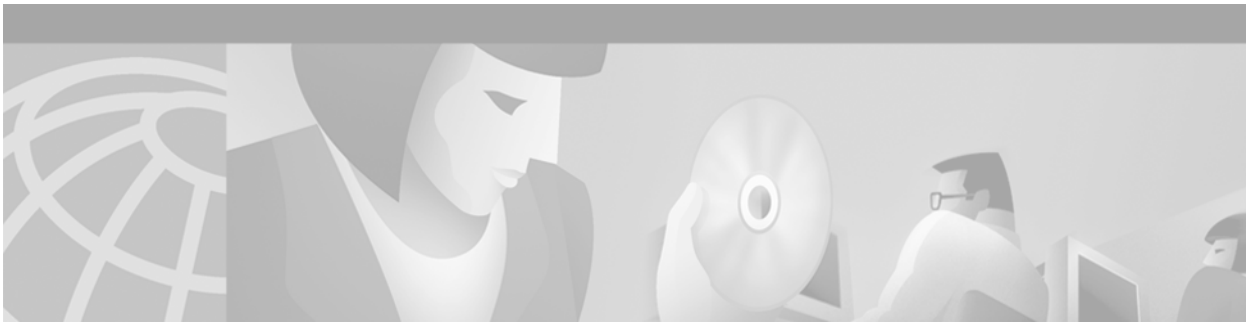

Release Notes for the Cisco ICS 7750 for Cisco IOS Release 12.2(2)XK2

February 20, 2002

Cisco IOS Release 12.2(2)XK2 introduces support for connections between Cisco CallManager (running on system processing engine [SPE] cards) and analog station interface (ASI) cards and multiservice route processor (MRP) cards in the Cisco Integrated Communications System (ICS) 7750, using the Media Gateway Control Protocol (MGCP).

Note Cisco IOS Release 12.2(2)XK2 on the Cisco ICS 7750 supports MGCP on analog interfaces only. MGCP support on digital interfaces on the Cisco ICS 7750 will be available in a later release.

- Previous releases:
  - System software release 1.1.1, 7/9/2001: Cisco IOS Release 12.2(1)XD1
  - System software release 1.1.0, 5/25/2001: Cisco IOS Release 12.2(1a)
  - System software release 1.0.6, 4/30/2001: Cisco IOS Release 12.1(5)T7
  - System software release 1.0.5, 4/20/2001: Cisco IOS Release 12.1(5)T2
  - System software release 1.0.4, 12/6/2000, and system software release 1.0.3, 11/16/2000: Cisco IOS Release 12.1(3a)XI2
  - System software release 1.0.2, 10/6/2000: Cisco IOS Release 12.1(3a)XI1

Caution Software upgrades for the Cisco ICS 7750 are typically delivered in packaged system software bundles that are distributed on CD-ROM. Each Cisco ICS 7750 system software bundle is certified with a specific IOS release. Appropriate consideration must be given to the other software in the bundle when installing Cisco IOS software in the Cisco ICS 7750. Contact your sales representative for ordering instructions.

These release notes are updated as needed to describe new memory requirements, new features, new hardware support, software platform deferrals, microcode changes, related document changes, and any other important changes. Use these release notes with the *Cross-Platform Release Notes for Cisco IOS 12.2T* located on CCO and the Documentation CD-ROM.

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Contents

These release notes discuss the following topics:

System Requirements

This section describes the system requirements for Release 12.2(2)XK2 on the Cisco ICS 7750. It includes the following sections:

Memory Requirements

Table 1 describes the memory requirements for the Cisco IOS feature sets supported by Cisco IOS Release 12.2(2)XK2 on ASI and MRP cards inside a Cisco ICS 7750 chassis.

Table 1 Available Software Images and Memory Requirements for ASI and MRP Cards

Platform	Image Name	Image	Software Bundles[1]	Required Flash Memory[2]	Required DRAM Memory[3]	Runs From
Cisco ICS 7750	IP/Voice Plus	ics7700-sv3y-mz	S77a-x.x.x	Not applicable	64 MB	RAM
	IP/FW/Voice Plus IPSec 56	ics7700-k8o3sv3y-mz	S77b-k8-x.x.x	Not applicable	64 MB	RAM
	IP/FW/Voice Plus IPSec 3DES	ics7700-k9o3sv3y-mz	S77c-k9-x.x.x	Not applicable	64 MB	RAM
	IP/IPX/AT/IBM/ Voice, Plus	ics7700-bnr2sv3y-mz	S77d-x.x.x	Not applicable	64 MB	RAM

Table 1 Available Software Images and Memory Requirements for ASI and MRP Cards (continued)

Platform	Image Name	Image	Software Bundles[1]	Required Flash Memory[2]	Required DRAM Memory[3]	Runs From
	IP/IPX/AT/IBM/FW/ Voice, Plus IPSec 56	ics7700-bk8no3r2sv3y-mz	S77e-k8-x.x.x	Not applicable	64 MB	RAM
	IP/IPX/AT/IBM/FW/ Voice, Plus IPSec 3DES	ics7700-bk9no3r2sv3y-mz	S77f-k9-x.x.x	Not applicable	64 MB	RAM

1. In addition to the IOS software listed above, each software bundle contains the following software: Cisco IOS software for the system switch processor (SSP) card, ICS System Manager, ICS Core Software, and system alarm processor (SAP) software.
2. Flash memory is not used for the Cisco IOS image on a Cisco ICS 7750. A Cisco IOS compressed image resides on the system processing engine (SPE) card and is downloaded to the RAM of each ASI or MRP card before image decompression.
3. You can upgrade ASI or MRP card memory to 80 MB or 96 MB by installing a dual in-line memory module (DIMM) in the card DIMM slot. For memory upgrade instructions, refer to *Installing Memory, PVDM, and VPN Modules in ASI Cards, MRP Cards, and SPE Cards in the Cisco ICS 7750*.

Hardware Supported

Cisco IOS Release 12.2(2)XK2 supports ASI and MRP cards in a Cisco ICS 7750. For detailed descriptions of new hardware features, see New and Changed Information, page 8.

Processor Cards

Table 2 lists the processor cards in the Cisco ICS 7750.

Table 2 Cisco ICS 7750 Processor Cards

Card	Card Description	Port Description
System processing engine (SPE)	A single-board computer that runs system software applications such as ICS System Manager and Cisco CallManager.	• SPE 200[1]: No front-panel ports. • SPE 310: Front-panel ports for video, keyboard, and universal serial bus (USB).
Multiservice route processor (MRP)	A voice-and-data-capable router that can carry voice traffic over an IP network and can link remote Ethernet LANs to central offices over WAN links. The multiservice route processor has two slots that support combinations of WAN interface cards (WICs), voice WAN interface cards (VWICs), and Voice interface cards (VICs). It also has two slots to support Packet Voice Data modules (PVDMs). Five versions of PVDMs are available.	Supports the data and voice interface port types listed in Table 5.
Analog station interface (ASI 81)	A voice-and-data-capable router that can carry voice traffic over an IP network and can link small-to- medium-size remote Ethernet LANs to central offices over WAN links (depending on the type of card installed in its WIC/VIC/VWIC slot) and can support connections to analog telephones, fax machines, and polycoms. It also has two PVDM slots.	• Eight FXS ports • One slot that supports the data and voice interface port types listed in Table 5

Table 2 Cisco ICS 7750 Processor Cards

Card	Card Description	Port Description
ASI 160	An analog gateway that supports connections to telephones, fax machines, and polycoms. It also has two PVDM slots.	Sixteen FXS ports
System alarm processor (SAP)	A module that monitors the status of the chassis, power supply modules, and fans, and feeds real-time data to the system processing engines. The SAP card delivers its data to the SPE running System Manager.	• Two COM ports • One console port
System switch processor (SSP)	An Ethernet switch that passes data between all system cards and to any other Ethernet switches connected to the system.	Two Ethernet 10/100 ports

1. SPE 310s are required in order to run system software release 2.1.0 and later.

Table 3 lists the number of processor cards supported by a Cisco ICS 7750.

Table 3 Number of Cards Supported in a Cisco ICS 7750 Chassis

Card	Minimum Required	Maximum Allowed
SAP	1	1
SSP	1	1
MRP	0	5
ASI 81 or ASI 160	0	5
SPE 310[1]	1	5
200W power supply module	1	2

1. SPE 310s are required in order to run system software release 2.1.0 and later.

MRP and ASI Card Upgrades

You can upgrade MRP and ASI cards as follows:

- Memory. MRP and ASI cards ship with 64 MB of dynamic RAM (DRAM). You can upgrade MRP and ASI card memory to 80 MB or 96 MB by installing a dual in-line memory module (DIMM) in the card DIMM slot.
- Voice and data processing power. VICs, VWICs, and FXS modules installed in MRP or ASI cards might require additional digital signal processors (DSPs) for processing heavier volumes of voice traffic. You can install Packet Voice/Data Modules (PVDMs) in one or both of the card PVDM slots to give MRP and ASI cards more processing power.

Note See *Installing Memory, PVDM, and VPN Modules in ASI Cards, MRP Cards, and SPE Cards in the Cisco ICS 7750* for instructions on how to upgrade ASI and MRP cards.

Table 4 provides information about the modules that you can install in ASI and MRP cards

Table 4 Cisco ASI and MRP Card Replacement DIMMs and PVDMs

Description	Cisco Part Number
16-MB SDRAM DIMM	MEM-MRP-16D=
32-MB SDRAM DIMM	MEM-MRP-32D=

Table 4 Cisco ASI and MRP Card Replacement DIMMs and PVDMs (continued)

Description	Cisco Part Number
4-channel packet voice/fax data DSP module	PVDM-256K-4=
8-channel packet voice/fax data DSP module	PVDM-256K-8=
12-channel packet voice/fax data DSP module	PVDM-256K-12=
16-channel packet voice/fax data DSP module	PVDM-256K-16=[1]
20-channel packet voice/fax data DSP module	PVDM-256K-20=

1. The PVDM-256K-16 is the recommended DSP module for ASI cards. Refer to the "PVDM Requirements" appendix in the *Cisco ICS 7750 Hardware Installation Guide*.

Wide Area Network Interface Cards, Voice Interface Cards, and Voice WAN Interface Cards

Table 5 lists the WICs, VICs, and VWICs that you can order in Cisco ICS 7750 MRP and ASI 81 cards. Refer to the *Cisco ICS 7750 Software Configuration Guide* and the ICS System Manager online help for configuration instructions.

Table 5 Supported WICs, VICs and VWICs

Card Description	Abbreviated Name
1-port serial, asynchronous and synchronous (T1/E1)	WIC-1T
2-port serial, asynchronous and synchronous (T1/E1)	WIC-2T
2-port serial, low speed (up to 128 kbps), asynchronous and synchronous	WIC-2A/S
1-port ISDN[1] BRI[2] (S/T interface)	WIC-1B-ST
1-port ISDN BRI with integrated NT1 (U interface)	WIC-1B-U
1-port, four-wire 56-kbps CSU/DSU[3]	WIC-1DSU-56K4
1-port, T1/fractional T1 CSU/DSU	WIC-1DSU-T1
2-port FXS[4] voice/fax interface card	VIC-2FXS
2-port FXO[5] voice/fax interface card	VIC-2FXO
2-port FXO voice/fax interface card with battery reversal detection and caller ID support (for the United States)	VIC-2FXO-M1
2-port FXO voice/fax interface card with battery reversal detection and caller ID support (for Europe)	VIC-2FXO-M2
2-port FXO voice/fax interface card with battery reversal detection (for Australia)	VIC-2FXO-M3
2-port E&M[6] voice/fax interface card	VIC-2E/M
2-port analog DID[7] voice/fax interface card	VIC-2DID
2-port ISDN BRI voice/fax interface card (network and terminal side)	VIC-2BRI-NT/TE
1-port T1/fractional T1 multiflex trunk with CSU/DSU	VWIC-1MFT-T1
2-port T1/fractional T1 multiflex trunk with CSU/DSU	VWIC-2MFT-T1
1-port E1/fractional E1 multiflex trunk with CSU/DSU	VWIC-1MFT-E1
2-port E1/fractional E1 multiflex trunk with CSU/DSU	VWIC-2MFT-E1

1. ISDN = Integrated Services Digital Network
2. BRI = Basic Rate Interface
3. CSU/DSU = channel services unit/data services unit
4. FXS = Foreign Exchange Station
5. FXO = Foreign Exchange Office
6. E&M = Ear and Mouth
7. DID = Direct Inward Dial

SPE Card Upgrades

The SPE 310 offers a keyboard port, a video port, and two universal serial bus (USB) ports supporting standard USB devices such as pointing devices and CD-ROM drives. These SPE 310 ports are required for Cisco CallManager installation and upgrades on the Cisco ICS 7750, beginning with system software release 2.1.0.

Note A Y-cable is shipped with SPE 310s to support the connection of a keyboard and mouse for Cisco CallManager installation and upgrades. To install or upgrade ICS System Manager, ICS Core Software, or IOS software, a PC that satisfies the requirements in the *Cisco ICS 7750 Release Notes* is required.

The SPE 310 also features a 700-MHz Pentium III processor, a 20.4-GB hard disk drive, and 512 MB of onboard memory. You can upgrade SPE 310 memory to 1024 MB or 1536 MB by installing a 512-MB dual in-line memory module (DIMM) in one or both of the SPE card DIMM slots.

Refer to *Installing Memory, PVDM, and VPN Modules in ASI Cards, MRP Cards, and SPE Cards in the Cisco ICS 7750* for instructions on how to upgrade the memory on SPE 310 cards.

For SPE 310 ordering instructions, contact your Cisco sales representative.

Determining Your Software Release

Complete the following steps to determine the Cisco IOS software version running on Cisco ICS 7750 ASI, MRP, or SSP cards:

Step 1 On a PC, choose **Start** > **Run**.

Step 2 Enter the following command to open a Telnet session, where *IP address* is the IP address of the card that you wish to verify:

```
telnet IP address
```

Step 3 Enter your login password.

Step 4 Enter the **show version** command:

```
card> show version
```

The following is some of the output that is displayed after entering the command **show version** on an ASI or MRP card:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) ICS7750 Software (ics7700-sv3y-mz), Version 12.2(2)XK2, RELEASE SOFTWARE
```

Additional output lines from the **show version** command include information such as the processor revision numbers, amount of available memory, hardware IDs, and partition information.

Feature Set Tables

The 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. Release 12.2(2)XK2 supports the same feature sets as Releases 12.2 and 12.2T, but Release 12.2(2)XK2 can include new features supported by the Cisco ICS 7750 platform. Table 6 lists the feature sets supported by the Cisco ICS 7750.

Table 6 Feature Sets Supported by the Cisco ICS 7750

Image Name	Feature Set Matrix Terms	Software Image
Cisco ICS 7750 IOS IP, Voice, Plus	IP/Voice Plus	ics7700-sv3y-mz
Cisco ICS 7750 IOS IP, FW, Voice, Plus, IPSec 56	IP/FW/Voice Plus IPSec 56	ics7700-k8o3sv3y-mz
Cisco ICS 7750 IOS IP, FW, Voice, Plus, IPSec, 3DES	IP/FW/Voice Plus IPSec 3DES	ics7700-k9o3sv3y-mz
Cisco ICS 7750 IOS IP, IPX, AT, IBM, Voice, Plus	IP/IPX/AT/IBM/Voice Plus	ics7700-bnr2sv3y-mz
Cisco ICS 7750 IOS IP, IPX, AT, IBM, FW, Voice, Plus, IPSec 56	IP/IPX/AT/IBM/FW/ Voice Plus IPSec 56	ics7700-bk8no3r2sv3y-mz
Cisco ICS 7750 IOS IP, IPX, AT, IBM, FW, Voice, Plus, IPSec, 3DES	IP/IPX/AT/IBM/FW/ Voice Plus IPSec 3DES	ics7700-bk9no3r2sv3y-mz

Table 7 lists the features and feature sets supported by the Cisco ICS 7750 in Cisco IOS Release 12.2(2)XK2. The table uses the following conventions:

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

Note These feature set tables only contain a selected list of features. These tables are not cumulative—nor do they list all the features in each image. For additional information about new feature support, refer to the *Release Notes for the Cisco ICS 7750 for System Software Release 2.x.x*.

Table 7 Feature List by Feature Set for the Cisco ICS 7750 Series

Features	Feature Sets					
	IP/Voice Plus	IP/FW/Voice Plus IPSec 56	IP/FW/Voice Plus IPSec 3DES	IP/IPX/AT/IBM/FW/ Voice Plus	IP/IPX/AT/ IBM/Voice Plus IPSec 56	IP/IPX/AT/IBM/ FW/Voice Plus IPSec 3DES
Security						
Virtual Private Network (VPN) Module (on MRP cards)	Yes	Yes	Yes	Yes	Yes	Yes
Voice/WAN						
Caller ID on FXS, FXO-M1, and FXO-M2 interfaces	Yes	Yes	Yes	Yes	Yes	Yes
VIC-2BRI-NT/TE support	Yes	Yes	Yes	Yes	Yes	Yes
VIC-2DID support	Yes	Yes	Yes	Yes	Yes	Yes
VIC-2FXO-M1 support	Yes	Yes	Yes	Yes	Yes	Yes
VIC-2FXO-M2 support	Yes	Yes	Yes	Yes	Yes	Yes
VIC-2FXO-M3 support	Yes	Yes	Yes	Yes	Yes	Yes
VWIC-1MFT-E1 and VWIC-2MFT-E1 support	Yes	Yes	Yes	Yes	Yes	Yes

New and Changed Information

The following sections list the new features supported by the Cisco ICS 7750 series for Cisco IOS software releases Release 12.2(2)XK2.

New Hardware Features in Release 12.2(2)XK2

Cisco IOS Release12.2(2)XK2 on the Cisco ICS 7750 supports the following new hardware features:

- Two-Port FXO for The United States With Battery Reversal (VIC-2FXO-M1)
- Two-Port FXO for Europe with Battery Reversal (VIC-2FXO-M2)
- Two-Port FXO for Australia with Battery Reversal (VIC-2FXO-M3)
- Two-Port Direct Inward-Dialing Voice Interface Card (VIC-2DID)

Two-Port FXO for The United States With Battery Reversal (VIC-2FXO-M1)

The Cisco ICS 7750 now supports two-port Foreign Exchange Office (FXO) voice interface cards for the United States using the battery reversal VIC-2FXO-M1 card. The Cisco FXO interface is an RJ-11 connector that allows an analog connection to be directed at the PSTN central office or to a station interface on a PBX. The FXO is on the switch end of the connection and plugs directly into the line side of the switch, so the switch perceives the FXO interface as a telephone. FXO-M1 is an enhancement of FXO with battery reversal and Caller ID features.

Two-Port FXO for Europe with Battery Reversal (VIC-2FXO-M2)

The Cisco ICS 7750 now supports a two-port Foreign Exchange Office (FXO) voice interface card, VIC-2FXO-M2, for Europe. VIC-2FXO-M2 is an enhancement of the VIC-2FXO-EU card, with battery reversal and Caller ID features.

Two-Port FXO for Australia with Battery Reversal (VIC-2FXO-M3)

The Cisco ICS 7750 now supports a two-port Foreign Exchange Office (FXO) voice interface card, VIC-2FXO-M3, for Australia. VIC-2FXO-M3 provides battery reversal features.

Two-Port Direct Inward-Dialing Voice Interface Card (VIC-2DID)

The Cisco ICS 7750 now supports the two-port, DID voice interface card (VIC-2DID). DID is a service offered by telephone companies that enables callers to dial directly to an extension on a Private Branch Exchange (PBX) or packet voice system (for example, Cisco CallManager and IOS routers or gateways) without the assistance of an operator or automated call attendant. This service uses DID trunks, which forward only the last three to five digits of a phone number to the PBX, router, or gateway. For example, if a company has the phone extensions 555-1000 to 555-1999, and a caller dials 555-1234, the local central office (CO) forwards 234 to the PBX or packet voice system. The PBX or packet voice system then rings extension 234. The entire process is transparent to the caller.

The VIC-2DID card services two analog DID trunks using analog voice or fax. The card provides dual-working modes, DID and FXS, which are mutually exclusive.

New Software Features in Release 12.2(2)XK2

Cisco IOS Release12.2(2)XK2 on the Cisco ICS 7750 supports the following new features:

- MCGP Control of Analog Interfaces
- DTMF Relay
- Supplementary Services
- Caller ID
- Modem Pass-Through Using H.323
- Fax Pass-Through Using H.323

MCGP Control of Analog Interfaces

Media Gateway Control Protocol (MGCP) and Simple Gateway Control Protocol (SGCP) are call control protocols that run between call agents (CA) and gateways in a packet telephony network.

As in the earlier implementations of the two protocols, a gateway handles the translation between audio signals and the packet network. These gateways interacts with a CA, also called a Media Gateway Controller (MGC), which performs signal and call processing on the gateways' calls.

On the Cisco ICS 7750, MRP and ASI cards can provide an interface between analog (RJ11) calls from a telephone and the VoIP network. This feature supports analog (POTS) calls for both SGCP and MGCP on the Cisco ICS 7750.

DTMF Relay

DTMF uses specific pairs of frequencies within the voice band for signaling. Over a 64-kbps pulse code modulation (PCM) voice channel, these signals can be carried without difficulty. However, when using a low-bit-rate codec for voice compression, the potential exists for DTMF signal loss or distortion. Using an out-of-band signaling method for carrying DTMF tones across a VoIP infrastructure provides an elegant solution for these codec-induced symptoms.

Supplementary Services

When MGCP is used, Cisco CallManager controls routing and tones and provides supplementary services to the gateway (MRP or ASI card). MGCP provides call preservation (calls are maintained during failover and failback), redundancy, dial plan simplification (no dial peer configuration is required on the gateway), hookflash transfer, and tone on hold. MGCP-controlled gateways do not require an MTP to enable supplementary services such as hold, transfer, call pickup, and call park.

Caller ID

The Cisco ICS 7750 supports Caller ID functions on analog FXS, FXO-M1, and FXO-M2 voice interfaces, and on the FXS mode of the Direct Inward Dialing (DID) voice interface card, VIC-2DID.

Caller ID (sometimes called *CLID* for calling line identification) is an analog service offered by a Central Office (CO), which supplies calling party information to subscribers. Typically, the calling party number and the name appears on a station (also called *extension*) device such as a PC telephony software application screen or the display on a telephone. Type 1 Caller ID provides the calling party information while the call is ringing, and Type 2 Caller ID provides the additional convenience of calling number display while the recipient is on another call. In this release, only Type 1 Caller ID is supported.

Modem Pass-Through Using H.323

Modem pass-through over VoIP provides for the transport of modem signals through a packet network by using pulse code modulation (PCM)-encoded packets.

Modem pass-through performs the following functions:

- Repressing processing functions like compression, echo cancellation, high-pass filter, and voice activity detection (VAD)
- Issuing redundant packets to protect against random packet drops
- Providing static jitter buffers of 200 milliseconds (ms) to protect against clock skew
- Differentiating modem signals from voice and fax signals, indicating the detection of the modem signal across the connection, and placing the connection in a state that transports the signal across the network with the least distortion
- Maintaining a modem connection reliably across the packet network for a long duration under normal network conditions

Modem pass-through offers the following benefits:

- Detecting modem tones
- Passing modem signals over the WAN
- Performing proper switchover to pass modem traffic on a bearer channel
- Detecting modems at speeds up to V.90

Fax Pass-Through Using H.323

The Cisco ICS 7750 allows you to pass through fax signals on one line at a time. To use the fax pass-through feature, the gateway must be configured to detect the fax tone and switch codec.

Note When you are using G.729 on one port, the other port automatically uses the G.711 protocol. Use the same codec type for both the originating gateway and the terminating gateway. The g711ulaw codec is required for T1, and the g711alaw codec is required for E1.

Important Notes

The following sections contain important notes about Cisco IOS-related issues that can apply to the Cisco ICS 7750. (Also, see the "Related Documentation" section on page 13.)

Networks with Cisco 2600 and Cisco 3600 Series Routers

In a network environment that uses Cisco 2600 series routers, Cisco 3600 series routers, and Cisco ICS 7750s, to avoid intermittent call setup failures all platforms should run Cisco IOS Release 12.2(2)XK2 or later.

Software Images on MRP and ASI Cards

All of the MRP and ASI cards in a Cisco ICS 7750 must run the same Cisco IOS image.

Caveats

Caveats describe unexpected behavior or defects in Cisco IOS software releases. Severity 1 caveats are the most serious caveats, severity 2 caveats are less serious, and severity 3 caveats are the least serious of these three severity levels.

All caveats in Release 12.2 T are also in Release 12.2(2)XK2. For information on caveats in Cisco IOS Release 12.2 T, refer to the *Caveats for Cisco IOS Release 12.2 T* document. For information on caveats in Cisco IOS Release 12.2, refer to the *Caveats for Cisco IOS Release 12.2* document. These documents list severity 1 and 2 caveats, and are located on CCO and the Documentation CD-ROM.

Note If you have an account with Cisco.com, you can also use the Bug Toolkit to find select caveats of any severity. To reach the Bug Toolkit, log in toCisco.com and click **Service & Support**: **Technical Assistance Center**: **Tool Index**: **Bug Toolkit**. Another option is to go to http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl.

Resolved Caveats

The caveats listed in this section are resolved in Cisco IOS Release 12.2(2)XK2.

Caveat CSCdw65903—Management Protocol Processing

An error can occur with management protocol processing. Please use the following URL for further information:

http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903

Other Caveats

- If you are using a H.323 gateway (such as an MRP card) that is running IOS Release 12.2(1)XD2, where the Music On Hold (MOH) feature has been enabled in Cisco CallManager 3.1(1), when you call from a Cisco IP Phone to an analog telephone and press the Hold softkey on the Cisco IP Phone, the listener on the analog telephone will not hear the MOH (CSCdu81104).
- The FXS port of the ASI81 and ASI160 cards may send an unexpected hookflash indication if the handset is lifted when the phone is ringing and if the phone is connected to an FXS port of the ASI81 or ASI160. As a result, if the remote (PSTN) side of the call supports hookflash, the caller may hear a dial tone. While the remote side is issuing a dial tone, conversation cannot take place. However, once the timeout period (set by the remote side) is reached, the dial tone ceases and conversation can begin.

  A typical topology with this problem is an analog telephone connected to the PSTN by way of an FXO port on the same ASI81 card. (CSCdu41511)
- Callers using a Cisco IP Phone may hear echoing of DTMF tones if the call is going out by way of a Cisco voice gateway to a PSTN or PBX and if the caller uses the keypad for dialing. This problem is more noticeable if dialing takes place in the absence of any conversation (when the echo canceler has not converged) and if echo cancellation coverage is set longer than required. (CSCdu41730)
- If you run multiple voice calls over a single DSP on an MRP card that is configured for echo cancellation coverage of 32 milliseconds on its voice ports, some voice quality degradation might be noticeable. (CSCdr66308)
- By default, fax relay is supported if a fax machine is directly connected to the MRP using an FXS port. However, fax relay is not supported if the fax call is routed through a T1 line. (CSCdu06186)
- Outgoing calls through the FXO port would fail if the called number is more than 10 digits, such as for long distance calls. (CSCdu41173)
- During the system boot, the MRP initializes, but no configuration (or only a partial configuration) is present. Because of this, the ICS 7750 system discovery fails or does not finish discovering the cards. (CSCdu07653)
- If the Cisco ICS 7750 MRP card is loaded with Cisco IOS release 12.1(5)T2 or 12.1(5)T7, the IP network might be variably and incorrectly masked after the MRP boots. (CSCdu06266)

Open Caveats

This section describes open caveats in Release 12.2(2)XK2.

- Pulse dialing is not supported on ASI or MRP analog interfaces when using MGCP. (CSCdv30796)

  There is no workaround.

- If you are using MGCP on an ASI or MRP FXO-M1 interface, battery-reversal answer supervision is not supported. (CSCdv43225)

  There is no workaround.

- Connections over T1 endpoints might experience unacceptable levels of background white noise, or "hiss," if Voice Activity Detection (VAD) is enabled on the MRP card. VAD, which is enabled by default, causes the Cisco IP Phone 7960 to generate a low level hiss to simulate the background circuit noise users experience on non-IP connections. (CSCdr31192)

  Workaround—Disabling VAD can solve this problem, however, if you disable VAD on a network that exhibits a significant amount of jitter (for example, greater than 100 milliseconds per second), latency becomes noticeable to the user in the form of delay and packet loss. Also, if the codec clocks are out of sync among the devices participating in the call, latency increases for the duration of the call. For example, if the codec clock at the transmitting end is 100 parts per million faster than the codec clock at the receiving end, latency increases to one-half second over the course of a one hour long connection (at 8 kHz).

- When placing a call through an MRP card to an IVR system, greeting messages played by the IVR might be clipped. (CSCds04904)

  There is no workaround.

Related Documentation

The following sections describe the documentation available for the Cisco ICS 7750. Typically, these documents consist of hardware and 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 available online on Cisco.com and the Documentation CD-ROM.

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

- Release-Specific Documents
- Cisco ICS 7750 Documents
- Feature Modules
- Cisco IOS Software Documentation Set

Release-Specific Documents

The following documents are specific to Release 12.2 and apply to Release 12.2(2)XK2. They are located on Cisco.com and the Documentation CD-ROM:

- *Release Notes for Cisco IOS Release 12.2(2)XK2*

  - To reach the *Release Notes for the Cisco 1CS 7750 for Cisco IOS Release 12.2(2)XK2* from Cisco.com, click this path (under the heading **Service & Support**):

    Technical Documents: Cisco IOS Software: Release 12.2: Release Notes: Cisco Integrated Communications System 7750 : Release Notes for the Cisco ICS 7750 for IOS Release 12.2(2)XK2

  - To reach the *Release Notes for the Cisco 1CS 7750 for Cisco IOS Release 12.2(2)XK2* on the Documentation CD-ROM, click this path:

    Cisco Product Documentation: Cisco IOS Software Configuration: **Cisco IOS Release 12.2**: **Release Notes**: **Cisco Integrated Communications System 7750 : Release Notes for the Cisco ICS 7750 for IOS Release 12.2(2)XK2**

- *Release Notes for Cisco IOS Release 12.2 T*
  - To reach the *Cross-Platform Release Notes for Cisco IOS Release 12.2 T* from Cisco.com, click this path (under the heading **Service & Support**):

    Technical Documents: Cisco IOS Software: Release 12.2: Release Notes: Cisco IOS Release 12.2 T

  - To reach the *Cross-Platform Release Notes for Cisco IOS Release 12.2* on the Documentation CD-ROM, click this path:

    Cisco Product Documentation: Cisco IOS Software Configuration: **Cisco IOS Release 12.2**: **Release Notes**: **Cisco IOS Release 12.2 T**

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

  To reach these documents from Cisco.com, click this path (under the heading **Service & Support**):

  Technical Documents: Product Bulletins

- *Caveats for Cisco IOS Release 12.2 and 12.2 T*

  The *Caveats for Cisco IOS Release 12.2* and *Caveats for Cisco IOS Release 12.2 T* documents contain caveats applicable to all platforms for all maintenance releases of Release 12.2.

  - To reach the caveats document from Cisco.com, click this path (under the heading **Service & Support**):

    Technical Documents: Cisco IOS Software: Release 12.2: Caveats

  - To reach the caveats document on the Documentation CD-ROM, click this path:

    Cisco Product Documentation: **Cisco IOS Software Configuration**: **Cisco IOS Release 12.2**: **Caveats**

Note If you have an account with Cisco.com, you can also use the Bug Toolkit to find select caveats of any severity. To reach the Bug Toolkit, log in toCisco.com and click **Service & Support**: **Technical Assistance Center**: **Tool Index**: **Bug Toolkit**. Another option is to go to http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl.

Cisco ICS 7750 Documents

The documents described in this section are available on Cisco.com and on CD:

On Cisco.com, beginning under the **Service & Support** heading:

Technical Documents: Voice/Telephony: Cisco ICS 7750

On the Documentation CD-ROM (order number DOC-CONDOCCD=) at:

Cisco Product Documentation: Voice/Telephony: Cisco ICS 7750

The following documents are available:

- *Cisco ICS 7750 System Description*
- *Cisco ICS 7750 Getting Started Guide*
- *Cisco ICS 7750 Hardware Installation Guide*
- *Cisco ICS 7750 Administration and Troubleshooting Guide*
- *Cisco ICS 7750 Software Configuration Guide*
- Installation and Configuration Notes:
  - *Installing Memory, PVDM, and VPN Modules in ASI Cards, MRP Cards, and SPE Cards in the Cisco ICS 7750*
  - *Cisco ICS 7750 FRU Installation and Replacement*
- Software Feature Module:
  - *Cisco ICS 7750 Multiservice Route Processor Model 200 Configuration*
- Release Notes:
  - *Release Notes for the Cisco ICS 7750 for System Software Release 2.x.x*
  - *Release Notes for the Cisco ICS 7750 for Cisco IOS Release 12.2(2)XK2* (this document)
- *Regulatory Compliance and Safety Information for the Cisco ICS 7750*

Documentation Set

Printed versions of most of the platform-specific documents can be ordered as a boxed set (order number DOCS-7750=).

Feature Modules

Feature modules describe new features supported by Release 12.2 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.

To reach the Release 12.2 feature modules:

- From Cisco.com, click this path (under the heading **Service & Support**):

  Technical Documents: **Cisco IOS Software**: **Release 12.2**: **New Feature Documentation**: **New Features in 12.2-Based Limited Lifetime Releases**: **New Features in 12.2X Releases**

- From the Documentation CD-ROM, click this path:

  Cisco Product Documentation: **Cisco IOS Software Configuration**: **Cisco IOS Release 12.2**: **New Feature Documentation**: **New Features in 12.2-Based Limited Lifetime Releases**: **New Features in 12.2X Releases**

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. If you do not have an account on Cisco.com, go to http://www.cisco.com/register and follow the directions to set up an account.

To use Feature Navigator, you must have a JavaScript-enabled web browser such as Netscape 3.0 or later, or Internet Explorer 4.0 or later. Internet Explorer 4.0 always has JavaScript enabled. To enable JavaScript for Netscape 3.x or Netscape 4.x, follow the instructions provided with the web browser. For JavaScript 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. 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. The Cisco IOS software documentation set is 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 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. The Cisco IOS software documentation set is available on Cisco.com and on the Documentation CD-ROM.

On Cisco.com (under the heading **Service & Support**) at:

Technical Documents: Cisco IOS Software: Release 12.2: Configuration Guides and Command References

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2: Configuration Guides and Command References

Release 12.2 Documentation Set

Table 8 describes the contents of the Cisco IOS Release 12.2 software documentation set, which is available in both electronic and printed form.

Note You can find the most current Cisco IOS documentation on Cisco.com and the Documentation CD-ROM. These electronic documents may contain updates and modifications made after the hard-copy documents were printed.

On Cisco.com (under the heading **Service & Support**) at:

Technical Documents: Cisco IOS Software: Release 12.2

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2

Note Some aspects of the complete Cisco IOS Release 12.2 software documentation set might not apply to the Cisco ICS 7750.

Table 8 Cisco IOS Release 12.2 Documentation Set

Books	Major Topics
• *Cisco IOS Configuration Fundamentals Configuration Guide* • *Cisco IOS Configuration Fundamentals Command Reference*	Cisco IOS User Interfaces File Management System Management
• *Cisco IOS Bridging and IBM Networking Configuration Guide* • *Cisco IOS Bridging and IBM Networking Command Reference, Volume 1 of 2* • *Cisco IOS Bridging and IBM Networking Command Reference, Volume 2 of 2*	Transparent Bridging SRB Token Ring Inter-Switch Link Token Ring Route Switch Module RSRB DLSW+ Serial Tunnel and Block Serial Tunnel LLC2 and SDLC IBM Network Media Translation SNA Frame Relay Access NCIA Client/Server Airline Product Set DSPU and SNA Service Point SNA Switching Services Cisco Transaction Connection Cisco Mainframe Channel Connection CLAW and TCP/IP Offload CSNA, CMPC, and CMPC+ TN3270 Server

Table 8 Cisco IOS Release 12.2 Documentation Set (continued)

Books	Major Topics
• *Cisco IOS Dial Technologies Configuration Guide: Dial Access* • *Cisco IOS Dial Technologies Configuration Guide: Large-Scale Dial Applications* • *Cisco IOS Dial Technologies Command Reference, Volume 1 of 2* • *Cisco IOS Dial Technologies Command Reference, Volume 2 of 2*	Dial Access Modem and Dial Shelf Configuration and Management ISDN Configuration Signaling Configuration Point-to-Point Protocols Dial-on-Demand Routing Dial Backup Dial Related Addressing Service Network Access Solutions Large-Scale Dial Solutions Cost-Control Solutions Internetworking Dial Access Scenarios
• *Cisco IOS Interface Configuration Guide* • *Cisco IOS Interface Command Reference*	LAN Interfaces Serial Interfaces Logical Interfaces
• *Cisco IOS IP Configuration Guide* • *Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services* • *Cisco IOS IP Command Reference, Volume 2 of 3: Routing Protocols* • *Cisco IOS IP Command Reference, Volume 3 of 3: Multicast*	IP Addressing IP Services IP Routing Protocols IP Multicast
• *Cisco IOS AppleTalk and Novell IPX Configuration Guide* • *Cisco IOS AppleTalk and Novell IPX Command Reference*	AppleTalk Novell IPX
• *Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide* • *Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference*	Apollo Domain Banyan VINES DECnet ISO CLNS XNS
• *Cisco IOS Voice, Video, and Fax Configuration Guide* • *Cisco IOS Voice, Video, and Fax Command Reference*	Voice over IP Call Control Signaling Voice over Frame Relay Voice over ATM Telephony Applications Trunk Management Fax, Video, and Modem Support
• *Cisco IOS Quality of Service Solutions Configuration Guide* • *Cisco IOS Quality of Service Solutions Command Reference*	Packet Classification Congestion Management Congestion Avoidance Policing and Shaping Signaling Link Efficiency Mechanisms

Table 8 Cisco IOS Release 12.2 Documentation Set (continued)

Books	Major Topics
• *Cisco IOS Security Configuration Guide* • *Cisco IOS Security Command Reference*	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options Supported AV Pairs
• *Cisco IOS Switching Services Configuration Guide* • *Cisco IOS Switching Services Command Reference*	Cisco IOS Switching Paths NetFlow Switching Multiprotocol Label Switching Multilayer Switching Multicast Distributed Switching Virtual LANs LAN Emulation
• *Cisco IOS Wide-Area Networking Configuration Guide* • *Cisco IOS Wide-Area Networking Command Reference*	ATM Frame Relay SMDS X.25 and LAPB
• *Cisco IOS Mobile Wireless Configuration Guide* • *Cisco IOS Mobile Wireless Command Reference*	General Packet Radio Service
• *Cisco IOS Terminal Services Configuration Guide* • *Cisco IOS Terminal Services Command Reference*	ARA LAT NASI Telnet TN3270 XRemote X.28 PAD Protocol Translation
• *Cisco IOS Configuration Guide Master Index* • *Cisco IOS Command Reference Master Index* • *Cisco IOS Debug Command Reference* • *Cisco IOS Software System Error Messages* • New Features in 12.2-Based Limited Lifetime Releases • New Features in Release 12.2T • Release Notes (Release note and caveat documentation for 12.2-based releases and various platforms)	

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

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

http://www.cisco.com

Translated documentation is available at the following URL:

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

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped 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 through 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

- 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, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

If you are reading Cisco product documentation on Cisco.com, you can submit technical comments electronically. Click **Feedback** at the top of the Cisco Documentation home page. After you complete the form, print it out and fax it to Cisco at 408 527-0730.

You can e-mail your comments to bug-doc@cisco.com.

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

Cisco Systems
Attn: 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 by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

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

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

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

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

http://www.cisco.com

Technical Assistance Center

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

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

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

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

Cisco TAC Web Site

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

http://www.cisco.com/tac

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

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

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

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

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

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

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

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

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

This document is to be used in conjunction with the documents listed in the "Related Documentation" section on page 13.