Upgrading Windows NT4 WS and Windows 2000 Professional to Windows XP Professional” on page 42
- “Upgrading Windows NT4 WS to Windows XP Professional” on page 43
- “Upgrading Windows 2000 Professional to Windows XP Professional” on page 45
- “Installing Japanese Windows XP Professional” on page 46
- “Configuring Virtual Ethernet Networking for Windows XP Professional” on page 49

This chapter includes instructions for completing the following tasks:

- “How to Perform a Custom Installation” on page 41
- “How to Upgrade Windows NT4 WS to Windows XP Professional” on page 44
- “How to Upgrade Windows 2000 Professional to Windows XP Professional” on page 45
- “How to Perform an Automatic Installation” on page 46
- “How to Perform a Manual Installation” on page 48
- “How to Add a Virtual Network Adapter” on page 50
- “How to Configure the Network for Windows XP Professional” on page 52
- “How to Reconfigure the Network Adapter for Physical Ethernet” on page 53
- “How to Prepare Windows XP Professional to Display External Video” on page 54
- “How to Configure Windows XP Professional for External Video Use” on page 54
- “How to Switch External Video Back to the System Monitor” on page 56

Throughout this chapter, Microsoft Windows XP Professional is referred to as Windows XP Professional.

Installing Windows XP Professional

You install operating system software when you create an emulated drive by choosing Create a New Emulated Drive from the SunPCi Options menu. See “Emulated Drives and SunPCi III Software” on page 12. If you want to perform a custom installation using scripts that differ from the standard Microsoft installation scripts, see “How to Perform a Custom Installation” on page 41.



Caution – This release does not support simultaneous operation of Windows XP Professional on both the system monitor and external monitors.

Installation Notes

Make sure that you have the following media and information available before you begin installation:

- Windows XP Professional retail installation software CD
- Customized installation scripts, if needed
- The network system name for each SunPCi III card installed in your system
- The workgroup or domain name for your Windows XP Professional installation on each SunPCi III card installed in your system

Note – When you install or upgrade to Windows XP Professional, a dialog box might appear that contains information about display settings. The mouse is disabled at this point, and you must use the Tab and Return keys to click buttons in the dialog box and also in the settings confirmation dialog box that might follow. The mouse is enabled after doing this.

▼ How to Perform a Custom Installation



Caution – When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box, the software automatically finds and copies setup files, boot files, system files, and drivers that are appropriate for that operating system. The software also launches Windows Setup when SunPCi software reboots. Do not perform a custom installation unless you want to use customized installation scripts.

1. Create a new emulated hard drive and auto-install the DR DOS 7.01 operating system software.

See “Emulated Drives and SunPCi III Software” on page 12. Set options in the Create a New Emulated Drive dialog box as follows:

- Select DR DOS 7.01 (Bootable) as the operating system to auto-install.
- Be sure to make the drive at least 2 Gbytes in size, which can be expanded later if needed.
- Attach the drive as a C: drive.
- For best performance, create your emulated drives on a local hard disk on your Sun system or server.

The SunPCi III software reboots. The OpenDOS prompt (C:\>) opens.

2. Install the SunPCi III drivers.

The default location for the Windows XP Professional files is `r:\cdrom\cdrom0\i386`. However, if your Windows XP Professional files reside at a location other than the default one, you need to use the `/s:` switch to specify where the files are located. For example, if your Windows XP Professional disk image is located in your Solaris directory at `/export/home/winxp`, you would access it from the R: drive in OpenDOS.

Note – Copy all the contents of the installation CD files to the `winxp` folder before starting the installation.

Type the following command all on one line:

```
C:\> f:\drivers\winxp\setupwxp /s:r:\export\home\winxp\i386
```

The setup process takes a few minutes to complete. SunPCi III software responds with the following messages.

```
Copying Setup Files...
Copying Boot Files...
Copying System Files...
Copying Optional Files...
Copying Assembly Files...
Copying SunPCi Installation Files...
```

When the setupwpxp script finishes copying the Windows XP Professional files to your C: drive, it reboots the SunPCi III software. The Windows XP Professional Setup screen opens. When Windows XP Professional Setup finishes copying files, it reboots the SunPCi III software again.

- 3. After the SunPCi III software reboots from the Windows XP Professional window, choose Attach Mouse from the Options menu or press Meta-M to attach the mouse.**

This enables the mouse to work with Windows XP Professional during the installation process. Once the installation is complete, the proper mouse drivers are installed and you no longer need to attach the mouse manually.

- 4. Change directory to the location for your customized installation scripts.**
- 5. Complete the installation using your customized installation scripts.**

Upgrading Windows NT4 WS and Windows 2000 Professional to Windows XP Professional

In SunPCi III software, you can upgrade emulated disk drive images. You can upgrade an existing C: drive that is configured for the of the following operating systems discussed in these sections:

- “Upgrading Windows NT4 WS to Windows XP Professional” on page 43
- “Upgrading Windows 2000 Professional to Windows XP Professional” on page 45

Upgrade Notes

Make sure that you have the following media and disk drive space available before you start an upgrade to Windows XP Professional:

- The Windows XP Professional retail software installation CD; the installation will *not* work without the CD in your CD-ROM drive
- At least 2 Gbytes of available space on your emulated C: drive

Tip – Before you perform the upgrade, make a backup copy of your existing C: emulated drive file and disable any anti-virus software.



Caution – Before upgrading to a supported operating system, you must update your Intel drivers. Refer to “Updating Intel Drivers” on page 112 for additional information.

Upgrading Windows NT4 WS to Windows XP Professional



Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi III program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows XP Professional CD or the installation will fail and your emulated C: drive can become corrupted.

Before You Begin the Upgrade

Although Windows NT is not supported in SunPCi III 3.1, you can upgrade from Windows NT to a supported operating systems in SunPCi III 3.1.



Caution – Before starting to upgrade Windows NT4 WS to Windows XP Professional, you must update your Intel drivers. Refer to “Updating Intel Drivers” on page 112 for additional information.



Caution – If you are using an external CD-RW drive with Windows NT4 WS, un-install the device. The upgrade to Windows XP Professional will fail unless the device is removed and its software uninstalled. Reinstall the drive after the upgrade.

Note – When upgrading from Windows NT to Windows XP Professional, a blank dialog box opens. This happens after the Dynamic Update completes, and when the Preparing Installation radio button on the left pane of the Windows XP Professional Installation Wizard is selected. This dialog box soon disappears and the installation process continues normally.

▼ How to Upgrade Windows NT4 WS to Windows XP Professional

1. **Insert the Windows XP Professional CD into your system's CD-ROM drive.**

2. **Click Start and then choose Programs and Windows Explorer.**

The Windows Explorer window opens.

3. **In Windows Explorer, navigate to the following path:**

C:\sun\wxpupg\upgrade.bat

Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi III software, or you did not update your SunPCi III drivers.

4. **Double-click** upgrade.bat.

The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

5. **Follow the prompts on the window and enter the information that Microsoft Windows requests.**

For example, enter the CD key on the back of your CD case and your administrator's password.

When you are finished entering all the information, the SunPCi III software reboots into Windows XP Professional.

Tip – This step can take several minutes to complete.

Upgrading Windows 2000 Professional to Windows XP Professional



Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi III software involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows XP Professional CD or the installation will fail and your emulated C: drive can become corrupted.

Before You Begin the Upgrade



Caution – Prior to performing any Windows upgrade, you must remove virtual networking if it is installed. Failure to remove virtual networking can result in undesirable behavior after upgrades.



Caution – Prior to performing an upgrade from Windows 2000 Professional to Windows XP Professional, you must remove virtual networking if it is installed.

▼ How to Upgrade Windows 2000 Professional to Windows XP Professional

1. Insert the Windows XP Professional CD into your system's CD-ROM drive.
2. From the Start menu, choose All Programs, and then choose Windows Explorer.
The Windows Explorer window opens.

3. In Windows Explorer, navigate to the following path:

C:\sun\wxpupg\upgrade.bat

Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi III software, or you did not update your drivers.

4. Double-click upgrade.bat .

The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

5. Follow the prompts on the window and enter the information that Microsoft Windows requests.

For example, enter the CD key on the back of your CD case and your administrator's password when prompted.

When you are finished entering all the information, the SunPCi III software reboots again into Windows XP Professional.

Tip – This step can take several minutes to complete.

Installing Japanese Windows XP Professional

There are two ways to install the Japanese version of Windows XP Professional on SunPCi III: the automatic method and the manual method.

▼ How to Perform an Automatic Installation

To install the Japanese version of Windows XP Professional using the automatic method, perform the following steps:

- 1. Insert the Japanese Windows XP Professional CD into your system's CD-ROM drive.**
- 1. Start the SunPCi software.**

2. Click OK.

The Create a New Emulated Drive dialog box opens.

3. In the Select an Operating System pane, select either Windows XP Professional-FAT16 or Windows XP Professional-NTFS.

4. Click the radio button to attach the drive as a C: drive.

5. Move the slider to make the size of the drive at least 4 Gbytes.

6. Specify the directory and file name for the drive and click OK.

SunPCi III software restarts after the disk drive is created.

7. Type `y` and press Return when this message appears:

This cdrom appears to be Japanese Windows, is that correct?

8. Choose Options, and select Create a New Emulated Drive from the SunPCi III window.

The Create a New Emulated Drive dialog box opens.

9. In the Select an Operating System pane, select DR DOS 7.01 (Bootable).

10. Attach this drive as the D: drive.

11. Move the slider to make the size of the drive at least 4 Gbytes.

12. Specify the directory and file name for the drive and click OK.

13. Click OK when you receive a message asking you to shut down Windows and reset SunPCi III.

14. Choose File, then select Reset PC from the SunPCi III window.

When the system finishes copying files, the SunPCi III software restarts.

15. When the Windows XP Professional operating system asks where to install Windows, install the software to the C: drive.

The installation routine continues. Follow the steps displayed on the screen. After you finish the installation, you can detach the D: drive, delete the emulated drive file, and remove it from your `SunPC.ini` file.

▼ How to Perform a Manual Installation

To install the Japanese version of Windows XP Professional using the manual method, perform the following steps:

1. **Insert the Japanese Windows XP Professional CD into your system's CD-ROM drive.**

2. **Start the SunPCi software.**

3. **Click OK.**

The Create a New Emulated Drive dialog box opens.

4. **In the Select an Operating System pane, select DR DOS 7.01 (Bootable).**

5. **Click the radio button to attach the drive as a C: drive.**

6. **Move the slider to make the size of the drive at least 4 Gbytes.**

7. **Specify the directory and file name for the drive and click OK.**

SunPCi III software reboots after the disk drive is created.

8. **Choose Options, then select Create a New Emulated Drive from the SunPCi III window.**

The Create a New Emulated Drive dialog box opens.

9. **In the Select an Operating System pane, select DR DOS 7.01 (Bootable).**

10. **Click the radio button to attach this drive as the D: drive.**

11. **Move the slider to make the size of the drive at least 4 Gbytes.**

12. **Specify the directory and file name for the drive and click OK.**

13. **Click OK when you receive a message asking you to shut down Windows and reset SunPCi III.**

14. **Choose File, then select Choose Reset PC from the SunPCi III window.**

15. **Create a file system for the emulated drive as follows:**

- To create a FAT file system on the drive, type the following at the C:\> prompt and press Return:

```
f:\drivers\winxp\setupwpxp /td
```

- To create an NTFS file system for the emulated drive, type the following at the C:\> prompt and press Return:

```
f:\drivers\winxp\setupwpx /td /NTFS:max
```

When the system finishes copying the files, SunPCi III software restarts.

16. When the Windows XP Professional operating system asks where to install Windows, install the software to the C: drive.

The installation routine continues. Follow the steps displayed on the screen. After you finish the installation, you can detach the D: drive, delete the emulated drive file, and remove it from your `SunPC.ini` file.

Configuring Virtual Ethernet Networking for Windows XP Professional

The SunPCi III software comes with *physical* Ethernet networking enabled by default. If you prefer to use *virtual* networking, you need to disable the physical Ethernet adapter in Microsoft Windows and install the virtual Ethernet adapter. This section explains the steps you need to follow.

Note – When more than one SunPCi III card is installed in a system, virtual networking is disabled by the SunPCi III software.



Caution – Do not enable both virtual and physical networking at the same time, since unpredictable results and operations can happen.

For more information about physical and virtual Ethernet networking, refer to “Setting Up Networking With SunPCi III Hardware and Software” on page 35.

To set up virtual Ethernet networking for Windows XP Professional, follow the steps outlined in the next procedure. This procedure explains how to configure the network adapter.

Note – If you use a static IP address for physical networking and are switching to virtual networking, and want to use your static IP address, you must remove your static IP address in physical networking. If you do not remove your static IP address first, you will receive various error messages about conflicting IP addresses.

▼ How to Add a Virtual Network Adapter

1. **On the Windows XP Professional desktop, right-click My Computer.**

A drop-down menu opens.

2. **Choose Properties.**

The System Properties dialog box opens.

3. **Click the Hardware tab.**

4. **Click Device Manager.**

The Device Manager window opens with a list of installed device drivers.

5. **Double-click Network Adapters.**

6. **Right-click VIA RHINE II Fast Ethernet Adaptor.**

7. **Click Disable.**

A message opens saying that disabling this device will cause it to stop functioning.

8. **Click Yes.**

9. **Click OK to close the System Properties dialog box.**

10. **Close the Device Manager window.**

This completes the first section of this task. Proceed with the second section to complete adding a virtual network adapter.

1. **From the Start menu and then choose Control Panel from the Windows XP Professional menu.**

2. **Double-click Add Hardware.**

The Add Hardware Wizard dialog box opens.

3. **Click Next.**

The Add Hardware Wizard dialog box opens.

4. **Click the Yes, I have already connected the hardware radio button.**

5. **Click Next.**

6. Click Add a New Hardware Device.

7. Click Next.

8. Click the Install the hardware that I manually select from a list [Advanced] radio button.

A dialog box opens asking what type of hardware you are installing.

9. Click Next.

10. Click the Network adapters options.

11. Click Next.

The Add/Remove Hardware Wizard opens.

12. Click Have Disk.

13. Click Browse.

14. Navigate to `c:\sun\sunnet\winxp\sunndis.inf`.

The Locate File dialog box opens.

15. Click Open.

The Install From Disk dialog box opens.

16. Click OK.

The Select Network Adapter dialog box opens.

17. Click Next.

A dialog box opens listing the SunNDIS Adapter Driver as the new hardware to install.

18. Click Next.

Files are copied and the Completing Add Hardware Wizard dialog box opens.

19. Click Finish.

If you are asked to restart the computer, click Yes to complete the configuration.

To make the virtual adapter function in the network, you need to complete the procedure “How to Configure the Network for Windows XP Professional” on page 52.

▼ How to Configure the Network for Windows XP Professional

After you finish configuring the virtual or the physical network adapter and restart Windows XP Professional, you need to configure *one* of the adapters to use TCP/IP. Log on to Windows XP Professional again and follow the steps in this procedure.



Caution – Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual or physical adapter before performing the following procedure.

1. From the Start menu and then choose My Network Places.

The Network Connections window opens. The window contains three icons: Make New Connection, Local Area Connection, and Local Area Connection 2.

Tip – If you attempt this operation several times, you might see more than the initial three icons in the window.

2. Right-click Local Area Connection or Local Area Connection 2.

Your choice of 2 or not depends on *which* Ethernet adapter is enabled. The Status window opens. A drop-down menu opens.

3. Click Properties.

The Local Area Connection Properties window opens.

4. Double-click Internet Protocol (TCP/IP).

The Internet Protocol (TCP/IP) Properties window opens.

5. Set up TCP/IP for your SunPCi III card as described in “How to Set TCP/IP Properties” on page 35.

Refer to your Windows XP Professional documentation if needed.

6. When you finish setting up TCP/IP, click OK to close the Internet Protocol (TCP/IP) Properties dialog box.

7. Click OK to close the Local Area Connection Properties dialog box.

8. Click OK to close the Local Area Connection Status dialog box.

9. Close the Network and Dial-up Connections.

Note – If you see a dialog box with the message `SunNDIS failed to start`, ignore the message and click OK. This message sometimes appears when DHCP networking is disabled.

▼ How to Reconfigure the Network Adapter for Physical Ethernet

If you need to reactivate the physical network adapter, follow these steps.



Caution – Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual adapter before performing the following procedure.

1. On the Windows XP Professional desktop, right-click My Computer.

A drop-down menu opens.

2. Choose Properties.

The System Properties dialog box opens.

3. Click the Hardware tab.

4. Click Device Manager.

The Device Manager window opens, listing the computer's installed device drivers.

5. Click the computer name.

6. Double-click Network Adapters.

7. Right-click the SunNDIS Virtual Adapter.

8. Click Disable.

A dialog box opens saying that disabling this device causes the adapter to stop functioning.

9. Click Yes.

10. Right-click the VIA RHINE II Fast Ethernet Adaptor.

A drop-down menu opens

11. Choose Enable.

12. Close the Device Manager window.

13. Click OK to close the System Properties dialog box.

To enable the physical adapter to use TCP/IP in the network, you need to complete the procedure “How to Configure the Network for Windows XP Professional” on page 52.

▼ How to Prepare Windows XP Professional to Display External Video

To use an external monitor, you need to attach the monitor to the SunPCi III main card backplate and install the external video driver. The video drivers are now automatically installed during the SunPCi III installation.



Caution – Do not use both system and external monitors at the same time. SunPCi software does not support multi-headed operation.

1. Attach the monitor to the external video port connector on the SunPCi III main card backplate.

Refer to FIGURE 9-1 to find the location of the external video port.

2. Close Windows XP and the SunPCi III software.

3. At the Solaris system prompt, verify you have attached the mouse, and restart the SunPCi III software using the `-v` option:

```
% /opt/SUNWspci3/bin/sunpci -v
```

Note – If you do not use the `-v` option, the Sun display will appear scrambled.

The SunPCi III software starts, and Windows XP Professional opens first on the external monitor, and then on your system monitor in the SunPCi III window. You are now ready to configure the Windows XP Professional display as described in the following procedure.

▼ How to Configure Windows XP Professional for External Video Use

For more information about configuring the display in Windows XP Professional, refer to your Windows XP Professional documentation.

1. On the Windows XP Professional desktop, choose right-click.

A drop-down menu opens.

2. Choose Properties.

The Display Properties dialog box opens.

3. Click the Settings tab.

Note – There are two displays shown in the window, marked 1 and 2. Video 2 is highlighted, showing that it (the system monitor) is the primary display. Video 1 is dimmed, indicating that it is not the primary display.

4. Click Video 1.

The driver listed underneath the video changes to Default Monitor on S3 Graphics ProSavage DDR.

5. Click the “Extend my Windows desktop onto this monitor” check box.

6. Click the “Use this device as the primary monitor” check box.

7. Click Video 2.

The driver listed underneath the video changes back to Sun Microsystems SunPCi Video.

8. Uncheck the “Extend my Windows desktop onto this monitor” check box.

The icons representing Video 1 and Video 2 change position, so that Video 1 appears first.

9. Click Apply.

Your external monitor is now active in Windows XP Professional. Your system monitor shows an empty SunPCi window with Video routed to external monitor in the title bar.

10. Click OK to close the Display Properties dialog box.

You can now use external video with Windows XP Professional. Refer to your Windows XP Professional documentation for more information.

Note – For best performance with Windows XP and an external monitor, attach a serial mouse to the serial port on the SunPCi III card’s Serial/Parallel Port Backplate.

▼ How to Switch External Video Back to the System Monitor

1. **On the Windows XP Professional desktop, choose right-click.**

A drop-down menu opens.

2. **Choose Properties.**

The Display Properties dialog box opens.

3. **Click the Settings tab.**

4. **Click Video 2.**

The driver listed underneath the video changes to Default Monitor on Sun Microsystems on SunPCi video.

5. **Click the “Extend my Windows desktop onto this monitor” check box.**

6. **Click the “Use this device as the primary monitor” check box.**

7. **Click Video 1.**

The driver listed underneath the video changes back to Sun Microsystems SunPCi Video.

8. **Uncheck the “Extend my Windows desktop onto this monitor” check box.**

9. **Click Apply.**

Your monitor is now active in Windows XP Professional.

Using Windows 2000 Professional or Windows 2000 Server

This chapter describes how to install and configure Microsoft Windows 2000 Professional and Microsoft Windows 2000 Server Edition operating system software for use with the SunPCi III product.

This chapter includes the following topics:

- “Installing Windows 2000” on page 58
- “Upgrading Windows NT to Windows 2000” on page 60
- “Upgrading Windows NT4 WS to Windows 2000 Professional” on page 61
- “Upgrading Windows NT4 Server or Windows NT4 TS to Windows 2000 Server” on page 63
- “Configuring Virtual Ethernet Networking for Windows 2000” on page 65
- “Configuring Virtual Ethernet Networking for Windows 2000” on page 65

This chapter includes instructions for completing the following tasks:

- “How to Perform a Custom Installation” on page 58
- “How to Upgrade Windows NT4 WS to Windows 2000 Professional” on page 61
- “How to Upgrade Windows NT4 Server or Windows NT4 TS to Windows 2000 Server” on page 64
- “How to Add a Virtual Network Adapter” on page 66
- “How to Configure the Network for Windows 2000” on page 67
- “How to Reconfigure the Network Adapter for Physical Ethernet” on page 69
- “How to Prepare Windows 2000 to Display External Video” on page 70
- “How to Configure Windows 2000 for External Video Use” on page 70
- “How to Switch External Video Back to the System Monitor” on page 72
- “How to Configure the MouseKeys Accessibility Option” on page 72

Throughout this chapter, Microsoft Windows 2000 Professional is referred to as Windows 2000 Professional, and Microsoft Windows 2000 Server Edition is referred to as Windows 2000 Server. In some sections in this chapter, Windows 2000 refers to both operating systems.

Tip – Throughout this chapter, wherever the installation and configuration of the Windows 2000 Server differs from the Windows 2000 Professional installation, a Tip for a server procedure follows the description.

Installing Windows 2000

You install operating system software when you create an emulated drive by choosing Create a New Emulated Drive from the SunPCi Options menu. See “Emulated Drives and SunPCi III Software” on page 12. If you want to perform a custom installation using scripts that differ from the standard Microsoft installation scripts, see “How to Perform a Custom Installation” on page 58.



Caution – SunPCi III 3.1 does not support simultaneous operation of Windows 2000 on both the system and external monitors.

Installation Notes

Make sure that you have the following media and information available before you begin installation:

- Windows 2000 retail installation software CD
- Customized installation scripts, if needed
- The network system name for each SunPCi III card installed in your system
- The workgroup or domain name for your Windows 2000 installation on each SunPCi III card installed in your system

▼ How to Perform a Custom Installation



Caution – When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box, the software automatically finds and copies setup files, boot files, system files, and drivers that are appropriate for that operating system. The software also launches Windows Setup when SunPCi software reboots. Do not perform a custom installation unless you want to use customized installation scripts.

1. Create a new emulated hard drive and auto-install the DR DOS 7.01 operating system software.

See “Emulated Drives and SunPCi III Software” on page 12. Set options in the Create a New Emulated Drive dialog box as follows:

- Select DR DOS 7.01 (Bootable) as the operating system to auto-install.
- Make the drive at least 2 Gbytes in size, which can be expanded later if needed.
- Attach the drive as a C: drive.
- For best performance, create your emulated drives on a local hard disk on your Sun system or server.

The SunPCi III software reboots. The OpenDOS prompt (C:\>) opens.

2. Install the SunPCi III drivers.

The default location for the Windows 2000 files is `r:\cdrom\cdrom0\i386`. However, if your Windows 2000 files reside at a location other than the default one, you need to use the `/s:` switch to specify where the files are located. For example, if your Windows 2000 disk image is located in your Solaris directory at `/export/home/win2k`, you would access it from the R: drive in OpenDOS.

Note – Copy all the contents of the installation CD files to the `win2k` folder before starting the installation.

Type the following command all on one line:

```
C:\> f:\drivers\win2k\setupw2k /s:r:\export\home\win2k\i386
```

The setup process takes a few minutes to complete. SunPCi III software responds with the following messages.

```
Copying Setup Files...
Copying Boot Files...
Copying System Files...
Copying Optional Files...
Copying SunPCi Installation Files...
```

When the `setupw2k` script finishes copying the Windows 2000 files to your C: drive, it reboots the SunPCi III software. The Windows 2000 Setup screen opens. When Windows 2000 Setup has finished copying files, it reboots the SunPCi III software again.

Tip – The SunPCi III messages are for the Windows 2000 Professional setup. The Windows 2000 Server messages differ slightly.

3. **After the SunPCi III software reboots from the Windows 2000 window, choose Attach Mouse from the Options menu or press Meta-M to attach the mouse.**

This enables the mouse to work with Windows 2000 during the installation process. Once the installation is complete, the proper mouse drivers are installed and you no longer need to attach the mouse manually.

4. **Change directory to the location for your customized installation scripts.**
5. **Complete the installation using your customized installation scripts.**

Upgrading Windows NT to Windows 2000

Although Windows NT is not supported in SunPCi III 3.1, you can upgrade from Windows NT to a supported operating systems in SunPCi III 3.1.

In SunPCi III 3.1 software, you can upgrade the emulated disk drive images. To upgrade an existing C: drive, perform one of the following upgrades:

- “How to Upgrade Windows NT4 WS to Windows 2000 Professional” on page 61
- “How to Upgrade Windows NT4 Server or Windows NT4 TS to Windows 2000 Server” on page 64



Caution – Before upgrading to a supported operating system, you must update your Intel drivers. Refer to “Updating Intel Drivers” on page 112 for additional information.

Upgrade Notes

Make sure that you have the following before you start an upgrade to Windows 2000:

- The retail Windows 2000 Professional CD or Windows 2000 Server installation CD. The installation will *not* work without the retail installation CD in your CD-ROM drive.

- At least 2 Gbytes of available free space on your emulated C: drive.

Tip – Before you perform the upgrade, make a backup copy of your existing C: emulated drive file and disable any anti-virus software.

Upgrading Windows NT4 WS to Windows 2000 Professional



Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi III program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows 2000 Professional CD or the installation will fail and your emulated C: drive can become corrupted.

Before You Begin the Upgrade



Caution – If you are using an external CD-RW drive with Windows NT4 WS, uninstall the device. The upgrade to Windows 2000 Professional will fail unless the device is removed and its software uninstalled. Reinstall the device after the upgrade.



Caution – Before starting to upgrade Windows NT4 WS to Windows 2000 Professional, you must update your Intel drivers. Refer to “Updating Intel Drivers” on page 112 for additional information.

▼ How to Upgrade Windows NT4 WS to Windows 2000 Professional

1. Insert the Windows 2000 Professional CD into your system's CD-ROM drive.

2. Click the Start button, and choose Programs and Windows Explorer.

The Windows Explorer window opens.

3. Using the Windows Explorer window, find the following path:

C:\sun\w2kupg\upgrade.bat

Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi III software, or you did not update your SunPCi III drivers.

4. Double-click upgrade.bat.

The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

5. Follow the prompts on the window and enter the information that Microsoft Windows requests.

For example, enter the CD key on the back of your CD case and your administrator's password when prompted.

When you are finished entering all the information, the SunPCi III software reboots into Windows 2000 Professional.

Tip – This step can take several minutes to complete.

6. Install the Service Pack.

To complete the process, you need to install the appropriate Service Pack. See "Microsoft Windows Service Packs" on page 20.

Upgrading Windows NT4 Server or Windows NT4 TS to Windows 2000 Server



Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi III program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows 2000 Server CD or the installation will fail and your emulated C: drive can become corrupted.



Caution – Before upgrading to Windows 2000 Server, you must update your Intel drivers. Refer to “Updating Intel Drivers” on page 112 for additional information.

Before You Begin the Upgrade

Before starting to upgrade Windows NT4 Server or Windows NT4 TS to Windows 2000 Server, follow these steps:

1. **Log off all clients and other processes from the server before upgrading Windows NT4 Server or Windows NT4 TS, and before enabling SunFSD mapping in Windows NT4 Server or Windows NT4 TS.**

Enabling SunFSD mapping enables it for *all current users*, creating a potential breach in security, so caution must be employed.

2. **Double-click the `fsdon.reg` Registry file located at:**

`C:\sun\sunfsd\fsdon.reg`



Caution – This enables SunFSD. Leave SunFSD enabled until after the upgrade to Windows 2000 Server and then disable.

▼ How to Upgrade Windows NT4 Server or Windows NT4 TS to Windows 2000 Server



Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi III program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows 2000 Server CD or the installation will fail, your Windows 2000 Server emulated disk will not run with SunPCi III, and your emulated C: drive can become corrupted.

1. Insert the Windows 2000 Server CD into your system's CD-ROM drive.

2. Click Start, and choose Programs and Windows Explorer.

The Windows Explorer window opens.

3. Using the Windows Explorer window, find the following path:

C:\sun\w2kupg\upgrade.bat

Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi III software, or you did not update your SunPCi III drivers.

4. Double-click upgrade.bat.

The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

5. Follow the prompts on the window and enter the information that Microsoft Windows requests.

For example, enter the CD key on the back of your CD case and your administrator's password when prompted.

When you are finished entering all the information, the SunPCi III software reboots again into Windows 2000 Server.

Tip – This step can take several minutes to complete.

6. Install the Service Pack.

To complete the process, you need to install the appropriate Service Pack. See “Microsoft Windows Service Packs” on page 20.

Configuring Virtual Ethernet Networking for Windows 2000

The SunPCi III software comes with *physical* Ethernet networking enabled by default. If you prefer to use *virtual* networking instead of physical networking, you need to disable the physical Ethernet adapter in Microsoft Windows and install the virtual Ethernet adapter. This section explains the steps you need to follow.

Note – When more than one SunPCi III card is installed in a system, virtual networking is disabled by the SunPCi III software.



Caution – Do not enable both virtual and physical networking at the same time, since unpredictable results and operations can happen.

For more information about physical and virtual Ethernet networking, refer to “Setting Up Networking With SunPCi III Hardware and Software” on page 35.

To set up virtual Ethernet networking for Windows 2000, follow the steps outlined in the following procedure. This procedure explains how to configure the network adapter.

Note – Microsoft Windows provides several different ways to install software. Follow the instructions in this section, even if you have installed Microsoft Windows software previously. The SunPCi III 3.1 software does not support other methods of installation.

Note – If you use a static IP address for physical networking and are switching to virtual networking, and want to use your static IP address, you must remove your static IP address in physical networking. If you do not remove your static IP address first, you will receive various error messages about conflicting IP addresses.

▼ How to Add a Virtual Network Adapter

1. **On the Windows 2000 desktop, right-click My Computer.**

A drop-down menu opens.

2. **Choose Properties.**

The System Properties dialog box opens.

3. **Click the Hardware tab.**

4. **Click Device Manager.**

The Device Manager window opens with a list of installed device drivers.

5. **Double-click Network Adapters.**

6. **Right-click VIA RHINE II Fast Ethernet Adapter.**

7. **Click Disable.**

A message opens saying that disabling this device will cause it to stop functioning.

8. **Click Yes.**

9. **Click OK to close the System Properties dialog box.**

10. **Close the Device Manager window.**

This completes the first section of this task. Proceed with the second section to complete adding a virtual network adapter.

1. **From the Start menu, choose Settings, and then choose Control Panel.**

2. **Double-click Add/Remove Hardware.**

The Add/Remove Hardware Wizard dialog box opens.

3. **Click Next.**

4. **Click the “Add/Troubleshoot a device” radio button.**

5. **Click Next.**

Microsoft Windows searches for new hardware devices. The Add/Remove Hardware Wizard - Choose a Hardware dialog box opens.

6. **Click the Add a New Device option.**

7. **Click Next.**

The Add/Remove Hardware Wizard - Find New Hardware dialog box opens.

8. **Click the No, I want to choose the Hardware from a list radio button.**

9. Click Next.

The Add/Remove Hardware Wizard - Hardware Types dialog box opens.

10. Click the Network adapters options.

11. Click Next.

The Add/Remove Hardware Wizard - Select Network Adapter dialog box opens.

12. Click Have Disk.

13. Click Browse.

14. Navigate to `c:\sun\sunnet\win2k\sunndis.inf`.

The Locate File dialog box opens.

15. Click Open.

The Install From Disk dialog box opens.

16. Click OK.

The Select Network Adapter dialog box opens.

17. Click Next (at the Select Network Adaptor dialog box).

The Add/Remove Hardware Wizard - Start Hardware Installation dialog box opens.

18. Click Next.

The Completing the Add/Remove Hardware Wizard dialog box opens saying hardware installed.

19. Click Finish.

If you are asked to restart the computer, choose Yes to complete the configuration.

To make the virtual adapter function in the network, you need to complete the procedure in “How to Configure the Network for Windows 2000” on page 67.

▼ How to Configure the Network for Windows 2000

After you finish configuring the virtual or the physical network adapter and restart Windows 2000, you need to configure *one* of the adapters to use TCP/IP. Log in to Windows 2000 again and follow the steps in this procedure.



Caution – Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual or physical adapter before performing the following procedure.

1. From the Start menu, choose Settings, and then choose Network and Dial-up Connections.

The Network and Dial-up Connections window opens. The window contains three icons: Make New Connection, Local Area Connection, and Local Area Connection 2.

Tip – If you attempt this operation several times, you might see more than the initial three icons in the window.

2. Right-click Local Area Connection or Local Area Connection 2.

Your choice of 2 or not depends on *which* Ethernet adapter is enabled. The Status window opens. A drop-down menu opens.

3. Click Properties.

The Local Area Connection Properties window opens.

4. Double-click Internet Protocol (TCP/IP).

The Internet Protocol (TCP/IP) Properties window opens.

5. Set up TCP/IP for your SunPCi III card as described in “How to Set TCP/IP Properties” on page 35.

Refer to your Windows 2000 documentation if needed.

6. When you finish setting up TCP/IP, click OK to close the Internet Protocol (TCP/IP) Properties dialog box.

7. Click OK to close the Local Area Connection Properties dialog box.

8. Close the Network and Dial-up Connections dialog box.

Note – If you see a dialog box with the message `Sunndis failed to start`, ignore the message and click OK. This message sometimes appears when DHCP networking is disabled.

▼ How to Reconfigure the Network Adapter for Physical Ethernet

If you need to reactivate the physical network adapter, follow these steps.



Caution – Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual adapter before performing the following procedure.

1. On the Windows 2000 desktop, right-click My Computer.

A drop-down menu opens.

2. Choose Properties.

The System Properties dialog box opens.

3. Click the Hardware tab.

4. Click Device Manager.

The Device Manager window opens, listing the computer's installed device drivers.

5. Click the computer name.

6. Double-click Network Adapters.

7. Right-click the SunNDIS Virtual Adapter.

8. Click Disable.

A dialog box opens saying that disabling this device causes the adapter to stop functioning.

9. Click Yes.

10. Right-click the VIA RHINE II Fast Ethernet Adapter.

A drop-down menu opens.

11. Choose Enable.

12. Close the Device Manager window.

13. Click OK to close the System Properties dialog box.

To enable the physical adapter to use TCP/IP in the network, you need to complete the procedure "How to Configure the Network for Windows 2000" on page 67.

▼ How to Prepare Windows 2000 to Display External Video

To use an external monitor, you need to attach the monitor to the SunPCi III main card backplate and install the external video driver. The video drivers are now automatically installed during the SunPCi III installation.



Caution – Do not use both system and external monitors at the same time. SunPCi software does not support multi-headed operation.

To complete this configuration, perform the following procedures:

1. **Attach the monitor to the external video port connector on the SunPCi III main card backplate.**
Refer to FIGURE 9-1 to find the location of the external video port.
2. **Close Windows 2000 and the SunPCi III software.**
3. **At the Solaris system prompt, verify you have attached the mouse, and restart the SunPCi III software using the `-v` option:**

```
% /opt/SUNWspci3/bin/sunpci -v
```

Note – If you do not use the `-v` option, the Sun display will appear scrambled.

The SunPCi III software starts, and Windows 2000 opens first on the external monitor, and then on your system monitor in the SunPCi III window. You are now ready to configure the Windows 2000 display as described in the following procedure.

▼ How to Configure Windows 2000 for External Video Use

For more information about configuring the display in Windows 2000, refer to your Windows 2000 documentation.

1. **On the Windows 2000 desktop, choose right-click.**
A drop-down menu opens.

2. Choose Properties.

The Display Properties dialog box opens.

3. Click the Settings tab.

Note – There are two displays shown in the window, marked 1 and 2. Video 2 is highlighted, showing that it (the system monitor) is the primary display. Video 1 is dimmed, indicating that it is not the primary display.

4. Click Video 1.

The driver listed underneath the video changes to Default Monitor on S3 Graphics ProSavage DDR.

5. Click the “Extend my Windows desktop onto this monitor” check box.

6. Click the “Use this device as the primary monitor” check box.

7. Click Video 2.

The driver listed underneath the video changes back to Sun Microsystems SunPCi Video.

8. Uncheck the “Extend my Windows desktop onto this monitor” check box.

The icons representing Video 1 and Video 2 change positions, so that Video 1 appears first.

9. Click Apply.

Your external monitor is now active in Windows 2000. Your system monitor shows an empty SunPCi window with Video routed to external monitor in the title bar.

10. Click OK to close the Display Properties dialog box.

You can now use external video with Windows 2000. Refer to your Windows 2000 documentation for more information.

Note – For best performance with Windows 2000 and an external monitor, attach a serial mouse to the serial port on the SunPCi III card’s Serial/Parallel Port Backplate.

▼ How to Switch External Video Back to the System Monitor

1. **On the Windows 2000 desktop, choose right-click.**

A drop-down menu opens.

2. **Choose Properties.**

The Display Properties dialog box opens.

3. **Click the Settings tab.**

4. **Click Video 2.**

The driver listed underneath the video changes to Default Monitor on Sun Microsystems on SunPCi video.

5. **Click the “Extend my Windows desktop onto this monitor” check box.**

6. **Click the “Use this device as the primary monitor” check box.**

7. **Click Video 1.**

The driver listed underneath the video changes back to Sun Microsystems SunPCi Video.

8. **Uncheck the “Extend my Windows desktop onto this monitor” check box.**

9. **Click Apply.**

Your monitor is now active in Windows 2000.

▼ How to Configure the MouseKeys Accessibility Option

To use MouseKeys on the system monitor in Windows 2000 Professional, do the following:

1. **Click Start and choose Settings and Control Panel from the Windows 2000 Professional menu.**

The Control Panel window opens.

2. **Double-click the Display icon.**

3. **Click the Settings tab.**

4. **Choose the “True Color (24-bit) option in the Colors” group box.**

5. **Click OK to close the Display Properties dialog box.**

6. Double-click the Mouse icon.
7. Click the Pointers tab.
8. Click the “Enable pointer shadow” check box.

Note – This step is only required when 24-bit color is displayed.

9. Click OK to close the Mouse Properties dialog box.
10. Double-click the Accessibility Options icon.
11. Click the Mouse tab.
12. Click the “Use MouseKeys” check box.
13. Click OK to close the Accessibility Options dialog box.
14. Close the Control Panel.
15. Use the arrow keys on the keyboard to move the cursor on the display.

Accessibility options cannot be enabled in any other supported Microsoft Windows operating system on the system monitor. Accessibility options might be available on Sun systems. Consult your sales representative for more information.

MouseKeys in any supported Microsoft Windows operating system are enabled on an external monitor and a serial mouse. Enable MouseKeys in the Accessibility Options dialog box from the Control Panel for the particular Microsoft Windows operating system.

Note – You must enable the True Color (24-bit) option in the Colors group box in the Settings tab for the “Enable pointer shadow” check box to be viewable in the Pointers tab.

Using Windows Server 2003

This chapter describes how to install and configure Microsoft Windows Server 2003 for use with the SunPCi III product. It also describes how to upgrade an existing emulated drive to Windows Server 2003. SunPCi III 3.1 currently supports the Windows Server 2003 Standard Edition.

This chapter includes the following topics:

- “Installing Windows Server 2003” on page 76
- “Upgrading Windows 2000 Server or Windows NT to Windows Server 2003” on page 78
- “Upgrading Windows 2000 Server to Windows Server 2003” on page 79
- “Upgrading Windows NT4 Server or Windows NT4 TS to Windows Server 2003” on page 81
- “Configuring Virtual Ethernet Networking for Windows Server 2003” on page 82

This chapter includes instructions for completing the following tasks:

- “How to Perform a Custom Installation” on page 76
- “How to Upgrade Windows 2000 Server to Windows Server 2003” on page 80
- “How to Upgrade Windows NT4 Server or Windows NT4 TS to Windows Server 2003” on page 82
- “How to Add a Virtual Network Adapter” on page 83
- “How to Configure the Network for Windows Server 2003” on page 85
- “How to Reconfigure the Network Adapter for Physical Ethernet” on page 86
- “How to Prepare Windows Server 2003 to Display External Video” on page 87
- “How to Configure Windows Server 2003 for External Video Use” on page 88
- “How to Switch External Video Back to the System Monitor” on page 89

Installing Windows Server 2003

You install operating system software when you create an emulated drive by choosing Create a New Emulated Drive from the SunPCi Options menu. See “Emulated Drives and SunPCi III Software” on page 12. If you want to perform a custom installation using scripts that differ from the standard Microsoft installation scripts, see “How to Perform a Custom Installation” on page 76.



Caution – SunPCi III 3.1 does not support simultaneous operation of Windows Server 2003 on both the system and external monitors.

Installation Notes

Make sure that you have the following media and information available before you begin installation:

- Windows Server 2003 retail installation software CD
- Customized installation scripts, if needed
- The network system name for each SunPCi III card installed in your system
- The workgroup or domain name for your Windows Server 2003 installation on each SunPCi III card installed in your system

▼ How to Perform a Custom Installation



Caution – When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box, the software automatically finds and copies setup files, boot files, system files, and drivers that are appropriate for that operating system. The software also launches Windows Setup when SunPCi software reboots. Do not perform a custom installation unless you want to use customized installation scripts.

1. Create a new emulated hard drive and auto-install the DR DOS 7.01 operating system software.

See “Emulated Drives and SunPCi III Software” on page 12. Set options in the Create a New Emulated Drive dialog box as follows:

- Select DR DOS 7.01 (Bootable) as the operating system to auto-install.

- Make the drive at least 2 Gbytes in size, which can be expanded later if needed.
- Attach the drive as a C: drive.
- For best performance, create your emulated drives on a local hard disk on your Sun system or server.

The SunPCi III software reboots. The OpenDOS prompt (C:\>) opens.

2. Install the SunPCi III drivers.

The default location for the Windows Server 2003 files is `r:\cdrom\cdrom0\i386`. However, if your Windows Server 2003 files reside at a location other than the default one, you need to use the `/s:` switch to specify where the files are located. For example, if your Windows Server 2003 disk image is located in your Solaris directory at `/export/home/2003`, you would access it from the R: drive in OpenDOS.

Note – Copy all the contents of the installation CD files to the 2003 folder before starting the installation.

Type the following command all on one line:

```
C:\> f:\drivers\winnet\setupnet /s:r:\export\home\winnet\i386
```

The setup process takes a few minutes to complete. SunPCi III software responds with the following messages:

```
Copying Setup Files...
Copying Boot Files...
Copying System Files...
Copying Optional Files...
Copying SunPCi Installation Files...
```

When the `setupnet` script finishes copying the Windows Server 2003 files to your C: drive, it reboots the SunPCi III software. The Windows Server 2003 Setup screen opens. When Windows Server 2003 Setup has finished copying files, it reboots the SunPCi III software again.

Note – Your mouse may not be active during installation process. Use the Tab key and the arrow keys to navigate the Windows Server 2003 Setup screens.

3. After the SunPCi III software reboots from the Windows Server 2003 window, choose **Attach Mouse** from the **Options** menu or press **Meta-M** to attach the mouse.

This enables the mouse to work with Windows Server 2003 during the installation process. Once the process is completed, the proper mouse drivers are installed and you no longer need to attach the mouse manually.

4. Change directory to the location for your customized installation scripts.
5. Complete the installation using your customized installation scripts.

Upgrading Windows 2000 Server or Windows NT to Windows Server 2003

Although Windows NT is not supported in SunPCi III 3.1, you can upgrade from Windows NT to a supported operating systems in SunPCi III 3.1.

In SunPCi III 3.1 software, you can upgrade the emulated disk drive images. To upgrade an existing C: drive, perform one of the following upgrades:

- “How to Upgrade Windows 2000 Server to Windows Server 2003” on page 80
- “How to Upgrade Windows NT4 Server or Windows NT4 TS to Windows Server 2003” on page 82



Caution – Before upgrading to a supported operating system, you must update your Intel drivers. Refer to “Updating Intel Drivers” on page 112 for additional information.

Upgrade Notes

Make sure that you have the following media and disk drive space available before you start an upgrade to Windows Server 2003:

- The Windows Server 2003 retail software installation CD; the installation will *not* work without the CD in your CD-ROM drive
- At least 2 Gbytes of available space on your emulated C: drive

Tip – Before you perform the upgrade, make a backup copy of your existing C: emulated drive file and disable any anti-virus software.

Upgrading Windows 2000 Server to Windows Server 2003



Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi III software involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows Server 2003 CD or the installation will fail and your emulated C: drive can become corrupted.



Caution – Prior to performing an upgrade from Windows 2000 Server to Windows Server 2003, you must remove virtual networking if it is installed.

Before You Begin the Upgrade



Caution – Before upgrading to a supported operating system, you must update your Intel drivers. Refer to “Updating Intel Drivers” on page 112 for additional information.

Before starting to upgrade Windows 2000 Server to Windows Server 2003, follow these steps:

1. **Log off all clients and other processes from the server before upgrading Windows 2000 Server, and before enabling SunFSD mapping in Windows 2000 Server.**

Enabling SunFSD mapping enables it for *all current users*, creating a potential breach in security, so caution must be employed.

2. **Double-click the `fsdon.reg` Registry file located at:**

`C:\sun\sunfsd\fsdon.reg`



Caution – This enables SunFSD. Leave SunFSD enabled until after the upgrade to Windows Server 2003 and then disable.

▼ How to Upgrade Windows 2000 Server to Windows Server 2003

1. **Insert the Windows Server 2003 CD into your system's CD-ROM drive.**
2. **From the Start menu, choose Programs, and then choose Windows Explorer.**
The Windows Explorer window opens.
3. **In Windows Explorer, navigate to the following path:**

C:\sun\wnetupg\upgrade.bat

Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi III software, or you did not update your drivers.

4. **Double-click** upgrade.bat .

The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

5. **Follow the prompts on the window and enter the information that Microsoft Windows requests.**

For example, enter the CD key on the back of your CD case and your administrator's password when prompted.

When you are finished entering all the information, the SunPCi III software reboots again into Windows Server 2003.

Tip – This step can take several minutes to complete.

Upgrading Windows NT4 Server or Windows NT4 TS to Windows Server 2003



Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi III software involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows Server 2003 CD or the installation will fail and your emulated C: drive can become corrupted.

Before You Begin the Upgrade



Caution – Before upgrading to a supported operating system, you must update your Intel drivers. Refer to “Updating Intel Drivers” on page 112 for additional information.

Before starting to upgrade Windows NT4 Server to Windows Server 2003, follow these steps:

1. **Log off all clients and other processes from the server before upgrading Windows NT4 Server or Windows NT4 TS, and before enabling SunFSD mapping in Windows NT4 Server or Windows NT4 TS.**

Enabling SunFSD mapping enables it for *all current users*, creating a potential breach in security, so caution must be employed.

2. **Double-click the `fsdon.reg` Registry file located at:**

`C:\sun\sunfsd\fsdon.reg`



Caution – This enables SunFSD. Leave SunFSD enabled until after the upgrade to Windows Server 2003 and then disable.

▼ How to Upgrade Windows NT4 Server or Windows NT4 TS to Windows Server 2003

1. Insert the Windows Server 2003 CD into your system's CD-ROM drive.
2. From the Start menu, choose Programs, and then choose Windows Explorer.
The Windows Explorer window opens.
3. In Windows Explorer, navigate to the following path:

```
C:\sun\wnetupg\upgrade.bat
```

Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi III software, or you did not update your drivers.

4. Double-click `upgrade.bat`.

The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

5. Follow the prompts on the window and enter the information that Microsoft Windows requests.

For example, enter the CD key on the back of your CD case and your administrator's password when prompted.

When you are finished entering all the information, the SunPCi III software reboots again into Windows Server 2003.

Tip – This step can take several minutes to complete.

Configuring Virtual Ethernet Networking for Windows Server 2003

The SunPCi III software comes with *physical* Ethernet networking enabled by default. If you prefer to use *virtual* networking instead of physical networking, you need to disable the physical Ethernet adapter in Microsoft Windows and install the virtual Ethernet adapter. This section explains the steps you need to follow.

Note – When more than one SunPCi III card is installed in a system, virtual networking is disabled by the SunPCi III software.



Caution – Do not enable both virtual and physical networking at the same time, since unpredictable results and operations can happen.

For more information about physical and virtual Ethernet networking, refer to “Setting Up Networking With SunPCi III Hardware and Software” on page 35.

To set up virtual Ethernet networking for Windows Server 2003, follow the steps outlined in the following procedure.

Note – If you use a static IP address for physical networking and are switching to virtual networking, and want to use your static IP address, you must remove your static IP address in physical networking. If you do not remove your static IP address first, you will receive various error messages about conflicting IP addresses.

▼ How to Add a Virtual Network Adapter

1. **On the Windows Server 2003 desktop, right-click My Computer.**

A drop-down menu opens.

2. **Choose Properties.**

The System Properties dialog box opens.

3. **Click the Hardware tab.**

4. **Click Device Manager.**

The Device Manager window opens with a list of installed device drivers.

5. **Double-click Network Adapters.**

6. **Right-click VIA RHINE II Fast Ethernet Adaptor.**

7. **Click Disable.**

A message opens saying that disabling this device will cause it to stop functioning.

8. **Click Yes.**

9. **Click OK to close the System Properties dialog box.**

10. **Close the Device Manager window.**

This completes the first section of this task. Proceed with the second section to complete adding a virtual network adapter.

1. **Click Start and choose Settings and Control Panel from the Windows Server 2003 menu.**

2. **Double-click Add Hardware.**

The Add Hardware Wizard dialog box opens.

Note – Click “Switch to Classic View” under the Control Panel heading in the upper left side of the Control Panel window and the traditional Control Panel window opens.

3. **Click Next.**

4. **Click the “Add/Troubleshoot a device” radio button.**

5. **Click Next.**

Microsoft Windows searches for new hardware devices. The Add/Remove Hardware Wizard - Choose a Hardware dialog box opens.

6. **Click the Add a New Device option.**

7. **Click Next.**

The Add/Remove Hardware Wizard - Find New Hardware dialog box opens.

8. **Click the No, I want to choose the Hardware from a list radio button.**

9. **Click Next.**

The Add/Remove Hardware Wizard - Hardware Types dialog box opens.

10. **Click the Network adapters options.**

11. **Click Next.**

The Add/Remove Hardware Wizard - Select Network Adapter dialog box opens.

12. **Click Have Disk.**

13. **Click Browse.**

14. **Navigate to c:\sun\sunnet\winnet\sunndis.inf.**

The Locate File dialog box opens.

15. **Click Open.**

The Install From Disk dialog box opens.

16. Click OK.

The Select Network Adapter dialog box opens.

17. Click Next (at the Select Network Adaptor dialog box).

The Add/Remove Hardware Wizard - Start Hardware Installation dialog box opens.

18. Click Next.

The Completing the Add/Remove Hardware Wizard dialog box opens saying hardware installed.

19. Click Finish.

If you are asked to restart the computer, choose Yes to complete the configuration.

To make the virtual adapter function in the network, you need to complete the procedure in “How to Configure the Network for Windows Server 2003” on page 85.

▼ How to Configure the Network for Windows Server 2003

After you finish configuring the virtual or the physical network adapter and restart Windows Server 2003, you need to configure *one* of the adapters to use TCP/IP. Log in to Windows Server 2003 again and follow the steps in this procedure.



Caution – Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual or physical adapter before performing the following procedure.

1. From the Start menu, choose Settings, and then choose Network Connections.

The Network Connections window opens. The window contains three icons: Make New Connection, Local Area Connection, and Local Area Connection 2.

Tip – If you attempt this operation several times, you might see more than the initial three icons in the window.

2. Right-click Local Area Connection or Local Area Connection 2.

Your choice of 2 or not depends on *which* Ethernet adapter is enabled. The Status window opens. A drop-down menu opens.

3. Click Properties.

The Local Area Connection Properties window opens.

4. Double-click Internet Protocol (TCP/IP).

The Internet Protocol (TCP/IP) Properties window opens.

5. Set up TCP/IP for your SunPCi III card as described in “How to Set TCP/IP Properties” on page 35.

Refer to your Windows Server 2003 documentation if needed.

6. When you finish setting up TCP/IP, click OK to close the Internet Protocol (TCP/IP) Properties dialog box.

7. Click OK to close the Local Area Connection Properties dialog box.

8. Close the Network Connections window.

Note – If you see a dialog box with the message `Sunndis failed to start`, ignore the message and click OK. This message sometimes appears when DHCP networking is disabled.

▼ How to Reconfigure the Network Adapter for Physical Ethernet

If you need to reactivate the physical network adapter, follow these steps.



Caution – Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual adapter before performing the following procedure.

1. On the Windows Server 2003 desktop, right-click My Computer.

A drop-down menu opens.

2. Choose Properties.

The System Properties dialog box opens.

3. Click the Hardware tab.

4. Click Device Manager.

The Device Manager window opens, listing the computer's installed device drivers.

5. Click the computer name.

6. Double-click Network Adapters.

7. Right-click the SunNDIS Virtual Adapter.

8. Click Disable.

A dialog box opens saying that disabling this device causes the adapter to stop functioning.

9. Click Yes.

10. Right-click the VIA RHINE II Fast Ethernet Adaptor.

A drop-down menu opens

11. Choose Enable.

12. Close the Device Manager window

13. Click OK to close the System Properties dialog box.

To enable the physical adapter to use TCP/IP in the network, you need to complete the procedure “How to Configure the Network for Windows Server 2003” on page 85.

▼ How to Prepare Windows Server 2003 to Display External Video

To use an external monitor, you need to attach the monitor to the SunPCi III main card backplate and install the external video driver.



Caution – Do not use both system and external monitors at the same time. SunPCi III 3.1 software does not support multi-headed operation.

1. Attach the monitor to the external video port connector on the SunPCi III main card backplate.

Refer to FIGURE 9-1 to find the location of the external video port.

2. Close Windows 2000 and the SunPCi III software.

3. At the Solaris system prompt, verify you have attached the mouse, and restart the SunPCi III software using the `-v` option:

```
% /opt/SUNWspci3/bin/sunpci -v
```

Note – If you do not use the `-v` option, the Sun display will appear scrambled.

The SunPCi III software starts, and Windows 2000 opens first on the external monitor, and then on your system monitor in the SunPCi III window. You are now ready to configure the Windows 2000 display as described in the following procedure.

▼ How to Configure Windows Server 2003 for External Video Use

For more information about configuring the display in Windows Server 2003, refer to your Windows Server 2003 documentation.

1. On the Windows Server 2003 desktop, choose right-click.

A drop-down menu opens.

2. Choose Properties.

The Display Properties dialog box opens.

3. Click the Settings tab.

Note – There are two displays shown in the window, marked 1 and 2. Video 2 is highlighted, showing that it (the system monitor) is the primary display. Video 1 is dimmed, indicating that it is not the primary display.

4. Click Video 1.

The driver listed underneath the video changes to Default Monitor on S3 Graphics ProSavage DDR.

5. Click the “Extend my Windows desktop onto this monitor” check box.

6. Click the “Use this device as the primary monitor” check box.

7. Click Video 2.

The driver listed underneath the video changes back to Sun Microsystems SunPCi Video.

8. Uncheck the “Extend my Windows desktop onto this monitor” check box.

The icons representing Video 1 and Video 2 change positions, so that Video 1 appears first.

9. Click Apply.

Your external monitor is now active in Windows Server 2003. Your system monitor shows an empty SunPCi window with Video routed to external monitor in the title bar.

10. Click OK to close the Display Properties dialog box.

You can now use external video with Windows Server 2003. Refer to your Windows Server 2003 documentation for more information.

Note – For best performance with Windows Server 2003 and an external monitor, attach a serial mouse to the serial port on the SunPCi III card's Serial/Parallel Port Backplate.

▼ How to Switch External Video Back to the System Monitor

1. On the Windows Server 2003 desktop, choose right-click.

A drop-down menu opens.

2. Choose Properties.

The Display Properties dialog box opens.

3. Click the Settings tab.

4. Click Video 2.

The driver listed underneath the video changes to Default Monitor on Sun Microsystems on SunPCi video.

5. Click the “Extend my Windows desktop onto this monitor” check box.

6. Click the “Use this device as the primary monitor” check box.

7. Click Video 1.

The driver listed underneath the video changes back to Sun Microsystems SunPCi Video.

8. Uncheck the “Extend my Windows desktop onto this monitor” check box.

9. Click Apply.

Your monitor is now active in Windows Server 2003.

Installing and Configuring Server Software

This chapter provides information about using the SunPCi server installation and configuration issues.

This chapter includes the following topic:

- “Using SunFSD for Mapping Between Solaris and Microsoft Windows” on page 92

This chapter includes instructions for completing the following tasks:

- “How to Enable SunFSD Mapping” on page 92
- “How to Disable SunFSD Mapping” on page 93

The following information is for installing and configuring the supported Microsoft Windows server products (Windows 2000 Server and Windows Server 2003) using the SunPCi III 3.1 software on the Solaris operating environment.

For advanced SunPCi III server support concerning SunPCi III memory, CPUs, and benchmark information, consult the SunPCi Web site:

<http://www.sun.com/desktop/products/sunpci>

Note – Due to naming conventions, mounting the CD-ROM drive on SunFSD (\\localhost\cdrom\cdrom0) results in files not being found by certain applications.

Using SunFSD for Mapping Between Solaris and Microsoft Windows

The SunPCi III 3.1 software includes the Sun File System Driver (SunFSD), which maps Microsoft Windows drive letters to Solaris software directories.

The administrator should disable client logins prior to enabling SunFSD. Additionally, after any update (or other activity) is complete, the administrator should delete or unmap all SunFSD drives, disable mapping in SunFSD, and reboot the system.

For SunPCi III 3.1 installations, the SunFSD mapping function is *disabled* by default in the supported Microsoft Windows server products.

Thus, while running one of the server variants of Microsoft Windows, any mapping of the `\\localhost` directory by any user (or program), including the administrator, will fail. Further, any reference or any attempt to access files using a Universal Naming Convention (UNC) path that includes `\\localhost` as the UNC prefix will also fail.

The mapping control is imposed for security reasons. In the current release of SunFSD, any mapping or file access through `\\localhost` inherits the privileges of the user or process that launched the SunPCi III software. Therefore, if the SunPCi III card is running a Microsoft server operating system, and SunPCi software was launched under the root account, ordinary server users inherit root privileges across the network.

SunFSD is *enabled* on Windows XP Professional and Windows 2000 Professional, because there are no multi-client file system security issues when using these operating systems. You can continue to map SunFSD drives in Windows XP Professional and Windows 2000 Professional the same as you did in previous releases of SunPCi.

For server installations that require access to Solaris directories, server administrators can use a package such as Solaris PC NetLink or Samba that employs per-client security credential verification, or a Citrix MetaFrame client that maps Microsoft Windows drive letters as the local user.

▼ How to Enable SunFSD Mapping

The main reason for an administrator to enable SunFSD is that SunFSD functionality is *required* to execute the update drivers script, as well as other SunPCi supplied scripts.

SunFSD can be enabled in server installations if necessary by the Server Administrator account only. Disable SunFSD when you are finished performing the maintenance tasks described below.

To enable SunFSD mapping, as the Server Administrator perform this step:

- **Double-click the `fsdon.reg` Registry file located at:**

```
C:\sun\sunfsd\fsdon.reg
```

This can only be done using the Server Administrator account. Any server client (or non-privileged program) attempting to modify the Registry is refused.

Once SunFSD is enabled, all subsequent mappings and references using the `\\localhost` prefix will succeed. Additionally, after rebooting the server, SunFSD *remains* enabled. Further, any mappings made after enabling SunFSD, after logging off, or after rebooting the system, are reconnected upon logging on to the system (if configured to be reconnected).



Caution – Once SunFSD is enabled by the administrator, all server clients and programs can map or access Solaris directories and files, using the security privileges of the process that launched the SunPCi software.



Caution – Once SunFSD is disabled by the administrator, you can still browse the unmapped drives. Only after you have unmapped the drives and rebooted will the drives then be disabled, although you still have to physically unmap the drives in Windows Explorer.

▼ How to Disable SunFSD Mapping

To disable SunFSD mapping, as the Server Administrator perform this step:

- **Double-click the `fsdoff.reg` Registry file located at:**

```
C:\sun\sunfsd\fsdoff.reg
```

Once SunFSD mapping is disabled, all subsequent mappings and references using the `\\localhost` prefix will fail. Additionally, after rebooting the server, SunFSD mapping *remains* disabled. So, if for example, there were any successful SunFSD directory mappings prior to disabling SunFSD mapping, after the system is rebooted such mappings are *no longer* available.

Using Drives and Configuring Peripheral Devices

This chapter includes information about using drives and configuring peripheral devices available with the SunPCi III product.

This chapter includes the following general topics:

- “Using a Diskette Drive With SunPCi III Software” on page 95
- “Using a CD/DVD Drive With SunPCi III Software” on page 96
- “Connecting Peripheral Devices” on page 99
- “Connecting Additional USB and 1394 Firewire Devices” on page 102
- “Connecting Serial and Parallel Port Devices” on page 103

This chapter includes instructions for completing the following tasks:

- “How to Mount a CD-ROM Drive” on page 97
- “How to Set Up a CD-ROM Drive” on page 98
- “How to Eject a CD From a CD-ROM Drive” on page 99
- “How to Configure a Serial Mouse for an External Monitor” on page 105



Caution – SunPCi III software is not compatible with a system after `bsmconv` (1M) is run. Specifically, the device allocation features are incompatible with the use of `vold`, the diskette drive, the CD-ROM drive, and audio for SunPCi III.

Using a Diskette Drive With SunPCi III Software

If the system you are using has an internal diskette drive, it is referred to in Microsoft Windows as drive A:.

Many Sun systems come with one diskette drive. If you have a Sun system that does not have a built-in diskette drive, you need to have the drive installed if you intend to copy data from diskette.

If you are running Solaris Volume Manager (the `vold` process) on your system, you need to disable Volume Manager's control of the diskette drive before it can function with SunPCi III 3.1 software. You also need to be root to perform this task. To disable `vold` and use the diskette drive with SunPCi III, run the script `/opt/SUNWspci3/bin/vold_floppy_disable` at the Solaris prompt before you start the SunPCi III software (as root). Otherwise, you will not be able to use the diskette drive as drive A:.

Note – If you have a diskette in the A: drive, you must use the command-line option `eject` and then physically eject the diskette from the system. Failure to use the `eject` command results in the diskette not operating properly.

Using a CD/DVD Drive With SunPCi III Software

SunPCi III software contains a direct CD-ROM driver for Microsoft Windows, so mapping the CD/DVD drive is not necessary. If you have created an emulated D: drive, the CD-ROM drive is automatically mapped to the E: drive in the default configuration. If you have not created a D: drive, the CD-ROM drive is mapped to the D: drive letter.

Note – SunPCi III 3.1 software supports DVD data, but not DVD video.

▼ How to Mount a CD-ROM Drive

If you have disabled Solaris Volume Manager (`vold`) on your system, you need to turn it back on to use `vold` with SunPCi III software, or you can manually mount the CD-ROM drive file system instead of using `vold`.

1. **To find out whether Volume Manager is enabled, open a Terminal window on your Solaris desktop and type:**

```
% ps -df | grep vold
```

The system returns information about the Volume Manager process (`vold`) if it is enabled.

If your Sun system does not have Solaris Volume Manager enabled, you need to become superuser and mount the CD-ROM drive manually as described in the next steps.

If `vold` is not enabled, the system returns only the `grep` process information, and no `vold` process information, similar to the following:

```
username 2698 1934 0 10:34:01 pts/s 0:00 grep vold
```

Because `grep vold` is the only information about `vold` that appears, Volume Manager is not enabled. If Volume Manager were enabled, an additional line and different process ID (shown by 2698 in the above `grep` example) would be displayed.

If your Sun system has Solaris Volume Manager enabled, skip the rest of this procedure.

2. **If Solaris Volume Manager is not enabled, type the following command and your root password to become superuser on your system:**

```
% su  
password
```

3. Type one of the following commands:

- *If your CD-ROM drive is a SCSI drive, type the following command in a Terminal window on your Sun system to mount the CD-ROM drive:*

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

Note – Make sure that you type `-o` with no space between the minus sign and the letter “o.”

- *If your CD-ROM drive is an IDE drive, type:*

```
# mount -o ro -F hsfs /dev/dsk/c0t2d0s2 /cdrom
```

To find out what type of CD-ROM drive you have, and what file system it supports, consult your hardware platform documentation.

4. Exit superuser status by typing:

```
# exit
```

▼ How to Set Up a CD-ROM Drive

If you have more than one SCSI CD-ROM drive installed in your Sun system, you have to specify which drive you want to use with SunPCi III software. To set up your CD-ROM drive, perform the following procedure:

1. Start SunPCi III software.

The Console window from which you start the application displays the following message:

```
sunpci3: Your sunpci.ini file does not specify a CD device
        assuming /vol/dev/aliases/cdrom0
```

2. From the Options menu, choose Attach CD-ROM.

The Specify CD-ROM Device File dialog box opens.

3. Type the path to the CD-ROM device you want to use (for example, /vol/dev/aliases/cdrom0).

4. Click OK.
5. Exit all Microsoft Windows operating systems.
6. From the File menu in the SunPCi III window, choose Reset PC.

When SunPCi III software restarts, it uses the CD-ROM drive that you specified.

▼ How to Eject a CD From a CD-ROM Drive

- To eject a CD from your CD-ROM drive, from the Options menu, choose Eject the CD-ROM or press Meta-E in the SunPCi III window.

Connecting Peripheral Devices

The SunPCi III card main backplate contains an LED indicator, two audio ports, a Universal Serial Bus (USB) 2.0 connection, an Ethernet connection, and an external video port. See “SunPCi III Main Card Backplate Connectors” on page 101

Using the LED Indicator

The LED indicator gives a visual indication of the status of the SunPCi card. The LED indicator is located on the SunPCi III main card backplate. The LED is especially useful when you have several SunPCi cards installed on a system, and helps you identify the active card, as well as check the status of each card.

The following table describes the states of the LED indicator in normal operation.

TABLE 9-1 LED Colors and Status

Color	Status
Solid green	SunPCi running normally.
Solid amber	Problem with SunPCi card. A system error has occurred and service is required.
Blinking amber	SunPCi running or booting up, but if the blinking amber light continues, it indicates a potential problem.
No Color	SunPCi is powered off and not running.

The LED indicator can be used to identify a specific SunPCi card on your system by either of the following methods.

- If SunPCi is running, you can identify the card on which the session is running by pressing the Meta-F keyboard combination in the SunPCi window. The LED indicator cycles through the green, red, and amber colors for one second each time the Meta-F keyboard combination is pressed.
- If SunPCi is not running, you can identify the card on which the session is running by using the `-f cardname` switch. The LED indicator cycles through the green, red, and amber colors until you type the `kill -INT pid` command to stop the process. You must specify each card, such as `card1`, to identify the card using this process.

Connecting Audio Devices

The SunPCi III audio ports do not route audio through your Sun system's speakers. In order to hear the audio, you need to connect a separate set of speakers or headphones to the Line-out stereo port.

Connecting the USB Device

You have one USB 2.0 connection on the SunPCi III main card backplate. The USB connection can accommodate any USB device, such as a digital camera, a CD-RW external drive, or printer. Once connected, the USB device should work immediately.

Refer to your Microsoft Windows documentation for more information.

Tip – Since the USB and Ethernet ports are next to each other and are a similar size and shape, you might incorrectly plug a USB device into the Ethernet port. Be careful to plug the USB device into the USB port and not into the Ethernet port or you might damage the Ethernet port.

Connecting the Ethernet Device

The SunPCi III main card backplate includes an Ethernet connection to plug a device into a network.

Connecting the External Video

The SunPCi III video connection enables you to connect a monitor or other video device.

FIGURE 9-1 shows the options available on the SunPCi III main card backplate.

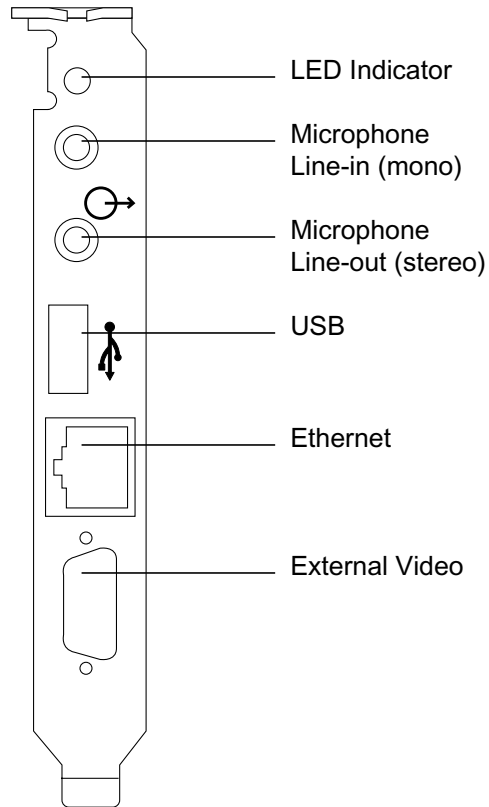


FIGURE 9-1 SunPCi III Main Card Backplate Connectors

Connecting Additional USB and 1394 Firewire Devices

The USB/Firewire card and backplate included with the SunPCi III main card features two USB 2.0 connections and one 1394a Firewire connection. Installing the USB/Firewire card and backplate is optional.

Connecting USB Devices

With SunPCi III, you now have three available USB devices: one on the main card backplate and two on the USB/Firewire backplate.

Since the USB devices are USB 2.0, they are much faster than the older USB 1.1 or parallel port devices.

Refer to the previous section, “Connecting the USB Device” on page 100, for further information about USB devices.

Connecting the Firewire Device

The 1394a Firewire device on the USB/Firewire backplate is another option for connecting different types of peripherals, such as printers, hubs, modems, digital cameras, and external CD-RW drives.

FIGURE 9-2 shows the options available on the USB/Firewire backplate.

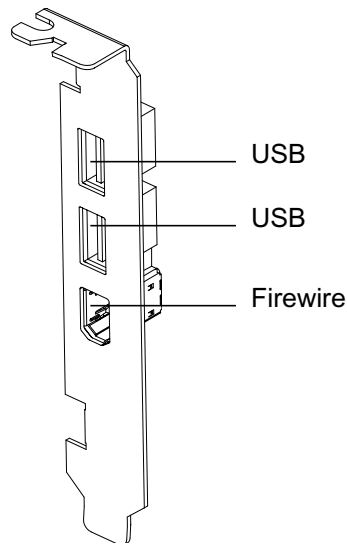


FIGURE 9-2 SunPCi III USB/Firewire Backplate Connectors

Refer to the *SunPCi III Quick Start Installation Guide* for instructions on how to install the backplate.

Connecting Serial and Parallel Port Devices

The Serial/Parallel Port backplate included with the SunPCi III card features a parallel port that you can use to connect a parallel device, such as a printer, to operate with SunPCi III software. FIGURE 9-3 shows the connectors on the Serial/Parallel Port backplate. Installing this backplate is optional.

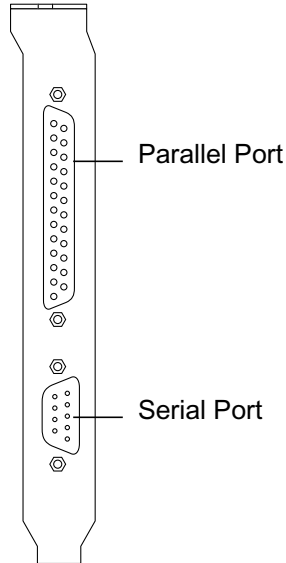


FIGURE 9-3 SunPCi III Serial/Parallel Port Backplate Connectors

Refer to the *SunPCi III Quick Start Installation Guide* for instructions on how to install the backplate.

Connecting a Parallel Device

Once you have installed the backplate, you can attach the parallel cable to the backplate's parallel port. The SunPCi III card's parallel port is assigned to LPT1.

To print to the parallel port with SunPCi III software, simply use the Print command from your PC-based application, just as you would from a PC.

Note – These instructions apply to a local printer that you attach to the parallel port on your SunPCi III card. For information about how to use your Solaris printer with Microsoft Windows operating systems, refer to “Printing From Microsoft Windows Using Solaris Printers” on page 128. For information about printers, refer to your Microsoft Windows documentation and to your printer documentation.

Connecting a Serial Device

The Serial/Parallel Port backplate contains a serial port that you can use to connect a modem or serial device to operate with SunPCi III software. This serial port is assigned to COM1. FIGURE 9-3 shows the location of the serial port on the backplate.

To use the serial port, connect the serial cable from your device to the serial port on the Serial/Parallel Port backplate. If you need to install any additional drivers for the device you want to use, have the software diskette or CD handy and use the corresponding Control Panel to install the drivers. For more information about connecting and using the serial device, refer to the documentation that came with your serial device.

▼ How to Configure a Serial Mouse for an External Monitor

- 1. Attach the mouse connector to the serial connector on the Serial/Parallel Port backplate.**
Ensure that the connector is firmly secured to the backplate.
- 2. Click Start and choose Settings and Control Panel from the Microsoft Windows menu.**
- 3. Click the Add New Hardware option.**

Follow the Wizard instructions to install the serial mouse.

Using SunPCi III Software

This chapter provides detailed information about how to use the `sunpci` command-line options and the SunPCi III 3.1 graphical user interface (GUI) window, menus, and dialog boxes. The chapter also gives instructions for updating Intel drivers, VNC, and extended drives. This chapter also explains how to set up printers for use with the SunPCi III system.

This chapter includes the following topics:

- “The `sunpci` Command and Its Options” on page 108
- “SunPCi III Menus” on page 111
- “Updating Intel Drivers” on page 112
- “Boot@Boot Support” on page 114
- “Configuring and Using Boot@Boot Support” on page 117
- “Extended Drives and SunPCi III Software” on page 125
- “Using the Copy and Paste Commands for the Japanese Locale” on page 127
- “Printing From Microsoft Windows Using Solaris Printers” on page 128
- “Avoid Using Screen Savers” on page 129

This chapter includes instructions for completing the following tasks:

- “How to Automatically Update Intel Drivers” on page 113
- “How to Manually Update Intel Drivers” on page 113
- “How to Interact With VNC From a Remote Client” on page 124
- “How to Access Solaris Files and Directories in Microsoft Windows” on page 126
- “How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris” on page 127
- “How to Set Up a Solaris Printer From Microsoft Windows” on page 128

The `sunpci` Command and Its Options

To use a command-line option with the `sunpci` command, type the command, followed by a dash, followed by the command-line option, followed by any required argument such as a file name, card name, or command.

For example:

```
% /opt/SUNWspci3/bin/sunpci -option argument
```

Use *option* to specify the command-line option you want to use. Use *argument* to specify the name of the file you want to use with the option. Not all options can accept file names. Note that there is no space between the dash and the option.

For example, to start SunPCi III software and place customized text in the window's title bar, type the following:

```
% /opt/SUNWspci3/bin/sunpci -title "Text string"
```

To start the SunPCi III software with a C: drive other than your default C: drive, type this command and substitute the name of the new C: drive file for `C.newdrive`:

```
% /opt/SUNWspci3/bin/sunpci -C C.newdrive
```

TABLE 10-1 lists the SunPCi III command-line options.

TABLE 10-1 SunPCi III Command-Line Options

Option	Purpose
No option	When no option is used with the <code>sunpci</code> command, by default SunPCi III opens the SunPCi menu.
-B	When used in conjunction with the <code>sunpci -C <i>disk.image</i></code> file name and <code>-c <i>cardname</i></code> options, the -B option binds the named <i>cardname</i> MAC address to the <i>disk.image</i> file name by writing the <i>cardname</i> card's MAC address into the <i>filename.ini</i> file header. This action overwrites the original MAC address in the file header. Formerly <code>-bindmac</code> . A general form of the -B option's use is: <code>sunpci -C <i>disk.image</i> -c <i>cardname</i> -B</code>
-b	Enables you to change the default depth of the boot time VGA window to be either 8 bit or 24 bit by default. If you change to 24 bit, you avoid some colormap flashing issues, while still allowing you to choose the 8-bit option, unlike NO8BIT. Formerly <code>-depth</code> .
-C <i>disk.image</i>	Starts the SunPCi III window using the <i>disk.image</i> file name as drive C:. This overrides the default drive specified in the default properties file <code>/\$HOME/pc/SunPC.ini</code> .
-c <i>cardname</i>	Starts the SunPCi III card using <i>cardname</i> as drive C:. The <i>cardname</i> is a label assigned by the SunPCi III software starting with Card1, Card2, and so on. To obtain a listing of installed card names use the -l option. For more information about multiple card use, see "Using Multiple SunPCi III Cards" on page 23.
-D <i>disk.image</i>	Starts the SunPCi III window using the <i>disk.image</i> file name as drive D:. This option overrides the default drive specified in the default properties file <code>/\$HOME/pc/SunPC.ini</code> .
-display <i>hostname.domain:0.0</i>	Displays the SunPCi III window on another Sun system <i>hostname</i> in <i>domain</i> . Formerly <code>-display</code> . For example, to open the SunPCi III window on another system named willow in the eastern domain, type the following command on your Sun system (where the SunPCi III card is installed): <code>/opt/SUNWspci3/bin/sunpci -d willow.eastern:0.0</code>
-f	Starts the card finder LED functionality in SunPCi III, which cycles through the colors of the LED (green, red, amber) for several seconds.
-h	Displays SunPCi III command-line Help. The option displays a list of all SunPCi III command-line options and formats. Formerly <code>-help</code> .

TABLE 10-1 SunPCi III Command-Line Options (*Continued*)

Option	Purpose
-l	Displays the system's installed and recognized SunPCi cards. The switch returns the Card Name, for example Card1; the device file name in the /dev directory, for example /dev/sunpci2drv0; the card's Type and Description; and the card's standard MAC address, for example ID = 08:00:20:F9:5F:2C. See "How to Identify Card Names" on page 27 for a complete listing of the output format.
-n	Stops the verification of card and disk image combination, and stops the display of the warning dialog box, if you start an image with a card on which the image was not created. See "How to Create an .ini File Using the -n Option" on page 26 for the full text of the warning. If you wish to rebind the image and current card, see the -B option. Formerly -nomac.
-n <i>filename.ini</i>	Creates a new <i>filename.ini</i> file and a new disk image name incorporating the file name. The command brings up the SunPCi III Disk Create menu GUI, with the default disk name already created as \$HOME/pc/C. <i>filename</i> .diskimage. If the file already exists the sunpci command aborts, and no file name is created. Formerly -new.
-p <i>filename.ini</i>	Starts SunPCi III software with the configuration information in the properties file specified with <i>filename</i> . The default properties file for SunPCi III is \$HOME/pc/SunPC.ini.
-R	Forces the CMOS to be reloaded in the current <i>disk.image</i> file, similar to clearing the CMOS on a PC motherboard. This command is used when the BIOS setup option has changed, if SunPCi does not boot, or to restore SunPCi default settings. After using this command, a message displays confirming the CMOS has been updated.
-title " <i>Text string</i> "	Writes the title argument into the title bar of the SunPCi III window when the argument <i>Text string</i> is a quoted character string including spaces. The quotes are unnecessary if the character string contains no spaces.
-v	Directs the Microsoft Windows video to the external video connector. Refer to FIGURE 9-1 to find the location of the video port. For information about how to set this for your monitor, consult the section "How to Configure External Video for..." in the chapter that describes the operating system you are using. Formerly -vga.
-w [<i>time</i>]	Causes SunPCi III software to retry failed X server connections, either indefinitely (if no <i>time</i> argument follows -w), or for <i>time</i> seconds. If <i>time</i> is specified and SunPCi III software has not successfully connected to an X server after <i>time</i> seconds, SunPCi III software exits. Formerly -xwait.

SunPCi III Menus

The first window you see when you start SunPCi III software is the SunPCi III window. This window provides the emulated OpenDOS command prompt, from which you execute DOS programs and from which you launch any installed Microsoft Windows operating system. The following sections describe the File and Options menus at the top of the SunPCi III window.

File Menu

The SunPCi III File menu contains two commands: Reset PC and Exit. TABLE 10-2 describes the commands available within the File menu.

TABLE 10-2 File Menu Commands

Menu Command	Purpose
Reset PC	Closes and reboots the SunPCi and Windows software. Similar to pressing the Reset button on a PC (and this is also called a hard reset or hard reboot). Perform this action in the following situations: <ul style="list-style-type: none">• If your keyboard or operating system running in the SunPCi III window no longer responds• To attach a different SunPCi III emulated hard drive
Exit	Closes SunPCi III software and closes the SunPCi III window. When you choose the Exit menu command, the SunPCi Exit dialog box opens with several button options: <ul style="list-style-type: none">• Exit Now• Shutdown Windows and Exit SunPCi• Cancel



Caution – It is important to close Microsoft Windows before closing SunPCi software by either selecting Shut Down from the Start menu or choosing the Shutdown Windows and Exit SunPCi button. If you do not shut down gracefully, you risk damage to the application.

Options Menu

The Options menu lets you create, update, attach, and grow emulated hard disk drives (C: and D: drives). From the Options menu, you can also attach a CD-ROM drive or eject a CD/DVD. The menu also enables you to attach the mouse to SunPCi III, which you need to do after you have installed your version of Microsoft Windows, but before you install the SunPCi III drivers.

TABLE 10-3 describes the disk-related commands in the Options menu. Complete instructions for choosing emulated drives are provided in “Emulated Drives and SunPCi III Software” on page 12.

TABLE 10-3 Options Menu Commands

Menu Command	Purpose
Attach an Existing Emulated Drive	Specifies the emulated hard drive (<i>directory/filename</i>) you want to assign to drive C: or D:.
Create a New Emulated Drive	Creates the file you want to use as an emulated drive.
Grow an Emulated Drive	Enables expansion and growth of an emulated hard disk.
Attach CD-ROM	Attaches a CD-ROM drive to SunPCi III.
Eject CD	Ejects the CD or DVD from the CD-ROM drive. The keyboard shortcut is Meta-E.
Attach Mouse	Enables you to attach the mouse to the SunPCi III window when you are in SMI mode. The keyboard shortcut is Meta-M.

Updating Intel Drivers

SunPCi III software automatically updates your Intel drivers during a fresh installation of SunPCi. You also can manually update your drivers, which you have to do if you are using a server product or if your automatic update fails. This section describes how to do both types of update.

Note – You must update your Intel drivers each time you update SunPCi III software and before upgrading to a supported Windows operating system.

▼ How to Automatically Update Intel Drivers

SunPCi III software recognizes the installation of a new SunPCi software package and prompts you to update the Intel drivers.

You can use the automatic update of Intel drivers with the following operating systems:

- Windows 2000 Professional
- Windows XP Professional

Since you cannot automatically update your Intel drivers with sever products, you *cannot* use the automatic update with the following operating systems:

- Windows Server 2003
- Windows 2000 Server

Refer to “How to Manually Update Intel Drivers” on page 113 for further information.

Note – The automatic update fails when there are no drive letters available for mapping of `\\localhost\opt\SUNWspci3`. If this update fails, the automatic update properly terminates, exits, and no update occurs.

To automatically update Intel drivers, follow these steps:

- **Log on to your version of Microsoft Windows.**

A dialog box opening during the Windows logon, which asks whether you want to update the Intel side drivers. You have several options:

- **If you choose either OK or press Return**, the Intel side driver updates start and the drivers are updated. This process is the same as if you manually update Intel side drivers by mapping to `\\localhost\opt\SUNWspci3`, navigating to the appropriate drivers directory, and starting `update.bat`.
- **If you choose Cancel or Close**, the dialog box closes and no updates occur. If you do not update the drivers, every time you start SunPCi, you will be asked to update the drivers.
- **If you do not choose any button**, the dialog box times out after a specified amount of time, closes, and no update occurs.

▼ How to Manually Update Intel Drivers

With SunPCi III 3.1 software, for some Windows operating systems, the drivers are automatically updated. However, for Windows operating systems server products, the update process must be manual. In rare situations, the automatic update process might fail, and you need to then update the Intel drivers manually.

Note – If you are using and running any server products, you must run `c:\sun\sunfsd\fsdon.reg` prior to mapping a network drive.

To manually update your existing C: drive, follow these steps:

1. **Map a drive in Microsoft Windows Explorer to the location where you installed the SunPCi III 3.1 software package (by default, the /opt directory), such as in the following example:**

`\\localhost\opt\SUNWspci3`

2. **Do one of the following, depending on the operating system you are running:**
 - **If you are running Windows Server 2003**, click down the directory tree to `\drivers\winnet\patch` and double-click `update.bat` to complete the installation
 - **If you are running Windows 2000 (Professional or Server)**, click down the directory tree to `\drivers\win2k\patch` and double-click `update.bat` to complete the installation.
 - **If you are running Windows XP Professional**, click down the directory tree to `\drivers\winxp\patch` and double-click `update.bat` to complete the installation.

Note – The default installation location is `/opt/SUNWspci3`. If you installed the SunPCi III package to another location, map the drive to that location.

When the script finishes, the Microsoft Windows software might ask you to reboot your machine. If so, you must reboot for the changes to take effect.

Boot@Boot Support

Boot@Boot is a feature that you can configure to automatically start the SunPCi III software on one or more SunPCi III cards when it is installed on a Sun system. The ability to automatically restart SunPCi sessions if they fail and the ability to gracefully shut down SunPCi sessions (including performing an orderly shutdown of the Microsoft Windows operating system) are also part of the Boot@Boot support.

Boot@Boot currently supports all supported SunPCi versions of Microsoft Windows.

The following SunPCi III 3.1 software components support Boot@Boot:

- **SunPCi daemon** - This is a required component.
- **Virtual Network Computing¹ (VNC)** - This is an optional component.

SunPCi Daemon

The SunPCi daemon (`sunpcid`) is a dual-function application of Boot@Boot support and includes such features as automatically starting SunPCi sessions at boot time and shutting down SunPCi sessions at system shutdown time. The daemon is controlled through the `sunpcidadm` command.

The `sunpcidadm` command implements control functionality through command-line arguments that enable Solaris server administrators to configure the SunPCi daemon process to work as needed. For example, you can use the `sunpcidadm` command to add Boot@Boot support for a SunPCi III card into the `/etc/Master.ini` file, which has been expanded to contain the configuration information for the `sunpcidadm` daemon.

You can also use the `sunpcidadm` command to enable and disable auto restart functionality, and to start and stop the SunPCi software on one or more cards. When changes are made to the SunPCi daemon configuration by the `sunpcidadm` command with command-line arguments, the controlling `sunpcidadm` daemon sends a signal to the SunPCi daemon process, informing it of the changes, and the daemon process reconfigures itself.

For complete information about the `sunpcidadm` command and its options, see the `sunpcidadm` man page. See “How to View Solaris Manual Pages” on page 5 for further information on using man pages.

Virtual Network Computing (VNC)

VNC is a customized version of a GNU Public-Licensed (GPL) software product from AT&T Laboratories that allows remote administration of the SunPCi III product. VNC enables SunPCi III software to run on a server that might either have no display hardware connected (headless) or have no normal X11 display available (for example, before a user logs in to the system).

The version of VNC shipped with the SunPCi III 3.1 release contains two components:

1. Virtual Network Computing (VNC) software is copyright 1993 by X Consortium and copyright 1999 by AT&T Laboratories. All rights reserved. The SunPCi implementation of VNC supports the SunPCi product only. Other versions of VNC will not interoperate with this version of VNC. VNC source code is included on the SunPCi III CD in the directory `/Source`. See legal notices in the source code for information about using, modifying, or redistributing VNC source code.

- **Xvnc** - A modified X11 server that renders data into a virtual frame buffer
- **vncviewer** - An X11 client that enables the contents of the Xvnc virtual frame buffer to be displayed on another X11 display

The installation and setup of Microsoft Windows via VNC is not recommended for the following reasons:

- Multiple cursors appear in the window, making mouse use confusing.
- The amount of window data generated during installation is high because of constant updates by the VGA emulation, which slows the installation process.

For optimal performance, complete the installation process while displaying information on a local monitor. If this option is not possible, complete the installation while displaying to a remote monitor is a better option than using VNC. Installation using VNC is strongly discouraged and should only be used as the last option. This issue is present for the installation of all Microsoft Windows systems that can use VNC.

The Xvnc server allows SunPCi sessions to display to what appears to the software as a normal X11 display. Xvnc is ordinarily started by the SunPCi daemon before starting the SunPCi sessions.

The vncviewer enables system administrators to interact with the SunPCi cards, either locally on the server where the cards are installed (assuming that the server has a display attached), or remotely on any Sun machine (including a Sun Ray™ display) that is running a Sun X server. With the combination of the vncviewer and SunPCi displaying to the Xvnc server, it is possible to attach “on the fly” to a currently running VNC session from any Sun machine on the network, and to interact with SunPCi sessions running on a remote server. The VNC session can be detached and later reattached from a totally different machine. The SunPCi sessions continue running even though no one is interacting with them.

Note that VNC is intended to be used only for SunPCi administration purposes, and that VNC is not a supported mechanism for remote display of SunPCi sessions for normal day-to-day Microsoft Windows interaction. Under normal circumstances (single-user Sun system usage), you should use X11 remote display functionality for remote display of SunPCi sessions. Multiuser server situations should use Citrix for remote display.

Note – The SunPCi III 3.1 version of Xvnc and vncviewer are modified and work only with each other. They are not compatible with any other versions of VNC software.

As part of the VNC licensing agreement, Sun is required to make the VNC source code available for viewing with each SunPCi release. The VNC sources provided here are not supported by Sun Microsystems and are provided for reference purposes only as required under the GNU General Public License.

The VNC source code is located in the SunPCi III 3.1 CD source directory and is named `vnc.tar.Z`.

Uncompress the `.Z` file and then extract the `.tar` file to view the VNC source code.

Note – You are not required to build the VNC sources to use VNC. A prebuilt package is available as `SUNWspvn3`.

Configuring and Using Boot@Boot Support

To use SunPCi Boot@Boot support, you must configure the SunPCi daemon so that the daemon knows what to run. You must log in as root to configure Boot@Boot support, because the SunPCi daemon runs under the root account.

Configuring Boot@Boot Support for VNC

Note – Remember that the VNC package must be installed prior to configuring Boot@Boot support.

The first task you must complete to configure Boot@Boot is to configure VNC support so that the SunPCi III cards have an X server available that is guaranteed to be running and accepting connections when the cards boot. If you want to use another X server to display your SunPCi consoles, and the X server is guaranteed to be available for connections at all times, you can choose not to use VNC support. See “Using an X Server Other Than Xvnc” on page 124.

To configure VNC support, you must first add VNC support to the file `/etc/Master.ini` by using the following command:

```
# /opt/SUNWspci3/bin/sunpcidadm -a VNC
```

This adds the necessary configuration information that the daemon needs to start the Xvnc server.

Note – The `sunpcidadm` command is case insensitive when referring to VNC or to cards, so that the commands `sunpcidadm -a vnc`, `sunpcidadm -a VNC`, and `sunpcidadm -a VnC` are all handled the same.

When you initially add the VNC configuration information to the file `/etc/Master.ini`, VNC is configured as disabled by default. This is so that you can customize the configuration information before `Xvnc` starts.

For example, if you want to run VNC and the SunPCi sessions under an account other than the root account, you can modify the user ID, group ID, and home directory for the user. Note that if you change the user name for VNC, the `vncviewer` application will expect you to type the password for that username when connecting to the `Xvnc` server, rather than the root password.

In this way, you can give administrators for the SunPCi cards full access to them without having to give them the root password to the machine in which they are installed. If the accounts you specify are not NIS or NIS+ accounts but rather *local* accounts, the accounts must have read access to the `/etc/shadow` password file.

To configure VNC to run under the `sunpciadmin` account, in the group `sunpcigroup`, with the home directory `/home/sunpciadmin`, you would modify the following VNC section into the `/etc/Master.ini` file as follows:

```
[VNC]
CmdLineArgs=-geometry "1152x900" -depth 24
DisplayNum=10
StartupScript=/opt/SUNWspci3/bin/VNCStartup
UID=sunpciadmin           ;User ID
GID=sunpcigroup           ;Group ID
HomeDir=/home/sunpciadmin ;Home directory
AutoStart=Disabled
```

This configuration information would set the SunPCi daemon to start up the `Xvnc` server running at 1152 x 900 pixel resolution, with a pixel depth of 24 bits per pixel. The server would accept connections for display number 10 (`DISPLAY=hostname:10`). The process would run under the `sunpciadmin` account, in the group `sunpcigroup`, with the home directory `/home/sunpciadmin`, and the daemon would also run the `/opt/SUNWspci3/bin/VNCStartup` script to start up the CDE window manager and an `xterm` terminal emulator.

You can add other entries for the `Xvnc` server, for example, one that tells `Xvnc` to use a foreign language keyboard key table. For example, if the person who will be administering the SunPCi cards has a Sun German Type 5 keyboard, you would modify the `CmdLineArgs` entry as follows:

```
CmdLineArgs=-geometry "1152x900" -depth 24 -keytable Germany5
```

The X11 key table files are located in the `/usr/openwin/share/etc/keytables` directory. See the `Xvnc` man page for other `Xvnc` command options.

After you have configured VNC, you must enable it, which will cause the SunPCi daemon to start running the `Xvnc` server. To enable VNC for Boot@Boot use the following command:

```
# /opt/SUNWspci3/bin/sunpcidadm -e VNC
```

This changes the `AutoStart` line in the `/etc/Master.ini` file to `Enabled`, and instructs the SunPCi daemon to reprocess the file and spawn the `Xvnc` server process with the configuration specified in the file. Once this is done, you can run the `vncviewer` to interact with any X applications that are displaying to the `Xvnc` server.

Preparing SunPCi III Cards for Boot@Boot Support

Each card that you want to configure for Boot@Boot support must have an existing and unique `.ini` file and a matching C: drive (and optionally a D: drive). By convention, the `.ini` file for `Cardn` is named `cardn.ini`, and is located in the `~/pc` directory for the username under which the SunPCi session or sessions will run.

Note – Remember you must create a new `.ini` file for each card. Refer to “How to Create an `.ini` File Using the `-n` Option” on page 26 for further information.

For example, if the SunPCi sessions run under the root account, the `.ini` file for `Card1` is `/pc/card1.ini`. The C: drive that is referenced by the `card1.ini` file can be anywhere on an accessible file system, but for best performance, the file system should be physically connected to the machine in which the cards are installed.

For example, the path to a C: drive with the Windows 2000 operating system installed on it for `Card1` might be `/files/drives/C.Win2K.diskimage`, and the `/pc/card1.ini` file would contain the following entry:

```
[Drives]
C drive = /files/drives/C.Win2K.diskimage
```

After you have created the appropriate `cardn.ini` file or files, installed Microsoft Windows operating systems, and so forth, you can configure the cards for Boot@Boot support. See “Configuring Multiple Cards With SunPCi III Software” on page 25.

Configuring SunPCi III Cards for Boot@Boot Support

As with VNC support, you must add each card individually and then enable it to run. To add Boot@Boot support for a card, you use the `sunpcidadm` command with the `-a` option.

For example, to add Boot@Boot support for Card1, use the following command:

```
# /opt/SUNWspci3/bin/sunpcidadm -a card1
```

This adds the following information to the already existing configuration information for Card1 in the `/etc/Master.ini` file:

```
[Card1]
CmdLineArgs=-p /pc/card1.ini -c card1 -xwait
AutoStart=Disabled
UID=root           ;User ID
GID=root           ;Group ID
HomeDir=/          ;Home directory
```

This information instructs the SunPCi daemon that Card1 is to be added to its internal list to handle. As with VNC, when you add Boot@Boot support for a card, the card is configured with `AutoStart` disabled. Again, this is to give the person who will configure the card the opportunity to customize the way the SunPCi software will run on the card, before starting the SunPCi software.

The information shown above, which was added to the Card1 section of the `/etc/Master.ini` file, contains many of the same items that are in the VNC section. The `UID`, `GID` and `HomeDir` entries, as well as the `CmdLineArgs` and `AutoStart` options, are all common to both, and act similarly.

For example, under normal circumstances, if you change the `UID`, `GID`, or `HomeDir` entries in the VNC section, make the same changes for each card that is configured for Boot@Boot.

After you have configured one or more cards properly, you can enable them using the `sunpcidadm` command with the `-e` option. Unlike the `-a` option, which you can use to add only one card at a time, you can use the `-e` option to enable multiple cards at once.

For example, if two cards, Card1 and Card2, are configured for Boot@Boot support, you can enable both at the same time by using the following command:

```
# /opt/SUNWspci3/bin/sunpcidadm -e card1 card2
```

After you issue this command, the SunPCi daemon will start SunPCi sessions on both cards.

Note – If the card has `AutoStart` enabled in the `/etc/Master.ini` file, be sure that the SunPCi software *is not* running on the card when you use the `sunpcidadm -e` option to enable the card. If `AutoStart` is enabled on a card that is running, the daemon will fail to start the SunPCi software on that card.

Listing Boot@Boot Sessions

If you want to see which SunPCi sessions are running, along with the process IDs of the sessions, use the following command:

```
# /opt/SUNWspci3/bin/sunpcidadm -l
```

The system returns a listing similar to the following:

```
sunpcid:      pid = 1131
VNC:          pid = 1134
Card1:        pid = 1135
Card2:        pid = 1136
#
```

Disabling Boot@Boot Support for VNC or for SunPCi III Cards

If it is necessary to shut down one or more SunPCi sessions (for example, to make a copy of C: drives for backup purposes), the SunPCi daemon must be set to disable the `AutoStart` capability. Otherwise, if a SunPCi session is shut down the SunPCi daemon will attempt to restart it automatically. To disable `AutoStart` capability for a SunPCi card or for the Xvnc server, use the `sunpcidadm` command with the `-d` option. You can use the `-d` option to disable multiple cards at a time.

For example, to disable Card1 and Card2, you would use the following command:

```
# /opt/SUNWspci3/bin/sunpcidadm -d card1 card2
```

This command modifies the `AutoStart` entries in the `Card1` and `Card2` sections to be `Disabled`. Note that the SunPCi sessions for each card continue to run, and will continue to run until they are shut down by some other means.

Shutting Down a VNC or SunPCi III Session

There are several ways to shut down a VNC or SunPCi session.

To shut down a SunPCi or VNC session without interacting with SunPCi software or VNC directly through `vncviewer`, use the `sunpcidadm` command with the `-D` option. This marks the session as `Disabled` in the `/etc/Master.ini` file, and also requests that the SunPCi daemon perform an orderly shutdown procedure on the session.

To shut down a session on `Cardn`, use the following command:

```
# /opt/SUNWspci3/bin/sunpcidadm -D cardn
```

Note that this disables `AutoStart` on `Cardn`, so to restart the session on `Cardn`, or have it booted automatically on the next reboot, you must reenable `Cardn` using the `sunpcidadm -e` command.

To shut down down VNC, use the following command:

```
# /opt/SUNWspci3/bin/sunpcidadm -D VNC
```

If you shut down VNC in this manner, all current SunPCi sessions are also shut down in an orderly manner.

Shutting Down the SunPCi Daemon Process

If it is necessary to shut down the SunPCi daemon process (for example, to upgrade the SunPCi software to a new release), either use the `sunpcidadm` command directly, with the `-t` or `-T` option, or indirectly, by using the `-stop` option with the `/etc/init.d/sunpci3.server` script.

The `-t` and `-T` options to the `sunpcidadm` command instruct the SunPCi daemon process to perform orderly shutdowns on all running SunPCi sessions, and then terminates. The difference between the two options is that `-t` waits for all sessions to terminate before returning to the calling shell, whereas the `-T` option instructs the daemon to terminate all sessions and return to the calling shell immediately.

Terminating the SunPCi daemon process does not modify the Boot@Boot configuration information in the `/etc/Master.ini` file. If you restart the SunPCi daemon by using the `sunpcidadm` command with no options and put it in the background, or by invoking the `/etc/init.d/sunpci3.server` script with the `-start` option, any enabled sessions will be restarted. This is the mechanism that is used to shut down SunPCi sessions during a normal Solaris system shutdown.

Making Manual Changes to the Boot@Boot Configuration

You can edit the `/etc/Master.ini` file in order to modify the following:

- The `DisplayNum` for `Xvnc` to use if there is already an existing display using that number (for instance, on a Sun Ray server)
- The `StartupScript` to use (the default is `/opt/SUNWspci3/bin/VNCStartup`)
- The command-line arguments for starting SunPCi (for example, to add the `-title title_string` option for the window manager decorations or to use a different `.ini` file with the `-p` option)
- The command-line arguments for VNC (for example, to make VNC display at a different resolution, such as 1280 x 1024)

If it is necessary to make changes manually to the Boot@Boot configuration information in the `/etc/Master.ini` file, for example, to change the configuration file that is to be used by `Card1` from `/pc/card1.ini` to `/pc/Win2K.ini`, the SunPCi daemon will not immediately process those changes, as it has no knowledge that the changes have taken place.

To inform the SunPCi software process that these changes have occurred, you must use the `sunpcidadm` command with the `-r` option. This tells the SunPCi daemon that it must reread the `/etc/Master.ini` file and reconfigure itself appropriately. Note that any change does not take place until the modified sessions are restarted, so to use the new `/pc/Win2K.ini` file, you must shut down and restart the SunPCi session for `Card1` using either the SunPCi graphical user interface or the `sunpcidadm` command with the `-D` option.

Using an X Server Other Than Xvnc

To use an X server other than Xvnc for a SunPCi card, you must add a line such as the following to the section for that card in the `/etc/Master.ini` file:

```
DisplayName=hostname:displaynum
```

For example, to configure Card1 to display on the X server running on the console of the host named `xyzyz` you would add an entry to the [Card1] section of the `/etc/Master.ini` file that would read `DisplayName=xyzyz:0`.

Note – Only Sun X servers and VNC are supported.

▼ How to Interact With VNC From a Remote Client

1. Install the `SUNWspvn3` package on the remote client.

The client system need not contain any SunPCi III cards, but it may.

2. Go to the `vncviewer` by going to the following path:

```
# /opt/SUNWspvn3/bin
```

A dialog box appears that asks for the Xvnc server name, and for the password of the user under whose account the Xvnc server is running on the server.

To supply this information directly on the command line, use a command similar to the following:

```
# vncviewer vncserverhostname:displaynum
```

Replace `vncserverhostname` with the name of the server running VNC, and replace `displaynum` with the number of the display to use. For example:

```
# vncviewer xyz:10
```

Extended Drives and SunPCi III Software

An extended drive is a mapping of a Windows drive letter to a directory in the Solaris file system. With extended drives, you can share applications and data files between the Solaris operating environment and Microsoft Windows operating systems. The SunPCi III program permits up to 22 extended drives for storing applications and files.

There are two kinds of extended drives: file system drives and network drives. This section describes both types of drives. Both are mapped using Windows Explorer.

File System Drives

A *file system drive* is an extended drive that maps to directories on any Solaris file system mounted on the local host.

To map a file system drive in Windows XP Professional or Windows 2000, refer to “How to Access Solaris Files and Directories in Microsoft Windows” on page 126.

Network Drives

A *network drive* is an extended drive that you mount to a SunPCi III PC (emulated PC) or real PC directory. To mount a network drive, you need the following:

- SunPCi or a PC running NET BEUI (a Microsoft supplied network protocol), making sure that Client for Microsoft Sharing and File and Printer Sharing are enabled. Refer to Microsoft Windows documentation for further information.
- Solaris operating environment running Samba or PC NetLink software.

Refer to Microsoft Windows documentation for information about mapping network drives and mounting and sharing network drives with an emulated PC. Also refer to Samba and PC NetLink documentation for additional information about mounting and sharing network drives.

▼ How to Access Solaris Files and Directories in Microsoft Windows

In Microsoft Windows, you need to specify that a file system drive is mounted on your Solaris system. This is done by specifying `localhost` as the device-node in the UNC path specification.

Note – For information on accessing files with Microsoft Windows server products, refer to “Using SunFSD for Mapping Between Solaris and Microsoft Windows” on page 92.

To map a file system drive, perform the following procedure.

1. **From the Start menu, choose Programs, and choose Windows Explorer.**

The Windows Explorer window opens.

2. **From the Tools menu, choose Map Network Drive.**

The Map Network Drive dialog box opens.

3. **Click on the arrow to the right of the Drive field.**

A list of unassigned drive letters opens in the menu.

4. **Scroll down the list until you find the drive letter you want, and then click to choose it.**

The drive letter opens in the Drive field.

5. **Type the following path into the Path field, substituting the names of your directory and subdirectory:**

`\\localhost\directory\subdirectory`

For example, to map a drive to `/home/joeuser` on your Sun system, use this path:

`\\localhost\home\joeuser`

6. **If you want this drive to map automatically whenever you start SunPCi III software, click the check box next to “Reconnect at logon.”**

7. **Click OK.**

The new file system drive appears in the Windows Explorer window the next time you open Windows Explorer.

Using the Copy and Paste Commands for the Japanese Locale

The SunPCi software enables you to configure copy and paste for the Japanese locale for Windows XP Professional and Windows 2000 Professional.

Copy and paste commands do not work on server products for security reasons.

Note – Font information is not passed along in copy and paste operations. Special characters and fonts might produce unexpected results when copied and pasted between UNIX and Microsoft Windows. For best results, use plain text.

▼ How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris

To configure Japanese copy and paste functions, perform the following procedure.

1. Exit SunPCi III software.
2. Using the text editor of your choice, open the `$HOME/pc/SunPC.ini` file.
3. Add the following lines to the end of the file:

```
[CopyAndPaste]
CodeSet=eucJP
```

4. Save your changes and close the file.

The next time you start the SunPCi III 3.1 software, the Japanese copy and paste functions should work.

Note – Make sure that the `CodeSet` line specifies `eucJP`, as shown in Step 3. If you try to substitute a different code or mistype the characters, Microsoft Windows returns the following message: `Warning, bad clipboard translation codeset specified in SunPC.ini file: codeset. Ignoring.` If you see this message, click OK to continue. Microsoft Windows continues to work, but Japanese copy and paste support is not enabled.

Printing From Microsoft Windows Using Solaris Printers

This section explains how to configure your Microsoft Windows settings with SunPCi III 3.1 software so that you can print using your Sun system's network printer.

When connecting a printer from your Sun system, do one of the following:

- Connect the printer to the SunPCi III hardware to print from Microsoft Windows.
- Connect the printer to the non-Sun hardware to print from Solaris.

There are hardware compatibility issues, particularly drivers, that might not work properly if you try to print from Microsoft Windows when you are connected to the non-SunPCi III Sun hardware.

Note – If you are trying to print and the network is busy, there might be delays in printing, as well as delays in retrieving printer status and printer queue contents.

Note – SunPCi III 3.1 software does not support printing from DOS to a UNIX printer. It is possible to choose that option during the setup process, but it will not function.

▼ How to Set Up a Solaris Printer From Microsoft Windows

1. **From the Start menu, choose Settings, and then choose Printers.**
The Printers window opens.
2. **Double-click the Add New Printer icon.**
The Printer Wizard dialog box opens.
3. **Select Network Printer, click Next, select Browse for a Printer, and then click Next.**
The Connect to Printer window opens.
4. **Double-click Entire Network to display all of the domains connected to your network.**

5. Locate Sunpci Host in the list of domains.

Click the plus sign (+) next to the name Sunpci Host to show the list of systems in the domain.

6. Locate the name of the system (print server) that corresponds to the printer you want to use.

7. Double-click that system name to show the printer connected to the machine.

Make sure that you know the model of the printer you are using so that you can choose the correct printer driver.

8. Click the system name, then click OK. Follow the instructions described in the Printer Wizard dialog boxes.

You are now ready to use your Sun system's network printer as a Microsoft Windows printer. For more information about how to print from Microsoft Windows applications, refer to the documentation that came with your copy of Microsoft Windows.

Avoid Using Screen Savers

Avoid using a Microsoft Windows screen saver program in a SunPCi III window that you minimize. When the window is not displayed, the screen saver program continues to consume system resources unnecessarily.

If you use the Windows 2000 or Windows XP Professional power-saving mode to power down your monitor, avoid using the 3D Maze screen saver. That screen saver conflicts with the power-saving mode timer and does not allow the monitor to go into the power-saving mode.

Certain 3D screen savers display slowly in the Windows 2000 and Windows XP Professional operating systems. This is expected behavior and does not interfere with screen saver functionality.

Note – To avoid any potential conflicts with screen savers and SunPCi, disable screen savers while using SunPCi.

Troubleshooting

The sections in this appendix describe known issues with the SunPCi III 3.1 products. This appendix provides tips for rectifying some of the issues you might encounter while using SunPCi hardware and software.

This appendix includes the following topics:

- “Support for Issues” on page 131
- “SunPCi III Hardware Issues” on page 132
- “SunPCi III Software Issues” on page 138
- “Networking and SunFSD Issues” on page 148
- “Windows XP Professional, Windows 2000, and Windows Server 2003 Issues” on page 154
- “Microsoft Windows Application Issues” on page 162

Support for Issues

If you have a question or encounter an issue with the SunPCi III 3.1 product, please contact your support provider. Include the following information in your email:

- What you observed, including any error messages that were displayed
- The application you were using (including the application version number)
- What you were doing in the application at the time the issue occurred
- Steps to re-create the issue (very important)
- The log file for the SunPCi session

SunPCi III 3.1 software creates a separate log file for each card installed in your system. By default, logging is enabled, log files are named `Cardn.log` (where *n* is the number of the SunPCi III card), and log files are placed in the directory `/var/preserve/sunpcilogs`. If a fatal issue occurs, a message should be posted to the log file, the Console window, and the Launch window. In such a case, please attach the *entire* log file to your email message or bug report.

The logging configuration file is `/etc/opt/SUNWspci3/log.conf`, and has the following default contents:

```
; This file controls the SunPCi logging feature. It allows logging to
; be enabled (the default) or disabled. In the LogConfig section below,
; uncomment the Status = Disabled line to disable all SunPCi logging.
;
; The log file destination can also be changed. Uncomment the Directory
; entry below and change the directory to any directory with world read
; and write permissions. Log files will be created in the specified
; directory. The default directory is /var/preserve/sunpcilogs/

[LogConfig]
; Status = Disabled
; Directory = /var/preserve/sunpcilogs/
```

Follow the directions in the file to disable logging or to change the log file destination.

SunPCi III Hardware Issues

This section includes the following topics:

- “Hardware Error Messages” on page 133
- “Mouse Issues” on page 134
- “Diskette Drive Issue” on page 134
- “CD-ROM Drive Issues” on page 135
- “Video Display Issues” on page 135
- “Power Management Error Message” on page 137
- “USB and Firewire Connection Issues” on page 138

Hardware Error Messages

The following table shows some error messages that result from hardware issues, possible causes of those issues, and solutions.

TABLE A-1 SunPCi III Hardware Error Messages and Solutions

Error Message	Possible Cause	Solution
Driver not found. Can't attach to device.	Your system cannot identify the PCI device. Your SunPCi III card might not be properly seated in the PCI slot.	Remove and reinstall your SunPCi III card as described in the <i>SunPCi III Quick Start Installation Guide</i> .
The SunPCi III drivers could not be loaded. Is another session running?	This message might appear for one of the following reasons: <ul style="list-style-type: none"> • You already have a SunPCi III session running. • You removed the SunPCi III card and then reinstalled it in a different PCI slot in your system. • You started SunPCi III software without first restarting your system after you installed the card. 	Perform a corresponding action: <ul style="list-style-type: none"> • Quit the other session before running SunPCi III software again. • If possible, remove the card and install it into the PCI slot it first occupied. • Log in as superuser, type <code>halt</code> at the <code>#</code> prompt to halt your system again, and restart at the <code>ok</code> prompt using <code>boot -r</code>.
Driver couldn't be loaded. SunPCi III cannot open the device.	Your SunPCi III card might not be properly seated in the PCI slot.	Make sure that the card is securely seated in the PCI slot.
System could not transfer file data from buffers.	You have run out of disk space on your host file system.	Make more space on your host file system.

Mouse Issues

TABLE A-2 lists some common mouse issues, possible causes, and solutions.

TABLE A-2 Mouse Issues and Solutions

Issue	Possible Cause	Solution
Two mouse cursors appear on the SunPCi III desktop.	You might have not yet installed the SunPCi III software drivers for Microsoft Windows, or you have not yet attached the mouse.	To use the mouse before you install the drivers, choose Attach Mouse from the Options menu, or press Meta-M. After you finish installing the drivers, the mouse operates normally. Refer to “Double Mouse Pointer Issue” on page 156.
Windows 2000 pointer moves slowly.	Pointer moves slowly when the display is set to 16-bit or 24-bit mode.	Refer to “Double Mouse Pointer Issue” on page 156.
Mouse pointer movements appear jerky after SunPCi III installation.	You might have not yet installed the SunPCi III software drivers for Microsoft Windows when performing an upgrade or custom installation.	Refer to the chapter about using the operating system for information about how to install the drivers. After you finish installing the drivers, the mouse pointer movement appears much smoother.

Diskette Drive Issue

SunPCi III software and the Solaris Volume Manager program (`vold`) tend to conflict with each other for control of the diskette drive. Volume Manager provides automatic mounting services for peripheral devices attached to your system, such as a diskette drive.

The conflict arises when Volume Manager support is enabled on your system and you attempt to access a diskette drive through a SunPCi III window. In such instances, an error message opens and the diskette access fails.

By default, when SunPCi III software is installed, Volume Manager support is disabled for a diskette drive, and so most users do not encounter an issue. However, it is possible to reenable Volume Manager on your system, and thus encounter the issue at a later time.

If Volume Manager support for a diskette drive is reenabled on your system, and you encounter issues accessing a diskette drive through SunPCi III software, try disabling Volume Manager and restarting the SunPCi III window. If the issue persists, try disabling Volume Manager and rebooting your system.

To disable the Solaris Volume Manager, perform the following steps:

1. **Make sure that SunPCi III software is not running.**
2. **Become superuser.**
3. **Disable Volume Manager by entering the following command:**

```
# /opt/SUNWspci3/bin/vold_floppy_disable
```

4. **Exit superuser.**
5. **Restart all SunPCi III software.**

CD-ROM Drive Issues

TABLE A-3 describes some issues you might encounter with CD-ROM drives, possible causes, and solutions.

TABLE A-3 CD-ROM Drive Issues and Solutions

Issue	Possible Cause	Solution
When you insert or eject a CD in one CD-ROM drive, the other CD-ROM drive becomes unreachable.	You have two SCSI CD-ROM drives in your system.	You need to select which CD-ROM drive to use with SunPCi III software.
When you insert a DVD into the CD-ROM drive, it does not work.	SunPCi III software only supports DVD data discs.	Use only data formatted DVD discs.
A Windows “blue screen” appears when you attempt to copy a CD using the Sun CD-ROM/DVD drive as the source and an external CD-ROM device as the destination drive.	Cannot use the Sun CD-ROM/DVD drive and an external CD-ROM together when copying (“burning”) a CD, when the external CD-ROM is the destination.	Use the external CD-ROM device as both the source and destination drive. This is a known issue that is being investigated.

Video Display Issues

When you use a remote display of SunPCi III session, use a Sun system as the display device. If you run a remote display of SunPCi III session using a non-Sun system, performance might be poor or might not work at all.

The remote display of a SunPCi III session is only supported when the display device is a Sun system.

24-Bit Display on Sun Blade 100

On a Sun Blade™ 100 workstation with an M64 frame buffer, follow this procedure to display 24-bit color in the SunPCi III window:

1. **Open a Terminal window and log in as root.**
2. **Open the file `/usr/dt/config/Xservers` in a text editor and edit the last line of the file so that it appears as follows:**

```
:0 Local local_uid@console root /usr/openwin/bin/Xsun :0
-nobanner -dev /dev/fb defdepth 24
```

3. **Save and close the file.**
4. **Type the following command to find out the current resolution setting:**

```
# m64config -prconf
```

5. **Type the following command to set the display to 24-bit color:**

```
# m64config -depth 24 -res current-resolution-setting
```

Use the resolution setting that was returned by the command `m64config -prconf`. For example, type: `m64config -depth 24 -res 1152x900x76`.

6. **Type the following command to confirm that the depth of the root window has changed to 24 planes:**

```
# xdpinfo
```

7. **Restart the system.**

External Video Resolutions

TABLE A-4 shows the external VGA display resolutions that SunPCi III software supports. For best results, increase the amount of available video memory from 8 Mbytes (the default) to 32 Mbytes. To make this change, refer to “Running Game Software on the SunPCi III Platform” on page 183.

Note – Remember that increasing your video memory decreases the amount of available system memory. Refer to “Increasing System Memory” on page 181 for more information.

Before you change the resolution or display depth of your monitor, be sure to shut down all running applications and save your work. You do not need to test a new setting before applying it. The following table shows the available resolutions.

TABLE A-4 External Video Resolutions (VIA S3 Graphics ProSavage DDR)

Resolution (Pixels)	Color Depth (Number of Colors)
640 x 480	8, 16, 32
800 x 600	8, 16, 32
1024 x 768	8, 16, 32
1280 x 1024	8, 16, 32
1600 x 1200	8, 16, 32
1920 x 1440	8, 16

Power Management Error Message

If SunPCi III 3.1 is running (so the SunPCi III card is booted) and you attempt to exit or suspend the Sun system, the operation fails and the `sunpci3drv` software displays this message to the console window:

```
sunpci3drv: sunpci_detach() Can't Suspend, there are N sessions
running.
```

Exit the SunPCi III 3.1 window before shutting down your system.

USB and Firewire Connection Issues

If you are having difficulty with either the USB or Firewire, or if you cannot connect these devices (such as digital cameras or external CD-RW drives), make sure that the SunPCi main card and USB/Firewire Card and Backplate are seated and installed correctly.

During installation, sometimes one of the two cards might unseat itself when the other is installed and seated.

Before completing installation, always verify that both cards are seated in the PCI slots properly.

SunPCi III Software Issues

This section includes the following topics:

- “Installation Error Message” on page 139
- “Startup Error Messages” on page 139
- “Emulated Hard Drive Issues” on page 140
- “FAT16 File System Limitation Issue” on page 141
- “File System Compatibility Issue” on page 141
- “Using Multiple Microsoft Windows Operating Systems” on page 142
- “Creating Bootable Partitions” on page 142
- “Solaris Stale Links Issue” on page 143
- “Missing Master.ini File After Factory Installation” on page 143
- “Sun Blade Workstation and Sun Enterprise Server Software Issue” on page 143
- “Multiple Cards and Microsoft Windows Issue” on page 144
- “Configuring Virtual Networking Using SunPCi III Software” on page 144
- “Xinerama Display Issues” on page 145
- “Application Installation to Solaris File System Issues” on page 145
- “Displaying Shortname Tails” on page 146
- “System Clock and Daylight Savings Time Issue” on page 146
- “Japanese Copy and Paste Issue” on page 147
- “Unexpected Power Failure Issue” on page 147
- “Colormap Flashing With IDEAS Software” on page 147

Installation Error Message

You might see the following error message in your Console window during or after installation of SunPCi III software. Refer to the actions you can perform to fix the issue.

Driver failed to attach.

This message might appear for the following reasons:

- The Sun system needs to be restarted after installation. Reboot your Sun system using the Solaris `boot -r` command and then restart the SunPCi III software.
- The SunPCi III card is not seated securely in the PCI slot. Reseat the card.
- If neither of the above actions helps, your SunPCi III card might be defective. Refer to the *SunPCi III Quick Start Installation Guide* for information about service.
- You might need to update the system OpenBoot™ Programmable Read-Only Memory (PROM). Ask your service provider if an updated OpenBoot PROM is available for your system configuration.

Startup Error Messages

When starting SunPCi III 3.1 software, you might encounter one of the following error messages.

TABLE A-5 Startup Error Messages and Solutions

Message	Solution
Command not found	Make sure that the SunPCi III program directory—by default, <code>/opt/SUNWspci3/bin</code> — is in your environment <code>\$PATH</code> . Refer to your Solaris documentation for instructions on how to set up your <code>\$PATH</code> variable.
Correct Solaris Installation Required	If you do not have the correct Solaris installation on your Sun system, you will encounter issues when attempting to start SunPCi III software. SunPCi III software requires at least the End User System, Developer System, or Entire Distribution installation of Solaris software. SunPCi III software does not run when you only have the Core System installed. Ask your system administrator for assistance in determining which system is installed on your Sun system.

Emulated Hard Drive Issues

The following table describes information about large emulated drives.

TABLE A-6 Emulated Hard Drive Issues and Solutions

Issue Description	Explanation	Solution
I just created a new 8-Gbyte emulated drive, but I can only see 2 Gbytes. Why?	DOS can only recognize file sizes of up to 2 Gbytes while doing a FAT installation.	Refer to “FAT16 File System Limitation Issue” on page 141. You need to partition your emulated drive. The remaining 6 Gbytes in your emulated drive file are available to create additional partitions. You could also do a fresh installation of the operating system using NTFS auto-install.
Are dual-boot emulated drivers supported?	SunPCi III 3.1 software does not support dual-boot emulated drives.	If you want to run different versions of Microsoft Windows, create an emulated drive for each operating system and install the operating system and applications to the emulated drive. To switch between operating systems, from the Options menu, choose Use the Attach Drive command.
Disk error message: Attaching Drive C.	Changing the permissions keeps other users from being able to attach drive C: even when you are not using the SunPCi III program.	To change permissions on drive C:, type the following in a command window: % chmod 600 ~/pc/C.diskimage This command makes the drive inaccessible to other users.
Disk error message: Non-system disk or disk error at startup.	Your C: drive might be corrupted or you have a non-bootable diskette in drive A:.	If you do not have a diskette in drive A:, delete the default C: drive file in \$HOME/pc (~/pc/sunpc.ini) and then restart the software.
I just created a new 8-Gbyte FAT emulated drive and installed Microsoft Windows. Now my OS partition won't boot. Why?	SunPCi automatically creates a 2-Gbyte partition when you create a new emulated disk file, using the first 2 Gbytes of the new disk. If you installed Microsoft Windows on the other partition, DOS does not recognize it, and the SunPCi III software does not boot from that partition.	You need to create a new 2-Gbyte partition for your version of Microsoft Windows. Refer to “FAT16 File System Limitation Issue” on page 141. You could also do a fresh installation of the operating system using NTFS auto-install.
Is there a limit to the number of partitions on a single emulated drive?	No, there is no limit to the number of partitions, but there are other limitations.	If you want to create multiple partitions on an emulated drive, you need to use PartitionMagic. Remember that Microsoft Windows and DOS only recognize the 26 drive letters, and that some are already mapped by default (such as A:, C:, D: or E:). Refer to PartitionMagic documentation.

FAT16 File System Limitation Issue

SunPCi III 3.1 software enables you to create emulated drive files as large as 40 Gbytes. However, if the emulated drive uses the FAT16 file system, an inherent limitation in the FAT16 file system makes only the first 2 Gbytes of disk space accessible.

After installing and booting a Microsoft Windows operating system, you can reformat, convert, and/or repartition the emulated drive to another file system such as the FAT32 or NT File System (NTFS). You can also create new partitions, or resize or reformat existing partitions. You can do this by using third-party packages such as PowerQuest's PartitionMagic or ServerMagic, or by using facilities present in some Microsoft operating systems, such as Disk Management in Windows XP Professional, Windows 2000, and Windows Server 2003.

File System Compatibility Issue

After you partition or convert the disk space to a different file system, some operating systems can view the converted file systems, some cannot. The following table denotes accessibility to the converted disk space among SunPCi III software-supported operating systems. A check in a column indicates common accessibility to file system formats among different operating systems.

TABLE A-7 Common Accessibility Among Converted File Systems

File System Formats	Operating Systems				
	¹ Windows XP Professional	¹ Windows 2000 Server	¹ Windows 2000 Professional	¹ Windows Server 2003	² Caldera OpenDOS
FAT16	✓	✓	✓	✓	✓
FAT32	✓	✓	✓	✓	
NTFS 4	✓	✓	✓	✓	
NTFS 5 ³	✓	✓	✓	✓	

¹ To partition or convert a drive, you can use the Microsoft Windows NTFS, FAT32, or PartitionMagic utilities. In addition, SunPCi III 3.1 software has been tested with the third-party tools ServerMagic for supported server operating systems, and PartitionMagic for supported non-server file systems.

² If you convert to FAT32, NTFS 4, or NTFS 5 formats you can no longer boot an emulated drive and view it with OpenDOS.

³ NTFS 5, which runs on Windows 2000, is *not* compatible with NTFS 4, which runs on Windows NT 4, although both products are often referred to by the common designation NTFS. Verify the version you wish to use before converting or partitioning.

Use the third-party PowerQuest tool ServerMagic for managing file systems on server installations. Use PowerQuest's PartitionMagic tool for managing file systems on non-server installations. These tools are available from PowerQuest at the following Web site:

<http://www.powerquest.com>

For more information about partitions, bootable partitions, and file system limitations, refer to the *ServerMagic User Guide* and ServerMagic online Help, or to the *PartitionMagic User Guide* and PartitionMagic online Help.

Using Multiple Microsoft Windows Operating Systems

If you want to use multiple versions of Microsoft Windows with SunPCi software, the best method is to install each operating system on a separate emulated drive file. Loading multiple operating systems on a single drive is not recommended. When you want to change operating systems, from the Options menu, choose Attach a Hard Drive command to change emulated drives.

For example, if you want to “dual-boot” SunPCi III software with Windows XP Professional or Windows 2000, create another C: drive. When you want to run one of those operating systems, from the Options menu, choose Attach a Hard Drive command to choose the C: drive file that has the corresponding operating system installed on it. Then reset the SunPCi III software.

Note – In order to use the multiple versions of Microsoft Windows installed onto separate partitions, you need to install a boot drive partitioning utility. BootMagic, which is packaged with PartitionMagic, and ServerMagic have been tested on SunPCi III software.

Creating Bootable Partitions

A *bootable partition* is a disk partition on which you have installed a supported Microsoft Windows operating system. Each version of Microsoft Windows has its own requirements for bootable partitions. Microsoft Windows operating system documentation and the *PartitionMagic User Guide* contain detailed information about the requirements of each operating system. If you are using PartitionMagic for your disk utility, consult the User Guide and the Help function in the application for more information about bootable partitions.

Solaris Stale Links Issue

If you have stale links to files in your Sun system's file system (such as symbolic links to files or directories that you have deleted or moved), update or remove the links. Otherwise, browsing in the file system can cause Microsoft Windows to freeze.

Missing `Master.ini` File After Factory Installation

If you have SunPCi III 3.1 software preinstalled or if you install the SunPCi III 3.1 software before the hardware, the `/etc/Master.ini` file will not get created and you will receive the following message when attempting to first open SunPCi III:

ERROR, there are no cards specified in the Master.ini file.

To run SunPCi III 3.1 software properly, you must force the reloading of the SunPCi Solaris driver, as well as the creation of the `/etc/Master.ini` file by doing the following:

1. **Go to the** `/opt/SUNWspci3/drivers/solaris` **directory in SunPCi III 3.1 software.**
2. **Type the** `sunpcload` **command.**

Note – You must be in root for the `sunpcload` command to work properly.

This command reloads the Solaris driver for SunPCi III 3.1 software and creates the `/etc/Master.ini` file, which contains the configuration information needed to properly run SunPCi III 3.1 software.

Sun Blade Workstation and Sun Enterprise Server Software Issue

If you have a SunPCi III card preinstalled in a Sun Blade™ workstation or a Sun Enterprise™ server or if the software version is not SunPCi III 3.1, you might need to install the SunPCi III 3.1 software after you configure your preinstalled Solaris image.

- To verify whether your SunPCi III software is already installed, type the following command at the system prompt:

```
% pkginfo -l SUNWspci3
```

If your system returns a message similar to the following message, you need to install the SunPCi III 3.1 software from the CD:

```
ERROR: information for "SUNWspci3"
```

Multiple Cards and Microsoft Windows Issue

In multiple card installations, select one of many configuration (.ini) files, which reference the desired emulated drives by using the `sunpci -p` command option.

Configuring Virtual Networking Using SunPCi III Software

If you are installing SunPCi III 3.1 software on an Sun system with more than one network interface, the SunPCi III startup script displays the following message:

```
SunPCi: This machine has multiple network interfaces. If you are
using SunPC networking, you need to set the environment variable
NVL_INTERFACE to indicate the desired network interface. Type
netstat -i for a list of interfaces on this machine.
```

Enter the interface name into the script, for example if the `netstat -i` command returns one of the following names: `hme0`, `hme1`, or `eri0`, then enter the name into the script. Be sure to use the correct Ethernet name, especially if you are planning on using virtual networking. Virtual networking shares the Sun system's Ethernet port.

Xinerama Display Issues

You might encounter any or all of the three following display issues with Xinerama:

- When using SunPCi III during an Xinerama session, the mouse can behave erratically if the SunPCi III session is set to display on the non-default (right-side) frame buffer. To avoid this issue, when using SunPCi III during an Xinerama session, set the SunPCi III display to the default (left-side) frame buffer.
- When using any supported operating system, you may encounter display issues after opening the Screen Saver tab within the Display Properties dialog box. The Windows desktop might become blank. This is a known issue with Xinerama and is currently under investigation.
- When using any supported operating system, you may encounter display issues when moving the mouse within the Windows desktop when running in 24 bit color quality.

To solve this problem, from the Windows Control Panel, do the following:

- 1. Click “Switch to Classic View” under the Control Panel heading in the upper left side of the Control Panel window.**

The traditional Control Panel window opens.

- 2. Click the Mouse icon.**

The Mouse Properties dialog box opens.

- 3. Click the Pointers tab.**

- 4. Uncheck the “Enable Pointer shadow” check box.**

- 5. Click Apply.**

- 6. Click OK in the Mouse Properties dialog box.**

- 7. Close the Control Panel window.**

Application Installation to Solaris File System Issues

On supported Microsoft Windows operating system the Sun File System Driver (SunFSD) does not support the DOS file name Short File Name (SFN) conversion convention. SFN is also known as the 8.3 DOS file name conversion format. When installing some Microsoft Windows applications, the installation can fail because of the DOS file name conversion convention.

Note – When you install new applications on the SunPCi III platform, make sure that you have your Microsoft Windows CD available. The installation program might require files from the Microsoft Windows CD.

The SFN convention converts long file names and directory names with a file name stem longer than eight characters to six characters followed by a tilde (~) and a number. For example, a file name such as `THIS_IS_A_LONG_FILE_NAME.DAT` could be converted to the file name `THIS_I~1.DAT` (8.3 SFN convention).

Because SunFSD does not support the SFN convention, some older Microsoft Windows applications that employ this convention sometimes fail to install correctly. Many recent applications do not rely on 8.3 file name conversion support in their file systems, and thus no issues arise.

Displaying Shortname Tails

On older Microsoft applications (such as in the DOS Command Prompt window), if file names are longer than eight characters, the file name might be truncated into the 8.3 DOS file name format and a number added to the file name (such as ~1). This number is called a *shortname tail*. When reading long file names on extended drives in the DOS window or Windows Command Prompt, the window can only display shortname tails ending in the number 1. It cannot display ~2, ~3, and so on.

Note – The term “DOS session” refers to the Command Prompt window. It does not refer to OpenDOS windows running under OpenDOS 7.01.

System Clock and Daylight Savings Time Issue

If you shut down a SunPCi III session before a Daylight Savings Time (DST) change, and then restart after the DST change, the first SunPCi III session after the time change displays a two-hour difference (that is, in the fall, the display time is two hours earlier instead of one hour earlier; in the spring, the display time is two hours later, instead of one hour later). However, for subsequent sessions, the clock displays correctly.

If the SunPCi III session is running through the time change, the system time is adjusted correctly.

Japanese Copy and Paste Issue

If you edited your `$HOME/pc/SunPCi.ini` file to support Japanese copy and paste functions, you may see the following error message: Warning, bad clipboard translation codeset specified in SunPC.ini file: codeset. Ignoring.

This message indicates that there might be an error in the file that you edited. Refer to “How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris” on page 127 for more information.

Unexpected Power Failure Issue

When an unexpected power failure occurs on your Sun system, the following message might appear:

```
Opening a SunPCi window...
ERROR, There are no cards specified in the Master.ini file
please run sunpload again using the following commands:

cd /opt/SUNWspci3/drivers/solaris
./sunpload
```

To fix this issue, power-cycle your Sun system.

Note – When this issue occurs, the LED indicator on the SunPCi III main card backplate is not lit.

Colormap Flashing With IDEAS Software

If you run the IDEAS software package at the same time as SunPCi software, you might experience colormap interactions which make the IDEAS menus unreadable.

To avoid this problem on an X11 display which supports both 8 and 24 bit depths, set the environment variable to NO8BIT.

Networking and SunFSD Issues

This section includes the following topics:

- “Installing Applications on SunFSD” on page 148
- “Extended Drive (SunFSD) Issues” on page 148
- “Network Startup Is Slow After Configuration” on page 149
- “Cannot Connect to Other Systems” on page 149
- “Installing Applications From a SunFSD Source Directory” on page 150
- “Installing Applications Into a SunFSD Target Directory” on page 150
- “Network Neighborhood Issue” on page 151
- “Software Appears to Hang When Browsing Network Drives” on page 151
- “Network Drive Issue” on page 152
- “Unable to Mount Certain NFS Mount Points as a Network Drive” on page 153
- “FSD Mapping Is Now Case Sensitive” on page 153
- “Installing Netscape 7.0 to FSD Requires Reboot Before First Use” on page 154

Installing Applications on SunFSD

Some software applications cannot be installed to a network drive, including SunFSD, and must be installed directly to the emulated disk.

Note – For specific information about issues with certain software installations and SunFSD, refer to the “Troubleshooting Microsoft Windows Applications and SunFSD Issues” on page 165.

Extended Drive (SunFSD) Issues

You might observe the following problems when using file system drives:

- File attributes (such as read-only and write-only) might not work correctly.
- File links do not work on file system drives. If you need to link to a file that is located on a file system drive, move the file to your C: or D: drive and then create the link.
- If you create a desktop shortcut to a file on a file system drive, that shortcut does not update automatically when you change the file’s location on the drive. You need to delete the existing shortcut and create a new one.

- Using UNC path names to locate Office XP or Office 2000 files, such as `\\localhost\export\home\myfiles.doc`, does not work in this version of the software.

Network Startup Is Slow After Configuration

After you configure your network and start Microsoft Windows for the first time, the network may take several minutes to start. This is especially true when you are using DHCP with your SunPCi III card. This is normal behavior for first-time startup.

Cannot Connect to Other Systems

Note – This section applies only to virtual Ethernet networking configurations. If you are using the physical Ethernet connection, skip this section.

Before you start to diagnose issues with using SunPCi III software to connect to other systems on the network, make sure that you have configured SunPCi III software and your system as follows:

- Your system and SunPCi III software host must have different IP addresses.
- Both the SunPCi III software host and the Sun system should be located on the same physical subnetwork, although they can be on different virtual subnetworks.
- Your Sun system and SunPCi III software must have the same network mask. The value of the network mask depends on the type of network you are using. Contact your network administrator for more information.

Note – You need to know the names and IP addresses of another system on the same subnet as your Sun system, and of a system not on the same subnetwork. Contact your network administrator if you do not have this information.

Installing Applications From a SunFSD Source Directory

If an application's installation from a SunFSD-mapped drive fails, make sure that the mapped directory path names in which the installation software resides all have names that do not exceed eight characters.

For example, suppose the drive letter Q: is mapped to \\localhost\WatchGuard\AntiVirusSoftware.

In the AntiVirusSoftware directory are the following subdirectories named AntiVirusForEmmy and AV4KATY.

If the software located in AntiVirusForEmmy fails to install, it might be due to the fact that the subdirectory used by the installation program has a file name longer than eight characters. If this is so, rename the subdirectory to a name that uses fewer than nine characters, for example, AV4EMM, and attempt the installation again.

Because the directory AV4KATY already is fewer than eight characters, the installation of the application from that subdirectory should succeed.

Note – Even though the path that is mapped, for example WatchGuard\AntiVirusSoftware, contains names that are more than eight characters, this does not matter to the installation program. Only file names below the drive letter mapping encounter the restriction.

Installing Applications Into a SunFSD Target Directory

If an application's installation program fails to install to a SunFSD-mapped drive with warnings about a Path Not Found or File Not Found, this might be because the installation program is relying upon the destination file system to support 8.3 file names. This is specifically the case where there are embedded file names in any of the destination installation paths.

For example, Corel WordPerfect Office 2000 uses a default destination directory of WordPerfect Office 2000. If this destination directory resides on a SunFSD drive, there is a portion of the installation program that attempts to use 8.3 file names. Thus, there is a resulting dialog box that states that the file Q:WordPerfect cannot be found. The embedded space, combined with the fact that SunFSD does not support 8.3 file names, confuses the installation program.

However, if the destination directory is changed so that there are no embedded spaces, for example change WordPerfect Office 2000 to WordPerfect_Office_2000, the installation proceeds normally.

Even though the file name is longer than eight characters, since this is a more recent application, longer file names are allowed. It is the fact that the installation procedure makes use of older technology that causes the issue.

Network Neighborhood Issue

Note – This section applies only to virtual Ethernet networking configurations. It does not apply to physical Ethernet connections.

When you open the Network Neighborhood on the Microsoft Windows desktop, the Network Neighborhood window does not show “My Workstation”. Your Sun system and the SunPCi III card share the same network interface, so they do not “see” each other on the network. Both can communicate with the network, however.

For more information about networking your Sun system with your SunPCi III host using virtual networking, refer to “Setting Up Networking With SunPCi III Hardware and Software” on page 35.

Software Appears to Hang When Browsing Network Drives

You might observe a very long time lag when browsing network drives. SunPCi III software might even appear to hang as it searches the contents of the drives. This is because Solaris software contains a “browsing” feature that allows you to automatically view all auto mount points on your Sun system.

This can cause Microsoft Windows applications to slow down considerably when browsing for files on your Sun system. It can also cause issues when viewing very large directories with Windows Explorer, or saving to a subdirectory in one of these large directories.

You can fix this issue by editing the Solaris `auto_master` file to turn off this feature. To edit this file, perform the following steps:

1. Use a text editor to open the file /etc/auto_master.

The file should look similar to the following:

```
# Master map for automounter
#
+auto_master
/net          -hosts          -nosuid,nobrowse
/home         auto_home       -nobrowse
/xfn          -xfn
```

2. Move the +auto_master line in the file to the bottom of the list.

If the -nosuid, nobrowse and -nobrowse keywords are not present in the file, add them before the +auto_master line. The result should look similar to the following:

```
# Master map for automounter
#
/net          -hosts          -nosuid,nobrowse
/home         auto_home       -nobrowse
/xfn          -xfn
+auto_master
```

3. Save the file and exit the text editor.

4. Reboot your system.

The “browsing” feature should be turned off.

Network Drive Issue

If you cannot mount network drives with Windows Explorer, networking might not be installed on the SunPCi III platform.

Try to log in to the network first. If you can reach the network from the Solaris side, then go to the Start menu in the SunPCi III software and select Control Panel, then double-click Network. Set up your SunPCi III installation on the network. Refer to your Microsoft Windows documentation for more information.

If you still cannot connect to the network after logging in, you need to reinstall your version of Microsoft Windows.

To log in to the network, follow this step:

- **Start the SunPCi III software and enter your user name and password when the dialog box prompts you to log in to Microsoft Networking.**

To log in to the network when you are already running SunPCi III software, follow these steps:

1. **Click Start and then choose Exit.**
2. **When the dialog box asks you whether you want to shut down or restart the computer, click Restart.**
3. **When the Microsoft Networking dialog box appears, type your user name and password.**

You are now able to mount network drives. Refer to “Extended Drives and SunPCi III Software” on page 125 for instructions on how to use Windows Explorer to map network drives.

Unable to Mount Certain NFS Mount Points as a Network Drive

When using supported Microsoft Windows operating systems, you can no longer mount specific Solaris directories (NFS mount points) as a SunFSD network drive. The Solaris directories that are not mountable are those autofs mount points which display a zero available and a zero used disk blocks statistic when you use the `df` command.

This was incorrectly allowed in previous releases and would cause certain applications to have access problems when accessing files and files in subdirectories.

The work around for this issue is to find a subdirectory for the autofs mount point that displays a non-zero available and a non-zero used disk blocks statistic.

FSD Mapping Is Now Case Sensitive

When using supported Microsoft Windows operating systems, FSD mapping is case sensitive with SunPCi III 3.1.

The mount points and the paths that are mounted are now case sensitive. If you were running SunPCi III 3.0 and mounted FSD drives with non-matching cases, when the drivers are upgraded, FSD will not mount these drives.

To fix this issue, verify your paths are case sensitive or remap your drives to match the correct case, such as in the following example:

- older (incorrect) mapping - `I:\localhost\opt\sunwspci3`

- newer (correct) mapping - I:\\localhost\\opt\\SUNWspci3

Installing Netscape 7.0 to FSD Requires Reboot Before First Use

If you install Netscape 7.0 to FSD, you must restart your system prior to opening Netscape 7.0 for the first time.

Note – Windows NT does not work properly when Netscape 7.0 is installed on FSD, so avoid this combination. This specific issue is currently under investigation.

Windows XP Professional, Windows 2000, and Windows Server 2003 Issues

This section lists known issues with Windows XP Professional, Windows 2000, and Windows Server 2003 in this release of SunPCi III software. This section includes the following topics:

- “Custom Display Mode Issue” on page 155
- “Double Mouse Pointer Issue” on page 156
- “File System Drive Issues” on page 157
- “Microsoft DirectDraw Performance Issue” on page 158
- “Troubleshooting Windows XP Professional, Windows 2000, and Windows Server 2003 Issues” on page 159
- “No Mouse Input After Booting Into Safe Mode” on page 160
- “Incorrect Path Name After Adding D: Drive” on page 160
- “CD-ROM Drive Issues” on page 160
- “Cannot Unmap SunFSD Drives” on page 160
- “RealPlayer 6.0 Attempts Installation of New CD-ROM Drivers” on page 161
- “Windows Media Player 8 and 9 and Audio CD Issue” on page 161
- “Windows Media Player 8 and 9 and Virtual CD-ROM Issue” on page 162

All issues listed here refer to both operating systems unless specifically noted.

Custom Display Mode Issue

Custom display modes can be specified for Windows 2000 and Windows XP Professional. The display modes specify a new size and optional color depths available within the Microsoft Windows desktop. A custom display mode consists of a width and height (in pixels) and an optional bit depth (8,16, or 24 bits).

In the [Display] section of the SunPC.ini file, the format is:

```
tag=width,height [,depth]
```

where *width*, *height*, and *depth* (optional) are all decimal values, and *tag* is one of the following strings:

- CustomMode
- CustomMode1
- CustomMode2
- CustomMode3
- CustomMode4
- CustomMode5
- CustomMode6
- CustomMode7
- CustomMode8
- CustomMode9

The *tag* values do not need to be in any numerical or alphabetical order. For example, you might add the following to the [Display] section:

```
[Display]
CustomMode=1280, 960, 16
CustomMode4=1000,800, 24
CustomMode2=1280, 960, 8
```

This will add 1280x960 16-bit, 1000x800 24-bit, and 1280x960 8-bit display modes to the list of available modes.

Note – If the display does not support 8-bit graphics, an 8-bit entry (such as CustomMode2) is ignored, and the rejected entry appears in the SunPCi log file.

The *width* and *height* parameters are required. However, if you do not specify a *depth* value, a mode is created for each depth that is supported by the display. Thus, on a system that supports 16-bit and 24-bit graphics, the following entry could be in the [Display] section:

```
CustomMode6=1200, 1000
```

In this instance, two modes are created: 1200x1000 16-bit and 1200x1000 24-bit.

Double Mouse Pointer Issue

If you are using supported Microsoft Windows operating systems and attempt to move the Microsoft Windows pointer outside the SunPCi III window, two pointers then appear on the desktop: one pointer is the Microsoft Windows pointer that freezes on the SunPCi III window border and the other pointer becomes visible outside the SunPCi III window.

The Microsoft Windows pointer works only while in the SunPCi III window. The other normally invisible pointer becomes visible only when you leave the SunPCi III window.

Once you return to the SunPCi III window, the normally invisible pointer disappears and the Microsoft Windows pointer again becomes active and the only pointer viewable. To fix this problem, you can either change the display to 16 bits per pixel (BPP) or disable the pointer shadows.

To change the display to 16 bits, do the following:

1. **Right-click your Windows desktop.**
2. **Choose Properties.**
The Display Properties dialog box opens.
3. **Click the Settings tab.**
4. **Click "Medium (16 bit)" in the Color quality drop-down list box.**
5. **Click Apply.**

The desktop flickers while applying the new settings.

6. **Click OK in the Display Properties dialog box.**

To disable the mouse pointer shadows, do the following:

1. **Right-click the My Computer icon.**

2. Choose Properties.

The System Properties dialog box opens.

3. Click the Advanced tab.

4. Click Settings in the Performance group box.

The Performance Options dialog box opens.

5. Uncheck the “Show shadows under the mouse pointer” check box.

6. Click Apply.

7. Click OK in the Performance Options dialog box.

8. Click OK to close the System Properties dialog box.

File System Drive Issues

You might observe the following issues when using file system drives:

- File attributes (such as read-only and write-only) might not work correctly.
- File links do not work on file system drives. If you need to link to a file that is located on a file system drive, move the file to your C: or D: drive and then create the link.
- If you create a desktop shortcut to a file on a file system drive, that shortcut does not update automatically if you change the file's location on the drive. You need to delete the existing shortcut and create a new one.
- If you insert an object (such as a clip art file) into a Microsoft Office XP application, and the original object is stored on a file system drive or a drive mapped using `\\localhost\path`, the insertion will not work correctly. You need to move or copy the object to your C: or D: drive, and then insert it into your document.
- Using Universal Naming Convention (UNC) path names to locate Office 97, Office 2000, or Office XP files, such as `\\localhost\export\home\myfiles.doc`, does not work in this version of the software. This is a known issue that is being investigated.

For more information about file system drives, refer to “File System Drives” on page 125.

Microsoft DirectDraw Performance Issue

Microsoft introduced a new suite of graphics engines known collectively as DirectX, and one of these components is known as DirectDraw. Because the SunPCi internal display is based on the X Windows protocol and does not have direct access to the Solaris platform's graphics adapter, DirectDraw functionality was disabled by default in older versions of SunPCi software. Many newer software suites, such as Office XP, enable DirectDraw by default.

DirectDraw is *enabled* by default. However, with DirectDraw enabled, Windows 2000 and Windows XP Professional might exhibit poor graphics performance, either in some specific applications or in specific applets in the base operating system, such as in 3D screen savers.

If normal performance of the 3D screen savers is required, or if graphics performance degraded after installing SunPCi III 3.1 software, you can disable DirectDraw by doing the following:

1. **Add the following line to the [Display] section of the SunPCi .ini file:**

```
[Display]
...
DirectDraw=off
```

2. **Restart the SunPCi session.**

Troubleshooting Windows XP Professional, Windows 2000, and Windows Server 2003 Issues

The following table lists some possible issues with Windows XP Professional, Windows 2000, and Windows Server 2003 and their causes and recommended solutions.

TABLE A-8 Windows XP Professional, Windows 2000, and Windows Server 2003 Issues and Solutions

Issue	Cause	Solution
Upgrading results in a “blue screen” with the error message INACCESSIBLE_BOOT_DEVICE.	You used the standard Microsoft upgrade procedure on the Windows CD instead of the recommended procedure in the appropriate chapter of this book.	Use the backup copy of your C: drive and restore the drive. If you did not create a backup C: drive, create a new C: drive and install Windows XP Professional as described in this document. You have to reinstall all of your applications.
Installing results in a “blue screen” with the error message INACCESSIBLE_BOOT_DEVICE.	You used the standard Microsoft installation procedure on the Windows CD instead of the recommended procedure in the appropriate chapter of this book. .	Use the installation procedure in “Installing Windows XP Professional” on page 40, “Installing Windows 2000” on page 58, or “Installing Windows Server 2003” on page 76 to properly install the software.
Inserting a file into Microsoft Office XP or Microsoft Office 2000 does not work.	The object file (such as clip art or an Excel spreadsheet) is located on a file system drive or on a drive mapped using \\localhost\path.	Copy or move the object file to your C: or D: drive and then insert it again.
The mouse no longer works when you click the Start button (16-bit and 24-bit displays only).	There is a software conflict with the screen fade effect in the Display Control Panel.	Turn off the fade effect by choosing the Display Control Panel. Deselect the first check box under Visual Effects. Click OK. The mouse should work again.

No Mouse Input After Booting Into Safe Mode

When booting into Safe Mode, the Sun Mouse Filter driver is uninstalled. Therefore you are left with no mouse with which to navigate.

You can boot into Safe Mode by following these steps:

- 1. During startup of Windows XP Professional, press the F8 key.**
- 2. Select Safe Mode and press Return.**
- 3. The operating system starts in Safe Mode and no mouse is available.**

This is a known issue and is currently under investigation.

Incorrect Path Name After Adding D: Drive

While using Windows XP Professional, the path name displayed for a newly mapped D: drive might be incorrect.

This situation occurs when you have an existing SunFSD mapping to letter D: and then attach another emulated drive as letter D:. After restart, the attached emulated D: drive shows the path name of the previously mapped SunFSD drive.

The contents of the D: drive and the SunFSD drive are unaffected and are correct, even if the path name listing is incorrect.

This is a known issue and is currently under investigation.

CD-ROM Drive Issues

While using Windows 2000 Professional, your CD-ROM drive might be slow to display, or will not update at all. This includes the system information about the CD, and the title of the CD when viewed in Windows Explorer. This is a known issue that is being investigated

Cannot Unmap SunFSD Drives

If multiple user accounts were created during a Windows 2000 Professional installation without Administrator privileges, there will be issues with non-Administrator users mapping and unmapping SunFSD drivers in the following situations:

- Administrators cannot unmap a SunFSD drive originally mapped by a user, although Administrators can unmap a drive mapped by another Administrator.
- Users cannot unmap a SunFSD drive they originally mapped if the user account was originally created without Administrator privileges.

This is a known issue and is currently under investigation.

RealPlayer 6.0 Attempts Installation of New CD-ROM Drivers

When using Windows 2000, if you connect the CD-ROM audio cable from the CD-ROM to the SunPCi card, RealPlayer may ask you to install updated drivers. If you allow the drivers to update, the CD-ROM drive then stops reading and playing music.

To avoid this issue, do not allow RealPlayer to install new drivers after connecting the CD-ROM drive to the SunPCi card.

Windows Media Player 8 and 9 and Audio CD Issue

While using Microsoft Windows and after opening Windows Media Player 8 or 9, you may have an issue with playing a CD.

After inserting the CD, a dialog box might open saying an error occurred reading the CD in digital mode, and then asks if you would like to listen to the CD in analog mode instead. Click OK. You also might have another dialog box open saying you can switch to analog mode. Click Close. The CD still might not operate properly.

SunPCi III does not support Digital Audio Extraction from a CD-ROM device. To avoid this problem, disable Digital Audio Extraction by doing the following:

1. **Open Windows Media Player.**
2. **From the Tools menu, choose Options.**
3. **Click the Devices tab.**
4. **Highlight the Audio CD (D:) option (if not already highlighted).**
5. **Click Properties.**
6. **Click the Analog radio button in the Playback group box.**
7. **Click OK to close the Properties window.**

8. Click OK to close the Options window.

You should be able to play your CD properly now.

Windows Media Player 8 and 9 and Virtual CD-ROM Issue

While using Microsoft Windows and Windows Media Player 8 or 9, a new window might appear and then disappear. This issue usually occurs when you are attempting to fix the issue, “Windows Media Player 8 and 9 and Audio CD Issue” on page 161.

This issue only happens when you go into this menu selection more than once in the same session, since Windows Media Player 8 and 9 does not always work properly with virtual CD-ROM drives.

To resolve this problem, close out the Windows Media Player and then restart the application to work properly.

Microsoft Windows Application Issues

These sections include information about known issues with various software, as well as known issues with software and SunFSD issues. The section includes the following topics:

- “Troubleshooting Microsoft Windows Applications” on page 163
- “Troubleshooting Microsoft Windows Applications and SunFSD Issues” on page 165

Troubleshooting Microsoft Windows Applications

The following table lists some possible Microsoft Windows application issues, their causes, and recommended solutions.

TABLE A-9 Troubleshooting Microsoft Windows Applications

Problem	Cause	Solution
Inserting a file into Microsoft Office 2000 does not work.	The object file (such as clip art or an Excel spreadsheet) is located on a file system drive or on a drive mapped using \\localhost\path.	Copy or move the object file to your C: or D: drive and then insert it again.
When attaching and running an external monitor at 1600 x 1200 display resolution, Windows 2000 resets.	The default shared memory configuration is set too low.	In the BIOS setup program, increase shared memory to at least 8 Mbytes to support the 1600x1200 display resolution.
System appears to hang during installation of Corel Draw 10 for Microsoft Windows.	CD is not completely mounted before you clicked OK.	After inserting the previous Corel Draw CD, you must wait until the new CD is fully mounted (when the LED stops blinking) before clicking OK. The Corel installer freezes if you do not wait for the CD to mount.
When installing the Corel Draw 10 upgrade version without a previous version of Corel Draw installed, the install software prompts you to insert a CD of a previous full version of the software.		
When installing Corel WorkPerfect 2000 on Windows XP Professional, the installation appears to hang.	The Installation Wizard dialog box is waiting for user information, while the user's registration dialog box is open in the background and covered by another Installation Wizard dialog box. The installation is placed in "waiting" mode.	To avoid this issue, make sure to delete the "white" Corel WP Office 2000 splash screen by closing the Corel setup window and then the Installation Wizard dialog box is viewable and works fine. This issue does not occur during every installation, but does happen with some frequency.

TABLE A-9 Troubleshooting Microsoft Windows Applications

Problem	Cause	Solution
When performing a virus scan in Norton Antivirus (all versions), the system appears to hang.	The virus scan can enter an infinite loop if another user or process is accessing the directory at the same time as Norton Antivirus.	Turn off all processes accessing that directory and do not read or write to the directory being scanned. Do not attempt to use the drive until after Norton Antivirus is finished with its scan.
Norton Antivirus 2002 might require increase in the Solaris file limit.	Norton Antivirus seems to “hold on” to many of the files it opens, which might result in the log file message: Too many open files.	Increase the number of files that can be simultaneously open by Solaris software, To find out the current limit, use the command: <code>ulimit -Hn</code> In the <code>/etc/system</code> , add the following line: <code>set rlim_fd_max=XXXX</code> (XXXX is a greater number than the one returned by the <code>ulimit -Hn</code> command.)
Some image rendering problems exist when working with Office XP WordArt files in Windows 2000 or Windows XP Professional.	Frame buffer is set to 8-bit color depth.	Change graphics settings to higher color depth (16-bit or 24-bit).
If a SunPCi III session running Windows XP Professional is used as a PC Anywhere host, the graphics display on the remote system is not updated.	Mouse movements are sent and effected on the host, and the graphics on the host are updated, but those updates are not sent back to the remote system.	If a PC is used as the host and a SunPCi III session is used as the remote system, the graphics display on the SunPCi III remote system is correct. This “session sharing” functionality is, by default, available on Windows XP Professional as “Remote Desktop.” See Microsoft documentation for more details.
Corel Office 2000 and Corel Office 2002 installations do not work properly and will not install.	CD-ROMs that are not ISO 9660 compliant might not work on Solaris systems.	Use only CD-ROMs that are ISO 9660 compliant.

TABLE A-9 Troubleshooting Microsoft Windows Applications

Problem	Cause	Solution
Cannot install Corel 10 (upgrade) without previous version already installed. Receive error message stating must install CD from previous version.	The previous software is not installed.	Insert the previous version of the Corel CD. Wait until the CD is fully mounted before clicking the OK button. The Corel installer will freeze if you do <i>not</i> wait for the CD to mount.
Inserting a Microsoft Office document as a graphic into another Office document does not work and Drive Not Found error message appears.	Microsoft Office 2000 or Office XP might not accept a document as a graphic.	Use an earlier version of Microsoft Office to avoid this problem. If you must use Microsoft Office 2000 or Office XP, convert the document to either a graphic (.jpg) or Word file (.doc).
Extra Lines Might Appear in Lotus Freelance Slides (Microsoft Windows 2000 Professional or Microsoft Windows XP Professional)	If you are generating slides with Lotus Freelance and hold the mouse button while dragging or performing any actions in a Freelance slide, extraneous lines might appear on the slide.	This issue happens since mouse pointer shadowing is enabled. To fix this issue, either minimize and then restore the Freelance window or disable mouse pointer shadowing. Refer to “Double Mouse Pointer Issue” on page 156 to fix this issue.

Troubleshooting Microsoft Windows Applications and SunFSD Issues

The following section describes known Microsoft Windows application and SunFSD issues, their causes, and recommended solutions.

Installation and SunFSD on Windows XP Professional

Some software applications cannot be installed to a network drive, including SunFSD, and must be installed directly to the emulated disk. This is exactly the same behavior with a standard PC running Windows XP Professional and using a Samba drive.

In Windows XP Professional, some software applications do not install to a SunFSD drive. The current list includes the following:

- Adobe Photoshop 7

- Corel Draw 10
- Corel WordPerfect 2002
- Microsoft FrontPage 2002
- Microsoft Office XP
- Microsoft Project 2002
- Microsoft Visio 2002

Note – This is not an exhaustive list, but includes the known applications that cannot be installed to a SunFSD at this time.

Note – If you are running Windows XP Professional, the installation of these software applications must be on the SunPCi III emulated drive.

Upgrading to Microsoft FrontPage 2002 Fails if FrontPage 2000 Installed on SunFSD

On Windows XP Professional and Windows 2000, if you are upgrading FrontPage 2000 to FrontPage 2002 while using a SunFSD drive, the upgrade fails.

To avoid this problem in Windows 2000, uninstall and remove the older version of FrontPage and then do a fresh full installation of FrontPage 2002 to a file system drive.

To avoid this problem in Windows XP, uninstall and remove the older version of FrontPage and then do a fresh full installation of FrontPage 2002 to the emulated drive. A fresh installation of FrontPage 2002 fails when installing to a file system drive using Windows XP and must be installed to the emulated drive.

Microsoft Office XP Installation and SunFSD on Windows 2000 Professional

In Windows 2000 Professional, Microsoft Office XP fails if it is installed to a SunFSD or a Samba drive, in which any of the directories in the path are longer than the DOS 8.3 format. For example, Office XP fails if you install it to the directory `\longpathname\name1\name2`, but it works if you install it to `\shortname\name1\name2`.

There are two workarounds for this problem:

- Install Office XP to an emulated drive.
- Make sure that the path name on a SunFSD or Samba drive contains only short names (eight characters or fewer).

WordPerfect 9 Installation and SunFSD on Windows XP Professional

WordPerfect 9 is part of the Corel WordPerfect Office 2000 Software Suite.

You might not be able to open WordPerfect 9 installed on a SunFSD while using Windows XP Professional. You might receive a Microsoft Windows error message if Corel WordPerfect Office 2000 was installed into a folder name that was more than seven characters.

To avoid this issue, install Corel WordPerfect Office 2000 to a folder with a name of seven characters or fewer.

Retrospect Software and SunFSD

In Microsoft Windows, if you use Retrospect software (Version 5.6 or 6.0) to back up data through SunFSD, an erroneous message might appear reporting that there is not enough available space for backup, even if the space exists.

This issue occurs since Retrospect checks the root of the SunFSD mounted path only for available space.

To avoid this problem, verify that the root of the destination path directory contains adequate space for backup.

Norton Antivirus Software Scanning and SunFSD on Windows 2000 and Windows XP Professional

When using Norton Antivirus software, specifically the 2002 Consumer Edition and the 7.60 Corporate Edition, you might have problems scanning files mounted on SunFSD drives.

If you use the 2002 Consumer Edition, the scanning might get into an infinite loop and not complete scanning. If you get into this situation, stop the scan and exit the application.

If you use the 7.60 Corporate Edition, the software might repeat scanning certain files and subdirectories, but it will eventually complete scanning.

Symantec states that Norton Antivirus 2002 Consumer Edition is not intended for use in scanning network-mapped drives.

Adobe Photoshop Installation and SunFSD on Windows XP Professional

On Windows XP Professional, if installing Photoshop 5.0, 5.5, or 6.0 to a SunFSD drive, the Choose Directory dialog box does not list any SunFSD mounted drives.

Instead of browsing for the location, type the drive letter and directory in the text entry field near the top of the dialog box. The installation then proceeds normally.

Note – This problem is not present in Photoshop 6.0.1.

SunPCi III International Support

This appendix includes the following topics:

- “International Support” on page 169
- “Using the Keyboard Environment Variables” on page 170
- “Using an International Keyboard Under DOS” on page 173
- “Using Code Pages and SunPCi III Software” on page 174

This appendix includes instructions for completing the following tasks:

- “How to Set an Environment Variable” on page 172
- “How to Turn Off an Environment Variable” on page 172
- “How to Configure the Keyboard for Microsoft Windows” on page 172

International Support

The SunPCi III 3.1 software gives you the national language support you need to run your applications using an international keyboard. The first time you started the SunPCi III program, you were presented with a list of regional languages and countries from which to choose. You entered the number that corresponded to the language or country your keyboard supports. These regional languages and country names represent code pages in PC terminology. If you want to change your code pages and keyboard language tables, use the instructions in this appendix.

To set up international keyboard support for SunPCi III 3.1 software, use the `KBTYPE` and `KBCP` environment variables to select the correct keyboard language table and code page for your installation. Refer to “Using the Keyboard Environment Variables” on page 170 for more information, and to the procedure to use with Windows XP Professional, Windows 2000, or Windows Server 2003.

Note – To configure Windows XP Professional or Windows 2000 Professional to work with Japanese copy and paste functions, refer to “How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris” on page 127.

Using the Keyboard Environment Variables

This section describes the following topics:

- “KBTYPe Environment Variable Values” on page 170
- “KBCP Environment Variable Values” on page 171
- “How to Set an Environment Variable” on page 172
- “How to Turn Off an Environment Variable” on page 172

KBTYPe Environment Variable Values

The KBTYPe environment variable specifies the keyboard language table to use with the SunPCi III software. To set KBTYPe, refer to “How to Set an Environment Variable” on page 172. TABLE B-1 lists the values for KBTYPe and the corresponding languages.

TABLE B-1 KBTYPe Values

KBTYPe Value	Keyboard Language
be	Belgium
cf	Canadian French
dk	Danish
fr	French
gf	Swiss German
gr	German
it	Italian
ja	Japanese
ko	Korean

TABLE B-1 KBTYPe Values

KBTYPe Value	Keyboard Language
la	Latin American Spanish
nl	Dutch (Netherlands)
no	Norwegian
po	Portuguese
sf	Swiss French
sg	Swiss German
sp	Spanish
su	Finnish
sv	Swedish
uk	U.K. English
us	U.S. English
zh	Chinese
zh_TW	Chinese (Taiwan)

KBCP Environment Variable Values

The KBCP environment variable specifies the keyboard code page. The code page specifies the characters set (accents, currency symbols, and so on) to be used with a keyboard. To set KBCP, refer to “How to Set an Environment Variable” on page 172. For more information about code pages and their functions, refer to “Code Page Table” on page 174. TABLE B-2 lists the possible values for the KBCP environment variable.

TABLE B-2 KBCP Values

KBCP Value	Description
437	United States code page
850	Multilingual code page, including all characters for most languages of European, North American, and South American countries
860	Portuguese code page
863	Canadian French code page
865	Nordic code page, including all characters for the Norwegian and Danish languages

▼ How to Set an Environment Variable

To set an environment variable, follow these steps:

1. **Make sure that the SunPCi III software is not running, or exit SunPCi III if it is running.**
2. **Open a Terminal window on your desktop.**
3. **Type the following command at the % prompt. Substitute the name of the environment variable for *VARIABLE_NAME*, and the value for the variable (if required) for *value*.**

C Shell:

```
% setenv VARIABLE_NAME value
```

Bourne Shell:

```
% VARIABLE_NAME=value  
% export VARIABLE_NAME
```

4. **Start the SunPCi III software.**

▼ How to Turn Off an Environment Variable

To turn off an environment variable, follow this step:

- **Type the following command and substitute the name of the environment variable for *VARIABLE_NAME*.**

```
% unsetenv VARIABLE_NAME
```

▼ How to Configure the Keyboard for Microsoft Windows

In order for your keyboard layout to function correctly for your language, you also need to configure the keyboard for your version of Microsoft Windows. To set up the keyboard, perform the following steps:

1. **Check that the Solaris `KBCP` and `KBTYP` environment variables are set to use the same language (for example, `us`, `gr`, and so on).**

If the environment variables are not set, refer to “`KBCP` Environment Variable Values” on page 171 to set `KBTYP`, and to “`KBCP` Environment Variable Values” on page 171 to set `KBCP`.

2. **From the Microsoft Windows Start menu, choose Settings, and then choose Control Panel.**

The Control Panel window opens.

3. **Set the default keyboard layout in Microsoft Windows to the same value as you set in `KBTYP`.**

Using an International Keyboard Under DOS

Your Sun international keyboard fully emulates the local-language DOS AT/102 keyboard. Each keyboard offers all the characters in the US-ASCII and the local AT/102 character set, plus any other characters routinely used within that country.

International Keyboard

In general, there is nothing unusual about the way the Sun international keyboard works for most characters. You press the key and the character appears on the screen. To get an uppercase character, you either press the Shift key or set the Caps Lock. If there are three characters shown on the key, you press the Alt-Graph key while pressing the key to get the third character. However, there are a few special ways in which the keyboard operates under DOS:

- The keyboard provides access to more characters than are available on the local-language DOS keyboard.
- Under both DOS and Solaris operating systems, some characters are used both as accents and as separate characters, such as the carat (^) and the tilde (~). Under the Solaris system, these characters have separate keys—one for use as a floating accent and one for the separate character. Under DOS, there is one key that provides both functions. To use the key to enter a floating accent, press the key. To use the key to enter a separate character, simultaneously press the key and the space bar.
- Characters that are not available on the local DOS keyboard might be ignored when you attempt to use them.

DOS Character Set

When you, or a program you are using, creates a file under DOS, the DOS character set is used. When you create a file under the Solaris system, the ISO 8859 Latin 1 character set is used. You do not need to be aware of this unless you want to use a DOS file in the Solaris environment, or a Solaris file in the DOS environment. To convert files from one format to the other, two conversion utilities are provided—`dos2unix` and `unix2dos`. Only characters that are available in both the DOS character set and the ISO 8859 Latin 1 character set can be converted between formats. Fortunately, most commonly used characters are available in both character sets.

However, if you have a text file that contains special characters, these characters might not be convertible. Most word processors and text-processing programs use special codes in their files to indicate character style or page layout. Most of these programs, however, have options to store the file as “text only” or to “print to a file,” which eliminates the special codes and enables you to convert the file using the `dos2unix` and `unix2dos` commands.

Using Code Pages and SunPCi III Software

DOS provides national language support through the use of language-specific code pages.

If you want to change code pages at some time, use the `KBCP` environment variable as described in “`KBCP` Environment Variable Values” on page 171.

Code Page Table

A *code page* is a table that defines the character set you are using. Each *character set* contains 256 entries that are specific to a country or language. The characters are translated from the code page table and used by your keyboard, screen, and printer. An example is the set of letters, numbers, and symbols (such as accent marks) used by French Canadians. When the character set is put into a table for use by DOS, it becomes the Canadian French code page.

There are two types of code pages, *hardware* and *prepared*. A *hardware* code page is built into a device. For example, a printer manufactured for use in Portugal has a Portuguese hardware code page in it. Many devices can use only their own hardware code page.

Prepared code pages are provided in code-page information (.CPI) files in your software. OpenDOS includes the following prepared code pages:

- 437 – United States code page
- 850 – Multilingual code page, including all characters for most languages of European, North American, and South American countries
- 860 – Portuguese code page
- 863 – Canadian French code page
- 865 – Nordic code page, including all characters for the Norwegian and Danish languages

National Language Support Codes

Both Swiss French and Swiss German use country code 041. Country codes 358 and 972 assume United States code page 437, but include country-specific date and time conventions. For example, if you use country code 351 (Portugal), you can use prepared code pages 860 and 850 and the po (Portugal) keyboard code. You could not use the us (United States) keyboard code.

TABLE B-3 National Language Support

Country, Region, or Language	Country Code	Prepared Code Pages	Key Code
United States	001	437, 850	us
Canadian French	002	863, 850	cf
Latin America	003	437, 850	la
Netherlands	031	437, 850	nl
Belgium	032	437, 850	be
France	033	437, 850	fr
Spain	034	437, 850	sp
Italy	039	437, 850	it
Switzerland	041	437, 850	sf, sg
United Kingdom	044	437, 850	uk
Denmark	045	865, 850	dk
Sweden	046	437, 850	sv
Norway	047	865, 850	no
Germany	049	437, 850	gr

TABLE B-3 National Language Support

Country, Region, or Language	Country Code	Prepared Code Pages	Key Code
English (International)	061	437, 850	-
Portugal	351	860, 850	po
Finland	358	437, 850	su
Israel	972	437	-
Japan	081		ja
Korea	082		ko
Peoples Republic of China	086		ch
Taiwan	088		tn

The \$LANG Variable

There are two Solaris commands—`/usr/bin/dos2unix` and `/usr/bin/unix2dos`—that enable you to specify code pages. For example, to convert the `task_list` file, created with code page 850, from a DOS to a Solaris format, use the `dos2unix` command, and enter the following:

```
C:\> dos2unix -850 task_list task_list
```

If the code page is not specified on the command line, `dos2unix` and `unix2dos` will check the `$LANG` environment variable to determine which code page to use. To check whether your `$LANG` variable is set, enter the following in a Solaris command window:

```
% env | grep LANG
```

If you do not have the `$LANG` variable set, or if it is set to anything but the settings listed in TABLE B-4, SunPCi III software uses the default US code page 437 and the `en_US` (English-US) `$LANG` setting.

TABLE B-4 `$LANG` Variable Settings

<code>\$LANG</code> Variable Setting	Language/Territory
<code>C</code>	Default “C” locale
<code>de</code>	German
<code>de_AT</code>	Austrian German
<code>de_CH</code>	Swiss German
<code>en_AU</code>	Australian English
<code>en_CA</code>	Canadian English
<code>en_IE</code>	Irish English
<code>en_GB</code>	U.K. English
<code>en_NZ</code>	New Zealand English
<code>en_US</code>	U.S. English
<code>es</code>	Spanish
<code>es_BO</code>	Bolivian Spanish
<code>es_CL</code>	Chilean Spanish
<code>es_CO</code>	Colombian Spanish
<code>es_CR</code>	Costa Rican Spanish
<code>es_EC</code>	Ecuadorian Spanish
<code>es_GT</code>	Guatemalan Spanish
<code>es_MX</code>	Mexican Spanish
<code>es_NI</code>	Nicaraguan Spanish
<code>es_PA</code>	Panamanian Spanish
<code>es_PE</code>	Peruvian Spanish
<code>es_PY</code>	Paraguayan Spanish
<code>es_SV</code>	Salvadoran Spanish
<code>es_UY</code>	Uruguayan Spanish
<code>es_VE</code>	Venezuelan Spanish
<code>fr</code>	French
<code>fr_BE</code>	Belgian French

TABLE B-4 \$LANG Variable Settings

\$LANG Variable Setting	Language/Territory
fr_CA	Canadian French
fr_CH	Swiss French
it	Italian
ja	Japanese
ko	Korean
sv	Swedish
zh	Chinese
zh_CN	Chinese (China)
zh_HK	Chinese Hong Kong
zh_TW	Chinese Taiwan

Note that the settings listed in the table are the ones that SunPCi III supports. The table does not list all the languages Solaris supports.

For more information about using Solaris environment variables, refer to your Solaris documentation.

SunPCi III Online Support

This appendix includes listings of various Web sites and online resources for SunPCi.

This chapter includes the following topics:

- “SunPCi III Product Web Page” on page 179
- “SunPCi III Documentation” on page 180

SunPCi III Product Web Page

The SunPCi III product Web site contains the latest information about the SunPCi III product, as well as links to software updates and patches. Check the product Web site regularly for software updates.

The Web site is located at the following URL:

`http://www.sun.com/desktop/products/sunpci`

This Web site also includes links to SunPCi White Papers and other information.

There are many links from this Web site to further information about SunPCi III, including specific articles about the SunPCi product at the following URL:

`http://www.sun.com/desktop/products/sunpci/articles.html`

SunPCi III Documentation

The `docs.sun.com` Web site enables you to access SunPCi documentation on the Web. You can search for a specific book title or subject at the following URL:

`http://docs.sun.com`

You can find specific SunPCi documentation by searching for “SunPCi” in the search option on `docs.sun.com` for both HTML and PDF versions of documentation. PDF versions of SunPCi documentation are available at the following URL:

`http://www.sun.com/products-n-solutions/hardware/
docs/Workstation_Products/Interoperability_Products/
SunPCi/index.html`

SunPCi III Performance Tips

This appendix provides various ways to improve the performance of your SunPCi III system and the performance of your Microsoft Windows applications.

This appendix includes the following topics:

- “Fine-Tuning the SunPCi III Configuration” on page 181
- “Running Game Software on the SunPCi III Platform” on page 183
- “Using a Palm Pilot With SunPCi III Software” on page 184

This appendix includes instructions for completing the following tasks:

- “Increasing System Memory” on page 181
- “Specifying Emulated Drives” on page 182
- “Improving Video Performance” on page 182
- “How to Increase Video Memory” on page 183
- “Video Display Routing” on page 184

Fine-Tuning the SunPCi III Configuration

The following sections describe some aspects of SunPCi III configuration that you can change to improve performance of the SunPCi III software.

Increasing System Memory

The more system memory you have, the better the performance of the SunPCi III program. A 256-Mbyte memory module comes installed on the SunPCi III card by default.

If you want to increase the amount of memory allocated to the SunPCi III platform, purchase additional Mbyte memory. Refer to the *SunPCi III SODIMM Installation Guide* for installation information or for purchasing information contact your Sun reseller.



Caution – Do not allocate too much memory to the VGA driver. Every Mbyte allocated to video means that there is one less Mbyte allocated to Microsoft Windows. If Microsoft Windows system memory is set too low, the SunPCi III software will show the Microsoft Windows “blue screen” and the following error message: SunPCi.VXD: Can’t dvma_alloc xxx bytes. The system is low on memory.

Specifying Emulated Drives

Specify as large a drive size as possible when creating a new C: or D: drive. You can specify up to 40 Gbytes of space, although only 2 Gbytes is initially viewable until you expand and reboot your system.

For more information about using emulated hard disk drives, see the section “Emulated Drives and SunPCi III Software” on page 12.

Improving Video Performance

If your Sun system video display is running in 8-bit mode, you can improve video performance by selecting a simple pattern or None for your desktop wallpaper. A complicated wallpaper pattern causes the screen to repaint more often while you work, thus slowing down video performance.

Note – Changing your desktop wallpaper does not affect performance for 24-bit video.

Running Game Software on the SunPCi III Platform

Note – This procedure applies *only* if you are using an external VGA monitor with your SunPCi III card. For more information about how to install and configure an external VGA monitor, refer to Chapter 9.

This section is designed to help you fine-tune game performance on the SunPCi III platform. Although the default VGA memory setting of 8 Mbytes on your SunPCi III card should provide enough VGA memory for most games, you can increase the amount of VGA memory for more graphics-intensive games.

Note – Remember that increasing your video memory decreases the amount of available system memory. Refer to “Increasing System Memory” on page 181 for more information.

▼ How to Increase Video Memory

To increase the amount of VGA memory available to SunPCi III, perform the following procedure:

1. Start the SunPCi III software.

If SunPCi III software is already running, from the File menu, choose Reset PC to exit Microsoft Windows.

You will see the Startup window and the RAM check routine.

2. While the RAM check routine is proceeding, press the Delete key on your keyboard.

The Startup routine stops, and the Setup screen opens.

3. Select Integrated Peripherals.

4. Change the System Shared Memory Size parameter to a larger value.

The default is 8 Mbytes. This parameter accepts values of 8, 16, or 32 Mbytes.

5. Exit the Setup window.

The SunPCi III Startup routine starts over, using the new VGA memory settings.

Video Display Routing

The following table describes some video output routing in SunPCi III software.

TABLE D-1 describes the type of video output that occurs for the operating system you want to use, the video driver you installed, and whether you typed `sunpci -v` at the prompt.

TABLE D-1 Video Display Routing Options

PC Operating System	With VGA Monitor Connected	Without VGA Monitor Connected
DOS (<code>-v</code> switch used)	Video is routed to VGA monitor.	Video is discarded. SunPCi III window displays <code>Video routed</code> message.
DOS (<code>-v</code> switch not used)	Video is routed to SunPCi III X-Window on your Sun system screen.	Video is routed to SunPCi III window on your Sun system screen.
Windows XP Professional or Windows 2000 Professional (SunPCi III drivers installed automatically)	Video is routed to SunPCi III X-Window on your Sun system screen to use external monitor; install the S3 Graphics ProSavage DDR driver.	Video is routed to SunPCi III window on your Sun system screen.

Using a Palm Pilot With SunPCi III Software

The SunPCi III software supports the hotsync function with the Palm Pilot. For best results select a specific hotsync speed on the Palm Pilot, rather than As Fast As Possible.

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