



Release Notes for Cisco ONS 15540 ESP for Cisco IOS Release 12.1(12c)E

This document describes caveats for Cisco IOS Release 12.1(12c)E for the Cisco ONS 15540 ESP (Extended Services Platform).

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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(12c)E, and it includes the following sections:

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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
Mux/demux modules with OSC	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—1310-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—1310-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-02C3	Fibre Channel (2 Gbps) 1310-nm SM MTLC	12.1(11b)E
	15500-XVRA-07B1	SONET OC-12 1310-nm SM 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(12c)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.

Determining the Release Version of Your Processor Card ROMMON Image

To determine the existing ROMMON image release version installed on your processor card, use the following command in EXEC mode:

Command	Purpose
show version	Displays the ROMMON image information.

Example

The following example shows the ROMMON image information for the processor card in slot 6:

```
Switch# show version

Cisco Internetwork Operating System Software
IOS (tm) ONS-15540 Software (manopt-M0-M), Release Version 12.1(12c)E
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 23-Mar-02 15:23 by
Image text-base:0x60010950, data-base:0x604E8000

→ ROM:System Bootstrap, Version 12.1(12c)E, RELEASE SOFTWARE

Switch uptime is 30 minutes
System returned to ROM by power-on
System image file is "slot0:manopt-m0-mz"

cisco (QUEENS-CPU) processor with 98304K/32768K bytes of memory.
R7000 CPU at 234Mhz, Implementation 39, Rev 2.1, 256KB L2, 2048KB L3 Cache

Last reset from power-on
2 Ethernet/IEEE 802.3 interface(s)
509K bytes of non-volatile configuration memory.

20480K bytes of Flash PCMCIA card at slot 0 (Sector size 128K).
16384K bytes of Flash internal SIMM (Sector size 64K).
Configuration register is 0x102
```

Updating to a New ROMMON Image Release

To update a ROMMON image for the active processor card and redundant processor card, follow these steps:

-
- Step 1** Check the available space on the Flash memory device (bootflash, slot0, slot1, disk0, or disk1) on the active processor card. Make space available, if necessary.
 - Step 2** Copy the ROMMON image to the Flash memory device on the active processor card.
 - Step 3** Load the ROMMON image from the Flash memory device to the active processor card.
 - Step 4** Repeat [Step 1](#) through [Step 3](#) on the redundant processor card.
-



Note

You can manage ROMMON image files like any other image file on the Cisco ONS 15540 ESP. For more information on downloading and managing image files, refer to the *Cisco IOS Configuration Fundamentals Configuration Guide, Release 12.1* and the *Cisco ONS 15540 ESP Configuration Guide and Command Reference*.



Caution

Do not interrupt the reprogramming process. A failure during reprogramming can result in the processor card being unusable. The ROMMON image cannot be reverted once reprogramming starts.

Copying a ROMMON Image from a TFTP Server to a Flash Memory File System

To download a ROMMON image from a TFTP server and upgrade the ROMMON image on both processor cards, perform the following steps, starting with the active processor card:

	Command	Purpose
Step 1	Switch# show <i>flash-filesystem:</i>	Verifies that space is available in Flash memory on the active processor card. If space is available, continue to Step 5 .
Step 2	Switch# copy <i>flash-filesystem:[filename]</i> tftp: [[[//location]/directory]/filename]	(Optional) Copies a file from the Flash memory device to the TFTP server, if you wish to have a backup copy of the file on the TFTP server before deleting it. Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command.
Step 3	Switch# delete <i>flash-filesystem:filename</i>	(Optional) Deletes a file from Flash memory.
Step 4	Switch# squeeze <i>flash-filesystem:</i>	(Optional) Recovers the space in Flash memory.
Step 5	Switch# copy tftp: [[[//location]/directory]/filename] <i>flash-filesystem:[filename]</i>	Copies the image from the TFTP server to the Flash memory device. Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command. Note Wait until after the download finishes before attempting any commands on the switch. Confirm that the image download is done in binary mode and check file sizes before and after download.
Step 6	Switch# reprogram <i>flash-filesystem:filename</i> rommon	Updates the ROMMON image on the processor card and returns the processor card to ROMMON mode. This causes a switchover to the Hot Standby processor card, if one is available.
Step 7	rommon 1 > boot [<i>flash-filesystem:filename</i>]	(Optional) Boots the IOS system image on the new standby processor card if it does not boot automatically. Repeat Step 1 through Step 7 on the new active processor card.



Note

For more information on manually booting your Cisco ONS 15540 ESP, refer to the *Cisco ONS 15540 Configuration Guide and Command Reference*.

Example

The following example shows how to download a ROMMON image from a TFTP server and update the ROMMON image on the active processor card:

```
Switch# show slot0:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1  .. image    1BD2EA73 2A7B24  26  2652836 Feb 11 2002 18:07:41 ons15540-i-mz
2  .. config   36DC62E3 2AAC54  14   12461 Feb 11 2002 18:10:34 running-config

17912748 bytes available (2665556 bytes used)

Switch# copy tftp: slot0:
Address or name of remote host []? 10.0.0.1
Source filename []? MANOPT_RM.srec
Destination filename [MANOPT_RM.srec]? y

Loading tftpboot/MANOPT_RM.srec from 10.0.0.1 (via Ethernet3/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 629458/17912748 bytes]

629458 bytes copied
```

Copying a ROMMON Image from an FTP Server to a Flash Memory File System

To download a ROMMON image from an FTP server and upgrade the ROMMON image on both processor cards, perform the following steps, starting with the active processor card:

	Command	Purpose
Step 1	Switch# configure terminal Switch(config)#	(Optional) Enters configuration mode from the terminal. This step is required only if you override the default remote username (see Step 2 and Step 3). Otherwise, continue to Step 5 .
Step 2	Switch(config)# ip ftp username <i>username</i>	(Optional) Changes the default remote username.
Step 3	Switch(config)# ip ftp password <i>password</i>	(Optional) Changes the default password.
Step 4	Switch(config)# end Switch#	(Optional) Exits configuration mode. This step is required only if you override the default remote username (see Step 2 and Step 3).
Step 5	Switch# show flash-filesystem:	Verifies that space is available in Flash memory. If space is available, continue to Step 9 .
Step 6	Switch# copy flash-filesystem:[filename] ftp:[[/[username[:password]@][location]/ directory]/filename]	(Optional) Copies a file from the Flash memory device to the FTP server, if you wish to have a backup copy of the file on the FTP server before deleting it. Reply to any CLI prompts for additional information or confirmation. The prompting depends on how much information you provide in the copy command.
Step 7	Switch# delete flash-filesystem:filename	(Optional) Deletes a file from Flash memory.
Step 8	Switch# squeeze flash-filesystem:	(Optional) Recovers the space in Flash memory.

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 15540 ESP.

Table 2 Feature Sets Supported by the Cisco ONS 15540 ESP

Feature Set	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
Fast Ethernet	X	X	X	X	X
Ethernet	X	X	X	X	X
ATM OC-3/STM-1, OC-12/STM-4, and OC-48/STM-16	X	X	X	X	X
SONET ¹ /SDH ²	X	X	X	X	X
POS ³	X	X	X	X	X
Coupling link	X	X	X	X	X
Fibre Channel (1 Gbps)	X	X	X	X	X
Fibre Channel (2 Gbps)	X	X	X	X	X
FDDI ⁴	X	X	X	X	X
ESCON ⁵ SM (200 Mbps)	X	X	X	X	X
FICON ⁶ (800 Mbps)	X	X	X	X	X
Token Ring	X	X	X	X	X
SNMP	X	X	X	X	X
CiscoView	X	X	X	X	X
Cisco Transport Manager	X	X	X	X	X
IP packets	X	X	X	X	X
OSCP ⁷	X	X	X	X	X
APS ⁸ protocol packets	X	X	X	X	X
Point-to-point	X	X	X	X	X
Hubbed ring	X	X	X	X	X
Meshed ring	X	X	X	X	X
Sysplex	X	X	X	X	X
GDPS ⁹	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
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

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)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 3](#) to determine the status of a particular caveat. In the tables, “C” indicates a corrected caveat, and “O” indicates an open caveat.

Table 3 Caveat Matrix for the Cisco ONS 15540 ESP

DDTS Number	12.1(12c)E	12.1(11b)E1	12.1(11b)E	12.1(7a)EY3	12.1(7a)EY2
CSCdv33165	C	C	C	O	O
CSCdv37024	C	C	C	O	O
CSCdv90351	O	O	O	O	O
CSCdw26675	C	C	C	O	O
CSCdw32072	C	C	O		
CSCdw49750	C	C	O		
CSCdw65903	C	C	C	C	
CSCdw66715	C	C	O		
CSCdw71880	C	C			
CSCdw80987	C	C	O		
CSCdw82701	C	O	O		
CSCdw87421	C	O	O		
CSCdx07666	O				
CSCdx09167	C				
CSCdx27201	C	C	O		
CSCdx31068	C				
CSCdx32408	C				
CSCdx32438	O				
CSCdx37144	O				
CSCdx42595	C				

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

- [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.

- [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.

- [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.

- [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. Please 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 an 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 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 and SF 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 < -30dBm.

Workaround: None.

- [CSCdx09167](#)
Symptom: The alarm LED is not raised or cleared by SD/SF indications.
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, SD condition on the working channel does not clear the lower priority manual-switch condition on the protection channel. This caused manual-switch to persist after the SD condition was 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.
Workaround: None
- [CSCdx42595](#)
Symptom: No alarm is raised when the transponder channel does not match the channels supported by the mux/demux module.
Workaround: None.

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 15540 ESP](#)
- [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

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

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

<http://www.cisco.com>

Translated documentation is available at the following 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 is 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.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM 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 corporate headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

If you are reading Cisco product documentation on Cisco.com, you can submit technical comments electronically. Click **Leave Feedback** at the bottom of the Cisco Documentation home page. After you complete the form, print it out and fax it to Cisco at 408 527-0730.

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 San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

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

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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 through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- 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.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you 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 Web Site, go to the following URL:

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

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires 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 the following URL to register:

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

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

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

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; 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 will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following 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). In addition, please have available your service agreement number and your product serial number.

This document is to be used in conjunction with the [Related Documentation](#) section.

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