



# Release Notes for Cisco ONS 15530 for Cisco IOS Release 12.1(12c)EV1

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This document describes caveats for Cisco IOS Release 12.1(12c)EV1 for the Cisco ONS 15530.

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## Introduction

The Cisco ONS 15530 is a modular, scalable optical switching and aggregation platform designed to supplement the Cisco ONS 15540 ESP. With the Cisco ONS 15530, users can take advantage of the availability of dark fiber to build a common infrastructure that supports data, SAN (storage area network), and TDM (time-division multiplexing) traffic. For more information about DWDM technology and applications, refer to the [Introduction to DWDM Technology](#) publication and the [Cisco ONS 15530 Planning Guide](#).



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# System Requirements

This section describes the system requirements for Cisco IOS Release 12.1(12c)EV1 and includes the following sections:

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## Memory Requirements

The DRAM memory configuration is 64 MB, which is the default for the Cisco ONS 15530.

## Hardware Supported

[Table 1](#) lists the hardware components supported on the Cisco ONS 15530 and the minimum software version required. See the [“Determining the Software Version” section on page 15](#).

**Table 1** Cisco ONS 15530 Supported Hardware and Minimum Software Requirements

Component	Part Number	Description	Minimum Software Version Required
Chassis	15530-CHAS-N	15530-CHAS-N chassis, NEBS Version	12.1(10)EV1
	15530-CHAS-E	15530-CHAS-E chassis, ETSI Version	12.1(10)EV1
Power supplies	15530-PWR-AC	120 to 240 VAC power supply	12.1(10)EV1
	15530-PWR-DC	Power supply –48 VDC	12.1(10)EV1
CPU switch module	15530-CPU	ONS 15530 CPU switch module	12.1(10)EV1
Carrier motherboard	15530-LCMB-0100	Carrier motherboard (supports OSC, WB-VOA, and PB-OE modules)	12.1(10)EV1
OADM modules without OSC	15530-MDXA-04A0	4-channel Band A	12.1(10)EV1
	15530-MDXA-04B0	4-channel Band B	12.1(10)EV1
	15530-MDXA-04C0	4-channel Band C	12.1(10)EV1
	15530-MDXA-04D0	4-channel Band D	12.1(10)EV1
	15530-MDXA-04E0	4-channel Band E	12.1(10)EV1
	15530-MDXA-04F0	4-channel Band F	12.1(10)EV1
	15530-MDXA-04G0	4-channel Band G	12.1(10)EV1
	15530-MDXA-04H0	4-channel Band H	12.1(10)EV1
OADM modules with OSC	15530-MDXB-04A0	4-channel Band A	12.1(10)EV1
	15530-MDXB-04B0	4-channel Band B	12.1(10)EV1
	15530-MDXB-04C0	4-channel Band C	12.1(10)EV1
	15530-MDXB-04D0	4-channel Band D	12.1(10)EV1
	15530-MDXB-04E0	4-channel Band E	12.1(10)EV1
	15530-MDXB-04F0	4-channel Band F	12.1(10)EV1
	15530-MDXB-04G0	4-channel Band G	12.1(10)EV1
	15530-MDXB-04H0	4-channel Band H	12.1(10)EV1

*Table 1 Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)*

Component	Part Number	Description	Minimum Software Version Required
MM transponder modules with splitter	15530-TSP1-0111	Ch 1-2 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-0311	Ch 3-4 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-0511	Ch 5-6 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-0711	Ch 7-8 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-0911	Ch 9-10 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1111	Ch 11-12 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1311	Ch 13-14 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1511	Ch 15-16 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1711	Ch 17-18 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1911	Ch 19-20 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2111	Ch 21-22 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2311	Ch 23- 24 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2511	Ch 25-26 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2711	Ch 27-28 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2911	Ch 29-30 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
15530-TSP1-3111	Ch 31-32 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1	

**Table 1** Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
MM transponder modules without splitter	15530-TSP1-0121	Ch 1-2 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-0321	Ch 3-4 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-0521	Ch 5-6 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-0721	Ch 7-8 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-0921	Ch 9-10 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1121	Ch 11-12 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1321	Ch 13-14 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1521	Ch 15-16 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1721	Ch 17-18 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-1921	Ch 19-20 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2121	Ch 21-22 — 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2321	Ch 23- 24— 1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2521	Ch 25-26—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2721	Ch 27-28—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
	15530-TSP1-2921	Ch 29-30—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1
15530-TSP1-3121	Ch 31-32—1310-nm MM 16 to 622 Mbps with SC	12.1(10)EV1	

*Table 1 Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)*

Component	Part Number	Description	Minimum Software Version Required
SM transponder modules with splitter	15530-TSP1-0112	Ch 1-2—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-0312	Ch 3-4—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-0512	Ch 5-6—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-0712	Ch 7-8—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-0912	Ch 9-10—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1112	Ch 11-12—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1312	Ch 13-14—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1512	Ch 15-16—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1712	Ch 17-18—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1912	Ch 19-20—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2112	Ch 21-22—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2312	Ch 23-24—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2512	Ch 23-24—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2712	Ch 25-26—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2912	Ch 27-28—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
15530-TSP1-3112	Ch 29-30—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1	

**Table 1** Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
SM transponder modules without splitter	15530-TSP1-0122	Ch 1-2—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-0322	Ch 3-4—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-0522	Ch 5-6—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-0722	Ch 7-8—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-0922	Ch 9-10—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1122	Ch 11-12—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1322	Ch 13-14—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1522	Ch 15-16—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1722	Ch 17-18—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-1922	Ch 19-20—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2122	Ch 21-22—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2322	Ch 23-24—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2522	Ch 23-24—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2722	Ch 25-26—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
	15530-TSP1-2922	Ch 27-28—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1
15530-TSP1-3122	Ch 29-30—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(10)EV1	
Aggregation cards	15530-LCMB-0200	ONS 15530 10-port ESCON aggregation card	12.1(10)EV1
	15530-FCGE-8P	ONS 15530 8-port Fibre Channel/Gigabit Ethernet aggregation card	12.1(12c)EV

*Table 1 Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)*

Component	Part Number	Description	Minimum Software Version Required
2.5-Gbps ITU trunk cards	15530-ITU3-XX10	ONS 15530 Ch XX 2.5Gbps ITU trunk card MU with splitter	12.1(12c)EV
	15530-ITU3-XX20	ONS 15530 Ch XX 2.5Gbps ITU trunk card MU without splitter	12.1(12c)EV



**Table 1** Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
10-Gbps ITU trunk cards with splitter (1550 nm)	15530-ITU2-0110	CH 1—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-0210	CH 2—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-0310	CH 3—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-0410	CH 4—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-0510	CH 5—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-0610	CH 6—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-0710	CH 7—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-0810	CH 8—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-0910	CH 9—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1010	CH 10—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1110	CH 11—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1210	CH 12—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1310	CH 13—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1410	CH 14—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1510	CH 15—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1610	CH 16—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1710	CH 17—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1810	CH 18—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-1910	CH 19—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2010	CH 20—10-Gbps ITU trunk card with splitter	12.1(10)EV1

*Table 1 Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)*

Component	Part Number	Description	Minimum Software Version Required
	15530-ITU2-2110	CH 21—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2210	CH 22—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2310	CH 23—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2410	CH 24—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2510	CH 25—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2610	CH 26—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2710	CH 27—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2810	CH 28—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-2910	CH 29—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-3010	CH 30—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-3110	CH 31—10-Gbps ITU trunk card with splitter	12.1(10)EV1
	15530-ITU2-3210	CH 32—10-Gbps ITU trunk card with splitter	12.1(10)EV1

**Table 1** *Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)*

<b>Component</b>	<b>Part Number</b>	<b>Description</b>	<b>Minimum Software Version Required</b>
10-Gbps ITU trunk cards without splitter (1550 nm)	15530-ITU2-0120	CH 1—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-0220	CH 2—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-0320	CH 3—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-0420	CH 4—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-0520	CH 5—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-0620	CH 6—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-0720	CH 7—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-0820	CH 8—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-0920	CH 9—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1020	CH 10—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1120	CH 11—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1220	CH 12—10-Gbps ITU trunk card without splitter	12.1(10)EV1

Table 1 Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
	15530-ITU2-1320	CH 13—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1420	CH 14—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1520	CH 15—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1620	CH 16—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1720	CH 17—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1820	CH 18—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-1920	CH 19—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2020	CH 20—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2120	CH 21—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2220	CH 22—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2320	CH 23—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2420	CH 24—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2520	CH 25—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2620	CH 26—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2720	CH 27—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2820	CH 28—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-2920	CH 29—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-3020	CH 30—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-3120	CH 31—10-Gbps ITU trunk card without splitter	12.1(10)EV1
	15530-ITU2-3220	CH 32—10-Gbps ITU trunk card without splitter	12.1(10)EV1

**Table 1** Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
10-GE uplink card	15530-10GE-UPLINK	ONS 15530 10-Gbps uplink, 1310nm with SC	12.1(10)EV1
WB-VOA module	15500-VOA-0100	Single wide-band variable optical attenuator	12.1(10)EV1
	15500-VOA-0200	Dual wide-band variable optical attenuator	12.1(10)EV1
Single-band PB-OE module	15500-PEQ-01A0	Single-band optical equalizer Band A	12.1(10)EV1
	15500-PEQ-01B0	Single-band optical equalizer Band B	12.1(10)EV1
	15500-PEQ-01C0	Single-band optical equalizer Band C	12.1(10)EV1
	15500-PEQ-01D0	Single-band optical equalizer Band D	12.1(10)EV1
	15500-PEQ-01E0	Single-band optical equalizer Band E	12.1(10)EV1
	15500-PEQ-01F0	Single-band optical equalizer Band F	12.1(10)EV1
	15500-PEQ-01G0	Single-band optical equalizer Band G	12.1(10)EV1
	15500-PEQ-01H0	Single-band optical equalizer Band H	12.1(10)EV1
Dual-band PB-OE module	15500-PEQ-02AB	Dual band optical equalizer Band AB	12.1(10)EV1
	15500-PEQ-02CD	Dual band optical equalizer Band CD	12.1(10)EV1
	15500-PEQ-02EF	Dual band optical equalizer Band EF	12.1(10)EV1
	15500-PEQ-02GH	Dual band optical equalizer Band GH	12.1(10)EV1
Protection switch module	15530-PSM-01	ONS 15530 protection switch module	12.1(12c)EV

**Table 1** Cisco ONS 15530 Supported Hardware and Minimum Software Requirements (continued)

Component	Part Number	Description	Minimum Software Version Required
AC cables	15530-CAB-AC=	ONS 15530 ETSI AC cable, North America (spare)	12.1(10)EV1
	15530-CAB-ACA=	ONS 15530 ETSI AC cable, Australia (spare)	12.1(10)EV1
	15530-CAB-ACE=	ONS 15530 ETSI AC cable, Europe (spare)	12.1(10)EV1
	15530-CAB-ACU=	ONS 15530 ETSI AC cable, UK (spare)	12.1(10)EV1
	15530-CAB-ACI=	ONS 15530 ETSI AC cable, Italy (spare)	12.1(10)EV1
	15530-CAB-ACR=	ONS 15530 ETSI AC cable, Argentina (spare)	12.1(10)EV1
Blank panel cover	15530-COV-MUX=	OADM blank panel cover	12.1(10)EV1
	15530-COV-SLOT=	Full slot panel cover	12.1(10)EV1
	15530-COV-PWR=	Power supply blank panel cover	12.1(10)EV1
	15530-COV-OSC=	OSC blank panel cover	12.1(10)EV1
Fan assembly	15530-FT01=	Fan assembly (spare)	12.1(10)EV1
Air ramp baffle	15530-BAF-E=	Air baffle (spare) for 15530-CHAS-E chassis	12.1(10)EV1
CompactFlash card	15530-MEM=	CompactFlash card 32 MB	12.1(10)EV1
Accessory kit	15530-ACCKIT23	Accessory kit for 23 inch rack	12.1(10)EV1
	15530-ACCKIT19	Accessory kit for 19 inch rack	12.1(10)EV1
Rack mount kit	15530-RKMT-E=	Chassis rack mount kit for 15530-CHAS-E	12.1(10)EV1
	15530-RKMT-N23=	Chassis rack mount kit for 15530-CHAS-N (23 inch rack)	12.1(10)EV1
	15530-RKMT-N19=	Chassis rack mount kit for 15530-CHAS-N (19 inch rack)	12.1(10)EV1

## Determining the Software Version



**Note** We strongly recommend that you use the latest available software release for all Cisco ONS 15530 hardware.

To determine the version of Cisco IOS software currently running on a Cisco ONS 15530 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-15530 Software (ONS15530-I-M), Version 12.1(10)EV4
<Information deleted>
```

## Upgrading the System Image

To ensure proper system functioning, follow the system image upgrading procedure described in the *Cisco ONS 15530 Software Upgrade Guide*.

You can find the system images for the Cisco ONS 15530 at the following URL:

<http://www.cisco.com/kobayashi/sw-center/sw-optical.shtml>



**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 features. [Table 2](#) lists the Cisco IOS software feature sets available for the Cisco ONS 15530.

**Table 2** Feature Sets Supported by the Cisco ONS 15530

Feature Set	12.1(12c)EV1	12.1(12c)EV	12.1(10)EV4	12.1(10)EV1
Inband message channel	X	X	X	X
Gigabit Ethernet	X	X	X	X
Fast Ethernet	X	X	X	X
Ethernet	X	X	X	X
ATM OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16	X	X	X	X
SONET <sup>1</sup> /SDH <sup>2</sup>	X	X	X	X

Table 2 Feature Sets Supported by the Cisco ONS 15530

Feature Set	12.1(12c)EV1	12.1(12c)EV	12.1(10)EV4	12.1(10)EV1
POS <sup>3</sup>	X	X	X	X
IBM Sysplex coupling link	X	X	X	X
Fibre Channel (1 Gbps)	X	X	X	X
Fibre Channel (2 Gbps)	X	X	X	X
FDDI <sup>4</sup>	X	X	X	X
ESCON <sup>5</sup> aggregation (2.5 Gbps)	X	X	X	X
FICON <sup>6</sup> (800 Mbps)	X	X	X	X
Token ring	X	X	X	X
SNMP	X	X	X	X
CiscoView	X	X	X	X
Cisco Transport Manager	X	X	X	X
IP packets	X	X	X	X
OSCP <sup>7</sup>	X	X	X	X
APS <sup>8</sup> channel protocol	X	X	X	X
Point-to-point	X	X	X	X
Hubbed ring	X	X	X	X
Meshed ring	X	X	X	X
IBM Sysplex ETR/CLO <sup>9</sup>	X	X	X	X
Fibre Channel/FICON aggregation (2.5 Gbps)	X	X		
Gigabit Ethernet aggregation (2.5 Gbps)	X	X		

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. OSCP = Optical Supervisory Channel Protocol
8. APS = Automatic Protection Switching
9. 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 12.1. The new features are sorted by release number.

## New Features in Release 12.1(12c)EV1

The following new features are available for the Cisco ONS 15530 in Cisco IOS Release 12.1(12c)EV1:

- Maximum number of virtual terminals increased to 41
- Automatic attenuation support for WB-VOA modules
- **Tx-buffer size** command support moved from the portgroup interface to the esconphy interfaces on the ESCON aggregation card
- Supports TL1 commands



Note

---

Only use Cisco-certified SFP optics for the extended range transponders, ESCON cards, and 8-port FC/GE aggregation cards

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## New Features in Release 12.1(12c)EV

The following new hardware features are available for the Cisco ONS 15530 in Cisco IOS Release 12.1(12c)EV:

- The Cisco ONS 15530 8-port Fibre Channel/Gigabit Ethernet (FC/GE) aggregation card is capable of multiplexing up to eight FC/ FICON /GE signals onto a single 10-Gbps ITU trunk card, or groups of two ports (e.g., ports 0 and 1) onto a 2.5-Gbps ITU trunk card, 10-Gbps ITU trunk card, or 10-Gbps uplink cards for connectivity to another ONS 15530 or to an ONS 15540 ESPx. Pluggable transceiver modules are required for operation and up to eight are supported.
- The Cisco ONS 15530 8-port FC/GE aggregation card supports the following pluggable transceiver modules:
  - GE/FC - 1310nm SM - MTLC
  - GE/FC - 850nm MM - 1G MTLC
- The Cisco ONS 15530 2.5-Gbps ITU trunk card is designed to be used with the 10-port ESCON and 8-port FC/GE multiplexing cards to support up to ten ports of ESCON or two ports of FC/FICON/GE over a 2.5-Gbps ITU wavelength. The 2.5-Gbps ITU trunk card can be used in point-to-point and ring configurations.
- The Cisco ONS 15500 PSM (protection switch module) allows a customer to protect the entire fiber path by splitting an optical signal from one fiber trunk into two redundant fiber paths. This offers customers a more cost effective way to achieve protection against fiber cuts in the network.

The following new software features are available for the Cisco ONS 15530 in Cisco IOS Release 12.1(12c)EV:

- The Cisco ONS 15530 8-port FC/GE aggregation card can interwork with the 2.5-Gbps ITU trunk card, 10-Gbps ITU trunk card, or the 10-Gbps uplink card. All 8 ports of the FC/GE aggregation card can be sent over a single 10-Gbps ITU trunk/uplink or groups of 2 ports can be sent to a 2.5-Gbps ITU trunk card or a 10-Gbps ITU trunk/uplink card.

- The Cisco ONS 15530 supports per-channel unidirectional and bidirectional 1+1 path switching over both point-to-point and optical ring topologies for the 2.5-Gbps ITU trunk card. 1+1 protection, which is similar to SONET/SDH APS (Automatic Path Switching), is a method of protection in which one optical signal drives two sets of trunk fibers. One signal is used as the active fiber pair, and the other is used as the standby fiber pair should the working path be cut. When an active signal that is protected fails or in some cases degrades, the system automatically switches from the active network path to the standby network path.
- The Cisco ONS 15530 2.5-Gbps ITU trunk card supports a per-wavelength management channel providing OAM&P capabilities similar to SONET/SDH in the metropolitan DWDM network. The per-wavelength management channel provides the robustness and QoS (quality of service) required for a carrier-class optical network. The management channel provides optical performance monitoring with alarm indication, along with failure isolation and protection mechanisms.
- A protection switching mechanism in software allows the Cisco ONS 15500 with PSM to protect against a fiber failure on a trunk interface. Hardware and software is used to offer a 1+1 protection mechanism that is similar to the SONET APS standard. When a loss of light or a configurable level of signal degradation is detected, the software will switch from the working fiber path to the protection fiber path in less than 50 ms.
- SNMP (Simple Network Management Protocol) support for the ONS 15530 line cards (8-port FC/GE aggregation card, 2.5-Gbps ITU trunk card, and PSM) and for the Cisco ONS 15540 ESPx PSM.
- The Cisco ONS 15530 supports power-on diagnostics as follows:
  - Tests the accessibility and basic functionality of the components present at the time of system bootup.
  - Isolates the faults to a FRU level.
  - Disables/enables the power-on diagnostics tests selectively through the CLI.
  - Allows the user to view the power-on diagnostics results at a later time through the CLI.

## New Features in Release 12.1(10)EV4

No new features are available for the Cisco ONS 15530 in Cisco IOS Release 12.1(10)EV4.

## Caveats

This section lists the caveats for each release. Use [Table 3](#) to determine the status of a particular caveat. In the table, “C” indicates a corrected caveat, and “O” indicates an open caveat.

*Table 3 Caveat Matrix for the Cisco ONS 15530*

DDTS Number	12.1(12c)EV1	12.1(12c)EV	12.1(10)EV4	12.1(10)EV2
<a href="#">CSCea01053</a>	C	O		
<a href="#">CSCea01398</a>	C	O		
<a href="#">CSCea02355</a>	C			
<a href="#">CSCea02647</a>	C			
<a href="#">CSCea02800</a>	C	O		
<a href="#">CSCea04546</a>	C			

**Table 3** *Caveat Matrix for the Cisco ONS 15530 (continued)*

DDTS Number	12.1(12c)EV1	12.1(12c)EV	12.1(10)EV4	12.1(10)EV2
CSCea06404	O			
CSCea12030	C	O		
CSCea12147	C	O		
CSCea12279	C			
CSCea12516	O			
CSCea13361	C	O		
CSCea24932	C	O		
CSCea34432	C	O		
CSCea44648	O			
CSCea45557	C	O		
CSCea46181	C			
CSCea46938	C			
CSCea46997	C	O		
CSCea48059	O			
CSCea48320	C			
CSCea48333	O			
CSCea49205	O			
CSCea49400	C			
CSCea50241	C			
CSCea50554	O			
CSCea50863	C	O		
CSCea51765	O			
CSCea52092	O			
CSCea52132	O			
CSCea52308	C			
CSCea54739	O			
CSCea55040	C	O		
CSCea57663	C	O		
CSCea60850	O	O		
CSCin37780	O			
CSCdw35704	C	C	C	
CSCdx02980	C	C	C	
CSCdx78717	C	C	O	O
CSCdx83919	C	C	O	O
CSCdy01768	C	C	C	C
CSCdy02850	C	C	C	

Table 3 Caveat Matrix for the Cisco ONS 15530 (continued)

DDTS Number	12.1(12c)EV1	12.1(12c)EV	12.1(10)EV4	12.1(10)EV2
CSCdy08228	C	C	C	
CSCdy20002	C	C	C	
CSCdy20010	C	C	C	
CSCdy20022	C	C	C	
CSCdy40864	C	C	C	
CSCdy40882	C	C	C	
CSCdy46550	C	C	O	O
CSCdy49249	C	C	C	
CSCdy53288	C	C	C	
CSCdy59551	C	C	O	O
CSCdy61641	C	C	C	
CSCdy63359	C	C	C	
CSCdy65411	C	C	C	
CSCdy66507	C	C	C	O
CSCdy68224	C	C	C	
CSCdy68257	C	C	C	
CSCdy68663	C	C		
CSCdy69086	C	C	C	O
CSCdy72463	C	C	C	C
CSCdy78546	C	C	C	
CSCdy81501	C	C	C	
CSCdy82663	C	C	C	
CSCdy85125	C	C	C	
CSCdy85563	C	C	C	
CSCdy88154	C	C	C	
CSCdz00116	C	C	C	
CSCdz02638	C	C		
CSCdz04036	C	C	C	
CSCdz06004	C	C	C	
CSCdz06602	C	C	C	
CSCdz08641	C	C	O	
CSCdz08774	C	C	C	
CSCdz11505	C	C	C	
CSCdz12139	C	C	C	
CSCdz12200	C	C	O	
CSCdz13538	C	C	C	

**Table 3** *Caveat Matrix for the Cisco ONS 15530 (continued)*

DDTS Number	12.1(12c)EV1	12.1(12c)EV	12.1(10)EV4	12.1(10)EV2
CSCdz15649	C	C	O	
CSCdz16457	C	C	C	
CSCdz16522	C	C		
CSCdz20508	C	C	C	
CSCdz20982	C	O		
CSCdz28582	C	C	C	
CSCdz33672	C	C	C	
CSCdz33752	C	C	C	
CSCdz34105	C	C	C	
CSCdz34254	C	C	C	
CSCdz36187	C	C	C	
CSCdz36234	C	C	O	
CSCdz36420	C	C	C	
CSCdz36823	C	C	C	
CSCdz38508	C	C	C	
CSCdz39711	C	C	C	
CSCdz40904	C	C	C	
CSCdz42349	C	C	O	
CSCdz43222	C	C		
CSCdz43372	C	C	C	
CSCdz43833	C	C	C	
CSCdz44366	C	C	O	
CSCdz44515	C	C	C	
CSCdz49152	C	C		
CSCdz52675	C	C		
CSCdz55350	C			
CSCdz58566	C	C		
CSCdz59146	O	O		
CSCdz62286	C	O		
CSCdz62296	O	O		
CSCdz62922	C	C		
CSCdz64021	O	O		
CSCdz66093	O	O		
CSCdz66609	O	O		
CSCdz67967	C	C		
CSCdz69573	C	C		

Table 3 Caveat Matrix for the Cisco ONS 15530 (continued)

DDTS Number	12.1(12c)EV1	12.1(12c)EV	12.1(10)EV4	12.1(10)EV2
<a href="#">CSCdz69610</a>	C	O		
<a href="#">CSCdz69676</a>	C	C		
<a href="#">CSCdz74084</a>	C	C		
<a href="#">CSCdz74531</a>	C	O		
<a href="#">CSCdz75536</a>	C	C		
<a href="#">CSCdz75949</a>	C	O		
<a href="#">CSCdz76545</a>	O	O		
<a href="#">CSCdz76637</a>	C	C		
<a href="#">CSCdz76792</a>	C	C		
<a href="#">CSCdz76891</a>	C	O		
<a href="#">CSCdz76991</a>	C	C		
<a href="#">CSCdz77094</a>	C	O		
<a href="#">CSCdz77288</a>	C	O		
<a href="#">CSCdz79697</a>	C	O		
<a href="#">CSCdz79922</a>	C	O		
<a href="#">CSCdz80669</a>	O			
<a href="#">CSCdz81953</a>	C	O		
<a href="#">CSCdz82407</a>	C	O		
<a href="#">CSCdz85221</a>	C	O		
<a href="#">CSCdz86904</a>	C	O		
<a href="#">CSCdz89270</a>	O	O		

This section describes the caveats in the Cisco ONS 15530.

- [CSCea01053](#)

**Symptom:** The system can reload unexpectedly if there are APS groups configured on 8-port FC/GE aggregation card interfaces and there is a state change of one or more of the ports or cross-connected interfaces.

**Workaround:** None.

- [CSCea01398](#)

**Symptom:** If multiple APS groups are configured, and one group is in not associated state because there are working and protection ports in the admin down state, any Rx fail and recover of other groups causes both lasers to turn on in those groups.

**Workaround:** Disable the APS group if ports of any APS groups are in admin down state.

- [CSCea02355](#)

**Symptom:** Cisco routers and switches running Cisco IOS software and configured to process Internet Protocol version 4 (IPv4) packets are vulnerable to a Denial of Service (DoS) attack. A rare sequence of crafted IPv4 packets sent directly to the device may cause the input interface to stop

processing traffic once the input queue is full. No authentication is required to process the inbound packet. Processing of IPv4 packets is enabled by default. Devices running only IP version 6 (IPv6) are not affected.

**Workaround:** Cisco has made software available, free of charge, to correct the problem. This advisory is available at <http://www.cisco.com/warp/public/707/cisco-sa-20030717-blocked.shtml>

- [CSCea02647](#)

**Symptom:** The **show facility-alarm status** command output does not show loss of sync, loss of light, or signal failure alarms on a waveethernetphy interface on a 10-Gbps ITU trunk card or 2.5-Gbps ITU trunk card after a **shutdown/no shutdown** command sequence on the interface. The **show interfaces** command displays that the alarm persists.

**Workaround:** None.

- [CSCea02800](#)

**Symptom:** You cannot reconfigure new cross connections after reinserting a 10-Gbps ITU trunk card if a card fails due to low voltage of another hardware failure and is removed, the flow identifier values programmed in the 10-Gbps ITU trunk card are not cleared. Flow identifier mismatch errors are displayed and cross connections are not established.

**Workaround:** OIR the 10-Gbps trunk card.

- [CSCea04546](#)

**Symptom:** Cannot disable SNMP-server traps for TTY messages on a global basis.

**Workaround:** Configure traps on a per SNMP-server host basis.

- [CSCea06404](#)

**Symptom:** Both working and protection interfaces come up as the standby when configuring splitter APS using ENT-FFP-OCH. Both of the wavepatch interfaces are up in the transponder line card.

**Workaround:** Issue an **aps enable/disable** command sequence or OIR the transponder line card.

- [CSCea12030](#)

**Symptom:** The y-cable connection does not come up while connected to a Brocade switch.

**Workaround:** None.

- [CSCea12147](#)

**Symptom:** If multiple cross connections are created and deleted on an 8-port FC/GE aggregation card, the local or remote system might reload unexpectedly. This rarely happens.

**Workaround:** None.

- [CSCea12279](#)

**Symptom:** The **no** form of VOA attenuation commands might wipe out positive forms those commands

**Workaround:** None.

- [CSCea12516](#)

**Symptom:** If a command is partially successful, an error code for the parameter that cannot be modified is displayed.

**Workaround:** None.

- [CSCea13361](#)

**Symptom:** An internal error and a traceback results when a threshold group with Tx-CRC failure and Tx-CRC degrade is modified such that the index reaches 63 and there is an attempt to add a new Tx-CRC threshold.

**Workaround:** None.
- [CSCea24932](#)

**Symptom:** If a card with a bad IDPROM is detected in the system, the system crashes during bootup or online insertion.

**Workaround:** None.
- [CSCea34432](#)

**Symptom:** If a timer is rebooted and the CLO link is up and running, the link briefly turns off the lasers. This is seen as loss of light and the FLC turns off the transmitter laser on the transponder line card. When the timer is back on, the FLC does not turn the transmitter laser on.

**Workaround:** Issue the **shutdown/no shutdown** command sequence or OIR the card.
- [CSCea44648](#)

**Symptom:** If the **connect** command is executed, which results in traffic intermixing between ESCON/ Fibre Channel/ FICON and Gigabit Ethernet/ ESCON/Fibre Channel/FICON, traffic might slow down if the proper preconfiguration commands are not configured for the corresponding line cards.

**Workaround:** Configure the required preconfiguration commands.
- [CSCea45557](#)

**Symptom:** BDI-E (Backward Defect Indication) is asserted on FC/GE interfaces when there is no remote Tx fault. This does not affect functionality.

**Workaround:** None
- [CSCea46181](#)

**Symptom:** After a CPU switch module switchover, persistent alarms on an administratively shut interface might be erroneously reported when they exist. When a port interface is administratively down, alarm conditions should not be reported for that interface even though they exist.

**Workaround:** After a CPU switch module switchover, issue a **no shutdown/shutdown** command sequence on the already administratively shut interfaces. This ceases to report alarm conditions persistent on the administratively shut interfaces.
- [CSCea46938](#)

**Symptom:** If an ESCON aggregation card cross connected to a 10-Gbps ITU trunk card is removed and reserved flow identifier configured, reserved flow identifiers are not removed.

**Workaround:** OIR the 10-Gbps ITU trunk card to clear the flow identifiers.
- [CSCea46997](#)

**Symptom:** Catalyst 5000 FDDI link does not come up when connected over a Cisco ONS 15530 point-to-point topology using multimode transponders.

**Workaround:** Set the clock rate to 500 Mhz.



- [CSCea48059](#)

**Symptom:** The **show cdl** flow identifier does not show the reserved flow id configured under the portgroup.

**Workaround:** Use the **show interfaces portgroup x/y/z** command to display the configured group.

- [CSCea48320](#)

**Symptom:** After a CPU switch module switchover, if the **no shutdown** command is issued on the OSC wave interface, it is in the UP state even when the OSC module is not connected to the OADM module.

**Workaround:** Issue the **shutdown/no shutdown** command sequence on the OSC wave interface.

- [CSCea48333](#)

**Symptom:** APS state is not correct after an online removal and reinsertion of the local ESCON aggregation card. This happens only if the following sequence of events occur:

1. Shut down of the remote laser (working path)
2. Removal of the ESCON aggregation card (local)
3. Shut down of the local laser (working path)
4. Insertion of the ESCON aggregation card (local)

After the local ESCON aggregation card is reinserted, the protection waveethernetphy interface does not become active. At this point, the working interface is active even though it is in the down state.

**Workaround:** Remove and reinsert the protection and working 2.5-Gbps ITU trunk cards.

- [CSCea49205](#)

**Symptom:** The 10-Gbps ITU trunk card waveethernetphy interface does not come up after the peer laser is turned back on after a CPU switch module switchover. This happens only if a laser shut is carried across the CPU switch module switchover on the local system.

**Workaround:** Issue a **shutdown/no shutdown** command sequence on the local waveethernetphy interface

- [CSCea49400](#)

**Symptom:** If a Cisco ONS 15530 system with a 7.x hardware version of the 10-Gbps ITU trunk card is booted with the ons15530-i-mz.121-12c.ev image, the following warning displays:

```
Power-on Diagnostics: ----- .....FF.. . . . .
POD-CRITICAL_WARNING: Slot: 3, Hardware and Firmware are not compatible. ....
.F..... End of POD.
```

**Workaround:** Turn off power-on diagnostics, save the configuration, and reboot to get rid of the warning.

- [CSCea50241](#)

**Symptom:** With the duplicate reserved flow identifiers configured and OIR of the ESCON aggregation card, cross connection is rejected, but the client flow identifiers are not removed.

**Workaround:** OIR the 10-Gbps ITU trunk card.

- [CSCea50554](#)

**Symptom:** When the active 10-Gbps ITU trunk card in a line card protected configuration is removed, the following warning message displays:

```
idprom_get_line_wavelength: Unexpected card type: 4360
```

**Workaround:** None.

- [CSCea50863](#)

**Symptom:** Both active and standby lasers are on for a few seconds on a y-cable. This condition can cause Brocade ports to be disabled which requires a manual intervention to enable the ports.

**Workaround:** None.
- [CSCea51765](#)

**Symptom:** The wave interface goes down after restoring protection trunk failure followed by working trunk failure and restore on a transponder line card configured for unidirectional y-cable protection.

**Workaround:** Issue a **shutdown/ no shutdown** command sequence on the wave interface.
- [CSCea52092](#)

**Symptom:** After booting the system, power coming out of the OSC module seems to be null even though the laser is enabled.

**Workaround:** OIR the OSC module or carrier motherboard.
- [CSCea52132](#)

**Symptom:** The protection interface comes up first after an OIR of the 2.5-Gbps ITU trunk card, causing APS to switch to protection channel after OIR of the card.

**Workaround:** None.
- [CSCea52308](#)

**Symptom:** With the duplicate reserved flow identifiers configured, if line card protection is configured, both 10-Gbps ITU trunk cards end up in active state.

**Workaround:** Assign a unique reserved flow identifiers to the ESCON aggregation card ports.
- [CSCea54739](#)

**Symptom:** No autonomous messages are generated in TL1 for clearing alarms when an escon port is shutdown.

**Workaround:** None
- [CSCea55040](#)

**Symptom:** Backplane Ethernet loopback test fails occasionally on 10-Gbps ITU trunk cards.

**Workaround:** None.
- [CSCea57663](#)

**Symptom:** With reserved flow identifiers configured under a port group, after a CPU switch module switchover is performed both client and reserved flow identifiers are programmed.

**Workaround:** None.
- [CSCea60850](#)

**Symptom:** A keep alive timeout results on an FC interface even with correct flow identifier, cross-connects, and trunk connections. The hardware registers show an Uplink FIFO Full condition in the peer FC interface. No traffic flows out of the peer interface.

**Workaround:** Change the encapsulation to GE and then change it back to FC or remove and insert the SFP to reset the FIFOs and clear the Full condition

- [CSCin37780](#)  
**Symptom:** The correct hexadecimal value does not display for cifthIfThresholdsFired object for some particular bitmap patterns.  
**Workaround:** None.
- [CSCdw35704](#)  
**Symptom:** Unchecked buffer boundary in NTP.  
**Workaround:** None.
- [CSCdx02980](#)  
**Symptom:** When the NME is connected to an auto-sensing switch or hub, going from 10 Mbps and half-duplex to 100 Mbps and half-duplex (or similarly 10 Mbps and full-duplex to 100 Mbps and full-duplex) on fastethernet0 results in the link going down.  
**Workaround:** Configure fastethernet0 as duplex auto and speed auto.
- [CSCdx78717](#)  
**Symptom:** A change in optical threshold condition at a WB-VOA or PB-OE module power monitor might not be detected if the condition is temporary and does not last for more than a second.  
**Workaround:** None
- [CSCdx83919](#)  
**Symptom:** If you swap the ESCON aggregation card with the 10-Gbps ITU trunk card in a given slot, the following error message is seen four times:  

```
%BPE-3-NOT_REGISTERED: Interface[EthernetDcc9/0/0] MAC is not registered.
```

**Workaround:** None.
- [CSCdy01768](#)  
**Symptom:** The CPU switch module LED for alarms is not cleared even though the Optical Power Monitoring alarm is cleared. There is no functionality problem. On a CPU switch module switchover this alarm LED is cleared and gives the correct alarm status.  
**Workaround:** OIR the card on which the alarm was generated.
- [CSCdy02850](#)  
**Symptom:** When both wavepatch interfaces are in an administrative down state, a low alarm does not appear on the standby wavepatch interface after a **no shutdown** is done on the wave interface.  
**Workaround:** Issue the **shutdown/no shutdown** command sequence on the wavepatch interface.
- [CSCdy08228](#)  
**Symptom:** Interface reports up/up even when there is no light source connected.  
**Workaround:** Issue a **shutdown/no shutdown** command sequence on the interface.
- [CSCdy20002](#)  
**Symptom:** A transparent interface carrying Gigabit Ethernet traffic and configured with gigabit Fibre Channel encapsulation shows a good quality signal on the **show interfaces transparent** command output and does not assert any ingress alarms. The wave interface asserts loss of lock and loss of sync alarms.  
**Workaround:** OIR the transponder module to bring it to the correct state.

- [CSCdy20010](#)

**Symptom:** LoF (loss of frame) alarms are not reasserted after a **shutdown/no shutdown** command sequence on both the transparent and wave interfaces on the transponder line card.

**Workaround:** Disable and reenable monitoring on the transparent interface to reassert the alarms.
- [CSCdy20022](#)

**Symptom:** The **show facility-alarm status** command status does not report existing LoF/LoSync/LoLock alarms after an OIR.

**Workaround:** Disable and enable monitoring back to reassert existing alarms in the **show facility-alarm status** command output.
- [CSCdy40864](#)

**Symptom:** A software compatibility problem causes the active CPU switch module to reset the standby CPU switch module.

**Workaround:** None.
- [CSCdy40882](#)

**Symptom:** The **show hardware** command output displays information about a CPU switch module that has been removed from the system.

**Workaround:** None.
- [CSCdy46550](#)

**Symptom:** Ethernetdcc and OSC wave interfaces come up with default traffic-shaping parameters. Because this is the default, by removing the configuration using the **no** form of the command, the parameter value should revert back to the default value, which is not being done.

**Workaround:** Reconfigure the traffic-shaping parameters.
- [CSCdy49249](#)

**Symptom:** If a line card that was removed prior to switchover is inserted during switchover, the line card might not come up properly.

**Workaround:** Insert the line card after switchover is complete.
- [CSCdy53288](#)

**Symptom:** The system might crash at `is_optical_ifstatus_up`.

**Workaround:** None.
- [CSCdy59551](#)

**Symptom:** Issuing a **shutdown** command on the active wavepatch of a nonsplitter card brings the waveethernetphy interface down and reports loss of light in the output of the **show interfaces** command, but traffic continues to flow.

**Workaround:** If the intent is to stop traffic, issue a **shutdown** command on the waveethernetphy interface or wave interface.
- [CSCdy61641](#)

**Symptom:** Following a CPU switch module crash and switchover, the **show redundancy** command issued on the new active CPU switch module displays “Not known” for the Reported Switchover Reason field.

**Workaround:** Enter **show version** from the standby CPU switch module console to see additional information.

- [CSCdy63359](#)  
**Symptom:** The **getnext** and **getbulk** commands do not function properly after a CPU switch module switchover.  
**Workaround:** None.
- [CSCdy65411](#)  
**Symptom:** APS traps mode mismatch takes 30 minutes for completion.  
**Workaround:** None.
- [CSCdy66507](#)  
**Symptom:** Low alarm is not cleared on the wavepatch interface on a transponder line card.  
**Workaround:** Issue a **shutdown/no shutdown** command sequence on the wavepatch interface where the alarm is seen.
- [CSCdy68224](#)  
**Symptom:** On the 10-Gbps ITU trunk card, the CDL HEC and CRC error counters are not incremented upon reaching the threshold limits.  
**Workaround:** None.
- [CSCdy68257](#)  
**Symptom:** When trying to modify the cApsConfigSpan object through SNMP is set to an unsupported value, the value is not set but no error is reported.  
**Workaround:** None.
- [CSCdy68663](#)  
**Symptom:** Administrative shutdown on a waveethernetphy subinterface does not take affect. The displayed in the command output is “admin shut” but all the traffic flows through and the subinterface is fully functional.  
**Workaround:** None.
- [CSCdy69086](#)  
**Symptom:** After removing and reconnecting the fiber cable, the active wavepatch on the transponder line card is down even after unshutting the wave interface.  
**Workaround:** Use a **shutdown** command to clear the alarms on the wave interface.
- [CSCdy72463](#)  
**Symptom:** Spurious memory access is seen when issuing the **show tech** command on the standby CPU switch module.  
**Workaround:** None
- [CSCdy78546](#)  
**Symptom:** PTOPO configuration rows can be configured for nonexistent interfaces.  
**Workaround:** None.
- [CSCdy81501](#)  
**Symptom:** The **show connect intermediate** command output does not display all the protection paths when a switch fabric cross connect is used.  
**Workaround:** Display the information using the **show connect** command.

- [CSCdy82663](#)  
**Symptom:** The active CPU switch module incorrectly detects a faulty switch fabric port, causing a switchover to the standby CPU switch module.  
**Workaround:** None.
- [CSCdy85125](#)  
**Symptom:** When copying or reading a file to or from Compact flash (disk0), a transient error with the following message might appear and read/write access to compact flash is terminated:  

```
ATA_Status timeout waiting for <1/2/3>
```

**Workaround:** None.
- [CSCdy85563](#)  
**Symptom:** Defect-indication error messages do not indicate if the defect-indication bit was cleared or asserted for that interface.  
**Workaround:** None.
- [CSCdy88154](#)  
**Symptom:** Some interfaces are not be available to the NMS station since the agent does not create them on OIR.  
**Workaround:** Reload the system after removal/insertion of the cards.
- [CSCdz00116](#)  
**Symptom:** APS message channel configured for UDP/IP does not work over two IP hops. The UDP/IP packets are dropped at the end of the second hop.  
**Workaround:** None.
- [CSCdz02638](#)  
**Symptom:** Loopback interfaces cannot be deleted from configuration.  
**Workaround:** None.
- [CSCdz04036](#)  
**Symptom:** Switch fabric protection is not disabled if the standby CPU switch module is in ROM monitor mode. As a result if an RxFail is noticed on any fabric port, that fabric port will switch over its receive to the standby CPU switch module.  
**Workaround:** None.
- [CSCdz06004](#)  
**Symptom:** The **redundancy reload shelf** command on the active CPU switch module can cause a switchover if the peer CPU switch module is in ROM monitor mode.  
**Workaround:** Use the **reload** command to reload the active CPU switch module, if the peer CPU switch module is in ROM monitor mode.
- [CSCdz06602](#)  
**Symptom:** Issuing **getbulk** command to retrieve PM parameters returns 0 row.  
**Workaround:** None.
- [CSCdz08641](#)  
**Symptom:** The **ciscoFlashPartitionFileCount** returns an incorrect number of files on the CompactFlash card.  
**Workaround:** None.

- [CSCdz08774](#)

**Symptom:** No ciscoFlashDeviceChangeTrap trap is generated when a CompactFlash device is removed or inserted.

**Workaround:** None.
- [CSCdz11505](#)

**Symptom:** When forward laser control is disabled on all 10 esconphy ports and they are administratively shut down, packets are still sent to the backplane.

**Workaround:** None.
- [CSCdz12139](#)

**Symptom:** OPM feature does not work for nonsplitter transponder line cards.

**Workaround:** None.
- [CSCdz12200](#)

**Symptom:** Invalid mac-address or ip-address values can be made via SNMP. No error check is done.

**Workaround:** Delete the entry through SNMP or with the **topology neighbor disable** command.
- [CSCdz13538](#)

**Symptom:** Egress Loss of Signal alarm is not reasserted in the **show facility alarm status** command output after the hardware module power is turned off and turned back on.

**Workaround:** None.
- [CSCdz15649](#)

**Symptom:** Incorrect alarms are reported on wavepatch interfaces when the parent wave interface is Admin shut.

**Workaround:** None.
- [CSCdz16457](#)

**Symptom:** If a system is rebooted and a transient link failure condition occurs on 10-Gbps ITU trunk cards or 10-Gbps uplink cards, the system might continuously send backward defect indications.

**Workaround:** None.
- [CSCdz16522](#)

**Symptom:** Error messages appear when a 10-Gbps ITU trunk card or 10-Gbps uplink card with crossconnects to the switch fabric is removed.

**Workaround:** None.
- [CSCdz20508](#)

**Symptom:** The wavepatch interfaces are stuck in the down state after using the **shutdown/no shutdown** command sequence on the wave interface with splitter APS after the trunk fiber has been cut.

**Workaround:** None.
- [CSCdz20982](#)

**Symptom:** If the peer node is rebooted, the interfaces connected to that node experience some flaps in the bootup sequence. These flaps trigger unnecessary APS flaps in the near-end node.

**Workaround:** None.

- [CSCdz28582](#)  
**Symptom:** After a fiber cut, the OSC wave interface remains up with signal quality GOOD.  
**Workaround:** Use the **shutdown/no shutdown** command sequence on the OSC wave interface.
- [CSCdz33672](#)  
**Symptom:** The standby CPU switch module can be stuck in trying to register control ports.  
**Workaround:** Enter the **redundancy reload peer** command on the active CPU switch module.
- [CSCdz33752](#)  
**Symptom:** In bidirectional APS, if both NEs (network elements) have the same priority request, the master/slave determination fails, leading to both claiming the control and resulting in not sending a REVERSE-REQUEST.  
**Workaround:** None.
- [CSCdz34105](#)  
**Symptom:** When a **shutdown/no shutdown** command sequence is done on a waveethernetphy interface that is in the UP state, the Signal Condition shows Loss of Lock.  
**Workaround:** None.
- [CSCdz34254](#)  
**Symptom:** In bidirectional line card protection, if the APS group is associated with a working interface with an invalid cross connect invalid and protection interface with an active cross connect, APS erroneously sets the APS channel request on the working to WAIT-TO-RESTORE. This does not recover even when the working cross connect is made dormant by the connection manager. As a result both NEs are stay protection until an event (that has higher priority than WTR) is triggered.  
**Workaround:** None.
- [CSCdz36187](#)  
**Symptom:** Splitter APS protection comes up as active on system bootup.  
**Workaround:** None.
- [CSCdz36234](#)  
**Symptom:** Dynamic discovery of topology via CDP on the tengigethernetphy interface is not configurable.  
**Workaround:** None.
- [CSCdz36420](#)  
**Symptom:** In a preconfigured APS group (for the case when the interfaces do not exist), if the group is configured for revertive mode, it cannot be enabled.  
**Workaround:** Enable the group after the interfaces defined in the APS group are created or remove the revertive configuration from the preconfigured APS group and then enabling the group.
- [CSCdz36823](#)  
**Symptom:** The CPU switch module crashes after midnight with optical performance monitoring on when an interface capable of performance monitoring is shut down before 00-00hrs and unshut after midnight.  
**Workaround:** None.



- [CSCdz38508](#)

**Symptom:** In unidirectional revertive APS, after online removal is followed by online insertion of working and protection elements on both NEs, the active signal might be received from the protection line instead of the working line.

**Workaround:** Do a manual or force switch to working line.
- [CSCdz39711](#)

**Symptom:** SEF errors are repeatedly asserted on the console and are not soaked.

**Workaround:** None.
- [CSCdz40904](#)

**Symptom:** When an interface is shut down administratively, the **show aps detail** command shows the channel request as sf-lp; however, a get on the object cApsChanStatusCurrent does not reflect sf-lp in the corresponding bits.

**Workaround:** None.
- [CSCdz42349](#)

**Symptom:** A connection to a different subinterface on the same 10-Gbps ITU trunk card or 10-Gbps uplink card is accepted, but crossconnection fails in the switch fabric.

**Workaround:** None.
- [CSCdz43222](#)

**Symptom:** The MTU setting on the 10-Gbps ITU trunk card interface is not displayed in the **show interfaces** command output. Transmit side is reporting oversize frames.

**Workaround:** None.
- [CSCdz43372](#)

**Symptom:** APS group is displayed as “not associated” in **show aps detail** command output.

**Workaround:** Do a **shutdown/no shutdown** command sequence to either or both interfaces in the APS group. This causes a state change of the interfaces. You can also perform a **aps disable/aps enable** command sequence to the APS group.
- [CSCdz43833](#)

**Symptom:** Y-cable transponder protection does not come up as active after removing lockout.

**Workaround:** Perform a **aps disable/aps enable** command sequence to the APS group.
- [CSCdz44366](#)

**Symptom:** With line card protection configured, the switch fabric on both the active CPU switch module and the standby CPU switch module are out of sync.

**Workaround:** Insert all the cards and perform a **no connect** command and then **connect** command.
- [CSCdz44515](#)

**Symptom:** CDR loss of lock is not reported after Sysplex CLO/ETR encapsulation on a transparent interface.

**Workaround:** Perform a **shutdown/no shutdown** command sequence on the interface to correct the CDR loss of lock reporting.

- [CSCdz49152](#)

**Symptom:** Tx-CRC and CDL-HEC error counters do not show the proper values in the **show interfaces** command output for the waveethernetphy interface.

**Workaround:** None.
- [CSCdz52675](#)

**Symptom:** Wave interfaces see continuous flapping when the wavepatch interface on a nonsplitter card is shut.

**Workaround:** None.
- [CSCdz55350](#)

**Symptom:** If two different trunk cards in the same slot are hot-swapped, the newly inserted trunk card inherits the configuration of the ethernetdcc interface from the removed trunk card.

Example: If a user swaps a 2.5-Gbps ITU trunk card with a 10-Gbps ITU trunk card in the same slot, the ethernetdcc interface for the newly inserted 10-Gbps ITU trunk card inherits the ethernetdcc interface configuration from the removed 2.5-Gbps ITU trunk card.

**Workaround:** None.
- [CSCdz58566](#)

**Symptom:** Wavepatch interface configurations are retained when swapping a 10-Gbps ITU trunk card, 2.5-Gbps ITU trunk card, or transponder line card.

**Workaround:** None.
- [CSCdz59146](#)

**Symptom:** Loss of connectivity via the ethernetdcc interface occurs when splitter protection is configured and the waveethernetphy interface is shut down while protection on the wavepatch is active and the working wavepatch is down.

**Workaround:** Do not shut down the waveethernetphy interface while the working wavepatch is down.
- [CSCdz62286](#)

**Symptom:** If bidirectional nonrevertive splitter APS is configured on the 10-Gbps or 2.5-Gbps trunk cards, a simultaneous OIR of the local and remote cards might cause the APS to switch to protection wavepatch when the card comes up.

**Workaround:** Enable revertive mode if the working wavepatch comes up as Active.
- [CSCdz62296](#)

**Symptom:** The PSM is incorrectly recognized as an OADM module by Cisco IOS images that do not support the PSM.

**Workaround:** Upgrade software to 12.1(12c)EV.
- [CSCdz62922](#)

**Symptom:** When lockout on the protection path is removed with a signal failure on working, the splitter switches back and forth between protection and working on 2.5-Gbps and 10-Gbps splitter ITU trunk cards.

**Workaround:** None.

- [CSCdz64021](#)

**Symptom:** While performing an OIR of a protection card in a y-cable configuration, the local and remote working port is flooded with CRC errors.

**Workaround:** Disconnect the standby branch of the y-cable during standby line card or SFP insertion.
- [CSCdz66093](#)

**Symptom:** 10-Gbps ITU trunk cards fail during power-on diagnostics at the Quadphy loopback test (qphy-fabric-lb).

**Workaround:** None.
- [CSCdz66609](#)

**Symptom:** Traffic loss of 30-45 seconds might occur when a y-cable APS configuration with protection switchover is used with the Catalyst 6000 family.

**Workaround:** Disable auto-negotiation and enable debounce timer with 100-ms delay on Catalyst 6000 family using the **set port debounce mod/port enable** command sequence.
- [CSCdz67967](#)

**Symptom:** Update alarms and add new alarms for new cards.

**Workaround:** None.
- [CSCdz69573](#)

**Symptom:** Controller type for the backplane is not displayed in the **show hardware detail** command output.

**Workaround:** None.
- [CSCdz69610](#)

**Symptom:** The following problems might occur on 8-port FC/GE aggregation cards:

  - The interface is missing from the running-configuration after the insertion of SFP. The system message for the insertion will not be printed to the console.
  - The interface is present in the running-configuration after the removal of SFP. The system message for the removal will not be printed to the console.

**Workaround:** OIR the 8-port FC/GE aggregation card to recover from the problematic state.
- [CSCdz69676](#)

**Symptom:** The **show optical filter** command output shows invalid information regarding the interface wavelength for filters.

**Workaround:** None.
- [CSCdz74084](#)

**Symptom:** The system crashes when WB-VOA and PB-OE modules are removed.

**Workaround:** None.

- [CSCdz74531](#)  
**Symptom:** If the primary CPU switch module crashes due to a send break after executing POD and before booting the system image completely, the new primary CPU switch module comes up in Cisco IOS with junk entries programmed in the SII lookup tables of the 10-Gbps ITU trunk cards present in the chassis. As a result, all 10-Gbps ITU trunk cards are stuck in the decoder and the floating channels are enabled.  
**Workaround:** None.
- [CSCdz75536](#)  
**Symptom:** Transmit failure is cleared before APS is notified of failure and does not take correct action.  
**Workaround:** Issue a **shutdown/no shutdown** command sequence on the interface.
- [CSCdz75949](#)  
**Symptom:** Disconnecting a 10-port ESCON or 8-port FC/GE aggregation card from a 2.5-Gbps ITU trunk card can cause two ports to have the same flow identifier.  
**Workaround:** Avoid assigning the same flow identifier to the ports in the portgroup.
- [CSCdz76545](#)  
**Symptom:** The gt-interrupt and interrupt0 tests on the CPU switch module fail.  
**Workaround:** None.
- [CSCdz76637](#)  
**Symptom:** Because of the inability to synchronize the standby CPU switch module (with latest Cisco IOS image) has lower capabilities than the active processor (older EV4 image). The following alarm appears:  

```
%CPU_REDUN-3-CAPABILITIES: Alarm: ASSERT, MINOR, PSC card 5, Standby with lower capabilities
```

**Workaround:** None.
- [CSCdz76792](#)  
**Symptom:** The WB-VOA module functional image version is different in the **show hardware** and **show controllers** command outputs.  
**Workaround:** None.
- [CSCdz76891](#)  
**Symptom:** On a splitter APS switchover based on a CVRD SF condition, the SF threshold exceeded count is not incremented. There is also no log or event on the console that differentiates between switches overdue to CVRD SF or loss-of-lock.  
**Workaround:** None.
- [CSCdz76991](#)  
**Symptom:** High alarm and low alarm status not cleared for WB-VOA or PB-OE modules when optical power is in a high warning or low warning state.  
**Workaround:** None.

- [CSCdz77094](#)  
**Symptom:** When a new line card is inserted and the backplane connection does not happen properly or there is some other accessibility issue, the driver will see card access failure. But no alarm is raised to the Network Management station.  
**Workaround:** None.
- [CSCdz77288](#)  
**Symptom:** A y-cable switchover from working to protection does not work. The **show aps group** command output shows that “auto fail over” is disabled and transmitting sf-lp from protection port.  
**Workaround:** None.
- [CSCdz79697](#)  
**Symptom:** Removing the configured threshold for CDL HEC and CRC removes the template (and default values) resulting in CDL HEC and CRC errors.  
**Workaround:** Apply a threshold group for CRC/CDLHEC from CLI and remove it.
- [CSCdz79922](#)  
**Symptom:** When removing a 2.5-Gbps ITU trunk card from the shelf, the following error message might appear:  

```
%LC_2P5G-3-INTERNAL_CRITICAL: physubcard/idprom NULL in
city_island_get_laser_frequency
```

**Workaround:** None.
- [CSCdz80669](#)  
**Symptom:** After a CPU switch module switchover, sometimes ptopMIB and ptopoExtMibs are not readable or settable through SNMP.  
**Workaround:** The values can be read or set by using the CLI.
- [CSCdz81953](#)  
**Symptom:** When waveethernetphy interface on a 2.5-Gbps ITU trunk card with splitter APS configured is shutdown, loss-of-lock and loss-of-sync alarms are reported in the output of the **show facility-alarm status** command.  
**Workaround:** None.
- [CSCdz82407](#)  
**Symptom:** A fan tray removal does not trigger any alarms.  
**Workaround:** None.
- [CSCdz85221](#)  
**Symptom:** If ESCON data traffic is mixed with Gigabit Ethernet traffic cross connected to the same 10-GE ITU trunk card, ESCON traffic experiences errors. Ports on the ESCON director might not even come up.  
**Workaround:** Assign valid flow identifiers to all 10 ports on the ESCON aggregation card.
- [CSCdz86904](#)  
**Symptom:** Currently the Tx-buffer configuration is allowed on the port group interface on ESCON. This CLI has to be moved to the client interface.  
**Workaround:** Configure the CLI from the portgroup interface on the ESCON card.

- [CSCdz89270](#)

**Symptom:** OFC (open fibre control) is not supported with Fibre Channel on the 8-port FC/GE aggregation card. The link might not initialize if an 8-port FC/GE aggregation card is used with older Fibre Channel equipment that employ OFC laser safety mechanisms.

**Workaround:** None.

## Limitations and Restrictions

This section provides limitations and restrictions for Cisco ONS 15530 hardware and software.

### Transponder Modules

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

- CRC errors might occur with 2-Gbps Fibre Channel on single-mode transponders 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 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 client side receiver. The average transmitted power level from the GBIC does not violate the overload specification of the transponder 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.

### CPU Switch Modules

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

- If both CPU switch modules are removed, all aggregation cards, OSC modules, transponder line cards, ITU trunk cards, and uplink cards are shut down.



**Note**

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Traffic on pass through optical channels (which passively pass through the OADM modules) are not affected by the removal of the processor cards.

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## Related Documentation

Refer to the following documents for more information about the Cisco ONS 15530:

- [Regulatory Compliance and Safety Information for the Cisco ONS 15500 Series](#)
- [Cisco ONS 15530 Planning Guide](#)
- [Cisco ONS 15530 Hardware Installation Guide](#)
- [Cisco ONS 15530 Optical Transport Turn-Up and Test Guide](#)
- [Cisco ONS 15530 Cleaning Procedures for Fiber Optic Connections](#)
- [Cisco ONS 15530 Configuration Guide](#)
- [Cisco ONS 15530 Command Reference](#)
- [Cisco ONS 15530 System Alarms and Error Messages](#)
- [Cisco ONS 15530 Troubleshooting Guide](#)
- [Network Management for the Cisco ONS 15530](#)
- [Cisco ONS 15530 TLI Commands](#)
- [MIB Quick Reference for the Cisco ONS 15500 Series](#)
- [Cisco ONS 15530 Software Upgrade Guide](#)

## Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

### Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

International Cisco web sites can be accessed from this URL:

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

### Documentation CD-ROM

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

Registered Cisco.com users can order the Documentation CD-ROM (product number DOC-CONDOCCD=) through the online Subscription Store:

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

## Ordering Documentation

You can find instructions for ordering documentation at this URL:

[http://www.cisco.com/univercd/cc/td/doc/es\\_inpk/pdi.htm](http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm)

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:  
<http://www.cisco.com/en/US/partner/ordering/index.shtml>
- Registered Cisco.com users can order the Documentation CD-ROM (Customer Order Number DOC-CONDOCCD=) through the online Subscription Store:  
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

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## Obtaining Technical Assistance

Cisco provides Cisco.com, which includes the Cisco Technical Assistance Center (TAC) Website, as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from the Cisco TAC website. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC website, including TAC tools and utilities.

## Cisco.com

Cisco.com offers a suite of interactive, networked services that let you access Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com provides a broad range of features and services to help you with these tasks:

- Streamline business processes and improve productivity
- Resolve technical issues with online support



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<http://www.cisco.com>

## Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC website and the Cisco TAC Escalation Center. The avenue of support that you choose depends on the priority of the problem and the conditions stated in service contracts, when applicable.

We categorize Cisco TAC inquiries according to urgency:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

## Cisco TAC Website

You can use the Cisco TAC website to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC website, go to this URL:

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

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC website. Some services on the Cisco TAC website require a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

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

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC website, you can open a case online at this URL:

<http://www.cisco.com/en/US/support/index.html>

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC website so that you can describe the situation in your own words and attach any necessary files.

## Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

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

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

## Obtaining Additional Publications and Information

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

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:  
[http://www.cisco.com/en/US/products/products\\_catalog\\_links\\_launch.html](http://www.cisco.com/en/US/products/products_catalog_links_launch.html)
- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:  
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- *Packet* magazine is the Cisco monthly periodical that provides industry professionals with the latest information about the field of networking. You can access *Packet* magazine at this URL:  
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