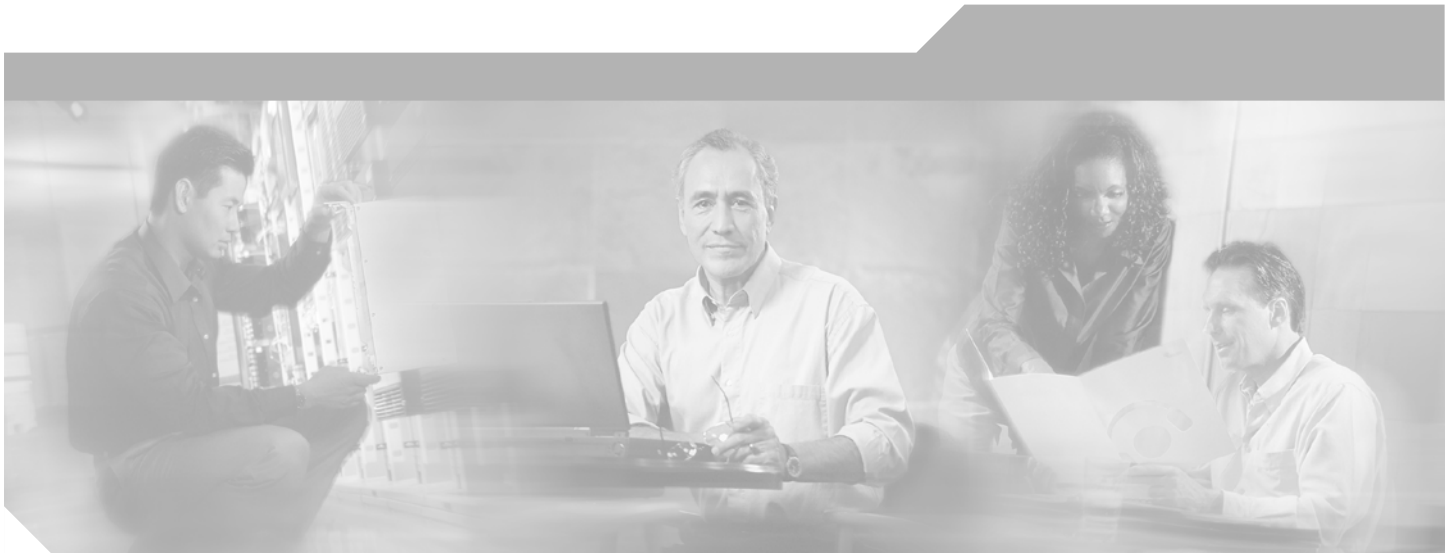

Cisco AVS 3120 Application Velocity System Hardware Installation Guide

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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.

Modifying the equipment without Cisco's written authorization may result in the equipment no longer complying with FCC requirements for Class A or Class B digital devices. In that event, your right to use the equipment may be limited by FCC regulations, and you may be required to correct any interference to radio or television communications at your own expense.

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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Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.

Cisco AVS 3120 Application Velocity System Hardware Installation Guide

CONTENTS

Preface

This guide describes how to install your Cisco AVS 3120 Application Velocity System and get it ready for operation. It describes how to prepare your site for installation, how to install the AVS in an equipment rack, and how to maintain and troubleshoot the AVS 3120 hardware.

This preface contains the following major sections:

Audience

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

This guide is intended for the following trained and qualified service personnel who are responsible for installing and operating the AVS:

- System installer
- Hardware technician
- System operator

You should be familiar with networking equipment and cabling, and have a basic knowledge of electronic circuitry and wiring practices.

To complete the installation, including the software configuration for the AVS, you should be familiar with basic networking principles and configurations, especially web page protocols.

Organization

This publication is organized as follows:

Chapter/Appendix	Description
Chapter 1, Product Overview	Describes the physical properties and provides a functional overview of the AVS 3120.
Chapter 2, Preparing for Installation	Describes safety considerations and provides an overview of the installation and procedures you should perform before the actual installation.
Chapter 3, Installing the AVS 3120	Describes how to install the hardware and connect the external network interface cables.
Chapter 4, Troubleshooting the AVS 3120 Hardware	Describes troubleshooting procedures for the hardware installation.
Chapter 5, Maintaining Your AVS 3120	Contains the procedures for maintaining your AVS 3120 in proper operating condition.
Appendix A, Specifications	Lists the hardware specifications for the AVS 3120.
Appendix B, Open Source License Files	Contains the open source license files for the product.

Related Documentation

In addition to this document, the AVS documentation set includes the following:

Document Title	Provides
Cisco AVS 3180A Management Station Hardware Installation Guide	Information on installing the companion hardware, the Cisco AVS 3180A Management Station.
Cisco Application Velocity System User Guide	A comprehensive guide to using the AVS software, including configuration, administration, and reporting functions.
Release Note for the Cisco Application Velocity System	Information on upgrading the AVS software, new features, operating considerations, and caveats for the AVS software.
Regulatory Compliance and Safety Information for the Cisco AVS 3120 Application Velocity System	International agency compliance, safety, statutory, and open source license information.

Conventions

This publication uses the following conventions:

- **Bold text** indicates a command in a paragraph.
- `Courier text` indicates text that appears in a command line, including the CLI prompt.
- **`Courier bold text`** indicates commands and text you enter in a command line.
- *Italic text* indicates the first occurrence of a new term, book title, and emphasized text.

Lists use the following conventions:

1. A numbered list indicates that the order of the list items is important.
   a. An alphabetical list indicates that the order of the secondary list items is important.
- A bulleted list indicates that the order of the list topics is unimportant.
  - An indented list indicates that the order of the list subtopics is unimportant.

Notes, cautionary statements, and safety warnings use these conventions:

Note Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.

Caution Means *reader be careful*. You might do something that could result in equipment damage or loss of data.

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. Statement 1071

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. This section explains the product documentation resources that Cisco offers.

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

The Product Documentation DVD is a library of technical product documentation on a portable medium. The DVD enables you to access installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the HTML documentation and some of the PDF files found on the Cisco website at this URL:

http://www.cisco.com/univercd/home/home.htm

The Product Documentation DVD is created and released regularly. DVDs are available singly or by subscription. Registered Cisco.com users can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at the Product Documentation Store at this URL:

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

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You must be a registered Cisco.com user to access Cisco Marketplace. Registered users may order Cisco documentation at the Product Documentation Store at this URL:

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

If you do not have a user ID or password, you can register at this URL:

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

Documentation Feedback

You can provide feedback about Cisco technical documentation on the Cisco Technical Support & Documentation site area by entering your comments in the feedback form available in every online document.

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 will find information about how to do the following:

- 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, security notices, and security responses for Cisco products is available at this URL:

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

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at 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 have identified a vulnerability in a Cisco product, contact PSIRT:

- For emergencies only—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.

- For 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 (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.*x* through 9.*x*.

Never use a revoked encryption key 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.html

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

If you do not have or use PGP, contact PSIRT to find other means of encrypting the data before sending any sensitive material.

Product Alerts and Field Notices

Modifications to or updates about Cisco products are announced in Cisco Product Alerts and Cisco Field Notices. You can receive Cisco Product Alerts and Cisco Field Notices by using the Product Alert Tool on Cisco.com. This tool enables you to create a profile and choose those products for which you want to receive information.

To access the Product Alert Tool, you must be a registered Cisco.com user. (To register as a Cisco.com user, go to this URL: http://tools.cisco.com/RPF/register/register.do) Registered users can access the tool at this URL: http://tools.cisco.com/Support/PAT/do/ViewMyProfiles.do?local=en

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 Tool** to locate your product serial number before submitting a request for service online or by phone. You can access this tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link, clicking the **All Tools (A-Z)** tab, and then choosing **Cisco Product Identification Tool** from the alphabetical list. This 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.

Tip Displaying and Searching on Cisco.com

If you suspect that the browser is not refreshing a web page, force the browser to update the web page by holding down the Ctrl key while pressing F5.

To find technical information, narrow your search to look in technical documentation, not the entire Cisco.com website. On the Cisco.com home page, click the **Advanced Search** link under the Search box and then click the **Technical Support & Documentation** radio button.

To provide feedback about the Cisco.com website or a particular technical document, click **Contacts & Feedback** at the top of any Cisco.com web page.

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)—An existing 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 operations 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 the network is impaired while 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.

- The Cisco Online Subscription Center is the website where you can sign up for a variety of Cisco e-mail newsletters and other communications. Create a profile and then select the subscriptions that you would like to receive. To visit the Cisco Online Subscription Center, go to this URL:

  http://www.cisco.com/offer/subscribe

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco channel product offerings. To order and find out more about the *Cisco Product Quick Reference Guide*, go to this URL:

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

- 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

- *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 where networking professionals 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

- “What’s New in Cisco Documentation” is an online publication that provides information about the latest documentation releases for Cisco products. Updated monthly, this online publication is organized by product category to direct you quickly to the documentation for your products. You can view the latest release of “What’s New in Cisco Documentation” at this URL:

  http://www.cisco.com/univercd/cc/td/doc/abtunicd/136957.htm

- 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

Product Overview

This chapter provides a basic functional overview of the Cisco AVS 3120 Application Velocity System and describes the hardware, major components, and front and rear panel indicators and controls.

This chapter contains the following major sections:

Introduction

The Cisco Application Velocity System (AVS) offers state-of-the-art dynamic content acceleration and web application security. AVS consists of these software components:

- Condenser—An application accelerator that applies several optimization technologies to accelerate Web application performance.
- Web Application Security Firewall—A highly configurable web application firewall. (In software version 5.0, AppScreen serves as the web application firewall.)
- AppScope Performance Monitor—A sophisticated performance monitoring and reporting facility.
- Management Console—A Web browser-based console that allows an administrator to manage deployed AVS nodes and generate reports. It includes a relational database that stores log and performance monitoring data.

All components run on the Cisco AVS 3120 Application Velocity System, except that the AVS 3120 runs a Device Management Console, which can configure and manage one or more AVS 3120 devices, but it includes no database and reporting features. The AVS 3120 uses an internal compact flash device for storage rather than a hard-disk drive. (Note that the externally accessible compact flash slot is not used.)

The related AVS 3180 Management Station includes the database and reporting features and can also be used to manage several deployed AVS 3120 devices.

System Hardware Features

The AVS 3120 is designed for AC-input power and has a single AC-input power supply. The AVS 3120 includes the following:

- An integrated Ethernet controller that provides an interface for connecting to 10-Mbps, 100-Mbps, or 1000-Mbps networks.
- Four 10BASE-T/100BASE-TX/1000BASE-TX Ethernet ports with RJ-45 receptacles.

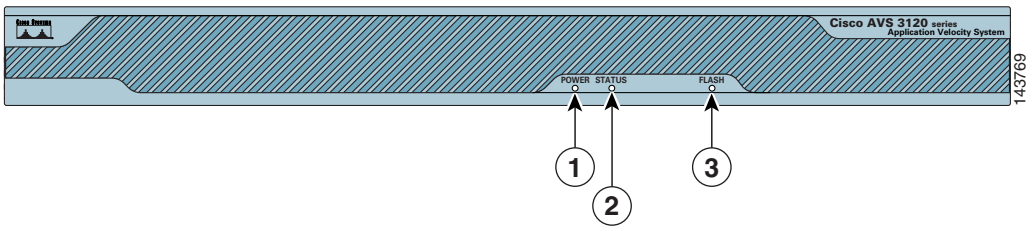
The Ethernet ports support autonegotiate, full-duplex, or half-duplex operation on an Ethernet LAN.

This section includes the following topics:

Front Panel Features

The AVS 3120 front panel contains LED indicators. Figure 1-1 illustrates the AVS 3120 front panel.

Figure 1-1 Front Panel View

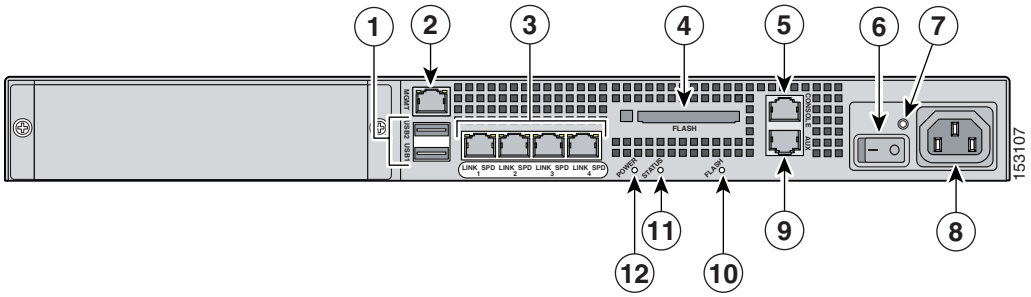


1	Power indicator. Off indicates no power. Green when the power supply is running.	**3**	Compact flash device indicator. Off when the compact flash device is not being accessed. Blinks green when the compact flash device is being accessed.
2	Status indicator. Blinks green while the power-up diagnostics are running or the system is booting. Solid green when the system has passed power-up diagnostics. Solid amber when the power-up diagnostics have failed.		

Rear Panel Features

The rear panel contains the AC power receptacle, power switch, Ethernet connectors, and the console/serial connector. Figure 1-2 illustrates the rear panel ports and connectors.

Figure 1-2 Rear Panel View



1	USB ports (not supported)	**7**	Power indicator. Off indicates no power. Green when the power supply is running.
2	Management port (not supported)	**8**	AC power receptacle
3	RJ-45 Ethernet connectors with 10/100/1000-Mbit/s operation	**9**	Auxiliary port (not supported)
4	External compact flash device (not used)	**10**	Compact flash indicator. Off when the compact flash device is not being accessed. Blinks green when the compact flash device is being accessed.
5	Console serial port (see Figure 1-6)	**11**	Status indicator. Blinks green while the power-up diagnostics are running or the system is booting. Solid green when the system has passed power-up diagnostics. Solid amber when the power-up diagnostics have failed.
6	Power switch	**12**	Power indicator. Off indicates no power. Green when the power supply is running.

Ports and Connectors

The AVS 3120 supports the following port connectors on the rear of the chassis:

- Ethernet Connectors
- Console Port

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

Ethernet Connectors

The AVS 3120 has four integrated 10/100/1000–megabit-per-second (Mbps) Ethernet connectors. The Ethernet controller provides an interface for connecting to 10-Mbps, 100-Mbps, or 1000-Mbps networks and supports autonegotiate, full-duplex, or half-duplex operation on an Ethernet LAN.

To access an Ethernet port, connect a Category 3, 4, or 5 unshielded twisted-pair (UTP) cable to one of the RJ-45 connectors on the back of the chassis. The ports have different functions depending on how the AVS software is configured. For details on port assignments, see the *Release Note for the Cisco Application Velocity System* and the *Cisco Application Velocity System User Guide*.

Note The 100BASE-TX/1000BASE-TX Ethernet standard requires that you use standard four twisted-pair Category 5e cable at lengths up to 328.08 ft. (100 m).

Figure 1-3 shows the four built-in Ethernet ports, which have two indicators per port.

Figure 1-3 Ethernet Port Indicators

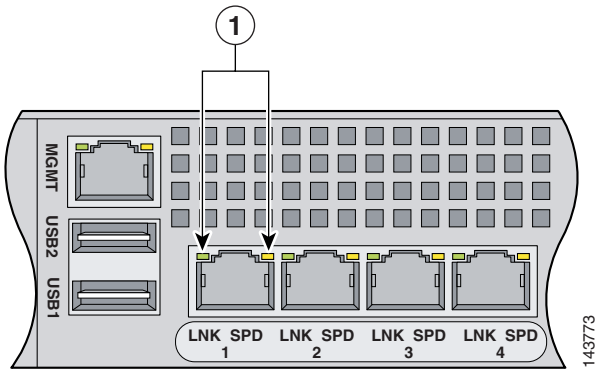


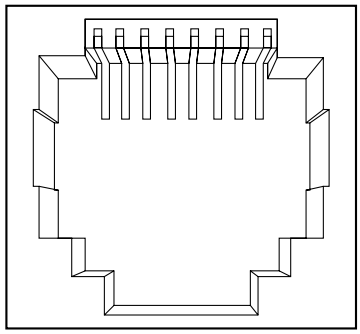
Table 1-1 lists the Ethernet port indicators.

Table 1-1 Ethernet Port Indicators

Indicator	Color	Description
Left side	Green solid Green blinking	Physical link Network activity
Right side	Not lit Green Amber	10 Mbps 100 Mbps 1000 Mbps

Figure 1-4 shows the 10/100/1000BASE-TX (RJ-45) port pinouts.

Figure 1-4 10/100/1000 Port Pinouts

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

60915

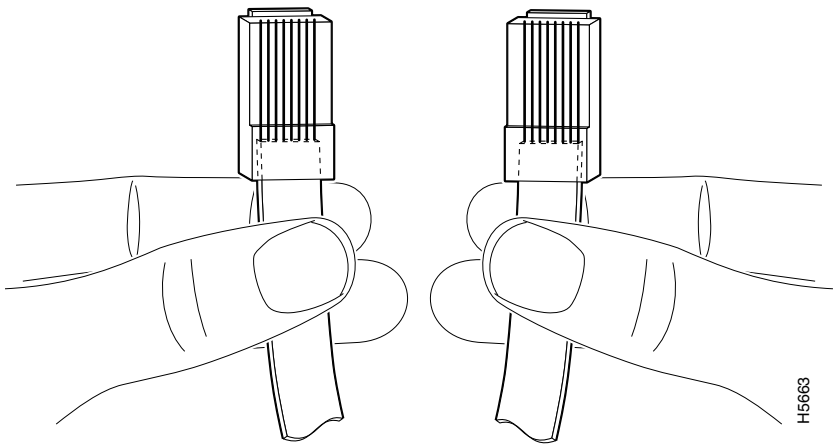
RJ-45 Cables

Cisco products use the following types of RJ-45 cables:

- Straight-through
- Cross-over
- Rolled (console)

To identify the RJ-45 cable type, hold the two ends of the cable next to each other so that you can see the colored wires inside the ends, as shown in Figure 1-5.

Figure 1-5 RJ-45 Cable Identification



Examine the sequence of colored wires to determine the type of RJ-45 cable, as follows:

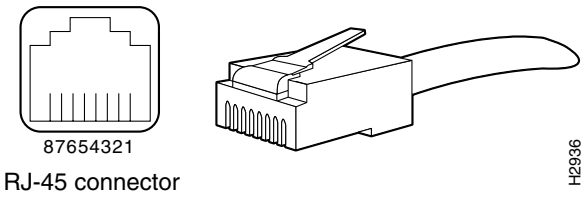
- Straight-through—The colored wires are in the same sequence at both ends of the cable.
- Cross-over—The first (far left) colored wire at one end of the cable is the third colored wire at the other end of the cable.
- Rolled—The colored wires are in the opposite sequence at either end of the cable.

Console Port

The AVS 3120 has one serial port located on the rear panel that operates as the console port. The integrated serial port uses a RJ-45 connector. Figure 1-6 shows the pin number assignments for the port.

Refer to Table 1-2 for the console port connector pinouts.

Figure 1-6 RJ-45 Serial Console Port Pinouts



RJ-45 connector

Table 1-2 Console Port Connector Pinouts

Pin	Signal	I/O	Definition
1	CTS	I	Clear to send
2	DSR	I	Data set ready
3	RxD	I	Receive data
4	GND	N/A	Signal ground
5	GND	N/A	Signal ground
6	TxD	O	Transmit data
7	DTR	O	Data terminal ready
8	RTS	O	Request to send

The console port operates at the settings outlined in Table 1-3. These settings are not user-configurable.

Table 1-3 AVS 3120 Console Port Settings

Parameter	Setting
Baud	9600
Data Bits	8
Parity	None
Stop Bits	1
Terminal Type	VT100/ANSI
Flow Control	None

RJ-45 to DB-9 or DB-25 Adapter

Table 1-4 lists the cable pinouts for the RJ-45 to DB-9 or DB-25 adapter. The DB-9 adapter is used to connect a rolled RJ-45 cable to the console serial port. The DB-9 or DB-25 adapter is used to connect the other end of the rolled RJ-45 cable to a PC or terminal serial port.

Table 1-4 Cable Pinouts for RJ-45 to DB-9 or DB-25

Signal	RJ-45 Pin	DB-9 /DB-25 Pin
RTS	8	8
DTR	7	6
TxD	6	2
GND	5	5
GND	4	5
RxD	3	3
DSR	2	4
CTS	1	7

CHAPTER 2

Preparing for Installation

This chapter contains important safety information that you should review before working with the AVS 3120. Use the following guidelines to ensure your own personal safety and to help protect your AVS 3120 from potential damage.

Note Read the *Regulatory Compliance and Safety Information for the Cisco AVS 3120 Application Velocity System* document before you prepare the AVS 3120 for installation.

This chapter contains the following major sections:

Safety

This section provides safety information for installing the AVS 3120. It includes the following topics:

Warnings and Cautions

Read the installation instructions in this document before you connect the AVS 3120 to its power source. Failure to read and follow these guidelines may lead to an unsuccessful installation and possibly damage the AVS 3120 and components.

You should observe the following safety guidelines when working with any equipment that connects to electrical power or telephone wiring. They can help you avoid injuring yourself or damaging the AVS 3120.

Note The English warnings in this document are followed by a statement number. To see the translations of a warning into other languages, look up its statement number in the *Regulatory Compliance and Safety Information for the Cisco AVS 3120 Application Velocity System* document that shipped with your appliance.

The following warnings and cautions are provided to help you prevent injury to yourself or damage to the devices:

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. Statement 1071

SAVE THESE INSTRUCTIONS

Warning **Installation of the equipment must comply with local and national electrical codes.** Statement 1074

Warning **The safety cover is an integral part of the product. Do not operate the unit without the safety cover installed. Operating the unit without the cover in place will invalidate the safety approvals and pose a risk of fire and electrical hazards.** Statement 117

Warning **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

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

Warning **This unit might have more than one power cord. To reduce the risk of electrical shock, disconnect all power supply cords before servicing the unit.** Statement 106

Warning **This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.** Statement 1045

Warning **This equipment is intended to be grounded to comply with emission and immunity requirements. Ensure that the switch functional ground lug is connected to earth ground during normal use.** Statement 1064

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

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

Warning **The power supply circuitry for the equipment can constitute an energy hazard. Before you install or replace the equipment, remove all jewelry (including rings, necklaces, and watches). Metal objects can come into contact with exposed power supply wiring or circuitry inside the equipment. This could cause the metal objects to heat up and cause serious burns or weld the metal object to the equipment.** Statement 207

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

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

Warning **Read the installation instructions before you connect the system to its power source.** Statement 1004

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

General Precautions

Observe the following general precautions when using and working with your AVS 3120:

- Keep your AVS 3120 components away from radiators and heat sources, and do not block cooling vents.
- Do not spill food or liquids on your AVS 3120 components, and never operate the product in a wet environment. If the AVS 3120 gets wet, see Chapter 4, "Troubleshooting the AVS 3120 Hardware" or contact the Cisco Technical Assistance Center. For instructions on contacting the Technical Assistance Center, see the "Obtaining Documentation" section on page xiv.
- Do not push any objects into the openings of your AVS 3120 components. Doing so can cause fire or electric shock by shorting out interior components.
- Position cables and power cables carefully; route all cables and the power cable and plug so that they cannot be stepped on or tripped over. Be sure that nothing rests on your AVS 3120 cables or the power cable.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications. Always follow your local/national wiring rules.
- To help avoid possible damage to the system board, wait 5 seconds after turning off the AVS 3120 before removing a component from the system board or disconnecting a peripheral device from the AVS 3120.

Maintaining Safety with Electricity

Follow these guidelines when working on equipment powered by electricity:

- Do not work alone if potentially hazardous conditions exist anywhere in your work space.
- Never assume that power is disconnected from a circuit; always check the circuit.
- 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.
  - Disconnect power from 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.
- Use the product within its marked electrical ratings and product usage instructions.
- Install the product in compliance with local and national electrical codes.
- If any of the following conditions occur, contact the Cisco Technical Assistance Center:
  - The power cable or plug is damaged.
  - An object has fallen into the product.
  - The product has been exposed to water.
  - The product has been dropped or damaged.
  - The product does not operate correctly when you follow the operating instructions.

- Use the correct external power source. Operate the product only from the type of power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult the Cisco Technical Assistance Center or a local power company.
- Use approved power cable(s) only. You have been provided with a power cable for your AVS 3120 that is intended for its use (approved for use in your country, based on the shipping location). Should you have to purchase a power cable, ensure that it is rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product.
- To help prevent electric shock, plug the AVS 3120, components, and peripheral power cables into properly grounded electrical outlets. These cables are equipped with three-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable.
- Observe power strip ratings. Make sure that the total ampere rating of all products plugged into the power strip does not exceed 80% of the rating.
- To help protect your AVS 3120 and components from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications. Always follow your local and national wiring rules.

Protecting Against Electrostatic Discharge

Static electricity can harm delicate components inside your product. To prevent static damage, discharge static electricity from your body before you touch any of your product's electronic components, such as the microprocessor. You can do so by touching an unpainted metal surface on the equipment chassis.

As you continue to work inside the product, periodically touch an unpainted metal surface to remove any static charge your body may have accumulated.

Work on ESD-sensitive parts only at an approved static-safe station on a grounded static dissipative work surface, for example, an ESD workbench or static dissipative mat.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the antistatic packing material until you are ready to install the component in your computer. Just before unwrapping the antistatic packaging, be sure to discharge static electricity from your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.

To remove and replace components in a chassis, follow these steps:

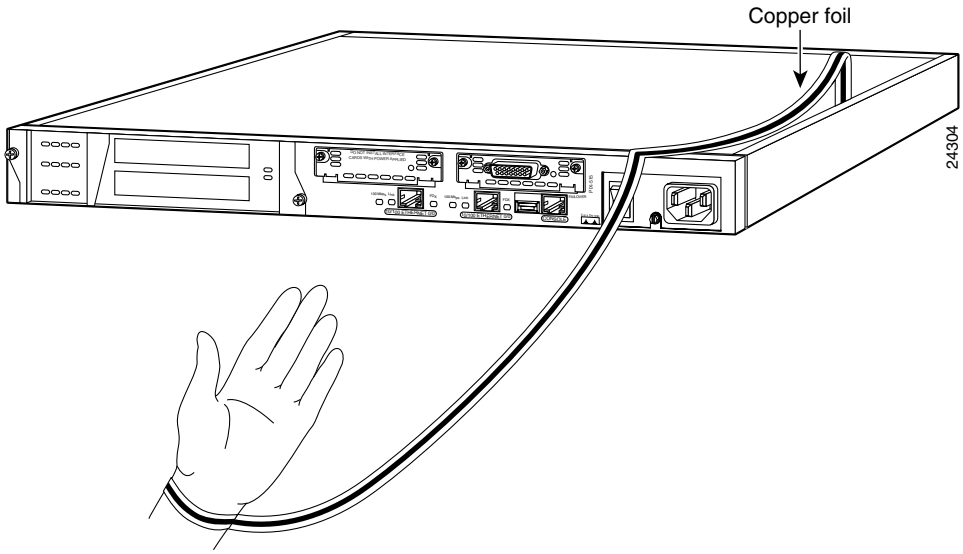
Step 1 Remove all static-generating items from your work area.

Step 2 Use a static dissipative work surface and wrist strap.

Note Disposable wrist straps, typically those included with an upgrade part, are designed for one time use.

Step 3 Attach the wrist strap to your wrist and to the terminal on the work surface. If you are using a disposable wrist strap, connect the wrist strap directly to an unpainted metal surface of the chassis. See Figure 2-1.

Figure 2-1 Chassis ESD Wrist Strap Ground Example



Step 4 Connect the work surface to the chassis using a grounding cable and alligator clip.

Caution Always follow ESD-prevention procedures when removing, replacing, or repairing components.

Preparing Your Site for Installation

This section describes the requirements your site must meet for safe installation and operation of your AVS 3120. Before you select an installation site for the AVS 3120, read the electrical, environmental, and physical requirements as described in Appendix A, "Specifications." Ensure that your site is properly prepared before beginning installation.

This section includes the following topics:

- Environmental Requirements
- Choosing a Site for Installation
- Ensuring Overcurrent Protection
- Grounding the AVS 3120
- Creating a Safe Environment
- AC Power Requirements
- Cabling

Environmental Requirements

When planning your site layout and equipment locations, remember the precautions described in this section to help avoid equipment failures and reduce the possibility of environmentally caused shutdowns. If you are experiencing shutdowns or unusually high errors with your existing equipment, these precautions will help you isolate the cause of failures and prevent future problems.

Use the following precautions when planning the operating environment for your AVS 3120.

- Always follow the ESD-prevention procedures described in the "Protecting Against Electrostatic Discharge" section to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Make sure that the chassis cover is secure. The chassis allows cooling air to flow effectively within it. An open chassis allows air leaks, which could interrupt and redirect the flow of cooling air from internal components.
- Electrical equipment generates heat. Ambient air temperature might not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Make sure that the room in which you operate has adequate air circulation.

Choosing a Site for Installation

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

Follow these guidelines when choosing a site for installation:

- Choose a site with a dry, clean, well-ventilated and air-conditioned area.
- Choose a site that maintains an ambient temperature of 0° to 40°C (32° to 104°F).

Ensuring Overcurrent Protection

The AVS 3120 relies on the protective devices in the building installation for protection against short-circuit, overcurrent, and earth (grounding) fault. Ensure that the protective devices in the building installation are properly rated to protect the AVS 3120, and that they comply with national and local codes.

Grounding the AVS 3120

Warning **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

Creating a Safe Environment

Follow these guidelines to create a safe operating environment:

- Keep tools and chassis components off of the floor and away from foot traffic.
- Clear the area of possible hazards, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- Keep the area around the chassis free from dust and foreign conductive material (such as metal flakes from nearby construction activity).

AC Power Requirements

Ensure that the plug-socket combination is accessible at all times, because it serves as the main disconnecting device. Refer to Appendix A, "Specifications," for the AVS 3120 power requirements.

Warning **This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.** Statement 1045

Power Supply Guidelines

Follow these guidelines for power supplies:

- Check the power at the site before installing the chassis to ensure that the power is free of spikes and noise. Install a power conditioner, if necessary, to ensure proper voltages and power levels in the source voltage.
- Install proper grounding for the site to avoid damage from lightning and power surges.
- The chassis does not have a user-selectable operating range. Refer to the label on the chassis for the correct AC-input power requirement.
- Several types of AC-input power supply cords are available; make sure that you have the correct type for your site.
- Install a UPS for your site.

Cabling

Use the cables in the accessory kit to connect the AVS 3120 console port to a console or computer that is running a console program. In addition to using the console cable, use the provided standard Ethernet cable to connect the AVS 3120 to your network. Refer to Chapter 1, "Product Overview," for information on cable requirements.

Precautions for Rack-Mounting

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

Note Component refers to any server, storage system, or appliance, and to various peripherals or supporting hardware.

Observe the following precautions for rack stability and safety. Also refer to the rack installation documentation accompanying the rack for specific warnings and caution statements and procedures.

- Do not move large racks by yourself. Due to the height and weight of the rack, a minimum of two people are needed to accomplish this task.
- Ensure that the rack is level and stable before extending a component from the rack.
- Do not overload the AC supply branch circuit that provides power to the rack. The total rack load should not exceed 80% of the branch circuit rating.
- Do not step or stand on any system or component when servicing other systems and components in a rack.
- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- Enclosed racks must have adequate ventilation. Make sure the rack is not overly congested because each chassis generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air.
- When mounting a chassis in an open rack, make sure 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 all the way into the rack.
- In an enclosed rack with a ventilation fan in the top, excessive heat generated by equipment near the bottom of the rack can be drawn upward and into the intake ports of the equipment above it in the rack. Make sure you provide adequate ventilation for equipment at the bottom of the rack.

- Baffles can help to 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. Experiment with different arrangements to position the baffles effectively.

Precautions for Products with Modems, Telecommunications, or Local Area Network Options

Observe the following guidelines when working with these components:

- Do not connect or use a modem or telephone during a lighting storm. There may be a risk of electrical shock from lightning.
- Never connect or use a modem or telephone in a wet environment.
- Do not plug a modem or telephone cable into the Ethernet connector.
- Disconnect the modem cable before opening a product enclosure, touching or installing internal components, or touching an uninsulated modem cable or jack.
- Do not use a telephone line to report a gas leak while you are in the vicinity of the leak.

Required Tools and Equipment

You need the following tools and equipment to install the AVS 3120:

- Number 2 Phillips screwdriver
- Tape measure and level
- Antistatic mat or antistatic foam
- ESD grounding strap with an alligator termination clip

CHAPTER 3

Installing the AVS 3120

This chapter explains how to install the AVS 3120 in an equipment rack, or on a table or workbench. This chapter also provides instructions for connecting cables, AC power, and for booting the AVS 3120.

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

This chapter contains the following major sections:

Before you begin the installation, be sure you have read the *Regulatory Compliance and Safety Information for the Cisco AVS 3120 Application Velocity System* document and Chapter 2, "Preparing for Installation."

Also, you may want to familiarize yourself with the AVS software by reading the following related documents, which you can obtain from Cisco.com:

- *Release Note for the Cisco Application Velocity System*
- *Cisco Application Velocity System User Guide*

Unpacking and Inspecting the AVS 3120

The AVS 3120 shipment contains the following items:

- One RJ-45 to female 25-pin sub-d connector
- One RJ-45 to female 9-pin sub-d connector
- One RJ-45 console cable
- Two 6-ft Ethernet cables
- One rack mounting kit—two metal brackets and screws
- Four rubber feet
- Cisco Product Documentation CD-ROM and Warranty Package
- *Cisco AVS 3120 Application Velocity System Hardware Installation Guide*

The AVS 3120 is shipped in a protective shipping carton. It is shipped as a self-contained chassis; no components can be added or removed.

Follow these steps to unpack the AVS 3120:

1. Remove the AVS 3120 accessories from the shipping carton. Save the packing materials in case you need to repack the AVS 3120 later.
2. Check the configuration of the AVS 3120 and the accessories against the items listed on the packing slip. Report any discrepancies as described in "If the Product is Damaged".
3. Before installing the AVS 3120, review the information outlined in Chapter 2, "Preparing for Installation."

If the Product is Damaged

If any portion of the unit or component is damaged in transit, forward an immediate request to the delivering carrier to perform an inspection of the product and to prepare a damage report. Save the container and all packing materials until the contents are verified.

Concurrently, report the nature and extent of the damage to Customer Service. Report the problem or deficiency to Customer Service along with the model number and serial number. Upon receipt of this information, you will be provided with service instructions, or a Return Material Authorization (RMA) number and shipping information. To obtain assistance, refer to the "Obtaining Documentation" section on page xiv.

Installing Your AVS 3120

Place the AVS 3120 in the desired location. You can mount it in a rack for your convenience, or place it on a solid, stable surface. If you do not plan to install the AVS 3120 in an equipment rack, proceed to the "Installing the AVS 3120 on a Workbench or Tabletop" section on page 3-5.

Racks are marked in vertical increments of 1.75 inches (4.45 cm). Each increment is referred to as a rack unit (RU). A 1-RU device is 1.75 inches (4.45 cm) tall.

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

This section contains the following procedures:

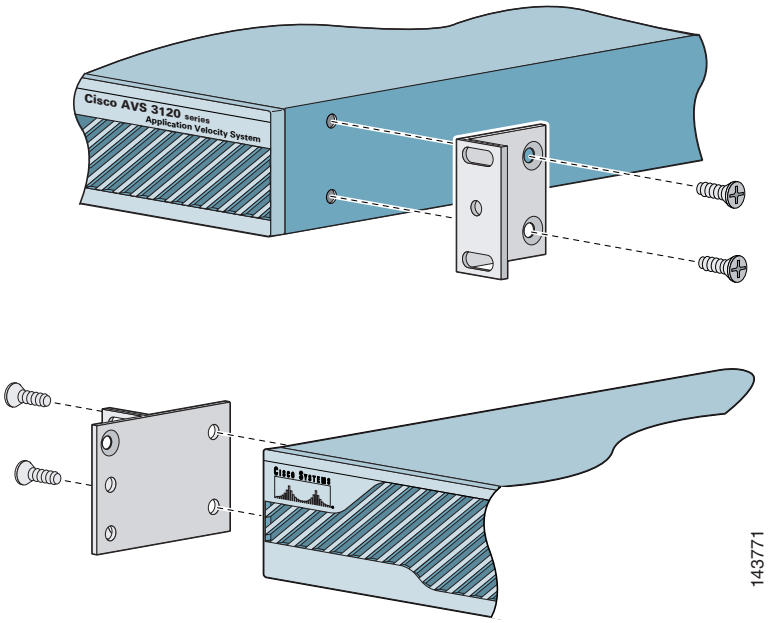
Attaching a Two-Post Rack Bracket to the AVS 3120

You may install the AVS 3120 in either a four-post rack or a two-post rack by using the two-post rack brackets included in the accessory kit. Follow these steps:

1. Place the right-hand bracket on the right side of the AVS 3120, as shown in Figure 3-1. Align the bracket with the screw holes in the AVS 3120, and use two round head screws to secure the bracket.

   Repeat this step to attach the left-hand bracket to the AVS 3120. Note that the brackets are different.

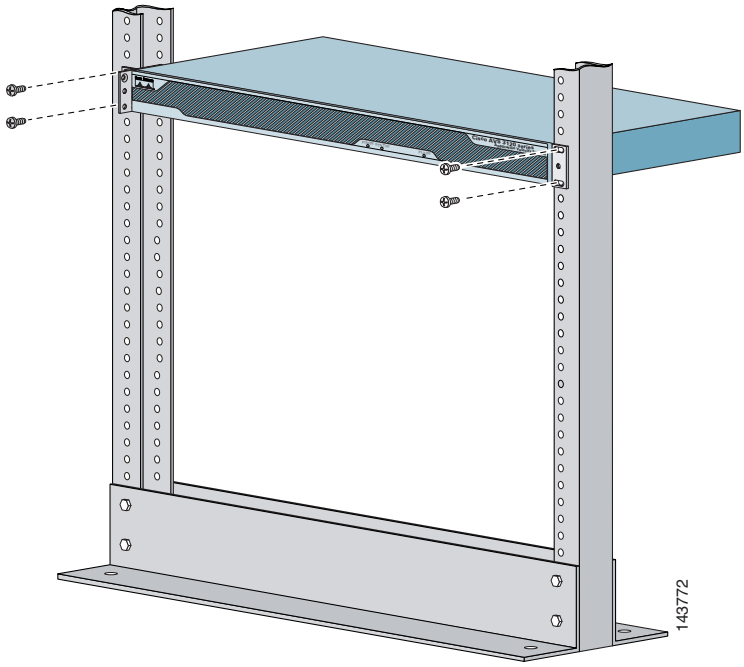
Figure 3-1 Attaching the Brackets to the Sides of the AVS 3120



Note The top hole on the left bracket is a banana jack that you can use for ESD grounding purposes when you are servicing the system. You can use the two threaded holes to mount a ground lug to ground the chassis.

2. Select a location in the rack to mount the AVS 3120, and then position the AVS 3120 and brackets in the rack.
3. Align the right side bracket on the AVS 3120 to the front of the rack, and then insert and tighten the two round head retaining screws to secure the AVS 3120 to the rack, as shown in Figure 3-2. Repeat this step to secure the left side bracket to the rack.

Figure 3-2 Installing the AVS 3120 in a Two-Post Rack



To remove the appliance from the rack, remove the screws that attach the appliance to the rack, and then remove the appliance.

Installing the AVS 3120 on a Workbench or Tabletop

When you install an AVS 3120 on a workbench or tabletop, ensure that the surface is clean and in a secure location and that you have complied with the following requirements:

- The chassis should be installed off of the floor. Dust that accumulates on the floor is drawn into the interior of the chassis by the cooling fans. Excessive dust inside the AVS 3120 can cause overtemperature conditions and component failures.
- There must be approximately 19 inches (48.26 cm) of clearance at the front and rear of the chassis for accessing network cables and equipment.
- The AVS 3120 must receive adequate ventilation.

Follow these steps to install the AVS 3120 on a workbench or tabletop:

1. Remove any debris and dust from the tabletop or workbench, as well as from the surrounding area. Ensure that your path between the AVS 3120 and its new location is unobstructed.
2. Place one rubber foot in each corner on the bottom of the AVS 3120. The rubber feet have an adhesive backing. Peel the protective tape off of the adhesive, and adhere the feet to the four round, recessed areas on the bottom of the chassis.
3. Place the chassis on the tabletop or workbench.
4. Ensure that no exhaust air from other equipment will be drawn into the chassis. Also, ensure that there is adequate clearance at the front and rear of the chassis.

Connecting Cables

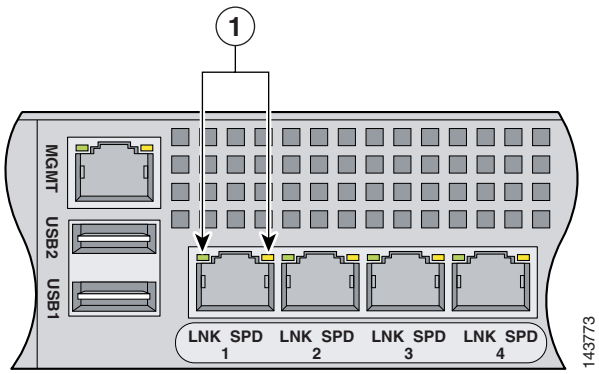
Warning **Do not work on the system or connect or disconnect cables during periods of lightning activity.** Statement 1001

To connect network and console cables to your AVS 3120:

1. For network connections, connect a Category 3, 4, or 5 unshielded twisted-pair (UTP) cable to the Ethernet port 1 connector on the AVS 3120 back panel (Figure 3-3). Ethernet port 1 is for management console connectivity. Note that in software version:
   - 5.0, the other ports are not active. Ethernet port 1 is used for all network traffic.
   - 6.0 and greater, the other ports have different functions depending on how you configure the AVS software. For details on port assignments, see the *Release Note for the Cisco Application Velocity System* and the *Cisco Application Velocity System User Guide*.

Note The 100BASE-TX/1000BASE-T Ethernet standard requires that you use standard four twisted-pair Category 5e cable at lengths up to 328.08 ft. (100 m).

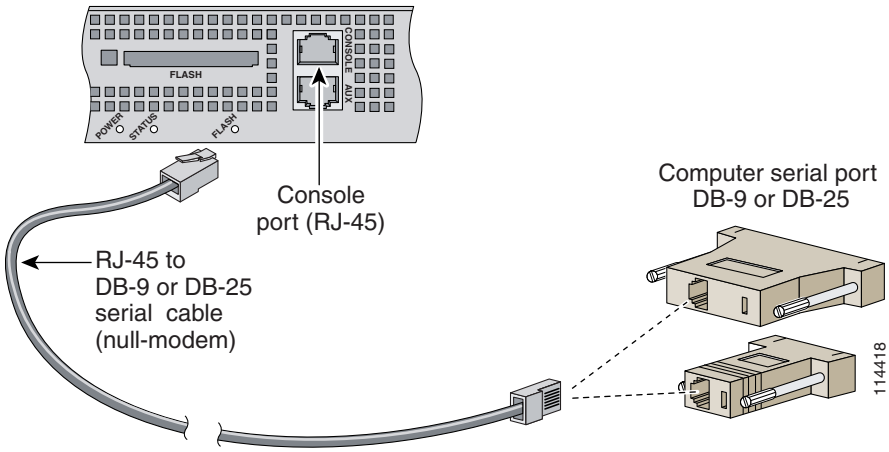
Figure 3-3 Ethernet Port 1



2. Connect the other end of the network cables to a hub or switch in your network.
3. Connect the console cable as shown in Figure 3-4 so that you have either a DB-9 or DB-25 connector on one end, as required by the serial port for your console, and the other end is the RJ-45 connector. Connect the RJ-45 connector to the console port, and connect the other end to the DB-9 or DB-25 connector on a console or a communications server.

Note Use the console port to connect to a computer, console, or communications server to enter configuration commands. Locate the serial cable from the accessory kit. The serial cable assembly consists of a 180/rollover cable with RJ-45 connectors, a DB-9 connector adapter PN 74-0495-01, and a DB-25 connector adapter PN 29-0810-01.

Figure 3-4 Console Connection

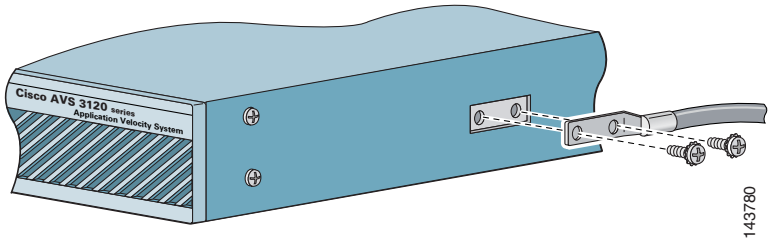


Connecting AC Power

Warning **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.** Statement 1024

To connect AC power to your AVS 3120, follow these steps:

1. Ensure that you have reviewed the safety information outlined in Chapter 2, "Preparing for Installation."
2. Attach the grounding lug to the side of the appliance.



Note Use 8-32 screws to connect a copper standard barrel grounding lug to the holes. The appliance requires a lug where the distance between the center of each hole is 0.56 inches (1.42 cm). The ground lug must be NRTL listed or recognized. In addition, the copper conductor (wires) must be used and the copper conductor must comply with the NEC code for ampacity. A lug is not supplied with the appliance.

3. Plug the AC power cord into the power cord receptacle at the rear of the AVS 3120 (see Figure 1-2).
4. Connect the other end of the power cord to a power source.

5. Power up all externally-connected devices.
6. Switch on the power switch on the rear of the AVS 3120.

Booting the AVS 3120

When you power up the AVS 3120, the boot process does the following:

- Performs hardware initialization and power-on self tests
- Initializes the BIOS
- Loads the rommon
- Displays the boot menu (only if a console is connected, see the subsection below)
- Boots the AVS 3120 image (kernel and software)

Note During power-up, the green status LED on the front of the AVS 3120 blinks.

At this point, you are ready to configure and use the AVS 3120. Refer to following sections for information on establishing a console connection and configuring the network settings.

Additionally, refer to the *Cisco Application Velocity System User Guide* for details about configuring and administering the AVS 3120 device.

Booting with a Console Connected

If you boot the device while a console is connected to the serial port (see the next section), a boot menu is displayed on the console, like this:

```
Launching BootLoader...
Boot configuration file contains 2 entries.
GNU GRUB version 1.0(11)0 (631K lower / 4062208K upper memory)
------------------------------------------------------------------------
0: Cisco AVS Runtime Image
1: Cisco AVS Maintenance Image
------------------------------------------------------------------------
Use the ^ and v keys to select which entry is highlighted.
Press enter to boot the selected OS or 'p' to enter a
password to unlock the next set of features.
Highlighted entry is 0:
```

Normally, you do not need to interact with this menu. After ten seconds, the device will automatically boot into the standard Cisco AVS Runtime Image (choice 0 on the menu, and the default). You can press **Enter** to avoid this delay and choose the default. To select a different boot image, use the up or down arrow keys to select it, and press **Enter** to continue with the boot process.

Note The Cisco AVS Maintenance Image is used only for device maintenance or upgrade purposes and should not be used for normal operation.

Establishing a Serial Console Connection

Before you can configure the AVS 3120 by using the command line interface (CLI), you must establish a serial console connection to it. This requires a PC, a DB-9 to RJ-45 adapter (provided), an RJ-45 180/rollover cable (provided), and terminal emulation communication software (Hyper Terminal or equivalent). You may also use a serial concentrator connection, if desired.

To establish a serial console connection, follow these steps:

1. Connect a console to the serial console port on the rear panel:
   a. Attach a DB-9 or DB-25 to RJ-45 adapter to the serial port of the console computer.
   b. Use the RJ-45 180/rollover cable to connect the console to the console serial port on the AVS 3120. For the location of the serial port, see Figure 3-4.
2. If you have not already done so, power up the AVS 3120 as described in the "Booting the AVS 3120" section on page 3-8.
3. Open your terminal emulation application on your PC to access the AVS 3120 CLI. The following procedure uses HyperTerminal for Windows:
   a. Launch HyperTerminal. The Connection Description window appears.
   b. Enter a name for your session in the Name field.
   c. Click **OK**. The Connect To window appears.
   d. From the drop-down list, choose the COM port to which the device is connected.
   e. Click **OK**. The Port Properties window appears.
   f. Set the port properties:

      Baud Rate = 9600

      Data Bits = 8

      Flow Control = none

      Parity = none

      Stop Bits = 1
   g. Click **OK** to connect.
   h. Press **Enter** to display the CLI prompt.
4. After you create a session, choose **Save As** from the File menu to save the connection description. Saving the connection description has the following two advantages:
   - The next time you launch HyperTerminal, the session is listed as an option under **Start > Programs > Accessories > HyperTerminal > Name_of_session**. This option lets you reach the CLI prompt directly without repeating the configuration steps.
   - You can connect your cable to a different device without configuring a new HyperTerminal session. If you use this option, ensure that you connect to the same port on the new device as was configured in the saved HyperTerminal session. Otherwise, a blank screen appears without a prompt.

For information about using the CLI to configure the AVS 3120, refer to the following section, "Configuring Network Settings" and the *Cisco Application Velocity System User Guide*.

Configuring Network Settings

After you have installed the AVS 3120, you must configure the basic network settings by using the **set** command in the CLI from a console connection. After the basic network settings have been configured, you can perform additional CLI configuration through the network by using an SSH connection. Additionally, you can configure application acceleration and other features by using the Management Console GUI in a Web browser. For details about using the CLI and Management Console, refer to the *Cisco Application Velocity System User Guide.*

To configure the basic network settings, follow these steps:

Step 1 Log in to the AVS 3120 from a console connected to the serial port.

Note The default username is **fgn**, and the password is **fineground**.

After you log in, the `velocity>` prompt appears.

Step 2 Enable writing configuration settings with the **enable** command:

```
velocity>enable
```

Step 3 Configure the network interface with the **set interface** command:

```
velocity>set interface ip ip netmask mask default-gateway gw autoneg on
```

where:

ip is the device interface IP address, such as 10.210.10.45

mask is the device interface network mask, such as 255.255.255.0

gw is the gateway address, such as 10.210.2.1

autoneg can be set to **on** or **off**, for speed autonegotiation (if off, you must set the speed and duplex settings manually by using the **speed** and **duplex** options)

You can view the interface settings by using the **show interface** command:

```
velocity>show interface
PHYSICAL INTERFACE eth1
        MAC ADDRESS: 00.0f.f7.75.75.73
        Auto Negotiation: on
        Duplex: full
        Speed: 100
        RX:  PKTS=1206954     BYTES=114173340     ERRORS=0
        TX:  PKTS=428072     BYTES=53566339     ERRORS=0
        MTU:         1500
INTERFACE NUMBERS
        IP/NETMASK:  10.210.2.45/255.255.255.0
        DEFAULT GATEWAY:  10.210.2.1
```

Step 4 Configure the DNS server addresses with the **set dns** command:

```
velocity>set dns primary ip1 secondary ip2
```

where:

ip1 is the primary DNS server IP address or name, such as 10.68.226.120

ip2 is the secondary DNS server IP address name, such as 10.68.226.121

You can view the DNS settings by using the **show dns** command:

```
velocity>show dns
PRIMARY NAMESERVER 10.68.226.120
SECONDARY NAMESERVER 10.68.226.121
```

Step 5 Configure the local time zone with the **set date tz** command:

```
velocity>set date tz timezone
```

where:

timezone is the local city/time zone name, such as America/New_York. To see a list of available city/time zone names, use the command **show timezone all**. The default time zone is America/Tijuana.

You can view the current time zone setting by using the **show timezone current** command:

```
velocity>show timezone current
America/Tijuana
```

Step 6 Configure the initial date and time setting. You can do this automatically by synchronizing to a network time protocol (NTP) server, or manually by using the **set date time** command. To use an NTP server, use the **set ntp** command, as follows:

```
velocity>set ntp start ip
```

where:

start can be **start**, to start using NTP, or **stop**, to stop using NTP

ip is the NTP server IP address or fully qualified domain name, such as 10.68.226.100 or time.nst.gov

You can view the NTP settings by using the **show ntp** command:

```
velocity>show ntp
STATUS: RUNNING
NTP SERVER:  time.nist.gov
```

If you would rather manually set the time, use the following command:

```
velocity>set date time MM:DD:hh:mm:YYYY
```

where *MM:DD:hh:mm:YYYY* is month:day:hour:minute:year

You can view the time and date by using the **show date** command:

```
velocity>show date
Wed Dec  7 19:10:04 2005
TimeZone=America/Tijuana
```

Note You must set the accurate date and time for the appliance to function properly.

Step 7 Configure the system host name with the **set hostname** command:

```
velocity>set hostname name
```

where:

name is the system host name, such as velocity2

You can view the host name setting by using the **show hostname** command:

```
velocity>show hostname
velocity
```

Step 8 We also recommend that you change the account password from its default. To do this, use the **edit admin** command:

```
velocity>edit admin current-name fgn new-password password
```

where:

password is the new password for the **fgn** account.

For more details about using the CLI and the Management Console, refer to the *Cisco Application Velocity System User Guide*.

Setting the Time

Many features of AVS depend on having the clocks synchronized among all of the deployed AVS devices and the origin servers. It is important to synchronize all clocks whenever a new device is deployed.

Here is a summary of the ways to set the clock on an AVS device:

- Use the **set date** command to set the date, time, and local time zone.
- Use the **set ntp** command to configure the AVS device to get its time from an NTP time synchronization source. The NTP source should be the same for all deployed AVS devices and origin servers.

Note We recommend that you use an NTP time synchronization source.

For information on using the CLI to configure the AVS 3120, refer to the *Cisco Application Velocity System User Guide*. For an example of using the **set ntp** and **set date** commands, refer to the previous section, Configuring Network Settings.

Checking the Front Panel LEDs

When the AVS 3120 is up and operational, observe the front panel LEDs to monitor the AVS 3120 operating status. Figure 3-5 shows the location of front panel LEDs, and Table 3-1 describes their function.

Figure 3-5 Front Panel LEDs

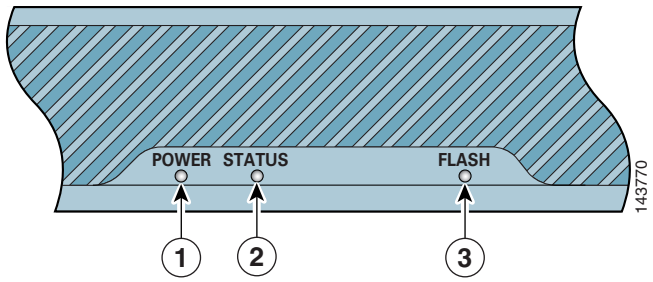


Table 3-1 Front Panel LED Indicators

	Indicator	Color	State	Indicates
1	Power	Green	On	The AVS 3120 is on
			Off	The AVS 3120 is off
2	Status	Green	On	Normal operation, system has passed power-up diagnostics
			Blinking	Power-up diagnostics are running or the system is booting
		Amber	On	Power-up diagnostics have failed
3	Compact flash device	Green	Blinking	The compact flash device is being accessed
			Off	The compact flash device is not in use

Removing or Replacing an AVS 3120

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

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

To physically remove an AVS 3120 from your network follow these steps:

1. Login to the shell as the root user and execute the **poweroff** command. To do this:
   a. Access the CLI and open the shell by using the **sysopen** command:
      ```
      velocity>sysopen
      ```
   b. Change to the root user using the **su** command with the dash option:
      ```
      bash-2.05b$ su - root
      ```
   c. Enter the root password (the default is FineGr0und5!):
      ```
      password:
      ```
   d. Execute the **poweroff** command:
      ```
      -sh-2.05b# /sbin/poweroff
      ```
2. Power down the AVS 3120 by turning off the power switch on the rear panel of the AVS 3120.
3. Disconnect the power cords and network cables.
4. Physically remove the chassis from the rack.

To physically replace an AVS 3120, install the new AVS 3120 and configure it using the same configuration parameters (such as the IP address) that you used for the removed AVS 3120. Refer to the *Cisco Application Velocity System User Guide* for configuration details.

Troubleshooting the AVS 3120 Hardware

If your AVS 3120 is not working as expected, begin troubleshooting by using the procedures in this chapter. This chapter guides you through some initial checks and procedures that can solve basic AVS 3120 problems.

This chapter contains the following major sections:

Checking the Basics

To solve some basic AVS 3120 problems, follow these steps:

1. Was an alert message issued by the AVS software?
   - ***Yes***. Check the component named in the alert message.
   - ***No***. Go to step 2.
2. Visually inspect the AVS 3120. Is the AVS 3120 wet or damaged?
   - ***Yes***. Liquid spills, splashes, and excessive humidity can cause damage to the AVS 3120. If the AVS 3120 gets wet, contact your service representative for instructions. Refer to the "Obtaining Technical Assistance" section on page xvii.

     If the AVS 3120 was dropped or damaged while being moved, you should check it to see if it functions properly. If an external device attached to the AVS 3120 is dropped or damaged, contact your service representative for instructions. Refer to the "Obtaining Technical Assistance" section on page xvii.
   - ***No***. Go to step 3.
3. Perform the steps in the "Checking Connections" section.

   Is the problem resolved?
   - ***Yes***. The power to the AVS 3120 was faulty, or the connections were loose. You have fixed the problem.
   - ***No***. Go to step 4.

4. Did the AVS 3120 complete the boot routine?
   - ***Yes***. The AVS 3120 configuration information was correct.
   - ***No***. Call your service representative. Refer to the "Obtaining Technical Assistance" section on page xvii.

Checking Connections

Loose, incorrect, or improperly connected cables are the most likely source of problems for the AVS 3120 or other external equipment. A quick check of all cable connections can solve most problems. Refer to Chapter 1, "Product Overview," for the location of the front panel indicators and for the location of back panel indicators, connections, and controls on the AVS 3120.

To check all the connections, follow these steps:

1. Power down the AVS 3120. Disconnect all power cables from their electrical outlets.
2. If the AVS 3120 is connected to a power strip or power distribution unit, turn the power strip off and then on again.

   Is the power strip receiving power?
   - ***Yes***. Go to step 5.
   - ***No***. Go to step 3.
3. Plug the power strip into another electrical outlet.

   Is the power strip receiving power?
   - ***Yes***. The original electrical outlet probably does not function. Use a different electrical outlet.
   - ***No***. Go to step 4.
4. Connect a known working AVS 3120 directly to the electrical outlet.

   Does the AVS 3120 receive power?
   - ***Yes***. The power strip is probably not functioning properly. Use another power strip.
   - ***No***. Go to step 5.
5. Reconnect the AVS 3120 to the electrical outlet or power strip.

   Make sure that all connections fit tightly together. Ensure that the Ethernet and Console cables are correct for use with the AVS 3120. (See Chapter 1, "Product Overview.")
6. Power up the AVS 3120.

   Is the problem resolved?
   - ***Yes***. The connections were loose. You have fixed the problem.
   - ***No***. Call your service representative. Refer to the "Obtaining Technical Assistance" section on page xvii.

Maintaining Your AVS 3120

Proper use of preventive maintenance procedures can ensure that the AVS 3120 operates properly and can minimize the need for time-consuming service procedures. This chapter contains maintenance procedures that you should perform regularly.

This chapter includes the following major sections:

Maintaining Your Site Environment

An exhaust fan in the power supply cools the power supply and the AVS 3120 by drawing in air through various openings and blowing it out through the back panel. However, the fan might also draw dust and other particles into the AVS 3120, causing contaminant buildup, which increases the chassis internal temperature and interferes with the operation of various components.

To avoid these conditions, we recommend keeping your work environment clean to reduce the amount of dust and dirt around the AVS 3120 and to reduce the amount of contaminants drawn into it by the power supply fan.

This section discusses various environmental factors that can adversely affect AVS 3120 performance and longevity, and it covers these topics:

Temperature

Temperature extremes can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices. Extreme temperature fluctuations can cause chips to become loose in their sockets.

To minimize the negative effects of temperature on AVS 3120 performance, follow these guidelines:

- Ensure that the AVS 3120 operates in an environment no colder than 32°F (0°C) or hotter than 104°F (40°C).
- Ensure that the AVS 3120 has adequate ventilation. Do not place it within a closed-in wall unit or on top of cloth, which can act as insulation. Do not place it in direct sunlight. Do not place it next to a heat source of any kind, including heating vents during winter.

Adequate ventilation is particularly important at high altitudes. AVS 3120 performance may not be optimum when operating at high temperatures as well as high altitudes.

- Ensure that all slots and openings on the AVS 3120 remain unobstructed, especially the fan vent on the back of the AVS 3120.
- Clean the AVS 3120 at regular intervals to avoid any buildup of dust and debris, which can cause it to overheat.
- If the AVS 3120 has been exposed to abnormally cold temperatures, allow a 2-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components.

Humidity

High-humidity conditions can cause moisture in the AVS 3120. This moisture can cause corrosion of internal components and degradation of properties, such as electrical resistance, thermal conductivity, physical strength, and size. Extreme moisture buildup inside the AVS 3120 can result in electrical shorts, which can cause serious damage.

Each AVS 3120 is rated to operate at 8 to 80 percent relative humidity, with a humidity gradation of 10 percent per hour. Buildings in which climate is controlled by air conditioning in the warmer months and by heat during the colder months usually maintain an acceptable level of humidity for the AVS 3120. However, if an AVS 3120 is located in an unusually humid location, use a dehumidifier to maintain the humidity within an acceptable range.

Altitude

Operating an AVS 3120 at high altitude (low pressure) reduces the efficiency of forced and convection cooling and can result in electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

The AVS 3120 is for use at a maximum altitude of 9843 feet (3000 meters).

Dust and Particles

A clean operating environment can greatly negate the effects of dust and other particles, which act as insulators and interfere with the operation of mechanical components. Also, in addition to regular cleaning, follow these guidelines to deter contamination of the AVS 3120 equipment:

- Do not permit smoking anywhere near the AVS 3120.
- Do not permit food or drink near the AVS 3120.
- Use dust covers when the AVS 3120 is not in use.
- Close windows and outside doors to keep out airborne particles.

Corrosion

The oil from a person's fingers or prolonged exposure to high temperature or humidity can corrode the gold-plated edge connectors and pin connectors on various devices in the AVS 3120. This corrosion on AVS 3120 connectors is a gradual process that can eventually lead to intermittent failures of electrical circuits.

To prevent corrosion, avoid touching contacts on boards and cards. Protecting the AVS 3120 from corrosive elements is especially important in moist and salty environments, which tend to promote corrosion. Also, as a further deterrent to corrosion, the AVS 3120 should not be used in extreme temperatures, as explained in the "Temperature" section on page 5-2.

Electrostatic Discharge

Electrostatic discharge (ESD) results from the buildup of static electricity on the human body and certain other objects. Static electricity is often produced by simple movements such as walking across a carpet. ESD is a discharge of a static electrical charge that occurs when a person whose body contains such a charge touches a component in the AVS 3120, especially chips, and causes the component to fail.

ESD is a problem particularly in dry environments where the relative humidity is below 50 percent.

To reduce the effects of ESD, observe the following guidelines:

- Wear a grounding wrist strap. If a grounding wrist strap is unavailable, touch an unpainted metal surface on the chassis periodically to neutralize any static charge.
- Keep components in their antistatic packaging until they are installed.
- Avoid wearing clothing made of wool or synthetic materials.

Electromagnetic and Radio Frequency Interference

Electromagnetic interference (EMI) and radio frequency interference (RFI) can adversely affect devices such as radio and television (TV) receivers operating near the AVS 3120. Radio frequencies emanating from the AVS 3120 can also interfere with cordless and low-power telephones. Conversely, RFI from high-power telephones can cause spurious characters to appear on a monitor screen.

RFI is defined as any EMI with a frequency above 10 kHz. This type of interference can travel from the AVS 3120 to other devices through the power cable and power source or through the air like transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of EMI and RFI emitted by computing equipment. Each AVS 3120 meets these FCC regulations.

To reduce the possibility of EMI and RFI, follow these guidelines:

- Operate the AVS 3120 only with its cover installed.
- Ensure that the screws on all peripheral cable connectors are securely fastened to their corresponding connectors on the back of the AVS 3120.
- Always use shielded cables with metal connector shells for attaching peripherals to the AVS 3120.

Power Source Interruptions

The AVS 3120 is especially sensitive to variations in voltage supplied by the AC power source. Overvoltage, undervoltage, and transients (or spikes) can erase data from memory or even cause components to fail. To protect against these types of problems, always properly ground power cables. Use one or both of the following methods:

- Use one of the power protection devices described in the "Using Power Protection Devices" section.
- Place the AVS 3120 on a dedicated power circuit (rather than sharing a circuit with other heavy electrical equipment). In general, do not allow the AVS 3120 to share a circuit with any of the following equipment:
  - Copier machines
  - Air conditioners
  - Vacuum cleaners
  - Space heaters
  - Power tools
  - Teletype machines
  - Adding machines
  - Laser printers
  - Facsimile machines
  - Any other motorized equipment

In addition to these appliances, the greatest threats to the AVS 3120 power supply are surges or blackouts caused by electrical storms. Whenever possible, turn off the AVS 3120 and any peripherals, and unplug them from their power sources during thunderstorms.

If a blackout occurs—even a temporary one—while the AVS 3120 is turned on, turn it off immediately and disconnect it from the electrical outlet. Leaving the AVS 3120 on may cause problems when the power is restored; all other appliances left on in the area can create large voltage spikes that can damage the AVS 3120.

Using Power Protection Devices

A number of devices are available that protect against power problems such as power surges, transients, and power failures. The following subsections describe some of these devices.

Surge Protectors

Surge protectors are available in a variety of types and usually provide a level of protection commensurate with the cost of the device. Surge protectors prevent voltage spikes, such as those caused during an electrical storm, from entering an AVS 3120 through the electrical outlet. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

Line Conditioners

Line conditioners go beyond the overvoltage protection of surge protectors. Line conditioners keep an AVS 3120's AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors—up to several hundred dollars. However, these devices cannot protect against a complete loss of power.

Uninterruptible Power Supplies

Uninterruptible power supply (UPS) systems offer the most complete protection against variations in power because they use battery power to keep the AVS 3120 running when AC power is lost. The battery is charged by the AC power while it is available, so once AC power is lost, the battery can provide power to the AVS 3120 for a limited amount of time—from 15 minutes to an hour or so—depending on the UPS system.

Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety-approved.

Specifications

Table A-1 lists the specifications for the AVS 3120.

Table A-1 AVS 3120 Specifications

Dimensions and Weight	
Height	1.75 in. (4.45 cm)
Width	17.5 in. (44.45 cm)
Depth	14.5 in. (36.83 cm)
Weight	20.0 lb (9.07 kg)
Form factor	1 RU, standard 19-inch rack-mountable
Expansion	One chassis expansion slot (not used)
Power	
Autoswitching	100 V to 240 V AC
Frequency	47 to 63 Hz, single phase
Operating current	3.0 A
Steady state	150 W
Maximum peak	190 W
Maximum heat dissipation	648 BTU/hr, full power usage (65 W)
Environment	
Temperature	Operating +32°F to +104°F (+0°C to +40°C) Nonoperating -13°F to +158°F (-25°C to +70°C)
Relative humidity	Operating 5% to 95% (noncondensing) Nonoperating 5% to 95% (noncondensing)
Altitude	Operating 0 to 9843 ft (3000 m) Nonoperating 0 to 15,000 ft (4572 m)
Shock	Operating 1.14 m/sec (45 in./sec) ½ sine input Nonoperating 30 G
Vibration	0.41 Grms2 (3 to 500 Hz) random input
Acoustic noise	60 dBa (maximum)

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