Cross-Platform Release Notes for Cisco IOS Release 12.2SR

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Release: Cisco IOS Release 12.2(33)SRE9

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These release notes support Cisco IOS Release 12.2SR for the Cisco 7600 series routers up to and including Cisco IOS Release 12.2(33)SRE9. With the release of Cisco IOS Release 12.2(33)SRC, Cisco IOS Release 12.2SR also supports the Cisco 7200 series routers (Cisco 7200, Cisco 7200-NPE-G2, and Cisco 7201 routers) and the Cisco 7301 router. These release notes are updated as needed to describe new features, caveats, potential software deferrals, and related documents.

Cisco IOS Software Release 12.2SR is designed for Enterprise WAN and service provider edge networks that require world-class IP and Multiprotocol Label Switching (MPLS) services. The routers in Cisco IOS Release 12.2SR provide scalable, secure, converged network services in the most demanding Enterprise WAN and service provider edge environments.

For more information, see the "Introduction" section on page 2.

For a list of the software caveats that apply to Cisco IOS Release 12.2SR, see the following document:

- *Caveats for Cisco IOS Release 12.2*

These documents are updated for every maintenance release and are located on Cisco.com.

Use these release notes with the appropriate platform documentation. See the "Related Documentation" section on page 1478.

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/warp/customer/tech_tips/index/fn.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.

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Contents

Introduction

Cisco IOS Release 12.2SR is based on the following releases:

- Cisco IOS Release 12.2
- Cisco IOS Release 12.2S up to and including Release 12.2(18)S
- Cisco IOS Release 12.2SX up to and including Release 12.2(18)SXF
- Cisco IOS Release 12.2SB up to and including Release 12.2(31)SB2 (beginning with Cisco IOS Release 12.2(33)SRC).

In addition, many new features are introduced in Release 12.2SR. Many features and hardware that are supported in this software have been previously released to customers on other software releases.

For information on new features and Cisco IOS commands that are supported by Release 12.2SR, see the "New and Changed Information" section on page 8.

Early Deployment Releases

These release notes describe the networking devices for Cisco IOS Release 12.2SR, which is an early deployment (ED) release that is based on Release 12.2, Release 12.2S, Release 12.2SB, and Release 12.2SX. Early deployment releases contain fixes for software caveats and support for new Cisco hardware and software features.

Chronological List of ED Releases for Cisco IOS Release 12.2SR

Table 1 shows the Cisco IOS Release 12.2SR early deployment releases in chronological order.

Table 1 Chronological List of 12.2SR Early Deployment Releases

Cisco IOS ED Release	Type of ED Release	Additional Software Features	Additional Hardware Features	Availability
12.2(33)SRE9	Rebuild	There are no new software features	There are no new hardware features	09/11/2013
12.2(33)SRE8	Rebuild	There are no new software features.	There are no new hardware features.	03/19/2013
12.2(33)SRE7a	Rebuild	There are no new software features.	There are no new hardware features.	10/25/2012
12.2(33)SRE7	Rebuild	There are no new software features.	There are no new hardware features.	09/18/2012
12.2(33)SRE6	Rebuild	There are no new software features.	There are no new hardware features.	04/10/2012
12.2(33)SRE5	Rebuild	There are no new software features.	There are no new hardware features.	09/16/2011
12.2(33)SRE4	Rebuild	There are no new software features.	There are no new hardware features.	05/31/2011
12.2(33)SRE3	Rebuild	There are no new software features.	There are no new hardware features.	01/28/2011
12.2(33)SRE2	Rebuild	"New Software Features in Cisco IOS Release 12.2(33)SRE2" section on page 10	There are no new hardware features.	08/10/2010
12.2(33)SRE1	Rebuild	"New Software Features in Cisco IOS Release 12.2(33)SRE1" section on page 11	"New Hardware Features in Cisco IOS Release 12.2(33)SRE1" section on page 10	03/26/2010
12.2(33)SRE0a	Rebuild	There are no new software features.	There are no new hardware features.	02/12/2010
12.2(33)SRE	Maintenance	"New Software Features in Cisco IOS Release 12.2(33)SRE" section on page 14	"New Hardware Features in Cisco IOS Release 12.2(33)SRE" section on page 12	11/20/2009
12.2(33)SRD6	Rebuild	There are no new software features.	There are no new hardware features.	12/20/2010
12.2(33)SRD5	Rebuild	There are no new software features.	There are no new hardware features.	10/03/2010
12.2(33)SRD4	Rebuild	There are no new software features.	"New Hardware Features in Cisco IOS Release 12.2(33)SRD4" section on page 32	02/23/2010
12.2(33)SRD3	Rebuild	"New Software Features in Cisco IOS Release 12.2(33)SRD3" section on page 33	"New Hardware Features in Cisco IOS Release 12.2(33)SRD3" section on page 33	09/14/2009
12.2(33)SRD2a	Rebuild	There are no new software features.	There are no new hardware features.	07/20/2009
12.2(33)SRD2	Rebuild	"New Software Features in Cisco IOS Release 12.2(33)SRD2" section on page 35	"New Hardware Features in Cisco IOS Release 12.2(33)SRD2" section on page 34	05/22/2009
12.2(33)SRD1	Rebuild	"New Software Features in Cisco IOS Release 12.2(33)SRD1" section on page 36	"New Hardware Features in Cisco IOS Release 12.2(33)SRD1" section on page 35	02/13/2009
12.2(33)SRD	Maintenance	"New Software Features in Cisco IOS Release 12.2(33)SRD" section on page 40	"New Hardware Features in Cisco IOS Release 12.2(33)SRD" section on page 37	10/24/2008
12.2(33)SRC6	Rebuild	There are no new software features.	There are no new hardware features.	03/11/2010

Table 1 Chronological List of 12.2SR Early Deployment Releases (continued)

Cisco IOS ED Release	Type of ED Release	Additional Software Features	Additional Hardware Features	Availability
12.2(33)SRC5	Rebuild	There are no new software features.	There are no new hardware features.	10/7/2009
12.2(33)SRC4	Rebuild	There are no new software features.	There are no new hardware features.	05/15/2009
12.2(33)SRC3	Rebuild	There are no new software features.	There are no new hardware features.	12/18/2008
12.2(33)SRC2	Rebuild	See the "New Software Features in Cisco IOS Release 12.2(33)SRC2" section on page 49	There are no new hardware features.	08/29/2008
12.2(33)SRC1	Rebuild	See the "New Software Features in Cisco IOS Release 12.2(33)SRC1" section on page 50	See the "New Hardware Features in Cisco IOS Release 12.2(33)SRC1" section on page 49	05/27/2008
12.2(33)SRC	Maintenance	See the "New Software Features in Cisco IOS Release 12.2(33)SRC" section on page 53.	See the "New Hardware Features in Cisco IOS Release 12.2(33)SRC" section on page 50. Added support for Cisco 7200 series routers (Cisco 7200, Cisco 7200-NPE-G2, and Cisco 7201 routers) and Cisco 7301 router.	01/14/2008
12.2(33)SRB6	Rebuild	There are no new software features.	There are no new hardware features.	06/08/2009
12.2(33)SRB5	Rebuild	There are no new software features.	There are no new hardware features.	11/7/2008
12.2(33)SRB4	Rebuild	There are no new software features.	There are no new hardware features.	07/25/2008
12.2(33)SRB3	Rebuild	See the "New Software Features in Cisco IOS Release 12.2(33)SRB3" section on page 78.	See the "New Software Features in Cisco IOS Release 12.2(33)SRB3" section on page 78.	04/14/2008
12.2(33)SRB2	Rebuild	There are no new software features.	There are no new hardware features.	10/12/2007
12.2(33)SRB1	Rebuild	See the "New Software Features in Cisco IOS Release 12.2(33)SRB1" section on page 79.	See the "New Hardware Features in Cisco IOS Release 12.2(33)SRB1" section on page 79.	06/04/2007
12.2(33)SRB	Maintenance	See the See the "New Software Features in Cisco IOS Release 12.2(33)SRB" section on page 86.	See the "New Hardware Features in Cisco IOS Release 12.2(33)SRB" section on page 83.	02/28/2007
12.2(33)SRA7	Rebuild	There are no new software features.	There are no new hardware features.	03/07/2008
12.2(33)SRA6	Rebuild	There are no new software features.	There are no new hardware features.	10/29/2007
12.2(33)SRA5	Rebuild	There are no new software features.	There are no new hardware features.	07/30/2007
12.2(33)SRA4	Rebuild	There are no new software features.	There are no new hardware features.	05/29/2007
12.2(33)SRA3	Rebuild	There are no new software features.	There are no new hardware features.	03/05/2007
12.2(33)SRA2	Rebuild	There are no new software features.	There are no new hardware features.	12/07/2006
12.2(33)SRA1	Rebuild	See the "New Software Features in Cisco IOS Release 12.2(33)SRA1" section on page 105.	There are no new hardware features.	09/06/2006
12.2(33)SRA	Maintenance	See the "New Software Features in Cisco IOS Release 12.2(33)SRA" section on page 106.	See the"New Hardware Features in Cisco IOS Release 12.2(33)SRA" section on page 105.	06/19/2006

System Requirements

This section describes the system requirements for Cisco IOS Release 12.2SR and includes the following sections:

Supported Hardware

Cisco IOS Release 12.2SR supports Cisco 7600 series routers, including the following models and supervisor engines:

- Cisco 7603-S, Cisco 7604, Cisco 7606, Cisco 7606-S, Cisco 7609, Cisco 7609-S, and Cisco 7613 routers
- Supervisor Engine 32, Supervisor Engine 720, Route Switch Processor 720
- RSP720-3CXL-10GE, RSP720-3C-10GE (The Cisco 7600 Series RSP 720-10GE is introduced on Cisco IOS 12.2(33)SRC on a limited orderability basis.)

Guide to Supported Hardware for Cisco 7600 Series Routers

For extensive information about all supported hardware for Cisco 7600 series routers, see the *Guide to Supported Hardware for Cisco 7600 Series Routers with Release 12.2SR*.

Note Cisco IOS Release 12.2SR supports Cisco 7600 series routers. Do not run this release on Cisco Catalyst 6500 series switches.

With the release of Cisco IOS Release 12.2(33)SRC, Cisco IOS Release 12.2SR also supports the following Cisco 7200 and Cisco 7300 series routers:

- Cisco 7200, Cisco 7200-NPE-G2, and Cisco 7201 routers
- Cisco 7301 router

For information about the new hardware features, see the "New and Changed Information" section on page 8.

Determining the Software Version

To determine the version of Cisco IOS software that is running on your Cisco router, log in to the router and enter the **show version** EXEC command:

```
Router#> show version
Cisco Internetwork Operating System Software
IOS (tm) 7600 Software (s72033-ipservices_wan-mz), Version 12.2(33)SRD, EARLY DEPLOYMENT
RELEASE SOFTWARE
```

Upgrading to a New Software Release

For information about selecting a new Cisco IOS software release, see *How to Choose a Cisco IOS Software Release* at the following location:

http://www.cisco.com/en/US/customer/products/sw/iosswrel/ps1834/products_tech_note09186a00800fb9d9.shtml

For information about upgrading the Cisco 7600 series routers, see the document at the following location:

http://www.cisco.com/en/US/products/hw/routers/ps133/products_tech_note09186a0080094c07.shtml

For Cisco IOS upgrade ordering instructions, see the document at the following location:

http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/957_pp.htm

To choose a new Cisco IOS software release by comparing feature support or memory requirements, use Cisco Feature Navigator. Cisco Feature Navigator is a web-based tool that enables you to determine which Cisco IOS and Catalyst OS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or by feature set (software image). Under the release section, you can compare Cisco IOS software releases side by side to display both the features that are unique to each software release and the features that the releases have in common.

Cisco Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

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

To choose a new Cisco IOS software release based on information about defects that affect that software, use Bug Toolkit at the following URL:

http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl

Feature Support

Cisco IOS 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 software images are included in a release. Each feature set contains specific Cisco IOS features.

Caution Cisco IOS 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/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.

Feature-to-image mapping is available through Cisco Feature Navigator. Cisco Feature Navigator is a web-based tool that enables you to determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or by feature set (software image). You can compare Cisco IOS software releases side-by-side to display both the features unique to each software release and the features that the releases have in common.

Cisco Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

www.cisco.com/go/cfn

For help with Cisco Feature Navigator, see the help information at the following URL:

http://www.cisco.com/web/applicat/CFNTOOLS/Help_Docs/help/cfn_support.html

Determining the Software Images (Feature Sets) That Support a Specific Feature

To determine which software images (feature sets) in a Cisco IOS release support a specific feature, go to the Cisco Feature Navigator home page and perform the following steps.

Step 1 From the Cisco Feature Navigator home page, click **Research Features**.

Step 2 Select your software type or leave the field as "All".

Step 3 To find a feature, you can search by either Feature or Technology (select the appropriate button). If you select Search by Feature, you can further filter your search by using the Filter By text box.

Step 4 Choose a feature from the Available Features text box, and click the **Add** button to add the feature to the Selected Features text box.

Note To learn more about a feature in the list, click the **View Desc** button in the Available Features text box.

Repeat this step to add features. A maximum of 20 features can be chosen for a single search.

Step 5 Click **Continue** when you are finished choosing features.

Step 6 In the Release/Platform Tree area, select either your release (from the Train-Release list) or your platform (from the Platform list).

Step 7 The "Search Result" table will list all the software images (feature sets) that support the features that you chose.

Note You can download your results into an Excel spreadsheet by clicking on the Download Excel button.

Determining the Features Supported in a Specific Software Image (Feature Set)

To determine which features are supported in a specific software image (feature set), go to the Cisco Feature Navigator home page and perform the following steps.

Step 1 From the Cisco Feature Navigator home page, click **Research Software**.

Step 2 Select your software type from the drop-down list and chose the **Release** button in the "Search By" area.

Step 3 From the Major Release drop-down list, chose the appropriate major release.

Step 4 From the Release drop-down list, choose the appropriate maintenance release.

Step 5 From the Platform drop-down list, choose the appropriate hardware platform.

Step 6 From the Feature Set drop-down list, choose the appropriate feature set. The Image Details area will provide details on the specific image. The Available Features area will list all the features that are supported by the feature set (software image) that you chose.

Note To learn more about a feature in the list, click the **View Desc** button in the Available Features text box.

Memory Recommendations

To determine memory recommendations for software images (feature sets) in your Cisco IOS release, go to the Cisco Feature Navigator home page and perform the following steps.

Step 1 From the Cisco Feature Navigator home page, click **Research Software**.

Step 2 Select your software type from the drop-down list and choose the **Release** button in the "Search By" area.

Step 3 From the Major Release drop-down list, choose the appropriate major release.

Step 4 From the Release drop-down list, choose the appropriate maintenance release.

Step 5 From the Platform drop-down list, choose the appropriate hardware platform.

Step 6 From the Feature Set drop-down list, choose the appropriate feature set.

Step 7 The Image Details area will provide details on the specific image including the DRAM and flash memory recommendations for each image. The Available Features area will list all the features that are supported by the feature set (software image) that you chose.

New and Changed Information

This section lists the new hardware and software features supported by Cisco IOS Release 12.2SR and contains the following subsections:

Note These release notes are not cumulative and list only features that are new to Cisco IOS Release 12.2SR, which is based on Release 12.2, Release 12.2S, Release 12.2SB, and Release 12.2SX. For information about inherited features, go to Cisco.com or Cisco Feature Navigator. For Cisco.com, either go to Cisco.com and select the appropriate software release under Products and Service and IOS Software, or go to http://www.cisco.com/cisco/web/psa/default.html and select the appropriate software release under Cisco IOS Software and Release Notes. You can use the Cisco Feature Navigator tool at http://www.cisco.com/go/cfn.

Note For extensive information about all supported hardware in Cisco IOS Release 12.2SR, see the *Guide to Supported Hardware for Cisco 7600 Series Routers with Release 12.2SR*.

New Hardware Features in Cisco IOS Release 12.2(33)SRE2

There are no new hardware features in Cisco IOS Release 12.2(33)SRE2.

New Software Features in Cisco IOS Release 12.2(33)SRE2

This section describes new and changed features in Cisco IOS Release 12.2(33)SRE2. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRE2. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

IPv6 Services: DNS Lookups over an IPv6 Transport

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-addrg_bsc_con.html

ISG: Triple Key Authentication Support

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/en_isg_ext_plcy_svrs.html

New Hardware Features in Cisco IOS Release 12.2(33)SRE1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRE1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRE1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Addition of ES Transport Line Cards for Cisco 7600

For additional information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

ES Line Cards for Cisco 7600

This feature introduces the following line cards:

- 76-ES+T-20G
- 76-ES+T-2TG
- 76-ES+T-40G
- 76-ES+T-4TG

- 76-ES+XC-20G3C
- 76-ES+XC-20G3CXL
- 76-ES+XC-40G3C
- 76-ES+XC-40G3CXL

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_chap2.html

New Software Features in Cisco IOS Release 12.2(33)SRE1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRE1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRE1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Call Home

The Call Home feature provides e-mail and web-based notification of critical system events. A versatile range of message formats are available for optimal compatibility with pager services, standard e-mail, or XML-based automated parsing applications. Common uses of this feature includes direct paging of a network support engineer, e-mail notification to a Network Operations Center, XML delivery to a support website, and direct case generation with the Cisco Systems Technical Assistance Center (TAC).

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7200/configuration/feature_guides/callhome_7200.html#wp1055783

CWDM-SFP-xxxx on RSP720 GE

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

DWDM-SFP-xxxx 40x Wavelengths on RSP720

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

DWDM-SFP-xxxx on SUP32 and 67xx-SFP on Cisco 7600 (8x Additional Wavelengths)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

IP SERVICES

IP Base (IP SERVICES) supports the standard IP version 6 (IPv6) features on the Cisco 7600 series routers with Cisco IOS Release 12.2(33)SRE1.

Private Host on Pseudoport on CWAN Cards

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/pacl.html

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/baldcfg.html

WANPHY and OTN Support on ES+XC Combination Line Card

The 10GE ports on the ES+ and ES+T line cards are hardware, which are capable of supporting the Optical Transport Network (OTN) and Wide Area Network (WAN)PHY. This feature provides the software functionality to support OTN and WAN PHY on ES+ and ES+T line cards on Cisco 7600 series routers. WANPHY leverages 10 Gig SONET infrastructure and accesses WAN facilities using:

- Dark Fiber
- Dark Wavelengths
- SONET TDM Networks

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap10.html

XFP-10G-MM-SR on 10GE Ports for Cisco 7600

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

New Hardware Features in Cisco IOS Release 12.2(33)SRE

This section describes new and changed features in Cisco IOS Release 12.2(33)SRE. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRE. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Enable Support for DWDM-SFPs

This feature enables support for additional DWDM SFPs on ES+ and ES+Combo line cards and on ES20/SIP400/SIP600 (HW):

- DWDM-SFP-3346

- DWDM-SFP-3739
- DWDM-SFP-4134
- DWDM-SFP-4532
- DWDM-SFP-4931
- DWDM-SFP-5332
- DWDM-SFP-5736,
- DWDM-SFP-6141

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES20_Line_Card_Installation_Guide/baldintr_ps368_TSD_Products_Module_Installation_Guide_Chapter.html

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/dynarp.html

ES Line Cards for Cisco 7600

This feature introduces the following line cards:

- 76-ES+XC-20G3C
- 76-ES+XC-20G3CXL
- 76-ES+XC-40G3C
- 76-ES+XC-40G3CXL

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_chap2.html

FWSM with RSP720-10GE

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/security/fwsm/fwsm11/configuration/guide/fwsm112.html

Persistent Storage Device (PSD)

The Cisco Persistent Storage Device (PSD) provides persistent storage capabilities to Cisco clients, and allows the clients to store data on the PSD's internal hard drive. Release 1.x provides content data records (CDR) backup capabilities for Cisco's Content Services Gateway (CSG). Release 2.0 adds CDR backup capabilities for the Cisco Gateway GPRS Serving Node (GGSN).

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/mw_psd/configuration/guide/mw_psd12233srd.html

PWR-4500-DC Power Supply

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Chassis_Installation/7600_Series_Router_Installation_Guide/cis_76xx.html

SFP-GE-T/S/L/Z Support on X6724/X6748

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html#wp1266117

STM1E-SFP Support

This feature supports ATM only. For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

USB Storage Filesystem Support

The USB Storage Filesystem Support feature extends the DOSFS component to support USB flash devices on Cisco 7200-NPE-G2 series routers.

X2-DWDM and X2-10GB-LRM/ZR Support on Cisco 7600 Cards (RSP720-10GE and WS-X6708-10GE)

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

New Software Features in Cisco IOS Release 12.2(33)SRE

This section describes new and changed features in Cisco IOS Release 12.2(33)SRE. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRE. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in

this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

7600 ISSU for IP Multicast

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/mcastv4.html

802.1ah

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

AAA Per VC QoS Policy Support

The AAA Per VC QoS Policy Support feature provides the ability to modify an existing quality of service (QoS) profile applied to a session while that session remains active using new Cisco attribute-value (AV) pairs that specify service policy output and service policy input.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/sec_user_services/configuration/guide/sec_aaa_vc_qos_ps.html

AAA Support for Greater than 8 Login and EXEC Authentication List

The maximum size for the following AAA method lists has been enhanced from 8 to 250.

Before this the maximum size was 8, where one can configure 7 named lists + 1 default list.

After this the user can configure 250 (249 named lists + 1 default list).

- Login Authentication (aaa authentication login .....)
- Exec Authorization __(aaa authorization exec .....)
- Exec Accounting _____(aaa accounting exec .....)

AAA-SERVER-MIB Set Operation

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/sec_user_services/configuration/guide/sec_aaa_serv_mib_op.html

Access Circuit Redundancy

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html

ATM In ARP Support for Different Subnet

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/atm/command/reference/atm_m1.html#wp1014484

ATM VP Average Traffic Rate

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/atm/configuration/guide/atm_vp_avg_tfc_rate.html

BFD IPv6 Encapsulation Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-bfd.html

BGP Best External

Beginning with Cisco IOS Release 12.2(33)SRE, this feature is supported by Cisco 7200 and Cisco 7600 routers. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_best_external.html

BGP Event-Based VPN Import

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_event_vpn_import.html

BGP PIC Edge for IP/MPLS

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_bgp_mp_pic.html

BGP RT Changes Without PE-CE Neighbor Impact

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_event_vpn_import.html

BGP Support for 4-byte ASN

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_basic_net.html

BGP VPLS Auto Discovery Support on Route Reflector

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_int_features.html

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_vpls_auto_bgp.html

Bidirectional Forwarding Detection (BFD) MIB Version 2

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute_bfd/configuration/guide/irb_bfd_mib.html

Bridge Domain MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/technical_references/7600_mib_guides/MIB_Guide_ver_6/7600mib3.html

Cisco 7600 ARP Scale

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_mon_main_arp.html

Commands for SNMP Diagnostics

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cfg_snmp_sup.html

Configurable Domain Name Prefix and Suffix Stripping

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/vpdn/configuration/guide/config_aaa_for_vpdn.html#wp1210170

Configuring _ITU-T Y.1731 Fault Management Functions

The ITU-Y.1731 Fault Management Functions feature provides new functions for fault and performance management to serve the needs of service providers in large networks. These new functions extend Ethernet Alarm Indication Signal (ETH-AIS) and Ethernet Remote Defect Indication (ETH-RDI) to include fault detection, fault verification, and fault isolation for large Ethernet Metropolitan-Area Networks (MANs) and Wide-Area Networks (WANs).

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm-ieee_y1731.html

Custom Ethertype for EVC Port Channel

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

DHCP—DHCPv6 Relay SSO/ISSU

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-dhcp.html

DHCP—Server User Authentication

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

DHCP Relay Server ID Override and Link Selection Option 82 Suboptions

Server Id Override and Link Selection Option 82 Sub-options are supported on the DHCP Relay. Server Id Override sub-option tells the DHCP Server which value to put in the Server-id option. Link Selection Sub-option tells the DHCP Server from which subnet to assign an IP address when the Giaddr field can not serve _this purpose. Combined together those two sub-options enable the deployment of architecture where it is desired to have the DHCP traffic flowing through the Relay in all cases.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcpservidlink_mcp.html

DHCP Snooping with Option 82 on EVC Port Channel

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

DHCPv6 Relay—Source Configuration

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-dhcp.html

DHCPv6 Repackaging

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-dhcp.html

Dynamic Layer-3 VPNs (RFC 2547) with Multipoint GRE (mGRE) Tunnel Support for SIP400 & ES40 on Cisco 7600 Platform

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/interface/configuration/guide/ir_greL3vpn.html

Embedded Event Manager (EEM) 2.4

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_eem_overview.html

Embedded Event Manager (EEM) 3.0

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_eem_overview.html

Event MIB and Expression MIB Enhancements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cfg_snmp_sup.html

Reverse L2GP

Beginning with Cisco IOS Release 12.2(33)SRE, this feature is supported by ES+ and ES20 line cards. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

Flash MIB Enhancements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/release/notes/ol_14271.html

Flexible NetFlow—Ingress VRF Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fnetflow/configuration/guide/cust_fnflow_rec_mon.html

Flexible Netflow— IPv4 Multicast Statistics Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fnetflow/configuration/guide/cgf-mcast.html

Flexible NetFlow—IPv6 Unicast Flows

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fnetflow/configuration/guide/cust_fnflow_rec_mon.html

Flexible Netflow—Layer 2 Fields

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fnetflow/configuration/guide/cust_fnflow_rec_mon.html

Flexible NetFlow— NetFlow v9 Export Format

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fnetflow/configuration/guide/cfg_de_fnflow_exprts.html

Flexible Netflow—Netflow v5 Export Protocol

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fnetflow/configuration/guide/cfg_de_fnflow_exprts.html

Flexible Netflow—Top N Talkers Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fnetflow/configuration/guide/cgf-topn.html

Flexible Service Mapping Based on CoS, Ethertype

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html

Manual Load Balancing for EVC over Port-Channel/LACP

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/baldcfg.html

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

HC-ALARM-MIB

Enables support for HC-ALARM-MIB as specified in RFC 3434.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cfg_rmon_sup.html

H-VPLS with Port-Channel Core Interface

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/baldcfg.html

IEEE 802.1ag-2007 Compliant CFM - Bridge Domain Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm-ieee.html

IGMP MIB Support Enhancements for SNMP

The Internet Group Management Protocol (IGMP) is used by IP hosts to report their multicast group memberships to neighboring multicast routers. The IGMP MIB describes objects that enable users to remotely monitor and configure IGMP using Simple Network Management Protocol (SNMP). It also allows users to remotely subscribe and unsubscribe from multicast groups. The IGMP MIB Support

Enhancements for SNMP feature adds full support of RFC 2933 (Internet Group Management Protocol MIB) in Cisco IOS software. There are no new or modified Cisco IOS commands associated with this feature.

For detailed information about the IGMP MIB, see the IGMP-STD-MIB.my file available from the Cisco MIB Locator at

http://tools.cisco.com/ITDIT/MIBS/servlet/index

IGMP Static Group Range Support

This feature adds new commands to configure a range of IGMP static groups.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipmulti/configuration/guide/imc_igmp_static_rng.html

IGMPv3 Host Stack

IGMPv3 host stack support enables a router or switch to behave as a multicast network end point or host.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipmulti/configuration/guide/imc_customize_igmp.html

IP and PPPoE Session Coexistence with Multicast

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

IP Session Support on the Cisco 7600 ES+ Series Line Cards

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_sub_aware_enet.html

IP SLAs Metro-Ethernet 3.0 (CFM d8.1)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipsla/configuration/guide/sla_metro_ethernet.html

IPv6 - Hop by Hop Rate Limiter on SIP200 and Enhanced FlexWAN

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1492073

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexqos.html

IPv6 BSR - Configure RP Mapping

This featurette allows IPv6 BSR routers to directly announce scope-to-RP mappings instead of learning them from candidate-RP messages.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-multicast.html

IPv6 BSR Bidirectional Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-multicast.html

IPv6 Multicast: Bandwidth-Based Call Admission Control (CAC)

This feature implements a method to monitor bandwidth per interface and multicast group, avoiding oversubscription due to multicast services.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-multicast.html

IPv6 Neighbor Discovery Non-Stop Forwarding (NSF)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-addrg_bsc_con.html

IPv6 Source Specific Multicast (SSM) Mapping

SSM Mapping for IPv6 will support both static and dynamic DNS mapping for MLD v1 receivers. This feature allows deployment of IPv6 SSM with hosts that are (at least currently) incapable to provide MLD version 2 support in their TCP/IP host stack and their IP multicast receiving application.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-multicast.html

IPv6: Multicast Address Group Range Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-multicast.html

IPv6: NSF & Graceful Restart for MP-BGP IPv6 Address Family

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mptcl_bgp.html

IPv6: RIPng Non-Stop Forwarding

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-rip.html

ISG: Instrumentation: DHCP Lease Query Support

This feature supports a DHCP lease query mechanism to get information about a DHCP lease based on the client's IP address as described in RFC 4388.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/partner/docs/ios-xml/ios/isg/configuration/12-2sr/isg-acess-ip-sess.html

ISG: Session: Multicast: Coexistence

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ios_xe/isg/configuration/guide/isg_acess_sub_sessns_xe.html

ISG: Session: Static Session Creation

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

ISG:AAA Wireless Enhancements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_radius_proxy.html

ISG: Authentication: Radius Proxy WiMax Enhancements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_radius_proxy.html

ISG: Policy Control: Differentiated Initial Policy Control

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_cntrl_policies.html

IS-IS - MPLS LDP Autoconfiguration

The SYNC feature helps synchronize ISIS forwarding with MPLS forwarding to reduce MPLS traffic being IP forwarded during a link flap. There must be an alternate path for this feature to operate correctly. This feature helps prevent black-holing when using MPLS VPNs with fast convergence.

The AUTOCONFIG feature allows LDP to be turned ON automatically on ISIS-enabled interfaces.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_ldp_autoconfig.html

IS-IS - MPLS LDP Synchronization

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_ldp_igp_synch.html

ISSU - IPv4 Multicast

Extends NSF/SSO and ISSU support to v4 and v6 Multicast Protocols.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipmulti/configuration/guide/imc_high_availability.html

L2VPN Interworking: VLAN Enable/Disable Option for AToM

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_l2vpn_intrntwkg.html

L2VPN Pseudowire Control Word Configuration (enable/disable/autosense)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_l2vpn_intrntwkg.html

L2VPN Pseudowire Redundancy for L2TPv3

Provides pseudowire redundancy for Layer 2 Tunnel Protocol Version 3 (L2TPv3) xconnect configurations.

http://www.cisco.com/en/US/docs/ios/wan/configuration/guide/wan_l2vpn_pw_red.html

L2VPN Pseudowire Switching

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_l2vpn_pseudo_swit.html

L2VPN PW Preferential Forwarding (Active/Standby Status)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/l2vpn_pw_preferential_forwarding.html

L2VPN Support for ATM Cell Packing on Static PW

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_atom_pseud_prov.html

L3 Classification and Marking on EVC on ES20

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/bald_qos.html

L3/L4 Security ACL on Service Instance

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/bald_qos.html

Login Password Retry Lockout

The Login Password Retry Lockout feature allows system administrators to lock out a local authentication, authorization, and accounting (AAA) user account after a configured number of unsuccessful attempts by the user to log in.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/sec_user_services/configuration/guide/sec_login_pw_retry_ps6350_TSD_Products_Configuration_Guide_Chapter.html

Label Switched Multicast Point-to-Multipoint Traffic Engineering

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_p2mp.html

MLD Group Limits

This feature enables global and per-interface MLD join limits.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-multicast.html

MPLS Support for Multi-Segment PWs—MPLS OAM/VCCV

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/multisegmentpseudowires.html

MPLS TE—Autoroute Destinations

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_interarea_tun.html

MPLS TE—Autotunnel/Automesh SSO Coexistence

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_autotun_mesh.html

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_autotunnel.html

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_rsvp_grace.html

MPLS TE—Enhanced Path Protection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_path_prot.html

MPLS Point-to-Multipoint Traffic Engineering

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_p2mp.html

MPLS VPN—L3VPN Over GRE on Cisco 7600 ES+ Series Line Cards

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_vpn_gre.html

MPLS VPN over mGRE

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/interface/configuration/guide/ir_mplsvpnomgre.html

MSDP MD5 Password Authentication

This featurette adds support for MD5 signature protection for MSDP TCP connections in accordance with RFC2385.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipmulti/configuration/guide/imc_msdp_im_pim_sm.html

Multicast Address Group Range Support

The Multicast Address Group Range Support feature enhances multicast access control by introducing the capability to define a global range of multicast groups and channels to be permitted or denied using the IP multicast **group-range** command.

Multicast MIB VRF Support

The Multicast MIB VRF Support feature is an enhancement to help manage Cisco devices in a multicast VPN (MVPN) environment using SNMP. This feature enhances the Cisco suite of supported multicast MIBs by making the following multicast MIBs VRF aware:

- CISCO-IPMROUTE-MIB
- CISCO-PIM-MIB
- IGMP-STD-MIB
- IPMROUTE-STD-MIB
- MSDP-MIB

- PIM-MIB

Multicast VRF (MVRF) awareness enables the MIB objects associated with these multicast MIBs to be queried and set for the individual MVRFs configured. In addition, MVRF awareness provides the capability to detect conditions for a trap inside of an MVRF and lookup the correct information for that MVRF; the traps would then be sent to the SNMP manager that is configured for that MVRF.

For detailed information about these MIBs, and to locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at

http://tools.cisco.com/ITDIT/MIBS/servlet/index

Multi-Chassis Support for LACP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

NSF/SSO—IPv4 Multicast

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipmulti/configuration/guide/imc_high_availability.html

NSF/SSO—IPv6 Multicast

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-multicast.html

NSF/SSO and ISSU—MPLS VPN 6VPE and 6PE

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_6vpe_6pe_issu_sso.html

NSSA-Only

The NSSA-Only feature can be used to restrict the scope of routes imported into NSSA areas. The following commands were modified by this feature: **redistribute** (IP), **summary-address**, **set level**, **area nssa** and **show ip opsf**.

For more information about configuring this feature, see these commands in the Cisco IOS IP Routing: Protocol Independent Command Reference at http://www.cisco.com/en/US/docs/ios/iproute_pi/command/reference/iri_book.html.

OSPF Mechanism to Exclude Connected IP Prefixes from LSA Advertisements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute_ospf/configuration/guide/iro_ex_lsa.html

OSPFv3 BFD

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-bfd.html

OSPFv3 Graceful Restart

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-ospf.html

Parser Concurrency and Locking Improvements

With new proposal of configuration locking mechanism, an exclusive access is granted to the requested process and prevents others from concurrently accessing the IOS configurations.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fundamentals/configuration/guide/cf_config-lock.html

PfR EIGRP mGRE DMVPN Hub-and-Spoke Support

Beginning with Cisco IOS Release 12.2(33)SRE, this feature is supported by Cisco 7200 and Cisco 7300 routers. Cisco 7600 routers are not supported. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/oer/configuration/guide/pfr-eigrp.html

PIM Stub

Provide basic PIM connectivity support for IPbase images.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipmulti/configuration/guide/imc_stub_routing.html

PIM Triggered Joins

This feature enables better multicast route convergence after a high-availability switchover.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipmulti/configuration/guide/imc_pim_triggered_joins.html

Privilege Command Enhancements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/csprienh.html

QoS—Per-VC QoS Classification for ATM VP Pseudowires

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/qos_atm_vp_support.html

QoS Support on Access Circuit Redundancy

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html

REP Integration with EVC and VPLS

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/ios/lanswitch/configuration/guide/lsw_cfg_rep.html

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/baldcfg.html

RMON MIB Enhancement to Support 64 bit Counters

This feature provides RMON MIB support for the ability to poll 64 bit counters.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cfg_rmon_sup.html

Server Load Balancing: BWG Sticky Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/12_2sr/iap_12_2sr_book.html

Server Load Balancing: GTPv2 Load Balancing

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/12_2sr/iap_12_2sr_book.html

Server Load Balancing: Sub-Interface support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/partner/docs/ios/ipapp/configuration/guide/ipapp_slb.html

Service Advertisement Framework (SAF)

Beginning with Cisco IOS Release 12.2(33)SRE, this feature is supported by Cisco 7200 and Cisco 7300 routers. It is not supported by Cisco 7600 routers. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/saf/configuration/guide/saf_cg.html

http://www.cisco.com/en/US/docs/ios/saf/command/reference/saf_book.html

Service Groups

The Service Group feature allows network administrators to create service groups, add members (such as service instances) to those service groups, and apply service policies (also known an policy maps) to those newly created groups. The service policies (policy maps) contain the aggregate features (such as traffic policing and queueing) to be applied to the groups in compliance with the Service-Level Agreement (SLA) negotiated between the service provider and the subscribers.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/qos/configuration/guide/service_groups_ps6922_TSD_Products_Configuration_Guide_Chapter.html

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/bald_qos.html

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1492120

Show Command for Interface Trap Status

Beginning with Cisco IOS Release 12.2(33)SRE, the Show Command for Interface Trap Status feature adds the show snmp mib ifmib traps command to display the status of linkUp and linkDown traps.

For more information about viewing linkUp and linkDown trap status, see the show snmp mib ifmib traps command in the Cisco IOS Network Management Command Reference at the following URL:

http://www.cisco.com/en/US/docs/ios/netmgmt/command/reference/nm_book.html

For more information about enabling SNMP notification types, see the

Cisco IOS Network Management Configuration Guide at the following URL:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/15_0/nm_15_0_book.html

SNMP Trap Simulation

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cfg_snmp_sup.html

SSO BFD

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute_bfd/configuration/guide/irb_bfd.html

Static MAC Binding to EVCs and Pseudowires

For detailed information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/baldcfg.html

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html

http://www.cisco.com/en/US/products/ps5845/products_installation_and_configuration_guides_list.html

Suppressing EXEC Accounting Record

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/EXECstub.html

Synchronous Ethernet Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

System Accounting Record Generation for Server Addition/Deletion made VRF Aware

New for this 12.2(33)SRE release, system accounting records are generated whenever a RADIUS server is added or deleted in a VRF when using the server-private CLI command. For details about this new feature, see the accounting (server-group) command page.

http://www.cisco.com/en/US/docs/ios/security/command/reference/sec_a2.html

Triple Nesting QoS Support on SIP400

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

VP & VC Mode Cell Packing Support on Cisco 7600/SIP400

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

VPDN Extended Fail-Over

The Virtual Private Dial-up Network (VPDN) failover has been extended to occur in instances where the receiving node sends an error message to the transmitting node. Before this feature, the failover mechanism would only occur when the transmitting node did not receive a response from the receiving node.

Beginning with Cisco IOS Release 12.2(33)SRE, this feature is supported by Cisco 7200 and Cisco 7300 routers. It is not supported by Cisco 7600 routers. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/vpdn/configuration/guide/vpdn_tunnel_mgmt.html

WCCP: VRF Support

Beginning with Cisco IOS Release 12.2(33)SRE, this feature is supported by Cisco 7200 and Cisco 7300 routers. It is not supported by Cisco 7600 routers. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/ipapp_wccp.html

XML-PI

The eXtensible Markup Language Programmatic Interface (XML-PI) Release 1.0 leverages the Network Configuration Protocol (NETCONF) and offers new data models that collect **show** command output down to the keyword level and running configurations without the complexity and expense of screen-scraping technologies or external XML-to-CLI gateways. XML-PI allows you to quickly develop XML-based network management applications that remotely adapt and control the behavior of any number of network devices simultaneously. XML-PI uses an industry standard protocol that allows Cisco network devices to be managed in a more automatic and programmatic way and is command-line interface (CLI) accessible.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_xmlpi_v1.html

New Hardware Features in Cisco IOS Release 12.2(33)SRD4

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD4. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD4. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Addition of ES Transport Line Cards for Cisco 7600

For additional information about this feature, see the following documents:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

ES Line Cards for Cisco 7600

This feature introduces the following line cards:

- 76-ES+T-20G
- 76-ES+T-2TG
- 76-ES+T-40G
- 76-ES+T-4TG

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_chap2.html

New Software Features in Cisco IOS Release 12.2(33)SRD4

There are no new software features in Cisco IOS Release 12.2(33)SRD4.

New Hardware Features in Cisco IOS Release 12.2(33)SRD3

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD3. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD3. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Flexible Service Mapping based on CoS, Ethertype

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html

New Software Features in Cisco IOS Release 12.2(33)SRD3

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD3. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD3. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Cisco 7600 ARP Scale

For additional information about this feature, see the following document:

https://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_mon_main_arp.html

IPv6—Hop by Hop Rate Limiter

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Supporting 2G Grooming with c7600 CEOP SPA AIS Processing

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

New Hardware Features in Cisco IOS Release 12.2(33)SRD2

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD2. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD2. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

512K ARP Entry Validation for ES40 with 2G Memory

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/dynarp.html

Enable STM1E-SFP Support on OC3 SPA for Cisco 7600

For additional information about this feature, see the following documents:

- *Cisco 7600 Series Router SIP, SSC, and SPA Hardware Installation Guide*:
  - http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html
- *Cisco 7600 Series Router SIP, SSC, and SPA Software Installation Guide*:
  - http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Extended-Temp SFP (SFP-GE-T/S/L/Z) Support on WS-X6724/6748-SFP LAN Cards

Note

- DOM is not supported on these line cards.
- SFP-GE-T supports only 1GE speeds on these line cards.

This support did not require any changes to Cisco IOS, and support has been confirmed back to Cisco IOS Release 12.2(33)SRB.

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

MLPPP APS

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

New Software Features in Cisco IOS Release 12.2(33)SRD2

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD2. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD2. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Multi-Segment Pseudo Wire

For additional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_l2vpn_pseudo_swit.html

New Hardware Features in Cisco IOS Release 12.2(33)SRD1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

1xOC-12/STM-4SONET/SDH SPA

1xOC-12/STM-4SONET/SDH SPA provides channelized SPA support at OC12 level. Channelization up to DS0 level is supported. Along with basic channelization, it supports MLP and LFI features at SPA level. For additional information, see the following documentation:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

76-ES+XT-2TG and 76-ES+XT-4TG

Cisco IOS Release 12.2(33)SRD1 introduces support for the following line cards:

- 76-ES+XT-2TG
- 76-ES+XT-4TG

For additional information, see the following documentation:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

New Software Features in Cisco IOS Release 12.2(33)SRD1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

DHCP Option 82 Configurable Circuit ID and Remote ID

DHCP Option 82 provides customers a great deal of flexibility when it comes to identifying individual users for various reasons, for example location of attachment, or controlling how many IP addresses a device or user is allowed from the DHCP Server. This enhancement provides customers additional flexibility to determine what information is provided within the Option 82 Remote ID sub-option and Option 82 Circuit ID sub- option.

Remote ID: The customer now has the option to use a switches configured Hostname or specify an ascii text string both are subject to a max length of 63 bytes.

The default is to provide the MAC address of the switch.

Circuit ID: The customer now has the option to configure an ascii text string up to 63 bytes, and override the default Circuit ID which is vlan- module-port in binary format.

For additional detail about the feature, see the following documentation:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_op82_id.html

EVC MIB

The EVC MIB is a Cisco proprietary Simple Network Management Protocol (SNMP) MIB for managing an Ethernet infrastructure. SNMP versions 1 and 2c are supported. The EVC MIB consists of 18 tables and three notifications. The command-line interface (CLI) commands **snmp-server enable traps ethernet evc** and **snmp-server host traps evc** are implemented for enabling or disabling notifications. Notifications are disabled by default.

Support for service instances such as Layer 2 VLAN interfaces was added in Cisco IOS Release 12.2(33)SRD1. Service instances are represented as subinterfaces in the IF-MIB and associated with an ifIndex. Four commands support this feature: **debug if-mgr trace efp-ext**, **debug if-mgr errors efp-ext**, **snmp ifindex**, and **snmp trap link-status**. The **snmp** commands are supported under service instance configuration mode (config-if-srv). Changes to configurations and existing commands are not required.

To use the EVC MIB, the Ethernet Infrastructure module must be present in the Cisco IOS software image, and Metro Ethernet Infrastructure High Availability must be in place. SET operations are not supported on any object in Cisco IOS Releases 12.2(33)SRD and 12.2(33)SRD1.

For detailed information about EVC MIB-related commands, see the Cisco IOS Carrier Ethernet Command Reference at http://www.cisco.com/en/US/docs/ios/cether/command/reference/ce_book.html

For detailed information about SNMP commands, see both the Cisco IOS Network Management Command Reference at http://www.cisco.com/en/US/docs/ios/netmgmt/command/reference/nm_book.html and the Cisco IOS Interface and Hardware Component Command Reference at http://www.cisco.com/en/US/docs/ios/interface/command/reference/ir_book.html.

For detailed information about the EVC MIB, and to locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at http://tools.cisco.com/ITDIT/MIBS/servlet/index

IPv6—Hop by Hop Rate Limiter

This feature adds support for IPv6 Hop-by-Hop rate limiter on ES+ and SIP400 platforms. For additional information, see the following documentation:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

QoS on Port-Channel Member-Link

This feature provides support for configuring egress QoS on port-channel member link. For additional information, see the following documentation:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

Syslog Support for Ethernet Connectivity Fault Manager

This feature provides syslog message support for Connectivity Fault Management (CFM) features. It enables network administrators to develop scripts for configuring and managing CFM functionality.

For additional details about this feature, see the following documentation:

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm-syslog.html

New Hardware Features in Cisco IOS Release 12.2(33)SRD

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

CWDM SFP Support

For detailed information about this feature, see the following publications:

- http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html
- http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

DWDM SFP Support

For detailed information about this feature, see the following document:

- http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html
- http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES20_Line_Card_Installation_Guide/es20-install-guide.html
- http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

DWDM-XFP Support

For detailed information about this feature, see the following document:

- http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html
- http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES20_Line_Card_Installation_Guide/es20-install-guide.html

Network Analysis Module (NAM)

The Network Analysis Module (NAM), an integrated and powerful traffic monitoring solution for the high-performance routers, enables network managers to gain application level visibility into network traffic with the ultimate goal of improving performance, reducing failures, and maximizing returns on network investment. The NAMs come with an embedded, web based, Traffic Analyzer, which provides full scale remote monitoring and troubleshooting capabilities accessible through a web browser.

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

New Line Cards

Cisco IOS Release 12.2(33)SRD introduces support for the following line cards:

- Ethernet Services Line Cards
  - ES+40G3C
  - ES+40G3CXL
  - ES+20G3C
  - ES+20G3CXL
  - ES+4TG3C
  - ES+4TGCXL
  - ES+2TG3C
  - ES+2TGCXL

Note ES40 line cards are not currently available. They will begin shipping during the first quarter of 2009.

For detailed information about these line cards, see the following documents:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

Persistent Storage Device

The Cisco Persistent Storage Device (PSD) provides persistent storage capabilities to Cisco clients, and allows the clients to store data on the PSD internal hard drive. Release 1.x provides content data records (CDR) backup capabilities for Cisco's Content Services Gateway (CSG). Release 2.0 adds CDR backup capabilities for the Cisco Gateway GPRS Serving Node (GGSN).

http://www.cisco.com/en/US/docs/ios/12_2sr/mw_psd/configuration/guide/mw_psd12233srd.html

Service and Application Module for IP

The Cisco SAMI, is a high performance, Cisco IOS software application module that occupies one slot in the Cisco 7600 series router platform.

With an IXP2800 network processor flow-distributor running at 1.4 GHz, and six PowerPCs (PPCs) running at 1.25 GHz, each of which runs an instance of the same Cisco IOS image, the SAMI offers a parallel architecture for Cisco software applications such as the Cisco Content Services Gateway - 2nd Generation (CSG2), the Cisco Gateway GPRS Support Node (GGSN), and the Cisco Mobile Wireless Home Agent (HA).

The benefits of the SAMI architecture over the Cisco Multiprocessor WAN Application Module (MWAM) include:

- Increased processing power and session density
- Reduced inter-CPU data sharing
- Separation of the control and the data plane
- Improved management capabilities
- Easier to configure and troubleshoot

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/wireless/service_application_module/sami/user/guide/samiv1.html

SFP-GE-T on ES40 Line Card

Support for SFP-GE-T was added to the ES40 line card.

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

SPA-8X1FE-TX-V2 & SPA-4X1FE-TX-V2 Support on SIP-400

Provides support for FE SPA (SPA-8X1FE-TX-V2 & SPA-4X1FE-TX-V2) SIP-400 line card.

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html#wp102076

Support for BX Optics (GLC-BX-U=, GLC-BX-D=) with GE SPA (SIP line cards), ES20 & ES40 Line Cards

Adds support for GLC-BX-U=, GLC-BX-D= to the following line cards:

- GE SPA (with SIP200, SIP400 and SIP600)
- ES20
- ES40

See the following publications:

- http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html
- http://cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES20_Line_Card_Installation_Guide/es20-install-guide.html
- http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

XFP-10GZR-OC192LR= XFP Support

For detailed information about this feature, see the following document:

- http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html
- http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES20_Line_Card_Installation_Guide/es20-install-guide.html
- http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES40_Line_Card_Installation_Guide/es40_hw_install_guide.html

XFP-10GER-OC192LR= Version 2 XFP Support

For detailed information about this feature, see the following documents:

- http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES20_Line_Card_Installation_Guide/es20-install-guide.html
- http://www.cisco.com/en/US/products/hw/routers/ps368/prod_installation_guides_list.html

New Software Features in Cisco IOS Release 12.2(33)SRD

This section describes new and changed features in Cisco IOS Release 12.2(33)SRD. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRD. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

32K EVC Scale

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

802.3ah SNMP MIB

The 802.3ah SNMP MIB is a Cisco proprietary Operations, Administration, and Maintenance (OAM) MIB. It is an adaptation of the IETF draft OAM MIB and is compliant with Simple Network Management Protocol version 2 (SNMPv2). In conjunction with OAM protocols, the 802.3ah SNMP MIB provides the capability to monitor network health, identify link failures and fault conditions, and test and troubleshoot OAM-enabled links. The 802.3ah SNMP MIB consists of six tables and two notifications. SET operations and row creation are not supported in Cisco IOS Release 12.2(33)SRD.

The command-line interface (CLI) command snmp-server enable traps ether-oam is implemented to enable the MIB traps, and the ethernet oam mib log size entries command is implemented to set the maximum size of the event log table.

For detailed information about these commands, see the Cisco IOS Carrier Ethernet Command Reference at http://www.cisco.com/en/US/docs/ios/cether/command/reference/ce_book.html

For detailed information about the 802.3ah SNMP MIB, and to locate and download MIBs for selected platforms, Cisco IOS releases, and feature

sets, use Cisco MIB Locator found at http://tools.cisco.com/ITDIT/MIBS/servlet/index

Asymmetric Carrier Delay

Asymmetric carrier delay provides the ability to control the delay separately for interface up and interface down state notifications.

http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html

Bandwidth Remaining Ratio Support for ES20

This feature enables support for Bandwidth remaining ratio and thus enables support of utilizing unused bandwidth can be shared across logical interfaces.

http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html

Bridging using RFC1483 Routed Encapsulation (BRE)

See this publication:

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html#wp102076

Broadcast Storm Control on Switchports and Ports having EVCs

This feature implements mechanism to detect and control broadcast/multicast congestion/storm scenario via rate control mechanism in ES line cards. See the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/storm.html

CFM (802.1ag) IEEE MIB

The Cisco proprietary CFM (802.1ag) IEEE MIB is a mechanism for managing connectivity and detecting faults in a network. This MIB interacts with the IF MIB and interfaces with Simple Network

Management Protocol (SNMP) to exchange information. The CFM (802.1ag) IEEE MIB consists of 14 tables and one trap.

To use the CFM (802.1ag) IEEE MIB, the CFM 8.1ag module must be present in the Cisco IOS software image. SET operations and row creation are not supported in Cisco IOS Release 12.2(33)SRD.

The command-line interface (CLI) command snmp-server enable traps ethernet cfm alarm is implemented for enabling or disabling the connectivity fault management (CFM) alarm trap, which is disabled by default. For detailed information about the snmp-server enable traps ethernet cfm alarm command, see the Cisco IOS Carrier Ethernet Command Reference at

http://www.cisco.com/en/US/docs/ios/cether/command/reference/ce_book.html

For detailed information about the CFM (802.1ag) IEEE MIB, and to locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at

http://tools.cisco.com/ITDIT/MIBS/servlet/index

CFM Outward Facing MEP on Switchports

The Outward Facing MEP on Switchports feature is an enhancement to The Outward Facing MEP feature that supports the distribution and access environments by supporting outward facing MEPs on switch ports. See the following publication:

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm.html

CISCO-NETFLOW-MIB

The NetFlow MIB feature provides MIB objects to allow users to configure NetFlow and to monitor flow cache information, the current NetFlow configuration, and statistics.

http://www.cisco.com/en/US/docs/ios/netflow/configuration/guide/cfg_snmp_mib_mon_nf.html

Custom Ethertype for EVC interfaces

Provides the capability to configure a VLAN ethertype other than 0x8100 on EVC interfaces.

http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html

DBUS COS API on SIP-400

The SIP-400 currently treats packets with CoS values of 6 or 7 as high priority traffic. This was all that could be done in the past to help identify high priority traffic and to ensure that when higher rates of traffic than the SIP-400 can process are received, the lower priority traffic is what is dropped. This feature provides the configuration to allow a user to selectively choose any CoS value (or range of values) for the SIP-400 to classify as high priority packets.

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html#wp102076

DHCP Relay Option 82 Encapsulation

The DHCP Relay Option 82 Encapsulation feature allows a second relay agent to encapsulate the relay agent information option (option 82) from a prior relay agent, add its own option 82, and forward the packet to the DHCP server. This feature allows the DHCP server to use option 82 information from both relay agents.

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_rly_agt.html

DHCP Snooping with Option-82 on EVC

This feature allows for DHCP snooping option 82 to be aware of EVC VLAN.

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

Dual Rate Three Color Ingress Policer on Service Instances on ES20 cards

This feature allows user to configure dual rates policing with three actions (conform, exceed and violate) that can be specified on the ingress of service instances.

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

E-OAM: CFM & PVST Co-Existence

See the following publication:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

Ethernet-OAM 3.0: CFM over BD, Untagged

The Ethernet-OAM3.0: CFM Over BD, Untagged feature provides support for Ethernet CFM on Cisco IOS devices that support the bridge domain functionality. See the following publication:

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm.html

EVC MIB

The EVC MIB is a Cisco proprietary Simple Network Management Protocol (SNMP) MIB for managing an Ethernet infrastructure. SNMP versions 1 and 2c are supported. The EVC MIB consists of 18 tables

and three notifications.

To use the EVC MIB, the Ethernet Infrastructure module must be present in the Cisco IOS software image, and Metro Ethernet Infrastructure High Availability must be in place. SET operations are not supported on any object in Cisco IOS Release 12.2(33)SRD.

The command-line interface (CLI) commands snmp-server enable traps ethernet evc and snmp-server host traps evc are implemented for enabling or disabling notifications. Notifications are disabled by default.

For detailed information about these commands, see the Cisco IOS Carrier Ethernet Command Reference at http://www.cisco.com/en/US/docs/ios/cether/command/reference/ce_book.html.

For detailed information about the EVC MIB, and to locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at http://tools.cisco.com/ITDIT/MIBS/servlet/index.

EVC on Port Channel

The EVC on Port Channel feature extends Ethernet port channels to EVC interfaces. QoS is configurable on EVC port channel, similar to EVCs on Ethernet interfaces.

For more detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

IEEE 802.1s on Bridge Domains

For more detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_mst_evc_bd.html

IMA on SIP-400 for 24xT1/E1 CEOP and 1xOC3 CEOP SPAs

The IMA on SIP-400 for 24xT1/E1 CEOP and 1xOC3 CEOP SPAs feature adds support for Inverse Multiplexing over ATM (IMA).

For more detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html#wp102076

IP SLAs Metro-Ethernet 2.0 (EVC)

The IP SLAs Metro-Ethernet 2.0 (EVC) feature adds support for Ethernet Virtual Circuits (EVCs) to the existing IP SLAs for Metro-Ethernet feature. The IP SLAs for Metro-Ethernet feature provides the capability to gather Ethernet-layer network performance metrics.

For more detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipsla/configuration/guide/sla_metro_ethernet.html

IP Source Guard for Service Instance

For more detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

ISG: Authentication: DHCP Option 60 and Option 82 with VPN-ID Support for Transparent Automatic Logon

This feature enables service providers to provision triple-play services to households by supporting transparent automatic logon through DHCP option 60 and option 82, and wholesale IP sessions through VPN ID extension to option 82.

For more detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_auth_dhcp_op60_82.html

ISG Support for SAMI Blade

This feature combines the subscriber management features and functions of ISG with the processing power of the Cisco SAMI blade.

For more detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_sup_sami_blade.html

ISSU - 802.3ah OAM Support

The ISSU — 802.3ah OAM Support feature allows software to be upgraded or downgraded without disrupting packet flow.

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_oam.html

ISSU Support in CFM 802.1ag/1.0d

ISSU is automatically enabled in CFM and lowers the impact that planned maintenance activities have on network availability by allowing software changes while the system is in service.

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm.html

ISSU Support in E-LMI

ISSU allows you to perform a Cisco IOS software upgrade or downgrade without disrupting packet flow. ISSU allows these software changes while the system is in service.

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_elmi-pe.html

L2 Access Control List on EVC

This is a security feature which customers can use to filter packets under an EVC based on MAC addresses.

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_l2acl-evc.html

L2 Classification on Default EVC

This features enables select QoS support (classification, marking, police, shaping) on EVCs (service instances) with encapsulation default.

http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html

L2TPv3 - Layer-2 Tunneling Protocol Version 3

This feature adds support for Layer-2 Tunneling Protocol Version 3 to ES40 line cards. See the following publications:

- http://www.cisco.com/en/US/docs/ios/12_3t/12_3t2/feature/guide/gtl2tpv3.html
- http://www.cisco.com/en/US/docs/ios/12_3t/12_3t2/feature/guide/gtl2tpv3.html

L2VPN Interworking: Ethernet VLAN to ATM AAL5

Layer 2 transport allows connectivity of sites over an IP/MPLS network. If different transport types are present at each end then creating a layer 2 connection is impossible without interworking. This feature allows interworking at layer 2 between, Ethernet VLANs and ATM VCs/FR/PPP. This feature supports routed mode encapsulation for interworking Layer 2 transport allows connectivity of sites over AToM Pseudowires.

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_l2vpn_intrntwkg.html

LACP support for EVC port channel

Adds support for Link Aggregate Control Protocol (LACP) to Ethernet virtual circuit (EVC) port channels. See the following publications:

- http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html
- http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

MAC Address Limiting on Service Instance / Bridge Domain

See the following publication:

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_mac-addlmt-bdsin.html

MAC Address Security for EVC Bridge-Domain

Provides the capability to control and filter the MAC address learning behavior at the granularity of a single EVC service instance.

- http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html
- http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

Mini Protocol Analyzer

The mini protocol analyzer allows network administrators to select and then capture Layer 2 and Layer 3 protocol traffic for network diagnostics purposes. The packet capture utilizes SPAN functionality and is performed in band without service disruption.

http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/configuration/guide/mpa.html

MST on EVC Bridge-Domain

Enables multiple spanning tree (MST) on EVC interfaces. The forwarding behavior of EVCs on these interfaces is determined by the spanning tree state of their router VLAN.

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_sw_config.html

NSF/SSO - 802.3ah OAM Support

The NSF/SSO — 802.3ah OAM Support feature allows processes which support dual route processors in active/standby mode to continue forwarding packets following a switchover.

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_oam.html

NSF/SSO Support in CFM 802.1ag/1.0d

The redundancy configurations Stateful Switchover (SSO) and Non-Stop Forwarding (NSF) are both supported in Ethernet CFM and are automatically enabled. A switchover from an active to a standby RP occurs when the active RP fails, is removed from the networking device, or is manually taken down for maintenance. NSF interoperates with the SSO feature to minimize network downtime following a switchover. The primary function of Cisco NSF is to continue forwarding IP packets following an RP switchover.

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm.html

NSF/SSO Support in E-LMI

The redundancy configurations SSO and NSF are supported in Ethernet LMI and are automatically enabled. The primary function of Cisco NSF is to continue forwarding IP packets following a route processor switchover. NSF also interoperates with the SSO feature to minimize network downtime following a switchover.

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_elmi-pe.html

Port Mode Cell Relay support on Cisco 7600/SIP

See the following publications:

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html#wp102076

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_any_transport.html

Private Host on Interface VLAN

This feature configures a server MAC address to the LAN port to allow isolated ports to be able to access to external server.

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html#wp102076

RSVP Support for IP Sessions

The RSVP Support for IP Sessions feature allows Resource Reservation Protocol (RSVP) and Intelligent Services Gateway (ISG) to coexist in a structured framework in which edge access devices can deliver flexible and scalable services that include voice on demand (VoD) call admission control (CAC) to subscribers.

Shaping on ES20 Main Interface

This feature enables the shaping support in class-default of a policy-map configured on ES20 main interface

http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html

SLB: Access Service Network (ASN) R6 Load

Load Balancing is supported across Access Service Network Gateways.

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/ipapp_slb.html

Unidirectional Ethernet on 7600-ES20 Line Cards

UniDirectinal Ethernet (UDE) is a feature that allows it allows a Gigaport to unidirectionally transmit and receive traffic.

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

Uni-Directional Link Detection on ES20 Ports with EVCs

The feature supports handling of UDLD protocol PDUs when service instances are configured on an ES20 port.

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

Y.1731 Fault Management Functions

The Y.1731 Fault Management Functions feature defines new functionality for fault and performance management to serve the needs of service providers in large networks. These enhancements extends the functionality of Ethernet Alarm Indication Signal (ETH-AIS) and Ethernet Remote Defect Indication (ETH-RDI). The enhanced functionality includes, fault detection, fault verification and fault isolation for large Ethernet Metropolitan-Area Networks (MANs) and Wide-Area Networks (WANs).

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_cfm-ieee_y1731.html

New Hardware Features in Cisco IOS Release 12.2(33)SRC2

There are no new hardware features in Cisco IOS Release 12.2(33)SRC2.

New Software Features in Cisco IOS Release 12.2(33)SRC2

This section describes new and changed features in Cisco IOS Release 12.2(33)SRC2. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRC2. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

BGP VPLS AD Route Reflector Without L2VPN Support

Enables BGP VPLS AD route reflector without L2VPN support. L2VPN can be supported even when L2VPN is not present in the image.

Shaping on Cisco 7600-ES20 Main Interface

This featurette enables the shaping support in class-default of a policy- map configured on ES20 main interface.

UniDirectional Ethernet on Cisco 7600-ES20 Line Cards

UniDirectinal Ethernet (UDE) is a feature which allows it allows a Gigaport to unidirectionally transmit or receive traffic. So instead of using two strands of fiber for a full-duplex Gigaport Ethernet port, it only uses one strand of fiber which is to either transmit or receive the one-way traffic for the Gigaport, depending on which direction the Gigaport is configured.

New Hardware Features in Cisco IOS Release 12.2(33)SRC1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRC1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRC1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

SPA-4XT-Serial (Cisco 4-Port Serial Shared Port Adapter) support on Cisco 7600/SIP200

This feature introduces the SPA-4XT-Serial support on 7600/SIP200, each supporting six different cable standards V35,X21, RS232, RS449, RS530, RS530A in two modes DTE, DCE. This is a clearchannel SPA integrated into the Cisco 7600 platform for SIP 200.

DWDM-XFP Optics

This feature provides additional support for the DWDM variants of XFP transceiver modules to the SIP/SPA 10GE and ES20 10GE Line Cards.

CWDM-SFP Optics

This feature provides additional support for the CWDM variants of SFP transceiver modules to the ES20 GE Line Cards.

New Software Features in Cisco IOS Release 12.2(33)SRC1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRC1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRC1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Access Service Network - Server Load Balancing (ASN-SLB)

Load Balancing is supported across Access Service Network Gateways.

LACP support for EVC Portchannel on ES-20

Through this feature Ethernet service instances earlier configurable only under physical ports can now be bundled as Ethernet ports to increase the capacity of a logical link and provide availability and redundancy. This feature supports service instances over bundled Ethernet links, so that ingress traffic for a single EVC can arrive on any member of the bundle while egress traffic for any ethernet flow point uses only a single assigned member link. EVC link bundling supports bridge-domain, xconnect and local switching.

New Hardware Features in Cisco IOS Release 12.2(33)SRC

This section describes new and changed features in Cisco IOS Release 12.2(33)SRC. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRC. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Cisco 7201 Router

The Cisco 7201 router is a Cisco 7200 router with a NPE-G2 engine in a 1RU fixed configuration form factor. This is the next generation Cisco 7301 that is equipped with four built-in Gigabit Ethernet (GE) ports and a port adapter (PA) slot.

CT3 CEoP on Cisco 7600-SIP-400

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

PA-MC-T3-EC and PA-MC-2T3-EC

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-mc-t3-ec_install_config/mc-t3ec.htmlr09186a0080796f7f.html

Port Adapter Enhancements—2 New Clear Channel Port Adapters and Channelized PA Hardware Acceleration of MLPPP/MLFR/LFI/FRF12

For detailed information about these feature, see the following documents:

- PA-T3/E3-EC Port Adapter Installation and Configuration at

  http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-t3.e3-ec_install_config/te3e-ec.htmlok09186a008085de57.html
- PA-MC-T3-EC Port Adapter Installation and Configuration at

  http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-t3.e3-ec_install_config/te3e-ec.htmlok09186a0080796e92.html

RSP720-3C-10GE

The Cisco 7600 Series RSP 720-10GE is introduced on Cisco IOS 12.2(33)SRC on a limited orderability basis. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Hardware_Guides/Supervisor_Engine_and_Route_Switch_Processor_Guide/76-sup-rsp.html

RSP720-3CXL-10GE

The Cisco 7600 Series RSP 720-10GE is introduced on Cisco IOS 12.2(33)SRC on a limited orderability basis. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Hardware_Guides/Supervisor_Engine_and_Route_Switch_Processor_Guide/76-sup-rsp.html

Service and Application Module for IP

The Cisco Service and Application Module for IP (SAMI) is a new-generation high performance Cisco IOS software application module that occupies a single slot in the Cisco 7600 series router platform.

With an IXP2800 network processor flow-distributor running at 1.4GHz, and six PowerPCs (PPCs) running at 1.25GHz, each of which can run an instance of the same Cisco IOS image, the SAMI offers a parallel architecture for Cisco IOS mobile wireless applications.

The benefits of the SAMI architecture include the following:

- Increased processing power and session density
- Reduced inter-CPU data sharing
- Separation of the control plane and the data plane
- Improved management capabilities
- Less complex configuration
- Easier debugging

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/wireless/service_application_module/sami/user/guide/samiv1.html

SFP-GE-T Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Shared Port Adapters

Cisco IOS Release 12.2(33)SRC introduces support for the following new shared port adapters (SPAs):

- Cisco 8-Port Channelized T1/E1 Shared Port Adapter (SPA-8XCHT1/E1)

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html
- Cisco Channelized T3 to DS0 Shared Port Adapter (SPA-2XCT3/DS0, SPA-4XCT3/DS0)

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html
- Cisco Clear Channel T3/E3 Shared Port Adapter (SPA-2XT3/E3, SPA-4XT3/E3)

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html
- SPA-1X10GE-L-V2

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html
- SPA-1xCHSTM1/OC3

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

WiSM Support on Cisco 7600 Platform

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/wireless/technology/wism/installation/note/78_17121.html

WS-X6708-10G-3C, WS-X6708-10G-3CXL

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

New Software Features in Cisco IOS Release 12.2(33)SRC

This section describes new and changed features in Cisco IOS Release 12.2(33)SRC. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRC. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

32K EVC Scale

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html07e5826.html

7600 VRF-Aware Lawful Intercept

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html07e0acb.html

802.1P CoS—PPP & PPPoE Control Frames

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_cos_ppp_pppoe.html

ACFC and PFC Support on Multilink Interface on 7600/EnhancedFlexWAN/SIP200

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

AToM Tunnel Selection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_any_transport.html

Attribute Filtering Per-Domain and VRF Aware Framed-Routes

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_per_vrf_aaa.html

Attribute Screening for Access Requests

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_att_scrn_accreq.html

Authentication, Authorization, and Accounting (AAA) Features

Cisco IOS Release 12.2(33)SRC introduces support for the following AAA features.

- AAA Authorization and Authentication Cache

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_aaa_auth_cache.html
- AAA CLI Stop Record Enhancement

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_per_vrf_aaa.html
- AAA Double Authentication Secured by Absolute Timeout

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_aaa_double_auth.html
- AAA High Availability Support for Local PPPoX Sessions

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/ha/configuration/guide/ha_aaa_pppox.html
- AAA Interim Accounting

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_cfg_accountg.html
- AAA Method Lists Enhancement

  The number of method lists that can be configured has been increased from 8 to 250.
- AAA Per-User Scalability

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_cfg_authentifcn.html

- AAA Session MIB

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_cfg_accountg.html

- AAA-PPP-VPDN Non-Blocking

  Cisco IOS software created a statically configurable number of processes to authenticate calls. Each process would handle a single call, but in some situations the limited number of processes could not keep up with the incoming call rate. This resulted in some calls timing out. The AAA-PPP-VPDN Non-Blocking feature changes the software architecture such that the number of processes do not limit the rate of call handling.

BFD—VRF Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/irp_bfd.html

BFD—WAN Interface Support (STM, FR, POS, and Serial)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/irp_bfd.html

BGP Per Neighbor Graceful Restart Configuration

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/irp_bgp_adv_features.html

Call Home

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/swcg.html

Calling Station ID Attribute 31

The **radius-server attribute 31** command is a new command in Cisco IOS Release 12.2(31)SB2. This new command replaces the **radius-server attribute 31 remote-id** command, which was introduced in Release 12.2(28)SB. The new command adds two new keywords, **mac** and **send**, and includes the **remote-id** keyword from the original **radius-server attribute 31 remote-id** command.

Cisco Express Forwarding—SNMP CEF-MIB Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipswitch/configuration/guide/cef_snmp_mib.html

Cisco IOS Scripting with Tcl

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_script_tcl.html

CISCO-DATA-COLLECTION-MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_mib_collect_trans.html

CISCO-IP-URPF-MIB Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_urpf_mib.html

CNS—Interactive CLI

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cns_services.html

CNS Config Retrieve Enhancement with Retry and Interval

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cns_services.html

Command Scheduler (Kron) Policy for System Startup

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_cns_services.html

Config Change Tracking Identifier

The Config Change Tracking Identifier feature assigns a version number to each saved version of the Cisco IOS running-config file and displays output about the versions. When the version number is updated, a notification of the change in version number is generated. The Config Logger can use this feature to determine if there have been any changes to the Cisco IOS running-config file. To enable the Config Change Tracking Identifier feature, enter the **show config id** command.

Configuration Enhancements for Broadband Scalability

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_preparing.html

Configuration Generation Performance Enhancement

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/fundamentals/configuration/guide/config_cache.html

Connect-Info RADIUS Attribute 77

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_77_connect.html

Connection Accounting

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_cfg_accountg.html

CoPP Enhancements on SIP-400

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Dynamic Host Configuration Protocol Features

Cisco IOS Release 12.2(33)SRC introduces support for the following Dynamic Host Configuration Protocol (DHCP) features.

DHCP—DHCP Server MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_mib.html

DHCP—DHCPv6 Relay Agent Notification for Prefix Delegation

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-dhcp.html

DHCP—Server Multiple Subnet

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_svr_cfg.html

DHCP—Static Mapping

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_svr_cfg.html

DHCP—Statically Configured Routes Using a DHCP Gateway

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_svr_cfg.html

DHCP Authorized ARP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_acct_sec.html

DHCP ODAP Server Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_sod_apm.html

DHCP On Demand Address Pool (ODAP) Manager for Non-MPLS VPN Pools

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_sod_apm.html

DHCP Per Interface Lease Limit and Statistics

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_acct_sec.html

DHCP Relay—MPLS VPN Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_rly_agt.html

DHCP Relay Option 82—Per Interface Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_rly_agt.html

DHCP Release and Renew CLI in EXEC Mode

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_client.html

DHCP Secured IP Address Assignment

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_acct_sec.html#wp1094512

DHCP Server—On Demand Address Pool Manager

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_sod_apm.html

DHCP Server Import All Enhancement

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_svr_cfg.html

DHCPv6—Relay—Reload Persistent Interface ID Option

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-dhcp.html

DHCPv6 Ethernet Remote ID Option

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-dhcp.html

Digital Optical Monitoring

The Digital Optical Monitoring (DOM) feature allows you to display transceiver operating conditions, such as temperature and power levels, while the transceiver is in service. Use the **show interfaces transceiver** command to display operating conditions.

Dynamic Per VRF AAA

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_per_vrf_aaa.html

Embedded Syslog Manager (ESM)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_esm_syslog.html

Encrypted Vendor-Specific Attributes

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_encrypt_ven_attr.html

Enhanced Test Command

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_enhanced_tst_cmd.html

EtherChannel Load Distribution

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_lnkbndl.html

EVC on Port-Channel

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/ES20_Line_Card_Installation_Guide/es20-install-guide.html

Extended NAS-Port-Type and NAS-Port Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_extd_nas_port.html

FHRP—HSRP Group Shutdown

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/ipapp_hsrp.html

Framed-Route in RADIUS Accounting

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_frame_rte.html

Hot Fabric Sync

The switch fabric module functionality is built into the Supervisor Engine 720 and the RSP720. When a supervisor engine switchover occurs, a fabric switchover also occurs. During this process, the line cards must resynchronize with the new active switch fabric. The Hot Fabric Sync feature, which is enabled by default, keeps both the active and standby fabric in sync at the same time, minimizing the switchover time and thereby minimizing any impact on switch fabric traffic. To verify the fabric sync status of active and standby supervisors, enter the **show fabric status** command.

This feature is supported on the following chassis: Cisco 7603-S, Cisco 7604, Cisco 7606-S, and Cisco 7609-S. All WAN modules with DFC, SIP-200, SIP-400, and WS-67xx with DFC or CFC are supported.

HTTP TACACS+ Accounting Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/nm_http_web.html

H-VPLS N-PE Redundancy for MPLS Access

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_hvpls_npe_red.html

H-VPLS N-PE Redundancy for QinQ Access

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_hvpls_npe_red.html

IEEE 802.1x with DHCP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/swcg.html

IMA on SIP-400 for 24xT1/E1 CEOP and 1xOC3 CEOP SPAs. For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.htmls_book09186a00802109bf.html

IP SLAs for MPLS Pseudo Wire (PWE3) via VCCV

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipsla/configuration/guide/sla_lsp_mon_autodisc.html

IP Version 6 Features

Cisco IOS Release 12.2(33)SRC introduces support for the following IP version 6 (IPv6) features.

IPv6—CNS Agents

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mng_apps.html

IPv6—Config Logger

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mng_apps.html

IPv6—HTTP(S)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mng_apps.html

IPv6—IP SLAs (UDP Jitter, UDP Echo, ICMP Echo, TCP Connect)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mng_apps.html

IPv6—Netconf

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mng_apps.html

IPv6—SOAP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mng_apps.html

IPv6—Tcl

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mng_apps.html

Intelligent Service Gateway Features

Cisco IOS Release 12.2(33)SRC introduces support for the following ISG features.

ISG: Accounting: Per Session, Service, and Flow

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/cfg_isg_acctng.html

ISG: Accounting: Postpaid

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/cfg_isg_acctng.html

ISG: Authentication: DHCP Option 82 Line ID—AAA Authorization Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_pol_auto_sub_log.html

ISG: Flow Control: Flow Redirect (L4, Captive Portal)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_l4_redirect.html

ISG: Instrumentation: Advanced Conditional Debugging

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_tshoot_sa_dcd.html

ISG: Instrumentation: Session and Flow Monitoring (Local and External)

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_tshoot_sa_dcd.html

ISG: Network Interface: IP Routed, VRF-Aware MPLS

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

ISG: Policy Control: DHCP Proxy

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_cntrl_policies.html

ISG: Policy Control: Multidimensional Identity per Session

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_cntrl_policies.html

ISG: Policy Control: Policy: Domain-Based (Auto-Domain, Proxy)

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_cntrl_policies.html

ISG: Policy Control: Policy Server: CoA (QoS, L4 Redirect, User ACL, TimeOut)

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/en_isg_ext_plcy_svrs.html

ISG: Policy Control: Policy Server: CoA ASCII Command Code Support

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/en_isg_ext_plcy_svrs.html

ISG: Policy Control: Policy Server: SSG-SESM Protocol

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_cntrl_policies.html

ISG: Policy Control: Policy: Triggers (Time, Volume, Duration)

For detailed information about this feature, see the following document:
http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_cntrl_policies.html

ISG: Policy Control: Service Profiles

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_cntrl_policies.html

ISG: Policy Control: User Profiles

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_cntrl_policies.html

ISG: Session: Auth: PBHK

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_port_bundle_hkey.html

ISG: Session: Auth: Single Sign On

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_overview.html

ISG: Session: Authentication (MAC, IP, EAP)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_pol_reg_net_accs.html

ISG: Session: Creation: Interface IP Session: L2

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

ISG: Session: Creation: Interface IP Session: L3

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

ISG: Session: Creation: IP Session: Protocol Event (DHCP,RADIUS)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

ISG: Session: Creation: IP Session: Subnet and Source IP: L2

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

ISG: Session: Creation: IP Session: Subnet and Source IP: L3

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

ISG: Session: Creation: P2P Session (PPPoE, PPPoXoX)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_ppp_sessns.html

ISG: Session: LifeCycle: Idle Timeout

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_pol_sessn_maint.html

ISG: Session: LifeCycle: POD

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_pol_sessn_maint.html

ISG: Session: Protection and Resiliency: Keepalive—ARP, ICMP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_pol_sessn_maint.html

ISG: Session: VRF Transfer

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html

ISG: Subscriber Aware Ethernet

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_sub_aware_enet.html

In-Service Software Upgrade (ISSU)

Cisco IOS Release 12.2(33)SRC and later releases support the following ISSU features:

- ISSU—AToM ATM Attachment Circuit
- ISSU—AToM FR/MFR Attachment Circuit
- ISSU—AToM HDLC Attachment Circuit

For detailed information about these features, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_trnsprt_mlps_atom.html#wp1115583

- ISSU—DHCP ODAP Client/Server
- ISSU—DHCP Proxy Client
- ISSU—DHCP Relay on Unnumbered Interface
- ISSU—DHCP Server

For detailed information about these features, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp-sso_ha.html

- ISSU—PPPoE

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_ha_svc_sw_up.html

- ISSU—Virtual Private LAN Service (VPLS)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_vpls_atom.html

- ISSU—Virtual Template Manager

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ha/configuration/guide/ha-inserv_updg.html#wp1062261

- ISSU—VRRP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/ipapp_vrrp.html

KEOPS Phase 2 Access Circuit Redundancy with Local Switching

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

LACP 1-1 Redundancy with Fast Switchover

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/swcg.html

LACP Fast Rate

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/cether/command/reference/ce_book.html

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/cether/configuration/guide/ce_lnkbndl.html

Layer 2 Tunneling Protocol Version 3

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/wan/configuration/guide/wan_l2_tun_pro_v3.html

Local AAA Server

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_loc_aaa_srvr.html

Message Banners for AAA Authentication

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_cfg_authentifcn.html

MPLS EM—MPLS VPN MIB RFC4382 Upgrade

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_em_vpn_mib_4382.html

Multiprotocol Label Switching Label Distribution Protocol Features

Cisco IOS Release 12.2(33)SRC introduces support for the following Multiprotocol Label Switching Label Distribution Protocol (MPLS LDP) features.

MPLS LDP—Local Label Allocation Filtering

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_ldp_alloc_filter.html

MPLS LDP—Lossless MD5 Session Authentication

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_ldp_lossless_md5.html

MPLS Pseudowire Status Signaling

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_pw_status.html

Multiprotocol Label Switching Traffic Engineering Features

Cisco IOS Release 12.2(33)SRC introduces support for the following Multiprotocol Label Switching Traffic Engineering (MPLS TE) features.

MPLS TE—BFD-Triggered Fast Reroute (FRR)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_bfd_frr.html

MPLS TE—Bundled Interface Support (EtherChannel and MLPPP)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_bundle_interface.html

MPLS TE—Tunnel-Based Admission Control (TBAC)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/qos/configuration/guide/qos_mpls_te_tbac.html

MPLS TE—Fast Reroute Path Protection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_path_prot.html

Multiprotocol Label Switching Virtual Private Network Features

Cisco IOS Release 12.2(33)SRC introduces support for the following Multiprotocol Label Virtual Private Network (MPLS VPN) features.

MPLS VPN—Inter-AS Option AB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_vpn_ias_optab.html

MPLS VPN Half Duplex VRF (HDVRF)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_vpn_half_dup_vrf.html

MPLS VPN PE-CE Link Protection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_vpn_pece_lnk_prot.html

MQC—Traffic Shaping Overhead Accounting for ATM

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/qos/configuration/guide/overhead_acctng.html

Multicast VPN Extranet Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipmulti/configuration/guide/imc_mc_vpn_extranet.html

NAS-Port Format E

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_extd_nas_port.html

NAS-Port ID Format C Enhancement

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/vpdn/configuration/guide/config_aaa_for_vpdn.html

Network Accounting (RADIUS/TACACS+)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_cfg_accountg.html

Nonstop Forwarding Stateful Switchover Features

Cisco IOS Release 12.2(33)SRC introduces support for the following Nonstop Forwarding (NSF) Stateful Switchover (SSO) features.

NSF/SSO—AToM ATM Attachment Circuit

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_trnsprt_mlps_atom.html#wp1115583

NSF/SSO—AToM FR/MFR Attachment Circuits

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_trnsprt_mlps_atom.html#wp1115583

NSF/SSO—AToM HDLC Attachment Circuit

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_trnsprt_mlps_atom.html#wp1115583

NSF/SSO—Virtual Private LAN Services

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_vpls_atom.html

Offload Server Accounting Enhancement

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_offload_enhance.html

OSPF Graceful Shutdown

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/irp_ospf_ttl.html

OSPF TTL Security Check

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/irp_ospf_ttl.html

OSPFv2 Local RIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/irp_ospf_local_rib.html

OSPFv3 Fast Convergence—LSA and SPF Throttling

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-ospf.html

Per Session Queuing and Shaping for PPPoEoVLAN Using RADIUS

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_ppoe_ses_q_rad.html

Per Subinterface MTU for Ethernet over MPLS (EoMPLS)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_any_transport.html

Per VRF AAA

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_per_vrf_aaa.html

Per-Session QoS

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/qos/configuration/guide/per_session_qos.html

Per-User Access-List

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_lock_key_secrty.html

Per-User QoS via AAA Policy Name

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_qos_aaa_policy.html

PPP MLP MRRU Negotiation Configuration

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/dial/configuration/guide/dia_pppmlp_mrru_neg.html

PPP-Max-Payload and IWF PPPoE Tag Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_ppp_mx_payld.html

PPPoE Support

Cisco IOS Release 12.2(33)SRC introduces support for the following PPPoE features.

PPPoE—QinQ Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_pppoe_qinq.html

PPPoE—Session Limiting on Inner QinQ VLAN

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_qinq_vlan_limt.html

PPPoE Agent Remote ID and DSL Line Characteristics Enhancement

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_rmtid_dsl.html

PPPoE Circuit-ID Tag Processing

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_cir_id_tag_pr.html

PPPoE Connection Throttling

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_pppoe_baa.html

PPPoE on Ethernet

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_ppoe_enet.html

PPPoE over Gigabit Ethernet Interface

The PPPoE over Gigabit Ethernet feature enhances PPP over Ethernet (PPPoE) functionality by adding support for PPPoE and PPPoE over IEEE 802.1Q VLANs on Gigabit Ethernet interfaces.

PPPoE over VLANs Scaling and PPPoE over VLANs Forwarding over PVC

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_ppoe_vlan_enh.html

PPPoE RADIUS Port Identification

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_radius_psl.html

PPPoE Service Selection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_svc_callstup.html

PPPoE Session Count MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_mon_pppoe_snmp.html

PPPoE Session Limit

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_limit_legcfg.html

PPPoE Session Limit per NAS Port

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_ses_lim_nas.html

PPPoE Session Recovery After Reload

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_pppoe_baa.html

PPPoE Tag Support with Agent Remote ID Field

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_rmtid_dsl.html

PPPoEoE on SIP-400

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Programmable BERT Patterns Enhancement on Channelized SPAs

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

QoS: Tunnel Marking for GRE Tunnels

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/qos/configuration/guide/tnl_mrkg_gre_tnls.html

RADIUS Attribute 5 (NAS-Port) Format Specified on a Per-Server Group Level

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_5_pre_serv.html

RADIUS Attribute 52 and 53 Gigaword Support

The RADIUS Attribute 52 and Attribute 53 Gigaword Support feature introduces support for Attribute 52 (Acct-Input-Gigawords) and Attribute 53 (Acct-Output-Gigawords) in accordance with RFC 2869. Attribute 52 keeps track of the number of times the Acct-Input-Octets counter has rolled over the 32-bit integer throughout the course of the provided service; attribute 53 keeps track of the number of times the Acct-Output-Octets counter has rolled over the 32-bit integer throughout the delivery of service. Both attributes can be present only in Accounting-Request records where the Acct-Status-Type is set to “Stop” or “Interim-Update.” These attributes can be used to keep accurate track of and bill for usage.

RADIUS Attribute 77 for DSL

The RADIUS Attribute 77 for DSL feature introduces support for attribute 77 (Connect-Info) to carry the textual name of the virtual circuit class associated with the given permanent virtual circuit (PVC). (Although attribute 77 does not carry the unspecified bit rate (UBR), the UBR can be inferred from the classname used if one UBR is set up on each class.) Attribute 77 is sent from the network access server (NAS) to the RADIUS server via Accounting-Request and Accounting-Response packets.

RADIUS Attribute Value Screening

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_attr_scrng.html

RADIUS Centralized Filter Management

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_central_filt.html

RADIUS DNIS Screening, RADIUS Packet of Disconnect (POD), ISDN Guard Timer

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_cfg_radius.html

RADIUS Logical Line ID

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_logic_lne_id.html

RADIUS NAS-IP-Address Configurability

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_nas_ip_cfg.html

RADIUS Per-VRF Server Group

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_per_vrf_aaa.html

RADIUS Progress Codes

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/sec_user_services/configuration/guide/sec_rad_progrs_codes.html

RADIUS Push for MOD CLI Policies

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_vsa_pmap.html

RADIUS Route Download

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_route_dwnld.html

RADIUS Server Load Balancing

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/sec_user_services/configuration/guide/sec_rad_load_bal.html

RADIUS Server Reorder on Fail

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_reorder_fail.html

Resilient Ethernet Protocol

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/lanswitch/configuration/guide/lsw_cfg_rep.html

Retransmit Counter for Exponential Backoff Accounting

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_radius_for_acct.html

RFC 4293 IP-MIB (IPv6 Only) and RFC 4292 IP-FORWARD-MIB (IPv6 Only)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mng_apps.html

RSVP Aggregation

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/qos/configuration/guide/qos_rsvp_agg.html

SIP-400 Accelerated Lawful Intercept

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/lawful_intercept/76licfg.html

SLB (Server Load Balancing)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/ipapp_slb.html

SLB: KAL-AP Agent Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/ipapp_slb.html

SLB: RADIUS Loadbalancing Accelerated Data Plane Forwarding

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/ipapp_slb.html

Source IPv4 and Source MAC Address Binding

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

SPAN Destination Port Support on Etherchannels

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/swcg.html

SPAN Egress Session Increase

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/swcg.html

SSO—BFD (Admin Down)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/irp_bfd.html

SSO—DHCP ODAP Client/Server

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp-sso_ha.html

SSO—DHCP Proxy Client

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp-sso_ha.html

SSO—PPPoE

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_ha_stfl_swovr.html

SSO—Virtual Template Manager

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ha/configuration/guide/ha-stfl_swovr.html

SSO—VRRP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/ipapp/configuration/guide/ipapp_vrrp.html

Static Routes for BFD

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/irp_bfd.html

Sticky IP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_rad_8_accss_req.html

Subscriber Service Switch

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/bbdsl/configuration/guide/bba_cfg_sss_pol.html

Switch Port Analyzer (SPAN)—Input Packets with Don't Learn Option

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/swcg.html

TDM Local Switching

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Throttling of AAA (RADIUS) Records

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/security/configuration/guide/sec_throtl_aaa.html

VPLS MAC Address Withdrawal

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_hvpls_npe_red.html

VTP v3

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/swcg.html

New Hardware Features in Cisco IOS Release 12.2(33)SRB3

This section describes new and changed features in Cisco IOS Release 12.2(33)SRB3. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRB3. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

CWDM-SFP

CWDM-SFP provides optical pluggable support on Cisco 7600-ES20-GE3C and Cisco 7600-ES20-GE3CXL line cards.

PIDs:

CWDM-SFP-1470, CWDM-SFP-1490, CWDM-SFP-1510, CWDM-SFP-1530,

CWDM-SFP-1550, CWDM-SFP-1570, CWDM-SFP-1590, CWDM-SFP-1610

DWDM-XFP

DWDM-XFP provides optical pluggable support on Cisco 7600-ES20-10G3C, Cisco 600-ES20-10G3CXL, and Cisco 7600-SIP-600/SPA-1X10GE-L-V2 line cards.

PIDs:

DWDM-XFP-30.33, DWDM-XFP-31.12, DWDM-XFP-31.90, DWDM-XFP-32.68,

DWDM-XFP-34.25, DWDM-XFP-35.04, DWDM-XFP-35.82, DWDM-XFP-36.61,

DWDM-XFP-38.19, DWDM-XFP-38.98, DWDM-XFP-39.77, DWDM-XFP-40.56,

DWDM-XFP-42.14, DWDM-XFP-42.94, DWDM-XFP-43.73, DWDM-XFP-44.53,

DWDM-XFP-46.12, DWDM-XFP-46.92, DWDM-XFP-47.72, DWDM-XFP-48.51,

DWDM-XFP-50.12, DWDM-XFP-50.92, DWDM-XFP-51.72, DWDM-XFP-52.52,

DWDM-XFP-54.13, DWDM-XFP-54.94, DWDM-XFP-55.75, DWDM-XFP-56.55,

DWDM-XFP-58.17, DWDM-XFP-58.98, DWDM-XFP-59.79, DWDM-XFP-60.61

SFP-GE-T Support

The copper pluggable SFP-GE-T provides support on Cisco 7600-ES20-GE3C and Cisco 7600-ES20-GE3CXL line cards. These pluggables support 10/100/1000 Ethernet (no auto-negotiation).

New Software Features in Cisco IOS Release 12.2(33)SRB3

There are no new software features in Cisco IOS Release 12.2(33)SRB3.

New Hardware Features in Cisco IOS Release 12.2(33)SRB1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRB1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRB1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

New Small-Form Factor Chassis

Cisco IOS Release 12.2(33)SRB1 introduces support for the following new routers:

Cisco 7603-S Router

For detailed information about the small-form factor Cisco 7603-S (CISCO7603-S), see the *Cisco 7600 Series Router Installation Guide*:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Chassis_Installation/7600_Series_Router_Installation_Guide/cis_76xx.html

Cisco 7606-S Router

For detailed information about the small-form factor Cisco 7603-6 (CISCO7606-S), see the *Cisco 7600 Series Router Installation Guide*:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Chassis_Installation/7600_Series_Router_Installation_Guide/cis_76xx.html

New Software Features in Cisco IOS Release 12.2(33)SRB1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRB1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRB1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

1 Rate 2 Color per EVC Policer

For detailed information about this feature, see the “Configuring QoS on the Cisco 7600 Series Ethernet Services 20G Line Card” chapter in the *Cisco 7600-ES20 Ethernet Line Card Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

AToM Support over GRE

For detailed information about this feature, see the "Configuring the Fast Ethernet and Gigabit Ethernet SPAs" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

ATM Pseudowire Redundancy

For detailed information about this feature, see the *L2VPN Pseudowire Redundancy* document:

http://www.cisco.com/en/US/docs/ios/wan/configuration/guide/wan_l2vpn_pw_red_external_docbase_0900e4b1805e9066_4container_external_docbase_0900e4b1806a218a.html

Backup Interface for Flexible UNI

For detailed information about this feature, see the following documents:

- The "Configuring the Cisco 7600 Series Ethernet Services 20G Line Card" chapter in the *Cisco 7600-ES20 Ethernet Line Cards Configuration Guide*:

  https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

- The "Configuring the Fast Ethernet and Gigabit Ethernet SPAs" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

  https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Enhanced Fast Software Upgrade (eFSU)

The Enhanced Fast Software Upgrade (eFSU) feature was introduced in Cisco 12.2(33)SRB. Cisco IOS Release 12.2(33)SRB1 adds support for the Route Switch Processor 720 (RSP720). For detailed information about this feature, see the "ISSU and eFSU on Cisco 7600 Series Router" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR*:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/efsuovrw.html

In-Service Software Upgrade (ISSU)

Cisco IOS Release 12.2(33)SRB1 and later releases support the following ISSU features:

- MPLS OAM
- MPLS LDP
- MPLS TE
- MPLS VPN

For detailed information about these features, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/iscli28.html

- L2 Multicast
- EtherChannel

- IEEE 802.1x
- IPv4 ISSU
- MPLS
- Netflow
- SPAN and Remote SPAN
- STP

For detailed information about these features, see the "ISSU and eFSU on Cisco 7600 Series Router" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR*:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/efsuovrw.html

- ARP
- ATM
- Frame Relay
- HDLC
- PPP/MLP
- QoS
- RIB/VRF
- SNMP

For detailed information about these features, see *Cisco IOS In Service Software Upgrade Process*:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/sbisefsu.html

- MTR

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmtrdoc.html
- GLBP

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/glbpissu.html
- HSRP

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/hsrpissu.html
- IS-IS

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sbisissu.html

IP SLAs Features

Cisco IOS IP SLAs features provide the capability to verify service guarantees, increase network reliability by validating network performance, proactively identify and alert users about network issues or deviations, and increase Return on Investment (ROI) by easing the deployment of new IP services. Cisco IOS IP SLAs use active probing techniques for end-to-end quantitative measurement of network performance, health, and connectivity for Voice over IP (VoIP), Multiprotocol Label Switching (MPLS),

and TCP/IP networks. The IP SLAs features are also directly integrated with other Cisco IOS products such as Optimized Edge Routing (OER), Enhanced Object Tracker (EoT), and Embedded Event Manager (EEM).

Cisco IOS Release 12.2(33)SRB1 and later releases support the following IP SLAs features:

- IP SLAs - DHCP Operation
- IP SLAs - Distribution of Statistics
- IP SLAs - DNS Operation
- IP SLAs - FTP Operation
- IP SLAs - HTTP Operation
- IP SLAs - ICMP Echo Operation
- IP SLAs - ICMP Path Echo Operation
- IP SLAs - MPLS VPN Aware
- IP SLAs - Multi-Operation Scheduler
- IP SLAs - One-way Measurements
- IP SLAs - Path Jitter
- IP SLAs - Reaction Threshold
- IP SLAs - Scheduling
- IP SLAs - TCP Connect Operation
- IP SLAs - UDP Echo Operation
- IP SLAs - UDP Jitter Operation
- IP SLAs - UDP VoIP Operation
- IP SLAs - VoIP Threshold Traps

Cisco IOS IP SLAs configuration information is included in the *Cisco IOS IP SLAs Configuration Guide, Release 12.4T*:

http://www.cisco.com/en/US/products/ps6441/products_installation_and_configuration_guides_list.html

Cisco IOS IP SLAs command reference information is included in the *Cisco IOS IP SLAs Command Reference, Release 12.2SR*:

http://www.cisco.com/en/US/docs/ios/ipsla/configuration/guide/12_2sr/sla_12_2sr_book.html

MPLS VPN 6VPE Support over IP Tunnels

For detailed information about this feature, see the “Implementing IPv6 VPN over MPLS (6VPE)” chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/products/sw/iosswrel/ps5187/products_configuration_guide_chapter09186a00807d26c0.html#wp1049404

MTU Support on MLP Interfaces

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Multi-VRF Selection using Policy Based Routing (PBR)

The Multi-VRF Selection using Policy Based Routing (PBR) feature allows a specified interface on a provider edge (PE) router to route packets to Virtual Private Networks (VPNs) based on match criteria defined in an Internet Protocol (IP) access list or based on packet length.

Out of Band Clocking

For detailed information about this feature, see the "Configuring the CEoP and Channelized ATM SPAs" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guid*e:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Session Border Controller

For detailed information about this feature, see the *Cisco 7600 Series Routers Session Border Controller Configuration Guide*:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

New Hardware Features in Cisco IOS Release 12.2(33)SRB

This section describes new and changed features in Cisco IOS Release 12.2(33)SRB. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRB. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

New Chassis and Power Supply

Cisco IOS Release 12.2(33)SRB introduces support for the following chassis and power supply:

- Enhanced 9-Slot CISCO7609 Chassis: CISCO7609-S
  For detailed information about this chassis, see the *Cisco 7600 Series Router Installation Guide*:

  http://www.cisco.com/en/US/docs/routers/7600/Hardware/Chassis_Installation/7600_Series_Router_Installation_Guide/cis_76xx.html

- PWR-6000-DC
  For detailed information about this power supply, see the *Cisco 7600 Series Router Installation Guide*:

  http://www.cisco.com/en/US/docs/routers/7600/Hardware/Chassis_Installation/7600_Series_Router_Installation_Guide/cis_76xx.html

New Line Cards

Cisco IOS Release 12.2(33)SRB introduces support for the following line cards:

- Distributed Forwarding Cards 3CXL:
  - Distributed Forwarding Card 3CXL (DFC3CXL) for use on CEF720 modules: WS-F6700-DFC3CXL
  - Distributed Forwarding Card 3C (DFC3C) for use on CEF720 modules: WS-F6700-DFC3C

  For detailed information about these line cards, see the *Guide to Supported Hardware for Cisco 7600 Series Routers with Cisco IOS Release 12.2SR*:

  http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/intro.html
- Ethernet Services (7600 ES20) Line Cards
  - 2-port version Ethernet Services (7600 ES20) Line Card: 7600-ES20-10G
  - 20-port Ethernet Services (7600 ES20) Line Card: 7600-ES20-GE

  For detailed information about these line cards, see the *Cisco 7600 Series Ethernet Services 20G Line Card Hardware Installation Guide*:

  https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html
- Extended-Temp SFP (SFP-GE-T/S/L/Z) Support on WS-X6724/6748-SFP LAN Cards

Note

- DOM is not supported on WS-X6724/6748-SFP LAN Cards.
- SFP-GE-T supports only 1GE speeds on these WS-X6724/6748-SFP LAN Cards.

For addtional information about this feature, see the following document:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

New Modules

Cisco IOS Release 12.2(33)SRB introduces support for the following module:

- Application Control Engine Service Module

  For detailed information about this module, see the *Cisco Application Control Engine Module Installation Note*:

  http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/ace/installation/note/acei_note.html

New Route Switch Processors

Cisco IOS Release 12.2(33)SRB introduces support for the following Route Switch Processors (RSPs):

- RSP720-3C-GE
- RSP720-3CXL-GE

For detailed hardware information about these RSPs, see the "Route Switch Processors and Supervisor Engines" chapter in the *Cisco 7600 Series Router Supervisor Engine and Route Switch Processor Guide*:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Hardware_Guides/Supervisor_Engine_and_Route_Switch_Processor_Guide/SupE02_ps368_TSD_Products_Installation_Guide_Chapter.html

For software configuration information and new feature descriptions, see the "Configuring a Route Switch Processor 720" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR*:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

New SPAs

Cisco IOS Release 12.2(33)SRB introduces support for the following shared port adapters (SPAs):

- Circuit Emulation over Packet (CEoP) SPAs, supported on the SIP-400:
  - 1-port channelized OC-3 STM1 ATM CEoP SPA (SPA-1CHOC3-CE-ATM)
  - 24-port channelized T1/E1/J1 ATM CEoP SPA (SPA-24CHT1-CE-ATM)

  For detailed information about the CEoP SPA, see the "Overview of the CEoP and Channelized ATM SPAs" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html
- SPA-2x1GE-V2, supported on the SIP-400

  For detailed information about the SPA-2x1GE-V2, see the "Overview: Cisco 7600 Series Router Shared Port Adapters" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Hardware Installation Guide*:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Note The SPA-5x1GE-V2 was introduced in Cisco IOS Release 12.2(33)SRA for the SIP-600. Release 12.2(33)SRB adds support for the SPA-5x1GE-V2 on the SIP-400. For detailed information about the SPA-5x1GE-V2, see the "Overview: Cisco 7600 Series Router Shared Port Adapters" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Hardware Installation Guide*:
http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

New Software Features in Cisco IOS Release 12.2(33)SRB

This section describes new and changed features in Cisco IOS Release 12.2(33)SRB. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRB. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

1024 MLP Bundles

The number of MLP bundles that are supported on a SIP-200 has been increased from 256 to 1024.

For detailed information about the SIP-200, see the "Overview of the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Alarm Filtering Support in the Cisco Entity Alarm MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t4/nmhtalrm.html

Any Transport over MPLS Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Any Transport over MPLS (AToM) features.

- Any Transport over MPLS (AToM): ATM Cell Relay over MPLS: Packed Cell Relay
- Any Transport over MPLS (AToM) Graceful Restart
- Any Transport over MPLS (AToM): Ethernet over MPLS (EoMPLS)
- Any Transport over MPLS (AToM): Frame Relay over MPLS (FRoMPLS)
- Any Transport over MPLS (AToM): Static Pseudowire Provisioning
- Any Transport over MPLS (AToM): Tunnel Selection

For detailed information about the above-mentioned AToM features with the exception of the Any Transport over MPLS (AToM) Graceful Restart feature and the Any Transport over MPLS (AToM): Tunnel Selection feature, see the *Any Transport over MPLS* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsatom28.html

For detailed information about the Any Transport over MPLS (AToM) Graceful Restart feature, see the *AToM Graceful Restart* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsgr29s.html

For detailed information about the Any Transport over MPLS (AToM): Tunnel Selection feature, see the *Any Transport over MPLS (AToM): Tunnel Selection* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srtunsel.html

Bandwidth-Based Local Call Admission Control (CAC) Policy for IP Multicast

For detailed information about this feature, see the *Per Interface Mroute State Limit with Bandwidth Based CAC for IP Multicast* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmcac.html

Bidirectional Forwarding Detection Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Bidirectional Forwarding Detection (BFD) features.

- BFD Echo Mode
- Bidirectional Forwarding Detection (BFD) Standard Implementation
- BFD Version 1 Support

For detailed information about these features, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fs_bfd.html

Border Gateway Protocol Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Border Gateway Protocol (BGP) features.

Note Multicast BGP peer support is not available in Cisco IOS software after Release 12.2(33)SRA.

BGP Neighbor Policy

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbgpnp.html

BGP Per Neighbor SOO Configuration

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/htbgpsoo.html

BGP Route-Map Continue Support for Outbound Policy

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbgprco.html

BGP Selective Address Tracking

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbgpsn.html

BGP Support for MTR

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbgpmtr.html

BGP Support for the L32VPN Address Family

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbgpl2v.html

BITS Clock Support - Receive and Distribute

For detailed information about this feature, see the "Configuring the CEoP and Channelized ATM SPAs" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

CNS Image Agent

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbcnsia.html

Compact Generic Attribute Registration Protocol (cGVRP)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbcgvrp.html

Configuration Partitioning

The Configuration Partitioning feature provides modularization ("partitioning") of the running configuration state to provide granular access to the running configuration in Cisco IOS software. This feature is enabled by default in Cisco IOS software images that include this feature.

The Configuration Partitioning feature allows the system to group the configuration state of the device into parts (called "partitions") so that only the configuration state the user wishes to review is retrieved when a user issues the **show running-config partition** *part* command. This feature improves performance for high-end systems with complex configurations because only a part of the running configuration state is processed when generating the running configuration command list, as opposed to the existing method of processing the entire system configuration state.

Default configuration partitions are provided by the introduction of this feature; other Cisco IOS software features may define their own command partitions in later releases.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/cnfprts.html

Connectivity Fault Management-2

The Connectivity Fault Management-2 (CFM-2) feature consists of the following features.

802.1ag and 802.3ah Interworking

For detailed information about this feature, see the *Ethernet Connectivity Fault Management* document:

http://www.cisco.com/en/US/docs/ios/12_2sx/12_2sxh/feature/guide/sxh_cfm.html

Configuring Ethernet Local Management Interface on a Provider Edge Device

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbpelmi.html

Ethernet Local Management Interface

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/htethlmi.html

IEEE 802.3ad Link Bundling

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sbcelacp.html

Outward Facing MEP

For detailed information about this feature, see the *Ethernet Connectivity Fault Management* document:

http://www.cisco.com/en/US/docs/ios/12_2sx/12_2sxh/feature/guide/sxh_cfm.html

Control Plane DSCP Support for RSVP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2t/12_2t2/feature/guide/dscprsvp.html

Disk File System Enhancements - ATA Enhancements and FAT32 Support

The Disk File System Enhancements - ATA Enhancements and FAT32 Support feature adds support in Cisco IOS software-based devices for flash cards that have been formatted with partitions on external devices. This feature also provides support for larger disk sizes through FAT32 support and support for disk partitions. In most scenarios, no user configuration is required to take advantage of this feature. Additional file system information is now available through existing command-line interface (CLI) commands. See the documentation of the **format** command for additional information about reformatting flash-based devices.

Additional file system enhancements that are introduced with this feature improve the performance and reliability of the system as a whole. The disk file system enhancements implemented as part of this feature include shared data structures, control structures, and other file system functions that apply to flash disks in various formats, such NVRAM, ATA flash disks, linear flash, USB flash, and the system RAM.

Dynamic Host Configuration Protocol Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Dynamic Host Configuration Protocol (DHCP) features. For detailed information about these features, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbdhcpf.html

- DHCP Accounting: see the *Configuring DHCP Services for Accounting and Security* chapter.
- DHCP Address Allocation Using Option 82: see the *Configuring the Cisco IOS DHCP Server* chapter.
- DHCP Relay Subscriber Identifier Suboption of Option 82: see the *Configuring the Cisco IOS DHCP Relay Agent* chapter.

In addition, support for the following DHCP feature is introduced:

- DHCP Server Multiple Subnet.

  For detailed information about this feature, see the following document:

  http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbmultd.html

For the most recent information about the DHCP Server feature, see the *Configuring the Cisco IOS DHCP Server* document:

http://www.cisco.com/en/US/docs/ios/12_4t/ip_addr/configuration/guide/htdhcpsv.html

For the most recent information about the DHCP Relay Agent, see the *Configuring the Cisco IOS DHCP Relay Agent* document:

http://www.cisco.com/en/US/docs/ios/12_4t/ip_addr/configuration/guide/htdhcpre.html

Dual Priority Queue Support

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Enhanced Fast Software Upgrade

For detailed information about this feature, see the following documents:

- *Cisco IOS In Service Software Upgrade and Enhanced Fast Software Upgrade Processes*:

  http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/sbisefsu.html

- The "Enhanced Fast Software Upgrade on the Cisco 7600 Series Routers" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR*:

  http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/efsuovrw.html

EIGRP MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gteigmib.html

EIGRP Support for MTR

For detailed information about this feature, see the *Multi-Topology Routing* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmtrdoc.html

Embedded Event Manager (EEM) 2.2

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/sr_eem22.html

Embedded Resource Manager (ERM)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/neverest_docs/stub_documents/nm_ermST.html

Embedded Resource Manager (ERM) - MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/ermmib.html

Ethernet Local Management Interface (LMI) at Provider Edge (PE)

For detailed information about this feature, see the *Configuring Ethernet Local Management Interface on a Provider Edge Device* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbpelmi.html

Ethernet OAM-Phase2/ELMI-PE

For detailed information about this feature, see the "Configuring the Fast Ethernet and Gigabit Ethernet SPAs" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

FHRP - HSRP Multiple Group Optimization

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbhsrmg.html

FHRP - Integration of Embedded Event Manager with Enhanced Object Tracking

For detailed information about this feature, which is also known as the FHRP - EOT integration with EEM feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbeotem.html

Flexible Mapping of QinQ (2-2, 2-1, 1-2, 1-1) and QinQ Service Awareness

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Flexible QinQ Mapping and Service Awareness

For detailed information about this feature, see the "Configuring the Cisco 7600 Series Ethernet Services 20G Line Card" chapter in the *Cisco 7600-ES20 Ethernet Line Cards Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Hierarchical Quality of Service (HQoS) with Multipoint Bridging (MPB)

For detailed information about this feature, see the "Configuring QoS on the Cisco 7600 Series Ethernet Services 20G Line Card" chapter in the *Cisco 7600-ES20 Ethernet Line Cards Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

HSRP for IPv6

For detailed information about these features, see the "Implementing IPv6 Addressing and Basic Connectivity" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

IGMP/PIM Snooping for VPLS Pseudowire

For detailed information about this feature for the Ethernet Services 20G line cards, see the "Configuring the Cisco 7600 Series Ethernet Services 20G Line Card" chapter in the *Cisco 7600-ES20 Ethernet Line Cards Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

For detailed information about this feature for the SIP-400, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Interfaces MIB: SNMP Context-based Access

The interface MIB (IF-MIB) has been modified to support context-aware packet information in Virtual Route Forwarding (VRF) environments. VRF environments require that contexts apply to Virtual Private Networks (VPNs) so that clients can be given selective access to the information stored in the IF-MIB. Clients that belong to a particular VRF can access information about the interface from the IF-MIB that belongs to that VRF only. When a client tries to get information from an interface that is associated with

a particular context, the client can see only the information that belongs to that context and cannot see IF-MIB information that is associated with interfaces that are connected to another VRF to which it is not entitled. No commands have been modified or added to support this feature.

The IF-MIB supports all tables that are defined in RFC 2863 and the CISCO-IFEXTENSION-MIB.

IP Multicast Load Splitting—Equal Cost Multipath (ECMP) Using S, G and Next Hop

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbmpath.html

IP SLAs Features

Cisco IOS Release 12.2(33)SRB introduces support for the following IP Service Level Agreements (SLAs) features.

IP SLAs for Metro-Ethernet

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/sr_meth.html

IP SLAs - LSP Health Monitor with LSP Discovery

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srpdisc.html

IP SLAs Random Scheduler

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/sr_slars.html

IP Version 6 Features

Cisco IOS Release 12.2(33)SRB introduces support for the following IP version 6 (IPv6) features.

IPv6 ACL Extensions for Mobile IPv6

For detailed information about this feature, see the "Implementing Mobile IPv6" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/configuration/12-2sr/ip6-mobile.html

IPv6 Routing - EIGRP Support

For detailed information about this feature, see the "Implementing IPv6 VPN over MPLS (6VPE)" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

IPv6 VPN over MPLS (6VPE)

For detailed information about this feature, see the "Implementing Mobile IPv6" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/ios/ipv6/configuration/guide/ip6-mobile_ps6441_TSD_Products_Configuration_Guide_Chapter.html

Intermediate System-to-Intermediate System Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Intermediate System-to-Intermediate System (IS-IS) features.

IS-IS MIB

For detailed information about these features, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2/12_2sg/feature/guide/ismibspt.html

IS-IS Support for an IS-IS Instance per VRF for IP

For detailed information about these features, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/vrf_isis.html

IS-IS Support for MTR

For detailed information about this feature, see the *Multi-Topology Routing* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmtrdoc.html

Layer 2 Virtual Private Network Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Layer 2 Virtual Private Network (L2VPN) features.

L2VPN Pseudowire Redundancy

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fspseudo.html

For information about limitations of the L2VPN Pseudowire Redundancy feature in Cisco IOS Release 12.2(33)SRB, see the "Limitations and Restrictions in Cisco IOS Release 12.2(33)SRB" section on page 130.

L2 VPN Pseudowire Switching

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsstitch.html

VPLS Autodiscovery: BGP-Based

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/fs_vpls.html

Lawful Intercept

For detailed information about this feature, see the following *Cisco 7600 Lawful Intercept Configuration Guide*:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/lawful_intercept/76licfg.html

For information about the Lawful Intercept feature on the SIP-400, see the "Overview of the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Layer 2 Local Switching - Same-Port Switching for Frame Relay

For detailed information about this feature, see the following *Layer 2 Local Switching* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fslocal.html

Logging to Local Non-Volatile Storage (ATA Disk)

For detailed information about this feature, see the *SYSLOG Writing to Flash* document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/cs_sysls.html

Multiprotocol Label Switching Embedded Management Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Multiprotocol Label Switching Embedded Management (MPLS EM) features.

MPLS EM - MPLS LDP MIB - RFC 3815

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/ldpmbrfc.html

MPLS EM - MPLS LSR MIB - RFC 3813

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/lsrmbrfc.html

MPLS EM - MPLS Multipath (ECMP) LSP Tree Trace

For detailed information about this feature, see the *MPLS EM—MPLS LSP Multipath Tree Trace* document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sb_mmtr.html

Multiprotocol Label Switching Label Distribution Protocol Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Multiprotocol Label Switching Label Distribution Protocol (MPLS LDP) features.

MPLS LDP - Autoconfiguration

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsldpaut.html

MPLS LDP - IGP Synchronization

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsldpsyn.html

MPLS LDP - MD5 Global Configuration

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sb_md5.html

MPLS LSP Ping/Traceroute for LDP/TE, and LSP Ping for VCCV

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/ht_lspng.html

Multiprotocol Label Switching Traffic Engineering Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Multiprotocol Label Switching Traffic Engineering (MPLS TE) features.

MPLS TE - DS-TE (RFC-3270)

For detailed information about this feature, see the *MPLS Traffic Engineering—DiffServ Aware (DS-TE)* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/dsteietf.html

MPLS TE - Fast Reroute over ATM

For detailed information about this feature, see the *MPLS TE: Link and Node Protection, with RSVP Hellos Support (with Fast Tunnel Interface Down Detection)* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fslnph30.html

MPLS TE - Fast Tunnel Interface Down Detection

For detailed information about this feature, see the *MPLS TE: Link and Node Protection, with RSVP Hellos Support (with Fast Tunnel Interface Down Detection)* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fslnph30.html

MPLS TE - Node Protection Desired Bit

For detailed information about this feature, see the *MPLS TE: Link and Node Protection, with RSVP Hellos Support (with Fast Tunnel Interface Down Detection)* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fslnph30.html

Multiprotocol Label Switching Virtual Private Network Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Multiprotocol Label Virtual Private Network (MPLS VPN) features.

MPLS VPN - Show Running VRF

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sb_svrf.html

MPLS VPN - VRF CLI for IPv4 & IPv6 VPNs

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/sr_mpvrf.html

MPLS VPN VRF Selection Using Policy Based Routing

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fs_pbrsv.html

MultiPoint Bridging over Ethernet

For detailed information about this feature, see the "Configuring the Cisco 7600 Series Ethernet Services 20G Line Card" chapter in the *Cisco 7600-ES20 Ethernet Line Cards Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Multiprotocol BGP (MP-BGP) Support for CLNS

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/brbclns.html

Multi-Topology Routing

For detailed information about this feature, see the *Multi-Topology Routing* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmtrdoc.html

NDE for VRF Interfaces

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/nfvrfsrb.html

Netconf Access for Configuration over BEEP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbnetbe.html

NetFlow v9 for IPv6

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/nfv6xsrb.html

Network Clock Support

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Optimized Edge Routing (OER)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/sr_oer.html

Open Shortest Path First Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Open Shortest Path First (OSPF) features.

Area Command in Interface Mode for OSPFv2

For detailed information about this feature, see the following document:

http://www.cisco.com/cisco/web/psa/default.html/td/doc/product/software/ios120/120newft/120limit/120s/120s29/ospfarea.htm

OSPF Enhanced Traffic Statistics for OSPFv2 and OSPFv3

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/htostats.html

OSPF SNMP ifIndex Value for Interface ID

For detailed information about this feature, see the *OSPF: SNMP ifIndex Value for Interface ID in OSPFv2 and OSPFv3 Data Fields* document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/ht_ifndx.html

OSPF Support for MTR

For detailed information about this feature, see the *Multi-Topology Routing* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmtrdoc.html

Outward Facing MEP

For detailed information about this feature, see the *Ethernet Connectivity Fault Management* document:

http://www.cisco.com/en/US/docs/ios/12_2sx/12_2sxh/feature/guide/sxh_cfm.html

PBR over TE Tunnel

In Cisco IOS Release 12.2(33)SRB, hardware switching support is introduced for policy-based routing (PBR) packets that are sent over a traffic engineering (TE) tunnel interface on a Cisco 7600 series router. When a TE tunnel interface is configured by using the **set interface** command in a policy, the packets are processed in hardware. In previous releases, PBR packets that were sent over TE tunnels were fast-switched by route-processor software.

Per Interface Mroute State Limit

For detailed information about this feature, see the *Per Interface Mroute State Limit with Bandwidth Based CAC for IP Multicast* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmcac.html

Per Interface NetFlow

For detailed information about this feature, see the "Configuring NetFlow and NDE" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR*:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/nde.html

Note The configuration granularity for IPv4 NetFlow Data Export (NDE) has changed from global to per-interface configuration granularity. Global enabling of NDE collection for IPv4 L3 interfaces is not available in Cisco IOS Release 12.2(33)SRB. For a Cisco 7600 series that perform NDE, configurations must be reviewed and modified to conform to the per-interface configuration guidelines.

Per IP Subscriber DHCP Triggered RADIUS Accounting

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/ipradacc.html

Per Subscriber/Per Protocol CoPP Support

For detailed information about this feature, see the "Overview of the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Percent Priority/Percent Bandwidth Support

For detailed information about this feature, see the "Overview of the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Private Hosts

For detailed information about this feature, see the "Private Hosts (Using PACLs)" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR*:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

Pseudowire Emulation Edge-to-Edge MIBs for Ethernet and Frame Relay Services

For detailed information about this feature, see the *Pseudowire Emulation Edge-to-Edge MIBs for Ethernet, Frame Relay, and ATM Services* document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sbpweatm.html

Quality of Service Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Quality of Service (QoS) features.

QoS Enhancement for Dual Priority Queues

For detailed information about this feature, see the "Configuring QoS on the Cisco 7600 Series Ethernet Services 20G Line Card" chapter in the *Cisco 7600-ES20 Ethernet Line Cards Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

QoS/MQC Support for MTR

For detailed information about this feature, see the *Multi-Topology Routing* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmtrdoc.html

Rate Limiting Support for DAI and DHCP Snooping

For detailed information about this feature, see the "Configuring Denial of Service Protection" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR* document:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/dos.html

In addition, see the **mls rate-limit unicast ip** command in the *Cisco 7600 Series Internet Router IOS Commands Reference, 12.2 SX*:

http://www.cisco.com/en/US/partner/products/hw/routers/ps368/products_command_reference_chapter09186a00801727751.html

Reliable Delivery and Filtering for Syslog

For detailed information about this feature, see the *Reliable Delivery for Syslog over BEEP* document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/htnmsylg.html

Remote Port Shutdown

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbrpsdn.html

RFC 3020 Multilink Frame Relay MIB Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/mfr_mib.html

Role-Based Access Control CLI Commands

For detailed information about this feature, see the *Role-Based CLI Access* document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gtclivws.html

Resource-Reservation Protocol Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Resource-Reservation Protocol (RSVP) features.

RSVP Application ID Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/ht_appid.html

RSVP Fast Local Repair (RSVP FLR)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/rsvp_flr.html

RSVP Interface-Based Receiver Proxy

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/rsvpprox.html

RSVP Refresh Reduction and Reliable Messaging

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsrelmsg.html

RSVP Scalability Enhancements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2t/12_2t2/feature/guide/rsvpscal.html

Scalable EoMPLS

For detailed information about this feature, see the "Configuring the Cisco 7600 Series Ethernet Services 20G Line Card" chapter in the *Cisco 7600-ES20 Ethernet Line Cards Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Scale for IP Subscriber Awareness over Ethernet

For detailed information about this feature, see the "IP Subscriber Awareness over Ethernet" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR*:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/ipsuboe.html

Security ACLs

For detailed information about this feature, see the "Overview of the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Simple Network Management Protocol Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Simple Network Management Protocol (SNMP) features.

SNMP over IPv6

For detailed information about these features, see the "Managing Cisco IOS Applications over IPv6" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

SNMP Support for MTR

For detailed information about this feature, see the *Multi-Topology Routing* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srmtrdoc.html

SNMPv3 - 3DES and AES Encryption Support

For detailed information about this feature, see the following *AES and 3-DES Encryption Support for SNMP Version 3* document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t2/snmpv3ae.html

SLB: GPRS Load Balancing Maps

For detailed information about this feature, see the *IOS Server Load Balancing Feature in IOS Release 12.2(33)SRB* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/slbsrb1.html

SLB: RADIUS Load Balancing Maps

For detailed information about this feature, see the *IOS Server Load Balancing Feature in IOS Release 12.2(33)SRB* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/slbsrb1.html

Stateful Switchover Features

Cisco IOS Release 12.2(33)SRB introduces support for the following Stateful Switchover (SSO) features.

SSO - DHCP Relay on Unnumbered Interface

For detailed information about this feature, see the *ISSU and SSO—DHCP High Availability Features* document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sbdhcpha.html

SSO - DHCP Server

For detailed information about this feature, see the *ISSU and SSO—DHCP High Availability Features* document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sbdhcpha.html

SSO - GLBP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/srbssogl.html

SSO - Multilink Frame Relay

For detailed information about this feature, see the *Stateful Switchover* document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fssso20s.html

SSO - PPP

For detailed information about this feature, see the *Stateful Switchover* document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fssso20s.html

Support for IP-TUNNEL-MIB as per RFC4087

For detailed information about this feature, see the *IP Tunnel MIB* document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2srb/feature/guide/iptunmib.html

Syslog over IPV6

For detailed information about these features, see the "Implementing IPv6 Addressing and Basic Connectivity" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

System Logging - EAL4 Certification Enhancements

Note Official EAL4 certification is not claimed by Cisco. This feature is part of current and planned enhancements which may qualify Cisco IOS Software for future certification.

This feature includes the following enhancements:

- The system logging process will now generate "audit start" and "audit stop" messages.
- The system logging process will now generate messages that include the date and time of an event, the type of event, the subject identity, and the outcome (success or failure) of an event.
- Changes to logging parameters will be logged.
- Further enhancements to minimize lost audit records.

VPLS and SVI-Based EoMPLS - Routed Pseudowire Support

The VPLS and SVI-Based EoMPLS - Routed Pseudowire Support feature makes it possible to route (Layer 3) as well as switch (Layer 2) frames for pseudowire connections between provider edge (PE) devices. Both point-to-point PE connections, in the form of Ethernet over MPLS (EoMPLS), and multipoint PE connections, in the form or Virtual Private LAN Services (VPLS), are supported. The ability to route frames to and from these interfaces now makes it possible to terminate a pseudowire into a Layer 3 network (VPN or global) on the same router, or to tunnel Layer 3 frames over a Layer 2 tunnel (EoMPLS or VPLS). The feature supports faster network convergence in the event of a physical interface or device failure through the MPLS Traffic Engineering (MPLS-TE) and Fast Reroute (FRR) features of the network. In particular, the feature enables MPLS TE-FRR protection for Layer 3 multicast over a VPLS domain.

To configure routing support for the pseudowire, configure an IP address and other Layer 3 features for the Layer 3 domain (VPN or global) in the virtual LAN (VLAN) interface configuration. The following example assigns the IP address 10.10.10.1 to the VLAN 100 interface, and enables Multicast PIM. (Layer 2 forwarding is defined by the VFI VFI100.)

```
int vlan 100
     xconnect vfi VFI100
     ip address 10.10.10.1 255.255.255.0
     ip pim sparse-mode
```

The following example assigns an IP address 20.20.20.1 of the VPN domain VFI200. (Layer 2 forwarding is defined by the VFI VFI200.)

```
int vlan 200
     xconnect vfi VFI200
     ip vrf forwarding VFI200
     ip address 20.20.20.1 255.255.255.0
```

New Hardware Features in Cisco IOS Release 12.2(33)SRA1

There are no new hardware features in Cisco IOS Release 12.2(33)SRA1.

New Software Features in Cisco IOS Release 12.2(33)SRA1

This section describes new and changed features in Cisco IOS Release 12.2(33)SRA1. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRA1. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Per VRF for TACACS+ Servers

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gt_pvt.html

New Hardware Features in Cisco IOS Release 12.2(33)SRA

This section describes new and changed features in Cisco IOS Release 12.2(33)SRA. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRA. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Shared Port Adapters

Cisco IOS Release 12.2(33)SRA introduces support for the following new shared port adapters (SPAs):

- Channelized SPA
  - 1-port CHOC-3/CHSTM-1 SPA (SPA-1xCHSTM1/OC3)
- Ethernet SPAs
  - 1-Port 10 Gigabit Ethernet SPA, LANPHY XFP Optics (SPA-1XTENGE-XFP-V2)
  - 4-port 10/100 Ethernet SPA TX (SPA-4X1FE-TX-V2)
  - 8-port 10/100 Ethernet SPA TX (SPA-8X1FE-TX-V2)
  - 5-port Gigabit Ethernet SPA, SFP Optics (SPA-5X1GE-V2)
  - 10-Port Gigabit Ethernet SPA, SFP Optics (SPA-10X1GE-V2)

- POS SPAs
  - 1-Port OC-48 POS/RPR SPA with SFP Optics (SPA-1XOC48POS/RPR)
  - 2-Port OC-48 POS/RPR SPA with SFP Optics (SPA-4XOC48POS/RPR)
  - 4-Port OC-48 POS/RPR SPA with SFP Optics (SPA-4XOC48POS/RPR)

For a complete list of all supported SPAs in Cisco IOS Release 12.2SR, see the *Guide to Supported Hardware for Cisco 7600 Series Routers with Release 12.2SR*.

For further information about SPAs, see the *Cisco 7600 Series Router SIP, SSC, and SPA Hardware Installation Guide*:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

New Software Features in Cisco IOS Release 12.2(33)SRA

This section describes new and changed features in Cisco IOS Release 12.2(33)SRA. Some features may be new to Cisco IOS Release 12.2SR but were released in earlier Cisco IOS software releases. Some features may have been released in earlier Cisco IOS software releases and have been changed in Cisco IOS Release 12.2(33)SRA. To determine if a feature is new or changed, see the feature history table at the beginning of the feature module for that feature. Links to feature modules are included in this section. If a feature listed in this section does not have a link to a feature module, that feature is documented only in the release notes, and information about whether the feature is new or changed will be available in the feature description provided in this section.

Any Transport over ATM Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Any Transport over ATM (AToM) features.

Any Transport over MPLS (AToM) Graceful Restart

Any Transport over MPLS (AToM) Graceful Restart (GR) assists neighboring routers that have MPLS AToM stateful switchover/nonstop forwarding (SSO/NSF) support and Graceful Restart to recover gracefully from an interruption in service. In Cisco IOS Release 12.2(33)SRA, AToM GR functions strictly in helper mode, which means it can only help other routers that are enabled with AToM SSO/NSF and GR to recover. If the router with AToM GR fails, its peers cannot help it recover. AToM GR is based on MPLS Label Distribution Protocol (LDP) Graceful Restart.

Note The NSF/SSO: Any Transport over MPLS and Graceful Restart feature (which is also referred to as "AToM SSO/NSF") is not supported in Release 12.2(33)SRA. The AToM GR feature that is supported in Release 12.2(33)SRA refers to AToM GR helper mode.

For detailed information about this feature, see the *AToM Graceful Restart* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsgr29s.html

Any Transport over MPLS (AToM): Tunnel Selection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srtunsel.html

AToM—VP Mode Cell Relay

The AToM—VP Mode Cell Relay feature is supported on the following shared port adapters:

- SPA-2XOC3-ATM
- SPA-4XOC3-ATM
- SPA-1XOC12-ATM
- SPA-1XOC48-ATM

For more information about the AToM—VP Mode Cell Relay feature, which is also referred to as the AToM: ATM Cell Relay over MPLS: VP Mode feature, see the "Configuring ATM VP to VP Local Switching with AAL0 Encapsulation" section and the "Layer 2 Local Switching-ATM to ATM" section in the *Configuring Multiprotocol Label Switching on FlexWAN and Enhanced FlexWAN Modules* document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexmpls.html

Also, see the *Configuring the ATM SPAs* document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76cfgatm.html

AutoRP Enhancement

For detailed information about this feature, which is also referred to as the PIM Dense Mode Fallback Prevention in a Network Following RP Information Loss feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srautorp.html

BCP Support on MLPPP

For detailed information about this feature, see the "Configuring the 2-Port and 4-Port Channelized T3 SPAs" and "Configuring the 8-Port Channelized T1/E1 SPA" chapters in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

- Configuring the 2-Port and 4-Port Channelized T3 SPAs

  https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

- Configuring the 8-Port Channelized T1/E1 SPA

  https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

For information about how to configure this feature on the Enhanced FlexWAN module, see the "Configuring BCP over MLPPP (Trunk Mode Only)" section in the *Cisco 7600 FlexWAN and Enhanced FlexWAN Modules Configuration Guide*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html

Border Gateway Protocol Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Border Gateway Protocol (BGP) features.

BGP MIB Support Enhancements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gt_bmibe.html

BGP Multicast Inter-AS (IAS) VPN

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/cs_bmiav.html

BGP Reduction in Transient Memory Usage

Cisco IOS Release 12.2(33)SRA has implemented a reduction in transient memory usage by BGP when BGP updates are built.

BGP Support for BFD

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srbgpbfd.html

BGP Support for Dual AS Configuration for Network AS Migrations

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srbgpdas.html

BGP Support for Fast Peering Session Deactivation

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srbsfda.html

BGP Support for IP Prefix Import from Global Table into a VRF Table

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gt_bgivt.html

BGP Support for Named Extended Community Lists

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srnextcl.html

BGP Support for Next-Hop Address Tracking

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srbhnt.html

BGP Support for Sequenced Entries in Extended Community Lists

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srextseq.html

BGP Support for TCP Path MTU Discovery per Session

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srbgpmtu.html

Per-VRF Assignment of BGP Router-ID

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srbgprid.html

Suppress BGP Advertisement for Inactive Routes

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sr_sbair.html

Bidirectional Forwarding Detection (BFD) Standard Implementation

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fs_bfd.html

Call Admission Control for IKE

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t8/feature/guide/gtcallik.html

Certificate - ISAKMP Profile Mapping

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t8/feature/guide/gt_isakp.html

Certificate - Storage Location Specification

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srpkicsl.html

Cisco IOS Login Enhancements

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t4/feature/guide/gt_login.html

Cisco Networking Services

Cisco IOS Release 12.2(33)SRA introduces support for the following Cisco Networking Services (CNS) features.

CNS

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sr_cns.html

CNS Configuration Agent

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sr_cnsca.html

CNS Enhanced Results Message

The CNS - Enhanced Results Message feature is documented as the **cns config partial** command change in the *Cisco IOS Network Management Command Reference, Release 12.2 SR* document:

http://www.cisco.com/en/US/docs/ios/netmgmt/configuration/guide/12_2sr/nm_12_2sr_book.html

CNS Event Agent

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sr_cnsea.html

CNS Security Enhancement

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_4t/12_4t11/ht_cnsse.html

CLNS Support for GRE Tunneling of IPv4 and IPv6 Packets in CLNS Networks

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gtclnsv6.html

Command Scheduler

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3/feature/guide/g_kron.html

Configuration Change Notification and Logging

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t4/feature/guide/gtconlog.html

Configuration Logger Persistency

The Configuration Logger Persistency feature implements a "quick save" functionality. The aim is to provide a "configuration save" mechanism in which the time to save changes from the startup configuration is proportional to the size of the incremental changes (with respect to the startup configuration) that must be saved. The persisted commands from the Cisco IOS Configuration logger are used as an extension to the startup configuration. The saved command, which is used as an extension to the startup configuration, provides a quick-save ability. Rather than saving the entire startup configuration, Cisco IOS software now saves just the commands that were entered since the last startup configuration was generated.

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srmgtint.html

Configuration Replace and Configuration Rollback

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gtrollbk.html

Configuration Versioning

For detailed information about this feature, see the *Configuration Replace and Rollback* document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gtrollbk.html

Contextual Configuration Diff Utility

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t4/feature/guide/gt_diff.html

Easy VPN

For detailed information about this feature, see the following documents:

- *Easy VPN Server*

  http://www.cisco.com/en/US/docs/ios/12_2t/12_2t4/feature/guide/ft_admss.html
- *Cisco Easy VPN Remote*

  http://www.cisco.com/en/US/docs/ios/12_2t/12_2t15/feature/guide/ftezvpnr.html

Easy VPN Client RSA - Signature Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gtevcrsa.html

EIGRP Support for Route Map Filtering

For detailed information about this feature, see the *EIGRP Route Map Support* document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t8/feature/guide/gteigrpr.html

Embedded Event Manager (EEM) 2.1

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sr_eem.html

Encrypted Multicast over GRE

The Encrypted Multicast over GRE feature, also referred to as secure multicast over Generic Routing Encapsulation (GRE), is integrated in Cisco IOS Software Release 12.2(33)SRA. This feature provides a secure and scalable solution to protect multicast traffic in an enterprise or managed service-provider environment. Each head-end device that is configured with an IP Security (IPsec) Virtual Private Network (VPN) shared port adapter (SPA) can support IPsec encrypted multicast traffic for up to 500 remote tunnels. The practical applications include voice, video, and data broadcast.

Note that this feature requires specific hardware, including a Cisco Catalyst 6500 series switch or a Cisco 7600 series router with an IPsec VPN SPA and a Services SPA Carrier (SSC) module: either an SPA-IPsec-2G or an 7600-SSC-400.

For detailed information, see the IPsec VPN Shared Port Adapter documentation:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Enhanced Crashinfo File Collection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t11/feature/guide/gt_cricm.html

Enhanced Tracking Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sretrac.html

Ethernet Connectivity Fault Management

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srethcfm.html

Ethernet Operations, Administration, and Maintenance

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srethoam.html

Exclusive Configuration Change Access and Access Session Locking

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gt_exclu.html

Extended ACL Support for IGMP to Support SSM in IPv4

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srmcxacl.html

FHRP—Enhanced Object Tracking of IP SLAs

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sreotsla.html

Note FHRP—Enhanced Object Tracking of IP SLAs is not stateful switchover (SSO)-aware and cannot be used with Hot Standby Routing Protocol (HSRP), Virtual Router Redundancy Protocol (VRRP), or Gateway Load Balancing Protocol (GLBP) in SSO mode. (CSCtd31237)

FHRP—Object Tracking List

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srobtrls.html

Front Side VRF for the IPsec VPN SPA

The VRF-Aware IPsec feature provides IP Security (IPsec) tunnel mapping to Multiprotocol Label Switching (MPLS) Virtual Private Networks (VPNs). By using the VRF-Aware IPsec feature, you can map IPsec tunnels to Virtual Routing and Forwarding (VRF) instances by using a single public-facing address.

A VRF instance is a per-VPN routing information repository that defines the VPN membership of a customer site attached to the Provider Edge (PE) router. A VRF comprises an IP routing table, a derived Cisco Express Forwarding (CEF) table, a set of interfaces that use the forwarding table, and a set of rules and routing protocol parameters that control the information that is included in the routing table. A separate set of routing and CEF tables is maintained for each VPN customer.

Front Door VRF (FVRF) and Inside VRF (IVRF) are central to understanding the feature.

Each IPsec tunnel is associated with two VRF domains. The outer encapsulated packet belongs to one VRF domain, called the FVRF, while the inner protected IP packet belongs to another domain called the IVRF. Another way of stating the same thing is that the local endpoint of the IPsec tunnel belongs to the FVRF while the source and destination addresses of the inside packet belong to the IVRF.

One or more IPsec tunnels can terminate on a single interface. The FVRF of all these tunnels is the same and is set to the VRF that is configured on that interface. The IVRF of these tunnels can be different and depends on the VRF that is defined in the Internet Security Association and Key Management Protocol (ISAKMP) profile that is attached to a crypto map entry.

In previous releases of the IPsec VPN SPA, VRF-Aware IPsec was supported, but FVRF was not; as of Cisco IOS Release 12.2(33)SRA, FVRF is supported.

For more information about the VRF-Aware IPsec feature, including Front Door VRF, see the *VRF-Aware IPSec* document:

http://www.cisco.com/en/US/docs/ios/sec_secure_connectivity/configuration/guide/sec_vrf_aware_ipsec.html

For information about configuring Front Side VRF on the IPsec VPN SPA, see the documents at the following location:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

GRE Tunnel IP Source and Destination VRF Membership

For detailed information about this feature, see the *Generic Routing Encapsulation Tunnel IP Source and Destination VRF Membership* document:

http://www.cisco.com/en/US/docs/ios/interface/configuration/guide/ir_impl_tun.html

HQoS Support for Ethernet Over MPLS (EoMPLS) VCs on the SIP-400

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

HSRP MD5 Authentication

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sr_hsmd.html

HTTPS—HTTP Server and Client with SSL 3.0

The HTTPS—HTTP Server and Client with SSL 3.0 feature provides Secure Socket Layer (SSL) version 3.0 support for the HTTP 1.1 server and HTTP 1.1 client within Cisco IOS software. SSL provides server authentication, encryption, and message integrity to allow secure HTTP communications. SSL also provides HTTP client authentication. HTTP over SSL is abbreviated as HTTPS.

H-VPLS with MPLS Edge on the SIP-400

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Ingress/Egress CoS Classification with Ingress Policing per VLAN or EoMPLS VC (L2 and L3 QoS)

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Inter-AS Support for Multicast VPN

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/iasmcvpn.html

Interface Management Improvements - Scalability and Reliability

The Interface Management Improvements - Scalability and Reliability feature provides enhancements to the IF-MIB:

- The scalability and reliability of the interface management are improved.
- The extensibility of the interface management infrastructure is ensured.

For more information about the IF-MIB, see the *Cisco 7600 Series Router MIB Specifications Guide*:

http://www.cisco.com/en/US/docs/routers/7600/technical_references/7600_mib_guides/MIB_Guide_ver_6/mibgde6.html

Internet Protocol Security Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Internet Protocol Security (IPsec) features.

Note IPSec is not supported on Cisco 7200 platforms.

IPsec Anti-Replay Window: Expanding and Disabling

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gt_iarwe.html

IPsec Dead Peer Detection (DPD) Periodic Message Option

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gtdpmo.html

IPsec Preferred Peer

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gt_ipspp.html

IPsec VTI - Virtual Tunnel Interface

For detailed information about this feature, see the *IPsec Virtual Tunnel Interface* document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gtIPSctm.html

Internet Protocol version 6 Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Internet Protocol version 6 (IPv6) features.

IPv6 Anycast Address

For detailed information about these features, see the "Implementing IPv6 Addressing and Basic Connectivity" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

IPv6 Default Router Preferences

For detailed information about these features, see the "Implementing IPv6 Addressing and Basic Connectivity" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

Internet Protocol version 6 Multicast Features

Cisco IOS Release 12.2(33)SRA supports the following Internet Protocol version 6 (IPv6) multicast features:

- IPv6 Multicast: Bootstrap Router (BSR)
- IPv6 Multicast: Explicit Tracking of Receivers
- IPv6 Multicast: MLD Access Group
- IPv6 Multicast: PIM Accept Register
- IPv6 Multicast: PIM Embedded RP Support
- IPv6 Multicast: Routable Address Hello Option
- IPv6 Multicast: RPF Flooding of Bootstrap Router (BSR) Packets
- IPv6 Multicast: Static Multicast Routing (mroute) for IPv6

For detailed information about these features, see the "Implementing IPv6 Multicast" chapter in the *Cisco IOS IPv6 Configuration Library*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/es20-config-guide.html

IPMROUTE-STD-MIB

The IPMROUTE-STD-MIB, as defined in RFC 2932, is a module for managing IP multicast routing, independent of the specific multicast routing protocol in use. Support for this MIB replaces the draft form of the IPMROUTE-MIB.

The IPMROUTE-STD-MIB supports all the MIB objects of the IPMROUTE-MIB and also supports the following four new MIB objects:

- ipMRouteEntryCount
- ipMRouteHCOctets

- ipMRouteInterfaceHCInMcastOctets
- ipMRouteInterfaceHCOutMcastOctets

Note The ipMRouteScopeNameTable MIB object is not supported because it is not relevant to multicast routers.

IP SLAs - LSP Health Monitor

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/products/ps6566/products_feature_guide09186a0080528450.html

IS-IS Support for Priority-Driven IP Prefix RIB Installation

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fslocrib.html

Layer 2 Virtual Private Network Interworking Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Layer 2 Virtual Private Network (L2VPN) Interworking features:

- L2VPN Interworking: Ethernet VLAN to ATM AAL5
- L2VPN Interworking: Ethernet VLAN to Frame Relay
- L2VPN Interworking: Ethernet VLAN to PPP

For detailed information about these features, see the *L2VPN Interworking* document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_l2vpn_intrntwkg.html

Memory Leak Detector

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t7/feature/guide/gtmleakd.html

Memory Pool - SNMP Notification Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t4/feature/guide/gtmemnot.html

Multiprotocol Label Switching Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Multiprotocol Label Switching (MPLS) features.

MPLS Embedded Management - High Capacity Counter

For detailed information about this feature, see the "Restrictions for MPLS Enhancements to Interfaces MIB" section in the *MPLS Enhancements to Interfaces MIB* document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t8/feature/guide/ftifemib.html

MPLS Enhancements to Interfaces MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t8/feature/guide/ftifemib.html

MPLS Label Distribution MIB: MPLS LDP Trap Enhancement

For detailed information about this feature, see the following documents:

- *MPLS Label Distribution Protocol MIB*

  http://www.cisco.com/en/US/docs/ios/12_2t/12_2t13/feature/guide/ldpmib13.html
- *MPLS Label Distribution Protocol MIB Version 8 Upgrade*

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fs27ldp8.html

MPLS LDP - Graceful Restart

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsgr29s.html

MPLS LDP - Session Protection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fssespro.html

MPLS over RBE

The ATM SPAs and Enhanced FlexWAN module support MLPS over Routed Bridge Encapsulation (RBE) on a Cisco 7600 series SIP-200. RBE is similar in functionality to RFC 1483 ATM half-bridging, except that ATM half-bridging is configured on a point-to-multipoint PVC, while RBE is configured on a point-to-point PVC.

For detailed information about this feature, see the following documents:

- *Configuring the ATM SPAs*

  https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html
- *Configuring Multiprotocol Label Switching on FlexWAN and Enhanced FlexWAN Modules*

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexmpls.html

MPLS Static Labels

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_static_labels.html

MPLS VRF Aware Static Labels

For detailed information about this feature, see the *VRF Aware MPLS Static Labels* document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_static_labels.html

Multiprotocol Label Switching Traffic Engineering Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) features.

MPLS Traffic Engineering (TE) - AutoTunnel Mesh Groups

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gsamg2.html

MPLS Traffic Engineering (TE) - AutoTunnel Primary and Backup

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gsautotn.html

MPLS Traffic Engineering (TE) - Class-Based Tunnel Selection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gscbts.html

Also, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

MPLS Traffic Engineering (TE) - Fast Reroute MIB

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/frr_mib.html

MPLS Traffic Engineering (TE) - Fast Reroute Link and Node Protection

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gslnh29.html

MPLS Traffic Engineering (TE) - Inter-AS TE

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gsintast.html

MPLS Traffic Engineering (TE) - LSP Attributes

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fslspatt.html

MPLS Traffic Engineering (TE) - RSVP Hello State Timer

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gsrsvpht.html

MPLS Traffic Engineering (TE) - Shared Risk Link Groups (SRLG)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fs29srlg.html

MPLS Traffic Engineering (TE) - Verbatim Path Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsvbmlsp.html

Multiprotocol Label Switching Virtual Private Network Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Multiprotocol Label Switching (MPLS) Virtual Private Network (VPN) features.

MPLS VPN - eBGP Multipath support for CSC and InterAS MPLS VPNs

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sbmulti.html

MPLS VPN - Explicit Null Label Support with BGP IPv4 Label Session

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gsxnlbsp.html

MPLS VPN - Loadbalancing Support for Inter-AS and CSC VPNs

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srmplc.html

MPLS VPN-MIB Support - MPLS VPN Trap Enhancement

For detailed information about this feature, see the “Command Reference” section in the *MPLS VPN—MIB Support* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsvnmb25.html

MPLS VPN - Multi-Path Support for Inter-AS VPNs

For detailed information about this feature, see the *MPLS VPN—Interautonomous System Support* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsiaseb.html

MPLS VPN - Route Target Rewrite

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsrtrw4.html

MPLS VPN - VPN Aware LDP MIB

For detailed information about this feature, see the *MPLS Label Distribution Protocol MIB Version 8 Upgrade* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fs27ldp8.html

MSDP Compliance with IETF RFC 3618

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t4/feature/guide/gt_msdp.html

Multicast VPN MIB Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/mcvpnmib.html

Multilink Frame Relay (FRF.16.1) - Variable Bandwidth Class

For detailed information about this feature, see the following *Multilink Frame Relay (FRF.16.1)* document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fs_mfr.html

Multipoint Bridging on the SIP-400

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Multi-VC to VLAN Scalability

For information about this feature, see the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

http://www.cisco.com/en/US/partner/products/hw/routers/ps368/module_installation_and_configuration_guides_book09186a00802109bf.html

MUX UNI Support on the SIP-400 (MPB on GE)

For detailed information about this feature, see the "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

MUX UNI Support on LAN Cards

For detailed information about this feature, which is also referred to as the 7600-MUX-UNI Support on LAN Cards feature, see the "Configuring PFC3BXL and PFC3B Mode Multiprotocol Label Switching" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide, Release 12.2SR*:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/pfc3mpls.html

NETCONF over SSHv2

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srnetcon.html

NetFlow Layer 2 and Security Monitoring Exports

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/sronfsc.html

NetFlow MPLS Label Export

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sx_pal.html

Nonstop Forwarding Stateful Switchover Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Nonstop Forwarding (NSF) Stateful Switchover (SSO) features.

NSF/SSO—MPLS LDP and LDP Graceful Restart

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsldpgr.html

NSF/SSO—MPLS LDP MIB

For detailed information about this feature, see the "MIBs" section in the *NSF/SSO—MPLS LDP and LDP Graceful Restart* document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsldpgr.html

NSF/SSO—MPLS TE and RSVP Graceful Restart

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_te_rsvp_grace.html

NSF/SSO—MPLS VPN

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsvpngr.html

NSF/SSO—MPLS VPN MIB

For detailed information about this feature, see the "MIBs" section in the *NSF/SSO—MPLS VPN* document:

http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsvpngr.html

SSO HSRP

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srssohsr.html

Optional OCSP Nonce

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srpkinon.html

Open Shortest Path First Features

Cisco IOS Release 12.2(33)SRA introduces support for the following Open Shortest Path First (OSPF) features.

OSPF Area Transit Capability

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/ospfatc.html

OSPF Per-Interface Link-Local Signaling

For detailed information about this feature, which is also referred to as the OSPF Link-local Signaling (LLS) Per Interface Basis feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/ospflls.html

OSPF RFC 3623 Graceful Restart

For detailed information about this feature, which is also referred to as the NSF - OSPF RFC 3623 Graceful Restart feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gr_ospf.html

OSPF Sham-Link MIB Support

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/ospfslms.html

Periodic MIB Data Collection and Transfer Mechanism

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/gdatacol.html

Persistent Self-Signed Certificates

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srpkissc.html

PIM RPF Vector

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/pimrpfvr.html

Pseudowire Emulation Edge-to-Edge MIBs for Ethernet, Frame Relay, and ATM Services

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sb/feature/guide/sbpweatm.html

QoS Support on Bridging Features

For detailed information about this feature, see the following documents:

- The "Configuring the SIPs and SSC" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

  https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

- "Configuring QoS on Bridged Interfaces" section in the *Configuring QoS on the FlexWAN and Enhanced FlexWAN Modules* document:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexqos.html

Reliable Static Routing Back-Up Using Object Tracking

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3/12_3x/12_3xe/feature/guide/dbackupx.html

Reverse Route Injection (RRI)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_3t/12_3t14/feature/guide/gt_rrie.html

RFC 1490 Spanning-Tree Interoperability Enhancements

For detailed information about this feature, see the "Enhancements to RFC 1483 and RFC 1490 Spanning Tree Interoperability" section in the *Cisco 7600 FlexWAN and Enhanced FlexWAN Modules Configuration Guide*:

http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html

RSVP Message Authentication

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsrsvpnk.html

Scalable EoMPLS (SIP-Based)

For detailed information about this feature, see the "Configuring Fast Ethernet and Gigabit Ethernet SPAs" chapter in the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*:

https://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/install_upgrade/7600series/SIP-SSC-SPA-HW-Install.html

Secure SNMP Views

The USM, VACM and Community MIBs have information that can potentially be used to gain access to the router using SNMP. Therefore, the USM, VACM, and Community MIBs are excluded from the default SNMP access view so as not to allow remote access unless specifically configured. However, when an SNMP view is created with any parent object identifier (OID) of these MIBs included (for example "internet included"), these MIBs also get included in the view. To increase security, the Secure SNMP Views enhancement excludes these MIBs from SNMP access views even when parent OIDs are included in the view. Prior to this release, when configuring SNMP views with parent OIDs that include the USM, VACM, or Community OIDs, the user was required to explicitly exclude them. For example, the following configuration can be used for excluding security-sensitive MIBs from the SNMP view named "test":

```
! - include all MIBs under the parent tree "internet" snmp-server view test internet
included
! -- exclude snmpUsmMIB snmp-server view test 1.3.6.1.6.3.15 excluded
! -- exclude snmpVacmMIB snmp-server view test 1.3.6.1.6.3.16 excluded
! -- exclude snmpCommunityMIB snmp-server view test 1.3.6.1.6.3.18 excluded
```

Beginning in Cisco IOS Releases 12.0(26)S and 12.2(2)T, the USM, VACM, and Community MIBs are excluded from any parent OIDs in a configured view by default. If you wish to include these MIBs in a view, you must now explicitly include them.

SNMP Support for VPNs

For detailed information about this feature, see the *SNMP Notification Support for VPNs* document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/cs23vpn.html

TCP MSS Adjustment

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2t/12_2t4/feature/guide/ft_admss.html

Two-Rate Policer

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/ft2plc26.html

VPLS Multiple VCs per Spoke

For detailed information about this feature, see the "Virtual Private LAN Services on the Optical Services Modules" section in the *Configuring Multiprotocol Label Switching on the Optical Services Modules* document:

http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SR_OSM_config/mpls.html

VRF Aware Multicast Error Messages

The VRF Aware Multicast Error Messages feature improves the troubleshooting of MPLS VPN environments by allowing service providers to track the multicast error messages that are associated with a particular MVPN customer.

VRF Aware System Message Logging (Syslog)

For detailed information about this feature, see the following document:

http://www.cisco.com/en/US/docs/ios/12_2sr/12_2sra/feature/guide/srvrfslg.html

MIBs

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

http://tools.cisco.com/ITDIT/MIBS/servlet/index

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

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

Limitations and Restrictions

The following sections contain information about limitations and restrictions in Cisco IOS Release 12.2SR that can apply to the Cisco 7600 series routers. With the release of Cisco IOS Release 12.2(33)SRC, Cisco IOS Release 12.2SR supports the Cisco 7200 series routers (Cisco 7200, Cisco 7200-NPE-G2, and Cisco 7201 routers) and the Cisco 7301 router.

Limitations and Restrictions in Cisco IOS Release 12.2(33)SRE

This section describes limitations and restrictions in Cisco IOS Release 12.2(33)SRE and later releases.

Enhanced Optical Services Modules Not Supported

Beginning with Cisco IOS Release 12.2(33)SRE, Enhanced Optical Service Modules are not supported by Cisco 7600 routers. The following modules are now unsupported:

- OSM Guidelines and Restrictions
- Gigabit Ethernet WAN
- OC-48 Packet over SONET
- OC-48 DPT/Packet over SONET
- OC-12 Packet over SONET
- OC-3 Packet over SONET
- OC-12 Channelized
- CT3/T1 Channelized/Unchannelized
- OC-12 ATM

For more information, see the following document:

http://www.cisco.com/en/US/products/hw/routers/ps368/prod_eol_notice0900aecd8073fdf9.html

Limitations and Restrictions in Cisco IOS Release 12.2(33)SRC2

This section describes limitations and restrictions in Cisco IOS Release 12.2(33)SRC2 and later releases.

Cisco 7600 With Redundant Supervisor Cards Running 12.2(33)SRC2

You might experience an error condition with a Cisco 7600 chassis that has redundant supervisor cards running the 12.2(33)SRC2 IOS image and a NAM service blade. The error occurs when you perform a sequential boot of the two supervisor cards because the secondary (standby) supervisor does not go into proper standby mode.

You can find more information about this issue in Field Notice #63179.

This problem does not occur:

- When you boot the two supervisor cards in parallel
- When you boot the standby supervisor card after the primary supervisor is up
- When the Cisco 7600 router runs the 12.2SRC1 image
- When only one supervisor card is installed in the Cisco 7600 chassis

Problem Symptom

When the primary supervisor functions as a standalone with the secondary supervisor card in RPR mode, the Cisco 7600 chassis functions normally (as if it has a standalone supervisor card). A switchover causes the system to be unavailable for up to three minutes because the secondary supervisor card is not in proper standby mode.

Note When both supervisors are booted simultaneously, the system will go to Hot Standby status. The primary supervisor will reboot when you issue the **redun force-switchover** command which causes the redundant supervisor to boot up to be the primary and the primary to be the redundant.

Solution

This problem requires you to downgrade the IOS image from 12.2SRC2 to 12.2SRC1. Account teams will help you do this if needed.

This problem will be fixed in 12.2SRC3, targeted for mid-January, 2009. When IOS image 12.2SRC3 is available, upgrade the image from 12.2SRC1 to 12.2SRC3 at your earliest opportunity.

Limitations and Restrictions in Cisco IOS Release 12.2(33)SRC

This section describes limitations and restrictions in Cisco IOS Release 12.2(33)SRC and later releases.

Cisco 7200VXR Limitations on Support for Voice Features

Voice-related port adaptors and features are not supported on Cisco 7200VXR platforms in Cisco IOS Release 12.2(33)SRC and later releases. The following port adaptors are not supported on the Cisco 7200VXR:

- PA-VXA-1TE1+
- PA-VXB/VXC-2TE1+
- PA-MCX-2/4/8TE1

Cisco 7600 Platform Restrictions for Broadband Support with Cisco IOS Release 12.2SRC

Physical Interface Restrictions

- The Broadband/ISG sessions are only supported on Gigabit (GE) Ethernet interfaces. See the Hardware Restriction section in the documentation for the specific type of GE interfaces that are required.
- The Broadband/ISG sessions are not supported on ATM interfaces.

Hardware Restrictions

- The Broadband/ISG sessions are only supported on Cisco 7600 series routers with RSP720 as the supervisor.
- The Broadband/ISG sessions are only supported on Cisco 7600 series routers with 7600-SIP-400 as the subscriber facing line card.
- The Broadband/ISG sessions are only supported on Cisco 7600 series routers with SPA-5X1GE-V2 or SPA-1X10GE-L2 as the subscriber facing port adaptor.

Restriction on Session Types

The Broadband/ISG sessions are *not* supported with following access protocols:

- L2TPv2/VPDN
- PPPoA
- PPPoEoA
- PPPoL2TP
- RBE

Configuration Restriction

The Broadband/ISG sessions are *only* supported with access subinterfaces, which were introduced in Cisco IOS Release 12.2(33)SRB. For more information on this restriction, see the following document:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/sipspasw.html

ISG Specific Restrictions

- Traffic classes are not supported on Cisco 7600 series routers.
- Prepaid accounting is not supported on Cisco 7600 series routers.
- Per flow accounting using Traffic Classes is not supported on Cisco 7600 series routers.
- ISG Rate limiting via (QU,QD) is not supported on Cisco 7600 series routers.
- Layer 4 Redirect and PBHK are performed on the Centralized Route processor (RP) on Cisco 7600 series routers.

HA Support for DHCP Initiated IP Sessions When ISG Is a DHCP Relay Content

When ISG is configured as a DHCP relay, high availability for DHCP initiated IP sessions is supported only on “unnumbered” interfaces. On numbered interfaces, where the IP address is configured directly on the interface, HA is not supported.

HA Support for ISG Features Includes Change of Authorization but not Per-feature Push

ISG features can be dynamically changed through Change of Authorization (COA). The COA commands are supported for SSO/ISSU. But if a feature is changed, dynamically via per-feature push, HA support is not provided.

VLAN Mobility Is Not Allowed for ISG Sessions

For IP sessions initiated through DHCP, ISG does not allow the users to roam from one VLAN to the other. ISG expects the VLAN to remain the same throughout the user session.

If the user moves from one VLAN to the other, the user needs to reboot the Customer Premise Equipment (laptop or the modem) to initiate a new session.

Limitations and Restrictions in Cisco IOS Release 12.2(33)SRB

This section describes limitations and restrictions in Cisco IOS Release 12.2(33)SRB and later releases.

IP Routing Protocols

- CSCso59114: i-BGP routes not getting re-distributed between PEs

  Symptom: In rare cases a PE router running BGP may stop announcing BGP updates to subsets of its configured address families.

  Conditions: A cisco7600 router running 12.2(33)SRB2 IOS in a L3VPN + L2 VPN converged topology may stop sending BGP updates during initial BGP convergence after enduring a period of interface flaps and linecard OIR.

  Workaround: Un-configuring and re-configuring the corresponding neighbor configuration statement will clear the problem.

Multicast VPN

- CSCso61282: Sometimes after SSO switchover all traffic dropped in vrf.

  Symptoms: In rare cases, multicast traffic within VRF may not recover after a multicast RP router reload.

  Conditions: In a mVPN environment, and on a Cisco7600 PE router running 12.2(33)SRB3 with PIM-SM running in the VRF and mvpn-bidir in the core and with auto-rp, if this PE router encountered a forced SSO switchover while the Multicast RP router is being reloaded, L3VPN multicast traffic on this PE may not recover.

  Workaround: Issuing a “clear ip mroute vrf red” command on the PE router will restore the traffic flow.

- CSCso67500 mvpn-bidir: Reloading encap rtr and performing sso causes df index issue

  Symptoms: After a SSO switchover on the PE encap router, mVPN multicast traffic may drop in a VRF

  Conditions: In a mVPN environment, and on a Cisco 7600 PE router running 12.2(33)SRB3, and with mvpn-bidir in the core, sparse mode in the VRFs, and with auto-rp, if the encap PE router is reloaded and then followed by a forced SSO switchover, multicast traffic within the VRF may stop forwarding.

  Workaround: Unconfiguring and reconfiguring MDT via the following commands will restore the traffic:

  - **no mdt default**
  - **mdt default**

Quality of Service

- CSCso68966 Policy-map matching all traffic as class-default

  Symptoms: All traffic on an ES-20 line card may get classified as class-default *mistakenly.*

  Conditions: On a Cisco7600 router that is running Cisco IOS Release 12.2(33)SRB3, and with an egress policy-map configured on an ES20 to match multiple class-maps, a policy-map may match all traffic as class-default due to unknown triggers.

Workaround: Remove/reapply the policy-map applied.

L2VPN

- CSCsl95761: L2VPN traffic loss for a single VC after system reload

  Symptoms: Traffic may stop flowing across ONE VC after system reload.

  Conditions: This problem is seen on Cisco 7600 router that is running Cisco IOS Release 12.2SRB3 image with ES20 having around 100 EVCs configured with encap dot1q and Xconnect. The problem may be triggered after a router reload or the reset of the ES20 module. To verify if the problem condition is resent, from the ES20 console issue the command **sh hw-module subslot** *slot-no* **tcam entry vlan** *port vlan-id1 vlan-id2 etype* and if the Ingress policy field is marked as "Deny" as opposed to "Permit" then the condition is present.

  Workaround: Reload the ES20 module using command **hw-module module** *module_no* **reset**.

Miscellaneous

- CSCsh92982: Looping packets get flooded in multi-vc per spoke topology

  Symptoms: Mac-address tables on different DFCs may get out of sync and cause flooding.

  Conditions: This problem may occur on a Cisco 7600 that is running Cisco IOS Release 12.2SRB code with distributed forwarding and multi-vc per spoke VPLS configuration on an ES20, SIP400 or SIP600 with mac-sync enabled.

  Workaround: Use software based Mac-sync along with Mac-aging timer adjustments using the following guidelines:

  - Mac-oob-timer—160 (default value = 160s)
  - Mac-aging-timer—3 x Mac-oob-timer (default value = 300s)
  - Arp-timer—Less than Mac-aging-timer (recommended 300s, default value = 6 hours)

- CSCsm35806: Clock source in OOR being active immediate after adding network-clock

  Symptoms: The clock source is active immediately after the addition of 'network-clocks' command corresponding to the source, though it is still in OOR actually.

  Conditions: On a Cisco 7600 router running 12.2(33)SRB with Dual CEoP Spas, receiving a ref-clock with revertive mode. Once the primary is in OOR, the reference clock switches over to the secondary. If the primary clock source is reconfigured too quickly (removing and adding 'network-clocks select' command), that primary source is reverted back to the reference immediately without waiting for the stabilization.

  Workaround: There is no workaround.

MPLS

- CSCsl25879: 7600: EoMPLS not passing traffic on 7600-SIP-400 SPA-2X1GE

  Symptoms: Scalable Ethernet over MPLS configuration on a Cisco 7600 does not work in some configurations. This problem is only for the Scalable EoMPLS case, in which xconnect is configured on SIP400 sub-interfaces, a feature which is documented in the following URL:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76cfgeth.html#wp1172434

Conditions: This symptom is observed on a Cisco 7600 series router with sup720 and IOS 12.2(33)SRA5 and a SIP400 card configured with Scalable EoMPLS.

Workaround: Issue the command 'clear ip route ' when the problem is seen.

The problem is also not seen in the following EoMPLS configurations so changing to the following configurations will avoid the problem:

- software-based EoMPLS where xconnect is configured on an SVI interface
- hardware-based EoMPLS where xconnect is configured on a non-SVI interface and non-SIP400 subinterface.

L2VPN Pseudowire Redundancy

The following restrictions affect the L2VPN Pseudowire Redundancy feature on the Cisco 7600 series in Cisco IOS Release 12.2(33)SRB:

- IP (routed) Ethernet to VLAN Interworking is not supported.
- Data traffic may switch from the primary pseudowire to the backup pseudowire when the primary attachment circuit at the tail-end goes down. However, when the MPLS switching path for the primary pseudowire goes down, data traffic is not switched from the primary pseudowire to the backup pseudowire.

Limitations and Restrictions in Cisco IOS Release 12.2(33)SRA

This section describes limitations and restrictions in Cisco IOS Release 12.2(33)SRA and later releases.

ADM and AGM Modules

In Cisco IOS Release 12.2(33)SRA and later releases, traffic Anomaly Detection Module (ADM) and Anomaly Guard Module (AGM) modules are supported on the Supervisor Engine 720 but not on the Supervisor Engine 32.

Advanced QinQ Service Mapping

In Cisco IOS Release 12.2(33)SRA and later releases, Advanced QinQ Service Mapping is not supported on the OSM-2+4GE-WAN+ Optical Services Module (OSM).

Content Switching Modules

In Cisco IOS Release 12.2(33)SRA and later releases, the Content Switching Module (CSM) and Content Switching Module with SSL (CSM-S) are not supported

IP Services Bundle Image

In the IP services bundle image of Cisco IOS Release 12.2(33)SRA and later releases, you cannot configure both MPLS and IPv6.

IPSec Not Supported by Cisco 7200

Cisco IOS Release 12.2SR does not support IPSec on Cisco 7200 platforms.

L2VPN Interworking

The Cisco 7600 series does not support IP (routed) Ethernet to VLAN Interworking. This restriction affects the L2VPN Interworking feature in Cisco IOS Release 12.2(33)SRA.

Maximum Number of IPsec Tunnels with PKI

In Cisco IOS Release 12.2(33)SRA and later releases, when Public Key Infrastructure (PKI) is configured with the IPsec VPN SPA, a maximum number of 2000 IP security (IPsec) tunnels is supported.

MPLS Aware Netflow

MPLS aware netflow is not supported on Cisco 7600 series routers due to hardware limitation of EARL7 and EARL7.5.

OSM-1CHOC12/T1-SI and QoS Packet Counts

On an OSM-1CHOC12/T1-SI, when Class-Based Weighted Fair Queueing (CBWFQ) or Low Latency Queueing (LLQ) is configured in combination with any feature that requires MSFC or PFC processing, the counters in the output of the **show policy-map interface** command do not increment. This situation occurs because the MSFC and PFC do not support CBWFQ or LLQ and do not count packets for QoS purposes.

Examples of configurations for which the counters do not increment are the following:

- **frame-relay ip tcp header-compression**
- **frame-relay ip rtp header-compression**
- **access-list** *access-list-number* **permit ip any any log**

Note that the **log** keyword in the **access-list** command causes packets to be processed by the MSFC or PFC.

- CSCsg58652

  Symptoms: On a Cisco 7600 series that is configured with a Supervisor Engine 720 and an OSM-1CHOC12/T1-SI, the output of the **show policy-map interface** command may display a packet counter of 0 for a serial interface.

  This symptom is observed on a Cisco 7600 series that has a Class-Based Weighted Fair Queueing (CBWFQ) or Low Latency Queueing (LLQ) configuration when packets are process-switched in software on the MSFC or PFC instead of being fast-switched, and then the router is reloaded with one of the following saved configurations:

  – When you have entered and saved commands such as the following to configure an access control list (ACL):

    access-list *199* **permit ip any any log**

    interface *s1/1.1/1:0.2*

    ip access-group *199* **out**

– When you have entered and saved commands such as the following to configure IP header compression:

```
interface serial1/1.1/1:0
encapsulation frame-relay
frame-relay ip tcp header-compression
service-policy output TEST
```

Workaround for the ACL symptom: Remove the **log** keyword from the **access-list** command, and then reload the router.

Workaround for the header compression symptom: Enter the **no frame-relay ip tcp header-compression** command or the **no frame-relay ip rtp header-compression** command, and then reload the router.

SNMP Version 1 BGP4-MIB Limitations

You may notice incorrect BGP trap OID output when you use the SNMP version 1 BGP4-MIB that is available for download at ftp://ftp.cisco.com/pub/mibs/v1/BGP4-MIB-V1SMI.my. When a router sends BGP traps (notifications) about state changes on an SNMP version 1 monitored BGP peer, the enterprise OID is incorrectly displayed as .1.3.6.1.2.1.15 (bgp) instead of .1.3.6.1.2.1.15.7 (bgpTraps). The problem is not due to any error with Cisco IOS software. This problem occurs because the BGP4-MIB does not follow RFC 1908 rules regarding version 1 and version 2 trap compliance. This MIB is controlled by IANA under the guidance of the IETF, and work is currently in progress by the IETF to replace this MIB with a new version that represents the current state of the BGP protocol. In the meantime, we recommend that you use the SNMP version 2 BGP4-MIB or the CISCO-BGP4-MIB to avoid an incorrect trap OID.

Important Notes

The following sections contain important notes about Cisco IOS Release 12.2SR that can apply to the Cisco 7600 series routers.

Cisco IOS Behavior Changes

Behavior changes describe the minor modifications to the way a device works that are sometimes introduced in a new software release. These changes typically occur during the course of resolving a software defect and are therefore not significant enough to warrant the creation of a stand-alone document. When behavior changes are introduced, existing documentation is updated with the changes described in this section.

Cisco IOS Release 12.2(33)SRE8

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRE8.

- Logging persistent auto command configuration modifications.

  Old Behavior: If logging persistent auto was configured and a boot image loaded, part of the startup configuration may be erased.

  New Behavior: Logging persistent auto will be removed from the config archive configuration.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios-xml/ios/config-mgmt/configuration/15-1sy/config-mgmt-15-1sy-book.html

- Old Behavior: No reporting was available for Wanphy alarms.

  New Behavior: Alarm reporting can be enabled for Wanphy alarms.

  Additional Information:
  http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap10.html#wp1468974

- GLC-SX-MMD and GLC-LH-SMD SFP support in 12.2(33)SRE8

  Old Behavior: GLC-SX-MMD and GLC-LH-SMD SFPs were not supported in Cisco IOS Release 12.2(33)SRE releases.

  New Behavior: GLC-SX-MMD and GLC-LH-SMD SFPs will be supported on 1GE ES+ line cards in Cisco IOS Release 12.2(33)SRE 8 and later releases.

  Additional Information:
  http://www.cisco.com/en/US/docs/routers/7600/Hardware/15_0s/7600_hwd.html

Cisco IOS Release 12.2(33)SRE7

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRE7.

- The maximum value for cleanup-delay time that is configured using the **mpls traffic-eng reoptimize timers delay cleanup-delay time** command to delay the removal of old LSPs after tunnel reoptimization, is changed to 300 seconds.

  Old Behavior: The maximum value for cleanup-delay time that is configured using the **mpls traffic-eng reoptimize timers delay cleanup-delay time** command, is 60 seconds.

  New Behavior: The maximum value for cleanup-delay time that is configured using the **mpls traffic-eng reoptimize timers delay cleanup-delay time** command, is 300 seconds.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios-xml/ios/mpls/command/mp-m4.html#GUID-B64630A1-3CD7-42DE-8E86-6CD47AC8981A

- NetFlow and microflow configuration support.

Old Behavior: You cannot configure the NetFlow and microflow policy on an interface together.

New Behavior: You can configure per-interface NetFlow and QoS micropolicing on an interface. However, do not configure different flow mask types on an interface. Only a single flow mask type should be configured for the per-interface NetFlow and microflow policy.

Additional Information:
http://www.cisco.com/en/US/docs/routers/7600/ios/15S/configuration/guide/nde.html#wp1131072

- A new keyword is added to the **hw-module slot** (7600) command.

  Old Behavior: The **mp-recovery-enable** keyword is not available for the **hw-module slot** command.

  New Behavior: The **mp-recovery-enable** keyword is available.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-f1.html#GUID-642623C0-B2E7-4C48-8163-534377F38142

- Taps on the same stream with different port range is accepted for RP-based LI.

  Old Behavior: Taps on the same stream with different port range was rejected.

  New Behavior: Taps on the same stream with different port range is accepted.

  Additional Information:
  http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/lawful_intercept/76LIch2.html

- The **snmp-server enable traps atm snmp-walk-serial** command, which is used to include missing ATM VC SNMP MIB objects of cAal5VccEntry type, is introduced.

  Old Behavior: Some ATM VC SNMP MIB objects of cAal5VccEntry type are not displayed when you use the snmpwalk application.

  New Behavior: The missing ATM VC SNMP MIB objects are displayed.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios-xml/ios/snmp/command/nm-snmp-cr-book.html

- Prevent **switchport** command configuration on EtherChannel ports.

  Old Behavior: The **switchport** commands could be configured on Layer 2 EtherChannel ports, which frequently caused mismatched attributes between the member ports and with LACP, the formation of a secondary aggregator.

  New Behavior: The **switchport** commands cannot be configured on Layer 2 EtherChannel ports. The **switchport** commands can be configured only on the Layer 2 port-channel interface.

  Additional Information: This message is displayed if you attempt to configure the **switchport** command on an EtherChannel member port:

  ```
  Configuration is not allowed on Port members. Remove the interface from the Port
  Channel to modify its config.
  ```

Cisco IOS Release 12.2(33)SRE6

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRE6.

- Status of the **snmp trap link-status** command on the ATM subinterface changes when the device is reloaded.

  Old Behavior: The **snmp-server enable traps atm subif** command enables Simple Network Management Protocol (SNMP) link trap generation on all the ATM subinterfaces. When the device is reloaded SNMP trap generation is enabled on all ATM subinterfaces.

New Behavior: To enable SNMP link trap generation on an ATM subinterface, first configure the **snmp-server enable traps atm subif** command in global configuration mode and then configure the **snmp trap link-status** command on the ATM subinterface on which SNMP link trap generation is to be enabled.

Additional Information:
http://www.cisco.com/en/US/docs/ios-xml/ios/snmp/command/nm-snmp-cr-s4.html

- Optimization of ACL TCAM entry consumption on the 7600 platforms for Policy Based Routing under certain circumstances.

  Old Behavior: When configuring multiple PBR sequences (or a single PBR sequence with multiple ACLs) in which more than one PBR ACL contains DENY entries, the result of the merge is sub-optimal in terms of number of TCAM entries and masks used.

  New Behavior: Entering the new **platform ipv4 pbr optimize tcam** command allows for better optimization in the case described.

  Additional Information:

  http://www.cisco.com/en/US/docs/routers/7600/ios/15S/configuration/guide/layer3.html#wp1027016

Cisco IOS Release 12.2(33)SRE5

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRE5.

- A change has been made to the **neighbor prefix-length-size** command.

  Old Behavior: When the **neighbor prefix-length-size** command is configured in the L2VPN VPLS address family, if that neighbor has a peer policy or route map that is removed, the **neighbor prefix-length-size** command setting is also removed.

  New Behavior: When the **neighbor prefix-length-size** command is configured in the L2VPN VPLS address family, the value of that command overrides the value set for the peer-group. If the command is locally configured for the peer, it will not be inherited from the peer-group.

- Chopper: The state of MLP bundles is not synced to standby after SPA OIR.

  Old Behavior: Prior to the Cisco IOS SRE4 release, the SPA-1xCHOC12/DS0 SPA boots up with the old controller status. If it is not admin down, it starts with no admin down and interfaces comes up as soon as the SPA boots up.

  New Behavior: Effective from Cisco IOS Release 15.1(3)S and Cisco IOS Release 12.2(33)SRE05, the SPA-1xCHOC12/DS0 boots up with admin down status and the original SPA status is restored after one second of the SPA bootup. Wait for a second after the log message "SPA_OIR-6-ONLINECARD: SPA (SPA-1XCHOC12/DS0) online in subslot" is displayed, to configure the SPA.

  Additional Information:
  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76ovwser.html#wp1058053

- The IPv6 configuration under a subinterface is no longer blocked.

  Old Behavior: IPv6 IP addresses were blocked when configured under a subinterface.

  New Behavior: IPv6 IP addresses are supported when configured under a subinterface using the xconnect command.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/mpls/command/reference/mp_t1.html#wp1051476

Cisco IOS Release 12.2(33)SRE4

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRE4.

- BGP no longer activates IPv6 peers in IPv4 address family automatically.

  Old Behavior: By default, both IPv6 and IPv4 capability is exchanged with a BGP peer that has an IPv6 address. When an IPv6 peer is configured, that neighbor is automatically activated under the IPv4 unicast address family.

  New Behavior: Starting with new peers being configured, an IPv6 neighbor is no longer automatically activated under the IPv4 address family. You can manually activate the IPv6 neighbor under the IPv4 address family if you want. If you do not want an existing IPv6 peer activated under the IPv4 address family, you can manually deactivate the peer with the no neighbor ipv6-address activate command. Until then, existing configurations that activate an IPv6 neighbor under the IPv4 unicast address family will continue to try to establish a session.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_basic_net_ps11280_TSD_Products_Configuration_Guide_Chapter.html#wp1137536

  http://www.cisco.com/en/US/partner/docs/ios/ios_xe/iproute_bgp/configuration/guide/irg_basic_net_xe_ps11174_TSD_Products_Configuration_Guide_Chapter.html

- Two new keywords, **protocol** and **pbr**, are added to the mode route command.

  Old Behavior: Destination-only traffic classes cannot be controlled when more than one protocol is operating at the border routers.

  New Behavior: Destination-only traffic classes can be controlled when more than one protocol is operating at the border routers using dynamic PBR.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios-xml/ios/pfr/command/pfr-cr-book.html

- M:N LAG support provided on the port-channel access type subinterface.

  Old Behavior: Only two members can be added to the port-channel access type subinterface.

  New Behavior: Multiple members can be added to the port-channel access type subinterface if the ISG is not configured.

  Additional Information:
  http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap4.html#wp1554373

- MLS QoS protocol ARP police does not work with the ES+ switchport/SVI interface.

  Old Behavior: The behavior on the L2 interfaces is trust cos by default.

  New Behavior: For switchport and SVI instances, the default port behavior is trust dscp. The CoS value is now derived from the dscp value.

  Additional Information:
  http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1346147

Cisco IOS Release 12.2(33)SRE3

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRE3.

- SNMP agent returns new error values if the NMS sending the query has a correct SNMP community but does not have a read or a write view.

Old Behavior: In the case of the NMS sending the query, the SNMP agent checks whether the community string is valid. If the community string is valid, then it ensures whether the community has access to a read or write view. This causes a very high CPU load.

New Behavior: In the case of the NMS sending the query having a correct SNMP community but that does not have a read or a write view, the SNMP agent returns the following error values:

- For a get or a getnext query, returns GEN_ERROR for SNMPv1 and AUTHORIZATION_ERROR for SNMPv2C.
- For a set query, returns NO_ACCESS_ERROR.

Additional information:

http://www.cisco.com/en/US/docs/ios/csa/command/reference/csa_03.html

http://www.cisco.com/en/US/docs/ios/ha/command/reference/ha_s3.html

http://www.cisco.com/en/US/docs/ios/ipv6/command/reference/ipv6_16.html

http://www.cisco.com/en/US/docs/ios/ipswitch/command/reference/isw_s3.html

http://www.cisco.com/en/US/docs/ios/mpls/command/reference/mp_s3.html

http://www.cisco.com/en/US/docs/ios/netmgmt/command/reference/nm_20.html

- Source IP address sent in prune echo messages is now set to the source IP address of the prune echoer.

  Old Behavior: The source IP address of prune echo messages is not set to the source IP address of the router that is echoing the prune message (prune echoer). This behavior is not in accordance with RFC 4601 and could potentially cause interoperability issues in certain IPTV deployment scenarios, for example, in VPLS deployments with a mix of Cisco and third-party routers.

  New Behavior: The source IP address that is sent in prune echo messages is now set to the source IP address of the prune echoer.

- Specific BGP show commands display dampening information on an individual VRF basis.

  Old Behavior: The following commands display flap-statistics, dampened-paths, and dampening parameters of VRFs under the VPNv4 or VPNv6 address family identifier:

  - **show ip bgp all dampening**
  - **show ip bgp vpnv4 all dampening**
  - **show ip bgp vpnv6 unicast all dampening**

  New Behavior: Because VRFs can have dampening enabled independently of other VRFs and the global VPNv4 and VPNv6 topologies, the following commands display flap-statistics, dampened-paths, and dampening parameters of individual VRFs under that VRF name:

  - **show ip bgp all dampening**
  - **show ip bgp vpnv4 all dampening**
  - **show ip bgp vpnv6 unicast all dampening**

  If dampening is not enabled for a VRF, that is stated under the VRF name.

  For more information, see the *Cisco IOS IP Routing: BGP Command Reference*.

- The **ipv6 access-class** command has been changed.

  Old behavior: A crash occurs when removing an IPv6 access list that is still applied to a vty.

  New behavior: The phrase "Identical restrictions should be set on all the virtual terminal lines because a user can connect to any of them" has been added so users can avoid this problem.

Additional Information:
http://www.cisco.com/en/US/docs/ios/ipv6/command/reference/ipv6_05.html

- BGP address families no longer stuck in NoNeg or idle state after reload

  Old Behavior: After a reload of a router, some or all of the BGP address families do not come up. This is because the router is receiving messages from a neighbor that the AFI or SAFI is not supported, and the router does not retry those AFIs. The output of show ip bgp all summary shows the address family in NoNeg or idle state, and it will never leave that state. Typical output looks like:

  ```
  Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd
  x.x.x.x 4 1 0 0 1 0 0 never (NoNeg)
  ```

  New Behavior: When the router receives a message that the AFI or SAFI is not supported, the router does not simply drop the rejected AFIs or SAFIs from subsequent OPEN messages. Instead, the router retries the AFI/SAFI within the existing OPEN message retry timing sequence, but with an exponential backoff (stopping at 10 minutes) applied to decisions about whether to include a particular AFI/SAFI in an OPEN message. The timing of OPEN messages is not changed. Successful negotiation of the AFI results in a reset of the backoff sequence for future attempts. Also, when a BGP connection collision occurs with a session in the ESTABLISHED state, BGP sends a CEASE notification on the newly opened connection, and a keepalive message on the old connection. The new connection is closed. If the old session was stale, the keepalive causes it to be closed. The neighbor will retry its OPEN message after receiving the CEASE message and waiting a few seconds.

- Modified Debug Output and CLI Change

  Old Behavior: The output of the **debug ip mfib mrib** and the **debug ipv6 mfib mrib** commands would display EOF messages for a particular multicast group.

  New Behavior: EOF messages are no longer displayed in the output of the **debug ip mfib mrib** and **debug ipv6 mfib mrib** commands. The *detail* keyword was added to the **debug ip mfib mrib** and **debug ipv6 mfib mrib** commands to display detailed debugging output (including EOF messages). The removal of EOF messages from the display of the **debug ip mfib mrib** and **debug ipv6 mfib mrib** commands eases troubleshooting of the MFIB communication with the MRIB.

- ISG can be configured to use the SSG format for the *ssg-control-info accounting* attribute.

  Old Behavior: ISG reverses the inbound and outbound data values in the *ssg-control-info* attribute.

  New Behavior: The **subscriber accounting ssg** command allows ISG to use the same format as SSG for the *ssg-control-info* attribute.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/isg/command/reference/isg_m1.html

- Active Flow Counts in NetFlow

  Old Behavior: The total number of active NetFlow flows in a module obtained from an SNMP query is always instantaneous value.

  New Behavior: A new keyword, *cache*, is added to the **mls netflow** command. When the **mls netflow** *cache* command is executed, the command returns a cached value of the total active flow count. The cached value is updated every 30 seconds.

  Additional Information:

  http://www.cisco.com/en/US/docs/ios/netflow/command/reference/nf_02.html#wp1136217

- The MTU and TTL rate limiters are enabled by default.

  Old Behavior: The MTU and TTL rate limiters were not enabled by default.

  New Behavior: The MTU and TTL rate limiters are enabled by default. The default values are 970 and 97 respectively.

Additional Information:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/dos.html#wp1163490

- Rate limit SIP200_MP-4-PAUSE message to avoid console flooding.

  Old Behavior: In scaled scenario, SIP200_MP-4-PAUSE messages takes on a lot of logging space and in the process other important logs might get missed.

  New Behavior: SIP200_MP-4-PAUSE message to avoid console flooding. Rate limit SIP200_MP-4-PAUSE ensures that one pause message is logged per unique occurrence across the SIP200 reloads and the subsequent occurrences are only statistically accounted.

  Additional information:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76tblsip.html.

- Disable NP crashinfo for all Network Processor exceptions.

  Old Behavior: A fix is required to reduce the NP reload time

  New Behavior: Network Processor crashinfo is disabled for all Network Processor exceptions by default.

  Additional Information:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76ovwsip.html

Cisco IOS Release 12.2(33)SRE2

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRE2.

- The **error throttling** command is supported on E1 controllers.

  Old Behavior: The **error throttling** command can be enabled only on T1 controllers.

  New Behavior: The **error throttling** command can be enabled on E1 controllers of a channelized E3 port adapter also.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/interface/command/reference/ir_d1.html#wp1015132

- DHCP server sends infinite lease time to the clients.

  Old Behavior: DHCP server does not send infinite lease time to the clients for which manual bindings are configured.

  New Behavior: DHCP server sends infinite lease time to the clients for which manual bindings are configured.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/ipaddr/configuration/guide/iad_dhcp_svr_cfg_ps10592_TSD_Products_Configuration_Guide_Chapter.html#wp1155880

- Add the **force** keyword to the **vrf upgrade-cli** command for Cisco IOS Release 12.2(33)SRE2.

  New Behavior: The optional **force** keyword was added to the **vrf upgrade-cli** command. Using this keyword disables the confirmation prompt when performing the upgrade process.

- New method to prevent BGP route loops when neighbor as-override configured.

  Old Behavior: When the **neighbor as-override** command is specified to configure that a PE router overrides the autonomous system number (ASN) of a site with the ASN of a provider, it is standard practice to also configure Site of Origin (SoO). SoO, configured on a PE along with neighbor as-override, helps to identify the site of origin for the prefix so that the prefix is not sent back to the source CE from a PE.

  New Behavior: An alternative to the SoO feature is using the **bgp update-group split as-override** command. The **bgp update-group split as-override** command causes the peers configured with the **neighbor as-override** command under the same address-family IPv4 VRF, which were previously under one update group, to be removed from that update group and each placed in their own update group.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/iproute_bgp/command/reference/irg_bgp1.htm

- BGP selects oldest paths as multipaths.

  Old Behavior: BGP selects paths which are not the oldest paths for multipaths. This causes BGP to unnecessarily flap from multipaths to non-multipath as a result of route flaps

  New Behavior: BGP uses the best-path selection algorithm to find a set of equally good routes. These routes are the potential multipaths. In Cisco IOS Release 12.2(33)SRD and later releases, when there are more equally good multipaths available than the maximum permitted number, then the oldest paths are selected as multipaths.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_external_sp.html

  http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_overview.html

- Behavior change for **auto-summary** (BGP) command.

  Old Behavior: When a connected route is automatically summarized by the **auto-summary** (BGP) command, the route is not deleted from the BGP routing table if the interface assigned that address is shut down.

  New Behavior: When a connected route is automatically summarized by the **auto-summary** (BGP) command, the route is properly deleted from the BGP routing table if the interface assigned that address is shut down.

  For more information, see the auto-summary (BGP) command:
  http://www.cisco.com/en/US/docs/ios/iproute_bgp/command/reference/irg_bgp1.html

- Command accounting and command authorization to be sent in asplain notation.

  Old Behavior: Command accounting and command authorization that include a 4-byte ASN number are sent in the same format that is used on the command line interface.

  New Behavior: Command accounting and command authorization that include a 4-byte ASN number are sent in the asplain notation irrespective of the format that is used on the command line interface.

  Additional information:
  http://www.cisco.com/en/US/docs/ios/iproute_bgp/command/reference/irg_bgp3.html

  http://www.cisco.com/en/US/docs/ios/iproute_bgp/command/reference/irg_bgp4.html

  http://www.cisco.com/en/US/docs/ios/ipv6/command/reference/ipv6_10.html

  http://www.cisco.com/en/US/docs/ios/ipv6/command/reference/ipv6_11.html

- Ingress CoS Marking not working on ES+ with “mls qos” enabled global.

  Old Behavior: On routed interfaces, when mls qos is enabled, ES+ mark the packet as “trust dscp” even when ingress marking of CoS is configured (“set cos *0-7*”) in the policy map. Because of this, CoS value always propagated from dscp/prec (by EARL).

  New Behavior: With the new behavior, for routed interfaces, ES+ mark the packet as “trust cos” when ingress marking of COS is configured. As the result of this, cos value configured using “set cos” will be preserved in the outgoing packet and will not be rewritten by EARL.

  Impact to customer: The ES+ line card marks a packet as trust cos when ingress marking for CoS is configured for a routed interface. Hence, the CoS value configured using the **set cos** *value* command is retained on the outgoing packet. This cos value is not overwritten by EARL or derived from dscp.

  Additional information:
  http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1346147

- BFD MIB: bfdSessDiag wrong value for session down traps.

  Old Behavior: MIB uses the same diag code as BFD internal. However, the MIB definition has values starting at offset 1, while BFD internal (and ietf spec) starts at offset 0. This means all diag codes for down are off by 1.

  New Behavior: BFD MIB: bfdSessDiag value for session down traps corrected and updated in the document.

  Additional Information:
  https://www.cisco.com/en/US/docs/ios/iproute_bfd/configuration/guide/irb_bfd_mib.html

- Upper limit MTU value for POS interfaces is changed across all 7200 branches.

  Old Behavior: The maximum MTU size that can be configured on POS interfaces is 117994.

  New Behavior: The maximum MTU size that can be configured on POS interfaces is 9216.

  Additional Information:
  http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-pos-1oc3_install_config/6514conf.html#wp1041110

  http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-pos-2oc3_install_config/3028conf.html#wp1028535

- Interface configuration fail when prowler reinserted in different LC in the same bay.

  Old Behavior: No note was present in the guide saying that the system will not retain the configuration of the old interface.

  New Behavior: Added a note in the SIP/SPA Configuration Guide saying “If you move the SPA (SPA-8XTE1/SPA-4xCT3/DS0/SPA-2xCT3/DS0/SPA-1xCHSTM1/OC3) from one LC to another type of LC in the same bay and same slot, the system will not retain the configuration of the old interface”.

  Additional information:
  http://preview.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76tblsip.html#wp1105809

- Old Behavior: Existing behavior is to block the configuration.

  New Behavior: The shape rate cannot be configured greater than 131Mb at the leaf level on ES+ interfaces.

  Information is updated in the Restrictions and Guidelines section, under the topic “Configuring Shaping”, in the Chapter Configuring QoS.

Additional information:
http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1352263

- VC QoS on VP-PW support extended to CEoP SPA from Cisco IOS Release 12.2(33)SRE2 and Cisco IOS Release 15.0(1)S onwards.

  Old Behavior: VC QoS on VP-PW was supported on ATM SPA.

  New Behavior: VC QoS on VP-PW support is extended to CEoP SPA.

  Additional Information:
  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76cfgatm.html

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76cfgsip.html#wp1162382>

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76ovwsip.html#wp1053930>

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76ovwcep.html

Cisco IOS Release 12.2(33)SRE1

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRE1.

- The syslog error message for multicast Call Admission Control (CAC) limits now shows information about both limits and interfaces.

  Old Behavior: When the multicast CAC limit is configured at both the main and subinterface, the syslog error message shown when the multicast CAC limit was reached did not mention the exact interface limit that denied the OLE addition.

  New Behavior: The syslog error message is updated with the information about the limit and the interface on which it was denied. See the following example:

  ```
  *Feb 19 10:36:11.514 PST: %IPMCAST_LIB-4-IPMCAST_LIMIT: Adding Outgoing interface
  'Ethernet0/0.2' denied for (*,FF03::1:1:6) due to limit (4) in Ethernet0/0
  -Process= "PIM IPv6", ipl= 0, pid= 143.
  ```

  Additional Information:

  http://www.cisco.com/en/US/docs/ios/12_2sb/system/messages/sys_msg_book.html

- The **dialer pool-member** command is not available on Cisco IOS Release 12.2SR.

  Old Behavior: The **dialer pool-member** command was available on Cisco IOS Release 12.2(33)SRB and later releases.

  New Behavior: The **dialer pool-member** command is not supported on Cisco IOS 12.2SR releases.

  Additional Information:

  http://www.cisco.com/en/US/docs/ios/dial/command/reference/dia_d1.html#wp1033489

- BRE does not work with SONET/SDH APS.

  New Behavior: Use the BRE+APS feature to configure two VCs for the same VLAN, provided their parent interfaces too belong to the same Automatic Protection Switching (APS) group.

  Old Behavior: BRE does not work on APS protected ATM interfaces. You should configure “bre-connect” on both ATM interfaces with the same vlan. Currently, software allows only one bre-connect per vlan. This restriction needs to be removed for making BRE work with APS.

Additional Information:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/vlans.html and http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/vlans.html

Updated section: Bridged routed Encapsulation with Automatic Protection Switching

Commands, keywords, and arguments that have been changed:

show atm vlan bre

- Software configuration updates as part of the Private Host SVI feature for Cisco IOS Release 12.2(33) SRD3. This feature will be shared as part of a hidden doc for select customers.

  Old Behavior: Unicast and broadcast traffic from Private host isolated ports were not sent over VPLS enabled interfaces.

  New Behavior: Unicast and broadcast traffic from Private host isolated ports are sent over VPLS enabled interfaces.

  Impact to customer:

  Private Host feature can be enabled with VPLS enabled interfaces acting as Private host promiscuous ports.

  New commands and key words included:

  private-hosts

  private-hosts mac-list mac-list-name mac address

  private-hosts vlan-list vlan-id

  private-hosts promiscuous mac-list-name [**vlan-list vlan-id**]

- Support for 8 additional DWDM SFPs on ES20/SIP-400/SIP-600.

  Old Behavior: 8 DWDM SFPs DWDM-SFP-3346, DWDM-SFP-3739, DWDM-SFP-4134, DWDM-SFP-4532, DWDM-SFP-4931, DWDM-SFP-5332, DWDM-SFP-5736, DWDM-SFP-6141 were not supported on ES20/SIP-400/SIP-600.

  New Behavior: Support the additional 8 DWDM SFPs on ES20/SIP-400/SIP-600.

  Additional Information:

  http://www.cisco.com/en/US/docs/routers/7600/Hardware/12.2SR_supported_hw/7600_hwd.html

- Operational state of the peer port in SPAN and UDLD combinations

  New Behavior: Current operational state of the peer port is not “error disabled”and is in “Advertisment” state.

  Old Behavior: When you configure SPAN and UDLD combinations on a port where the interface is a SPAN destination port, the current operational state of the peer is disabled as the peer disables the port.

  Additional Information:
  http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/ude_udlr.html#wp1041358

  Updated section: UDE Configuration Guidelines

  No commands, keywords, and arguments that have been changed.

  Changes to default behavior if appropriate: Peer port is no longer in error disabled state but is in Advertisement state.

- Layer 4 redirect limit can be configured for ISG

  Old Behavior: There is no limit on the number of L4 redirects.

  New Behavior: Maximum number of L4 redirects can be configured with redirect session-limit command.

  Additional Information:

  http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_l4_redirect.html and http://www.cisco.com/en/US/docs/ios/isg/command/reference/isg_m1.html

- CoS resets to zero for MVPN traffic on c7600 in PFC3C mode.

  New Behavior: A new CLI enables or disables the trust state over the internal recirculate path. The CLI is described as: "[no] mls qos recirc untrust [slot]".

  For complete syntax and usage information for the command **mls qos recirc untrust**, see the Cisco QoS command reference at this URL:

  http://www.cisco.com/en/US/docs/ios/qos/command/reference/qos_book.html

  Old Behavior: The bit "CR_UNTRUST" on DE_NOT_DE_MISC_CNTRL is currently enabled by default on the Earl, when it boots up in PFC3C mode and currently does not have any CLI to control or modify its state.

  Additional Information:

  http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/swcg.html and http://www.cisco.com/en/US/docs/routers/7600/Hardware/Hardware_Guides/Supervisor_Engine_and_Route_Switch_Processor_Guide/76-sup-rsp.html

  Updated section: QoS on the RSP720-10GE

  Commands, keywords, and arguments have been changed. A new command **mls qos recirc untrust** is introduced

- Egress CoS based WRED does not work on ES+ L3 interfaces.

  Old Behavior: Policy map with cos based wred is rejected on main interface of ES+ line card.

  New Behavior: Policy map with cos based wred is accepted on the main interface of ES+ line card.

  All the dot1q traffic passing through this main interface is subjected to this wred based on their respective cos markings.

  Impact to customer: For EVC, subinterfaces, and Layer 3 main interface the WRED support is now dscp-based, precedence-based, and cos-based.

  Additional Information:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1437667

- ISG can be configured to ignore Address Resolution Protocol (ARP) requests.

  Old Behavior: ISG replies to ARP requests for destinations on the same interface.

  New Behavior: ISG does not reply to ARP requests for destinations on the same interface if the **arp ignore local** command is configured.

  Additional Information:

  http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html and http://www.cisco.com/en/US/docs/ios/isg/command/reference/isg_a1.html

- Four new protocol keywords are added to the **mls qos protocol** command.

Old Behavior: The **bfd-ctrl**, **bfd-echo**, **glbp**, and **vrrp** keywords are not available with the **mls qos protocol** command.

New Behavior: These four keywords are now available with this command.

Additional Information:

http://www.cisco.com/en/US/docs/ios/qos/command/reference/qos_m2.html

- NTP mode 7 packet processing

  Old Behavior: Cisco IOS software releases process NTP mode 7 packets.

  New Behavior: Cisco IOS software releases where CSCtd75033 is resolved do not process

  NTP mode 7 packets, and instead, if debugs for NTP are enabled, display “NTP: Receive: dropping message: Received NTP private mode packet. 7”.

  To have Cisco IOS Software process NTP mode 7 packets, enter the **ntp allow mode private** command (disabled by default).

Cisco IOS Release 12.2(33)SRD6

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRD6.

- Rate limit SIP200_MP-4-PAUSE message is added to avoid console flooding.

  Old Behavior: In scaled scenario, SIP200_MP-4-PAUSE messages takes on a lot of logging space, and in the process other important logs might get missed.

  New Behavior: SIP200_MP-4-PAUSE message is added to avoid console flooding.

  Impact to customer: Rate limit SIP200_MP-4-PAUSE ensures that one pause message is logged per unique occurrence across the SIP200 reloads, and the subsequent occurrences are only statistically accounted.

  Additional Information:
  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76tblsip.html

Cisco IOS Release 12.2(33)SRD5

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRD5.

- The **error throttling** command is supported on E1 controllers .

  Old Behavior: The **error throttling** command can be enabled only on T1 controllers.

  New Behavior: The **error throttling** command can be enabled on E1 controllers of a channelized E3 port adapter also.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/interface/command/reference/ir_d1.html#wp1015132

- Source IP address sent in prune echo messages is now set to the source IP address of the prune echoer.

  Old Behavior: The source IP address of prune echo messages is not set to the source IP address of the router that is echoing the prune message (prune echoer). This behavior is not in accordance with RFC 4601 and could potentially cause interoperability issues in certain IPTV deployment scenarios, for example, in VPLS deployments with a mix of Cisco and third-party routers.

  New Behavior: The source IP address that is sent in prune echo messages is now set to the source IP address of the prune echoer.

- BGP selects oldest paths as multipaths.

  Old Behavior: BGP selects paths which are not the oldest paths for multipaths. This causes BGP to unnecessarily flap from multipaths to non-multipath as a result of route flaps

  New Behavior: BGP uses the best-path selection algorithm to find a set of equally good routes. These routes are the potential multipaths. In Cisco IOS Release 12.2(33)SRD and later releases, when there are more equally good multipaths available than the maximum permitted number, then the oldest paths are selected as multipaths.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_external_sp.html

  http://www.cisco.com/en/US/docs/ios/iproute_bgp/configuration/guide/irg_overview.html

- Ingress CoS Marking not working on ES+ with “mls qos” enabled global.

  Old Behavior: On routed interfaces, when mls qos enabled, ES+ mark the packet as “trust dscp” even when ingress marking of COS is configured (set con *0-7*) in the policy map. Because of this, CoS value always propagated from dscp/prec.

  New Behavior: With the new behavior, for routed interfaces, ES+ mark the packet as “trust cos” when ingress marking of CoS is configured. As the result of this, CoS value configured using “set cos” will be preserved in the outgoing packet and will not be rewritten.

  Impact to customer: The ES+ line card marks a packet as trust cos when ingress marking for CoS is configured for a routed interface. Hence, the CoS value configured using the set cos value command is retained on the outgoing packet. This CoS value is not overwritten or derived from DSCP.

  Additional information:
  http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1346147

- Old Behavior: No note was present in the guide saying that the system will not retain the configuration of the old interface.

  New Behavior: If you move the SPA (SPA-8XTE1/ SPA-4xCT3/DS0 / SPA-2xCT3/DS0/SPA-1xCHSTM1/OC3) from one LC to another type of LC in the same bay and same slot, the system will not retain the configuration of the old interface.

  Additional information:
  http://preview.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76tblsip.html#wp1105809

- Old Behavior: Existing behavior blocks the configuration.

  New Behavior: The shape rate cannot be configured greater than 131Mb at the leaf level on ES+ interfaces.

  Additional information:
  http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1352263

- Upper limit MTU value for POS interfaces is changed across all 7200 branches.

  Old Behavior: The maximum MTU size that can be configured on POS interfaces is 117994.

  New Behavior: The maximum MTU size that can be configured on POS interfaces is 9216.

  Additional Information:
  http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-pos-1oc3_install_config/6514conf.html#wp1041110

  http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-pos-2oc3_install_config/3028conf.html#wp1028535

Cisco IOS Release 12.2(33)SRD4

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRD4.

- Old Behavior: There was no means to configure username domain options for the RADIUS application.

  New Behavior: Added the **domain** command under - aaa dynamic author context which configures username domain options for the RADIUS application.

  The latest command is available at:

  http://www.cisco.com/en/US/docs/ios/security/command/reference/sec_d2.html

- CLI change to **bgp aggregate-timer** command to suppress more specific routes.

  Old Behavior: More specific routes are advertised and withdrawn later, even if aggregate-address summary-only is configured. The BGP table shows the specific prefixes as suppressed.

  New Behavior: The **bgp aggregate-timer** command now accepts the value of 0 (zero), which disables the aggregate timer and suppresses the routes immediately.

- New method to prevent BGP route loops when neighbor as-override configured.

  Old Behavior: When the **neighbor as-override** command is specified to configure that a PE router overrides the autonomous system number (ASN) of a site with the ASN of a provider, it is standard practice to also configure Site of Origin (SoO). SoO, configured on a PE along with neighbor as-override, helps to identify the site of origin for the prefix so that the prefix is not sent back to the source CE from a PE.

  New Behavior: An alternative to the SoO feature is using the bgp update-group split as- override command. The bgp update-group split as-override command causes the peers configured with the neighbor as-override command under the same address-family IPv4 VRF, which were previously under one update group, to be removed from that update group and each placed in their own update group.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/iproute_bgp/command/reference/irg_bgp1.html

- Old Behavior: BRE does not work on APS protected ATM interfaces. You should configure “bre-connect” on both ATM interfaces with the same vlan. Currently, software allows only one bre-connect per vlan. This restriction needs to be removed for making BRE work with APS.

  New Behavior: Use the BRE+APS feature to configure two VCs for the same VLAN, provided their parent interfaces too belong to the same Automatic Protection Switching (APS) group.

  Additional Information:
  http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/vlans.html

- In the earlier design (up to SRD3) subinterfaces numbered 1-300, support high bandwidth (> OC3) operation with QoS configured. Even if only say single subinterface is configured but with subinterface number > 300, then there is a chance that packets may be dropped if traffic rate exceeds OC3 and QoS is configured under the subinterface, due to QoS lock failures. The probability of packet drops, due to QoS lock failures is higher if the pps rate for the subinterface is high (pps cutoff not available) This happens because only subinterface numbered 1-300 are allocated QoS statistics in SRAM, any other subinterface is allocated QoS statistics in DRAM which is considerably slower.

  With this DDTS, there is no limitation w.r.t subinterface number used. But, there is still a limit on the total number of subinterfaces (300) per physical port which can have QoS statistics in SRAM. So, with this change, if only g2/0/0.700 to g2/0/0.999 subinterfaces are configured under g2/0/0, then all the subinterfaces will have QoS statistics in SRAM, and there is no bandwidth limitation for these subinterfaces.

Look for following in line card output for interfaces with QoS configuration, below output will indicate if subinterface QoS statistics are maintained in SRAM or DRAM:

SIP-400-2#sh platform np qos class tables all | include SRAM

SIP-400-2#sh platform np qos class tables all | include DRAM

- Limits enforced for number of ISG subscriber sessions on Cisco 7600.

  Old Behavior: Limits are not enforced on the number of subscriber sessions.

  New Behavior: Number of subscriber sessions is restricted per ES+ line card, SIP400 line card, and per chassis.

  Additional Information: http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_acess_sub_sessns.html#wp1054501 and http://www.cisco.com/en/US/docs/ios/isg/command/reference/isg_m1.html.

- Old Behavior: When you configure SPAN and UDLD combinations on a port where the interface is a SPAN destination port, the current operational state of the peer is disabled as the peer disables the port.

  New Behavior: Current operational state of the peer port is not “error disabled” and is in “Advertisement” state.

  Additional Information: http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/ude_udlr.html#wp1041358

- Old Behavior: There is no limit on the number of L4 redirects.

  New Behavior: Maximum number of L4 redirects can be configured with redirect session-limit command.

  Additional Information: http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/isg_l4_redirect.html and http://www.cisco.com/en/US/docs/ios/isg/command/reference/isg_m1.html

- Old Behavior: Policy map with cos based wred is rejected on main interface of ES+ line card.

  New Behavior: Policy map with cos based wred is accepted on the main interface of ES+ line card.

  All the dot1q traffic passing through this main interface is subjected to this wred based on their respective cos markings.

  Impact to customer: For EVC, subinterfaces, and Layer 3 main interface the WRED support is now dscp-based, precedence-based, and cos-based.

  Additional Information: http://www.cisco.com/en/US/docs/routers/7600/install_config/ES40_config_guide/es40_chap7.html#wp1437667

Cisco IOS Release 12.2(33)SRD3

The following behavior changes are introduced in Cisco IOS Release 12.2(33)SRD3.

- New **snmp mib flash cache** command

  Old Behavior: No cache was maintained for CISCO-FLASH-MIB

  New Behavior: A new command **snmp mib flash cache** has been added to start a process that constructs and maintains a cache.

  Additional Information: http://www.cisco.com/en/US/docs/ios/netmgmt/command/reference/nm_17.html#wp1109596

- Change for networks using redistribution from BGP into OSPF in VRF tables, either in MPLS VPN or VRF-lite environments, where redistribution happens on more than one router and the metric of the redistributed route is being used to choose the preferred exit point.

  Old Behavior: If BGP is redistributed into OSPF and no route-map or default redistribution metric is specified, the OSPF route is assigned either a metric of 1 if redistribution happens in the global routing table or the metric of the BGP route if redistribution happens in a VRF.

  New Behavior: A redistributed OSPF route inherits the BGP metric only if the OSPF route was received via MPLS VPN and contains extended attributes propagating the OSPF metric. In all other cases, the OSPF route receives a metric of 1, including the case of MPLS-VPN routes not carrying an OSPF metric in extended attributes.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/mpls/configuration/guide/mp_cfg_layer3_vpn_ps6922_TSD_Products_Configuration_Guide_Chapter.html

- ISG accounting does not count or bill for dropped packets

  Old Behavior: Packets dropped by the IP access control lists (ACLs), filters, ISG policing, and prepaid volume features were counted.

  New Behavior: Starting with Cisco IOS Release 12.2(33)SRD3, ISG accounting does not count, and subscribers are not billed for, packets dropped by these features.

  Additional information:
  http://www.cisco.com/en/US/docs/ios/isg/configuration/guide/cfg_isg_acctng.html

- New CLI command

  Old Behavior: Call-home is not VPN Routing/Forwarding (VRF) aware for email messages.

  New Behavior: A new CLI command is introduced to enable the VRF support for call-home. Call-home can use the configured interface to send an email message.

  Call-home can use the VRF infrastructure to route email messages. If a VRF is not specified in call-home configuration, call-home will use the global routing table to send email messages. If a VRF is specified in call-home config, call-home will only try to use the specified vrf table to send email messages.

  Note that call-home HTTPS messages can be sent over a specified source interface on the VRF only by **ip http client source-interface** command, not depending on this new VRF command under call-home config mode.

  Additional Information:
  http://cisco.com/en/US/docs/ios/ha/command/reference/ha_a1.html#wp1035245

- Software configuration updates as part of the Private Host SVI feature for 12.2(33) SRD3. This feature will she shared as part of a hidden doc for select customers.

  Old Behavior: Unicast and broadcast traffic from Private host isolated ports were not sent over VPLS enabled interfaces.

  New Behavior: Unicast and broadcast traffic from Private host isolated ports are sent over VPLS enabled interfaces. Private Host feature can be enabled with VPLS enabled interfaces acting as Private host promiscuous ports.

- CLI Changes

  Old Behavior: If SAMI card was running a singleip application, it was not possible to execute **rcal** commands on TP/TCOPs from SUP through **execute-on** command.

  New Behavior: Executing **execute rcal** commands on TP/TCOPs is now enabled by providing the command:

execute-on (slot)(control_proc) execute-on (traffic_proc | all) LINE

Additional Information:
http://www.cisco.com/en/US/docs/ios/fundamentals/command/reference/cf_book.html

- Support for the **mls cef tunnel fragment** command in PFC3A and PFC3B modes

  Old Behavior: In releases later than 12.2(18)SFX and rebuilds, the **mls cef tunnel fragment** command is not supported in PFC3A and PFC3B modes.

  New Behavior: In releases where CSCsy69228 is resolved, the **mls cef tunnel fragment** command is supported in PFC3A and PFC3B modes.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/ipswitch/command/reference/isw_i1.html#mls_cef_tunnel_fragment

- Support for 2G grooming with Cisco 7600 CEOP SPA AIS processing

  Old Behavior: Currently when one BTS goes down, a Cisco 7600 generates an AIS for the whole VC-12 bringing all base stations sharing VS-12 down.

  New Behavior: Support a IP RAN 2G aggregation case where multiple base stations share a single VS-12 on the CEOP SPAs.

  Additional Information:
  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76cfgcep.html

- IPv6 HBH policing support on SIP200/FW2

  Old Behavior: The handling of IPv6 packets with hop-by-hop extension header was such that EARL treated them as layer 2 packets and punted all of them to the Routing Processor.

  L3 ACLs could not be applied to these packets. A large number of these packets may cause a DoS attack. The requirement is to rate-limit these packets on the SIP-200 line card.

  New Behavior: Rate-limiting IPv6 packets with Hop-By-Hop extension headers is supported on SIP-200.

  Additional Information:
  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76cfgsip.html

- Change in **keepalive** command support

  Old Behavior: **keepalive** command is supported for ES20.

  New Behavior: **keepalive** command is not supported.

  Additional Information:
  http://www.cisco.com/en/US/docs/routers/7600/install_config/ES20_config_guide/baldcsm.html

- NAT pool size is limited to 15 bits netmask.

  Old Behavior: NAT pool size of more than 15 bits was allowed, but led to high CPU during configuration.

  New Behavior: When NAT pool size of more than 15 bits is configured, the following error message is thrown:

  ```
  %Error, pool size should be maximum 15 bits long.
  ```

  Additional Information:
  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/7600series/76cfgsip.html

- Default error message change to Point-to-Point Tunnelling Protocol (PPTP) with RADIUS Accounting.

  Old Behavior: When using PPTP with RADIUS Accounting, the Terminate-Cause default error message displays “nas-error”.

  New Behavior: When using PPTP with RADIUS Accounting the Terminate-Cause default message displays “none”.

  Additional Information:
  http://www.cisco.com/en/US/docs/ios/vpdn/command/reference/vpd_a1.html
- The L2TP network server (LNS) must reply with the same attribute-value pairs (AVPs) it receives from the L2TP access concentrator (LAC).

  Old Behavior: The LNS replied with all AVPs irrespective of the AVP it received from the LAC.

  New Behavior: The LNS must reply with the same AVPs it receives from the LAC.

  Additional information:
  http://www.cisco.com/en/US/docs/ios/vpdn/configuration/guide/config_aaa_for_vpdn_ps6922_TSD_Products_Configuration_Guide_Chapter.html

Deferrals

Cisco IOS software images are subject to deferral. Cisco recommends that you view the deferral notices at the following location to determine if your software release is affected:

http://www.cisco.com/kobayashi/sw-center/sw-ios-advisories.shtml

Field Notices and Bulletins

For general information about the types of documents listed in this section, see the following document:

http://www.cisco.com/warp/customer/cc/general/bulletin/software/general/index.shtml

- Field Notices—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 with 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/customer/support/tsd_products_field_notice_summary.html.
- Product Bulletins—If you have an account with Cisco.com, you can find product bulletins at http://www.cisco.com/warp/customer/cc/general/bulletin/index.shtml. If you do not have a Cisco.com login account, you can find product bulletins at http://www.cisco.com/warp/public/cc/general/bulletin/iosw/index.shtml

Important Notes for Cisco IOS Release 12.2(33)SRE3

This section describes important issues that you should be aware of for Cisco IOS Release 12.2(33)SRE3 and later releases.

Validated Software Upgrade Matrix to Cisco IOS Release 12.2(33)SRE3

The Cisco 7600 software upgrade matrix shows the tested and recommended image upgrade paths to Cisco IOS Release 12.2(33)SRE3. The upgrade testing was conducted with these services running in the network:

- IP Multicast
- IPv4 and IPv6 QoS
- Converged PE
- Broadband Network Gateway
- Mobile PE

The following table shows the Cisco 7600 images tested in the upgrade test to Cisco IOS Release 12.2(33)SRE3 image. Router image upgrade was tested using 3 different methods: Reload, RPR and ISSU CLI. The FPD FW upgrade and migration of 67xx to ES+ LC was also tested. The recommended upgrade procedure for 12.2(33)SRE3 is:

1. Reload method (recommended)
2. RPR method (recommended)
3. ISSU CLI method (not recommended because of known caveat)

See the following for upgrade procedures:

http://www.cisco.com/en/US/docs/routers/7600/ios/12.2SR/configuration/guide/redund.html#wp1089399

Table 1 shows the validated software upgrade matrix to Cisco IOS Release 12.2(33)SRE4.

Table 2 Validated Software Upgrade Matrix to Cisco IOS Release 12.2(33)SRE4

Upgrade Method	SXF18 to SRE4	SRB6 to SRE4	SRC5 to SRE4	SRD5 to SRE4	SRE1 to SRE4	SRE2 to SRE4
Reload	Passed	Passed	Passed	Passed	Passed	Passed
RPR	Not supported	Passed	Passed	Passed	Passed	Passed
ISSU CLI	Not supported	Not supported	Not supported	Mcast: CSCti20319 L2VPN: CSCtk36239	Mcast: CSCti20319 L2VPN: CSCti97777 CSCtk36239	Mcast: CSCti20319 L2VPN: CSCti97777 CSCtk36239
FPD DW	Passed	Passed	Passed	Passed	Passed	Passed
67xx to ES+ Migration	Passed	Passed	Passed	Passed	Passed	Passed

Important Notes for Cisco IOS Release 12.2(33)SRD3

This section describes important issues that you should be aware of for Cisco IOS Release 12.2(33)SRD3.

Parity With Previous Releases

Cisco IOS Release 12.2(33)SRD3 has bug-fix parity with Cisco IOS Release 12.2(33)SRB6 and 12.2(33)SRC4. Nearly all bug fixes committed to Cisco IOS Release 12.2(33)SRB6 and 12.2(33)SRC4 have also been committed to Cisco IOS Release 12.2(33)SRD3. The following exceptions are still open in Cisco IOS Release 12.2(33)SRD3:

- CSCsw64473
- CSCsx97605
- CSCsy34805
- CSCsz38711
- CSCsz55348

Important Notes for Cisco IOS Release 12.2(33)SRD2a

This section describes important issues that you should be aware of for Cisco IOS Release 12.2(33)SRD2a and later releases.

Cisco Coarse Wavelength Division Multiplexing (CWDM) SFP Modules

Cisco IOS Release 12.2(33)SRD2a is a special rebuild that resolves a critical defect affecting the use of Cisco Coarse Wavelength Division Multiplexing (CWDM) SFP modules. This release is preferred for new deployments and for existing deployments with CWDM-SFP pluggables.

Important Notes for Cisco IOS Release 12.2(33)SRD1

This section describes important issues that you should be aware of for Cisco IOS Release 12.2(33)SRD1 and later releases.

Command-Line Help on CHOC12

The CHOC12 displays incorrect options when using command-line interface help. Examples of this problem follow below. In all cases you can enter the correct commands, regardless of what help suggests. The router accepts the correct input.

POS OC3

```
Router#sh run int POS12/1/0?
/
Router#sh run int POS12/1/0/
                                                                ^

% Invalid input detected at '^' marker.
```

T3

```
Router#sh run int Serial3/1/0?
/
Router#sh run int Serial3/1/0/?
% Unrecognized command
Router#sh run int Serial3/1/0/        <==== Instead of "/" it should have been "."
```

T1

```
Router#sh run int Serial3/1/0.4/1/0
% Invalid input detected at '^' marker.
Router#sh run int Serial3/1/0.4/1?     <==== option for ":" is not shown
/
Router#sh run int Serial3/1/0.4/1:0 <===== This is the interface name
```

DS0

```
Router#sh run interface Serial3/1/0.5/1?    <===== option for ":" is not shown
/
Router#sh run interface Serial3/1/0.5/1:?
  <0-30>  Serial interface number
Router#sh run interface Serial3/1/0.5/1:2
```

Important Notes for Cisco IOS Release 12.2(33)SRC1

This section describes important issues that you should be aware of for Cisco IOS Release 12.2(33)SRC1 and later releases.

ip nbar protocol-discovery Command

On WS-X6582-2PA, the **ip nbar protocol-discovery** command works only on the main interface, not the subinterface. (CSCtb92628)

Important Notes for Cisco IOS Release 12.2(33)SRB

This section describes important issues that you should be aware of for Cisco IOS Release 12.2(33)SRB and later releases.

CEoP SPA and APS

When a pseudowire is configured on an interface of a Circuit Emulation over Packet (CEoP) SPA, Automatic Protection Switching (APS) for the interface is useful only in conjunction with pseudowire redundancy.

CEoP SPA and ATMoMPLS

When ATM over MPLS (ATMoMPLS) is configured on a Circuit Emulation over Packet (CEoP) SPA, you cannot connect an ATM network to an OC-3 link nor can you connect an OC-12 network to a T1 link. In order for AToM tunnels that are configured for AAL0 encapsulation or VP mode to function over non-symmetric links, shape the VC or VP to a rate that can be carried by interfaces at both ends by configuring CBR, UBR, or UBR+.

CEoP SPA and Clock Recovery Configuration Guidelines

When configuring clock recovery in Cisco IOS Release 12.2(33)SRB, consider the following guidelines:

- Adaptive Clock Recovery:
  - Only the 24-port channelized T1/E1 ATM CEoP SPA can be used as a clock source.
  - Only a single clock can be sourced for a router if adaptive clock recovery mechanism is used.
  - The clock must be the same as used by the router as the network-clock. Any pseudowire in this case can carry the clock.
  - The minimum bundle size of CEM pseudowires on the network which delivers robust clock recovery is 4 DS0s.
  - The minimum packet size of CEM pseudowires on the network which delivers robust clock recovery is 64 bytes.
- Differential Clocking:
  - The maximum number of differential clocks sourced from a 24-port channelized T1/E1 ATM CEoP SPA is 24.
  - The 24-port channelized T1/E1 ATM CEoP SPA can recover up to 24 T1/E1 clocks.
  - There are several bundles sent from the same port, the bundle which is used for carrying clock of the port is the first created bundle of the port. Only pseudowires which include the first DS0 of a port can carry differential clock.

Important Notes for Cisco IOS Release 12.2(33)SRA2

This section describes important issues that you should be aware of for Cisco IOS Release 12.2(33)SRA2 and later releases.

BPDU Support on dot1q Tunnels [CSCsf98713]

A Bridge Protocol Data Unit (BPDU) is now supported between a CE and PE router that are connected through only a Layer 2 protocol tunnel, that is, the BPDU is supported even when there is no dot1q tunnel between the CE and PE router.

Important Notes for Cisco IOS Release 12.2(33)SRA

This section describes important issues that you should be aware of for Cisco IOS Release 12.2(33)SRA and later releases.

Detection Mechanism for the MPLS Traffic Engineering (TE)—Fast Reroute (FRR) Node Protection, with RSVP Hellos Support Feature

When the detection mechanism for the MPLS Traffic Engineering (TE)—Fast Reroute (FRR) Node Protection, with RSVP Hellos Support feature is configured with a refresh interval and missed refresh limit that are too short, a neighbor may be declared down while the neighbor is actually up, and a warning message may be generated. To prevent this situation, configure the refresh interval and missed refresh limit in the following ways:

- Ensure that the *interval-value* argument in the **ip rsvp signalling hello refresh interval** *interval-value* command is 200 milliseconds or longer.
- Ensure that the *msg-countip* argument in the **rsvp signalling hello** [**fast-reroute**] **refresh misses** *msg-count* command has a value of 4 or more.

The detection interval for the detection mechanism should be at least 800 milliseconds (that is, 200 milliseconds of the *interval-value* argument multiplied by the value 4 of the *msg-countip* argument) or longer.

ip routing protocol purge interface Command

As of Cisco IOS Release 12.2(33)SRA, you can use the **ip routing protocol purge interface** command in global configuration mode to enable routing protocols to purge their routes when an interface goes down in the global configuration mode. To disable this function, use the **no** form of this command.

For detailed information about this command, see the "IP Routing Protocol-Independent Commands" section of the *Cisco IOS IP Routing Protocols Command Reference, Release 12.2 SR*:

http://www.cisco.com/en/US/docs/ios/iproute/configuration/guide/12_2sr/irp_12_2sr_book.html

Caveats

To reduce the size of these release notes, caveats have been moved to the following locations:

- Caveats for Cisco IOS Release 12.2(33)SRE through 12.2(33)SRE9
- Caveats for Cisco IOS Release 12.2(33)SRD through 12.2(33)SRD8
- Caveats for Cisco IOS Release 12.2(33)SRC through 12.2(33)SRC6
- Caveats for Cisco IOS Release 12.2(33)SRB through 12.2(33)SRB6
- Caveats for Cisco IOS Release 12.2(33)SRA through 12.2(33)SRA7