



Preface

This document describes how to configure assembled Cisco 3200 Series Mobile Access Routers. For information regarding the specific hardware configuration of your router, contact your vendor.



Note

The *Cisco 3200 Series Mobile Router Software Configuration Guide* was completed before the finished product was shipped. Therefore, that guide might not exactly represent the Cisco 3200 Series Mobile Access Router. However, any differences are subtle and should not affect overall use of the system or the performance of certain tasks. For the latest information, refer to <http://www.cisco.com>.

Document Organization

This guide is organized as follows:

[Chapter 1, “Introduction,”](#) provides an overview of the Cisco 3200 Series Mobile Access Routers and tells how the router fit into the larger network.

[Chapter 2, “Cisco 3200 Series Mobile Access Router Interfaces,”](#) describes how the Cisco 3200 Series router interfaces can be accessed.

[Chapter 3, “Introduction to Mobile IP,”](#) provides an overview of Mobile IP, as it relates to the Cisco 3200 Series router.

[Chapter 4, “Basic Home Agent and Foreign Agent Configurations,”](#) describes how to enable mobile access router services on the router, a foreign agent, and a home agent.

[Chapter 5, “Wireless LAN Example Scenario,”](#) provides an example of a Cisco 3200 Series router deployed in a public safety situation.

[Chapter 6, “Static and Dynamic Network Configuration,”](#) describes static and dynamic router network configuration.

[Chapter 7, “Static and Dynamic Collocated Care-of Address,”](#) describes how the router is allowed to roam to foreign networks where foreign agents are not deployed.

[Chapter 8, “Foreign Agent Route Optimization,”](#) describes how the router *injects* mobile network routes into a foreign agent routing table, improving deployments that are running latency-sensitive applications.

[Chapter 9, “Mobile IP Security,”](#) describes the registration messages and the Mobile-Home Authentication Extension (MHAE).

[Chapter 10, “Zeroization,”](#) describes how the zeroization feature erases all potentially sensitive information in the router memory.

Chapter 11, “Redundancy in a Mobile Environment,” describes Mobile IP redundancy and provides example configurations.

Chapter 12, “Quality of Service for Cisco 3200 Routers,” provides a description of the QoS features, such as Class Based Weighted Fair Queuing (CBWFQ), Network Based Application Recognition (NBAR), and Class Based Packet Marking.

Chapter 13, “Modems in a Mobile Environment,” describes the GPRS/CDMA modems that provide the mobile access router with a layer 2 roaming interface.

Chapter 14, “FESMIC Switch Port Functionality,” provides an overview of VLANs, IGMP Snooping, and Auto-negotiation.

Chapter 15, “IEEE 802.1Q Configuration,” describes how to configure IEEE 802.1Q Configuration for the Cisco 3200 Series router.

Chapter 16, “MIB Support,” describes Mobile IP MIB support for the Simple Network Management Protocol (SNMP).

Chapter 17, “Configuring SNMP,” provides an example of a Cisco 3200 Series router deployed in a public safety situation.

Chapter 18, “Troubleshooting the Cisco 3200 Series Mobile Access Router,” provides some information on troubleshooting a Cisco 3200 Series router

Audience and Scope

The audience for this document is the system integrator (SI) and system engineer (SE). They are experts, with networking industry training and experience. We assume that users are familiar with the terminology and concepts of the PC-104, IOS, and Mobile IP networking.

The SI or SE uses this document to configure the router to communicate with peripheral devices through the network and to troubleshoot the cards. Although they might not be specifically identified as SIs or SEs, all users of this documentation are assumed to have comparable skills and knowledge.

Related Documentation

We recommend, “Fundamentals of Wireless LANs” (ISBN 1-58713-119-6) by Cisco Press.

You can access the following documents on the Documentation page on Cisco Connection Online (CCO) at www.cisco.com.

- *Cisco 3200 Series Mobile Access Router Card Release Notes*
- *Cisco 3200 Wireless MIC Software Configuration Guide*
- *Cisco IOS Command Reference for Access Points and Bridges*
- *Cisco 3200 Series Mobile Access Router Hardware Reference*
- *Cisco IOS IP and IP Routing Command Reference*

For information on configuring Mobile IP using Cisco IOS software, refer to the following documents:

- The “Configuring Mobile IP” chapter of the *Cisco IOS IP Configuration Guide*
- The “Mobile IP Commands” chapter of the *Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services*

For information about using Cisco IOS software to configure SNMP, refer to the following documents:

- The “Configuring SNMP Support” chapter of the *Cisco IOS Configuration Fundamentals Configuration Guide*, Release 12.2
- The “SNMP Commands” chapter of the *Cisco IOS Configuration Fundamentals Command Reference*, Release 12.2

See also RFC 2006, *The Definitions of Managed Objects for IP Mobility Support Using SMIPv2*.

Documentation Locations

These sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com>

Translated documentation is available at this URL:

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

Cisco Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package. The Cisco Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit comments electronically on Cisco.com. In the Cisco Documentation home page, click the **Fax** or **Email** option in the “Leave Feedback” section at the bottom of the page. You can e-mail your comments to bug-doc@cisco.com.

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

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

We appreciate your comments.

Documentation Conventions

This guide uses the following conventions for information and instructions.

Notes, Cautions, and Warnings

Notes, cautions, and warnings use the following conventions and symbols:



Note

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



Caution

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



Warning

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. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this IAD.

Waarschuwing

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 bij7 elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

Varoitus	Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta <i>Regulatory Compliance and Safety Information</i> -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).
Attention	Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document <i>Regulatory Compliance and Safety Information</i> (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.
Warnung	Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument <i>Regulatory Compliance and Safety Information</i> (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.
Avvertenza	Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento <i>Regulatory Compliance and Safety Information</i> (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.
Advarsel	Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet <i>Regulatory Compliance and Safety Information</i> (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.
Aviso	Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento <i>Regulatory Compliance and Safety Information</i> (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.

- ¡Advertencia!** Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.
- Varning!** Denna varningssymbol 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 vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förekommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Commands

Table 1 describes the syntax used with the commands in this document.

Table 1 Command Syntax Guide

Convention	Description
boldface	Commands and keywords.
<i>italic</i>	Command input that is supplied by you.
[]	Keywords or arguments that appear within square brackets are optional.
{ x x x }	A choice of keywords (represented by x) appears in braces separated by vertical bars. You must select one.
^ or Ctrl	Represent the key labeled <i>Control</i> . For example, when you read ^D or <i>Ctrl-D</i> , you should hold down the Control key while you press the D key.
screen font	Examples of information displayed on the screen.
boldface screen font	Examples of information that you must enter.
< >	Nonprinting characters, such as passwords, appear in angled brackets.
[]	Default responses to system prompts appear in square brackets.

Documentation CD

The *Cisco 3200 Series Router Documentation CD* contains the technical publications for the Cisco 3200 Series Mobile Access Router. To view the documentation requires Acrobat Reader 4.0 or higher.

Major topics are broken into PDF files and the file names are the same as the section names. Each PDF file contains a complete set of bookmarks, so you can jump to any topic in any file by double-clicking a bookmark.

After the CD is inserted in the CD ROM drive and recognized by your PC, do the following:

-
- Step 1** Open Windows Explorer.
 - Step 2** Access the CD drive.
 - Step 3** Double click any PDF file.
-

A single file named EntireBook.PDF contains the entire book, as opposed to the file being broken into sections, primarily for the purpose of printing the entire book.

System Requirements

Processor	Pentium 150 MHz or faster recommended
PC Operating System	Microsoft Windows 95 Microsoft Windows 98 Microsoft Windows ME Microsoft Windows XP Microsoft Windows NT 4.0 Microsoft Windows 2000
Memory	64-MB DRAM
Drives	4x CD-ROM drive
Monitor	Color monitor capable of 800 x 600 pixel resolution
Software	Adobe Acrobat Reader 4.0 or later

Printing Documents

The documentation is organized into sections.

To print a document section:

-
- Step 1** Click the **Printer** icon on the Acrobat toolbar.
The Windows Print Dialog box appears.
- Step 2** Select your default printer, and click **OK**.
-

To print the entire book:

-
- Step 1** Open Windows Explorer.
- Step 2** Access the CD drive.
- Step 3** Double click the EntireBook.PDF file.
- Step 4** Click the **Printer** icon on the Acrobat toolbar.
The Windows Print Dialog box appears.
- Step 5** Select your default printer, and click **OK**.
-

Sending CD Feedback

This CD was created with simplicity in mind. We hope that you find it easy to navigate and that it contains the information that you need to successfully install and configure your router. Please feel free to provide us with your feedback about the CD interface, the information on the CD, and the usefulness of the content.

To provide feedback directly to the Cisco 3200 Series Mobile Access Router documentation team, e-mail us at doccd-feedback-smb@cisco.com.

Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you with these tasks:

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

If you want to obtain customized information and service, you can self-register on Cisco.com. To access Cisco.com, go to this URL:

<http://www.cisco.com>

Technical Assistance Center

The Cisco Technical Assistance Center (TAC) is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Cisco TAC inquiries are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

The Cisco TAC resource that you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

You can use the Cisco TAC Web Site to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to this URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

<http://www.cisco.com/register/>

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC Web Site, you can open a case online by using the TAC Case Open tool at this URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.