



## Preface

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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:

- [Revision History](#)
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- [Related Documentation](#)
- [Document Conventions](#)
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- [Obtaining Documentation and Submitting a Service Request](#)

# Revision History

Date	Notes
November 2008	<ul style="list-style-type: none"> <li>• Added note in section “Terminal and Facility Loopback on LCAS Circuits In Split Fibre Routing” in chapters, “CE-Series Ethernet Cards” and “Configuring POS on the ML-MR-10 Card”.</li> <li>• Added a section for QoS Configuration on ML-MR-10 card “ML-MR-10 Card-Based QoS Example” and “QoS Combinations on ML-MR-10 card” in Chapter 22, Configuring Quality of service”.</li> </ul>
December 2008	<ul style="list-style-type: none"> <li>• Added the following sections in chapter “Configuring Link Aggregation”: <ul style="list-style-type: none"> <li>– Load Balancing on the ML-Series Cards</li> <li>– Load Balancing on the ML-MR-10 Card</li> <li>– VLAN Load Balancing</li> <li>– Configuration Commands for Load Balancing.</li> </ul> </li> <li>• Modified a note in section “POS on the ML-Series Card”, chapter “Configuring POS”.</li> <li>• Added section “Cisco IOS Commands for POS Ports Configuration” in chapter “Configuring POS on the ML-MR-10 Card”.</li> <li>• Added examples for “platform interface-count pos &lt;18-26&gt;” and “show platform interface-count” commands in section “Monitoring and Verifying POS”, chapter, “Configuring POS on the ML-MR-10 Card”.</li> <li>• Added a caution in section “VCAT”, chapter, “Configuring POS on the ML-MR-10 Card and section “CE-MR-10 VCAT Characteristics” in chapter “CE-Series Ethernet Cards”.</li> </ul>
January 2009	<ul style="list-style-type: none"> <li>• Added the following sections in chapter “Configuring Quality of Service”: <ul style="list-style-type: none"> <li>– QoS not Configured on Egress</li> <li>– ML-Series Egress Bandwidth Example</li> </ul> </li> <li>• Updated section “IP SLA Restrictions on the ML-Series”.</li> <li>• Added Tables 10-1 and 10-3 and updated Table 10-4 in section “Load Balancing on the ML-Series Cards” section in chapter “Configuring Link Aggregation”.</li> <li>• Added a note in section “Aggregate Traffic from POS Interfaces to Front Ports” in chapter “Configuring Card Port Protection on the ML-MR-10 Card”.</li> </ul>
March 2009	<ul style="list-style-type: none"> <li>• Updated section, Ethernet OAM (IEEE 802.3ah) Configuration Guidelines in chapter, “Configuring Ethernet OAM (IEEE 802.3ah), CFM (IEEE 802.1ag), and E-LMI on the ML-MR-10 Card”.</li> </ul>
May 2009	<ul style="list-style-type: none"> <li>• Updated the section, “Configuring QoS Traffic Policies” in chapter “Configuring Ethernet Virtual Circuits and QoS on the ML-MR-10 Card”.</li> <li>• Added a note in section, “EoMPLS Configuration on PE-CLE SPR Interface” in chapter, “Configuring Ethernet over MPLS”.</li> </ul>

Date	Notes
June 2009	<ul style="list-style-type: none"> <li>• Added cross reference links from Chapters 3, 8, 9, 14, and 20 in Part 1 to Chapters 27, 29, 20, and 31 in Part 2.</li> <li>• Added note in section in chapters, CE-Series Ethernet Cards and Configuring POS on the ML-MR-10 Card.</li> </ul>
August 2009	Updated ethernet wire speed values in Table 1-18 and Table 1-19 in chapter CE-Series Ethernet Cards.
October 2009	Deleted caution “Do not use the abbreviations g0 or g1 for Gigabit Ethernet user-defined abbreviations. This creates an unsupported group asynchronous interface” from chapter, “Configuring Interfaces”.
November 2009	Updated “Memory Utilization” section in appendix, “CPU and Memory Utilization on the ML-MR-10 Card”.
February 2010	<ul style="list-style-type: none"> <li>• Updated image in chapter, “Configuring VRF Lite”.</li> <li>• Deleted the section “Configuring POS Channel” in the chapter “Configuring Link Aggregation”.</li> </ul>
May 2010	Updated the link integrity soak duration range as 200 ms to 10000 ms in the sub-section “Ethernet Link Integrity Support” of the section “CE-MR-10 Ethernet Features” in the chapter “CE-Series Ethernet Cards”.
September 2010	Updated the Example 24-1 Limiting the IP-Prefix Region to 2K Entries.
October 2010	<ul style="list-style-type: none"> <li>• Updated the “CE-MR-10 VCAT Characteristics” section in the “CE-Series Ethernet Cards” chapter.</li> <li>• Updated the “VCAT” section in the “Configuring POS on the ML-MR-10 Card” chapter.</li> </ul>
November 2010	Updated the section, “VCAT” for the ML-MR-10 card in the chapter, “Configuring POS on the ML-MR-10 Card”.
December 2010	<ul style="list-style-type: none"> <li>• Updated the section “CE-MR-10 VCAT Characteristics” in the chapter “CE-Series Ethernet Cards”.</li> <li>• Updated the table “Features Supported on ML-MR-10 card” in the chapter “ML-MR-10 Card Overview”.</li> </ul>
January 2011	<ul style="list-style-type: none"> <li>• Updated the section “CE-100T-8 VCAT Characteristics” in the chapter “CE-Series Ethernet Cards”.</li> <li>• Updated the section “CE-MR-10 VCAT Characteristics” in the chapter “CE-Series Ethernet Cards”.</li> </ul>
March 2011	<ul style="list-style-type: none"> <li>• Updated the section “Flow Control Threshold Provisioning” in the chapter “CE-Series Ethernet Cards”.</li> <li>• Updated the section “IEEE 802.3z Flow Control and Frame Buffering” in the chapter “E-Series and G-Series Ethernet Cards”.</li> <li>• Updated the table “ML-MR-10 Card Switching Conditions and Outcome” in the chapter “Configuring Card Port Protection on the ML-MR-10 Card”.</li> </ul>

Date	Notes
August 2011	<ul style="list-style-type: none"> <li>• Updated the following tables in the chapter “CE-Series Ethernet Cards”:               <ul style="list-style-type: none"> <li>– Supported SONET Circuit Sizes of CE-MR-10 on ONS 15454</li> <li>– Minimum SONET Circuit Sizes for Ethernet Speeds</li> <li>– VCAT High-Order Circuit Combinations for STS on ONS 15454 SONET (Slots 1 to 4 and 14 to 17)</li> <li>– VCAT High-Order Circuit Combinations of STS for SONET (Slots 5, 6, 12, and 13)</li> <li>– VCAT Circuit Provisioning Time Slot Limitations (SONET)</li> </ul> </li> <li>• Updated the section “CE-MR-10 Pool Allocation” in the chapter “CE-Series Ethernet Cards”.</li> </ul>
May 2012	<ul style="list-style-type: none"> <li>• Updated the following sections:               <ul style="list-style-type: none"> <li>– CE-1000-4 POS Encapsulation, Framing, and CRC</li> <li>– CE-100T-8 POS Encapsulation, Framing, and CRC</li> <li>– CE-MR-10 POS Encapsulation, Framing, and CRC</li> </ul> </li> <li>• Moved Chapter 9 “POS on ONS Ethernet Cards” to Appendix A.</li> <li>• Updated ”POS Interoperability” Section of Appendix A “POS on ONS Ethernet Cards”.</li> </ul>
August 2012	The full length book-PDF was generated.

## Document Objectives

This guide covers the software features and operations of Ethernet cards for the Cisco ONS 15454 and Cisco ONS 15454 SDH. It 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 or Cisco ONS 15454 SDH system. It also explains software feature and configuration for CTC on the E-Series, G-Series and CE-Series cards. The E-Series cards and G-Series cards are modules in the Cisco ONS 15454 and Cisco ONS 15454 SDH. The CE-Series cards are modules in the Cisco ONS 15454. The CE-100T-8 is also available as module for the Cisco ONS 15310-CL. The Cisco ONS 15310-CL version of the card is covered in the *Cisco ONS 15310-CL and Cisco ONS 15310-MA Ethernet Card Software Feature and Configuration Guide*. Use this guide in conjunction with the appropriate publications listed in the [Related Documentation](#) section.

## Audience

To use the ML-Series card chapters of this publication, you should be familiar with Cisco IOS and preferably have technical networking background and experience. To use the E-Series, G-Series and CE-Series card chapters of this publication, you should be familiar with CTC and preferably have technical networking background and experience.

# Document Organization

The *Cisco ONS 15454 and Cisco ONS 15454 SDH Ethernet Card Software Feature and Configuration Guide, Releases 9.0, 9.1, 9.2, and 9.2.1* is organized into the following chapters and parts. A part consists of more than one and parts have been in organizing the content for ML-Series cards and the ML-MR-10 card in *Cisco ONS 15454 and Cisco ONS 15454 SDH Ethernet Card Software Feature and Configuration Guide, Releases 9.0, 9.1, 9.2, and 9.2.1*.

- [“Cisco ONS Documentation Roadmap for Release 9.2.1”](#) provides a link to quickly access publications of Cisco ONS Release 9.2.1.
- [Chapter 1, “CE-Series Ethernet Cards,”](#) describes the operation of the CE-1000-4 card.
- [Chapter 2, “E-Series and G-Series Ethernet Cards,”](#) details and explains the features and operation of E-Series and G-Series Ethernet cards for the ONS 15454, ONS 15454 SDH and ONS 15327 platform.
- Part1, ML-Series cards contains chapters specific to ML-Series cards. The following are the chapters, which are specific to ML-Series cards.
  - [Chapter 3, “ML-Series Card Overview,”](#) provides a description of the ML-Series card, a feature list, and explanations of key features
  - [Chapter 4, “CTC Operations,”](#) provides details and procedures for using Cisco Transport Controller (CTC) software with the ML-Series card.
  - [Chapter 5, “Initial Configuration,”](#) provides procedures to access the ML-Series card and create and manage startup configuration files.
  - [Chapter 6, “Configuring Interfaces,”](#) provides information on the ML-Series card interfaces and basic procedures for the interfaces.
  - [Chapter 7, “Configuring CDP,”](#) describes how to configure Cisco Discovery Protocol (CDP) on the ML-Series card or the ML-MR-10 card.
  - [Chapter 8, “Configuring POS,”](#) provides information on the ML-Series card POS interfaces and advanced procedures for the POS interfaces.
  - [Chapter , “POS on ONS Ethernet Cards,”](#) details and explains POS on Ethernet cards. It also details Ethernet card interoperability.
  - [Chapter 9, “Configuring Bridges,”](#) provides bridging examples and procedures for the ML-Series card.
  - [Chapter 10, “Configuring IEEE 802.1Q Tunneling and Layer 2 Protocol Tunneling,”](#) provides tunneling examples and procedures for the ML-Series card.
  - [Chapter 11, “Configuring STP and RSTP,”](#) provides spanning tree and rapid spanning tree examples and procedures for the ML-Series card.
  - [Chapter 12, “Configuring Link Aggregation,”](#) provides Etherchannel and packet-over-SONET/SDH (POS) channel examples and procedures for the ML-Series card.
  - [Chapter 13, “Configuring Security for the ML-Series Card,”](#) describes the security features of the ML-Series card.
  - [Chapter 14, “Configuring RMON,”](#) describes how to configure remote network monitoring (RMON) on the ML-Series card.
  - [Chapter 15, “Configuring SNMP,”](#) describes how to configure the ML-Series card for operating with Simple Network Management Protocol (SNMP).

- [Chapter 16, “Configuring VLANs”](#), provides information about configuring VLANs on the ML-Series card.
- [Chapter 17, “Configuring Networking Protocols”](#), provides network protocol examples and procedures for the ML-Series card.
- [Chapter 18, “Configuring IRB”](#), provides integrated routing and bridging (IRB) examples and procedures for the ML-Series card.
- [Chapter 19, “Configuring IEEE 802.17b Resilient Packet Ring”](#), provides information about IEEE 802.17b-based resilient packet ring (RPR-IEEE) and how to configure it on the ML-Series cards.
- [Chapter 20, “Configuring VRF Lite”](#), provides VPN Routing and Forwarding Lite (VRF Lite) examples and procedures for the ML-Series card.
- [Chapter 21, “Configuring Quality of Service”](#), provides quality of service (QoS) examples and procedures for the ML-Series card.
- [Chapter 22, “Configuring Ethernet over MPLS”](#), provides Ethernet over Multiprotocol Label Switching (EoMPLS) examples and procedures for the ML-Series card.
- [Chapter 23, “Configuring the Switching Database Manager”](#), provides switching database manager examples and procedures for the ML-Series card.
- [Chapter 24, “Configuring Access Control Lists”](#), provides access control list (ACL) examples and procedures for the ML-Series card.
- [Chapter 25, “Configuring Cisco Proprietary Resilient Packet Ring”](#), provides resilient packet ring (RPR) examples and procedures for the ML-Series card.
- Part 2, ML-MR-10 card, contains chapters specific to the ML-MR-10 card. The following are the chapters, which are specific to ML-MR-10 card.
  - [Chapter 26, “ML-MR-10 Card Overview”](#), describes the ML-MR-10 card overview and the features supported on the ML-MR-10 card.
  - [Chapter 27, “IP Host Functionality on the ML-MR-10 Card”](#), provides information about the IP host functionality configured on the ML-MR-10 card.
  - [Chapter 28, “Configuring Security for the ML-MR-10 Card”](#), describes the security features of the ML-MR-10 card.
  - [Chapter 29, “Configuring IEEE 802.17b Resilient Packet Ring on the ML-MR-10 Card”](#), provides IEEE 802.17b-based resilient packet ring (RPR-IEEE) examples and how to configure it on the ML-Series cards.
  - [Chapter 30, “Configuring POS on the ML-MR-10 Card”](#), provides information about configuring POS ports on the ML-MR-10 card.
  - [Chapter 31, “Configuring Card Port Protection on the ML-MR-10 Card”](#), describes card and port protection (CPP) for ML-MR-10 card and how to configure CPP using Cisco IOS command line interface (CLI). For information on ML-MR-10 card features.
  - [Chapter 32, “Configuring Ethernet Virtual Circuits and QoS on the ML-MR-10 Card”](#), provides information about configuring Ethernet Virtual Circuits (EVC) for the ONS 15454, ML-MR-10 card.
  - [Chapter 33, “Configuring Ethernet OAM \(IEEE 802.3ah\), CFM \(IEEE 802.1ag\), and E-LMI on the ML-MR-10 Card”](#), provides information about configuring the EOAM, E-LMI, and CFM features on the ML-MR-10 card.
- [Appendix 34, “CPU and Memory Utilization on the ML-MR-10 Card”](#), provides the CPU and Memory utilization percentage values when CFM is configured on the ML-MR-10 card.

- [Appendix B, “Command Reference,”](#) is an alphabetical listing of unique ML-Series card Cisco IOS commands with definitions and examples.
- [Appendix C, “Unsupported CLI Commands,”](#) is a categorized and alphabetized listing of Cisco IOS commands that the ML-Series card does not support.
- [Appendix D, “Using Technical Support,”](#) instructs the user on using the Cisco Technical Assistance Center (Cisco TAC) for ML-Series card problems.

## Related Documentation

Use the *Cisco ONS 15454 and Cisco ONS 15454 SDH Ethernet Card Software Feature and Configuration Guide, Releases 9.0, 9.1, 9.2, and 9.2.1* in conjunction with the following general ONS 15454 or ONS 15454 SDH system publications:

- *Cisco ONS 15454 Procedure Guide*  
Provides procedures to install, turn up, provision, and maintain a Cisco ONS 15454 node and network.
- *Cisco ONS 15454 SDH Procedure Guide*  
Provides procedures to install, turn up, provision, and maintain a Cisco ONS 15454 SDH node and network.
- *Cisco ONS 15454 Reference Manual*  
Provides detailed card specifications, hardware and software feature descriptions, network topology information, and network element defaults.
- *Cisco ONS 15454 SDH Reference Manual*  
Provides detailed card specifications, hardware and software feature descriptions, network topology information, and network element defaults.
- *Cisco ONS 15454 Troubleshooting Guide*  
Provides alarm descriptions, alarm and general troubleshooting procedures, error messages, and performance monitoring and SNMP parameters.
- *Cisco ONS 15454 SDH Troubleshooting Guide*  
Provides general troubleshooting procedures, alarm descriptions and troubleshooting procedures, error messages, and performance monitoring and SNMP parameters.
- *Cisco ONS SONET TL1 Command Guide*  
Provides a full TL1 command and autonomous message set including parameters, AIDs, conditions, and modifiers for the Cisco ONS 15454, ONS 15327, ONS 15600, ONS 15310-CL, and ONS 15310-MA systems.
- *Cisco ONS 15454 SDH TL1 Command Guide*  
Provides a full TL1 command and autonomous message set including parameters, AIDs, conditions and modifiers for the Cisco ONS 15454 SDH.
- *Cisco ONS SONET TL1 Reference Guide*  
Provides general information and procedures for TL1 in the Cisco ONS 15454, ONS 15327, ONS 15600, ONS 15310-CL, and Cisco ONS 15310-MA systems.
- *Cisco ONS 15454 SDH TL1 Reference Guide*  
Provides general information and procedures for TL1 in the Cisco ONS 15454 SDH.
- *Cisco ONS 15454 SDH TL1 Reference Guide*  
Provides general information, procedures, and errors for TL1 in the Cisco ONS 15454 SDH.

- *Release Notes for the Cisco ONS 15454 Release 9.0*  
Provides caveats, closed issues, and new feature and functionality information.
- *Release Notes for the Cisco ONS 15454 SDH Release 9.0*  
Provides caveats, closed issues, and new feature and functionality information.
- *Release Notes for the Cisco ONS 15454 Release 9.1*  
Provides caveats, closed issues, and new feature and functionality information.
- *Release Notes for the Cisco ONS 15454 SDH Release 9.1*  
Provides caveats, closed issues, and new feature and functionality information.
- *Release Notes for the Cisco ONS 15454 SONET and SDH Release 9.2*  
Provides caveats, closed issues, and new feature and functionality information.
- *Release Notes for the Cisco ONS 15454 Release 9.2.1*  
Provides caveats, closed issues, and new feature and functionality information.
- *Release Notes for the Cisco ONS 15454 SDH Release 9.2.1*  
Provides caveats, closed issues, and new feature and functionality information.

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

- Cisco IOS Quality of Service Solutions Configuration Guide, Release 12.2
- Cisco IOS Quality of Service Solutions Command Reference, Release 12.2

The ML-Series card employs Cisco IOS 12.2. For more general information on Cisco IOS 12.2, refer to the extensive Cisco IOS documentation at:

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

## Document Conventions

This publication uses the following conventions:

<b>Convention</b>	<b>Application</b>
<b>boldface</b>	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.
<b>boldface screen font</b>	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. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

### SAVE THESE INSTRUCTIONS

Waarschuwing

### BELANGRIJKE VEILIGHEIDSINSTRUCTIES

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 de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

### BEWAAR DEZE INSTRUCTIES

Varoitus

### TÄRKEITÄ TURVALLISUUSOHJEITA

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

### SÄILYTÄ NÄMÄ OHJEET

Attention

### IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

### CONSERVEZ CES INFORMATIONS

**Warnung WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

**BEWAHREN SIE DIESE HINWEISE GUT AUF.**

**Avvertenza IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

**CONSERVARE QUESTE ISTRUZIONI**

**Advarsel VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

**TA VARE PÅ DISSE INSTRUKSJONENE**

**Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

**GUARDE ESTAS INSTRUÇÕES**

**¡Advertencia! INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

**GUARDE ESTAS INSTRUCCIONES**

**Varning! VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal 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 vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

**SPARA DESSA ANVISNINGAR****FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejtő helyzetben van. Mielőtt bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető meg.

**ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!****Предупреждение ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ**

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

**СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ****警告 重要的安全性说明**

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

**警告 安全上の重要な注意事項**

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

これらの注意事項を保管しておいてください。

**주의**    **중요 안전 지침**

이 경고 기호는 위험을 나타냅니다. 작업자가 신체 부상을 일으킬 수 있는 위험한 환경에 있습니다. 장비에 작업을 수행하기 전에 전기 회로와 관련된 위험을 숙지하고 표준 작업 관례를 숙지하여 사고를 방지하십시오. 각 경고의 마지막 부분에 있는 경고문 번호를 참조하여 이 장치와 함께 제공되는 번역된 안전 경고문에서 해당 번역문을 찾으십시오.

이 지시 사항을 보관하십시오.

**Aviso**    **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

**Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.**

**GUARDE ESTAS INSTRUÇÕES****Advarsel**    **VIGTIGE SIKKERHEDSANVISNINGER**

**Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemeskadedigelse. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.**

**GEM DISSE ANVISNINGER****تحذير****إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمة الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في آخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز. قم بحفظ هذه الإرشادات

**Upozorenje**    **VAŽNE SIGURNOSNE NAPOMENE**

**Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.**

**SAČUVAJTE OVE UPUTE**

**Upozornění DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY**

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

**USCHOVEJTE TYTO POKYNY****Προειδοποίηση ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ**

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθειες πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

**ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ****אזהרה****הוראות בטיחות חשובות**

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במגעלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כדי לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

**שמור הוראות אלה****Opomena VAŽNI BEZBEDNOSNI NAPATCTVIJA**

Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.

**ЧУВАЈТЕ ГИ ОБИЕ НАПАТCTBIJA****Ostrzeżenie WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA**

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

**NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ**

## Obtaining Optical Networking Information

This section contains information that is specific to optical networking products. For information that pertains to all of Cisco, refer to the [Obtaining Documentation and Submitting a Service Request](#) section.

## Where to Find Safety and Warning Information

For safety and warning information, refer to the *Cisco Optical Transport 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 system. It also includes translations of the safety warnings that appear in the ONS 15454 system documentation.

## Cisco Optical Networking Product Documentation CD-ROM

Optical networking-related documentation, including Cisco ONS 15xxx 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.

## 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.