



# Release Notes for Cisco uBR924 Cable Access Router for Cisco IOS Release 12.1 XM

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February 13, 2002



Note

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You can find the most current Cisco IOS documentation on Cisco.com. This set of electronic documents may contain updates and modifications made after this document was published.

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These release notes for the Cisco uBR924 cable access router describe the enhancements provided in Cisco IOS Release 12.1(5)XM7. These release notes are updated as needed to describe new features, memory requirements, hardware support, software platform deferrals, and changes to the microcode or modem code and related documents.

For a list of software caveats that apply to Release 12.1(5)XM7, see the [“Caveats” section on page 22](#) and *Caveats for Cisco IOS Release 12.1 T*. The caveats document is updated for every maintenance release and is located on Cisco.com and the Documentation CD-ROM.

Use these release notes with *Cross-Platform Release Notes for Cisco IOS Release 12.1 T*, located on Cisco.com and the Documentation CD-ROM.

## Contents

These release notes describe the following topics:

- [Introduction, page 2](#)
- [Early Deployment Releases, page 2](#)
- [System Requirements, page 4](#)
- [New and Changed Information, page 8](#)
- [MIBS, page 14](#)
- [Limitations and Restrictions, page 19](#)
- [Important Notes, page 20](#)
- [Caveats, page 22](#)



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- [Troubleshooting, page 23](#)
- [Related Documentation, page 24](#)
- [Obtaining Documentation, page 30](#)
- [Obtaining Technical Assistance, page 31](#)

## Introduction

For information on new features and Cisco IOS commands supported by Release 12.1 XM, see the “[New and Changed Information](#)” section on [page 8](#) and the “[Related Documentation](#)” section on [page 24](#).

The DOCSIS-based Cisco uBR924 cable access router gives residential or small office/home office (SOHO) subscribers high-speed Internet or intranet access. The Cisco uBR924 cable access router supports both data traffic and packet voice and fax traffic via a shared two-way cable system and Internet Protocol (IP) backbone network. The Cisco uBR924 cable access router connects computers and other customer premises devices at a subscriber site to the service provider’s cable, hybrid-fiber coaxial (HFC), and IP backbone network.

The Cisco uBR924 cable access router is based on Data-over-Cable Service Interface Specifications (DOCSIS) and interoperates with any bidirectional, DOCSIS-qualified cable modem termination system (CMTS). The Cisco uBR924 cable access router ships from the Cisco factory with a Cisco IOS software image stored in nonvolatile Flash memory that supports DOCSIS-compliant bridging data operations. The Cisco uBR924 cable access router functions as a cable modem at the subscriber site to convey data communications on the cable television system.

Special operating modes, based on your service offering and the practices in place for your network, can be supported for the Cisco uBR924 router, based on the available images in Cisco IOS Release 12.1(5)XM7. The Cisco uBR924 cable access router can also function as an advanced router, providing wide-area network (WAN) data connectivity in a variety of configurations.

**Note**

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All Cisco uBR924 cable access router images support DOCSIS Baseline Privacy Interface (BPI) encryption. BPI is subject to export restrictions.

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## Cisco uBR924 Cable Access Router

The Cisco uBR924 cable access router features a single F-connector interface to the cable system, four RJ-45 (10BASE-T Ethernet) hub ports, two RJ-11 Foreign Exchange Station (FXS) voice ports, one RJ-11 port for an optional backup analog telephone line connection, and one RJ-45 console port to connect to a laptop computer/console terminal for local Cisco IOS configuration. The Cisco uBR924 cable access router supports voice and data Cisco IOS software images; available feature sets include Easy IP and voice.

## Early Deployment Releases

These release notes describe the Cisco uBR924 cable access router for Cisco IOS Release 12.1(5)XM7, which is an early deployment (ED) release based on Cisco IOS Release 12.1(5)T. Early deployment releases contain fixes for software caveats and support for new Cisco hardware and software features.

In addition to the new features that are introduced in Cisco IOS Release 12.1(5)XM2 for the Cisco uBR924 cable access router, all features that are supported in Release 12.1(5)T are also supported in Release 12.1(5)XM7. [Table 1](#) shows the new features supported in Release 12.1(5)XM2. [Table 3 on page 7](#) lists all features supported in Release 12.1(5)XM7.

**Table 1** Early Deployment Releases for the Cisco uBR924 Cable Access Router

ED Release	Maintenance Release	New Software Features in Release 12.1(5)XM2 and Software Features Inherited from Release 12.1(5)T	Availability
Cisco IOS Release 12.1 XM3	(5)	<ul style="list-style-type: none"> <li>MGCP<sup>1</sup> CAS<sup>2</sup> PBX<sup>3</sup> and AAL2<sup>4</sup> PVC<sup>5</sup></li> <li>MGCP Basic CLASS<sup>6</sup> and Operator Services</li> </ul>	Now
Cisco IOS Release 12.1 T	(5)	<ul style="list-style-type: none"> <li>NAT<sup>7</sup> - Support for NetMeeting Directory (Internet Locator Service - ILS)</li> <li>Parser Cache</li> <li>Support for the <b>ip address docsis</b> command</li> </ul>	Now
	(3a)	<ul style="list-style-type: none"> <li>HSRP<sup>8</sup> Support for ICMP<sup>9</sup> Redirect</li> <li>Media Gateway Control Protocol Residential Gateway Support</li> <li>Secure Shell (SSH) Version 1 Client Support</li> <li>Support for the <b>ip address dhcp</b> command</li> <li>XGCP<sup>10</sup> MIB<sup>11</sup> support for both the MGCP and SGCP<sup>12</sup> protocols</li> </ul>	Now
	(2)	<ul style="list-style-type: none"> <li>Configurable H.225 Timers</li> <li>Ecosystem Gatekeeper Interoperability Enhancements, Phase 2</li> <li>H.323 Support for Virtual Interfaces</li> <li>RFC 2233 support for link up/down traps and for the IF-MIB MIB</li> </ul>	Now
	(1)	<ul style="list-style-type: none"> <li>Cable Monitor Web Diagnostics Tool</li> <li>Cisco Cable Clock Card Support</li> <li>DOCSIS 1.0+ Extensions—Dynamic Multi-SID<sup>13</sup> Assignment and Concatenation</li> <li>Dynamic Host Configuration Protocol (DHCP) Proxy Support</li> <li>Ecosystem Gatekeeper Interoperability Enhancements</li> <li>H.323 Enhancements</li> <li>Secure Shell Server (SSH) Support</li> <li>SNMP<sup>14</sup> Enhancements</li> </ul> <p><b>Note</b> Release 12.1 T also includes the features from Release 12.0 T and Release 12.0(7)XR.</p>	Now

1. MGCP = Media Gateway Control Protocol
2. CAS = Channel Associated Signaling
3. PBX = private branch exchange
4. AAL2 = ATM Adaptation Layer 2
5. PVC = Permanent Virtual Circuit
6. CLASS = Custom Local Area Subscriber Services
7. NAT = Network Address Translation
8. HSRP = Hot Standby Router Protocol

9. ICMP = Internet Control Message Protocol
10. XGCP is meant to represent both Simple Gateway Control Protocol and Media Gateway Control Protocol.
11. MIB = Management Information Base
12. SGCP = Simple Gateway Control Protocol
13. SID = Service ID
14. SNMP = Simple Network Management Protocol

## System Requirements

This section describes the system requirements for Cisco IOS Releases 12.1(5)XM7 and includes the following sections:

- [Memory Recommendations, page 4](#)
- [Headend Interoperability, page 4](#)
- [Supported Hardware, page 5](#)
- [Determining the Software Version, page 6](#)
- [Upgrading to a New Software Release, page 6](#)
- [Feature Set Tables, page 6](#)

## Memory Recommendations

[Table 2](#) lists the memory recommendations for each of the feature sets available for the Cisco uBR924 cable access router in Cisco IOS Release 12.1(5)XM7. The image subset legend for [Table 2](#) is as follows:

- y5=Reduced IP image with Easy IP functionality (PAT/NAT/DHCP server)
- v4=Voice set
- k1=DOCSIS baseline privacy

**Table 2** *Memory Recommendations for the Cisco uBR924 Cable Access Router, Release 12.1(5)XM7 Feature Sets*

Feature Set Matrix Term	Image Name	Minimum Recommended Flash Memory	Minimum Recommended DRAM Memory	Runs From
Home Office with Voice—Base image with Easy IP and Voice	ubr920-k1v4y5-mz	4 MB Flash	16 MB DRAM	RAM

## Headend Interoperability

### Cisco Cable Clock Card Support

The Cisco uBR924 cable access router automatically supports the Cisco Cable Clock Card feature for voice traffic when the CMTS is a Cisco uBR7200 series universal broadband router with the Cisco Cable Clock Card feature.

## DOCSIS Concatenation

If using DOCSIS concatenation with a 16-QAM (quadrature amplitude modulation) symbol rate, the CMTS must be configured for Unique Word 16 in the preamble for both short and long data burst profiles. On the Cisco uBR7200 series universal broadband routers, use the **cable modulation-profile** global configuration command and specify “uw16” for both the long and short modulation profiles.

## DOCSIS 1.0+ Extensions

Cisco IOS Release 12.1 XM images support the Cisco DOCSIS 1.0+ Extensions, which include dynamic multi-SID assignment and concatenation. To use the dynamic multi-SID and concatenation features, both the Cisco uBR924 router and the CMTS router must support them. If you are using the Cisco uBR7200 series headend equipment as the CMTS router, Cisco IOS Release 12.0(7)XR, Release 12.1(1)T, or greater is required on the CMTS router to ensure that these features are activated.

To configure the Cisco uBR924 cable access router to support multiple classes of service, use either the Cisco Subscriber Registration Center (CSRC) tool or the configuration file editor of your choice. DOCSIS configuration files can contain multiple classes of service (CoS) to support voice. The first CoS is used for data (and voice if no other CoS is defined), and up to three additional classes of service can be defined to give higher priority for voice traffic.

## Voice Protocol Support

When using a voice-enabled Cisco IOS Release 12.1 image, the Cisco uBR924 cable access router can packetize and transport voice in compliance with the H.323 protocol. H.323v2 is integrated in Cisco gatekeeper/gateway products, such as the Cisco 2600 series and Cisco 3600 series, using Cisco IOS Release 12.0(5)T. The gatekeeper must be running Cisco IOS Release 12.0(5)T or greater to support registration of the full E.164 address for each Cisco uBR924 cable access router voice port.

To support the MGCP CAS PBX and AAL2 PVC feature and the MGCP Basic CLASS and Operator Services feature, both the Cisco uBR924 cable access router and the Cisco gatekeeper/gateway products must be running Cisco IOS Release 12.1(5)XM7 or greater.

The Cisco uBR924 cable access router also supports the Simple Gateway Control Protocol (SGCP) when using voice-enabled Cisco IOS Release 12.1 images. SGCP is an alternative to the H.323 protocol that provides signaling and feature negotiation via a remote Call Agent. SGCP eliminates the need for a dial plan mapper. It also eliminates the need for static configuration on the router to map IP addresses to telephone numbers because this function is provided by the remote Call Agent.

## Supported Hardware

The Cisco uBR924 cable access router contains the following interfaces:

- A single F-connector interface to the cable system.
- Four RJ-45 (10BASE-T Ethernet) hub ports to connect:
  - Up to 254 computers directly to the four Ethernet hub ports at the rear of the Cisco uBR924 router when operating in bridging mode. When operating in routing mode, all four Ethernet hub ports can be connected directly to four computers.

**Note**


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For releases earlier than Cisco IOS Release 12.0(5)T, the four Ethernet hub ports only support a maximum of three computers when operating in bridging mode. (The maximum of three computers is for all four ports together— not three computers per port).

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- One of the four Ethernet hub ports at the rear of the Cisco uBR924 router can be connected to an Ethernet hub, which then connects additional computers or devices at the site when operating in routing or bridging mode.
- Two RJ-11 Foreign Exchange Station (FXS) ports connect telephones and fax devices to the cable system and IP backbone; the router ships from the Cisco factory with the voice ports enabled. The FXS ports on the Cisco uBR924 router can be connected to analog telephones or fax machines but cannot be used for private branch exchange (PBX) extensions.
- One RJ-11 port connects to a standard, analog telephone line (optional) to provide a backup plain old telephone service (POTS) connection to the Public Switched Telephone Network (PSTN). The backup port becomes operational if the Cisco uBR924 router loses power or its connection to the cable network.
- One RJ-45 console port (optional) to connect to a laptop computer or console terminal when locally configuring the Cisco uBR924 router; the router ships from the Cisco factory with the console port enabled.

## Determining the Software Version

To determine the version of Cisco IOS software running on your Cisco uBR924 cable access router, log into the Cisco uBR924 cable access router and enter the **show version EXEC** command:

For the Cisco uBR924 cable access router:

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) 920 Software (ubr920-k1v4y5-mz), Version 12.1(5)XM7, RELEASE SOFTWARE
```

## Upgrading to a New Software Release

For technical information about upgrading to a new software release, see *Cisco IOS Upgrade Ordering Instructions* on Cisco.com at <http://www.cisco.com/warp/public/620/6.html>.

For other information about upgrading to Cisco IOS Release 12.1, see the product bulletin *Cisco IOS Software Release 12.1 Upgrade Paths and Packaging Simplification* on Cisco.com at:

**Service & Support: Software Center: Cisco IOS Software: Product Bulletins: Software**

Under **Cisco IOS 12.1**, click **Cisco IOS Software Release 12.1 Ordering Procedures and Platform Support**

## Feature Set Tables

Cisco IOS software is packaged in feature sets consisting of software images, depending on the platform. Each feature set contains a specific set of Cisco IOS features.

**Caution**

Cisco IOS images with strong encryption (including, but not limited to, 168-bit Triple Data Encryption Standard [3DES] data encryption feature sets) are subject to United States government export controls and have limited distribution. Strong encryption images to be installed outside the United States are likely to require an export license. Customer orders may be denied or subject to delay because of United States government regulations. When applicable, purchaser and user must obtain local import and use authorizations for all encryption strengths. Please contact your sales representative or distributor for more information, or send an e-mail to [export@cisco.com](mailto:export@cisco.com).

**Table 3** lists the voice and data software images by feature sets for the Cisco uBR924 cable access router. This table uses the following conventions:

- Yes—The feature is supported in the feature set.
- No—The feature is not supported in the feature set.

**Note**

These feature set tables might contain a selected list of features. These tables might not be cumulative—nor do they list all the features in each image.

**Note**

This table might not be cumulative or list all the features in each image. You can find the most current Cisco IOS documentation on Cisco.com. This set of electronic documents may contain updates and modifications made after this document was published. If you have a Cisco.com login account, you can find image and release information regarding features prior to Cisco IOS Release 12.1(5)XM7—that is, Release 12.1(5)T, on which Release 12.1(5)XM7 is based— by using the Feature Navigator tool at: <http://www.cisco.com/go/fn>.

**Table 3** *Feature List by Feature Set for the Cisco uBR924 Cable Access Router—Voice and Data*

<b>Features</b>	<b>Home Office with Voice Feature Set</b>
Baseline Privacy Interface (BPI) Encryption	Yes
Baseline Privacy Interface (BPI) MIB	Yes
Cable Device MIB (RFC 2669)	Yes
Cable Monitor	Yes
Firewall (Cisco Secure Integrated Software)	No
Cisco Standard MIBs	Yes
Cisco Voice MIBs	Yes
Configurable H.225 Timers	Yes
DHCP Proxy Support	Yes
DOCSIS 1.0+ Extensions (Dynamic multi-SID assignment and concatenation)	Yes
DOCSIS-Compliant Bridging	Yes
Easy IP	Yes
Ecosystem Gatekeeper Interoperability Enhancements	Yes

**Table 3 Feature List by Feature Set for the Cisco uBR924 Cable Access Router—Voice and Data (continued)**

<b>Features</b>	<b>Home Office with Voice Feature Set</b>
HSRP Support for ICMP Redirect	Yes
H.323v2 Protocol	Yes
H.323 Support for Virtual Interfaces	Yes
IPSec Encryption with 56-bit DES	No
IPSec Encryption with Triple DES [3DES]	No
Layer 2 Tunneling Protocol (L2TP)	No
Media Gateway Control Protocol (MGCP) Basic CLASS and Operator Services	Yes
MGCP CAS PBX and AAL2 PVC	Yes
MGCP Residential Gateway Support (RGW)	Yes
NAT—Support for NetMeeting Directory (Internet Locator Service—ILS)	Yes
Parser Cache	Yes
RFC 2233 Support	Yes
Radio Frequency Interface MIB (RFC 2670)	Yes
Routing (RIP V2)	Yes
Secure Shell (SSH)—56-bit encryption	Yes
Secure Shell (SSH)—3DES encryption	No
Simple Gateway Control Protocol (SGCP)	Yes
XGCP MIB	Yes

## New and Changed Information

The following sections list the new hardware and software features supported by the Cisco uBR924 cable access router.

### New Hardware Features in Release 12.1(5)XM7

There are no new hardware features in the Cisco uBR924 for Cisco IOS Release 12.1(5)XM7.

### New Software Features in Release 12.1(5)XM7

There are no new software features in the Cisco uBR924 for Cisco IOS Release 12.1(5)XM7.

## New Hardware Features in Release 12.1(5)XM4

There are no new hardware features in the Cisco uBR924 for Cisco IOS Release 12.1(5)XM4.

## New Software Features in Release 12.1(5)XM4

There are no new software features in the Cisco uBR924 for Cisco IOS Release 12.1(5)XM4.

## New Hardware Features in Release 12.1(5)XM3

There are no new hardware features in the Cisco uBR924 for Cisco IOS Release 12.1(5)XM3.

## New Software Features in Release 12.1(5)XM3

There are no new software features in the Cisco uBR924 for Cisco IOS Release 12.1(5)XM3.

## New Hardware Features in Release 12.1(5)XM2

Cisco IOS Release 12.1(5)XM2 does not contain any new hardware features for the Cisco uBR924 cable access router.

## New Software Features in Release 12.1(5)XM2

The following new software features are supported by the Cisco uBR924 cable access router for Cisco IOS Release 12.1(5)XM2.

### MGCP CAS PBX and AAL2 PVC

The Media Gateway Control Protocol (MGCP) Channel Associated Signaling (CAS) private branch exchange (PBX) and ATM Adaptation Layer 2 (AAL2) Permanent Virtual Circuit (PVC) feature set—referred to as the MGCP CAS PBX and AAL2 PVC feature set— extends the earlier Simple Gateway Control Protocol (SGCP) CAS and AAL2 support onto the merged SGCP/MGCP software base. These features enable various service provider solutions, including Integrated Access, IP PBX, Residential Cable Access, and Voice over DSL.



#### Note

For extensive information on the MGCP CAS PBX and AAL2 PVC feature, refer to the *MGCP CAS PBX and AAL2 PVC* feature module, on Cisco.com at [http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121newft/121limit/121x/121xm/121xm\\_5/ftmgcpba.htm](http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121newft/121limit/121x/121xm/121xm_5/ftmgcpba.htm).

MGCP CAS PBX and AAL2 includes the following features:

### CAS Termination and Translation to MGCP on BGWs and TGWs

Channel Associated Signaling termination and translation to MGCP is supported on Business Gateways (BGWs) and Trunking Gateways (TGWs).

### Support for CAS PBX and Feature Group D CAS Functions

MGCP 0.1 has been expanded to support CAS packages that handle CAS PBX and Feature Group D CAS functions, including Barge-In/Busy-Line-Verify capabilities on the TGW.

### Expanding MGCP 0.1 to Control AAL2 Voice Transport

The earlier version of the merged SGCP/MGCP stack supported only Voice over IP. The merged stack will now support both VoIP and VoAAL2. However, the Cisco uBR924 cable access router does not support this feature in Cisco IOS Release 12.1(5)XM2—only the Cisco MC3810 platform supports this feature in this release.

### Addition of SGCP CAS PBX Support to the Existing Merged SGCP/MGCP Software Stack

The CAS PBX gateway features include CAS PBX trunks, digit maps, CAS events, and quarantine buffer software. These features were available in the existing standalone SGCP software; now they are supported using the SGCP protocol option in the merged stack:

- Digital and analog E&M CAS PBX trunks include:
  - emulated Direct Outward Dial (DOD), PBX originating, multifrequency (MF) or dual tone multifrequency (DTMF), wink start or immediate start
  - emulated Direct Inward Dial (DID), PBX terminating, MF or DTMF, wink start or immediate start
  - emulated DOD/DID, bidirectional, MF or DTMF, wink start or immediate start
  - basic, bidirectional, DTMF, ground start

This feature is supported for both Voice over IP and Voice Transport over ATM.

- SGCP CAS events include:
  - DTMF and MF tones
  - timer
  - power ringing
  - network congestion tone
  - busy tone
  - dial tone
  - FAX tone
  - modem tone
  - hookflash
  - ringback tone (analog, Rapid Transport Protocol [RTP], and Named Service Events [NSE])

The essential difference for current SGCP users is that support for the SGCP application has been replaced with the MGCP application. The MGCP application supports both SGCP commands and MGCP commands, permitting access to a larger feature set than with the SGCP application alone. The MGCP CAS PBX and AAL2 PVC software assumes the MGCP mode as the default environment. This allows the gateway to recognize both MGCP and SGCP messages sent by the Call Agent. However, the user can specify SGCP mode for certain messages that will be sent by the gateway (by using the **sgcp** option as the service type in the **mgcp call-agent** command).

## MGCP Basic CLASS and Operator Services

The MGCP Basic CLASS (Custom Local Area Subscriber Services) and Operator Services (BCOS) are a set of calling features, sometimes called “custom calling” features, that use MGCP to transmit voice, video, and data over the IP network. These features are usually found in circuit-based networks. MGCP BCOS brings them to the Cisco IOS gateways on packet-based networks.

The MGCP BCOS software is built on the MGCP CAS PBX and AAL2 software package (see the section above), and supports MGCP 0.1 and the earlier protocol versions SGCP 1.1 and 1.5.

The following MGCP BCOS features are available on Residential Gateways (RGWs):

- Distinctive Power Ring
- Visual Message Waiting Indicator
- Caller ID
- Caller ID with Call Waiting
- Call Forwarding
- Ring Splash
- Distinctive Call Waiting Tone
- Message Waiting Tone
- Stutter Dial Tone
- Off-Hook Warning Tone

The following two features can be run as RGW or trunking gateway (TGW) features:

- 911 Calls

This feature is supported in SGCP mode on Cisco uBR924, Cisco 3660, and Cisco AS5300 platforms and in MGCP mode on the Cisco 3660 and Cisco AS5300 TGW platforms and on the Cisco MC3810, Cisco 2600, and Cisco uBR924 RGW platforms.

- Three-Way Calling

This feature is supported on the Cisco 3660 and Cisco AS5300 TGW platforms and on the Cisco MC3810, Cisco 2600, and Cisco uBR924 RGW platforms. This feature cannot be supported on the G.728 and G.723 codecs.

### Distinctive Power Ring

A telephone rings in a distinctive pattern when a call comes in from a pre-defined telephone number. Five patterns are available:

- R1: one long ring
- R2: long ring -long ring
- R3: short ring-short ring-long ring
- R4: short ring - long ring - short ring
- R5: one short ring

### Visual Message Waiting Indicator

A light will go on when a message is waiting for the line.

### Caller ID

The calling party's telephone number, date, and time of the call appear on the receiving telephone's display between the first and second rings. Up to 18 digits are shown. Private and unlisted numbers are displayed. If the called party answers the phone on the first ring, the calling party's number will not appear.

If the called party has an appropriate name display unit, the calling party's name appears on the display along with the telephone number. The name and number appear between the first and second rings.

If the calling party has blocked Caller ID from displaying the telephone number, the called party will see "P" for private or "Anonymous" on the display unit.

### Caller ID with Call Waiting

If the called party has Caller ID and has enabled the Call Waiting feature, then the calling party's telephone number and name (if an appropriate display unit is available) appear while the called party is on the line with another call.

If the calling party has blocked Caller ID from displaying the telephone number and name, the called party will see "P" for private or "Anonymous" on the display unit.

### Call Forwarding

Several scenarios are available:

- The system transfers all incoming calls to a designated telephone number when the called number does not answer after a predetermined interval.
- The system transfers all incoming calls to a designated telephone number when the called number is busy.
- The system transfers all incoming calls to a specific destination when the user enters a code and a destination telephone number that receives the calls. The user is responsible for all charges between the original called number and the receiving telephone number.
- A user can activate Call Forwarding remotely using a touch-tone telephone and a user-defined PIN (default is the last four digits of the user's telephone number). The original destination telephone emits a Ring Splash when a call is forwarded.

### 911 Calls

The user can make a 911 call to an Emergency Service Bureau (ESB), and the call is maintained as long as the ESB does not hang up. If the user hangs up, the call is maintained. If the user hangs up then picks up the phone again, the call can resume. If the user hangs up and does not pick the phone up again, the ESB can ring the user and resume the call.

This feature is available in SGCP mode on the Cisco uBR924, Cisco 3660, and Cisco 5300 platforms and in MGCP mode on all five supported platforms.

### Ring Splash

Also known as Reminder Ring, Ring Splash is activated when the user enables Call Forwarding on the telephone. The user hears Distinctive Power Ring R5 when the line is idle and a call has been forwarded. This serves as a reminder to the user that Call Forwarding is active.

### Distinctive Call-Waiting Tone

The called party hears four audible tone patterns (*waiting tones*, or WTs) when a call is waiting on the called party's line. The tone patterns are heard in sequence as the incoming call continues to wait:

- WT1: one short tone

- WT2: short tone - short tone
- WT3: short tone - short tone - short tone
- WT4: short tone - long tone - short tone

### Message Waiting Tone

For users with an active voice mail system, a special dial tone is heard when the user goes off-hook and a message is waiting. The dial tone is a sequence of 10 short tones followed by a steady tone. If the user has a telephone with a visual message indicator, the indicator light goes on when a message is waiting.

### Stutter Dial Tone

This tone is used in place of the dial tone to indicate that a message is waiting. When the user goes off-hook, a sequence of three short tones followed by a steady tone is heard.

### Off-Hook Warning Tone

The user hears this tone when the telephone is off-hook. The tone is repeated bursts of sound of rising pitch.

### Three-way Calling

The user can create a 3-way call by pressing the switchhook quickly to put the first call on hold, dialing a third party, and pressing the switchhook again quickly to join all parties to the call. This feature is supported on all five platforms.

Requirements and limitations for Three-way Calling (TWC):

- The user who sets up the 3-way call must be connected to a residential gateway, which handles the call setup. TWC is transparent to a trunking gateway.
- Only the G.711u codec supports TWC. If any part of a 3-way call is made on a non-G.711u codec, that codec must be switched to G.711u mode before the second switchhook flash in order for the 3-way call to be set up.
- TWC supports calls originating as Voice over IP calls, not Voice over ATM or Voice over Frame Relay calls. However, if the network has ATM or Frame Relay as a transport protocol, the VoIP call will be completed.
- The user originating the 3-way call is the *controller*. Each of the two other users on the call can add another person onto the call, which is referred to as *call chaining*. Those new users can also add another person to the call. However, once five people in total are on the call, adding more users will cause voice quality to degrade.
- If the controller of the call hangs up, all the users are disconnected from the call. If one of the noncontroller users hangs up, the remaining users are still connected to the call.
- If the controller presses the switchhook quickly for a third time, the last user connected to the call is dropped from the call.
- If two users are on a call and a third user calls one of them, that third user cannot be joined (bridged) into the two-party call.



#### Note

Three-way calling services are limited to using only the G.711 codec voice algorithms. Attempts to connect a call using a high-complexity algorithm, such as G.729, will result in blocked calls.

## Hardware and Software Features Inherited From Release 12.1(5)T

For information on hardware and software features that have been inherited from Cisco IOS Release 12.1(5)T, see the *Release Notes for Cisco uBR924 Cable Access Router for Cisco IOS Release 12.1(5)T* on Cisco.com at <http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121relnt/ubr900/9001215t.htm>.

## MIBS

### Current MIBs

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

### Supported MIBs

The Cisco uBR924 cable access router supports the following categories of MIBs:

- Cable Device MIBs—These MIBs are for DOCSIS-compliant cable modems and CMTS to record statistics related to the configuration and status of the cable modem. These MIBs include support for the MIB attributes defined in RFC 2669.
- Cisco's standard MIBs—These MIBs are common across most of Cisco's router platforms. If your network management applications are already configured to support other Cisco routers, such as the Cisco 2600 series or Cisco 7200 series, no further configuration is needed unless the version of Cisco IOS software being used has updated these MIBs.
- Cisco Voice MIBs—These MIBs are common across Cisco's router platforms that support Voice over IP (VoIP). These MIBs provide access to voice-related parameters and statistics, including the SGCP protocol.
- Radio Frequency Interface MIBs—These MIBs are for DOCSIS-compliant radio frequency interfaces in cable modems and CMTS. This MIB includes support for the MIB attributes defined in RFC 2670.
- SNMP standard MIBs—These are the MIBs required by any agent supporting SNMPv1 or SNMPv2 network management.
- Cable-specific MIBs—These MIBs provide information about the cable interface and related information on the Cisco uBR924 cable access router. They include both DOCSIS-required MIBs and Cisco-specific enterprise MIBs. If your network management applications have not already been configured for the Cisco uBR924 cable access router, these MIBs must be loaded.
- Deprecated MIBs—These MIBs were supported in earlier releases of Cisco IOS software but have been replaced by more standardized, scalable MIBs. Network management applications and scripts should convert to the replacement MIBs as soon as possible.

## Cable Device MIBs

The Cisco uBR924 cable access router supports the Cable Device MIB, which is defined by RFC 2669 and describes DOCSIS-compliant cable modems and CMTS. The Cable Device MIB records statistics related to the configuration and status of the cable modem. Statistics include an events log and device status. The following list details the components of the Cable Device MIB:

- “docsDevBase” group extends the MIB-II “system” group with objects needed for cable device system management.
- “docsDevNmAccess” group provides a minimum level of SNMP access security.
- “docsDevSoftware” group provides information for network downloadable software upgrades.
- “docsDevServe” group provides information about the progress of interaction with various provisioning servers.
- “docsDevEven” group provides information about the progress of reporting.
- “docsDevFilter” group configures filters at link layer and IP layer for bridge data traffic.

The Cable Device MIB is very similar to the RFI MIB in that both allow access to statistics; they are different in that the Cable Device MIB reports statistics on the cable modem, and the RFI MIB reports statistics on the radio frequency transmissions over the cable television line.

## Cisco Standard MIBs

The Cisco uBR924 cable access router supports the Cisco Standard MIBs, which consist of the following components:

- CISCO-PRODUCT-MIB
- CISCO-SYSLOG-MIB
- CISCO-FLASH-MIB
- BRIDGE-MIB
- IF-MIB (RFC 2233)
- CiscoWorks/CiscoView support



### Note

The *Cisco Management Information Base (MIB) User Quick Reference* publication is no longer published. For the latest list of MIBs supported by Cisco, see the *Cisco Network Management Toolkit* on Cisco.com. From the Cisco.com home page, click on this path: **Service & Support: Software Center: Network Mgmt Products: Cisco Network Management Toolkit: Cisco MIB**

## Cisco Voice MIBs

The Cisco uBR924 cable access router supports the Cisco Voice MIBs are supported, which consist of the following components:

- CISCO-VOICE-IF-MIB
- CISCO-VOICE-DIAL-CONTROL-MIB
- CISCO-VOICE-ANALOG-MIB
- CISCO-DIAL-CONTROL-MIB
- DIAL-CONTROL-MIB

- SGCP-MIB
- XGCP-MIB

## Radio Frequency Interface MIBs

The Cisco uBR924 cable access router supports the Radio Frequency Interface (RFI) MIB. The RFI MIB module is defined in RFC 2670 and describes DOCSIS-compliant radio frequency interfaces in cable modems and CMTS. On the cable modem, RFI MIB entries provide:

- Upstream and downstream channel characteristics
- Class-of-service attributes
- Physical signal quality of the downstream channels
- Attributes of cable access router MAC interface
- Status of several MAC layer counters

The RFI MIB includes tables describing both the CMTS and the cable modem side of the cable interface. All cable modem tables are implemented.

With IPsec, data can be transmitted across a public network without fear of observation, modification, or spoofing. This enables applications such as VPNs, extranets, and remote user access.

IPsec services are similar to those provided by Cisco Encryption Technology, a proprietary Cisco security solution. However, IPsec provides a more robust security solution, and is standards based.

## SGCP and MGCP MIBs

The Cisco uBR924 cable access router supports the Simple Gateway Control Protocol (SGCP) and Media Gateway Control Protocol (MGCP) through a single MIB (XGCP-MIB). This MIB supports configuration, performance, and fault management of the SGCP and MGCP interfaces.

The key attributes of this MIB are as follows:

- `xgcpInBadVersions`—Number of incoming messages delivered to the protocol entity and that are for an unsupported protocol version
- `xgcpRequestTimeout`—Timeout value used for retransmitting an unacknowledged message
- `xgcpRequestRetries`—Number of retries for a request that exceeds timeout
- `xgcpAdminStatus`—Desired state of the protocol entity
- `xgcpOperStatus`—Current operational status of the protocol entity
- `xgcpUnRecognizedPackets`—Number of unrecognized packets since reset
- `xgcpMsgStatTable`—Table that contains SGCP statistics information since reset
- `xgcpMsgStatEntry`—Row in the “`xgcpMsgStatTable`” that contains information about SGCP message statistics per IP address of the Media Gateway Controller (MGC)
- `xgcpIPAddress`—IP address of the MGC
- `xgcpSuccessMessages`—Number of successful messages that communicate with the MGC on that IP address
- `xgcpFailMessages`—Number of failed messages that communicate with the MGC on that IP address
- `xgcpUpDownNotification`—Notification sent when the protocol status changes between up and down

**Note**

For complete details on the SGCP and MGCP MIB, see the XGCP-MIB.my file on the Cisco.com MIB website.

## Cable-Specific MIBs

[Table 4](#) shows the cable-specific MIBs that are supported on the Cisco uBR924 cable access router. This table also provides a brief description of each MIB's contents. Because of interdependencies, the MIBs must be loaded in the order given in the table.

**Note**

The names given in [Table 4](#) are the filenames for the MIBs as they exist on Cisco's FTP site (<ftp://ftp.cisco.com/pub/mibs/> or <http://www.cisco.com/public/mibs>). Most MIBs are available in both SNMPv1 and SNMPv2 versions; the SNMPv1 versions have *V1SMI* as part of their filenames. Also see the Cisco MIBs home page at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

**Table 4 Supported MIBs for the Cisco uBR924 Cable Access Router**

MIB Filename	Description
SNMPv2-SMI.my SNMPv2-SMI-V1SMI.my	This module specifies the Structure of Management Information (SMI) for SNMPv2, as defined in RFC 1902.
SNMPv2-TC.my SNMPv2-TC-V1SMI.my	This module defines the textual conventions as specified in pages 4 and 10-11 of RFC 854.
CISCO-SMI.my CISCO-SMI-V1SMI.my	This module specifies the SMI for Cisco's enterprise MIBs.
CISCO-TC.my CISCO-TC-V1SMI.my	This module defines the textual conventions used in Cisco's enterprise MIBs.
IF-MIB.my IF-MIB-V1SMI.my	This module describes generic objects for the Layer 3 network interface sublayers. This MIB is an updated version of MIB-II's <i>if</i> table, and incorporates the extensions defined in RFC 2233.
CISCO-CABLE-SPECTRUM-MIB.my CISCO-CABLE-SPECTRUM-MIB-V1SMI.my	This module describes the spectrum management flap list attributes.
DOCS-IF-MIB.my DOCS-IF-MIB-V1SMI.my	This module describes the DOCSIS-compliant Radio Frequency (RF) interfaces in cable modems and cable modem termination systems, as described in RFC 2670.
DOCS-BPI-MIB.my DOCS-BPI-MIB-V1SMI.my	This module describes the attributes for the DOCSIS-specified Baseline Privacy Interface (BPI) on cable modems and the CMTS.
DOCS-CABLE-DEVICE-MIB.my DOCS-CABLE-DEVICE-MIB-V1SMI.my	This module was previously known as the CABLE-DEVICE-MIB and contains cable-related objects for DOCSIS-compliant cable modems, as specified in RFC 2669.

**Note**

Because of interdependencies, the MIBs must be loaded in the order given in the table.

## Deprecated and Replacement MIBs

A number of Cisco-provided MIBs have been replaced with more scalable, standardized MIBs; these MIBs have filenames that start with “*OLD*” and first appeared in Cisco IOS Release 10.2. The functionality of these MIBs has already been incorporated into replacement MIBs, but the old MIBs are still present to support existing Cisco IOS products or network management system (NMS) applications. However, because the deprecated MIBs will be removed from support in the future, you should update your network management applications and scripts to refer to the table names and attributes that are found in the replacement MIBs.

[Table 5](#) shows the deprecated MIBs and their replacements. In most cases, SNMPv1 and SNMPv2 replacements are available, but some MIBs are available only in one version. A few of the deprecated MIBs do not have replacement MIBs; support for these MIBs will be discontinued in a future release of Cisco IOS software.

**Table 5** Replacements for Deprecated MIBs

Deprecated MIB	Replacement MIBs	
	SNMPv1 MIB	SNMPv2 MIB
OLD-CISCO-APPLETALK-MIB	RFC1243-MIB	—
OLD-CISCO-CHASSIS-MIB	ENTITY-MIB-V1SMI	ENTITY-MIB
OLD-CISCO-CPU-MIB	—	CISCO-PROCESS-MIB
OLD-CISCO-DECNET-MIB	—	—
OLD-CISCO-ENV-MIB	CISCO-ENVMON-MIB-V1SMI	CISCO-ENVMON-MIB
OLD-CISCO-FLASH-MIB	CISCO-FLASH-MIB-V1SMI	CISCO-FLASH-MIB
OLD-CISCO-INTERFACES-MIB	IF-MIB-V1SMI CISCO-QUEUE-MIB-V1SMI	IF-MIB CISCO-QUEUE-MIB
OLD-CISCO-IP-MIB	—	—
OLD-CISCO-MEMORY-MIB	CISCO-MEMORY-POOL-MIB-V1SMI	CISCO-MEMORY-POOL-MIB
OLD-CISCO-NOVELL-MIB	NOVELL-IPX-MIB	—
OLD-CISCO-SYS-MIB	(Compilation of other OLD* MIBS)	
OLD-CISCO-SYSTEM-MIB	CISCO-CONFIG-COPY-MIB-V1SMI	CISCO-CONFIG-COPY-MIB
OLD-CISCO-TCP-MIB	CISCO-TCP-MIB-V1SMI	CISCO-TCP-MIB
OLD-CISCO-TS-MIB	—	—
OLD-CISCO-VINES-MIB	CISCO-VINES-MIB-V1SMI	CISCO-VINES-MIB
OLD-CISCO-XNS-MIB	—	—

**Note**

Some of the MIBs listed in [Table 5](#) represent feature sets that are not supported on the Cisco uBR924 cable access router.

# Limitations and Restrictions

This section describes warnings and cautions about using Cisco IOS Release 12.1(5)XM7 software.

## Bridging Support

The Cisco uBR924 cable access router interoperates with DOCSIS cable networks. Cisco IOS Release 12.1 XM does not support bridging traffic across a non-DOCSIS cable network.

## GRE IP Tunnels Are Not Supported

Generic routing encapsulation (GRE) IP tunnels cannot be built between two Cisco uBR924 cable access routers because GRE IP tunnels are not supported in any Cisco IOS image for the Cisco uBR924 cable access routers. IPSec tunnels, however, are supported when using Cisco IOS images that support IPSec encryption.

## IP Address Negotiation

The DOCSIS specifications require that a cable modem obtain its IP address at power-on or reset from a DHCP server that is available through the cable interface. For this reason, the Cisco uBR924 cable access router defaults to a configuration that uses the **ip address docsis** command for the cable interface. It is not possible to override this setting by specifying a specific static IP address; to assign a static IP address to the Cisco uBR924 router, configure the DHCP server so that it assigns the desired IP address on the basis of the unit's Media Access Controller (MAC) address. However, service providers should warn subscribers that changes in the cable network's topology—due to traffic levels, growth, or changes to the cable plant and other hardware—might still require changing the subnets and IP addresses assigned to a particular cable modem.



**Note**

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The **ip address negotiated** and **ip address dhcp** commands cannot be used on the cable interface.

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## Upgrading Software Images Using BPI

To enable BPI encryption, the Cisco uBR924 cable access router must use a Cisco IOS image that supports BPI encryption. If the router's current software image does not support BPI encryption (or if the current software image is corrupted), you must disable BPI encryption in the DOCSIS configuration file and reset the router before you will be able to download a new software image.

## Using Access Lists

Avoid manually configuring access lists 100, 101, and 102 on the Cisco uBR924 cable access router. Configuring these access lists, either by using the CLI or an Cisco IOS configuration file, can cause the router to reload. Use access lists 103 through 109 instead for those configurations that require access lists.

This situation occurs when the DOCSIS “docsDevNmAccessEntry” table is filled at initial provisioning with the network management stations that are allowed SNMP access. The router automatically uses access lists 100, 101, and 102 for the cable, Ethernet, and USB interfaces to control this access.

## Using Multiple PCs with the Cisco uBR924 Cable Access Router

The “MAX CPE” parameter in a Cisco uBR924 cable access router’s DOCSIS configuration file determines how many PCs (or other customer premises equipment [CPE] devices) are supported by the Cisco uBR924 cable access router. The default value for the “MAX CPE” parameter is 1, which means only one PC can be connected to the Cisco uBR924 cable access router.

The DOCSIS 1.0 specification states that a CMTS cannot age out MAC addresses for CPE devices, so the first PC that is connected to the Cisco uBR924 cable access router is normally the only one that the CMTS recognizes as valid. If a subscriber replaces an existing PC or changes its network interface card (NIC) to one that has a different MAC address, the CMTS will refuse to let the PC come online because this would exceed the maximum number of CPE devices specified by the “MAX CPE” parameter. A similar thing would happen if a user decides to move a PC from one Cisco uBR924 router to another.

To allow a subscriber to replace an existing PC or NIC, the following workarounds are possible:

- If using a Cisco uBR7200 series router as the CMTS, enter the **clear cable host MAC address** command on the Cisco uBR7200 series router to remove the PC’s MAC address from the router’s internal address tables. The new PC will be rediscovered and associated with the correct Cisco uBR924 cable access router during the next DHCP lease cycle.
- Increase the value of the “MAX CPE” parameter in the Cisco uBR924 cable access router’s DOCSIS configuration file so that it can accommodate the desired number of PCs. Reset the Cisco uBR924 cable access router to force it to load the new configuration file.

## Using the Reset Switch

The reset switch on the back panel of the Cisco uBR924 cable access router is recessed to prevent accidental resets of the router. To depress the switch, use a blunt object, such as a pen or pencil point; do not use a sharp object, such as a knife or awl, because this could damage the switch and the router’s circuitry.

## Important Notes

This section contains important information about using Cisco IOS Release 12.1(5)XM7 software.

## CPE Device Filtering

In Cisco IOS Release 12.1(5)XM7, the “docsDevCpeIpMax” attribute defaults to -1 instead of a default of 1, which was used in the past. This attribute controls the maximum number of CPE devices that can pass traffic through the router from its Ethernet interface as follows:

- When “docsDevCpeIpMax” is set to -1, the Cisco uBR924 cable access router does not filter any IP packets on the basis of their IP addresses, and CPE IP addresses are not added to the “docsDevFilterCpeTable” table.

- When “docsDevCpeIpMax” is set to 0, the Cisco uBR924 cable access router does not filter IP packets on the basis of the IP addresses. However, the source IP addresses are still entered into the “docsDevFilterCpeTable” table.
- When “docsDevCpeIpMax” is set to a positive integer, it specifies the maximum number of IP addresses that can be entered into the “docsDevFilterCpeTable” table. The Cisco uBR924 cable access router compares the source IP address for packets it receives from CPE devices to the addresses in this table. If a match is found, the packet is processed; otherwise, the packet is dropped.

CPE IP address filtering is done as part of the following process:

1. MAC address filtering—Packets are filtered on the basis of the CPE device’s MAC address. This is controlled by the value of the “MAX CPE” parameter, which is set in the DOCSIS configuration file.
2. Link Level Control (LLC) filtering—Packets are filtered on the basis of the packet’s protocol. This is controlled by the “docsDevFilterLLCTable” table.
3. CPE IP address filtering—Packets are filtered on the basis of the CPE device’s IP address, as controlled by the “docsDevCpeIpMax” attribute and the “docsDevFilterCpeTable” table.
4. Access list filtering—Packets are filtered on the basis of access lists. IP filtering is controlled by the “docsDevFilterIpTable” table, and SNMP access filters are controlled by the “docsDevNmAccessTable” table.

See the DOCS-CABLE-DEVICE-MIB.my MIB for more information on the attributes and tables listed above.

## Disabling the Finger Server

By default, the Cisco uBR900 series cable access router enables its onboard TCP/IP “finger” server to allow remote users to query the number and identities of any users who are logged in to the router. Unless your network operations center (NOC) requires this service, it should be disabled to prevent denial-of-service attacks that access the finger server’s well-known port (TCP port 79). To disable the finger server, include the **no service finger** command in the Cisco IOS configuration file that the router downloads at initial power-on.

## Supplemental and Corrected Text for the Online Feature Module

*Troubleshooting Tips for the uBR924 Cable Access Router, page 15, indicates:*

“Some CATV systems use alternative frequency plans such as the IRC (Incrementally Related Carrier) and HRC (Harmonically Related Carrier) plans. Most of the IRC channel slots overlap the EIA plan. The HRC plan is not supported by Cisco’s cable access routers since so few cable plants are using this plan.”

The correction should read:

“For the Cisco uBR924 cable access router, both the IRC (Incrementally Related Carrier) and HRC (Harmonically Related Carrier) plans are supported. Most of the IRC channel slots overlap the EIA plan. For the Cisco uBR924 cable access router, both the IRC and HRC plans are supported.

“The list of downstream search bands added for HRC have appropriate center frequencies and step values for an HRC channel plan. The expanded search band list may increase the amount of time required by the Cisco uBR924 cable access router to acquire the downstream signal on the HRC channel plan, which can add to the total time for complete registration of the modem the very first time it is added to the cable system.”

# Caveats

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious. Severity 3 caveats are moderate caveats, and only select severity 3 caveats are included in the caveats document.

All caveats in Cisco IOS Release 12.1(5)T and earlier 12.1 T releases are also in Cisco IOS Release 12.1(5)XM7. For information on caveats in Cisco IOS Release 12.1 T, see the *Caveats for Cisco IOS Release 12.1 T* document.

All caveats in Cisco IOS Release 12.1 are also in Cisco IOS Release 12.1 T.

For information on caveats in Cisco IOS Release 12.1, see *Caveats for Cisco IOS Release 12.1*, which lists severity 1 and 2 caveats and select severity 3 caveats and is located on Cisco.com and the Documentation CD-ROM.

Caveat numbers and brief descriptions are listed in [Table 7](#) and [Table 8](#). For details about a particular caveat, go to Bug Toolkit at:

<http://www.cisco.com/kobayashi/bugs/bugs.html>

To access this location, you must have an account on Cisco.com. For information about how to obtain an account, go to the “[Feature Navigator](#)” section on [page 26](#).



## Note

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, go to Cisco.com and press **Login**. Then go to **Software Center: Cisco IOS Software: Cisco Bugtool Navigator II**. Another option is to go to <http://www.cisco.com/support/bugtools/>.

## Open Caveats in Release 12.1(5)XM7

There are no open caveats specific to Cisco IOS Release 12.1(5)XM7 that require documentation in the release notes.

## Closed or Resolved Caveats—Release 12.1(5)XM7

All the caveats listed in [Table 6](#) are resolved in Cisco IOS Release 12.1(5)XM7. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

**Table 6** *Closed and Resolved Caveats for Release 12.1(5) XM7*

Caveat ID Number	Description
CSCdw65903	An error can occur with management protocol processing. Please use the following URL for further information: <a href="http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903">http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903</a>

## Open Caveats in Release 12.1(5)XM4

All the caveats listed in [Table 7](#) are open in Cisco IOS Release 12.1(5)XM4. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

**Table 7** Open Caveats for Release 12.1(5) XM4

Caveat ID Number	Description
CSCdt61467	Need a way to change the default value of VPDN parameters
CSCds52536	ISDN sync call rejected/failed caller id screening/workaround>reload
CSCds70303	SHOW ISDN STAT shows hanging CCBs (CCBs without active calls)

## Closed or Resolved Caveats—Release 12.1(5)XM4

All the caveats listed in [Table 8](#) are resolved in Cisco IOS Release 12.1(5)XM4. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

**Table 8** Closed and Resolved Caveats for Release 12.1(5) XM4

Caveat ID Number	Description
CSCdt55258	MLP hangs router or causes stack overrun
CSCds52920	Syslog messages are not logged onto syslog server.
CSCdt01452	Lex interface forward bridge BPDUs coming from remote LAN extender
CSCdt09023	Cannot build the 7200 platform -p- images
CSCdt10151	H323 VSA attribute being sent for all platforms
CSCdt30629	Need to speed up RM to TACACS+ accounting processing
CSCdt38813	H323 GW leaks RTCP ports with signal only call
CSCdt78196	Cisco 3640 router crashes at L3_ProcessInternal
CSCdu62721	B-channels do not come up. No incoming calls connect

# Troubleshooting

## uBR Cable Modems Not Coming Online

The tech note *Troubleshooting uBR Cable Modems Not Coming Online* is available on Cisco.com:

[http://www-tac.cisco.com/Teams/esupport/Cable/troubleshooting\\_cm\\_online\\_from\\_ac.html](http://www-tac.cisco.com/Teams/esupport/Cable/troubleshooting_cm_online_from_ac.html)

This tech note discusses the different states that CMs go through before coming online and establishing IP connectivity. The tech note highlights the most commonly used IOS troubleshooting commands to verify what state the CM is in and the reasons that can cause the modem to arrive at that state. This is illustrated by debug and show commands at both the CMTS and the CM. The tech note also discusses some of steps that can be taken to arrive at the correct status, online.

## Related Documentation

The following sections describe the documentation available for the Cisco uBR924 cable access router. These documents consist of hardware and software installation guides, Cisco IOS configuration guides and command references, system error messages, feature modules, and other documents.

Most documentation is available as printed manuals or electronic documents, except for feature modules and select manuals, which are available online on Cisco.com and the Documentation CD-ROM.

Use these release notes with these documents:

- [Release-Specific Documents, page 24](#)
- [Platform-Specific Documents, page 25](#)
- [Feature Modules, page 25](#)
- [Feature Navigator, page 26](#)

## Release-Specific Documents

The following documents are specific to Release 12.1 and are located on Cisco.com and the Documentation CD-ROM:

- *Cross-Platform Release Notes for Cisco IOS Release 12.1*

On Cisco.com at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Release Notes: Cross-Platform Release Notes**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Release Notes: Cross-Platform Release Notes**

- Product bulletins, field notices, and other release-specific documents on Cisco.com at:

**Technical Documents**

- *Caveats for Cisco IOS Release 12.1*

As a supplement to the caveats listed in these release notes, see *Caveats for Cisco IOS Release 12.1*, which contains caveats applicable to all platforms for all maintenance releases of Release 12.1.

On Cisco.com at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Release Notes: Caveats**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS 12.1: Caveats**



### Note

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. You can reach Bug Navigator II on Cisco.com at **Service & Support: Online Technical Support: Software Bug Toolkit** or at <http://www.cisco.com/support/bugtools/>.

## Platform-Specific Documents

These documents are available for the Cisco uBR924 cable access router on Cisco.com and the Documentation DC-ROM:

- *Cisco uBR924 Cable Access Router Hardware Installation Guide*
- *Cisco uBR924 Cable Access Router Software Configuration Guide*
- *Cisco uBR924 Cable Access Router Subscriber Setup Quick Start Guide*
- *Cisco uBR924 Cable Access Router Quick Start Guide* (Service Provider Job Aid)
- *Troubleshooting Tips for the Cisco uBR924 Cable Access Router*
- *Regulatory Compliance and Safety Information for the Cisco uBR924 Cable Access Router*
- *DOCSIS CPE Configurator* online help




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**Note** The *Cisco uBR924 Cable Access Router Installation and Configuration Guide* is still available on Cisco.com but has been made obsolete by the hardware and software guides listed above.

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On Cisco.com at:

**Technical Documents: Documentation Home Page: Cisco Product Documentation: Broadband/Cable Solutions: Cisco uBR900 Series Cable Access Routers**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Broadband/Cable Solutions: Cisco uBR900 Series Cable Access Routers**

## Feature Modules

Feature modules describe new features supported by Release 12.1, and are updates to the Cisco IOS documentation set. A feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference. As updates, the feature modules are available online only. Feature module information is incorporated in the next printing of the Cisco IOS documentation set.

On Cisco.com at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation**

## Feature Navigator

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a particular set of features and which features are supported in a particular Cisco IOS image.

Feature Navigator is available 24 hours a day, 7 days a week. To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, e-mail the Contact Database Administration group at [cdbadmin@cisco.com](mailto:cdbadmin@cisco.com). If you do not have an account on Cisco.com, go to <http://www.cisco.com/register> and follow the directions to establish an account.

To use Feature Navigator, you must have a Java Script-enabled web browser such as Netscape 3.0 or later, or Internet Explorer 4.0 or later. Internet Explorer 4.0 always has Java Script enabled. To enable Java Script for Netscape 3.x or Netscape 4.x, follow the instructions provided with the web browser. For Java Script support and enabling instructions for other browsers, check with the browser vendor.

Feature Navigator is updated when major Cisco IOS software releases and technology releases occur. It contains feature information about mainline-, T-, S-, and P-trains. You can access Feature Navigator at the following URL:

<http://www.cisco.com/go/fn>

## Cisco IOS Software Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents that are available in electronic form on the Documentation CD-ROM and Cisco.com and in printed form on request.

### Documentation Modules

Each module in the Cisco IOS documentation set consists of one or more configuration guides and one or more corresponding command references. Chapters in a configuration guide describe protocols, configuration tasks, and Cisco IOS software functionality, and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference.

On Cisco.com and the Documentation CD-ROM, two master hot-linked documents provide information for the Cisco IOS software documentation set.

On Cisco.com at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References**

## Release 12.1 Documentation Set Contents

Table 9 lists the contents of the Cisco IOS Release 12.1 software documentation set, which is available in electronic form and in printed form upon request.



### Note

You can find the most current Cisco IOS documentation on Cisco.com and the Documentation CD-ROM. This set of electronic documents may contain updates and modifications made after this document was published.

On Cisco.com at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1**

**Table 9 Cisco IOS Release 12.1 Documentation Set**

Books	Major Topics
<ul style="list-style-type: none"> <li><i>Cisco IOS Configuration Fundamentals Configuration Guide</i></li> <li><i>Cisco IOS Configuration Fundamentals Command Reference</i></li> </ul>	Configuration Fundamentals Overview Cisco IOS User Interfaces Cisco IOS File Management Cisco IOS System Management Cisco IOS User Interfaces Commands Cisco IOS File Management Commands Cisco IOS System Management Commands
<ul style="list-style-type: none"> <li><i>Cisco IOS Bridging and IBM Networking Configuration Guide</i></li> <li><i>Cisco IOS Bridging and IBM Networking Command Reference, Volume I</i></li> <li><i>Cisco IOS Bridging and IBM Networking Command Reference, Volume II</i></li> </ul>	Transparent Bridging Source-Route Bridging Token Ring Inter-Switch Link Remote Source-Route Bridging DLSw+ Serial Tunnel and Block Serial Tunnel Commands LLC2 and SDLC Commands IBM Network Media Translation Commands SNA Frame Relay Access Support Commands NCIA Client/Server Commands Airline Product Set Commands

**Table 9 Cisco IOS Release 12.1 Documentation Set (continued)**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Dial Services Configuration Guide: Terminal Services</i></li> <li>• <i>Cisco IOS Dial Services Configuration Guide: Network Services</i></li> <li>• <i>Cisco IOS Dial Services Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Preparing for Dial Access</li> <li>Modem Configuration and Management</li> <li>ISDN and Signaling Configuration</li> <li>PPP Configuration</li> <li>Dial-on-Demand Routing Configuration</li> <li>Dial-Backup Configuration</li> <li>Terminal Service Configuration</li> <li>Large-Scale Dial Solutions</li> <li>Cost-Control Solutions</li> <li>Virtual Private Networks</li> <li>X.25 on ISDN Solutions</li> <li>Telco Solutions</li> <li>Dial-Related Addressing Services</li> <li>Dial Access Scenarios</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Interface Configuration Guide</i></li> <li>• <i>Cisco IOS Interface Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Interface Configuration Overview</li> <li>Configuring LAN Interfaces</li> <li>Configuring Serial Interfaces</li> <li>Configuring Logical Interfaces</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS IP and IP Routing Configuration Guide</i></li> <li>• <i>Cisco IOS IP and IP Routing Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>IP Overview</li> <li>IP Addressing and Services</li> <li>IP Routing Protocols</li> <li>IP Multicast</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS AppleTalk and Novell IPX Configuration Guide</i></li> <li>• <i>Cisco IOS AppleTalk and Novell IPX Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>AppleTalk and Novell IPX Overview</li> <li>Configuring AppleTalk</li> <li>Configuring Novell IPX</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide</i></li> <li>• <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Overview</li> <li>Configuring Apollo Domain</li> <li>Configuring Banyan VINES</li> <li>Configuring DECnet</li> <li>Configuring ISO CLNS</li> <li>Configuring XNS</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Multiservice Applications Configuration Guide</i></li> <li>• <i>Cisco IOS Multiservice Applications Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Multiservice Applications Overview</li> <li>Voice</li> <li>Video</li> <li>Broadband</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Quality of Service Solutions Configuration Guide</i></li> <li>• <i>Cisco IOS Quality of Service Solutions Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Quality of Service Overview</li> <li>Classification</li> <li>Congestion Management</li> <li>Congestion Avoidance</li> <li>Policing and Shaping</li> <li>Signaling</li> <li>Link Efficiency Mechanisms</li> <li>Quality of Service Solutions</li> </ul>

**Table 9 Cisco IOS Release 12.1 Documentation Set (continued)**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Security Configuration Guide</i></li> <li>• <i>Cisco IOS Security Command Reference</i></li> </ul>	Security Overview Authentication, Authorization, and Accounting (AAA) Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Configuring Passwords and Privileges Neighbor Router Authentication Configuring IP Security Options
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Switching Services Configuration Guide</i></li> <li>• <i>Cisco IOS Switching Services Command Reference</i></li> </ul>	Cisco IOS Switching Services Overview Cisco IOS Switching Paths Cisco Express Forwarding NetFlow Switching Multiprotocol Label Switching Multilayer Switching Multicast Distributed Switching Virtual LANs LAN Emulation
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Wide-Area Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Wide-Area Networking Command Reference</i></li> </ul>	Introduction: Wide-Area Networking Overview Configuring ATM Configuring Frame Relay Configuring Frame Relay-ATM Interworking Configuring SMDS Configuring X.25 and LAPB
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Configuration Master Index</i></li> <li>• <i>Cisco IOS Command Reference Master Index</i></li> <li>• <i>Cisco IOS Debug Command Reference</i></li> <li>• <i>Cisco IOS Dial Services Quick Configuration Guide</i></li> <li>• <i>Cisco IOS Software System Error Messages</i></li> <li>• <i>Cisco IOS Configuration Guide Master Index</i></li> <li>• <i>New Features in 12.1-Based Limited Lifetime Releases</i></li> <li>• <i>New Features in Release 12.1 T</i></li> <li>• Release Notes (Release-note and caveat documentation for 12.1-based releases and various platforms)</li> </ul>	

**Note**

*Cisco Management Information Base (MIB) User Quick Reference* is no longer published. If you have an account with Cisco.com, you can find the latest list of MIBs supported by Cisco. To reach the *Cisco Network Management Toolkit*, press **Login** at Cisco.com and go to **Software Center: Network Mgmt Products: Cisco Network Management Toolkit: Cisco MIB**.

# Obtaining Documentation

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

## World Wide Web

The most current Cisco documentation is available on the World Wide Web at <http://www.cisco.com>. Translated documentation can be accessed at [http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml).

## 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, for your convenience many documents contain a response card behind the front cover. Otherwise, you can mail your comments to the following address:

Cisco Systems, Inc.  
Document Resource Connection  
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.

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This document is to be used in conjunction with the documents listed in the “[Related Documentation](#)” section on page 24.

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