Preface

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

Date	Notes
September 2007	Added this Revision History table. Incorporated the NEBS Compliance changes in Appendix-A A1.11 System Power section.
October 2007	Added note on mounting brackets in Chapter 1, Install the Shelf and Common Control Cards . Updated the receiver power range of the SFP, ONS-SE-4G-SM, in Hardware Specification appendix. Added a note in Chapter 8 Transponder and Muxponder Cards, section 8.7.4 MXP_2.5G_10E Card.

Date	Notes
November 2007	Added replacement SFPs for the EOL/EOS SFPs in Chapter 8, Transponder and Muxponder Cards and Appendix A, Hardware Specification. Added a note about managing a DWDM Ring through Telcordia OSS in the Multishelf Node Layout section of Chapter 9, Node Reference.
February 2008	Updated trunk rate for TXP_MR_10E, TXP_MR_10E_C, and TXP_MR_10E_L cards in Chapter 8, Transponder and Muxponder Cards. Updated cabling details for ONS-SE-ZE-EL SFP in Chapter 8. Updated the “Computer Requirements for CTC” table in Chapter 12, Cisco Transport Controller Operation. Updated note in Table 8-40 in Chapter 8, Transponder and Muxponder Cards.
April 2008	Corrected applicable slot number for the TXP_MR_10E Card in Section 8.4 TXP_MR_10E Card. Corrected part number from 10-2193-01 to 10-2193-02 in the chapter, Transponder and Muxponder Cards. Updated Table 11-2 for ADM-10G card in Chapter 11, Optical Channel Circuits and Virtual Patchcords Reference. Added a note in chapter 8, Transponder and Muxponder Cards, section ADM-10G Card, Configuration Management.
May 2008	Added power-level LED information for TCC2 and TCC2P cards in Chapter 2, Common Control Cards. Modified Fig 7-34 in section 7.12.2 40-WXC-C Block Diagram in Chapter 7, Reconfigurable Optical Add/Drop Cards. Added autonegotiation support in ADM-10G feature list in Chapter 8, Transponder and Muxponder Cards.
June 2008	Added a note in the Key Features section of MXP_MR_10DME_C and MXP_MR_10DME_L Cards in Chapter 8, Transponder and Muxponder Cards.

Date	Notes
July 2008	Added information about the Force APC Correction button in Chapter 10, Network Reference, section Managing APC. Added operating wavelength range for the following SFPs in the SFP Specifications section of Appendix A, Hardware Specifications: • 15454-SFP3-1-IR= Intermediate Reach • 15454E-SFP-L.1.1= Short Haul • 15454-SFP12-4-IR= Intermediate Reach • 15454E-SFP-L.4.1= Short Haul • 15454-SFP-OC48-IR= Intermediate Reach • ONS-SE-2G-S1= Short Reach • 15454E-SFP-L.16.1= Short Haul • 15454-SFP-GE+-LX=/15454E-SFP-GE+-LX= Long Reach • ONS-SE-G2F-LX • ONS-SE-4G-SM • 15454-SFP-200/15454E-SFP-200 Long Reach • 15454-SFP-GEFC-SX/15454E-SFP-GEFC-S Short Reach • ONS-SE-G2F-SX • ONS-SE-4G-MM Added the following information in the section, GE_XP and 10GE_XP Cards, of chapter, Transponder and Muxponder Cards: • reduced traffic due to 10 ports in full line rate for the 10GE MXP mode. • cannot sustain full traffic with all 20 ports connected to the trunk for 20GE MXP mode. Deleted the note in the ONS 15454 ANSI Power and Ground section in Chapter 1, Shelf Assembly Hardware. Added a note in sections 7.12.1 “40-WXC-C Faceplate Ports” and 9.3.1 “Line Termination Mesh Node” of Chapter 7, Recongifurable Optical Add/Drop Crads and Chapter 9, Node Reference. Reorganized and updated the Optical Sides section in Chapter 9, Node Reference. Updated Table B-8 in Appendix B, Administrative and Service States. Deleted the note in the ONS 15454 ANSI Power and Ground section in Chapter 1, Shelf Assembly Hardware. Added information about troubleshooting the power monitoring levels of the WXC card in section 7.12.3 40-WXC-C Power Monitoring of Chapter 7, Reconfigurable Optical Add/Drop Cards.

Date	Notes
August 2008	Modified the table footnote for Table A-51 in section A-11 XFP Specifications. Modified the cell content for "Table A-18 40-WSS-C Optical Specifications" in section A.7.8 40-WSS-C Card Specifications. Updated link failure behavior of ADM-10G card in Configuration Management section of Chapter 8, Transponder and Muxponder Cards.
September 2008	Added a note in Card Default Settings and Node Default Settings section of Appendix C, Network Element Defaults. Updated the Hub Node and Terminal Node sections in Chapter 9, Node Reference.
October 2008	Added a reference to "CTC Port Numbers and TL1 Aids" section of TL1 Command Guide, in the Power Monitoring sections.
December 2008	• Updated the table "GE_XP and 10GE_XP Card Modes" in the chapter "Transponder and Muxponder Cards". • Added a note in the Client Interface section of Chapter 8, Transponder and Muxponder Cards. • Added new section on DCN Extension in Chapter 16, Management Network Connectivity. • Added a note in the "Y-Cable and Splitter Protection" section of Chapter 8, Transponder and Muxponder Cards.
March 2009	• Added a note in the "SFP Specifications" section of Appendix A, "Hardware specifications". • Added the optical module functional block diagram for the OPT-AMP-C card in the chapter, Optical Amplifier Cards. • Added a note to the section "GE_XP and 10GE_XP Cards" in the chapter, "Transponder and Muxponder Cards". • Updated details of ONS-SE-ZE-EL SFP in Chapter 8, Transponder and Muxponder Cards and Appendix A, Hardware specifications.
April 2009	Added a note in the section "Automatic Power Reduction" of chapter 10, "Network Reference".
July 2009	Updated the minimum output power (with one channel) value in the "A.5 Optical Amplifier Cards" section of Appendix A, Hardware specifications.
August 2009	Added details on how the throughput of the MXP_MR_10DME_C and MXP_MR_10DME_L cards is affected in Chapter 8, Transponder and Muxponder Cards.
September 2009	Added a new section titled "Management of Non-LAN Connected Multishelf Node" in Chapter 15, Management Network Connectivity.

Date	Notes
November 2009	• Updated the section “32WSS Block Diagram” in the chapter “Reconfigurable Optical Add/Drop Cards”. • Added a note in “GE_XP, 10GE_XP, GE_XPE, and 10GE_XPE Cards” section of chapter, Transponder and Muxponder Cards. • Updated the table "2R and 3R Mode and ITU-T G.709 Compliance by Client Interface" in chapter, Transponder and Muxponder Cards. • Updated the table “Card View Tabs and Subtabs” in Chapter, Cisco Transport Controller Operation. • Updated the section “Layer 2 Over DWDM Protection” in the chapter “Transponder and Muxponder Cards”.
February 2010	• Changed the BIEC parameter to BIT-EC in Chapter 17, “Performance Monitoring”. • Updated the SFP/XFP Card Compatibility table for ADM-10G card in chapter Transponder and Muxponder Cards.
March 2010	• Updated the section “Client Interface” under the section “GE_XP and 10GE_XP Cards” in the chapter “Transponder and Muxponder Cards”. • Added the section, “Mesh Patch Panel Specifications” in the appendix, Hardware Specifications. • Updated the table “Multimode Fiber SFP Port Cabling Specifications” in the appendix “Hardware Specifications”.
April 2010	• Updated the section “SNMP Overview” in the chapter “SNMP”. • Created a section “Fan Tray Units for ONS 15454 Cards” in the chapter “Shelf Assembly Hardware”. • Added footnote and note for ONS-SC-2G-28.7 SFP in the chapter “Transponder and Muxponder Cards” and appendix “Hardware Specifications”.
June 2010	• Updated the table “ONS 15454 Security Levels—Node View” in the chapter “Security Reference”.
July 2010	• Updated the section, Y-cable protection in the chapter, Transponder and Muxponder Cards.
August 2010	• Updated the table “Node View (Single-Shelf Mode) or Shelf View (Multishelf Mode) Tabs and Subtab” in the chapter, “Cisco Transport Controller Operation”.
September 2010	• Added the FAPS switching criteria in the section, “Layer 2 Over DWDM Protection” in the chapter, “Transponder and Muxponder Cards”.

Date	Notes
November 2010	• Updated the section, “SNMP in Multishelf Management” in the chapter, SNMP. • Updated the width of the single slot cards for Control cards and Transponder and Muxponder Cards in the appendix, "Hardware Specifications". • Updated the table “SFP/XFP Card Compatibility” in the chapter “Transponder and Muxponder Cards”. • Updated the tables “SFP Specifications” and “Single-Mode Fiber SFP Port Cabling Specifications” in the appendix, “Hardware Specifications”.
January 2011	• Updated the width of all the cards in the appendix, "Hardware Specifications".
April 2011	• Updated the "Key Features" section for ADM-10G card in the chapter "Transponder and Muxponder Cards". • Updated the power values in the “Individual Card Power Requirements” table in the appendix, “Hardware Specifications”.
May 2011	• Updated the section “SFP and XFP Modules” in the chapter “Transponder and Muxponder Cards”. • Removed the sections “SFP Specifications” and “XFP Specifications” and added the section “SFP and XFP Specifications” in the appendix “Hardware Specifications”.
June 2011	Updated the section “AIC-I Card” in the chapter “Common Control Cards”.
July 2011	• Added a note in the “PC and UNIX Workstation Requirements” section of Chapter, “Cisco Transport Controller Operation”.
September 2011	• Updated the key features section of TXP_MR_10G, TXP_MR_10E, TXP_MR_10E_C, and TXP_MR_10E_L cards in the chapter “Transponder and Muxponder Cards”. • Added a note to SONET PM Parameters table in “SONET PM Parameter Definitions” section. • Replaced G.975.1 with G.975.1 I.7 and added a note in the chapter, “Transponder and Muxponder Cards”. • Created a “Summary Pane” section in the chapter, “Cisco Transport Controller Operation”.
October 2011	• Removed the Temperature table and updated the Temperature section with standard operating temperature values and removed the Environmental section from all the 15454 card specifications in the appendix "Hardware Specifications." • Updated the figure “Scenario 3: Using Proxy ARP with Static Routing (ANSI and ETSI)” in the chapter “Management Network Connectivity”.
December 2011	• Updated the power values in the table “Individual Card Power Requirements” in the appendix “Hardware Specifications”. • Updated the section “Termination Modes” in the chapter “Transponder and Muxponder Cards”.

Date	Notes
April 2012	Upadted the section “SNMP in Multishelf Management” in the chapter “SNMP”.
May 2012	Updated the section “Optical Channel Circuits” in the chapter “Optical Channel Circuits and Virtual Patchcords Reference”.
June 2012	Updated the section “Generic Threshold and Performance Monitoring MIBs” in the chapter “SNMP”.
July 2012	Document Part Number revisioned to 78-18343-02 and a full length book-PDF was generated.
August 2012	Updated the power values in the table “Individual Card Power Requirements” in the appendix “Hardware Specifications”.
October 2012	Added a caution to the section, “IP Addressing with Secure Mode Enabled” in the chapter, “Management Network Connectivity”.
December 2012	Renamed chapter "Management Network Connectivity" to "Manage Network Connectivity".
April 2013	Updated the section “External Firewalls” in the chapter “Manage Network Connectivity”.
June 2013	Updated the section “Administrative States” in the chapter “Administrative and Service States”.

Document Objectives

This document provides background and reference material for Cisco ONS 15454 dense wavelength division (DWDM) systems.

Audience

To use this publication, you should be familiar with Cisco or equivalent optical transmission hardware and cabling, telecommunications hardware and cabling, electronic circuitry and wiring practices, and preferably have experience as a telecommunications technician.

Document Organization

Table 1 Cisco ONS 15454 Reference Manual Chapters

Title	Summary
Chapter 1, “Shelf Assembly Hardware”	Provides a description of Cisco ONS 15454 hardware for the ANSI and ETSI shelf assemblies.
Chapter 2, “Common Control Cards”	Includes descriptions of the TCC2, TCC2P, AIC-I, and MS-ISC-100T cards.
Chapter 3, “Optical Service Channel Cards”	Includes descriptions of OSCM and OSC-CSM cards.

Table 1 Cisco ONS 15454 Reference Manual Chapters (continued)

Title	Summary
Chapter 4, "Optical Amplifier Cards"	Includes descriptions of the OPT-PRE, OPT-BST, OPT-BST-E, OP-BST-L, OPT-AMP-L, OPT-AMP-C, and OPT-AMP-17-C cards, as well as card temperature ranges and card compatibility.
Chapter 5, "Multiplexer and Demultiplexer Cards"	Includes descriptions of the 32-MUX-O, 32DMX-O, and 4MD-xx.x cards.
Chapter 6, "Optical Add/Drop Cards"	Includes descriptions of the AD-1C-xx.x, AD-2C-xx.x, AD-4C-xx.x, AD-1B-xx.x, and AD-4B-xx.x cards, card temperature ranges, compatibility, and applications.
Chapter 7, "Reconfigurable Optical Add/Drop Cards"	Includes descriptions of the 32WSS, 32WSS-L, 32DMX, 32DMX-L, 40-DMX-C, 40-DMX-CE, 40-MUX-C, 40-WSS-C, 40-WSS-CE, 40-WXC-C, and MMUC cards, card temperature ranges, compatibility, and applications.
Chapter 8, "Transponder and Muxponder Cards"	Includes information about ransponder (TXP), muxponder (MXP), GE_XP, 10GE_XP, and ADM-10G cards, as well as their associated plug-in modules (Small Form-factor Pluggables [SFPs or XFPs]).
Chapter 9, "Node Reference"	Explains the DWDM node types t available for the ONS 15454. The DWDM node type is determined by the type of amplifier and filter cards that are installed in an ONS 15454. Also explains the DWDM automatic power control (APC), reconfigurable optical add/drop multiplexing (ROADM) power equalization, span loss verification, and automatic node setup (ANS) functions.
Chapter 10, "Network Reference"	Explains the DWDM network applications and topologies. Also provides network-level optical performance references.
Chapter 11, "Optical Channel Circuits and Virtual Patchcords Reference"	Explains the DWDM optical channel (OCH) circuit types and virtual patchcords that can be provisioned. Circuit types include the OCH client connection (OCHCC), the OCH trail, and the OCH network connection (OCHNC).
Chapter 12, "Cisco Transport Controller Operation"	Describes Cisco Transport Controller (CTC), the software interface for the Cisco ONS 15454.
Chapter 13, "Security Reference"	Provides information about Cisco ONS 15454 users and security.
Chapter 14, "Timing Reference"	Provides information about Cisco ONS 15454 users and node timing.

Table 1 Cisco ONS 15454 Reference Manual Chapters (continued)

Title	Summary
Chapter 15, "Manage Network Connectivity"	Provides an overview of ONS 15454 data communications network (DCN) connectivity. Cisco Optical Networking System (ONS) network communication is based on IP, including communication between Cisco Transport Controller (CTC) computers and ONS 15454 nodes, and communication among networked ONS 15454 nodes. The chapter shows common Cisco ONS 15454 IP network configurations and includes detailed data communications network (DCN) case studies.
Chapter 16, "Alarm and TCA Monitoring and Management"	Describes Cisco Transport Controller (CTC) alarm and threshold crossing alert (TCA) monitoring and management.
Chapter 17, "Performance Monitoring"	Performance monitoring (PM) parameters are used by service providers to gather, store, set thresholds for, and report performance data for early detection of problems. In this chapter, PM parameters and concepts are defined for transponder, muxponder, and dense wavelength division multiplexing (DWDM) cards in the Cisco ONS 15454 including optical amplifier, multiplexer, demutiplexer, optical add/drop multiplexer (OADM), and optical service channel (OSC) cards.
Chapter 18, "SNMP"	Explains Simple Network Management Protocol (SNMP) as implemented by the Cisco ONS 15454.
Appendix A, "Hardware Specifications"	Contains hardware and software specifications for the ONS 15454 ANSI and ETSI shelf assemblies and cards.
Appendix B, "Administrative and Service States"	Describes the administrative and service states for Cisco ONS 15454 dense wavelength division multiplexing (DWDM) cards, optical payload ports, out-of-band optical service channel (OSC) ports, optical channel network connections (OCHNCs), and transponder/muxponder cards and ports.

Related Documentation

Use the *Cisco ONS 15454 DWDM Reference Manual* in conjunction with the following referenced publications:

- *Cisco ONS 15454 DWDM Procedure Guide, Release 8.5*
- *Cisco ONS 15454 DWDM Troubleshooting Guide, Release 8.5*
- *Cisco ONS SONET TL1 Command Guide, Release 8.5*

- *Cisco ONS SONET TL1 Reference Guide, Release 8.5*
- Cisco *ONS SONET TL1 Command Quick Reference Guide, 8.5*
- *Cisco ONS 15454 SDH TL1 Command Guide, Release 8.5*
- *Cisco ONS 15454 SDH TL1 Reference Guide, Release 8.5*
- Cisco *ONS 15454 SDH TL1 Command Quick Reference Guide, 8.5*
- *Release Notes for Cisco ONS 15454 Release 8.5*
- *Release Notes for Cisco ONS 15454 SDH Release 8.5*
- *Cisco TransportPlanner DWDM Operations Guide, Release 8.5*

For an update on End-of-Life and End-of-Sale notices, refer to http://www.cisco.com/en/US/products/hw/optical/ps2006/prod_eol_notices_list.html.

Document Conventions

This publication uses the following conventions:

Convention	Application
boldface	Commands and keywords in body text.
italic	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. 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 figyelmezeto jel veszélyre utal. Sérülésveszélyt rejto helyzetben van. Mielott bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplo figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján keresheto 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 legemesbeskadigelse. 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 للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في أخر 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 συνήθεις 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 במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כד לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה

Opomena

ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА

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 ОВИЕ НАПАТСТВИЈА

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

Upozornenie

DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD

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.