



PA-1C-E ESCON Channel Port Adapter Installation and Configuration

Product Number: PA-1C-E(=)

This document contains instructions for installing and configuring the Enterprise Systems Connection (ESCON) IBM Channel Port Adapter (PA-1C-E), which is used in the Cisco 7200-series routers.

For complete descriptions of interface configuration commands and the configuration options available for Cisco 7200-series interfaces that support the ESCON Channel Port Adapter functionality, refer to the appropriate software configuration publication listed in the [“Obtaining Documentation”](#) section on [page 4](#).



Note

Cisco IOS Release 11.3(3)T and later supports the ESCON Channel Port Adapter. When ordered as a spare, the ESCON Channel Port Adapter microcode is available via Cisco.com. When ordered as part of a new system, the ESCON Channel Port Adapter microcode is available on Flash memory cards and SanDisk memory devices (which also include the Cisco IOS release compatible with the microcode version) and via Cisco.com. When the ESCON Channel Port Adapter is shipped with a new system, there is a default setting in Cisco IOS that points to the ESCON Channel Port Adapter microcode with which it has been virtually bundled (separately bundled and preloaded onto the Flash memory card or SanDisk memory device along with the compatible Cisco IOS software). The Cisco IOS software loads the ESCON Channel Port Adapter microcode image onto the port adapter when the router boots and when an ESCON Channel Port Adapter is inserted into a router that has already been booted.

We recommend that you use the version of the ESCON Channel Port Adapter microcode that is virtually bundled with your Cisco IOS software. If you choose not to, you must then copy a microcode image onto the router Flash memory card or SanDisk memory device and use the **microcode** router configuration command to instruct the Cisco IOS software to use this microcode image instead of the microcode image virtually bundled with your version of the Cisco IOS software.

For instructions on placing ESCON Channel Port Adapter microcode on the router Flash memory card, see the [“Copying to the Flash Memory Card on a Cisco 7200-Series Router”](#) section on [page 34](#).



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For instructions on placing ESCON Channel Port Adapter microcode on the SanDisk memory device, see the [“Using SanDisk Devices” section on page 37](#).

For instructions on configuring Cisco IOS to use an ESCON Channel Port Adapter image from the router Flash memory card or SanDisk memory device, refer to the [“Configuring Microcode” section on page 32](#).

For general information on ESCON Channel Port Adapter microcode, refer to the [“ESCON Channel Port Adapter Microcode Overview” section on page 9](#). For specific instructions to configure the Cisco IOS software to download microcode from the router Flash memory card or SanDisk memory device, refer to the [“ESCON Channel Port Adapter Microcode Upgrade Overview” section on page 31](#).

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Related Documentation

The documentation listed below is available online, on the Documentation CD-ROM, or as printed documents.

Your router, switch, or gateway and the Cisco IOS software running on it contain extensive features and functionality, which are documented in the following resources:

- Cisco IOS software:
 - For configuration information and support, refer to the modular configuration and modular command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware.
 - To check the minimum software requirements of Cisco IOS software with the hardware installed on your router, Cisco maintains the Software Advisor tool on Cisco.com: <http://www.cisco.com/cgi-bin/Support/CompNav/Index.pl>. You must be a registered user on Cisco.com to access this tool.



Note

You can access Cisco IOS software configuration and hardware installation and maintenance documentation on the World Wide Web at http://www.cisco.com/public/countries_languages.shtml.

- Cisco 7200 series routers:
 - For port adapter hardware and memory configuration guidelines, refer to the *Cisco 7200 Series Port Adapter Hardware Configuration Guidelines*.
 - For hardware installation and maintenance information (including the Cisco 7206 or Cisco 7206VXR as a router shelf in a Cisco AS5800 Universal Access Server), refer to the installation and configuration guide that shipped with your Cisco 7200 series router.
 - For information on network processing engines or network services engines, refer to the *Network Processing Engine and Network Services Engine Installation and Configuration* publication.
 - For information on the router boot images, refer to the *Cisco 7200 Series Routers Boot Images Information* publication.
- Cisco 7200 VXR routers:

For hardware installation and maintenance information, refer to the *Cisco 7200 VXR Installation and Configuration Guide* or the *Cisco 7200 VXR Quick Start Guide*.
- For international agency compliance, safety, and statutory information for WAN interfaces:
 - *Regulatory Compliance and Safety Information for the Cisco 7200 Series Routers*
 - “Regulatory Compliance and Safety Information” appendix in the *Cisco uBR7200 Series Universal Broadband Router Hardware Installation Guide*
 - *Site Preparation and Safety Guide*
- To view Cisco documentation or obtain general information about the documentation, refer to the following sections:
 - [Obtaining Documentation](#), page 4
 - [Obtaining Technical Assistance](#), page 5

- Customer service at 800 553-6387 or 408 526-7208. Customer service hours are 5:00 a.m. to 6:00 p.m. Pacific time, Monday through Friday (excluding Cisco-observed holidays). You can also send e-mail to cs-rep@cisco.com.

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 **Leave Feedback** at the bottom 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.

Port Adapter Installation Prerequisites

This section provides software and hardware requirements, a list of parts and tools you will need to install the port adapter, and safety and electrostatic discharge (ESD)-prevention guidelines to help you avoid injury and damage to the equipment during installation. Also included is information on the systems in which you can install the port adapters overview information on interface specifications.

The following sections discuss general information about port adapter installation requirements:

- [Software and Hardware Requirements, page 7](#)
- [Checking Hardware and Software Compatibility, page 9](#)
- [ESCON Channel Port Adapter Microcode Overview, page 9](#)
- [List of Parts and Tools, page 10](#)

Software and Hardware Requirements

The following hardware and software prerequisites ensure proper operation of the ESCON Channel Port Adapter:

- The ESCON Channel Port Adapter is used in the Cisco 7200-series routers and can be installed in any available port adapter slot.
- The Cisco 7200-series router requires a minimum of 32 MB of dynamic RAM (DRAM) to support up to three installed ESCON Channel Port Adapters. The ESCON Channel Port Adapter is a high-speed interface. A maximum of three high-speed interfaces can be installed in a Cisco 7200-series router.



Note For port adapter hardware and memory configuration guidelines for the Cisco 7200-series routers, refer to the document *Cisco 7200 Series Port Adapter Hardware Configuration Guidelines*.

- The ESCON Channel Port Adapter requires that the Cisco 7200-series router is running Cisco IOS Release 11.3(3)T or later.

[Table 1](#) lists the specific Cisco IOS software images that are compatible with the ESCON Channel Port Adapter.

Table 1 Cisco IOS Release Image Names

Cisco IOS Release	Image Names
Release 11.3(3)T	c7200-aejs-mz
	c7200-aejs40-mz
	c7200-aejs56i-mz
	c7200-ajs-mz
	c7200-ajs40-mz
	c7200-ajs56i-mz
	c7200-js-mz
	c7200-js40-mz
	c7200-js56i-mz
	c7200-ds-mz
	c7200-ds40-mz
	c7200-ds56i-mz

Table 2 specifies the recommended minimum level of ESCON Channel Port Adapter microcode for a corresponding Cisco IOS release.

Table 2 Cisco IOS Releases and ESCON Channel Port Adapter Microcode Image

Cisco IOS Release	ESCON Channel Microcode Image
Release 11.3(3)T	xcpa26-0

The **show version** command displays the current hardware configuration of the router, including the system software version that is loaded and running. For the ESCON Channel Port Adapter, the **show microcode** command lists the recommended and the configured microcode version. The **show controller** command shows the microcode version running on the ESCON Channel Port Adapter in the router. For additional descriptions of configuration commands, refer to the publications listed in the “[Related Documentation](#)” section on page 3.

You can view the current version of software or microcode stored on the router Flash memory card by using the **show flash slot0:** or the **dir slot0: EXEC** commands. Refer to the “[ESCON Channel Port Adapter Microcode Guidelines](#)” section on page 31 for basic configuration information and refer to the appropriate software documentation for complete configuration instructions and examples, which are listed in the “[Related Documentation](#)” section on page 3.

If the displays indicate that the required system software and microcode are not available in your system, refer to the “[Obtaining Documentation](#)” section on page 4 or contact a service representative for upgrade information.

Checking Hardware and Software Compatibility

To check the minimum software requirements of Cisco IOS software with the hardware installed on your router, Cisco maintains the Software Advisor tool on Cisco.com. This tool does not verify whether modules within a system are compatible, but it does provide the minimum IOS requirements for individual hardware modules or components.



Note

Access to this tool is limited to users with Cisco.com login accounts.

To access Software Advisor, click **Login** at Cisco.com and go to **Technical Support Help—Cisco TAC: Tool Index: Software Advisor**. You can also access the tool by pointing your browser directly to <http://www.cisco.com/cgi-bin/support/CompNav/Index.pl>.

Choose a product family or enter a specific product number to search for the minimum supported software release needed for your hardware.

ESCON Channel Port Adapter Microcode Overview

Microcode, also known as firmware, is a set of processor-specific software instructions that enables and manages the features and functions of a specific port adaptor type. At system startup or reload, the system loads the microcode for each port adaptor type present in the system.

The entire ESCON Channel Port Adapter microcode image is delivered on a router Flash memory card or SanDisk memory device, or you can download it from Cisco.com.

New microcode is released to enable new features, improve performance, or fix known problems in earlier versions. The Cisco 7200-series routers support downloadable software and microcode images for most upgrades. This support lets you download new or upgraded images remotely, store the images in router memory, and load the new images at system startup without physically accessing the router. You can store multiple versions of an image in Flash or SanDisk memory for a specific processor type, and use configuration commands to specify which version of the image loads at startup. All port adapters of the same type (for example, all ESCON Channel Port Adapters) use the same microcode image.



Caution

To ensure proper operation of the ESCON channel, and to prevent system problems, you should use *only* the default ESCON Channel Port Adapter microcode image that is recommended for the Cisco IOS release you are running, unless directed otherwise by Cisco support personnel (see [Table 2](#)).

By default, the ESCON Channel Port Adapter microcode is loaded from the router Flash memory card or SanDisk memory device for the Cisco 7200-series routers. The default ESCON Channel Port Adapter microcode version is found by entering the **show microcode** command.

The following example is a partial display of the **show microcode** command output:

```
Router# show microcode
Microcode images for downloadable hardware
HW Type           Microcode image names
-----
ecpa      default   slot0:xcpa26-1
          configured slot0:xcpa214-10
pcpa      default   slot0:xcpa26-1

(additional display text omitted from this example)
```

**Note**

In Cisco IOS Release 11.3(3)T or later, the filenames of all released ESCON Channel Port Adapter microcode images use the conventions `xcpa26-nn` (for example, `xcpa26-1`). Interim prerelease versions of ESCON channel microcode images use the convention `xcpa214-nnn` (for example, `xcpa214-10`).

List of Parts and Tools

You need the following parts and tools to install a port adapter. If you need additional equipment, contact a service representative for ordering information.

- ESCON Channel Port Adapter
- ESCON interface cables
- ESD-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, field-replaceable units (FRUs), and spares

Safety Guidelines

This section provides safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone wiring.

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, might harm you. A warning symbol precedes each warning statement.

**Warning**

This warning symbol means ***danger***. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

Waarschuwing

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

Varoitus

Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).

Attention	Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document <i>Regulatory Compliance and Safety Information</i> (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.
Warnung	Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument <i>Regulatory Compliance and Safety Information</i> (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.
Avvertenza	Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento <i>Regulatory Compliance and Safety Information</i> (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.
Advarsel	Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet <i>Regulatory Compliance and Safety Information</i> (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.
Aviso	Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento <i>Regulatory Compliance and Safety Information</i> (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.
¡Advertencia!	Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado <i>Regulatory Compliance and Safety Information</i> (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.
Varning!	Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förekommer i denna publikation i dokumentet <i>Regulatory Compliance and Safety Information</i> (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist and never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe. Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Preventing ESD Damage

ESD damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. Port adapters and processor modules comprise printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, use a preventive antistatic strap during handling.

The following guidelines help prevent ESD damage:

- Always use an ESD wrist or ankle strap and ensure that it makes good skin contact.
- Connect the equipment end of the strap to an unfinished chassis surface.
- When installing a component use any available ejector levers or captive installation screws to properly seat the bus connectors in the backplane or midplane. These devices prevent accidental removal, provide proper grounding for the system, and help to ensure that bus connectors are properly seated.
- When removing a component use any available ejector levers or captive installation screws to release the bus connectors from the backplane or midplane.
- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.
- Place a removed component board-side-up on an antistatic surface or in a static shielding container. If you plan to return the component to the factory, immediately place it in a static shielding container.
- Avoid contact between the printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- Never attempt to remove the printed circuit board from the metal carrier.



Caution

For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohm.

Laser LED Safety Information

The ESCON Channel Port Adapter contains laser LEDs. The expansion module is classified as a Class 1 laser product and is certified to conform to the requirements of EN60825-1:1994 and IEC825-1:1993.

Class 1 laser products are not considered hazardous. The ESCON Channel Port Adapter has embedded Class 3a laser LED assemblies operating at a nominal wavelength of 850 nanometer and a maximum potential output power of 1.25 milliwatts. The design of the ESCON Channel Port Adapter incorporates engineering features including current limiting, which ensures that there is no human access to LED radiation greater than Class 1 under any set of operating, maintenance, or service conditions, including a single fault.

There are fewer than 0.442 milliwatts propagating in the link or in any portion of the module. Therefore, according to IEC825-2:1993, Hazard Level 1 prevails in all parts of the system.

The LEDs are located on the front face of the module.

Laser Radiation Warning



Laser radiation is present when the system is open.

Waarschuwing Laserstraling wanneer geopend.

Varoitus Lasersäteitä aukkojen ollessa avoinna.

Attention Production d'un rayonnement laser en position ouverte.

Warnung Laserstrahlung in geöffnetem Zustand

Avvertenza Emette radiazioni laser quando è aperto.

Advarsel Laserstråling er til stede når enheten er åpen.

Aviso Radiação laser presente quando aberto.

¡Advertencia! Radiación láser cuando está abierto.

Varning! Rikta inte blicken in mot strålen.

Laser Beam Exposure Warning



Do not stare into the laser beam.

Waarschuwing Niet in de straal staren.

Varoitus Älä katso säteeseen.

Attention Ne pas fixer le faisceau des yeux.

Warnung Nicht direkt in den Strahl blicken.

Avvertenza Non fissare il raggio con gli occhi.

Advarsel Stirr ikke på strålen.

Aviso Não olhe fixamente para o raio.

¡Advertencia! No mirar fijamente el haz.

Varning! Laserstrålning när enheten är öppen.

What is the ESCON Channel Port Adapter

This section discusses channel attachment and the ESCON Channel Port Adapter, its LED functions, and its memory and cable requirements.

The following information is included in this section:

- [Channel Attachment Overview, page 14](#)
- [ESCON Channel Port Adapter Overview, page 14](#)
- [ESCON Channel Port Adapter Description, page 15](#)

Channel Attachment Overview

A mainframe channel (referred to as a *channel*) is an intelligent processor that manages the protocol on the communications media and controls the data transfer to and from the main central processing unit (CPU) storage. Devices called input/output processors (IOPs) communicate between the host CPU and the channel. One IOP controls multiple channels. There is no relationship between the number of CPUs and the number of IOPs.

The channel relieves the mainframe CPU of direct communication with input/output (I/O) devices, which saves processing cycles and allows data processing and communications tasks to run concurrently. Channels use one or more channel paths as the links between mainframes and I/O devices. I/O devices are connected directly to control units, which provide the logical capabilities required to operate and control the I/O devices.

ESCON Channel Port Adapter Overview

An ESCON Channel Port Adapter provides a single channel interface for Cisco 7200-series routers. In some situations, this interface can eliminate the need for a separate front-end processor (FEP). The ESCON Channel Port Adapter contains an ESCON I/O connector.

The ESCON Channel Port Adapter is a high-bandwidth port adapter. A Fast Ethernet port adapter is an example of another type of high-speed port adapter. A single Cisco 7200-series router can support up to three high-speed port adapters.



Note

The ESCON Channel Port Adapter supports online insertion and removal (OIR), which allows you to install or remove an ESCON Channel Port Adapter while the system is operating without shutting down system power.

ESCON Channel Port Adapter Description

The following information is included in this section:

- [ESCON General Layout, page 15](#)
- [ESCON Channel Port Adapter DRAM Configurations, page 16](#)
- [Port Adapter Locations in Cisco 7200-Series Routers, page 16](#)
- [ESCON Channel Port Adapter LED Indicators and Sequences, page 17](#)
- [ESCON Specifications, page 18](#)
- [ESCON Cable, page 19](#)

ESCON General Layout

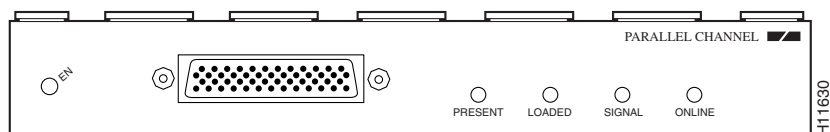
The ESCON Channel Port Adapter ([Figure 1](#)) provides a single channel attachment interface for connecting Cisco 7200-series routers to an ESCON director or to a mainframe channel.



Note

The Cisco 7200-series routers support the OIR of all port adapter types.

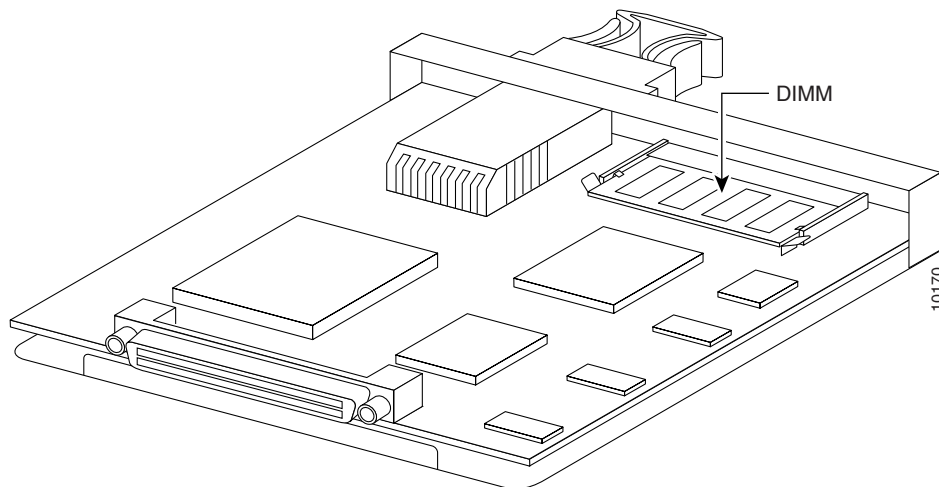
Figure 1 *ESCON Channel Port Adapter, Faceplate View*



The ESCON Channel Port Adapter has a single female duplex connector.

The ESCON Channel Port Adapter has a single DRAM dual in-line memory module (DIMM) and comes configured with 16 MB of DRAM as the minimum standard, and default, memory configuration ([Figure 2](#)).

Figure 2 *ESCON Channel Port Adapter DRAM DIMM Location*



ESCON Channel Port Adapter DRAM Configurations

Each ESCON Channel Port Adapter model is available in the following configurations of DRAM DIMM:

- 16 MB DRAM—MEM-CPA-16M
- 32 MB DRAM—MEM-CPA-32M
- 32 MB DRAM—MEM-CPA-32M=



Note

MEM-CIP-16M is the default memory configuration that ships on the ESCON Channel Port Adapter. MEM-CPA-32M is a memory option that can be specified when ordering the port adapter. MEM-CPA-32M= is a spare memory option that is intended for ESCON Channel Port Adapters with the 16 MB default that have already been installed.

ESCON Channel Port Adapter DRAM can be upgraded in the field by Cisco-certified service personnel *only*.

Port Adapter Locations in Cisco 7200-Series Routers

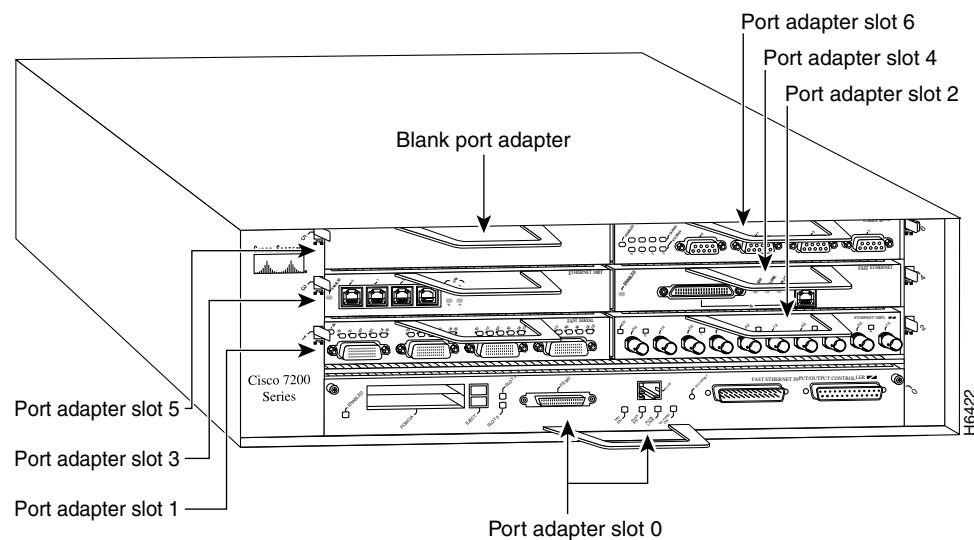
In Cisco 7200-series routers, which consist of the Cisco 7204 and the Cisco 7206, port adapter slots are numbered from the lower left to the upper right, beginning with port adapter slot 1 and continuing through port adapter slot 4 for the Cisco 7204, and slot 6 for the Cisco 7206. Port adapter slot 0 is reserved for the optional Fast Ethernet port on the I/O controller. [Figure 3](#) shows a Cisco 7206 with port adapters installed.



Note

Interface ports are numbered from left to right starting with 0.

Figure 3 Cisco 7200-Series Port Adapters (Cisco 7206)



ESCON Channel Port Adapter LED Indicators and Sequences

The functions of the ESCON Channel Port Adapter LEDs are as follows:

- Enabled—Indicates that the ESCON Channel Port Adapter is enabled for operation by the system.
- Present—Indicates that the ESCON channel is detected by the ESCON Channel Port Adapter.
- Loaded—Indicates that the ESCON channel firmware is completely loaded.
- Signal—Indicates that the sync signal has been detected from the ESCON neighbor node.
- Online—Indicates that an establish-logical-path request has been received from the channel and that the establish-logical-path request matches one of the paths configured on the ESCON Channel Port Adapter.

Figure 4 shows the LED indicators.

Figure 4 *ESCON Channel Port Adapter LED Indicators*

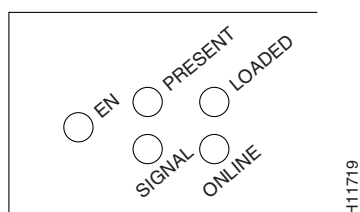


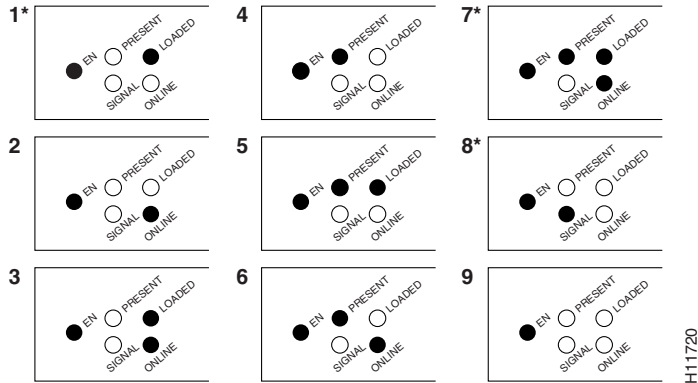
Table 3 shows the ESCON Channel Port Adapter LED indicator sequences during a cold boot. The enabled LED is not part of the following sequences; it remains on during the boot sequence (Figure 5).

Table 3 *Cold Boot LED Sequence*

Sequence	Present	Loaded	Signal	Online
1	Off	On	Off	Off
2	Off	Off	Off	On
3	Off	On	Off	On
4	On	Off	Off	Off
5	On	On	Off	Off
6	On	Off	Off	On
7	On	On	Off	On
8	Off	Off	On	Off
9 ¹	Off	Off	Off	Off

1. Indicates that the ESCON Channel Port Adapter is starting to execute the microcode and waiting for commands

Figure 5 LED Boot Sequence



* Because of the short duration of the LEDs, you will typically see only these LED sequences.

ESCON Specifications

Table 4 lists the specifications for the ESCON interfaces.

Table 4 ESCON Specifications

Characteristic	ESCON Specification
Supported processor I/O architectures	ESA/390
Bit transmission	Serial
Maximum distance (for LED with ESCON)	1.9 miles (3.1 km) point-to-point 5.7 miles (9.2 km) with two ESCON Directors and each hop not exceeding 3 km.
Channel data rate	Up to 17 MBps
Signaling rate	200 Mbps
Cable types	Fiber-optic (62.5/125 micron multimode)
Addition of devices to running systems	Dynamic ¹
Number of addressable devices per channel	256 x 16 x 16 x 253 ²
Connectable control units per channel	Up to 59 (through a 9032 ESCON Director)
Connectable channels per adapter	Up to 59 (through a 9032 ESCON Director); varies by control unit

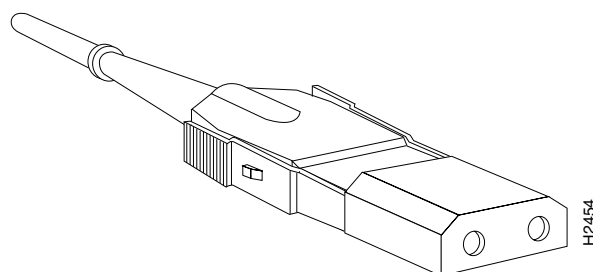
1.The ESCON Channel Port Adapter requires dynamic = NO with HCD.

2.Where 256 represents available unit addresses, 16 represents the number of logical partitions (LPARs), 16 represents the number of control unit images, and 253 represents the number of ESCON director paths. It is unlikely a system would have the resources to support the total number of available addresses.

ESCON Cable

The ESCON channel interface uses 62.5/125 micrometer, multimode, fiber-optic cable with male duplex connectors at each end (Figure 6). ESCON cables are not available from Cisco. Refer to the ESCON specifications in Table 4 and contact your cable supplier or the vendor of your host CPU to order the correct ESCON cable.

Figure 6 *ESCON Interface Duplex Connector for the ESCON Channel Port Adapter*



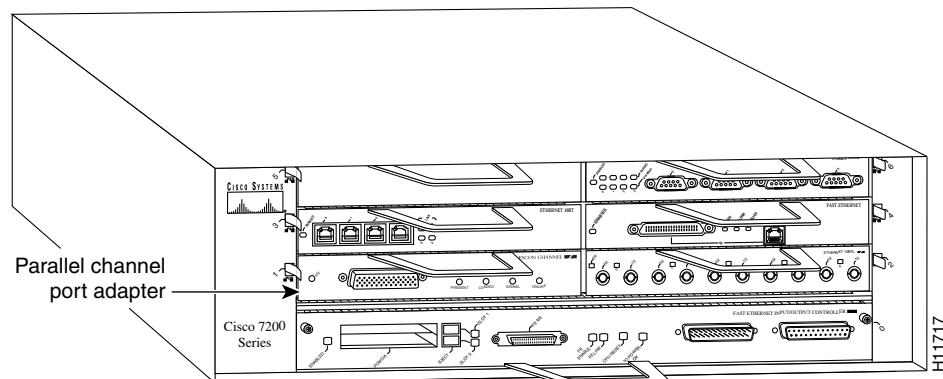
Using the ESCON Channel Port Adapter in Cisco 7200-Series Routers

The following sections include information about using the ESCON Channel Port Adapter in the Cisco 7200-series routers:

- [Installing or Replacing a Port Adapter in Cisco 7200-Series Routers, page 20](#)
- [Attaching the ESCON Channel Port Adapter to the Channel, page 23](#)
- [Using the EXEC Command Interpreter, page 24](#)
- [Configuring ESCON Channel Port Adapter Interface, page 25](#)

You can install the ESCON Channel Port Adapter in any of the available port adapter slots in a Cisco 7200-series router. Figure 7 shows an ESCON Channel Port Adapter installed in port adapter slot 1 of a Cisco 7206.

Figure 7 *Cisco 7206 with an ESCON Channel Port Adapter in Port Adapter Slot 1*



**Caution**

When powering off the router, wait a minimum of 30 seconds before powering it on again.

Installing or Replacing a Port Adapter in Cisco 7200-Series Routers

**Note**

The Cisco 7200-series routers support OIR. You do not need to power down the Cisco 7200-series routers when removing and replacing ESCON Channel Port Adapters.

When a port adapter slot is not in use, a blank port adapter must fill the empty slot to allow the router to conform to EMI emissions requirements and to allow proper air flow across the port adapters. If you plan to install a new port adapter in a slot that is not in use, you must first remove the blank port adapter.

The following sections describe how to remove and replace a port adapter:

- [Removing a Port Adapter, page 20](#)
- [Replacing a Port Adapter, page 22](#)

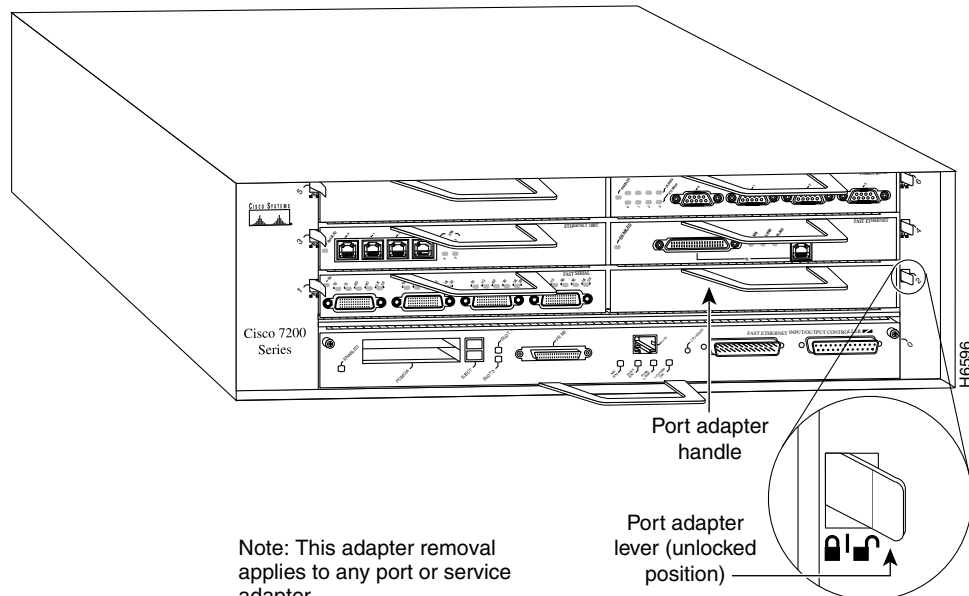
Removing a Port Adapter

You do not need to power down the Cisco 7200-series routers when removing and replacing ESCON Channel Port Adapters; however, to prevent a possible interface control check on the mainframe, consult with your system administrator to take appropriate precautions.

The following procedure describes how to remove a port adapter from a Cisco 7200-series router:

-
- Step 1** Attach an ESD wrist strap to your wrist and an unfinished chassis surface.
- Step 2** Place the port adapter lever for the desired port adapter slot in the unlocked position. The port adapter lever remains in the unlocked position ([Figure 8](#)).

Figure 8 Placing the Port Adapter Lever in the Unlocked Position (Cisco 7206)



- Step 3** Grasp the handle on the port adapter and pull the port adapter from the midplane until it is about halfway out of its slot. If you are removing a blank port adapter, pull the blank port adapter from the chassis slot.



Note As you disengage the port adapter from the router midplane, OIR administratively shuts down all active interfaces on the port adapter.

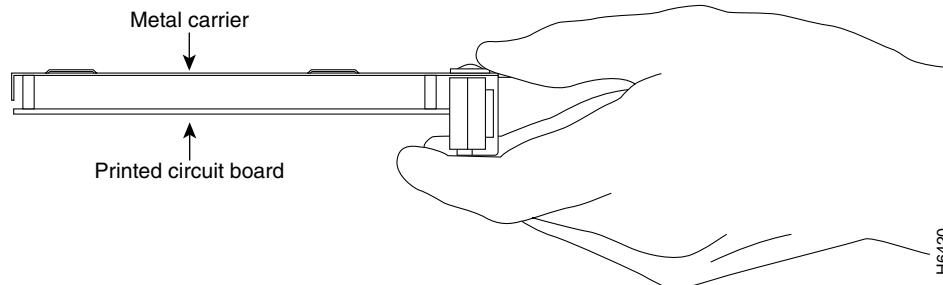
- Step 4** With the port adapter halfway out of the slot, disconnect all cables from the port adapter.

- Step 5** After disconnecting the cables, pull the port adapter from its chassis slot.



Caution Always handle the port adapter by the carrier edges and handle; never touch the port adapter's components or connector pins (Figure 9).

Figure 9 Handling a Port Adapter



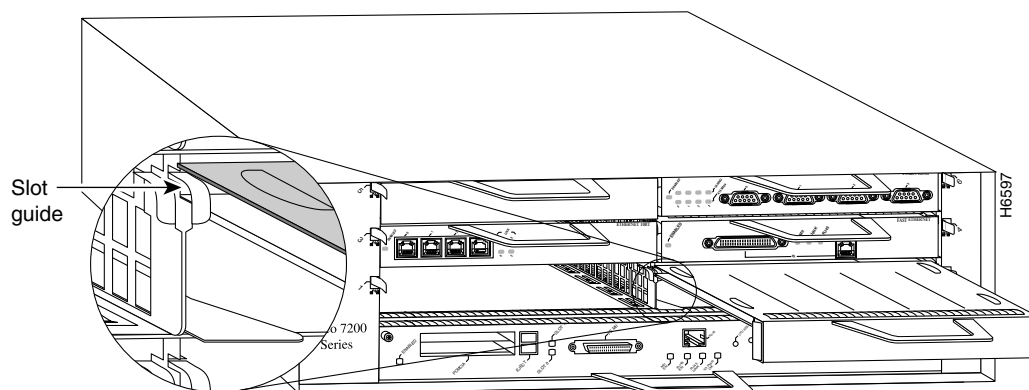
- Step 6** Place the port adapter on an antistatic surface with its components facing upward or place in a static shielding bag. If the port adapter will be returned to the factory, immediately place it in a static shielding bag.

Replacing a Port Adapter

The following procedure describes how to replace a port adapter in a Cisco 7200-series router:

-
- Step 1** Attach an ESD wrist strap to your wrist and an unfinished chassis surface.
 - Step 2** Use both hands to grasp the port adapter by its metal carrier edges and position the port adapter so that its components are downward ([Figure 9](#)).
 - Step 3** Align the left and right edges of the port adapter metal carrier between the guides in the port adapter slot ([Figure 10](#)).

Figure 10 Align the Port Adapter Metal Carrier Between the Slot Guides (Cisco 7206)



Note: This adapter alignment applies to any port or service adapter.

- Step 4** With the metal carrier aligned in the slot guides, gently slide the port adapter halfway into the slot.



Caution

Do not slide the port adapter all the way into the slot until you have connected all required cables. Trying to do so will disrupt normal operation of the router.

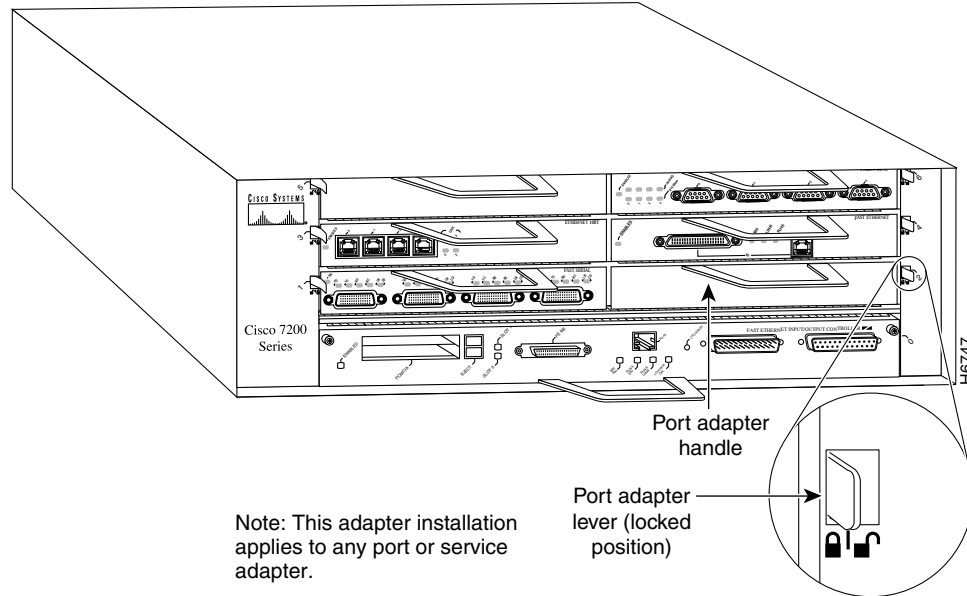
- Step 5** With the port adapter halfway in the slot, connect all required cables to the port adapter.
- Step 6** After connecting all required cables, carefully slide the port adapter all the way into the slot until you feel the port adapter's connectors mate with the midplane.
- Step 7** After feeling the connectors mate, move the port adapter lever to the locked position. [Figure 11](#) shows the port adapter lever in the locked position.



Note

If the port adapter lever does not move to the locked position, the port adapter is not completely seated in the midplane. Carefully pull the port adapter halfway out of the slot, reinsert it, and move the port adapter lever to the locked position.

Figure 11 Port Adapter Lever in the Locked Position (Cisco 7206)



Attaching the ESCON Channel Port Adapter to the Channel

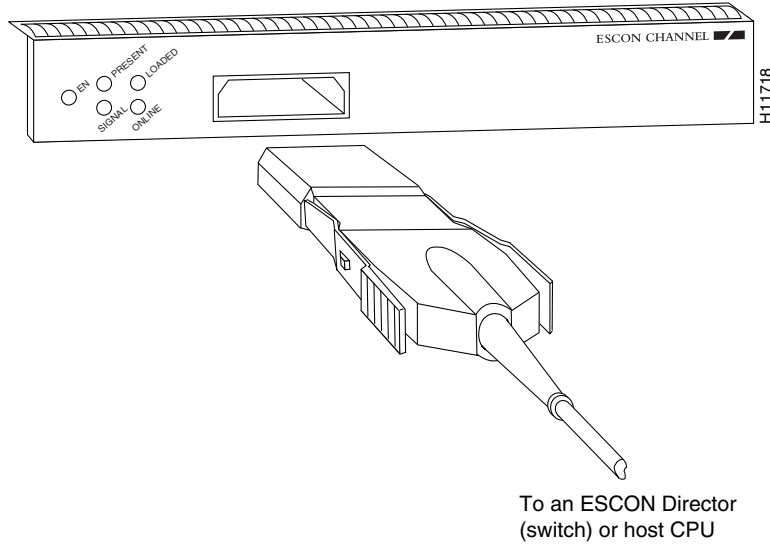
The following procedure describes how to attach the ESCON cable between the ESCON Channel Port Adapter and the host channel.



We recommend that an authorized service representative or other qualified service person perform the following procedure. To prevent hardware problems with your host processor, all the channel connections must be tight. A loose connection can cause the host processor or its channel to halt. Every cable must be tightly seated in its connector.

- Step 1** Use the **shutdown** interface command on the router to shut down the ESCON Channel Port Adapter interface. This action prevents excessive error messages from being sent to the router log output. In addition, we recommend that you vary offline the host channel to which the ESCON Channel Port Adapter will be attached. For instructions on how to vary offline the host channel, refer to the documentation for your mainframe operating system.
- Step 2** Attach an ESCON cable between the ESCON Channel Port Adapter and the host channel (Figure 12). Make certain the ESCON cable plug “clicks” in place in the receptacle on the ESCON Channel Port Adapter. Connection problems may result if the plug does not click in place. Visually inspect the connection to make sure it is not loose.

Figure 12 Connecting an ESCON Cable to the ESCON Channel Port Adapter



-
- Step 3** Vary online the host channel. For instructions on how to vary the host channel online, refer to the documentation for your mainframe operating system.
- Step 4** Use the **no shutdown** interface configuration command to enable the ESCON Channel Port Adapter interface.
-

Using the EXEC Command Interpreter

You modify the configuration of your router through the software command interpreter called the EXEC. You must enter the privileged level of the EXEC command interpreter with the **enable** command before you can use the **configure** command to configure a new interface or to change the existing configuration of an interface. The EXEC command interpreter prompts you for a password if one has been set.

The system prompt for the privileged level ends with a pound sign (#) instead of an angle bracket (>). At the console terminal, use the following procedure to enter the privileged EXEC level:

-
- Step 1** At the user-level EXEC prompt, enter the **enable** command. The EXEC prompts you for a privileged-level password:
- ```
Router> enable
Password:
```
- Step 2** Enter the password (the password is case sensitive). For security purposes, the password is not displayed.
- Step 3** When you enter the correct password, the system displays the privileged-mode system prompt (#):
- ```
Router#
```
-

Proceed to the following section to configure the new interfaces.

Configuring ESCON Channel Port Adapter Interface

If you installed a new ESCON Channel Port Adapter or if you want to change the configuration of an existing interface, you must use the privileged EXEC **configure** command. If you remove and replace an ESCON Channel Port Adapter in the same slot that was previously configured, the system will recognize the new ESCON Channel Port Adapter interface and bring it up in its existing configuration. An ESCON Channel Port Adapter removed from one slot and replaced in another slot must be reconfigured.

After you verify that the new ESCON Channel Port Adapter is installed correctly, use the **configure** command to configure the new interfaces. The enabled LED (EN) goes on when the port adapter is installed correctly (Figure 4). Be prepared with the information you will need to configure the interface, including the following:

- Protocols and encapsulations you plan to use on the new interfaces.
- Protocol-specific information, such as internet protocol (IP) addresses if you will configure the interfaces for IP routing.
- Special services you plan to use on the interface, such as Common Link Access for Workstations (CLAW), offload support, TN3270 server support, CIP SNA, or Cisco MultiPath Channel.



Note

Configuration commands are executed from the privileged EXEC command interpreter, which usually requires password access. Refer to the [“Using the EXEC Command Interpreter” section on page 24](#) and contact your system administrator, if necessary, to obtain access.

The following sections provide specific information about configuring the ESCON Channel Port Adapter interface:

- [Selecting Port Adapter Slots and ESCON Channel Port Numbers, page 25](#)
- [Configuring Interfaces, page 26](#)
- [Checking the Configuration, page 27](#)

For complete descriptions of interface subcommands and the configuration options available for Cisco 7200-series interfaces, refer to the publications listed in the [“Related Documentation” section on page 3](#).

Selecting Port Adapter Slots and ESCON Channel Port Numbers

This section describes how to identify port adapter slots and ESCON channel port numbers.

Physical port addresses specify the actual physical location of each interface port on the router. This address is composed of a two-part number in the format *port adapter slot number/interface port number*, as follows:

- The first number identifies the port adapter slot in which the ESCON Channel Port Adapter is installed.
- The second number identifies the interface port on the ESCON Channel Port Adapter, which is always numbered as interface 0 for the ESCON Channel Port Adapter.

**Note**

Some IBM channel attach software features are configured on a *virtual port*. On the CIP cards installed in a Cisco 7500-series router, there are up to two physical ports, numbered 0 and 1, and a virtual port, numbered 2. However, on the ESCON Channel Port Adapter installed in a Cisco 7200-series router, the single physical port and the virtual port are configured using the same port number identifier, number 0.

Interface ports maintain the same address regardless of whether other port adapters are installed or removed from the slot. However, when you move a port adapter to a different slot, the first number in the address changes to reflect the new port adapter slot number.

The port adapter slot numbers start with 1 and continue through 6. Slot 0 is always reserved for the Fast Ethernet port on the I/O controller. The individual interface port numbers are always 0. For example, the ESCON port on an ESCON Channel Port Adapter in port adapter slot 3 would have the address 3/0. If the ESCON Channel Port Adapter was in port adapter slot 1, this same interface port would be 1/0.

You can identify interface ports by physically checking the slot/interface port location on the front of the router or by using **show** commands to display information about a specific interface or all interfaces in the router.

**Note**

The ESCON Channel Port Adapter is considered a high-bandwidth port adapter; there are specific configuration guidelines that must be observed. Refer to the publication *Cisco 7200 Series Port Adapter Hardware Configuration Guidelines* (Document Number 78-3471-xx), which shipped with your Cisco 7200-series chassis and is also available on the Cisco Connection Documentation, Enterprise Series CD-ROM.

Configuring Interfaces

This section describes the procedure for performing a basic configuration of the interfaces on ESCON Channel Port Adapters installed in a Cisco 7200-series router.

Press the **Return** key after each step unless otherwise noted. At any time you can exit the privileged level and return to the user level by entering **disable** at the prompt as follows:

```
Router# disable
Router>
```

The following example describes a basic configuration procedure:

- Step 1** At the privileged EXEC prompt, enter configuration mode and specify that the console terminal will be the source of the router configuration commands, as follows:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

- Step 2** At the prompt, enter the interface configuration mode by using the **interface** configuration command. The example that follows prepares you to configure the interface on the channel port adapter in slot 2, port 0:

```
Router(config)# interface channel 2/0
```

- Step 3** If IP routing is enabled on the system, you can assign an IP address and subnet mask to the interface with the **ip address** interface configuration, as in the following example:

```
Router(config-if)# ip address 1.1.1.10 255.255.255.0
```

- Step 4** Add any additional configuration subcommands required to enable routing protocols and set the interface characteristics.

- Step 5** Change the shutdown state to up and enable the interface as follows:

```
Router(config-if)# no shutdown
```

- Step 6** Configure additional interfaces as required.

- Step 7** When you have included all configuration commands to complete the configuration, press **Ctrl-Z** to exit configuration mode. You may also type **end** to exit configuration mode and return to the EXEC prompt.

- Step 8** Write the new configuration to nonvolatile memory as follows:

```
Router# copy running-config startup-config
[OK]
Router#
```

- Step 9** To check the interface configuration using **show** commands, see the [“Checking the Configuration” section on page 27](#).
-

Checking the Configuration

After configuring the new interface, use the **show** commands to display the status of the new interface or all interfaces and use the **ping** command to check connectivity.

Using show Commands to Verify the New Interface Status

Use **show** commands to verify that the new interfaces are configured and operating correctly, as follows:

-
- Step 1** Display the system hardware configuration with the **show version** command. Ensure that the list includes the new interfaces.
- Step 2** Display all the current port adapters and their interfaces with the **show controllers** command. Verify that the new ESCON Channel Port Adapter appears in the correct slot.
- Step 3** Specify one of the new interfaces with the **show interfaces port adapter type slot/interface** command and verify that the first line of the display specifies the interface with the correct slot number. Also verify that the interface and line protocol are in the correct state: up or down.
- Step 4** Display the protocols configured for the entire system and specific interfaces with the **show protocols** command. If necessary, return to configuration mode to add or remove protocol routing on the system or specific interfaces.
- Step 5** Display the running configuration file with the **show running-config** command. Display the configuration stored in nonvolatile RAM (NVRAM) using the **show startup-config** command. Verify that the configuration is accurate for the system and each interface.

If the interface is down and you configured it as up, or if the displays indicate that the hardware is not functioning properly, ensure that the network interface is properly connected and terminated. If you still have problems bringing up the interface, contact a service representative for assistance.

Using show Commands to Display Interface and System Information

Use the **show interfaces** *type slot/port* command to display information about a specific interface. The following example of the **show interfaces channel slot/port** command shows all of the information specific to the ESCON Channel Port Adapter in port adapter slot 5:

```
Router# show interfaces channel 5/0
Channel5/0 is up, line protocol is up
  Hardware is Escon Channel
  Internet address is 168.18.1.105/29
  MTU 4472 bytes, BW 98304 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation CHANNEL, loopback not set
  ECA adapter card
  Data transfer rate 12 Mbytes, number of subchannels 4
  Last input 01:13:26, output never, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    58312 packets input, 191351408 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    58309 packets output, 191351216 bytes, 0 underruns
    0 output errors, 0 collisions, 9 interface resets
    0 output buffer failures, 0 output buffers swapped out
```

With the **show interfaces** *type slot/port* command, use arguments such as the interface type and the port adapter slot and port number to display information about a specific ESCON Channel Port Adapter.

Display all the current interface processors and their interfaces with the **show controllers** command. Following is an example of the **show controllers type slot/port** command that shows information about a specific ESCON Channel Port Adapter:

```
Router# show controllers channel 5/0
ECA 5, hardware version 0.1, microcode version 209.120
  Microcode loaded from flash slot0:xcpa209-120_kernel_xcpa
  Loaded:seg_eca          Rev. 0    Compiled by jpod on Fri 16-Jan-98 17:45
  Loaded:seg_offload      Rev. 0    Compiled by jpod on Fri 16-Jan-98 17:44
  Loaded:seg_tcpip        Rev. 0    Compiled by jpod on Fri 16-Jan-98 17:46
  EPROM version 209.120, VPLD version 0.86
  ECA0: hw version 255, microcode version C50602C4
  Load metrics:
    Memory    sram 3323864/4096K, dram 13389864/16M
    CPU        1m  1%, 5m  1%, 60m  0%
    DMA        1m  1%, 5m  0%, 60m  0%
    ECA0       1m  0%, 5m  0%, 60m  0%
Interface Channel5/0
Hardware is Escon Channel
HW Registers control status=0x0001EC07  LED control=0x00045DDF
HW Poll Register 4B05A5C0:[00000001]

Free buffer queues
  queue=0 max_entries=64 size=600 head=55 ring=4B0F0F40
  queue=1 max_entries=64 size=4520 head=47 ring=4B0A3BA0
Tx Queues
  queue=0 head=5 tail=5 tx_cnt=0 tx_pakcnt=0
  max_entries=128 type=1 poll_index=0 ring=4B0B2F00
  queue=1 head=18 tail=18 tx_cnt=0 tx_pakcnt=0
  max_entries=32 type=2 poll_index=1 ring=4B0A30A0
Rx Queues
  max_entries=126 poll_index=3 head=82 ring=4B0B3340
```

Use the **show diag slot** command to determine which type of port adapter is installed in your system. Specific port adapter information is displayed, as shown in the following example of an ESCON Channel Port Adapter in port adapter slot 5:

```
Router# show diag 5
Slot 5:
Escon port adapter, 1 port
Port adapter is analyzed
Port adapter insertion time 1d19h ago
Hardware revision 1.0          Board revision A0
Serial number      56          Part number    73-2961-02
Test history       0x0         RMA number     00-00-00
EEPROM format version 1
EEPROM contents (hex):
  0x20: 01 2F 01 00 00 00 00 38 49 0B 91 01 00 00 00 00
  0x30: 50 00 00 00 98 03 00 00 00 00 FF FF FF FF 00
```

Use the **show version** (or **show hardware**) command to display the configuration of the router hardware, the software version, the names and sources of configuration files, and the boot images. An example of the output from the **show version** command is as follows:

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-AJS-M), Experimental Version 11.3(19980105:225321)
 [jpod-xcpa_col_p.nightly 171]
Copyright (c) 1986-1998 by cisco Systems, Inc.
Compiled Tue 20-Jan-98 02:17 by
Image text-base: 0x600088B8, data-base: 0x60E46000

ROM: System Bootstrap, Version 11.1(11855) [beta 2], INTERIM SOFTWARE
BOOTFLASH: 7200 Software (C7200-BOOT-M), Version 11.1(472), RELEASE SOFTWARE (fc
1)

Router uptime is 20 hours, 8 minutes
System image file is "xcpa-ios/980120/c7200-ajs-mz.XCPA_980120", booted via tftp
from 171.69.160.37

cisco 7206 (NPE150) processor with 57344K/8192K bytes of memory.
R4700 processor, Implementation 33, Revision 1.0 (512KB Level 2 Cache)
Last reset from power-on
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
8 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
2 IBM channel interface(s)
125K bytes of non-volatile configuration memory.
1024K bytes of packet SRAM memory.

20480K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
4096K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0
```

For complete command descriptions and examples for the Cisco 7200-series routers, refer to the publications listed in the [“Related Documentation” section on page 3](#).

Using the Ping Command to Verify Network Connection

Use the **ping** command to verify that an interface port is functioning properly and to check the path between a specific port and connected devices at various locations on the network. This section provides brief descriptions of the **ping** command. After you verify that the system has booted successfully and is operational, you can use the **ping** command to verify the status of interface ports.

The **ping** command sends an echo request out to a remote device at the IP address that you specify. After sending a series of signals, the command waits a specified time for the remote device to echo the signals. Each returned signal is displayed as an exclamation point (!) on the console terminal; each signal that is not returned before the specified time-out is displayed as a period (.). A series of exclamation points (!!!!!) indicates a good connection; a series of periods (.....) or the messages “timed out” or “failed” indicate that the connection failed.

The following example shows a successful **ping** command to a remote server with the IP address 1.1.1.10:

```
Router# ping 1.1.1.10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes to 1.1.1.10, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/15/64 ms
Router#
```

If the connection fails, verify that you have the correct IP address for the server and that the server is active, then repeat the **ping** command.

For complete descriptions of interface configuration commands and the configuration options available for Cisco 7200-series interfaces and functions, refer to the publications listed in the [“Related Documentation”](#) section on page 3.

ESCON Channel Port Adapter Microcode Guidelines

The following sections discuss ESCON Channel Port Adapter microcode configuration requirements:

- [How Does ESCON Channel Port Adapter Microcode Ship?, page 31](#)
- [ESCON Channel Port Adapter Microcode Upgrade Overview, page 31](#)
- [Configuring Microcode, page 32](#)

For additional information about specific microcode requirements, refer to the [“ESCON Channel Port Adapter Microcode Overview”](#) section on page 9.

How Does ESCON Channel Port Adapter Microcode Ship?

For the Cisco 7200-series routers, when the ESCON Channel Port Adapter is ordered as part of a new system, the Channel Port Adapter microcode is available on a Flash memory card or SanDisk memory device (which also includes the Cisco IOS release compatible with the microcode version) and via Cisco.com. When the ESCON Channel Port Adapter is ordered as a spare, the Channel Port Adapter microcode is available via Cisco.com.



Note

The ESCON Channel Port Adapter-compatible microcode images are virtually bundled with all Cisco IOS releases that support ESCON Channel Port Adapter. The virtual bundling of the microcode means that the microcode software is loaded separately by the Cisco IOS software.

ESCON Channel Port Adapter Microcode Upgrade Overview

To upgrade the ESCON Channel Port Adapter microcode obtained from Cisco.com, complete the steps in the following procedures.



Note

Perform the following procedure only if you are upgrading your microcode.

**Caution**

To prevent system problems in the following procedure, you must be running Cisco IOS Release 11.3(3)T or later. For information on upgrading your Cisco IOS software, refer to the appropriate software configuration publication listed in the [“Related Documentation” section on page 3](#).

Upgrading from Cisco.com

To upgrade ESCON Channel Port Adapter microcode images obtained from Cisco.com, do the following:

-
- Step 1** Download the Channel Port Adapter microcode image from Cisco.com to a TFTP server.
 - Step 2** Remove any configuration commands that specify a Channel Port Adapter microcode image from the running configuration.
 - Step 3** Copy the Channel Port Adapter microcode image to the Flash memory card in slot 0 or slot 1, or to the SanDisk memory device in disk0 or disk1.
 - Step 4** Reconfigure the router, as necessary, to use the Channel Port Adapter microcode image stored in the Flash memory card in slot 0 or slot 1, or in the SanDisk memory device in disk0 or disk1.
 - Step 5** Save your running configuration to a TFTP server, Flash memory card, or SanDisk memory device.
 - Step 6** Perform a microcode reload.
-

Configuring Microcode

This section describes how to modify the startup configuration to load different microcode images at startup, or to change existing configuration instructions and re-enable the system default.

At system startup or reload, the system loads a microcode image for each processor type. All processors of the same type use the same microcode image; only one image for each type can load at startup. The ESCON Channel Port Adapter microcode image must be located on a Flash memory card or SanDisk memory device.

When you upgrade software or microcode by downloading new images onto a Flash memory card or SanDisk memory device, you must configure the system to load the new microcode image at startup. Otherwise, the system will continue to load the default image from the system or attempt to load any previous image if it is still specified in the configuration file.

**Note**

If you are running anything other than the default ESCON Channel Port Adapter microcode with your Cisco IOS software and you want to upgrade to a later version of Cisco IOS software, and want to use the default ESCON Channel Port Adapter microcode that comes with that later version, you must remove the **microcode ecpa slot:filename** statement from the system configuration file, otherwise the Cisco IOS software will try to load that old version of the ESCON Channel Port Adapter microcode.

To instruct the system to load an ESCON Channel Port Adapter microcode image other than the default at startup, use the **microcode ecpa slot:filename** and the **microcode reload** configuration commands to add the instructions to the configuration file.

To load a microcode image from a file stored on a Flash memory card, enter the **show flash slot0: EXEC** command to display the Flash directory contents and verify the exact name of the file (**xcpa26-1** is used in this example):

```
Router> show flash slot0:
```

```
(additional displayed text omitted)
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
23 .. unknown 00000001 4930F8 11          1 Jan 20 1998 14:33:19 xcpa26-1
24 .. unknown 70908993 4E213C 23      323522 Jan 20 1998 14:33:19 xcpa26-1_kernel_xcpa
25 .. unknown 5CD4E560 51A4F4 19      230200 Jan 20 1998 14:33:34 xcpa26-1_seg_802
26 .. unknown 0954E702 56522C 20      306360 Jan 20 1998 14:33:44 xcpa26-1_seg_cmpc
27 .. unknown 44575172 57A814 20       87400 Jan 20 1998 14:33:59 xcpa26-1_seg_csna
28 .. unknown 1C73CFC5 5EB2F4 19      461408 Jan 20 1998 14:34:03 xcpa26-1_seg_eca
29 .. unknown 090B4417 5FC0F4 23       68992 Jan 20 1998 14:34:24 xcpa26-1_seg_offload
30 .. unknown BE20EFEA 60D064 19       69360 Jan 20 1998 14:34:28 xcpa26-1_seg_pca
31 .. unknown 4A1D172A 610DB4 20       15568 Jan 20 1998 14:34:31 xcpa26-1_seg_push
32 .. unknown 227EF97E 63D9C4 21      183184 Jan 20 1998 14:34:32 xcpa26-1_seg_tcpip
33 .. unknown 249B5D63 6C8FBC 22      570744 Jan 20 1998 14:34:41 xcpa26-1_seg_tn3270
```

```
(additional displayed text omitted)
```

```
2927520 bytes available (17650784 bytes used)
```

Perform the following steps to configure the microcode for an ESCON Channel Port Adapter on a router configured with Cisco IOS Release 11.3(3)T or later:

Step 1 Enter the privileged EXEC mode command interpreter:

```
Router> enable
Password:
Router#
```



Note For complete information on the command interpreter and software functions, refer to the publications listed in the [“Related Documentation” section on page 3](#).

Step 2 If you need to copy a new ESCON Channel Port Adapter microcode image to your router’s Flash memory, refer to the [“Using Flash Memory” section on page 34](#), then proceed to Step 3.

Step 3 In privileged command mode, enter router configuration mode and specify that the console terminal will be the source of the configuration subcommands:

```
Router# configure terminal
```

To load the microcode from an individual microcode image that is stored as a file on a Flash memory card, enter the **microcode** command, the processor type, the specific memory location of the ESCON Channel Port Adapter microcode image, and the exact argument for *filename* (**xcpa26-1** is used in this example):

```
Router(config)# microcode ecpa slot0:xcpa26-1
Router(config)# microcode reload
```



Note The **microcode reload** command is written automatically in the configuration file following the **microcode ecpa** command when you modify the system default to load a microcode image.

```
Router(config)# no microcode ecpa slot0:xcpa26-1
```

- Step 4** To save the configuration file, press **Ctrl-Z** (or type **end**), then copy the new configuration to NVRAM:

```
Router# copy running-config startup-config
```

- Step 5** To verify that the correct microcode is loaded according to the new instructions, enter the **show controllers EXEC** command. The display indicates the currently loaded and running microcode version for each Channel Port Adapter.

- Step 6** To verify the contents of the configuration file, enter the **show running-config EXEC** command. You can also verify that the correct software image is configured to load at system restart or reload by using the **show startup-config EXEC** command.

Using Flash Memory

The following provides information on the different functions of Flash memory that you might need when configuring microcode:

- [Copying to the Flash Memory Card on a Cisco 7200-Series Router, page 34](#)
- [Additional Flash Memory Commands, page 35](#)
- [Recovering from Locked Blocks, page 36](#)

Copying to the Flash Memory Card on a Cisco 7200-Series Router

Copying a new image to a Flash memory card might be required when a new microcode image becomes available. Use the command **copy tftp:filename [bootflash | slot0 | slot1]:filename** for the copy procedure, where **tftp:filename** is the source of the file and **[bootflash | slot0 | slot1]:filename** is the destination in onboard Flash memory or on either of the Flash memory cards. The following example shows the output from the **copy tftp:filename** command for Cisco IOS Release 11.3:

```
Router# copy tftp:xcpa26-1 slot0:xcpa26-1
2283972 bytes available on device flash, proceed? [confirm]
Address or name of remote host [biff.cisco.com]?
Accessing file "xcpa26-1" on biff.cisco.com ...FOUND
Loading xcpa26-1 from 1.1.1.22 (via Ethernet0/0): !Verifving via checksum...
```

```
Flash verification successful. Length = 1, checksum = 0xFFFF
```

```
--- expanding multi-segment file ---  
flash:xcpa26-1_kernel_hw4 size = 238626  
!!!!!!!!!!!!!!Verifying via checksum... vvvvvvvvvvvvvv
```

Flash verification successful. Length = 238626, checksum = 0x0000

```
--- expanding multi-segment file ---  
flash:xcpa26-1_seg_802 size = 198600  
!!!!!!!!!!!!!!!!!!!!!!Verifying via checksum... vvvvvvvvvvvv
```

```
Flash verification successful. Length = 198600, checksum = 0x9237
```


Note

In the preceding example, the exclamation points (!) appear as the file is downloaded, and the “v” characters signify calculation of the checksum, which is a verification that the file has been correctly downloaded to the Flash memory card.

There are additional commands related to the bootflash Flash memory in the Cisco 7200-series router (called *bootflash*) and in Personal Computer Memory Card International Association (PCMCIA) Flash memory cards. The following example assumes you are currently accessing the Flash memory card in PCMCIA slot 0. You can determine which PCMCIA slot you are accessing using the **pwd** command as follows:

You can move between Flash memory media using the **cd [bootflash: | slot0: | slot1:]** command:

```
Router# cd slot0:
slot0
Router# cd slot1:
Router# pwd
slot1
```

You can list the directory of any Flash memory media using the **dir** [**bootflash:** | **slot0:** | **slot1:**] command:

```
Router# dir
-#- -length- ----date/time----- name
1  4601977  May 19 1994 09:42:19 myfile1
6   679    May 19 1994 05:43:56 todays-config
7    1     May 19 1994 09:54:53 fun1
```

You can delete a file from any Flash memory media using the **delete** command:

```
Router# delete slot0:fun1
Router# dir
-#- -length- ----date/time----- name
1  4601977  May 19 1994 09:42:19 myfile1
6   679    May 19 1994 05:43:56 todays-config
```

To verify that the **delete** command was successful, use the **dir /deleted** command to view the deleted files.



Note

Files that are deleted are simply marked as deleted, but still occupy space in Flash memory. To remove the files, use the **squeeze** command.

The **squeeze** command permanently removes files, which are marked as deleted, and pushes together all other undeleted files to eliminate spaces between them.

The following example shows the **squeeze** command:

```
Router# squeeze slot0:
All deleted files will be removed, proceed? [confirm]
Squeeze operation may take a while, proceed? [confirm]
ebESZ
```

To prevent loss of data because of sudden power loss, the “squeezed” data is temporarily saved to a special location of Flash memory.

In the **squeeze** command display output, the displayed characters have the following meaning:

- The character “e” means the Flash memory special location has been erased, which occurs before a write operation.
- The character “b” means that the data that is about to be written to this special location has been temporarily copied.
- The character “E” signifies that the sector that was temporarily occupied by the data has been erased.
- The character “S” signifies that the data was written to its permanent location in Flash memory.
- The character “Z” means this log was erased after the successful **squeeze** command operation.

The **squeeze** command automatically tracks which of these functions has been performed so upon sudden power failure, it can safely continue with the process.

Recovering from Locked Blocks

A locked block of Flash memory occurs when power is lost or a Flash memory card is unplugged during a write or erase operation. When a block of Flash memory is locked, it cannot be written to or erased, and the operation will consistently fail at a particular block location. The only way to recover from locked blocks is by reformatting the Flash memory card with the **format** command.



Caution

Formatting a Flash memory card to recover from locked blocks will cause existing data to be lost.

Using SanDisk Devices

PCMCIA Flash memory cards use a slot0/slot1 convention to specify memory locations; slot0 is the default directory for IOS searches. However, SanDisk memory devices use a disk0/disk1 convention. Therefore, when you use a SanDisk device on a Cisco 7200-series router, you need to specify disk0 or disk1 explicitly in IOS search arguments.

For example, to copy a new microcode image to a Sandisk device, use the following command:

```
copy tftp:source_filename {disk0|disk1}:sandisk_filename
```

where:

- *tftp:source_filename* is the source location of the microcode image file
- *sandisk_filename* is the destination on disk0 or disk1 of the SanDisk memory card

The following example shows sample output for the **copy tftp:filename** command:

```
Router# copy tftp:xcpa27-1 disk0:xcpa27-1
2283972 bytes available on device flash, proceed? [confirm]
Address or name of remote host [biff.cisco.com]? [confirm]
Source filename [xcpa27-1]? [confirm]
Destination filename [xcpa27-1]? [confirm]
Accessing file "xcpa27-1" on biff.cisco.com ...
Loading xcpa26-1 from 1.1.1.22 (via FastEthernet0/0):!
  Expanding disk0:xcpa27-1_kernel_xcpa (406910 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_802 (245522 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_cmpc (564632 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_csna (96024 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_eca (460704 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_offload (91420 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_pca (68840 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_push (15488 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_tcpip (161140 bytes):!!!!!!!!!!!!
  Expanding disk0:xcpa27-1_seg_tn3270 (620400 bytes):!!!!!!!!!!!!
[OK - 2739200/5478400 bytes]

2739200 bytes copied in 68.500 secs (40282 bytes/sec)
```

To update your running configuration:

Step 1 Enter the following commands, beginning in global configuration mode:

```
Router# configuration term
Router(config)# microcode ecpa diskX:xcpaXX-YY
Router(config)# microcode reload
Router(config)# end
```

where:

- *diskX* is **disk0** or **disk1** on the SanDisk device
- *xcpaXX-YY* is the xCPA image you want to use, such as **xcpa27-1**

Step 2 Save the running configuration to NVRAM.

Running ESCON Channel Port Adapter Diagnostic Tests

The ESCON Channel Port Adapter diagnostic test routines are as follows:

- Processor test 1
- Processor test 2
- I/O device tests
- Serial link controller (SLC) device tests
- Internal electrical wrap
- External optical wrap for the ESCON Channel Port Adapter



Note

All diagnostic tests are run every time the adapter is started. They cannot be run independently. The external optical wrap test requires special wrap plugs for the ESCON Channel Port Adapter. Contact a service representative to obtain the appropriate wrap plugs.

This document is to be used in conjunction with the *Cisco 72xx Installation and Configuration Guide* publication.

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