SunSwitch™ 1.0 Installation and Configuration Guide

THE NETWORK IS THE COMPUTER™

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Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

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

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

FCC Class A Notice

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

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

FCC Class B Notice

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

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

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

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

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

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

DOC Class A Notice - Avis DOC, Classe A

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

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

DOC Class B Notice - Avis DOC, Classe B

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

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

VCCI 基準について

第一種VCCI基準について

第一種VCCIの表示があるワークステーションおよびオプション製品は、第一種情報装置です。これらの製品には、下記の項目が該当します。

この装置は、第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会(VCCI)基準に適合しております。したがって、本製品を、住宅地域または住宅地域に隣接した地域でご使用になりますと、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。

取り扱い説明書に従って正しくお取り扱いください。

第二種VCCI基準について

第二種VCCIの表示  があるワークステーションおよびオプション製品は、第二種情報装置です。これらの製品には、下記の項目が該当します。

この装置は、第二種情報装置（住宅地域または住宅地域に隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会(VCCI)基準に適合しております。しかし、本製品を、ラジオ、テレビジョン受信機に近接してご使用になりますと、受信障害の原因となることがあります。

取り扱い説明書に従って正しくお取り扱いください。

Safety Agency Compliance Statements

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

Safety Precautions

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

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

Symbols

The following symbols may appear in this book:

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

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

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

On – Applies AC power to the system.

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

Off – Removes AC power from the system.

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

Modifications to Equipment

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

Placement of a Sun Product

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

SELV Compliance

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

European Ergonomics

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

Power Cord Connection

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

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

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

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

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

Lithium Battery

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

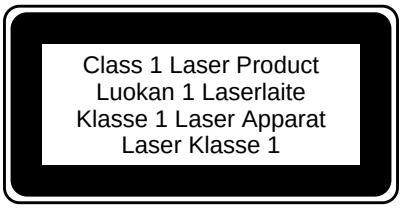
System Unit Cover

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

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

Laser Compliance Notice

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



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

Einhaltung sicherheitsbehördlicher Vorschriften

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

Sicherheitsvorkehrungen

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

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.
- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen einen Kurzschluß verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:

Achtung – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.

Achtung – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

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

Ein – Setzt das System unter Wechselstrom.

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

Aus – Unterbricht die Wechselstromzufuhr zum Gerät.

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

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

Aufstellung von Sun-Geräten

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

Einhaltung der SELV-Richtlinien

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

Ergonomie-Richtlinien

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

Anschluß des Netzkabels

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

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

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

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

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

Lithiumbatterie

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

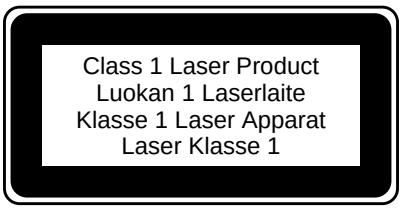
Gehäuseabdeckung

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

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

Einhaltung der Richtlinien für Laser

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



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Warnung – Die Verwendung von anderen Steuerungen und Einstellungen oder die Durchfhrung von Prozeduren, die von den hier beschriebenen abweichen, knnen gefhrliche Strahlungen zur Folge haben.

Conformité aux normes de sécurité

Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

Mesures de sécurité

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

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

Symboles

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

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

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

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

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

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

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

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

Modification du matériel

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

Positionnement d'un produit Sun

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

Conformité SELV

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

Ergonomie européenne

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

Connexion du cordon d'alimentation

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

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

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

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

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

Batterie au lithium

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

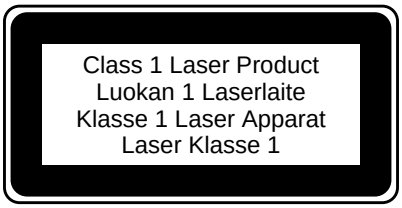
Couvercle

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

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

Conformité aux certifications Laser

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



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

Normativas de seguridad

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

Precauciones de seguridad

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

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

Símbolos

En este libro aparecen los siguientes símbolos:

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

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

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

Encendido – Aplica la alimentación de CA al sistema.

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

Apagado – Elimina la alimentación de CA del sistema.

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

Modificaciones en el equipo

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

Ubicación de un producto Sun

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

Cumplimiento de la normativa SELV

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

Normativa ergonómica europea

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

Conexión del cable de alimentación eléctrica

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

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

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

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

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

Batería de litio

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

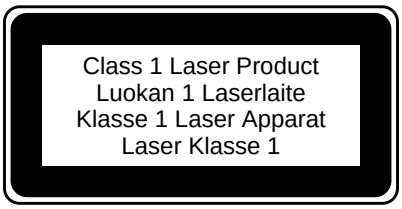
Tapa de la unidad del sistema

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

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

Aviso de cumplimiento con requisitos de láser

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



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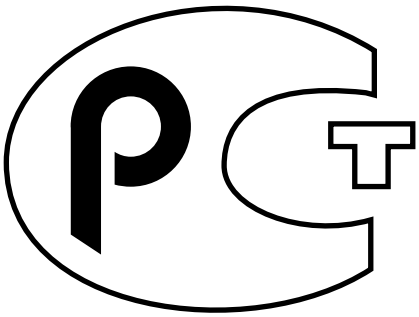
Precaución – El manejo de los controles, los ajustes o la ejecución de procedimientos distintos a los aquí especificados pueden exponer al usuario a radiaciones peligrosas.

GOST-R Certification Mark



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Nordic Lithium Battery Cautions

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

Sverige

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

Danmark

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

Suomi

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

Contents

Figures

Tables

Preface

The *SunSwitch 1.0 Installation and Configuration Guide* describes how to install and configure the Sun Gigabit Ethernet switch. It provides procedures for viewing and configuring switch parameters.

The *SunSwitch 1.0 Installation and Configuration Guide* is intended for network installers and system administrators engaged in configuring and maintaining a Gigabit Ethernet network. It assumes that you are familiar with Ethernet concepts, IP addressing, the IEEE 802.1d Spanning-Tree Protocol, and SNMP configuration parameters.

How This Book Is Organized

Chapter 1, "Product Overview," provides a brief overview of the SunSwitch, including a description of switch features, ports, and LEDs.

Chapter 2, "Installing the Switch," describes how to install the switch.

Chapter 3, "The User Interface," provides an overview of the command-line interface, and describes how to connect to the switch.

Chapter 4, "Viewing Switch Information," shows how to use the command-line interface to view switch configuration and statistics parameters.

Chapter 5, "Configuring the Switch," shows how to use the command-line interface to configure switch parameters.

Chapter 6, "Configuring Boot Options," describes the use of the primary and alternate switch images, how to load an image, and how to reset the software to factory defaults.

Chapter 7, "Switch Maintenance," describes the Maintenance menu options, including how to access, capture, and clear dump information.

Chapter 8, "Troubleshooting Procedures," describes troubleshooting procedures for the most common problems.

Typographic Conventions

The following table describes the typographic changes used in this book.

TABLE P-1 Typographic Conventions

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

Shell Prompts

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

TABLE P-3 Related Documents

Application	Title	Part Number
Options	*Solaris 2.x Handbook for SMCC Perpherals*	801-5488
Diagnostics	*SunVTS 2.0 User's Guide*	802-5331

Ordering Sun Documents

SunDocs[SM] is a distribution program for Sun Microsystems technical documentation. Contact SunExpress for easy ordering and quick delivery. You can find a listing of available Sun documentation on the World Wide Web.

TABLE P-4 SunExpress Contact Information

Country	Telephone	Fax
Belgium	02-720-09-09	02-725-88-50
Canada	1-800-873-7869	1-800-944-0661
France	0800-90-61-57	0800-90-61-58
Germany	01-30-81-61-91	01-30-81-61-92
Holland	06-022-34-45	06-022-34-46
Japan	0120-33-9096	0120-33-9097
Luxembourg	32-2-720-09-09	32-2-725-88-50
Sweden	020-79-57-26	020-79-57-27
Switzerland	0800-55-19-26	0800-55-19-27
United Kingdom	0800-89-88-88	0800-89-88-87
United States	1-800-873-7869	1-800-944-0661

World Wide Web: `http://www.sun.com/sunexpress/`

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- Email: `smcc-docs@sun.com`
- Fax: SMCC Document Feedback
  1-415-786-6443

CHAPTER 1

Product Overview

When the SunSwitch is attached to the network backbone, it interconnects servers using 10 Mbps, 100Mbps, and 1,000 Mbps Ethernet connections. This flexibility offloads server-to-server traffic from the backbone, frees backbone bandwidth, and accelerates client-server performance.

The SunSwitch offers the following features:

- Two full-duplex Gigabit Ethernet ports on the base unit
- Eight half-duplex or full-duplex 10/100Mbps Ethernet ports
- IEEE 802.1d Spanning-Tree Protocol support
- 4,000 MAC addresses
- Large buffer memory: 256KB buffers on 10/100 Mbps ports, 1MB buffers on Gigabit Ethernet ports

The Switch Front Panel

The front panel of the SunSwitch has eight RJ-45 ports for connecting 10/100 Mbps Ethernet segments. The ports are auto-negotiating and support half- or full-duplex operation (see FIGURE 1-1).

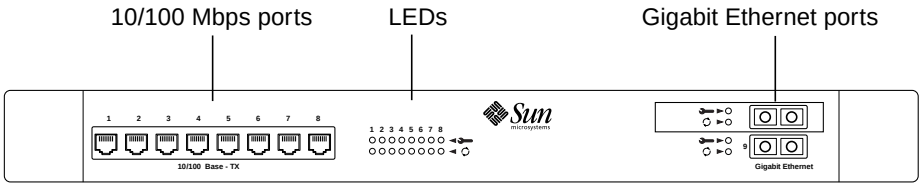

FIGURE 1-1 SunSwitch Front Panel

In addition, the switch comes with two SC-style ports for Gigabit Ethernet fiber connections.

In the center of the front panel are two rows of LEDs: the top row has yellow lights and the bottom row has green lights. TABLE 1-1 describes the lights and conditions represented by the state of the lights.

TABLE 1-1 Front Panel LEDs

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

The Rear Panel

The rear panel of the SunSwitch has these components (see FIGURE 1-2):

- A power switch and fuse
- An A/C power connector
- A female DB-9 serial connector labeled Serial Port A for the console connection

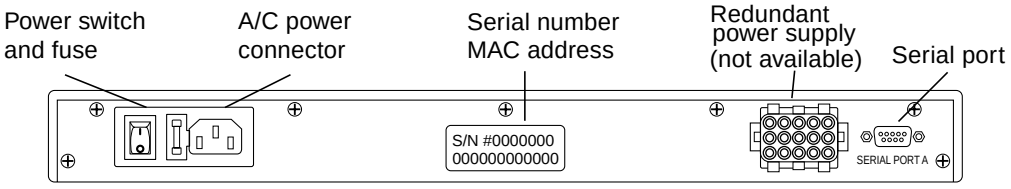

FIGURE 1-2 SunSwitch Rear Panel

CHAPTER 2

Installing the Switch

This chapter tells you how to install the SunSwitch.

The SunSwitch is shipped with the following items:

- An A/C power cord
- Two mounting brackets (for rack or wall mounting)
- Four rubber feet (for tabletop placement of the switch)
- Six Phillips screws for installing the mounting brackets

Switch installation involves these tasks:

- Unpacking the switch
- Mounting the switch
- Connecting the power cord and plugging it into a power outlet
- Connecting network cables to the switch
- Powering on the switch

Performing the Installation

Before installing the SunSwitch:

1. **Unpack the switch from the box.**
2. **Turn the power switch to the OFF (O) position.**

▼ To Install the SunSwitch

1. **Determine where the unit will be mounted from the following options:**
   - To mount the unit into an equipment rack, connect the two mounting brackets and install the switch, as shown in FIGURE 2-1 and FIGURE 2-2.

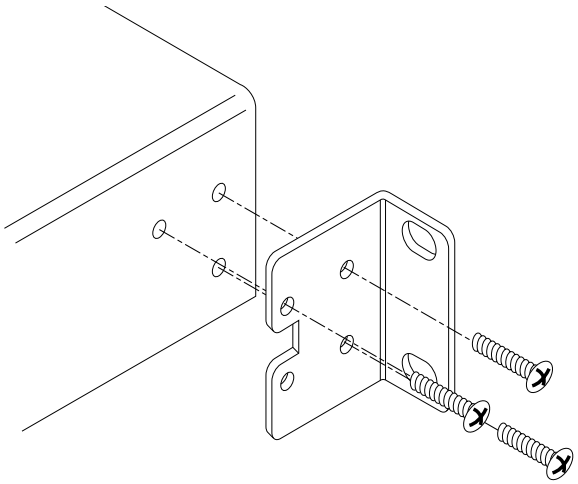

FIGURE 2-1 Positioning Mounting Brackets for Rack Mount

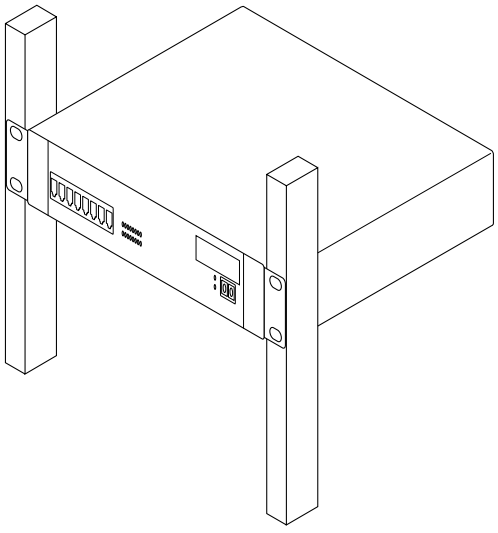

FIGURE 2-2 Rack Mounted SunSwitch

- To mount the unit to a wall, connect the mounting brackets and mount the switch as shown in FIGURE 2-3 and FIGURE 2-4.

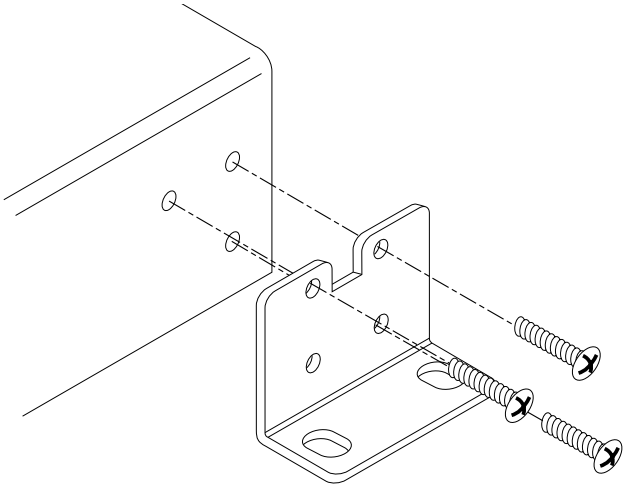

FIGURE 2-3 Positioning Brackets for Wall Mount

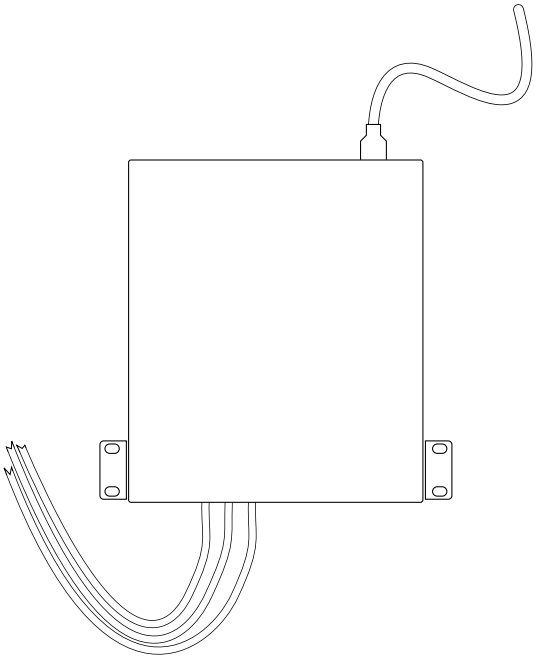

FIGURE 2-4 Wall Mounted SunSwitch

- To place the unit on a tabletop, connect the four rubber feet to the bottom of the switch.

Note – Do not use the rubber feet for a rack or wall mount installation.

---

2. **Connect the power cord to the SunSwitch, verify that the switch is powered off, and plug it into a properly fused socket.**
3. **Connect the Ethernet cables to the switch.**
4. **Power on (|) the switch.**

CHAPTER 3

The User Interface

The SunSwitch has an interactive command-line interface (CLI). The program contains a hierarchy of menus, which enable you to view information about the switch, view statistics, and configure the device.

You can access the command-line interface using either of two methods:

- A console connection via the console port
- A Telnet connection over the network

This chapter describes how to access the command-line interface, how to set passwords for the two command modes (user and administrator), and common commands.

Establishing a Console Connection

To establish a console connection with the SunSwitch, you will need:

- An ASCII terminal, or a computer running terminal emulation software (configured for 9,600 bps, 8 data bits, no parity, 1 stop bit)
- A standard male DB9 serial connector

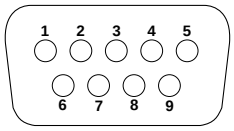

FIGURE 3-1 DB9 Serial Connector

TABLE 3-1 Pinouts for DB9 Serial Connector

Pin	Description
1	DCD
2	RxD
3	TxD
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	Not used

▼ To Establish a Console Connection

1. **Connect the terminal to the serial port A using the serial cable.**
2. **Power on the terminal.**
3. **Enter the password when prompted.**

   The default administrator password is `admin`. Once your password is verified, the Main menu is displayed (FIGURE 3-2).

   FIGURE 3-2 shows the Main menu for the Administrator command mode.

```
[Main Menu]
        info   -  Information Menu
        stats  -  Statistics Menu
        cfg    -  Configuration Menu
        boot   -  Boot Options Menu
        diff   -  Show pending config changes  [global command]
        apply  -  Apply pending config changes [global command]
        save   -  Save updated config to flash [global command]
        exit   -  Exit [global command, always available]

>> Main#
```

FIGURE 3-2 Administrator Main Menu

FIGURE 3-3 illustrates the administrator menu hierarchy.

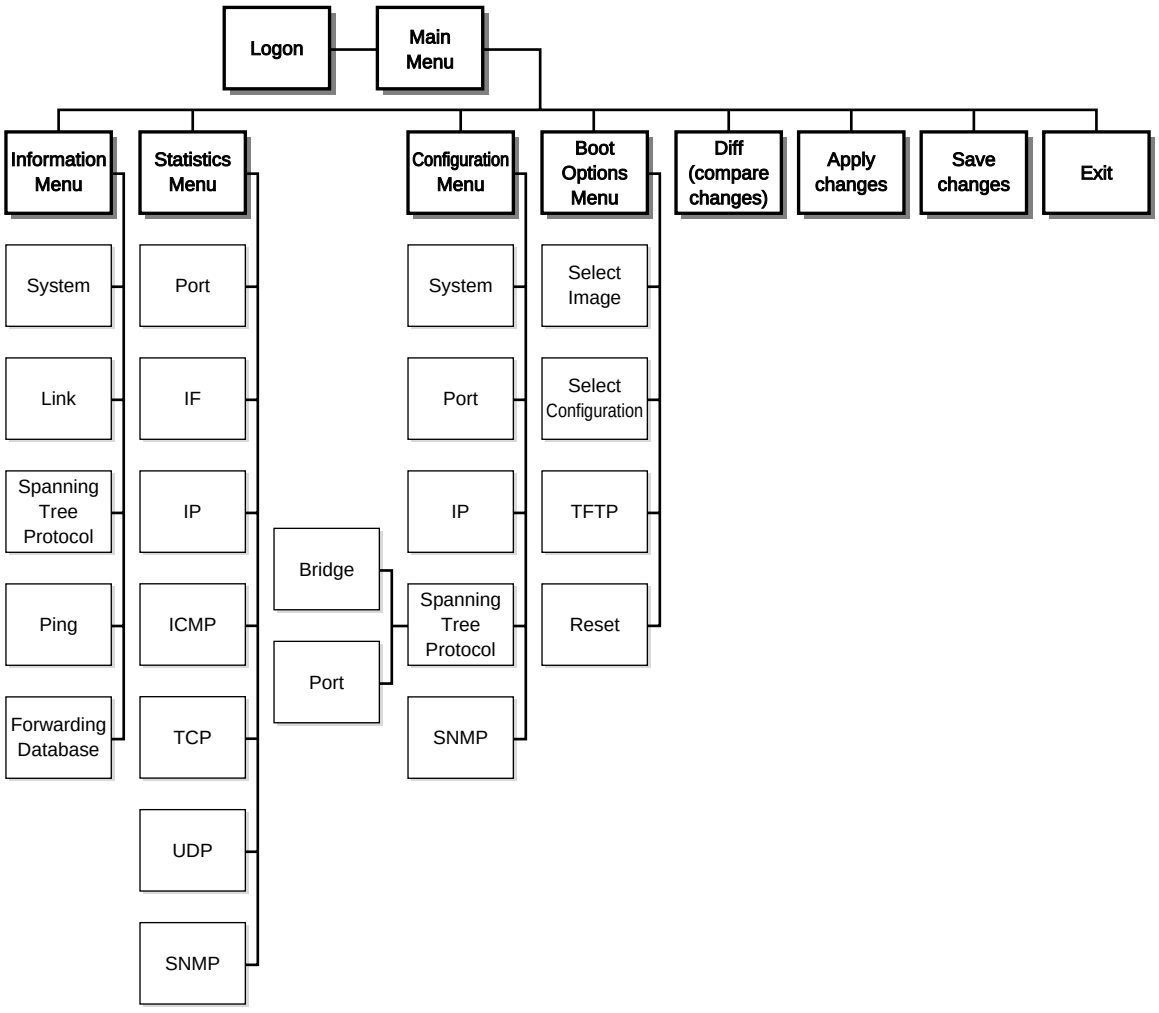

FIGURE 3-3 Administrator Menu Hierarchy

Idle Timeout

By default, the switch will disconnect your Telnet or console session after five minutes of inactivity. This function is controlled by the idle timeout parameter. For information on changing the idle timeout parameter, see “Configuring System Parameters” on page 32.

Establishing a Telnet Connection

A Telnet connection offers the convenience of accessing the switch from any workstation connected to the network. Telnet access provides the same options for user access and administrator access as those available through the console port.

Note – To configure the switch for Telnet access, you must have a device with Telnet software located on the same network as the switch.

The switch must have an IP address. The switch can get its IP address in one of two ways:

- Dynamically, from a bootp server on your network
- Manually, when you configure the IP address

Using a bootp Server

By default, the SunSwitch is set up to request its IP address from a bootp server. If you have a bootp server on your network, add the MAC address of the SunSwitch to the bootp configuration file located on the bootp server. The MAC address for the SunSwitch is located on the back panel of the switch, on a small white label. The MAC address can also be found in the System Information menu.

Configuring Switch IP Settings

If you do not have a bootp server on your network, disable bootp and manually configure the IP address, the subnet mask (if applicable), and the default gateway (if applicable) for the switch.

You must have administrative access to the switch to disable bootp and to configure the IP settings. Make sure that you typed the administrator password at the prompt when you first logged in, and that the screen prompts you with a pound sign (#), as shown in FIGURE 3-4.

```
Main#
```

FIGURE 3-4 Administrator Prompt

▼ To Disable bootp

1. **Select the Configuration menu by typing** `cfg`**.**

   The Configuration menu is displayed:

```
>> Main# cfg

[Configuration Menu]
        sys  -  System-wide parameter menu
        port -  Port configuration menu
        ip   -  IP addressing menu
        stp  -  Spanning Tree menu
        snmp -  SNMP menu

>> Configuration#
```

2. **Select system configuration, by typing** `sys`**.**

   The System menu is displayed:

```
>> sys

[System Menu]
        date  -  Set system date
        time  -  Set system time
        usrpw -  Set user password
        admpw -  Set administrator password
        idle  -  Set timeout for idle CLI sessions
        bootp -  Enable/disable use of BOOTP
        cur   -  Display current system-wide parameters

>> System#
```

3. **Disable bootp by typing** `bootp`**.**

4. **To return to the Main menu, type a forward slash**:

```
>> System# /
```

▼ To Configure the Switch IP Settings

1. **Select the Configuration menu by typing** `cfg`**.**

   The Configuration menu is displayed:

```
>> Main# cfg

[Configuration Menu]
        sys  -  System-wide parameter menu
        port -  Port configuration menu
        ip   -  IP addressing menu
        stp  -  Spanning Tree menu
        snmp -  SNMP menu

>> Configuration#
```

2. **Select IP configuration, by typing** `ip`**.**

   The IP menu is displayed:

```
>> Configuration# ip

[IP Menu]
       addr  -  Set switch IP address
       mask  -  Set IP subnet mask
       gw    -  Set IP default gateway
       log   -  Set IP address of syslog host
       cur   -  Display current IP configuration

>> IP#
```

   The IP menu options are as explained in the following table.

Option	Description
`addr`	The IP address of the switch
`mask`	The IP subnet address mask for the switch
`gw`	The IP default gateway address; the default gateway is the IP address of the default router for this segment
`log`	The IP syslog host address; if the address is defined, syslog messages are sent to this host

3. **After you configure the IP parameters, save your changes as follows:**

   a. **Type save at the** `IP#` **prompt to save the changes to flash memory.**

   b. **Type** `boot/reset` **at the** `IP#` **prompt to reset the switch and activate the new IP parameters.**

Running Telnet

Once you configure the IP parameters on the SunSwitch, you can access it using a Telnet connection. To establish a Telnet connection with the switch, run the Telnet program on your workstation and issue the Telnet command, followed by the switch IP address.

```
telnet ip-address
```

You are prompted to enter a password. Type the user or administrator password to see the Main Menu, as discussed in the next section.

Setting Passwords

After establishing a connection with the switch, change the user and administrator passwords. Typing the user password at the password prompt gives you read-only access to the switch. User access enables you to view operational information and statistics. The default user password is `user`.

To make changes to the switch configuration, use the administrator password. Administrative access enables you to view configuration information and statistics, as well as make configuration changes on the switch. The default administrator password is `admin`.

To change both the user password and the administrator password you must enter the administrator password at the "`Enter current administrator password:`" prompt. Passwords cannot be modified from the user command mode.

▼ To Change the Default Administrator Password

1. **Open the configuration menu at the** `Main#` **prompt by typing** `cfg`**.**

```
Main# cfg
```

The Configuration menu is displayed.

```
[Configuration Menu]
        sys  -  System-wide parameter menu
        port -  Port configuration menu
        ip   -  IP addressing menu
        stp  -  Spanning Tree menu
        snmp -  SNMP menu

>> Configuration#
```

2. **Select system parameters by typing** `sys` **at the** `Configuration#` **prompt.**

```
>> Configuration# sys
```

The System menu is displayed.

```
[System Menu]
        date  -  Set system date
        time  -  Set system time
        usrpw -  Set user password
        admpw -  Set system password
        idle  -  Set timeout for idle CLI sessions
        bootp -  Enable/disable use of BOOTP
        cur   -  Display current system-wide parameters

>> System#
```

3. **Select the administrator password by typing** `admpw` **at the** `System#` **prompt.**

```
System# admpw
```

4. **Type the current administrator password at the prompt:**

```
Enter current administrator password:
```

Note – If you forget your administrator password, call your SunService representative to use the password fix-up mode.

---

5. **Type the new administrator password at the prompt:**

```
Enter new administrator password:
```

6. **Type the new administrator password, again, at the prompt:**

```
Re-enter new administrator password:
```

7. **Save your change by typing:**

```
System# apply
System# save
```

▼ To Change the Default User Password

1. **Open the configuration menu at the** `Main#` **prompt by typing** `cfg`**.**

```
Main# cfg
```

The Configuration menu is displayed.

```
[Configuration Menu]
        sys  -  System-wide parameter menu
        port -  Port configuration menu
        ip   -  IP addressing menu
        stp  -  Spanning Tree menu
        snmp -  SNMP menu

>> Configuration#
```

2. **Select system parameters by typing** `sys` **at the** `Configuration#` **prompt.**

```
>> Configuration# sys
```

The System menu is displayed.

```
[System Menu]
        date  -  Set system date
        time  -  Set system time
        usrpw -  Set user password
        admpw -  Set system password
        idle  -  Set timeout for idle CLI sessions
        bootp -  Enable/disable use of BOOTP
        cur   -  Display current system-wide parameters

>> System#
```

3. **Select the user password by typing** `usrpw` **at the** `System#` **prompt.**

```
System# usrpw
```

4. **Type the current administrator password at the prompt.**

Only the administrator can change the user password. Entering the administrator password confirms your authority.

```
Enter current administrator password:
```

5. **Type the new user password at the prompt:**

```
Enter new user password:
```

6. **Type the new user password, again, at the prompt:**

```
Re-enter new user password:
```

7. **Save your change by typing:**

```
System# apply
System# save
```

Basic Commands

Some basic commands are recognized throughout the menu hierarchy of the command-line interface. They can be used to navigate through the various menus. TABLE 3-2 lists some basic commands.

TABLE 3-2 Basic Commands

Command	Action
`.`	Displays the current menu
`..`	Goes up one menu level
`/`	Goes to the main menu
`diff`	Shows pending configuration changes
`apply`	Applies pending configuration changes
`save`	Writes configuration changes to flash memory
`exit`	Exits the command-line interface
lines	Controls the number of lines that display on the screen at one time; the default is 24 lines
?	Provides more information about the options on a menu

Command-line Interface Shortcuts

The command-line interface includes a facility to display the desired menu option within the interface using a sequence of keyboard shortcuts. Keyboard shortcuts are useful for scripting strings of commands.

Keyboard shortcuts let you type in the command, separated by forward slashes (/). You can connect as many commands as required to access the menu option that you want.

For example, the keyboard shortcut to access the Spanning Tree Port Configuration menu from the `Main#` prompt is:

```
Main# cfg/stp/port
```

CHAPTER 4

Viewing Switch Information

You can view configuration and statistical information for the SunSwitch in both the user and administrator command modes. This chapter discusses how to use the command-line interface to display SunSwitch information.

Accessing the Information Menu

Use the Information menu to view SunSwitch configuration information.

- **To access the Information menu, at the** `Main#` **prompt, type:**

```
Main# info
```

The Information menu is displayed:

```
[Information Menu]
        sys  - Show system information
        link - Show link status
        stp  - Show STP information
        ping - Ping an IP host
        fdb  - Forwarding Database display menu

>> Information#
```

The Information menu has the following options; they are discussed in greater detail in the following sections.

- Display system information
- Display link status
- Display Spanning-Tree Protocol information
- Use the `ping` command
- Display forwarding database information

Displaying System Information

System information includes:

- System date and time
- Switch model name
- Switch name and location
- Software image file and version number
- Configuration name

- **To view system information, at the** `Information#` **prompt, type:**

```
Information# sys
```

The system information displayed will be similar to the following example:

```
System Information at 11:20:31 Fri Apr 8, 1997

Sun Microsystems, Inc. SunSwitch
sysName:       Finance Switch
sysLocation:   Building 3A
Last boot:  17:26:19  Fri  Apr  8, 1997 (reset from console)

MAC address:  00:11:22:33:44:55     IP address: 201.178.13.32
Hardware Revision B
Software Version 1.0.0 (FLASH image1), active configuration

>>Information#
```

Displaying Link Status

Link status displays configuration information about each port, including:

- Port number
- Port speed (10, 100, 10/100, 1000 or auto)
- Duplex mode (half, full, or auto)
- Flow control for transmit and receive (no, yes, or auto)
- Link status (up or down)

- **To see the status of the switch ports, at the** `Information#` **prompt, type:**

```
Information# link
```

The current link status is displayed:

```
Port  Speed  Duplex    FlowCtl    Link
----  -----  ------  --TX---RX--  ----
  1    100    full     no   no*    up
  2    100    full     no*  no*    up
  3     10*   half*    no*  no*    up
  4    100    full     no*  no*    up
  5  10/100   auto     no*  no*   down
  6    100    full     no*  no*    up
  7    100    full     no*  no*    up
  8    100    full     no*  no*    up
  9   1000*   full*    no*  no*    up
* = value set by configuration; not autonegotiated

>> Information#
```

Displaying Spanning-Tree Information

The SunSwitch uses the IEEE 802.1d Spanning-Tree Protocol (STP). In addition to seeing if STP is enabled or disabled, you can view the following STP bridge information:

- Priority
- Hello interval
- Maximum age value
- Forwarding delay
- Aging time

You can also see the following port-specific STP information:

- Port number
- Priority
- Cost
- State

- **To view STP information, at the** `Information#` **prompt, type:**

```
Information# stp
```

The current STP information is displayed:

```
Current Root:           Path-Cost Port Hello MaxAge FwdDel Aging
8000 00:60:cf:00:04:a2      10      1    2     20      15    300

Parameters:  Priority  Hello  MaxAge  FwdDel  Aging
               32768       2      20      15    300

Port  Priority   Cost     State
  1     128       10     FORWARDING
  2     128        0     FORWARDING
  3     128        0      DISABLED *
  4     128        0      DISABLED *
  5     128        5     FORWARDING
  6     128        0      DISABLED *
  7     128        0      DISABLED *
  8     128        0      DISABLED *
  9     128        1     FORWARDING
 10     128        1      DISABLED *
*=STP turned off for this port

>> Information#
```

TABLE 4-1 describes the STP parameters.

TABLE 4-1 Spanning-Tree Parameter Descriptions

Parameter	Description
`Priority`	The bridge priority parameter controls which bridge on the network will become the STP root bridge.
`Hello`	The hello time parameter specifies how often, in seconds, the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value.
`MaxAge`	The maximum age parameter specifies, in seconds, the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network.
`FwdDel`	The forward delay parameter specifies, in seconds, the amount of time that a bridge port has to wait before it changes from learning state to forwarding state.
`Aging`	The aging time parameter specifies, in seconds, the amount of time the bridge waits without receiving a packet from a station before removing the station from the Forwarding Database.
`Priority` (port)	The port priority parameter helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
`Cost`	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been autonegotiated.
`State`	The state parameter shows current state of the port. Options include BLOCKING, LISTENING, LEARNING, FORWARDING, and DISABLED.

Using `ping`

You can use the `ping` command to verify station-to-station connectivity across the network.

- **To verify connectivity with a device, at the `Information#` prompt, type:**

```
Information# ping IP-address
```

where *IP-address* is the IP address of the device using dotted decimal notation. For example:

```
Information# ping 191.17.235.18
```

Viewing Forwarding Database Information

The forwarding database (FDB) contains information that maps the media access control (MAC) address of each known device to the appropriate switch port on which the device address was learned. The FDB also shows which other ports have seen frames destined for a particular MAC address.

- **To access the Forwarding Database menu, at the `Information#` prompt, type:**

```
Information# fdb
```

The Forwarding Database menu is displayed.

```
[Forwarding Database Menu]
        find  - Show a single FDB entry
        port  - Show FDB entries for a single port
        refpt - Show FDB entries referenced by a single port
        dump  - Show all FDB entries
        stats - Show FDB statistics

>> Forwarding Database#
```

- **To view information for a particular FDB entry, at the** `Forwarding Database#` **prompt, type:**

```
Forwarding Database# find
```

You are prompted to enter the MAC address of the device. Enter the MAC address using the format, `xx:xx:xx:xx:xx:xx`. For example, `08:00:20:12:34:56`.

You can also enter the MAC address using the format, `xxxxxxxxxxxx`. For example, `080020123456`.

- **To show the FDB entries for a particular port, at the** `Forwarding Database#` **prompt, type:**

```
Forwarding Database# port port-number
```

- **To show FDB entries referenced by a single port, at the** `FDB Display#` **prompt, type:**

```
Forwarding Database# refpt port -number
```

The current FDB information referenced by that port is displayed:

```
-- MAC Address    Port  State  Referenced from Ports...
08:00:20:73:b4:98   4    FWD    1  7  8
08:00:20:81:24:1d   6    FWD    1  2
08:00:20:81:9a:db   3    FWD    1

>> Forwarding Database#
```

- **To show all FDB entries, at the** `FDB Display#` **prompt, type:**

```
Forwarding Database# dump
```

The current FDB information is displayed:

```
   MAC Address     Port   State   Referenced from Ports...
00:a0:24:76:be:90   1      FWD
00:a0:24:c6:56:28   1      FWD
08:00:20:0a:a7:7f   2      FWD
08:00:20:73:b6:29   1      FWD
08:00:20:7e:85:bd   2      FWD
08:00:20:82:4d:8d   3      FWD
08:00:20:8a:54:2b          UNK

>> Forwarding Database#
```

An address that is in the forwarding (FWD) state means that it has been learned by the switch. If the state for the port is listed as unknown (UNK), the MAC address has not yet been learned by the switch, it has only been seen as a destination address. When an address is in the unknown state, no port is indicated.

- **To show Forwarding Database statistics, at the** `Forwarding Database#` **prompt, type:**

```
Forwarding Database# stats
```

Using the Statistics Menu

The Statistics menu displays statistical information about the SunSwitch. You can view the following information using the Statistics menu:

- Traffic statistics for a single port
- IP statistics
- ICMP statistics
- TCP statistics
- UDP statistics

Accessing the Statistics Menu

- **To access the Statistics menu, at the** `Main#` **prompt, type:**

```
Main# stats
```

The Statistics menu is displayed:

```
[Statistics Menu]
        port  -  Statistics Menu for one port
        if    -  IF interface (“if”) statistics
        ip    -  IP statistics
        icmp  -  ICMP statistics
        tcp   -  TCP statistics
        udp   -  UDP statistics
        snmp  -  SNMP statistics

>> Statistics#
```

Displaying Port Statistics

The SunSwitch provides traffic statistics on a port-by-port basis. Traffic statistics include SNMP Management Information Base (MIB) objects from three groups:

- Bridging (dot1)
- Ethernet (dot3)
- Interface (if)

- **To view traffic statistics for a port, at the** `Statistics#` **prompt, type:**

```
Statistics# port port-number
```

The Port Statistics menu is displayed:

```
[Port Statistics Menu]
        brg   -  Bridging (“dot1”) stats
        ether -  Ethernet (“dot3”) stats
        if    -  Interface (“if”) stats

>>Port Statistics#
```

Select the type of statistics you want to see for the port by typing the appropriate entry from the Port Statistics menu.

Displaying Protocol Statistics

You can display protocol statistics for the following protocols:

- IP
- ICMP
- TCP
- UDP
- SNMP

- **To display statistics for a particular protocol, at the `Statistics#` prompt, type the name of the protocol (`IP`, `ICMP`, `TCP`, or `UDP`).**

```
Statistics# protocol
```

Displaying Interface Statistics

- **To display interface statistics for the management process, at the `Statistics#` prompt, type:**

```
Statistics# if
```

CHAPTER 5

Configuring the Switch

This chapter discusses how to make, view, and save switch configuration changes.

Using the command-line interface, you can make configuration changes to the SunSwitch. To make changes to the switch, you must enter the administrator password at the prompt when you are connected to the device.

This chapter describes the following parameters, which can be modified on the SunSwitch:

- System parameters
- Port parameters
- IP parameters
- Spanning-Tree parameters
- SNMP parameters

Note – After you make a configuration change to the switch, you must *apply* the change.

Using the Configuration Menu

The Configuration menu displays configuration options for the SunSwitch.

- **To access the Configuration menu, at the `Main#` prompt, type:**

```
Main# cfg
```

The Configuration menu is displayed:

```
[Configuration Menu]
        sys  -  System-wide parameter menu
        port -  Port configuration menu
        ip   -  IP addressing menu
        stp  -  Spanning Tree menu
        snmp -  SNMP menu

>> Configuration#
```

The Configuration menu has configuration options for the following parameters:

- System parameters
- Port parameters
- IP parameters
- Spanning-Tree parameters
- SNMP parameters

Configuring System Parameters

System parameters affect the operation of the switch globally, as well as the operation of individual switch ports. System parameters that can be modified include:

- Date
- Time
- User password
- Administrator password
- Idle timer
- Bootp

- **To modify system parameters, at the** `Configuration#` **prompt, type:**

```
Configuration# sys
```

The System menu is displayed:

```
[System Menu]
        date  -  Set system date
        time  -  Set system time
        usrpw -  Set user password
        admpw -  Set administrator password
        idle  -  Set timeout for idle CLI sessions
        bootp -  Enable/disable use of BOOTP
        cur   -  Display current system-wide parameters

>> System#
```

TABLE 5-1 describes the System menu options.

TABLE 5-1 System Menu Options

Option	Description
`date`	Configures the system date
`time`	Configures the system time using a 24-hour clock format
`usrpw`	Configures the user password; the user password can have a maximum of 15 characters
`admpw`	Configures the administrator password; the administrator password can have a maximum of 15 characters
idle	Configures the idle timeout for command-line interface sessions; the range is 1 - 60 minutes, and the default is 5 minutes
`bootp`	Enables / disables the use of bootp; if you enable bootp, the switch will query its bootp server for all of the switch IP parameters, including the switch IP address
`cur`	Displays current system parameters

Configuring Port Parameters

- **To configure a port, at the** `Configuration#` **prompt, type:**

```
Configuration# port port-number
```

The Port menu is displayed:

```
[Port 1 Menu]
        speed - Set link speed [“auto”/”10”/”100”/”1000”]
        mode  - Set operating mode [“auto”/”full”/”half”]
        fctl  - Set flow control [“auto”/”rx”/”tx”/”both”/”none”]
        dis   -  Disable port
        ena   -  Enable port
        cur   -  Display current port configuration

>> Port 1#
```

Port configuration options are described in TABLE 5-2.

TABLE 5-2 Port Configuration Options

Option	Description
`speed`	Sets the link speed; the choices include: • Automatic detection • 10 Mbps • 100 Mbps • 1000 Mbps
`mode`	Sets the operating mode; the choices include: • Autonegotiation • Full-duplex • Half-duplex
`fctl`	Sets the flow control; the choices include: • Autonegotiation • Receive flow control • Transmit flow control • Both receive and transmit flow control • No flow control

TABLE 5-2 Port Configuration Options *(Continued)*

Option	Description
`dis`	Disables the port
`ena`	Enables the port
`cur`	Displays current port parameters

You can only configure options that are supported by the port. For example, you cannot configure a port speed of 1000 for a 10/100 Mbps port.

Configuring IP Parameters

The IP menu provides access to the switch IP parameters. IP parameters are configured to provide Telnet and SNMP management access to the switch.

- **To configure IP parameters, at the** `Configuration#` **prompt, type:**

```
Configuration# ip
```

The IP menu is displayed:

```
[IP Menu]
       addr  -  Set switch IP address
       mask  -  Set IP subnet mask
       gw    -  Set IP default gateway
       log   -  set IP address of syslog host
       cur   -  Display current IP configuration

>> IP#
```

TABLE 5-3 describes the IP menu options.

TABLE 5-3 IP Menu Options

Option	Description
`addr`	Configures the IP address of the switch using dotted decimal notation
`mask`	Configures the IP subnet address mask for the switch using dotted decimal notation
`gw`	Configures the default gateway for the switch using dotted decimal notation; the default gateway is the IP address of the default router for this segment
log	Configures the IP address of the syslog host. If configured, log messages are sent to the syslog host.
`cur`	Displays current IP configuration settings

Syslog Host Messages

If an IP address is configured for the syslog host, the SunSwitch logs the following messages to it:

TABLE 5-4 Syslog Host Messages

Level	Message
NOTICE	booted
NOTICE	reset from console
NOTICE	reset from Telnet
ERR	PANIC ()
ERR	VERIFY (*text*)
ERR	ASSERT (*text*)
NOTICE	admin password changed
NOTICE	syslog host changed
NOTICE	boot config block changed
NOTICE	boot image changed
INFO	new configuration applied (general)
INFO	new configuration saved (general)

TABLE 5-4 Syslog Host Messages *(Continued)*

Level	Message
INFO	new software image downloaded
INFO	Telnet login
INFO	Telnet logout
INFO	Console login
INFO	Console logout
NOTICE	PASSWORD FIX-UP MODE IN USE

Configuring Spanning-Tree Parameters

The SunSwitch supports the IEEE 802.1d Spanning-Tree Protocol (STP). STP is used to prevent loops in the network topology.

- **To configure STP parameters, at the** `Configuration#` **prompt, type:**

```
Configuration# stp
```

The Spanning-Tree menu is displayed:

```
[Spanning Tree Menu]
        brg   -  Bridge parameter menu
        port  -  Port parameter menu
         on   -  Globally turn Spanning Tree ON
        off   -  Globally turn Spanning Tree OFF
        cur   -  Current bridge parameters

>> Spanning Tree#
```

TABLE 5-5 describes the Spanning-Tree menu options.

TABLE 5-5 Spanning-Tree Menu Options

Option	Description
`brg`	Displays the bridge parameter menu
`port`	Displays the port parameter menu
`on`	Globally enables STP
`off`	Globally disables STP
`cur`	Displays current STP parameters

Configuring Spanning-Tree Bridge Parameters

Spanning-Tree bridge parameters affect the global STP operation of the switch. STP bridge parameters include:

- Bridge priority
- Bridge hello time
- Bridge maximum age
- Forwarding delay
- Bridge aging time

- **To configure STP bridge parameters, at the** `Spanning-Tree#` **prompt, type:**

```
Spanning Tree# brg
```

The Bridge Spanning-Tree menu is displayed:

```
[Bridge Spanning Tree Menu]
        prior - Set bridge Priority (0-65535)
        hello - Set bridge Hello Time (1-10 secs)
        mxage - Set bridge Max Age (6-40 secs)
        fwd   - Set bridge Forward Delay (4-30 secs)
        aging - Set bridge Aging Time (1-65535 secs, 0 to disable)
        cur   - Display current bridge parameters

>> Bridge Spanning Tree#
```

Bridge Spanning-Tree menu options are described in TABLE 5-6.

TABLE 5-6 Bridge Spanning-Tree Menu Options

Option	Description
`prior`	Configures the bridge priority. The bridge priority parameter controls which bridge on the network is the STP root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority. The range is 0 - 65535, and the default is 32768.
`hello`	Configures the bridge hello time. The hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value. The range is 1-10 seconds, and the default is 2 seconds.
`mxage`	Configures the bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it reconfigures the STP network. The range is 6-40 seconds, and the default is 20 seconds.
`fwd`	Configures the bridge forward delay parameter. The forward delay parameter specifies the amount of time that a bridge port has to wait before it changes from learning state to forwarding state. The range is 4-30 seconds, and the default is 15 seconds.
`aging`	Configures the forwarding database aging time. The aging time specifies the amount of time the bridge waits without receiving a packet from a station before removing the station from the forwarding database. The range is 1-65535 seconds, and the default is 300 seconds. To disable aging, set this parameter to `0`.
`cur`	Displays current bridge STP parameters.

When configuring STP bridge parameters, the following formulas must be followed:

- $2*(fwd-1) \geq mxage$
- $2*(hello+1) \leq mxage$

Configuring Spanning-Tree Port Parameters

Spanning-Tree port parameters are used to modify STP operation on an individual port. STP port parameters include:

- Port priority
- Port path cost

- **To configure STP port parameters, at the** `Spanning Tree#` **prompt, type:**

```
Spanning Tree# port port-number
```

The Spanning-Tree Port menu is displayed:

```
[Spanning Tree Port 1 Menu]
        on     -  Turn port's Spanning Tree ON
        off    -  Turn port's Spanning Tree OFF
        prior  -  Set port Priority (0-255)
        cost   -  Set port Path Cost (1-65535, 0 for default)
        cur    -  Display current port Spanning Tree parameters

>> Spanning Tree Port 1#
```

The Spanning-Tree Port menu options are described in TABLE 5-7.

TABLE 5-7 Spanning-Tree Port Menu Options

Option	Description
`on`	Enables STP on the port.
`off`	Disables STP on the port.
`prior`	Configures the port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment. The range is 0-255, and the default is 128.
`cost`	Configures the port path cost. The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. The range is 1-65535. The default is 10 for 100Mbps ports, and 1 for gigabit ports. A value of 0 indicates that the default cost will be computed for an autonegotiated link speed.
`cur`	Displays current STP port parameters.

Configuring SNMP Parameters

The SunSwitch supports SNMP-based network management. If you are running an SNMP network management station on your network, you can manage the switch using the following standard SNMP MIBs:

- MIB II (RFC 1213)
- Ethernet MIB (RFC 1643)
- Bridge MIB (RFC 1493)

SNMP parameters that can be modified include:

- System name
- System location
- System contact
- Use of the SNMP system authentication trap function
- Read community string
- Write community string
- Trap hosts

- **To configure SNMP parameters, at the** `Configuration#` **prompt type:**

```
Configuration#snmp
```

The SNMP menu is displayed:

```
[SNMP Menu]
        name   -  Set SNMP “sysName”
        locn   -  Set SNMP “sysLocation”
        cont   -  Set SNMP “sysContact”
        auth   -  Disable/enable SNMP “sysAuthenTrap”
        rcomm  -  Set SNMP read community string
        wcomm  -  Set SNMP write community string
        trap1  -  Set IP addr of first SNMP trap host
        trap2  -  Set IP addr of second SNMP trap host
        cur    -  Display current SNMP information

>> SNMP#
```

The SNMP menu options are described in TABLE 5-8.

TABLE 5-8 SNMP Menu Options

Option	Description
`name`	Configures the name for the system. The name can have a maximum of 64 characters.
`locn`	Configures the system location. The system location can have a maximum of 64 characters.
`cont`	Configures the system contact. The system contact can have a maximum of 64 characters.
`auth`	Enables or disables the use of the system authentication trap facility. The default setting is disabled.
`rcomm`	Configures the SNMP read community string. The read community string controls SNMP “get” access to the switch. It can have a maximum of 32 characters.
`wcomm`	Configures the SNMP write community string. The write community string controls SNMP “set” and “get” access to the switch. It can have a maximum of 32 characters.
`trap1`	Configures the IP address of the first SNMP trap host using dotted decimal notation. The SNMP trap host is the device that receives SNMP trap messages from the switch.
`trap2`	Configures the IP address of the second SNMP trap host using dotted decimal notation.
`cur`	Displays current SNMP information.

Viewing, Applying, and Saving Changes

Once you have made configuration changes to the switch, the changes are pending. While pending, you can do the following:

- View the pending changes
- Apply the pending changes
- Save the changes to flash memory

Viewing Pending Changes

- **To view the pending configuration changes, type `diff` at the `Main#` prompt.**

Note – The `diff` command is a global command. Therefore, you can type `diff` at any prompt in the administrative interface.

Applying Pending Changes

To make the changes active, you must apply them.

- **To apply configuration changes, type `apply` at an administrative prompt.**

```
#apply
```

Note – The `apply` command is a global command. Therefore, you can type `apply` at any prompt in the administrative interface.

With the exception of IP configuration changes and starting STP, once your changes are applied they take effect immediately.

Note – To make a change to the switch IP address or subnet mask take effect and to turn STP on and off, you must save the configuration and reset the switch after applying the changes.

For information about resetting the switch, see Chapter 6, “Configuring Boot Options.”

Saving the Configuration

In addition to applying the configuration changes, you can save them to flash memory on the switch.

Note – If you do not save the changes, they will be lost the next time the system is rebooted.

- **To save the new configuration, type `save` at an administrative prompt.**

```
#save
```

When you save configuration changes, the changes are saved to the active configuration block. The configuration that resided in the active block prior to doing the save is first copied to the backup configuration block. If you do not want the active configuration block copied to the backup configuration block, type:

```
#save noback
```

You can decide which configuration you want to run the next time you reset the switch. Your options include:

- The active configuration block
- The backup configuration block
- Factory default configuration

For instructions on selecting the configuration to run at the next system reset, see Chapter 6, “Configuring Boot Options.”

CHAPTER 6

Configuring Boot Options

The Boot Options menu is part of the SunSwitch administrator command-line interface. It provides options for:

- Selecting an image to be used for the next system reset
- Selecting a configuration block to be used for the next system reset
- Downloading a new software image to the switch via TFTP

Using the Boot Options Menu

To use the Boot Options menu, you must be logged in to the switch as the administrator. Access the Boot Options menu from the Main menu, as shown in FIGURE 6-1.

```
[Main Menu]
        info   -  Information Menu
        stats  -  Statistics Menu
        cfg    -  Configuration Menu
        boot   -  Boot Options Menu
        diff   -  Show pending config changes  [global command]
        apply  -  Apply pending config changes [global command]
        save   -  Save updated config to flash [global command]
        exit   -  Exit [global command]

>> Main#
```

FIGURE 6-1 Administrator Main menu

- **To access the Boot Options menu, at the `Main#` prompt, type:**

```
Main# boot
```

The Boot Options menu is displayed.

```
[Boot Options Menu]
        image  -  Select software image to use on next boot
        conf   -  Select config block to use on next boot
        tftp   -  Download new software image via TFTP
        reset  -  Reset switch [WARNING: Restarts Spanning Tree]
        cur    -  Display current boot options

>> Boot Options#
```

Loading and Selecting a Software Image

The software image is the executable code running on the SunSwitch. A version of the image ships with the switch, and comes pre-installed on the device. As new versions of the software image are released, you can upgrade the version running on your switch.

Upgrading the software image on your switch requires a three step-process:

- Loading the new image onto a TFTP server on your network
- Downloading the new image from the TFTP server to your switch
- Selecting the new software image to be loaded into switch memory the next time the switch is reset

Downloading a New Image to Your Switch

The SunSwitch can store up to two different software images, called `image1` and `image2`. When you download a new software image, you must specify where the new image should be placed, either into `image1` or into `image2`.

For example, if your active image is currently loaded into `image1`, you would probably load the new image software into `image2`. This enables you to test the new software and reload the original active image (stored in `image1`), if needed.

To download a new software image to your switch, you will need the following:

- The image loaded on a TFTP server on your network
- The IP address of the TFTP server
- The name of the new software image file

▼ To Download the New Image to Your Switch

1. **At the** `Boot Options#` **prompt, type:**

```
Boot Options# tftp
```

2. **Enter the name of the switch software image to be replaced:**

```
Enter name of switch software image to be replaced
 ["image1"/"image2"]:
```

3. **Enter the IP address of the TFTP server using dotted decimal notation.**

```
Enter IP address of TFTP server:
```

4. **Enter the name of the new software image file on the server.**

```
Enter name of file on TFTP server:
```

   The exact form of the name will vary by TFTP server. However, the file location is normally relative to the TFTP directory (usually `/tftpboot`).

5. **The systems prompts you to confirm your request.**

Selecting a Software Image to Run

You can select which software image (`image1` or `image2`) you want to run in switch memory for the next reboot.

▼ To Select a Software Image to Be Loaded

1. **At the** `Boot Options#` **prompt, type:**

```
Boot Options# image
```

The system prompts by telling you the current image that will be loaded at the next reset.

```
Currently set to use switch software “image1” on next boot.
```

2. **Type the name of the image to use on the next boot.**

```
Specify new image to use on next boot [“image1”/”image2”]:
```

Selecting a Configuration Block

When you make configuration changes to the switch, you must save the changes so that they are retained and can take effect at the next system reset. Changes are saved to the *active* configuration block. The configuration that was running prior to doing the save is first saved to the *backup* configuration block.

You can decide which configuration block you want the switch to load the next time it is reset. Select from the following options:

- Active
- Backup
- Factory default

▼ To Select a Configuration Block to Be Loaded

1. **At the** `Boot Options#` **prompt, type:**

```
Boot Options# conf
```

The system prompts by telling you the configuration block that will be loaded at the next reset.

```
Currently set to use active config block on next boot.
```

2. **Type the name of the configuration block you want the switch to use.**

```
Specify new block to use [“active”/”backup”/”factory”]:
```

Resetting the Switch

You can reset the switch to make your software image file and configuration block changes occur.

Note – Resetting the switch causes the Spanning-Tree Protocol to restart. This process can be lengthy, depending on the topology of your network.

- **To reset the switch, at the** `Boot Options#` **prompt, type:**

```
>> Boot Options# reset
```

You are prompted to confirm your request.

CHAPTER 7

Switch Maintenance

A *dump* is a flash-resident snapshot of critical state information contained in the switch. The Maintenance menu is used to manage dump information. This chapter describes the Maintenance menu options.

Capturing Dump Information

Dump information contains internal switch state data that is written to flash memory on the switch after any one of the following:

- The switch administrator forces a switch panic. The panic option, found in the Maintenance menu, causes the switch to dump state information to flash memory and then causes the switch to reboot.
- The switch administrator enters the switch reset key combination on a device attached to the console port. The switch reset key combination is Shift-Control-6.
- The watchdog timer forces a switch reset. The purpose of the watchdog timer is to reboot the switch if the switch software freezes.
- The switch detects a hardware or software problem that requires a reboot.

Using the Maintenance Menu

To use the Maintenance menu, you must be logged in to the switch as the administrator. Access the Maintenance menu from the Main menu (FIGURE 7-1).

```
[Main Menu]
        info   -  Information Menu
        stats  -  Statistics Menu
        cfg    -  Configuration Menu
        boot   -  Boot Options Menu
        diff   -  Show pending config changes  [global command]
        apply  -  Apply pending config changes [global command]
        save   -  Save updated config to flash [global command]
        exit   -  Exit [global command, always available]

>> Main#
```

FIGURE 7-1 Administrator Main Menu

To access the Maintenance menu, at the `Main#` prompt, type:

```
Main# maint
```

The Maintenance menu is displayed.

```
[Maintenance Menu]
        uudmp   -  Uuencode FLASH dump
        cldmp   -  Clear FLASH dump
        panic   -  Dump state information to FLASH and reboot

>> Maintenance#
```

Accessing Dump Information

Dump information is presented in uuencoded format. This format make s it easy to capture the dump information as a file or a string of characters. You can then contact Sun Technical Support for help in analyzing the information.

The `uudmp` command reads the dump information from the flash memory, uuencodes it and displays it on the screen. If you want to capture dump information to a file, set the communication software on your workstation prior to issuing the command. This will ensure that you do not lose any information. Once entered, the command will cause approximately 1460 lines of data to be displayed on your screen and copied into the file.

Using the `uudmp` command, dump information can be read multiple times. the command does not cause the information to be cleared from flash memory.

Note – Dump information is not cleared automatically. You must manually clear the dump region before any subsequent dump information can be written to flash memory. For more information on clearing the dump region, see “Clearing Dump Information.”

To access dump information, at the `Maintenance#` prompt, type:

```
Maintenance# uudmp
```

The dump information is displayed on your screen and if you have configured your communication software to do so, captured to a file.

If the dump region is empty, the following message appears:

```
No FLASH dump available.
```

Clearing Dump Information

To clear dump information from flash memory, at the `Maintenance#` prompt, type:

```
Maintenance# cldmp
```

You are prompted to confirm your request.

The switch clears the dump region of flash memory and displays the following message:

```
FLASH dump region is already clear.
```

Using the Panic Command

The `panic` command causes the switch to immediately dump state information to flash memory and automatically reboot.

To access panic, at the `Maintenance#` prompt, type:

```
Maintenance# panic
```

Type y to confirm the dumping and rebooting:

```
Confirm dump and reboot [y/n] y
```

Messages similar to the following example are displayed:

```
Starting system dump...done.

Reboot at 11:54:08 Thursday June 26, 1997...

Boot version 1.0.1

SunSwitch 1.0

Rebooted because of console PANIC command.

Booting complete 11:55:01 Thursday June 26, 1997
```

Unscheduled System Dumps

If there is an unscheduled system dump to flash memory, the message similar to the following example is displayed when you log on to the switch:

```
Note: A system dump exists in FLASH. The dump was saved at 13:43:22
      Fri Jun 27, 1997. Use /maint/uudmp to extract the dump for
      analysis and /maint/cldmp to clear the FLASH region. The
      region must be cleared before another dump can be taken.
```

To extract the dump and clear the flash memory, follow the instructions outlined previously in this chapter.

CHAPTER 8

Troubleshooting Procedures

This chapter describes the most common problems that might occur with the SunSwitch, lists the probable causes for the problems, and the possible solutions.

Definitions

Management Processor (MP)
The processor that handles management of SunSwitch. It processes SNMP operation, CLI, Telnet, and Spanning Tree.

Switch Processor (SP)
The switch processor that processes both switched user frames and switched management frames.

Forwarding Data Base (FDB)
This is the data base of learned and being-learned MAC Addresses.

Spanning Tree Protocol (STP)
The IEEE 802.1d specified loop prevention protocol widely used in Ethernet bridge networks.

Bridge Protocol Data Unit (BPDU)
Frames used to convey Spanning Tree information to form a loop-free network topology.

Simple Thread Execution Model (STEM)
The “microkernel” of the MP.

System Problems

This section lists the most common system problems, their causes, and solutions.

Reset Problem

- **Symptom:** All LEDs (both yellow and green) for 10/100 and Gigabit ports are on after switch reset without any cables connected to the ports.

  Possible Causes:

  - Special character was typed while switch was coming up after reset and switch is in Serial Software Download mode
  - Esc key was hit and the switch booted with the maintenance kernel
  - SP bring up failed due to DMA lock up or other unknown reason.
  - Bad Serial EEPROM
  - Corrupted boot software region or active MP kernel region in flash
  - PCI card is inserted incorrectly.

  Things to Check:

  Check the last message on the console connected to the switch for the following:

  - "Download binary flash image using Xmodem now."
  - "booting maintenance kernel....."

  Action:

  - If the last message displayed was a normal prompt, similar to the example,

```
Rebooted because of reset from console
Booting complete 14:02:11 Thu May 22, 1997:
Version 1.0.0.6 from FLASH image1, active config block

Enter password
```

    check and re-seat the PCI card in the extension slot.

  - If the last message displayed was *not* a normal prompt:

    Access the maintenance kernel and set `boot_verbose` flag (`/debug/flags 0x00000001`)

Reset the switch and see if the SP bring up fails.

If the SP bring up fails, extract the console display, send it to Sun Technical Support, and replace the switch.

Switch Management Problem

- **Symptoms:** Cannot `ping` the switch. Cannot Telnet into the switch. MIB Browser cannot discover the switch. Traps are not sent.

  Possible Causes:

  - Incorrect Switch IP configuration
  - Link state of the port the pinging station is connected to is in the `down' state
  - Spanning Tree port state is not in `forwarding' state
  - ARP or ICMP Echo frames are not forwarded to MP
  - Incorrect SNMP community strings
  - Trap server is not specified
  - Switch IP address is used by some other device in the network

  Action:

  - Check `/cfg/ip/cur` to be sure the switch IP address, subnet mask, and default gateway configurations are correct.
  - Check `/info/link` to be sure the management port link is in the ‘up’ state.
  - Check `/info/stp` to be sure management port Spanning Tree is in ‘forwarding’ state.
  - Check `/cfg/snmp/cur` to be sure SNMP community strings are correct.
  - Check `/cfg/snmp/cur` to be sure the Trap server is specified.
  - Check for duplicate IP address and correct if needed.

SNAP Problem

- **Symptoms:** If a console is hooked up to the switch, a message will indicate that the switch had taken a “snap trace”

  Possible Causes:

  - Watchdog Timer: If the Management Processor fails to refresh the on-board timer, this will reset the processor which will initiate a snap trace and reset of the switch.

- Different software resets: Upon encountering certain error conditions or anomalies, the software will trigger a panic which in turn will generate a snap trace, coredump, and reset switch.

Action:

- Messages: Any message(s) on the console will have to be recorded and sent to Sun Technical Support.
- Coredump: Retrieve the coredump (if available) by getting into the maintenance menu and invoking the `uudmp` option. Alternately, you can type `/maint/uudmp` to retrieve the coredump.

Switch Lockup Problem

- **Symptom:** No response to console input. Cannot `ping` or Telnet. LEDs are lit solid yellow, indicating non-connected ports.

Potential Causes:

- SP crash
- Switch reset

Things to Check:

- Check for any port-to-port traffic
- Check the status of the LEDs (both yellow and green)
- Check for any response to `ping` or Telnet to the switch

Action:

- Verify that you can connect a console to the switch and get to the CLI
- Verify that the messages stopped printing to the console in mid-stream

Physical Layer Problems

This section lists the most common physical layer problems, their causes, and solutions.

Link Problem

- **Symptom:** Green link LED does not come on. Link state is in “down” state from the CLI (`/info/link`)

  Potential Causes:

  - Port Configuration mismatch between the SunSwitch and the other device.
  - Bad or incorrect cable
  - Bad link status LED

  Action:

  - If ports are configured with specific values such as 100Mbs speed, then make sure the other device is configured the same way.
  - Port Configuration: Make sure both the switch port and the other device are configured with the same negotiation mode. If switch port is configured with either Speed or Duplex Mode in `auto', the other device must have the same configuration. Flow Control can be configured through CLI asymmetrically. You can configure Flow Control for Transmit and Receive separately or together.
  - Check the cabling between the switch and the other device. If the other device is a workstation, straight through cable should be used. However, if it is either another switch or a hub, cross-over cable should be used unless there is a “uplink” enable/disable switch on the switch or hub.

    Pin Outs for Cross-over cable

    pin 1 ---------- pin 3

    pin 2 ---------- pin 6

    pin 3 ---------- pin 1

    pin 6 ---------- pin 2
  - Check link status in `/info/link`. If link state is “up”, then the problem must be a bad LED.

Switching Problems

This section lists the most common switching problems, their causes, and solutions.

Connectivity Problem

- **Symptom:** Client `A' on port 1 cannot connect to server `B' on port 2

  Potential Causes:

  - Incorrect configuration of client/server machines: the IP address is wrong.
  - Ports 1 or 2 may be down. (Link down).
  - Spanning Tree Port State is not in `Forwarding' state.
  - Frames from either `A' or `B' are received with errors or not transmitted due to error conditions on outgoing port.
  - MAC Address of either `A' or `B' is learned incorrectly from ports other than 1 and 2.

  Action:

  - Check `/info/link` to be sure link state is up.
  - Check `/info/stp` to be sure Spanning Tree Port is in ‘forwarding’ state.
  - Check port interface statistics (`/stats/port 1/if`: where 1 is the port number) to see whether ifInErrors, ifInDiscards, ifOutErrors, or ifOutDiscards are incrementing.

    - ifInErrors: MAC errors

    - ifInDiscards: STP blocking state, filtering, frame errors, PCI busy

    - ifOutErrors: not used

    - ifOutDiscards: due to backup on link

  - Check port dot3 statistics (`/stats/port 1/ether`) for Ethernet specific errors.
  - Search MAC addresses for `A' and `B' from FDB. For example, if A's MAC address is 00:00:00:00:00:01 and Bus is 00:00:00:00:00:02, search for `A's MAC address by typing the following from the CLI:

```
/info/fdb/find 00:00:00:00:00:01
```

Output similar to the following example should be displayed.

```
>> Main# /info/fdb/find 00:00:00:00:00:01
MAC Address    Port State Referenced from Ports...
00:00:00:00:00:01   1    FWD
```

Spanning Tree Protocol Problem

The topology in FIGURE 8-1 is used to illustrate STP problems.

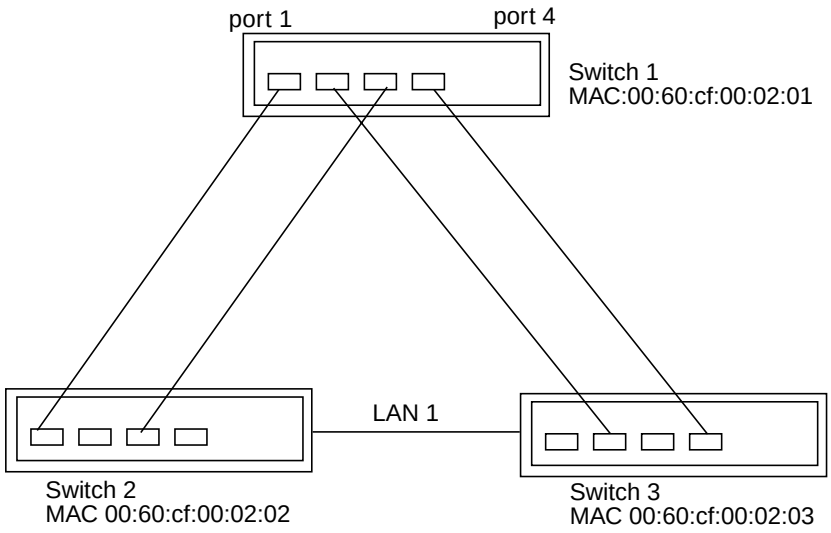

FIGURE 8-1 Spanning Tree Topology

All switches have the default STP parameters except the following:

- Switch 1 MAC: 00:60:cf:00:02:01
- Switch 2 MAC: 00:60:cf:00:02:02, Path cost for port 1 (to Switch 1) is 10. Path cost for port 3 (to Switch 1) is 5.
- Switch 3 MAC: 00:60:cf:00:02:03, Path cost for port 2 and port 4 (to Switch 1) is 1.

Incorrect Root Bridge Selection

- **Symptom:** Switch 2 claims that it is the Root switch in this topology.

  Potential Causes:

  - Switch 1 is not transmitting BPDUs out to its port 1 (to Switch 2)
  - Switch 3 is not transmitting BPDUs out to its port 1 (to Switch 2)
  - Due to the lower path cost to root switch (Switch 1), Switch 3 should be the designated bridge for LAN 1and transmit BPDUs to that segment.
  - Switch 2 is not receiving BPDUs from ports 1, 3, or 4.
  - BPDU is received by ports 1, 3, or 4, but not forwarded to MP.

  Action:

  - Confirm BPDU transmissions from Switch 1 and Switch 3 using the protocol analyzer.
  - Check STP port configuration for ports 1, 3, and 4 on Switch 2 and make sure they are 'ON'. (`/cfg/stp/port 1/cur` or `/cfg/stp/port 4/cur`)

  The sample output:

```
>> Spanning Tree Port 1# /cfg/stp/port 1/cur
Current Spanning Tree params for Port 1:
Priority 128, Path Cost 0, Spanning Tree turned on
```

  - From Switch 2, check port statistics for any receive errors from ports 1, 3, and 4.

Incorrect Designated Bridge Selection

- **Symptom:** Both Switch 2 and Switch 3 transmit BPDUs out to LAN 1.

  Potential Causes:

  - Switch 2 is not receiving BPDUs from its port 4
  - STP port configuration errors on Switch 2 and Switch 3

  Action:

  - Check STP port parameters on both Switch 2 and Switch 3 (`/cfg/stp/port 3/cur` and `/cfg/stp/port 1/cur`)
  - Check port statistics for transmit (Switch 3) and receive (Switch 2) error counters.
  - Due to the lower path cost to root switch (Switch 1), Switch 3 should be the designated bridge for LAN 1 and transmit BPDUs to that segment.

Incorrect Root Port Selection with Different Port Path Cost

- **Symptom:** Switch 2 reports (`/info/stp`) that port 1 is in `forwarding' and port 3 is in `blocking' state.

  Because Path Cost for port 3 is higher (smaller number), port 1 should go into `blocking' state and port 3 should be in `forwarding' state.

  Potential Causes:

  - Incorrect STP port path cost configuration
  - Switch 1 is not transmitting BPDUs to its port 3
  - Switch 2 is not receiving BPDUs from its port 3

  Action:

  - Check STP port parameters for ports 1 and 3 on Switch 2 (`/cfg/stp/port 1/cur` and `/cfg/stp/port 3/cur`)
  - Confirm BPDU transmission from Switch 3 using the protocol analyzer.
  - Check for error counters. (`/stats/port 1/if` and `/stats/port 3/if`)

Incorrect Root Port Selection with the Same Port Path Cost

- **Symptom:** Switch 3 reports (`/info/stp`) port 2 is in ‘blocking' state and port 4 in `forwarding' state.

  All parameters discussed below are the same (both ports 2 and 4 are connected to the same switch) except Port Identifier in the configuration BPDU. Port 2 (smaller port number than port 4) should be in the `forwarding' state and port 4 in `blocking' state.

  The following information will be checked from received configuration BPDUs in the order listed. Remember that the smaller number is better in STP.

  - Root bridge id in BPDU and recorded designated root bridge id. (They are same (Switch 1) in this example)
  - Root path cost and recorded designated root path cost.
  - Sending bridge id in BPDU and recorded designated bridge id which should be the same (Switch 1) in this example.
  - Sending bridge id in BPDU and Switch 3 bridge Id. Switch 1 has a smaller bridge id because it has a smaller MAC address. Bridge priorities are all same in this example.
  - Port id in BPDU and recordeddesignated port id (Switch 1's ports 2 and 4). If two switches are connected through multiple redundant paths and path costs are all the same, then this last information is used to select a root port.

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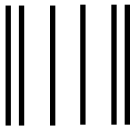

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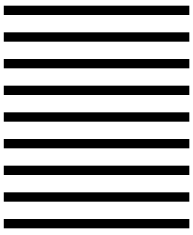

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