Cisco AS5350XM Universal Gateway Chassis Installation Guide

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The following information is for FCC compliance of Class B devices: The equipment described in this manual generates and may radiate radio-frequency energy. If it is not installed in accordance with Cisco's installation instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in part 15 of the FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

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You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

• Turn the television or radio antenna until the interference stops.

• Move the equipment to one side or the other of the television or radio.

• Move the equipment farther away from the television or radio.

• Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

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Preface

This preface describes the objectives and organization of this document and explains how to find additional information on related products and services. This preface contains the following sections:

Document Organization

This publication is designed for people who have some experience installing networking equipment such as routers, hubs, servers, and switches. The person installing the universal gateway should be familiar with electronic circuitry and wiring practices and have experience as an electronic or electromechanical technician.

This table describes the contents of each chapter in this document.

Table 1 Document Organization

Chapter	Title	Description
Chapter 1	Overview	Overview of the Cisco AS5350XM universal gateway.
Chapter 2	Preparing to Install the Cisco AS5350XM Universal Gateway	Describes the tasks you must perform before you begin to install the chassis.
Chapter 3	Installing the Cisco AS5350XM Universal Gateway	Describes the tasks you must perform to install the Cisco AS5350XM chassis.
Chapter 4	Troubleshooting	Describes how to troubleshoot the chassis by referring to the chassis LEDs.
Appendix A	Replacing Memory Components	Describes how to replace memory chips in the chassis field-replaceable units.

Table 1 Document Organization (continued)

Chapter	Title	Description
Appendix B	Replacing the Power Supply	Describes how to replace the power supply.
Appendix C	Cabling Specifications	Describes cabling and pinout information for the chassis.

Document Conventions

This publication uses the following conventions to convey instructions and information.

Table 2 Document Conventions

Convention	Description
boldface font	Commands and keywords.
italic font	Variables for which you supply values.
[ ]	Keywords or arguments that appear within square brackets are optional.
{x | y | z}	A choice of required keywords appears in braces separated by vertical bars. You must select one.
`screen font`	Examples of information displayed on the screen.
`boldface screen font`	Examples of information you must enter.
< >	Nonprinting characters, for example passwords, appear in angle brackets in contexts where italic font is not available.
[ ]	Default responses to system prompts appear in square brackets.

Note This symbol means *reader take note*. Notes contain helpful suggestions or references to additional information and material.

Timesaver This symbol means *the described action saves time*. You can save time by performing the action described in the paragraph.

Caution This symbol means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Tip This symbol means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

Warning Definition

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Waarschuwing **BELANGRIJKE VEILIGHEIDSINSTRUCTIES**

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

Varoitus **TÄRKEITÄ TURVALLISUUSOHJEITA**

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET

Attention **IMPORTANTES INFORMATIONS DE SÉCURITÉ**

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS

Warnung **WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

Avvertenza **IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI

Advarsel **VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

Aviso **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES

¡Advertencia! **INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES

Varning! **VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR

Figyelem **FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmezeto jel veszélyre utal. Sérülésveszélyt rejto helyzetben van. Mielott bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplo figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján keresheto meg.

ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!

Предупреждение **ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ**

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

警告 重要的安全性说明

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

警告 安全上の重要な注意事項

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

これらの注意事項を保管しておいてください。

주의 중요 안전 지침

이 경고 기호는 위험을 나타냅니다. 작업자가 신체 부상을 일으킬 수 있는 위험한 환경에 있습니다. 장비에 작업을 수행하기 전에 전기 회로와 관련된 위험을 숙지하고 표준 작업 관례를 숙지하여 사고를 방지하십시오. 각 경고의 마지막 부분에 있는 경고문 번호를 참조하여 이 장치와 함께 제공되는 번역된 안전 경고문에서 해당 번역문을 찾으십시오.

이 지시 사항을 보관하십시오.

Aviso **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES

Advarsel **VIGTIGE SIKKERHEDSANVISNINGER**

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemesbeskadigelse. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER

تحذير **إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في أخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز.
قم بحفظ هذه الإرشادات

Upozorenje **VAŽNE SIGURNOSNE NAPOMENE**

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE

Upozornění

DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKYNY

Προειδοποίηση

ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθεις πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

אזהרה

הוראות בטיחות חשובות

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כד לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה

Opomena

ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА
Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.
ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА

Ostrzeżenie **WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA**

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie **DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY**

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/techsupport

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

Cisco documentation and additional literature are available in the Product Documentation DVD package, which may have shipped with your product. The Product Documentation DVD is updated regularly and may be more current than printed documentation.

The Product Documentation DVD is a comprehensive library of technical product documentation on portable media. The DVD enables you to access multiple versions of hardware and software installation, configuration, and command guides for Cisco products and to view technical documentation in HTML. With the DVD, you have access to the same documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .pdf versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

http://www.cisco.com/en/US/partner/ordering/

Cisco Marketplace:

http://www.cisco.com/go/marketplace/

Ordering Documentation

Beginning June 30, 2005, registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL:

http://www.cisco.com/go/marketplace/

Cisco will continue to support documentation orders using the Ordering tool:

- Registered Cisco.com users (Cisco direct customers) can order documentation from the Ordering tool:

  http://www.cisco.com/en/US/partner/ordering/

- Instructions for ordering documentation using the Ordering tool are at this URL:

  http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

Documentation Feedback

You can rate and provide feedback about Cisco technical documents by completing the online feedback form that appears with the technical documents on Cisco.com.

You can send comments about Cisco documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

http://www.cisco.com/go/psirt

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com

  An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- Nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Tip We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.*x* through 8.*x*.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.htm

The link on this page has the current PGP key ID in use.

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is "down," or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

  http://www.cisco.com/packet

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

  or view the digital edition at this URL:

  http://ciscoiq.texterity.com/ciscoiq/sample/

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/ipj

- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:

  http://www.cisco.com/en/US/products/index.html

- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

  http://www.cisco.com/discuss/networking

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

Overview

This chapter provides an overview of the Cisco AS5350XM universal gateway, a versatile data and voice communications platform that provides high performance, high density, and hot-swap capability in only one rack unit. (See Figure 1-1 and Figure 1-2)

The Cisco AS5350XM universal gateway is intended for small- to medium-size companies who require dense and scalable solutions to create new multiservice access networks, replace existing gateway hardware, or expand and enhance their current access offering. The Cisco AS5350XM universal gateway provides you with a cost-effective platform for deploying the widest range of IP-based services.

This chapter includes the following sections:

Chassis Components

The chassis consists of the following components:

- One modular chassis with motherboard, high-speed backplane, and three slots for dial feature cards (DFCs) or voice feature cards (VFCs).
- Building integrated timing system (BITS) interface port
- Two Gigabit Ethernet (GE) LAN ports
- Two T serial ports for backhaul WAN support
- Fast console auxiliary ports for local administrative access
- An integral AC or DC power supply
- Replaceable fan tray

Figure 1-1 Cisco AS5350XM Universal Gateway Front Panel

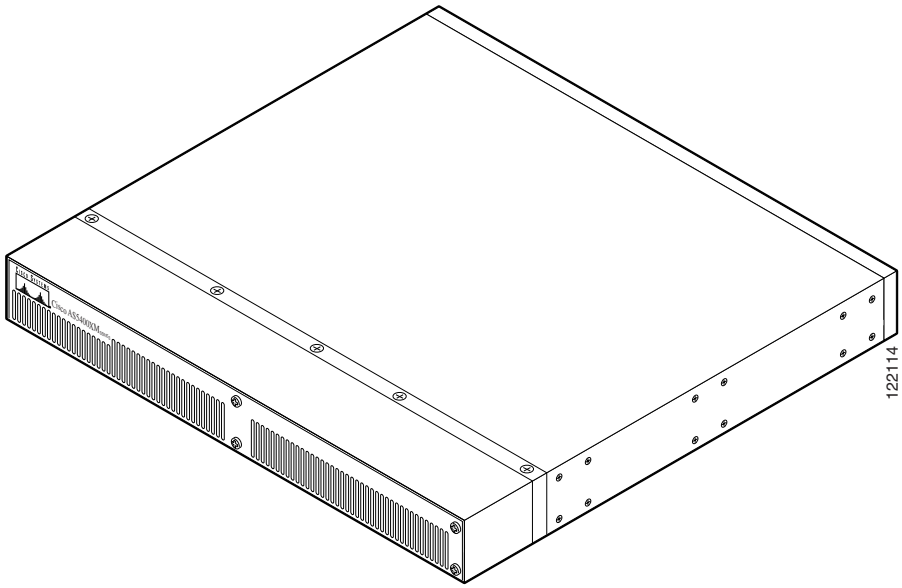
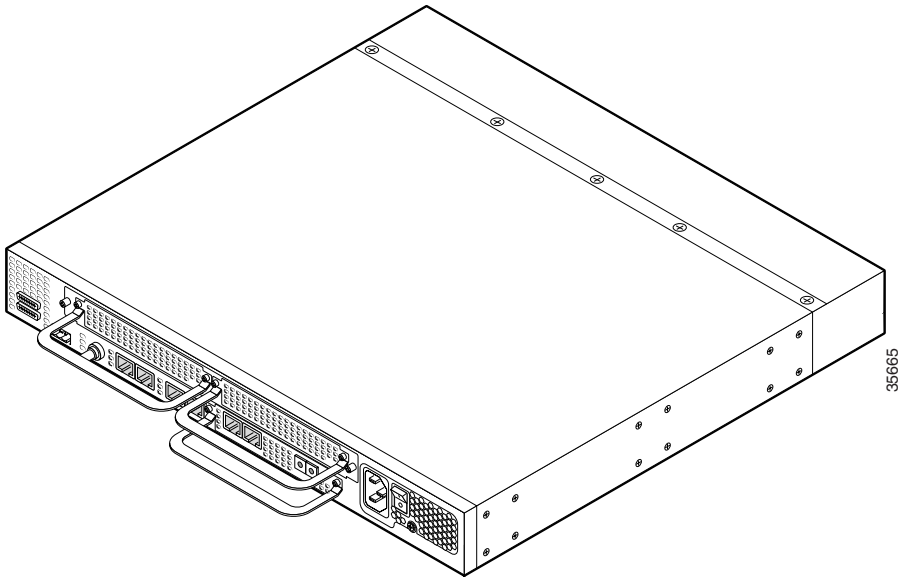


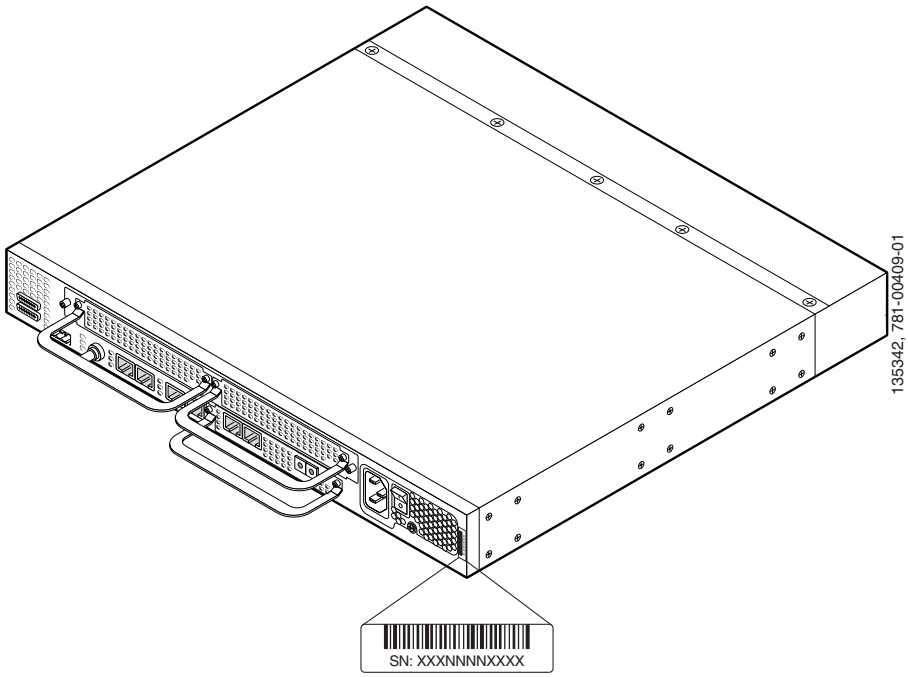
Figure 1-2 Cisco AS5350XM Universal Gateway Rear Panel



Product Serial Number Location

The serial number label for the Cisco AS5350XM universal gateway is located on the rear of the chassis, on the right side. (See Figure 1-3.)

Figure 1-3 Serial Number Location



Note The serial number for the Cisco AS5350XM universal gateway is 11 characters long.

Cisco Product Identification Tool

The Cisco Product Identification (CPI) tool provides detailed illustrations and descriptions showing where to locate serial number labels on Cisco products. It includes the following features:

- A search option that allows browsing for models using a tree-structured product hierarchy
- A search field on the final results page making it easier to look up multiple products
- End-of-sale products are clearly identified in results lists

The tool streamlines the process of locating serial number labels and identifying products. Serial number information expedites the entitlement process and is important for access to support services.

The Cisco Product Identification tool can be accessed at the following URL:

http://tools.cisco.com/Support/CPI/index.do

Dial Feature Cards (DFCs)

The dial feature card (DFC) is a 5.1- by 13-inch (12.9- by 33-cm) Peripheral Component Interconnect (PCI)-based interface board that allows online insertion and removal (OIR) without rebooting or powering off the system.

The chassis includes one backplane slot that accepts a DFC carrier card. The DFC carrier card accepts two DFCs, which allow OIR. The motherboard accepts one DFC in its own dedicated slot.

Note For details on cards, installation, and troubleshooting, see the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Card Installation Guide*. This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.)

Power Supply

The power system consists of a single input AC or DC power supply or a dual input (redundant) AC or DC power supply. Cooling is provided by two self-contained fans.

Each power module is capable of supplying a maximum DC load of 150 watts, and is composed of four independent output voltages: 3.3V, 5V, 12V, and –12V. AC input units have power factor correction, and low total harmonic distortion. Power failures are reported through environmental monitoring software.

Check the power at your site to ensure that you are receiving "clean" power (free of spikes and noise). Install a power conditioner if necessary.

Note The grounding architecture for the Cisco AS5350XM universal gateway is isolated DC return (DC-I).

Chassis Specifications

Table 1-1 Chassis Specifications

Description	Specification
Dimensions (H x W x D)	1.7 x 17.5 x 20.5 in. (4.39 x 44.45 x 52.07 cm)
Weight	22 lb maximum (10 kg)
Processor	250 MHz
Operating temperature	32 to 104°F (0 to 40°C)
Operating humidity	5 to 95%, noncondensing
Noise level	55 dB[1] @ 3 ft (0.914 m)
Input voltage, AC power supply Current Frequency Power factor Input AC power	100 to 240 VAC[2]; –10%, +6% tolerance 2.0 to 1.0 A; dependent on load 50/60 Hz 0.80 to 0.90 140 to 170W; dependent on load
Input voltage, DC power supply Maximum input current Input DC power	–48/-60 VDC, –10%, +10% tolerance 3 A (1.5-2.0 A typical) 150 W (maximum)
WAN interface options	T1 and E1 dial feature cards
Serial interfaces (for backhaul WAN support)	2 serial line interfaces
LAN interface options	2 Gigabit Ethernet 10/100/1000BASE-T (RJ-45) ports

Table 1-1 Chassis Specifications (continued)

Description	Specification
Console and auxiliary ports	Asynchronous serial (RJ-45)
Regulatory compliance	See the *Regulatory Compliance and Safety Information* document that shipped with your universal gateway. This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.)

1. dB = decibels.
2. VAC = volts alternating current.

Preparing to Install the Cisco AS5350XM Universal Gateway

This chapter describes the tasks you must perform before you begin to install the Cisco AS5350XM universal gateway and includes the following sections:

Safety Recommendations

Any device that uses electricity must be handled carefully; follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Put the removed chassis cover in a safe place.
- Keep tools away from walk areas where you and others could fall over them.
- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040

Maintaining Safety with Electricity

Warning **Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.** Statement 43

Follow these guidelines when you work on equipment powered by electricity.

- Locate the emergency power-OFF switch for the room in which you are working. Then, if an electrical accident occurs, you can act quickly to turn OFF the power.
- Before working on the system, unplug the power cord.
- Disconnect all power before doing the following:
  - Installing or removing a chassis
  - Working near power supplies

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

- Never assume that power is disconnected from a circuit. Always check.

Warning **Read the installation instructions before connecting the system to the power source.** Statement 1004

- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself.
  - Turn OFF power to the system.
  - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).** Statement 13

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures.

Always follow ESD-prevention procedures when you remove and replace components. Ensure that the chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground unwanted ESD voltages. To guard against ESD damage and shocks, the wrist strap and cord must operate properly. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Caution For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohm (Mohm).

Required Tools and Equipment

The following items are included with the universal gateway:

- 19- (48.26-) and 24-inch (60.96-cm) rack-mount kits
- Rubber feet for desktop installation
- RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL)
- RJ-45-to-DB-25 female DTE adapter (labeled TERMINAL)
- RJ-45-to-DB-25 male DCE adapter (labeled MODEM)
- RJ-45-to-RJ-45 rollover console cable
- ESD-preventive wrist strap
- Nylon cable tie
- Cable tie holder
- Grounding lug

You might need the following equipment, which is not included:

- Straight-through RJ-45-to-RJ-45 cable for an Ethernet connection

Caution To comply with the intra-building lightning surge requirements of GR-1089-CORE, Issue III, October 2002, you must use a shielded cable when connecting to either of the Cisco AS5350XM universal gateway Ethernet ports. The cable must consist of shielded cable terminated by shielded connectors on both ends, with the cable shield material tied to both connectors.

- Straight-through RJ-45-to-RJ-45 cables for T1 connections (one for each connection)
- E1 cables for E1 connections (one for each connection)
- Ethernet hub or PC with a network interface card for Ethernet LAN connections
- PC running terminal emulation software for local administrative access
- Modem for remote administrative access

Preparing to Connect to a Network

When you set up your universal gateway, consider distance limitations and potential electromagnetic interference (EMI) as defined by the Electronic Industries Association (EIA).

Warning **Hazardous network voltages are present in WAN ports regardless of whether power to the router is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the router first.** Statement 77

Warning **The ISDN connection is regarded as a source of voltage that should be inaccessible to user contact. Do not attempt to tamper with or open any public telephone operator (PTO)-provided equipment or connection hardware. Any hardwired connection (other than by a nonremovable, connect-one-time-only plug) must be made only by PTO staff or suitably trained engineers.** Statement 23

Ethernet Connections

Two Gigabit Ethernet (GE) RJ-45 ports are located on the rear panel of the universal gateway: GE0 and GE1 (selectable). To configure the Ethernet ports, see the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Software Configuration Guide*. Both ports use unshielded twisted-pair (UTP) cable and require Category 5 cable. The maximum segment distance is 328 feet (100 meters).

Note UTP cables look like the cables used for ordinary telephones; however, UTP cables meet certain electrical standards that telephone cables do not. Cables are not included.

Console and Auxiliary Ports

The Cisco AS5350XM universal gateway includes an asynchronous serial console port and an auxiliary port. The console and auxiliary ports provide access to the universal gateway either locally (with a console terminal) or remotely (with a modem). This section discusses important cabling information to consider before connecting a console terminal (an ASCII terminal or PC running terminal emulation software) to the console port, or a modem to the auxiliary port.

Console Port

The Cisco AS5350XM universal gateway includes an EIA/TIA-232 asynchronous serial console port (RJ-45). Depending on the cable and the adapter used, this port will appear as a data terminal equipment (DTE) or data communications equipment (DCE) device at the end of the cable. Your universal gateway arrives with cables and adapters to connect a console terminal (an ASCII terminal or PC running terminal emulation software) to the console port. To connect an ASCII terminal to the console port, use the RJ-45 rollover cable with the female RJ-45-to-DB-25 adapter (labeled TERMINAL).

To connect a PC running terminal emulation software to the console port, use the RJ-45 rollover cable with the female RJ-45-to-DB-9 adapter (labeled TERMINAL). The default parameters for the console port are 9600 baud, 8 data bits, no parity, and 2 stop bits. The console port does not support hardware flow control.

For detailed information about installing a console terminal, see Chapter 3, “Installing the Cisco AS5350XM Universal Gateway.” See Appendix C, “Cabling Specifications,” for cable and port pinouts.

Auxiliary Port

The Cisco AS5350XM universal gateway includes an EIA/TIA-232 asynchronous serial auxiliary port (RJ-45) that supports flow control. Depending on the cable and the adapter used, this port will appear as a DTE or DCE device at the end of the cable. Your universal gateway arrives with a cable and an adapter to connect a modem to the auxiliary port. To connect a modem to the auxiliary port, use the RJ-45 rollover cable with the male RJ-45-to-DB-25 adapter (labeled MODEM).

For detailed information about connecting devices to the auxiliary port, see Chapter 3, "Installing the Cisco AS5350XM Universal Gateway." See Appendix C, "Cabling Specifications," for cable and port pinouts.

2T Serial Ports

Two high-speed 12-in-1 serial ports on the rear panel of the Cisco AS5350XM universal gateway provide backhaul WAN and IP support.

The following types of serial interface standards (in DTE or DCE devices) are supported:

- EIA/TIA-232
- EIA/TIA-449
- EIA/TIA-530
- EIA/TIA-530A
- EIA/TIA-X.21
- ITU-T V.35

Each interface supports up to 8 Mbps.

Alarm Port

The three pins on the alarm port are connected to the output of a relay. This relay is controlled by system software. To configure the alarm port, see the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Software Configuration Guide*. This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.)

With the alarm port connected and configured, Cisco IOS software polls the universal gateway every one second to detect the failure events that occur and turns on the alarm when it detects any failure event. See Appendix C, "Cabling Specifications," for pinouts and cable specifications.

BITS Port

The BITS port is a coaxial interface that provides external synchronized clocking through a timing signal generator (TSG). To configure the BITS port, see the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Software Configuration Guide*. This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.) See Appendix C, "Cabling Specifications," for pinouts and cable specifications.

Power Supply Considerations

Check the power at your site to ensure that you are receiving "clean" power (free of spikes and noise). Install a power conditioner if necessary.

Warning **The device is designed to work with TN power systems.** Statement 19

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).** Statement 13

The universal gateway AC power supply includes the following features:

- The full range of operation is—100 to 240 VAC.
- All units include a 6-foot (1.8-m) electrical power cord. (A label near the power inlet indicates the correct voltage, frequency, and current draw for the unit.)

Note The redundant AC power supply has a non-standard connector. Use the electrical power cord that came with your universal gateway.

The universal gateway DC power supply includes the following features:

- 150-W output.
- Dual input connections for power source redundancy.
- Removable DC connector. (A label near the power inlets indicates the correct voltage, current draw, and power dissipation for the unit.)
- Double-hole grounding lug for reliable grounding to the chassis.

Installing the Cisco AS5350XM Universal Gateway

This chapter guides you through the installation of the Cisco AS5350XM universal gateway and includes the following sections:

Warning **Only trained and qualified personnel should be allowed to install or replace this equipment.** Statement 49

Warning **This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.** Statement 39

Warning **Incorrect connection of this or connected equipment to a general purpose outlet could result in a hazardous situation.** Statement 87

Setting Up the Chassis

You can set the chassis on a desktop or install it in a rack. Use the procedure in this section that best meets the needs of your network:

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Warning **This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.** Statement 1017

Setting the Chassis on a Desktop

The location of the chassis is extremely important for proper operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause malfunctions and shutdowns, and can make maintenance difficult. The following information will help you plan the location of the chassis:

- Plan for access to both front and rear panels of the chassis.
- Ensure that the room where the chassis operates has adequate ventilation. Remember that electrical equipment generates heat. Ambient air temperature may not cool equipment to acceptable operating temperatures without adequate ventilation.

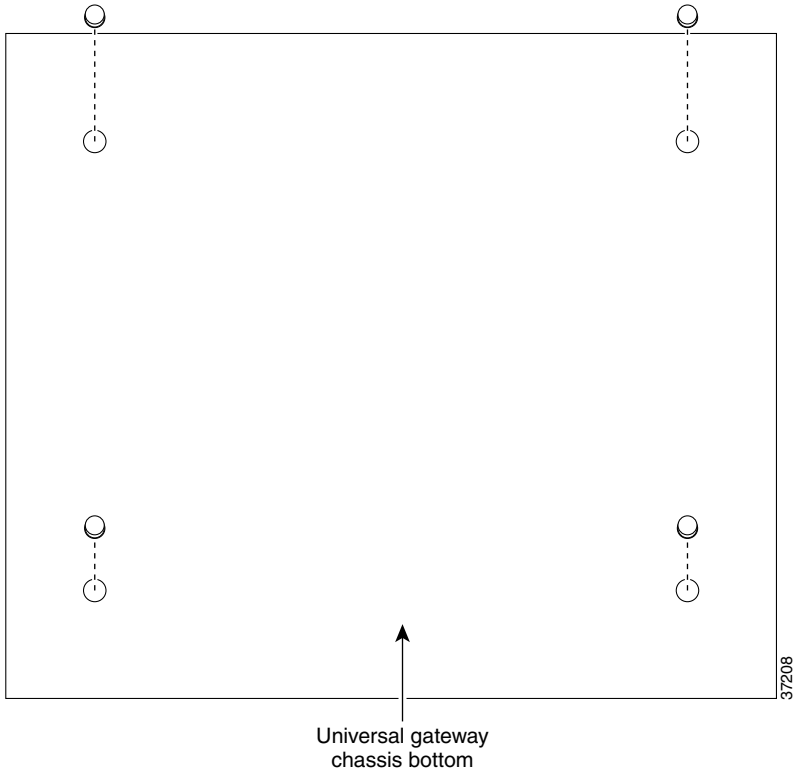
Attaching the Rubber Feet

To attach the rubber feet to the chassis, follow this procedure:

Step 1 Carefully turn the chassis over so you can see the four small depressions made for attaching the rubber feet. (See Figure 3-1.) The rubber feet are included in the accessory kit that shipped with your universal gateway.

Step 2 Remove the wax paper from the bottom of each rubber foot and press the foot into the small depression on the bottom of the chassis. (See Figure 3-1.)

Figure 3-1 Attaching the Rubber Feet



Rack-Mounting the Chassis

This section describes how to rack-mount the chassis. The universal gateway arrives with 19-inch (48.26-cm) rack-mount brackets and larger brackets for use with a 23- (58.429-) or 24-inch (60.96-cm) rack (See Figure 3-2).

The following information will help you plan your equipment rack configuration:

- Enclosed racks must have adequate ventilation. Ensure that the rack is not congested, because each unit generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air. Heat generated by equipment near the bottom of the rack can be drawn upward into the intake ports of the equipment above.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the intake or exhaust ports. If the chassis is installed on slides, check the position of the chassis when it is seated in the rack.
- Baffles can isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack, which can be found by experimenting with different configurations.

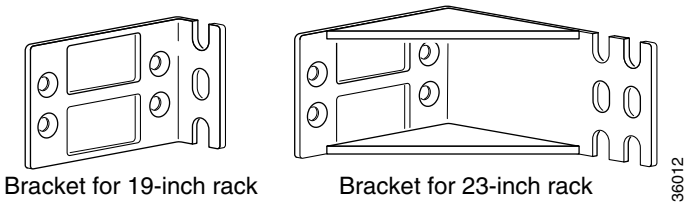
Warning **Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.** Statement 12

Required Tools and Equipment

You need the following tools and equipment to rack-mount the chassis:

- Number 2 Phillips screwdriver (not included)
- Medium flat-blade screwdriver (not included)
- Screws for attaching the chassis to the rack (not included)
- Standard rack-mount brackets (included)
- Screws for attaching the brackets to the chassis (included)

Figure 3-2 Standard Rack-Mount Brackets



Attaching the Brackets

To attach the mounting brackets to the chassis, follow this procedure:

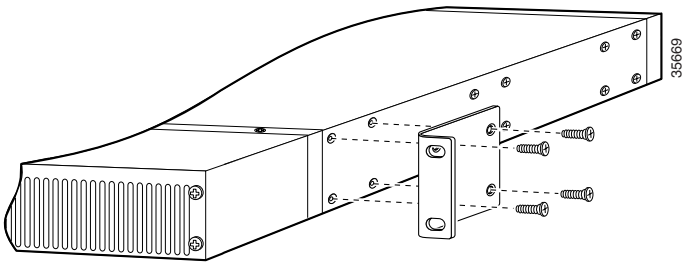
Step 1 Set the chassis on a flat surface. (See Figure 3-3.)

Note The chassis may be installed with either the front or rear panel facing forward.

Step 2 Attach the standard 19- (48.26-) or 23-inch (58.42-cm) rack brackets to the sides of the chassis. Use the screws provided with the mounting brackets. (See Figure 3-3.)

Note There are three sets of mounting holes on the sides of the chassis. Attach the brackets for front, rear, or middle mounting.

Figure 3-3 Standard Bracket Installation—Front Panel Forward



Note: The second bracket attaches to the other side of the chassis.
The chassis can also be installed with the rear panel forward.

Installing in a Rack

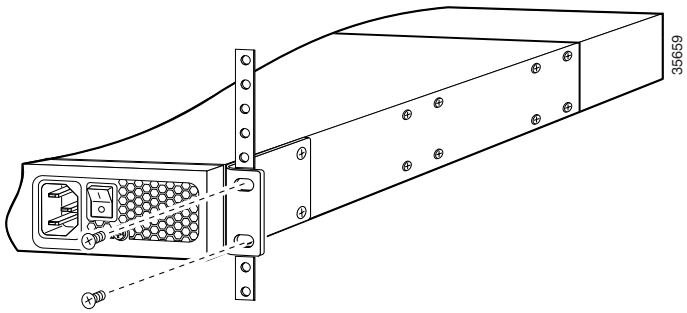
Caution Do not use the handles on the dial feature cards to assist in lifting the chassis.

To install the chassis into the equipment rack, follow this procedure:

Step 1 With the mounting brackets attached to the chassis, support the chassis and align the holes in the brackets with the screw holes in the rack. (See Figure 3-4.)

Step 2 Attach the chassis to the rack with the screws you have provided. (See Figure 3-4.)

Figure 3-4 Attaching the Chassis to a 19-Inch Rack—Rear Panel Forward



Note: The second bracket attaches to the rack at the other side of the chassis. The chassis can also be installed with the front panel forward.

Connecting the Chassis Ground

You must connect the chassis to a reliable earth ground using the ground lug (provided) and size AWG 6 (13 mm^2) wire.

To attach the chassis ground, take the following steps:

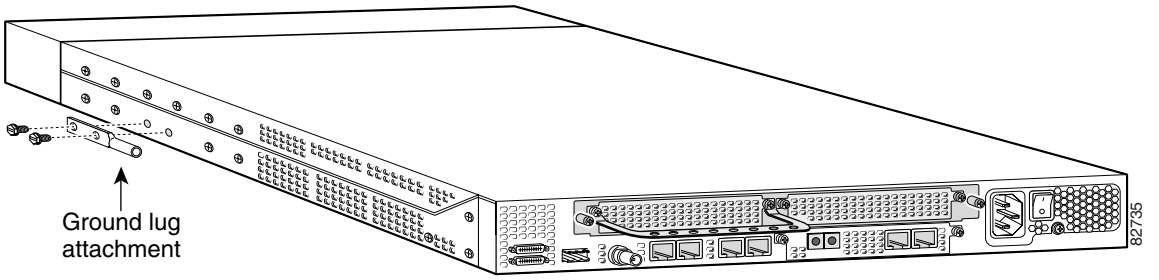
Step 1 Strip one end of the ground wire to expose approximately 0.75 in. (20 mm) of conductor.

Step 2 Crimp the ground wire to the ground lug, using a crimp tool of the appropriate size.

Step 3 Attach the ground lug to the chassis. (See Figure 3-5.) Use a medium flat-blade screwdriver and the screws supplied with the ground lug. Tighten the screws to a torque of 8 to 10 in-lb (0.9 to 1.1 N-m).

Step 4 Connect the other end of the ground wire to a suitable grounding point at your site.

Figure 3-5 Cisco AS5350XM Universal Gateway Ground Lug Attachment



Connecting to the Network

This section describes how to connect the Cisco AS5350XM universal gateway to your network. The cables required to connect the universal gateway to a network are not provided. For ordering information, contact customer service. See the "Obtaining Technical Assistance" section on page xvii, or see Appendix C, "Cabling Specifications," for cable and port pinouts.

Warning **To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.** Statement 1021

Warning **Do not work on the system or connect or disconnect cables during periods of lightning activity.** Statement 1001

Caution If the universal gateway is configured with fewer than three DFCs, make sure that a blank slot cover is installed over each open slot to ensure proper airflow.

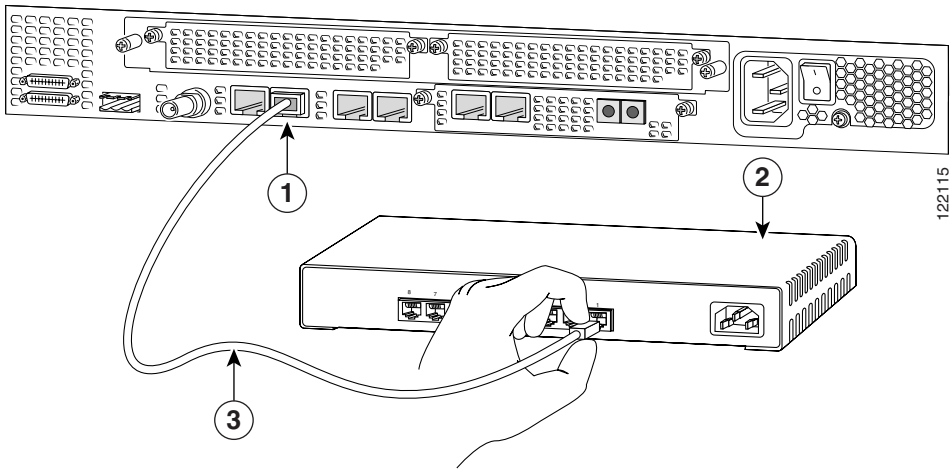
Note The Cisco AS5350XM universal gateway arrives with all carrier cards and DFCs already installed, unless you order a card separately as a spare. See the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Card Installation Guide* for card installation instructions. This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.)

Connecting to an Ethernet Network

Connect an Cisco AS5350XM universal gateway Gigabit Ethernet port to an Ethernet hub using a straight-through, RJ-45-to-RJ-45 Ethernet cable. (See Figure 3-6.)

Caution To comply with the intra-building lightning surge requirements of GR-1089-CORE, Issue III, October 2002, you must use a shielded cable when connecting to either of the Cisco AS5350XM universal gateway Ethernet ports. The cable must consist of shielded cable terminated by shielded connectors on both ends, with the cable shield material tied to both connectors.

Figure 3-6 Connecting to an Ethernet Hub (10/100BASE-T Shown)



1	GE1 10/100/1000BASE-T port	**2**	Ethernet hub
3	Straight-through Ethernet cable		

Connecting to a WAN

Warning **The telecommunications lines must be disconnected 1) before unplugging the main power connector and/or 2) while the housing is open.** Statement 89

Warning **Hazardous network voltages are present in WAN ports regardless of whether power to the router is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the router first.** Statement 77

Warning **This equipment is to be installed and maintained by service personnel only as defined by AS/NZS 3260 Clause 1.2.14.3 Service Personnel.** Statement 88

Warning **To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.** Statement 1023

You can connect the Cisco AS5350XM universal gateway to a WAN in the following ways:

- Connect each T1/PRI port to an RJ-45 jack with a straight-through RJ-45 to RJ-45 cable. (See Figure 3-7 and Figure 3-8.)

Figure 3-7 Connecting a 2-Port or 4-Port DFC to an RJ-45 (T1) Jack

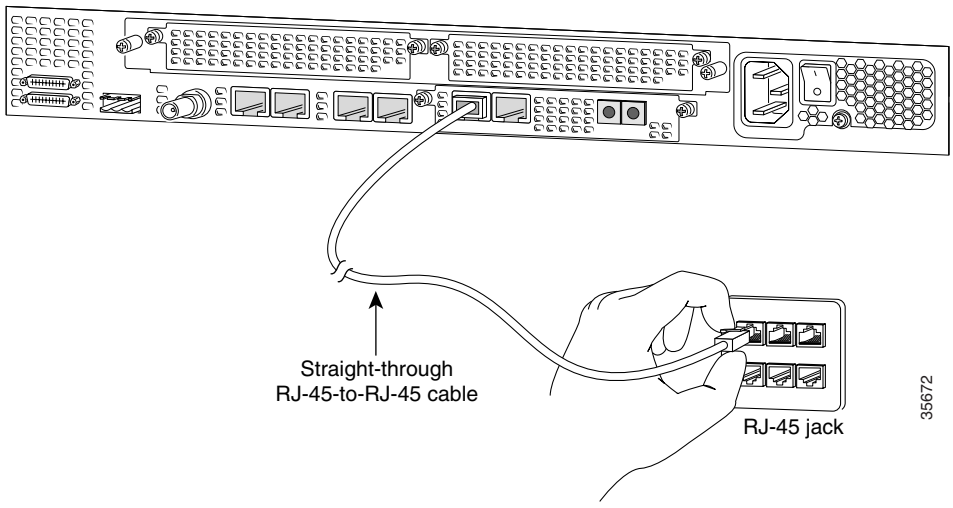
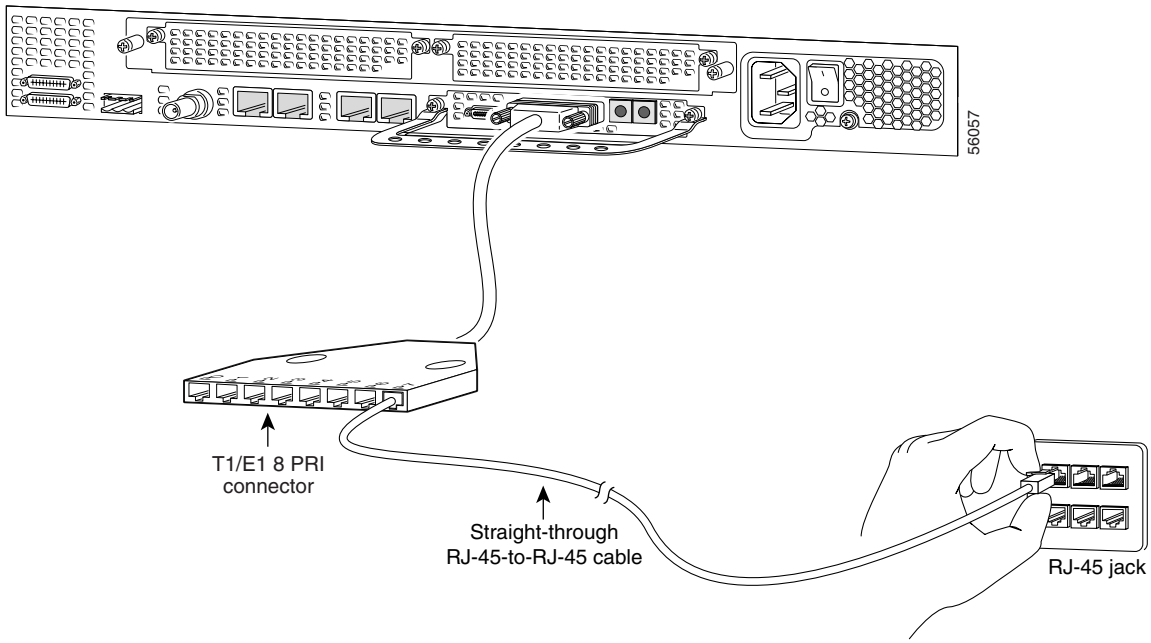


Figure 3-8 Connecting an 8-Port DFC to an RJ-45 (T1) Jack



Note Use software commands to choose a specific port and the line termination on that port. For information about software commands, see the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Software Configuration Guide*. This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.)

Note If you choose a port with 75-ohm input impedance, use an RJ-45-to-75-ohm coaxial cable adapter and plug it into that port.

- Connect each E1/PRI port to an RJ-45 jack with a straight-through RJ-45 to RJ-45 cable. (See Figure 3-9 and Figure 3-10.)

Warning **The E1 interface card may only be installed in an ACA-permitted customer equipment or a Data Terminal Equipment (DTE) that is exempted from ACA's permit requirements. The customer equipment must only be housed in a cabinet that has screw-down lids to stop user access to overvoltages on the customer equipment. The customer equipment has circuitry that may have telecommunications network voltages on them.** Statement 90

Figure 3-9 Connecting a 2-Port or 4-Port DFC to an RJ-45 Jack

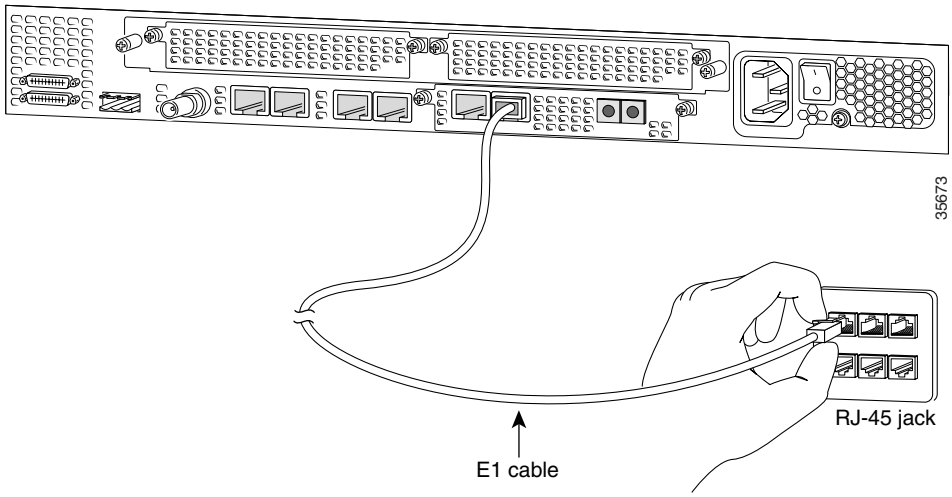
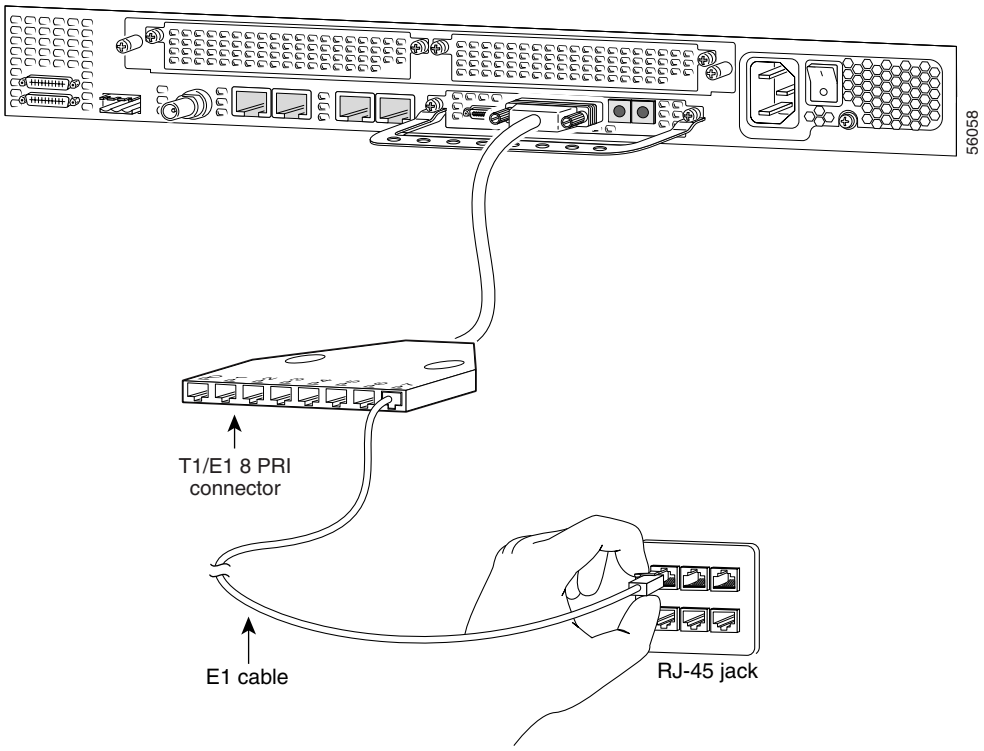
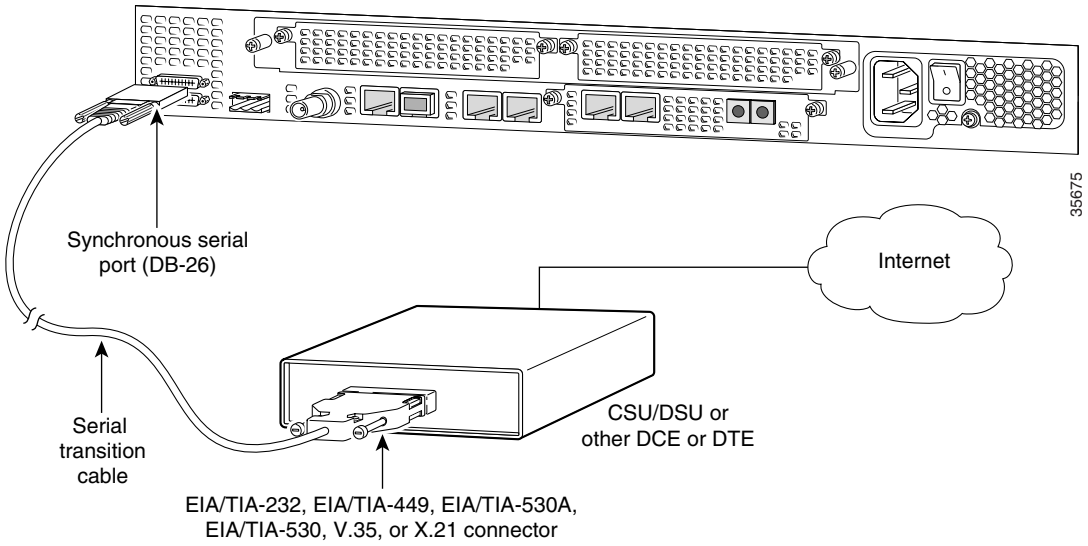


Figure 3-10 Connecting an 8-Port DFC to an RJ-45 Jack



- Connect a synchronous serial port to a modem or a CSU/DSU with a serial transition cable. (See Figure 3-11.)

Figure 3-11 Connecting to a CSU/DSU



Connecting to the Console and Auxiliary Ports

Use the console terminal for local administrative access to the universal gateway. You can only connect a terminal to the console port. You can use the auxiliary port to connect a terminal or a modem for remote access to the universal gateway.

Connecting to the Console Port

To connect a terminal (an ASCII terminal or a PC running terminal emulation software) to the console port on the Cisco AS5350XM universal gateway, follow this procedure:

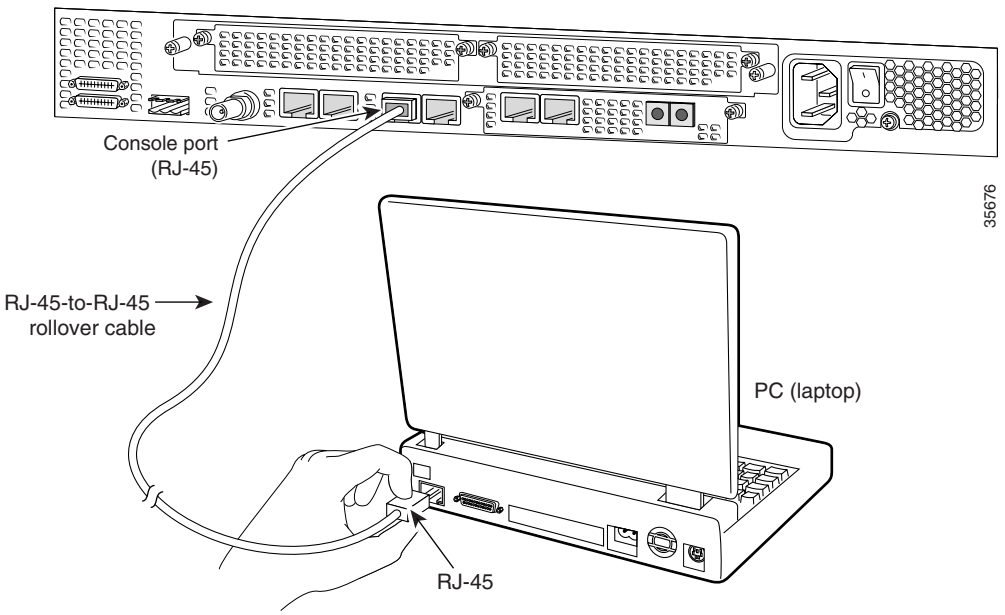
Step 1 Connect the terminal to the console port using an RJ-45 rollover cable and an RJ-45-to-DB-25 or RJ-45-to-DB-9 adapter. The adapters provided are labeled TERMINAL. The adapters and the rollover cable are included in the accessory kit that comes with the universal gateway. (See Figure 3-12.)

Note For additional information on rollover cable pinouts, see Appendix C, "Cabling Specifications."

Step 2 Configure your terminal or PC terminal emulation software for 9600 baud, 8 data bits, no parity, and 2 stop bits.

Step 3 Configure the console port. See the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Software Configuration Guide*. This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.)

Figure 3-12 Connecting the Console Terminal

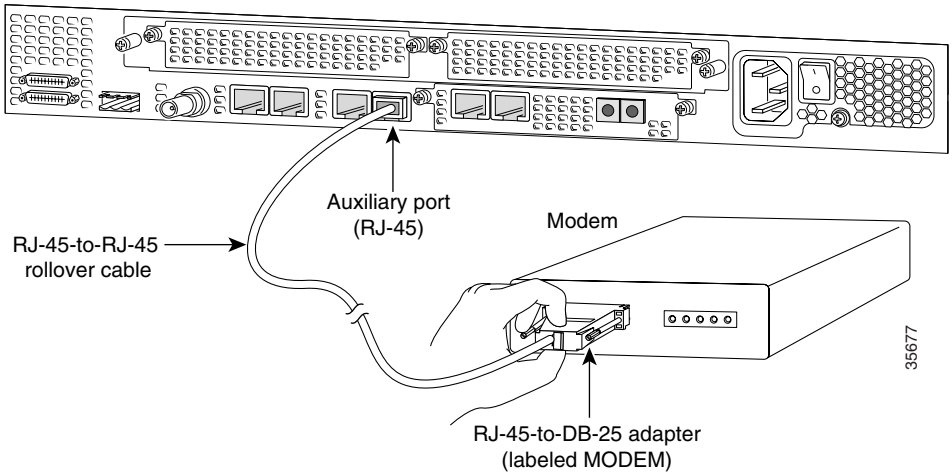


Connecting a Modem to the Auxiliary Port

To connect a modem to the auxiliary port, use an RJ-45 rollover cable with an RJ-45-to-DB-25 adapter. The adapter provided is labeled MODEM. The adapter and the rollover cable are included in the accessory kit that comes with the universal gateway. (See Figure 3-13.)

Note Make sure that your modem and the auxiliary port on the Cisco AS5350XM universal gateway are configured for the same transmission speed (38400 baud is typical) and hardware flow control with Data Carrier Detect (DCD) and Data Terminal Ready (DTR) operations.

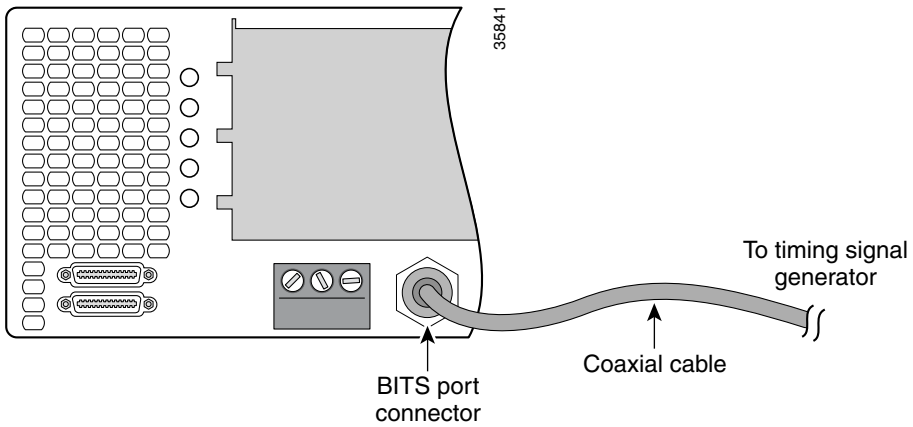
Figure 3-13 Connecting a Modem to the Auxiliary Port



Connecting a Signal Generator to the BITS Port

Use a coaxial cable to connect a timing signal generator (TSG) to the BITS port. The BITS port is used for external clocking. (See Figure 3-14.)

Figure 3-14 Connecting to the BITS Port



Connecting an Alarm to the Alarm Port

To connect an alarm device to the alarm port, follow this procedure:

Note The alarm connector is a 3-wire connector that plugs into a receptacle in the rear of the chassis. The connector is provided in the accessory kit that ships with the Cisco AS5350XM universal gateway.

Step 1 Insert the 3-pin alarm port connector (included in the accessory kit) into the alarm port terminal block.

Step 2 Strip a minimum of 1/4 in. (0.625 cm) off the wire insulation to connect the stranded wires to the alarm connector. The maximum insulation strip length is 0.31 in. (0.78 cm).

Note Connect the alarm port only to a safety extra-low voltage (SELV) source using 22 AWG or thicker copper wire. SELV ratings are maximum 30 volts AC (RMS), maximum 60 volts DC, and maximum 50 VA power. The alarm port is rated for 2.0 amp maximum current.

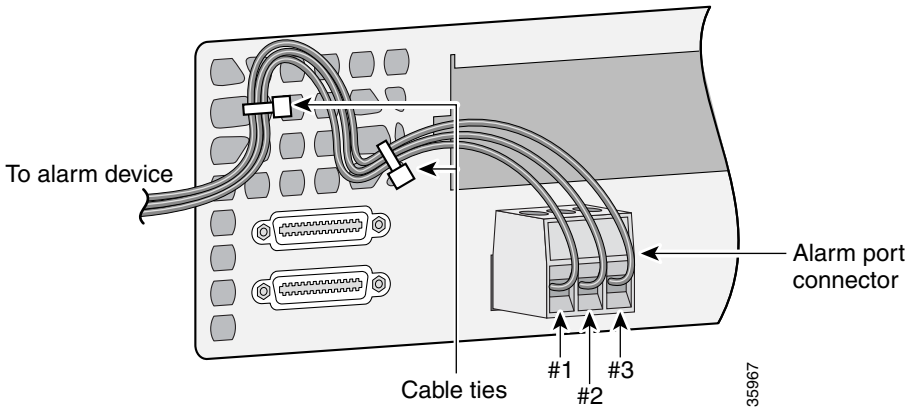
Step 3 Secure the wires to the alarm connector with the screws on the connector. See Appendix C, "Cabling Specifications," for alarm port pinouts.

Caution The maximum tightening torque on the screws is 7 in.-lb (0.79 N-m).

Step 4 Attach two cable ties to the chassis and connect the wires to the cable ties. (See Figure 3-15.)

Step 5 Attach the alarm wires to the alarm device.

Figure 3-15 Connecting to the Alarm Port



Supplying Power

The power system consists of a single input AC or DC power supply or a dual input (redundant) AC or DC power supply. For more information about the power system, see the "Power Supply" section on page 1-4 and the "Power Supply Considerations" section on page 2-6.

Note The grounding architecture for the Cisco AS5350XM universal gateway is isolated DC return (DC-I).

Warning **Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is off and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.** Statement 4

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).** Statement 13

Warning **The device is designed to work with TN power systems.** Statement 19

Connecting the AC Power Cord

To connect the power cord, follow these steps:

Note The redundant AC power supply has a non-standard connector. Use the electrical power cord that came with your universal gateway.

Step 1 Connect one end of the AC power cord to the power connector on the rear panel of the Cisco AS5350XM universal gateway (See Figure 3-16 or Figure 3-17.)

Step 2 Connect the other end of the AC power cord to the power outlet.

Warning **The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device.** Statement 1019

Figure 3-16 Connecting the AC Power Cord

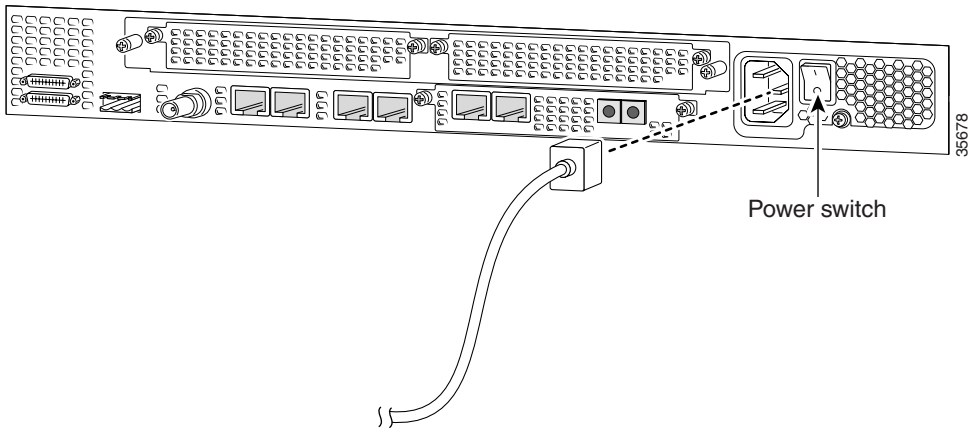
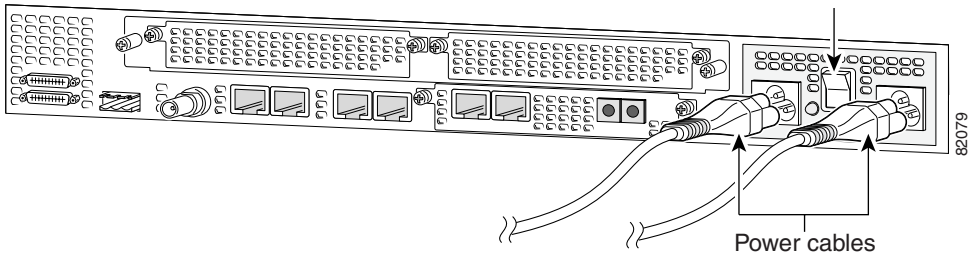


Figure 3-17 Connecting the AC Power Cord to the Redundant Power Supply

Step 3



Step 4 Power up the universal gateway.

The internal power supply fan should power up.

Wiring the DC Power Supply

If you ordered the Cisco AS5350XM universal gateway with a DC power supply, follow the procedure in this section to wire the terminal block.

Note The grounding architecture for the Cisco AS5350XM universal gateway is isolated DC return (DC-I).

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Warning **Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.** Statement 140

Note This product is intended for installation in restricted access areas and is approved for connection using 12 or 14 AWG copper conductors only. The installation must comply with all applicable codes.

See Figure 3-18 or Figure 3-19 and follow these steps to wire the terminal blocks:

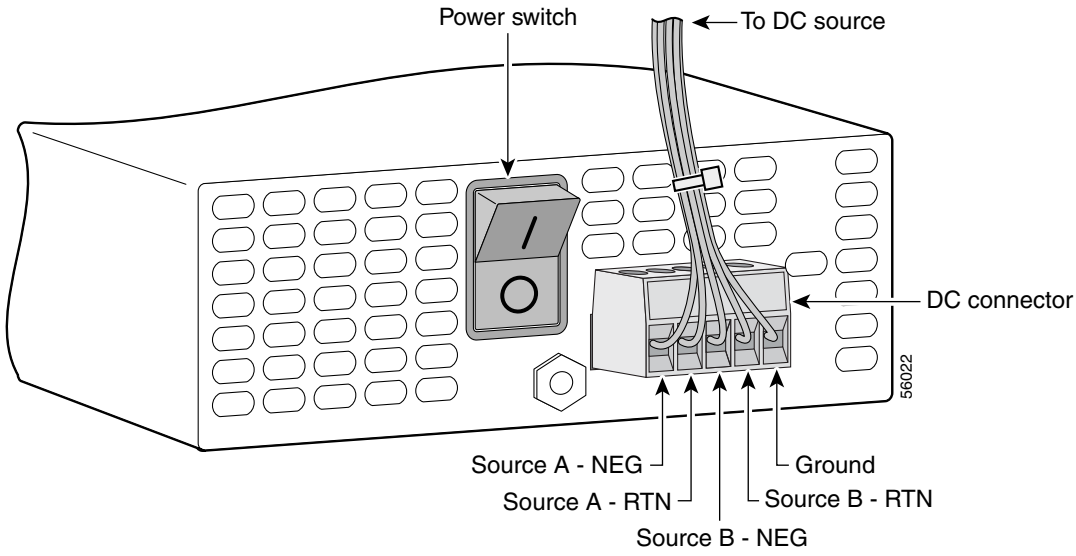
Step 1 Note the orientation of the DC power supply. The power supply cord should have three wires: 48 VDC Return, –48 VDC, and a safety ground (green wire).

Note If you are installing a redundant power supply, you should attach appropriate-sized spade terminals to the stripped ends of the ground and input wires.

Step 2 Strip off 1/4 in. (0.625 cm) of insulation on the safety ground, +48 VDC, and –48 VDC input wires.

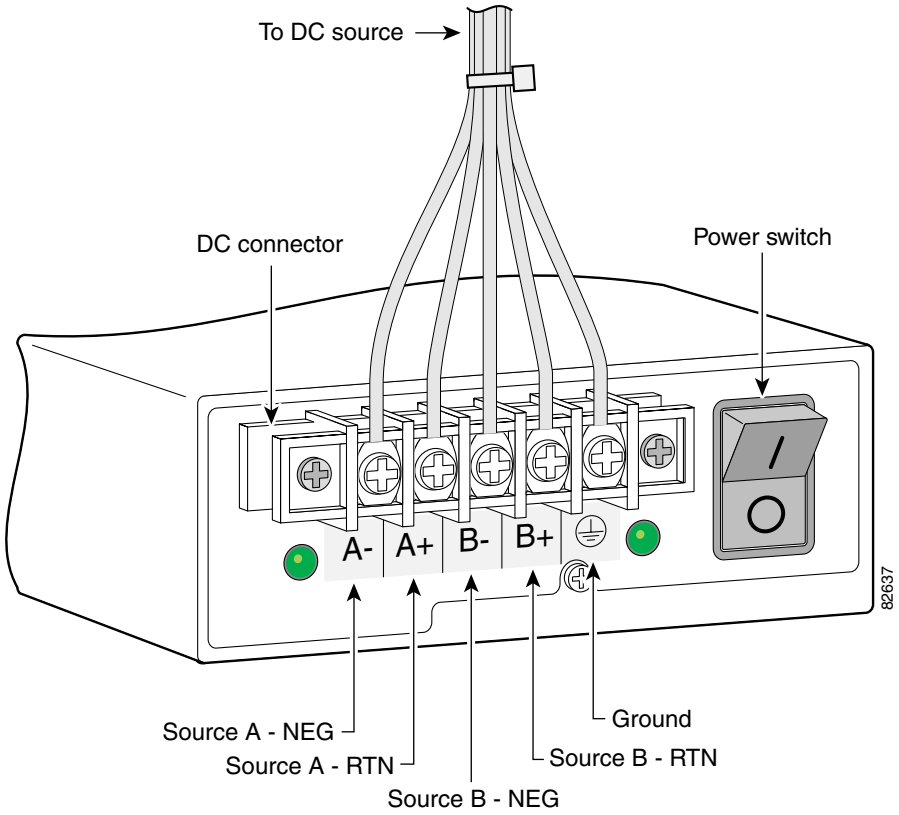
Warning **The illustration shows the DC power supply terminal block. Wire the DC power supply using the appropriate lugs at the wiring end, or with no lugs, as illustrated. The proper wiring sequence is ground to ground, positive to positive, and negative to negative. Note that the ground wire should always be connected first and disconnected last.** Statement 197

Figure 3-18 DC Power Supply Connections—Single Power Supply



Warning **The illustration shows the DC power supply terminal block. Wire the DC power supply using the appropriate lugs at the wiring end, or with no lugs, as illustrated. The proper wiring sequence is ground to ground, positive to positive, and negative to negative. Note that the ground wire should always be connected first and disconnected last.** Statement 197

Figure 3-19 DC Power Supply Connections—Redundant Power Supply



Caution Do not overtorque the terminal block contact screws. The recommended torque is 4.5 lb-in (0.50 N-m).

Step 3 Insert the safety ground (green wire) into the DC connector ground connector and tighten the locking screws. Ensure that no bare wire is exposed.

Step 4 Insert the 48 VDC Return wires into the DC connector positive connectors (+) and tighten the locking screws. Ensure that no bare wire is exposed.

Step 5 Insert the –48 VDC wires into the DC connector negative connectors (–) and tighten the locking screws. Ensure that no bare wire is exposed.

Step 6 Make sure that the power supply wires are secured to cable strain-relief clamps with cable ties.

Warning **After wiring the DC power supply, remove the tape from the circuit breaker switch handle and reinstate power by moving the handle of the circuit breaker to the ON position.** Statement 8

Step 7 Power up the universal gateway.

The internal power supply fan should power up.

Where to Go Next

When you power up the Cisco AS5350XM universal gateway for the first time, messages begin to appear on your console screen. See the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Software Configuration Guide* for configuration instructions. This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.)

The remaining chapters of this guide include reference material for replacing spare parts, troubleshooting, and creating your own cables:

- Chapter 4, "Troubleshooting"
- Appendix A, "Replacing Memory Components"
- Appendix B, "Replacing the Power Supply"
- Appendix C, "Cabling Specifications"

Troubleshooting

This chapter describes troubleshooting techniques for the Cisco AS5350XM universal gateway and contains the following sections:

LEDs

The LEDs indicate the current operating condition of the Cisco AS5350XM universal gateway. You can observe the LEDs, note any fault condition that the product is encountering, and then contact your system administrator or a customer service representative (see the "Obtaining Technical Assistance" section on page xvii) if necessary. See Figure 4-1 for a diagram illustrating the rear panel LEDs and Table 4-1 for a description of the LEDs.

For information about LEDs and troubleshooting Cisco AS5350XM universal gateway dial feature cards, see the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Card Installation Guide.* This document is available on Cisco.com. (See the "Obtaining Documentation" section on page xiv.)

Figure 4-1 Rear Panel LEDs

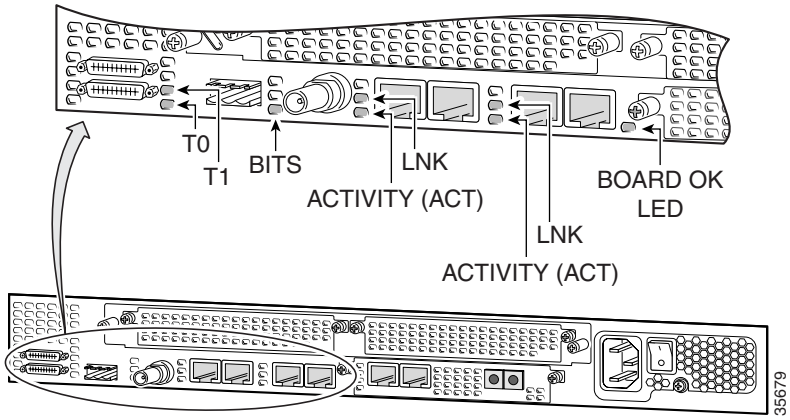


Table 4-1 Chassis LEDs

Function	LED	State	Description
Alarm	Alarm	On	An alarm error is detected.
Gigabit Ethernet	Activity (ACT)	Flickering	The Gigabit Ethernet LAN connection is transmitting and receiving data normally.
		Off	The Gigabit Ethernet LAN connection is not transmitting or receiving data.
	Link (LNK)	On	The Gigabit Ethernet cable is connected properly.
		Off	The Gigabit Ethernet port is not connected.
Console/Auxiliary	Activity (ACT)	Flickering	The console or auxiliary connection is transmitting and receiving data normally.
		Off	The console or auxiliary connection is not transmitting or receiving data.
	Link (LNK)	On	The console or auxiliary cable is connected properly.
		Off	The console or auxiliary port is not connected.
System Board Status (Located to right of Console/Auxiliary ports)	OK	On	The system board is operating normally.
		Off	Power is off or the system has not booted.
		Blinking	A memory failure occurred.
Serial Ports	T0, T1	Flickering	The serial ports are transmitting and receiving data normally.
		Off	The serial port connection is not transmitting or receiving data.
BITS Port	BITS	ON	There is a valid signal on the BITS port.

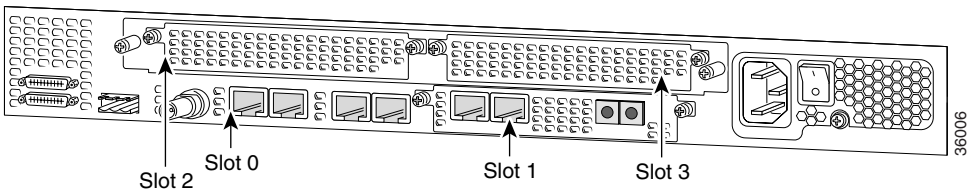
Monitoring the Environment

The Cisco AS5350XM universal gateway contains temperature sensors to detect abnormal temperature conditions during system operation. The three levels of sensor detection are as follows:

- If the operating temperature of the system exceeds 45°C (104°F), the system reaches a warning state. A warning message appears on the console. When the operating temperature of the system drops below 45°C (104°F), another message is displayed on the console indicating a recovery. At this level of sensor detection, there is no disruption in system operation.
- When the operating temperature of the system continues to rise above 45°C (104°F) and reaches a temperature of 60°C (140°F), the system reaches a critical state. Cisco IOS software gracefully shuts down the first DFC. If the operating temperature continues to be critical after 10 minutes, Cisco IOS software shuts down another DFC.

Note DFC slot numbering starts from the motherboard and works up from left to right. Slot 0 is reserved for the motherboard. The DFC slots are numbered sequentially from 1 to 3. (See Figure 4-2.)

Figure 4-2 Cisco AS5350XM Universal Gateway Slot Numbering



This process is repeated at 10-minute intervals until the final DFC is shut down. The console displays the slot number of the DFC and the type of DFC that was shut down.

If the operating temperature cools down to 45°C (104°F), Cisco IOS software powers on the first DFC, repeating the process for each DFC at 10 minute intervals.

- When the operating temperature of the system rises above 65°C, Cisco IOS software shuts down all DFCs immediately.

Displaying the Environment Status

You can use the command-line interface (CLI) to check environment monitoring status of the Cisco AS5350XM universal gateway.

To check environment monitoring, enter the **show environment** command in privileged EXEC mode, as follows:

```
Router# show environment
```

- The display shown below appears on your console during normal operating conditions. The slot number corresponds to the DFC in that slot. The outlet and inlet sensors read the temperature of the air circulating inside the chassis.

```
Router# show environment
Temperature:
        Temperature Reading:
                Temperature at inlet is measured as 22C/71F.
                Temperature at outlet is measured as 27C/80F.
        Temperature State:
                Temperature is in normal state.
Fans:
        Fans temperature delta is measured as 5C.
        All fans are running well.
Power Supply:
        Redundant Power System is present.
```

- The display below appears on your console when the system reaches a warning state:

```
Router# show environment
Temperature:
        Temperature Reading:
                Temperature at inlet is measured as 52C/125F.
                Temperature at outlet is measured as 64C/147F.
        Temperature State:
                Temperature is in warning state.
Fans:
        Fans temperature delta is measured as 6C.
        All fans are running well.
Power Supply:
        Redundant Power System is present.
        RPS Input Voltage status: normal
```

```
        RPS Output Voltage status: normal
        RPS Fan status: normal
        RPS Thermal status: normal
        RPS OverVoltage status: normal
Environmental monitor experienced the following events:
        Temperature:sensor failed.
        Fans:monitor dropped.
        Temperature:warning.
        Temperature:sensor recovered.
        Fans:monitor recovered.
        Fans:normal.
```

- The display below appears on your console when the system reaches a critical state:

```
Router# show environment
Temperature:
        Temperature Reading:
                Temperature at inlet is measured as 62C/143F.
                Temperature at outlet is measured as 74C/165F.
        Temperature State:
                Temperature is in critical state.
        DFC Busyout/Power-down:
                A DFC is powered down. Slot:1, Type:NP108 DFC
                A DFC is busyout. Slot:2, Type:T1 8 PRI DFC
                A DFC is busyout. Slot:3, Type:NP108 DFC
Fans:
        Fans temperature delta is measured as 6C.
        All fans are running well.
Power Supply:
        Redundant Power System is present.
        RPS Input Voltage status: normal
        RPS Output Voltage status: normal
        RPS Fan status: normal
        RPS Thermal status: normal
        RPS OverVoltage status: normal
Environmental monitor experienced the following events:
        Temperature:sensor failed.
        Fans:monitor dropped.
        Temperature:warning.
        Temperature:sensor recovered.
        Fans:monitor recovered.
        Fans:normal.
        Temperature:critical.
```

- The display below appears on your console when the system reaches a shutdown state:

```
Router# show environment
Temperature:
        Temperature Reading:
                Temperature at inlet is measured as 70C/158F.
                Temperature at outlet is measured as 82C/179F.
        Temperature State:
                Temperature is in shutdown state.
        DFC Busyout/Power-down:
                A DFC is powered down. Slot:1, Type:NP108 DFC
                A DFC is powered down. Slot:2, Type:T1 8 PRI DFC
                A DFC is powered down. Slot:3, Type:NP108 DFC
Fans:
        Fans temperature delta is measured as 6C.
        All fans are running well.
Power Supply:
        Redundant Power System is present.
        RPS Input Voltage status: normal
        RPS Output Voltage status: normal
```

```
        RPS Fan status: normal
        RPS Thermal status: normal
        RPS OverVoltage status: normal
Environmental monitor experienced the following events:
        Temperature:sensor failed.
        Fans:monitor dropped.
        Temperature:warning.
        Temperature:sensor recovered.
        Fans:monitor recovered.
        Fans:normal.
        Temperature:critical.
        Temperature:shutdown.
```

Troubleshooting Network Interfaces

For information about isolating problems with the network connections to your Cisco AS5350XM universal gateway, see the *Internetwork Troubleshooting Guide* publication available on Cisco.com. For more information, see the section "Obtaining Documentation" section on page xiv.

Replacing the Fan Tray

Warning **Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord.** Statement 1

Caution Before you remove the fan tray, read the "Safety Recommendations" section on page 2-1.

Removing the Fan Tray

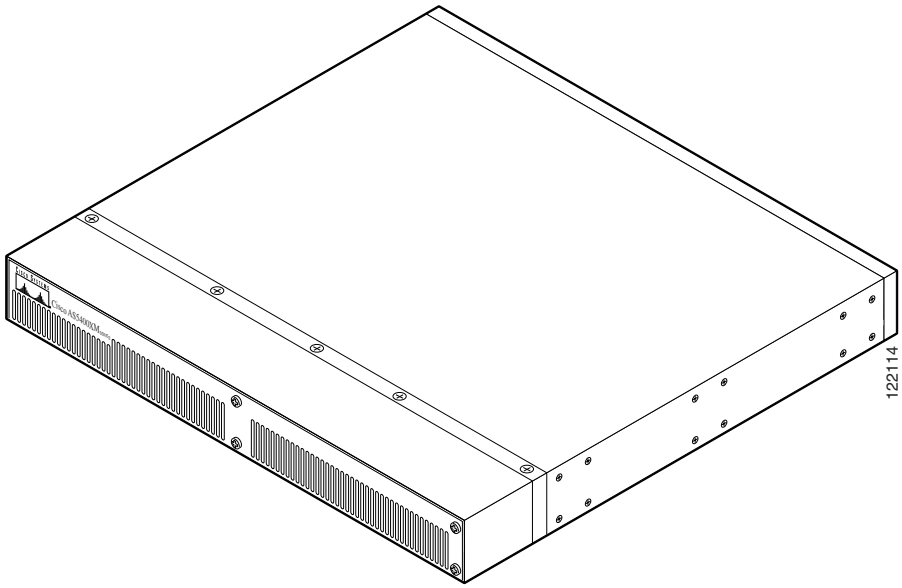
To remove the fan tray, follow this procedure:

Step 1 Use the power switch on the chassis to power down the chassis.

Caution The fan tray is not hot-swappable. You must power down the system before removing the fan tray.

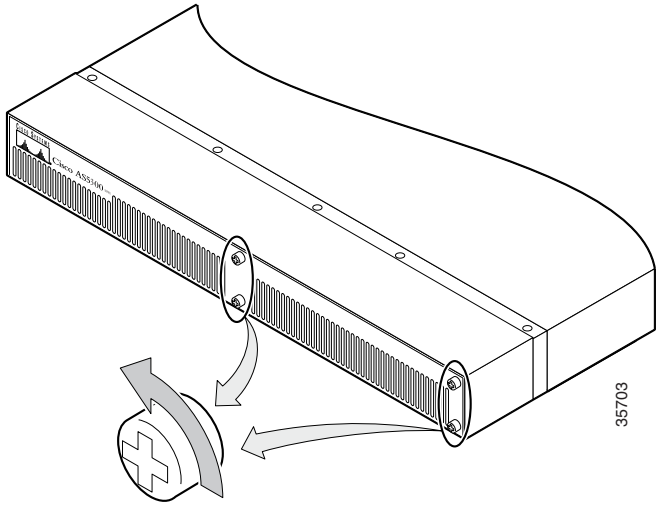
Step 2 Position the chassis with the front panel facing you. (See Figure 4-3.) The front panel contains the fan tray.

Figure 4-3 Cisco AS5350XM Front Panel



Step 3 Loosen the four screws securing the fan tray to the chassis. (See Figure 4-4.)

Figure 4-4 Loosen Fan Tray Screws



Step 4 Grasp the edge of the fan tray near the two end-screws and carefully pull it towards you. (See Figure 4-5.) The fan tray power connector disconnects from its receptacle. (See Figure 4-6.)

Figure 4-5 Pulling the Edge of the Fan Tray

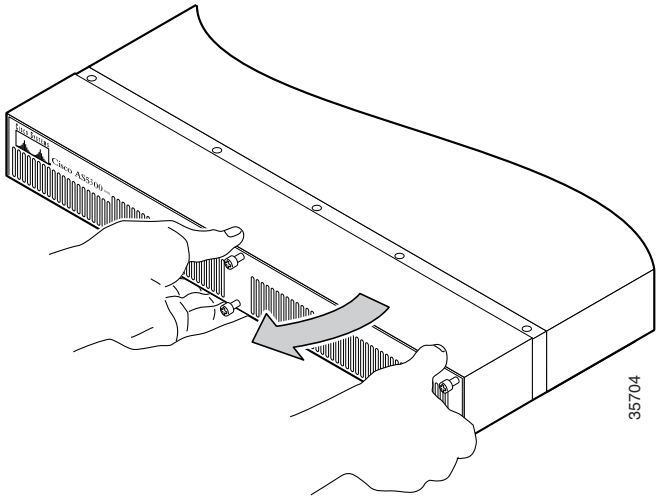
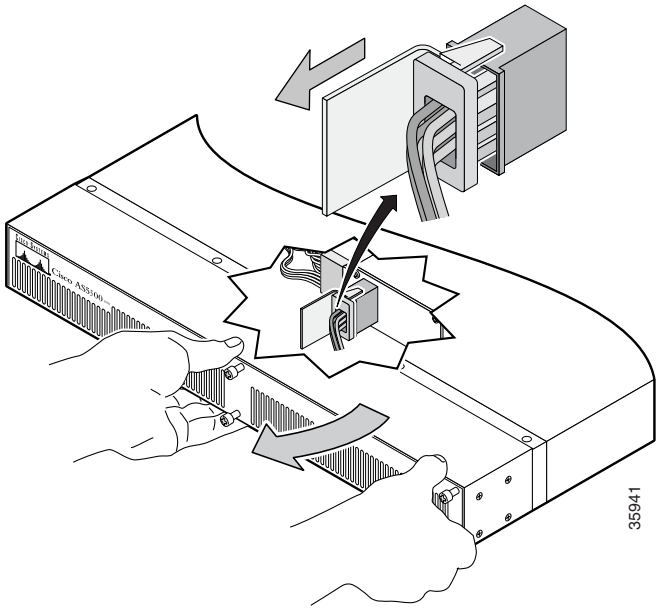
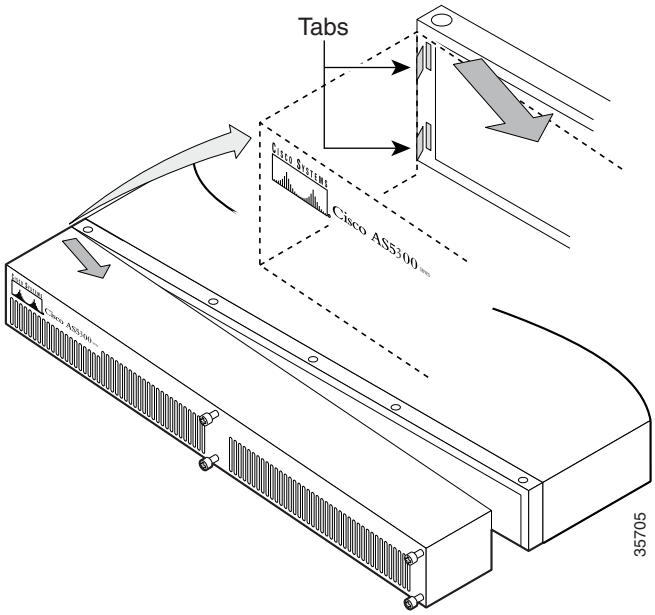


Figure 4-6 Fan Tray Power Connector Disconnecting from the Receptacle



Step 5 Slide the metal tabs located at the other end of the fan tray out of their slots. (See Figure 4-7.)

Figure 4-7 Slide Metal Tabs out of the Slots

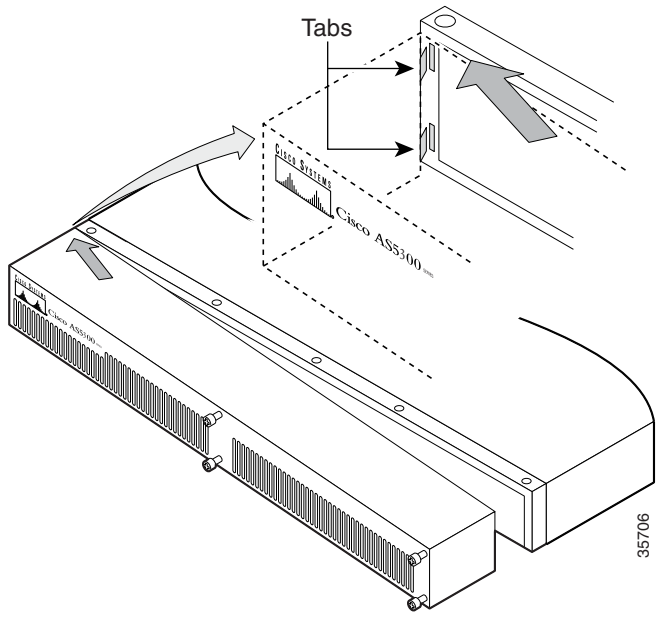


Installing the Fan Tray

To install the fan tray, follow this procedure:

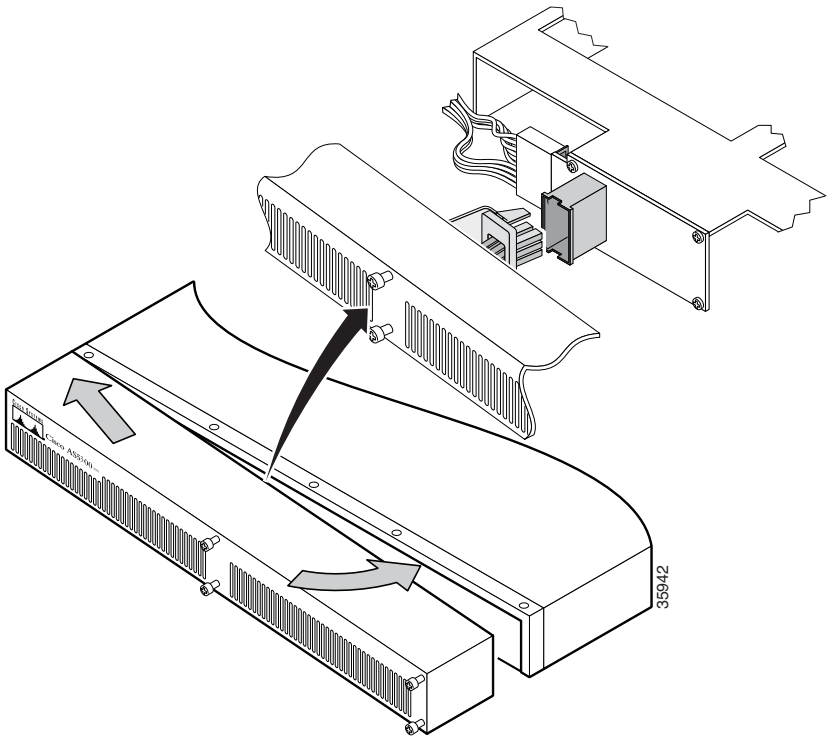
Step 1 Insert the metal tabs located at the end of the fan tray into their slots. (See Figure 4-8.) Use your left hand to hold that end of the fan tray against the chassis to ensure that the metal tabs do not slip out of their slots.

Figure 4-8 Inserting the Metal Tabs into the Slots



Step 2 Use your right hand to rotate the other end of the fan tray towards the front panel of the chassis. Make sure the fan tray power connector slides into the receptacle. (See Figure 4-9.)

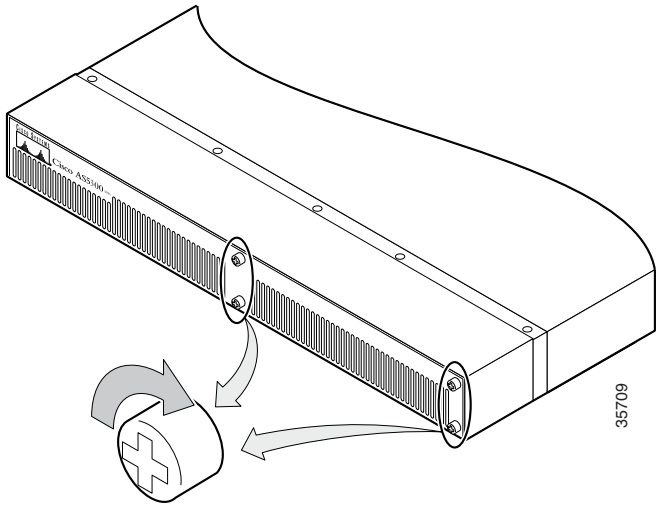
Figure 4-9 Sliding the Fan Tray Power Connector into the Receptacle



Step 3 Carefully slide the fan tray connector into its receptacle until the fan tray touches the front panel. (See Figure 4-9.)

Step 4 Tighten the four screws to secure the fan tray to the chassis. (See Figure 4-10.)

Figure 4-10 Tightening Fan Tray Screws



Getting Help

For information about technical support, onsite service, and exchange and repair services, see the "Obtaining Technical Assistance" section on page xvii.

Replacing Memory Components

This appendix contains procedures on how to replace memory components in the Cisco AS5350XM universal gateway field-replaceable units. The appendix contains the following sections:

Removing the Chassis Cover

This section describes how to open the chassis by removing the chassis cover.

Required Tools

You need the following tools:

- Medium Phillips screwdriver
- Small or medium flat-blade screwdriver

Safety Recommendations

Note the following safety recommendations:

Warning **Before opening the unit, disconnect the telephone-network cables to avoid contact with telephone-network voltages.** Statement 1041

Warning **Do not work on the system or connect or disconnect cables during periods of lightning activity.** Statement 1001

Warning **Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.** Statement 12

NVRAM in the universal gateway uses an internal lithium battery to maintain data. Although this is not a field-serviceable component, we are required to provide the following safety warnings:

Warning **There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.** Statement 1015

Warning **Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.** Statement 43

Chassis Cover Removal

You must open the universal gateway chassis to gain access to its interior components: boot read-only memory (ROM) software, synchronous dynamic random-access memory, dual in-line memory (SDRAM DIMMs) modules. (When you replace the boot ROM, you must also remove all feature cards in the chassis.)

To remove the chassis cover, follow this procedure:

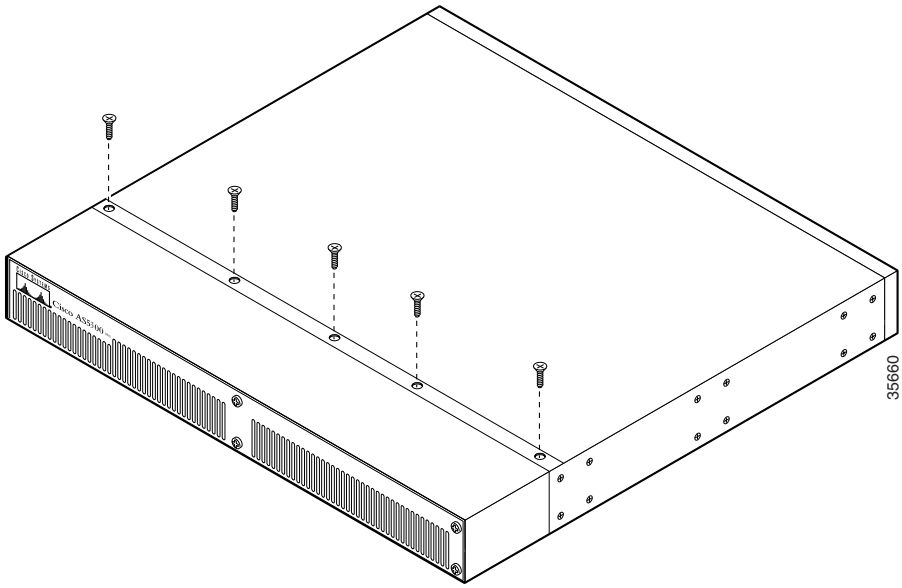
Step 1 Turn the power switch on the universal gateway off and disconnect site power.

Step 2 Remove all interface cables from the rear panel of the universal gateway.

Step 3 Place the gateway so that the front panel is facing you.

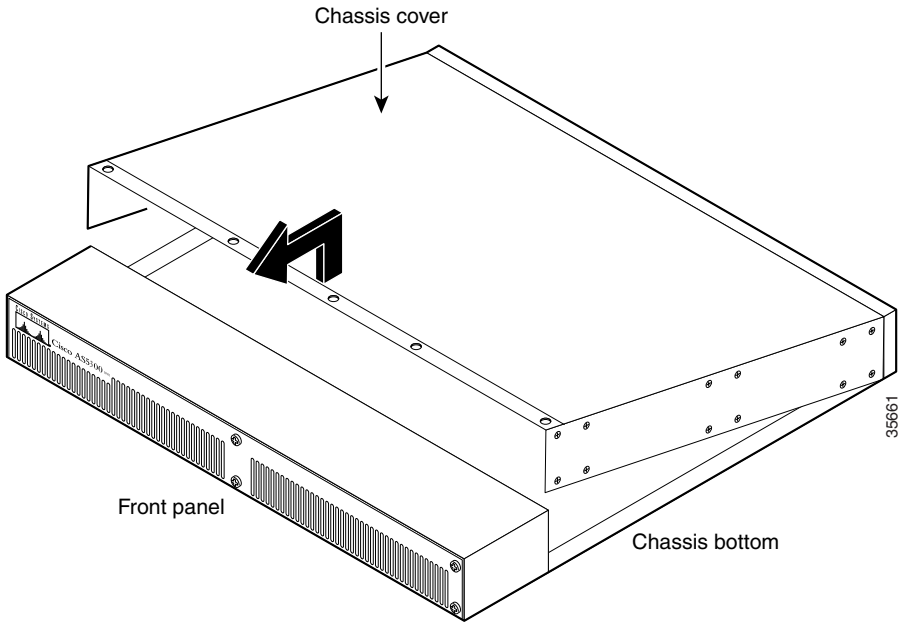
Step 4 Remove the five screws on the chassis cover, as shown in Figure A-1.

Figure A-1 Removing the Chassis Cover Screws



Step 5 Gently pry the cover off with a flat-blade screwdriver. Lift the chassis cover upward, as shown in Figure A-2, and pull it away from the tabs on the rear of the chassis.

Figure A-2 Removing the Chassis Cover



Replacing the Compact Flash

To replace the compact flash, follow these steps:

Step 1 Turn the power switch off and disconnect site power.

For DC-powered units, note the following warnings:

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Warning **Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.** Statement 140

Warning **Before opening the unit, disconnect the telephone-network cables to avoid contact with telephone-network voltages.** Statement 1041

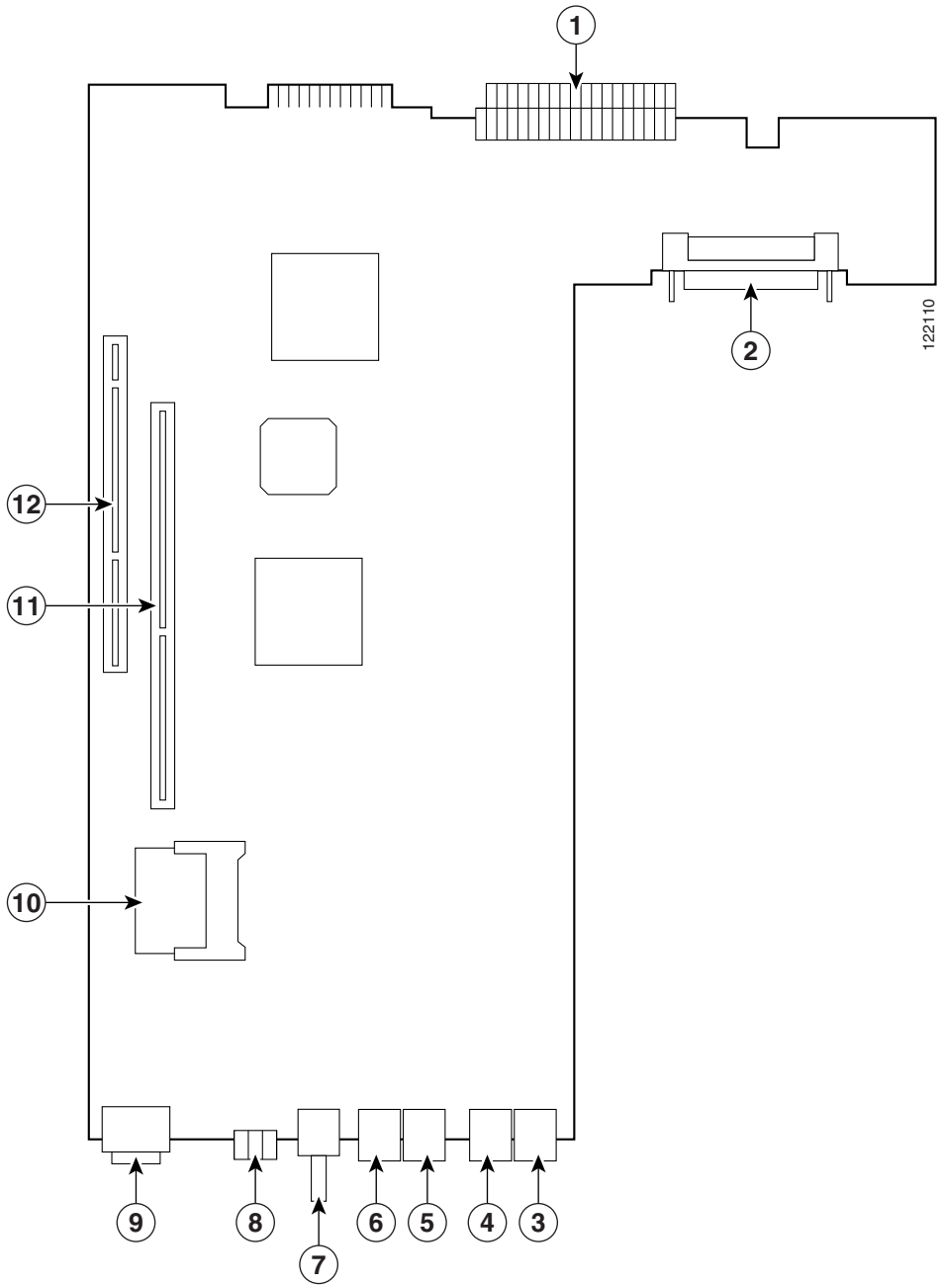
Step 2 Remove all interface cables from the DFCs.

Step 3 Attach an ESD-preventive wrist strap.

Step 4 Remove the chassis cover. (See the instructions in the "Removing the Chassis Cover" section on page A-1.)

Step 5 Locate the compact flash on the system board. (See Figure A-3.)

Figure A-3 Memory Locations



1	Backplane connector	**2**	System board DFC connector
3	AUX	**4**	CON
5	GE1	**6**	GE0
7	BITS port	**8**	Alarm port
9	2T serial interface	**10**	Compact flash
11	DIMM slot	**12**	32-bit PCI interface

Step 6 Using your fingers, gently extract the old compact flash and set it on a nonconductive surface. Do not use excessive force, because the socket might break.

Step 7 Insert the new compact flash into the socket. Be careful not to bend or crush any of the bottom pins. If necessary, use needlenose pliers to straighten out any bent pins.

Step 8 Replace the chassis cover. (See the instructions in the "Replacing the Chassis Cover" section on page A-8.)

Step 9 Power up the universal gateway. If error messages relating to memory are displayed, remove the new compact flash and reinstall it, taking care to seat the compact flash firmly in the socket.

Replacing DIMMs

This section describes how to replace a DIMM on the Cisco AS5350XM universal gateway. The universal gateway has a single DIMM (see Figure A-4). The default factory configuration is a 512 MB double data rate (DDR1) SDRAM DIMM.

You might need to upgrade the DIMM for the following reasons:

- You have upgraded to a new Cisco IOS feature set or release that requires more memory.
- You are using very large routing tables or many protocols (for example, when the universal gateway is set up as a connection device between large external networks and your internal network).

Required Tools and Equipment

You need the following tools and equipment:

- ESD-preventive wrist strap
- Appropriate DIMM

Replacing the DIMM

To replace the DIMM, follow this procedure:

Step 1 Power down the universal gateway and disconnect site power.

For DC-powered units only, note the following warning.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Warning **Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.** Statement 140

Warning **Before opening the unit, disconnect the telephone-network cables to avoid contact with telephone-network voltages.** Statement 1041

Step 2 Remove all interface cables from the rear panel of the universal gateway.

Step 3 Attach an ESD-preventive wrist strap.

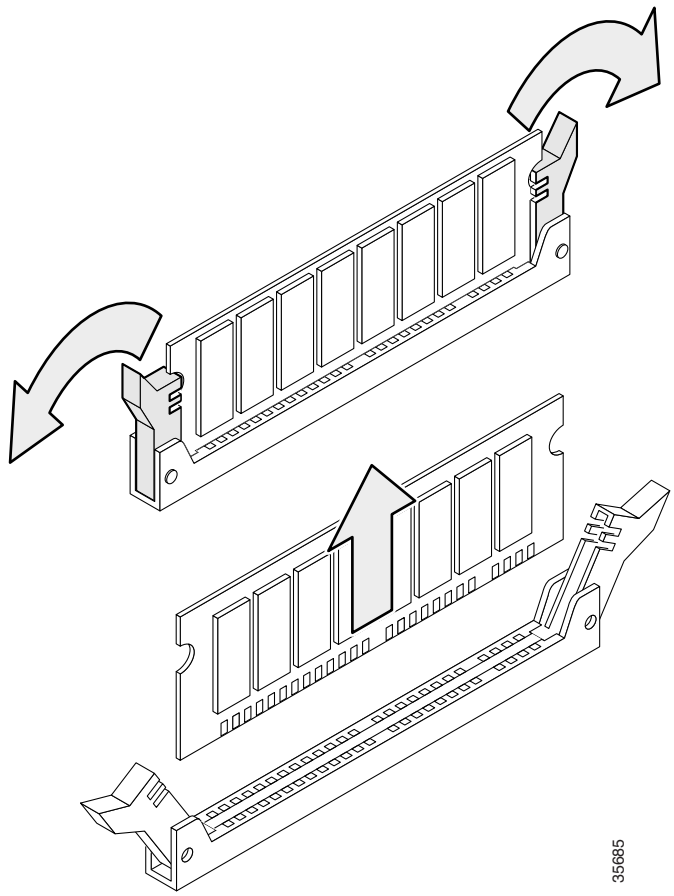
Step 4 Remove the chassis cover. (See the instructions in the "Removing the Chassis Cover" section on page A-1.)

Step 5 Use Figure A-3 to locate the DIMM you are replacing.

Step 6 Pull the socket latches away from the DIMM, and then pull the DIMM out of the socket. (See Figure A-4.) The latches hold the DIMM tightly, so be careful not to break the socket.

Caution To prevent damage, do not press on the center of the DIMM. Handle the DIMM carefully.

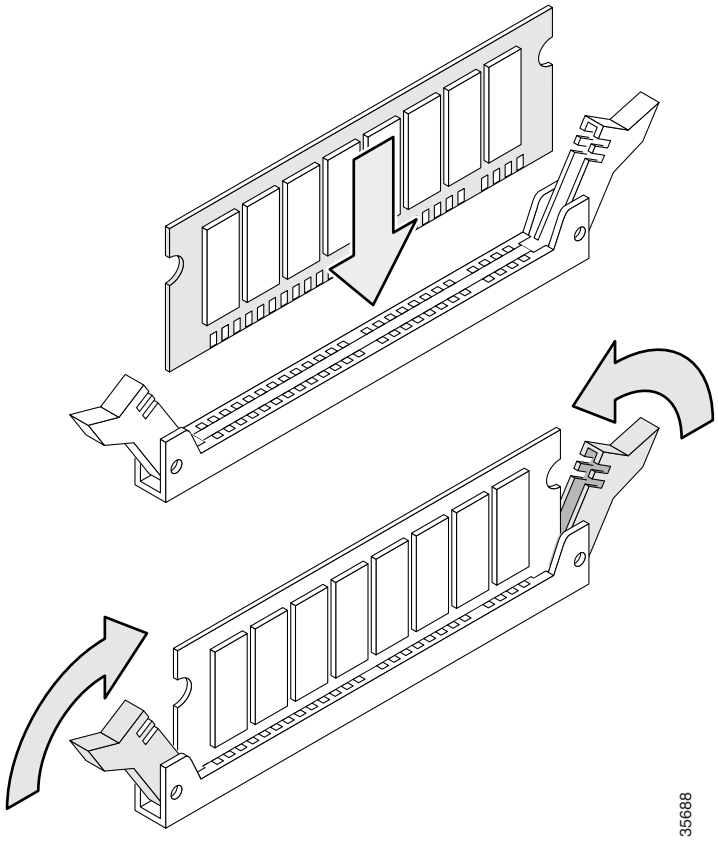
Figure A-4 Removing and Replacing the DIMM



Step 7 Position the new DIMM so that the polarization notch is located at the right end of the DIMM socket.

Step 8 Insert the new DIMM by sliding the end with the metal fingers into the DIMM socket, as shown in Figure A-5.

Figure A-5 Inserting the New DIMM into the Socket



Step 9 Snap the latches into place. Do not use excessive force, because the socket might break.

Step 10 Replace the gateway chassis cover. (See the "Replacing the Chassis Cover" section on page A-8.)

Step 11 Power on the universal gateway. If error messages relating to memory are displayed, remove the DIMM and reinstall it, taking care to seat the DIMM firmly in its socket.

Replacing the Chassis Cover

This section describes the procedure for replacing the chassis cover.

Required Tools and Equipment

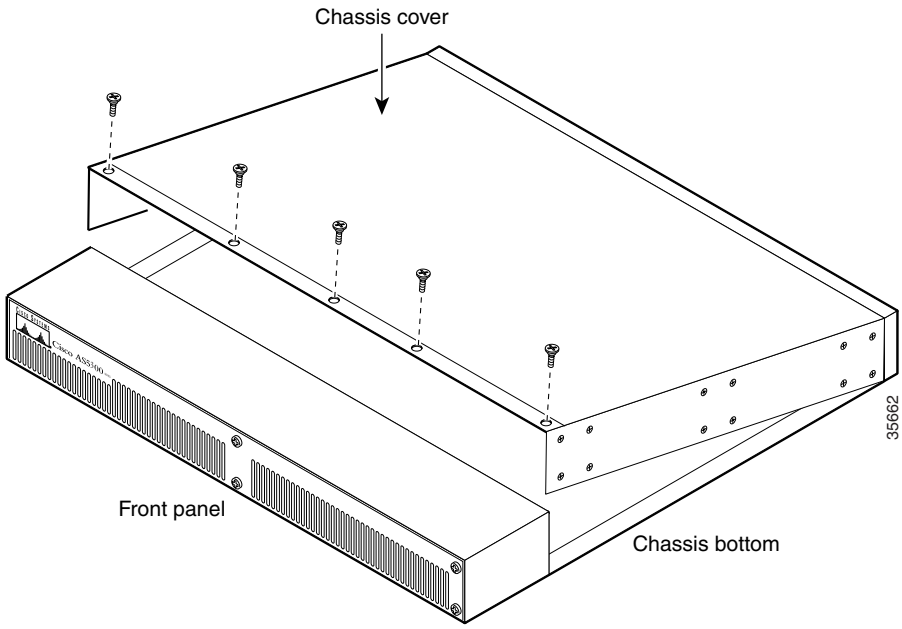
- Medium Phillips screwdriver
- Five screws

Chassis Cover Replacement

To replace the chassis cover, follow this procedure:

Step 1 Place the chassis bottom so that the front panel is facing you. (See Figure A-6.)

Figure A-6 Replacing the Chassis Cover



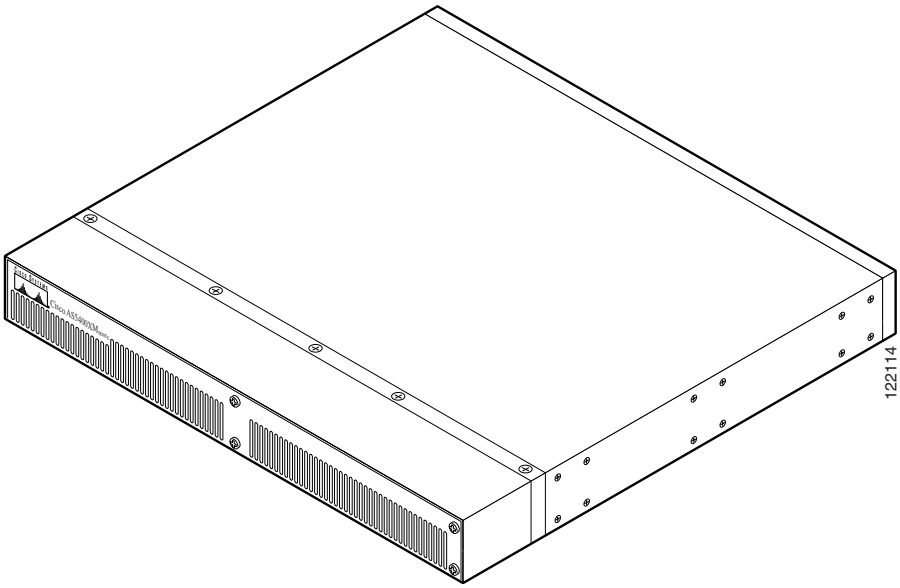
Step 2 Hold the chassis cover over the chassis bottom, and align each of the cover tabs with the chassis tabs at the top rear of the chassis.

Step 3 Lower the front of the top cover to close the chassis, and ensure the following:

- The chassis cover tabs fit under the edge of the chassis rear panel so that they are not exposed.
- The chassis tabs fit under the chassis cover so that they are not exposed.
- The chassis cover side tabs on both sides fit inside the chassis side panels so that they are not exposed.

When the chassis cover is properly assembled, no tabs are visible. (See Figure A-7.)

Figure A-7 Cisco AS5350XM Chassis



Step 4 Secure the chassis cover with five screws.

Step 5 Reinstall the chassis on a rack, desktop, or table.

Step 6 Reinstall all interface cables.

Step 7 Reconnect the AC power cord to the power supply.

Step 8 Power up the universal gateway.

The internal power supply fan should power up.

Replacing the Power Supply

This appendix includes information on how to replace the power supply for the Cisco AS5350XM universal gateway and contains the following sections:

Overview

The power system consists of a single input AC or DC power supply or a dual input (redundant) AC or DC power supply. For more information about the power system, see the "Power Supply" section on page 1-4 and the "Power Supply Considerations" section on page 2-6.

Safety Recommendations

Note the following safety recommendations:

Warning **Before opening the unit, disconnect the telephone-network cables to avoid contact with telephone-network voltages.** Statement 1041

Warning **Do not work on the system or connect or disconnect cables during periods of lightning activity.** Statement 1001

Warning **Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.** Statement 12

Warning **Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.** Statement 43

Warning **Only trained and qualified personnel should be allowed to install or replace this equipment.** Statement 49

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a UL Listed and Certified fuse or circuit breaker no larger than 60 VDC, 15 A is used on all current-carrying conductors.** Statement 96

Caution Before opening the chassis, ensure that you have discharged all static electricity from your body and that the chassis is powered down.

Required Tools and Equipment

You need the following tools and equipment:

- Medium-size Phillips screwdriver
- Small or medium flat-blade screwdriver
- ESD-preventive wrist strap
- Tie-wraps (optional)
- Antistatic bag (optional)

Removing the Chassis Cover

You must open the universal gateway chassis to gain access to its interior components.

To open the chassis cover, follow this procedure:

Step 1 Turn the power switch on the universal gateway off and disconnect site power.

Note Note that the power switch is part of the power supply.

Step 2 If you are using a DC-powered unit, refer to Figure B-1 or Figure B-2 and complete the Step a through Step d.

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003

Warning **Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.** Statement 140

Figure B-1 DC Power Supply Connections—Single Power Supply

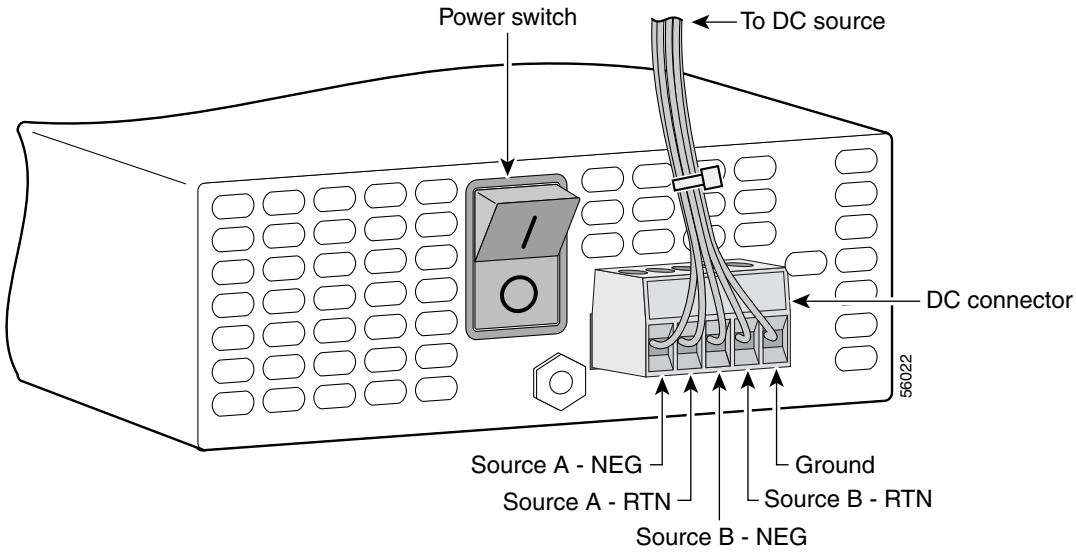
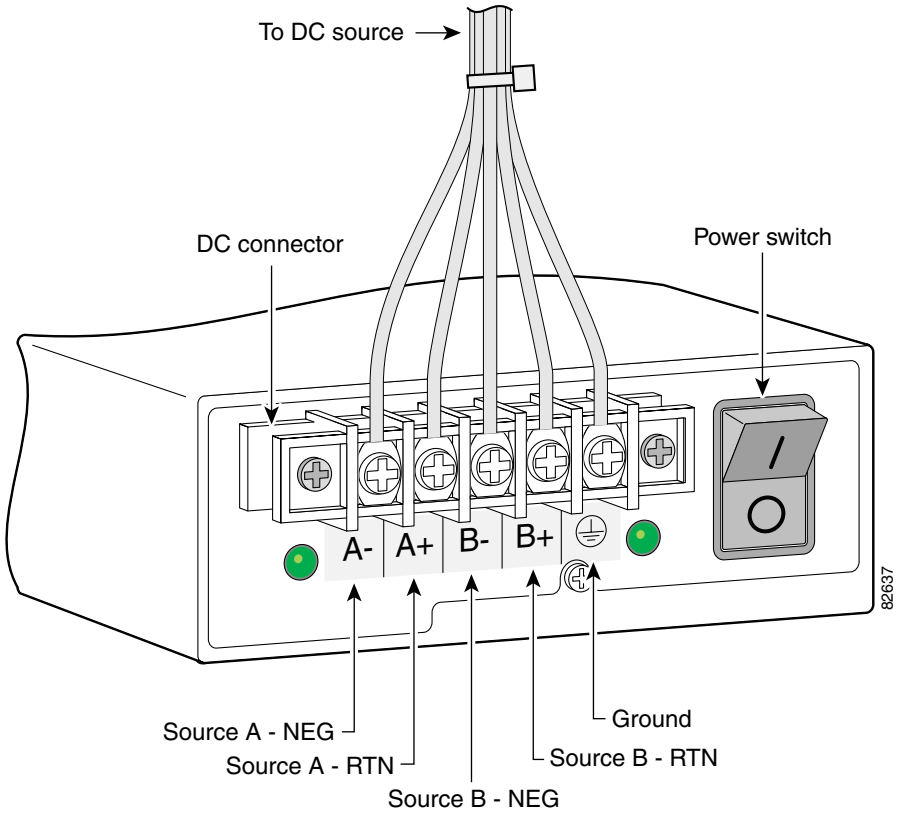


Figure B-2 DC Power Supply Connections—Redundant Power Supply



a. Loosen the five locking screws for the negative, return, and ground connectors on the DC connector.

b. Remove the +48 VDC return wires from the DC connectors.

c. Remove the -48 VDC wires into the DC negative connectors.

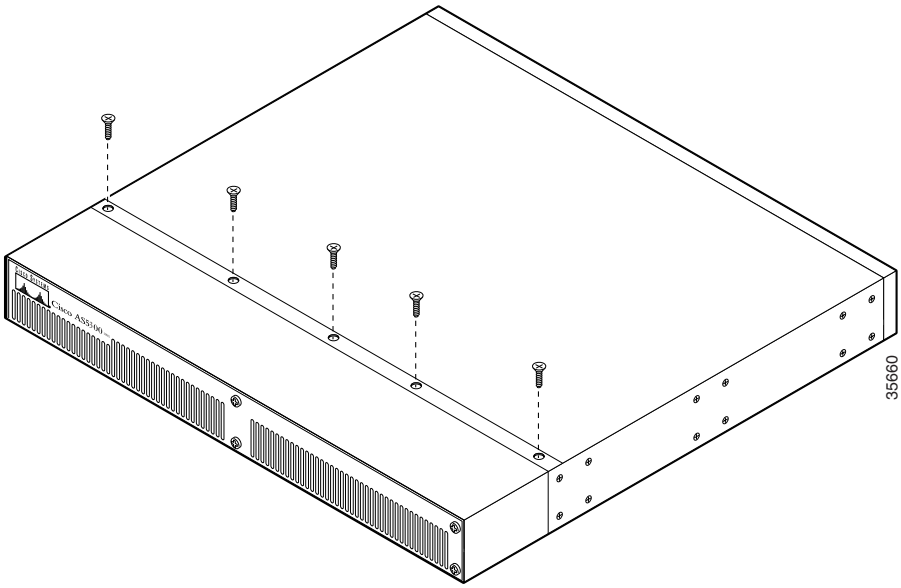
d. Remove the safety ground wire from the DC connector.

Step 3 Remove all interface cables from the rear panel of the universal gateway.

Step 4 Place the universal gateway so that the front panel is facing you.

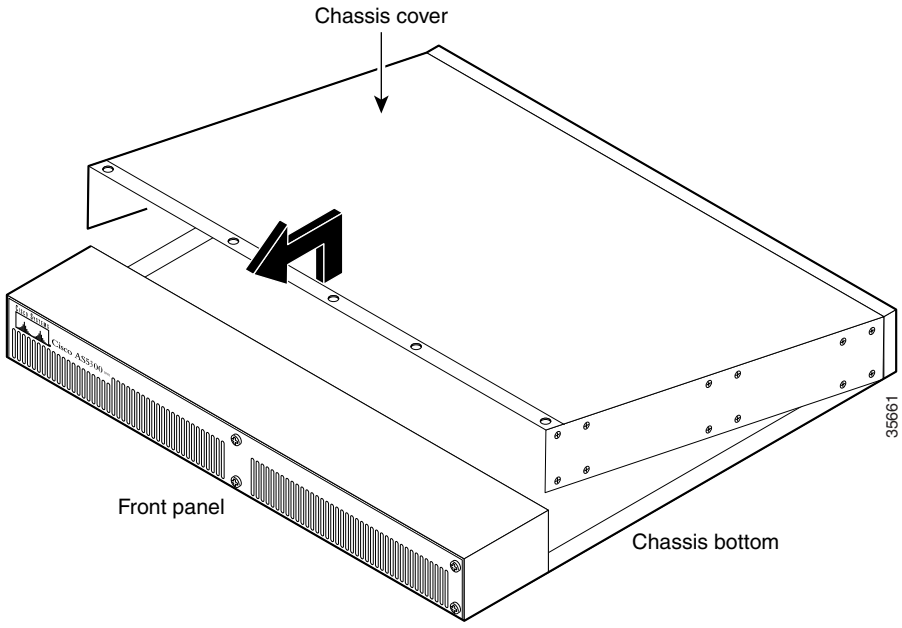
Step 5 Remove the five screws on the chassis cover. (See Figure B-3.)

Figure B-3 Removing the Chassis Cover Screws



Step 6 Gently pry the cover off with a flat-blade screwdriver. Lift the chassis cover upward, as shown in Figure B-4, and pull it away from the tabs on the rear of the chassis.

Figure B-4 Removing the Chassis Cover



Step 7 Continue with the "Removing the Old Power Supply" section on page B-6.

Removing the Old Power Supply

This section describes how to remove the power supply. Note the following safety warnings before you remove the power supply:

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040

Warning **Only trained and qualified personnel should be allowed to install or replace this equipment.** Statement 49

Warning **Read the installation instructions before connecting the system to the power source.** Statement 1004

Warning **Before working on a system that has an on/off switch, turn OFF the power and unplug the power cord.** Statement 1

Warning **Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.** Statement 43

To remove the power supply, follow this procedure:

Step 1 Place the universal gateway so that the rear panel is facing you.

Step 2 Remove the mounting screw that secures the power supply to the chassis and set it aside. (See Figure B-5 or Figure B-6.)

Note Although the following illustrations show only the AC power supply, the procedures are the same for the DC power supply.

Figure B-5 Removing the Mounting Screw on the Single AC Power Supply

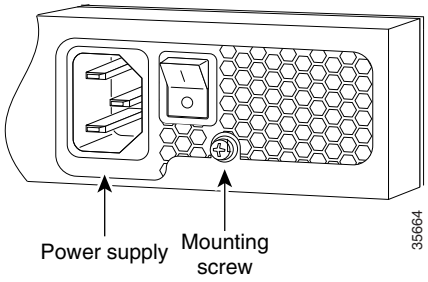
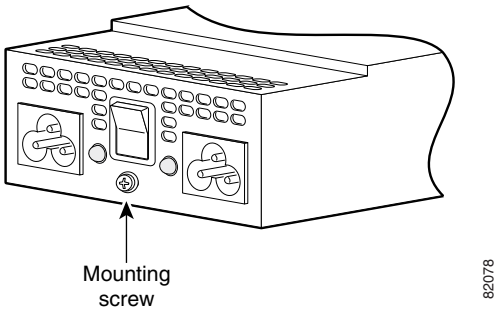


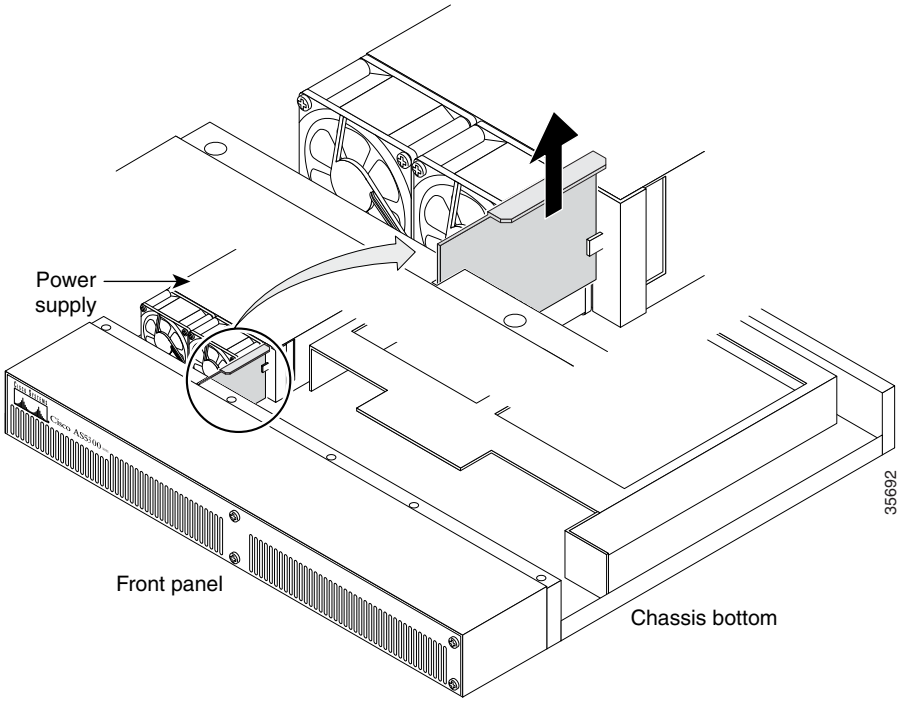
Figure B-6 Removing the Mounting Screw on the Redundant AC Power Supply



Step 3 Turn the universal gateway so that the front panel is facing you.

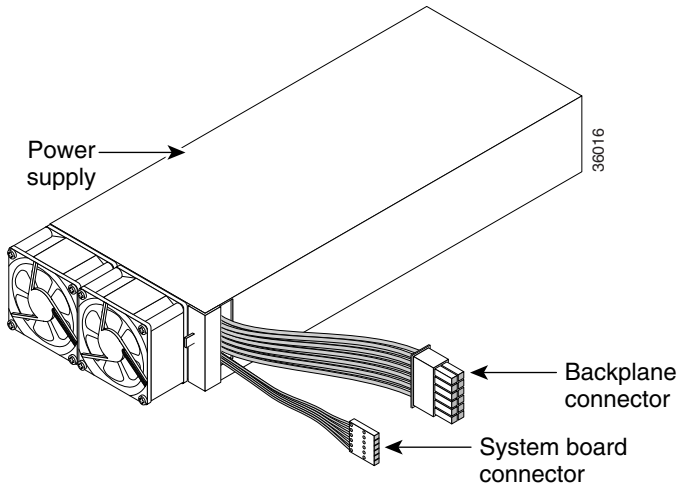
Step 4 Lift the air separator out of the chassis. (See Figure B-7.)

Figure B-7 Removing the Air Separator



Note There are two power connectors on the power supply. One connects to the backplane and the other to the system board. (See Figure B-8.)

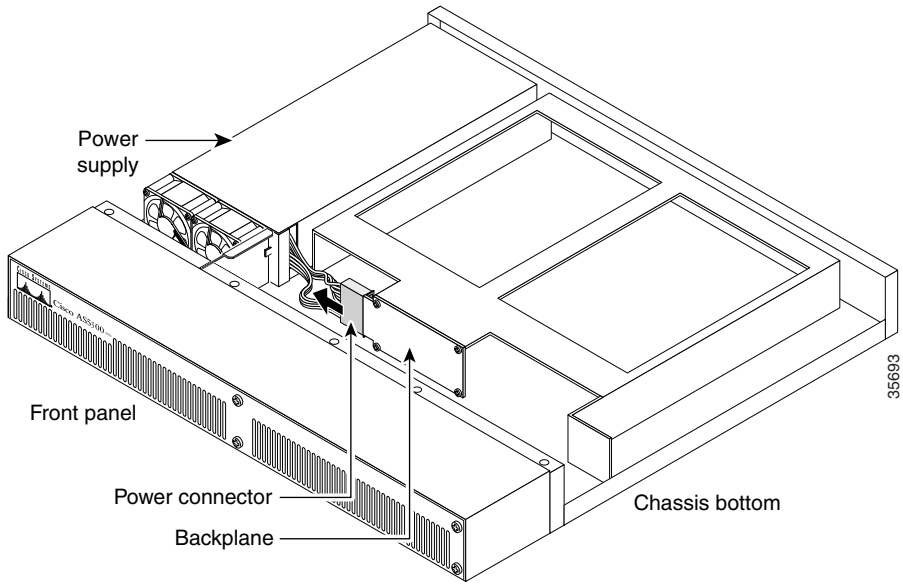
Figure B-8 Power Supply Connectors



Step 5 Disconnect both power supply connectors. Disconnect the backplane connector first, followed by the system board connector. (See Figure B-9.)

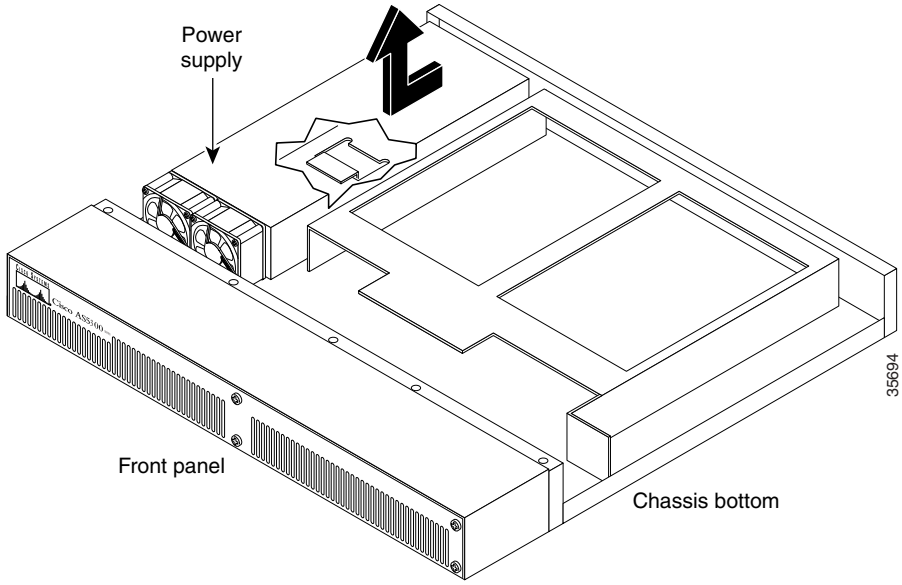
Note The system board connector is located on the system board, below and to the left of the backplane connector.

Figure B-9 Disconnecting the Power Connectors from the Backplane



Step 6 Slide the power supply toward the front panel to disengage the power supply from the chassis hooks. (See Figure B-10.) Remove the power supply from the chassis.

Figure B-10 Lifting the Power Supply Out of the Chassis

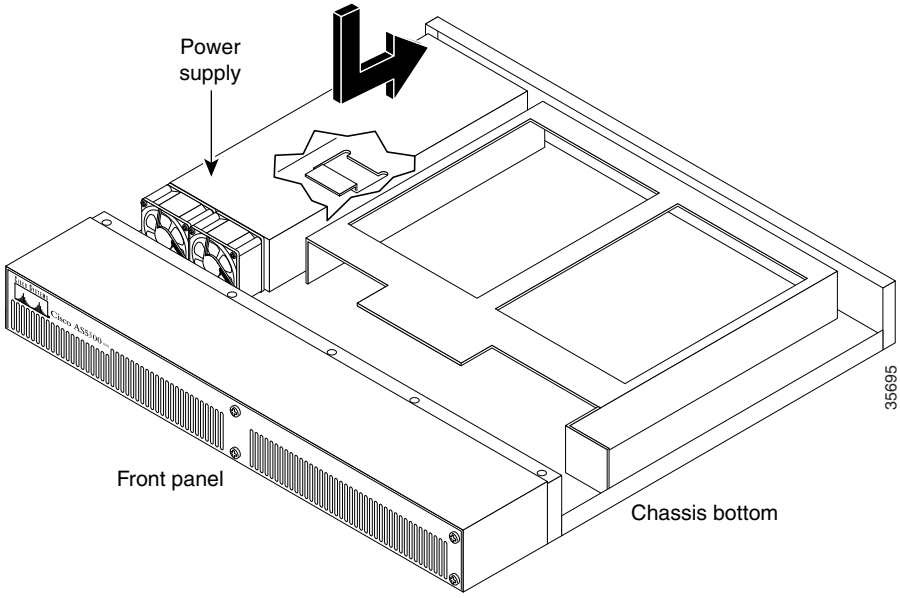


Installing the Power Supply

To install the power supply, follow this procedure:

Step 1 Place the power supply as shown in Figure B-11, and then slide it toward the rear panel. You will be able to feel the chassis hooks engage with the slots on the bottom of the power supply. The same procedure applies to both AC and DC power supplies.

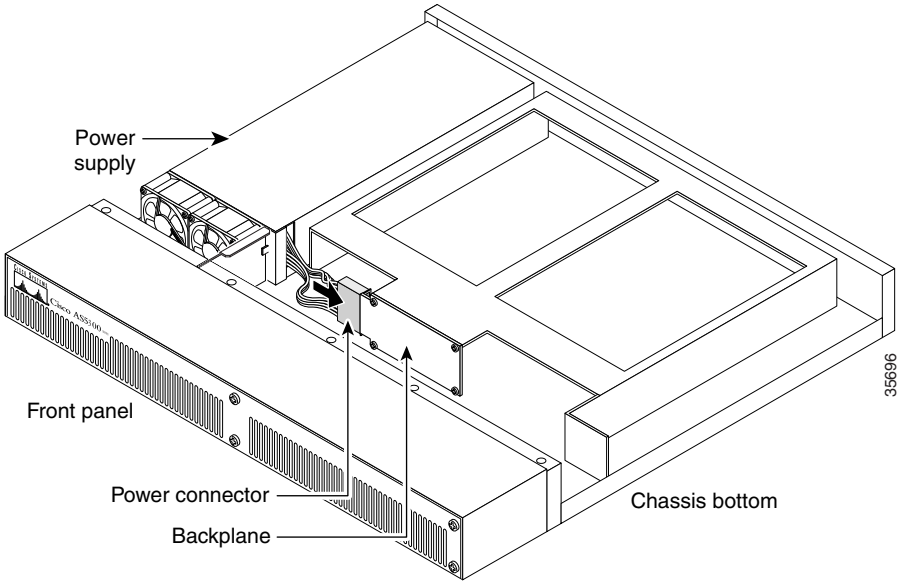
Figure B-11 Inserting the Power Supply in the Chassis



Step 2 Connect the two power connectors to the system board and backplane. (See Figure B-8.) Connect the system board connector first, followed by the backplane connector. (See Figure B-12.)

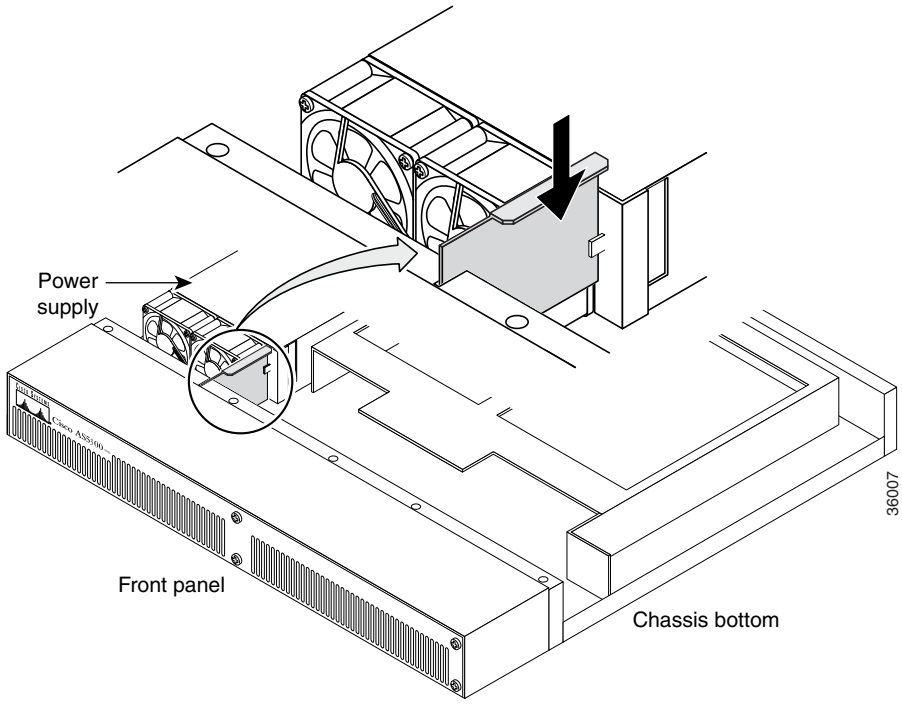
Note The system board connector is located on the system board, below and to the left of the backplane connector.

Figure B-12 Reconnecting the Power Cables to the Backplane



Step 3 Replace the air separator, holding all cables to the right of the separator as you slip it into the chassis. (See Figure B-13.)

Figure B-13 Replacing the Air Separator



Step 4 Reinstall the power supply mounting screw.

Step 5 Replace the chassis cover using the procedures in the "Replacing the Chassis Cover" section on page B-11.

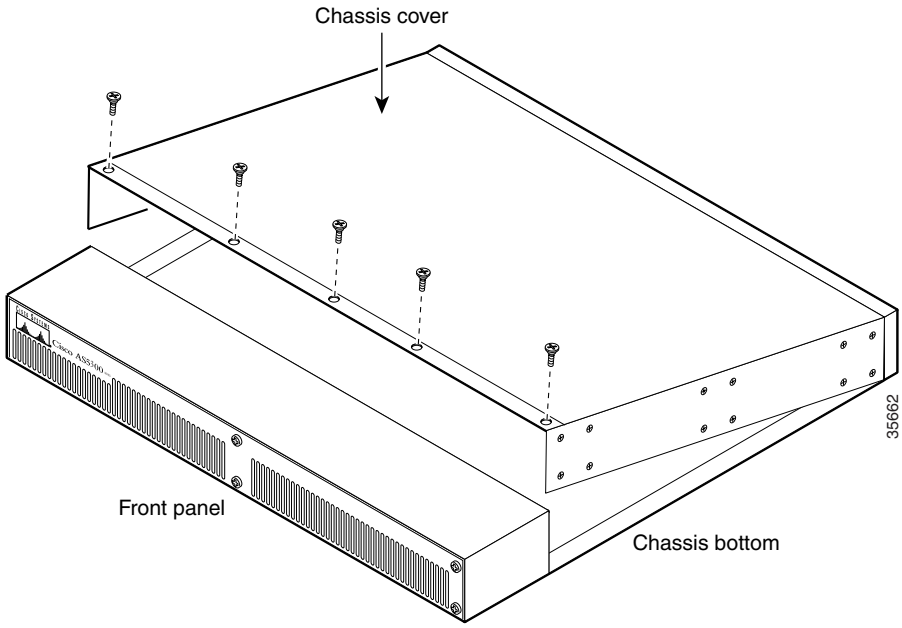
Replacing the Chassis Cover

To replace the chassis cover, follow this procedure:

Step 1 Place the chassis bottom so that the front panel is facing you.

Step 2 Hold the chassis cover over the chassis bottom, and align each of the cover tabs with the chassis tabs at the top rear of the chassis, as shown in Figure B-14.

Figure B-14 Replacing the Chassis Cover



Step 3 Lower the front of the top cover to close the chassis, and ensure the following:

- The chassis cover tabs fit under the edge of the chassis rear panel so that they are not exposed.
- The chassis tabs fit under the chassis cover so that they are not exposed.
- The chassis cover side tabs on both sides fit inside the chassis side panels so that they are not exposed.

When the chassis cover is properly assembled, no tabs are visible.

Step 4 Secure the chassis cover with five screws.

Step 5 If you installed a different type of power supply (AC or DC) than was originally installed in the universal gateway, place one of the power ratings labels that came in the plastic bag with the documentation directly over the power ratings information on the rear panel. For example, if the original chassis came with an AC power supply and you replaced it with a DC power supply, place the DC power ratings label over the ratings stamped on the rear panel of the chassis. This will ensure that the correct power ratings information appears on the rear panel. (See Figure B-15 and Figure B-16.)

Figure B-15 Power Ratings Label for DC Power Supply

INPUT -48/-60V == 3A 150VA

Figure B-16 Power Ratings Label for AC Power Supply

INPUT 100 – 240V~ 50/60Hz 2 – 1A

Figure B-17

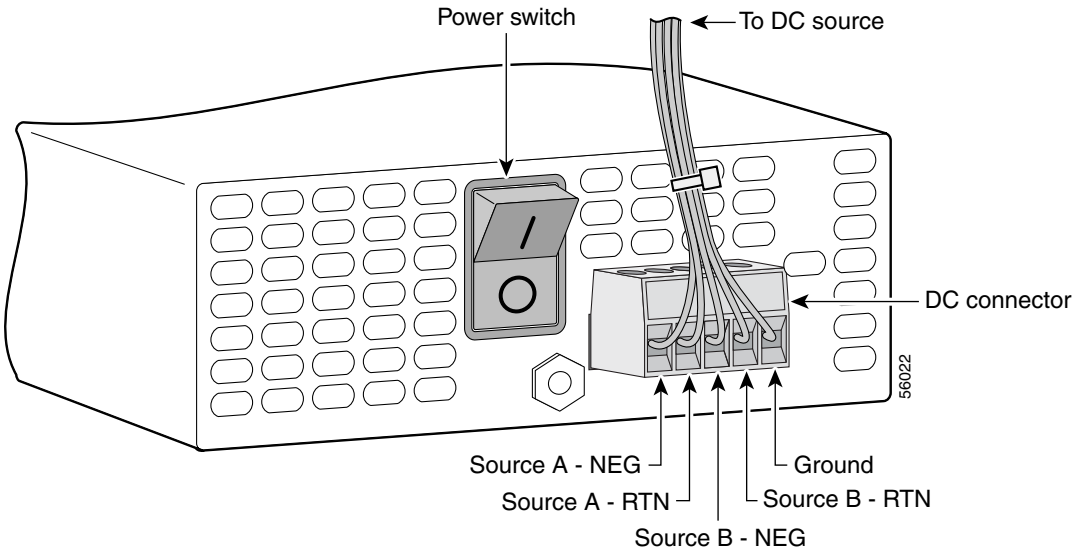
Step 6 Reinstall the chassis on a rack, desktop, or table.

Step 7 Reinstall all interface cables.

Step 8 Reconnect the AC power cord. Or, if you are using a DC-powered unit, refer to Figure B-18 or Figure B-19, and complete Step a through Step e for each power supply.

Warning **The illustration shows the DC power supply terminal block. Wire the DC power supply using the appropriate lugs at the wiring end, or with no lugs, as illustrated. The proper wiring sequence is ground to ground, positive to positive, and negative to negative. Note that the ground wire should always be connected first and disconnected last.** Statement 197

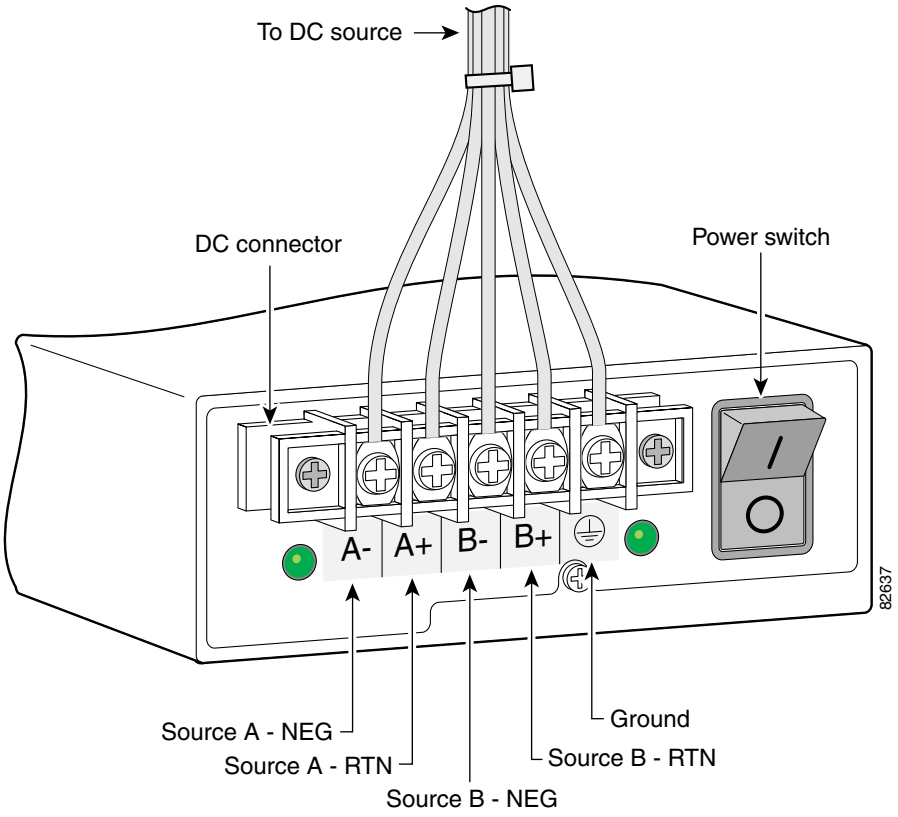
Figure B-18 Connecting DC Power Supply—Single Power Supply



a. Connect the DC connector to the rear of the power supply.

Caution Do not overtorque the terminal block contact screws. The recommended torque is 4.5 lb-in (0.50 N-m).

Figure B-19 Connecting DC Power Supply—Redundant Power Supply



Note This product is intended for installation in restricted access areas and is approved for connection using 12 or 14 AWG copper conductors only. The installation must comply with all applicable codes.

Note For central office installations, we recommend using a 6 AWG green ground wire with one end connected to reliable earth. The other end of the wire should be crimped onto the double-hole lug provided in the installation pack. The lug should be secured to the mating holes on the side of the chassis with the two screws included in the accessory pack.

Note If you are installing a redundant power supply, you should attach appropriate-sized spade terminals to the stripped ends of the ground and input wires.

b. Insert the safety ground (green wires) into the DC connector ground connector and tighten the locking screw. Ensure that no bare wire is exposed.

c. Insert the +48 VDC return wires into the DC connectors (+) and tighten the locking screws. Ensure that no bare wire is exposed.

d. Insert the –48 VDC wires into the DC negative connectors (–) and tighten the locking screws. Ensure that no bare wire is exposed.

e. Make sure that the power supply wires are secured to cable strain-relief clamps with cable ties.

Warning **After wiring the DC power supply, remove the tape from the circuit breaker switch handle and reinstate power by moving the handle of the circuit breaker to the ON position.** Statement 8

Step 9 Power up the universal gateway.

The internal power supply fan should power up.

Cabling Specifications

This appendix provides the following cabling and pinout information for the Cisco AS5350XM universal gateway:

Note This appendix provides cabling information for chassis connections only. For cabling information for the Cisco AS5350XM dial feature cards, see the *Cisco AS5350XM and Cisco AS5400XM Universal Gateways Card Installation Guide.*

Note This appendix specifies pinouts only for the pins used. Pins not listed in the tables in this appendix are not connected.

Console and Auxiliary Port Cables and Pinouts

The universal gateway arrives with a console and auxiliary cable kit, which contains the cable and adapters you need to connect a console (an ASCII terminal or PC running terminal emulation software) or modem to your universal gateway. The console and auxiliary cable kit includes:

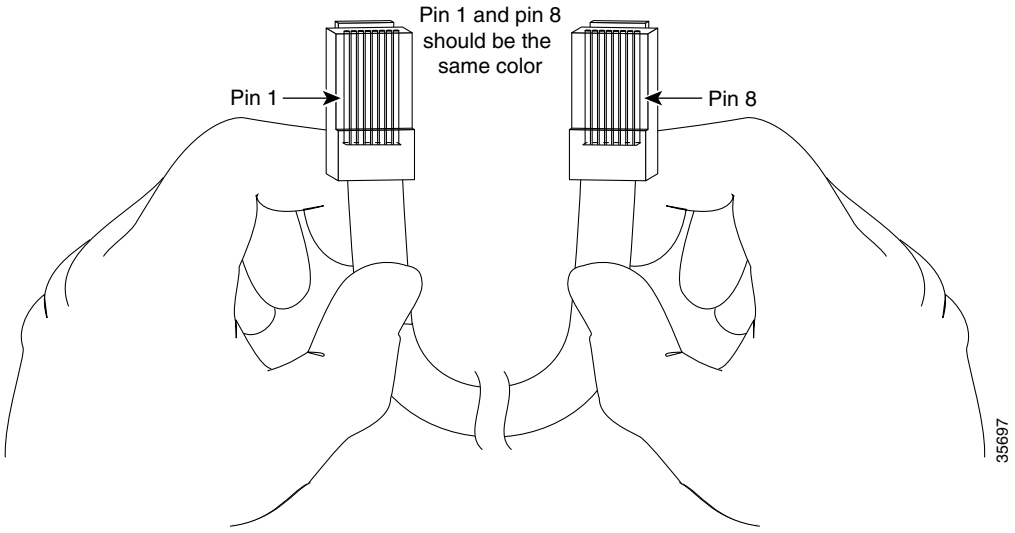
- RJ-45-to-RJ-45 rollover cable. (See the next section, "Identifying a Rollover Cable," for more information.)
- RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL).
- RJ-45-to-DB-25 female DTE adapter (labeled TERMINAL).
- RJ-45-to-DB-25 male DCE adapter (labeled MODEM).

For console connections, proceed to the "Console Port Cables and Pinouts" section on page C-2. For modem connections, proceed to the "Auxiliary Port Cables and Pinouts" section on page C-4.

Identifying a Rollover Cable

You can identify a rollover cable by comparing the two modular ends of the cable. Holding the cables side by side, with the tab at the back, the wire connected to the pin on the outside of the left plug should be the same color as the wire connected to the pin on the outside of the right plug. (See Figure C-1.) If your cable was purchased from Cisco Systems, pin 1 will be white on one connector, and pin 8 will be white on the other connector (a rollover cable reverses pins 1 and 8, 2 and 7, 3 and 6, and 4 and 5).

Figure C-1 Identifying a Rollover Cable



Console Port Cables and Pinouts

Use the RJ-45-to-RJ-45 rollover cable and RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL) to connect the console port to a PC running terminal emulation software. Figure C-2 shows how to connect the console port to a PC. Table C-1 lists the pinouts for the asynchronous serial console port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL).

Figure C-2 Connecting the Console Port to a PC

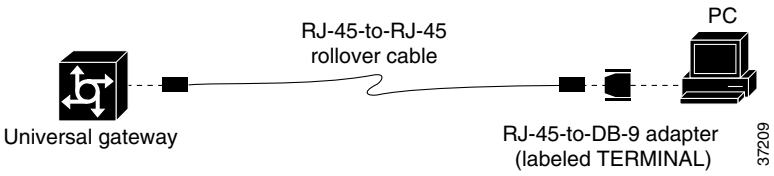


Table C-1 Console Port Signaling and Cabling Using a DB-9 Adapter

Console Port (DTE)	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-9 Terminal Adapter	Console Device
Signal	**RJ-45 Pin**	**RJ-45 Pin**	**DB-9 Pin**	**Signal**
RTS	1[1]	8	8	CTS
DTR	2	7	6	DSR
TxD	3	6	2	RxD
GND	4	5	5	GND
GND	5	4	5	GND
RxD	6	3	3	TxD
DSR	7	2	4	DTR
CTS	8[1]	1	7	RTS

1. Pin 1 is connected internally to pin 8.

Use the RJ-45-to-RJ-45 rollover cable and RJ-45-to-DB-25 female DTE adapter (labeled TERMINAL) to connect the console port to a terminal. Figure C-3 shows how to connect the console port to a terminal. Table C-2 lists the pinouts for the asynchronous serial console port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-25 female DTE adapter (labeled TERMINAL).

Figure C-3 Connecting the Console Port to a Terminal

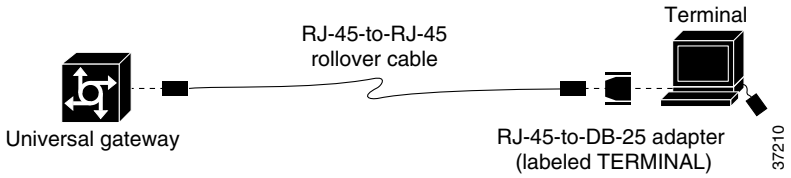


Table C-2 Console Port Signaling and Cabling Using a DB-25 Adapter

Console Port (DTE)[1]	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-25 Terminal Adapter	Console Device
Signal	**RJ-45 Pin**	**RJ-45 Pin**	**DB-25 Pin**	**Signal**
RTS	1[2]	8	5	CTS
DTR	2	7	6	DSR
TxD	3	6	3	RxD
GND	4	5	7	GND
GND	5	4	7	GND
RxD	6	3	2	TxD
DSR	7	2	20	DTR
CTS	8[1]	1	4	RTS

1. You can use the same cabling to connect a console to the auxiliary port.
2. Pin 1 is connected internally to pin 8.

Auxiliary Port Cables and Pinouts

Use the RJ-45-to-RJ-45 rollover cable and RJ-45-to-DB-25 male DCE adapter (labeled MODEM) to connect the auxiliary port to a modem. Figure C-4 shows how to connect the auxiliary port to a modem. Table C-3 lists the pinouts for the asynchronous serial auxiliary port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-25 male DCE adapter (labeled MODEM).

Figure C-4 Connecting the Auxiliary Port to a Modem

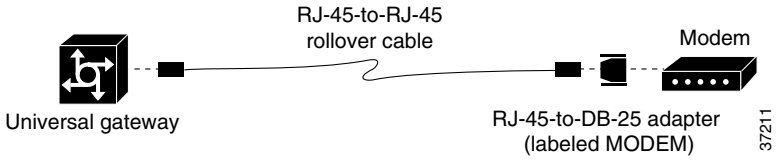


Table C-3 Auxiliary Port Signaling and Cabling Using a DB-25 Adapter

AUX Port (DTE)	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-25 Modem Adapter	Modem
Signal	**RJ-45 Pin**	**RJ-45 Pin**	**DB-25 Pin**	**Signal**
RTS	1	8	4	RTS
DTR	2	7	20	DTR
TxD	3	6	3	TxD
GND	4	5	7	GND
GND	5	4	7	GND
RxD	6	3	2	RxD
DSR	7	2	8	DCD
CTS	8	1	5	CTS

Ethernet Port Pinouts

Table C-4 lists the pinouts for the Ethernet ports.

Caution To comply with the intra-building lightning surge requirements of GR-1089-CORE, Issue III, October 2002, you must use a shielded cable when connecting to either of the Cisco AS5350XM universal gateway Ethernet ports. The cable must consist of shielded cable terminated by shielded connectors on both ends, with the cable shield material tied to both connectors.

Table C-4 10/100BASE-T Port Pinouts

RJ-45 Pin	Description
1	TXD+
2	TXD–
3	RXD+

Table C-4 10/100BASE-T Port Pinouts (continued)

RJ-45 Pin	Description
4	–
5	–
6	RXD–
7	–
8	–

BITS Port Pinouts

Table C-5 lists the pinouts for the BITS port.

Table C-5 BITS Port Pinouts

Pin	Description
1	BITS signal
2	Ground

Alarm Port Pinouts

Table C-6 lists the pinouts for the alarm port.

Table C-6 Alarm Port Pinouts

Pin	Description
1	Normally open
2	Pole
3	Normally closed

Bantam Jack Port Pinouts

Table C-7 lists the port pinouts for the bantam jacks on the 8-port T1 or E1 DFC and T3 DFC.

Table C-7 Bantam Jack Port Pinouts

Pin	Description
1	Tip
2	Ring

Numerics

A

B

C

D

E

F

G

H

I

L

M

N

O

P

R

S

T

W