Introduction

This Release Notes contain information about downloading and installing Cisco IOS XE Fuji 16.7.x and its maintenance releases. The document also provides new and changed information, hardware support, limitations and restrictions, and caveats for Cisco IOS XE Fuji 16.7.x and its maintenance releases.

We recommend that you view the field notices for this release to see if your software or hardware platforms are affected. If you have an account on Cisco.com, you can find field notices at http://www.cisco.com/en/US/customer/support/tsd_products_field_notice_summary.html .

If you do not have a Cisco.com login account, you can find field notices at http://www.cisco.com/en/US/support/tsd_products_field_notice_summary.html .

Note
- Cisco IOS XE Fuji 16.7.x is generally available for field deployment. However, we recommend that you validate and qualify Cisco IOS XE Fuji 16.7.x in a limited field trial with your specific network configuration requirements. This validation would ensure a smoother, faster, and successful field deployment.

- The **no http secure server-identity-check** option was the default in versions 16.7.2 or earlier, and was not configurable. Ensure that you configure the **no http secure server-identity-check** option after upgrading to maintain parity with images earlier than 16.7.3. The default option is **http secure server-identity-check**.

This chapter includes the following sections:

System Requirements

These sections describe the system requirements for Cisco IOS XE Fuji 16.7.x:

Memory Requirements

The following table displays the memory recommendations for the Cisco cBR Series Converged Broadband Routers with Cisco IOS XE Release 16.7.2 feature sets.

Table 1: Memory Recommendations for the Cisco cBR Series Converged Broadband Routers

Feature Set	Cisco cBR Route Processor	Software Image	Recommended Flash Memory	Recommended DRAM Memory	Runs From
CISCO IOS-XE universalk9	Cisco cBR8 (CBR) Processor	cbrsup-universalk9.16.07.02.SPA.bin	8G	48G	Bootflash:
CISCO IOS-XE CLC K9	Cisco cBR8 (CYLONS) Processor	cbrsup-universalk9.16.07.02.SPA.bin	8G	16G	Supervisor

The following table displays the memory recommendations for the Cisco cBR Series Converged Broadband Routers with Cisco IOS XE Release 16.7.1 feature sets.

Table 2: Memory Recommendations for the Cisco cBR Series Converged Broadband Routers

Feature Set	Cisco cBR Route Processor	Software Image	Recommended Flash Memory	Recommended DRAM Memory	Runs From
CISCO IOS-XE universalk9	Cisco cBR8 (CBR) Processor	cbrsup-universalk9.16.07.01.SPA.bin	8G	48G	Bootflash:
CISCO IOS-XE CLC K9	Cisco cBR8 (CYLONS) Processor	cbrsup-universalk9.16.07.01.SPA.bin	8G	16G	Supervisor

Hardware Supported

For detailed information about the hardware supported in Cisco IOS XE Release 16.7.x and its maintenance releases, see:

http://www.cisco.com/c/en/us/td/docs/cable/cbr/installation/guide/b_cbr_how_and_what_to_order.html.

Note The Cisco cBR chassis must house line cards with either Downstream DOCSIS 3.0 PHY modules or Downstream DOCSIS 3.1 PHY modules. Mixed configuration is not supported.

Determining the Software Version for Cisco IOS XE Fuji 16.7.4

To determine the version of the Cisco IOS XE software running on your Cisco cBR Series Converged Broadband Routers, log in and enter the **show version** EXEC command:

```
Router#show version
Cisco IOS XE Software, Version 16.07.04
Cisco IOS Software [Fuji], cBR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 16.7.4,
 RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
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Compiled Sun 28-Apr-19 04:21 by mcpre


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or the applicable URL provided on the flyer accompanying the IOS-XE
software.


ROM: IOS-XE ROMMON

guam uptime is 4 minutes
Uptime for this control processor is 9 minutes
System returned to ROM by reload at 13:11:21 PDT Mon Apr 29 2019
System restarted at 13:20:01 PDT Mon Apr 29 2019
System image file is "harddisk:cbrsup-universalk9.16.07.04.SPA.bin"
Last reload reason: Reload Command



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Cisco cBR-8 (CBR) processor (revision CBRVE) with 9448082K/6147K bytes of memory.
Processor board ID FXS1849Q1FE
16 Ten Gigabit Ethernet interfaces
4 Hundred Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
50331648K bytes of physical memory.
7649279K bytes of eUSB flash at bootflash:.
234365527K bytes of SATA hard disk at harddisk:.
60718080K bytes of USB flash at usb1:.
0K bytes of WebUI ODM Files at webui:.

Configuration register is 0x2
```

Determining the Software Version for Cisco IOS XE Fuji 16.7.3

To determine the version of the Cisco IOS XE software running on your Cisco cBR Series Converged Broadband Routers, log in and enter the **show version** EXEC command:

```
Router#show version
Cisco IOS XE Software, Version 16.07.03
Cisco IOS Software [Fuji], cBR  Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 16.7.3,
 RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
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Compiled Tue 27-Nov-18 17:29 by mcpre


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documentation or "License Notice" file accompanying the IOS-XE software,
or the applicable URL provided on the flyer accompanying the IOS-XE
software.


ROM: IOS-XE ROMMON
Router uptime is 5 minutes
Uptime for this control processor is 10 minutes
System returned to ROM by reload at 20:15:49 IST Fri Jun 1 2018
System restarted at 20:30:28 IST Fri Jun 1 2018
System image file is "harddisk:cbrsup-universalk9.16.07.02.SPA.bin"
Last reload reason: Reload Command



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Cisco cBR-8 (CBR) processor (revision CBR) with 3588666K/6147K bytes of memory.
Processor board ID FXS1811Q2ZH
16 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
50331648K bytes of physical memory.
7743487K bytes of eUSB flash at bootflash:.
97620247K bytes of SATA hard disk at harddisk:.
0K bytes of WebUI ODM Files at webui:.

Configuration register is 0x1820
```

Determining the Software Version for Cisco IOS XE Fuji 16.7.2

To determine the version of the Cisco IOS XE software running on your Cisco cBR Series Converged Broadband Routers, log in and enter the **show version** EXEC command:

```
Router#show version
Cisco IOS XE Software, Version 16.07.02
Cisco IOS Software [Fuji], cBR  Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 16.7.2,
 RELEASE SOFTWARE (fc3)
Technical Support: http://www.cisco.com/techsupport
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Compiled Tue 29-May-18 19:33 by mcpre


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or the applicable URL provided on the flyer accompanying the IOS-XE
software.


ROM: IOS-XE ROMMON
Router uptime is 5 minutes
Uptime for this control processor is 10 minutes
System returned to ROM by reload at 20:15:49 IST Fri Jun 1 2018
System restarted at 20:30:28 IST Fri Jun 1 2018
System image file is "harddisk:cbrsup-universalk9.16.07.02.SPA.bin"
Last reload reason: Reload Command



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http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
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Cisco cBR-8 (CBR) processor (revision CBR) with 3588666K/6147K bytes of memory.
Processor board ID FXS1811Q2ZH
16 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
50331648K bytes of physical memory.
7743487K bytes of eUSB flash at bootflash:.
97620247K bytes of SATA hard disk at harddisk:.
0K bytes of WebUI ODM Files at webui:.

Configuration register is 0x1820
```

Determining the Software Version for Cisco IOS XE Fuji 16.7.1b

To determine the version of the Cisco IOS XE software running on your Cisco cBR Series Converged Broadband Routers, log in and enter the **show version** EXEC command:

```
PSIT-Scale#show version
Cisco IOS XE Software, Version 16.07.01b
Cisco IOS Software [Fuji], cBR  Software
(X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 16.7.1b, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
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or the applicable URL provided on the flyer accompanying the IOS-XE
software.


ROM: IOS-XE ROMMON

PSIT-Scale uptime is 4 minutes
Uptime for this control processor is 10 minutes
System returned to ROM by reload at 22:34:28 PST Tue Dec 19 2017
System restarted at 22:42:54 PST Tue Dec 19 2017
System image file is "harddisk:cbrsup-universalk9.16.07.01a.SPA.bin"
Last reload reason: Reload Command



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Cisco cBR-8 (CBR) processor (revision CBRVE) with 9448426K/6147K bytes of memory.
Processor board ID FXS1921Q1WZ
16 Ten Gigabit Ethernet interfaces
4 Hundred Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
50331648K bytes of physical memory.
7649279K bytes of eUSB flash at bootflash:.
117155287K bytes of SATA hard disk at harddisk:.
3911744K bytes of USB flash at usb0:.
60708128K bytes of USB flash at usb1:.
0K bytes of WebUI ODM Files at webui:.
```

```
Configuration register is 0x2
```

Determining the Software Version for Cisco IOS XE Fuji 16.7.1a

To determine the version of the Cisco IOS XE software running on your Cisco cBR Series Converged Broadband Routers, , log in and enter the **show version** EXEC command:

```
PSIT-Scale#show version
Cisco IOS XE Software, Version 16.07.01a
Cisco IOS Software [Fuji], cBR  Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 16.7.1a,
 RELEASE SOFTWARE (fc4)
Technical Support: http://www.cisco.com/techsupport
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ROM: IOS-XE ROMMON

PSIT-Scale uptime is 4 minutes
Uptime for this control processor is 10 minutes
System returned to ROM by reload at 22:34:28 PST Tue Dec 19 2017
System restarted at 22:42:54 PST Tue Dec 19 2017
System image file is "harddisk:cbrsup-universalk9.16.07.01a.SPA.bin"
Last reload reason: Reload Command



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Cisco cBR-8 (CBR) processor (revision CBRVE) with 9448426K/6147K bytes of memory.
Processor board ID FXS1921Q1WZ
16 Ten Gigabit Ethernet interfaces
4 Hundred Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
50331648K bytes of physical memory.
7649279K bytes of eUSB flash at bootflash:.
117155287K bytes of SATA hard disk at harddisk:.
```

```
3911744K bytes of USB flash at usb0:.
60708128K bytes of USB flash at usb1:.
0K bytes of WebUI ODM Files at webui:.

Configuration register is 0x2
```

Determining the Software Version for Cisco IOS XE Fuji 16.7.1

To determine the version of the Cisco IOS XE software running on your Cisco cBR Series Converged Broadband Routers, , log in and enter the **show version** EXEC command:

```
tb28-CBR8#show version
Cisco IOS XE Software, Version 16.07.01
Cisco IOS Software [Fuji], cBR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 16.7.1,
 RELEASE SOFTWARE (fc6)
Technical Support: http://www.cisco.com/techsupport
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software.


ROM: IOS-XE ROMMON

tb28-CBR8 uptime is 19 minutes
Uptime for this control processor is 23 minutes
System returned to ROM by reload at 11:56:35 EST Tue Nov 21 2017
System restarted at 12:16:45 EST Tue Nov 21 2017
System image file is "bootflash:cbrsup-universalk9.16.07.01.SPA.bin"
Last reload reason: Reload Command



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http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
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Cisco cBR-8 (CBR) processor (revision CBR) with 3589054K/6147K bytes of memory.
Processor board ID FXS2038Q3GC
16 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
50331648K bytes of physical memory.
```

```
7743487K bytes of eUSB flash at bootflash:.
97620247K bytes of SATA hard disk at harddisk:.
15330288K bytes of USB flash at usb0:.
0K bytes of WebUI ODM Files at webui:.

Configuration register is 0x0
```

Microcode Software

This section describes microcode software that is supported for the Cisco cBR Series Converged Broadband Routers.

For more information, see the Upgrading the Cisco cBR Series Converged Broadband Routers for Cisco IOS XE Fuji 16.7.x guide.

Feature Support

Cisco IOS XE software is packaged in feature sets that consist of software images that support specific platforms. The feature sets available for a specific platform depend on which Cisco IOS XE software images are included in a release. Each feature set contains a specific set of Cisco IOS XE features.

⚠️

Caution   Cisco IOS XE images with strong encryption (including, but not limited to 168-bit [3DES] data encryption feature sets) are subject to U.S. government export controls and have limited distribution. Strong encryption images to be installed outside the United States are likely to require an export license. Customer orders may be denied or subject to delay because of U.S. government regulations. When applicable, the purchaser or user must obtain local import and use authorizations for all encryption strengths. Please contact your sales representative or distributor for more information, or send an e-mail to export@cisco.com.

New and Changed Information

Cisco cBR-8 Converged Cable Access Router Supervisor 250

Cisco cBR-8 Converged Cable Access Router Supervisor 250 is supported now. For more information see, Cisco cBR-8 Converged Cable Access Router Supervisor 250.

The following section lists the new software and hardware features supported on the Cisco cBR Series Converged Broadband Routers in this release:

New Software Features in Cisco IOS XE Fuji 16.7.4

There are no new software features in Cisco IOS XE Fuji 16.7.4.

New Software Features in Cisco IOS XE Fuji 16.7.3

There are no new software features in Cisco IOS XE Fuji 16.7.3.

New Software Features in Cisco IOS XE Fuji 16.7.2

There are no new software features in Cisco IOS XE Fuji 16.7.2.

New Software Features in Cisco IOS XE Fuji 16.7.1b

There are no new software features in Cisco IOS XE Fuji 16.7.1b.

New Software Features in Cisco IOS XE Fuji 16.7.1a

There are no new software features in Cisco IOS XE Fuji 16.7.1a.

New Software Features in Cisco IOS XE Fuji 16.7.1

Configurable DOCSIS CMTS Capabilities DHCPvx6 Field

According to DOCSIS 3.1 specification, CMTS must support DOCSIS 3.0 cable modems and features. To support backward compatibility of DOCSIS versions, the DHCPv6 vendor option must change from 30 to 31.

You can now upgrade to any DOCSIS version using the **cable docsis-ver [major version | minor version]** command.

Dynamic Bonding Group

Dynamic Bonding Group (DBG) helps manage the resource of all downstream bonding groups, including automatically creating and reclaiming the downstream bonding groups. Additionally, Dynamic Bonding Group supports the following:

- Support 896 bonding groups per CLC.

- Support DOCSIS 3.0 and DOCSIS 3.1 channel types.

- Support DOCSIS 3.0 and DOCSIS 3.1 load balance.

- Supports DBG interoperation – Modem registration and load balancing.

- Enhance dynamic load balance – Fixed primary channel movement.

- Enhance raider FPGA SQF – Fairness in channel utilization.

Voltage Thresholds for AC Power Supply Module Mode Control

Configuring voltage thresholds help switch between different modes when power budget provided by AC PSMs is not sufficient to power Field Replaceable Units (FRUs).

Configurable Tilt adjustment for all channels on a port

The Downstream Power tilt feature is used to correct cable loss in the head-end to produce a flat power spectrum for all channels in the controller port.

RPHY IPV6 Support

The CableLabs' MHAv2 standards require both IPv4 and IPv6 support between CCAP core and RPD, which means the Remote PHY Signaling between the CCAP Core and RPD is able to run on both IPv4 and IPv6 networks.

ISSU I-CCAP Upgrade Across Major Releases

ISSU can be used to upgrade I-CCAP cBR-8 from the 16.6 release to the 16.7.1 release.

RPHY and ICMTS Mixed mode support

Starting from Cisco IOS XE Fuji 16.7.1 release, both iCMTS linecard and RPHY linecard can be plugged in cbr-8 simultaneously. But only one RPHY linecard is supported, and can only be plugged in slot 9. The other slots support iCMTS linecard in LCHA configuration.

Time and Frequency Division Multiplexing (TaFDM) Support

TaFDM enables the ability for OFDMA and SC-QAM channels to overlap and share the same spectrum within the same scheduling domain, removing the need to dedicate overlapping spectrum for the exclusive use of an SC-QAM channel.

Network Configuration Protocol

The Network Configuration Protocol (NETCONF) defines an XML-based interface through which you can manage network devices, retrieve configuration data, and upload and manipulate new configuration data. NETCONF defines an interface between a network device and a network management system to provide a mechanism to manage, configure, and monitor a network device.

In cBR Series Converged Broadband Routers, NETCONF protocol is supported from this release.

You can use a web-based application to access the Cisco cBR router to add, modify, delete, or retrieve information stored within those data stores.

Enabling IOx on Cisco cBR

Cisco IOx is an end-to-end application enablement platform that provides application hosting capabilities for different application types in a consistent and uniform manner across various Cisco network platforms. The IOx platform allows you to manage the whole life cycle of applications including development, distribution, deployment, hosting, monitoring, and management.

In cBR Series Converged Broadband Routers, the following features related to Cisco IOx are available:

- Support for two types of applications:

  - Virtual machine based application.

  - LXC (Linux Containers) based application.

- Support for generic application-hosting CLI.

- Support for using Local Manager(LM) GUI, which is integrated with Cisco IOS-XE 16.7.1 Web UI, to manage IOx applications.

Remote PHY DVB Video on Demand

The Digital Video Broadcasting (DVB) protocol for encrypting video services as defined in the ETSI TS 103 197 DVB Simulcrypt specification has been implemented on the line card for DVB R-PHY on Cisco cBR-8.

Remote PHY Switched Digital Video

The Switched Digital Video (SDV) services are supported for the MPEG video subsystem on the Cisco Remote PHY Device. It consists of Multicast IP Packet based video streams that are managed as "Video Sessions". The Cisco Remote PHY Device supports both Any Source Multicast (ASM) and Source Specific Multicast (SSM) sessions.

- For ASM, the input is identified by the group IP address.

- For SSM, the input is identified by the source and group IP address pair.

In both cases, the UDP ports are ignored. Both ASM and SSM can co-exist but cannot overlap in a group IP address. Hence, for a group IP address, either a single ASM, or one or more SSM can be used.

Modified Software Features in Cisco IOS XE Fuji 16.7.4

There are no modified software features in Cisco IOS XE Fuji 16.7.4.

Modified Software Features in Cisco IOS XE Fuji 16.7.3

There are no modified software features in Cisco IOS XE Fuji 16.7.3.

Modified Software Features in Cisco IOS XE Fuji 16.7.2

There are no modified software features in Cisco IOS XE Fuji 16.7.2.

Modified Software Features in Cisco IOS XE Fuji 16.7.1b

There are no modified software features in Cisco IOS XE Fuji 16.7.1b.

Modified Software Features in Cisco IOS XE Fuji 16.7.1a

There are no modified software features in Cisco IOS XE Fuji 16.7.1a.

Modified Software Features in Cisco IOS XE Fuji 16.7.1

512 RPD per Chassis

Starting from Cisco IOS XE Fuji 16.7.1 release, RPHY configuration supports 512 RPDs per CBR-8 chassis and 64 RPDs per CBR-CCAP-LC-40G-R line card.

SG Based Config (OpSimp) Phase 2

As density increases with the merging of CMTS and UEQAM functions in the same device, the current controller configuration method becomes too complex and difficult. To simplify the controller configuration, a new concept called Controller Profile is introduced.

Multicast Session

The Cisco cBR routers support 40000 DSG multicast sessions per chassis.

OFDMA Channel Configuration Enhancements

The Cisco cBR Series Converged Broadband Routers support 50 kHz subcarrier spacing from this release. Cisco cBR support exclusion bands, which can be used to prevent interference with SC-QAM channels.

New Hardware Features in Cisco IOS XE Fuji 16.7.4

There are no new hardware features in Cisco IOS XE Fuji 16.7.4.

New Hardware Features in Cisco IOS XE Fuji 16.7.3

There are no new hardware features in Cisco IOS XE Fuji 16.7.3.

New Hardware Features in Cisco IOS XE Fuji 16.7.2

There are no new hardware features in Cisco IOS XE Fuji 16.7.2.

New Hardware Features in Cisco IOS XE Fuji 16.7.1b

There are no new hardware features in Cisco IOS XE Fuji 16.7.1b.

New Hardware Features in Cisco IOS XE Fuji 16.7.1a

There are no new hardware features in Cisco IOS XE Fuji 16.7.1a.

New Hardware Features in Cisco IOS XE Fuji 16.7.1

Cisco cBR-8 Converged Cable Access Router Supervisor 250

The Cisco® cBR-8 Converged Cable Access Router Supervisor 250G perform the data forwarding and routing processing functions of carrier-class and high performance cBR-8 Converged Cable Access Router. Not only does the supervisor provide advanced routing capabilities, but it also monitors and manages other components in the Cisco® cBR-8 Converged Cable Access Router.

MIBs

To locate and download MIBs for selected platforms, Cisco IOS XE releases, and feature sets, use Cisco MIB Locator found at the following URL:

https://mibs.cloudapps.cisco.com/ITDIT/MIBS/servlet/index

New and Changed MIB Information in Cisco IOS XE Fuji 16.7.4

There are no new MIBs in Cisco IOS XE Fuji 16.7.4.

New and Changed MIB Information in Cisco IOS-XE Fuji 16.7.3

There are no new MIBs in Cisco IOS-XE Fuji 16.7.3.

New and Changed MIB Information in Cisco IOS-XE Fuji 16.7.2

There are no new MIBs in Cisco IOS-XE Fuji 16.7.2.

New and Changed MIB Information in Cisco IOS-XE Fuji 16.7.1b

There are no new MIBs in Cisco IOS-XE Fuji 16.7.1b.

New and Changed MIB Information in Cisco IOS-XE Fuji 16.7.1a

There are no new MIBs in Cisco IOS-XE Fuji 16.7.1a.

New and Changed MIB Information in Cisco IOS-XE Fuji 16.7.1

The CISCO-DOCS-EXT-MIB was changed in Cisco IOS-XE Fuji 16.7.1.

Best Practice Manual of Procedure for Cisco IOS XE Fuji 16.7.x Upgrade

See the Upgrading the Cisco cBR Series Converged Broadband Routers for Cisco IOS XE Fuji 16.7.x guide.

Cisco cBR Series Converged Broadband Routers Documentation References

Go to the following link to access the technical documents:

http://www.cisco.com/c/en/us/support/video/cbr-series-converged-broadband-routers/tsd-products-support-series-home.html

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation.

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the What's New in Cisco Product Documentation RSS feed. The RSS feeds are a free service.