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Release Notes for the Cisco MC3810 for Cisco IOS Release 12.0(3)XG

March 29, 1999

These release notes describe new features and significant software components that support Cisco IOS Release 12.0(3)XG for the Cisco MC3810 multiservice access concentrator. Cisco IOS Release 12.0(3)XG is based on Cisco IOS Release 12.0(3)T.

Use these release notes with the cross-platform *Release Notes for Cisco IOS Release 12.0* located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

For a list of software caveats that apply to Release 12.0(3)XG, refer to the “Caveats” section on page 14.

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Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA

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Introduction

As part of an enterprise backbone or as customer premises equipment (CPE) to service provider-managed network services, the Cisco MC3810 multiservice access concentrator reduces operating costs and complexity, and increases network throughput and performance. Cisco IOS software fully supports the Cisco MC3810 for multiprotocol routing, bridging, and Systems Network Architecture (SNA).

To make file management easier, the Cisco MC3810 provides a complete file system for software images, message files, and reports. The standard Flash memory size is 8 MB, and a 16-MB upgrade option can simultaneously hold two code images for fail-safe upgrades.

You can manage the Cisco MC3810 by using standard Cisco management platforms and facilities such as CiscoView and the native remote log-in facilities provided by Telnet and rlogin. Three types of configuration interfaces are provided:

- Cisco CLI
- HTTP-based configuration server
- SNMP-based Management Information Base (MIB)

The HTTP-based interface allows configuration from any Web browser such as Netscape Navigator or Microsoft Explorer. The SNMP MIB allows management of the Cisco MC3810 from SNMP managers, such as HP OpenView.

System Requirements

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Memory Requirements

Table 1 Memory Requirements for the Cisco MC3810

Feature Set	Image Name	Required Flash Memory	Required DRAM Memory	Runs From
IP	mc3810-i-mz	4 MB ¹	16 MB	RAM
IP Plus	mc3810-is-mz	8 MB	32 MB	RAM
IP/ATM Plus	mc3810-a2is-mz	8 MB	32 MB	RAM
Enterprise Plus	mc3810-js-mz	8 MB	32 MB	RAM
Enterprise/ATM Plus	mc3810-a2js-mz	8 MB	32 MB	RAM

¹ Required flash memory for the IP feature set: The standard configuration includes 8 MB of flash memory.

Hardware Supported

Cisco IOS Release 12.0(3)XG supports the Cisco MC3810 multiservice access concentrator.

Determining Your Cisco IOS Software Release

To determine the version of Cisco IOS software currently running on a Cisco 2600 series router, log in to the router and enter the **show version EXEC** command. See the following 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) MC3810 Software (mc3810-js-mz), Version 12.0(3)XG, RELEASE SOFTWARE
```

Upgrading to a New Software Release

For general information about upgrading to a new software release, refer to the *Cisco IOS Software Release 11.3 Upgrade Paths and Packaging Simplification (#703: 12/97)* product bulletin located on CCO.

From the CCO home page, click on this path:

Service & Support: Product Bulletins: Software

Under **Cisco IOS 11.3**, click on **Cisco IOS Software Release 11.3 Upgrade Paths (#703: 12/97)**.

This product bulletin does not contain information specific to Cisco IOS Release 12.0(3)XG but provides general upgrade information that may apply to Cisco IOS Release 12.0(3)XG.

Feature Set Table

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.

Table 2 Feature Sets Supported by the Cisco MC3810 for Release 12.0(3)XG

Feature Sets	Feature Set Matrix Term	Software Image
IP Standard Feature Sets	IP	mc3810-i-mz
	IP Plus	mc3810-is-mz
	IP/ATM Plus	mc3810-a2is-mz
Enterprise Standard Feature Sets	Enterprise Plus	mc3810-js-mz
	Enterprise ATM Plus	mc3810-a2js-mz

Table 3 lists the features and feature sets supported by the Cisco MC3810 in Cisco IOS Release 12.0(3)XG and uses the following conventions:

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

Note This feature set table only contains a selected list of features. This table is not cumulative—nor does it list all the features in each image.

Table 3 Feature List by Feature Set for the Cisco MC3810

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
ATM Access					
Frame Relay–ATM Interworking (FRF.5)	No	No	Yes	No	Yes
PPP Over ATM	No	No	Yes	No	Yes
RFC 1483	No	No	Yes	No	Yes
rtVBR, nrtVBR, CBR, UBR	No	No	Yes	No	Yes
Structured CES ¹	No	No	Yes	No	Yes
Traffic Shaping	No	No	Yes	No	Yes
UNI 3.1 ²	No	No	Yes	No	Yes
IBM Support					
APPN	No	No	No	No	No
APPN High-Performance Routing	No	No	No	No	No
APPN MIB Enhancements	No	No	No	No	No
APPN over Ethernet LAN Emulation	No	No	No	No	No
APPN Scalability Enhancements	No	No	No	No	No
BAN for SNA Frame Relay Support	No	Yes	Yes	Yes	Yes
Bisync	No	Yes	Yes	Yes	Yes
Bridging-Code Rework	No	No	No	No	No
Caching and Filtering	Yes	Yes	Yes	Yes	Yes
DLSw+	No	Yes	Yes	Yes	Yes
DLSw (RFC 1795)	No	Yes	Yes	Yes	Yes
DLSw+ Enhanced Load Balancing	No	Yes	Yes	Yes	Yes
DLSw+ Peer Clusters	No	Yes	Yes	Yes	Yes
DLSw Version 2 (RFC 1266)	No	Yes	Yes	Yes	Yes
DLSw+ RSVP Bandwidth Reservation	No	Yes	Yes	Yes	Yes
Downstream PU Concentration (DSPU)	No	Yes	Yes	Yes	Yes
Frame Relay SNA Support (RFC 1490)	No	Yes	Yes	Yes	Yes
NCIA	No	Yes	Yes	Yes	Yes
NetView Native Service Point	No	Yes	Yes	Yes	Yes
Polled Async	No	Yes	Yes	Yes	Yes

Table 3 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
QLLC	No	Yes	Yes	Yes	Yes
Response Time Reporter	No	Yes	Yes	Yes	Yes
RIF Passthru in DLSw+	No	Yes	Yes	Yes	Yes
SDLC Integration	No	Yes	Yes	Yes	Yes
SDLC Transport (STUN)	No	Yes	Yes	Yes	Yes
SDLC-to-LAN Conversion (SDLLC)	No	Yes	Yes	Yes	Yes
SNA and NetBIOS WAN Optimization	No	Yes	Yes	Yes	Yes
SRB/RSRB	No	Yes	Yes	Yes	Yes
SRT	No	No	No	No	No
SRTL B	No	Yes	Yes	Yes	Yes
TG/COS	No	No	No	No	No
TN3270	No	No	No	Yes	Yes
TN3270 LU Nailing	No	Yes	Yes	No	No
TN3270 Server Enhancements	No	Yes	Yes	No	No
IP Routing					
BGP	Yes	Yes	Yes	Yes	Yes
BGP4	Yes	Yes	Yes	Yes	Yes
EGP	Yes	Yes	Yes	Yes	Yes
Enhanced IGRP	Yes	Yes	Yes	Yes	Yes
Enhanced IGRP Optimizations	Yes	Yes	Yes	Yes	Yes
ES-IS	No	No	No	Yes	Yes
GRE VPN	No	No	No	Yes	Yes
IGRP	Yes	Yes	Yes	Yes	Yes
IS-IS	No	No	No	Yes	Yes
Named IP Access Control List	Yes	Yes	Yes	Yes	Yes
Network Address Translation (NAT)	Yes	Yes	Yes	Yes	Yes
NHRP	Yes	Yes	Yes	Yes	Yes
On Demand Routing	Yes	Yes	Yes	Yes	Yes
OSPF	Yes	Yes	Yes	Yes	Yes
OSPF Not-So-Stubby-Areas (NSSA)	Yes	Yes	Yes	Yes	Yes
OSPF On Demand Circuit (RFC 1793)	Yes	Yes	Yes	Yes	Yes
Protocol-Independent Multicast (PIM)	Yes	Yes	Yes	Yes	Yes

Table 3 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
PIM Version 2	Yes	Yes	Yes	Yes	Yes
Policy-Based Routing	Yes	Yes	Yes	Yes	Yes
RIP	Yes	Yes	Yes	Yes	Yes
RIP Version 2	Yes	Yes	Yes	Yes	Yes
LAN Support					
Apollo Domain	No	No	No	Yes	Yes
AppleTalk Phase 2	No	No	No	Yes	Yes
Banyan VINES	No	No	No	Yes	Yes
Concurrent Routing and Bridging	Yes	Yes	Yes	Yes	Yes
DECnet IV	No	No	No	Yes	Yes
DECnet V	No	No	No	Yes	Yes
GRE	No	No	No	Yes	Yes
Integrated Routing and Bridging (IRB)	Yes	Yes	Yes	Yes	Yes
IP	Yes	Yes	Yes	Yes	Yes
LAN Extension Host	No	No	No	No	No
Multiring	No	No	No	No	No
Novell IPX	No	No	No	Yes	Yes
OSI	No	No	No	Yes	Yes
Source-Route Bridging	Yes	Yes	Yes	Yes	Yes
Transparent and Translational Bridging	Yes	Yes	Yes	Yes	Yes
VLANs (ISL & IEEE 802.10)	No	No	No	Yes	Yes
XNS	No	No	No	Yes	Yes
Management					
AutoInstall	Yes	Yes	Yes	Yes	Yes
Automatic Modem Configuration	Yes	Yes	Yes	Yes	Yes
HTTP Server	Yes	Yes	Yes	Yes	Yes
Cisco IOS File System	Yes	Yes	Yes	Yes	Yes
Response Time Reporter Enhancements	Yes	Yes	Yes	Yes	Yes
RMON Events and Alarms	No	No	No	No	No
RMON Full	No	No	No	No	No
SNMP version 3	Yes	Yes	Yes	Yes	Yes
SNMP Inform Request	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes

Table 3 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
VPDN MIB Feature	Yes	Yes	Yes	Yes	Yes
Multimedia and Quality of Service					
Application Specific Routing	No	No	No	No	No
Generic Traffic Shaping	Yes	Yes	Yes	Yes	Yes
H.323 Gatekeeper and Proxy	No	No	No	No	No
H.323 Hot Standby Routing Protocol (HSRP)	No	No	No	No	No
Multimedia Conference Manager	No	No	No	No	No
Process MIB	Yes	Yes	Yes	Yes	Yes
Random Early Detection (RED)	Yes	Yes	Yes	Yes	Yes
Response Time Reporter Enhancements	Yes	Yes	Yes	Yes	Yes
RSVP	Yes	Yes	Yes	Yes	Yes
Other Routing					
AURP	No	No	No	Yes	Yes
IPX RIP	No	No	No	Yes	Yes
NLSP	No	No	No	Yes	Yes
RTMP	No	No	No	Yes	Yes
SMRP	No	No	No	Yes	Yes
SRTP	No	No	No	Yes	Yes
Protocol Translation					
LAT	No	No	No	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
Rlogin	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes
TN3270	No	No	No	Yes	Yes
X.25	Yes	Yes	Yes	Yes	Yes
Remote Node					
ARAP 1.0/2.0	No	No	No	Yes	Yes
Asynchronous Master Interfaces	Yes	Yes	Yes	Yes	Yes
ATCP	No	No	No	Yes	Yes
CPMP	Yes	Yes	Yes	Yes	Yes
CSLIP	Yes	Yes	Yes	Yes	Yes
DHCP	Yes	Yes	Yes	Yes	Yes
IP Pooling	Yes	Yes	Yes	Yes	Yes

Table 3 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
IPX and ARAP on Virtual Async Interfaces	No	No	No	Yes	Yes
IPXCP	No	No	No	Yes	Yes
MacIP	No	No	No	Yes	Yes
NASI	No	No	No	Yes	Yes
NetBEUI over PPP	No	No	No	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
SLIP	Yes	Yes	Yes	Yes	Yes
Scalability					
Airline Product Set (ALPS)	No	No	No	No	No
Cisco IOS File System	Yes	Yes	Yes	Yes	Yes
Cisco MC3810 – IGX 8400 Interworking	No	Yes	Yes	Yes	Yes
Entity MIB	Yes	Yes	Yes	Yes	Yes
Expression MIB	Yes	Yes	Yes	Yes	Yes
OSPF Point to Multipoint	Yes	Yes	Yes	Yes	Yes
Per Port Debugging (Conditionally Triggered Debugging)	Yes	Yes	Yes	Yes	Yes
Priority Queuing Support Enhancement for Cisco MC3810-IGX Interworking	No	Yes	Yes	Yes	Yes
SNMP Manager	Yes	Yes	Yes	Yes	Yes
Security					
Access Lists	Yes	Yes	Yes	Yes	Yes
Access Security	Yes	Yes	Yes	Yes	Yes
Additional Vendor-Proprietary RADIUS Attributes	Yes	Yes	Yes	Yes	Yes
Authenticating ACLs	No	No	No	No	No
Automated Double Authentication	No	No	No	Yes	Yes
Certificate Authority Interoperability	No	No	No	No	No
Context-Based Access Control (CBAC)	No	No	No	No	No
Extended Access Lists	Yes	Yes	Yes	Yes	Yes
Internet Key Exchange Security Protocol	No	No	No	No	No
IPSec Network Security	No	No	No	No	No
Kerberized Login	No	No	No	Yes	Yes

Table 3 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
Kerberos V Client Support	No	No	No	Yes	Yes
Lock and Key	Yes	Yes	Yes	Yes	Yes
Mac Security for Hubs	Yes	Yes	Yes	Yes	Yes
Md5 Routing Authentication	Yes	Yes	Yes	Yes	Yes
MS-CHAP Support	No	No	No	Yes	Yes
Named Method Lists for AAA Authentication & Accounting	Yes	Yes	Yes	Yes	Yes
Network Layer Encryption (40-bit or Export Controlled 56-bit DES)	No	No	No	No	No
RADIUS	Yes	Yes	Yes	Yes	Yes
Router Authentication	No	No	No	No	No
Subblock Phase I	Yes	Yes	Yes	Yes	Yes
TACACS+	Yes	Yes	Yes	Yes	Yes
Switching					
Enhanced ATM VC Configuration and Management	No	No	Yes	No	Yes
Multiple ISDN Switch Types	Yes	Yes	Yes	Yes	Yes
Terminal Services					
LAT	No	No	No	Yes	Yes
Rlogin	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes
TN3270	No	No	No	Yes	Yes
X.25 Pad	Yes	Yes	Yes	Yes	Yes
Xremote	No	No	No	Yes	Yes
Voice and Multimedia					
Analog Signaling	No	Yes	Yes	Yes	Yes
Call Detail Records (CDR)	No	Yes	Yes	Yes	Yes
E1 CAS Signaling ³	No	Yes	Yes	Yes	Yes
Fancy Queuing on Frame Relay or Cisco HDLC	Yes	Yes	Yes	Yes	Yes
G.726 (ADPCM)	No	Yes	Yes	Yes	Yes
Gain Control	No	Yes	Yes	Yes	Yes
ISDN PRI QSIG Voice Signaling	No	Yes	Yes	Yes	Yes
Local Dialing	No	Yes	Yes	Yes	Yes
Local Voice Busy Out	No	Yes	Yes	Yes	Yes
Multiple Ring Tones	No	Yes	Yes	Yes	Yes

Table 3 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
ISDN BRI Voice	No	Yes	Yes	Yes	Yes
Facility Data Link on Multiflex Trunk	No	Yes	Yes	Yes	Yes
Multi-length Dial Patterns	No	Yes	Yes	Yes	Yes
Off-Net Dialing	No	Yes	Yes	Yes	Yes
On-Net/Off-Net Call Rerouting	No	Yes	Yes	Yes	Yes
OPX Ring-Through	No	Yes	Yes	Yes	Yes
Pass-Through Voice	Yes	Yes	Yes	Yes	Yes
Permanent Connection	No	Yes	Yes	Yes	Yes
PLAR	No	Yes	Yes	Yes	Yes
Preference-based Hunt Groups	No	Yes	Yes	Yes	Yes
Remote Dialing	No	Yes	Yes	Yes	Yes
T1 CAS Signaling	No	Yes	Yes	Yes	Yes
Transparent CCS	No	Yes	Yes	Yes	Yes
Voice Activity Detection	No	Yes	Yes	Yes	Yes
Voice over ATM	No	No	Yes	No	Yes
Voice over Frame Relay	No	Yes	Yes	Yes	Yes
Voice over HDLC	No	Yes	Yes	Yes	Yes
Voice over IP	No	No	No	No	No
WAN Optimization					
Bandwidth-on-Demand	Yes	Yes	Yes	Yes	Yes
Custom and Priority Queuing ⁴	Yes	Yes	Yes	Yes	Yes
Dial Backup	Yes	Yes	Yes	Yes	Yes
Dial-on-Demand	Yes	Yes	Yes	Yes	Yes
DRP Server Agent	Yes	Yes	Yes	Yes	Yes
Header, Link and Payload Compression	Yes	Yes	Yes	Yes	Yes
Snapshot Routing	Yes	Yes	Yes	Yes	Yes
Weighted Fair Queuing ⁴	Yes	Yes	Yes	Yes	Yes
WAN Services					
Always On/Direct ISDN	No	No	No	No	No
ATM LAN Emulation: Decnet Routing and Banyan Vines Support	No	No	Yes	No	Yes
ATM LAN Emulation: (HSRP and SSRP)	No	No	Yes	No	Yes
ATM: Rate Queues for SVC per Subinterface	No	No	Yes	No	Yes

Table 3 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
ATM: UNI 3.1 Signaling for ATM	No	No	Yes	No	Yes
Combinet Packet Protocol (CPP)	No	No	No	No	No
Dialer Profiles	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes
Facility Data Link Capabilities on Multiflex Trunk	Yes	Yes	Yes	Yes	Yes
Frame Relay Compression (FRF.9)	Yes	Yes	Yes	Yes	Yes
Frame Relay SVCs Support (DTE)	No	No	No	No	No
Frame Relay Traffic Shaping	Yes	Yes	Yes	Yes	Yes
Frame Relay Switching	Yes	Yes	Yes	Yes	Yes
Frame Relay UNI	Yes	Yes	Yes	Yes	Yes
Frame Relay-ATM Interworking (FRF.5)	No	No	Yes	No	Yes
Half Bridge/Half Router For CPP And PPP	Yes	Yes	Yes	Yes	Yes
HDLC	Yes	Yes	Yes	Yes	Yes
Integrated BRI Backup ⁵	No	Yes	Yes	Yes	Yes
IPXwan 2.0	No	No	No	Yes	Yes
ISDN	Yes	Yes	Yes	Yes	Yes
ISDN Advise of Charge	Yes	Yes	Yes	Yes	Yes
ISDN Caller ID Callback	Yes	Yes	Yes	Yes	Yes
ISDN NFAS	Yes	Yes	Yes	Yes	Yes
Leased Line ISDN at 128 kbps	No	No	No	No	No
MPPC-MS PPP Compression	Yes	Yes	Yes	Yes	Yes
MS Callback	No	No	No	No	No
Multichassis Multilink PPP (MMP)	No	No	No	Yes	Yes
National ISDN Switch Type	Yes	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
SMDS	Yes	Yes	Yes	Yes	Yes
Stackable Home Gateway	No	No	No	No	No
Switched 56	Yes	Yes	Yes	Yes	Yes
Virtual Private Dialup Network (VPDN)	No	No	No	Yes	Yes
Voice over Frame Relay Using FRF.11 and FRF.12	Yes	Yes	Yes	Yes	Yes

Table 3 Feature List by Feature Set for the Cisco MC3810 (continued)

Features	Feature Set				
	IP	IP Plus	IP/ATM Plus	Enterprise Plus	Enterprise ATM Plus
X.25	Yes	Yes	Yes	Yes	Yes
X.25 Enhancements	Yes	Yes	Yes	Yes	Yes
X.25 on ISDN	Yes	Yes	Yes	Yes	Yes
X.25 over Frame Relay (Annex G)	Yes	Yes	Yes	Yes	Yes
X.25 Switching between PVCs and SVCs	Yes	Yes	Yes	Yes	Yes

- 1 Voice signaling on CES is not available.
- 2 ATM PVCs only. SVCs are not supported.
- 3 Includes T1 CAS protocols, UK Standard CAS (Mercury protocol), and CEPT standard E&M.
- 4 Applicable to data-only interfaces.
- 5 When you use the older motherboard (SCB 6.06) with this feature, you cannot use serial port 1. When you use the new motherboard (SCB 6.07), you can use serial port 1 clocked at speeds up to 192 kbps.

Cisco IOS File System

To make file management easy, the Cisco MC3810 provides a complete file system for software images, message files and reports. The standard Flash memory size is 8 MB, and a 16-MB upgrade option can simultaneously hold two code images for fail-safe upgrades.

New and Changed Information

The following sections list new information about the Cisco MC3810 in Cisco IOS Release 12.0(3)XG.

New Features in Release 12.0(3)XG

The following hardware and software enhancements are available for the Cisco MC3810 in Cisco IOS Release 12.0(3)XG.

ISDN BRI Voice on the Cisco MC3810

With the optional BRI voice module (BVM) installed, the Cisco MC3810 multiservice access concentrator provides four ISDN Basic Rate Interface (BRI) ports for connection to ISDN PBXs (PINXs). The BVM has four ISDN BRI ports for voice traffic. Each BRI port supports two voice channels (ISDN B channels) and one signaling channel (ISDN D channel). The BRI voice ports have the following features:

- ITU I.430 BRI
- Full-duplex S/T interfaces supporting 2 bearer channels and 1 signaling channel (2B + D)
- Total of 8 simultaneous voice channels
- LT-S mode: Line termination of subscriber lines from PINX, with port configured as network termination (NT)

- LT-T mode: Line termination of an ISDN trunk from an ISDN exchange switch, with port configured as terminal equipment (TE)
- Each port individually configurable as NT or TE
- Configurable clock recovery and distribution

Voice over Frame Relay Using FRF.11 and FRF.12

The Voice over Frame Relay (VoFR) capabilities that were introduced on the Cisco MC3810 multiservice access concentrator beginning with IOS Release 11.3 are now extended to the Cisco 2600, 3600, and 7200 series router platforms.

The following additional functionality is supported in Release 12.0(3)XG:

- FRF.11-compliant Voice over Frame Relay trunking
- FRF.12-compliant end-to-end fragmentation
- Dynamic call switching and termination
- Permanent trunks over dynamic switched calls

When VoFR is implemented on a Cisco router, the router is able to carry voice traffic, such as telephone calls and faxes over a Frame Relay network.

This feature also adds support for full FRF.11 and FRF.12 compliance to the Cisco MC3810 and is backward-compatible with earlier versions of the Cisco MC3810, which used a fragmentation format based on an early draft version of FRF.12.

Important Notes

This section contains important information about the use of your Cisco IOS Release 12.0(3)XG software.

Using the Cisco MC3810 with the PSTN

This section describes important notes regarding use of the Cisco MC3810 with the Public Switched Telephone Network (PSTN).

Connections to a PSTN

Be careful when connecting switched voice ports on the Cisco MC3810 directly to the PSTN because improper configurations can expose the corporate network to telephone fraud.

Switched Access from the PSTN

The Cisco MC3810 has the capability to connect a user from the PSTN directly to the corporate wide-area telephone network. Using the Cisco MC3810 as a phone switch, you can configure the access concentrator to switch the user to any location in that network, even to remote locations that are connected again to another PSTN. However, the Cisco MC3810 does not provide any mechanism to restrict users from calling after they are connected. Without proper network design, this condition could result in the unauthorized use of the corporate network for making calls at the corporation's expense. To prevent this from occurring, you should not connect a switched voice interface on the Cisco MC3810 directly to the PSTN. Instead, connect the interface to a PBX that implements a security scheme that prevents unauthorized use.

Non-Switched Calls

The same opportunity for illicit use does not exist for non-switched call types, such as pass-through connections (although the possibility for fraud does exist at the direct contact point). Pass-through calls create a path to a single location specified by the network administrator. For example, you might use a pass-through connection to pass a trunk from a PBX to the PSTN. In this case, the trunk on the PBX always passes straight through the Cisco MC3810 to the PSTN. As a result, the necessary security is provided by the PBX.

Caveats

This section contains open caveats for the current Cisco IOS maintenance release only. Caveats describe unexpected behavior or defects in Cisco IOS software releases. The caveats listed below are severity 3, moderately serious, with the exception of CSCdk74350, as noted in the description.

For information on caveats in Cisco IOS Release 12.0, refer to the document *Caveats for Cisco IOS Release 12.0* that describes caveats affecting all maintenance releases. Because Release 12.0(3)XG is based on Release 12.0, all caveats in Release 12.0 are also in Release 12.0(3)XG.

Cisco IOS Release 12.0(3)XG is also based on Cisco IOS Release 12.0(3)T. For information on other caveats that also apply to this release, refer to the *Caveats for Cisco IOS Release 12.0 T* document. This caveats document lists severity 1 and 2 caveats for Release 12.0 T. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious.

Note If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. From CCO, log in and click on this path: **Service & Support: Online Technical Support: Software Bug Toolkit**. You can also find Bug Navigator II at <http://www.cisco.com/support/bugtools>.

- CSCdk74350

This is a severity 2 caveat. On permanent calls (cisco-trunk or frf11-trunk) between two Cisco MC3810 units, the Calling and Called fields within the Call Detail Record (CDR) are empty.

- CSCdk85062

When making a fax call through a permanent connection using either a frf11-trunk or cisco-trunk, some brands of fax machine may report an error at the end of the fax call, even though the fax was transmitted correctly.

The problem is caused by a slightly premature on-hook signal going to the fax machine at the end of the call. This causes the final fax T.30 DCN (disconnect message) to the receiving fax machine to be chopped off.

At this point the transmission of the fax image is complete, but some fax machines may report an error as a result of the missing DCN message. The fax machine continues to operate correctly after this and can receive and send additional fax messages.

- CSCdm15134

The router may crash unexpectedly if the voice mode for a frame-relay permanent virtual circuit (PVC) is changed too quickly while voice connections are active on the PVC.

Workarounds: Shut down the voice connections using the PVC (for example, by executing **no connection trunk** on the voice port) before attempting to change the PVC voice mode from **vofr** to **vofr cisco**. The router does generate a warning message, informing the user that connections are active, when the command **no vofr** is entered.

Alternatively, simply wait for about 30 seconds after issuing the **no vofr** command and before entering the command **vofr cisco**, giving the voice connections time to be torn down completely and avoid this problem.

- CSCdm15522

The DTMF detector used for DTMF digit relay is designed to meet the requirements of EIA-464, which are: “The receiver should register DTMF signals having a power per frequency of -25 to 0 dBm.”

With this range, one would expect the DTMF digit-relay feature to correctly handle digits generated by a PBX or CO for call routing on trunks or tie lines. However, this range may not be sufficient to handle DTMF digits sent after call setup over long distance—for example, when accessing a voice mail system—where the total call path has a significant amount of attenuation.

Related Documentation

The following sections describe the documentation available for the Cisco MC3810. Typically, these documents consist of hardware installation guides, software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents.

Documentation is available as printed manuals or electronic documents, except for feature modules, which are only available online.

You can find the most up-to-date documentation on CCO and the Documentation CD-ROM. These electronic documents may contain updates and modifications made after the hardcopy documents were printed.

Use these release notes with the documents listed in the following sections:

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

Release-Specific Documents

The following documents are specific to Cisco IOS Releases 12.0 T and 12.0, on which Release 12.0(3)XG is based. 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:

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes

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

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

To access these documents on CCO, select **Technical Documents** under the Service & Support heading.

- 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 that contains caveats applicable to all platforms for all maintenance releases of Release 12.0 T. Caveats for Release 12.0(3)T apply to Release 12.0(3)XG.

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

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Caveats: Caveats for Cisco IOS Release 12.0 T

To reach the caveats 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. From CCO, log in and click on this path: **Service & Support: Online Technical Support: Software Bug Toolkit**. You can also find Bug Navigator II at <http://www.cisco.com/support/bugtools>.

Platform-Specific Documents

The documents listed below are available for the Cisco MC3810. These documents are also available online at Cisco Connection Online (CCO) and on the Documentation CD-ROM.

- *Cisco MC3810 Multiservice Access Concentrator Hardware Installation Guide*
- *Quick Start Guide: Cisco MC3810 Multiservice Access Concentrator Installation and Startup*
- *Cisco MC3810 Multiservice Access Concentrator Regulatory Compliance and Safety Information*
- *Installing and Removing Field-Replaceable Units in the Cisco MC3810 Multiservice Access Concentrator*
- *Cisco Redundant Power System Hardware Installation Guide*
- *Cisco MC3810 Multiservice Access Concentrator Software Configuration Guide*

To reach Cisco MC3810 documentation on CCO, follow this path:

Service & Support: Documentation Home Page: Access Servers and Access Routers: Multiservice Access Concentrators

To reach Cisco MC3810 documentation on the Documentation CD-ROM, follow this path:

Cisco Product Documentation: Access Servers and Access Routers: Multiservice Access Concentrators

Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.0 T, 12.0(3)XG, and other ED releases and are updates to the Cisco IOS documentation set. They consist of a brief overview of the feature, benefits, configuration tasks, and a command reference. 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.

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

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation

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

Cisco IOS Software Document Set

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, Cisco IOS software functionality, and 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.

To reach these documents on CCO, follow this path:

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

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

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

Cisco IOS Release 12.0 Documentation Set

Table 4 describes 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 You can find the most current Cisco IOS documentation on the latest Documentation CD-ROM and on the Web. These electronic documents may contain updates and modifications made after the paper documents were printed.

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

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0

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

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0

Related Documentation

Table 4 Cisco IOS Software Release 12.0 Documentation Set

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
<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

Table 4 Cisco IOS Software Release 12.0 Documentation Set (continued)

Books	Chapter Topics
<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> • <i>Quality of Service Solutions Command Reference</i> 	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> 	

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 *Cisco Network Management Toolkit* on Cisco Connection Online. From CCO, click on the following path: **Service & Support: Software Center: Network Mgmt Products: Cisco Network Management Toolkit: Cisco MIB.**

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 that are described in the “Service and Support” section of the information packet 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 Technical Assistance Center Home Page

If you have a CCO login account you can access the following URL. It contains links and helpful tips on configuring your Cisco products:

http://www.cisco.com/kobayashi/serv_tips.shtml

This URL is subject to change without notice. If it changes, point your web browser to CCO and click on this path: **Products & Technologies: Products: Technical Tips.**

The following sections are provided from the Technical Tips page:

- Access Dial Cookbook—Contains common configurations or recipes for configuring various access routes and dial technologies.
- Field Notices—Designed to provide notification of any critical issues regarding Cisco products. These notices include problem descriptions, safety or security issues, and hardware defects
- Hardware—Technical Tips related to specific hardware platforms
- Hot Tips—Popular tips and hints gathered from the Cisco Technical Assistance Center (TAC). Most of these documents are available from the TAC FAX-on-demand service. To reach FAX-on-demand and receive documents at your FAX machine from the USA, call 888-50-CISCO (888-502-4726). From other areas, call 650-596-4408.
- Internetworking Features—Tips on using and deploying Cisco IOS software features and services
- Sample Configurations—Actual configuration examples—examples complete with topology and annotations
- Software Products—MultiNet & Cisco Suite 100, Network Management, Cisco IOS Software Bulletins, and CiscoPro Configurations
- Special Collections—Other Helpful Documents, including Case Studies, References & RFCs, and Security Advisories.

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 that 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 read 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 the documents listed in the "Related Documentation" section on page 15.

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