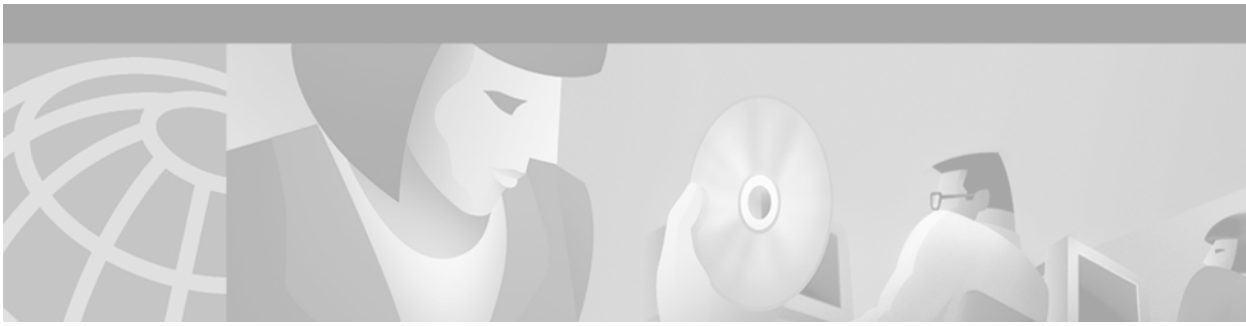

Release Notes for the Cisco 1700 Series Routers for Cisco IOS Release 12.2(4)XW

November 19, 2001

These release notes describe new features and significant software components for the Cisco 1700 series routers that support Cisco IOS Release 12.2 T, up to and including Release 12.2(4)XW. These release notes are updated as needed to describe new memory requirements, new features, new hardware support, software platform deferrals, microcode or modem code changes, related document changes, and any other important changes. Use these release notes with the *Cross-Platform Release Notes for Cisco IOS Release 12.2 T* located on CCO and the Documentation CD-ROM.

For a list of the software caveats that apply to Release 12.2(4)XW, refer to the section "Caveats" and to the online *Caveats for Cisco IOS Release 12.2 T* document. The caveats document is updated for every 12.2 T maintenance release and is located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

Contents

These release notes discuss the following topics:

CISCO SYSTEMS

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System Requirements

This section describes the system requirements for Release 12.2(4)XW and includes the following sections:

Memory Requirements

This section describes the memory requirements for the Cisco IOS feature sets supported by Cisco IOS Release 12.2(4)XW on the Cisco 1700 series routers.

Table 1 Recommended Memory for the Cisco 1700 Series Routers

Platform	Image Name	Feature Set	Image	Recommended Flash Memory	Recommended DRAM Memory	Runs from
Cisco 1720, 1750, 1751, and 1760	Cisco 1700 IOS IP/ ADSL/IPX/AT/IBM/ FW/IDS Plus IPSec 56	IP/ADSL/IPX/AT/ IBM/FW/IDS Plus IPSec 56	c1700-bk8no3r2sy7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/IPX/AT/IBM/ FW/IDS Plus IPSec 3DES	IP/ADSL/IPX/AT/ IBM/FW/IDS Plus IPSec 3DES	c1700-bk9no3r2sy7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/IPX/AT/IBM Plus	IP/ADSL/IPX/AT/ IBM Plus	c1700-bnr2sy7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/IPX/ AT/IBM	IP/IPX/AT/IBM	c1700-bnr2y-mz	8 MB	32 MB	RAM
	Cisco 1700 IOS IP/ ADSL/FW/IDS Plus IPSec 56	IP/ADSL/FW/IDS Plus IPSec 56	c1700-k8o3sy7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL Plus IPSec 56	IP/ADSL Plus IPSec 56	c1700-k8sy7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/FW/IDS Plus IPSec 3DES	IP/ADSL/FW/IDS Plus IPSec 3DES	c1700-k9o3sy7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL Plus IPSec 3DES	IP/ADSL Plus IPSec 3DES	c1700-k9sy7-mz	16 MB	48 MB	RAM

Table 1 Recommended Memory for the Cisco 1700 Series Routers (continued)

Platform	Image Name	Feature Set	Image	Recommended Flash Memory	Recommended DRAM Memory	Runs from
Cisco 1720, 1750, 1751, and 1760 (Continued)	Cisco 1700 IOS IP/ ADSL/IPX/FW/IDS Plus	IP/ADSL/IPX/ FW/IDS Plus	c1700-no3sy7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/IPX	IP/IPX	c1700-ny-mz	8 MB	32 MB	RAM
	Cisco 1700 IOS IP/ FW/IDS	IP/FW/IDS	c1700-o3y-mz	8 MB	32 MB	RAM
	Cisco 1700 IOS IP/ ADSL Plus	IP/ADSL Plus	c1700-sy7-mz	8 MB	48 MB	RAM
	Cisco 1700 IOS IP	IP	c1700-y-mz	8 MB	32 MB	RAM
	Cisco 1700 IOS IP/ADSL	IP/ADSL	c1700-y7-mz	8 MB	32 MB	RAM
Cisco 1750, 1751, and 1760	Cisco 1700 IOS IP/ ADSL/IPX/AT/IBM/ Voice/FW/IDS Plus IPSec 56	IP/ADSL/IPX/AT/ IBM/Voice/FW/ IDS Plus IPSec 56	c1700-bk8no3r2sv3y7-mz	32 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/IPX/AT/IBM/ Voice/FW/IDS Plus IPSec 3DES	IP/ADSL/IPX/ AT/IBM/Voice/ FW/IDS Plus IPSec 3DES	c1700-bk9no3r2sv3y7-mz	32 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/Voice/FW/IDS Plus IPSec 56	IP/ADSL/Voice/ FW/IDS Plus IPSec 56	c1700-k8o3sv3y7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/Voice Plus IPSec 56	IP/ADSL/Voice Plus IPSec 56	c1700-k8sv3y7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/Voice/FW/IDS Plus IPSec 3DES	IP/ADSL/Voice/ FW/IDS Plus IPSec 3DES	c1700-k9o3sv3y7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/Voice Plus IPSec 3DES	IP/ADSL/Voice Plus IPSec 3DES	c1700-k9sv3y7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/IPX/Voice/FW / IDS Plus	IP/ADSL/IPX/Voice/ FW/IDS Plus	c1700-no3sv3y7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/Voice/FW/ IDS Plus	IP/ADSL/Voice/FW/ IDS Plus	c1700-o3sv3y7-mz	16 MB	48 MB	RAM

Table 1 Recommended Memory for the Cisco 1700 Series Routers (continued)

Platform	Image Name	Feature Set	Image	Recommended Flash Memory	Recommended DRAM Memory	Runs from
Cisco 1750, 1751, and 1760 (Continued)	Cisco 1700 IOS IP/ Voice Plus	IP/Voice Plus	c1700-sv3y-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ ADSL/Voice Plus	IP/ADSL/Voice Plus	c1700-sv3y7-mz	16 MB	48 MB	RAM
	Cisco 1700 IOS IP/ VOX Plus	IP/VOX Plus	c1700-sv8y-mz	16 MB	48 MB	RAM
Cisco 1751 and 1760	Cisco 1700 IOS IP/ ADSL/IPX/AT/IBM/ VOX[1]/FW/IDS Plus IPSec 56	IP/ADSL/IPX/AT /IBM/VOX/FW/ IDS Plus IPSec 56	c1700-bk8no3r2sv8y7-mz	16 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/IPX/AT/IBM/ VOX/FW/IDS Plus IPSec 3DES	IP/ADSL/IPX/ AT/IBM/VOX/ FW/IDS Plus IPSec 3DES	c1700-bk9no3r2sv8y7-mz	32 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/VOX/FW/IDS Plus IPSec 56	IP/ADSL/VOX/ FW/IDS Plus IPSec 56	c1700-k8o3sv8y7-mz	32 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/VOX Plus IPSEC 56	IP/ADSL/VOX Plus IPSEC 56	c1700-k8sv8y7-mz	16 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/VOX/FW/IDS Plus IPSec 3DES	IP/ADSL/VOX/ FW/IDS Plus IPSec 3DES	c1700-k9o3sv8y7-mz	16 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/VOX Plus IPSec 3DES	IP/ADSL/VOX Plus IPSec 3DES	c1700-k9sv8y7-mz	16 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/IPX/VOX/FW/ IDS Plus	IP/ADSL/IPX/VOX/ FW/IDS Plus	c1700-no3sv8y7-mz	16 MB	64 MB	RAM
	Cisco 1700 IOS IP/ ADSL/VOX Plus	IP/ADSL/VOX Plus	c1700-sv8y7-mz	16 MB	64 MB	RAM
Cisco 1760 routers	Cisco 1700 IOS IP/ ADSL/VOX/FW/ IDS Plus	IP/ADSL/VOX/ FW/IDS Plus	c1700-o3sv8y7-mz	16 MB	64 MB	RAM

1. The “VOX” image represents and contains voice-extended features.

Hardware Supported

Cisco IOS Release 12.2(4)XW supports the following Cisco 1700 series routers:

- Cisco 1720 router
- Cisco 1750, 1750-2V, and 1750-4V routers

- Cisco 1751 and 1751-V routers
- Cisco 1760 and 1760-V routers

The Cisco 1720 router runs data images only. The Cisco 1750, 1750-2V, and 1750-4V routers run data and data-and-voice images, providing analog voice support. Cisco 1751, 1751-V, 1760, and 1760-V routers run data and data-and-voice images, providing digital and analog voice support.

For detailed descriptions of the new hardware features, see the documents listed in the "Platform-Specific Documents" section on page 15.

Cisco 1720 Routers

The 1720 router provides Internet and intranet access and includes the following:

- Support for virtual private networking.
- Modular architecture.
- Network device integration.

The Cisco 1720 router has the following hardware components:

- One autosensing 10/100 Fast Ethernet port, which operates in full- or half-duplex mode (with manual override available).
- Two WAN interface card slots.
- One auxiliary (AUX) port (up to 115.2 kbps asynchronous serial).
- One console port.
- RISC Processor for high performance encryption.
- One internal expansion slot for support of hardware-assisted services such as encryption (up to T1/E1) and compression.
- DRAM memory: 32 MB default, expandable to 48 MB.
- Flash memory: 8 MB default, expandable to 16 MB.
- Desktop form factor.

The Cisco 1720 router supports any combination of one or two of the following WAN interface cards:

- WIC-1T—One port high speed serial (sync/async).
- WIC-2T—Two port high speed serial (sync/async).
- WIC-2A/S—Two port low speed serial (sync/async) (up to 128 kbps).
- WIC-1B-S/T—One port ISDN BRI S/T.
- WIC-1B-U—One port ISDN BRI U.
- WIC-1DSU-56K4—One port integrated 56/64 kbps 4-wire DSU/CSU.
- WIC-1DSU-T1—One port integrated T1 / Fractional T1 DSU/CSU.
- WIC-1ENET—One-port 10Base-T Ethernet interface.
- WIC-1ADSL--One-port asymmetrical digital subscriber line.

Cisco 1750, 1750-2V, and 1750-4V Routers

The voice-and-data capable Cisco 1750, 1750-2V and 1750-4V routers provide global Internet and company intranet access and includes the following:

- Voice-over-IP (VoIP) voice-and-data functionality; the router can carry voice traffic (for example, telephone calls and faxes) over an IP network.
- Support for virtual private networking.
- Modular architecture.
- Network device integration.

The Cisco 1750, 1750-2V and 1750-4V routers have the following hardware components:

- One autosensing 10/100 Fast Ethernet port, which operates in full- or half-duplex mode (with manual override available).
- One voice interface card (VIC) slot—Supports a single voice interface card with two ports per card.
- Two WAN interface card (WIC) slots for either WICs or VICs.
- Synchronous serial interfaces on serial WICs.
- Asynchronous serial interfaces on serial WICs.
- ISDN WICs—ISDN dialup and ISDN leased line (IDSL) at 144 kbps; encapsulation over ISDN leased line; Frame Relay and PPP.
- One auxiliary (AUX) port (up to 115.2 kbps asynchronous serial).
- One console port.
- One internal expansion slot—Supports hardware-assisted services such as encryption (up to T1/E1 speeds).
- RISC Processor—Motorola MPC860T PowerQUICC at 48 MHz.
- One security slot that supports Kensington or similar lockdown equipment.
- DRAM: 16 MB default, expandable to 48 MB.
- Flash memory: 4 MB default, expandable to 16 MB.
- Desktop form factor.

The Cisco 1750, 1750-2V and 1750-4V routers support any combination of one or two of the following WICs:

- WIC-1T—One-port high speed serial (sync/async)(T1/E1).
- WIC-2T—Two-port high speed serial (sync/async) (T1/E1).
- WIC-2A/S—Two-port low speed serial (sync/async) (up to 128 kbps).
- WIC-1B-S/T—One-port ISDN BRI S/T.
- WIC-1B-U—One-port ISDN BRI U with integrated NT1.
- WIC-1DSU-56K4—One-port integrated 56/64 kbps 4-wire DSU/CSU.
- WIC-1DSU-T1—One-port integrated T1 / Fractional T1 DSU/CSU.
- WIC-1ADSL—One-port asymmetric digital subscriber line.
- WIC-1ENET—One-port 10Base-T Ethernet interface.

The Cisco 1750, 1750-2V and 1750-4V routers support any combination of one or two of the following voice interface cards:

- VIC-2FXS—Two-port Foreign Exchange Station (FXS) voice interface card.
- VIC-2FXO—Two-port Foreign Exchange Office (FXO) voice interface card.
- VIC-2FXO-EU—Two-port FXO voice interface card for Europe.
- VIC-2E/M—Two-port Ear and Mouth (E & M) voice interface card.
- VIC-2FXO-M1—Two-port FXO for the United States with battery reversal.
- VIC-2FXO-M2—Two-port FXO for Europe with battery reversal.
- VIC-2FXO-M3—Two-port FXO for Australia.

Cisco 1751 and 1751-V Routers

The voice-and-data capable Cisco 1751 and 1751-V routers provide global Internet and company intranet access and include the following:

- Voice-over-IP (VoIP) voice-and-data functionality; the router can provide support for digital and analog voice traffic (for example, telephone calls and faxes) over an IP network.
- Support for virtual private networking.
- Modular architecture.
- Network device integration.

The Cisco 1751 and 1751-V routers have the following hardware components:

- One autosensing 10/100 Fast Ethernet port, which operates in full- or half-duplex mode (with manual override available).
- IEEE 802.1Q VLAN support.
- One VIC slot—Supports a single voice interface card with two ports per card.
- Two WIC slots for either WICs or VICs.
- Synchronous serial interfaces on serial WICs.
- Asynchronous serial interfaces on serial WICs.
- ISDN WICs—ISDN dialup and ISDN leased line (IDSL) at 144 kbps; encapsulation over ISDN leased line; Frame Relay and PPP.
- One auxiliary (AUX) port (up to 115.2 kbps asynchronous serial).
- One console port.
- One internal expansion slot—Supports hardware-assisted services such as encryption (up to T1/E1 speeds).
- RISC Processor—Motorola MPC860P PowerQUICC at 48.384 MHz.
- One security slot that supports Kensington or similar lockdown equipment.
- DRAM:
  - Cisco 1751: 32 MB default, expandable to 96 MB.
  - Cisco 1751-V: 64 MB default, expandable to 128 MB.

- Flash memory:
  - Cisco 1751: 16 MB.
  - Cisco 1751-V: 32 MB.
- Desktop form factor.

The Cisco 1751 and 1751-V routers support any combination of one or two of the following WICs:

- WIC-1T—One-port high speed serial (sync/async)(T1/E1).
- WIC-2T—Two-port high speed serial (sync/async) (T1/E1).
- WIC-2A/S—Two-port low speed serial (sync/async) (up to 128 kbps).
- WIC-1B-S/T—One-port ISDN BRI S/T.
- WIC-1B-U—One-port ISDN BRI U with integrated NT1.
- WIC-1DSU-56K4—One-port integrated 56/64 kbps 4-wire DSU/CSU.
- WIC-1DSU-T1—One-port integrated T1 / Fractional T1 DSU/CSU.
- WIC-1ADSL—One-port asymmetric digital subscriber line.
- WIC-1ENET—One-port 10Base-T Ethernet interface.

The Cisco 1751 and 1751-V routers support any combination of one, two or three of the following VICs:

- VIC-2FXS—Two-port Foreign Exchange Station (FXS) voice interface card.
- VIC-2FXO—Two-port Foreign Exchange Office (FXO) voice interface card.
- VIC-2FXO-EU—Two-port FXO voice interface card for Europe.
- VIC-2E/M—Two-port Ear and Mouth (E&M) voice interface card.
- VIC-2FXO-M1—Two-port FXO for the United States with battery reversal.
- VIC-2FXO-M2—Two-port FXO for Europe with battery reversal.
- VIC-2FXO-M3—Two-port FXO for Australia.
- VIC-2BRI-NT/TE—Two-port ISDN interface.
- VIC-2DID—Two-port direct inward-dialing voice interface card.

Cisco 1760 and 1760-V Routers

The voice-and-data capable Cisco 1760 and 1760-V routers provide global Internet and company intranet access and include the following:

- Voice-over-IP (VoIP) voice-and-data functionality; the router can provide support for digital and analog voice traffic (for example, telephone calls and faxes) over an IP network.
- Cisco 1760-V routers integrate data and voice services with support for multiple voice channels.
- VoIP and Voice-over-Frame Relay (VoFR) connections.
- Support for virtual private networking.
- Modular architecture.
- Network device integration.
- Support for the following network management tools and applications:
  - Simple Network Management Protocol (SNMP).
  - AutoInstall (for downloading configuration files to the router over a WAN connection).

The Cisco 1760 and 1760-V routers have the following hardware components:

- One autosensing 10/100 Fast Ethernet port, which operates in full- or half-duplex mode (with software override support).
- IEEE 802.1Q VLAN support.
- Two VIC slots—Support voice interface cards with two ports per card.
- Two WIC slots for either WICs or VICs.
- Synchronous serial interfaces on serial WICs.
- Asynchronous serial interfaces on serial WICs.
- One auxiliary (AUX) port (to support a modem connection to the router, which can be configured and managed from a remote location, up to 115.2 kbps asynchronous serial).
- One console port (for router configuration and management from a connected terminal or PC, up to 115.2 kbps).
- One internal expansion slot—Supports hardware-assisted services such as encryption (up to T1/E1 speeds).
- RISC Processor—Motorola MPC860P PowerQUICC at 40 MHz externally and 80MHz internally.
- DRAM:
  - Cisco 1760: 32 MB default, expandable to 96 MB.
  - Cisco 1760-V: 64 MB default, expandable to 96 MB.
- Flash memory:
  - Cisco 1760: 16 MB default, expandable to 64 MB.
  - Cisco 1760-V: 32 MB default, expandable to 64 MB.

The Cisco 1760 and 1760-V routers support any combination of one or two of the following WICs:

- WIC-1T—One-port high speed serial (sync/async)(T1/E1).
- WIC-2T—Two-port high speed serial (sync/async) (T1/E1).
- WIC-2A/S—Two-port low speed serial (sync/async) (up to 128 kbps).
- WIC-1B-S/T—One-port ISDN BRI S/T.
- WIC-1B-U—One-port ISDN BRI U with integrated NT1.
- WIC-1DSU-56K4—One-port integrated 56/64 kbps 4-wire DSU/CSU.
- WIC-1DSU-T1—One-port integrated T1 / Fractional T1 DSU/CSU.
- WIC-1ADSL—One-port asymmetric digital subscriber line.
- WIC-1ENET—One-port 10Base-T Ethernet interface.

The Cisco 1760 and 1760-V routers support any combination of one, two, three, or four of the following VICs:

- VIC-2FXS—Two-port Foreign Exchange Station (FXS) voice interface card.
- VIC-2FXO—Two-port Foreign Exchange Office (FXO) voice interface card.
- VIC-2FXO-EU—Two-port FXO voice interface card for Europe.
- VIC-2E/M—Two-port Ear and Mouth (E&M) voice interface card.
- VIC-2FXO-M1—Two-port FXO for the United States with battery reversal.
- VIC-2FXO-M2—Two-port FXO for Europe with battery reversal.

- VIC-2FXO-M3—Two-port FXO for Australia.
- VIC-2BRI-NT/TE—Two-port ISDN interface.
- VIC-2DID—Two-port direct inward-dialing voice interface card.

Determining Your Software Release

To determine the version of Cisco IOS software currently running on your Cisco 1700 series router, log in to the router and enter the **show version** EXEC command. The following sample output from the **show version** command indicates the version number on the second output line:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) c1700 Software (c1700-y-mz), Release 12.2(4)XW, RELEASE SOFTWARE
```

Upgrading to a New Software Release

For general information about upgrading to a new software release, see *Software Installation and Upgrade Procedures* located at: http://www.cisco.com/warp/public/130/upgrade_index.shtml.

Feature Sets

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(4)XW supports the same feature sets as Releases 12.2 and 12.2 T, but Release 12.2(4)XW can also include new features supported by the Cisco 1700 series routers.

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

Release 12.2(4)XW supports the Survivable Remote Site Telephony feature on the following Cisco 1700 series routers and images:

- Cisco 1750, 1751, and 1760 Routers: **IP/VOX Plus**

  Note Survivable Remote Site Telephony is supported on the Cisco 1750 router with the image **IP/VOX/PLUS** only.

- Cisco 1751, and 1760 Routers
  - **IP/ADSL/VOX Plus**
  - **IP/ADSL/VOX/FW/IDS Plus**
  - **IP/ADSL/IPX/VOX/FW/IDS Plus**

- **IP/ADSL/VOX Plus IPSec 56**
- **IP/ADSL/IPX/AT/IBM/VOX/FW/IDS Plus IPSec 56**
- **IP/ADSL/VOX/FW/IDS Plus IPSec 56**
- **IP/ADSL/IPX/AT/IBM/VOX/FW/IDS Plus IPSec 3DES**
- **IP/ADSL/VOX/FW/IDS Plus IPSec 3DES**
- **IP/ADSL/VOX Plus IPSec 3DES**

Note The feature above was introduced on Cisco 1700 series routers in Release 12.2(4)XW. However, this feature list does not include all the previously-released features in each image. Additional features are listed in previously-released software versions for Cisco 1700 series routers, the *Cross-Platform Release Notes for Cisco IOS Release 12.2 T and* Release 12.2 T Cisco IOS documentation.

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco 1700 series for Release 12.2(4)XW.

New Software Features in Release 12.2(4)XW

The following section describes the new software features supported by the Cisco 1700 series for Release 12.2(4)XW:

Survivable Remote Site Telephony

The Survivable Remote Site Telephony (SRST) feature provides the Cisco CallManager application with fallback support for Cisco IP phones attached to a local Ethernet router interface. Prior to SRST, if WAN connectivity was lost between a remote branch office router and a remote primary, secondary, or tertiary Cisco CallManager, Cisco IP phones at the branch office were unusable for the duration of the failure. Using SRST, Cisco 1750, 1751, and 1760 series routers provide call-handling support for up to 24 Cisco IP phones and 48 lines when the WAN connection is down or connectivity to the Cisco CallManager is lost.

Cisco CallManager with SRST automatically detects any failures between Cisco IP phones at remote sites and Cisco branch office multi-service routers, attached across a WAN. If a failure occurs, the SRST feature uses Simple Network Auto Provisioning (SNAP) technology to autoconfigure the branch router and provide call-processing service for the Cisco IP phones. During a failure, the Cisco IP phone displays a message indicating the Cisco IP phone is in the Cisco CallManager fallback mode and able to perform a limited set of functions. When WAN connectivity is restored, call-handling support for Cisco IP phones returns to the primary Cisco CallManager.

For more information, see the document *Survivable Remote Site Telephony*:
http://www.cisco.com/univercd/cc/td/doc/product/access/ip_ph/srs/index.htm

Note You need to purchase a feature license to turn this new feature on. You also need an account on Cisco.com to access the Cisco IP phone firmware versions.

Important Notes

The following sections contain important notes about Cisco IOS Release 12.2(4)XW that can apply to the Cisco 1700 series. (Also, see the "Caveats" section on page 12.)

IP Phone Quantity with 10BaseT Interfaces

When data and voice are running on a Cisco router with a 10BaseT interface, the 10 Mbps bandwidth of the interface might negatively impact voice traffic. In this case, Cisco recommends connecting a maximum of 12 IP phones to the router, to keep the 10BaseT connection from becoming a bottleneck. For interfaces of 100 Mbps or higher, up to 24 IP phones are supported.

Fan Operation in Cisco 1700 Series Routers

The fans in some Cisco 1700 series routers stay off until thermally activated. The fans in Cisco 1760 and 1760-V routers are always on.

Flash defaults to Flash:1 on Multipartition Flash

When using a multipartition flash card, the various flash partitions are referred to as "flash:1:", "flash:2:", etc. If you specify only "flash" in a multipartition flash, the parser assumes "flash:1:." For example, if you enter **show flash all** the parser defaults to "show flash:1: all" and only the flash information for the first partition displays. To see information for all flash partitions, enter the command **show flash ?**. After all of the valid partitions are displayed, enter the command **show flash:xx: all** on each valid partition.

Peak Cell Rate and Sustainable Cell Rate Values

On Cisco 1700 routers, specify the Peak Cell Rate (PCR) and Sustainable Cell Rate (SCR) as multiples of 32 Kbps. Other rates are treated as the next lower value of a multiple of 32. For example, an entered PCR value of 150 is considered 128.

Using the boot flash Command

Booting a Cisco 1700 series router with the commands **boot flash** or **boot system flash** results in unpredictable behavior. To work around this problem, be sure to enter a colon (:) following both commands (for example, **boot flash:** or **boot system flash:.**)

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(4)XW. 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 CCO, you can use Bug Navigator II to find caveats of any severity for any release. You can reach Bug Navigator II on CCO at **Software Center**: **Cisco IOS Software**: **BUG TOOLKIT**: **Cisco Bug Navigator II**, or at http://www.cisco.com/support/bugtools/bugtool.shtml.

Caveats for Release 12.2(4)XW

This section describes possibly unexpected behavior by Release 12.2(4)XW. Only severity 1 through 3 caveats are included.

CSCdv62649

The command **ip tacacs source-interface** does not function properly. If you use the command to configure a router to use "loopback interface" for TACACS packets, the router might still use "interface address".

CSCdv72916

If a call is made in "normal mode" and the WAN link fails, the call stays up even though the link failed. If the WAN link comes back up during the call and the call is between two IP phones or two analog phones, the call is not dropped. However, if the call is between an IP phone and an analog phone, the call is dropped.

CSCdv84847

Under rare conditions, voice over IP (VoIP) calls might experience a one-way audio path. To work around this problem, use a slow-connect procedure by adding the following configuration to the Global IOS configuration:

```
Router# conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# voice service voip
Router(conf-voi-serv)# h323
Router(conf-serv-h323)# call start slow
Router(conf-serv-h323)# end
Router#
```

CSCdv89737

The DTMF-Relay "cisco-rtp" does not work for DTMF tone transmission over VoIP networks. To work around this problem, use one of the following DTMF-Relays instead:

- "h245-alphanumeric"—DTMF Relay via H245 Alphanumeric IE
- "h245-signal"—DTMF Relay via H245 Signal IE
- "rtp-nte"—RTP Named Telephone Event RFC 2833

Related Documentation

The following sections describe the documentation available for the Cisco 1700 series routers. 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

The following documents are specific to Release 12.2 and apply to Release 12.2(4)XW. They are located on Cisco.com and the Documentation CD-ROM (under the heading **Service & Support**):

- To reach the *Release Notes for the Cisco 1700 Series Routers for Cisco IOS Release 12.2(4)XW*, click this path:

  Technical Documents: **Cisco IOS Software**: **Release 12.2**: **Release Notes**: **Cisco 1700 Series Routers**: **Cisco 1700 Series - Release Notes for Release 12.2(4)XW**

- To reach the *Cross-Platform Release Notes for Cisco IOS Release 12.2 T*, click this path:

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

- To reach product bulletins, field notices, and other release-specific documents, click this path:

  Technical Documents: **Product Bulletins**

- To reach the *Caveats for Cisco IOS Release 12.2* and *Caveats for Cisco IOS Release 12.2 T* documents, which contain caveats applicable to all platforms for all maintenance releases of Release 12.2, click this path:

  Technical Documents: **Cisco IOS Software**: **Release 12.2**: **Caveats**

Note If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. You can reach Bug Navigator II on Cisco.com at **Software Center**: **Cisco IOS Software**: **BUG TOOLKIT**: **Cisco Bug Navigator II**, or at http://www.cisco.com/support/bugtools/bugtool.shtml.

Platform-Specific Documents

Cisco 1720 Routers

These documents are available for the Cisco 1720 router on CCO and the Documentation CD-ROM at **Technical Documents**: **Access Servers and Access Routers**: **Modular Access Routers**: **Cisco 1720 Series Routers**:

- Installing Your Cisco 1700 Router Quick Start Guide
- Cisco 1720 Series Router Hardware Installation Guide
- Cisco 1700 Series Router Software Configuration Guide
- Cisco 1720 Series Router Release Notes
- Installing and Upgrading the Boot ROM in Cisco 1720 Routers
- Cisco 1700 Series (Cisco IOS) Router Release Notes
- Configuration Notes for Cisco 1700 Series Routers
- WAN Interface Cards Hardware Installation Guide

Cisco 1750 Routers

These documents are available for the Cisco 1750 router on CCO and the Documentation CD-ROM at **Technical Documents**: **Access Servers and Access Routers**: **Modular Access Routers**: **Cisco 1750 Series Routers**:

- Installing Your Cisco 1700 Router Quick Start Guide
- Cisco 1750 Series Router Hardware Installation Guide
- Cisco 1700 Series Router Software Configuration Guide
- Cisco 1750 Series Router Release Notes
- Cisco 1750 Router Voice-over-IP quick start guide
- Cisco 1750 Voice-over-IP Software Configuration Guide
- Cisco 1700 Series (Cisco IOS) Router Release Notes
- Configuration Notes for Cisco 1700 Series Routers
- WAN Interface Cards Hardware Installation Guide

Cisco 1751 and 1751-V Routers

These documents are available for the Cisco 1751 and 1751-V routers on CCO and the Documentation CD-ROM at **Technical Documents**: **Access Servers and Access Routers**: **Modular Access Routers**: **Cisco 1751 Series Routers**:

- Installing Your Cisco 1700 Router Quick Start Guide
- Cisco 1751 Router Hardware Installation Guide
- Cisco 1751 Router Software Configuration Guide
- Cisco 1700 Series Router Software Configuration Guide
- Cisco 1751 Router Hardware Release Notes

- Configuring the Voice Interface Card for the Cisco 1751 Router
- Installing and Removing Packet Voice/fax DSP Modules
- Cisco 1700 Series (Cisco IOS) Router Release Notes
- Configuration Notes for Cisco 1700 Series Routers
- WAN Interface Cards Hardware Installation Guide

Cisco 1760 and 1760-V Routers

These documents are available for the Cisco 1760 and 1760-V routers on CCO and the Documentation CD-ROM at **Technical Documents**: **Access Servers and Access Routers**: **Modular Access Routers**: **Cisco 1760 Series Routers**:

- *Quick Start Guide for Installing Your Cisco 1760 Modular Access Router*
- *Cisco 1760 Modular Access Router Hardware Installation Guide*
- Cisco 1751 Router Software Configuration Guide
- Cisco 1700 Series Router Software Configuration Guide
- Configuration Notes for Cisco 1700 Series Routers
- Configuring the Voice Interface Card for the Cisco 1751 Router
- Installing and Removing Packet Voice/fax DSP Modules
- WAN Interface Cards Hardware Installation Guide

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, 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**

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 (under the heading **Service & Support**) at:

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

Release 12.2 Documentation Set

Table 2 lists the contents of the Cisco IOS Release 12.2 software documentation set, which is available in both electronic and printed form (under the heading **Service & Support**) on Cisco.com and on the Documentation CD-ROM:

Technical Documents: **Cisco IOS Software**: **Release 12.2**

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.

Table 2 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
• Cisco IOS Dial Technologies Configuration Guide • Cisco IOS Dial Technologies Command Reference	Preparing for Dial Access Modem and Dial Shelf Configuration and Management ISDN Configuration Signaling Configuration Dial-on-Demand Routing Configuration Dial Backup Configuration Dial Related Addressing Service Virtual Templates, Profiles, and Networks PPP Configuration Callback and Bandwidth Allocation Configuration Dial Access Specialized Features 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 and 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

Table 2 Cisco IOS Release 12.2 Documentation Set (continued)

Books	Major Topics
• 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
• 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 Broadband Access Frame Relay SMDS X.25 and LAPB
• Cisco IOS Mobile Wireless Configuration Guide • Cisco IOS Mobile Wireless Command Reference	General Packet Radio Service

Table 2 Cisco IOS Release 12.2 Documentation Set (continued)

Books	Major Topics
• 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 12.2 T • Release Notes (Release note and caveat documentation for 12.2-based releases and various platforms)	

Obtaining Documentation

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

World Wide Web

The most current Cisco documentation is available on the World Wide Web at http://www.cisco.com. Translated documentation can be accessed at http://www.cisco.com/public/countries_languages.shtml.

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:

  http://www.cisco.com/cgi-bin/order/order_root.pl

- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:

  http://www.cisco.com/go/subscription

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

Documentation Feedback

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

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

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

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

We appreciate your comments.

Obtaining Technical Assistance

The following sections provide sources for obtaining technical assistance from Cisco Systems.

Cisco.com

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

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

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

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

http://www.cisco.com

Technical Assistance Center

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

Contacting TAC by Using the Cisco TAC Website

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

http://www.cisco.com/tac

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

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

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

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

Cisco.com registered users who cannot resolve a technical issue by using the TAC online resource can open a case online by using the TAC Case Open tool at the following website:

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

Contacting TAC by Telephone

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

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

P1 and P2 level problems are defined as follows:

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

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

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