



## Preface

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This document is the *Cisco uBR905/uBR925 Cable Access Router Software Configuration Guide* and describes the configuration of the Cisco uBR905 and Cisco uBR925 cable access routers. This section describes the following topics:

- [Audience](#)
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## Audience

This configuration guide is designed for system administrators who have some experience downloading software from the World Wide Web and configuring cable modem/router systems. This guide is also directed to the network administrators who are responsible for administering the customer's local area network.

All users should have some experience with configuring Cisco routers and using the Cisco IOS command-line interface (CLI). A basic familiarity with DOCSIS 1.0 and DOCSIS 1.0+ quality of service (QoS) principles is helpful. Cisco uBR925 cable access router users should also be familiar with VoIP operations, including the H.323, SGCP, and MGCP voice signaling protocols.

Cable system installers and technicians should be familiar with their cable plant's base operating parameters and subscriber service offerings. Cable system support engineers and administrators should be acquainted with cable data networks and WAN communications protocols. Network administrators should be familiar with the principles of IP routing and subnetting; some of the advanced configurations also require a thorough understanding of access lists and how to use them.



**Note**

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This document contains instructions to install or configure the Cisco uBR905 and Cisco uBR925 cable access routers using procedures that only qualified personnel should perform. This document is not intended for subscribers. Refer to the [“Subscriber Publications” section on page xvi](#) for a list of documents that are available for subscribers.

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## Purpose

This configuration guide explains the initial and basic software configuration procedures for the Cisco uBR905 and Cisco uBR925 cable access routers. This guide contains procedures for configuring the Cisco uBR905 cable access router for data-only operation; it also contains procedures for configuring the Cisco uBR925 cable access router for both data-only operation and voice and data operation. This guide also describes how to set up basic security, how to manage additional modems (peer-to-peer) and the headend interface (CMTS-to-CM), and how to use and upgrade the Cisco IOS ROM monitor.


**Note**

Unless otherwise indicated, the information in this manual applies to both the Cisco uBR905 and Cisco uBR925 cable access routers.

## Organization

This guide is organized into the following chapters and appendixes:

**Table 1**    *Organization*

Title	Description
<a href="#">Chapter 1, “Overview”</a>	Provides an overview of the Cisco uBR905 and Cisco uBR925 cable access routers and their possible configurations.
<a href="#">Chapter 2, “DOCSIS-Bridging Configuration”</a>	Describes how to configure the Cisco uBR905 and Cisco uBR925 cable access routers for their default of DOCSIS-compliant bridging operation.
<a href="#">Chapter 3, “Advanced Data-Only Configurations”</a>	Describes how to configure the Cisco uBR905 and Cisco uBR925 cable access routers for various data-only configurations such as routing operation and IPSec encryption.
<a href="#">Chapter 4, “Voice over IP Configurations”</a>	Describes how to configure the Cisco uBR925 cable access router for Voice over IP (VoIP) operation.
<a href="#">Appendix A, “Using Cisco IOS Software”</a>	Describes the basics of using the Cisco IOS command line interface (CLI).
<a href="#">Appendix B, “Using the Cable Monitor Tool”</a>	Describes how to display diagnostic information about the Cisco uBR905 and Cisco uBR925 cable access routers using any web browser.
<a href="#">Appendix C, “Using the ROM Monitor”</a>	Describes how to use and upgrade the Cisco IOS ROM monitor.
<a href="#">Appendix D, “New and Changed Commands Reference”</a>	Lists the commands that are new to the Cisco IOS 12.1 T software releases.

# Document Conventions

This publication uses the following conventions:

Convention	Meaning	Comments
<b>Boldface</b>	Commands and keywords you enter literally as shown	<b>offset-list</b>
<i>Italics</i>	Variables for which you supply values	<b>command</b> <i>type interface</i> You replace the variable with the type of interface. In contexts that do not allow italics, such as online help, arguments are enclosed in angle brackets (<>).
Square brackets ([ ])	Optional elements	<b>command</b> [abc] abc is optional (not required), but you can choose it.
Vertical bars ( )	Separated alternative elements	<b>command</b> [ abc   def ] You can choose either abc or def, or neither, but not both.
Braces ({ })	Required choices	<b>command</b> { abc   def } You <b>must</b> use either abc <b>or</b> def, but not both.
Braces and vertical bars within square brackets ([ {   } ])	A required choice within an optional element	<b>command</b> [ abc { def   ghi } ] You have three options: <ul style="list-style-type: none"> <li>• Nothing</li> <li>• abc def</li> <li>• abc ghi</li> </ul>
Caret character (^)	Control key	The key combinations ^D and Ctrl-D are equivalent: Both mean hold down the Control key while you press the D key. Keys are indicated in capital letters, but are not case sensitive.
A string	A non-quoted set of characters	For example, when setting an SNMP community string to <i>public</i> , do not use quotation marks around the string; otherwise, the string will include the quotation marks.
System prompts	Denotes interactive sessions, indicates that the user enters commands at the prompt	The system prompt indicates the current command mode. For example, the prompt <code>Router (config) #</code> indicates global configuration mode.
Screen font	Terminal sessions and information the system displays	

Convention	Meaning	Comments
Angle brackets (< >)	Non-printing characters such as passwords	Text between the brackets is not displayed as you enter it.
Exclamation points (!) at the beginning of a line	A comment line	Comments are sometimes displayed by the Cisco IOS software.

**Caution**

Means *reader be careful*. You are capable of doing something that might result in equipment damage or loss of data.

**Note**

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

**Timesaver**

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

**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 appendix, "Translated Safety Warnings," in the installation guide that accompanied this device.)

**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 bij 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 aanhangsel "Translated Safety Warnings" (Vertalingen van veiligheidsvoorschriften) in de installatiegids die bij dit toestel is ingesloten, raadplegen.

**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 tämän laitteen mukana olevan asennusoppaan liitteestä "Translated Safety Warnings" (käännetyt turvallisuutta koskevat varoitukset).)

**Attention**

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures. Avant d'accéder à cet équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures courantes de prévention des accidents. Pour obtenir les traductions des mises en garde figurant dans cette publication, veuillez consulter l'annexe intitulée « Translated Safety Warnings » (Traduction des avis de sécurité) dans le guide d'installation 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 Anhang mit dem Titel "Translated Safety Warnings" (Übersetzung der Warnhinweise) in der diesem Gerät beiliegenden Installationsanleitung.)
Avvertenza	Questo simbolo di avvertenza indica un pericolo. Si è in una situazione che può causare infortuni. 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 nell'appendice, "Translated Safety Warnings" (Traduzione delle avvertenze di sicurezza), del manuale d'installazione 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 vedlegget "Translated Safety Warnings" [Oversatte sikkerhetsadvarslar] i installasjonsveiledningen 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 apêndice "Translated Safety Warnings" - "Traduções dos Avisos de Segurança", no guia de instalação 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 traducciones de las advertencias que aparecen en esta publicación, consultar el apéndice titulado "Translated Safety Warnings," en la guía de instalación 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 appendix "Translated Safety Warnings" [Översatta säkerhetsvarningar] i den installationshandbok som medföljer denna anordning.)

## Acronyms and Terms

To fully understand the content of this guide, you should be familiar with the acronyms and terms listed in this section. These terms are specific to the operation of a data cable network; more general networking acronyms and terms can be found in *Internetworking Terms and Acronyms*, available on Cisco.com and the Documentation CD-ROM.

- 3DES—Triple Data Encryption Standard.
- ASIC—Application Specific Integrated Circuit.
- BPI—Baseline Privacy Interface.

- BPI+ —Extension to the initial BPI standard with improved authentication and encryption.
- CM—Cable modem.
- CMTS—Cable Modem Termination System (headend).
- CoS—Class of service.
- CPE—Customer Premises Equipment.
- DES—Data Encryption Standard.
- DOCSIS 1.0—Data Over Cable Service Interface Specification.
- DOCSIS 1.0+—Extension of the DOCSIS 1.0 standard with features that support quality of service (QoS) options to offer better than best effort, low latency, and low jitter services.
- Downstream—Transmission of traffic from the CMTS (headend) to the CM (cable modem).
- HFC—Hybrid fiber coax.
- IPsec—IP network security.
- Kbps—Kilobits per second.
- MAC—Media Access Control.
- Mbps—Megabits per second.
- MGCP—Media Gateway Control Protocol.
- MODEM—modulator/demodulator.
- MSO—Multiple Systems Operator.
- NIU/STB—Network Interface Unit/Set-Top Box.
- PPS—Packets per second.
- QAM—Quadrature Amplitude Modulation.
- QoS—Quality of service.
- QPSK—Quadrature Phase Shift Keying.
- RF—Radio frequency.
- SGCP—Simple Gateway Control Protocol.
- SID—Service Identifier (DOCSIS MAC-level service flow identifier).
- SM—Subscriber Modem or Spectrum Manager.
- uBR—Universal broadband router.
- Upstream—Transmission of traffic from CM (cable modem) to the CMTS (headend).
- VoIP—Voice over IP.

## Related Documentation

Refer to the following Cisco documents for related information. The documents can be found online at Cisco Connection Online (CCO) or on the Documentation CD-ROM. You can also order printed copies of most current documents.

**Note**

The list that follows is not all-inclusive. New documents and revisions occur frequently. The most current information is always available in the Cisco Product Documentation section on CCO.

## Cisco uBR905 Cable Access Router

- *Cisco uBR905/uBR925 Cable Access Router Software Configuration Guide* (this manual)
- *Cisco Cable CPE Error Messages*
- *Cisco uBR905 Cable Access Router Hardware Installation Guide*
- *DOCSIS CPE Configurator Help*
- Release Notes for each release of Cisco IOS software for the Cisco uBR905 cable access router

## Cisco uBR925 Cable Access Router

- *Cisco uBR905/uBR925 Cable Access Router Software Configuration Guide* (this manual)
- *Cisco Cable CPE Error Messages*
- *Cisco uBR925 Cable Access Router Hardware Installation Guide*
- *DOCSIS CPE Configurator Help*
- Release Notes for each release of Cisco IOS software for the Cisco uBR925 cable access router

## CMTS Installation Publications

### Cisco uBR7100 Series Universal Broadband Routers

- *Cisco uBR7100 Series Hardware Installation Guide*
- *Cisco uBR7100 Series Software Configuration Guide*

### Cisco uBR7200 Series Universal Broadband Routers

- *Cisco uBR7200 Series Universal Broadband Router Hardware Installation Guide*
- *Cisco uBR7200 Series Universal Broadband Router Software Configuration Guide*
- *Cisco uBR7200 Series Universal Broadband Router Cable Modem Card Installation and Configuration* publication
- *Cisco uBR7200 Series Universal Broadband Router Port Adapter Installation and Configuration* publication
- *Cisco uBR7200 Series Universal Broadband Router 550-Watt DC-Input Power Supply Replacement Instructions*
- *Cisco uBR7200 Series Universal Broadband Router Subchassis and Midplane Replacement Instructions*
- *Cisco uBR7200 Series Rack-Mount and Cable-Management Kit Installation Instructions*

- *Cisco uBR7200 Series Universal Broadband Router Fan Tray Replacement Instructions*
- *Cisco uBR7200 Series Universal Broadband Router Feature Enhancements* publication

## Cisco uBR10012 Universal Broadband Routers

- *Cisco uBR10012 Series Hardware Installation Guide*
- *2400W AC-Input Power Shelf for the Cisco uBR10000 Series Router*
- *Cable Interface Line Card Processor Hardware Installation for the Cisco uBR10000 Series Router*
- *Fan Assembly Module for the Cisco uBR10000 Series Router*
- *DC Power Entry Module for the Cisco uBR10000 Series Router*
- *Performance Routing Engine Card Hardware Installation for the Cisco uBR10000 Series Router*
- *TCC+ Card for the Cisco uBR10000 Series Router*

## Cisco IOS Publications

- *Cisco IOS Release 12.1 New Feature* documentation for feature module descriptions on Cisco IOS Release 12.1-based releases
- *Cisco IOS Release 12.1 Configuration Guides and Command References* for task and command descriptions on Cisco IOS Release 12.1-based releases



### Note

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Use the Cisco IOS *Command Reference Master Index(es)* to obtain document pointers for specific software release feature sets and commands.

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## Configuration Editor and Network Management Publications

- *Cisco Cable Configuration Guide* for information on the Cisco Network Registrar (CNR) product
- *CiscoView: Internetworking Device Monitoring and Management*
- *CiscoView Incremental Installation Quick Reference Guide*
- CiscoWorks documentation for networks that use the Simple Network Management Protocol (SNMP) to monitor the Cisco uBR905 and Cisco uBR925 cable access routers
- MIB information is available on Cisco.com at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

## Subscriber Publications

- *Quick Start, Cisco uBR905 Cable Access Router Subscriber Setup*
- *Quick Start, Cisco uBR925 Cable Access Router Subscriber Setup*
- *Cisco uBR925 Cable Access Router User Guide*

**Note**

Service provider and subscriber publications for other models of Cisco uBR900 Series cable access routers are also available on CCO.

## Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

### World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following sites:

- <http://www.cisco.com>
- <http://www-china.cisco.com>
- <http://www-europe.cisco.com>

### Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The 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 as an annual subscription.

### Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:  
[http://www.cisco.com/cgi-bin/order/order\\_root.pl](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 corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

### Documentation Feedback

If you are reading Cisco product documentation on the World Wide Web, you can submit technical comments electronically. Click **Feedback** in the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco.

You can e-mail your comments to [bug-doc@cisco.com](mailto:bug-doc@cisco.com).

To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

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

We appreciate your comments.

## Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools. For Cisco.com registered users, additional troubleshooting tools are available from the TAC website.

### Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information and resources at anytime, from anywhere in the world. This highly integrated Internet application is a powerful, easy-to-use tool for doing business with Cisco.

Cisco.com provides a broad range of features and services to help customers and partners streamline business processes and improve productivity. Through Cisco.com, you can find information about Cisco and our networking solutions, services, and programs. In addition, you can resolve technical issues with online technical support, download and test software packages, and order Cisco learning materials and merchandise. Valuable online skill assessment, training, and certification programs are also available.

Customers and partners can self-register on Cisco.com to obtain additional personalized information and services. Registered users can order products, check on the status of an order, access technical support, and view benefits specific to their relationships with Cisco.

To access Cisco.com, go to the following website:

<http://www.cisco.com>

### Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

### Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

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

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.

- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

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

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

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

## Contacting TAC by Telephone

If you have a priority level 1 (P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

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

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

