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Release Notes for Cisco uBR7200 Series for Cisco IOS Release 12.0 XC

January 7, 1999

These release notes describe new features for the Cisco uBR7200 series routers that support Cisco IOS Release 12.0(2)XC. Cisco IOS Release 12.0(2)XC is based on Cisco IOS Release 12.0 T. These release notes are updated with each maintenance release of the Cisco IOS software, which is typically every 6 weeks.

Use these release notes in conjunction with the *Release Notes for Cisco IOS Release 12.0* and *Release Notes for Cisco uBR904 Cable Modem for Cisco IOS Release 12.0 XC* located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

For a list of software caveats that apply to Release 12.0(2)XC and previous releases, refer to the "Caveats" section on page 12. Refer also to the *Caveats for Cisco IOS Release 12.0 T* located on CCO and the Documentation CD-ROM.

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Introduction

This section contains information on the Cisco uBR7200 series routers and Early Deployment Releases (ED) for the Cisco uBR7200 series routers.

For information on new features, see the “New Features in Cisco IOS Release 12.0(2)XC” section on page 11.

Cisco Data-over-Cable Products

The Cisco data-over-cable products—the Cisco uBR7223 universal broadband router, the Cisco uBR7246 universal broadband router, and the Cisco uBR904 cable modem—are compliant with Multimedia Cable Network Partners, Ltd. (MCNS) specifications. MCNS is a consortium of cable television companies whose goal is to create standards for interoperable data over cable systems.

Cisco uBR7223 Universal Broadband Router

The Cisco uBR7223 is a cost-effective, scalable interface between subscriber cable modems and the backbone data network, and is designed specifically for small to medium-sized network installations. The Cisco uBR7223 is based on the Cisco uBR7246.

Cisco uBR7246 Universal Broadband Router

The Cisco uBR7246 is the first of data-over-cable products designed to allow two-way transmission of digital data over hybrid fiber-coaxial (HFC) cable. The Cisco uBR7246 supports Internet Protocol (IP) routing with a wide variety of protocols and any combination of Ethernet, Fast Ethernet, High-Speed Serial Interface (HSSI), and Asynchronous Transfer Mode (ATM) media. The Cisco uBR7246 universal broadband router gives cable operators a cost-effective, scalable, and feature-rich interface between subscriber cable modems and the backbone data network.

Cisco uBR904 Cable Modem

The Cisco uBR904 cable modem is the subscriber unit, a key component within a cable data system. This subscriber unit functions as an interface between the subscriber’s personal computer and the cable operator’s network within the subscriber’s small office or home office.

For more information on Cisco uBR904, refer to the “Related Documentation” section on page 15.

Early Deployment Releases

This release notes document is based on the Cisco uBR7246 for Cisco IOS Release 12.0(2)XC. Release 12.0 XC is an Early Deployment (ED) release, delivering both fixes to software caveats and support for new Cisco hardware. The following table briefly describes some of the ED releases that will be available for the Cisco uBR7200 series.

Table 1 Early Deployment Releases for the Cisco uBR7200 Series

ED Release	Maintenance Release	Additional Software Features	Additional Hardware Features	Availability
Release 12.0 XC	2	N/A	<ul style="list-style-type: none"> MC16A Modem Card MC16B Modem Card MC16C Modem Card 	Now
Release 12.0 T	2	N/A	<ul style="list-style-type: none"> Cisco uBR7223 	Now
Release 11.3 NA	7	<ul style="list-style-type: none"> MCNS Two-way with VPN/NAT MCNS Two-way with Baseline Privacy MCNS Two-way with Baseline Privacy and VPN/NAT 	<ul style="list-style-type: none"> MC16A Modem Card MC16B Modem Card MC16C Modem Card Cisco uBR7223 	Now
Release 11.3 T	7	N/A	<ul style="list-style-type: none"> Cisco uBR7223 	Now

System Requirements

This section describes the system requirements for Release 12.0(2)XC and includes the following sections:

- Memory Requirements, page 3
- Hardware Supported, page 4
- Determining Your Cisco IOS Software Release, page 5
- Upgrading to a New Release, page 5
- Feature Set Tables, page 6

Memory Requirements

Table 2 describes the memory requirements for the Cisco uBR7200 for Release 12.0 XC. Cisco uBR7246 universal broadband routers are shipped with a 16- or 20-MB Flash memory card.

Table 2 Memory Requirements for the Cisco uBR7200 Series

Feature Set	Image Name	Required Flash Memory	Required DRAM Memory	Runs From	Feature Status
IP Routing Standard Feature Sets					
MCNS Two-way	ubr7200-p-mz	16 MB Flash	32 MB DRAM	RAM	Added in Release 12.0 T
MCNS Two-way with VPN/NAT	ubr7200-ps-mz	16 MB Flash	32 MB DRAM	RAM	Added in Release 12.0(2)XC
MCNS Two-way with Baseline Privacy	ubr7200-klp-mz	16 MB Flash	32 MB DRAM	RAM	Encryption image added in Release 12.0(2)XC

Table 2 Memory Requirements for the Cisco uBR7200 Series

Feature Set	Image Name	Required Flash Memory	Required DRAM Memory	Runs From	Feature Status
MCNS Two-way with Baseline Privacy and VPN/NAT	ubr7200-klps-mz	16 MB Flash	32 MB DRAM	RAM	Encryption image added in Release 12.0(2)XC

Hardware Supported

Cisco IOS Release 12.0(2)XC supports the Cisco uBR7200 universal broadband routers:

- Cisco uBR7223
- Cisco uBR7246

For detailed descriptions of the new hardware features refer to the “New and Changed Information” section on page 11.

Cisco IOS Release 12.0(2)XC also supports the available MC11 and MC16 cable line cards:

- MC11 cable line cards provide connection to the HFC network, offering one upstream port and downstream port. The cable modem card slots are numbered from top to bottom: cable modem card slot#3, slot#4, slot#5, and slot#6.
- MC16 cable router line cards provide connection between the Cisco uBR7200 memory to and from the MAC chip on the MC16 cable router line cards. One MC16 card offers six upstream ports and one downstream port.

For more information on the MC11 and MC16 cable line card software, refer to the “New and Changed Information” section on page 11.

Table 3 summarizes the hardware supported on the Cisco uBR7246 universal broadband router.

Table 3 Supported Interfaces on the Cisco uBR7200 Series

Interface, Network Module, or Data Rate	Product Number ¹	Description	Platforms Supported
Ethernet	PA-4E	4-port Ethernet 10BaseT port adapter	Cisco uBR7200 series
	PA-8E	8-port Ethernet 10BaseT port adapter	Cisco uBR7200 series
	PA-FE-TX	1-port 100BaseTX Fast Ethernet port adapter	Cisco uBR7200 series
	PA-FE-FX	1-port 100BaseFX Fast Ethernet port adapter	Cisco uBR7200 series
Serial	PA-4T+	4-port synchronous serial port adapter	Cisco uBR7200 series
	PA-8T-232	8-port EIA/TIA-232 synchronous serial port adapter	Cisco uBR7200 series
	PA-8T-V35	8-port V.35 synchronous serial port adapter	Cisco uBR7200 series
	PA-8T-X21	8-port X.21 synchronous serial port adapter	Cisco uBR7200 series
	PA-4E1G-75	4-port unbalanced (75-ohm) E1-G.703/G.704 synchronous serial port adapter	Cisco uBR7200 series
	PA-4E1G-120	4-port balanced (120-ohm) E1-G.703/G.704 synchronous serial port adapter	Cisco uBR7200 series
High Speed Serial Interfaces (HSSI)	PA-H	1-port HSSI port adapter	Cisco uBR7200 series

Table 3 Supported Interfaces on the Cisco uBR7200 Series

Interface, Network Module, or Data Rate	Product Number ¹	Description	Platforms Supported
ATM	PA-A1-OC3SMI	1-port ATM OC-3c/STM-1 single-mode intermediate reach port adapter	Cisco uBR7200 series
	PA-A1-OC3MM	1-port ATM OC-3c/STM-1 multimode port adapter	Cisco uBR7200 series
	PA-A2-4E1XC-OC3SM	5-port ATM CES ² (4 E1 120-ohm CBR ³ ports and 1 OC-3 ATM single-mode port) port adapter	Cisco uBR7246 only
	PA-A2-4E1XC-E3ATM	5-port ATM CES ² (4 E1 120-ohm CBR ³ ports and 1 E3 ATM port) port adapter	Cisco uBR7246 only
	PA-A2-4T1C-OC3SM	5-port ATM CES ² (4 T1 CBR ³ ports and 1 OC-3 ATM single-mode port) port adapter	Cisco uBR7246 only
	PA-A2-4T1C-T3ATM	5-port ATM CES ² (4 T1 CBR ³ ports and 1 T3 ATM port) port adapter	Cisco uBR7246 only
Packet-Over-SONET (POS)	PA-POS-OC3SML	1-port POS OC-3 single-mode, long reach port adapter	Cisco uBR7200 series
	PA-POS-OC3SMI	1-port OC3 single-mode, intermediate reach port adapter	Cisco uBR7200 series
	PA-POS-OC3MM	1-port POS OC3 multimode port adapter	Cisco uBR7200 series

1 Refer to the Documentation CD-ROM or <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com> for the most current list of supported port adapters.

2 CES = circuit emulation services.

3 CBR = constant bit rate.

Determining Your Cisco IOS Software Release

To determine the version of Cisco IOS software currently running on the Cisco uBR7200 series router, log into the router and use the **show version EXEC** command. The following is sample output from the **show version** command. The version number is indicated on the second line as shown below:

```
Cisco Internetwork Operating System Software
IOS (tm) uBR7200 Software (ubr7200-p-mz), Version 12.0(2)XC, RELEASE SOFTWARE
```

Additional command output lines include more information, such as processor revision numbers, memory amounts, hardware IDs, and partition information.

Upgrading to a New Release

At the time of this printing, no product bulletins are available for upgrading to Cisco IOS Release 12.0 XC. For generic information about upgrading to a new software release, refer to the *Cisco IOS Software Release Upgrade Paths and Packaging Simplification product bulletin* located on CCO. On CCO, follow this path:

Products & Ordering: More Information: Product Bulletins

Scroll to **Software**. Under **Cisco IOS 11.3**, click *Cisco IOS Software Release 11.3 Upgrade Paths (#703: 12/97)*. The *Cisco IOS Software Release Upgrade Paths and Packaging Simplification product bulletin* does not contain information specific to Cisco IOS Release 12.0 XC, but provides generic upgrade information that might apply to Cisco IOS Release 12.0 XC.

Feature Set Tables

The Cisco IOS software is packaged in feature sets (also called software images) depending on the platform. Each feature set contains a specific set of Cisco IOS features. The following section lists the feature set matrix and the features supported by each feature set.

Table 4 lists the Cisco IOS software feature sets available for the Cisco uBR7200 in Cisco IOS Release 12.0(2)XC. Table 4 lists the feature set name, the software image name, the platform, and whether the feature set is available with additional functionality.

Table 4 Feature Sets Supported by Cisco uBR7200 Series

Feature Set	Feature Set Matrix Term	Software Image
IP Routing Standard Feature Sets		
MCNS Two-way	Basic ¹	ubr7200-p-mz
MCNS Two-way with VPN/NAT	Basic, VPN/NAT ²	ubr7200-ps-mz
MCNS Two-way with Baseline Privacy	Basic, Baseline Privacy ³	ubr7200-klp-mz
MCNS Two-way with Baseline Privacy and VPN/NAT	Basic, Baseline Privacy, VPN/NAT	ubr7200-klps-mz

- 1 This feature is offered in the Basic feature set.
- 2 This feature is offered with VPN/NAT functionality.
- 3 This feature is offered in the encryption feature sets which consist of 56bit DES (k1) data encryption feature sets.



Caution Cisco IOS images with strong encryption (including, but not limited to, 56-bit data encryption feature sets) are subject to U.S. government export controls, and have a limited distribution. Images to be installed outside the U.S. require an export license. Customer orders might be denied or subject to delay due to U.S. government regulations. Contact your sales representative or distributor for more information, or send e-mail to export@cisco.com.

Table 5 lists the features and feature sets supported by the Cisco IOS Release 12.0(2)XC for the Cisco uBR7200. This tables uses the following conventions to identify features:

- Yes—The feature is supported in the feature set.
- No—The feature is not supported in the feature set.
- In—The Cisco IOS release that first introduced the feature. For example, (2) means the feature is introduced in 12.0(2)XC. If the cell is empty in this column, the feature was included in the initial base release.

Table 5 Feature List by Feature Set for the Cisco uBR7200 Series

Feature	In¹	MCNS Two-way	MCNS Two-way with VPN/NAT	MCNS Two-way with Baseline Privacy	MCNS Two-way with Baseline Privacy and VPN/NAT
Internet					
DRP Server Agent	(3)	Yes	Yes	Yes	Yes
IP Routing					
Easy IP (Phase 1)	(3)	Yes	Yes	Yes	Yes
Hot Standby Router Protocol (HSRP) over ISL in Virtual LAN Configurations	(3)	Yes	Yes	Yes	Yes
IP Type of Service and Precedence for GRE Tunnels	(4)	Yes	Yes	Yes	Yes
IP Enhanced IGRP Route Authentication	(3)	Yes	Yes	Yes	Yes
TCP Enhancements, including: <ul style="list-style-type: none"> • TCP Selective Acknowledgment • TCP Timestamp 	(3)	No	No	No	No
LAN Support					
AppleTalk Access List Enhancements		No	No	No	No
DECnet Accounting		No	No	No	No
IPX Named Access Lists		No	No	No	No
IPX SAP-after-RIP		No	No	No	No
NLSP Enhancements		No	No	No	No
NLSP Multicast Support		No	No	No	No
Management					
Improved and Extended Command Line Interface, including: <ul style="list-style-type: none"> • Additional or Changed Show Commands • Burst Profile Configuration • DHCP Relay Subscriber ID Insertion • Improved MAC Scheduler • Improved Parameter Configuration 	(5)NA	No	Yes	Yes	Yes
Cisco Call History MIB Command Line Interface	(3)	Yes	Yes	Yes	Yes
Cisco IOS Internationalization	(3)	Yes	Yes	Yes	Yes
Entity MIB, Phase 1	(3)	Yes	Yes	Yes	Yes
MIB Enhancements	(5)NA	No	Yes	Yes	Yes

Table 5 Feature List by Feature Set for the Cisco uBR7200 Series

Feature	In¹	MCNS Two-way	MCNS Two-way with VPN/NAT	MCNS Two-way with Baseline Privacy	MCNS Two-way with Baseline Privacy and VPN/NAT
SNMPv2C	(3)	Yes	Yes	Yes	Yes
Spectrum Management Enhancements					
Virtual Profiles	(3)	Yes	Yes	Yes	Yes
Multimedia					
IP Multicast Load Splitting across Equal-Cost Paths	(3)	Yes	Yes	Yes	Yes
IP Multicast over ATM Point-to-Multipoint Virtual Circuits	(3)	Yes	Yes	Yes	Yes
IP Multicast over Token Ring LANs	(3)	Yes	Yes	Yes	Yes
Stub IP Multicast Routing	(3)	Yes	Yes	Yes	Yes
Quality of Service					
Downstream QoS Handling	(5)NA	No	Yes	Yes	Yes
QoS Configuration	(5)NA	No	Yes	Yes	Yes
Read/Create Implementation of QoS	(5)NA	No	Yes	Yes	Yes
RTP Header Compression	(3)	Yes	Yes	Yes	Yes
Improved Upstream QoS	(5)NA	No	Yes	Yes	Yes
Security					
Automated Double Authentication	(3)	Yes	Yes	Yes	Yes
Cable Modem and Multicast Authentication using RADIUS	(5)NA	No	Yes	Yes	Yes
Encrypted Baseline Privacy Key Exchange	(5)NA	No	Yes	Yes	Yes
Security					
Encrypted Kerberized Telnet		No	No	No	No
HTTP Security	(3)	Yes	Yes	Yes	Yes
Named Method Lists for AAA Authorization & Accounting	(3)	Yes	Yes	Yes	Yes
Per-User Configuration	(3)	Yes	Yes	Yes	Yes
Reflexive Access Lists	(3)	Yes	Yes	Yes	Yes
TCP Intercept		No	No	No	No
Vendor-Proprietary RADIUS Attributes	(3)	Yes	Yes	Yes	Yes
Switching					
AppleTalk Routing over ISL and IEEE 802.10 in Virtual LANs		No	No	No	No
CLNS and DECnet Fast Switching over PPP		No	No	No	No

Table 5 Feature List by Feature Set for the Cisco uBR7200 Series

Feature	In¹	MCNS Two-way	MCNS Two-way with VPN/NAT	MCNS Two-way with Baseline Privacy	MCNS Two-way with Baseline Privacy and VPN/NAT
DECnet/Vines/XNS over ISL, including:		No	No	No	No
<ul style="list-style-type: none"> • Banyan VINES Routing over ISL Virtual LANs • DECnet Routing over ISL Virtual LANs • XNS Routing over ISL Virtual LANs 					
Fast-Switched Policy Routing	(3)	Yes	Yes	Yes	Yes
IPX Routing over ISL Virtual LANs		No	No	No	No
VIP Distributed Switching Support for IP Encapsulated in ISL		No	No	No	No
Terminal Services					
Virtual Interface Template Service		No	No	No	No
Virtual Templates for Protocol Translation		No	No	No	No
WAN Optimization					
ATM MIB Enhancements		No	No	No	No
PAD Enhancements		No	No	No	No
PAD Subaddressing	(3)	Yes	Yes	Yes	Yes
WAN Services					
Bandwidth Allocation Control Protocol (BACP)	(3)	Yes	Yes	Yes	Yes
WAN Services (continued)					
Enhanced Local Management Interface (ELMI)	(3)	Yes	Yes	Yes	Yes
Frame Relay Enhancements	(3)	Yes	Yes	Yes	Yes
Frame Relay MIB Extensions	(3)	Yes	Yes	Yes	Yes
Frame Relay Router ForeSight	(3)	Yes	Yes	Yes	Yes
ISDN Advice of Charge		Yes	Yes	Yes	Yes
ISDN Caller ID Callback		Yes	Yes	Yes	Yes
ISDN Multiple Switch Type		Yes	Yes	Yes	Yes
ISDN NFAS		Yes	Yes	Yes	Yes
LANE Per-subinterface Debug Messages		No	No	No	No
Layer 2 Forwarding—Fast Switching		No	No	No	No
Leased-Line ISDN at 128 kbps		No	No	No	No
MPPC		Yes	Yes	Yes	Yes

Table 5 Feature List by Feature Set for the Cisco uBR7200 Series

Feature	In¹	MCNS Two-way	MCNS Two-way with VPN/NAT	MCNS Two-way with Baseline Privacy	MCNS Two-way with Baseline Privacy and VPN/NAT
Multilink PPP Interleaving and Fair-Queuing Support		No	No	No	No
National ISDN Switch Types for BRI and PRI	(3)	Yes	Yes	Yes	Yes
PPP over ATM		No	No	No	No
Telnet Extensions for Dialout		No	No	No	No
VPDN MIB and Syslog facility	(3)	Yes	Yes	Yes	Yes
VPDN Tunnel Lookup Based on Dialed Number Information		No	No	No	No
X.25 Enhancements		Yes	Yes	Yes	Yes
X.25 on ISDN		No	No	No	No
X.25 Switching between PVCs and SVCs	(3)	Yes	Yes	Yes	Yes
X.28 Emulation		No	No	No	No

1 This column indicates the maintenance release in which the feature was introduced. For example, (3) means a feature is introduced in 11.3(3)T and a (2) means a feature was introduced in 12.0(2)XC. If this cell is empty in this column, this feature was introduced in the initial base release.

Optional feature set licenses for the Cisco uBR7246 universal broadband router are as follows:

- WAN Packet Protocols
 - ATM DXI
 - Frame Relay switching
 - Frame Relay SVC support (DTE)
 - Frame Relay traffic shaping
 - SMDS over ATM
 - X.25
 - X.25 switching
- Interdomain Routing
 - BGP
 - BGP4—Includes soft configuration, multipath support, and prefix filtering with inbound route maps
 - EGP for Internet scale routing

New and Changed Information

The following sections list the new features supported by the Cisco uBR7246 universal broadband router in Cisco IOS Release 12.0 XC.

New Features in Cisco IOS Release 12.0(2)XC

The following hardware enhancements were introduced in Cisco IOS Release 12.0(2)XC and are available for the Cisco uBR7200 series router.

For more information refer to the *Release Notes for Cisco IOS Release 12.0*.

Cisco uBR7246 Universal Broadband Router

Cisco uBR7246 universal broadband features enable the Cisco uBR7200 universal broadband router to communicate with a hybrid fiber-coaxial (HFC) cable network via a Cisco MC11 cable modem card. Cisco MC11 cable modem cards allow you to connect cable modems on the HFC network to a Cisco uBR7246 in a Community Antenna Television (CATV) headend facility. The modem card provides the interface between the Cisco uBR7246 protocol control information (PCI) bus and the radio frequency (RF) signal on the HFC network.

Cisco uBR7223 Universal Broadband Router

The Cisco uBR7223 is part of a new class of Cisco data-over-cable products designed to allow two-way transmission of digital data over hybrid fiber-coaxial (HFC) cable. The Cisco uBR7223 supports IP routing with a wide variety of protocols and any combination of Ethernet, Fast Ethernet, High-Speed Serial Interface (HSSI), serial, Packet-Over-SONET (POS), and Asynchronous Transfer Mode (ATM) media.

Cable Router Line Card (MC16)

The Cable Router Line Card (MC16) is available for the Cisco uBR7200. The software for the MC16 card is a driver running on the Cisco uBR7246. Using a PCI interface, the universal broadband router line card software interacts with the MC16 card. Data is passed back and forth, as direct memory access (DMA) transfers, from the Cisco uBR7246 memory to the MC16 card.

Additionally, the MC16 card supports universal broadband router line card management and control with the MC16 MIB, MAC control software and logical link management software based on MCNS standards, and minimized security.

For more information refer to the *Update to the Cisco uBR7200 Series Cable Modem Card Installation and Configuration for the MC16A EFT Card* publication.

Important Notes

This section contains important information about use of your Cisco IOS Release 12.0 XC software.

Deprecated MIBs

Older Cisco Management Information Bases (MIBs) will be replaced in a future release. OLD-CISCO-* MIBs are currently being migrated into more scalable MIBs, without affecting existing Cisco IOS products or NMS applications. Application developers should update from deprecated MIBs to the replacement MIBs as shown in the table below.

Table 6 **Deprecated MIBs**

Deprecated MIB	Replacement
OLD-CISCO-APPLETALK-MIB	RFC1243-MIB
OLD-CISCO-CHASSIS-MIB	ENTITY-MIB
OLD-CISCO-CPUK-MIB	In Development
OLD-CISCO-DECNET-MIB	
OLD-CISCO-ENV-MIB	CISCO-ENVMON-MIB
OLD-CISCO-FLASH-MIB	CISCO-FLASH-MIB
OLD-CISCO-INTERFACES-MIB	IF-MIB CISCO-QUEUE-MIB
OLD-CISCO-IP-MIB	
OLD-CISCO-MEMORY-MIB	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
OLD-CISCO-TCP-MIB	CISCO-TCP-MIB
OLD-CISCO-TS-MIB	
OLD-CISCO-VINES-MIB	CISCO-VINES-MIB
OLD-CISCO-XNS-MIB	

Caveats

This section contains a detailed list of the open and resolved caveats affecting Cisco IOS Release 12.0(2) XC only. For information on other caveats that also apply to this release, refer to the *Caveats for Cisco IOS Release 12.0 T* document and the *Cross-Platform Release Notes for Cisco IOS Release 12.0* document located on CCO and the Documentation CD-ROM.

Note If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. Bug Navigator II can be found at <http://www.cisco.com/support/bugtools>, or from CCO, select **Software & Support: Tools: Bug Toolkit II**.

Open Caveats—Release 12.0(2)XC

This section describes possibly unexpected behavior by Release 12.0(2)XC. This section describes only severity 1 and 2 caveats.

Miscellaneous

- CSCdk77426

Description: If a User Datagram Protocol (UDP) packet with an invalid length is sent to port 514 (the "syslog" port) on an IOS device, the device is likely to reload. In this situation, a stack trace might not be saved. Such packets are sent by the popular nmap port scanning program.

Workaround: You can work around this vulnerability by preventing any affected Cisco IOS device from receiving or processing UDP datagrams addressed to its port 514. This can be done either using packet filtering on surrounding devices, or by using input access list filtering on the affected IOS device itself.

If you use an input access list, that list should be applied to all interfaces to which attackers may be able to send datagrams. This includes not only physical LAN and WAN interfaces, but virtual subinterfaces of those physical interfaces, as well as virtual interfaces and/or interface templates corresponding to GRE, L2TP, L2F, and other tunnelling protocols.

The input access list must block traffic destined for any of the CiscoIOS device's own IP addresses, as well as for any broadcast or multicast addresses on which the Cisco IOS device may be listening. It's important to remember to block old-style "all-zeroes" broadcasts as well as new-style "all-ones" broadcasts.

There is no single input access list that will work in all configurations. It is very important that you understand the effect of your access list in your specific configuration before you activate the list.

The following example shows a possible access list for a three-interface router, along with the configuration commands needed to apply that access list. The example assumes no need for input filtering other than as a workaround for this vulnerability.

```

! Deny all multicasts, and all unspecified-net broadcasts, to port 514
access-list 101 deny udp any 224.0.0.0 31.255.255.255 eq 514
! Deny old-style unspecified-net broadcasts
access-list 101 deny udp any host 0.0.0.0 eq 514
! Deny network-specific broadcasts. This example assumes that all of
! the local interfaces are on the class B network 172.16.0.0, subnetted
! everywhere with mask 255.255.255.0. This will differ from network
! to network. Note that we block both new-style and old-style broadcasts.
access-list 101 deny udp any 172.16.0.255 0.0.255.0 eq 514
access-list 101 deny udp any 172.16.0.0 0.0.255.0 eq 514
! Deny packets sent to the addresses of our own network interfaces.
access-list 101 deny udp any host 172.16.1.1 eq 514
access-list 101 deny udp any host 172.16.2.1 eq 514
access-list 101 deny udp any host 172.16.3.3 eq 514
! Permit all other traffic (default would be to deny)
access-list 101 permit ip any any

! Apply the access list to the input side of each interface
interface ethernet 0
ip address 172.16.1.1 255.255.255.0
ip access-group 101 in

interface ethernet 2
ip address 172.16.2.1 255.255.255.0
ip access-group 101 in

```

```
interface ethernet 3
ip address 172.16.3.3 255.255.255.0
ip access-group 101 in
```

It can be complicated to list all possible addresses, and especially all possible broadcast addresses, to which attack packets might be sent. If you do not expect to receive any legitimate syslog traffic on an interface, you may wish to simply block all syslog traffic arriving on that interface. Remember that this will affect traffic routed through the Cisco IOS device as well as traffic destined to the device.

Input access lists have an impact on system performance, and should be installed with a degree of caution, especially on systems that are running very near their capacity limits.

- CSCdk29115

Description: When you configure Bisync (**encapsulation bstun**) with the ASCII character set (**bsc char-set ascii**) on the first port of a serial WIC (1T, 2T, or 2A/S) in WIC slot 0 of a Cisco 2600 series router, only the first character of each frame is received, and the BSTUN tunnel is not established. This only affects Bisync mode when it is configured with the ASCII character set. Other encapsulations are not affected, and using the EBCDIC character set with Bisync works correctly.

Details: For the first serial port in WIC slot 0, the parity detection is not configured correctly for Bisync in ASCII mode. The first character of each frame generates a parity error that causes the receiver to discard the frame after the first character received.

Workaround: Use a different serial port: either the second serial port (port 1) on a 2T or 2A/S WIC in WIC slot 0 or any serial port in WIC slot 1. If you have only one serial WIC, moving it from WIC slot 0 to WIC slot 1 fixes this problem.

Resolved Caveats—Release 12.0(2)XC

Because Cisco IOS Release 12.0(2)XC is a limited-time release, only the initial caveats are documented in these release notes.

Related Documentation

The following sections describe the documentation available for the Cisco uBR7200 series routers. Typically, these documents consist of hardware installation guides, software installation guides, Cisco IOS configuration and command references, system error messages, and feature modules, which are updates to the Cisco IOS documentation. Documentation is available as printed manuals or electronic documents, except for feature modules, which are available online only.

The most up-to-date documentation can be found on the Web via Cisco Connection Online (CCO) and the Documentation CD-ROM. These electronic documents might contain updates and modifications made after the hard copy documents were printed.

These release notes should be used in conjunction with the documents listed in this section.

- Release-Specific Documentation, page 15
- Feature Modules, page 16
- Platform-Specific Documents, page 16
- Cisco IOS Software Documents, page 17

Release-Specific Documentation

The following documents are specific to Release 12.0. They are located on CCO and the Documentation CD-ROM:

- *Release Notes for Cisco IOS Release 12.0*

To reach the cross-platform *Release Notes for Cisco IOS Release 12.0* on CCO, follow this path:

Software & Support: Cisco Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes for Cisco IOS Release 12.0

To reach the cross-platform *Release Notes for Cisco IOS Release 12.0* on the Documentation CD-ROM, follow this path:

Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes for Cisco IOS Release 12.0

- Product bulletins, field notices, and other release-specific documents

To reach these documents, refer to the Software Center at this path on CCO:

Software & Support: Software Center: Cisco IOS Software

- Caveat documents

As a supplement to the caveats listed in the “Caveats” section in these release notes, see the *Caveats for Cisco IOS Release 12.0 T* document, which contains caveats applicable to all platforms for all maintenance releases of Release 12.0 T.

To reach the caveat document on CCO, follow this path:

Products & Ordering: Cisco Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Caveats: Caveats for Cisco IOS Release 12.0 T

To reach the caveat document on the Documentation CD-ROM, follow this path:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS 12.0: Caveats: Caveats for Cisco IOS Release 12.0 T

Note If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. Bug Navigator II can be found at <http://www.cisco.com/support/bugtools>, or from CCO, select **Software & Support: Tools: Bug Toolkit II**.

Feature Modules

Feature modules describe new features supported by Release 12.0, and are an update to the Cisco IOS documentation set. As updates, the features modules are available online only. The feature module information is included in the next printing of the Cisco IOS documentation set. Each feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference.

To reach the feature modules on CCO, follow this path:

Products & Ordering: Cisco Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation: New Features in 12.0-Based Limited Lifetime Releases

To reach the feature modules on the Documentation CD-ROM, follow this path:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation: New Features in 12.0-Based Limited Lifetime Releases

Platform-Specific Documents

The documents listed in this section are available for the Cisco uBR7200 series. These documents are also available on CCO and the Documentation CD-ROM.

- Cisco uBR7200 Series Hardware
 - *Cisco uBR7246 Installation and Configuration Guide*
 - *Cisco uBR7223 Installation and Configuration Guide*
 - Cisco uBR7200 Series Configuration Notes
 - Cisco Network Registrar for the uBR7200 Series
 - Regulatory and Safety Compliance for the Cisco uBR7246
 - Regulatory and Safety Compliance for the Cisco uBR7223
 - Cisco uBR7200 Series Universal Broadband Router Features
- Cisco uBR900 Series Hardware
 - *Cisco uBR904 Cable Modem Installation and Configuration Guide*
 - *Cisco uBR904 Cable Modem Quick Reference Guide*
 - *Update to the uBR904 Cable Modem Installation and Configuration Guide*
 - Bridging and Routing Features for the Cisco uBR904
 - Regulatory Compliance and Safety Info. for the Cisco uBR904
 - Troubleshooting Tips for the Cisco uBR904 Cable Modem

To reach Cisco uBR7200 and Cisco uBR900 series documentation on CCO, follow this path:

Software & Support: Documentation: Cisco Documentation: Cisco Product Documentation: Broadband/Cable Solutions: Cisco uBR7200 Series Universal Broadband Routers or Cisco uBR904 Cable Modem

To reach Cisco uBR7200 and Cisco uBR900 series documentation on the Documentation CD-ROM, follow this path:

Broadband/Cable Solutions: Cisco uBR7200 Series Universal Broadband Routers or Cisco uBR904 Cable Modem

Cisco IOS Software Documents

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents. These documents are shipped with your order in electronic form on the Documentation CD-ROM, unless you specifically ordered the printed versions.

Documentation Modules

Each module in the Cisco IOS documentation set consists of two books: a configuration guide and a corresponding command reference. 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. Each configuration guide can be used in conjunction with its corresponding command reference.

On CCO and the Documentation CD-ROM, two master hot-linked documents provide information for the Cisco IOS software documentation set: configuration guides and command references.

To reach these documents on CCO, follow this path:

Products & Ordering: Cisco Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References: Cisco IOS Interface Configuration Guide or Cisco IOS Interface Command Reference

To reach these documents on the Documentation CD-ROM, follow this path:

Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References: Cisco IOS Interface Configuration Guide or Cisco IOS Interface Command Reference

Release 12.0 Documentation Set

Table 7 details the contents of the Cisco IOS Release 12.0 software documentation set. The document set is available in electronic form, and also in printed form upon request.

Note The most current Cisco IOS documentation can be found on the latest Documentation CD-ROM and on the Web. These electronic documents might contain updates and modifications made after the paper documents were printed.

To reach the Cisco IOS documentation set on CCO, follow this path:

Products & Ordering: Cisco Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

Related Documentation

To reach the Cisco IOS documentation set on the Documentation CD-ROM, follow this path:

Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

Table 7 Cisco IOS Software Documentation Set for Release 12.0

Books	Chapter Topics
<ul style="list-style-type: none">• <i>Configuration Fundamentals Configuration Guide</i>• <i>Configuration Fundamentals Command Reference</i>	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management System Management
<ul style="list-style-type: none">• <i>Bridging and IBM Networking Configuration Guide</i>• <i>Bridging and IBM Networking Command Reference</i>	Transparent Bridging Source-Route Bridging Token Ring Inter-Switch Link Remote Source-Route Bridging DLSw+ STUN and BSTUN LLC2 and SDLC IBM Network Media Translation DSPU and SNA Service Point SNA Frame Relay Access Support APPN Cisco Database Connection NCIA Client/Server Topologies Cisco Mainframe Channel Connection Airline Product Set
<ul style="list-style-type: none">• <i>Dial Solutions Configuration Guide</i>• <i>Dial Solutions Command Reference</i>	Dial-In Port Setup Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions ISDN X.25 over ISDN VPDN Dial Business Solutions and Examples
<ul style="list-style-type: none">• <i>Cisco IOS Interface Configuration Guide</i>• <i>Cisco IOS Interface Command Reference</i>	Interface Configuration Overview
<ul style="list-style-type: none">• <i>Network Protocols Configuration Guide, Part 1</i>• <i>Network Protocols Command Reference, Part 1</i>	IP Addressing IP Services IP Routing Protocols
<ul style="list-style-type: none">• <i>Network Protocols Configuration Guide, Part 2</i>• <i>Network Protocols Command Reference, Part 2</i>	AppleTalk Novell IPX
<ul style="list-style-type: none">• <i>Network Protocols Configuration Guide, Part 3</i>• <i>Network Protocols Command Reference, Part 3</i>	Apollo Domain Banyan VINES DECnet ISO CLNS XNS

Table 7 Cisco IOS Software Documentation Set for Release 12.0 (continued)

Books	Chapter Topics
<ul style="list-style-type: none"> • <i>Security Configuration Guide</i> • <i>Security Command Reference</i> 	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options
<ul style="list-style-type: none"> • <i>Cisco IOS Switching Services Configuration Guide</i> • <i>Cisco IOS Switching Services Command Reference</i> 	Switching Paths for IP Networks Virtual LAN (VLAN) Switching and Routing
<ul style="list-style-type: none"> • <i>Wide-Area Networking Configuration Guide</i> • <i>Wide-Area Networking Command Reference</i> 	ATM Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none"> • <i>Voice, Video, and Home Applications Configuration Guide</i> • <i>Voice, Video, and Home Applications Command Reference</i> 	Voice over IP Voice over Frame Relay Voice over ATM Voice over HDLC Video Support Universal Broadband Features
<ul style="list-style-type: none"> • <i>Quality of Service Solutions Configuration Guide</i>¹ • <i>Quality of Service Solutions Command Reference</i>¹ 	Classification Scheduling Packet Drop Traffic Shaping ATM QoS SNA QoS Line Protocols
<ul style="list-style-type: none"> • <i>Cisco IOS Software Command Summary</i> • <i>Dial Solutions Quick Configuration Guide</i> • <i>System Error Messages</i> • <i>Debug Command Reference</i> 	

¹ This book will not be available until January 1999.

Note The *Cisco Management Information Base (MIB) User Quick Reference* publication is no longer being published. For the latest list of MIBs supported by Cisco, see the *Cisco Network Management Toolkit* on Cisco Connection Online. On CCO, use the following path: **Software & Support: Software Center: Network Management Products: Cisco Network Management Toolkit: Cisco MIBs.**

Service and Support

For service and support for a product purchased from a reseller, contact the reseller. Resellers offer a wide variety of Cisco service and support programs, which are described in the section “Service and Support” in the information packet that shipped with your product.

Note If you purchased your product from a reseller, you can access CCO as a guest. CCO is Cisco Systems’ primary real-time support channel. Your reseller offers programs that include direct access to CCO services.

For service and support for a product purchased directly from Cisco, use CCO.

Software Configuration Tips on the Cisco TAC Home Page

For helpful tips on configuring Cisco products, follow this path on CCO:

Software & Support: Technical Tips (button on left margin)

“Hot Tips” are popular tips and hints gathered from Cisco's Technical Assistance Center (TAC). Most of these documents are also available from the TAC's Fax-on-Demand service. To reach Fax-on-Demand and receive documents at your fax machine, call 888-50-CISCO (888-502-4726).

The following sections are provided from the Technical Tips page:

- **Field Notices**—Designed to provide notification of critical issues regarding Cisco products. These include problem descriptions, safety or security issues, and hardware defects.
- **Hardware**—Technical Tips related to specific hardware platforms.
- **Internetworking Features**—Tips on using and deploying Cisco IOS software features and services.
- **Sample Configurations**—Actual configuration examples complete with topology and annotations.
- **Software Products**—MultiNet & Cisco Suite 100, Network Management, Cisco IOS Software Bulletins, CiscoPro Configurations.
- **Special Collections**—Other Helpful Documents: Frequently Asked Questions, Security Advisories, References & RFCs, Case Studies, CiscoPro Documentation CD-ROM.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems’ primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco’s customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: <http://www.cisco.com>
- WWW: <http://www-europe.cisco.com>
- WWW: <http://www-china.cisco.com>
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@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, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

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

This document is to be used in conjunction with documents mentioned in the "Related Documentation" section on page 15.

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