



# Preface

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This preface describes who should read the *Optical Services Modules Software Configuration Note, 12.2SX*, how it is organized, and its document conventions.

# Document Revision History

The Document Revision History table below records technical changes to this document. The table shows the document revision number for the change, the date of the change, and a brief summary of the change. Note that not all Cisco documents use a Document Revision History table.

Revision	Date	Change Summary
OL-5347-21	January, 2006	Added <a href="#">RFC 1483 Spanning-Tree Interoperability Enhancements</a> to Chapter 8. Added <a href="#">Configuring Dot1q Transparency for EoMPLS</a> to Chapter 11.
OL-5347-20	September, 2005	Added information about <a href="#">H-VPLS</a> to Chapter 11.
OL-5347-19	August, 2005	Added notes to HDLC and AToM sections in Chapter 11 for SUP720-PFC3B and SUP720-PFC3BXL core-facing configurations.
OL-5347-19	May, 2005	Added <a href="#">Distribution of Remaining Bandwidth</a> to Chapter 9.
OL-5347-18	April, 2005	<ul style="list-style-type: none"> <li>• Added the following information to Chapter 3:               <ul style="list-style-type: none"> <li>– <a href="#">Configuring Multipoint Bridging</a></li> <li>– <a href="#">Configuring Strict Priority LLQ Support on POS Optical Service Modules</a></li> </ul> </li> <li>• Added <a href="#">Configuring Strict Priority Low Latency Queuing (LLQ) Support on the OSM-2+4GE-WAN+</a> to Chapter 4.</li> <li>• Added <a href="#">Configuring Multipoint Bridging</a> to Chapter 8.</li> <li>• Added the following information to Chapter 9:               <ul style="list-style-type: none"> <li>– <a href="#">Cisco IPv6 QoS on the OSMs</a></li> <li>– <a href="#">Configuring QoS: Match VLAN</a></li> </ul> </li> <li>• Added the following information to Chapter 11:               <ul style="list-style-type: none"> <li>– <a href="#">HQoS for EoMPLS Virtual Circuits</a></li> <li>– Support bandwidth command in HQoS parent class at <a href="#">Supported Features</a></li> <li>– <a href="#">DE/CLP and EXP Mapping on FR/ATMoMPLS VC</a></li> <li>– <a href="#">HDLC Over MPLS</a></li> <li>– <a href="#">PPP Over MPLS</a></li> </ul> </li> </ul>
OL-5347-17	March, 2005	<ul style="list-style-type: none"> <li>• Changed text for Bridging Control Protocol <a href="#">Usage Guidelines and Restrictions</a> section in Chapter 3.</li> <li>• Added note to Bridging Control Protocol <a href="#">Usage Guidelines and Restrictions</a> section in Chapter 3.</li> <li>• Added Document Revision History table.</li> </ul>

# Audience

This publication is for experienced network administrators who are responsible for configuring and maintaining the Optical Services Modules (OSMs) for the Cisco 7600 series router and Catalyst 6000 family switches.

Only trained and qualified service personnel (as defined in IEC 60950 and AS/NZS3260) should install, replace, or service the equipment described in this publication.

# Organization

This publication is organized as follows:

Chapter	Title	Description
Chapter 1	Product Overview	Provides an overview of the OSM.
Chapter 2	Basic Configurations	Describes how to perform basic configurations on the OSMs.
Chapter 3	Configuring the OC-3c/STM-1, OC-12c/STM-4, and OC-48c/STM-16 SONET/SDH Optical Services Modules	Describes how to configure the POS/SDH modules.
Chapter 4	Configuring 4-Port Gigabit Ethernet WAN Optical Services Modules	Describes how to configure the 4-port Gigabit Ethernet WAN modules.
Chapter 5	Configuring the Channelized OC-12/T3 SONET/SDH Optical Services Modules	Describes how to configure the OC-12 and OC-48 channelized modules.
Chapter 6	Configuring the Channelized OC-12/T1 Optical Services Modules	Describes how to configure the channelized OSM-1CHOC12/T1-SI SONET/SDH Optical Services Modules (OSMs).
Chapter 7	Configuring the Channelized 12-port CT3/T1 Optical Services Modules	Describes how to configure the 12-port channelized and unchannelized DS3 Optical Services Modules (OSM-12CT3/T1).
Chapter 8	Configuring the OC-12 ATM Optical Services Modules	Describes how to configure the OC-12 ATM WAN modules.
Chapter 9	Configuring QoS on the Optical Services Modules	Describes how to configure quality of service (QoS) on the OSMs.
Chapter 10	Configuring Destination Sensitive Services on the Optical Services Modules	Describes how to configure Destination Sensitive Services (DSS) on the OSMs.
Chapter 11	Configuring Multiprotocol Label Switching on the Optical Services Modules	Describes how to configure MPLS and EoMPLS on the OSMs.

## Related Documentation

The following publications are available for the OSMs:

- *Optical Services Module Installation and Verification Note*
- *Cisco 7600 Series Router Module Installation Guide*
- *Cisco 7600 Series Router Command Reference*
- *Cisco 7600 Series Router System Message Guide*
- *Catalyst 6000 Family and Cisco 7600 Series Router MSFC Release Notes*
- *Catalyst 6000 Family Quick Software Configuration*
- *Catalyst 6000 Family Module Installation Guide*
- *Catalyst 6000 Family Software Configuration Guide*
- *Catalyst 6000 Family Command Reference*
- *System Message Guide—Catalyst 6000 Family, 4000 Family, 2926G Series, and 2980G Switches*

- *Release Notes for Catalyst 6000 Family Software Release 6.x*
- *Regulatory Compliance and Safety Information for the Cisco 7600 Series Router*
- *Regulatory Compliance and Safety Information for the Catalyst 6000 Family Switches*
- Cisco IOS Configuration Guides and Command References—Use these publications to help you configure the Cisco IOS software that runs on the MSFC.
- For information about MIBs, refer to <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

## Conventions



### Note

Throughout this publication, the term *supervisor engine* is used to refer to Supervisor Engine 2.

This publication uses the following conventions:

Convention	Description
<b>boldface font</b>	Commands and keywords are in <b>boldface</b> .
<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 screen font.
<b>boldface screen font</b>	Information you must enter is in <b>boldface screen font</b> .
<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.

Notes use the following conventions:

**Note**

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

Cautions use the following conventions:

**Caution**

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

Warnings use the following conventions:

**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 *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.**

<b>Warnung</b>	<b>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.</b>
<b>Avvertenza</b>	<b>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.</b>
<b>Advarsel</b>	<b>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.</b>
<b>Aviso</b>	<b>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.</b>
<b>¡Advertencia!</b>	<b>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.</b>
<b>Varning!</b>	<b>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.</b>

# Obtaining Documentation

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

## World Wide Web

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

- <http://www.cisco.com>
- <http://www-china.cisco.com>
- <http://www-europe.cisco.com>

## Documentation CD-ROM

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

## Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:  
[http://www.cisco.com/cgi-bin/order/order\\_root.pl](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/pcgi-bin/marketplace/welcome.pl>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS Version 2.0.

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.