



# Release Notes for *Cisco ONS 15540 ESPx* for Cisco IOS Release 12.2(29)SV

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This document describes caveats for Cisco IOS Release 12.2(29)SV for the Cisco ONS 15540 ESPx.

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# Introduction

The Cisco ONS 15540 ESPx is an optical transport platform that employs DWDM (dense wavelength division multiplexing) technology. With the Cisco ONS 15540 ESPx, users can take advantage of the availability of dark fiber to build a common infrastructure that supports data, SAN (storage area networking), and TDM (time-division multiplexing) traffic. The system uses an enhanced chassis with front fiber optic cable access for optical interconnections between transponder modules and optical mux/demux modules. For more information about DWDM technology and applications, refer to the [Introduction to DWDM Technology](#) publication and the [Cisco ONS 15540 ESPx Planning Guide](#).

## System Requirements

This section describes the system requirements for the Cisco ONS 15540 ESPx and includes the following sections:

- [Memory Requirements, page 2](#)
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## Memory Requirements

The DRAM memory configuration is 128 MB, which is the default for the Cisco ONS 15540 ESPx.

## Hardware Supported

[Table 1](#) lists the hardware components supported on the Cisco ONS 15540 ESPx and the minimum software version required. See the [“Determining the Software Version”](#) section on page 10.

*Table 1 Cisco ONS 15540 ESPx Supported Hardware Modules and Minimum Software Requirements*

Component	Part Number	Description	Minimum Software Version Required
Chassis	15540-CHSB=	Chassis external connection system —19 in. RM, 14 U, 12 slots	<b>12.1(10)EV1</b>

**Table 1** Cisco ONS 15540 ESPx Supported Hardware Modules and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
Power supplies and spare power supply cables	15540-PWR-AC	120 to 240 VAC power supply	12.1(10)EV1
	15540-ACPS-N-E=	AC/DC power supply rectifier shelf	12.1(10)EV1
	15540-CAB-AC	Custom AC-input power entry cable	12.1(10)EV1
	15500-CAB-AC	North America	12.1(10)EV1
	15500-CAB-ACA	Australia	12.1(10)EV1
	15500-CAB-ACE	Europe	12.1(10)EV1
	15500-CAB-CU	UK	12.1(10)EV1
	15500-CAB-ACI	Italy	12.1(10)EV1
	15500-CAB-ACR	Argentina	12.1(10)EV1
Blank motherboards and blank modules	15540-COV-07	Mux/demux motherboard blank panel	12.1(10)EV1
	15540-COV-08	4 / 8 Ch. mux/demux blank panel	12.1(10)EV1
	15540-COV-09	Line card motherboard blank panel	12.1(10)EV1
	15540-COV-10	Transponder module blank panel	12.1(10)EV1
Fans	15540-FTMP=	Fan tray module populated with eight fans	12.1(10)EV1
Processor cards	15540-CPU	Processor card	12.1(10)EV1
Flash PC Cards	15500-PCMCIA16=	PCMCIA memory card 16 MB	12.1(10)EV1
	15500-PCMCIA20=	PCMCIA memory card 20 MB	12.1(10)EV1
Mux/demux motherboards	15540-MMMB-1100	Supports mux/demux modules with OSC	12.1(10)EV1
	15540-MMMB-1200	Supports mux/demux modules without OSC	12.1(10)EV1
Mux/demux modules without OSC	15540-MDXC-04A0	4-channel Band A	12.1(10)EV1
	15540-MDXC-04B0	4-channel Band B	12.1(10)EV1
	15540-MDXC-04C0	4-channel Band C	12.1(10)EV1
	15540-MDXC-04D0	4-channel Band D	12.1(10)EV1
	15540-MDXC-04E0	4-channel Band E	12.1(10)EV1
	15540-MDXC-04F0	4-channel Band F	12.1(10)EV1
	15540-MDXC-04G0	4-channel Band G	12.1(10)EV1
	15540-MDXC-04H0	4-channel Band H	12.1(10)EV1
	15540-MDXC-08A0	8-channel Band AB	12.1(10)EV1
	15540-MDXC-08B0	8-channel Band CD	12.1(10)EV1
	15540-MDXC-08C0	8-channel Band EF	12.1(10)EV1
	15540-MDXC-08D0	8-channel Band GH	12.1(10)EV1

Table 1 Cisco ONS 15540 ESPx Supported Hardware Modules and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
Mux/demux modules with OSC	15540-MDXD-04A0	4-channel Band A	12.1(10)EV1
	15540-MDXD-04B0	4-channel Band B	12.1(10)EV1
	15540-MDXD-04C0	4-channel Band C	12.1(10)EV1
	15540-MDXD-04D0	4-channel Band D	12.1(10)EV1
	15540-MDXD-04E0	4-channel Band E	12.1(10)EV1
	15540-MDXD-04F0	4-channel Band F	12.1(10)EV1
	15540-MDXD-04G0	4-channel Band G	12.1(10)EV1
	15540-MDXD-04H0	4-channel Band H	12.1(10)EV1
	15540-MDXD-08A0	8-channel Band AB	12.1(10)EV1
	15540-MDXD-08B0	8-channel Band CD	12.1(10)EV1
	15540-MDXD-08C0	8-channel Band EF	12.1(10)EV1
	15540-MDXD-08D0	8-channel Band GH	12.1(10)EV1
	15540-MDXD-32A0	32-channel AH	12.1(10)EV1
Line card motherboards	15540-LCMB-1100	Supports four transponders with protection or four extended range transponders with protection	12.1(10)EV1
	15540-LCMB-1200	Supports four transponders without protection or four extended range transponders without protection	12.1(10)EV1
	15540-LCMB-1400	Supports two 10-GE transponders with protection	12.1(10)EV2
	15540-LCMB-1401	Supports two 10-GE transponders without protection	12.1(10)EV2
MM transponder modules	15540-TSP1-01A3	Ch 1-2 —1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-03A3	Ch 3-4 —1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-05A3	Ch 5-6 —1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-07A3	Ch 7-8 — 310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-09A3	Ch 9-10 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-11A3	Ch 11-12 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-13A3	Ch 13-14 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-15A3	Ch 15-16 —1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-17A3	Ch 17-18 —1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-19A3	Ch 19-20 —1310nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-21A3	Ch 21-22 —1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-23A3	Ch 23- 24—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-25A3	Ch 25-26—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-27A3	Ch 27-28—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15540-TSP1-29A3	Ch 29-30—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
15540-TSP1-31A3	Ch 31-32—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1	

Table 1 Cisco ONS 15540 ESPx Supported Hardware Modules and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
SM transponder modules	15540-TSP1-01B3	Ch 1-2—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15540-TSP1-03B3	Ch 3-4—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-05B3	Ch 5-6—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-07B3	Ch 7-8—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-09B3	Ch 9-10—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-11B3	Ch 11-12—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-13B3	Ch 13-14—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-15B3	Ch 15-16—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-17B3	Ch 17-18—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-19B3	Ch 19-20—1310nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-21B3	Ch 21-22—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-23B3	Ch 23- 24—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-23B3	Ch 23- 24—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-25B3	Ch 25-26—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-27B3	Ch 27-28—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
	15540-TSP1-29B3	Ch 29-30 —1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>
15540-TSP1-31B3	Ch 31-32—1310-nm SM 16 Mbps to 2.5 Gbps with SC	<b>12.1(10)EV1</b>	
Type 2 extended range transponder modules with SFP optics	15540-TSP2-0100	Ch 1-2	12.1(10)EV1
	15540-TSP2-0300	Ch 3-4	<b>12.1(10)EV1</b>
	15540-TSP2-0500	Ch 5-6	<b>12.1(10)EV1</b>
	15540-TSP2-0700	Ch 7-8	<b>12.1(10)EV1</b>
	15540-TSP2-0900	Ch 9-10	<b>12.1(10)EV1</b>
	15540-TSP2-1100	Ch 11-12	<b>12.1(10)EV1</b>
	15540-TSP2-1300	Ch 13-14	<b>12.1(10)EV1</b>
	15540-TSP2-1500	Ch 15-16	<b>12.1(10)EV1</b>
	15540-TSP2-1700	Ch 17-18	<b>12.1(10)EV1</b>
	15540-TSP2-1900	Ch 19-20	<b>12.1(10)EV1</b>
	15540-TSP2-2100	Ch 21-22	<b>12.1(10)EV1</b>
	15540-TSP2-2300	Ch 23-24	<b>12.1(10)EV1</b>
	15540-TSP2-2500	Ch 25-26	<b>12.1(10)EV1</b>
	15540-TSP2-2700	Ch 27-28	<b>12.1(10)EV1</b>
	15540-TSP2-2900	Ch 29-30	<b>12.1(10)EV1</b>
15540-TSP2-3100	Ch 31-32	<b>12.1(10)EV1</b>	

Table 1 Cisco ONS 15540 ESPx Supported Hardware Modules and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
Single port 10-Gigabit Ethernet transponder modules	15540-10GE-03B301	10-GE 1310-nm SM Client with SC and ITU Laser Ch 1	12.1(10)EV2
	15540-10GE-03B302	10-GE 1310-nm SM Client with SC and ITU Laser Ch 2	12.1(10)EV2
	15540-10GE-03B303	10-GE 1310-nm SM Client with SC and ITU Laser Ch 3	12.1(10)EV2
	15540-10GE-03B304	10-GE 1310-nm SM Client with SC and ITU Laser Ch 4	12.1(10)EV2
	15540-10GE-03B305	10-GE 1310-nm SM Client with SC and ITU Laser Ch 5	12.1(10)EV2
	15540-10GE-03B306	10-GE 1310-nm SM Client with SC and ITU Laser Ch 6	12.1(10)EV2
	15540-10GE-03B307	10-GE 1310-nm SM Client with SC and ITU Laser Ch 7	12.1(10)EV2
	15540-10GE-03B308	10-GE 1310-nm SM Client with SC and ITU Laser Ch8	12.1(10)EV2
	15540-10GE-03B309	10-GE 1310-nm SM Client with SC and ITU Laser Ch 9	12.1(10)EV2
	15540-10GE-03B3010	10-GE 1310-nm SM Client with SC and ITU Laser Ch 10	12.1(10)EV2
	15540-10GE-03B3011	10-GE 1310-nm SM Client with SC and ITU Laser Ch 11	12.1(10)EV2
	15540-10GE-03B3012	10-GE 1310-nm SM Client with SC and ITU Laser Ch 12	12.1(10)EV2
	15540-10GE-03B3013	10-GE 1310-nm SM Client with SC and ITU Laser Ch 13	12.1(10)EV2
	15540-10GE-03B3014	10-GE 1310-nm SM Client with SC and ITU Laser Ch 14	12.1(10)EV2
	15540-10GE-03B3015	10-GE 1310-nm SM Client with SC and ITU Laser Ch 15	12.1(10)EV2
	15540-10GE-03B3016	10-GE 1310-nm SM Client with SC and ITU Laser Ch 16	12.1(10)EV2
	15540-10GE-03B3017	10-GE 1310-nm SM Client with SC and ITU Laser Ch 17	12.1(10)EV2
	15540-10GE-03B3018	10-GE 1310-nm SM Client with SC and ITU Laser Ch 18	12.1(10)EV2
	15540-10GE-03B3019	10-GE 1310-nm SM Client with SC and ITU Laser Ch 19	12.1(10)EV2
	15540-10GE-03B3020	10-GE 1310-nm SM Client with SC and ITU Laser Ch 20	12.1(10)EV2
	15540-10GE-03B3021	10-GE 1310-nm SM Client with SC and ITU Laser Ch 21	12.1(10)EV2
	15540-10GE-03B3022	10-GE 1310-nm SM Client with SC and ITU Laser Ch 22	12.1(10)EV2
	15540-10GE-03B3023	10-GE 1310-nm SM Client with SC and ITU Laser Ch 23	12.1(10)EV2
	15540-10GE-03B3024	10-GE 1310-nm SM Client with SC and ITU Laser Ch 24	12.1(10)EV2
	15540-10GE-03B3025	10-GE 1310-nm SM Client with SC and ITU Laser Ch 25	12.1(10)EV2
	15540-10GE-03B3026	10-GE 1310-nm SM Client with SC and ITU Laser Ch 26	12.1(10)EV2
	15540-10GE-03B3027	10-GE 1310-nm SM Client with SC and ITU Laser Ch 27	12.1(10)EV2
	15540-10GE-03B3028	10-GE 1310-nm SM Client with SC and ITU Laser Ch 28	12.1(10)EV2
	15540-10GE-03B3029	10-GE 1310-nm SM Client with SC and ITU Laser Ch 29	12.1(10)EV2
	15540-10GE-03B3030	10-GE 1310-nm SM Client with SC and ITU Laser Ch 30	12.1(10)EV2
	15540-10GE-03B3031	10-GE 1310-nm SM Client with SC and ITU Laser Ch 31	12.1(10)EV2
	15540-10GE-03B3032	10-GE 1310-nm SM Client with SC and ITU Laser Ch 32	12.1(10)EV2

**Table 1** Cisco ONS 15540 ESPx Supported Hardware Modules and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
SFP optics for extended range transponder modules	15500-XVRA-01A2	ESCON and OC-3 1310-nm MM MT-RJ	<b>12.1(10)EV1</b>
	15500-XVRA-03B1	Gigabit Ethernet and Fibre Channel (1 Gbps) 1310-nm SM MTLC	<b>12.1(10)EV1</b>
	15500-XVRA-03B2	Fibre Channel (1 Gbps and 2 Gbps) 1310-nm SM MTLC	<b>12.1(10)EV1</b>
	15500-XVRA-02C1	Gigabit Ethernet and Fibre Channel (1 Gbps) 850-nm MM MTLC	<b>12.1(10)EV1</b>
	15500-XVRA-02C2	Fibre Channel (1 Gbps and 2 Gbps) 850-nm MM MTLC	<b>12.1(10)EV1</b>
	15500-XVRA-06B1	SONET OC-12 1310-nm SM MTLC	<b>12.1(10)EV1</b>
	15500-XVRA-07B1	SONET OC-48 1310-nm SM MTLC	<b>12.1(10)EV1</b>
Variable rate SFP optics	15500-XVRA-10A1	Low band (16 to 200 Mbps) variable rate, MM (1310 nm) with LC	12.1(12c)EV3
	15500-XVRA-10B1	Low band (16 to 200 Mbps) variable rate, SM (1310 nm) with LC	12.1(12c)EV3
	15500-XVRA-11A1	Mid band (200 to 622 Mbps) variable rate, MM (1310 nm) with LC	12.1(12c)EV3
	15500-XVRA-11B1	Mid band (200 to 1250 Mbps) variable rate, SM (1310 nm) with LC	12.1(12c)EV3
	15500-XVRA-12B1	High band (1.062 Gbps to 2.5 Gbps) variable rate, SM (1310 nm) with LC	12.1(12c)EV3
Protection switch module	15540-PSM-01	ONS 15540 protection switch module	12.1(12c)EV
Optical cross connect	15500-CCDK01	ONS 15500 cross connect drawer kit	<b>12.1(10)EV1</b>
	15500-CSDK01	ONS 15500 cable storage drawer kit	<b>12.1(10)EV1</b>
	15500-VCGK01	ONS 15500 vertical cable guide kit	<b>12.1(10)EV1</b>
	15500-CAB-MU-ADTR=	ONS 15540 MU-MU insertion adapter	<b>12.1(10)EV1</b>
	15500-CAB-TL01=	Cable installation and removal tool. SFP removal tool.	<b>12.1(10)EV1</b>
Optical cable kits	15500-CAB-KIT1	Cable Kit 1 - (order 1x for LCMB without splitter, order 2x for line card motherboard with splitter): 2 x MTP-8MU, 2 x MU adapter, 8x MU-MU	<b>12.1(10)EV1</b>
	15500-CAB-KIT2	Cable Kit 2 - 10-GE lower channels - (order 1x for every 10-Gbps line card motherboard with without splitter, order 2x for line card motherboard with splitter): 1 x MTP-8MU, 1 x MTP-4MU, 2 x MU adapter, 4 x MU-MU	<b>12.1(10)EV1</b>
	15500-CAB-KIT3	Cable Kit 3 - 10-GE higher channels - (order 1 x for every 10-Gbps line card motherboard with without splitter, order 2 x for LCMB with splitter): 1 x MTP-8MU, 1 x MTP-4MU, 2 x MU adapter, 4 x MU-MU	<b>12.1(10)EV1</b>

**Table 1** *Cisco ONS 15540 ESPx Supported Hardware Modules and Minimum Software Requirements (continued)*

Component	Part Number	Description	Minimum Software Version Required
MTP cables	15500-CAB-MTP-01=	86 in. MTP to MTP cable - 2.5-Gbps line card motherboard	<b>12.1(10)EV1</b>
	15500-CAB-MTPMU-M	86 in. MTP to 8 MU optical cable - mux/demux to cross connect drawer - (Gray)	<b>12.1(10)EV1</b>
	15500-CAB-MTPMU-L	86 in. MTP to 8 MU optical cable - line card to cross connect drawer - (Green)	<b>12.1(10)EV1</b>
	15500-CAB-MTPMU-1	86 in. MTP to 4 MU optical cable-10-Gbps Ch 1/2 (Aqua)	<b>12.1(10)EV1</b>
	15500-CAB-MTPMU-2	86 in. MTP to 4 MU optical cable- 10-Gbps Ch 3/4 (Rose)	<b>12.1(10)EV1</b>
	15500-CAB-MTP-01,	86 in. MTP to MTP cable- 2.5-Gbps line card motherboard (Blue)	<b>12.1(10)EV1</b>
	15500-CAB-MTP-02	86 in. MTP to MTP cable - 10-Gbps line card motherboard- Ch. 1/2 (Aqua)	<b>12.1(10)EV1</b>
	15500-CAB-MTP-03	86 in. MTP to MTP cable - 10-Gbps line card motherboard- Ch. 3/4 (Rose)	<b>12.1(10)EV1</b>
	15500-CAB-MTP-04	86 in. MTP to 2x MTP cable - 10G line card motherboard Y-cable (Violet)	<b>12.1(10)EV1</b>
Optical trunk cables (simplex)	15500-CAB-MSC01=	1.0-m tuned low loss MU to SC SM patch cable	<b>12.1(10)EV1</b>
	15500-CAB-MSC02=	3.0-m tuned low loss MU to SC SM patch cable	<b>12.1(10)EV1</b>
	15500-CAB-MST03=	1.0-m Tuned low loss MU to ST SM patch cable	<b>12.1(10)EV1</b>
	15500-CAB-MST04=	3.0-m Tuned low loss MU to ST SM patch cable	<b>12.1(10)EV1</b>



Table 1 Cisco ONS 15540 ESPx Supported Hardware Modules and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
Optical OADM and intra chassis cables (simplex)	15500-CAB-MMU-01=	0.25-m (10 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
	15500-CAB-MMU-02=	0.35-m (14 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
	15500-CAB-MMU-03=	0.45-m (17 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
	15500-CAB-MMU-04=	0.5-m (20 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
	15500-CAB-MMU-05=	1.0-m (40 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
	15500-CAB-MMU-09=	1.16-m (46 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
	15500-CAB-MMU-06=	1.5-m (60 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
	15500-CAB-MMU-07=	2.0-m (79 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
	15500-CAB-MMU-08=	2.5-m (98 in.) tuned low loss MU to MU SM OADM patch cable	12.1(10)EV1
Optical client cables (simplex)	15500-CAB-SC11=	1.0-m SC to SC 62.5/125m MM cable	12.1(10)EV1
	15500-CAB-SC19=	1.0-m SC to SC 50/125m MM cable	12.1(10)EV1
	15500-CAB-SC12=	1.0-m SC to SC SM cable	12.1(10)EV1
	15500-CAB-SC13=	3.0-m SC to SC 62.5/125m MM cable	12.1(10)EV1
	15500-CAB-SC20=	3.0-m SC to SC 50/125m MM cable	12.1(10)EV1
	15500-CAB-SC14=	3.0-m SC to SC SM cable	12.1(10)EV1
	15500-CAB-ST15=	1.0-m SC to ST 62.5/125m MM cable	12.1(10)EV1
	15500-CAB-ST21=	1.0-m SC to ST 50/125m MM cable	12.1(10)EV1
	15500-CAB-ST16=	1.0-m SC to ST SM cable	12.1(10)EV1
	15500-CAB-ST17=	3.0-m SC to ST 62.5/125m MM cable	12.1(10)EV1
	15500-CAB-ST22=	3.0-m SC to ST 50/125m MM cable	12.1(10)EV1
	15500-CAB-ST18=	3.0-m SC to ST SM cable	12.1(10)EV1
Optical y-cables	15500-CAB-YMM-SC=	50/125m multimode y cable with SC for channel protection	12.1(10)EV1
	15500-CAB-YMM2-SC=	62.5/125m multimode y cable with SC for channel protection	12.1(10)EV1
	15500-CAB-YSM-SC=	Single mode y cable with SC for channel protection	12.1(10)EV1
	15500-CAB-YMM-SC=	50/125m multimode y cable with SC for channel protection	12.1(10)EV1

## Determining the Software Version



### Note

We strongly recommend that you use the latest available software release for all Cisco ONS 15540 ESPx hardware.

To determine the version of Cisco IOS software currently running on a Cisco ONS 15540 ESPx system, log in to the system and enter the **show version EXEC** command. The following sample output is from the **show version** command. The software version number is shown on the second line of the sample output.

```
Switch# show version
Cisco Internetwork Operating System Software
IOS (tm) ONS-15540 Software (ONS15540-I-M), Version 12.2(29)SV
<Information deleted>
```

## Upgrading the System Image

To ensure proper system functioning, follow the system image upgrading procedure described in the *Cisco ONS 15540 ESPx Software Upgrade Guide*.



### Note

Always set the configuration register to 0x2102 when upgrading the system image using the **config-reg 0x2102** command in configuration mode.



### Caution

Improper system image upgrades can affect system functioning and redundancy. Always follow the recommended upgrade procedures.

## Feature Set Table

The Cisco IOS Release software is packaged in feature sets (also called software images) depending on the platform. Each feature set contains a specific set of Cisco IOS software features. [Table 2](#) lists the Cisco IOS software feature sets available for the Cisco ONS 15540 ESPx.

This section lists new features that appear in this and previous releases of Cisco IOS Release 12.2. The new features are sorted by release number.

*Table 2 Feature Sets Supported by the Cisco ONS 15540 ESPx*

Feature Set	Introduced in This Release
Gigabit Ethernet	12.1(10)EV
Fast Ethernet	12.1(10)EV
Ethernet	12.1(10)EV
ATM OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16	12.1(10)EV

**Table 2** *Feature Sets Supported by the Cisco ONS 15540 ESPx (continued)*

Feature Set	Introduced in This Release
SONET <sup>1</sup> /SDH <sup>2</sup>	12.1(10)EV
POS <sup>3</sup>	12.1(10)EV
Fibre Channel (1 Gbps)	12.1(10)EV
Fibre Channel (2 Gbps)	12.1(10)EV
FDDI <sup>4</sup>	12.1(10)EV
ESCON <sup>5</sup> SM (200 Mbps)	12.1(10)EV
FICON <sup>6</sup> (800 Mbps)	12.1(10)EV
FICON (1 Gbps)	12.2(18)SV
Token Ring	12.1(10)EV
SNMP	12.1(10)EV
CiscoView	12.1(10)EV
Cisco Transport Manager	12.1(10)EV
CDP <sup>7</sup>	12.1(10)EV
IP packets	12.1(10)EV
OSCP <sup>8</sup>	12.1(10)EV
APS <sup>9</sup> protocol packets	12.1(10)EV
Point-to-point	12.1(10)EV
Hubbed ring	12.1(10)EV
Meshed ring	12.1(10)EV
IBM GDPS <sup>10</sup> ETR/CLO <sup>11</sup>	12.1(10)EV1
IBM GDPS <sup>10</sup> coupling link	12.1(10)EV1
Unidirectional path switching	12.1(10)EV
Bidirectional path switching	12.1(10)EV
CDL over 10 GE	12.1(10)EV2
2-Gbps Fibre Channel protocol monitoring on 2.5-Gbps transponder modules	12.2(18)SV
2-Gbps FICON protocol monitoring on 2.5-Gbps transponder modules	12.2(18)SV
Functional image version diagnostics	12.2(18)SV
2-Gbps ISC links peer mode protocol monitoring on 2.5-Gbps transponder modules	12.2(22)SV
1-Gbps ISC links peer mode protocol monitoring on 2.5-Gbps transponder modules	12.2(23)SV
SSHv1 client and server support	12.2(24)SV
SNMPv3 support	12.2(24)SV
Counter preservation on processor card switchovers	12.2(24)SV

**Table 2** *Feature Sets Supported by the Cisco ONS 15540 ESPx (continued)*

Feature Set	Introduced in This Release
Performance history counter support on Cisco ONS 15540 ESPx line cards	12.2(29)SV
SSHv2 support on Cisco ONS 15540 ESPx	12.2(29)SV
Critical temperature shutdown support on Cisco ONS 15540 ESPx. Temperature alarm thresholds can be configured.	12.2(29)SV

1. SONET = Synchronous Optical Networking
2. SDH = Synchronous Digital Hierarchy
3. POS = Packet over SONET
4. FDDI = Fiber Distributed Data Interface
5. ESCON = Enterprise Systems Connection
6. FICON = Fiber Connection
7. CDP = Cisco Discovery Protocol
8. OSCP = Optical Supervisory Channel Protocol
9. APS = Automatic Protection Switching
10. GDPS = Geographically Dispersed Parallel Sysplex
11. ETR/CLO = external timer reference/control link oscillator

## New and Changed Information

This section lists new features that appear in this and previous releases of Cisco IOS Release 12.2. The new features are sorted by release number.

### New Features in Release 12.2(29)SV

The following new software features are available for the Cisco ONS 15540 ESPx in Cisco IOS Release 12.2(29)SV:

- Performance history counter support on Cisco ONS 15540 ESPx line cards.
- SSHv2 support.
- Critical temperature shutdown and configurable temperature alarm thresholds are supported.

### New Features in Release 12.2(26)SV1

There are no new features for this release.

### New Features in Release 12.2(26)SV

There are no new features in this release.

## New Features in Release 12.2(25)SV

There are no new features in this release.

## New Features in Release 12.2(24)SV

The following new software features are available for the Cisco ONS 15540 ESPx in Cisco IOS Release 12.2(24)SV:

- SSHv1 client and server support
- SNMPv3 support
- Counter preservation on processor card switchovers

## New Features in Release 12.2(23)SV

The following new software feature is available for the Cisco ONS 15540 ESPx in Cisco IOS Release 12.2(23)SV:

- Support for 1-Gbps ISC links peer mode protocol monitoring on 2.5-Gbps transponder modules

## New Features in Release 12.2(22)SV

The following new software feature is available for the Cisco ONS 15540 ESPx in Cisco IOS Release 12.2(22)SV:

- 2-Gbps ISC links peer mode protocol monitoring on 2.5-Gbps transponder modules




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**Note** 2-Gbps Fibre Channel/FICON protocol monitoring requires transponder functional image release 1.A3 or later.

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## New Features in Release 12.2(18)SV2

No new features are available for this release.

## New Features in Release 12.2(18)SV1

No new features are available for this release.

## New Features in Release 12.2(18)SV

The following new software features are available for the Cisco ONS 15540 ESPx in Cisco IOS Release 12.2(18)SV:

- 2-Gbps Fibre Channel protocol monitoring on 2.5-Gbps transponder modules




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**Note** 2-Gbps Fibre Channel/FICON protocol monitoring requires transponder functional image release 1.A3 or later.

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- 2-Gbps FICON protocol monitoring on 2.5-Gbps transponder modules




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**Note** 2-Gbps Fibre Channel/FICON protocol monitoring requires transponder functional image release 1.A3 or later.

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- Data file with upgrade information for the ROMMON and functional images
- **show upgrade-info functional-image** command

## Caveats

This section describes open and resolved severity 1 and 2 caveats and certain severity 3 caveats. The “Open Caveats” section lists open caveats that apply to the current release and may apply to previous releases. The “Resolved Caveats” sections list caveats resolved in a particular release, but open in previous releases.

### Open Caveats in Release 12.2(29)SV

- CSCed74239

**Symptom:** Though the working trunk has a failure, the protection path may not become active for a Y-cable APS link when the client device is administratively shutdown and restarted.

**Conditions:** The symptom may be observed on some FC devices connected to 2.5-Gbps transparent transponder cards.

**Workaround:** Configure a loopback interface on the client side to restore the traffic.

- CSCeb79990

**Symptom:** The **patch** commands saved on the system are not compatible with CTM (Cisco Transport Manager).

**Workaround:** Remove the **patch** commands that show up out of order after the configuration is saved. Then, reset the active processor card or switch to the standby processor card and reenter the **patch** commands.

- CSCee70825

**Symptom:** During normal operation, an outage may result when trying to connect through the console port. The console port issues error messages. These can be routine messages relating to Loss of Light on wave ports that were enabled. Interface alarm flapping may cause a hardware watchdog timeout that failed to switchover to the standby processor card.

**Workaround:** None

- CSCee75578

**Symptom:** The GE optical link fails to come up between two Catalyst 65xx 8-port GBIC modules through the Cisco ONS 15540 transparent transponders when Forward Laser Control (FLC) is enabled on the system. The link fails to come up irrespective of the type of protection scheme.

**Workaround:** Use a 16-port GBIC module on the Catalyst 65xx or deactivate FLC on the Cisco ONS 15540.

- CSCef12108

**Symptom:** The Cisco ONS15540 might not allow you to connect to the standby processor card due to an authentication failure. This occurs when AAA or a local database is used for user authentication as this information (AAA or local database) is not replicated from the active to the standby processor card.

**Workaround:** None.

- CSCsb38669

**Symptom:** When there are no connections on the OSC wave interface, the state of the interface and the line protocol must be `down`, and signal quality must be `Loss of Light`. But, the **show interface** command incorrectly displays the wave interface state as `up`, and the signal quality as `good`.

**Conditions:** The symptom is observed only when the PSM is inserted in subslot 0 of the motherboard.

**Workaround:** Insert the PSM in any other subslot.

- CSCin86897

**Symptom:** A temporary traffic interruption in 2.5G transparent transponders during ONS 15540 and 15530 CPU switchover. This depends on the software versions of the Active CPU before and after the switchover. When the switchover is complete, traffic resumes. This symptom is intermittent and may not affect all transponders in a chassis.

The traffic interruption may occur for the following types of encapsulation:

- ETR/CLO
- 100-Mbps Fast Ethernet / FDDI
- 1-Gbps FC/FICON
- 1-Gbps ISC (ISC-1, ISC-3 peer mode, 1-Gbps)
- 2-Gbps FC/FICON
- 2-Gbps ISC (ISC-3 peer mode, 2 Gbps)

**Conditions:** This can occur when switching from a CPU that is running on IOS software without the fix for CSCec64326, to a CPU running on IOS software with the fix for CSCec64326. The fix for CSCec64326 involves changes to hardware settings, causing the temporary datahit.

**Workaround:** None. The problem will be fixed in a future release of IOS software.

- CSCsa51395

**Symptom:** The client Laser on the ten gig interface goes down for around 4 to 5 seconds, when the FLC is configured on the waveethernetphy interface and PSM APS switchover happens on an ONS 15540 setup with a combination of 10GE transponder and PSM APS.

**Workaround:** Disable FLC on Waveethernetphy interface.

## Resolved Caveats in Release 12.2(29)SV

- CSCsb26802

**Symptom:** When a client or trunk laser fails, the **show facility-alarm status** command displays the `Line laser failure detected` error message. However, this error message does not indicate which laser has failed.

**Condition:** This symptom is observed on Cisco ONS 15540 ESPx cards when there are transparent transponders.

**Workaround:** None.

- CSCsb97958

**Symptom:** Adding a Cisco ONS 15540 in to CiscoWorks Resource Manager Essentials 4.0 fails with RICS0001 error.

**Condition:** This symptom is observed while adding a Cisco ONS 15540 that is running on Cisco IOS Release 12.2(18)SV2.

**Workaround:** None.

- CSCsb35798

**Symptom:** The Cisco ONS 15540 ESPx node may reload on performing **shut/no shut** on the wavee or wavepatch interface.

**Conditions:** This symptom is observed if the optical monitoring trap is enabled on the node.

**Workaround:** None.

- CSCsc51288

**Symptom:** Cisco Transport Manager (CTM) does not retrieve the software version of the standby CPU of Cisco ONS 15540 ESPx, and marks the related network element (NE) as unreachable.

**Conditions:** This symptom is observed with Cisco IOS Release 12.2(24)SV or later. The symptom may not occur if the NE is lightly equipped (few transponder modules).

**Workaround:** None.

- CSCed75110

**Symptom:** If a protection switch module (PSM) is placed in subslot 0 of a LCMB, the optical supervisory channel (OSC) wave interface goes into an invalid state. The OSC recovers when the PSM module is removed from subslot0. If the chassis is reloaded with the PSM in subslot 0, the OSC wave interface will not be operational.

**Workaround:** Do not place the PSM module in subslot0 of the LCMB if the OSC port on that LCMB is being used.

- CSCee70185

**Symptom:** An informational warning is issued instead of a critical alarm when the line cards are shut down in response to a multiple fan failure event after issuing the **environment-monitor shutdown fan** command.

**Workaround:** None.

- CSCsa71267

**Symptom:** The Cisco ONS 15540 ESP system does not shutdown if the fan tray is removed or is faulty.

**Conditions:** None.

**Workaround:** None.

## Resolved Caveats in Release 12.2(26)SV1

- CSCuk58617

**Symptom:** The physical Performance Monitoring (PM) statistics may not be collected correctly.



**Condition:** This symptom is observed on a Cisco ONS15500 series card that is configured for SNMP when optical monitoring traps are enabled.

**Workaround:** None.

- CSCei25594

**Symptom:** Memory leak may occur when CiscoView is used to monitor a router.

**Condition:** This condition may be seen on routers running 12.2(26)SV.

**Workaround:** None.

## Resolved Caveats in Release 12.2(26)SV

- CSCeg84037

**Symptom:** When a CPU switchover is performed on an ONS 15540 or ONS 15530 system, the memory utilization on the new primary increases by 10MB. In such a case, the memory utilization may go up to 85%. This problem is seen only with 12.2 based images.

**Workaround:** None.

- CSCin88118

**Symptom:** PSM APS switchover may rarely occur on an ONS 15540 system due to false low alarms reported for the wdm split interfaces.

**Condition:** This occurs rarely when spurious low alarms are seen for the PSM wdm split interfaces.

**Workaround:** None.

- CSCsa45294

**Symptom:** Traffic is disrupted for one to two seconds on ONS 155xx transponders configured with Forward Laser Control, when a protection switchover occurs on a trunk Protection Switch Module (PSM). This exceeds the specification of 50ms maximum failover time for the optical transport layer.

**Workaround:** Disable FLC on trunk-to-client direction of transponder, if feasible for the service. This workaround does not apply for ISC, ETR or CLO services.

**Resolution:** This will be fixed in the future release of IOS software on ONS15530 and ONS15540, with a caveat that the following configuration will not be supported on the platform:

- Transponder motherboard or linecard with on-board optical splitter module (even if the optical splitter is disabled by configuration)
- Trunk protection with Protection Switch Module
- Forward Laser Control enabled on transponder

- CSCsa46389

**Symptom:** On an ONS 15540/15530 system with Protection Switch Module, if a CPU switch occurs with the APS state such that protect interface is active and working interface is standby, then after the new CPU comes up there will be an extra APS switch to working. This is seen with all ONS15540 and ONS15530 software based on 12.1 and 12.2.

**Workaround:** None.

## Resolved Caveats in Release 12.2(25)SV

- CSCee75578

**Symptom:** The GE optical link fails to come up between two Catalyst 65xx 8-port GBIC modules through the Cisco ONS 15540 transparent transponders when Forward Laser Control (FLC) is enabled on the system. The link fails to come up irrespective of the type of protection scheme.

**Workaround:** Use a 16-port GBIC module on the Catalyst 65xx or deactivate FLC on the Cisco ONS 15540.

- CSCee71928

**Symptom:** The GE optical link fails to come up between two Catalyst 65xx 8-port GBIC modules through the Cisco ONS 15540 PSM DWDMs when forward laser control (FLC) is enabled.

**Workaround:** Use a 16-port GBIC module or disable FLC.

## Resolved Caveats in Release 12.2(24)SV

- CSCdz82276

**Symptom:** A warning is issued if the card has an unknown functional image. Version compatibility checks need to be performed during system initialization. The hardware version compatibility should identify any mismatch between functional image versions and hardware versions. The software version compatibility should identify any mismatch between FPGA image and software image.

**Workaround:** None

- CSCec45305

**Symptom:** If the transparent interface on a multimode transponder module is configured for Sysplex ETR traffic (**encap sysplex etr** command), the **show interfaces transparent** command output shows that forward laser control is set to off. Forward laser control is automatically enabled for Sysplex ETR.

**Workaround:** Add client input traffic and the trunk side laser will function.

- CSCec55713

**Symptom:** The Prot Switch Byte Failure - In Effect alarm message appears on the console.

**Workaround:** None.

- CSCec78648

**Symptom:** The **show redundancy** command is not valid on specific versions of the Cisco ONS 15540 software but the choice still exists.

**Workaround:** Use the **show redundancy summary** command.

- CSCee50294

**Symptom:** Cisco IOS® devices running branches of Cisco IOS version 12.2S that have Dynamic Host Configuration Protocol (DHCP) server or relay agent enabled, even if not configured, are vulnerable to a denial of service where the input queue becomes blocked when receiving specifically crafted DHCP packets. Cisco is providing free fixed software to address this issue. There are also workarounds to mitigate this vulnerability. This issue was introduced by the fix included in CSCdx46180 and is being tracked by Cisco Bug ID CSCee50294.

This advisory is available at

<http://www.cisco.com/warp/public/707/cisco-sa-20041110-dhcp.shtml>.

**Workaround:** None.

- CSCin69960

**Symptom:** A receive failure might display a message that the laser is shut due to forward laser control.

**Workaround:** None.

## Resolved Caveats in Release 12.2(23)SV

- CSCed38657

**Symptom:** DWDM links set at a 196.608-Mbps rate, or an uncommon rate close to this, may not work properly on the 2.5-Gbps transponder module. Link initialization failures and bit errors may occur.

**Workaround:** None.

- CSCee34107

**Symptom:** APS behavior for the **aps clear** command is inconsistent with the standard behavior if the following conditions occur:

- Traffic runs from the working link (link A) and you perform a manual switch to the protected link (link B), causing traffic to switch to link B.
- You enter the **aps clear** command for the aps-group; link A becomes active, regardless of whether the APS group is configured revertively or nonrevertively.

**Workaround:** None.

- CSCeb70408

**Symptom:** The IDPROM values from the high band single-mode SFPs are not readable. The SFPs cannot be configured and cannot be used.

**Workaround:** None.

- CSCec08603

**Symptom:** In a splitter configuration with 10-GE transponder modules, switchover eventually fails if continuous back and forth switchovers are performed from working to protection.

**Workaround:** None.

## Resolved Caveats in Release 12.2(22)SV

- CSCeb18103

**Symptom:** The OSC wave interface does not come back up after resolving a trunk fiber break if laser safety control was configured after the trunk fiber break occurred.

**Workaround:** None.

**Resolution:** Upgrade the 15540 mux/demux motherboard functional image to release 2.67 or later.

- CSCec18408

**Symptom:** A y-cable APS bidirectional switchover caused by a trunk Rx failure takes as long as 10 seconds in a configuration with 10-GE transponder modules.

**Workaround:** None.

- CSCec28182

**Symptom:** Tracebacks related to processor hog issues are seen when reprogramming the functional image for a 2.5-Gbps transponder module.

**Workaround:** None.

- CSCec31146

**Symptom:** If monitoring is disabled, Loss of Light on the local transparent interface results in Loss of Sync on the far side wave interface.

**Workaround:** Enable monitoring on the transparent interface.

- CSCed33451

**Symptom:** After configuring a patch between a wavepatch interface and a wdmrelay interface, issuing a **show connect intermediate** command results in spurious memory access.

**Workaround:** Do not issue the **show connect intermediate** command when a patch between a wavepatch interface and a wdmrelay interface is configured.

- CSCin60562

**Symptom:** If a row is created in cApsChanConfigTable using createAndWait, a set operation on an instance of cApsChanConfigIfIndex might modify another instance of that object.

**Workaround:** Use createAndGo to create the row.

- CSCin66424

**Symptom:** An APS switchover from a working interface to a protect interface might not occur for 10-GE transponder modules.

This symptom occurs with the following configurations:

- The 10-GE transponder module is configured for y-cable line card protection.
- The interfaces of the module have threshold groups that are configured for converged data link header error checksum (CDL HEC) errors or cyclic redundancy check (CRC) errors, or both.
- The CDL HEC error thresholds or CRC error thresholds, or both, are exceeded.

- CSCin67971

**Symptom:** If a one-way patch configuration is removed between a thru interface and a wdm interface, the system hangs for a long time and eventually crashes.

**Workaround:** Configure two-way patches between the thru and wdm interfaces.

## Resolved Caveats in Release 12.2(18)SV2

- CSCeb87507

**Symptom:** In some instances the system crashes when it attempts to parse IP SNMP related commands.

**Workaround:** None.

- CSCed05346

**Symptom:** Bidirectional APS fails when the ethernetdcc interface is used as a message channel for trunk based protection if the PSM is connected directly to a wavepatch interface on a transponder module rather than to the wdm interface on a mux/demux module.

**Workaround:** None.

- CSCed22589

**Symptom:** Link initialization failure due to Loss of Lock might occur for ESCON traffic on some transponder modules due to a transient failure of *the* clock recovery unit. Only some transponder modules are susceptible to this failure and not all. This is an initialization failure and not a run-time failure.

**Workaround:** None.

- CSCin63480

**Symptom:** The input power level to the wavepatch x/y/1 interface on a 10-GE transponder module falls below the configured optical threshold but the alarm is not raised. The alarm works correctly for wavepatch x/y/0.

**Workaround:** None.

## Resolved Caveats in Release 12.2(18)SV1

- CSCec36614

**Symptom:** Performing an online removal and insertion on a tengigethernetphy interface or waveethernetphy interface when loopback is configured causes a loss of the loopback information on the hardware. However, the loopback CLI configuration is still present in the software.

**Workaround:** Remove and reinsert the module, and then issue the **loopback** command to manually configure loopback.

- CSCec59409

**Symptom:** Issuing a **Ctrl-U** when connected to a raw TL1 port causes the system to crash.

**Workaround:** If a TL1 port is unused, apply an IP ACL to the management Ethernet interface that blocks the incoming TCP connections to that port.

## Resolved Caveats for Release 12.2(18)SV

- CSCdu53656

A Cisco device running Cisco IOS software and enabled for the Border Gateway Protocol (BGP) is vulnerable to a Denial of Service (DOS) attack from a malformed BGP packet. The BGP is not enabled by default, and must be configured to accept traffic from an explicitly defined peer. Unless the malicious traffic appears to be sourced from a configured, trusted peer, it would be difficult to inject a malformed packet. BGP MD5 is a valid workaround for this problem.

Cisco has made free software available to address this problem. For more details, refer to this advisory, available at <http://www.cisco.com/warp/public/707/cisco-sa-20040616-bgp.shtml>.

- CSCea28131

A Cisco device running Cisco IOS software and enabled for the Border Gateway Protocol (BGP) is vulnerable to a Denial of Service (DOS) attack from a malformed BGP packet. The BGP is not enabled by default, and must be configured to accept traffic from an explicitly defined peer. Unless the malicious traffic appears to be sourced from a configured, trusted peer, it would be difficult to inject a malformed packet. BGP MD5 is a valid workaround for this problem.

Cisco has made free software available to address this problem. For more details, refer to this advisory, available at <http://www.cisco.com/warp/public/707/cisco-sa-20040616-bgp.shtml>.

- CSCeb61427  
**Symptom:** The system crashes when the user exits from the console after the active processor card has been removed and inserted online and is switched back to being the active processor card.  
**Workaround:** None.
- CSCeb72528  
**Symptom:** Client Tx fault alarm is asserted when an SFP optics is inserted or upon a y-cable switchover.  
**Workaround:** Upgrade to Cisco IOS Release 12.1(12c)EV3 and transponder functional image version 1.A2 or higher.
- CSCec05746  
**Symptom:** In a point-to-point network topology setup where bidirectional PSM trunk fiber protection APS is configured, and the CDL (Converged Data Link) is configured for dcc and the controller type of the mux/demux module is 0x1104 (4-channel mux/demux module without OSC), APS cannot track a valid ethernetdcc interface. Therefore the group cannot be associated.  
**Workaround:** Do not configure CDL as dcc for PSM APS if the corresponding mux/demux module does not have OSC ports (controller type 0x1104).
- CSCec22377  
**Symptom:** Continuous optical performance monitoring alarms cause memory leaks that lead to bus error exceptions and an unexpected reload.  
**Workaround:** None.
- CSCec31512  
**Symptom:** When you enter the **send break** command on the active processor and keep the active processor in the ROM monitor (ROMMON) mode for a long time, the standby processor may reload because of a bus error exception.  
**Workaround:** None.

## Limitations and Restrictions

This section provides limitations and restrictions for Cisco ONS 15540 ESPx hardware and software.

### Transponder Modules

This section contains limitations and restrictions that apply to transponder modules.

- When you insert the standby transponder module in a y-cable protected configuration, remove the cable from the transponder module before inserting the transponder module into the shelf. Failure to remove the cable might result in errors that can affect the performance of the active signal received by the client equipment.
- CRC errors occur with 2-Gbps Fibre Channel on single-mode transponder modules when high input power levels are received from the client laser sources.

Data errors or link-down conditions for 2-Gbps Fibre Channel might occur on single-mode transponder modules when used with certain client laser sources. Transmitters in some client GBIC and SFP transceiver units might send large overshoots in optical power with signal bit transitions, causing momentary overload conditions on the transponder module client side receiver. The average transmitted power level from the GBIC does not violate the overload specification of the transponder module client side receiver, so a power meter does not detect the overload.

The workaround is to attenuate the signal from the client equipment to a recommended level of -12 dBm when transmitting 2-Gbps Fibre Channel services.

- Error-free transmission of some D1 video signals (defined by the SMPTE 259M standard) and test patterns (such as Matrix SDI) cannot be guaranteed by the Cisco 15500 Series because of the pathological pattern in D1 video. This well-known limitation is usually overcome by the D1 video equipment vendor, who uses a proprietary, second level of scrambling. No standards exist at this time for the second level of scrambling

## Related Documentation

Use this release notes in conjunction with the following referenced publications:

- *Regulatory Compliance and Safety Information for the Cisco ONS 15500 Series*  
Provides the regulatory compliance and safety information for the Cisco ONS 15500 Series.
- *Cisco ONS 15540 ESPx Planning Guide*  
Provides detailed information on the Cisco ONS 15540 ESPx architecture and functionality.
- *Cisco ONS 15540 ESPx Hardware Installation Guide*  
Provides detailed information about installing the Cisco ONS 15540 ESPx.
- *Cisco ONS 15540 ESPx Optical Transport Turn-Up and Test Guide*  
Provides acceptance testing procedures for Cisco ONS 15540 ESPx nodes and networks.
- *Cisco ONS 15540 ESPx Cleaning Procedures for Fiber Optic Connections*  
Provides processes and procedures for cleaning the fiber optic connectors and component interfaces of the Cisco ONS 15540 ESPx.
- *Cisco ONS 15540 ESPx Command Reference*  
Provides commands to configure and manage the Cisco ONS 15540 ESPx.
- *Cisco ONS 15540 ESPx System Alarms and Error Messages*  
Describes the system alarms and error messages for the Cisco ONS 15540 ESPx.
- *Cisco ONS 15540 ESPx Troubleshooting Guide*  
Describes how to identify and resolve problems with the Cisco ONS 15540 ESPx.
- *Network Management for the Cisco ONS 15540 ESPx*  
Provides information on the network management systems that support the Cisco ONS 15540 ESPx.

- *Cisco ONS 15540 ESPx TL1 Commands*  
Provides a full TL1 command and autonomous message set including parameters, AIDs, conditions and modifiers for the Cisco ONS 15540 ESPx.
- *MIB Quick Reference for the Cisco ONS 15500 Series*  
Describes the Management Information Base (MIB) objects and explains how to access Cisco public MIBs for the Cisco ONS 15500 Series.
- *Cisco ONS 15540 ESPx Software Upgrade Guide*  
Describes how to upgrade system images and functional images on the Cisco ONS 15540 ESPx.

## Document Conventions

This publication uses the following conventions:

Convention	Application
<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

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

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### Caution

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

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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**

## 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 15xxx systems. It also includes translations of the safety warnings that appear in the ONS 15xxx 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 at this URL:

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

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

[http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml)

### Product Documentation DVD

The Product Documentation DVD is a comprehensive library of technical product documentation on a portable medium. The DVD enables you to access multiple versions of installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the same HTML documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .PDF versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at this URL:

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

## 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.

## Ordering Documentation

Registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL:

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

Nonregistered Cisco.com users can order technical documentation from 8:00 a.m. to 5:00 p.m. (0800 to 1700) PDT by calling 1 866 463-3487 in the United States and Canada, or elsewhere by calling 011 408 519-5055. You can also order documentation by e-mail at [tech-doc-store-mkpl@external.cisco.com](mailto:tech-doc-store-mkpl@external.cisco.com) or by fax at 1 408 519-5001 in the United States and Canada, or elsewhere at 011 408 519-5001.

## Documentation Feedback

You can rate and provide feedback about Cisco technical documents by completing the online feedback form that appears with the technical documents on Cisco.com.

You can submit comments about Cisco documentation 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.

## Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

From this site, you will find information about how to:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories, security notices, and security responses for Cisco products is available at this URL:

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

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at this URL:

[http://www.cisco.com/en/US/products/products\\_psirt\\_rss\\_feed.html](http://www.cisco.com/en/US/products/products_psirt_rss_feed.html)

## Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you have identified a vulnerability in a Cisco product, contact PSIRT:

- For Emergencies only—[security-alert@cisco.com](mailto:security-alert@cisco.com)

An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- For Nonemergencies—[psirt@cisco.com](mailto:psirt@cisco.com)

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532



Tip

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We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.x through 9.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

The link on this page has the current PGP key ID in use.

If you do not have or use PGP, contact PSIRT at the aforementioned e-mail addresses or phone numbers before sending any sensitive material to find other means of encrypting the data.

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## Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

## Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

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

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

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



### Note

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

## Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests, or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request 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 list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

## Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—An existing 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.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operations 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.

Severity 3 (S3)—Operational performance of the network is impaired, while most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—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.

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco offerings. To order and find out more about the Cisco Product Quick Reference Guide, go to this URL:

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

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

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

- *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 at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

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

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

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

or view the digital edition at this URL:

<http://ciscoiq.texterity.com/ciscoiq/sample/>

- *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>
- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:  
<http://www.cisco.com/en/US/products/index.html>
- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:  
<http://www.cisco.com/discuss/networking>
- World-class networking training is available from Cisco. You can view current offerings at this URL:  
<http://www.cisco.com/en/US/learning/index.html>

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