



Preface

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Objectives

This guide explains how to configure basic commands and scenarios for Ethernet switching, IP WAN routing, Voice over IP (VoIP), and IP telephony on the Catalyst 4224 Access Gateway Switch. To use this document effectively, you need to be an experienced data networking professional with a background in telecommunications.

Audience

This guide is intended for network administrators, engineers, and managers who need to understand the Catalyst 4224 system or configure the software. It is also intended for Cisco customer service representatives and system engineers.

Organization

This guide contains the following chapters:

	Title	Description
Chapter 1	Product Overview	Provides an overview of the Catalyst 4224 Access Gateway Switch software features.
Chapter 2	Configuring for the First Time	Describes the initial steps of configuring the Catalyst 4224.
Chapter 3	Configuring Ethernet Switching	Describes how to configure the Ethernet ports and voice VLANs.
Chapter 4	Configuring the Data Interfaces	Describes how to configure the data interfaces for IP WAN routing.
Chapter 5	Configuring the Voice Interfaces	Describes how to configure key voice interfaces.
Chapter 6	Configuring VoIP	Provides comprehensive information on Cisco VoIP configuration.
Chapter 7	Configuring the Eight-Port FXS RJ-21 Module	Describes how to configure the 8-Port FXS Module.
Chapter 8	Configuring Survivable Remote Site Telephony	Describes how to configure survivable remote site telephony.
Chapter 9	Implementing Fax over IP on Cisco Voice Gateways	Provides an overview and configuration information for fax over IP technologies supported on Cisco voice gateways.

	Title	Description
Chapter 10	Traffic Shaping	Describes different types of traffic shaping and provides pointers to configuration and command information.
Chapter 11	Configuring Encryption Services	Describes how to configure encryption services.
Chapter 12	Configuring Other Routing Protocols	Describes how to configure the Novell Internetwork Packet Exchange (IPX) and IBM Systems Network Architecture (SNA) routing protocols.
Appendix A	Command Reference for Voice VLAN	Describes the key voice VLAN commands used on Catalyst 4224.
Appendix B	Synopsis of Basic VoIP Concepts	Describes some basic VoIP concepts.
Appendix C	VoIP Configuration Examples	Provides examples of VoIP configurations.

Related Documentation

The following publications are available for the Catalyst 4224 Access Gateway Switch:

- *Catalyst 4224 Access Gateway Switch Hardware Installation Guide*
- Cisco IOS configuration guides and command references—Use these publications to help you configure the Cisco IOS software.
- For information about MIBs, refer to the following URL:
<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

Conventions

This guide uses the following conventions:

Convention	Description
boldface font	Commands and keywords are in boldface .
<i>italic font</i>	Arguments for which you supply values are in <i>italics</i> .
[]	Elements in square brackets are optional.
{ x y z }	Alternative keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
screen font	Terminal sessions and information the system displays are in <i>screen font</i> .
boldface screen font	Information you must enter is in boldface screen font .
<i>italic screen font</i>	Arguments for which you supply values are in <i>italic screen font</i> .
→	This pointer highlights an important line of text in an example.
^	The symbol ^ represents the key labeled Control—for example, the key combination ^D in a screen display means hold down the Control key while you press the D key.
< >	Nonprinting characters, such as passwords are in angle brackets.



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.

**Caution**

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

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

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

International Cisco websites can be accessed from this 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 may have 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.

Registered Cisco.com users can order the Documentation CD-ROM (product number DOC-CONDOCCD=) through the online Subscription Store:

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

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

<http://www.cisco.com/en/US/partner/ordering/index.shtml>

- Registered Cisco.com users can order the Documentation CD-ROM (Customer Order Number DOC-CONDOCCD=) 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 Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit comments electronically on Cisco.com. On the Cisco Documentation home page, click **Feedback** at the top of the page.

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

You can submit your comments by mail by using the response card behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com, which includes the Cisco Technical Assistance Center (TAC) Website, as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from the Cisco TAC website. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC website, including TAC tools and utilities.

Cisco.com

Cisco.com offers a suite of interactive, networked services that let you access Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com provides a broad range of features and services to help you with these tasks:

- 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

To obtain customized information and service, you can self-register on Cisco.com at this 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 levels of support are available: the Cisco TAC website and the Cisco TAC Escalation Center. The avenue of support that you choose depends on the priority of the problem and the conditions stated in service contracts, when applicable.

We categorize Cisco TAC inquiries according to urgency:

- 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.

Cisco TAC Website

You can use the Cisco TAC website 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 website, go to this URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC website. Some services on the Cisco TAC website require 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 this URL to register:

<http://tools.cisco.com/RPF/register/register.do>

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC website, you can open a case online at this URL:

<http://www.cisco.com/en/US/support/index.html>

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC website so that you can describe the situation in your own words and attach any necessary files.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. 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 automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this 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). When you call the center, please have available your service agreement number and your product serial number.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:

http://www.cisco.com/en/US/products/products_catalog_links_launch.html

- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco monthly periodical that provides industry professionals with the latest information about the field of networking. You can access *Packet* magazine at this URL:

http://www.cisco.com/en/US/about/ac123/ac114/about_cisco_packet_magazine.html

- *iQ Magazine* is the Cisco monthly periodical that provides business leaders and decision makers with the latest information about the networking industry. You can access *iQ Magazine* at this URL:

http://business.cisco.com/prod/tree.taf%3fasset_id=44699&public_view=true&kbns=1.html

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in the design, development, and operation of public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:

http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html

- Training—Cisco offers world-class networking training, with current offerings in network training listed at this URL:

http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html