Release Notes for Cisco ONS 15540 ESP
for Cisco IOS Release 12.1(19)E

This document describes caveats for Cisco IOS Release 12.1(19)E for the Cisco ONS 15540 ESP (Extended Services Platform).

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Contents

This document includes the following information:

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Introduction

The Cisco ONS 15540 ESP is an optical transport platform that employs DWDM (dense wavelength division multiplexing) technology. With the Cisco ONS 15540 ESP, 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. For more information about DWDM technology and applications, refer to the *Introduction to DWDM Technology* publication and the *Cisco ONS 15540 ESP Planning and Design Guide*.

System Requirements

This section describes the system requirements for Cisco IOS Release 12.1(19)E, and it includes the following sections:

Memory Requirements

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

Hardware Supported

Table 1 lists the hardware components supported on the Cisco ONS 15540 ESP and the minimum software version required. See the "Determining the Software Version" section on page 8 for information on determining your software version.

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

Component	Part Number	Description	Minimum Software Version Required
Chassis	15540-CHSA		12.1(7a)EY2
Power supplies	15540-PWR-AC	120 to 240 VAC power supply	12.1(7a)EY2
	15540-CAB-AC	Custom AC-input power entry cable	12.1(7a)EY2
	15540-CAB-AC	North America	12.1(7a)EY2
	15540-CAB-ACA	Australia	12.1(7a)EY2
	15540-CAB-ACE	Europe	12.1(7a)EY2
	15540-CAB-CU	UK	12.1(7a)EY2
	15540-CAB-ACI	Italy	12.1(7a)EY2
	15540-CAB-ACR	Argentina	12.1(7a)EY2
Filler motherboards and filler modules	15540-COV-01	Mux/demux motherboard blank panel	12.1(7a)EY2
	15540-COV-02	Mux/demux module	12.1(7a)EY2
	15540-COV-03	Line card motherboard blank panel	12.1(7a)EY2
	15540-COV-04	Transponder module blank panel	12.1(7a)EY2
	15540-COV-06	Processor card cover panel	12.1(7a)EY2
Fans	15540-FTMP	Fan tray module populated with eight fans	12.1(7a)EY2
Processor cards	15540-CPU	Processor card without switch fabric	12.1(7a)EY2
Mux/demux motherboards	15540-MMMB-0100	Supports mux/demux modules with OSC	12.1(7a)EY2
	15540-MMMB-0200	Supports mux/demux modules without OSC	12.1(7a)EY2

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

Component	Part Number	Description	Minimum Software Version Required
Mux/demux modules without OSC	15540-MDXA-04A0	4-channel Band A	12.1(7a)EY2
	15540-MDXA-04B0	4-channel Band B	12.1(7a)EY2
	15540-MDXA-04C0	4-channel Band C	12.1(7a)EY2
	15540-MDXA-04D0	4-channel Band D	12.1(7a)EY2
	15540-MDXA-04E0	4-channel Band E	12.1(7a)EY2
	15540-MDXA-04F0	4-channel Band F	12.1(7a)EY2
	15540-MDXA-04G0	4-channel Band G	12.1(7a)EY2
	15540-MDXA-04H0	4-channel Band H	12.1(7a)EY2
	15540-MDXA-08A0	8-channel Band AB	12.1(7a)EY2
	15540-MDXA-08B0	8-channel Band CD	12.1(7a)EY2
	15540-MDXA-08C0	8-channel Band EF	12.1(7a)EY2
	15540-MDXA-08D0	8-channel Band GH	12.1(7a)EY2
	15540-MDXA-16EH	16-channel Band EH	12.1(7a)EY2
Mux/demux modules with OSC	15540-MDXA-04A0	4-channel Band A	12.1(7a)EY2
	15540-MDXB-04B0	4-channel Band B	12.1(7a)EY2
	15540-MDXB-04C0	4-channel Band C	12.1(7a)EY2
	15540-MDXB-04D0	4-channel Band D	12.1(7a)EY2
	15540-MDXB-04E0	4-channel Band E	12.1(7a)EY2
	15540-MDXB-04F0	4-channel Band F	12.1(7a)EY2
	15540-MDXB-04G0	4-channel Band G	12.1(7a)EY2
	15540-MDXB-04H0	4-channel Band H	12.1(7a)EY2
	15540-MDXB-08A0	8-channel Band AB	12.1(7a)EY2
	15540-MDXB-08B0	8-channel Band CD	12.1(7a)EY2
	15540-MDXB-08C0	8-channel Band EF	12.1(7a)EY2
	15540-MDXB-08D0	8-channel Band GH	12.1(7a)EY2
	15540-MDXB-16AD	16-channel Band AD	12.1(7a)EY2
Line card motherboards	15540-LCMB-0100	Supports four transponders with protection	12.1(7a)EY2
	15540-LCMB-0200	Supports four transponders -East	12.1(7a)EY2
	15540-LCMB-0201	Supports four transponders -West	12.1(7a)EY2

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

Component	Part Number	Description	Minimum Software Version Required
MM transponder modules	15540-TSP1-01A3	Ch 1-2—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-03A3	Ch 3-4—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-05A3	Ch 5-6—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-07A3	Ch 7-8—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-09A3	Ch 9-10—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-11A3	Ch 11-12—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-13A3	Ch 13-14—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-15A3	Ch 15-16—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-17A3	Ch 17-18—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-19A3	Ch 19-20—1310nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-21A3	Ch 21-22—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-23A3	Ch 23- 24—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-25A3	Ch 25-26—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-27A3	Ch 27-28—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-29A3	Ch 29-30—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2
	15540-TSP1-31A3	Ch 31-32—1310-nm MM 16 to 622 Mbps with SC	12.1(7a)EY2

Table 1 Cisco ONS 15540 ESP 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(7a)EY2
	15540-TSP1-03B3	Ch 3-4—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-05B3	Ch 5-6—310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-07B3	Ch 7-8—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-09B3	Ch 9-10—310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-11B3	Ch 11-12—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-13B3	Ch 13-14—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-15B3	Ch 15-16—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-17B3	Ch 17-18—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-19B3	Ch 19-20—1310nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-21B3	Ch 21-22—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-23B3	Ch 23- 24—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-23B3	Ch 23- 24—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-25B3	Ch 25-26—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-27B3	Ch 27-28—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-29B3	Ch 29-30—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2
	15540-TSP1-31B3	Ch 31-32—1310-nm SM 16 Mbps to 2.5 Gbps with SC	12.1(7a)EY2

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

Component	Part Number	Description	Minimum Software Version Required
Extended range transponder modules	15540-TSP2-0100	Ch 1-2	12.1(11b)E
	15540-TSP2-0300	Ch 3-4	12.1(11b)E
	15540-TSP2-0500	Ch 5-6	12.1(11b)E
	15540-TSP2-0700	Ch 7-8	12.1(11b)E
	15540-TSP2-0900	Ch 9-10	12.1(11b)E
	15540-TSP2-1100	Ch 11-12	12.1(11b)E
	15540-TSP2-1300	Ch 13-14	12.1(11b)E
	15540-TSP2-1500	Ch 15-16	12.1(11b)E
	15540-TSP2-1700	Ch 17-18	12.1(11b)E
	15540-TSP2-1900	Ch 19-20	12.1(11b)E
	15540-TSP2-2100	Ch 21-22	12.1(11b)E
	15540-TSP2-2300	Ch 23-24	12.1(11b)E
	15540-TSP2-2500	Ch 25-26	12.1(11b)E
	15540-TSP2-2700	Ch 27-28	12.1(11b)E
	15540-TSP2-2900	Ch 29-30	12.1(11b)E
	15540-TSP2-3100	Ch 31-32	12.1(11b)E
Pluggable transceivers for extended range transponder modules	15500-XVRA-01A2	ESCON and OC-3 1310-nm MM MT-RJ	12.1(11b)E
	15500-XVRA-03B1	Gigabit Ethernet and Fibre Channel (1 Gbps) 1310-nm SM MTLC	12.1(11b)E
	15500-XVRA-02C1	Gigabit Ethernet and Fibre Channel (1 Gbps) 850-nm MM MTLC	12.1(11b)E
	15500-XVRA-02C2	Fibre Channel (2 Gbps) 850-nm MM MTLC	12.1(11b)E
	15500-XVRA-07B1	SONET OC-12 1310-nm SM MTLC	12.1(11b)E
	1550-XVRA-06B1	SONET OC-12 1310-nm MTLC	12.1(11b)E
	15500-XVRA-07B1	SONET OC-48 1310-nm SM MTLC	12.1(11b)E

Determining the Software Version

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

To determine the version of Cisco IOS software currently running on a Cisco ONS 15540 ESP 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 12.1(19)E
<Information deleted>
```

Upgrading the System Image

To ensure proper system functioning, follow the system image upgrading procedure described in the *Cisco ONS 15540 ESP Configuration Guide and Command Reference*.

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 and Table 3 list the Cisco IOS software feature sets available for the Cisco ONS 15540 ESP.

Table 2   Feature Sets Supported by the Cisco ONS 15540 ESP Release 12.1(19)E and 12.1(13)E1

Feature Set	12.1(19)E	12.1(13)E1
Gigabit Ethernet	X	X
Fast Ethernet	X	X
Ethernet	X	X
ATM OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16	X	X
SONET[1]/SDH[2]	X	X
POS[3]	X	X
Coupling link	X	X
Fibre Channel (1 Gbps)	X	X

Table 2   Feature Sets Supported by the Cisco ONS 15540 ESP Release 12.1(19)E and 12.1(13)E1

Feature Set	12.1(19)E	12.1(13)E1
Fibre Channel (2 Gbps)	X	X
FDDI[4]	X	X
ESCON[5] SM (200 Mbps)	X	X
FICON[6] (800 Mbps)	X	X
Token Ring	X	X
SNMP	X	X
CiscoView	X	X
Cisco Transport Manager	X	X
IP packets	X	X
OSCP[7]	X	X
APS[8] protocol packets	X	X
Point-to-point	X	X
Hubbed ring	X	X
Meshed ring	X	X
Sysplex	X	X
GDPS[9]	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. GDPS = Geographically Dispersed Parallel Sysplex

Table 3   Feature Sets Supported by the Cisco ONS 15540 ESP Release 12.1(12c)E3 and Prior

Feature Set	12.1(12c)E3	12.1(12c)E1	12.1(12c)E	12.1(11b)E1	12.1(11b)E	12.1(7a)EY3	12.1(7a)EY2
Gigabit Ethernet	X	X	X	X	X	X	X
Fast Ethernet	X	X	X	X	X	X	X
Ethernet	X	X	X	X	X	X	X
ATM OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16	X	X	X	X	X	X	X
SONET[1]/SDH[2]	X	X	X	X	X	X	X
POS[3]	X	X	X	X	X	X	X
Coupling link	X	X	X	X	X	X	X
Fibre Channel (1 Gbps)	X	X	X	X	X	X	X

Table 3 Feature Sets Supported by the Cisco ONS 15540 ESP Release 12.1(12c)E3 and Prior (continued)

Feature Set	12.1(12c)E3	12.1(12c)E1	12.1(12c)E	12.1(11b)E1	12.1(11b)E	12.1(7a)EY3	12.1(7a)EY2
Fibre Channel (2 Gbps)	X	X	X	X	X	X	X
FDDI[4]	X	X	X	X	X	X	X
ESCON[5] SM (200 Mbps)	X	X	X	X	X	X	X
FICON[6] (800 Mbps)	X	X	X	X	X	X	X
Token Ring	X	X	X	X	X	X	X
SNMP	X	X	X	X	X	X	X
CiscoView	X	X	X	X	X	X	X
Cisco Transport Manager	X	X	X	X	X	X	X
IP packets	X	X	X	X	X	X	X
OSCP[7]	X	X	X	X	X	X	X
APS[8] protocol packets	X	X	X	X	X	X	X
Point-to-point	X	X	X	X	X	X	X
Hubbed ring	X	X	X	X	X	X	X
Meshed ring	X	X	X	X	X	X	X
Sysplex	X	X	X	X	X	X	X
GDPS[9]	X	X	X	X	X	X	X

1. SONET = Synchronous Optical Networking

2. SDH = Synchronous Digital Hierarchy

3. POS = Packet over SONET

4. FDDI = Fiber Distributed Data Interface

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7. OSCP = Optical Supervisory Channel Protocol

8. APS = Automatic Protection Switching

9. GDPS = Geographically Dispersed Parallel Sysplex

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(19)E

No new features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(19)E.

New Features in Release 12.1(13)E1

No new features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(13)E1.

New Features in Release 12.1(12c)E3

No new features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(12c)E3.

New Features in Release 12.1(12c)E1

No new features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(12c)E1.

New Features in Release 12.1(12c)E

No new features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(12c)E.

New Features in Release 12.1(11b)E1

No new features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(11b)E1.

New Features in Release 12.1(11b)E

The following new features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(11b)E:

- Extended range transponder modules supporting the following transceivers:
  - ESCON and SONET OC-3 MM (1310 nm)
  - Gigabit Ethernet and Fibre Channel (1 Gbps) MM (850 nm)
  - Gigabit Ethernet and Fibre Channel (1 Gbps) SM (1310 nm)
  - Fibre Channel (2 Gbps) MM (850 nm)
  - Fibre Channel (2 Gbps) SM (1310 nm)
  - SONET OC-12 SM (1310 nm)
  - SONET OC-48 SM (1310 nm)

New Features in Release 12.1(7a)EY3

The following new software features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(7a)EY3:

- Cisco IOS software on the processor.
- Autoconfiguration at startup.
- Autodiscovery of network neighbors.
- Online diagnostics.
- Processor redundancy provided by arbitrations of processor status and switchover in case of failure without loss of connections.
- Autosynchronization of startup and running configurations.

- Support for in-service software upgrades.

- Support for per-channel APS (Automatic Protection Switching) in point-to-point and ring topologies using redundant subsystems that monitor link integrity and signal quality.

- Unidirectional and bidirectional 1+1 path switching.

- System configuration and management through the CLI (command-line interface), accessible through an Ethernet connection or console terminal.

- Optical power monitoring on the transport side, digital monitoring on both client and transport side, and per-channel transponder in-service and out-of-service loopback (client and transport sides).

- Optional out-of-band management of other Cisco ONS 15540 ESP systems on the network through the OSC (optical supervisory channel).

- Support for network management systems that use SNMP. Its capabilities include configuration management, fault isolation, topology discovery, and path trace.

New Features in Release 12.1(7a)EY2

The following new features are available for the Cisco ONS 15540 ESP in Cisco IOS Release 12.1(7a)EY2:

- Cisco IOS software on the processor.

- Autoconfiguration at startup.

- Autodiscovery of network neighbors.

- Online diagnostics.

- Processor redundancy provided by arbitrations of processor status and switchover in case of failure without loss of connections.

- Autosynchronization of startup and running configurations.

- Support for in-service software upgrades.

- Support for per-channel APS (Automatic Protection Switching) in point-to-point and ring topologies using redundant subsystems that monitor link integrity and signal quality.

- Unidirectional and bidirectional 1+1 path switching.

- System configuration and management through the CLI (command-line interface), accessible through an Ethernet connection or console terminal.

- Optical power monitoring on the transport side, digital monitoring on both client and transport side, and per-channel transponder in-service and out-of-service loopback (client and transport sides).

- Optional out-of-band management of other Cisco ONS 15540 ESP systems on the network through the OSC (optical supervisory channel).

- Support for network management systems that use SNMP. Its capabilities include configuration management, fault isolation, topology discovery, and path trace.

Caveats

This section lists the caveats and corrected caveats for each release. Use Table 4 and Table 5 to determine the status of a particular caveat. In the tables, "C" indicates a corrected caveat, and "O" indicates an open caveat.

Table 4   Caveat Matrix for the Cisco ONS 15540 ESP Release 12.1(13)E1 and 12.1(19)E

DDTS Number	12.1(19)E	12.1(13)E1
CSCea02355	C	
CSCdv33165	C	O
CSCdv37024	C	C
CSCdv90351	C	C
CSCdw26675	C	C
CSCdw32072	C	C
CSCdw49750	C	C
CSCdw65903	C	C
CSCdw66715	C	C
CSCdw71880	C	C
CSCdw80987	C	C
CSCdw82701	C	C
CSCdw87421	C	C
CSCdx07666	C	O
CSCdx09167	C	C
CSCdx22433	C	C
CSCdx27201	C	C
CSCdx31068	C	C
CSCdx32408	C	C
CSCdx32438	C	O
CSCdx37144	C	C
CSCdx42595	C	C
CSCdx77331	C	C
CSCdx80175	C	
CSCdx80804	C	C
CSCdx81765	C	C
CSCdx82558	C	C
CSCdx85761	C	
CSCdy03245	C	
CSCdy08228	C	C
CSCdy10401	C	C

Table 4   Caveat Matrix for the Cisco ONS 15540 ESP Release 12.1(13)E1 and 12.1(19)E (continued)

DDTS Number	12.1(19)E	12.1(13)E1
CSCdy13935	C	C
CSCdy20002	C	O
CSCdy20010	C	O
CSCdy23001	O	O
CSCdy23025	C	C
CSCdy23325	O	O
CSCdy27291	C	C
CSCdy40352	C	C
CSCdy40429	C	C
CSCdy40882	C	
CSCdy47909	C	C
CSCdy49146	C	C
CSCdy49249	C	
CSCdy61641	C	
CSCdy62752	C	
CSCdy79659	C	
CSCdy83757	C	C
CSCdy87237	C	O
CSCdy88154	C	
CSCdz00116	C	C
CSCdz03989	C	
CSCdz06004	C	
CSCdz08774	C	
CSCdz13025	C	C
CSCdz13538	C	
CSCdz13673	C	
CSCdz14420	C	
CSCdz20508	C	C
CSCdz22455	C	
CSCdz28582	C	
CSCdz28903	C	
CSCdz36420	C	
CSCdz36424	C	
CSCdz36823	C	
CSCdz39112	C	

Table 4   Caveat Matrix for the Cisco ONS 15540 ESP Release 12.1(13)E1 and 12.1(19)E (continued)

DDTS Number	12.1(19)E	12.1(13)E1
CSCdz60081	C	
CSCdz71127	C	

Table 5   Caveat Matrix for the Cisco ONS 15540 ESP Release 12.1(12c)E3 and Prior

DDTS Number	12.1(12c)E3	12.1(12c)E1	12.1(12c)E	12.1(11b)E1	12.1(11b)E	12.1(7a)EY3	12.1(7a)EY2
CSCdv33165	O	O	O	O	O	O	O
CSCdv37024	C	C	C	C	C	O	O
CSCdv90351	C	O	O	O	O	O	O
CSCdw26675	C	C	C	C	C	O	O
CSCdw32072	C	C	C	C	O		
CSCdw49750	C	C	C	C	O		
CSCdw65903	C	C	C	C	C	C	
CSCdw66715	C	C	C	C	O		
CSCdw71880	C	C	C	C			
CSCdw80987	C	C	C	C	O		
CSCdw82701	C	C	C	O	O		
CSCdw87421	C	C	C	O	O		
CSCdx07666	O	O	O				
CSCdx09167	C	C	C				
CSCdx27201	C	C	C	C	O		
CSCdx31068	C	C	C				
CSCdx32408	C	C	C				
CSCdx32438	O	O	O				
CSCdx37144	C	O	O				
CSCdx42595	C	C	C				
CSCdx77331	C	C	O				
CSCdx80804	C	C	O				
CSCdx81765	C	C	O				
CSCdx82558	C	C	O				
CSCdy10401	C	O					
CSCdy20002	O	O					
CSCdy20010	O	O					
CSCdy23001	O	O					
CSCdy23025	C	O					
CSCdy23325	O	O					

Table 5   Caveat Matrix for the Cisco ONS 15540 ESP Release 12.1(12c)E3 and Prior (continued)

DDTS Number	12.1(12c)E3	12.1(12c)E1	12.1(12c)E	12.1(11b)E1	12.1(11b)E	12.1(7a)EY3	12.1(7a)EY2
CSCdy27291	C						
CSCdy40352	C						
CSCdy40429	C						
CSCdy47909	C						
CSCdy49146	C						

This section describes the caveats in the Cisco ONS 15540 ESP.

- 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.

- CSCdv33165

  Symptom: If you attempt to change or edit a threshold in the threshold list that is already associated with an interface, the threshold is applied to that interface even when no changes are made to it. Usually the change in error counts are more important than the error counters themselves.

  Workaround: Issue the **clear counters** command.

- CSCdv37024

  Symptom: If CiscoView files are extracted on a Flash disk (disk0: or disk1:), the package does not work.

  Workaround: Install CiscoView on a Flash PC Card (slot0: or slot1:).

- CSCdv90351

  Symptom: When there is a constant stream of loss of sync alarms, a port fail notification is not generated.

  Although both signal failure and signal degrade thresholds are applied, only signal degrade is observed. The signal failure threshold is monitored by hardware registers. When the signal failure threshold is exceeded, the hardware normally generates a port fail notification. Because the loss of sync alarms are constant, the threshold exceeded cannot generate a port fail notification. The signal degrade is reported because it is monitored by software and does not need any notifications from hardware.

  Workaround: Disable and reenable monitoring once with the **no monitor/monitor enable** command sequence to generate the port fail notification.

- CSCdw26675

  Symptom: Upon switchover, the active processor card can become nonresponsive. The processor card's Active LED remains on, even though it is no longer actively controlling the system.

  Workaround: None

  Remove and reinsert the processor card to correct the fault.

- CSCdw32072

  Symptom: The ROMMON might continuously loop in an attempt to autoboot a missing system image.

  Continuous looping happens when autoboot is configured in the configuration register (0x2102), but the system image corresponding to the **system boot** *filename* command in the startup configuration is missing and no alternate **system boot** *filename* command is configured for an existing system image.

  During normal system functioning, the system first checks for system image file names in the startup configuration **system boot** *filename* commands. If there are none, or the images are not valid, the system checks the Flash device in slot0: and then bootflash for loadable images before stopping its attempts to autoboot.

  Workaround: Configure at least one **system boot** *filename* command for an existing system image on both processor cards before reloading either processor card.

  If autoboot looping occurs, issue a console **send break** command during the first few seconds of a reload attempt to stop autobooting. Then manually boot the system using a valid system image in Flash memory or on the network.

  Upgrade the processor card ROMMON image to release 12.1(11r)E3 or later.

- CSCdw49750

  Symptom: If during a netboot attempt the processor card fails to netboot or the peer processor card changes its active/standby state, any further changes to the peer processor card active/standby state are ignored until a **reset** command is issued at the processor card ROMMON prompt.

  Workaround: Issue a **reset** command at the ROMMON prompt after failing to netboot.

  Upgrade the processor card ROMMON image to release 12.1(11r)E3 or later.

- CSCdw65903

  Symptom: An error can occur with management protocol processing. See the following URL for more information:
  http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903

  Workaround: None

- CSCdw66715

  Symptom: Following an IOS crash, a second ROMMON exception might cause the original stack trace to be lost. This happens if a pending PCI (peripheral component interconnect) bus interrupt was in progress but was not handled before the IOS crash.

  Workaround: Upgrade the processor card ROMMON image to release 12.1(11r)E3 or later.

- CSCdw71880

  Symptom: The following errors might occur:

  - The 100 Mbps LED for the NME (Network Management Ethernet) port might be on even if the port is connected to a 10 Mbps source. This LED should be on only when connected to a 100 Mbps source.

  - The full duplex LED might not stay on even when the port is connected to a full duplex source.

  - Auto negotiation of speed and duplex mode might not work when switched from a 10 Mbps source to a 100 Mbps source.

  - Auto negotiation of speed and duplex mode might not work when switched from a 100 Mbps source to a 10 Mbps source.

Workaround: None.

- CSCdw80987

  Symptom: The system power cycles and the standby processor card startup configuration is not synchronized with the active processor card startup configuration. If this occurs, then the previous standby processor card might become the active processor card and a different set of connections might be set up.

  The standby processor card startup configuration can become outdated when it is in maintenance mode.

  Workaround: Remove the standby processor card from the shelf when it is not in use.

  Upgrade the processor card ROMMON image to release 12.1(11r)E3 or later.

- CSCdw82701

  Symptom: Loopback cannot be configured on the wave interface of an extended range transponder module if no transceiver is present. The **loopback** command is accepted but the loopback is not configured.

  Workaround: Insert a transceiver before configuring the loopback on the wave interface.

- CSCdw87421

  Symptom: When laser safety control is enabled on the OSC wave 0 interface or wave 1 interface, the OSC trunk laser does not shut down when a fiber cut occurs.

  Workaround: None

- CSCdx07666

  Symptom: Loss of signal may be encountered before SD (signal degrade) and SF (signal failure) thresholds are exceeded and traffic may still continue to pass transparently.

  The loss of signal detection is taken from the OE conversion subsystem which is different from the source of the SD and SF counters. The OE conversion is not gated by its loss of light indication so the data and clock extraction continues and the signal is regenerated transparently. The loss of light sensitivity is a characteristic of the OE conversion unit and it may vary from unit to unit but is always < -30 dBm.

  Workaround: None.

- CSCdx09167

  Symptom: The alarm LED is not raised or cleared by SD/SF indications.

  Workaround: None.

- CSCdx22433

  Symptom: Diagnostic statistics are not shown for the standby processor card when logged into the active processor card.

  Workaround: None.

- CSCdx27201

  Symptom: If the configuration register autoboot field is set to either 0x1 or 0x2 and the first file in bootflash memory is not a loadable system image, then the system continues to try to reboot.

  Workaround: Use the **send break** command on the console CLI to stop the autoboot cycling, and then manually boot a loadable system image. Make sure the first image in bootflash memory is a valid system image.

  Upgrade the processor card ROMMON image to release 12.1(11r)E3 or later.

- CSCdx31068

   Symptom: With APS y-cable, the SD condition on the working channel does not clear the lower priority manual-switch condition on the protection channel. This causes the manual-switch condition to persist after the SD condition is removed and APS to switch back to the working channel.

   Workaround: None.

- CSCdx32408

   Symptom: Customer installed mismatching wavelength transponders and did not receive a wavelength mismatch alarm. The Cisco ONS 15540 does not report this condition.

   Workaround: None.

- CSCdx32438

   Symptom: When the Rx port fiber is removed, ingress alarms are reported and cleared repeatedly. The alarm should not clear and the alarm should be reported only once.

   Workaround: None

- CSCdx37144

   Symptom: Processor card gets into a nonresponsive state when the hardware version is below 6.5.

   Workaround: Ensure that the processor card hardware version is 6.5 or above.

- CSCdx42595

   Symptom: No alarm is raised when the transponder channel does not match the channels supported by the mux/demux module.

   Workaround: None.

- CSCdx77331

   Symptom: CTM is flooded with traps every second when hardware port flap alarms occur.

   Workaround: None.

- CSCdx80175

   Symptom: The **show interfaces** command output for a wave interface displays an UP state, but the signal quality shows loss of sync.

   Workaround: None.

- CSCdx80804

   Symptom: The **encapsulation fastethernet** command fails on multimode transponders. The **clock rate 100000** command succeeds but then pings over the signal fail intermittently.

   Workaround: None.

- CSCdx81765

   Symptom: The OSC intermittently drops IP packets because of an erroneous calculation of the FCS-16 (frame check sequence 16).

   Workaround: None.

- CSCdx82558

   Symptom: The system image on the standby processor card cannot be upgraded to a new system image because the format of the redundancy messages from the active processor card are not recognized on the standby processor card. The standby processor card fails to boot and returns to ROMMON mode.

   Workaround: None.

- CSCdx85761

   Symptom: Multiple %METOPT-2-PORTFAIL messages are seen when using the y-cable APS configuration with single auto-failover. However, this does not affect the functionality.

   Workaround: None.

- CSCdy03245

   Symptom: Topology neighbor configuration is lost on mux/demux motherboard online removal and reinsertion.

   Workaround: The topology neighbor is viewable after reconfiguring the wdm interface.

- CSCdy08228

   Symptom: Interface reports up/up even when there is no light source connected.

   Workaround: Perform a **shutdown/no shutdown** command sequence on the interface.

- CSCdy10401

   Symptom: The transparent interface of an extended range transponder module continues to report good signal quality even after the transceiver is removed and reinserted without being connected to the traffic source.

   Workaround: Perform a **shutdown**/**no shutdown** command sequence on the transparent interface.

- CSCdy13935

   Symptom: ifMIB cannot see fa-sby0 on an OIR insertion of standby processor card and ifMIB does not delete fa-sby0 on an OIR removal of the standby processor card.

   Workaround: Reboot the system.

- CSCdy20002

   Symptom: A transparent interface carrying Gigabit Ethernet traffic and configured with gigabit Fibre Channel encapsulation shows good quality signal on the **show interfaces transparent** command output and does not assert any ingress alarms. The wave interface assert loss of lock and loss of sync alarms.

   Workaround: Remove and reinsert 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 module.

   Workaround: Disable and reenable monitoring on the transparent interface to reassert the alarms.

- CSCdy23001

   Symptom: A line laser failure alarm is asserted but not cleared when an extended range transponder module is removed and reinserted. The **show facility-alarm status** command output shows a message similar to the following:

   ```
   Source: TranspdrSC 2/3  Severity: MAJOR Description: 2    Line laser failure detected
   ```

   Workaround: None.

- CSCdy23025

   Symptom: The SF (signal failure) alarms are not cleared from the **show facility-alarm status** command output after monitoring is disabled.

   Workaround: None.

- CSCdy23325

  Symptom: An ingress LOF alarm on a transparent interface is not asserted when an SEFs (severely errored frames) alarm is present due to the alarm priority handling error in the driver.

  Workaround: A **shutdown**/**no shutdown** command sequence on the transparent interface reasserts the ingress LOF alarm.

- CSCdy27291

  Symptom: Use of MGD_TIMER_DEBUG crashes the box.

  Workaround: None

- CSCdy40352

  Symptom: The processor card gets stuck in a nonresponsive state waiting for the console UART TxReady to get set. Normally a watchdog timeout forces recovery, but in some instances the standby processor card does not recover on its own.

  Workaround: Remove and replace the standby processor card.

- CSCdy40429

  Symptom: Under some situations the erratas of the system controller used on the processor card (GT64120A) can cause:

  — A software forced crash due to memory ECC errors

  — A bus error exception

  — Corruption of data

  Workaround: None.

- CSCdy40882

  Symptom: Information appears in **show hardware** command output for processor cards that have been removed.

  Workaround: None.

- CSCdy47909

  Symptoms:

  The value of the Rx optical power reading in the **show interfaces wave** command output is not accurate.

  Workaround: None.

- CSCdy49146

  Symptom: Under some circumstances single bit ECC errors occur and are corrected by the system controller, but are not recorded. Therefore, the user is unaware of these occurrences.

  Workaround: None.

- CSCdy49249

  Symptom: If a module is inserted during a processor card switchover, then the module and its interfaces might not come up properly.

  Workaround: Remove and reinsert module after switchover is complete.

- CSCdy61641

  Symptom: Following a processor card crash and switchover, if a **show redundancy** command is issued on the new active processor card, it currently shows "Reported Switchover Reason" as "Not known". If a **show version** command is issued on the standby processor card that crashed, it shows additional troubleshooting information.

  Workaround: None.

- CSCdy62752

  Symptom: The active processor card becomes nonresponsive and cannot be enabled from the standby processor.

  Workaround: Remove and reinsert the active processor card.

- CSCdy79659

  Symptom: Incorrect OPM alarm status information for the standby wavepatch interface displays in the **show interfaces** command output.

  Workaround: None.

- CSCdy83757

  Symptom: When EIGRP is configured, FastEthernet0 automatically becomes a passive-interface and routing updates and management access are lost.

  Workaround: Connect to the console port and remove passive-interface config in EIGRP configuration.

- CSCdy87237

  Symptom: After removing an extended range transponder, the **show facility status** command does not report the line laser failure.

  Workaround: None.

- CSCdy88154

  Symptom: Some interfaces are not available to the NMS station because the agent does not create them when a module is removed and reinserted.

  Workaround: Reload the system after removal and reinsertion of a module.

- 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.

- CSCdz03989

  Symptom: Both active and standby lasers in a bidirectional y-cable APS configuration on modules in subslot 0 turn on erroneously.

  Workaround: None.

- CSCdz06004

  Symptom: The **redundancy reload shelf** command on the active processor card can cause a switchover if the peer processor card is in ROM monitor mode.

  Workaround: Use the **reload** command to reload the active processor card, if the peer processor card is in ROM monitor mode.

- CSCdz08774

  Symptom: ciscoFlashDeviceChangeTrap is not generated when a removable Flash device is removed or inserted.

  Workaround: None.

- CSCdz13025

  Symptom: IOS may crash while ROMMON is being reprogrammed. The occurrence of this crash is rare. If it happens a customer processor card becomes non-bootable.

  Workaround: To prevent this crash from happening:

   - ROMMON reprogram must be done one processor card at a time, while the other processor card is in ROMMON or physically removed from the chassis.

   Note that this process impacts data flow and should be done during a maintenance window.

- CSCdz13538

  Symptom: The egress loss of signal alarm is not reasserted in the **show facility-alarm status** command output after using a **hw-module subslot power** command to turn the module power off or on.

  Workaround: None.

- CSCdz13673

  Symptom: The wave interface remains down when the signal quality is GOOD after using a **hw-module subslot power** command to turn the module power off or on.

  Workaround: None.

- CSCdz14420

  Symptom: The Rx power display in some cases is off by 4dBm in comparison with the real reading using a power meter.

  Workaround: Use a calibrated transponder module.

- CSCdz20508

  Symptom: When a trunk fiber is cut, the wavepatch gets stuck in a down state after **shutdown**/**no shutdown** command sequence of the wave interface with splitter APS.

  Workaround: None

- CSCdz22455

  Symptom: When a Flash PC Card or ATA card is inserted or removed in either Flash PC Card slots, IOS may crash and display the following message:
  ```
  %ERR-1-GT64120: Fatal error, PCI Master abort GT=0xB4000000, cause=0x0100E483,
  mask=0x0EF01F00, real_cause=0x00000400 bus_err_high=0x00000000,
  bus_err_low=0x00000000, addr_decode_err=0x00000470.
  ```

  Workaround: None.

- CSCdz28582

  Symptom: After a fiber cut, the OSC interface remains up with signal quality good.

  Workaround: Issue the **shutdown/no shutdown** command sequence.

- CSCdz28903

  Symptom: For the Sysplex protocol, forward laser control does not work after removing and reinserting the 2.5-Gbps transponder module and reprogramming the functional image.

  Workaround: Using the **no encapsulation** and **encapsulation sysplex etr** commands on the transparent interface programs it correctly.

- CSCdz36420

  Symptom: In a preconfigured APS group (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 are defined in the APS group are created or remove the revertive configuration from the preconfigured APS group and then enable the group.

- CSCdz36424

  Symptom: Insertion of a Flash PC Card or PCMCIA ATA card causes the processor card to reset. This happens if this is the first insertion of card after an IOS boot.

  Workaround: Boot IOS after the Flash PC Card is already inserted in a slot, either before power up, or when the processor card card is in ROMMON.

- CSCdz36823

  Symptom: A processor card crash occurs after midnight when optical performance is on if an interface capable of performance monitoring is un-shutdown.

  Workaround:None.

- CSCdz39112

  Symptom: When an invalid channel number is detected by the OSCP client while it processes the client message received from the peer, OSCP does not free the message buffer. This results in buffer starvation over a period of time and connectivity through the Network Management interface and backplane Ethernet (IPC and OSCP) interface is lost.

  Workaround: None.

- CSCdz60081

  Symptom: Loss of loss on a GOOD signal is reported after online removal and insertion of a transponder module configured with Sysplex ETR encapsulation.

  Workaround: Issue a **no encapsulation** command and configure the encapsulation back to Sysplex ETR.

- CSCdz71127

  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.

Limitations and Restrictions

This section provides limitations and restrictions for Cisco ONS 15540 ESP 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 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 on single-mode transponders 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.

- If both processor cards are removed, traffic through the system is affected as follows:

  - For Type 2 extended range transponder modules, traffic is shut down.

  - For 10-GE transponder modules, traffic is shut down.

  - Type 1 SM transponder modules and MM transponder modules do not operate reliably. The traffic might be affected.

  - In the shutdown state, the Status LED on the line card motherboard turns orange.

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

Related Documentation

Refer to the following documents for more information about the Cisco ONS 15540 ESP:

- *Cisco ONS 15540 ESP Planning and Design Guide*
- *Regulatory Compliance and Safety Information for the Cisco ONS 15500 Series*
- *Cisco ONS 15540 ESP Hardware Installation Guide*
- *Cisco ONS 15540 ESP Configuration Guide and Command Reference*
- *Cisco ONS 15540 ESP Troubleshooting Guide*
- *Cisco ONS 15540 ESP MIB Quick Reference*
- *Glossary of Optical Networking Terms*

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 websites can be accessed from this URL:

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 regularly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual or quarterly subscription.

Registered Cisco.com users can order a single Documentation CD-ROM (product number DOC-CONDOCCD=) through the Cisco Ordering tool:

http://www.cisco.com/en/US/partner/ordering/ordering_place_order_ordering_tool_launch.html

All users can order monthly or quarterly subscriptions through the online Subscription Store:

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

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You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

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- 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

- 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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Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

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.

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- Streamline business processes and improve productivity
- Resolve technical issues with online support
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To obtain customized information and service, you can self-register on Cisco.com at this URL:

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

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available: the Cisco TAC website and the Cisco TAC Escalation Center. The type 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. There is little or no impact to your business operations.
- Priority level 3 (P3)—Operational performance of the network is impaired, but most business operations remain functional. You and Cisco are willing to commit resources during normal business hours to restore service to satisfactory levels.

- Priority level 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively impacted by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

- Priority level 1 (P1)—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.

Cisco TAC Website

The Cisco TAC website provides online documents and tools to help troubleshoot and resolve technical issues with Cisco products and technologies. 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/tac/caseopen

If you have Internet access, we recommend that you open P3 and P4 cases online so that you can fully describe the situation 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 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

- 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:

  http://www.ciscopress.com

- *Packet* magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access *Packet* magazine at this URL:

  http://www.cisco.com/go/packet

- iQ Magazine is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:

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

- 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/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html

- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:

  http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html

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