



About the Cisco IOS Documentation



Note

The terms "Unidirectional Path Switched Ring" and "UPSR" may appear in Cisco literature. These terms do not refer to using Cisco ONS 15xxx products in a unidirectional path switched ring configuration. Rather, these terms, as well as "Path Protected Mesh Network" and "PPMN," refer generally to Cisco's path protection feature, which may be used in any topological network configuration. Cisco does not recommend using its path protection feature in any particular topological network configuration.

This section explains the objectives, intended audience, and organization of this publication and describes the conventions that convey instructions and other information.

This section provides the following information:

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Revision History

Date	Notes
08/22/2007	Updated About this Guide

Document Objectives

This guide explains software features and configuration for Cisco IOS on the ML-Series card. The ML-Series card is a module in the Cisco ONS 15454 SONET/SDH system. Use this guide in conjunction with the appropriate publications listed in the [Related Documentation](#) section.

Audience

To use this publication, you should be familiar with Cisco IOS and preferably have technical networking background and experience.

Document Organization

This *Cisco ONS 15454 SONET/SDH ML-Series Multilayer Ethernet Card Software Feature and Configuration Guide, R4.6* is organized into the following chapters:

- [Chapter 1, “Overview,”](#) provides a description of the ML-Series card, a feature list, and explanations of key features.
- [Chapter 2, “CTC Operations,”](#) provides details and procedures for using Cisco Transport Controller (CTC) software with the ML-Series card.
- [Chapter 3, “Initial Configuration,”](#) provides procedures to access the ML-Series card and create and manage startup configuration files.
- [Chapter 4, “Configuring Interfaces,”](#) provides information on the ML-Series card interfaces and procedures for the interfaces.
- [Chapter 5, “Configuring Bridging,”](#) provides bridging examples and procedures for the ML-Series card.
- [Chapter 6, “Configuring STP and RSTP,”](#) provides spanning tree and rapid spanning tree examples and procedures for the ML-Series card.
- [Chapter 7, “Configuring VLANs,”](#) provides VLAN examples and procedures for the ML-Series card.
- [Chapter 8, “Configuring IEEE 802.1Q and Layer 2 Protocol Tunneling,”](#) provides tunneling examples and procedures for the ML-Series card.
- [Chapter 9, “Configuring Link Aggregation,”](#) provides Etherchannel and packet-over-SONET/SDH (POS) channel examples and procedures for the ML-Series card.
- [Chapter 10, “Configuring Networking Protocols,”](#) provides network protocol examples and procedures for the ML-Series card.
- [Chapter 11, “Configuring IRB,”](#) provides integrated routing and bridging (IRB) examples and procedures for the ML-Series card.
- [Chapter 12, “Configuring VRF Lite,”](#) provides VPN Routing and Forwarding Lite (VRF Lite) examples and procedures for the ML-Series card.
- [Chapter 13, “Configuring Quality of Service,”](#) provides quality of service (QoS) examples and procedures for the ML-Series card.
- [Chapter 14, “Configuring the Switching Database Manager,”](#) provides switching database manager examples and procedures for the ML-Series card.
- [Chapter 15, “Configuring Access Control Lists,”](#) provides access control list (ACL) examples and procedures for the ML-Series card.
- [Chapter 16, “Configuring Resilient Packet Ring,”](#) provides resilient packet ring (RPR) examples and procedures for the ML-Series card.
- [Chapter 17, “Configuring Ethernet over MPLS,”](#) provides Ethernet over Multiprotocol Label Switching (EoMPLS) examples and procedures for the ML-Series card.
- [Appendix A, “Command Reference,”](#) is an alphabetical listing of unique ML-Series card Cisco IOS commands with definitions and examples.
- [Appendix B, “Unsupported CLI Commands,”](#) is a categorized and alphabetized listing of Cisco IOS commands that the ML-Series card does not support.
- [Appendix C, “Using Technical Support,”](#) instructs the user on using the Cisco Technical Assistance Center (Cisco TAC) for ML-Series card problems.

Related Documentation

Use this *Cisco ONS 15454 SONET/SDH ML-Series Multilayer Ethernet Card Software Feature and Configuration Guide, R4.6* in conjunction with the following general ONS 15454 or ONS 15454 SDH system publications:

- To install, turn up, provision, and maintain a Cisco ONS 15454 node and network, refer to the *Cisco ONS 15454 Procedure Guide*.
- For alarm clearing, general troubleshooting, and hardware replacement procedures for a Cisco ONS 15454 node, refer to the *Cisco ONS 15454 Troubleshooting Guide*.
- For detailed reference information on a Cisco ONS 15454 node, refer to the *Cisco ONS 15454 Reference Manual*.
- To install, turn up, provision, and maintain a Cisco ONS 15454 SDH node and network, refer to the *Cisco ONS 15454 SDH Procedure Guide*.
- For alarm clearing, general troubleshooting, and hardware replacement procedures for the Cisco ONS 15454 SDH node, refer to the *Cisco ONS 15454 SDH Troubleshooting Guide*.
- For detailed reference information on the Cisco ONS 15454 SDH node, refer to the *Cisco ONS 15454 SDH Reference Manual*.

The ML-Series card employs the Cisco IOS Modular QoS CLI (MQC). For more information on general MQC configuration, refer to the following IOS documents:

- *Cisco IOS Quality of Service Solutions Configuration Guide, Release 12.1* at this URL:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121cgcr/qos_c/index.htm
- *Cisco IOS Quality of Service Solutions Command Reference, Release 12.1* at this URL:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121cgcr/qos_r/index.htm

The ML-Series card employs Cisco IOS 12.1. For more general information on Cisco IOS 12.1, refer to the extensive Cisco IOS documentation at:

- <http://www.cisco.com/univercd/cc/td/doc/product/software/ios121.htm>
- <http://www.cisco.com/univercd/home/home.htm>

Document Conventions

This publication uses the following conventions:

Convention	Application
boldface	Commands and keywords in body text.
<i>italic</i>	Command input that is supplied by the user.
[]	Keywords or arguments that appear within square brackets are optional.
{ x x x }	A choice of keywords (represented by x) appears in braces separated by vertical bars. The user must select one.
Ctrl	The control key. For example, where Ctrl + D is written, hold down the Control key while pressing the D key.
screen font	Examples of information displayed on the screen.
boldface screen font	Examples of information that the user must enter.
< >	Command parameters that must be replaced by module-specific codes.



Note

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



Caution

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



Warning

IMPORTANT SAFETY INSTRUCTIONS

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 translated safety warnings that accompanied this device.

Note: SAVE THESE INSTRUCTIONS

Note: This documentation is to be used in conjunction with the specific product installation guide that shipped with the product. Please refer to the Installation Guide, Configuration Guide, or other enclosed additional documentation for further details.

Where to Find Safety and Warning Information

For safety and warning information, refer to the *Cisco Optical Products Safety and Compliance Information* document that accompanied the product. This publication describes the international agency compliance and safety information for the Cisco ONS 15454 systems. It also includes translations of the safety warnings that appear in the ONS 15454 system documentation.

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain 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

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 Ordering tool:
<http://www.cisco.com/en/US/partner/ordering/index.shtml>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Cisco Optical Networking Product Documentation CD-ROM

Optical networking-related documentation, including Cisco ONS 15454 and Cisco ONS 15454 SDH product documentation, is available in a CD-ROM package that ships with your product. The Optical Networking Product Documentation CD-ROM is updated periodically and may be more current than printed documentation.

Documentation Feedback

You can submit e-mail comments about technical documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) 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

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, the Cisco Technical Assistance Center (TAC) provides 24-hour-a-day, award-winning technical support services, online and over the phone. Cisco.com features the Cisco TAC website as an online starting point for technical assistance. If you do not hold a valid Cisco service contract, please contact your reseller.

Cisco TAC Website

The Cisco TAC website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The Cisco TAC website is available 24 hours a day, 365 days a year. The Cisco TAC website is located at this URL:

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

Accessing all the tools on the Cisco TAC website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a login ID or password, register at this URL:

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

Opening a TAC Case

Using the online TAC Case Open Tool is the fastest way to open P3 and P4 cases. (P3 and P4 cases are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Case Open Tool automatically recommends resources for an immediate solution. If your issue is not resolved using the recommended resources, your case will be assigned to a Cisco TAC engineer. The online TAC Case Open Tool is located at this URL:

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

For P1 or P2 cases (P1 and P2 cases are those in which your production network is down or severely degraded) or if you do not have Internet access, contact Cisco TAC by telephone. Cisco TAC engineers are assigned immediately to P1 and P2 cases to help keep your business operations running smoothly.

To open a case by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete listing of Cisco TAC contacts, go to this URL:

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

TAC Case Priority Definitions

To ensure that all cases are reported in a standard format, Cisco has established case priority definitions.

Priority 1 (P1)—Your network is “down” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Priority 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Priority 3 (P3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Priority 4 (P4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

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

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Go to this URL to visit the company store:
<http://www.cisco.com/go/marketplace/>
- 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://cisco.com/univercd/cc/td/doc/pcat/>
- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. 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 quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access Packet magazine at this URL:
<http://www.cisco.com/packet>
- *iQ Magazine* is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:
<http://www.cisco.com/go/iqmagazine>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:
<http://www.cisco.com/ipj>
- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:
<http://www.cisco.com/en/US/learning/index.html>

