



Cisco Network Analysis Module Appliances Installation and Configuration Note, 5.1(2220)

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CONTENTS

About This Guide ix

Document Revision History	ix
Objectives	x
Audience	x
Organization	x
Conventions	xi
Safety Warnings	xi
Related Documentation	xvii
Obtaining Documentation and Submitting a Service Request	xviii

CHAPTER 1

Introducing the Cisco NAM 2220 Appliance 1-1

Product Overview	1-2
Cisco NAM 2220 Appliance Configurations	1-3
Hardware Features	1-4
Cisco NAM 2220 Appliance Front View	1-4
Product Serial Number Location	1-4
Cisco Product Identification Tool	1-5
Front Control Panel LEDs and Switches	1-5
Cisco NAM 2220 Appliance Rear View	1-6
NIC LEDs	1-7
AC Power Supply LED	1-8
Input/Output Ports and Connectors	1-8
Management Port (NIC 1)	1-8
Serial (Console) Port	1-9
AC Power Supplies	1-11
Environmental Monitoring	1-12
Overcurrent Protection (OCP)	1-12
Overvoltage Protection (OVP)	1-12
Overtemperature Protection (OTP)	1-12
Regulatory Compliance	1-12

CHAPTER 2

Preparing to Install the Cisco NAM 2220 Appliance 2-1

Safety Guidelines	2-2
-------------------	-----

- General Precautions 2-2
- Safety with Equipment 2-3
- Safety with Electricity 2-3
- Preventing Electrostatic Discharge Damage 2-5
- Lifting Guidelines 2-5
- Preparing Your Site for Installation 2-6
 - Site Planning 2-6
 - Rack Installation Safety Guidelines 2-7
 - Site Environment 2-8
 - Airflow Guidelines 2-8
 - Temperature and Humidity Guidelines 2-9
 - Power Considerations 2-9
 - Method of Procedure 2-10
 - Unpacking and Checking the Contents of Your Shipment 2-11
 - Cisco Information Packet and Warranty 2-13
 - Required Tools and Equipment 2-14
 - Installation Checklist 2-15
 - Creating a Site Log 2-15
- Management and Console Port Considerations 2-16
 - NIC 1 (RJ-45) Ethernet Connections 2-16
 - Serial (Console) Port Connections 2-16

CHAPTER 3

- Installing the Cisco NAM 2220 Appliance 3-1**
 - Installation Overview 3-2
 - Installing the XFP Transceiver Module 3-3
 - Rack-Mounting Configuration Guidelines 3-3
 - Mounting the Cisco NAM 2220 Appliance in a 4-Post Rack 3-4
 - 4-Post Rack-Mount Hardware Kit 3-5
 - Attaching the Inner Slide Rails and Rack-Mounting Ears to the Appliance 3-6
 - Attaching the Outer Slide Rails to the Rack 3-7
 - Installing the Appliance into the Rack 3-7
 - Cisco NAM 2220 Appliance Power 3-9
 - Connecting the Appliance AC Power 3-10
 - Power Connections 3-10
 - Grounding the Rack 3-10
 - Connecting Appliance Cables 3-11
 - Connecting the Management Port 3-12
 - Connecting a Console Terminal 3-12
 - Connecting the Monitoring Ports 3-13

Direct Connection	3-13
Optical Tap Connection	3-13
Cable Management	3-15
Powering Up the Cisco NAM 2220 Appliance	3-16
Power-Up Procedure	3-16
Checking the LEDs	3-17
Removing or Replacing the Cisco NAM 2220 Appliance	3-18

CHAPTER 4

Installing and Replacing Hardware Options	4-1
Before You Begin	4-2
Preparing for a Successful Installation	4-2
Completing the Replacement	4-2
Field Replaceable Units	4-2
Installing and Replacing XFP Transceiver Modules	4-3
Installing an XFP	4-4
Replacing an XFP	4-5
Removing and Replacing a Hard Disk Drive	4-6
Hard Disk Configurations	4-6
Replacing a Hard Disk Drive	4-7
Replacing a RAID1 Disk Drive	4-9
Replacing a RAID0 Disk Drive	4-10
Installing or Replacing a Power Supply	4-17
Replacing a Redundant Power Supply	4-18
Replacing a Nonredundant Power Supply	4-19
Adding a New Redundant Power Supply	4-19
Mounting the Cisco NAM 2220 Appliance in a 2-Post Rack	4-20
2-Post Rack-Mount Hardware Kit	4-21
Mid-Mounting in a 2-Post Rack	4-22
Attaching the L Brackets to the Appliance	4-22
Installing the Appliance in the Rack	4-23

CHAPTER 5

Configuring the Cisco NAM 2220 Appliance	5-1
Logging In For the First Time	5-1
Changing the Root Password	5-2
Examples	5-3
Establishing Network Connectivity	5-3
Checking Your Configuration	5-5
Enabling the NAM GUI Web Server	5-6

- Enabling the Web Server Summary 5-7
- Checking the NAM GUI Web Server 5-8
- Additional Configuration Using the NAM GUI 5-8
- Managing the Cisco NAM 2220 Appliance 5-12
 - Shutting Down and Starting Up NAM 2220 Appliance 5-12
 - Verifying System Status 5-12
 - Configuring Logging Options and Generating Diagnostics 5-13
 - Resetting the NAM Root Password to the Default Value 5-13
 - What to Do Next 5-14
 - Opening and Closing a Telnet or SSH Session to the NAM 5-14
 - Prerequisites 5-14
 - Examples 5-16
- Configuring the Monitored Device 5-17
 - Configuring a Monitored Device Interface 5-17
 - Creating a SPAN Session 5-17

CHAPTER 6

Backing up and Restoring NAM Configuration 6-1

- Backing Up Your Configuration 6-1
- Restoring Your Configuration 6-2

APPENDIX A

Maintaining the Cisco NAM 2220 Appliance A-1

- Maintaining Your Site Environment A-1
 - General Exterior Cleaning and Inspection A-2
 - Appliance A-2
 - Cables and Connectors A-2
 - Adapter Cards A-2
 - Cooling A-3
 - Temperature A-3
 - Humidity A-4
 - Altitude A-4
 - Electrostatic Discharge A-4
 - Electromagnetic and Radio Frequency Interference A-4
 - Magnetism A-5
 - Power Source Interruptions A-5

APPENDIX B

Monitor Port Requirements B-1

- XFP Modules B-1
- Cables B-2

Optical Tap Devices **B-3**
 Breakout Mode Configuration **B-4**

APPENDIX C

Troubleshooting C-1

Troubleshooting Overview **C-1**
 Problem Solving **C-2**
 Troubleshooting the Power and Cooling Systems **C-3**
 Environmental Reporting Features **C-3**
 Troubleshooting Adapter Cards, Cables, and Connections **C-4**
 Reading the LEDs **C-5**
 Front-Panel LEDs **C-5**
 NIC LEDs **C-6**
 Product Serial Number Location **C-7**
 Cisco Product Identification Tool **C-7**

APPENDIX D

Site Log D-1

APPENDIX E

BIOS Settings E-1

APPENDIX F

Using the Recovery CD F-1

Booting the Recovery CD **F-1**
 Helper Utility Menu Options **F-2**
 Option n - Configure Network **F-3**
 Option 1 - Download Application Image and Write to HDD **F-4**
 Option 2 - Download Application Image and Reformat HDD **F-4**
 Option 3 - Install Application Image from CD **F-4**
 Option 4 - Display Software Versions **F-4**
 Option 5 - Reset Application Image CLI Passwords to Default **F-5**
 Option 6 - Change File Transfer Method **F-5**
 Option 7- Send Ping **F-5**
 Option r- Exit and Reset Services Engine **F-5**
 Option h- Exit and Shutdown Services Engine **F-5**
 Restoring the NAM Appliance Configuration **F-6**

INDEX



About This Guide

This preface describes who should read the *Installation and Configuration Guide for the Cisco NAM 2220 Appliance* and the objectives, audience, organization, and conventions for the guide.



Note

Use this document along with the documents listed in the [“Related Documentation”](#) section on page xvii.

This preface contains the following sections:

- [Document Revision History, page ix](#)
- [Objectives, page x](#)
- [Audience, page x](#)
- [Organization, page x](#)
- [Conventions, page xi](#)
- [Safety Warnings, page xi](#)
- [Related Documentation, page xvii](#)
- [Obtaining Documentation and Submitting a Service Request, page xviii](#)

Document Revision History

The following Document Revision History table records technical changes to this document. The table shows the document revision number for the change, the date of the change, and a brief summary of the change.

Revision	Date	Change Summary
01	January 25, 2011	First release.
02	April 01, 2011	Second release.

Objectives

This guide explains how to prepare your site for installation, how to install the Cisco NAM 2220 appliance in an equipment rack, and how to troubleshoot and maintain the appliance. After completing the appliance installation procedures covered in this guide, you then use the appropriate publications to configure your appliance.

Warranty, service, and support information is located in the *Cisco Information Packet* that is shipped with your appliance.

Audience

This guide is designed for personnel who install, configure, and maintain the Cisco NAM 2220 appliance. To use this hardware publication, you should be familiar with internetworking equipment and cabling, and have a basic knowledge of electronic circuitry and wiring practices.



Warning

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

Organization

The major sections of this hardware installation guide are listed in the following table.

Chapter	Title	Description
Chapter 1	Introducing the Cisco NAM 2220 Appliance	Describes the hardware features and specifications of the Cisco NAM 2220 appliance.
Chapter 2	Preparing to Install the Cisco NAM 2220 Appliance	Describes the safety recommendations, site requirements, network connection considerations, required tools and equipment, and provides an installation checklist.
Chapter 3	Installing the Cisco NAM 2220 Appliance	Includes appliance installation information, including how to connect the appliance console and network ports.
Chapter 4	Configuring the Cisco NAM 2220 Appliance	Describes how to configure the Cisco NAM 2220 appliance to establish network connectivity, set IP parameters, and perform other required administrative tasks using the NAM command line interface (CLI) and the graphical user interface (GUI).
Chapter 5	Installing and Replacing Hardware Options	Describes how to remove and replace the hardware options and field replaceable units (FRUs) including hard disk drives and power supplies.
Chapter 6	Backing up and Restoring NAM Configuration	Describes how to back up your configuration, upgrade NAM application software, and restore your configuration.

Chapter	Title	Description
Appendix A	Maintaining the Cisco NAM 2220 Appliance	Contains the procedures for keeping your appliance in good condition.
Appendix B	Monitor Port Requirements	Provides information about XFP cable specifications.
Appendix C	Troubleshooting	Describes troubleshooting procedures for the appliance.
Appendix D	Site Log	Provides a sample site log; a way to record all actions related to installing and maintaining the Cisco NAM 2220 appliance.
Appendix E	BIOS Settings	Provides the BIOS settings for the Cisco NAM 2220 appliance.
Appendix F	Using the Recovery CD	Provides information about how to use the recovery CD to reinstall NAM application software and perform other recovery tasks.
Index		Provides an alphabetical list of common appliance components and other topics.

Conventions

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



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.



Timesaver

Means *the described action saves time*. You can save time by performing the action described in the paragraph.



Tip

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



Caution

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

Safety Warnings

Safety warnings appear throughout this guide in procedures that, if performed incorrectly, might harm you. A warning symbol precedes each warning statement. The safety warnings provide safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone

wiring. Included in the warnings are translations in several languages. (See the *Cisco Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliances* for detailed information about compliance guidelines and translated safety warnings.)

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/regulatory/compliance/nam2200rcsi.html



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**FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejtő helyzetben van. Mielőtt bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető 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 legemeskade. 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 للإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في آخر 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 συνήθειες 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 כדי 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 ОБИЕ 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

Related Documentation

For information beyond the scope of this document, or for additional information about the Cisco NAM 2220 appliance, see the following publications:

- *Cisco Regulatory Compliance and Safety Information for the Cisco NAM Appliance*
http://www.cisco.com/en/US/products/ps10113/prod_installation_guides_list.html
- *Release Notes for the Cisco Network Analysis Module, Release 5.1*
http://www.cisco.com/en/US/products/sw/cscowork/ps5401/prod_release_notes_list.html
- *Quick Start and Documentation Guide for the Cisco NAM 2200 Series Appliance*
http://www.cisco.com/en/US/products/ps10113/products_documentation_roadmaps_list.html
- *User Guide for the Cisco Prime Network Analysis Module, Release 5.1*
http://www.cisco.com/en/US/products/sw/cscowork/ps5401/products_user_guide_list.html
- *Cisco NAM Command Reference, Release 5.1*
http://www.cisco.com/en/US/products/sw/cscowork/ps5401/prod_command_reference_list.html
- *Copyright Notices for the Cisco Network Analysis Module, Release 5.1*
http://www.cisco.com/en/US/products/sw/cscowork/ps5401/products_licensing_information_listing.html

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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CHAPTER 1

Introducing the Cisco NAM 2220 Appliance

This chapter provides an introduction to the Cisco NAM 2220 appliance and describes the appliance hardware, major components, and front- and rear-panel LED indicators, controls, and connectors.

The Cisco NAM 2220 appliance comes preloaded with Cisco Prime Network Analysis Module (NAM) software. NAM software enables network managers to understand, manage, and improve how applications and services are delivered to end users.

The Cisco Prime portfolio of enterprise and service provider management offerings supports integrated lifecycle management of Cisco architectures and technologies based on a service-centric framework. Built on an intuitive workflow-oriented user experience, Cisco Prime products help increase IT productivity and reduce operations costs through innovative management solutions for the network services, infrastructure, and endpoints.

The NAM offers flow-based traffic analysis of applications, hosts, and conversations, performance-based measurements on application, server, and network latency, quality of experience metrics for network-based services such as voice over IP (VoIP) and video, and problem analysis using deep, insightful packet captures.

The Cisco NAM includes an embedded, web-based GUI that provides quick access to the configuration menus and presents easy-to-read performance dashboards for different types of services and traffic including voice and video, response time, and network flow-based reports.

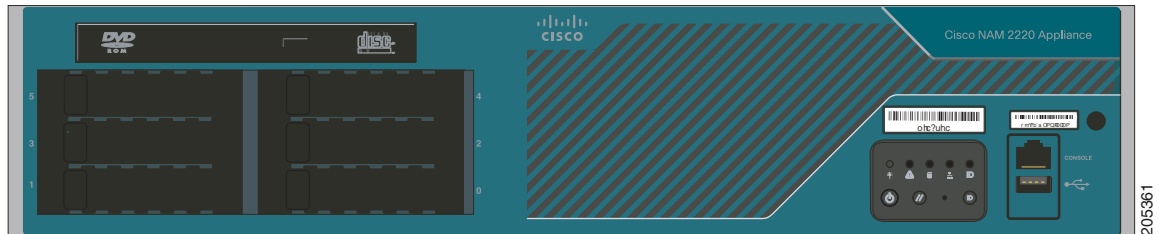
This chapter contains the following sections:

- [Product Overview, page 1-2](#)
- [Hardware Features, page 1-4](#)
- [Environmental Monitoring, page 1-12](#)
- [Regulatory Compliance, page 1-12](#)

Product Overview

The Cisco NAM 2220 appliance (see [Figure 1-1](#)) is contained in a standard shelf-rack enclosure. The appliance weighs 44.7 lb (20.3 kg) and measures 3.5 inches high x 16.93 inches wide x 20 inches deep (8.9 cm x 43.2 cm x 50.8 cm).

Figure 1-1 Cisco NAM 2220 Appliance



Note

The rack-mount brackets are not installed at the factory. You must install them at the site. (See the [“4-Post Rack-Mount Hardware Kit”](#) section on page 3-5 for how to install the rack-mount brackets.) See [Chapter 4, “Installing and Replacing Hardware Options,”](#) for upgrade options and spare part numbers.

The Cisco NAM 2220 appliance is configured for AC-input power, mounted in a standard 19-inch (48.3 cm) 2- or 4-post equipment rack (using the rack-mount brackets provided), and includes the following features:

- Dual Intel Xeon E5440 Quad Core processors with 12 MB L2 cache, 2.83 GHz clock speed, and 1333 MHz Front Side Bus (FSB)
- Eight synchronous dynamic RAM (SDRAM) slots with 2 GB DIMM (16 GB factory installed)
- Six 146-GB SAS hard drives (6 x 146-GB SAS hard drive factory installed)
- Dual 10 GB Ethernet hardware enhanced PCI-E network interface card (NIC) supporting optical XFP interface modules
- Integrated RAID at levels 0 and 1.
- One DVD-ROM drive (located on the front panel)
- Single or redundant (optional) AC power supply
- Front-to-rear airflow blowers using two 40 x 40 x 56-mm exhaust fans and ducting for the CPU and memory, and two 40-mm exhaust fans built in to the power supply
- One RJ-45 10BASE-T/100BASE-TX/1000BASE-T network interface connector (located on the rear panel)
- One RJ-45 serial console port (located on the rear panel)
- One PS/2 (keyboard) port (located on the rear panel)¹
- One PS/2 (mouse) port (located on the rear panel)¹
- One DB-15 video port (located on the rear panel)
- Rear access cabling

1. Either PS/2 port can support the mouse or keyboard. Neither port supports hot-plugging.

- Five front-panel appliance LEDs (for a description, see the “[Cisco NAM 2220 Appliance Front View](#)” section on page 1-4):
 - NIC activity (indicates whether interrupts or packet transfers are running)
 - Power (indicates whether the power supply is operational)
 - Hard disk drive activity (indicates whether the drive is functioning properly)
 - Appliance status
 - Appliance identification
- The Cisco NAM 2220 appliance is normally shipped with:
 - Rack-mount kit with rails to enable you to position the Cisco NAM 2220 appliance in a four-post equipment rack. (See [Chapter 3, “Installing the Cisco NAM 2220 Appliance.”](#))

Cisco NAM 2220 Appliance Configurations

[Table 1-1](#) lists the processor, memory, hard disk drive, and expansion slot specifications of the Cisco NAM 2220 appliance.

Table 1-1 Cisco NAM 2220 Series Appliance

Specification	Description	Cisco Spare Part Number ¹
Microprocessor	Dual Intel Xeon E5440 Quad Core processors	n/a
Monitoring interfaces	Dual 10 GB Ethernet hardware enhanced PCI-E network interface card (NIC) supporting optical XFP interface modules	n/a
	Short Range XFP, 10 GB 850 nm	XFP-10GBASE-SR
	Long range XFP, 10 GB 1310 nm	XFP-10GBASE-LR
Memory	Eight (8) 2 GB DIMMs (total 16 GB)	NAM2220-DIMM-16GB
Hard disk drives	Six (6) 146 GB hard disk drives	NAM2220-HDD-6X146
Power supply	AC power supply (one or two)	NAM2220-AC-PS

1. See [Chapter 4, “Installing and Replacing Hardware Options,”](#) for hardware option descriptions and installation and removal procedures.

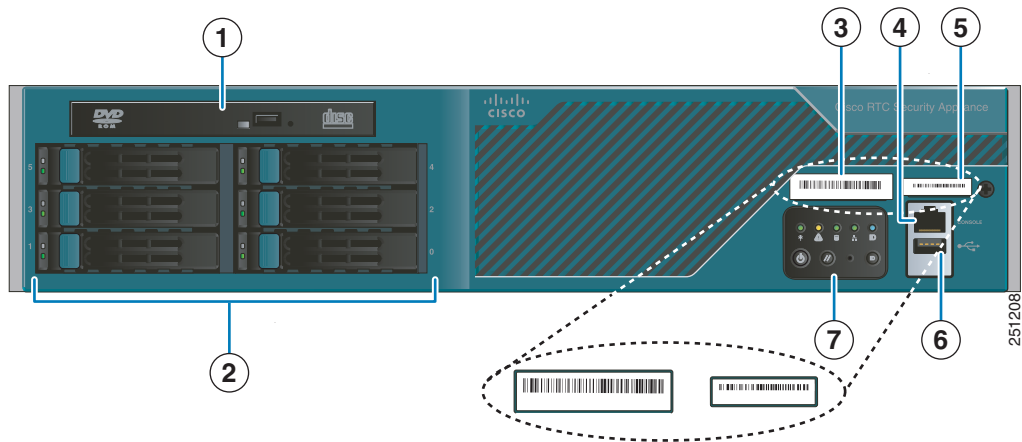
Hardware Features

This section illustrates and describes the front- and rear-panel controls, ports, and LED indicators on the Cisco NAM 2220 appliance.

Cisco NAM 2220 Appliance Front View

Figure 1-2 shows the front view of the Cisco NAM 2220 appliance.

Figure 1-2 Cisco NAM 2220 Appliance Front View



1	DVD drive	5	Product serial number location
2	Hard drive trays (6)	6	USB port
3	Product ID (PID) of the Cisco NAM 2220 appliance	7	Control switches and status LEDs (see Figure 1-3)
4	Unused RJ-45 port		

Product Serial Number Location

On the Cisco NAM 2220 appliance, the serial number label is located on the right side of the appliance. See location #5 in [Figure 1-2](#).



Note

The serial number for the Cisco NAM 2220 appliance is 11 characters long.

Cisco Product Identification Tool

The Cisco Product Identification (CPI) tool helps you retrieve the serial number of the Cisco products. Before you submit a request for service online or by phone, use the CPI tool to locate the product serial number. You can access this tool from the Cisco Support website by clicking the **Get 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:

- Search by product ID or model name
- Browse for Cisco model
- Copy and paste the output of the **show** command to identify the product

Search results show an illustration of the product with the serial number label location highlighted. Locate the serial number label on the product and record the information before you place a service call.

The CPI tool is accessed via Cisco.com at the following URL:

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

Access to the CPI tool on the Cisco Support 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:

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

Front Control Panel LEDs and Switches

Figure 1-3 shows the location of the Cisco NAM 2220 appliance LEDs and switches on the front panel. Table 1-2 describes the LEDs and switches located on the front panel.

Figure 1-3 Cisco NAM 2220 Appliance Front Control Panel

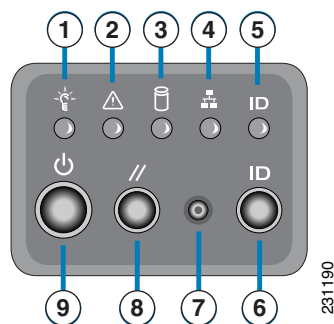


Table 1-2 Front Control Panel LEDs and Switches

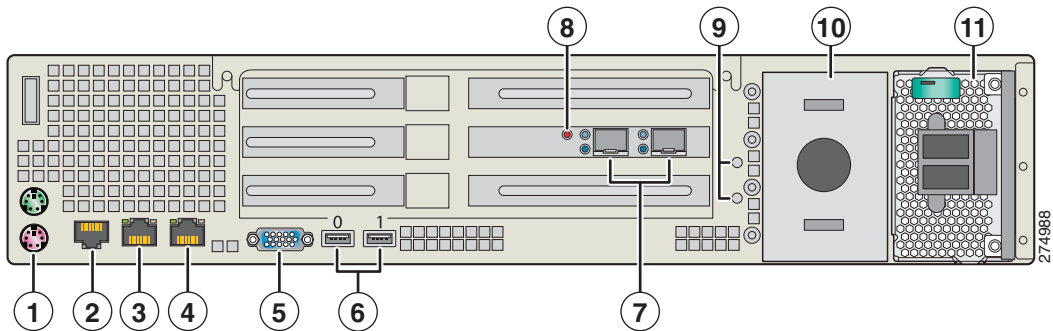
Loc.	LED	Color	State	Description
1	Appliance Power	Green	On	Power on
		Off	Off	Power off

Table 1-2 Front Control Panel LEDs and Switches (continued)

Loc.	LED	Color	State	Description
2	Appliance Status	Green	On	Standby or ready for operation
		Green	Blinking	Degraded operation (for example, power supply nonredundancy, part of system memory mapped out of BIOS)
		Amber	On	One or more critical fault conditions
		Amber	Blinking	One or more noncritical fault conditions
3	Hard Disk Drive	Green	On	HDD activity
		Amber	On	HDD fault Note This is an aggregated indication for all hard disk drives. Each hard disk drive contains its own activity and fault LEDs.
4	NIC	Green	On	NIC activity
5	System ID	Blue		System identity
6	ID			Toggles appliance ID LED
7	NMI			Unused non-maskable interrupt
8	Reset			Resets the appliance
9	Power			Turns the appliance power on and off

Cisco NAM 2220 Appliance Rear View

Figure 1-4 shows the rear view of the Cisco NAM 2220 appliance.

Figure 1-4 Cisco NAM 2220 Appliance Rear View

1	PS/2 connectors for keyboard and mouse (used only for maintenance)	7	XFP transceiver slots <ul style="list-style-type: none"> Slot on right provides input to logical DataPort 1 Slot on left provides input to logical DataPort 2.
2	RJ-45 serial (console) port	8	GPS time sync signal connector
3	NAM Management port; NIC 1 (10/100/1000 Mb/s)	9	Ground studs
4	Non-functional NIC port Note A plastic plug covers this unused NIC port.	10	Power supply 2 location (optional redundant power supply) If a second power supply is not used, a baffle covers this space (as shown).
5	Video (VGA) connector (used only for maintenance)	11	Power supply 1
6	Unused USB ports (0 and 1)		

NIC LEDs

The rear of the Cisco NAM 2220 appliance includes LEDs (a green LED to the left of the connector and a bi-color [green/amber] LED to the right of the connector) that indicate the connection activity and speed of the NIC ports. (See [Figure 1-5](#).)

[Table 1-3](#) describes the activity and connection speed associated with the NIC LEDs.

Figure 1-5 NIC 1 LEDs

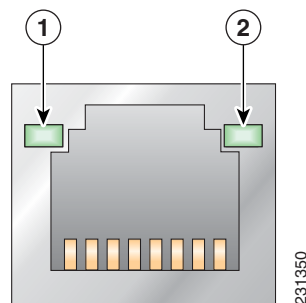


Table 1-3 NIC LEDs

Loc.	LED	Color	State	Description
1	Left		Off	No network connection
		Green	Solid	Network connection
		Green	Blinking	Transmit/receive activity
2	Right		Off	10-Mb/s connection (if left LED is on or blinking)
		Green	Solid	100-Mb/s connection
		Amber	Solid	1000-Mb/s (or 1-Gb/s) connection

AC Power Supply LED

The rear of Cisco NAM 2220 appliance includes LEDs that indicate the power status of the AC power supply (or supplies for optional redundant power supplies). (See locations 10 and 11 in [Figure 1-4](#).) [Table 1-4](#) describes the power status associated with the AC power supply LED.

Table 1-4 AC Power Supply LED

LED	Color	State	Description
Below AC power supply input connector		Off	No AC input power to power supply
	Green	Blinking	AC power applied to power supply and standby voltages are available
	Green	Solid	All power available
	Amber	Blinking	AC power supply warning due to overcurrent or overtemperature condition or slow fan
	Amber	Solid	AC power supply failed or shut down due to blown fuse, high overcurrent or overtemperature condition, or fan failure

Input/Output Ports and Connectors

The Cisco NAM 2220 appliance supports the following I/O connectors on the rear of the appliance:

- Management port (NIC 1 Ethernet connection)
- Serial connector

The following connectors are not required for normal day-to-day operation of the NAM appliance. These connectors are only used in the case of a RAID0 hard disk replacement:

- Video connector
- Mouse connector
- Keyboard connector



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

Management Port (NIC 1)

The Cisco NAM 2220 appliance uses the NIC 1 port, an integrated Ethernet controller (10/100/1000 Mb/s), as the management port. When you connect this port to a gateway, you enable management and NAM application access to the Cisco NAM 2220 appliance.



Note

We recommend that you use no less than a Category 5e or 6 unshielded twisted-pair (UTP) cable for the management port connection.

To access the Ethernet port, connect a Category 5e or 6 unshielded twisted-pair (UTP) cable to the RJ-45 connector on the back of the appliance. (See [Table 1-5](#). The appliance comes with an Ethernet RJ-45-to-RJ-45 yellow cable.)

Table 1-5 Ethernet Cabling Guidelines

Type	Description
10BASE-T	EIA Categories 3, 4, or 5 UTP (2 or 4 pairs) up to 328 ft (100 m)
100BASE-TX	EIA Category 5e UTP (2 pairs) up to 328 ft (100 m)
1000BASE-T	EIA Category 6 (recommended), Category 5E or 5 UTP (2 pairs) up to 328 ft (100 m)

Ethernet Port Connector

Figure 1-6 shows the Ethernet RJ-45 port and plug.

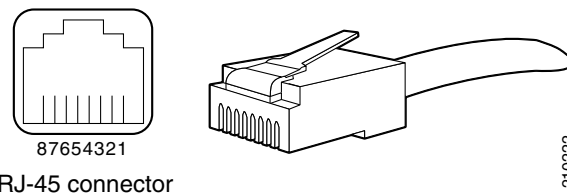
Figure 1-6 RJ-45 Port and Plug

Table 1-6 lists the RJ-45 pin signals used on the connector.

Table 1-6 Ethernet Port Pinout

Ethernet Port Pin	Signal	Description
1	BI_DA+	Bidirectional pair A, +
2	BI_DA-	Bidirectional pair A, -
3	BI_DB+	Bidirectional pair B, +
4	BI_DC+	Bidirectional pair C, +
5	BI_DC-	Bidirectional pair C, -
6	BI_DB-	Bidirectional pair B, -
7	BI_DD+	Bidirectional pair D, +
8	BI_DD-	Bidirectional pair D, -

Serial (Console) Port

The Cisco NAM 2220 appliance has a standard serial (console) port. The appliance comes with a console port cable kit, which contains the cable and adapter to connect a console terminal (an ASCII terminal or PC running terminal-emulation software). The console cable kit includes the following items:

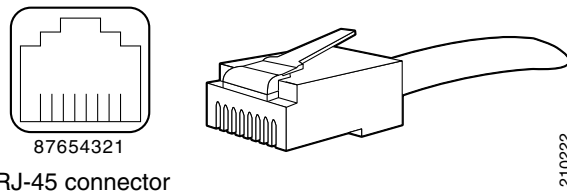
- RJ-45-to-RJ-45 rollover cable (light blue)
- RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL)

Serial (Console) Port Connector

The Cisco NAM 2220 appliance uses the RJ-45 serial port connector located on the back of the appliance. The RJ-45 port connector located on the front panel is not functional and should not be used.

Figure 1-7 shows the pin number assignments for the RJ-45 serial (console) port connector on the back or front of the appliance. These pin number assignments conform to industry standards.

Figure 1-7 Serial Port Connector



RJ-45 connector



Note

The serial (console) RJ-45 port pinout differs slightly between the front- and rear-panel ports, specifically in relation to Pin 6 and Pin 7.



Note

Port settings are preset at the factory before shipping and should not be modified.

On the rear-panel serial (console) port, Pin 7 can be configured with a jumper located on the appliance motherboard. This jumper allows you to set Pin 7 to either Data Set Ready (DSR) or Data Carrier Detect (DCD) as might be required when using a serial port concentrator. The default jumper configuration selects the DSR signal, which conforms to the Cisco serial port standard.

Table 1-7 shows the rear-panel serial (console) port pinout description.

Table 1-7 Rear-Panel RJ-45 Serial (Console) Port Pinout

Serial Port Pin	Signal	Description
1	RTS	Request to send
2	DTR	Data terminal ready
3	TXD	Transmit data
4	GND	Earth ground
5	GND	Earth ground
6	RXD	Receive data
7	DSR or DCD ¹	Data set ready or Data carrier detect
8	CTS	Clear to send

1. A jumper block on the appliance motherboard determines whether DSR or DCD is routed to Pin 7. The appliance motherboard has the jumper block preconfigured with DSR enabled.

Serial (Console) Port Cables

Use the thin, flat, RJ-45-to-RJ-45 rollover cable and the RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL) to connect the console port to an ASCII terminal or a PC running terminal-emulation software. Table 1-8 lists the pinouts for the asynchronous serial console port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-9 female DTE adapter.

Table 1-8 Serial Console Port Signaling and Cabling Using a DB-9 Adapter

Console Port (DTE)	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-9 Terminal Adapter (Connected to Rollover Cable)	Console Device
	RJ-45 Pin	RJ-45 Pin	DB-9 Pin	
Signal				Signal
RTS	1 ¹	8	8	CTS
DTR	2	7	6	DSR
TXD	3	6	2	RXD
GND	4	5	5	GND
GND	5	4	5	GND
RXD	6	3	3	TXD
DSR	7	2	4	DTR
CTS	8 ¹	1	7	RTS

1. Pin 1 is connected internally to pin 8.

AC Power Supplies

The Cisco NAM 2220 appliance is equipped with either a 110-V or 220-V AC power supply (see locations 10 and 11 in Figure 1-4). If an appliance has an optional redundant power supply, both power supplies must be of the same type. A baffle panel covers the empty power supply slot in an appliance without a redundant power supply as shown in location 10 of Figure 1-4.

The power supply is rated for 600-W output capacity in full AC input voltage.

The power supply incorporates a single 40-mm fan for cooling, which also contributes to overall appliance cooling. The cooling air enters the power supply from the power distribution side. If airflow through the power supply is insufficient, the overtemperature protection circuits activate a shutdown before the temperature passes the maximum rated temperature.



Caution

To ensure proper cooling if only one power supply is installed, the power supply must be in the right-hand slot and the power supply blank filler panel must be in the left-hand slot. (See Figure 4-22 on page 4-20.)



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

To maintain hot-swap capability, ensure that an active power supply is in both power supply slots before replacing (hot-swapping) a power supply. Check the power supply LED to determine if a power supply module has failed.

AC Power Supply Input

A single receptacle is provided at the rear of the AC power supply for AC input.

Environmental Monitoring

The Cisco NAM 2220 appliance has protection circuits that monitor and detect overcurrent, overvoltage, and overtemperature conditions inside the appliance. If the power supply shuts down or latches off, a cycle of off for 15 seconds and on for 1 second will reset the power supply.

Overcurrent Protection (OCP)

The power supply shuts down and latches off after an overcurrent condition occurs. This latch is cleared by a power interruption.



Note

The power supply will not be damaged from power cycling.

Overvoltage Protection (OVP)

The power supply shuts down and latches off after an overvoltage condition occurs. This latch is cleared by a power interruption.

Overtemperature Protection (OTP)

The power supply is protected against overtemperature conditions caused by the loss of fan cooling or excessive ambient temperature. In an OTP condition, the power supply will shut down. When the power supply temperature drops to the rated safety limit, the power supply restores power automatically.

Regulatory Compliance

For regulatory compliance and safety information, see the Cisco *Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliance* document. This document is provided with the Cisco NAM 2220 appliance and is also available online at Cisco.com:

http://www.cisco.com/en/US/docs/net_mgmt/network_analysis_module_appliance/regulatory/compliance/nam2200rcsi.html



CHAPTER 2

Preparing to Install the Cisco NAM 2220 Appliance

This chapter describes the tasks you must perform before you install a Cisco NAM 2220 appliance.

This chapter contains the following sections:

- [Safety Guidelines, page 2-2](#)
- [Preparing Your Site for Installation, page 2-6](#)
- [Management and Console Port Considerations, page 2-16](#)



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment. This equipment contains an energy hazard. Disconnect the system before servicing. Statement 186



Warning

Read the installation instructions before you connect the system to its power source. Statement 10



Note

Read the *Regulatory Compliance and Safety Information for the Cisco NAM 2220 Appliance* document at http://www.cisco.com/en/US/products/ps10113/prod_installation_guides_list.html and the *Site Preparation and Safety Guide* that came with your Cisco NAM 2220 appliance before you begin the installation.

Safety Guidelines

Before you begin installing the Cisco NAM 2220 appliance, review the safety guidelines in this chapter and the “[Rack-Mounting Configuration Guidelines](#)” section on page 3-3 to avoid injuring yourself or damaging the equipment.

In addition, before replacing, configuring, or maintaining the appliance, review the safety warnings listed in the [Safety Warnings, page -xi](#) and in the *Cisco Regulatory Compliance and Safety Information for the Cisco NAM 2220 Appliance* document.

http://www.cisco.com/en/US/products/ps10113/prod_installation_guides_list.html

General Precautions

Observe the following general precautions for using and working with your appliance:

- Observe and follow service markings. Do not service any Cisco product except as explained in your appliance documentation. Opening or removing covers that are marked with the triangular symbol with a lightning bolt might expose you to electrical shock. Components inside these compartments should be serviced only by an authorized service technician.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your authorized service provider:
 - 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.
- Keep your appliance away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your appliance, and never operate the product in a wet environment.
- Do not push any objects into the openings of your appliance. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with other equipment approved by Cisco.
- Allow the product to cool before removing covers or touching internal components.
- 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 your service representative or local power company.
- Use only approved power cables. If you have not been provided with a power cable for your appliance or for any AC-powered option intended for your appliance, purchase a power cable that is approved for use in your country. The power cable must be 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 appliance and 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.
- Do not use appliance or voltage converters or kits sold for appliances with your product.

- To help protect your appliance from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Position cables and power cords carefully; route cables and the power cord and plug so that they cannot be stepped on or tripped over. Be sure that nothing rests on your appliance cables or power cord.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications. Always follow your local or national wiring rules.

Safety with Equipment

The following guidelines will help ensure your safety and protect the equipment. This list does not include potentially hazardous situations, so be *alert*.



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

- Always disconnect all power cords and interface cables before moving the appliance.
- Never assume that power is disconnected from a circuit; *always* check.
- Keep the appliance chassis area clear and dust-free before and after installation.
- Keep tools and assembly components away from walk areas where you or others could fall over them.
- Do not work alone if potentially hazardous conditions exist.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Do not wear loose clothing that might get caught in the appliance chassis.
- Wear safety glasses when working under conditions that might be hazardous to your eyes.

Safety with Electricity



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



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. Statement 1021



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

**Warning**

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

**Warning**

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

**Warning**

Before working on a chassis or working near power supplies, unplug the power cord on AC units. Statement 246

**Warning**

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

**Warning**

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

**Warning**

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

**Warning**

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

**Warning**

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

Follow these guidelines when working on equipment powered by electricity:

- Locate the room's emergency power-off switch. Then, if an electrical accident occurs, you can quickly turn off the power.
- Disconnect all power before doing the following:
 - Working on or near power supplies
 - Installing or removing an appliance
 - Performing most hardware upgrades
- Never install equipment that appears damaged.
- Carefully examine your work area for possible hazards, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- Never assume that power is disconnected from a circuit; *always* check.
- Never perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Never work alone when potentially hazardous conditions exist.

- If an electrical accident occurs, proceed as follows:
 - Use caution, and do not become a victim yourself.
 - Turn off power to the appliance.
 - If possible, send another person to get medical aid. Otherwise, determine the condition of the victim, and then call for help.
 - Determine whether the person needs rescue breathing, external cardiac compressions, or other medical attention; then take appropriate action.

In addition, use the following guidelines when working with any equipment that is disconnected from a power source but still connected to telephone wiring or network cabling:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for it.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD can occur when electronic printed circuit cards are improperly handled and can cause complete or intermittent failures. Always follow ESD-prevention procedures when removing and replacing components:

- 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 appliance. 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.
- Ensure that the Cisco NAM 2220 appliance is electrically connected to earth ground.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Attach the antistatic wrist strap to your wrist and connect its cord to the ESD socket on the top, left-hand side on the front of the appliance to channel unwanted ESD voltages safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching a metal part of the appliance.



Caution

For the safety of your equipment, periodically check the resistance value of the antistatic wrist strap. It should be between 1 and 10 Mohm.

Lifting Guidelines

A Cisco NAM 2220 appliance weighs 44.7 lb (20.3 kg). The appliance is not intended to be moved frequently. Before you install the appliance, ensure that your site is properly prepared so you can avoid having to move the appliance later to accommodate power sources and network connections.

Whenever you lift the appliance or any heavy object, follow these guidelines:

- Always disconnect all external cables before lifting or moving the appliance.
- Ensure that your footing is solid, and balance the weight of the object between your feet.
- Lift the appliance slowly; never move suddenly or twist your body as you lift.
- Keep your back straight and lift with your legs, not your back. If you must bend down to lift the appliance, bend at the knees, not at the waist, to reduce the strain on your lower back muscles.
- Lift the appliance from the bottom and grasp the underside of the appliance exterior with both hands.

Preparing Your Site for Installation

Before installing the Cisco NAM 2220 appliance, it is important to prepare for installation by:

- Preparing the site (site planning) and reviewing the installation plans or method of procedures (MOPs)
- Unpacking and inspecting the appliance
- Gathering tools and test equipment required to properly install the appliance

Site Planning



Warning

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

Statement 1017

Typically, you should have prepared the installation site beforehand. As part of your preparation, obtain a floor plan of the site and the equipment rack where the Cisco NAM 2220 appliance will be housed. Determine the location of any existing appliances and their interconnections, including communications and power. Following the airflow guidelines (see the [“Airflow Guidelines” section on page 2-8](#)) ensures that adequate cooling air is provided to the appliance.

All personnel involved in the installation of the appliance including installers, engineers, and supervisors should participate in the preparation of a MOP for approval by the customer. (See the [“Method of Procedure” section on page 2-10](#).)

The following sections provide the site requirement guidelines that you must consider before installing the appliance:

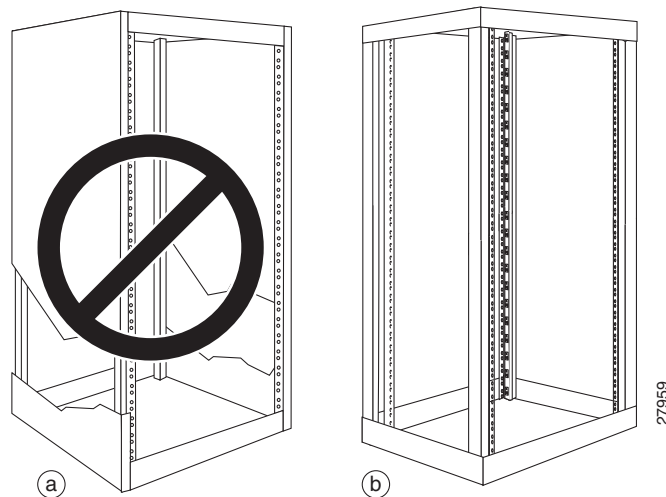
- [Rack Installation Safety Guidelines, page 2-7](#)
- [Site Environment, page 2-8](#)
- [Airflow Guidelines, page 2-8](#)
- [Temperature and Humidity Guidelines, page 2-9](#)
- [Power Considerations, page 2-9](#)
- [Method of Procedure, page 2-10](#)

Rack Installation Safety Guidelines

The Cisco NAM 2220 appliance can be mounted in most 4-post equipment racks that comply with the Electronics Industries Association (EIA) standard for equipment racks (EIA-310-D). The rack must have at least two posts with mounting flanges to mount the appliance. The distance between the center lines of the mounting holes on the two mounting posts must be 18.31 inches +/- 0.06 inch (46.50 cm +/- 0.15 cm). The rack-mounting hardware included with the appliance is suitable for most 19-inch equipment racks.

Figure 2-1 shows examples of Enclosed rack (do not use) and 4-post (open-type) equipment racks, respectively.

Figure 2-1 Equipment Rack Types



Enclosed Rack (Do Not Use)

Figure 2-1a shows a free-standing, enclosed rack with two mounting posts in the front. The Cisco NAM 2220 appliance should *not* be installed in this type of enclosed rack, because the appliance requires an unobstructed flow of cooling air to maintain acceptable operating temperatures for its internal components. Installing the appliance in any type of enclosed rack—even with the front and back doors removed—could disrupt the airflow, trap heat next to the appliance, and cause an overtemperature condition inside the appliance.

4-Post (Open) Rack

Figure 2-1b shows a free-standing, 4-post open rack with two mounting posts in front and two mounting posts at the back. The mounting posts in this type of rack are often adjustable so that you can position the rack-mounted unit within the depth of the rack rather than flush-mount it with the front of the rack.

Before installing your Cisco NAM 2220 appliance in a rack, review the following guidelines:

- Two or more people are required to install the appliance in a rack.
- Ensure that the room air temperature is below 95°F (35°C).
- Do not block any air vents; usually 6 inches (15 cm) of space provides proper airflow.

- Plan the appliance installation starting from the bottom of the rack.
- Do not extend more than one appliance out of the rack at the same time.
- Connect the appliance to a properly grounded outlet.
- Do not overload the power outlet when installing multiple devices in the rack.
- Do not place any object weighing more than 110 lb (50 kg) on top of rack-mounted devices.

Site Environment

The location of your appliance and the layout of your equipment rack or wiring room are important considerations for proper operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause malfunctions and shutdowns, and can make maintenance difficult. Plan for access to front and rear panels of the appliance.

The following precautions will help you plan an acceptable operating environment for your appliance and will help you avoid environmentally caused equipment failures:

- Ensure that the room where your appliance operates has adequate circulation. Electrical equipment generates heat. Without adequate circulation, ambient air temperature might not cool equipment to acceptable operating temperatures (see the [“Airflow Guidelines”](#) section on page 2-8).
- Ensure the site of the rack includes provisions for source AC power, grounding, and network cables.
- Allow sufficient space to work around the rack during the installation. You need:
 - At least 3 feet (9.14 m) adjacent to the rack to move, align, and insert the appliance.
 - At least 24 inches (61 cm) of clearance in front of and behind the appliance for maintenance after installation.
- To mount the appliance between two posts or rails, the usable aperture (the width between the *inner* edges of the two mounting flanges) must be at least 17.7 inches (45.0 cm).
- Use appropriate strain-relief methods to protect cables and equipment connections.
- To avoid noise interference in network interface cables, do not route them directly across or along power cables.
- Always follow ESD-prevention procedures as described in the [“Preventing Electrostatic Discharge Damage”](#) section on page 2-5 to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.

Airflow Guidelines



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

To ensure adequate airflow through the equipment rack, it is recommended that you maintain a clearance of at least 6 inches (15.24 cm) at the front and the rear of the rack.

If airflow through the equipment rack and the appliances that occupy it is blocked or restricted, or if the ambient air being drawn into the rack is too warm, an overtemperature condition within the rack and the appliances that occupy it can occur.

The site should also be as dust-free as possible. Dust tends to clog the appliance fans, reducing the flow of cooling air through the equipment rack and the appliances that occupy it. This reduction increases the risk of an overtemperature condition.

Additionally, the following guidelines will help you plan your equipment rack configuration:

- Besides airflow, you must allow clearance around the rack for maintenance.
- When mounting an appliance in an open rack, ensure that the rack frame does not block the front intakes or the rear exhausts.

Temperature and Humidity Guidelines

Table 2-1 on page 2-9 lists the operating and nonoperating environmental site requirements for the Cisco NAM 2220 appliance. The appliance normally operates within the ranges listed; however, if a temperature measurement approaching a minimum or maximum parameter indicates a potential problem. Maintain normal operation by anticipating and correcting environmental anomalies before they approach critical values by properly planning and preparing your site before you install the appliance.



Warning

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 95°F (35°C). Statement 1047

Table 2-1 *Operating and Nonoperating Environmental Specifications*

Specification	Minimum	Maximum
Temperature, ambient operating	50°F (10°C)	95°F (35°C)
Temperature, ambient nonoperating and storage	-40°F (-40°C)	158°F (70°C)
Humidity, ambient (noncondensing) operating	5%	85%
Humidity, ambient (noncondensing) nonoperating and storage	50%	90%
Vibration, operating	5–500 Hz, 2.20 g RMS random	—

Power Considerations

You can configure your Cisco NAM 2220 appliance with either 110-V or 220-V AC-input. (For power supply pinout descriptions, see the “AC Power Supplies” section on page 1-11.) Power supplies are hot-swappable. You can also configure your appliance for redundancy with an option second power supply.



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

When the appliance is configured with two power supply modules, the hot-swap feature allows you to replace a failed power supply without interrupting the appliance operation. During this hot-swap replacement, a maximum of two minutes is recommended.

**Caution**

If only one power supply is installed, it must be in the right-hand slot and a power supply blank filler panel must be installed in the left-hand slot to ensure proper cooling. (See location 10 in [Figure 3-8, Cisco NAM 2220 Appliance Back Panel](#).)

AC Power Supply Safety Considerations

Ensure all power connections conform to the rules and regulations in the National Electrical Codes (NECs), as well as local codes. Follow these precautions and recommendations when planning power connections to your appliance:

- Check the power at your site before installation and periodically after installation to ensure that you are receiving clean power (free of spikes and noise). Install a power conditioner if necessary.
- The AC power supply includes the following features:
 - Autoselects either 110-V or 220-V operation.
 - All appliances include an electrical cord. (A label near the power cord indicates the correct voltage, frequency, current draw, and power dissipation for the appliance.)

**Warning**

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

- Install proper grounding to your appliance and host equipment rack to avoid damage from lightning and power surges.

**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 appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

- The AC-input power supply operates on input voltage and frequency within the ranges of 100 to 240 VRMS and 50/60 Hz without the need for operator adjustments.

Method of Procedure

As described previously, part of your preparation includes reviewing installation plans or Method of Procedures (MOPs). An example of a MOP (a preinstallation checklist of tasks and considerations that need to be addressed and agreed upon before proceeding with the installation) is as follows:

1. Assign personnel.
2. Determine protection requirements for personnel, equipment, and tools.
3. Evaluate potential hazards that might affect service.
4. Schedule time for installation.
5. Determine any space requirements.
6. Determine any power requirements.
7. Identify any required procedures or tests.
8. On an equipment plan, make a preliminary decision that locates each Cisco NAM 2220 appliance that you plan to install.

9. Read this hardware installation guide.
10. Verify the list of replaceable parts for installation (screws, bolts, washers, and so on) so that the parts are identified.
11. Check the required tools list to make sure the necessary tools and test equipment are available. (See the “Required Tools and Equipment” section on page 2-14.)
12. Perform the installation.

Unpacking and Checking the Contents of Your Shipment

The shipping package for the Cisco NAM 2220 appliance is designed to reduce the possibility of product damage associated with routine material handling experienced during shipment. To reduce the potential damage to the product, transport the appliance in its original Cisco packaging. Failure to do so might result in damage to the appliance. Also, do not remove the appliance from its shipping container until you are ready to install it.

The appliance, cables, and any optional equipment you ordered might be shipped in more than one container. When you unpack the containers, check the items against a packing list to ensure that you received all the parts. Table 2-2 lists items that will ship with your appliance and some optional parts. A *Notes* section has been provided to record damaged or missing items.



Note

Do not discard the packaging materials used in shipping your Cisco NAM 2220 appliance. You will need the packaging materials in the future if you move or ship your appliance.

Table 2-2 Cisco NAM 2220 Appliance Packing List

✓	Item	Cisco Part Number
<input type="checkbox"/>	Cisco NAM 2220 Appliance	NAM2220 NAM2220-HDD-6X146G NAM2220-DIMM-16GB
<input type="checkbox"/>	Cisco NAM Software with Recovery CD	NAM-APPL-SW-5.1
<input type="checkbox"/>	Power cables, one of the following:	<ul style="list-style-type: none"> • CAB-AC (default) • CAB-ACA • CAB-ACE • CAB-ACI • CAB-ACR • CAB-ACS • CAB-ACU • CAB-JPN
<input type="checkbox"/>	Cable assembly, RJ45 Rolled, Modular, Console/Config, Lt.	72-1259-01
<input type="checkbox"/>	Cable assembly, Ethernet, RJ45-RJ45, Yellow, 6 ft	72-1482-01

Table 2-2 Cisco NAM 2220 Appliance Packing List (continued)

✓	Item	Cisco Part Number
<input type="checkbox"/>	Cable assembly, Crossover, RJ45-RJ45, Org, 6 ft	72-3515-01
<input type="checkbox"/>	Cisco 90-Day Limited Hardware Warranty Terms	83-1294-01
<input type="checkbox"/>	<i>Software Right-to-Use License</i>	90-0031-01
<input type="checkbox"/>	4-post Server Rack-mount kit (For kit contents, see the “4-Post Rack-Mount Hardware Kit” section on page 3-5.)	NAM2220-RAILS
<input type="checkbox"/>	<i>Quick Start and Documentation Guide for the Cisco NAM 2200 Series Appliance</i>	78-18440-01
<input type="checkbox"/>	<i>Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliance</i>	78-18787-01

Notes**Table 2-3 Cisco NAM 2220 Appliance Options and Spares**

✓	Item	Cisco Part Number
<input type="checkbox"/>	10 GB Short Range XFP Transceiver Module ¹ (up to two plus spares)	XFP-10GBASE-SR
<input type="checkbox"/>	10 GB Long Range XFP Transceiver Module ¹ (up to two plus spares)	XFP-10GBASE-LR
<input type="checkbox"/>	Optional redundant power supply	NAM2220-AC-PS
<input type="checkbox"/>	4-post Server Rack-mount kit (For kit contents, see the “4-Post Rack-Mount Hardware Kit” section on page 3-5.)	NAM2220-RAILS

Notes

1. To use the appliance, you must have at least one of the XFP transceiver modules listed (or equivalent).

Inspect all items for shipping damage. If anything appears to be damaged, or if you encounter problems installing or configuring your appliance, contact your customer service representative.

Cisco Information Packet and Warranty

The *Cisco Information Packet* provides warranty, service, and support information.

To access and download the *Cisco Information Packet* and your warranty and license agreements from Cisco.com:

-
- Step 1** Launch your Internet browser, then go to this URL:
http://www.cisco.com/univercd/cc/td/doc/es_inpk/cetrans.htm
The Warranties and License Agreements page appears.
- Step 2** To read the *Cisco Information Packet*:
- Click the **Information Packet Number** field, and make sure the part number 78-5235-03D0 is highlighted.
 - Select the language in which you would like to read the document.
 - Click **Go**.
The Cisco Limited Warranty and software License page from the Information Packet appears.
 - Read the document online, or click the **PDF** icon to download and print the document.



Note You must have Adobe Acrobat Reader to view and print PDF files. You can download the reader from the Adobe website at: <http://www.adobe.com>

- Step 3** To read translated and localized warranty information about your product:
- Enter this part number in the Warranty Document Number field:
78-5236-01C0
 - Select the language in which you would like to read the document.
 - Click **Go**.
The Cisco warranty page appears.
 - Review the document online, or click the **PDF** icon to download and print the document in PDF.
- Step 4** You can also contact the Cisco Service and Support website for assistance at:
<http://www.cisco.com/en/US/support/>
-

Duration of Hardware Warranty

Ninety (90) days.

Replacement, Repair, or Refund Policy for Hardware

Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of the Return Materials Authorization (RMA) request. Actual delivery times can vary depending on the customer location.

Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

To Receive a Return Materials Authorization (RMA) Number

Contact the company from whom you purchased the product. If you purchased the product directly from Cisco, contact your Cisco Sales and Service Representative.

Complete the information below, and keep it for reference:

Company product purchased from	
Company telephone number and website	
Product model number	
Product serial number ¹	
Maintenance contact number	

1. See the “[Product Serial Number Location](#)” section on page 1-4 and the [Product Serial Number Location](#), page C-7 for more information.

Required Tools and Equipment

**Caution**

The fastener pack, within the rack-mount kit, contains eight rack screws. You must check these screws to ensure that they are the appropriate size for the holes in your rack. Using the wrong-sized screws for your threaded rack holes can damage the rack.

You need the following tools and equipment to install the Cisco NAM 2220 appliance in a 2- or 4-post rack:

**Warning**

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

- ESD-preventive cord and wrist strap.
- Number 2 Phillips screwdriver.
- Flat-blade screwdrivers: small, 3/16-inch (0.476 cm) and medium, 1/4-inch (0.625 cm).
 - To remove the cover, if you are upgrading memory or other components
- Rack-Mount Kit (For kit contents, see the “[4-Post Rack-Mount Hardware Kit](#)” section on page 3-5 or the “[2-Post Rack-Mount Hardware Kit](#)” section on page 4-21.)
- Cables for connection to the LAN ports (depending on the configuration).
- Ethernet hub or PC with a network interface card for connection to the Ethernet (LAN) port or ports.
- Console terminal (an ASCII terminal or a PC running terminal-emulation software) that is configured for 9600 baud, 8 data bits, no parity, 1 stop bit, and no hardware flow control.
- Console cable for connection to the serial (console) port.

Installation Checklist

To assist you with your installation and to provide a historical record of what was done, and by whom, use the following Installation Checklist. Make a copy of this checklist and mark the entries as you complete each task. When the checklist is completed, include a copy of the checklist for each Cisco NAM 2220 appliance in your Site Log (see the “[Creating a Site Log](#)” section on page 2-15 for information about creating a Site Log) along with other records for your new appliance.

Installation Checklist for Site:

Cisco NAM 2220 Appliance Name:

Task	Verified by	Date
Installation Checklist copied		
Background information placed in Site Log		
Site power voltages verified		
Installation site power check completed		
Required tools available		
Additional equipment available		
Cisco NAM 2220 appliance received		
<i>Cisco Information Packet</i> publication received		
Appliance components verified		
Initial electrical connections established		
ASCII terminal (for local configuration)		
Signal distance limits verified		
Startup sequence steps completed		
Initial operation verified		

Creating a Site Log

The Site Log (see [Appendix D, “Site Log,”](#) for a sample Site Log) provides a record of all actions related to installing and maintaining the Cisco NAM 2220 appliance. Keep the log in an accessible place near the appliance so that anyone who performs tasks has access to it. Use the Installation Checklist (see the previous section, “[Installation Checklist](#)”) to verify the steps in the installation and maintenance of your appliance. Site Log entries might include the following:

- Installation progress—Make a copy of the appliance Installation Checklist, and insert it into the Site Log. Make entries as you complete each task.
- Upgrade, removal, and maintenance procedures—Use the Site Log as a record of ongoing appliance maintenance and expansion history. Each time a task is performed on the appliance, update the Site Log to reflect the following information:
 - Installation of new adapter cards
 - Removal or replacement of adapter cards and other upgrades
 - Configuration changes
 - Maintenance schedules and requirements

- Maintenance procedures performed
- Intermittent problems
- Comments and notes

Management and Console Port Considerations

The management port, the (NIC 1) network interface connector on the rear panel of the Cisco NAM 2220 appliance uses an unshielded twisted-pair (UTP) cable. We recommend at least a Category 5E or 6 UTP cable. The maximum segment distance is 328 feet (100 meters). The UTP cables look like the cables used for ordinary telephones; however, UTP cables meet certain electrical standards that telephone cables do not. (See the [“Management Port \(NIC 1\)”](#) section on page 1-8 for UTP cabling specifications.)

The appliance includes an asynchronous serial console port, which provides access to the appliance locally (using a console terminal). The following sections describe important cabling information to consider before connecting a console terminal—either an ASCII terminal or a PC running terminal-emulation software—to the console port. (See the [“Serial \(Console\) Port”](#) section on page 1-9 for serial (console) cabling specifications.)

NIC 1 (RJ-45) Ethernet Connections

The NIC 1 management port connection supports 10BASE-T, 100BASE-TX, and 1000BASE-T standards. The transmission speed of the Ethernet ports is autosensing by default and is user configurable. See location #3 in [Figure 1-4, Cisco NAM 2220 Appliance Rear View](#). [Figure 1-6 on page 1-9](#) shows the pin orientation of the RJ-45 Ethernet port and the modular cable plug it accepts.

Serial (Console) Port Connections

The console port on the Cisco NAM 2220 appliance includes an EIA/TIA-232 asynchronous serial (RJ-45) connector. This serial console connector (port) allows you the capability to access the appliance locally by connecting a terminal—either a PC running terminal-emulation software or an ASCII terminal—to the console port.

To connect a PC running terminal-emulation software to the console port, use an RJ-45-to-RJ-45 rollover cable and an RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL). (For more information, see the [“Serial \(Console\) Port”](#) section on page 1-9.)

The default parameters for the console port are 9600 baud, 8 data bits, no parity, 1 stop bit, and no hardware flow control.



CHAPTER 3

Installing the Cisco NAM 2220 Appliance

This chapter provides the information you need to install your Cisco NAM 2220 appliance, including how to install hardware options, how to mount the appliance in a rack, cabling, and how to connect it to the network.

This chapter contains the following sections:

- [Installation Overview, page 3-2](#)
- [Installing the XFP Transceiver Module, page 3-3](#)
- [Rack-Mounting Configuration Guidelines, page 3-3](#)
- [Mounting the Cisco NAM 2220 Appliance in a 4-Post Rack, page 3-4](#)
- [Cisco NAM 2220 Appliance Power, page 3-9](#)
- [Connecting Appliance Cables, page 3-11](#)
 - [Connecting the Management Port, page 3-12](#)
 - [Connecting a Console Terminal, page 3-12](#)
 - [Connecting the Monitoring Ports, page 3-13](#)
- [Powering Up the Cisco NAM 2220 Appliance, page 3-16](#)
- [Removing or Replacing the Cisco NAM 2220 Appliance, page 3-18](#)

Before you begin the installation, read the *Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliance* document and the *Site Preparation and Safety Guide* that shipped with your appliance.

http://www.cisco.com/en/US/products/ps10113/prod_installation_guides_list.html


Warning

Read the installation instructions before you connect the system to its power source. Statement 10


Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment. This equipment contains an energy hazard. Disconnect the system before servicing. Statement 186


Warning

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

**Warning**

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

Statement 1

**Warning**

To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit. Statement 1032

**Warning**

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

**Warning**

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

Installation Overview

This section provides a step-by-step procedure to help guide you through the installation of the Cisco NAM 2220 appliance.

Step 1 Open box in which the Cisco NAM 2220 appliance was shipped, and inspect each of the components for possible damage that might have occurred during shipping. Ensure that you have all required components.

Step 2 Review all safety information.

You can find safety information in this document at the following locations:

- [Safety Warnings](#), in "About This Guide"
- [Safety Guidelines](#), in Chapter 3, "Installing the Cisco NAM 2220 Appliance"

You can also find safety information in The *Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliances* (78-18308-01) which shipped with your Cisco NAM 2220 appliance and is available online at the following URL:

http://www.cisco.com/en/US/products/ps10113/prod_installation_guides_list.html

- Step 3** Install the Cisco NAM 2220 appliance in a rack.
See [Rack-Mounting Configuration Guidelines, page 3-3](#) and [Mounting the Cisco NAM 2220 Appliance in a 4-Post Rack, page 3-4](#) for more information.
- Step 4** Install the XFP transceiver modules.
See [Installing the XFP Transceiver Module, page 3-3](#).
- Step 5** Connect the Cisco NAM 2220 appliance to a power source.
See [Cisco NAM 2220 Appliance Power, page 3-9](#).
- Step 6** Connect the Cisco NAM 2220 appliance network interface.
See [Connecting the Management Port, page 3-12](#)
- Step 7** Connect the Cisco NAM 2220 appliance console cable.
See [Connecting a Console Terminal, page 3-12](#)
- Step 8** Connect the Cisco NAM 2220 appliance to a remote device to monitor.
See [Connecting Appliance Cables, page 3-11](#)
- Step 9** Turn on power.
See [Powering Up the Cisco NAM 2220 Appliance, page 3-16](#)
-

This completes the hardware installation of the Cisco NAM 2220 appliance. After completing the hardware installation, configure the appliance. See [Chapter 5, “Configuring the Cisco NAM 2220 Appliance.”](#)

Installing the XFP Transceiver Module

The Cisco NAM 2220 appliance uses one or two 10 GB Ethernet XFP transceiver modules to connect fiber optical cables as data input sources. The XFPs can both be long range or both be short range, or you can install one of each. Depending on the type of XFP you use, you must use the correct fiber optical cables.

You can order XFPs as hardware options or you can use XFPs you might already own as long as they meet the specifications described in [XFP Modules, page B-1](#).

Because XFPs are delicate devices, they are packaged separately and are not installed in the appliance prior to shipping. See [Installing and Replacing XFP Transceiver Modules, page 4-3](#), for more information about XFPs and installation information in [Installing an XFP](#).

Rack-Mounting Configuration Guidelines

You can mid-mount the appliance in a 19-inch (48.3-cm) equipment rack that conforms to the 2- and 4-post rack specification (the inside width of the rack should be 17.5 inches [44.45 cm]). When installed in the rack, the appliance requires two EIA 3.5-inch (8.9-cm) vertical mounting spaces or 2 rack units (RU) for mounting. (See [“Mounting the Cisco NAM 2220 Appliance in a 4-Post Rack” section on page 3-4.](#))

**Caution**

Clearance in the front and rear of the Cisco NAM 2220 appliance must be allowed for cooling air to be drawn in through the front and circulated through the appliance and out the rear of the appliance.

The “[Rack Installation Safety Guidelines](#)” section on page 2-7 and the following information will help you plan your equipment rack configuration:

- When mounting the appliance to an equipment rack, ensure that the rack is bolted to the floor.
- Because you will probably be installing more than one appliance into the rack, ensure that the weight of all the appliances installed does not make the rack unstable.

**Caution**

Some equipment racks are also secured to ceiling brackets, if necessary, due to the weight of the equipment in the rack. Make sure that the rack you are using to install the appliances is secured to the building structure.

- As mentioned in the “[Airflow Guidelines](#)” section on page 2-8, maintain a 6-inch (15.2-cm) clearance at the front and rear of the appliance to ensure adequate air intake and exhaust.
- Avoid installing the appliances in an overly congested rack. Air flowing to or from other appliances in the rack might interfere with the normal flow of cooling air through the appliances, increasing the potential for overtemperature conditions within the appliances. (See the “[Overtemperature Protection \(OTP\)](#)” section on page 1-12 for more information about overtemperature conditions.)
- Allow at least 24 inches (61 cm) of clearance at the front and rear of the rack for appliance maintenance.

**Caution**

To prevent appliance overheating, never install the appliance in an enclosed rack or room that is not properly ventilated or air conditioned.

- Follow your local practices for cable management. Ensure that cables to and from the appliances do not impede access to perform equipment maintenance or upgrades.

Mounting the Cisco NAM 2220 Appliance in a 4-Post Rack

**Warning**

When the appliance is installed in a rack and is fully extended on its slide rail, it is possible for the rack to become unstable and tip over, which could cause serious injury. To eliminate the risk of rack instability from extending the rail or in the event of an earthquake, you should affix the rack to the floor.

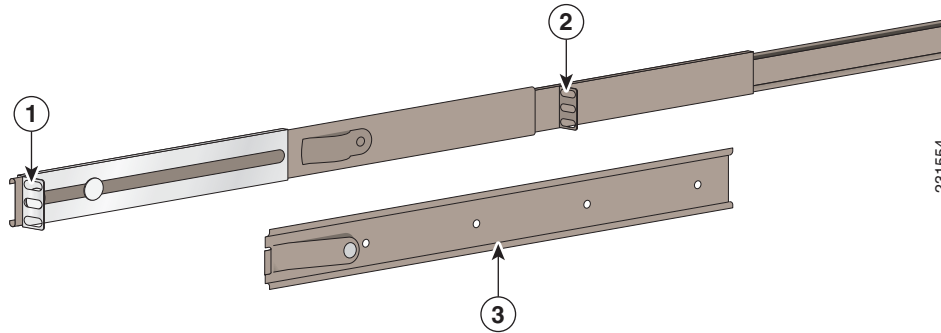
This section contains the following topics:

- [4-Post Rack-Mount Hardware Kit, page 3-5](#)
- [Attaching the Inner Slide Rails and Rack-Mounting Ears to the Appliance, page 3-6](#)
- [Attaching the Outer Slide Rails to the Rack, page 3-7](#)
- [Installing the Appliance into the Rack, page 3-7](#)

4-Post Rack-Mount Hardware Kit

Figure 3-1 shows the rails and brackets that you need to install the Cisco NAM 2220 appliance in a 4-post rack. Figure 3-2 and Table 3-1 on page 3-5 describes the contents of the rack-mount hardware kit, Cisco part number NAM2220-RAILS.

Figure 3-1 4-Post Rails and Brackets



1	Rear-mounting bracket of outer slide rail	3	Inner slide rail
2	Front-mounting bracket of outer slide rail		

Figure 3-2 4-Post Rack-Mount Hardware Kit

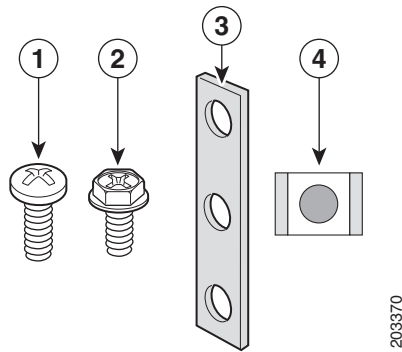


Table 3-1 4-Post Rack-Mount Hardware Kit

Item No.	Description	Quantity
1	Rack screw, 10-32 x 1/2-inch (1.27 cm)	12
2	Screw, 8-32 x 3/8-inch (.95 cm)	8
3	Nut bar ¹	4
4	Cage nut, 10-32 x 3/8-inch (.95 cm) ²	12
—	Screw, 6-32 x 1/4-inch (.63 cm) ³	8

1. Nut bar used in unthreaded round-hole racks or used over the cage nuts for square-hole racks.
2. Cage nuts are used only when mounting in square-hole racks.

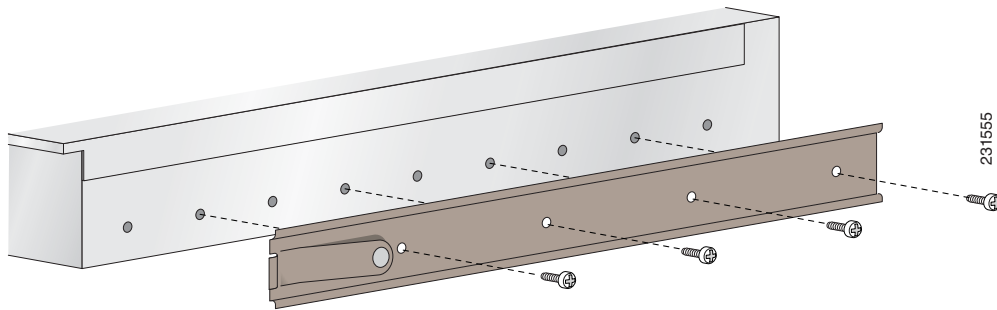
3. Not shown in [Figure 3-2](#). Depending on rack type, can be used in place of 8-32 x 3/8-inch screws.

Attaching the Inner Slide Rails and Rack-Mounting Ears to the Appliance

To install the Cisco NAM 2220 appliance into the slide rails:

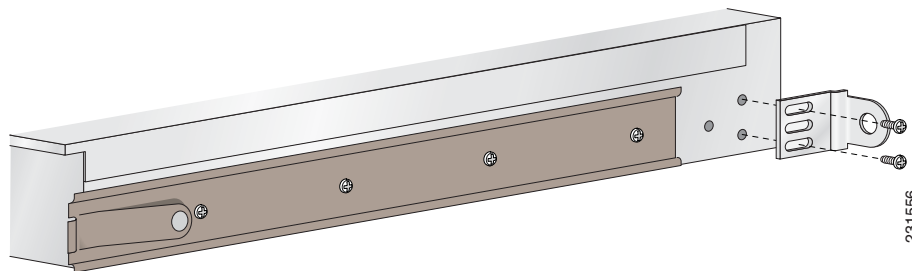
- Step 1** Align the inner slide rail holes with the horizontal holes on the side of the appliance beginning with the second hole. The release spring on the inner slide rail must point toward the rear of the appliance and face away from the appliance chassis. (See [Figure 3-3](#).)

Figure 3-3 *Aligning the Inner Slide Rail with the Mounting Studs*



- Step 2** Attach the inner slide rail to the appliance with the 8-32 x 3/8-inch screws.
- Step 3** Attach the rack-mounting ear bracket to the two vertical holes located on the front of the appliance with 8-32 x 3/8-inch screws. (See [Figure 3-4](#).)

Figure 3-4 *Attaching the Rack-Mounting Ear Bracket to the Appliance*



Caution

Failure to attach the mounting ear bracket to the appliance chassis could result in the appliance being pushed toward the rear of the rack during installation.

- Step 4** Repeat Steps 1 through 3 for the other inner slide rail and mounting ear bracket.
You are now ready to install the appliance into the 4-post rack.

Proceed to the next section, “[Attaching the Outer Slide Rails to the Rack](#),” to continue the installation.

Attaching the Outer Slide Rails to the Rack

**Caution**

Lifting the appliance and attaching it to the rack is a two-person job. If needed, use an appropriate lifting device. A fully loaded Cisco NAM 2220 appliance weighs approximately 51.5 lb (23.4 kg).

**Note**

This procedure describes the installation of the outer slide rails to a 4-post threaded-hole rack. If your 4-post rack uses rectangular holes, ensure that you have the proper adapters in place to secure the slide rails to the posts.

To attach the outer slide rails to the rack:

-
- Step 1** Determine the position on the rack where you want to mount the appliance.
 - Step 2** Position the rear-mounting bracket on the outer side of the rear rack post and attach with the 10-32 x 1/2-inch rack screws.
 - Step 3** Align the center end of the outer slide rail to the corresponding hole on the front rack post.
 - Step 4** Attach the front-mounting bracket of the outer slide rail to the corresponding holes on the front rack post with the 10-32 x 1/2-inch rack screws.
 - Step 5** Repeat Steps 2 through 4 for the other outer slide rail.
-

Proceed to the next section, “[Installing the Appliance into the Rack](#),” to continue the installation.

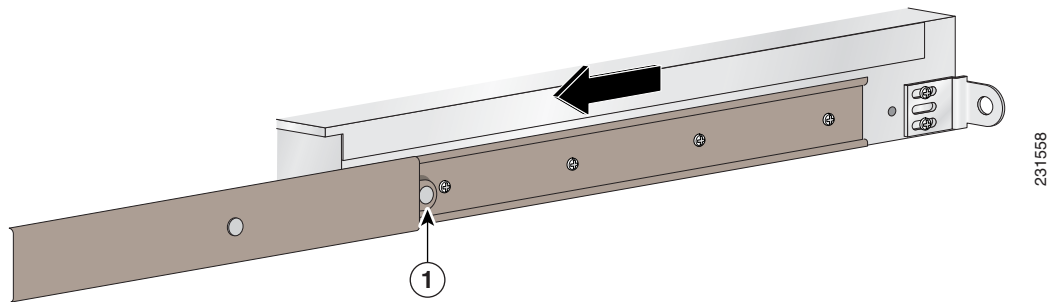
Installing the Appliance into the Rack

**Caution**

If you mount the outer slide rails in holes that are not vertically aligned from front to back, you might damage the slide rails and your mounting might not be secure.

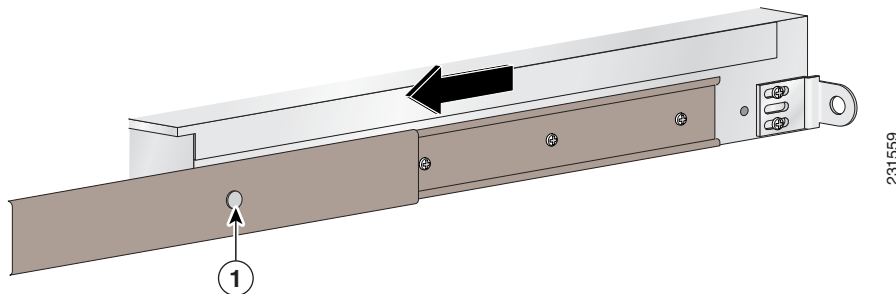
To install the appliance into the rack:

-
- Step 1** Extend the inner slide rail until it locks into place.
 - Step 2** Position the appliance so that the rear end of the inner slide rail aligns with the front end of the outer slide rails.
 - Step 3** Slide the appliance into the rack.
You might need to press on the release spring. (See location 1 in [Figure 3-5](#).)

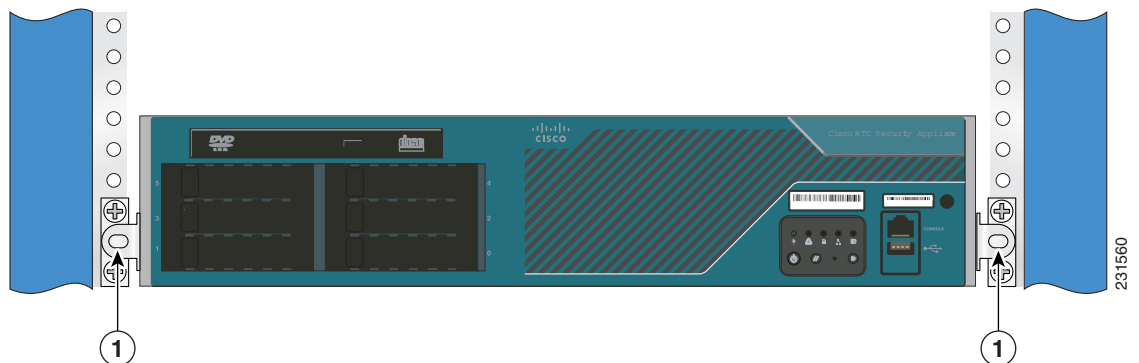
Figure 3-5 *Installing Appliance into Rack*

1	Release spring
----------	----------------

- Step 4** Slide the appliance until the release spring clicks into place, then push the appliance until the rack-mounting ear meets the front rack posts. (See location 1 in [Figure 3-6](#) on page 3-8.)

Figure 3-6 *Sliding Appliance into Rack*

- Step 5** (Optional) For extra security, you can attach a third 10-32 x 1/2-inch rack screw from the center of the rack-mounting ear into the front rack post. (See location 1 in [Figure 3-7](#).)

Figure 3-7 *Securing the Appliance to the Front Rack Posts*

1	Rack screw (10-32 x 1/2 inch)
---	-------------------------------

Proceed to the next section, “[Cisco NAM 2220 Appliance Power](#),” to continue the installation.

Cisco NAM 2220 Appliance Power

The Cisco NAM 2220 appliance uses an AC power supply.



Caution

To ensure proper cooling if only one power supply is installed, the power supply must be in the right-hand slot and the power supply blank filler panel must be in the left-hand slot. (See [Figure 4-22 on page 4-20](#).)



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

This product relies on the building’s installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 10 Amps Statement 1005



Warning

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



Warning

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



Warning

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

Connecting the Appliance AC Power

When installing the appliance, use the AC power cord that was shipped with the Cisco NAM 2220 appliance.

The AC power cord is considered the primary disconnect for the appliance and must be readily accessible when installed. If the appliance power cord is not readily accessible to be disconnected, you must install an AC power disconnect for the entire rack. This disconnect must be readily accessible, and it must be properly labeled as the controlling power to the entire rack, not just to the appliance.

Power Connections

To connect the AC power cord to the Cisco NAM 2220 appliance:



Caution

If only one power supply is installed, it must be in the right-hand slot and a power supply blank filler panel must be installed in the left-hand slot to ensure proper cooling. (See location 10 in [Figure 3-8 on page 3-11](#).)

Step 1

Review the information in the [Safety Warnings](#) and the [Safety Guidelines](#) sections.



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

Step 2

Plug the AC power cord into the AC power input connector at the rear of the appliance. (See location 11 in [Figure 3-8](#).)

Step 3

Connect the other end of the power cord to a power source at your site.

Step 4

If you are installing a second redundant AC power supply, repeat Steps 1 and 3 for the second power supply.

Step 5

After confirming that all installation steps are complete, continue with the installation of the network and console cables. (See [“Connecting Appliance Cables” section on page 3-11](#).)



Caution

Do not power on the unit, yet.

Proceed to the next section, [“Grounding the Rack,”](#) to continue the installation.

Grounding the Rack

To avoid the potential for an electrical shock, you must include a third wire safety ground conductor with the rack installation. If the appliance power cord is plugged into an AC outlet that is part of the rack, then you must provide proper grounding for the rack itself. If the appliance power cord is plugged into a wall outlet, the safety ground conductor in the power cord provides proper grounding only for the appliance. You must provide additional, proper grounding for the rack.

Connecting Appliance Cables

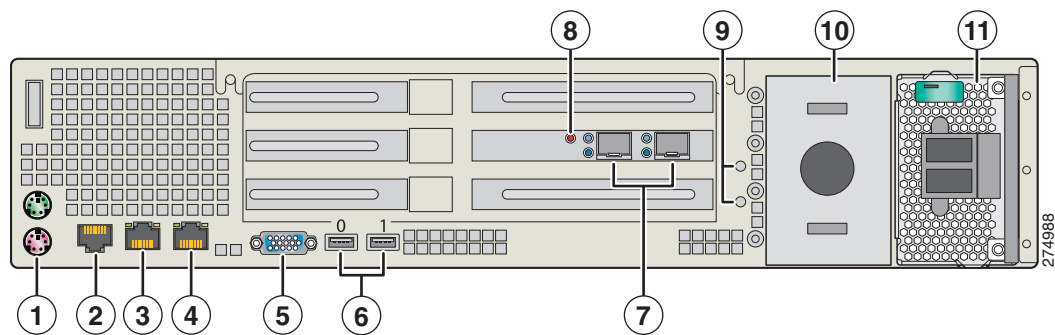
This section describes how to connect cables to your Cisco NAM 2220 appliance for connections to a management port, a console terminal, and the monitoring ports. This section also provides suggestions about how to maintain the cabling for appearance and reliability.

This section includes the following topics:

- [Connecting the Management Port, page 3-12](#)
- [Connecting a Console Terminal, page 3-12](#)
- [Connecting the Monitoring Ports, page 3-13](#)
- [Cable Management, page 3-15](#)

Figure 3-8 shows the locations of the Cisco NAM 2220 appliance back panel connectors.

Figure 3-8 Cisco NAM 2220 Appliance Back Panel



1	PS/2 connectors for keyboard and mouse (Used only for maintenance.)	7	Monitor port XFP transceiver slots <ul style="list-style-type: none"> • Slot on right provides input to logical DataPort 1 • Slot on left provides input to logical DataPort 2.
2	RJ-45 serial (console) port	8	GPS time sync signal connector
3	NAM Management port; NIC 1 (10/100/1000 Mb/s)	9	Ground studs
4	Non-functional NIC port Note This port is covered with a plastic connector.	10	Power supply 2 location (optional redundant power supply) If a second power supply is not used, a baffle covers this space (as shown).
5	Video (VGA) connector (Used only for maintenance.)	11	Power supply 1 (AC shown)
6	Unused USB ports (0 and 1)		

Connecting the Management Port



Warning

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

Statement 1001

The Cisco NAM 2220 appliance management port is the NIC 1 port, shown in location #3 in [Figure 3-8](#), an RJ-45 10BASE-T/100BASE-TX/1000BASE-T network interface connector.

To connect the Cisco NAM 2220 appliance management port, connect one end of a Cat5E UTP cable to the NIC 1 port on the appliance. Connect the other end of the cable to a hub or switch (a gateway) in your network.

The NIC 1 port supports standard straight-through Category 5E unshielded twisted-pair (UTP) cables. Your appliance shipped with one Category 5E UTP cable (yellow). If more UTP cables are needed, these cables are available commercially. (See [Table 1-5 on page 1-9](#) for information about Category 3, 4, 5, 5E, and 6 cables.)

Connecting a Console Terminal



Warning

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

Statement 1001

The Cisco NAM 2220 appliance console port is shown in location #2 on [Figure 3-8](#), an RJ-45 serial (console) connector. You can connect a console terminal using a PC running terminal-emulation software to the console port on the Cisco NAM 2220 appliance in either of two ways:

- Connect the terminal using a rollover cable to the appliance console port.
The rollover cable is provided in the cables shipped with your appliance. For cable pinouts, see the [“Serial \(Console\) Port Connector” section on page 1-10](#).
- Connect a terminal server to the appliance console port.

Configure your terminal or terminal-emulation software as shown in [Table 3-2](#).

Table 3-2 Terminal Configuration

Baud rate	9600
Data bits	8
Parity	No
Stop bit	1
Hardware flow control	Off

Connecting the Monitoring Ports

The Cisco NAM 2220 appliance monitoring ports are shown in location #7 on [Figure 3-8, Cisco NAM 2220 Appliance Back Panel](#). Each monitoring port supports a 10 GB long range (LR) or short range (SR) XFP transceiver module.

You can connect the Cisco NAM 2220 appliance directly to a device to monitor, such as a switch or router, or you can connect the appliance between two devices using an optical tap device.

Direct Connection

You connect the Cisco NAM 2220 appliance directly to a switch or router by running a fiber optical cable from a 10 GB Ethernet port on the remote device to an XFP transceiver module in the back panel of the Cisco NAM 2220 appliance.

**Note**

The Cisco NAM 2220 appliance supports both long range (LR) and short range (SR) 10 GB optical connections. Ensure that the 10 GB port on the switch or router port is the same type as its XFP transceiver module in the appliance.

The XFP slot on the right provides input to logical DataPort 1 and the slot on the left provides input to logical DataPort 2 of the Cisco NAM 2220 appliance.

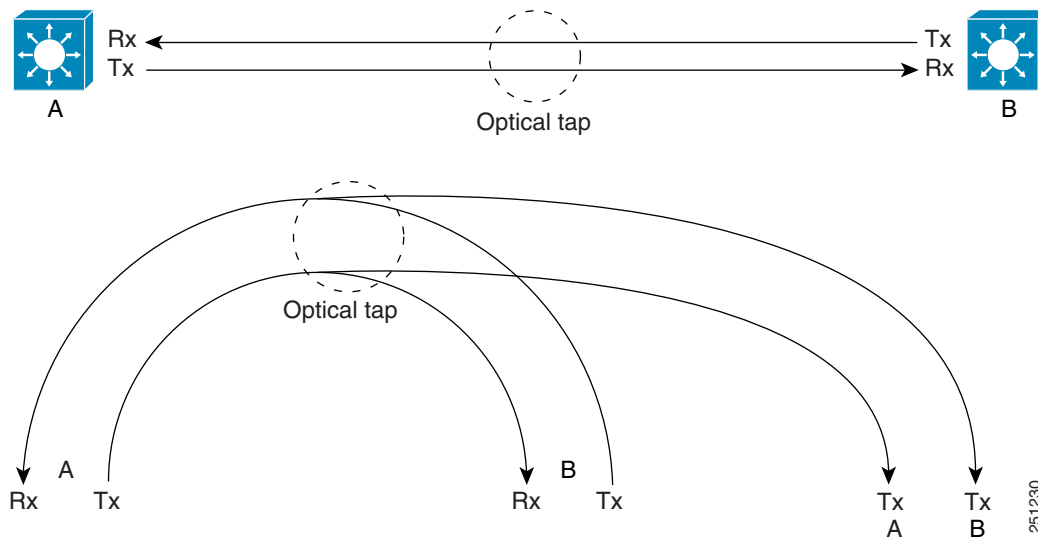
Optical Tap Connection

You can connect the Cisco NAM 2220 appliance between two remote devices using an optical tap device. The optical tap mirrors the transmit sides of the cable that connects two remote devices as shown in [Figure 3-9](#).

**Note**

The optical tap connection requires two additional fiber optical cables.

Figure 3-9 Optical Tap Connection

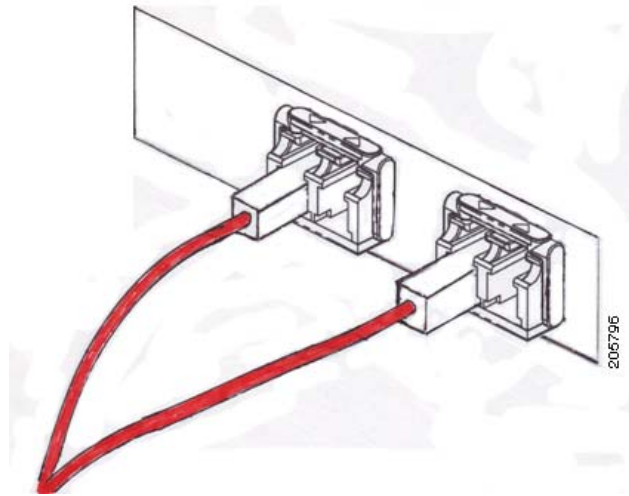
**Note**

You can find optical tap and cable specifications in [Appendix B, “Monitor Port Requirements.”](#)

To use an optical tap to connect the Tx signals of two devices to the Cisco NAM 2220 appliance monitoring ports:

- Step 1** Disconnect the 10 GE fiber optical cable that connects the two devices and plug the disconnected end of the cable into the appropriate ports on the optical tap for Device A.
- Step 2** Plug another 10 GE fiber optical cable into the output port for Device B, then plug the other end into the appropriate ports on the optical tap for Device B.
- Step 3** Run a third 10 GE fiber optical cable from the Tx A/Tx B ports on the optical tap device to the Cisco NAM 2220 appliance.
- Step 4** At the Cisco NAM 2220 appliance, separate the connectors at the end of the 10 GE fiber optical cable. The two connectors of the 10 GE fiber optical cable plug into different XFPs enabling the appliance to monitor all traffic between the two devices. See [Figure 3-9](#) for an illustration of the fiber optical cable inputs to the XFPs for an optical tap configuration.

Figure 3-10 Fiber Optical Cable Inputs for Optical Tap Configuration



- Step 5** Plug Device A's Tx connector into the left side of the XFP on the right (logical DataPort1).
- Step 6** Plug Device B's Tx connector into the left side of the XFP on the left (logical DataPort2).

Cable Management

Cable management is the most visual aspect of your appliance setup. However, cable management is often overlooked because it can be time consuming.

Equipment racks and enclosures house more equipment today than ever before. This growth has increased the need for organized cable management both inside and outside the rack. Poor cable management not only leads to damaged cables or increased time for adding or changing out cables, but also blocks critical airflow or access. These problems can lead to inefficiencies in the performance of your equipment or even downtime.

There are many solutions to address cable management. They can range from simple cable management rings, to cable management brackets, to vertical or horizontal organizers, to troughs and ladders.

All Cisco NAM 2220 appliance cables should be properly dressed so as not to interfere with each other or other pieces of equipment. Use local practices to ensure that the cables attached to your appliance are properly dressed.

Proceed to the next section, "[Powering Up the Cisco NAM 2220 Appliance](#)," to continue the installation.

Powering Up the Cisco NAM 2220 Appliance

**Warning**

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

**Warning**

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

See [Power-Up Procedure, page 3-16](#), for information about how to power up the appliance.

Power-Up Procedure

To power up a Cisco NAM 2220 appliance and verify its initialization and self-test, follow this procedure. When the procedure is finished, the appliance is ready to configure.

-
- Step 1** Review the information in the [“Safety Guidelines” section on page 2-2](#).
 - Step 2** Before proceeding, if the AC power cord is connected directly into the AC power outlet and because the AC power cord provides its own ground conductor, you only need to ensure that the rack has been properly grounded. (See the [“Connecting the Appliance AC Power” section on page 3-10](#) for more information.)
 - Step 3** Plug the AC power cord into the power cord receptacle at the rear of the appliance. (See location 11 in [Figure 3-8](#).)
 - Step 4** Connect the other end of the power cord to a power source at your installation site.
 - Step 5** If there is a second AC power supply, repeat Steps 3 and 4 for the second power supply.
 - Step 6** Press the power button on the front of the appliance. (See location 9 in [Figure 1-3](#), [Cisco NAM 2220 Appliance Front Control Panel](#).)

The appliance should begin its power-up procedure.

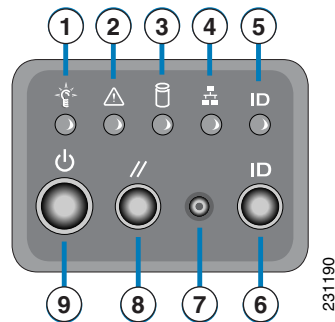
- Step 7** After the operating system boots up, observe the front-panel LEDs to verify that your system is operating properly. (See [Figure 3-11 on page 3-17](#) and the [“Checking the LEDs” section on page 3-17](#).)

After the operating system boots, you are ready to initialize the basic software configuration. (See the software installation guide or user guide that shipped with your appliance for proper configuration procedures.)

Checking the LEDs

When the Cisco NAM 2220 appliance is up and running, observe the front-panel LEDs as shown in [Figure 3-11](#).

Figure 3-11 Cisco NAM 2220 Appliance Front Control Panel



1	Appliance power LED	6	ID control switch (push button)
2	Appliance status LED	7	Unused non-maskable interrupt
3	Hard disk drive activity LED	8	Reset push button
4	NIC activity (all NICs)	9	Appliance power push button
5	Appliance system ID LED		

The following LEDs provide power, activity, and status information:

Cisco NAM 2220 Appliance Front-Panel LEDs

- Appliance power, green:
 - On when power is on.
 - Off when power is off or an error condition has been detected in the operating voltages.
- Hard disk activity, green:
 - On when appliance software has booted up, and the appliance is operational.
 - Off when appliance has not yet booted, or an error condition has been detected in the boot process.
- NIC 1 green:
 - On when packets are transferring
 - Off when no packets are transferring

For more detailed information about the LEDs, see [Appendix C, “Troubleshooting.”](#)

Removing or Replacing the Cisco NAM 2220 Appliance

Always use the NAM CLI command **shutdown** to shut down the NAM application when you turn power off.

**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 remove a Cisco NAM 2220 appliance from your network, power it down, disconnect the power cords and network cables, and physically remove the appliance from the rack.

The appliance is in constant communication on your network; thus, when the network notices that the appliance is no longer responding to it, the network stops sending requests to the appliance. This change is transparent to users. If other appliances are attached to the network, the network continues sending requests to the other appliances.

To replace an appliance, remove it from the network. Then, install a new appliance and configure it using the same configuration parameters that you used for the removed appliance.



CHAPTER 4

Installing and Replacing Hardware Options

This chapter provides instructions for installing and replacing the hardware components and field replaceable units (FRUs) in your Cisco NAM 2220 appliance.

These instructions are intended for technicians who are experienced with installing, replacing, and removing the hardware components from electronic devices and are familiar with the Cisco NAM 2220 appliance. Additionally, site planners, network administrators, and facility maintenance personnel might also find this chapter helpful.

This chapter contains the following sections:

- [Before You Begin, page 4-2](#)
- [Field Replaceable Units, page 4-2](#)
- [Installing and Replacing XFP Transceiver Modules, page 4-3](#)
 - [Installing an XFP, page 4-4](#)
 - [Replacing an XFP, page 4-5](#)
- [Removing and Replacing a Hard Disk Drive, page 4-6](#)
 - [Hard Disk Configurations, page 4-6](#)
 - [Replacing a Hard Disk Drive, page 4-7](#)
- [Installing or Replacing a Power Supply, page 4-17](#)
 - [Replacing a Redundant Power Supply, page 4-18](#)
 - [Replacing a Nonredundant Power Supply, page 4-19](#)
- [Mounting the Cisco NAM 2220 Appliance in a 2-Post Rack, page 4-20](#)

Before You Begin

Before you begin, read the *Regulatory Compliance and Safety Information for the Cisco NAM 2200 Series Appliance* document that shipped with your appliance. You can find an online version of this guide at the following URL:

http://www.cisco.com/en/US/products/ps10113/prod_installation_guides_list.html



Warning

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



Note

The order of installation or deinstallation tasks might vary. This chapter lists the tasks in the order that constitutes best practices for the installation or deinstallation.

The directions *left* and *right* in this chapter are synonymous with the *installer's left* and *right*. They refer to the installation or uninstallation as you face the appliance from the front.

Preparing for a Successful Installation

The installation and replacement of the hardware components of the Cisco NAM 2220 appliance involve many steps, most of which must be done in the order in which they are presented here. Each section explains one associated group of tasks upon which the next section's tasks are built.

Completing the Replacement

To complete the replacement of the FRU, you must reconnect all external cables and the AC power cord, then turn the NAM appliance power on.

Field Replaceable Units

[Table 4-1](#) lists the FRUs and hardware options of the Cisco NAM 2220 appliance.

Table 4-1 Cisco NAM 2220 Appliance FRUs

Description	Cisco Spare Part Number	Notes
Cisco NAM 2220 Appliance	NAM2220	
XFP, 10GE, Short Range	XFP-10GBASE-SR	See Installing and Replacing XFP Transceiver Modules , page 4-3.
XFP, 10GE, Long Range	XFP-10GBASE-LR	
Hard Disk Drive, 146 GB	NAM2220-HDD-6X146G	See Removing and Replacing a Hard Disk Drive , page 4-6.
AC Redundant Power Supply	NAM2220-AC-PS(=)	See Installing or Replacing a Power Supply , page 4-17.

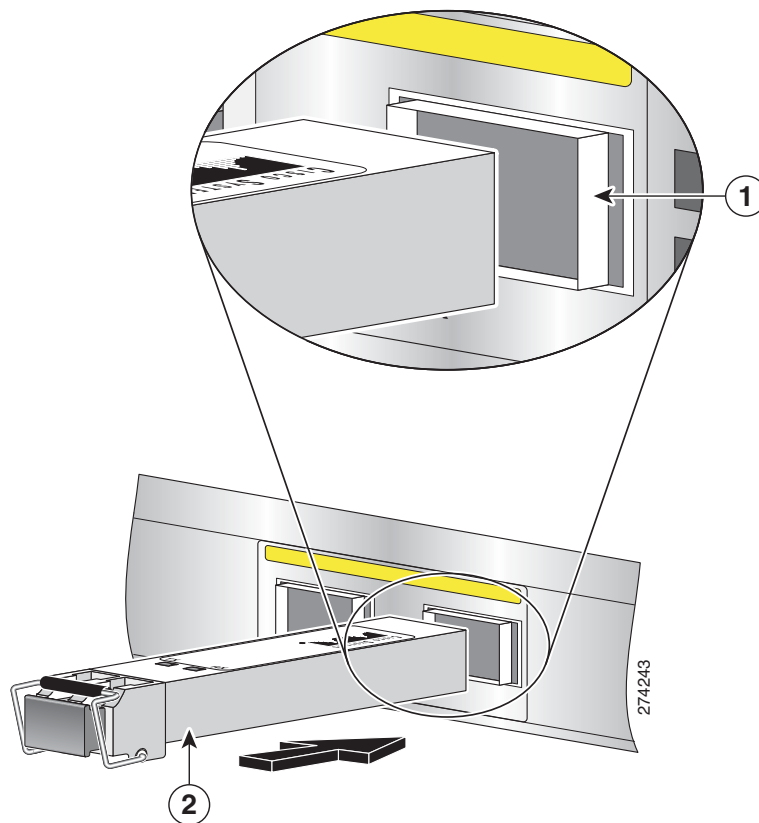
Table 4-1 Cisco NAM 2220 Appliance FRUs (continued)

Description	Cisco Spare Part Number	Notes
4-Post Rail Kit	NAM2220-RAILS=	See Mounting the Cisco NAM 2220 Appliance in a 4-Post Rack , page 3-4.
2-Post Rail Kit	NAM2220-BRKTS=	See Mounting the Cisco NAM 2220 Appliance in a 2-Post Rack , page 4-20.

Installing and Replacing XFP Transceiver Modules

The Cisco NAM 2220 appliance uses one or two 10 GB Ethernet XFP transceiver modules to connect fiber optical cables as data input sources. The XFPs can both be long range or both be short range, or you can install one of each. Depending on the type of XFP you use, you must use the correct fiber optical cables. See [Appendix B, “Monitor Port Requirements,”](#) for more information.

You install the XFPs into slots on the back panel of the Cisco NAM 2220 appliance. See location #7 in [Figure 4-20, Cisco NAM 2220 Appliance Back Panel](#). The slot on the right is the input to logical DataPort 1 of appliance, and the slot on the left is the input to logical DataPort 2. [Figure 4-1](#) shows a detailed view of an XFP transceiver module installation.

Figure 4-1 Installing an XFP Transceiver Module

1	XFP slot in back panel	2	XFP positioned for back panel slot
---	------------------------	---	------------------------------------

The XFP integrates the receiver and transmit path. The transmit side recovers and re-times the 10 Gbps serial data and passes it to a laser driver. The laser driver biases and modulates a 1310 nm DFB (distributed feedback) laser, enabling data transmission over SMF through an LC connector. The receive side recovers and re-times the 10 Gbps optical data stream from a positive-intrinsic-negative (PIN) photo detector, transimpedance amplifier and passes it to an output driver.

The XFP module uses the bail clasp latching mechanism as shown unlatched in [Figure 4-2](#) and latched in [Figure 4-3](#). See the label on the XFP for technology type and model.

XFP dimensions are:

- Height 0.33 inches (8.5 mm)
- Width 0.72 inches (18.3 mm)
- Depth 3.1 inches (78 mm)

XFP temperature ranges are:

- COM—Commercial operating temperature range between 23 degrees Fahrenheit to 158 degrees Fahrenheit (-5 degrees Celsius to 70 degrees Celsius)
- EXT—Extended operating temperature range between 23 degrees Fahrenheit to 185 degrees Fahrenheit (-5 degrees Celsius to 85 degrees Celsius)
- IND—Industrial operating temperature range between -40 degrees Fahrenheit to 185 degrees Fahrenheit (-40 degrees Celsius to 85 degrees Celsius)



Caution

Do not add labels or markings to the XFPs.

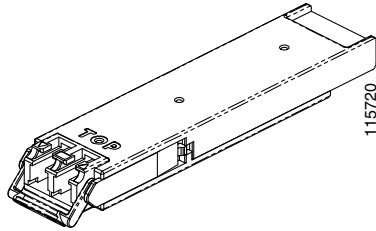
You can order XFPs as hardware options or you can use XFPs you might already own that meet the specifications found in the “[XFP Modules](#)” section on page B-1. Because XFPs are delicate devices, they are packaged separately and are not installed in the appliance prior to shipping.

Installing an XFP

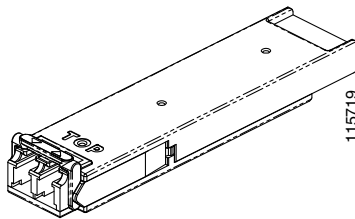
To install an XFP into the Cisco NAM 2220 appliance:

-
- Step 1** Locate the XFP you plan to install and remove any protective packaging.
 - Step 2** Determine into which of the two slots you will install the XFP.
 - Step 3** With its latch open, slide the XFP into the slot until you feel resistance, then push the XFP harder until you feel (or hear) it click into its socket.

[Figure 4-2](#) shows an example of an XFP with its latch open.

Figure 4-2 XFP (unlatched)

Step 4 With your finger, pull the latch upwards to lock the XFP into its slot.

Figure 4-3 XFP (latched)

The XFP is now ready to receive the fiber optical cable input.

Replacing an XFP

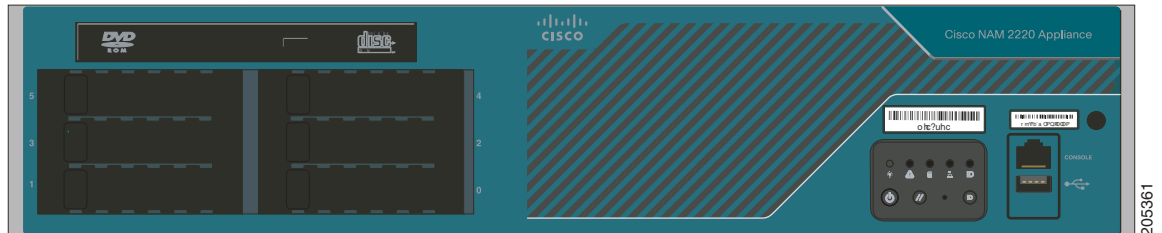
To replace an XFP in the Cisco NAM 2220 appliance:

-
- Step 1** Locate the new XFP you plan to install and remove any protective packaging. Examine the XFP for any signs of damage.
 - Step 2** Locate the XFP you want to replace on the Cisco NAM 2220 appliance back panel.
 - Step 3** Remove the fiber optical cable from the XFP.
 - Step 4** With your finger, pull the latch down to release the XFP from its latched position.
See [Figure 4-2](#).
 - Step 5** Using the latch, pull the XFP out of the appliance and place it in a safe location.
 - Step 6** Insert the new XFP into the slot and slide it in until you feel resistance, then push the XFP harder until you feel (or hear) it click into its socket.
 - Step 7** With your finger, pull the latch upwards to lock the XFP into its slot.
 - Step 8** Replace the fiber optical cable.
-

Removing and Replacing a Hard Disk Drive

The Cisco NAM 2220 appliance has six hard disk drives (HDD) installed. The hard drive bay is at the left side of the appliance chassis, underneath the DVD-ROM drive.

Figure 4-4 Cisco NAM 2220 Appliance Front Panel



The hard drive trays in the drive bay are labeled 1, 3, and 5 on the left side of the bay and 0, 2, and 4 on the right side of the bay (see Figure 4-5).

Each of the hard drive trays has two small LEDs. The green LED (lower) indicates the ready and read/write activities of the corresponding disk drive. The amber LED (upper) indicates a fault. There are two other LED indicators on the switch and control panel, near the Power and Reset buttons, that indicate the collective status of all six hard disk drives.

Audible alarms, or beeping tones, also indicate when a hard disk drive fails. For example, a repeating tone that is on for one second, then off for a second, indicates a degraded RAID or Disk Group. The tone remains on during a disk rebuild. After the rebuild completes, an alarm with a different tone sounds.

Hard Disk Configurations

The Cisco NAM 2220 appliance configures the six hard disk drives as two logical RAID disk drives.

- Drive 0 and Drive 1 are configured as a RAID1 disk, used to store system images, NAM configuration, and report data.

Unless you experience failures on both RAID1 disk drives, the NAM 2220 system will continue to function due to data redundancy in the RAID1 disk drives. If you should experience a failure on both RAID1 disk drives, you will need to replace both drives, and you must also do a system recovery.

- Drive 2 through Drive 5 are configured as a RAID0 disk, used to store capture data.

RAID0 disk drives do not have the data redundancy feature because they are optimized for advantages in disk speed and space. The RAID system automatically detects and skips any bad disk sectors. If any of the RAID0 hard disk drives fail, you will not be able to store or access capture data until you replace the failing drive.



Note A system recovery is not required when you replace a RAID0 disk drive.

Replacing a Hard Disk Drive

When you have to replace a hard drive, you face one of two tasks: replacing a RAID0 disk or replacing a RAID1 disk. Replacing a RAID1 disk is relatively easy. You locate the failing drive, remove it from its tray, drop in a new one, and slide the tray back into the appliance. Replacing a RAID0 disk is a bit more complicated.

**Note**

RAID1 disks (disks 0 and 1) are hot swappable. RAID0 disks (disks 2-5) are not.

Before doing the actual hardware removal and replacement, check the procedures for the type of disk you plan to replace to see when to do the hardware replacement.

- [Replacing a RAID1 Disk Drive, page 4-9](#)

RAID1 disks drives, disk 0 and disk 1, are hot swappable and do not require you to shut down the NAM appliance.

- [Replacing a RAID0 Disk Drive, page 4-10](#)

Replacing a RAID0 disk drive requires you to shut down the NAM appliance and temporarily install a VGA monitor, keyboard and mouse.

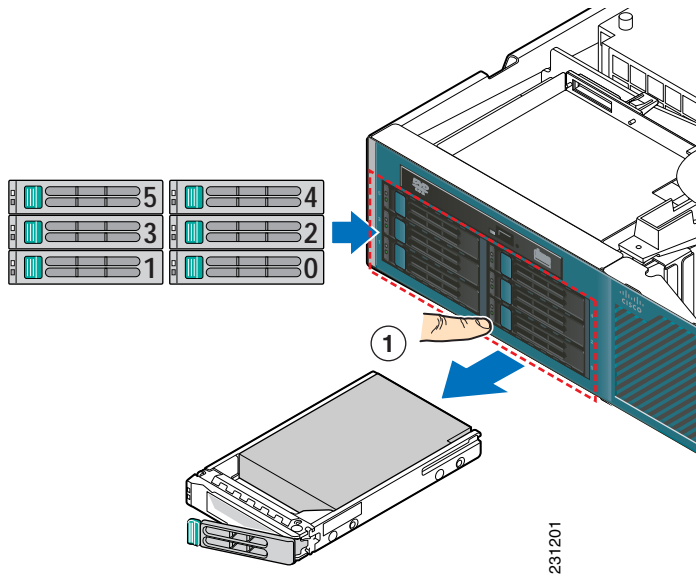
**Note**

Before you begin, inspect the new disk drive for any signs of damage.

To remove and replace a hard disk drive in the Cisco NAM 2220 appliance:

-
- Step 1** Review the information in the “[Safety Warnings](#)” section on page xi and the “[Safety Guidelines](#)” section on page 2-2.
- Step 2** Power down the appliance and all external devices. Disconnect the AC power cord source and all external cables.
- Note** This step is not required if you are replacing a RAID0 disk, disk 0 or 1.
- Step 3** Attach the antistatic wrist strap to your wrist and connect its cord to the ESD socket on the top, left-hand side on the front of the appliance.
- Step 4** Select the drive bay where you want to replace the drive.
- Step 5** Remove the drive tray by pressing the blue button to open the lever and pull the tray out. (See location 1 in [Figure 4-5](#).)

Figure 4-5 Removing the Hard Drive Tray



1	Blue button
----------	-------------

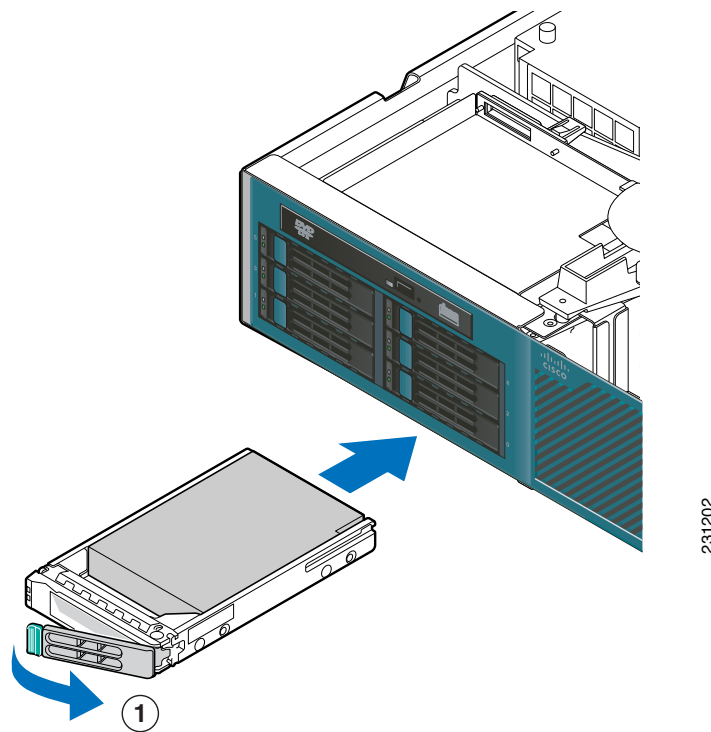


Note The drive tray numbers are shown in [Figure 4-5](#).

If a hard drive is already installed in the hard drive tray, you can remove it by unfastening the four screws that attach it to the drive tray with a Number 2 Phillips screwdriver.

- Step 6** Install the new drive in the drive tray and secure the drive with the four screws with a Number 2 Phillips screwdriver.
- Step 7** To reinstall the drive tray, with the drive tray locking lever open, push the drive tray into the drive bay until it stops. (See location 1 in [Figure 4-6](#) on page 4-9.)

Figure 4-6 Installing the Hard Drive Tray



1	Drive tray
----------	------------

Step 8 Press the lever until it snaps shut to secure the drive into the drive bay.

Replacing a RAID1 Disk Drive

This procedure describes how to replace a failing RAID1 disk drive when one of the two hard disk drives in a RAID1 configuration has failed. You can perform a *hot swap* of the failing drive while the Cisco NAM 2220 appliance continues to run.



Warning

Remember to use an ESD or antistatic wrist strap, a conductive foam pad or mat (recommended), and follow all necessary antistatic standards when handling the hard disk drives.

Step 1 Identify the failing disk drive by checking the LED status indicators.

An amber LED on indicates a failing disk drive.

Step 2 Remove the failing disk drive.

See [Replacing a Hard Disk Drive, page 4-7](#) for detailed information about removing and replacing a disk drive.

- Step 3** Replace the failing disk drive in the disk tray with a new working disk drive, or replace the disk tray with a new disk tray with a good working disk drive.



Note The Cisco part number for the Cisco NAM 2220 appliance disk drive is NAM2220-HDD-6X146G.

See [Replacing a Hard Disk Drive, page 4-7](#) for detailed information about removing a disk drive.

- Step 4** The RAID disk rebuild process will start automatically after few seconds. If the rebuild process does not start after a minute, try removing and inserting the disk tray again.

The entire rebuild process might take several hours. During the rebuild, the audible alarm (a mild off-on tone) will be on. The amber LED on the replaced disk might also continue to blink, but should be off after the rebuild process completes.



Note Do not reboot the Cisco NAM 2220 appliance until the rebuild process completes.

Replacing a RAID0 Disk Drive



Note This procedure requires you to temporarily attach a VGA monitor, keyboard, and mouse to your Cisco NAM 2220 appliance.

If any of the four hard disk drives in the RAID0 configuration fail, the Cisco NAM 2220 appliance will not be able to write or access capture data.

Please follow all necessary antistatic standards in handling the hard disk drives.



Warning **Remember to use an ESD or antistatic wrist strap, a conductive foam pad or mat (recommended), and follow all necessary antistatic standards when handling the hard disk drives.**

To replace a RAID0 hard disk drive:

- Step 1** Identify the failing disk drive by checking the LED status indicators.
An amber LED on indicates a failing disk drive.
- Step 2** Shut down NAM 2220 using the CLI **shutdown** command.
- Step 3** Remove the failing disk drive.
Do not proceed until the Cisco NAM 2220 appliance power is off. See [Replacing a Hard Disk Drive, page 4-7](#) for detailed information about removing and replacing a disk drive.
- Step 4** Replace the failing disk drive in the disk tray with a new working disk drive, or replace the disk tray with a new disk tray with a good working disk drive.



Note The Cisco part number for the Cisco NAM 2220 appliance disk drive is NAM2220-HDD-6X146G.

- Step 5** Attach a VGA monitor, keyboard, and mouse to the Cisco NAM 2220 appliance.
- Step 6** Power up the NAM 2220 by pressing the power button on the front panel.
- Step 7** Watch the NAM appliance monitor until you see the following window, then press **Ctrl+G** when it displays to enter the RAID BIOS console:

```
RAID Controller BIOS Version MT38 (Build Jan 05, 2007)
```

```
HA -0 (Bus 4 Dev 14) MegaRAID SAS PCI Express (TM) ROMB
FW package: 5.1-1-0838
```

```
Foreign configuration(s) found on adapter
Press any key to continue, or 'C' to load the configuration utility.
```

```
Some configured disks have been removed from your system, or are no longer
accessible. Please check your cables and also ensure all disks are present.
Press any key to continue, or 'C' to load the configuration utility.
```

```
>>>>> Press <Ctrl><G> to enter the RAID BIOS Console <<<<<<
Copyright (c) 2006 LSI Logic Corp. All rights reserved !
```

- Step 8** Watch the NAM appliance monitor until you see one of the two following windows.
If the [RAID BIOS Console Foreign Configuration Window](#) displays, [Figure 4-7](#), click **Cancel**.

Figure 4-7 RAID BIOS Console Foreign Configuration Window



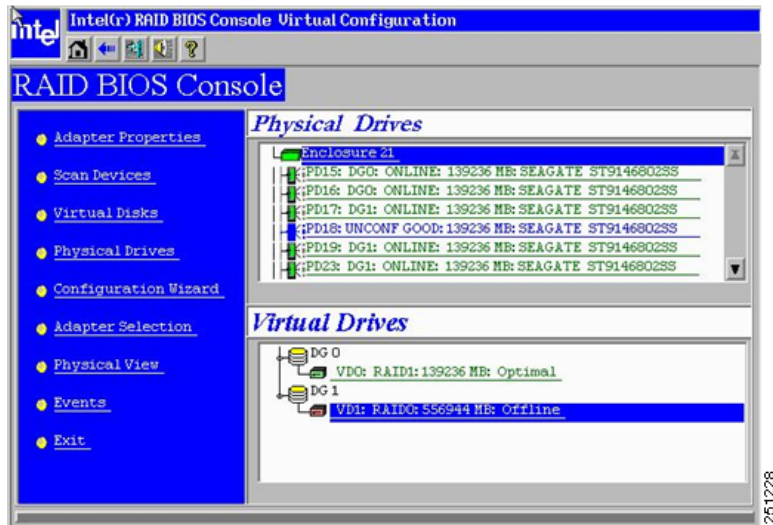
If the [Adapter Selection Window](#) displays, [Figure 4-8](#), click **Start**.

Figure 4-8 Adapter Selection Window



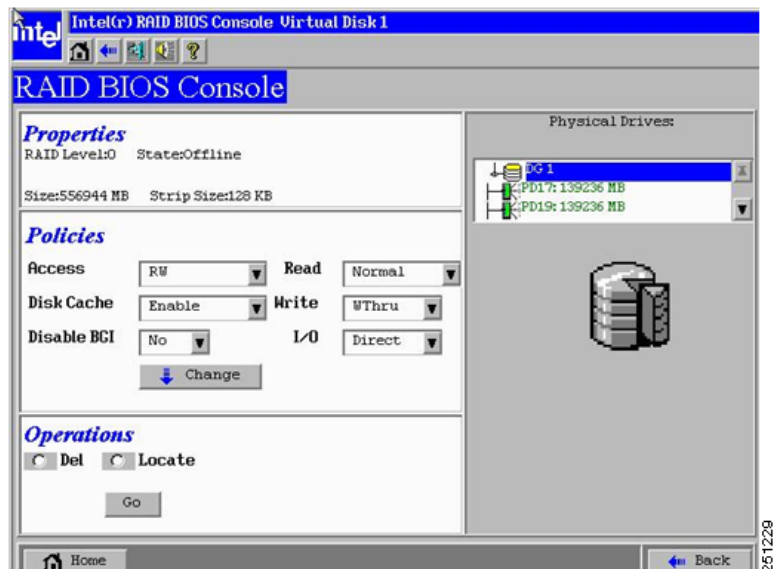
- Step 9** When the NAM appliance monitor displays the [RAID BIOS Console Virtual Configuration Window](#), [Figure 4-9](#), select the VD1 of DG1 from the Virtual Drives section and press **Enter**, or double-click on the VD1: RAID0: 556944 MB: Offline listing in the window.

Figure 4-9 RAID BIOS Console Virtual Configuration Window



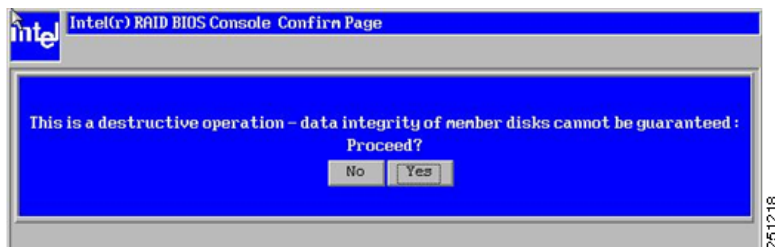
- Step 10** From the [RAID BIOS Console Virtual Disk 1 Window](#), [Figure 4-10](#), select **Del** from the Operations section of the [RAID BIOS Console Virtual Disk 1 Window](#) and click **Go** to delete.

Figure 4-10 RAID BIOS Console Virtual Disk 1 Window



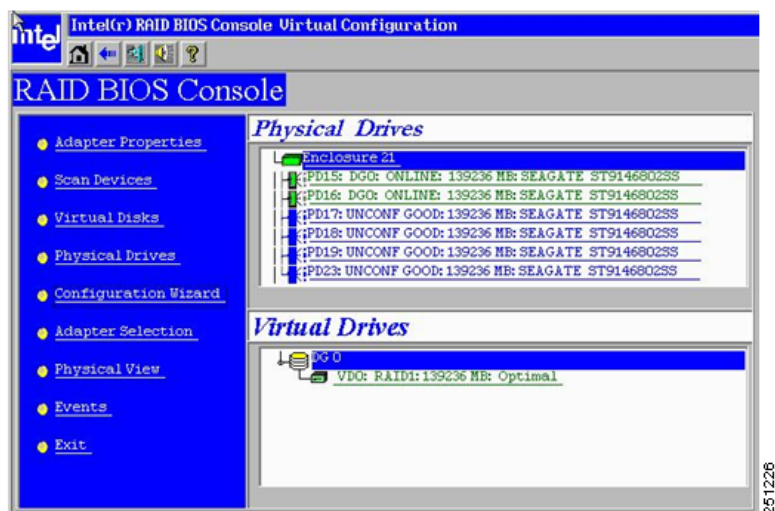
- Step 11** Confirm the delete of Disk Group 1 (DG1) by selecting the “Yes” option on the following window:

Figure 4-11 RAID BIOS Console Confirm Page



- Step 12** When the updated [Updated RAID BIOS Virtual Configuration Window](#) displays, [Figure 4-12](#), choose Configuration Wizard from the left-side menu.

Figure 4-12 Updated RAID BIOS Virtual Configuration Window

**Note**

The disk numbers (PDxx) will vary from those shown in [Figure 4-12](#).

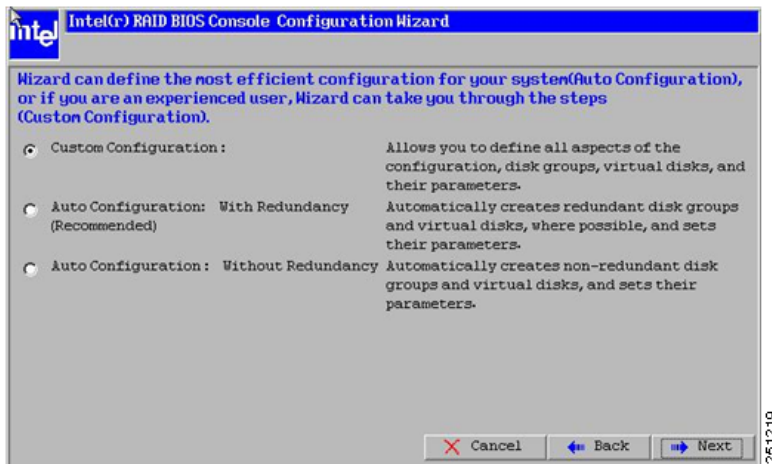
- Step 13** From the [RAID BIOS Console Configuration Wizard](#), [Figure 4-13](#), choose **Add Configuration**, then click **Next**.

Figure 4-13 RAID BIOS Console Configuration Wizard



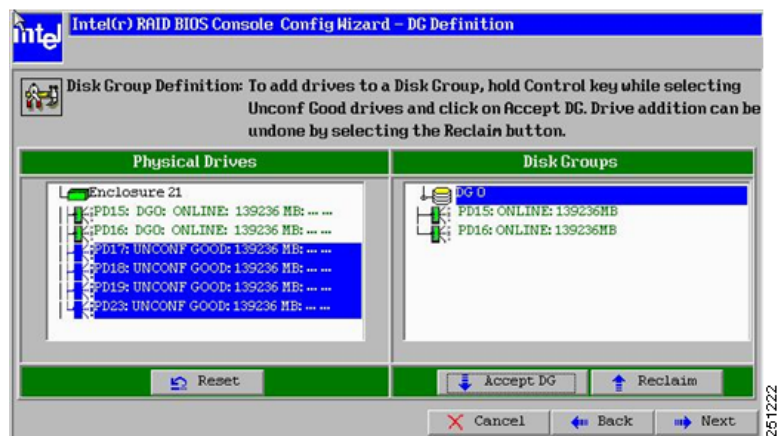
- Step 14** On the [Continuing Console Configuration Wizard](#), click **Custom Configuration**, then click **Next**.

Figure 4-14 Continuing Console Configuration Wizard



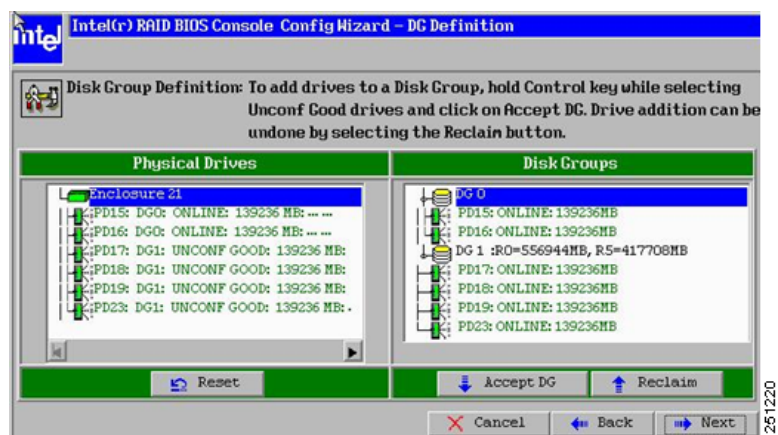
- Step 15** On the [Disk Group Definition Window](#), [Figure 4-15](#), use the *Ctrl* or *Shift* key and mouse to select (or highlight) the four *UNCONF GOOD* disks and then select **Accept DG** on the following window (Please note, the four *UNCONF GOOD* disks might be interleaved with the *ONLINE* disks):

Figure 4-15 *Disk Group Definition Window*



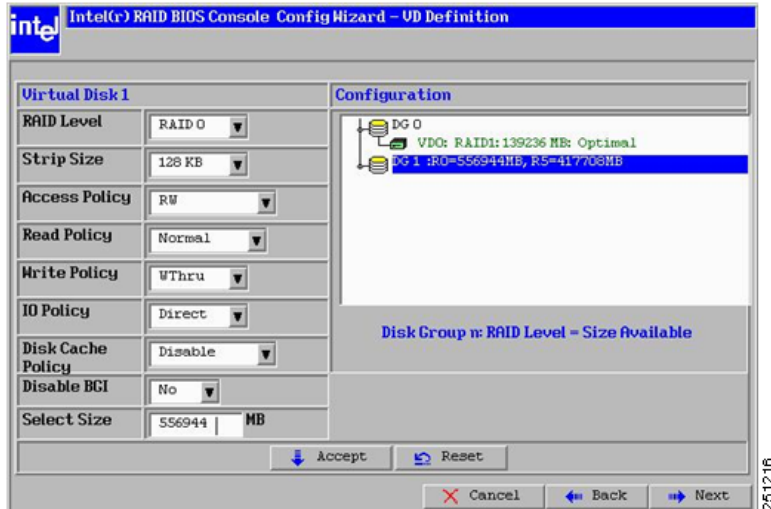
- Step 16** As you continue the Disk Group definition, click **Next** (bottom right corner) when the next DG Definition window displays, [Figure 4-16](#).

Figure 4-16 *Continuing Disk Group Definition*



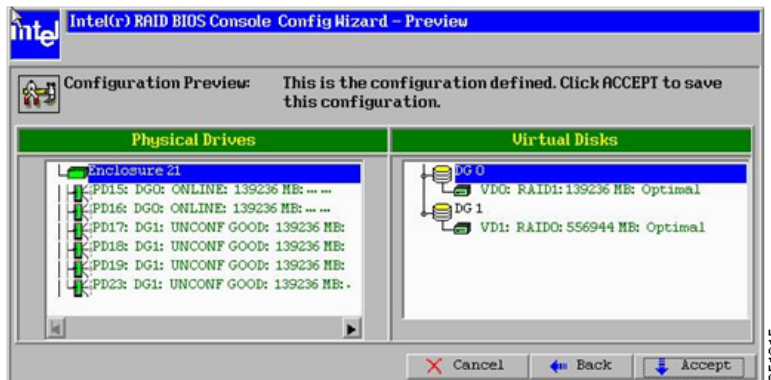
- Step 17** On the [Virtual Disk Configuration Wizard](#), [Figure 4-17](#), configure the DG1 as RAID0 with the all the parameters as shown in [Figure 4-17](#), and click **Accept** to accept the configuration, then **Next**:

Figure 4-17 Virtual Disk Configuration Wizard



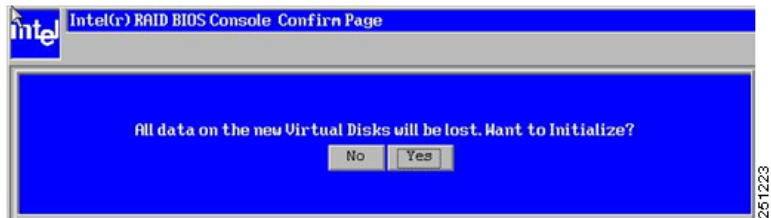
- Step 18** On the [Configuration Wizard Preview Window](#), [Figure 4-18](#), click **Accept** to save the configuration.

Figure 4-18 Configuration Wizard Preview Window



- Step 19** Click **Yes** at the following window to confirm that you want to save the configuration.

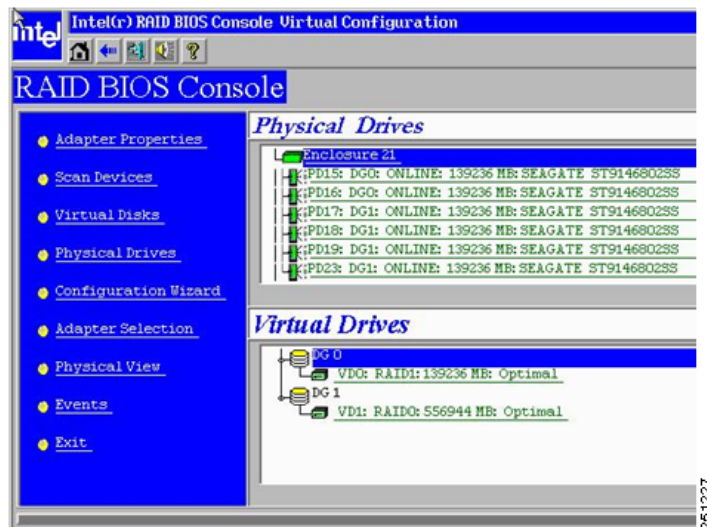
- Step 20** Click **Yes** on the following window to confirm the disk initialization.



- Step 21** Click the “Home” selection to go back to home window.

Step 22 Click **Exit** in the left-hand menu to exit the RAID BIOS Console.

Figure 4-19 RAID BIOS Console Menu



Step 23 Confirm the exit by clicking **Yes** on the Exit Confirmation window.

Step 24 Reboot your NAM 2220 by pressing the Ctrl+Alt+Del key combination when you see the Reset Page window.

The Cisco NAM 2220 appliance should now reboot normally.

Step 25 When you are confident that the disk replacement was successful, using the NAM command line, issue the **shutdown** command.

Step 26 When power to the Cisco NAM 2220 appliance has turned off, remove the VGA monitor, keyboard, and mouse.

Step 27 Use the power button on the Cisco NAM 2220 appliance front panel to turn power on to the NAM appliance and reboot the NAM application.

Installing or Replacing a Power Supply

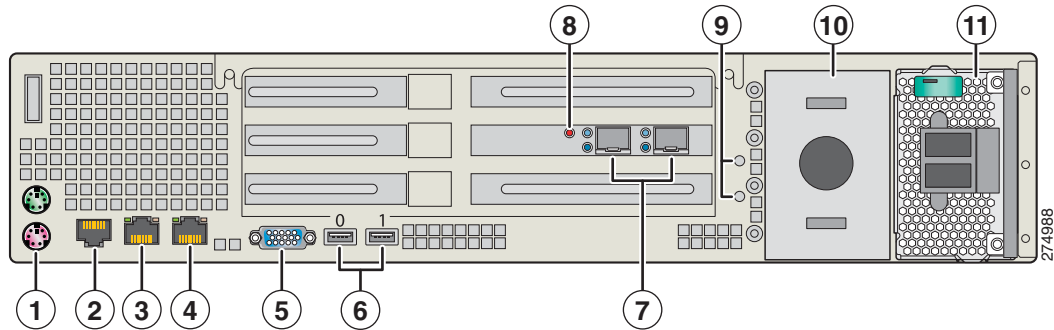
The Cisco part number for a Cisco NAM 2220 appliance power supply is NAM2220-AC-PS.



Caution

Your Cisco NAM 2220 appliance does not have a redundant power supply unless you have purchased an optional second power supply. If there is no second power supply, before replacing an existing power supply, you must first take the appliance out of service. To do so, turn off all external devices connected to the appliance, turn off the appliance by pressing the power button, and unplug the AC power cord.

Figure 4-20 Cisco NAM 2220 Appliance Back Panel



The Cisco NAM 2220 appliance can be equipped with one or two AC power supplies. If you have two AC power supplies, the power supplies create redundancy for the appliance, enabling one to become a backup for the other in case of failure.

Redundant power supplies also enable you to “hot-swap” a power supply, if you need to replace it. In other words, you can replace a power supply while the appliance is running. To maintain hot-swap capability, make sure that there is an active power supply in both appliance slots before replacing (hot-swapping) a power supply.

The AC power supplies are accessible from the rear of the appliance. If the appliance is equipped with only one power supply, the space next the module is occupied with a blank filler panel. See location 11 in [Figure 4-20](#).

**Caution**

If only one power supply is installed, it must be in the right-hand slot and a power supply blank filler panel must be installed in the left-hand slot to ensure proper cooling.

This section includes the following topics

- [Replacing a Redundant Power Supply, page 4-18](#)
- [Replacing a Nonredundant Power Supply, page 4-19](#)
- [Adding a New Redundant Power Supply, page 4-19](#)

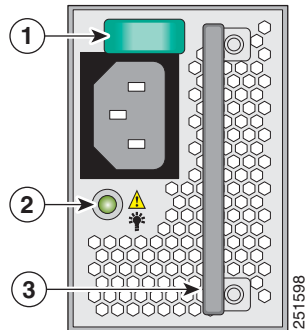
Replacing a Redundant Power Supply

If you have two power supplies installed in your Cisco NAM 2220 appliance, one of the modules is redundant, enabling you to hot-swap one of the power modules (replace a module without powering down the system), if you need to replace one of the power supplies.

To replace a redundant power supply:

- Step 1** Check the status LED on the power supplies (see location 2 in [Figure 4-21 on page 4-19](#)) to determine which power supply has failed.
- Step 2** Disconnect the appropriate AC power source.

Figure 4-21 AC Power Supply Module



1	Safety lock (green)	3	Handle
2	Status LED		

- Step 3** Press and hold the green safety lock (see location 1 in [Figure 4-21](#)) downward to disengage the power supply.
- Step 4** Grasp the handle (see location 3 in [Figure 4-21](#)) and pull the power supply from the appliance chassis.
- Step 5** Slide the new power supply into the appliance chassis until it clicks into place.

Replacing a Nonredundant Power Supply

If your Cisco NAM 2220 appliance has a single power supply, you can replace that power supply only when the appliance is safely powered down.

To replace a nonredundant power supply module:

- Step 1** Turn off all external devices connected to the appliance, turn off the appliance by pressing the power button, and unplug the AC power source.
- Step 2** Press and hold the green safety lock (see location 1 in [Figure 4-21 on page 4-19](#)) downward to disengage the power supply.
- Step 3** Grasp the handle (see location 3 in [Figure 4-21 on page 4-19](#)) and pull the power supply from the appliance chassis.
- Step 4** Slide the new power supply into the appliance chassis until it clicks into place.

Adding a New Redundant Power Supply



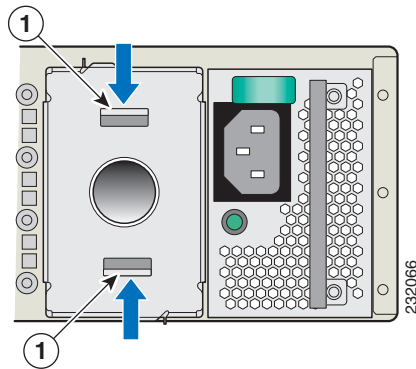
Note

When adding a redundant power supply to a Cisco NAM 2220 appliance, the additional power supply must be the same type as the existing power supply.

To add an additional power supply module to an appliance that has a single power supply:

- Step 1** Remove the blank filler panel from the rear panel by pressing the two release tabs toward each other (see location 1 in [Figure 4-22](#)).
- Step 2** Pull the blank filler panel from the appliance chassis.

Figure 4-22 Blank Filler Panel and AC Power Module



1	Release tabs
---	--------------

- Step 3** Slide the new power supply into the appliance chassis until it clicks into place.
- Step 4** Save the blank filler panel, in case you need to use it at a later date.

Mounting the Cisco NAM 2220 Appliance in a 2-Post Rack

Typically, the Cisco NAM 2220 appliance mounts to a 19-inch (48.3-cm) 2-post equipment rack with rack-mounting brackets that attach to the front sides of the appliance. The inside width between the two posts or mounting strips (left and right) must be at least 17.5 inches (44.45 cm). See the [“Preparing Your Site for Installation”](#) section on page 2-6 for information about the types of equipment racks.

Even though the intake and exhaust for cooling air are located on the front and on the rear of the appliance, respectively, it is recommended that multiple appliances be stacked in a rack with at least a 1.5-inch (3.81-cm) vertical clearance.



Caution

To prevent damage to the appliance, only use Cisco provided hardware and screws when installing the appliance.

To secure the appliance to the equipment rack, you must use the two 10-32 x 1/2-inch rack screws (see [Figure 4-23](#) on page 4-21 and [Table 4-2](#) on page 4-22) for each side or follow your local practices for installing the appliance into your equipment rack. Ensure that the rack-mount brackets have been securely fastened. See the [“Attaching the L Brackets to the Appliance”](#) section on page 4-22 for more information.

The following procedure provides a general outline for mounting the appliance into the equipment rack.

**Caution**

To prevent injury, review the “[Safety Guidelines](#)” section on page 2-2 and the “[Rack-Mounting Configuration Guidelines](#)” section on page 3-3 before installing the appliance in the equipment rack.

- Step 1** Locate the equipment rack position you plan to install the appliance into.
- Step 2** Verify that there are no obstructions and ensure that the equipment rack is stabilized.
- Step 3** Position the appliance in the equipment rack, lining up the bracket holes on the appliance with the holes on the rack, and secure it with two 10-32 x 1/2-inch rack screws (each side). You need two people to install the appliance in the rack—one person to hold the appliance and one person to secure it to the rack.

**Note**

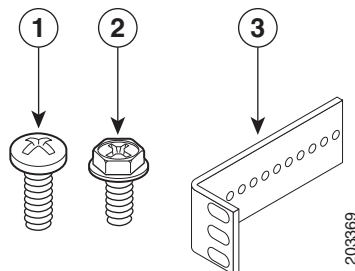
The vertical spacing for the equipment rack is at least 1.75 inches (4.44 cm), with mounting holes spaced 1.5 inches (3.81 cm) apart.

- Step 4** Tighten the screws using a Number 2 Phillips screwdriver (each side).

2-Post Rack-Mount Hardware Kit

[Figure 4-23](#) shows the bracket and screws that you need to install the Cisco NAM 2220 appliance in a 2-post rack. [Table 4-2](#) describes the contents of the rack-mount hardware kit, Cisco part number NAM2220-BRKTS.

Figure 4-23 2-Post Rack-Mount Kit



Mid-Mounting in a 2-Post Rack

Table 4-2 2-Post Rack-Mount Kit

Item No.	Description	Quantity
1	Rack screw, 10-32 x 1/2-inch (1.27 cm)	4
2	Screw, hex head	6
3	L bracket	2

This section contains the following topics:

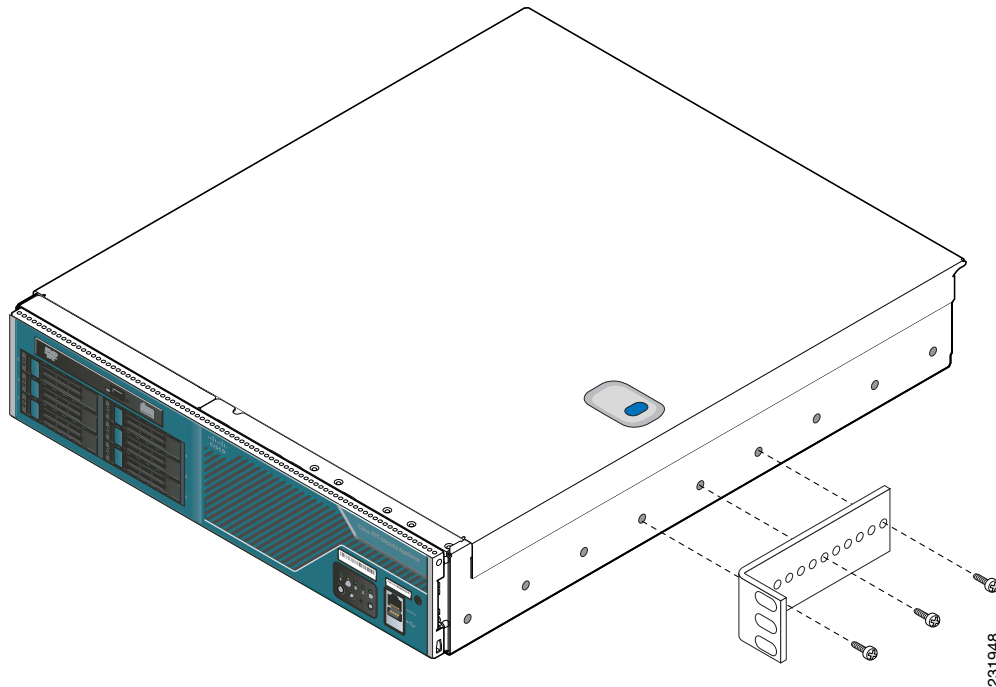
- [Attaching the L Brackets to the Appliance, page 4-22](#)
- [Installing the Appliance in the Rack, page 4-23](#)

Attaching the L Brackets to the Appliance

To attach the brackets to the appliance:

- Step 1** Place an L bracket (see [Figure 4-24](#)) along one side of the appliance in the mid-mount position (holes 4, 5, and 6 on the appliance).

Figure 4-24 Attaching the L Bracket



- Step 2** Insert the hex head screws (see [Figure 4-24](#)) and fasten the L bracket to the appliance using a Number 2 Phillips screwdriver.
- Step 3** Repeat Steps 1 and 2 for the other L bracket.

Step 4 You are now ready to install the appliance into the 2-post rack.

Proceed to the next section, “[Installing the Appliance in the Rack](#),” to continue the installation.

Installing the Appliance in the Rack



Caution

Lifting the appliance and attaching it to the rack is a two-person job. If needed, use an appropriate lifting device. A fully loaded Cisco NAM 2220 appliance weighs approximately 51.5 lb (23.4 kg).

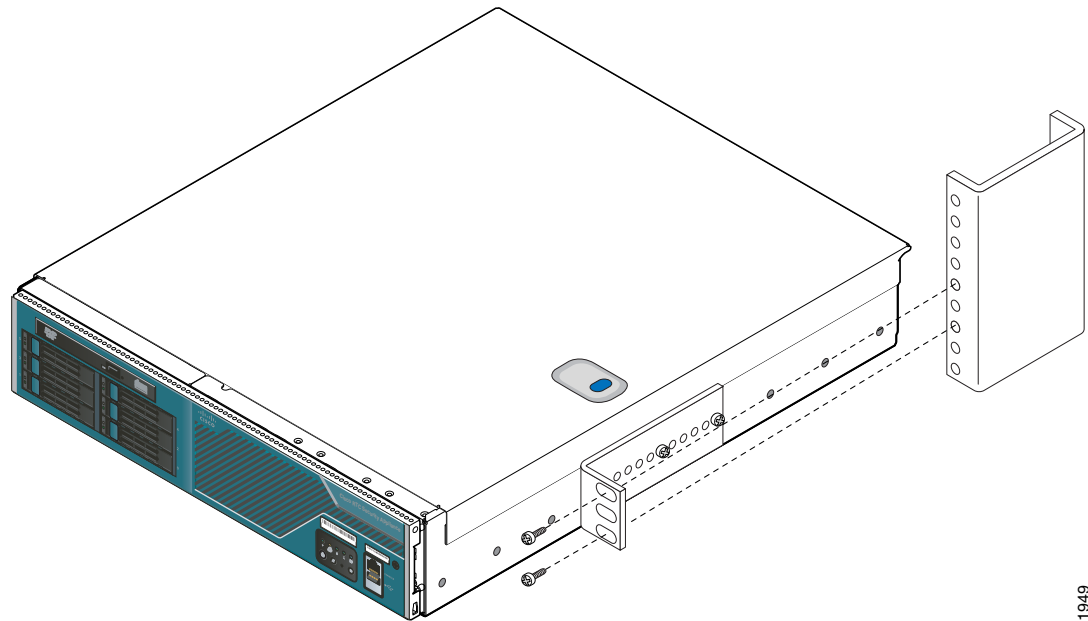
Before you begin, check the 10-32 x 1/2-inch screws that are included in the 2-post rack-mount kit (see [Table 4-2 on page 4-22](#)) to see if they are the correct size for your rack. If not, obtain the correct screws to use in the procedure where “rack screws” are required.

To mount the appliance in the rack:

Step 1 Locate one person at the front of the rack and one at the rear.

Step 2 Position an L bracket on the front side of the center post (see [Figure 4-25](#)).

Figure 4-25 Attaching an L Bracket to a Center Post



281949

Step 3 Attach the L bracket to the center post using the 10-32 x 1/2-inch rack screws (see [Figure 4-25](#)). Do not fully tighten the screws at this time.

Step 4 Repeat Steps 2 and 3 for the other L bracket.

Step 5 Tighten all the 10-32 x 1.2-inch rack screws on both sides of the rack.



CHAPTER 5

Configuring the Cisco NAM 2220 Appliance

This section describes how to configure the Cisco NAM 2220 appliance to establish network connectivity, configure IP parameters, and how to perform other required administrative tasks using the NAM command line interface (CLI). This chapter also provides information about how to get started with the NAM graphical user interface (GUI) and how to perform various system management tasks.

This chapter contains the following sections:

- [Logging In For the First Time, page 5-1](#)
- [Establishing Network Connectivity, page 5-3](#)
- [Enabling the NAM GUI Web Server, page 5-6](#)
- [Additional Configuration Using the NAM GUI, page 5-8](#)
- [Managing the Cisco NAM 2220 Appliance, page 5-12](#)



Note

For more advanced NAM configuration information, use the NAM web GUI or see the *Cisco Prime Network Analysis Module Command Reference* at the following URL:

http://www.cisco.com/en/US/products/sw/cscowork/ps5401/prod_command_reference_list.html

Logging In For the First Time

After you turn power on and boot the Cisco NAM 2220 appliance for the first time, the login prompt displays on the attached console. When shipped from the factory, the root user is preconfigured on the Cisco NAM 2220 appliance. The default password for the root user is *root*.



Note

We require you to change the user root password during the first login session.

The root user has access to the root (read/write) level of NAM and can enter NAM command-line interface (CLI) commands.

To log into the Cisco NAM 2220 appliance for the first time, open a console session or a serial session with the NAM appliance:



Note

After your initial login, you can enable **telnet** and **ssh** connections to the NAM appliance.

Step 1

When the NAM login prompt appears, enter **root** and press **Enter**.

```
nam.localdomain login: root
```

- Step 2** When the password prompt appears, enter **root** and press **Enter**.

After you enter the ID and password, you will be prompted to change the root password.

```
Cisco 2220 NAM Appliance (NAM2220)
```

```
nam.localdomain login: root
Password: root
```

```
Cisco 2220 NAM Appliance (NAM2220) Console, 5.1(1)
Copyright (c) 1999-2011 by Cisco Systems, Inc.
```

```
System Alert! Default password has not been changed!
Please enter a new root user password.
Enter new UNIX password:
```

- Step 3** Enter the new password for the root user.

We recommend that you make a record of the password, and store this information in a secure location. You should change this password regularly in accordance with your site's password security policies. See [Changing the Root Password, page 5-2](#).

```
Retype new UNIX password:
passwd: password updated successfully
root@nam.localdomain#
```

Changing the Root Password

This section describes how to change the root user password after the initial login session. To change the root password:

- Step 1** Open a console session or serial session with the NAM appliance.

- Step 2** When prompted for a username, enter **root**.

The Cisco NAM 2220 appliance ships from the factory with default settings for user **root** with a password of **root**.

- Step 3** When prompted, enter the password for user root.

After you log in as the root user, you have read and write access to the root level of the NAM appliance, and you can enter and perform CLI commands.

```
root@hostname#
```

- Step 4** Enter the following command to change the root user password.

```
password root
```

```
New password:
```

```
Confirm password:
```

- Step 5** Enter the new password for user root and confirm it.

We recommend that you make a record of the password and store this information in a secure location. You should change this password regularly in accordance with your site's password security policies.

Step 6 Enter **exit** to end the session and log out.

Examples

This section provides the following examples:

- [Changing the NAM Root Password: Example, page 5-3](#)
- [Verifying the NAM Root Password: Example, page 5-3](#)

Changing the NAM Root Password: Example

```
root@nam1.company.com# password root
Changing password for user root
New UNIX password: <rtpswd>
Retype new UNIX password: <rtpswd>
passwd:all authentication tokens updated successfully
root@nam1.company.com#
root@nam1.company.com# exit
```

Verifying the NAM Root Password: Example

```
nam1.company.com login: root
Password: <rtpswd>
Terminal type: vt100

Cisco Network Analysis Module (NAM 2220 Appliance) Console, 5.1
Copyright (c) 2011 by cisco Systems, Inc.

root@nam1.company.com#
root@nam1.company.com# exit
```

Establishing Network Connectivity

This section describes how to configure the Cisco NAM 2220 appliance to configure IP parameters and establish network connectivity.

Log in to the Cisco NAM 2220 appliance from the management console and enter the following CLI commands with the appropriate information for your site:

Step 1 Use the **ip address** command to configure the NAM appliance IP address. The syntax for this command is as follows:

```
ip address ip-address subnet-mask
```

Example

```
root@localhost# ip address 172.20.104.126 255.255.255.248
```

- Step 2** (Optional) You can use the **ip broadcast** command to configure the NAM appliance broadcast address. The syntax for this command is as follows:

```
ip broadcast broadcast-address
```

Example

```
root@localhost# ip broadcast 10.255.255.255
```

- Step 3** Use the **ip gateway** command to configure the NAM appliance default gateway address. The syntax for this command is as follows:

```
ip gateway ip-address
```

Example

```
root@localhost# ip gateway 172.20.104.123
```

- Step 4** (Optional) You can use the **exsession** command to enable remote login to the NAM appliance using either Telnet or SSH. The **exsession on ssh** requires crypto patch to be installed. See [Enabling the NAM GUI Web Server, page 5-6](#), to know how to download and install the software K9 cryptographic patch.

The syntax for this command is as follows:

```
exsession on (for Telnet)
```

or

```
exsession on ssh (for SSH)
```

Examples

To configure the NAM appliance to enable Telnet access:

```
root@localhost# exsession on
```

To configure the NAM appliance to enable SSH access:

```
root@localhost# exsession on ssh
```



Note The NAM software K9 cryptographic patch is required to configure the **ssh** option.

- Step 5** You can use the **ip domain** command to configure the NAM appliance system domain name. The syntax for this (optional) command is as follows:

```
ip domain name
```

Example

```
root@localhost# ip domain your_company.com
```

- Step 6** You can use the **ip host** command to configure the NAM appliance system hostname. The syntax for this command is as follows:

```
ip host name
```

Example

```
root@localhost# ip host nam_machine
```

- Step 7** You might (optionally) want to use the **ip nameserver** command to configure one or more name servers for the NAM appliance.

The syntax for this command is as follows:

```
ip nameserver ip-address [ip-address] [ip-address]
```

Examples

```
root@localhost# ip nameserver 172.20.104.10  
root@localhost# ip nameserver 172.20.104.10 172.20.104.20 172.20.104.30
```

Checking Your Configuration

After you finish configuring the NAM appliance for network connectivity, it is a good idea to check your connectivity and verify the IP parameters you have just configured for the NAM appliance.

- Step 1** Use the **show ip** command to verify that you have configured the NAM appliance IP parameters the way you want them.

The syntax for this command is as follows:

show ip

```
root@localhost# show ip  
root@nam1.company.com# show ip
```

Sample Output for the show ip NAM CLI Command

The following is an example of the **show ip** command output that shows a configured NAM appliance:

```
root@nam1.company.com# show ip  
  
IP address:                172.20.105.215  
Subnet mask:                255.255.255.192  
IP Broadcast:              10.255.255.255  
DNS Name:                   nam1.company.com  
Default Gateway:           172.20.105.210  
Nameserver(s):             209.165.201.29  
HTTP server:                Disabled  
HTTP secure server:        Disabled  
TACACS+ configured:        No  
Telnet:                     Enabled  
SSH:                         Disabled  
root@nam1.company.com#
```

- Step 2** Use the **ping** command to check connectivity between the NAM appliance and a network device.

The syntax for this command is as follows:

```
ping {hostname | ip-address}
```

Examples

```
root@localhost# ping nam_machine.your_company.com
```

```
root@localhost# ping 172.20.104.10
```

The following is an example of the **ping** command showing successful connectivity:

```
root@nam_machine.your_company.com# ping 172.20.104.10
PING 172.20.104.10 (172.20.104.10) 56(84) bytes of data.
64 bytes from 172.20.104.10: icmp_seq=1 ttl=254 time=1.27 ms
64 bytes from 172.20.104.10: icmp_seq=2 ttl=254 time=1.13 ms
64 bytes from 172.20.104.10: icmp_seq=3 ttl=254 time=1.04 ms
64 bytes from 172.20.104.10: icmp_seq=4 ttl=254 time=1.08 ms
64 bytes from 172.20.104.10: icmp_seq=5 ttl=254 time=1.11 ms

--- 172.20.104.10 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4003ms
rtt min/avg/max/mdev = 1.043/1.129/1.278/0.090 ms
root@nam_machine.your_company.com#
```

Enabling the NAM GUI Web Server

This section describes how to enable the NAM GUI web server and browser-based access to the NAM graphical user interface (GUI).

To enable the NAM web server and provide browser-based access, the following prerequisites must be met:

- If you plan to use the HTTP secure server (HTTPSs), you must first download and install the NAM software K9 cryptographic patch. You can download the NAM software K9 cryptographic patch from Cisco.com.

After downloading the software, install the patch using the following command:

```
patch <ftp url>
```

<ftp url>: *ftp://<username>@<host>/<path>/<filename>*. The username is optional based on the ftp server setting.

For example: **patch ftp://10.1.1.2/patch/nam-5-0-k9.patch**



Note

The **ip http secure** commands remain disabled until you install the patch.

- Ensure that your web browser supports your NAM software release. For a list of supported browsers, see the NAM software release notes at the following URL:

http://www.cisco.com/en/US/products/sw/cscowork/ps5401/prod_release_notes_list.html

To enable the NAM web server:

Step 1 Open a Telnet or SSH session to the NAM appliance and at the password prompt, enter your password.

```
telnet {ip-address | hostname}
```

or

```
ssh {ip-address | hostname}
```

- Step 2** Enter one of the following commands to enable either an HTTP server or an HTTPS secure server:
To enable the NAM HTTP web server:

```
ip http server enable
```

To enable the NAM HTTPS secure web server:

```
ip http secure server enable
```

The NAM requests a web administrator user name.

```
Enabling HTTP server...
```

```
No web users are configured.
```

```
Please enter a web administrator user name [admin]: <CR>
```

The NAM web server requires at least one properly-configured web administrator. If the NAM does not prompt you for a web username and password, then at least one web administrator was previously configured.

- Step 3** Enter the username of the web administrator. Otherwise, press **Enter** to use the default web administrator username *admin*.

The NAM requests a password for the web administrator, then requests the password to be entered again to ensure accuracy.

```
New password: <adminpswd>
```

```
Confirm password: <adminpswd>
```

- Step 4** Enter the password for the web administrator and confirm it. Otherwise, press **Enter** to use the default web administrator password *adminpswd*.



Note

Because this document is available to the public by way of Cisco.com, it is a good idea to change this and all default passwords as soon as possible.

Enabling the Web Server Summary

The following summarizes the steps or interaction when you enable the NAM web server and access to it.

```
root@localhost# ip http server enable
```

```
No web users are configured.
```

```
Please enter a web administrator user name [admin]: <CR>
```

```
New password: <admin-passwd>
```

```
Confirm password: <admin-passwd>
```

```
User admin added.
```

```
Starting httpd
```

Checking the NAM GUI Web Server

After you have configured the NAM web server and enabled access to it, you should check that the web server is working by launching a browser and trying to log in to the NAM.

To check the NAM web server functionality, launch an approved internet browser and enter the IP address or host and domain name in the browser address field.

**Note**

For a list of supported browsers, see the NAM software release notes at:

http://www.cisco.com/en/US/products/sw/cscowork/ps5401/prod_release_notes_list.html

If the Cisco NAM 2220 Appliance web server is properly configured, you should be able to access the NAM. At this point, the only user able to log into the NAM web server is the administrative user you configured when you enabled the web server.

Additional Configuration Using the NAM GUI

After you log in through the NAM login window, you have access to the NAM graphical user interface (GUI). The NAM GUI is a web-based interface that uses five main tabs for you to set up and use the NAM. The five main tabs are:

- Monitor
- Analyze
- Capture
- Setup
- Administration

For detailed information on the NAM GUI, see the User Guide for your NAM software release. You can find a PDF file of the user guide in the online help of the NAM GUI and on Cisco.com at the following URL:

http://www.cisco.com/en/US/products/sw/cscowork/ps5401/products_user_guide_list.html

After you log into the NAM GUI, perform the following tasks:

Step 1 Go to the **Setup > Managed Device > Device Information** window, and enter the parameters for your managed device in the Managed Device Information window.

Figure 5-1 shows the Managed Device Information window. You can find more detailed information about the parameters required to set up a managed device in Chapter 3 of the *Cisco Prime Network Analysis Module, 5.1 User Guide*.

http://www.cisco.com/en/US/products/sw/cscowork/ps5401/products_user_guide_list.html

Figure 5-1 *Managed Device Information Window*

Name **namlab-6509**

Hardware **Cisco Systems Catalyst 6500 9-slot Chassis System**

Managed Device Software Version **Version 12.2(18)SXF12a**

Managed Device System Uptime **33 days, 23 hours, 24 minutes**

Location **N/A**

Contact **N/A**

Managed Device

SNMP v1/v2c RW Community String Verify

Enable SNMP V3

Mode NoAuthNoPriv AuthNoPriv AuthPriv

User Name

Auth Password Verify

Auth Algorithm **MD5**

Privacy Password Verify

Privacy Algorithm **DES**

282942

Step 2 Go to the **Administration > System** window, and click Network Parameters in the content menu.

[Figure 5-2](#) shows an example of the Network Parameters window. Use this window to enter additional network connectivity parameters such as your site's name servers.

Figure 5-2 *Network Parameters Window*

IP Address

IP Broadcast

Subnet Mask

IP Gateway

Host Name

Domain Name

Nameservers

282943

Step 3 Continue with each option in the content menu of the **Administration > System** window.

[Figure 5-3](#) shows the content menu of the **Administration > System** window. The default view of that window is the System Overview window.

Figure 5-3 Administration > System Content Menu



You can find detailed information about the options in the **Administration > System** window content menu in the User and System Administration chapter of the *Cisco Prime Network Analysis Module User Guide*.

- Step 4** If you plan to use SNMP, go to the **Administration > System > SNMP Agent** window. Set the community strings for the NAM SNMP agent and enter the administrative contact information.
- Step 5** Go to the **Administration > System > System Time** window, and configure the NAM system time to synchronize with either the local managed device or an external network time protocol (NTP) server. The default setting is to synchronize with the local managed device. If NTP is used for time synchronization, enter at least one NTP server name or IP address.



Note You must configure the NAM local time zone regardless of the time synchronization method.

- Step 6** Go to the **Administration > System > E-Mail Setting** window, and enter the POP or external mail server for your organization. Also enter a complete e-mail address to receive a test message when you have completed the e-mail configuration.
- Step 7** Go to the **Administration > System > Web Data Publication** window, and check each item you want to make available for Web Data Publishing. The publication code, if required, must be present in the URL address or cookie to enable access to published data.
- Step 8** Go to the **Administration > System > Capture Data Storage** window, and enter the parameters required to set up capture storage to remote disks using either iSCSI or NFS storage systems.
- Step 9** Go to the **Administration > System > Syslog Setting** window, and specify optional remote syslog server names (up to five) to receive syslog messages from NAM. NAM syslogs are created for alarm threshold events, voice threshold events, or system alerts. You can use the NAM to view the local NAM syslogs.
- Step 10** Go to the **Administration > System > SNMP Trap Setting** window, and enter the parameters required to configure traps.
- Step 11** Go to the **Administration > System > Preferences** window, and enter the preferred parameters.
- If you plan to use the local user database, continue with the next step. If you plan to use a TACACS+ database, proceed to **Step 13**.

- Step 12** Go to the **Administration > Users > Local Database** window, and click **Create** to add any administrative users who require access. Click **Edit** to make any changes to the privilege each administrative user require for the functions they might perform, and **Delete** to remove the user access.

Figure 5-4 shows an example of the default local user database window.

Figure 5-4 Administration > Users > Local User Database Window



- Step 13** If you plan to use a TACACS+ server for authentication and authorization (AA), go to the **Administration > Users > TACACS+** window, and enter the parameters required to access the TACACS+ server for authentication and authorization.

Enter the IP address of the TACACS+ server and the secret key to communicate with the server. The secret key must be the same as the one configured in the TACACS+ server.

Figure 5-5 shows an example of the **Administration > Users > TACACS+** window.

Figure 5-5 Administration > Users > TACACS+ Window



Managing the Cisco NAM 2220 Appliance

This section contains the following information:

- [Shutting Down and Starting Up NAM 2220 Appliance, page 5-12](#)
- [Verifying System Status, page 5-12](#)
- [Configuring Logging Options and Generating Diagnostics, page 5-13](#)
- [Resetting the NAM Root Password to the Default Value, page 5-13](#)
- [Opening and Closing a Telnet or SSH Session to the NAM, page 5-14](#)



Note

- The tables in these sections show only common managed device and network module commands.
 - To view a complete list of available commands, type `?` at the prompt (Example: `user@nam_host.domain# ?`).
 - To view a complete list of command keyword options, type `?` at the end of the command (Example: `nam_host.domain# ip ?`).
- The tables group commands by the configuration mode in which they are available. If the same command is available in more than one mode, it might act differently in each mode.

Shutting Down and Starting Up NAM 2220 Appliance

To shut down the Cisco NAM 2220 appliance, issue the NAM CLI **shutdown** command.

The Cisco NAM 2220 appliance reboots after you press the Power button.

Verifying System Status

To verify the status of an installation, upgrade, or downgrade or to troubleshoot problems, use commands from those listed in [Table 5-1, Common Diagnostic and Show Commands](#).



Note

Among keyword options for many **show** commands is provision to display diagnostic output on your screen or to pipe it to a file or a URL.

Table 5-1 Common Diagnostic and Show Commands

Command	Purpose
show audit-trail	Displays the web GUI logins and CLI access settings
show configuration	Displays the current bootloader configuration as entered using the configure command
show ip	Displays the IP parameters
show patches	Displays any installed patches
show tech-support	Displays general information about the host router that is useful to Cisco technical support for problem diagnosis

Table 5-1 Common Diagnostic and Show Commands (continued)

Command	Purpose
show time	Displays the NAM system time settings
show version	Displays information about the loaded router, software, or network module bootloader version, and also hardware and device information.

Configuring Logging Options and Generating Diagnostics

To configure logging options for NAM 2220 Appliance, use commands as needed from the list of common network module commands shown in [Table 5-2](#).


Note

Some keyword options for many of the **log** and **trace** commands is provision to display diagnostic output on your screen or to pipe it to a file or a URL.

Table 5-2 Common System Log Commands

Configuration Mode	Command	Purpose
host.domain#	show log	Displays the contents of the specified log.
	copy log	Saves the system log to a destination of your choice.
	show logs	Displays a list of available log files.

Resetting the NAM Root Password to the Default Value

If you lose the password you set up for the root user, you can reset the root password to its default value. To reset the NAM root password to default value:

Step 1 Establish a console connection to the NAM and issue the **reboot** command.

When the NAM begins to boot, it will display the **bootloader** for approximately ten seconds as shown in [Figure 5-6](#).

Figure 5-6 GNU GRUB Boot Loader

```

GNU GRUB version 1.96
-----
| NAM-AP |
| helper |
|        |
|        |
|        |
|        |
-----
2057/95

```

Per the instructions, use the **^** and **v** keys to select and highlight an entry. Press **Enter** to boot the selected OS, **'e'** to edit the commands before booting or **'c'** for a GNU command-line.

Step 2 Use the **"v"** key to select **helper**, and press **Enter**.

The **helper** utility menu displays as shown in [Figure 5-7](#).

Figure 5-7 Helper Utility Menu

```

=====
Cisco Systems, Inc.
Network Analysis Module (NAM2200) helper utility
Version 1.1(0.5-Eng)

-----
Main menu
1 - Download application image and write to HDD
2 - Download application image and reformat HDD
3 - Install application image from CD
4 - Display software versions
5 - Reset application image CLI passwords to default
6 - Change file transfer method (currently ftp/http)
7 - Send Ping
n - Configure network
r - Exit and reset Services Engine
h - Exit and shutdown Services Engine

Selection [1234567dnfrh]:

```

Step 3 Choose option **5** and press Enter.

The default password for user *root* is changed back to the default value of *root*.

What to Do Next

Verify that the default root password of *root* is accepted by performing the steps described in the [“Opening and Closing a Telnet or SSH Session to the NAM”](#) section on page 5-14.

To change the NAM root password, see the [“Changing the Root Password”](#) section on page 5-2.

Opening and Closing a Telnet or SSH Session to the NAM

This procedure opens and closes a Telnet or SSH session to the NAM. This procedure is not commonly performed, because you would typically use the NAM (web GUI) to monitor and maintain the NAM. If, however, you cannot access the NAM, then you might want to use Telnet or SSH to troubleshoot from the NAM CLI.

If your Cisco NAM 2220 appliance is not properly configured for Telnet or SSH access (see the following [Prerequisites, page 5-14](#) section), then you can open a Telnet session to the managed device to which the Cisco NAM 2220 appliance is connected, then open a NAM console session from the managed device.

Prerequisites

- Configure the NAM system IP address. Optionally, set the NAM system hostname.
- Verify NAM network connectivity by performing one of the following ping tests:
 - From a host beyond the gateway, ping the NAM system IP address.
 - From the NAM CLI, ping the NAM system default gateway.

Telnet Prerequisites

- Enter the **exsession on** NAM CLI command.

SSH Prerequisites

- Install the NAM software K9 cryptographic patch, which you can download from Cisco.com.
- Enter the **exsession on ssh** NAM CLI command.

SUMMARY STEPS

1. **telnet** {*ip-address* | *hostname*}
or
ssh {*ip-address* | *hostname*}
2. At the login prompt, enter **root**.
3. At the password prompt, enter your password.
or
If you have not changed the password from the factory-set default, enter **root** as the root password.
4. Perform the tasks that you need to perform in the NAM CLI. When you want to end the Telnet or SSH session to the NAM and return to the Cisco IOS CLI, complete [Step 5](#) and [Step 6](#).
5. **exit**
6. **logout**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<pre>telnet {ip-address hostname} or ssh {ip-address hostname}</pre> <p>Example: host.domain# telnet 10.20.30.40</p> <p>Example: host.domain# ssh 10.20.30.40</p>	<p>Logs in to a host that supports Telnet.</p> <p>or</p> <p>Starts an encrypted session with a remote networking device.</p> <ul style="list-style-type: none"> • Use the NAM system IP address or NAM system hostname.
Step 2	<p>At the login prompt, enter root.</p> <p>Example: login: root</p>	Accesses the root (read/write) level of NAM.
Step 3	<p>At the password prompt, enter your password.</p> <p>or</p> <p>If you have not changed the password from the factory-set default, enter root as the root password.</p> <p>Example: Password: root</p>	—

	Command or Action	Purpose
Step 4	Perform the tasks that you need to perform in the NAM CLI. When you want to end the Telnet or SSH session to the NAM and return to the Cisco IOS CLI, complete Step 5 and Step 6 .	For help using NAM CLI commands.
Step 5	exit Example: root@localhost(sub-custom-filter-capture)# exit root@localhost#	Leaves a subcommand mode. <ul style="list-style-type: none"> Return to command mode.
Step 6	logout Example: root@localhost# logout Connection closed by foreign host.	Logs out of the NAM system.

Examples

Opening and Closing a Telnet Session to the NAM Using the NAM System IP Address: Example

```

nam_host> telnet 172.20.105.215
Trying 172.20.105.215 ... Open

Cisco Network Analysis Module (NAM 2220 Appliance)

login: root
Password: <password>
Terminal type: vt100

Cisco Network Analysis Module (NAM 2220 Appliance) Console, 5.1
Copyright (c) 2011 by Cisco Systems, Inc.

WARNING! Default password has not been changed!
root@nam.company.com#
root@nam.company.com# logout

[Connection to 172.20.105.215 closed by foreign host]
nam_host>

```

Opening and Closing an SSH Session to the NAM Using the NAM System Hostname: Example

```

host [/home/user] ssh -l root@namappl
root@namappl's password: <password>
Terminal type: vt100

Cisco Network Analysis Module (NAM 2220 Appliance) Console, 5.1
Copyright (c) 2011 by cisco Systems, Inc.

WARNING! Default password has not been changed!
root@namappl.company.com#
root@namappl.company.com# logout

Connection to namappl closed.
host [/home/user]

```


Configuring the Monitored Device

After you connect an output interface of a monitored (or managed) device to the monitoring ports of the Cisco NAM 2220 appliance, you must also configure the monitored device to send data to that interface. You do this in two steps:

- [Configuring a Monitored Device Interface](#)
- Span the port of the monitored device to use the Cisco NAM 2220 appliance as a destination port

Configuring a Monitored Device Interface

At the monitored device, configure the connection to the Cisco NAM 2220 appliance as a trunk port, but use the no negotiate option. Using the no negotiate option on the monitored device, precludes the switch or router from performing dynamic trunk protocol (DTP) with the appliance monitoring port.

The following example shows how to configure a switch port connected to the appliance monitoring port as Te 7/29.

From the monitored device command line, enter a CLI command like the following:

show run interface Te 7/29

```
C7600_SUP720_69# show run interface Te 7/29
Building configuration...

Current configuration : 178 bytes
!
interface Te7/29
  description connected to pilot unit NAM2220
  switchport
  switchport trunk allowed vlan 10-20
  switchport mode trunk
  switchport nonegotiate
end
```

Creating a SPAN Session

A SPAN session is required to you can SPAN the monitored device's traffic to the port connected to the monitoring port of the appliance. You can create a SPAN session using the monitored device's CLI or using the NAM appliance GUI.

See *Cisco Prime Network Analysis Module User Guide*, for information about how to use the NAM GUI to set up the SPAN session.



CHAPTER 6

Backing up and Restoring NAM Configuration

You can install/ reinstall NAM on your Cisco NAM 2220 appliance. You might also use the downloadable software to restore your appliance software in the case of a catastrophic failure.

After you restore your appliance software, if you have backed up your NAM appliance configuration, you can restore that configuration and resume network monitoring without undue delay.

This chapter contains the following sections:

- [Backing Up Your Configuration](#)

After you complete any changes to your NAM appliance configuration, use the command-line interface to upload your NAM configuration to an archive server.

- [Restoring Your Configuration](#)

Use the command-line interface to restore your previous NAM configuration.



Note

In this release, upgrading the NAM software is not supported.

Backing Up Your Configuration

Before you begin the install/ reinstall process, we recommend that you perform a complete backup of your current NAM configuration.



Note

Having a backup configuration file can save you time and frustration if your NAM appliance should suffer a hard disk failure that requires you to reformat or repartition your hard disk drives.

To back up your current configuration, use the NAM CLI **config upload** command, as in the following example:

```
root@172-20-104-106.yourcorp.com# config upload
ftp://admin:secret@buserver//archive
Building configuration, please wait... Done.
```

```
Uploading the configuration to '172-20-104-106-nam-5.1.confg'
on 'ftp://admin:secret@buserver//archive', This may take few minutes ...
```

```
Uploading the namxml setup to 172-20-104-106-nam-5.1.confg.namxml.tar on
ftp://admin:secret@buserver//archive
```

```
Operation completed.
```

The **config upload** command sends a copy of the NAM running configuration and archive of NAMs setup files in XML format to the destination you specify. The copy of your configuration is stored in a back-up configuration file with an ending suffix of **.config** as in *NAM_host-nam2220-5.1.config*. The destination address should be a valid server name and directory path where you have read and write permissions.

Restoring Your Configuration

After you complete the installation of the NAM application software, you can restore your previous configuration if you have backed up your configuration as described in [Backing Up Your Configuration, page 6-1](#).

Use the **config network** command to restore your previous NAM configuration, as in the following example:

```
root@172-20-104-106.yourcorp.com# config network
ftp://admin:secret@buserver//archive/172-20-104-106-nam-5.1.config
Downloading
ftp://admin:secret@buserver//archive/172-20-104-106-nam-5.1.config, please wait ...

ftp://admin:secret@buserver//archive/172-20-104-106-nam-5.1.config (8K)
/tmp/lrcfile.txt.26012 [#####] 8K | 3536.73K/s
8409 bytes transferred in 0.00 sec (3485.68k/sec)
Downloading
ftp://admin:secret@buserver//archive/172-20-104-106-nam-5.1.config.namxml.tar,
please wait ...

ftp://admin:secret@buserver//archive/172-20-104-106-nam-5.1.config.namxml.tar (50K)
namxml.tar [#####] 50K | 4932.96K/s
51200 bytes transferred in 0.01 sec (4918.41k/sec)

Download completed.

Configuring the NAM. This may take few minutes, please wait ...

NAM configuration completed.
To view the results, use the command 'show log config'.
```



APPENDIX **A**

Maintaining the Cisco NAM 2220 Appliance

Your Cisco NAM 2220 appliance is configured to your order and is ready for installation and startup when it leaves the factory. After you install and configure your appliance, you might have to perform specific maintenance procedures and operations to ensure that the appliance is operating properly.

Following these preventive maintenance procedures can keep your appliance in top operating condition and minimize the need for costly, time-consuming service procedures.



Caution

To help prevent problems, before performing any procedures in this chapter, review the [“Safety Warnings”](#) section on page xi and the [“Safety Guidelines”](#) section on page 2-2.

The following sections discuss various environmental factors that can adversely affect appliance performance and longevity.

Maintaining Your Site Environment

Good preventive maintenance includes regular visual inspections of the appliance including exterior cleaning and inspection.

Other important areas are:

- [General Exterior Cleaning and Inspection, page A-2](#)
- [Cooling, page A-3](#)
- [Temperature, page A-3](#)
- [Humidity, page A-4](#)
- [Altitude, page A-4](#)
- [Electrostatic Discharge, page A-4](#)
- [Electromagnetic and Radio Frequency Interference, page A-4](#)
- [Magnetism, page A-5](#)
- [Power Source Interruptions, page A-5](#)

General Exterior Cleaning and Inspection

This section details the cleaning requirements for exterior surfaces of the appliance and the inspection of cables and adapter cards.

**Caution**

Never spray cleaning solution on the surfaces of the appliance. Overspray can penetrate into the appliance and cause electrical problems and corrosion.

Appliance

Use a lint-free, nonabrasive cloth to perform cleaning. *Do not* use a solvent, abrasive cleaning agents, or tissue paper. If the appliance is dirty (for example, with thick dust), use a soft damp cloth and wipe the surface of the appliance gently.

Immediately wipe off any water or liquid from the appliance.

Dust and Particles

A clean operating environment can greatly reduce the negative effects of dust and other particles, which act as insulators and interfere with the operation of an appliance's mechanical components. In addition to regular cleaning, you should follow these guidelines to deter contamination of the appliance:

- Do not permit smoking anywhere near the appliance.
- Do not permit food or drink near the appliance.

Cables and Connectors

Inspect cables and connectors to and from your appliance periodically to see if they are worn out or loose.

Adapter Cards

Check the connections on the adapter cards. Be sure they are secured to the appliance and have not been jarred loose or mechanically damaged.

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 adapter cards in the appliance. This corrosion on adapter card connectors is a gradual process that can eventually lead to intermittent failures of electrical circuits.

To prevent corrosion, you should avoid touching contacts on adapter cards. Protecting the appliance from corrosive elements is especially important in moist and salty environments, which tend to promote corrosion. Also, as a further deterrent to corrosion, the appliance should not be used in extreme temperatures, as explained in the [“Temperature” section on page A-3](#).

Cooling



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

Exhaust fans in the power supply and in the appliance itself cool the power supply and the appliance by drawing air in through various openings in the front of the appliance and blowing it out the back. However, the fans also draw dust and other particles into the appliance, causing contaminant buildup, which results in an increase in the appliance's internal temperature and interferes with the operation of various appliance components.

To avoid these conditions, we recommend keeping your work environment clean to reduce the amount of dust and dirt around the appliance, thereby reducing the amount of contaminants drawn into the appliance by the fans.

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 and can cause expansion and contraction of disk drive platters, resulting in read or write data errors.

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

- Ensure that the appliance is operated in an environment no colder than 50°F (10°C) or hotter than 95°F (35°C).
- Ensure that the appliance 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 where it will receive direct sunlight, particularly in the afternoon. 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. Appliance performance might not be optimum when the appliance is operating at high temperatures as well as high altitudes.

- Make sure that all slots and openings on the appliance remain unobstructed, especially the fan vents on the back of the appliance.
- Clean the appliance at regular intervals to avoid any buildup of dust and debris, which can cause an appliance to overheat.
- If the appliance 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 might cause damage to internal components, particularly the hard disk drive.

Humidity

High-humidity conditions can cause moisture migration and penetration into the appliance. 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 appliance can result in electrical shorts, which can cause serious damage to the appliance.

Each appliance 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 appliances. However, if an appliance is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range.

Altitude

Operating an appliance at high altitude (low pressure) reduces the efficiency of forced, 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.

Electrostatic Discharge

Electrostatic discharge (ESD) results from the buildup of static electricity on the human body and certain other objects. This 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 appliance. This static discharge can cause components, especially chips, to fail. ESD is a problem particularly in dry environments where the relative humidity is below 50 percent.

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

- Wear a grounding wrist strap. If a grounding wrist strap is unavailable, touch an unpainted metal surface on the appliance 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



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

Electromagnetic interference (EMI) and radio frequency interference (RFI) from an appliance can adversely affect devices, such as radio and television (TV) receivers operating near the appliance. Radio frequencies emanating from an appliance can also interfere with cordless and low-power telephones.

RFI is defined as any EMI with a frequency above 10 kilohertz (kHz). This type of interference can travel from the appliance 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 appliance meets these FCC regulations.

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

- Operate the appliance only with the appliance cover installed.
- Ensure that the screws on all peripheral cable connectors are securely fastened to their corresponding connectors on the back of the appliance.

Magnetism

Because they store data magnetically, hard disk drives are susceptible to the effects of magnetism. Hard disk drives should never be stored near magnetic sources such as the following:

- Monitors
- Printers
- Telephones with real bells
- Fluorescent lights

Power Source Interruptions

Appliances are especially sensitive to variations in voltage supplied by the AC power source. Overvoltage, undervoltage, and transients (or spikes) can erase data from the memory or even cause components to fail. To protect against these types of problems, power cables should always be properly grounded and one or both of the following methods should be used:

- Place the appliance on a dedicated power circuit (rather than sharing a circuit with other electrical equipment). In general, do not allow the appliance to share a circuit with any of the following:
 - Copier machines
 - Teletype machines
 - Laser printers
 - Facsimile machines
 - Any other motorized equipment

Besides the above equipment, the greatest threats to an appliance's supply of power are surges or blackouts caused by electrical storms.

If a blackout occurs—even a temporary one—while the appliance is turned on, turn off the appliance immediately and disconnect it from the electrical outlet. Leaving the appliance on might cause problems when the power is restored.



APPENDIX **B**

Monitor Port Requirements

This appendix provides information about the specifications of fiber optical cables, XFP modules, and optical tap devices supported on the Cisco NAM 2220 appliances.

This appendix contains the following sections:

- [XFP Modules](#)
- [Cables, page B-2](#)
- [Optical Tap Devices, page B-3](#)

XFP Modules

The Cisco NAM 2220 appliance uses up to two 10 GB Ethernet XFP modules to connect fiber optical cables as monitoring input sources. The XFPs can both be long range (LR) or both be short range (SR), or you can install one of each. Depending on the type of XFP you use, you must use the correct fiber optical cables.

The XFP module uses the bail clasp latching mechanism as shown unlatched in [Figure 4-2](#) and latched in [Figure 4-3](#). See the label on the XFP for technology type and model.

XFP dimensions are:

- Height 0.33 inches (8.5 mm)
- Width 0.72 inches (18.3 mm)
- Depth 3.1 inches (78 mm)

XFP temperature ranges are:

- COM—Commercial operating temperature range between 23 degrees Fahrenheit to 158 degrees Fahrenheit (-5 degrees Celsius to 70 degrees Celsius)
- EXT—Extended operating temperature range between 23 degrees Fahrenheit to 185 degrees Fahrenheit (-5 degrees Celsius to 85 degrees Celsius)
- IND—Industrial operating temperature range between -40 degrees Fahrenheit to 185 degrees Fahrenheit (-40 degrees Celsius to 85 degrees Celsius)



Caution

Do not add labels or markings to the XFPs.

Table B-1 lists third-party 10 GBASE XFP modules that have been tested for use in the Cisco NAM 2220 appliance.

**Note**

Third-party XFP transceiver modules that meet the specifications of Cisco NAM 2220 appliance XFP modules can be used in place of Cisco XFPs. However, Cisco TAC will not support third-party XFPs.

Table B-1 Qualified OEM 10GBASE XFP Modules

Vendor	Model Number	Type
Finisar	FTLX1411D3	LR
MergeOptics	TRX10GVP2001	SR
	TRX10GDP0x01	LR
Picolight	PL-XXL-SC-S43-C1	SR
Sumitomo (ExceLight)	SXP3101LX	LR

Cables

The Cisco NAM 2220 appliance uses two types of fiber optical cables depending upon the XFP transceiver module you use. For short range XFPs, the appliance uses multi-mode (MM) fiber optical cables. For long range XFPs, the appliance uses single-mode (SM) fiber optical cables.

**Note**

Fiber optical cables are not included with the Cisco NAM 2220 appliance.

Table B-2, [XFP Port Cable Specifications](#), provides cable specifications for the Cisco NAM 2220 appliance monitoring ports.

Table B-2 XFP Port Cable Specifications

XFP Module	Wavelength	Cable Type	Core Size (micron)	Mondal Bandwidth (Mhz *km)	Cable Distance
(XFP-10GBASE-SR)	850 nm	MMF	62.5	160	26 m
			62.5	200	33 m
			50.0	400	66 m
			50.0	500	82 m
			50.0	2000	300 m
(XFP-10GBASE-LR)	1310 nm	SMF	G.652	-	10 km (10 Gigabit Ethernet)

Optical Tap Devices

You can use an optical tap device to get a copy of traffic flows between two network devices. Passive taps, such as optical tap devices, ensure that the flowing traffic is not altered regardless of its connection to the NAM appliance and provide a very low point of failure.

Traffic flows will be interrupted while you connect an optical tap, but doing so should take less than a minute and can be done during a network maintenance window.

NAM appliances are designed to receive tapped network traffic from both directions, from multiple links simultaneously, and to accurately merge received traffic to a single stream for high precision analysis.

Although passive optical taps do not alter the network characteristics and dynamics of flowing traffic, an optical tap does reduce the signal strength, so care should be taken to follow the tap specifications including your network link length and tapping location.



Note

Pay attention to the optical split ratio of your passive taps with regard to your optical cable lengths. If the cable between the two devices or the cable from the tap to your NAM appliance is very long, you might need to select a different split ratio other than 50/50 to make sure the receive side signals on your two devices and NAM appliance are all strong enough to not introduce any line errors. Refer to user instructions of your optical tap device for more information.

Table B-3 lists the 10 GE optical tap devices that have been successfully tested with the Cisco NAM 2220 appliance in a tap configuration.

Table B-3 **10 Gb Optical Taps**

Vendor	Product Description	Model
NetOptics	10 GigaBit Fiber Tap (MM50:50 850 nm SC)	TP-SR4-SCSLM
	10 GigaBit Fiber Tap (MM50:50 850 nm SC)	TP-SR5-SCSLM
	10 GigaBit Fiber Tap (SM50:50 1310 nm SC)	TP-LR5-SCSLM
DataCom Systems	Single channel 10 Gb passive Tap	F50/50/9-S-10G
Network Critical	SMF 9 850/1300NM supports 1000 base-LX, 10 Gig-LR, 10 Gig-ER	FO-S15002-LC
	MMF 50 850/1300NM supports 1000 base-SX, 10 Gig-SR	FO-M35002-LC

Breakout Mode Configuration

To use breakout mode configuration, use an optical tap to split the Tx and Rx signals of two connected devices so the NAM appliance receives the Tx of both devices to observe the transmitted output of each device.

There are two breakout mode configurations:

- Tx of one direction of the monitored data traffic is replicated on Tx of one breakout port and Tx of the other direction of the monitored data traffic is replicated on Tx of the other breakout port.

This case provides two output replicated ports: one for Tx in one direction and one for Tx of the other direction. Each replicated port is an input to a different monitoring port of the appliance to monitor both directions of traffic.

- Tx of one direction of the monitored data traffic is replicated in one Tx connection of the breakout port and Tx of the other direction of the monitored data traffic is replicated on the other Tx connection of the same breakout port.

This case provides only one replicated port which has Tx of both directions. This case requires you to split the connectors of one fiber optical cable and put one connector into one appliance monitoring port and put the other connector into a different appliance monitoring port.



APPENDIX **C**

Troubleshooting

The Cisco 2220 NAM appliance undergoes extensive testing before it leaves the factory. If you encounter problems, use the information in this appendix to help isolate problems or to eliminate the appliance as the source of the problem.

Although an overtemperature or overvoltage condition is unlikely at initial startup, a discussion of environmental temperature and voltage monitoring functions is provided in the [“Environmental Monitoring” section on page 1-12](#).



Note

The procedures in this chapter assume that you are troubleshooting the initial Cisco 2220 NAM appliance startup, and that the appliance is in the original factory configuration. If you have removed or replaced components or changed any default settings, the recommendations in this chapter might not apply.

This appendix does not cover every possible trouble event that might occur on an appliance but instead focuses on those events that are frequently seen by the customer.

This appendix contains the following sections:

- [Troubleshooting Overview, page C-1](#)
- [Problem Solving, page C-2](#)
- [Reading the LEDs, page C-5](#)
- [Product Serial Number Location, page C-7](#)

Troubleshooting Overview

Before and at initial system boot, you should verify the following:

- External power cable is connected, and the proper power source is being applied. (See the [“Power Considerations” section on page 2-9](#), the [“Powering Up the Cisco NAM 2220 Appliance” section on page 3-16](#), and the [“Troubleshooting the Power and Cooling Systems” section on page C-3](#).)
- The appliance fan and blower are operating. (See the [“Airflow Guidelines” section on page 2-8](#) and the [“Troubleshooting the Power and Cooling Systems” section on page C-3](#).)
- The appliance software boots successfully.
- The adapter cards (if installed) are properly installed in their slots, and each initializes (is enabled by the appliance software) without problems.

When each of these conditions is met, the hardware installation is complete, and you should proceed to perform a basic configuration (see the software installation guide or user guide that shipped with your appliance for proper configuration procedures).

If you cannot locate the source of the problem, contact a customer service representative for information on how to proceed. For technical support information, see the *Cisco Information Packet* publication that shipped with your appliance. Before you call, have the following information ready:

- Appliance chassis type and serial number (see the “[Cisco Product Identification Tool](#)” section on page 1-5 or the “[Cisco Product Identification Tool](#)” section on page C-7 for more information)
- Maintenance agreement or warranty information (see the *Cisco Information Packet*)
- Type of software and version number (if applicable)
- Date you received the new appliance
- Brief description of the problem you are having and the steps you have taken to isolate and resolve the problem

**Note**

Ensure you provide the customer service representative with any upgrade or maintenance information that was performed on the Cisco 2220 NAM appliance after your initial installation. (See the “[Creating a Site Log](#)” section on page 2-15 and [Appendix D, “Site Log,”](#) for Site Log information.)

Problem Solving

The key to problem solving is to isolate the problem to a specific location by comparing what the Cisco NAM 2220 appliance is doing to what it should be doing.

In other words, when troubleshooting, define the specific symptoms, identify all potential problems that could be causing the symptoms, and then systematically eliminate each potential problem (from most likely to least likely) until the symptoms disappear.

The following steps provide guidelines to use in the problem-solving process:

-
- Step 1** Analyze the problem and create a clear problem statement. Define symptoms and potential causes.
 - Step 2** Gather the facts that you need to help isolate possible causes.
 - Step 3** Consider possible causes based on the facts that you gathered.
 - Step 4** Create an action plan based on those causes. Begin with the most likely problem and devise a plan in which you manipulate only one variable.
 - Step 5** Implement the action plan. Perform each step carefully while testing to see whether the symptom disappears.
 - Step 6** Analyze the results to determine whether the problem has been resolved. If the problem was resolved, consider the process complete.
 - Step 7** If the problem has not been resolved, create an action plan based on the next most probable cause on your list. Return to [Step 4](#) and repeat the process until the problem is solved.
 - Step 8** Make sure that you undo anything that you changed while implementing your action plan. Remember that you want to change only one variable at a time.
-

**Note**

The LEDs on the front panel of the appliance enable you to determine appliance performance and operation. For a description of these LEDs, see the [“Reading the LEDs” section on page C-5](#).

When problem solving, check the following appliance subsystems first:

- Power and cooling systems—External power source, AC power cable or DC power wires, and appliance fans. Also check for inadequate ventilation, air circulation, or environmental conditions.
- Adapter cards—Checking the LEDs on the adapter card can help you to identify a failure.
- Cables—Ensure that the external cables connecting the appliance to the network are all secure.

Troubleshooting the Power and Cooling Systems

Both the power LED and the fans can help you troubleshoot a power problem. Check the following items to help isolate the problem:

- When the Cisco 2220 NAM appliance is connected to the power source, is the appliance power LED on the front panel on?
 - If not, check the connection of the AC power cord or DC power wires.
 - If the power LED is still off, the problem might be a power supply failure.
- Does the appliance shut down after being on for only a short time?
 - Check for an environmentally induced shutdown (see the [“Environmental Reporting Features” section on this page](#)).
 - Check the fans. If the fans are not working, the appliance will overheat and shut itself down.
 - If the fans are not working, you might need to check the power supply connections to the fans.
 - Ensure that the appliance intake and exhaust vents are clear.
 - Check the environmental site requirements in the [“Temperature and Humidity Guidelines” section on page 2-9](#).
- Does the appliance partially boot, but the LEDs do not light?
 - Check for a power supply failure by inspecting the power LED on the front panel of the appliance. If the LED is on, the power supply is functional.
 - If the LED is off, refer to the *Cisco Information Packet* for warranty information or contact your customer service representative.

Environmental Reporting Features

The Cisco 2220 NAM appliance has protection circuits that monitor and detect overcurrent, overvoltage, and overtemperature conditions inside the appliance. If the power supply shuts down or latches off, an AC cycle of off for 15 seconds and on for 1 second resets the power supply. For more information, see the [“Environmental Monitoring” section on page 1-12](#).

The following conditions can cause an abnormally high appliance temperature:

- Fan failure
- Air conditioner failure in the room
- Airflow blocked to cooling vents

Take steps to correct the problem. For information about environmental operating conditions, see the [“Temperature and Humidity Guidelines”](#) section on page 2-9.

Troubleshooting Adapter Cards, Cables, and Connections

Network problems can be caused by an adapter card, cables or cable connections, or external devices such as a hub, wall jack, WAN interface, or terminal. Check for the following symptoms to help isolate the problem:



Note

When connecting the Cisco NAM 2220 appliance monitoring ports to a 10 GE port on a switch or router such as Xenpack, ensure that the XFPs on both ends of the connection are the same type, either long range (LR) or short range (SR). Connections with LR on one end and SR on the other end will not function.

- Adapter card is not recognized by the Cisco 2220 NAM appliance.
 - Make sure that the adapter card is firmly seated in its slot. For information on adapter card installation and removal, see the [“Completing the Replacement”](#) section on page 4-2.
 - Check the LEDs on the adapter card. Each adapter card has its own set of LEDs. For information on these LEDs, see the [“Reading the LEDs”](#) section on page C-5.
 - Make sure that you have a version of software that supports the adapter card. Refer to the documentation that was included with your adapter card.
- Adapter card is recognized, but interface ports do not initialize.
 - Make sure that the adapter card is firmly seated in its slot. For information on adapter card installation and removal, see the [“Completing the Replacement”](#) section on page 4-2.
 - Check external cable connections.
 - Make sure that you have a version of software that supports the adapter card. Refer to the documentation that was included with your adapter card.
- The Cisco 2220 NAM appliance does not boot properly, or it constantly or intermittently reboots.
 - Make sure that the adapter card is firmly seated in its slot. For information on adapter card installation and removal, see the [“Completing the Replacement”](#) section on page 4-2.
 - Check the appliance chassis or the application software. For warranty information, refer to the *Cisco Information Packet* publication that shipped with your appliance or contact your customer service representative.
- If you are using the console port with a terminal, and the Cisco 2220 NAM appliance boots but the console window is frozen.
 - Check the external console connection.
 - Verify that the parameters for your terminal are set as follows:
 - (a) The terminal should have the same data rate that the appliance has (9600 bps is the default).
 - (b) 8 data bits.

- (c) No parity generated or checked.
- (d) 1 stop bit.
- The Cisco 2220 NAM appliance powers up and boots only when an adapter card is removed.
 - Check the adapter card. There might be a problem with the adapter card. Refer to the documentation that was included with your adapter card.
 - For warranty information, refer to the *Cisco Information Packet* publication that shipped with your appliance or contact your customer service representative.
- The Cisco 2220 NAM appliance powers up and boots only when a particular cable is disconnected.
 - There might be a problem with the cable. For warranty information, refer to the *Cisco Information Packet* publication that shipped with your appliance or contact your customer service representative.

Reading the LEDs

There are several LEDs on the Cisco 2220 NAM appliance. LEDs serve the following purposes:

- Indicate that basic power is available to the appliance
- Guide you to a broken adapter card, or to one that has failed its diagnostics
- Give an indication that traffic is flowing through the adapter card to the appliance

The LEDs on the front panel of the Cisco 2220 NAM appliance and corresponding adapter card are aids for determining appliance and adapter performance and operation.

Front-Panel LEDs

Figure C-1 shows the locations of the appliance's front-panel LEDs. Table C-1 describes these LEDs.

Figure C-1 Front-Panel LEDs

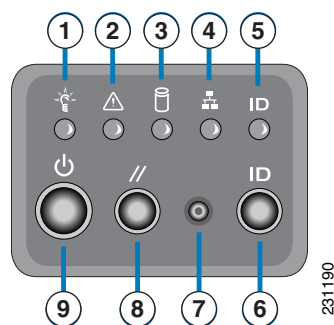


Table C-1 Front-Panel LEDs

Loc.	LED	Color	State	Description
1	Appliance Power	Green	On	Power on
		Off	Off	Power off

Table C-1 Front-Panel LEDs (continued)

Loc.	LED	Color	State	Description
2	Appliance Status	Green	On	Standby or ready for operation
		Green	Blinking	Degraded operation (for example, power supply nonredundancy, part of system memory mapped out of BIOS)
		Amber	On	One or more critical fault conditions
		Amber	Blinking	One or more noncritical fault conditions
3	Hard Disk Drive	Green	On	HDD activity
		Amber	On	HDD fault Note This is an aggregated indication for all hard disk drives. Each hard disk drive contains its own activity and fault LEDs.
4	NIC	Green	On	NIC activity
5	System ID	Blue		System identity Note LED can be toggled remotely or by the front-panel ID switch to obtain the system's identity.

NIC LEDs

Figure C-2 shows the NIC 1 LEDs located on the rear of the appliance. These LEDs indicate the connection activity and speed of the NIC ports. Table C-2 on page C-7 describes the activity and connection speed associated with each LED state.

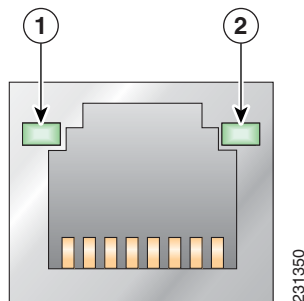
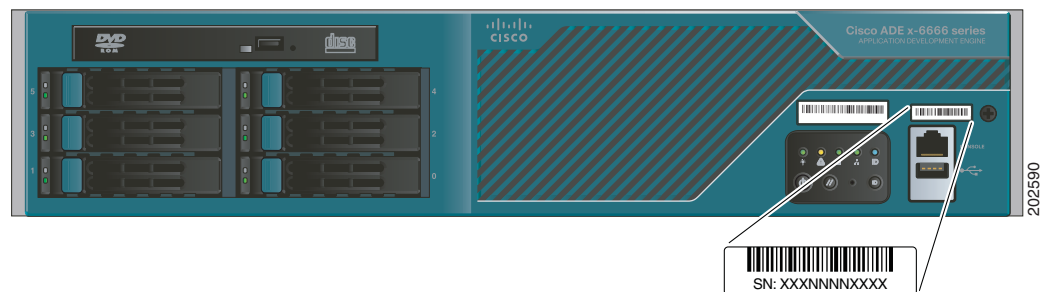
Figure C-2 NIC 1 LEDs

Table C-2 NIC 1 LED Descriptions

Loc.	LED	Color	State	Description
1	Left		Off	No network connection
		Green	Solid	Network connection
		Green	Blinking	Transmit/receive activity
2	Right		Off	10-Mb/s connection (if left LED is on or blinking)
		Green	Solid	100-Mb/s connection
		Amber	Solid	1000-Mb/s (or 1-Gb/s) connection

Product Serial Number Location

On the Cisco 2220 NAM appliance, the serial number label is located on the right-hand corner above the RJ-45 serial connector on the front of the appliance. (See [Figure C-3](#).)

Figure C-3 Cisco 2220 NAM Appliance Serial Number Location**Note**

The serial number for the Cisco 2220 NAM appliance is 11 characters long.

Cisco Product Identification Tool

The Cisco Product Identification (CPI) tool helps you retrieve the serial number of your Cisco products. Before you submit a request for service online or by phone, use the CPI tool to locate your product serial number. You can access this tool from the Cisco Support website by clicking the **Get 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:

- Search by product ID or model name
- Browse for Cisco model
- Copy and paste the output of the **show** command to identify the product

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 you place a service call.

The CPI tool is accessed via Cisco.com at the following URL:

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

Access to the CPI tool on the Cisco Support 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:

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



APPENDIX **D**

Site Log

The Site Log provides a record of all actions related to installing and maintaining the Cisco 2220 NAM appliance. Keep the log in an accessible place near the appliance chassis so that anyone who performs tasks has access to it. Use the Installation Checklist (see the [“Installation Checklist”](#) section on [page 2-15](#)) to verify the steps in the installation and maintenance of your appliance.

Site Log entries might include the following:

- Installation progress—Make a copy of the appliance Installation Checklist, and insert it into the Site Log. Make entries as you complete each task.
- Upgrade, removal, and maintenance procedures—Use the Site Log as a record of ongoing appliance maintenance and expansion history. Each time a task is performed on the appliance, update the Site Log to reflect the following:
 - Configuration changes
 - Maintenance schedules and requirements
 - Maintenance procedures performed
 - Intermittent problems
 - Comments and notes

[Table D-1 on page D-2](#) shows a sample site log. Make copies of the sample or design your own site log to meet the needs of your site and equipment.



BIOS Settings

This appendix lists the BIOS settings used in the Cisco NAM 2220 appliance. The appliance uses BIOS version 88.



Note

We recommend that you do not change any of these BIOS settings.

Table E-1 Cisco 2220 NAM Appliance BIOS Settings

Type	CMOS Setup Menu Contents	Setting
Main	Quiet Boot	Enabled
	POST Error Pause	Disabled
	System Date	Use CLI clock set command to set current date and time.
	System Time	
Advanced—Processor	Core Frequency	n/a
	System Bus Frequency	n/a
	Enhanced Speed Step	Enabled
	Core-Multi Processing	Enabled
	Virtualization Technology	Disabled
	Simulated MSI Support	Enabled
	Execute Disable Bit	Enabled
	Hardware Prefetcher	Enabled
	Adjacent Cache Line Prefetch	Enabled
	Processor Retest	Disabled
Advanced—Memory	Memory Mirroring Possible	Display only
	Memory Sparing Possible	
	Select Memory RAS Configuration	RAS Disabled
	Snoop Filter	Enabled
	FSB High Bandwidth Optimization	Disabled

Table E-1 Cisco 2220 NAM Appliance BIOS Settings (continued)

Type	CMOS Setup Menu Contents	Setting
Advanced—ATE Controller	Onboard PATA Controller	Enabled
	Onboard SATA Controller	Enabled
	SATA Mode	Enhanced
	AHCI Mode	Disabled
	Configure SATA as RAID	Disabled
Advanced—Mass Storage Controller	SAS Controller	Enabled
	Hardware-RAID Activation Key Present	Always installed
Advanced—Serial Port	Serial Port A Enable	Enabled
	Address	3F8
	IRQ	4
	Serial Port B Enable	Enabled
	Address	2F8
	IRQ	3
Advanced—USB Configuration	USB Controller	Enabled
	Legacy USB Support	Enabled
	Port 60/64 Emulation	Disabled
	Device Reset Timeout	20 seconds
	USB 2.0 Controller	Enabled
Advanced—PCI	Memory Mapped I/O Start Address	2.5 GB
	Memory Mapped I/O Above 4 GB	Disabled
	Onboard Video	Enabled
	Dual Monitor Video	Disabled
	Onboard NIC ROM	Enabled
	I/O Module NIC ROM	Enabled
	Intel I/OAT	Enabled
Advanced—System Acoustic and Performance Configuration	Set Fan Profile	Performance
	Altitude	301 m - 900 m
Advanced—Server	Admin Password	—
	User Password	—
	Front Panel Lockout	Disabled

Table E-1 Cisco 2220 NAM Appliance BIOS Settings (continued)

Type	CMOS Setup Menu Contents	Setting
Server Management	Assert NMI on SERR	Enabled
	Assert NMI on PERR	Enabled
	Resume on AC Power Loss	Last State
	Clear system Event Log	Disabled
	FRB-2 Enable	Enabled
	OS Boot Watchdog Timer	Disabled
	OS Boot Watchdog Timer Policy	Linked to above.
	Plug & Play BMC Detection	Enabled
Server Management—Console Redirection	Console Redirection	Serial Port B
	Flow Control	None
	Baud Rate	9.6 K
	Terminal Type	VT-100
Boot Options	Boot Timeout	10 seconds
	Boot Option #1	CD
	Boot Option #2	Hard Drive
	Boot Option #3	[EFI Shell]
Boot Manager	CD	
	Hard Drive	
	[EFI Shell]	
Error Manager		



APPENDIX F

Using the Recovery CD

You can use the recovery CD to reinstall NAM application software on your Cisco NAM 2220 appliance if your appliance should suffer a catastrophic event, such as a hard disk crash, and you can no longer boot the NAM application.



Note

The information found in [Chapter 6, “Backing up and Restoring NAM Configuration”](#), helps you prepare to recover from a catastrophic event.

After you use the recovery CD to reinstall the NAM application image, you can use the command-line interface (CLI) to restore the most recent configuration file to the NAM appliance if you have stored a configuration file at an accessible location. See [“Backing Up Your Configuration” section on page 6-1](#), for more information.

The recovery CD is part of the NAM software kit (part number NAM-APPL-SW-5.1).

Booting the Recovery CD

When you boot the Cisco NAM 2220 appliance from the recovery CD, the NAM appliance console will temporarily display the bootloader window. After this window displays for ten seconds, the Cisco NAM 2220 appliance will automatically boot the NAM application software.

When using the recovery CD, choose **helper** and press **Enter** within that 10 second interval to get to the helper utility Menu. Otherwise, you might have to reboot the Cisco NAM 2220 appliance again.

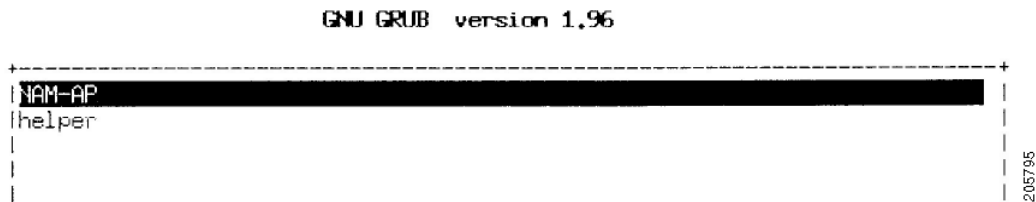
To use the recovery CD:

Step 1 Insert the NAM Software Recovery CD-ROM into the DVD-ROM drive on the front panel of the Cisco NAM 2220 appliance.

Step 2 From the NAM console or command line, enter the **reboot** command.

The Cisco NAM 2220 appliance performs a reset and launches the GNU GRUB boot loader and displays the window shown in [Figure F-1](#). This window displays for about ten seconds enabling you to select to boot the **helper utility** instead of the NAM application software (NAM-AP in [Figure F-1](#)).

Figure F-1 GNU GRUB Boot Loader

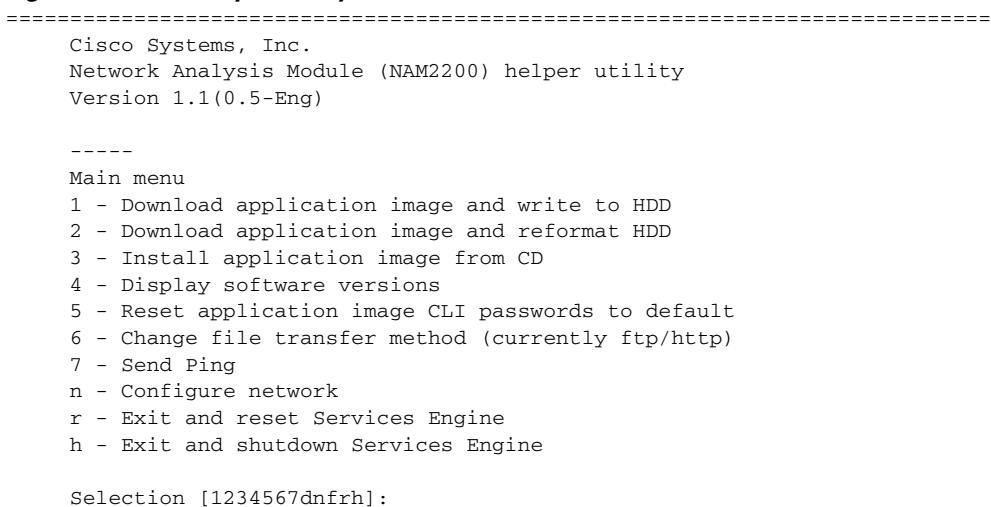


Per the instructions, use the ^ and v keys to select which entry is highlighted. Press **Enter** to boot the selected OS, 'e' to edit the commands before booting or 'c' for a GNU command-line.

Step 3 Use the “v” key to select **helper**, and press **Enter**.

The helper utility menu displays as shown in Figure F-2.

Figure F-2 Helper Utility Menu



See the next section, [Helper Utility Menu Options](#), for more information about the options.

Helper Utility Menu Options

This section describes the [Helper Utility Menu](#), what each option does, and any requirements for using a particular option.



Note

Before you can use menu items 1 and 2, you must first use menu item **n** to configure network parameters for the appliance.

Possible selections for the top level of the helper utility menu are **1**, **2**, **3**, **4**, **5**, **6**, **7**, **d**, **n**, **f**, **r**, and **h**.

Option n - Configure Network

Use **Option n** to configure the network parameters for the appliance.

Step 1 When the Configure Network Interface menu displays, enter **2** to configure manually.

```
-----
Configure Network interface:
1 - Use application image configuration
2 - Configure manually
3 - Show config
r - return to main menu
```

```
Selection [123r]: 2
```

Step 2 The utility prompts you for the IP address, netmask, and default gateway for the appliance.

```
Enter IP configuration:
IP address []: 172.20.122.93
netmask []: 255.255.255.128
default gateway []: 172.20.122.1
```

```
-----
Configure Network interface:
1 - Use application image configuration
2 - Configure manually
3 - Show config
r - return to main menu
```

```
Selection [123r]
```

Step 3 Check your network configuration using Configure Network menu option 3.

```
Selection [123r]: 3
```

```
eth0      Link encap:Ethernet  HWaddr 00:0E:0C:EE:50:3E
          inet addr:172.20.122.93  Bcast:172.20.122.127  Mask:255.255.255.128
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:210 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:13632 (13.3 KiB)  TX bytes:0 (0.0 b)
```

```
Kernel IP routing table
```

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
172.20.122.0	0.0.0.0	255.255.255.128	U	0	0	eth0	
0.0.0.0	172.20.122.1	0.0.0.0	UG	0	0	eth0	

```
-----
Configure Network interface:
1 - Use application image configuration
2 - Configure manually
3 - Show config
r - return to main menu
```

```
Selection [123r]:
```

Option 1 - Download Application Image and Write to HDD

Prior to using **Option 1**, first use **Option n** to configure the network.

Use **Option 1** to download a version of the NAM application image from an FTP server location and write the image to the hard disk drive. This option requires network connectivity and that network parameters be configured for the Cisco NAM 2220 appliance using helper menu item **n**.

This option enables you to download an image you might have stored at an FTP location or at a location you can access using **http**. You can download the latest version of NAM software from the following URL:

<http://www.cisco.com/cgi-bin/tablebuild.pl/nam-appl>

This URL requires you to have a Cisco service agreement and access to the internet to download the zipped software.

Option 2 - Download Application Image and Reformat HDD

Prior to using **Option 2**, first use **Option n** to configure the network.

Use **Option 2** to download the NAM application image and write the image to the hard disk drive. This option downloads a version of the NAM application image from an FTP server location or at a location you can access using **http**.

Using this option reformats the hard disk drives before writing the application image and will destroy all data such as reports or data captures.

You can also [download the latest version](#) from Cisco.com.

Option 3 - Install Application Image from CD

Use **Option 3** to install the NAM application image from the recovery CD. This option might be necessary if you are unable to connect to your network and download a version of NAM software you archived earlier.



Note

The version of NAM software available on the recovery CD is the first release of the software and has no patches or upgrades. If you use this option, see [Restoring Your Configuration, page 6-2](#).

This option reformats the hard disk drives before writing the application image and will destroy all data such as reports or data captures.

Option 4 - Display Software Versions

Use **Option 4** to display the current NAM application image version stored on your hard disk.

```
Selection [123456789dnfrh]:5
-----
NAM application version: 5.1(1)
Selection [123456789dnfrh]:
```


Option 5 - Reset Application Image CLI Passwords to Default

Use **Option 5** to reset the password for users root and admin to their default values.

Option 6 - Change File Transfer Method

Use **Option 6** to change the file transfer method. This option is only necessary if you change the file transfer method by mistake. Only **FTP** and **http** are supported.

```
Selection [123456789dnfrh]: 7
-----
Change file transfer method menu
The current file transfer method is ftp/http.
1 - Change to FTP/HTTP
r - return to main menu
```

Option 7- Send Ping

Use **Option 7** to send a ping to determine if network connectivity exists. When prompted, enter the IP address or full domain name of the location to send the ping.

```
IP address to ping []: 172.20.122.91

Sending 5 ICPM ECHO_REQUEST packets to 172.20.122.91.
PING 172.20.122.91 (172.20.122.91) 56(84) bytes of data.
64 bytes from 172.20.122.91: icmp_seq=1 ttl=64 time=0.151 ms
64 bytes from 172.20.122.91: icmp_seq=2 ttl=64 time=0.153 ms
64 bytes from 172.20.122.91: icmp_seq=3 ttl=64 time=0.125 ms
64 bytes from 172.20.122.91: icmp_seq=4 ttl=64 time=0.102 ms
64 bytes from 172.20.122.91: icmp_seq=5 ttl=64 time=0.166 ms

--- 172.20.122.91 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4000ms
rtt min/avg/max/mdev = 0.102/0.139/0.166/0.025 ms
```

Option r- Exit and Reset Services Engine

Use **Option r** to reset the NAM appliance prior to rebooting the newly installed NAM application image.

Before using **Option r**, remove the recovery CD from the CD drive to enable the NAM appliance to boot the application image.

Option h- Exit and Shutdown Services Engine

Use **Option h** to reset and shut down the NAM appliance.

```
-----
Option h for recovery CD
Selection [123456789dnfrh]: h
About to exit and reset NAM.
Are you sure? [y/N] :y
Stopping internet superserver: inetd.
Stopping OpenBSD Secure Shell server: sshd.
Stopping internet superserver: xinetd.
Stopping internet superserver: xinetd-ipv4.
```

```

: done.
Shutting down NAM (NAM2200), part 1:
Stopping klogd . . .
Stopping syslogd . . .
Sending all processes the TERM signal... done.
Sending all processes the KILL signal... done.
Unmounting remote filesystems... done.
Deactivating swap...done.
Unmounting local filesystems...done.
Starting halt command: halt
md: stopping all md devices.
Synchronizing SCSI cache for disk sdb:
FAILED
  status = 1, message = 00, host = 0, driver = 08
  <6>sd: Current: sense key=0x5
    ASC=0x20 ASCQ=0x0
Synchronizing SCSI cache for disk sda:
FAILED
  status = 1, message = 00, host = 0, driver = 08
  <6>sd: Current: sense key=0x5
    ASC=0x20 ASCQ=0x0
ACPI: PCI interrupt for device 0000:07:00.1 disabled
ACPI: PCI interrupt for device 0000:07:00.0 disabled
Power down.
acpi_power_off called
-----

```

Restoring the NAM Appliance Configuration

If you have stored your NAM configuration file at a remote server location you can access using FTP or HTTP, you can restore your NAM configuration file after a system recovery. See [Backing Up Your Configuration, page 6-1](#) and [Restoring Your Configuration, page 6-2](#).



INDEX

Numerics

- 2-post hardware kit
 - rack-mount [4-21](#)
- 2-post rack, mid-mounting appliance on [4-22](#)
- 4-post hardware kit
 - rack-mount [3-5](#)

A

- AC power up
 - procedure [3-16](#)
- adapter cards
 - troubleshooting [C-4](#)
- adapter pinouts [1-11](#)
- ADE 2130 and 2140 Series appliance
 - front view [1-4](#)
 - rear view [1-6](#)
- airflow
 - guidelines [2-8](#)
- altitude
 - guidelines [A-4](#)
- auxiliary port
 - pinouts [1-11](#)

B

- Backing up appliance configuration [6-1](#)
- back panel [1-6, 3-11](#)
- Boot loader [F-1](#)
- bootloader [5-13](#)

C

- cable
 - management [3-15](#)
- checking
 - LEDs [3-17](#)
- checklist, installation [2-15](#)
- CLI commands
 - exsession [5-4](#)
 - ip broadcast [5-4](#)
 - ip domain [5-4](#)
 - ip gateway [5-4](#)
 - ip host [5-4](#)
 - ip interface [5-3](#)
 - ip nameserver [5-5](#)
 - ping [5-5](#)
 - show ip [5-5](#)
- Configuration
 - backing up [6-1](#)
 - checking [5-5](#)
 - restoring [6-2](#)
- configuration
 - site [2-8](#)
- Configuring
 - broadcast address [5-4](#)
 - ip address [5-3](#)
 - NAM interface for management traffic [5-3](#)
- connecting
 - network interface [3-12](#)
- connections
 - console port [2-16](#)
 - Ethernet [2-16](#)
 - troubleshooting [C-4](#)

considerations
 power [2-9](#)
 Console [3-12](#)
 console port
 connections [2-16](#)
 pinouts
 serial [1-10](#)
 serial [1-9](#)
 console port signaling cabling, DB-9 (table) [1-11](#)
 Console terminal configuration [3-12](#)
 Conventions [iii-xi](#)
 cooling system
 troubleshooting [C-3](#)
 corrosion
 preventing damage [A-2](#)
 CPI tool
 identification [1-5, C-7](#)

D

dust
 preventing damage [A-4](#)

E

electricity
 safety with [2-3](#)
 electromagnetic interference
 See EMI
 electrostatic discharge
 See ESD
 EMI
 preventing effects of [A-4](#)
 environment
 maintaining [A-1](#)
 site [2-8](#)
 environmental
 features [C-3](#)

 specifications (table) [2-9](#)
 equipment
 racks
 rack-mounting [2-9](#)
 safety with [2-3](#)
 ESD
 preventing damage [2-5, A-4](#)
 preventing effects of [A-4](#)
 Ethernet
 connections [2-16](#)
 Ethernet ports
 NIC [1-8](#)

F

features
 environmental reporting [C-3](#)
 front panel
 LEDs and switches [1-5](#)
 front view
 ADE 2130 and 2140 Series appliance [1-4](#)

G

general
 precautions [2-2](#)
 GNU GRUB [F-1](#)
 guidelines
 airflow [2-8](#)
 lifting [2-5](#)
 rack installation [2-7](#)
 rack-mounting configuration [3-3](#)
 safety [2-2](#)
 temperature and humidity [2-9](#)
 temperature maintenance [A-3](#)

H

hardware

- installing [3-1](#)
- options [4-2](#)
- troubleshooting procedures [C-1](#)

helper utility [F-1](#)

humidity

- maintenance guidelines [A-4](#)
-

I

identification

- CPI [1-5, C-7](#)

information

- packet [2-13](#)

installation

- checklist [2-15](#)
 - hardware [3-1](#)
-

K

kit

- 2-post rack-mount (table) [4-22](#)
 - 4-post rack-mount (table) [3-5](#)
-

L

LEDs

- checking [3-17](#)
- front panel [1-5](#)
- front panel and NIC [C-5](#)
- NIC [1-7](#)
- power supply [1-8](#)

lifting guidelines [2-5](#)

location

- serial number [1-4, C-7](#)

log, site [2-15, D-1](#)Login prompt [5-2](#)

- logging in for the first time [5-1](#)
-

M

magnetism

- preventing effects of [A-5](#)

maintenance [A-1](#)

- temperature [A-3](#)

management

- cable [3-15](#)

method of procedures

- See* MOP

MOP [2-6, 2-10](#)**N**

network interface

- connecting [3-12](#)

NIC

- Ethernet ports [1-8](#)
 - LEDs [1-7](#)
 - RJ-45 pinout [1-9](#)
-

O

options

- hardware [4-2](#)

overcurrent

- protection [1-12](#)

overtemperature

- protection [1-12](#)

overview

- product [1-2](#)

overvoltage

- protection [1-12](#)

P

packet
 information [2-13](#)

packing list (table) [2-11](#)

Password
 default [5-14](#)

planning
 site [2-6](#)

power
 considerations [2-9](#)

power source interruptions
 preventing damage from [A-5](#)

power supply
 about [4-17](#)
 description [1-11](#)
 LEDs [1-8](#)
 redundant, adding new [4-19](#)
 replacing nonredundant [4-19](#)
 replacing redundant [4-18](#)

power system
 troubleshooting [C-3](#)

precautions
 general [2-2](#)

preventing
 electrostatic discharge damage [2-5](#)

problem solving
 See troubleshooting

procedure
 AC power up [3-16](#)
 method of [2-10](#)

product
 overview [1-2](#)

protection
 overcurrent [1-12](#)
 overtemperature [1-12](#)
 overvoltage [1-12](#)

R

rack
 4-post (open) [2-7](#)
 enclosed (do not use) [2-7](#)

rack, mid-mounting on 2-post [4-22](#)

rack installation
 guidelines [2-7](#)

rack-mount
 2-post hardware kit [4-21](#)
 4-post hardware kit [3-5](#)

rack-mounting configuration
 guidelines [3-3](#)

radio frequency interference. *See* RFI

rear view
 ADE 2130 and 2140 Series appliance [1-6](#)

redundant power supply, replacing [4-18](#)

regulatory compliance
 safety
 information [1-12](#)

removing
 ADE 1010 and 2120 Series appliance [3-18](#)

RFI
 preventing effects of [A-4](#)

RJ-45 pinout
 NIC [1-9](#)

root password
 resetting [5-13](#)

Root user password
 changing [5-2](#)

S

safety
 guidelines [2-2](#)
 information
 regulatory compliance [1-12](#)

serial
 console port [1-9](#)

- pinouts [1-10](#)
- serial number
 - location [1-4, C-7](#)
- shipment
 - unpacking and checking [2-11](#)
- site
 - configuration [2-8](#)
 - environment [2-8](#)
 - maintenance factors [A-1](#)
 - log [2-15, D-1](#)
 - planning [2-6](#)
 - requirement, MOPs [2-10](#)

- enabling [5-6](#)

X

- XFP [4-4](#)
- XFP transceiver module [4-4, B-1](#)

T

- temperature
 - maintenance guidelines [A-3](#)
- temperature and humidity
 - guidelines [2-9](#)
- tools and equipment
 - required [2-14](#)
- troubleshooting
 - adapter cards [C-4](#)
 - cables [C-4](#)
 - connections [C-4](#)
 - cooling system [C-3](#)
 - front-panel and NIC LEDs [C-5](#)
 - power system [C-3](#)

U

- unpacking and checking
 - shipment [2-11](#)

W

- warranty [2-13](#)
- Web server

