Feature Sets

These sections describe the feature sets in Release 12.2SX:

- Feature Set Guidelines and Restrictions, page 115
- Feature Set Descriptions, page 116

Feature Set Guidelines and Restrictions

These are the feature set guidelines and restrictions:

- This product bulletin explains the feature sets used in Release 12.2(18)SXE and later releases:

  http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps5460/prod_bulletin0900aecd80281b17_ps708_Products_Bulletin.html
- There are no 12.2SX boot loader images: none are required.
- The releases includes strong encryption images. Strong encryption images are subject to U.S. and local country export, import, and use laws. The country and class of end users eligible to receive and use Cisco encryption solutions are limited. See this publication for more information:

  http://www.cisco.com/web/about/doing_business/legal/global_export_trade/general_export/contract_compliance.html
- Many TFTP server implementations cannot transfer 16 MB or larger files. To transfer 16 MB or larger files, you might need to use FTP or rcp. See this online publication for procedures:

  http://www.cisco.com/en/US/docs/ios/12_2/configfun/configuration/guide/fcf008.html
- These features are not supported in Release 12.2(18)SXD and later releases:
  - Apollo Domain
  - AppleTalk EIGRP
  - Banyan Vines
  - Exterior Gateway Protocol (EGP)
  - HP Probe
  - IEEE 802.10 VLANs
  - IGRP
  - LAN Extension
  - NetWare Asynchronous Services Interface (NASI)
  - Next Hop Resolution Protocol (NHRP) for IPX
  - Novell Link-State Protocol (NLSP)
  - Simple Multicast Routing Protocol (SMRP) for Appletalk
  - Xerox Network Systems (XNS)
  - Xremote
- With releases earlier than Release 12.2(18)SXE, use of the EGP, BGP4, and IS-IS routing protocols requires the additional purchase of the InterDomain Routing Feature License (FR-IRC6), except when the price of the feature set already includes FR-IRC6.

- In Release 12.2(17d)SXB and later releases, the price of any Cisco 7600 series router feature set (part numbers starting with "S763") includes FR-IRC6.
- In Release 12.2(17b)SXA and later releases, the price of the "IP MPLS, IPv6, and BGP Feature Set" image (S733ZK9M-122* or S763ZK9M-122*) includes FR-IRC6.

Feature Set Descriptions

This section lists all of the features that are unique to each feature set and some of the features that are common to all feature sets. See the "New Features" section on page 117 for a more complete list of supported features.

Feature Name	IP Base	IP Services	Advanced IP Services	Enterprise Services	Advanced Enterprise Services
Firewall Feature Set **Note** Not required with the WS-SVC-FWM-1-K9 Firewall Services Module.					X
TCP Intercept					X
IPsec Network Security **Note** • The SPA-IPSEC-2G and the IPsec VPN Acceleration Services Module support IPsec Network Security in hardware. • Without a SPA-IPSEC-2G or IPsec VPN Acceleration Services Module, the IPsec Network Security feature (configured with the **crypto ipsec** command) is supported in software only for administrative connections to Catalyst 6500 series switches and Cisco 7600 series routers.			X		X
MPLS			X		X
VPNs			X		X
DECNet				X	X
ISO CLNS				X	X
Novell IPX				X	X
IPv6 (Search for "IPv6" in the "New Features" section on page 117 for information about supported IPv6 features.)			X	X	X
SLB (Search for "SLB" in the "New Features" section on page 117 for information about supported SLB features.)			X	X	X
IS-IS			X	X	X
BGP4		X	X	X	X
MBGP		X	X	X	X
VRF Lite (Search for "VRF Lite" in the "New Features" section on page 117 for information about supported VRF Lite features.)		X	X	X	X
Bidirectional PIM		X	X	X	X

Feature Name	IP Base	IP Services	Advanced IP Services	Enterprise Services	Advanced Enterprise Services
EIGRP		X	X	X	X
MSDP		X	X	X	X
OSPF		X	X	X	X
PBR (Search for "PBR" in the "New Features" section on page 117 for information about supported PBR features.)		X	X	X	X
NetFlow (Search for "NetFlow" in the "New Features" section on page 117 for information about supported NetFlow features.)	X	X	X	X	X
EIGRP Stub Routing	X	X	X	X	X
HSRP	X	X	X	X	X
IGMP	X	X	X	X	X
IPsec Triple DES Encryption (3DES) for SSH **Note** • The SSH k9 images support SSH 3DES access in software on the MSFC. • The k9 images in Release 12.2(17d)SXB and later releases support both SSHv2 server and SSHv2 client features. • The k9 images in releases earlier than Release 12.2(17d)SXB support only SSHv2 server features.	X	X	X	X	X
PIMv1, PIMv2 (Search for "PIM" in the "New Features" section on page 117 for information about supported PIM features.)	X	X	X	X	X
RIPv1, RIPv2	X	X	X	X	X

New Features

- New Features in Release 12.2(18)SXF17b, page 119
- New Features in Release 12.2(18)SXF17a, page 120
- New Features in Release 12.2(18)SXF17, page 120
- New Features in Release 12.2(18)SXF16, page 120
- New Features in Release 12.2(18)SXF15a, page 121
- New Features in Release 12.2(18)SXF15, page 121
- New Features in Release 12.2(18)SXF14, page 121
- New Features in Release 12.2(18)SXF13, page 122
- New Features in Release 12.2(18)SXF12a, page 122
- New Features in Release 12.2(18)SXF12, page 122
- New Features in Release 12.2(18)SXF11, page 123
- New Features in Release 12.2(18)SXF10a, page 123
- New Features in Release 12.2(18)SXF10, page 123

- New Features in Release 12.2(18)SXF9, page 124
- New Features in Release 12.2(18)SXF8, page 124
- New Features in Release 12.2(18)SXF7, page 124
- New Features in Release 12.2(18)SXF6, page 125
- New Features in Release 12.2(18)SXF5, page 125
- New Features in Release 12.2(18)SXF4, page 127
- New Features in Release 12.2(18)SXF3, page 127
- New Features in Release 12.2(18)SXF2, page 128
- New Features in Release 12.2(18)SXF1, page 132
- New Features in Release 12.2(18)SXF, page 132
- New Features in Release 12.2(18)SXE6b, page 136
- New Features in Release 12.2(18)SXE6a, page 136
- New Features in Release 12.2(18)SXE6, page 137
- New Features in Release 12.2(18)SXE5, page 137
- New Features in Release 12.2(18)SXE4, page 137
- New Features in Release 12.2(18)SXE3, page 138
- New Features in Release 12.2(18)SXE2, page 138
- New Features in Release 12.2(18)SXE1, page 139
- New Features in Release 12.2(18)SXE, page 139
- New Features in Release 12.2(18)SXD7b, page 150
- New Features in Release 12.2(18)SXD7a, page 150
- New Features in Release 12.2(18)SXD7, page 150
- New Features in Release 12.2(18)SXD6, page 151
- New Features in Release 12.2(18)SXD5, page 151
- New Features in Release 12.2(18)SXD4, page 151
- New Features in Release 12.2(18)SXD3, page 152
- New Features in Release 12.2(18)SXD2, page 152
- New Features in Release 12.2(18)SXD1, page 153
- New Features in Release 12.2(18)SXD, page 154
- New Features in Release 12.2(17d)SXB11a, page 160
- New Features in Release 12.2(17d)SXB11, page 161
- New Features in Release 12.2(17d)SXB10, page 161
- New Features in Release 12.2(17d)SXB9, page 161
- New Features in Release 12.2(17d)SXB9, page 161
- New Features in Release 12.2(17d)SXB7, page 162
- New Features in Release 12.2(17d)SXB6, page 162
- New Features in Release 12.2(17d)SXB5, page 163
- New Features in Release 12.2(17d)SXB4, page 163

- New Features in Release 12.2(17d)SXB3, page 163
- New Features in Release 12.2(17d)SXB2, page 164
- New Features in Release 12.2(17d)SXB1, page 164
- New Features in Release 12.2(17d)SXB, page 165
- New Features in Release 12.2(17b)SXA2, page 169
- New Features in Release 12.2(17b)SXA, page 169
- New Features in Release 12.2(17a)SX4, page 174
- New Features in Release 12.2(17a)SX3, page 174
- New Features in Release 12.2(17a)SX2, page 175
- New Features in Release 12.2(17a)SX1, page 175
- New Features in Release 12.2(17a)SX, page 177
- New Features in Release 12.2(14)SX1, page 179
- New Features in Release 12.2(14)SX, page 181
- Software Features from Earlier Releases, page 186

Note

- See the following site for information about MIBs:

  http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml
- Features in the Cisco IOS 12.2SX releases that are also supported in the Cisco IOS 12.2 mainline, 12.2T and 12.2S releases are documented in the publications for these releases. When applicable, this section refers to these publications for platform-independent features supported in the Cisco IOS 12.2SX releases.

New Features in Release 12.2(18)SXF17b

These sections describe the new features in Release 12.2(18)SXF17b 29 Mar 2011:

- New Hardware Features in Release 12.2(18)SXF17b, page 119
- New Software Features in Release 12.2(18)SXF17b, page 119

New Hardware Features in Release 12.2(18)SXF17b

None.

New Software Features in Release 12.2(18)SXF17b

None.

New Features in Release 12.2(18)SXF17a

These sections describe the new features in Release 12.2(18)SXF17a, 19 Mar 2010:

- New Hardware Features in Release 12.2(18)SXF17a, page 120
- New Software Features in Release 12.2(18)SXF17a, page 120

New Hardware Features in Release 12.2(18)SXF17a

None.

New Software Features in Release 12.2(18)SXF17a

None.

New Features in Release 12.2(18)SXF17

These sections describe the new features in Release 12.2(18)SXF17, 30 Sep 2009:

- New Hardware Features in Release 12.2(18)SXF17, page 120
- New Software Features in Release 12.2(18)SXF17, page 120

New Hardware Features in Release 12.2(18)SXF17

None.

New Software Features in Release 12.2(18)SXF17

Subinterface Crypto connect vlan support for E-Flexwan/FE PA—See this publication:

http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/76ovwvpn.html#Interoperability

New Features in Release 12.2(18)SXF16

These sections describe the new features in Release 12.2(18)SXF16, 05 Mar 2009:

- New Hardware Features in Release 12.2(18)SXF16, page 120
- New Software Features in Release 12.2(18)SXF16, page 120

New Hardware Features in Release 12.2(18)SXF16

None.

New Software Features in Release 12.2(18)SXF16

None.

New Features in Release 12.2(18)SXF15a

These sections describe the new features in Release 12.2(18)SXF15a, 29 Oct 2008:

- New Hardware Features in Release 12.2(18)SXF15a, page 121
- New Software Features in Release 12.2(18)SXF15a, page 121

New Hardware Features in Release 12.2(18)SXF15a

None.

New Software Features in Release 12.2(18)SXF15a

None.

New Features in Release 12.2(18)SXF15

These sections describe the new features in Release 12.2(18)SXF15, 05 Sep 2008:

- New Hardware Features in Release 12.2(18)SXF15, page 121
- New Software Features in Release 12.2(18)SXF15, page 121

New Hardware Features in Release 12.2(18)SXF15

None.

New Software Features in Release 12.2(18)SXF15

None.

New Features in Release 12.2(18)SXF14

These sections describe the new features in Release 12.2(18)SXF14, 09 May 2008:

- New Hardware Features in Release 12.2(18)SXF14, page 121
- New Software Features in Release 12.2(18)SXF14, page 121

New Hardware Features in Release 12.2(18)SXF14

None.

New Software Features in Release 12.2(18)SXF14

None.

New Features in Release 12.2(18)SXF13

These sections describe the new features in Release 12.2(18)SXF13, 17 Feb 2008:

- New Hardware Features in Release 12.2(18)SXF13, page 122
- New Software Features in Release 12.2(18)SXF13, page 122

New Hardware Features in Release 12.2(18)SXF13

- 6,000 W DC power supply (PWR-6000-DC)

New Software Features in Release 12.2(18)SXF13

None.

New Features in Release 12.2(18)SXF12a

These sections describe the new features in Release 12.2(18)SXF12a, 15 Jan 2008:

- New Hardware Features in Release 12.2(18)SXF12a, page 122
- New Software Features in Release 12.2(18)SXF12a, page 122

New Hardware Features in Release 12.2(18)SXF12a

None.

New Software Features in Release 12.2(18)SXF12a

None.

New Features in Release 12.2(18)SXF12

These sections describe the new features in Release 12.2(18)SXF12, 19 Nov 2007:

- New Hardware Features in Release 12.2(18)SXF12, page 122
- New Software Features in Release 12.2(18)SXF12, page 122

New Hardware Features in Release 12.2(18)SXF12

None.

New Software Features in Release 12.2(18)SXF12

None.

New Features in Release 12.2(18)SXF11

These sections describe the new features in Release 12.2(18)SXF11, 18 Sep 2007:

- New Hardware Features in Release 12.2(18)SXF11, page 123
- New Software Features in Release 12.2(18)SXF11, page 123

New Hardware Features in Release 12.2(18)SXF11

None.

New Software Features in Release 12.2(18)SXF11

None.

New Features in Release 12.2(18)SXF10a

These sections describe the new features in Release 12.2(18)SXF10a, 21 Sep 2007:

- New Hardware Features in Release 12.2(18)SXF10a, page 123
- New Software Features in Release 12.2(18)SXF10a, page 123

New Hardware Features in Release 12.2(18)SXF10a

None.

New Software Features in Release 12.2(18)SXF10a

None.

New Features in Release 12.2(18)SXF10

These sections describe the new features in Release 12.2(18)SXF10, 16 Jul 2007:

- New Hardware Features in Release 12.2(18)SXF10, page 123
- New Software Features in Release 12.2(18)SXF10, page 124

New Hardware Features in Release 12.2(18)SXF10

1-Port OC-48 POS/RPR SPA (SPA-1XOC48POS/RPR):

- Supported only with 7600-SIP-400
- See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

New Software Features in Release 12.2(18)SXF10

None.

New Features in Release 12.2(18)SXF9

These sections describe the new features in Release 12.2(18)SXF9, 21 May 2007:

- New Hardware Features in Release 12.2(18)SXF9, page 124
- New Software Features in Release 12.2(18)SXF9, page 124

New Hardware Features in Release 12.2(18)SXF9

None.

New Software Features in Release 12.2(18)SXF9

None.

New Features in Release 12.2(18)SXF8

These sections describe the new features in Release 12.2(18)SXF8, 07 Mar 2007:

- New Hardware Features in Release 12.2(18)SXF8, page 124
- New Software Features in Release 12.2(18)SXF8, page 124

New Hardware Features in Release 12.2(18)SXF8

- 8700 W AC power supply (WS-CAC-8700W-E)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/hardware/Chassis_Installation/Cat6500/6500_ins.html
- DWDM SFP transceivers (see the "Gigabit Ethernet SFPs" section on page 52)

New Software Features in Release 12.2(18)SXF8

None.

New Features in Release 12.2(18)SXF7

These sections describe the new features in Release 12.2(18)SXF7, 30 Nov 2006:

- New Hardware Features in Release 12.2(18)SXF7, page 125
- New Software Features in Release 12.2(18)SXF7, page 125

New Hardware Features in Release 12.2(18)SXF7

- Persistent Storage Device (PSD; WS-SVC-PSD-1) support with Supervisor Engine 32:
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/switches/ps708/prod_release_notes_list.html#anchor21

New Software Features in Release 12.2(18)SXF7

- With Cisco IOS software modularity images, support for 7600-SIP-400 and 7600-SIP-200.

New Features in Release 12.2(18)SXF6

These sections describe the new features in Release 12.2(18)SXF6, 22 Sep 2006:

- New Hardware Features in Release 12.2(18)SXF6, page 125
- New Software Features in Release 12.2(18)SXF6, page 125

New Hardware Features in Release 12.2(18)SXF6

None.

New Software Features in Release 12.2(18)SXF6

- IPSec Anti-Replay Window: Expanding and Disabling—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_dplane/configuration/12-2sx/sec-ipsec-antireplay.html

New Features in Release 12.2(18)SXF5

These sections describe the new features in Release 12.2(18)SXF5, 10 Jul 2006:

- New Hardware Features in Release 12.2(18)SXF5, page 125
- New Software Features in Release 12.2(18)SXF5, page 126

New Hardware Features in Release 12.2(18)SXF5

- 8-port 10-Gigabit Ethernet X2switching module (WS-X6708-10GE).

Note To configure WS-X6708-10GE port oversubscription, refer to the **hw-module oversubscription** command in the command reference at this URL: http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-f1.html#GUID-B5F8BEA0-B5DD-47BE-82F5-183765DF0F64

- With Cisco IOS software modularity images, support for WS-SVC-WISM-1-K9.
- Multi-Processor WAN Application Module (MWAM) support with Supervisor Engine 32:
  - WS-SVC-MWAM-1
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 2
  - See these publications for more information:

    http://www.cisco.com/en/US/docs/wireless/pdsn/12.28zb/mwan_install_config/mwamhwrn.html

    http://www.cisco.com/en/US/docs/wireless/pdsn/12.28zb/mwan_install_config/mwamhwrn.html

New Software Features in Release 12.2(18)SXF5

- Autostate - Firewall Capability for the Firewall service module—See this publication:

  http://www.cisco.com/en/US/products/hw/modules/ps2706/ps4452/tsd_products_support_model_home.html
- Cisco IOS software modularity images for the Supervisor Engine 32.
- With Cisco IOS software modularityimages, support for Multi-VRF (VRF Lite).
- With Cisco IOS software images, Embedded Event Manager (EEM) 2.1 (previously supported with Cisco IOS software modularity images)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/sw_modularity/configuration/guide/evnt_mgr.html
- Cisco IOS server load balancing (Cisco IOS SLB):
  - Initial support on Supervisor Engine 32.
  - Previously supported on Supervisor Engine 720.
  - Previously supported on Supervisor Engine 2.

  See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/slbsxd1.html

  Note Web Cache Control Protocol (WCCP) Layer 2 PFC redirection is supported with Cisco IOS SLB. Other WCCP configurations are not compatible with Cisco IOS SLB.
- DSCP-based Queue Mapping (supported only on WS-X6708-10GE)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html
- IGMP Static Group Range Support—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/stgrpsxf.html
- QoS - Ignore Port Trust—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html
- RSVP Interface-based Receiver Proxy—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/rsvpprox.html

- RSVP Refresh Reduction and Reliable Messaging—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsrelmsg.html
- RSVP Scalability Enhancements—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/qos_rsvp/configuration/12-2sx/rsvp-scalability.html
- SRR (Shaped Round Robin)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html
- WCCP L2 Return—With Supervisor Engine 2, you can configure WCCP to use the Layer 2 return WCCP feature.

New Features in Release 12.2(18)SXF4

These sections describe the new features in Release 12.2(18)SXF4, 27 Mar 2006:

- New Hardware Features in Release 12.2(18)SXF4, page 127
- New Software Features in Release 12.2(18)SXF4, page 127

New Hardware Features in Release 12.2(18)SXF4

- Application Control Engine (ACE) module (ACE10-6500-K9)

New Software Features in Release 12.2(18)SXF4

- IPS Inline VLAN Pairing for WS-SVC-IDSM2-K9—See this publication for more information:

  http://www.cisco.com/en/US/docs/security/ips/5.1/configuration/guide/cli/cliguide.html
- Cisco IOS Software Modularity images for the Supervisor Engine 720—See these sections for information about Cisco IOS Software Modularity:
  - Cisco IOS Software Modularity Documentation, page 13
  - Cisco IOS Software Modularity Unsupported Features, page 14

New Features in Release 12.2(18)SXF3

These sections describe the new features in Release 12.2(18)SXF3, 16 Feb 2006:

- New Hardware Features in Release 12.2(18)SXF3, page 127
- New Software Features in Release 12.2(18)SXF3, page 128

New Hardware Features in Release 12.2(18)SXF3

- 96-port 10/100TX RJ-45 switching module (WS-X6148X2-RJ-45, WS-X6148X2-45AF)
- 96-port 10/100TX RJ-21 switching module (WS-X6196-RJ-21, WS-X6196-21AF)
- IEEE 802.3af PoE daughtercard for WS-X6148X2-RJ-45 and WS-X6196-RJ-21 (WS-F6K-FE48X2-AF)

New Software Features in Release 12.2(18)SXF3

None.

New Features in Release 12.2(18)SXF2

These sections describe the new features in Release 12.2(18)SXF2, 20 Jan 2006:

- New Hardware Features in Release 12.2(18)SXF2, page 128
- New Software Features in Release 12.2(18)SXF2, page 129

New Hardware Features in Release 12.2(18)SXF2

- Wireless Services Module (WiSM):
  - WS-SVC-WISM-1-K9
  - Not supported with Cisco IOS software modularity images until Release 12.2(18)SXF5
- 1-port OC-192c/STM-64 POS/RPR SPA, VSR-1 (SPA-OC192POS-VSR):
  - Supported only with 7600-SIP-600
  - See this publication:

    http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- 100BASE SFPs for use with WS-X6148-FE-SFP:
  - 100BASE-BX10-U SFP (GLC-FE-100BX-U)
  - 100BASE-BX10-D SFP (GLC-FE-100BX-D)
- Support with Supervisor Engine 32 for these modules:
  - Services SPA Carrier (SSC; 7600-SSC-400)

    Note 7600-SSC-400 does not maintain state when an NSF with SSO redundancy mode switchover occurs.

  - IPsec SPA (SPA-IPSEC-2G)
  - Also supported with Supervisor Engine 720
  - SPA-IPSEC-2G supports the features that were previously supported with WS-SVC-IPSEC-1.
  - See this publication:

    http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- Support with Supervisor Engine 2 for these modules:
  - 48-port 10/100TX RJ-45 switching module (WS-X6148A-RJ-45, WS-X6148A-45AF)
  - 48-port 10/100/1000 Mbps switching module (WS-X6148A-GE-TX, WS-X6148A-GE-45AF)
  - 48-port 100BASE-FX switching module (WS-X6148-FE-SFP), with these SFPs:

    100BASE-BX10-U SFP (GLC-FE-100BX-U)

    100BASE-BX10-D SFP (GLC-FE-100BX-D)

100BASEEX SFP (GLC-FE-100EX)

100BASEZX SFP (GLC-FE-100ZX)

100BASEFX SFP (GLC-FE-100FX)

100BASELX SFP (GLC-FE-100LX)

- Fast Ethernet port adapters (PA-2FE, PA-1FE)—See this publication:

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

- 1-port Packet over SONET OC3c/STM1 port adapter (PA-POS-1OC3)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-pos-1oc3_install_config/6514_1oc.html

- Receive-only coarse or dense Wavelength Division Multiplexing (WDM) GBIC (WDM-GBIC-REC)

New Software Features in Release 12.2(18)SXF2

- NAC - L2 IP; Network Admission Control (NAC) Layer 2 Layer 2 IP validation (not supported with Supervisor Engine 2)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/nac.html

- Encrypted Multicast over GRE (supported on SPA-IPSEC-2G)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Control Plane DSCP Support for RSVP—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/qos_rsvp/configuration/15-mt/rsvp-dscp-spt-for-rsvp.html

- RSVP Scalability Enhancements—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/qos_rsvp/configuration/12-2sx/rsvp-scalability.html

- Dot1q Transparency for EoMPLS (supported on WAN ports)—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Configuring_Dot1q_Transparency_for_EoMPLS

- RFC 1483 Spanning-Tree Interoperability Enhancements on WAN ports—See these publications:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/atm.html#RFC_1483_Spanning-Tree_Interoperability_Enhancements

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

- Support with Supervisor Engine 32 for:
  - NetFlow v9 Export Format, including NetFlow Export of BGP Nexthop Information
  - NetFlow multicast support
  - PIM snooping DR flooding enhancement
- Support with Supervisor Engine 2 for these features, which are already supported with other Supervisor Engines:
  - Any transport over MPLS (AToM): HDLC over MPLS (HDLCoMPLS)

- Any transport over MPLS (AToM): PPP over MPLS (PPPoMPLS)
- ATM OAM ping
- ATM VC access trunk emulation
- Bandwidth command for HQoS parent class support
- BGP multipath load sharing for both eBGP and iBGP in an MPLS-VPN
- BGP support for TTL security check
- Bidirectional forwarding detection (BFD) standard implementation
- Bridge control protocol (BCP)
- Bridging using RFC1483 routed encapsulation (BRE)
- Clear hardware interface counters
- CNS interactive CLI
- Configurable per VLAN MAC learning (PVL)
- CSG: content services gateway release 6
- DE/CLP and EXP mapping on FR/ATMoMPLS VC
- Digital optical monitoring (DOM)
- Distributed MLPPP (dMLPPP) on FlexWAN module interfaces
- Dynamic Multipoint VPN (DMVPN) phase 2
- EIGRP MPLS VPN PE-CE Site of Origin (SoO)
- Embedded network management improvements
- EtherChannel enhancement - 128 EtherChannels support
- EtherChannel Min-Links
- Ethernet over MPLS (EoMPLS) per VLAN QoS
- Flex Links
- Frame Relay Virtual Circuit (VC) bundling
- Hardware capacity monitoring
- HQoS support for Ethernet over MPLS (EoMPLS) VC
- H-VPLS with MPLS edge
- IDSM-2 EtherChannel load balancing
- IEEE 802.1s - Multiple Spanning Tree (MST) standard compliance
- Integrated IS-IS global default metric
- Integrated IS-IS protocol shutdown support maintaining configuration parameters
- Integrated IS-IS support for BFD over IPv4
- Invalid Special Parameter Index (SPI) recovery
- IP routing of RFC1483 ATM Bridge Encapsulation (RBE)
- IP unnumbered for VLAN-SVI interfaces
- IS-IS caching of redistributed routes
- IS-IS support for priority-driven IP prefix RIB installation
- Key rollover for certificate renewal

- Layer 2 traceroute
- MPLS LDP - inbound label binding filtering
- MPLS LSP ping/traceroute and AToM VCCV
- MQC: distribution of remaining bandwidth
- Multicast-VPN: multicast support for MPLS VPN
- Multipoint Bridging (MPB)
- NetFlow - bridged flow statistics
- OSPF link state database overload protection
- OSPF Link-Local Signaling (LLS) per interface basis
- OSPF MIB support of RFC 1850 and latest extensions
- OSPF support for BFD over IPv4
- OSPF support for forwarding adjacencies over MPLS traffic engineered tunnels
- OSPF support for unlimited software VRFs per Provider Edge (PE) router
- Packet classification based on layer3 packet-length (supported on WAN ports)
- Per interface sticky ARP
- Per port MAC limiting
- Per VLAN load balancing for advanced QinQ service mapping
- PIM snooping DR flooding enhancement
- PKI AAA authorization using the entire subject name
- Port security on 802.1Q tunnel ports
- Port security on private VLAN ports
- Port security on trunk ports
- Port security with 4096 secure MAC addresses
- Port security with sticky MAC addresses
- Protected private key storage
- QoS: aggregated DSCP / precedence values for WRED
- QoS: ingress shaping on FlexWAN module interfaces
- QoS: match VLAN on OSMs
- QoS: percentage based policing on WAN ports
- Query mode definition per trustpoint
- Query multiple servers during certificate revocation check
- RADIUS Load Balancing (RLB) IMSI sticky
- Re-enroll using existing certificate
- RFC-1490 bridging on FlexWAN interfaces
- SafeNet IPsec VPN client support
- SCP health monitoring for enhanced-FlexWAN
- Show diagnostic sanity
- Show Top-N

- SLB: interface-aware
- SLB: stateful failover within single chassis
- SPAN destination port permit list
- Strict priority low latency queueing (LLQ)
- Sub interface features - phase 1
- Unicast flood blocking (UFB)
- Uni-Directional Link Routing (UDLR)
- verify certificate chain command
- VLANs over IP unnumbered sub-interfaces

New Features in Release 12.2(18)SXF1

These sections describe the new features in Release 12.2(18)SXF1, 22 Dec 2005:

- New Hardware Features in Release 12.2(18)SXF1, page 132
- New Software Features in Release 12.2(18)SXF1, page 132

New Hardware Features in Release 12.2(18)SXF1

None.

New Software Features in Release 12.2(18)SXF1

- DHCP Option 82 on Untrusted Port—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/snoodhcp.html

New Features in Release 12.2(18)SXF

These sections describe the new features in Release 12.2(18)SXF, 12 Sep 2005:

- New Hardware Features in Release 12.2(18)SXF, page 132
- New Software Features in Release 12.2(18)SXF, page 135

New Hardware Features in Release 12.2(18)SXF

Note Initial support for these modules is now in Release 12.2(18)SXF3:

- 96-port 10/100TX RJ-45 switching module (WS-X6148X2-RJ-45, WS-X6148X2-45AF)
- 96-port 10/100TX RJ-21 switching module (WS-X6196-RJ-21, WS-X6196-21AF)
- IEEE 802.3af PoE daughtercard for WS-X6148X2-RJ-45 and WS-X6196-RJ-21 (WS-F6K-FE48X2-AF)

(CSCsd16853)

- Compact Flash Adapter in Bootflash Slot (WS-CF-UPG=):
  - CompactFlash adapter with 512 MB CompactFlash card that replaces the bootflash device.
  - See this publication:

    http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/hardware/Config_Notes/78_17277.html
- Supervisor Engine 32 (WS-SUP32-10GE-3B, WS-SUP32-GE-3B)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/hardware/Module_Installation/Sup_Eng_Guide/supe_gd.html

Note See the "Supervisor Engine 32 (CAT6000-SUP32/MSFC2A, 7600-SUP32/MSFC2A)" section on page 38 for the list of features not supported with Supervisor Engine 32.

- 48-port 10/100/1000 Mbps switching module (WS-X6148A-GE-TX, WS-X6148A-GE-45AF)
- 48-port 100BASE-FX switching module (WS-X6148-FE-SFP), with these SFPs:
  - 100BASEFX SFP (GLC-FE-100FX)
  - 100BASELX SFP (GLC-FE-100LX)
- 48-port 10/100TX RJ-45 switching module (WS-X6148A-RJ-45, WS-X6148A-45AF)
- SPA Interface Processor-600 (7600-SIP-600)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- 1-port 10-Gigabit Ethernet SPA, LANPHY XFP Optics (SPA-1XTENGE-XFP), with this XFP module: 10-Gigabit Ethernet LR (10 km; XFP-10GLR-OC192LR)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- 10-port Gigabit Ethernet SPA, SFP Optics (SPA-10X1GE)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- 5-port Gigabit Ethernet SPA, SFP Optics (SPA-5X1GE)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- 2-port Gigabit Ethernet SPA, SFP Optics (SPA-2X1GE), with these SFPs:
  - Extended Temperature SX SFP (SFP-GE-S)
  - Extended Temperature LX/LH SFP (SFP-GE-L)
  - Extended Temperature ZX SFP (SFP-GE-Z)

  See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- 1-port OC-192c/STM-64 POS/RPR SPA, SM-LR (SPA-OC192POS-LR)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- 1-port OC-192c/STM-64 POS/RPR SPA, XFP Optics (SPA-OC192POS-XFP), with these XFP modules:
  - Single-Mode (SM) Short Reach (SR; XFP-10GLR-OC192SR)
  - Single-Mode (SM) Intermediate Reach (IR-2; XFP-10GER-OC192IR)

  See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- 1 port OC-48c/STM-16 ATM SPA (SPA-1XOC48-ATM)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Firewall Services module support with Supervisor Engine 32:
  - WS-SVC-FWM-1-K9
  - Also supported with Supervisor Engine 720.
  - Also supported with Supervisor Engine 2.
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/modules/ps2706/ps4452/tsd_products_support_model_home.html

- Network Analysis Module support with Supervisor Engine 32:
  - WS-SVC-NAM-1 and WS-SVC-NAM-2
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/sw/cscowork/ps5401/prod_release_notes_list.html

- Intrusion Detection System Module 2 support with Supervisor Engine 32:
  - WS-SVC-IDSM2-K9
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/modules/ps2706/ps5058/tsd_products_support_model_home.html

- Secure Sockets Layer (SSL) Services Module support with Supervisor Engine 32:
  - WS-SVC-SSL-1
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/ssl/2.1/release/notes/OL_5277.html

New Software Features in Release 12.2(18)SXF

Note See the "Supervisor Engine 32 (CAT6000-SUP32/MSFC2A, 7600-SUP32/MSFC2A)" section on page 38 for the list of features not supported with Supervisor Engine 32.

- H-VPLS with MPLS Edge—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#H-VPLS_with_MPLS_Edge_Configuration_Example
- 'match cos' classification on 7600-SIP-400—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- EtherChannel Min-Links—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/channel.html
- Flex Links—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/flexlink.html
- Hardware Capacity Monitoring—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/pwr_envr.html
- IEEE 802.1s - Multiple Spanning Tree (MST) Standard Compliance—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/mst.html
- IP Unnumbered for VLAN-SVI interfaces—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/layer3.html
- L3 MPLS VPN over GRE on 7600-SIP-400—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- Mapping a subinterface to an EoMPLS VC on 7600-SIP-400—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html
- Multicast enhancement - egress replication performance improvement—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/mcastv4.html
- Multicast Enhancement - Replication Mode Detection—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/mcastv4.html
- NetFlow v9 Export Format, including NetFlow Export of BGP Nexthop Information—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/netflow/configuration/12-2sx/cfg-nflow-data-expt.html

- NetFlow multicast support:
  - Supported only with NetFlow v9 export format.
  - See this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/netflow/configuration/12-2sx/cfg-nf-multi-acctg.html
  - The NetFlow Multicast Support document contains a prerequisite that does not apply when configuring NetFlow multicast support with Release 12.2(18)SXF and later 12.2SX releases:

    You do not need to configure multicast fast switching or multicast distributed fast switching (MDFS); multicast CEF switching is supported with Release 12.2(18)SXF and later 12.2SX releases.
- Per Interface Sticky ARP—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/dos.html
- PIM snooping DR flooding enhancement—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/snooppim.html

New Features in Release 12.2(18)SXE6b

These sections describe the new features in Release 12.2(18)SXE6a, 29 Dec 2006:

- New Hardware Features in Release 12.2(18)SXE6b, page 136
- New Software Features in Release 12.2(18)SXE6b, page 136

New Hardware Features in Release 12.2(18)SXE6b

None.

New Software Features in Release 12.2(18)SXE6b

None.

New Features in Release 12.2(18)SXE6a

These sections describe the new features in Release 12.2(18)SXE6a, 18 Sep 2006:

- New Hardware Features in Release 12.2(18)SXE6a, page 136
- New Software Features in Release 12.2(18)SXE6a, page 137

New Hardware Features in Release 12.2(18)SXE6a

None.

New Software Features in Release 12.2(18)SXE6a

None.

New Features in Release 12.2(18)SXE6

These sections describe the new features in Release 12.2(18)SXE6, 08 Jun 2006:

- New Hardware Features in Release 12.2(18)SXE6, page 137
- New Software Features in Release 12.2(18)SXE6, page 137

New Hardware Features in Release 12.2(18)SXE6

None.

New Software Features in Release 12.2(18)SXE6

None.

New Features in Release 12.2(18)SXE5

These sections describe the new features in Release 12.2(18)SXE5, 13 Feb 2006:

- New Hardware Features in Release 12.2(18)SXE5, page 137
- New Software Features in Release 12.2(18)SXE5, page 137

New Hardware Features in Release 12.2(18)SXE5

- Compact Flash Adapter in Bootflash Slot (WS-CF-UPG=):
  - CompactFlash adapter with 512 MB CompactFlash card that replaces the bootflash device.
  - See this publication:

    http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/hardware/Config_Notes/78_17277.html

New Software Features in Release 12.2(18)SXE5

- UDI - Unique Device Identifier—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/fundamentals/configuration/12-2sx/Unique_Device_Identifier_Retrieval.html

New Features in Release 12.2(18)SXE4

These sections describe the new features in Release 12.2(18)SXE4, 10 Oct 2005:

- New Hardware Features in Release 12.2(18)SXE4, page 138
- New Software Features in Release 12.2(18)SXE4, page 138

New Hardware Features in Release 12.2(18)SXE4

None.

New Software Features in Release 12.2(18)SXE4

None.

New Features in Release 12.2(18)SXE3

These sections describe the new features in Release 12.2(18)SXE3, 22 Aug 2005:

- New Hardware Features in Release 12.2(18)SXE3, page 138
- New Software Features in Release 12.2(18)SXE3, page 138

New Hardware Features in Release 12.2(18)SXE3

None.

New Software Features in Release 12.2(18)SXE3

None.

New Features in Release 12.2(18)SXE2

These sections describe the new features in Release 12.2(18)SXE2, 23 Jun 2005:

- New Hardware Features in Release 12.2(18)SXE2, page 138
- New Software Features in Release 12.2(18)SXE2, page 139

New Hardware Features in Release 12.2(18)SXE2

Support with Supervisor Engine 720 for these modules:

- Services SPA Carrier (SSC; 7600-SSC-400)

  Note 7600-SSC-400 does not maintain state when an NSF with SSO redundancy mode switchover occurs.

- IPsec SPA (SPA-IPSEC-2G):
- Also supported with Supervisor Engine 32
- SPA-IPSEC-2G supports the features that were previously supported with WS-SVC-IPSEC-1.
- See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

New Software Features in Release 12.2(18)SXE2

None.

New Features in Release 12.2(18)SXE1

These sections describe the new features in Release 12.2(18)SXE1, 18 Apr 2005:

- New Hardware Features in Release 12.2(18)SXE1, page 139
- New Software Features in Release 12.2(18)SXE1, page 139

New Hardware Features in Release 12.2(18)SXE1

- Application-Oriented Networking (AON) Module (WS-SVC-AON-1-K9) support with Supervisor Engine 720—See these publications:

  http://www.cisco.com/en/US/products/ps6480/prod_release_notes_list.html
- WebVPN Services Module (WS-SVC-WEBVPN-K9; not supported with Supervisor Engine 2)—See this publication:

  http://www.cisco.com/en/US/products/hw/switches/ps708/prod_release_notes_list.html#anchor24

New Software Features in Release 12.2(18)SXE1

None.

New Features in Release 12.2(18)SXE

These sections describe the new features in Release 12.2(18)SXE, 11 Apr 2005:

- New Hardware Features in Release 12.2(18)SXE, page 139
- New Software Features in Release 12.2(18)SXE, page 141

New Hardware Features in Release 12.2(18)SXE

- Anomaly Guard Module (WS-SVC-AGM-1-K9)—See this publication:

  http://www.cisco.com/en/US/prod/collateral/modules/ps2706/end_of_life_c51-573493.html
- Traffic Anomaly Detector Module (WS-SVC-ADM-1-K9)—See this publication:

  http://www.cisco.com/en/US/prod/collateral/modules/ps2706/end_of_life_c51-573493.html
- 2700 W AC power supply for CISCO7606 chassis (PWR-2700-AC)—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/Hardware/Chassis_Installation/7600_Series_Router_Installation_Guide/cis_76xx.html
- 2700 W DC power supply for CISCO7606 chassis (PWR-2700-DC)—See this publication:

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

- 2700 W AC power supply for 4-slot chassis (PWR-2700-AC/4)—See this publication:

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

- 2700 W DC power supply for 4-slot chassis (PWR-2700-DC/4)—See this publication:

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

- Catalyst 6500 series switch 4-slot chassis (WS-C6504-E)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/hardware/Chassis_Installation/Cat6500/6500_ins.html

- Cisco 7600 series router 4-slot chassis (CISCO7604)—See this publication:

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

- Cisco 7600 Series SPA Interface Processor-200 (7600-SIP-200)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Cisco 7600 Series SPA Interface Processor-400 (7600-SIP-400)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Cisco 1-Port OC-12c/STM-4c ATM Shared Port Adapter (SPA-1XOC12-ATM)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Cisco 1-Port OC-12c/STM-4c POS Shared Port Adapter (SPA-1XOC12-POS)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Cisco 8-Port Channelized T1/E1 Shared Port Adapter (SPA-8XCHT1/E1)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Cisco Channelized T3 to DS0 Shared Port Adapter (SPA-2XCT3/DS0, SPA-4XCT3/DS0)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Cisco Clear Channel T3/E3 Shared Port Adapter (SPA-2XT3/E3, SPA-4XT3/E3)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Cisco OC-3c/STM-1c ATM Shared Port Adapter (SPA-2XOC3-ATM, SPA-4XOC3-ATM)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Cisco OC-3c/STM-1c POS Shared Port Adapter (SPA-2XOC3-POS, SPA-4XOC3-POS)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/shared_port_adapters/configuration/6500series/sipspasw.html

- Fast Ethernet port adapters (PA-2FE, PA-1FE)—See this publication:

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

- 1-port Packet over SONET OC3c/STM1 port adapter (PA-POS-1OC3)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/port_adapters/install_upgrade/multichannel_serial/pa-pos-1oc3_install_config/6514_1oc.html

- Content Switching Module with SSL (CSM-S; WS-X6066-SLB-S-K9)—See this publication:

  http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/csms/1.1.1/release/notes/78_16597.html

- 10GBASE-LW XENPAK Module with WAN PHY for SMF (XENPAK-10GB-LW)
- 10GBASE dense wavelength-division multiplexing (DWDM) 100-GHz ITU grid (DWDM-XENPAK)
- 10GBASE receive-only wavelength division multiplexing (WDM; WDM-XENPAK-REC)
- 1000BASE-BX10 SFP module for single-strand SMF, 1490-nm TX/1310-nm RX wavelength (GLC-BX-D)
- 1000BASE-BX10 SFP module for single-strand SMF, 1310-nm TX/1490-nm RX wavelength (GLC-BX-U)
- Receive-only coarse or dense Wavelength Division Multiplexing (WDM) GBIC (WDM-GBIC-REC)

New Software Features in Release 12.2(18)SXE

- Any Transport over MPLS (AToM): HDLC over MPLS (HDLCoMPLS):
  - Supported on WAN ports.
  - See this publication:

    http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#HDLC_Over_MPLS

- Any Transport over MPLS (AToM): PPP over MPLS (PPPoMPLS):
  - Supported on WAN ports.
  - See this publication:

    http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#PPP_Over_MPLS

- ATM VC access trunk emulation—See this publication:

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

- BGP multipath load sharing for both eBGP and iBGP in an MPLS-VPN—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/fsxeibmp.html

Note With the BGP multipath load sharing for both eBGP and iBGP in an MPLS-VPN feature configured, do not attach output service policies to VRF interfaces. (CSCsb25509)

For nonMPLS environments, see the Interior Border Gateway Protocol (iBGP) Multipath Load Sharing feature.

- BGP support for TTL security check—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bgp/configuration/12-2sx/irg-neighbor.html
- Bidirectional Forwarding Detection (BFD) standard implementation—See this publication:

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

  Note Catalyst 6500 switches and Cisco 7600 routers support BFD only on Ethernet, Fast Ethernet (except PA-2FE and PA-1FE), Gigabit Ethernet, Gigabit Ethernet WAN (GE-WAN), and 10-Gigabit Ethernet ports, including Ethernet SPAs. The Catalyst 6500 switches and Cisco 7600 routers do not support BFD on PA-2FE or PA-1FE Ethernet LAN ports, or on POS, ATM, or serial WAN ports.

  Also see "Integrated IS-IS support for BFD over IPv4" and "OSPF support for BFD over IPv4."
- Bridge Control Protocol (BCP)—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/features.html
- Bridging using RFC1483 Routed Encapsulation (BRE)—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexwan-config-guide.html
- **clear hardware interface counters** command.
- CNS Interactive CLI—Network management applications can use the Cisco Networking Services (CNS) agents to manage network routers. The CNS agent provides the capability to send commands to a router from a programmable source. The CNS Interactive CLI feature introduces a new XML interface that allows you to send interactive commands to a router, such as commands that generate prompts for user input. A benefit of this feature is that interactive commands can be aborted before they have been fully processed. For example, for commands that generate a significant amount of output, the XML interface can be customized to limit the size of the output or the length of time allowed for the output to accumulate. The capability to use a programmable interface to abort a command before its normal termination (similar to manually aborting a command) can greatly increase the efficiency of diagnostic applications that might use this functionality. The new XML interface also allows for multiple commands to be processed in a single session. The response for each command is packaged together and sent in a single response event.
- Configurable Per VLAN MAC Learning (PVL)—See the **mac-address-table learning** command in this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-l2.html#GUID-326D5509-3E03-4E0B-8C69-3084E21D97BE
- CSG: Content Services Gateway Release 6—See this publication:

  http://www.cisco.com/en/US/products/sw/wirelssw/ps779/tsd_products_support_series_home.html

- DE/CLP and EXP mapping on FR/ATMoMPLS VC—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#DE/CLP_and_EXP_Mapping_on_FR/ATMoMPLS_VC

- DHCP Snooping (supported only with PFC3)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/snoodhcp.html

- Digital Optical Monitoring (DOM)—See the **show interfaces transceiver** command in this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-s4.html#GUID-73B23B10-A62E-4F88-9F4D-F37A9C14D8D8

  Note See this publication for additional information about DOM:

  http://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_8031.html

- Dynamic ARP Inspection (DAI; supported only with PFC3)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/dynarp.html

- Dynamic Multipoint VPN (DMVPN) Phase 2
  - In Release 12.2(18)SXE2 and later releases, supported with SPA-IPSEC-2G.
  - In Release 12.2(18)SXE and later releases, supported with WS-SVC-IPSEC-1.
  - See this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_dmvpn/configuration/15-s/sec-conn-dmvpn.html

- Egress ACL support for remarked DSCP (supported only with PFC3)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html

- EIGRP MPLS VPN PE-CE site of origin (SoO)—See this publication:

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

- Embedded network management improvements—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/technical_references/7600_mib_guides/MIB_Guide_ver_6/mibgde6.html

- Encapsulated Remote SPAN (ERSPAN)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/span.html

- EtherChannel Enhancement - 128 EtherChannels Support—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/channel.html

- Ethernet over MPLS (EoMPLS) per VLAN QoS—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Ethernet_over_MPLS

- Field-programmable device upgrade tool—The Cisco SPA field-programmable device (FPD) upgrade tool provides customers and field engineers a consistent way across platforms to upgrade firmware or images for the programmable devices (for example, FPGAs, PLDs, ROMMON). The customer can get proper images from Cisco.com, and use this tool to automatically download (with a flash card or TFTP) to the FPD tool, or manually if needed. The FPD tool provides a convenient and safe way for customer to upgrade an FPD for related bug fixes and feature enhancement with minimum system impact. The FPD tool significantly improves customer satisfaction and product reliability.
- Frame Relay virtual circuit (VC) bundling—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexwan-config-guide.html
- HQoS support for Ethernet over MPLS (EoMPLS) VC—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexwan-config-guide.html
- IDSM-2 EtherChannel load balancing—See this publication:

  http://www.cisco.com/en/US/products/hw/modules/ps2706/ps5058/tsd_products_support_model_home.html
- Integrated IS-IS global default metric—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_isis/configuration/15-mt/irs-netd.html
- Integrated IS-IS protocol shutdown support maintaining configuration parameters—See this publication:

  http://www.cisco.com/en/US/docs/ios/iproute_isis/configuration/guide/irs_initcf.html
- Integrated IS-IS support for BFD over IPv4—See this publication:

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

  Note Also see “Bidirectional Forwarding Detection (BFD) standard implementation.”
- Invalid Special Parameter Index (SPI) Recovery—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_dplane/configuration/12-2sx/sec-invald-index-rec.html
- IP routing of RFC1483 ATM bridge encapsulation (RBE)—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexwan-config-guide.html
- PFC3 hardware support for IPv4 multicast over point-to-point GRE tunnels—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2/interface/configuration/guide/icflogin.html

  Note Releases earlier than Release 12.2(18)SXE supported IPv4 multicast over point-to-point GRE tunnels in software on the MSFC. The PFC3 does not provide hardware acceleration for tunnels configured with the **tunnel key** command.
- IPv6 access services: DHCPv6 prefix delegation—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/config_library/15-sy/ipv6-15-sy-library.html

- IPv6 hardware: multicast assist—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/mcastv6.html

- IPv6 multicast RPR/RPR+ support—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/redund.html

- IPv6 multicast: Bootstrap Router (BSR)—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/configuration/12-2sx/ipv6-12-2sx-book.html

- IPv6 Multicast: HW assisted egress replication—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/mcastv6.html

- IPv6 QoS: (quality of service)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html

- IS-IS caching of redistributed routes—See this publication:

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

- IS-IS support for priority-driven IP prefix RIB installation—See this publication:

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

- Key rollover for certificate renewal—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cert-enroll-pki.html

- Layer 2 traceroute—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/l2trace.html

- MLD snooping—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/snoopmld.html

- MPLS LDP - Inbound Label Binding Filtering—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsinbd4.html

- MPLS LSP ping/traceroute and AToM VCCV—See this publication:

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

- MQC: distribution of remaining bandwidth (supported only on WAN ports)—You configure QoS features on an interface using the modular QoS CLI (MQC). Using MQC, you create service policies for traffic classes and attach the policies to an interface. You can use MQC to specify how the remaining bandwidth is distributed among the interface or subinterface output queues. The remaining bandwidth is the available bandwidth left on an interface or subinterface after all guaranteed traffic is accounted for. The amount of remaining bandwidth available for use is determined by the excess information rate (EIR) configured for the queue.

  The **bandwidth remaining percent** command allows you to configure the remaining bandwidth for output queues. The aggregate of all user-configured EIR bandwidth percentages cannot exceed 100 percent. If the aggregate of all remaining bandwidth is less than 100 percent, the remainder is evenly split among user queues (including the default queue) that do not have a remaining bandwidth percentage configured. The minimum EIR value of each output queue is 1.

This example shows how to use the **bandwidth remaining percent** command to distribute percentages of remaining bandwidth to various traffic classes in a policy map:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# policy-map myPolicy
Router(config-pmap)# class class-default
Router(config-pmap-c)# bandwidth remaining percent 20
Router(config-pmap-c)# class prec1
Router(config-pmap-c)# bandwidth remaining percent 30
Router(config-pmap-c)# class prec2
Router(config-pmap-c)# bandwidth remaining percent 10
Router(config-pmap-c)# bandwidth percent 50
Router(config-pmap-c)# end
Router# show policy-map myPolicy
  Policy Map myPolicy
    Class prec1
         bandwidth remaining percent 30
    Class prec2
         bandwidth percent 50
         bandwidth remaining percent 10
    Class class-default
         bandwidth remaining percent 20
Router#
```

- Multicast-VPN: Multicast Support for MPLS VPN—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/mvpn.html

  Note Support for MVPN also includes support for multicast VRF (MVRF). MVRF is also known as multicast over VRF-lite. MVPN and MVRF are supported in PFC3B or PDC3BXL mode.

- Multipoint bridging (MPB)—See these publications:

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

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/pos.html#Configuring_Multipoint_Bridging

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/atm.html#Configuring_Multipoint_Bridging

- NetFlow - Bridged Flow Statistics—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/nde.html

- Netflow Multiple Export Destinations:
  - In Release 12.2(18)SXF and later releases, supported with Supervisor Engine 32
  - In Release 12.2(18)SXE and later releases, supported with Supervisor Engine 720
  - In Release 12.2(18)SXD and later releases, supported with Supervisor Engine 2
  - Allows entry of a second **ip flow-export destination** command
  - See this publication:

    http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/nde.html

- OSPF link state database overload protection—See this publication:

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

- OSPF link-local signaling (LLS) per interface basis—See this publication:

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

- OSPF MIB support of RFC 1850 and latest extensions—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/technical_references/7600_mib_guides/MIB_Guide_ver_6/mibgde6.html

- OSPF support for BFD over IPv4—See this publication:

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

  Note Also see "Bidirectional Forwarding Detection (BFD) standard implementation."

- OSPF support for forwarding adjacencies over MPLS traffic engineered tunnels—See this publication:

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

- OSPF support for unlimited software VRFs per provider edge (PE) router—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/12-2sx/iro-un-sw-vrfs.html

- Packet classification based on layer3 packet-length (supported on WAN ports)—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/qos_classn/configuration/12-2sx/qos-classn-ntwk-trfc.html

- Per port MAC limiting—See the **mac-address-table limit** command in this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/lanswitch/command/lsw-m1.html#GUID-6B40F1F2-BB7D-45CD-B9CE-5B3E0FE019A5

- Per VLAN load balancing for advanced QinQ service mapping—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/pwan.html#Per_VLAN_Load_Balancing_for_Advanced_QinQ_Service_Mapping

- PKI AAA authorization using the entire subject name—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cfg-auth-rev-cert.html

- Port security on 802.1Q tunnel ports, port security on private VLAN ports, port security on trunk ports, port security with 4096 secure MAC addresses, and port security with sticky MAC addresses—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/port_sec.html

- Protected private key storage—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-deploy-rsa-pki.html

- QoS: Aggregated DSCP / Precedence Values for WRED—Aggregates multiple DSCP or IP Precedence values for a single minimum or maximum threshold and marks probability when specifying WRED parameters for 7600-SIP-400 ATM SPAs.
- QoS: ingress shaping on FlexWAN module interfaces—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexwan-config-guide.html
- QoS: match VLAN on OSMs—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/qos.html#Configuring_QoS:_Match_VLAN
- QoS: percentage based policing on WAN ports—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/12spctpg.html
- Query mode definition per trustpoint—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cfg-auth-rev-cert.html
- Query multiple servers during certificate revocation check—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cfg-auth-rev-cert.html
- Re-enroll using existing certificate—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cert-enroll-pki.html
- Redundant Supervisor Engine 720 system high availability enhancement:
  - When a module is inserted or removed (OIR), a data integrity mechanism engages to ensure that no corrupt data is transferred on the backplane bus. This mechanism can cause a minimal amount of packet loss during OIR in a non-DFC-based system. For a DFC-based system, this mechanism does not have an effect on any traffic during OIR.

    This feature causes the redundant supervisor engine to operate as a DFC-based module (the redundant supervisor engine operates as a non-DFC-based module by default), which protects the redundant supervisor engine from any packet loss during module OIR because it is disconnected from the backplane bus.

    This feature only applies to a system with redundant supervisor engines and DFCs on all the modules. The supervisor engine uplink ports (on both standby and active) cannot be used with this configuration.
  - See the **fabric switching-mode allow dcef-only** command in this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-f1.html#GUID-A815D749-F21A-4624-9DCB-81390BBE369E
- RFC-1490 bridging on FlexWAN interfaces—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/flexwan_config/flexwan-config-guide.html
- RADIUS Load Balancing (RLB) IMSI sticky—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/slbsxe1.html
- SafeNet IPsec VPN client support—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_vpnips/configuration/12-2sx/sec-safenet-supp t.html

- SCP health monitoring for enhanced-FlexWAN—The SCP health monitor feature provides improved debugging capabilities for problems that cause WAN module resets because of SCP keepalive failures.
- Show diagnostic sanity—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/diags.html
- Show Top-N—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/topn.html
- SLB: stateful failover within single chassis—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/slbsxe1.html
- SLB: interface-aware—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/slbsxe1.html
- SPAN destination port permit list—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/span.html
- SSM mapping for IPv6—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/config_library/15-sy/ipv6-15-sy-library.html
- Strict priority low latency queueing (LLQ) on WAN ports—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/qos.html#Configuring_Low_Latency_Queuing
- Sub interface features - phase 1—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/layer3.html
- Bandwidth Command for HQoS Parent Class Support—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Creating_the_Parent_Policy_Map_and_Attaching_It_to_the_Egress_Interface
- Uni-Directional Link Routing (UDLR)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/ude_udlr.html
- Unicast flood blocking (UFB)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/blocking.html
- **verify certificate chain** command—Allows the use of the Layer 2 overhead specification for shaping.
- VLANs over IP unnumbered sub-interfaces—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/ipaddr/command/ipaddr-i4.html#GUID-833D9D25-1E04-4430-84D8-1AA836DE4745
- ATM OAM ping—See this publication:

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

New Features in Release 12.2(18)SXD7b

These sections describe the new features in Release 12.2(18)SXD7b, 12 Dec 2006

- New Hardware Features in Release 12.2(18)SXD7b, page 150
- New Software Features in Release 12.2(18)SXD7b, page 150

New Hardware Features in Release 12.2(18)SXD7b

None.

New Software Features in Release 12.2(18)SXD7b

None.

New Features in Release 12.2(18)SXD7a

These sections describe the new features in Release 12.2(18)SXD7a, 15 Sep 2006

- New Hardware Features in Release 12.2(18)SXD7a, page 150
- New Software Features in Release 12.2(18)SXD7a, page 150

New Hardware Features in Release 12.2(18)SXD7a

None.

New Software Features in Release 12.2(18)SXD7a

None.

New Features in Release 12.2(18)SXD7

These sections describe the new features in Release 12.2(18)SXD7, 15 Dec 2005:

- New Hardware Features in Release 12.2(18)SXD7, page 150
- New Software Features in Release 12.2(18)SXD7, page 150

New Hardware Features in Release 12.2(18)SXD7

None.

New Software Features in Release 12.2(18)SXD7

None.

New Features in Release 12.2(18)SXD6

These sections describe the new features in Release 12.2(18)SXD6, 22 Aug 2005:

- New Hardware Features in Release 12.2(18)SXD6, page 151
- New Software Features in Release 12.2(18)SXD6, page 151

New Hardware Features in Release 12.2(18)SXD6

None.

New Software Features in Release 12.2(18)SXD6

None.

New Features in Release 12.2(18)SXD5

These sections describe the new features in Release 12.2(18)SXD5, 16 May 2005:

- New Hardware Features in Release 12.2(18)SXD5, page 151
- New Software Features in Release 12.2(18)SXD5, page 151

New Hardware Features in Release 12.2(18)SXD5

None.

New Software Features in Release 12.2(18)SXD5

None.

New Features in Release 12.2(18)SXD4

These sections describe the new features in Release 12.2(18)SXD4, 24 Mar 2005:

- New Hardware Features in Release 12.2(18)SXD4, page 151
- New Software Features in Release 12.2(18)SXD4, page 151

New Hardware Features in Release 12.2(18)SXD4

None.

New Software Features in Release 12.2(18)SXD4

None.

New Features in Release 12.2(18)SXD3

These sections describe the new features in Release 12.2(18)SXD3, 13 Dec 2004:

- New Hardware Features in Release 12.2(18)SXD3, page 152
- New Software Features in Release 12.2(18)SXD3, page 152

New Hardware Features in Release 12.2(18)SXD3

- Distributed Forwarding Card 3BXL (DFC3BXL; WS-F6K-DFC3BXL) for use on dCEF256 and CEF256 modules—See the "Distributed and Centralized Forwarding Cards" section on page 45.
- Distributed Forwarding Card 3B (DFC3B; WS-F6K-DFC3B) for use on dCEF256 and CEF256 modules—See the "Distributed and Centralized Forwarding Cards" section on page 45.
- Anomaly Guard Module (WS-SVC-AGM-1-K9)—See this publication:

  http://www.cisco.com/en/US/prod/collateral/modules/ps2706/end_of_life_c51-573493.html
- Traffic Anomaly Detector Module (WS-SVC-ADM-1-K9—See this publication:

  http://www.cisco.com/en/US/prod/collateral/modules/ps2706/end_of_life_c51-573493.html

New Software Features in Release 12.2(18)SXD3

- Source Specific Multicast (SSM) Mapping:
  - Do not configure SSM mapping in a VLAN that supports IGMPv3 multicast receivers.
  - See this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/ipmulti_igmp/configuration/12-2sx/imc_ssm_mapping.html

New Features in Release 12.2(18)SXD2

These sections describe the new features in Release 12.2(18)SXD2, 22 Oct 2004:

- New Hardware Features in Release 12.2(18)SXD2, page 152
- New Software Features in Release 12.2(18)SXD2, page 152

New Hardware Features in Release 12.2(18)SXD2

None.

New Software Features in Release 12.2(18)SXD2

None.

New Features in Release 12.2(18)SXD1

These sections describe the new features in Release 12.2(18)SXD1, 30 Sep 2004:

- New Hardware Features in Release 12.2(18)SXD1, page 153
- New Software Features in Release 12.2(18)SXD1, page 153

New Hardware Features in Release 12.2(18)SXD1

Note In Release 12.2(18)SXD1, all service modules have been tested with OSMs, the FlexWAN module, and the Enhanced FlexWAN module.

- Persistent Storage Device (PSD; WS-SVC-PSD-1) support with Supervisor Engine 720:
  - Also supported with Supervisor Engine 32
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/switches/ps708/prod_release_notes_list.html#anchor21
- Multi-Processor WAN Application Module (MWAM) support with Supervisor Engine 720:
  - WS-SVC-MWAM-1
  - Also supported with Supervisor Engine 32
  - Also supported with Supervisor Engine 2
  - See these publications for more information:

    http://www.cisco.com/en/US/docs/wireless/pdsn/12.28zb/mwan_install_config/mwamhwrn.html

    http://www.cisco.com/en/US/docs/wireless/pdsn/12.28zb/mwan_install_config/mwamhwrn.html

    Note With Release 12.2(18)SXD1 and later releases, WS-SVC-MWAM-1 maintains state when an NSF with SSO redundancy mode switchover occurs. With Release 12.2(18)SXD, WS-SVC-MWAM-1 does not maintain state when an NSF with SSO redundancy mode switchover occurs.
- Content Services Gateway (CSG) support with Supervisor Engine 720
  - WS-SVC-CSG-1
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/sw/wirelssw/ps779/tsd_products_support_series_home.html

New Software Features in Release 12.2(18)SXD1

- MPLS Traffic Engineering (TE) Fast Reroute (FRR) Link and Node Protection—See these publications:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsfrr24.html

Note Also see MPLS Traffic Engineering DiffServ Aware (DS-TE).
MPLS TE FRR Link and Node Protection is not supported on these interface types:
—Port channel interfaces
—Switch virtual interfaces (SVIs)
—Multiple link point-to-point protocol (MLPPP) interfaces
—Multilink Frame Relay (MLFR or MFR)

- VRF Aware IPsec:
  - In Release 12.2(18)SXE2 and later releases, supported with SPA-IPSEC-2G.
  - In Release 12.2(18SXD1 and later releases, supported with Supervisor Engine 720 and WS-SVC-IPSEC-1.
  - Not supported with Supervisor Engine 2 and WS-SVC-IPSEC-1.
  - See this publication:

    http://www.cisco.com/en/US/docs/ios/sec_secure_connectivity/configuration/guide/sec_vrf_aware_ipsec.html
- Hardware Control Plane Interface for Control Plane Policing (CoPP):
  - With Cisco IOS 12.2SX releases, only the PFC3 supports CoPP.
  - The PFC3 does not support CoPP output rate limiting (policing).
  - The PFC3 does not support the CoPP silent operation mode.
  - The PFC3 does not support the **match protocol arp** command.
  - The PFC3 automatically installs the CoPP service policy on all DFC-equipped switching modules.
  - See this publication:

    http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/dos.html
- Web Cache Control Protocol (WCCP) support with Supervisor Engine 720—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp/configuration/12-2sx/iap-wccp.html
- The **fabric switching-mode allow dcef-only** command support with Supervisor Engine 2 (CSCec05612):
  - By default, the two Gigabit Ethernet ports on a redundant Supervisor Engine 2 rely on the PFC on the active supervisor engine for all forwarding decisions.
  - The **fabric switching-mode allow dcef-only** command disables the Gigabit Ethernet ports on the redundant Supervisor Engine 2 to ensure that all modules are operating in dCEF mode.
  - Module OIR is nondisruptive when all active switching modules are dCEF-enabled.

New Features in Release 12.2(18)SXD

These sections describe the new features in Release 12.2(18)SXD, 26 Jul 2004:

- New Hardware Features in Release 12.2(18)SXD, page 155
- New Software Features in Release 12.2(18)SXD, page 155

New Hardware Features in Release 12.2(18)SXD

Note With Release 12.2(18)SXD and later releases, OSMs require a minimum of 128 MB of dynamic random-access memory (SDRAM)—See this publication for memory upgrade procedures:

http://www.cisco.com/en/US/docs/routers/7600/Hardware/Module_and_Line_Card_Installation_Guides/7600_Series_Router_Module_Installation_Guide/osmodule.html

- WS-F6700-DFC3BXL Distributed Forwarding Card 3BXL (DFC3BXL) for use on CEF720 modules—See the "Distributed and Centralized Forwarding Cards" section on page 45
- Distributed Forwarding Card 3B (DFC3B; WS-F6700-DFC3B) for use on CEF720 modules—See the "Distributed and Centralized Forwarding Cards" section on page 45
- Wireless LAN service module (WS-SVC-WLAN-1-K9) support with Supervisor Engine 720—See this publication:

  http://www.cisco.com/en/US/products/ps6526/tsd_products_support_eol_model_home.html
- WS-X6066-SLB-S-K9 Content Switching Module with SSL (CSM-S) with Supervisor Engine 2:
  - Also supported with Supervisor Engine 720
  - See this publication:

    http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/csms/1.1.1/release/notes/78_16597.html
- 6000 W AC power supply (WS-CAC-6000W)

New Software Features in Release 12.2(18)SXD

- Cisco Nonstop Forwarding (NSF) with stateful switchover (SSO) supervisor engine redundancy on Supervisor Engine 720 and Supervisor Engine 2—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/nsfsso.html

Note
- Release 12.2(18)SXD and later releases do not support the SRM with SSO redundancy mode (see the "New Software Features in Release 12.2(17b)SXA" section on page 170).
- With PFC3, NSF with SSO supports multicast traffic.
- NSF with SSO redundancy mode supports IPv4. NSF with SSO redundancy mode does not support IPv6, IPX, or MPLS.
- These protocols can coexist with NSF with SSO redundancy mode, but there is no stateful support for them:
  - MPLS and LDP
  - GLBP
  - HSRP
  - VRRP

  Following an NSF with SSO switchover, traffic loss occurs on the links where the protocols are configured until the protocols converge.

- The following modules do not maintain state when an NSF with SSO redundancy mode switchover occurs:
  - IPsec VPN Acceleration services module (WS-SVC-IPSEC-1).
  - WS-X6066-SLB-APC (CSM; with Release 12.2(18)SXD1 and later releases, WS-X6066-SLB-APC maintains state when an NSF with SSO redundancy mode switchover occurs).
  - WS-SVC-FWM-1-K9 firewall services module (with Release 12.2(18)SXD3 and later Cisco IOS releases and with Firewall Services Module Software Release 2.3(1), WS-SVC-FWM-1-K9 maintains state when an NSF with SSO redundancy mode switchover occurs).
  - WS-SVC-SSL-1 secure sockets layer (SSL) services module.
  - WS-SVC-MWAM-1 (with Release 12.2(18)SXD1 and later releases, WS-SVC-MWAM-1 maintains state when an NSF with SSO redundancy mode switchover occurs).
  - WS-SVC-PSD-1 (with Release 12.2(18)SXD1 and later releases, WS-SVC-PSD-1 maintains state when an NSF with SSO redundancy mode switchover occurs).

- ARP ACLs for QoS Filtering (supported only with PFC3)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html

  Note Supervisor Engine 2 applies IP ACLs to ARP traffic.

- Protocol-Independent MAC ACL Filtering (supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html

- Netflow Multiple Export Destinations:
  - In Release 12.2(18)SXE and later releases, supported with Supervisor Engine 720
  - In Release 12.2(18)SXD and later releases, supported with Supervisor Engine 2
  - Allows entry of a second **ip flow-export destination** command
  - See this publication:

    http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/nde.html

- For the IPsec VPN Acceleration services module (WS-SVC-IPSEC-1):

  Note In Release 12.2(18)SXE2 and later releases, these features are also supported with SPA-IPSEC-2G.

  - Easy VPN Server features—See this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_esyvpn/configuration/12-2sx/sec-easy-vpn-12-2sx-book.html

  - Distinguished Name-Based Crypto Maps—See this publication:

http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_ikevpn/configuration/12-2sx/sec-dist-nm-cyrpto.html

- IKE: Initiate Aggressive Mode—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_ikevpn/configuration/12-2sx/sec-aggr-mde-ike.html

- Real-Time Resolution for IPsec Tunnel Peer—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_vpnav/configuration/12-2sx/sec-realtime-ipsec.html

- IPsec VPN Accounting—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_imgmt/configuration/12-2sx/sec-ipsec-vpn-acctg.html

- Trusted Root Certification Authority—See this publication:

  http://www.cisco.com/en/US/docs/ios/sec_secure_connectivity/configuration/guide/sec_cfg_cert_auth_io_OBS.html

- Certificate Security Attribute-Based Access Control—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cfg-auth-rev-cert.html

- Trustpoint CLI—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cert-enroll-pki.html

- Multiple RSA Key Pair Support—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-deploy-rsa-pki.html

- Manual Certificate Enrollment (TFTP and Cut-and-Paste)—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cert-enroll-pki.html

- Source Interface Selection for Outgoing Traffic with Certificate Authority—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-sis-with-ca.html

- IP Security VPN Monitoring—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_imgmt/configuration/12-2sx/sec-ip-security-vpn.html

- Encrypted Preshared Key—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_ikevpn/configuration/12-2sx/sec-encrypt-preshare.html

- Crypto Conditional Debug Support—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_vpnips/configuration/12-2sx/sec-crypto-debug-sup.html

- Certificate Autoenrollment—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_conn_pki/configuration/12-2sx/sec-cert-enroll-pki.html

- Metro Ethernet Advanced QinQ Service Mapping—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/pwan.html#Advanced_QinQ_Service_Mapping

- Cisco IOS server load balancing (Cisco IOS SLB):
  - Initial support on Supervisor Engine 720 including GGSN-SLB Messaging
  - Also supported on Supervisor Engine 32
  - Previously supported on Supervisor Engine 2
  - Initial support for Home Agent Loadbalancing on Supervisor Engine 720 and Supervisor Engine 2

  See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/slbsxd1.html

  Note Web Cache Control Protocol (WCCP) Layer 2 PFC redirection is supported with Cisco IOS SLB. Other WCCP configurations are not compatible with Cisco IOS SLB.

- Cisco IOS Secure Copy (SCP)—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_ssh/configuration/12-2sx/sec-secure-copy.html

- Cisco IOS IP Event Dampening—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_pi/configuration/12-2sx/iri-ip-event-damp.html

- BGP Configuration Using Peer Templates—See this publication:

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

- BGP Cost Community—See this publication:

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

- BGP Dynamic Update Peer-Groups—See this publication:

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

- BGP Route Map Continue—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_4t/12_4t4/t_bgprco.html

- BGP Route-Map Policy List Support—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_4t/12_4t4/t_bgprco.html

- BGP Restart Session After Max-Prefix Limit—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bgp/configuration/12-2sx/irg-neighbor.html

- BGP Increased Support of Numbered AS-path Access Lists to 500—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2/ip/configuration/guide/1cfbgp.html

- IS-IS Mechanisms to Exclude Connected IP Prefixes from LSP Advertisements—See this publication:

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

- IS-IS Incremental SPF—See this publication:

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

- IS-IS Support for Route Tags—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_isis/configuration/15-mt/irs-isis-supp-route-tags.html
- IS-IS Limit on Number of Redistributed Routes—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsiredis.html
- OSPF Support for Fast Hellos—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fasthelo.html
- OSPF Forwarding Address Suppression in Translated Type-5 LSAs—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_ospf/configuration/12-2sx/iro-for-add-sup.html
- OSPF Incremental Shortest Path First (i-SPF)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/ospfispf.html
- OSPF Limit on Number of Redistributed Routes—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsoredis.html
- OSPF Support for Link State Advertisement (LSA) Throttling—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsolsath.html
- OSPF Inbound Filtering Using Route Maps with a Distribute List—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/routmap.html
- On LAN ports, Multi-VRF for CE Routers (VRF Lite) with IPv4 forwarding between VRFs interfaces, IPv4 ACLs, and IPv4 HSRP—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Configuring_MPLS

  Note Multi-VRF for CE Routers (VRF Lite) with the PFC3 supports multi-VRF CE functionality with EIGRP, OSPF, BGP and RIPv2 routing protocols running on a per VRF basis. Static routes are also supported. Also supported on WAN ports.

- MPLS Traffic Engineering DiffServ Aware (DS-TE)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsdserv3.html

  Note Also see MPLS Traffic Engineering (TE) Fast Reroute (FRR) Link and Node Protection.
  MPLS DS-TE is not supported on these interface types:
  —Port channel interfaces
  —Switch virtual interfaces (SVIs)
  —Multiple link point-to-point protocol (MLPPP) interfaces
  —Multilink Frame Relay (MLFR or MFR)

- MPLS Traffic Engineering Forwarding Adjacency—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fstefa_3.html
- MPLS Traffic Engineering (TE) Interarea Tunnels—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsiarea3.html

- MPLS VPN support for EIGRP between Provider Edge (PE) and Customer Edge (CE) —See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_eigrp/configuration/12-2sx/ire-mpls-vpn.html

  Note The MPLS VPN support for EIGRP between Provider Edge (PE) and Customer Edge (CE) feature also provides EIGRP support for VRF Lite.

- You can use the **set ip dscp** and **set ip precedence** policy map class commands on non-IP traffic to mark the internal DSCP value, which is the basis of the egress Layer 2 CoS value. (CSCec34212)
- Support for the **mls netflow maximum-flows** command. (CSCee28200)
- Support for the allowed VLAN list to filter the traffic transmitted from a SPAN destination trunk port. (CSCeb01318)
- Support for these CiscoView Device Managers:
  - CiscoView Device Manager for the Cisco Catalyst 6500 Series Switch 1.1 (CVDM-C6500)

    Resides in the switch and manages several Layer 2 and Layer 3 features for a single chassis. It is a task-based tool that eases the initial setup and deployment of end-to-end services across modules by offering configuration templates based on recommended practices.
  - CiscoView Device Manager for the Cisco Catalyst 6500 Series SSL Services Module 1.1 (CVDM-SSLSM)

    Enables users to easily configure Secure Socket Layer (SSL) services on their SSL services module. It is a task-based tool that allows users to take advantage of the versatility of their SSL services module. It offers configuration wizards based on best practices in tasks such as setting up Trustpoints and proxy services.
  - CiscoView Device Manager for the Cisco Content Switching Module 1.1 (CVDM-CSM)

    Enables users to easily configure content load-balancing services on their CSMs. It is a task-based tool that allows users to control the versatility of their CSM by offering configuration based on recommended practices in tasks, such as setting up virtual servers, creating server farms, and applying advanced policies.
  - CiscoView Device Manager for the Cisco IPsec VPN Acceleration services module (WS-SVC-IPSEC-1) 1.1 (CVDM-VPNSM)

    Allows users to manage VLANs, create and configure VPNs, and configure settings such as IPsec rules on their VPN module. It is a task-based tool that allows users to control the versatility of their Cisco VPN module by offering configuration wizards based on recommended practices in tasks such as creating Site-to-Site VPNs and configuring GRE tunnels.

  To access all CiscoView Device Manager documentation, go to this URL:

  http://www.cisco.com/en/US/products/sw/cscowork/ps4565/index.html

New Features in Release 12.2(17d)SXB11a

These sections describe the new features in Release 12.2(17d)SXB11a, 17 Apr 2006:

- New Hardware Features in Release 12.2(17d)SXB11a, page 161
- New Software Features in Release 12.2(17d)SXB11a, page 161

New Hardware Features in Release 12.2(17d)SXB11a

None.

New Software Features in Release 12.2(17d)SXB11a

None.

New Features in Release 12.2(17d)SXB11

These sections describe the new features in Release 12.2(17d)SXB11, 17 Nov 2005:

- New Hardware Features in Release 12.2(17d)SXB11, page 161
- New Software Features in Release 12.2(17d)SXB11, page 161

New Hardware Features in Release 12.2(17d)SXB11

None.

New Software Features in Release 12.2(17d)SXB11

None.

New Features in Release 12.2(17d)SXB10

These sections describe the new features in Release 12.2(17d)SXB10, 16 Aug 2005:

- New Hardware Features in Release 12.2(17d)SXB10, page 161
- New Software Features in Release 12.2(17d)SXB10, page 161

New Hardware Features in Release 12.2(17d)SXB10

None.

New Software Features in Release 12.2(17d)SXB10

None.

New Features in Release 12.2(17d)SXB9

These sections describe the new features in Release 12.2(17d)SXB8, 21 Jul 2005:

- New Hardware Features in Release 12.2(17d)SXB9, page 162
- New Software Features in Release 12.2(17d)SXB9, page 162

New Hardware Features in Release 12.2(17d)SXB9

None.

New Software Features in Release 12.2(17d)SXB9

None.

New Features in Release 12.2(17d)SXB8

These sections describe the new features in Release 12.2(17d)SXB8, 02 May 2005:

- New Hardware Features in Release 12.2(17d)SXB8, page 162
- New Software Features in Release 12.2(17d)SXB8, page 162

New Hardware Features in Release 12.2(17d)SXB8

None.

New Software Features in Release 12.2(17d)SXB8

None.

New Features in Release 12.2(17d)SXB7

These sections describe the new features in Release 12.2(17d)SXB7, 01 Mar 2005:

- New Hardware Features in Release 12.2(17d)SXB7, page 162
- New Software Features in Release 12.2(17d)SXB7, page 162

New Hardware Features in Release 12.2(17d)SXB7

- WebVPN Services Module (WS-SVC-WEBVPN-K9; not supported with Supervisor Engine 2)—See this publication:

  http://www.cisco.com/en/US/products/hw/switches/ps708/prod_release_notes_list.html#anchor24

New Software Features in Release 12.2(17d)SXB7

None.

New Features in Release 12.2(17d)SXB6

These sections describe the new features in Release 12.2(17d)SXB6, 21 Dec 2004:

- New Hardware Features in Release 12.2(17d)SXB6, page 163
- New Software Features in Release 12.2(17d)SXB6, page 163

New Hardware Features in Release 12.2(17d)SXB6

- Distributed Forwarding Card 3BXL (DFC3BXL; WS-F6700-DFC3BXL) for use on CEF720 modules—See the "Distributed and Centralized Forwarding Cards" section on page 45.
- Distributed Forwarding Card 3B (DFC3B; WS-F6700-DFC3B) for use on CEF720 modules—See the "Distributed and Centralized Forwarding Cards" section on page 45.

New Software Features in Release 12.2(17d)SXB6

None.

New Features in Release 12.2(17d)SXB5

These sections describe the new features in Release 12.2(17d)SXB5, 01 Nov 2004:

- New Hardware Features in Release 12.2(17d)SXB5, page 163
- New Software Features in Release 12.2(17d)SXB5, page 163

New Hardware Features in Release 12.2(17d)SXB5

None.

New Software Features in Release 12.2(17d)SXB5

None.

New Features in Release 12.2(17d)SXB4

These sections describe the new features in Release 12.2(17d)SXB4, 07 Sep 2004:

- New Hardware Features in Release 12.2(17d)SXB4, page 163
- New Software Features in Release 12.2(17d)SXB4, page 163

New Hardware Features in Release 12.2(17d)SXB4

None.

New Software Features in Release 12.2(17d)SXB4

None.

New Features in Release 12.2(17d)SXB3

These sections describe the new features in Release 12.2(17d)SXB3, 17 Aug 2004:

- New Hardware Features in Release 12.2(17d)SXB3, page 164
- New Software Features in Release 12.2(17d)SXB3, page 164

New Hardware Features in Release 12.2(17d)SXB3

None.

New Software Features in Release 12.2(17d)SXB3

- You can use the **set ip dscp** and **set ip precedence** policy map class commands on non-IP traffic to mark the internal DSCP value, which is the basis of the egress Layer 2 CoS value. (CSCee56918)

New Features in Release 12.2(17d)SXB2

These sections describe the new features in Release 12.2(17d)SXB2, 21 Jul 2004:

- New Hardware Features in Release 12.2(17d)SXB2, page 164
- New Software Features in Release 12.2(17d)SXB2, page 164

New Hardware Features in Release 12.2(17d)SXB2

None.

New Software Features in Release 12.2(17d)SXB2

- Initial support for the **mls rate-limit multicast non-rpf** command. (CSCee95301)
- Initial support for the **mls ip cef load-sharing** [**full**] [**simple** | **optimized**] command. (CSCed74512)

New Features in Release 12.2(17d)SXB1

These sections describe the new features in Release 12.2(17d)SXB1, 01 Jun 2004:

- New Hardware Features in Release 12.2(17d)SXB1, page 164
- New Software Features in Release 12.2(17d)SXB1, page 165

New Hardware Features in Release 12.2(17d)SXB1

Note Release 12.2(17d)SXB1 and later releases do not support XENPAK-10GB-ER units with part number 800-24557-01, as described in this external field notice (CSCee47030):

http://www.cisco.com/en/US/ts/fn/200/fn29736.html

- WS-SUP720-3B Supervisor Engine 720 with Policy Feature Card 3B (PFC3B)—See the "Supervisor Engines" section on page 34
- WS-F6K-PFC3B= Policy Feature Card 3BXL (PFC3B)—See the "Policy Feature Cards" section on page 41
- 1000BASE-ZX GBIC (GLC-ZX-SM)
- 10GBASE-CX4 XENPAK Module for CX4 (copper) cable (XENPAK-10GB-CX4)

New Software Features in Release 12.2(17d)SXB1

- GGSN-SLB Messaging (supported only with Supervisor Engine 2)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/slbsxb2.html
- Initial support for the **mls netflow usage notify** global configuration mode command to configure NetFlow table usage monitoring. (CSCdz64998)
- Initial support in the **show mls statistics** command for display of the approximate Layer 2 switching rate in packets-per-second. (CSCee28215; see resolved caveat CSCee92338)
- Distributed LFI (dLFI) and distributed QoS (dQoS) over Leased Lines on FlexWAN module interfaces—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/qos_latjit/configuration/15-mt/qos-mlppp-fr.html

New Features in Release 12.2(17d)SXB

These sections describe the new features in Release 12.2(17d)SXB, 05 Mar 2004:

- New Hardware Features in Release 12.2(17d)SXB, page 165
- New Software Features in Release 12.2(17d)SXB, page 167

New Hardware Features in Release 12.2(17d)SXB

- 48-port Gigabit Ethernet SFP switching module (WS-X6748-SFP; supported only with Supervisor Engine 720)
- IEEE 802.3af PoE daughtercard (WS-F6K-GE48-AF, WS-F6K-48-AF)
- Supervisor Engine 2, PFC2, and MSFC2
  - WS-X6K-S2U-MSFC2
  - WS-X6K-S2-MSFC2 with upgraded memory

  See the "Supported Hardware" section on page 33 for information about the hardware supported with Supervisor Engine 2.
- Distributed Forwarding Card (DFC; WS-F6K-DFC); requires Switch Fabric Module; supported only with Supervisor Engine 2
- The Switch Fabric Module (SFM; WS-C6500-SFM); does not support 13-slot chassis; supported only with Supervisor Engine 2
- WS-X6500-SFM 2 Switch Fabric Module version 2 (SFM2); supports all chassis; supported only with Supervisor Engine 2
- Persistent Storage Device (PSD) support with Supervisor Engine 2:
  - WS-SVC-PSD-1
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 32
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/switches/ps708/prod_release_notes_list.html#anchor21

- Multi-Processor WAN Application Module (MWAM) support with Supervisor Engine 2:
  - WS-SVC-MWAM-1
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 32
  - See this publication for more information:

    http://www.cisco.com/en/US/docs/wireless/pdsn/12.28zb/mwan_install_config/mwamhwrn.html
- Content Services Gateway (CSG) support with Supervisor Engine 2:
  - WS-SVC-CSG-1
  - Also supported with Supervisor Engine 720
  - See this publication for more information:

    http://www.cisco.com/en/US/products/sw/wirelssw/ps779/tsd_products_support_series_home.html
- Firewall Services module support with Supervisor Engine 2:
  - WS-SVC-FWM-1-K9
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 32
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/modules/ps2706/ps4452/tsd_products_support_model_home.html
- Network Analysis Module support with Supervisor Engine 2:
  - WS-SVC-NAM-1 and WS-SVC-NAM-2
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 32
  - See this publication for more information:

    http://www.cisco.com/en/US/products/sw/cscowork/ps5401/prod_release_notes_list.html
- Intrusion Detection System Module 2 support with Supervisor Engine 2:
  - WS-SVC-IDSM2-K9
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 32
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/modules/ps2706/ps5058/tsd_products_support_model_home.html
- Content Switching Module (CSM) support with Supervisor Engine 2:
  - WS-X6066-SLB-APC
  - Also supported with Supervisor Engine 720
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/modules/ps2706/ps780/tsd_products_support_model_home.html

- Secure Sockets Layer (SSL) Services Module support with Supervisor Engine 2:
  - WS-SVC-SSL-1
  - Also supported with Supervisor Engine 720
  - Also supported with Supervisor Engine 32
  - See this publication for more information:

    http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/ssl/2.1/release/notes/OL_5277.html

New Software Features in Release 12.2(17d)SXB

- Secure Shell SSH Version 2 Client Support—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_ssh/configuration/12-2sx/sec-secure-shell-v2.html
- Generic Online Diagnostics (GOLD) for Supervisor Engine 2—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/diags.html
- Enhanced support for interface link status messages (CSCeb06765). See the following publication for more information:

  http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-l1.html#GUID-54AC5D19-D058-4DF0-BB6E-380E0684D643
- Support for the **mls qos trust** [**dscp** | **ip-precedence** | **cos**] command on WS-X6148-RJ-45, WS-X6148-RJ-45V, WS-X6148-RJ-21, and WS-X6148-RJ-21V switching modules. (CSCec30649)
- VACL capture on LAN and WAN ports—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/vacl.html

  Note VACL capture is not supported on WS-X6708-10GE ports.
- Hardware-supported counters for hardware-supported ACLs, displayed by the **show tcam interface** command (supported only in PFC3BXL or PFC3B mode). See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-s6.html#GUID-1D17939B-1C8F-422C-83CE-64B096DAD13D
- Optimized ACL logging (supported only with PFC3)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/acl.html
- Release 12.2(17d)SXB provides initial Release 12.2SX support for Supervisor Engine 2. Support for Supervisor Engine 2 in Release 12.2SX has all the Supervisor Engine 2 features supported by Release 12.1(20)E, including these:
  - Web Cache Control Protocol (WCCP) support with Supervisor Engine 2—See this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp/configuration/12-2sx/iap-wccp.html
  - Cisco IOS server load balancing (SLB) support with Supervisor Engine 2—See this publication:

    http://www.cisco.com/en/US/docs/ios/12_2sx/feature/guide/slb17sxb.html

Note Web Cache Control Protocol (WCCP) Layer 2 PFC redirection is supported with Cisco IOS SLB. Other WCCP configurations are not compatible with Cisco IOS SLB.

  - Network-Based Application Recognition (NBAR) for LAN ports; supported only with Supervisor Engine 2—See this publication:

    http://www.cisco.com/en/US/docs/ios/12_4t/qos/configuration/guide/qsnbar1.html

  - Unknown unicast flood protection (UUFP; supported only with Supervisor Engine 2)—See the **mac-address-table unicast-flood** command at this URL:

    http://www.cisco.com/en/US/docs/ios/lanswitch/command/reference/lsw_m1.html#mac-address-table_unicast-flood

- Release 12.2(17d)SXB provides initial support with Supervisor Engine 2 for these features in software. These features are already supported with Supervisor Engine 720 in hardware:
  - IPv6 unicast traffic on LAN and WAN interfaces—See this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/config_library/15-sy/ipv6-15-sy-library.html

  - Bidirectional Protocol Independent Multicast (PIM)—See this publication:

    http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/mcastv4.html

- Release 12.2(17d)SXB provides initial support with Supervisor Engine 2 for these features. These features are already supported with Supervisor Engine 720:
  - Gateway Load Balancing Protocol (GLBP)—See this publication:

    http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fs_glbp2.html

  - Interior Border Gateway Protocol (IBGP) multipath—See this publication:

    http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsbgpls.html

  - Virtual Router Redundancy Protocol (VRRP)—See this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp_fhrp/configuration/12-2sx/fhp-vrrp.html

  - Distributed Multilink Frame Relay (FRF.16)—See this publication:

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

  - MPLS VPN—Inter-AS—IPv4 BGP Label Distribution—See this publication:

    http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsiaslbl.html

  - Virtual Private LAN Services (VPLS) on the Optical Services Modules—See this publication:

    http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Virtual_Private_LAN_Services_on_the_Optical_Services_Modules

  - Any Transport over MPLS (AToM) features:

    —Supported on WAN ports

    —Ethernet over MPLS (EoMPLS)

    —Frame Relay over MPLS (FRoMPLS)

    —ATM Single Cell Relay over MPLS-VC Mode (CRoMPLS)

    —ATM AAL5 over MPLS (AAL5oMPLS)

    See this publication:

http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Any_Transport_over_MPLS

  - TDR cable diagnostics—See "TDR cable diagnostics" in the "New Software Features in Release 12.2(17a)SX" section on page 178.

- ATM Cell Loss Priority (CLP) Setting on FlexWAN module ATM interfaces—See this publication:

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

- Support for these CiscoView Device Managers:
  - CiscoView Device Manager for Cisco Catalyst 6500 Series Switch 1.1 (CVDM-C6500)

    CVDM-C6500 resides in the switch and manages several Layer 2 and Layer 3 features for a single chassis. It is a task-based tool that eases the initial setup and deployment of end-to-end services across modules by offering configuration templates based on recommended practices.
  - CiscoView Device Manager for Cisco Catalyst 6500 Series SSL SM 1.1 (CVDM-SSLSM)

    CVDM-SSLSM enables users to easily configure Secure Socket Layer (SSL) services on their SSL services module. It is a task-based tool that allows users to take advantage of the versatility of their SSL services module. It offers configuration wizards based on best practices in tasks such as setting up Trustpoints and proxy services.
  - CiscoView Device Manager for Cisco Content Switching Module 1.1 (CVDM-CSM)

    CVDM-CSM enables users to easily configure content load-balancing services on their CSMs. It is a task-based tool that allows users to control the versatility of their CSM by offering configuration based on recommended practices in tasks, such as setting up virtual servers, creating server farms, and applying advanced policies.

  To access all CiscoView Device Manager documentation, go to this URL:

  http://www.cisco.com/en/US/products/sw/cscowork/ps4565/index.html

New Features in Release 12.2(17b)SXA2

These sections describe the new features in Release 12.2(17b)SXA2, 22 Apr 2004:

- New Hardware Features in Release 12.2(17b)SXA2, page 169
- New Software Features in Release 12.2(17b)SXA2, page 169

New Hardware Features in Release 12.2(17b)SXA2

None.

New Software Features in Release 12.2(17b)SXA2

None.

New Features in Release 12.2(17b)SXA

These sections describe the new features in Release 12.2(17b)SXA, 31 Dec 2003:

- New Hardware Features in Release 12.2(17b)SXA, page 170
- New Software Features in Release 12.2(17b)SXA, page 170

New Hardware Features in Release 12.2(17b)SXA

- WS-SUP720-3BXL Supervisor Engine 720-3BXL—see the "Supervisor Engines" section on page 34
- WS-F6K-PFC3BXL Policy Feature Card 3BXL (PFC3BXL)—See the "Policy Feature Cards" section on page 41
- Optical Service Modules (OSMs; see the "Optical Services Modules (OSMs)" section on page 80)
- WS-X6582-2PA Enhanced FlexWAN module—See the "FlexWAN and Enhanced FlexWAN Modules" section on page 89
- 2-port Packet-over-SONET OC-3c/STM-1 Port Adapter (PA-POS-2OC3)
- IPsec VPN Acceleration services module (WS-SVC-IPSEC-1)
- To avoid reloads with software releases where caveat CSCed17605 is not resolved (CSCed17605 is resolved in Release 12.2(17d)SXB and later releases), do not configure the single router mode with stateful switchover (SRM with SSO) redundancy mode with a WS-SVC-IPSEC-1 module installed. In software releases where caveat CSCed17605 is not resolved, the WS-SVC-IPSEC-1 module supports only RPR and RPR+ redundancy modes.

New Software Features in Release 12.2(17b)SXA

Note

- With a PFC3BXL or PFC3B functioning in PFC3A mode, there is no support for features that require the PFC3BXL (see the "Policy Feature Cards" section on page 41).
- In a system with a PFC3BXL or PFC3B, DFC3A modules are not recognized if inserted while the system is online.
- In a system with a PFC3BXL or PFC3B, after a reboot, any DFC3A modules are active, but the system functions in PFC3A mode and does not support the PCF3BXL or PFC3B mode features.

- BGP Policy Accounting—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsbgppa.html

- Support for these CiscoView Device Managers:
  - CiscoView Device Manager for Cisco Catalyst 6500 Series Switch 1.0 and 1.1 (CVDM-C6500)

    CVDM-C6500 resides in the switch and manages several Layer 2 and Layer 3 features for a single chassis. It is a task-based tool that eases the initial setup and deployment of end-to-end services across modules by offering configuration templates based on recommended practices.
  - CiscoView Device Manager for Cisco Catalyst 6500 Series SSL SM 1.0 and 1.1 (CVDM-SSLSM)

    CVDM-SSLSM enables users to easily configure Secure Socket Layer (SSL) services on their SSL services module. It is a task-based tool that allows users to take advantage of the versatility of their SSL services module. It offers configuration wizards based on best practices in tasks such as setting up Trustpoints and proxy services.
  - CiscoView Device Manager for Cisco Content Switching Module 1.0 and 1.1 (CVDM-CSM)

    CVDM-CSM enables users to easily configure content load-balancing services on their CSMs. It is a task-based tool that allows users to control the versatility of their CSM by offering configuration based on recommended practices in tasks, such as setting up virtual servers, creating server farms, and applying advanced policies.

To access all CiscoView Device Manager documentation, go to this URL:

http://www.cisco.com/en/US/products/sw/cscowork/ps4565/index.html

- Cisco IP Phone support enhancements:
  - Support for a high-powered phone to negotiate a low-power mode (dimmed screen) when powered by a pre-standard Cisco PoE daughtercard.
  - Support for a high-powered phone to negotiate a high-power mode (full screen brightness) when powered by a IEEE 802.3af Cisco PoE daughtercard.
- TDR cable diagnostics—See "TDR cable diagnostics" in the "New Software Features in Release 12.2(17a)SX" section on page 178.
- Support for more than 1 Gbps of traffic per EtherChannel on the WS-X6548-GE-TX and WS-X6548V-GE-TX switching modules.
- Hardware support for Network Address Translation (NAT) and Port Address Translation (PAT) of UDP traffic (supported only in PFC3BXL or PFC3B mode).
- Support for PFC QoS features on tunnels (supported only in PFC3BXL or PFC3B mode).
- Support for per-VLAN and CoS-based QoS filtering in MAC ACLs (supported only in PFC3BXL or PFC3B mode).
- Population of the NDE Layer 4 source port field with the ICMP type and code values (supported only in PFC3BXL or PFC3B mode).
- Hardware switching for ICMP traffic when Cisco IOS reflexive ACLs are configured (supported only in PFC3BXL or PFC3B mode). (CSCeb20666)
- VLAN translation—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/vlans.html
- Received ToS byte preservation—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html
- Ingress CoS mutation on IEEE 802.1Q tunnel ports—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html
- Single router mode with stateful switchover (SRM with SSO) redundancy mode for unicast traffic.

Note

- All releases that support SRM with SSO have been deferred.
- Release 12.2(18)SXD and later releases do not support SRM with SSO.

- Release 12.2(17b)SXA, rebuilds of Release 12.2(17b)SXA, Release 12.2(17d)SXB, and rebuilds of Release 12.2(17d)SXB support SRM with SSO on Supervisor Engine 720.
- SRM with SSO is not supported on Supervisor Engine 2 in any release.
- SRM with SSO redundancy mode does not support stateful switchover for multicast traffic. When a switchover occurs, all multicast hardware switching entries are removed and are then recreated and reinstalled in the hardware by the newly active MSFC.
- SRM with SSO redundancy mode does not support MPLS. If you configure MPLS, use the RPR or RPR+ redundancy mode.
- SRM with SSO redundancy mode does not support the IPsec VPN Acceleration services module (WS-SVC-IPSEC-1) in software releases where caveat CSCed17605 is not resolved (CSCed17605 is resolved in Release 12.2(17d)SXB and later releases).
- The following modules do not maintain state when an SRM with SSO redundancy mode switchover occurs:
  - IPsec VPN Acceleration services module (WS-SVC-IPSEC-1)
  - WS-X6066-SLB-APC (CSM)
  - WS-SVC-FWM-1-K9 firewall services module
  - WS-SVC-SSL-1 secure sockets layer (SSL) services module

- RFC-1483 Bridging on FlexWAN—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/atm.html
- On WAN ports, VRF-lite with IPv4 forwarding between VRFs interfaces, IPv4 ACLs, and IPv4 HSRP—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Configuring_MPLS

  Note Multi-VRF for CE Routers (VRF Lite) with the PFC3 supports multi-VRF CE functionality with EIGRP (Release 12.2(18)SXD and later releases), OSPF, BGP and RIPv2 routing protocols running on a per VRF basis. Static routes are also supported. Also supported on LAN ports (Release 12.2(18)SXD and later releases).
- Virtual Private LAN Services (VPLS) on the Optical Services Modules (supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Virtual_Private_LAN_Services_on_the_Optical_Services_Modules

Note These redundancy modes support MultiProtocol Label Switching (MPLS):

- Route Processor Redundancy (RPR) with:
  - Release 12.2(17b)SXA and rebuilds
  - Release 12.2(17d)SXB and rebuilds
- RPR+ with Release 12.2(18)SXD and rebuilds
- In Release 12.2(18)SXD and rebuilds, MPLS can coexist with NSF with SSO redundancy, but there is no support for stateful MPLS switchover.

- MPLS Basic, including Provider (P) and Provider Edge (PE) functionality (MPLS; supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/pfc3mpls.html
- MPLS Label Distribution Protocol (LDP; supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Configuring_MPLS
- MPLS Virtual Private Networks (MPLS VPN; supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsmvpns.html
- MPLS VPN Carrier Supporting Carrier (supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fs2scsc.html

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fscsclbl.html
- MPLS VPN—Inter-AS—IPv4 BGP Label Distribution (supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsiaslbl.html
- MPLS VPN ID (supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/vpnid2.html
- Any Transport over MPLS (AToM) Features:
  - Not supported with PFC3A
  - Supported on WAN ports
  - Ethernet over MPLS (EoMPLS)
  - Frame Relay over MPLS (FRoMPLS)
  - ATM Single Cell Relay over MPLS-VC Mode (CRoMPLS)
  - ATM AAL5 over MPLS (AAL5oMPLS)

  See this publication:

  http://www.cisco.com/en/US/docs/routers/7600/install_config/12.2SX_OSM_config/mpls.html#Any_Transport_over_MPLS

- MPLS VPN—OSPF and Sham-Link Support (supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/ios/iproute_ospf/configuration/guide/iro_sham_link.html
- Cisco IOS IPv6 Provider Edge Router (6PE) over MPLS (supported only in PFC3BXL or PFC3B mode)—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/configuration/12-2sy/ip6-over-mpls.html
- Distributed Multilink Frame Relay (FRF.16)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/dmfr.html
- ATM Virtual Circuit (VC) Bundling—See these publications:

  http://www.cisco.com/en/US/docs/ios/12_2/qos/configuration/guide/qcfipaov_ps1835_TSD_Products_Configuration_Guide_Chapter.html

  http://www.cisco.com/en/US/docs/ios/12_0s/feature/guide/fsmu26s.html
- IPv6 Support on WAN Interfaces—See this publication:

  http://www.cisco.com/en/US/tech/tk872/tech_white_papers_list.html
- OSPF Shortest Path First Throttling—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fs_spftrl.html
- Gateway Load Balancing Protocol—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fs_glbp2.html

New Features in Release 12.2(17a)SX4

These sections describe the new features in Release 12.2(17a)SX4, 23 Apr 2004:

- New Hardware Features in Release 12.2(17a)SX4, page 174
- New Software Features in Release 12.2(17a)SX4, page 174

New Hardware Features in Release 12.2(17a)SX4

None.

New Software Features in Release 12.2(17a)SX4

None.

New Features in Release 12.2(17a)SX3

These sections describe the new features in Release 12.2(17a)SX3, 05 Mar 2004:

- New Hardware Features in Release 12.2(17a)SX3, page 175
- New Software Features in Release 12.2(17a)SX3, page 175

New Hardware Features in Release 12.2(17a)SX3

None.

New Software Features in Release 12.2(17a)SX3

None.

New Features in Release 12.2(17a)SX2

These sections describe the new features in Release 12.2(17a)SX2, 29 Jan 2004:

- New Hardware Features in Release 12.2(17a)SX2, page 175
- New Software Features in Release 12.2(17a)SX2, page 175

New Hardware Features in Release 12.2(17a)SX2

None.

New Software Features in Release 12.2(17a)SX2

None.

New Features in Release 12.2(17a)SX1

These sections describe the new features in Release 12.2(17a)SX1, 30 Oct 2003:

- New Hardware Features in Release 12.2(17a)SX1, page 175
- New Software Features in Release 12.2(17a)SX1, page 175

New Hardware Features in Release 12.2(17a)SX1

- 10GBASE-SR Serial 850-nm short-reach XENPAK (XENPAK-10GB-SR; see the "10-Gigabit Ethernet Switching Modules" section on page 55)
- 10GBASE-LX4 Serial 1310-nm multimode fiber (MMF) XENPAK (XENPAK-10GB-LX4; see the "10-Gigabit Ethernet Switching Modules" section on page 55)

New Software Features in Release 12.2(17a)SX1

- Distributed network-based application recognition (dNBAR) on FlexWAN module interfaces—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_4t/qos/configuration/guide/qsnbar1.html
- Hardware support for these basic IPv6 functions:
  - IPv6 standard access control lists (ACLs)
  - IPv6 extended ACLs
  - Reflexive ACLs

  - Manually configured v6 tunnels
  - ISATAP (ISATAP with 6-to-4 prefix is not supported in hardware)
  - Automatically configured IPv4 compatible tunnels
  - 6-to-4 tunnel
  - IPv6 over IPV4 IP in IP tunnels
- Software support for these basic IPv6 functions:
  - IPv6 addressing architecture
  - ICMPv6
  - Neighbor Discovery
  - Static ND cache entry
  - IPv6 stateless autoconfiguration
  - ICMPv6 Redirect
  - MTU path Discovery for IPv6
  - IPv6 ICMP rate limiting
  - IPv6 over IPV4 GRE tunnels
- Software support for IPv6 routing:
  - Static routes within IPv6
  - RIPng
  - MP-BGP4
  - OSPFv3
  - ISIS
  - Configuring an IPv6 Multiprotocol BGP Peer using a link local address
  - IPv6 MP-BGP distance command
- Switching support for IPv6:
  - Process
  - CEFv6
  - Distributed CEFv6
- Software support for these IPv6 applications:
  - Ping
  - Traceroute
  - Telnet
  - TFTP (client only)
  - FTP
  - SSH over IPv6
  - DNS
  - HTTP server

  For configuration information, refer to this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/ipv6/config_library/15-sy/ipv6-15-sy-library.html

For command reference information, refer to this publication:

http://www.cisco.com/en/US/docs/ios/ipv6/command/reference/ipv6_book.html

New Features in Release 12.2(17a)SX

These sections describe the new features in Release 12.2(17a)SX, 06 Oct 2003:

- New Hardware Features in Release 12.2(17a)SX, page 177
- New Software Features in Release 12.2(17a)SX, page 178

New Hardware Features in Release 12.2(17a)SX

- 48-port 10/100/1000 Ethernet RJ-45 switching module (WS-X6748-GE-TX)
- 24-port Gigabit Ethernet SFP switching module (WS-X6724-SFP)
- 4-port 10-Gigabit Ethernet XENPAK switching module (WS-X6704-10GE)
- XENPAK-10GB-LR 10GBASE-LR Serial 1310-nm long-reach XENPAK
- XENPAK-10GB-LR+ 10GBASE-LR Serial 1310-nm long-reach XENPAK
- XENPAK-10GB-ER 10GBASE-ER Serial 1550-nm extended-reach XENPAK
- 1000BASE-DWDM GBIC (DWDM-GBIC)
- 1000BASE-CWDM SFP (CWDM-SFP)
- 1000BASE-LX/LH SFP (GLC-LH-SM)
- 1000BASE-T SFP (GLC-T)
- 48-port 10/100/1000 Mbps switching module (WS-X6548-GE-TX and WS-X6548V-GE-TX; WS-X6548V-GE-TX has WS-F6K-VPWR-GE).

Note The WS-X6548-GE-TX and WS-X6548V-GE-TX do not support the following:
—With Release 12.2(17a)SX and Release 12.2(17a)SX1, more than 1 Gbps of traffic per EtherChannel
—WS-F6K-DFC3A
—ISL trunking
—Jumbo frames
—802.1Q tunneling
—Traffic storm control

- 48-port 10/100/1000 Mbps switching module (WS-X6148-GE-TX and WS-X6148V-GE-TX; WS-X6148V-GE-TX has WS-F6K-VPWR-GE).

Note The WS-X6148-GE-TX and WS-X6148V-GE-TX do not support the following:
—More than 1 Gbps of traffic per EtherChannel
—WS-F6K-DFC3A
—ISL trunking
—Jumbo frames
—802.1Q tunneling
—Traffic storm control

- PWR-1400-AC 1,400 W AC power supply

New Software Features in Release 12.2(17a)SX

- TDR cable diagnostics—TDR is supported on these switching modules:
  - In Release 12.2(17a)SX and later releases:
    —WS-X6148-GE-TX
    —WS-X6148V-GE-TX
    —WS-X6148-GE-45AF
    —WS-X6548-GE-TX
    —WS-X6548V-GE-TX
    —WS-X6548-GE-45AF
  - In Release 12.2(18)SXE and later releases, WS-X6748-GE-TX
  - In Release 12.2(18)SXF and later releases:
    —WS-X6148A-GE-TX
    —WS-X6148A-GE-45AF
    —WS-X6148A-RJ-45
    —WS-X6148A-45AF

  Note TDR can test cables up to a maximum length of 115 meters.

  See these publications:
  - The “Checking the Cable Status Using the TDR” section of the “Configuring Interfaces” chapter at this URL:

    http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/intrface.html
  - The **test cable-diagnostics** command in the command reference at this URL:

    http://www.cisco.com/en/US/docs/ios-xml/ios/fundamentals/command/test_cable-diagnostics_through_xmodem.html#GUID-9EC19973-42B5-434D-9872-6A089E38441E
- Layer 2 protocol tunneling global threshold—See the **l2protocol-tunnel global drop-threshold** command in the command reference at this URL:

  http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-l1.html#GUID-ED398440-82A6-4553-906A-4EDE90143CD8
- Custom IEEE 802.1Q Ethertypes:
  - Supported on these modules:

    —Supervisor engines
    —WS-X6516-GE-TX
    —WS-X6748-GE-TX
    —WS-X6748-SFP
    —WS-X6724-SFP
    —WS-X6704-10GE
    —WS-X6816-GBIC
    —WS-X6516A-GBIC
    —WS-X6516-GBIC

Note The WS-X6516A-GBIC and WS-X6516-GBIC modules apply a configured custom EtherType field value to all ports supported by each port ASIC (1 through 8 and 9 through 16).

  - See this publication:

    http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/layer2.html

- PIM Snooping—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/snooppim.html

- Secure Shell (SSH) Version 2 server support in k9 images—By default, the k9 images support both SSHv1 connections and SSHv2 connections. To restrict connections to either SSHv1 or SSHv2, enter the **ip ssh mode** [**v1** | **v2**] global configuration mode command. Except for the **v1** and **v2** keywords for the **ip ssh mode** command, you configure SSHv2 in the same way as SSHv1. See this publication for more information:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_ssh/configuration/12-2sx/sec-usr-ssh-12-2sx-book.html

  For information about SSHv1 client support, refer to the following publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/sec_usr_ssh/configuration/12-2sx/sec-usr-ssh-12-2sx-book.html

- Support for these CiscoView Device Managers:
  - CiscoView Device Manager for Cisco Catalyst 6500 Series Switch 1.0 and 1.1 (CVDM-C6500)

    CVDM-C6500 resides in the switch and manages several Layer 2 and Layer 3 features for a single chassis. It is a task-based tool that eases the initial setup and deployment of end-to-end services across modules by offering configuration templates based on recommended practices.
  - CiscoView Device Manager for Cisco Catalyst 6500 Series SSL SM 1.0 and 1.1 (CVDM-SSLSM)

    CVDM-SSLSM enables users to easily configure Secure Socket Layer (SSL) services on their SSL services module. It is a task-based tool that allows users to take advantage of the versatility of their SSL services module. It offers configuration wizards based on best practices in tasks such as setting up Trustpoints and proxy services.
  - CiscoView Device Manager for Cisco Content Switching Module 1.0 and 1.1 (CVDM-CSM)

    CVDM-CSM enables users to easily configure content load-balancing services on their CSMs. It is a task-based tool that allows users to control the versatility of their CSM by offering configuration based on recommended practices in tasks, such as setting up virtual servers, creating server farms, and applying advanced policies.

  To access all CiscoView Device Manager documentation, go to this URL:

  http://www.cisco.com/en/US/products/sw/cscowork/ps4565/index.html

New Features in Release 12.2(14)SX1

These sections describe the new features in Release 12.2(14)SX1, 28 May 2003:

- New Hardware Features in Release 12.2(14)SX1, page 180

- New Software Features in Release 12.2(14)SX1, page 181

New Hardware Features in Release 12.2(14)SX1

- Content Switching Module (CSM) support with Supervisor Engine 720:
  - WS-X6066-SLB-APC
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/modules/ps2706/ps780/tsd_products_support_model_home.html

  Note Support with Supervisor Engine 720 requires CSM module software release 3.1(4) or later.

- Intrusion Detection System Module 2 support with Supervisor Engine 720:
  - WS-SVC-IDSM2-K9
  - Also supported with Supervisor Engine 32
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/modules/ps2706/ps5058/tsd_products_support_model_home.html
- Firewall Services module support with Supervisor Engine 720:
  - WS-SVC-FWM-1-K9
  - Also supported with Supervisor Engine 32
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/hw/modules/ps2706/ps4452/tsd_products_support_model_home.html
- Network Analysis Module support with Supervisor Engine 720:
  - WS-SVC-NAM-1 and WS-SVC-NAM-2
  - Also supported with Supervisor Engine 32
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/products/sw/cscowork/ps5401/prod_release_notes_list.html
- Secure Sockets Layer (SSL) Services Module support with Supervisor Engine 720:
  - WS-SVC-SSL-1
  - Also supported with Supervisor Engine 32
  - Also supported with Supervisor Engine 2
  - See this publication for more information:

    http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/ssl/2.1/release/notes/OL_5277.html

New Software Features in Release 12.2(14)SX1

- Half-Bridging on FlexWAN ATM interfaces (CSCin27157)
- RFC 1483 hardware bridging on FlexWAN (CSCea70308)
- VACL capture to support the WS-SVC-IDSM2-K9 Intrusion Detection System Module 2 and the WS-SVC-NAM-2 and WS-SVC-NAM-1 network analysis modules.

Note Caveat CSCec75140 prevents use of VACL capture on WAN ports in releases earlier than Release 12.2(17b)SXA. Caveat CSCec75140 is resolved in Release 12.2(17b)SXA.

- Support for embedded CiscoView—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/intro.html

- Support for these CiscoView Device Managers:
  - CiscoView Device Manager for Cisco Catalyst 6500 Series Switch 1.0 and 1.1 (CVDM-C6500)

    CVDM-C6500 resides in the switch and manages several Layer 2 and Layer 3 features for a single chassis. It is a task-based tool that eases the initial setup and deployment of end-to-end services across modules by offering configuration templates based on recommended practices.
  - CiscoView Device Manager for Cisco Catalyst 6500 Series SSL SM 1.0 and 1.1 (CVDM-SSLSM)

    CVDM-SSLSM enables users to easily configure Secure Socket Layer (SSL) services on their SSL services module. It is a task-based tool that allows users to take advantage of the versatility of their SSL services module. It offers configuration wizards based on best practices in tasks such as setting up Trustpoints and proxy services.
  - CiscoView Device Manager for Cisco Content Switching Module 1.0 and 1.1 (CVDM-CSM)

    CVDM-CSM enables users to easily configure content load-balancing services on their CSMs. It is a task-based tool that allows users to control the versatility of their CSM by offering configuration based on recommended practices in tasks, such as setting up virtual servers, creating server farms, and applying advanced policies.

  To access all CiscoView Device Manager documentation, go to this URL:

  http://www.cisco.com/en/US/products/sw/cscowork/ps4565/index.html

New Features in Release 12.2(14)SX

These sections describe the new features in Release 12.2(14)SX, 14 Apr 2003:

- New Hardware Features in Release 12.2(14)SX, page 182
- New Software Features in Release 12.2(14)SX, page 182

New Hardware Features in Release 12.2(14)SX

- WS-SUP720 Supervisor Engine 720—See the "Supervisor Engines" section on page 34
- Communication Media Module (WS-SVC-CMM)—See these publications:
  - Release 12.2(13)ZP3:

    http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/cmm/release/notes/OL_4847.html
  - Release 12.2(2)YK1:

    http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/cmm/release/notes/ol_3137.html
  - Release 12.2(13)ZC:

    http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/cmm/release/notes/OL_3732.html
- 1000BASE-SX SFP (GLC-SX-MM)
- Distributed Forwarding Card 3A (DFC3A; WS-F6K-DFC3A)—See the "Distributed and Centralized Forwarding Cards" section on page 45
- 16-port Gigabit Ethernet switching module (WS-X6516A-GBIC)
- FlexWAN port adapters:
  - 1-port ATM OC-3c/STM-1 multimode port adapter, enhanced (PA-A6-OC3MM)
  - 1-port ATM OC-3c/STM-1 single-mode (IR) port adapter, enhanced (PA-A6-OC3SMI)
  - 1-port ATM OC-3c/STM-1 single-mode (LR) port adapter, enhanced (PA-A6-OC3SML)
  - 1-port ATM DS3 port adapter, enhanced (PA-A6-T3)
  - 1-port ATM E3 port adapter, enhanced (PA-A6-E3)
- 4000 W DC-power supply (PWR-4000-DC)

New Software Features in Release 12.2(14)SX

- Generic Online Diagnostics (GOLD)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/diags.html
- Virtual Router Redundancy Protocol (VRRP)—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp_fhrp/configuration/12-2sx/fhp-vrrp.html
- Bidirectional Protocol Independent Multicast (PIM) in hardware—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/mcastv4.html
- Interior Border Gateway Protocol (iBGP) Multipath Load Sharing—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2s/feature/guide/fsbgpls.html

Note For MPLS support, see BGP Multipath Load Sharing for Both eBGP and iBGP in an MPLS-VPN.

- Internet Group Management Protocol Version 3 (IGMPv3) snooping—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/snooigmp.html

- User-based microflow policing—See the procedures in this publication for information about configuring microflow policing based on either source or destination addresses:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html

- Egress policing for LAN ports configured as Layer 3 interfaces and for VLAN interfaces—See the procedures in this publication for information about configuring the **service-policy output** command:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html

- Egress DSCP mutation—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html

- DSCP transparency (also called "Preserving the Received ToS Byte")—See the procedures in this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/qos.html

- Hardware-assisted NetFlow Aggregation—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/nde.html

- Hardware-assisted Multiple-path Unicast Reverse Path Forwarding (Unicast RPF)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/secure.html

- Hardware-assisted Network Address Translation (NAT) and Port Address Translation (PAT) for IPv4 unicast and multicast traffic—Note the following information about hardware-assisted NAT:
  - The PFC3A does not support NAT or PAT for UDP traffic.

    Note PFC3B and PFC3BXL modes support NAT and PAT for UDP traffic.

  - The PFC3 does not support NAT or PAT for multicast traffic.
  - The PFC3 does not support NAT or PAT configured with a route map that specifies length.
  - The PFC3 does not support NAT or PAT configured with a route map that specifies static translations.
  - When you configure NAT or PAT and NDE on an interface, the PFC3 sends all traffic in fragmented packets to the MSFC3 to be processed in software. (CSCdz51590)

  To configure NAT or PAT, refer to the Cisco IOS IP Configuration Guide, Release 12.2, "IP Addressing and Services," "Configuring IP Addressing," "Configuring Network Address Translation," at this URL:

  http://www.cisco.com/en/US/docs/ios/12_2/ip/configuration/guide/1cfipadr.html

  For information about configuring NAT or PAT with route maps, refer to this publication:

http://www.cisco.com/en/US/tech/tk648/tk361/technologies_q_and_a_item09186a00800e523b.shtml

To prevent a significant volume of NAT or PAT traffic from being sent to the MSFC, due to either a DoS attack or a misconfiguration, enter the **mls rate-limit unicast acl** {**ingress** | **egress**} command described in this publication:

http://www.cisco.com/en/US/docs/ios/security/command/reference/sec_m2.html#mls_rate-limit_unicast_acl

(CSCea23296)

- Hardware-assisted IP-in-IP tunneling and generic routing encapsulation (GRE) tunneling—The PFC3 and DFC3s support the following tunnel commands:
  - **tunnel destination**
  - **tunnel mode gre**
  - **tunnel mode ipip**
  - **tunnel source**
  - **tunnel ttl**
  - **tunnel tos**

  Other supported types of tunneling run in software on the MSFC3. The PFC3 does not provide hardware acceleration for tunnels configured with the **tunnel key** command.

  The **tunnel ttl** command (default 255) sets the TTL of encapsulated packets.

  The **tunnel tos** command, if present, sets the ToS byte of a packet when it is encapsulated. If the **tunnel tos** command is not present and QoS is not enabled, the ToS byte of a packet sets the ToS byte of the packet when it is encapsulated. If the **tunnel tos** command is not present and QoS is enabled, the ToS byte of a packet as modified by PFC QoS sets the ToS byte of the packet when it is encapsulated.

  To configure GRE Tunneling and IP in IP Tunneling, refer to these publications:

  http://www.cisco.com/en/US/docs/ios/12_2/interface/configuration/guide/icflogin.html

  http://www.cisco.com/en/US/docs/ios/12_2/interface/command/reference/irfshoip.html

  To configure the **tunnel tos** and **tunnel ttl** commands, refer to this publication:

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

  Note the following information about tunnels:

  - Each hardware-assisted tunnel must have a unique source address. Hardware-assisted tunnels cannot share a source address even if the destination addresses are different. Use secondary addresses on loopback interfaces or create multiple loopback interfaces. Failure to use unique source addresses may result in control plane failures when software path congestion occurs. (CSCdy72539)
  - Each tunnel interface uses one internal VLAN.
  - Each tunnel interface uses one additional router MAC address entry per router MAC address.
  - The PFC3A does not support any PFC QoS features on tunnel interfaces.
  - The PFC3B and PFC3BXL support PFC QoS features on tunnel interfaces.
  - In releases earlier than Release 12.2(18)SXE, the PFC3 does not support GRE tunnel encapsulation and de-encapsulation of multicast traffic.

  - The MSFC supports tunnels configured with egress features on the tunnel interface. Examples of egress features are output Cisco IOS ACLs, NAT and PAT (for inside to outside translation), TCP intercept, context-based access control (CBAC), and encryption.

- Hardware-assisted Cisco IOS Firewall Features—refer to this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/fw.html

Note For a complete listing of hardware-assisted features, refer to this publication:

http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/intro.html

- FlexWAN features:
  - Support for 4000 ATM VCs per port adapter on the following ATM port adapters:

    PA-A3-OC3MM

    PA-A3-OC3SMI

    PA-A3-OC3SML

    PA-A3-T3

    PA-A3-E3

    PA-A6-OC3MM

    PA-A6-OC3SMI

    PA-A6-OC3SML

    PA-A6-T3

    PA-A6-E3

  - Low Latency Queueing (LLQ) and Class-based Weighted Fair Queueing (CBWFQ) on MLPPP links—See this publication:

    http://www.cisco.com/en/US/docs/ios/12_2/qos/configuration/guide/fqos_c.html

  - Voice over Frame Relay (VoFR) FRF.11 and FRF.12—See this publication:

    http://www.cisco.com/en/US/docs/ios/12_2/voice/configuration/guide/vvfvofr.html

Note Because the Catalyst 6500 series switches and the Cisco 7600 series routers do not support voice modules, they can act only as a VoFR tandem switch when FRF.11 or FRF.12 is configured on the FlexWAN.

  - Link Fragmentation and Interleaving (LFI) for Frame Relay and ATM Virtual Circuits—See this publication:

    http://www.cisco.com/en/US/docs/ios-xml/ios/qos_latjit/configuration/15-mt/qos-mlppp-fr.html

  - RFC 1889 Compressed Real-Time Protocol (cRTP)—See this publication:

    http://www.cisco.com/en/US/docs/ios/12_2/qos/configuration/guide/qcfcrtp.html

Note cRTP is not supported on MLPPP bundled links.

Software Features from Earlier Releases

- Hardware-assisted TCP intercept—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/secure.html

- Hardware-assisted policy-based routing (PBR) for route-map sequences that use the **match ip address**, **set ip next-hop**, and **set ip default next-hop** PBR keywords.

  To configure PBR, refer to the *Cisco IOS Quality of Service Solutions Configuration Guide*, Release 12.2, "Classification," "Configuring Policy-Based Routing," at this URL:

  http://www.cisco.com/en/US/docs/ios/12_2/qos/configuration/guide/qcfpbr_ps1835_TSD_Products_Configuration_Guide_Chapter.html

  When configuring PBR, follow these guidelines and restrictions:

  - Releases earlier than Release 12.2(33)SXH use the syntax from Release 12.1, which supports **preempt** as a keyword for the **standby priority** command:

    http://www.cisco.com/en/US/docs/ios-xml/ios/ipapp_fhrp/command/fhp-s2.html#GUID-5A848994-88AD-4B7D-A046-3F20AFD1EF9E

  - The PFC provides hardware support for PBR configured on a tunnel interface.
  - The PFC does not provides hardware support for PBR configured with the **set ip next-hop** keywords if the next hop is a tunnel interface.
  - If the MSFC address falls within the range of a PBR ACL, traffic addressed to the MSFC is policy routed in hardware instead of being forwarded to the MSFC. To prevent policy routing of traffic addressed to the MSFC, configure PBR ACLs to deny traffic addressed to the MSFC. (CSCse86399)
  - Any options in Cisco IOS ACLs that provide filtering in a PBR route map that would cause flows to be sent to the MSFC3 to be switched in software are ignored. For example, logging is not supported in ACEs in Cisco IOS ACLs that provide filtering in PBR route maps.
  - PBR traffic through switching module ports where PBR is configured is routed in software if the switching module resets. (CSCee92191)

- Hardware support for directed broadcasts with the **mls ip directed-broadcast** command—See this publication:

  http://www.cisco.com/en/US/docs/ios-xml/ios/interface/command/ir-l2.html#GUID-C2BDF601-4096-470F-A2D8-CF2B35F4A3E8

- Cisco IP Phone Support—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/voip.html

- IEEE 802.1X Port-Based Authentication—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/dot1x.html

- Port Security—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/port_sec.html

- Remote SPAN—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/span.html

- MAC address-based traffic blocking—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/secure.html

- SNMP ifindex persistence—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/swcg.html

- Rapid-Per-VLAN-Spanning Tree (Rapid-PVST)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/spantree.html

- NDE—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/nde.html

- Route Processor Redundancy Plus (RPR+) redundancy—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/redund.html

- 4096 Layer 2 VLANs—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/vlans.html

  Note We recommend that you configure a combined total of no more than 2,000 Layer 3 VLAN interfaces and Layer 3 ports.

- IEEE 802.1Q tunneling—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/dot1qtnl.html

- IEEE 802.1Q protocol tunneling—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/dot1qtnl.html

- IEEE 802.1s, multiple spanning tree (MST)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/spantree.html

- IEEE 802.1w, rapid reconfiguration of spanning tree—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/spantree.html

- IEEE 802.3ad, link aggregation control protocol (LACP)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/channel.html

- PortFast BPDU filtering—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/stp_enha.html

- Traffic storm control—Prevents LAN ports from being disrupted by a broadcast, multicast, or unicast traffic storm on physical interfaces.
- Jumbo frames on all Ethernet ports except ports on the WS-X6548-GE-TX, WS-X6548V-GE-TX, WS-X6148-GE-TX, and WS-X6148V-GE-TX switching modules.

Caution The following switching modules support a maximum ingress frame size of 8092 bytes:

- WS-X6516-GE-TX when operating at 100 Mbps
- WS-X6148-RJ-45, WS-X6148-RJ-45V and WS-X6148-RJ21, WS-X6148-RJ21V
- WS-X6248-RJ-45 and WS-X6248-TEL
- WS-X6248A-RJ-45 and WS-X6248A-TEL
- WS-X6348-RJ-45, WS-X6348-RJ45V and WS-X6348-RJ21V

When jumbo frame support is configured, these modules drop ingress frames larger than 8092 bytes.

- Private VLANs—“Configuring Private VLANs”
- QoS Data Export—“Configuring QoS”
- VLAN Access Control Lists (VACLs)—“Configuring VLAN ACLs (VACLs)”
- VACL Deny Logging—“Configuring Network Security”
- Router-Port Group Management Protocol (RGMP)—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/rgmp.html

- Spanning tree PortFast, UplinkFast, and BackboneFast, and Root Guard Feature—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/stp_enha.html

- UniDirectional Link Detection—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/udld.html

- Layer 2 switch ports and VLAN trunks with the Dynamic Trunking Protocol (DTP), including support on Gigabit Ethernet ports for jumbo frames—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/layer2.html

- VLANs—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/vlans.html

- VLAN Trunk Protocol (VTP) and VTP domains—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/vtp.html

- EtherChannel—See this publication:

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

- Spanning Tree Protocol—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/spantree.html

- IGMP snooping and IGMP snooping querier—See this publication:

  http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/native/configuration/guide/snooigmp.html

- The ip local-proxy-arp command.

  Note To use the local proxy ARP feature, you must enable the IP proxy ARP feature. The IP proxy ARP feature is enabled by default. See the ip proxy-arp command documentation.

- Source-Specific Multicast with IGMPv3, IGMP v3lite, and URL Rendezvous Directory (URD)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2/ip/configuration/guide/1cfssm.html

- Data-link switching plus (DLSw+)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2/ibm/configuration/guide/bcfdlsw_ps1835_TSD_Products_Configuration_Guide_Chapter.html

- Standard Domain Naming System (DNS) support—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2/ip/configuration/guide/1cfipadr.html

- Dynamic Host Configuration Protocol (DHCP)—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2/ip/configuration/guide/1cfdhcp.html

- Boot Protocol (BOOTP) relay—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2/configfun/configuration/guide/fcf012.html

- Multiple-Hot Standby Routing Protocol—See this publication:

  http://www.cisco.com/en/US/docs/ios/12_2/ip/configuration/guide/1cfip.html

- Cisco Discovery Protocol (CDP); (refer to the “Configuring CDP” chapter)
- NetFlow Data Export (refer to the “Configuring NDE” chapter)
- Access control using several supported authentication methods (refer to the “Configuring the Supervisor Engine” chapter)
- Switched Port Analyzer (SPAN); (refer to the “Configuring SPAN” chapter)
- Redundant supervisor engines (refer to the “Configuring the Supervisor Engine” chapter)
- Quality of Service (QoS); (refer to the “Configuring QoS” chapter)
- Distributed MLPPP (dMLPPP) on FlexWAN module interfaces—See this publication:

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

  Note cRTP is not supported on dMLPPP bundled links.

- Inverse Multiplexing over ATM (IMA) on FlexWAN module interfaces—See this publication:

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

Unsupported Features and Commands

Note See also the "Supervisor Engine 32 Restrictions" section on page 38 and the "Cisco IOS Software Modularity Unsupported Features" section on page 14.

- Hardware—See the "Unsupported Hardware" section on page 114.
- These QoS interface commands are not supported on SPA interfaces:
  - **traffic shape**
  - **priority-group**
  - **custom-queue-list**
  - **tx-queue-limit**
  - **fair-queue**
  - **random-detect**
  - **rate-limit**
  - **tx-ring-limit**
  - **max-reserved-bandwidth**
- In Release 12.2(18)SXE and later releases, these QoS interface commands are no longer supported on FlexWAN and OSM interfaces:
  - **traffic shape**
  - **priority-group**
  - **custom-queue-list**
  - **tx-queue-limit**
- In Release 12.2(18)SXE and later releases, these QoS interface commands are no longer supported on OSM interfaces, but they are still supported on FlexWAN interfaces:
  - **fair-queue**
  - **random-detect**
  - **rate-limit**
  - **tx-ring-limit**
  - **max-reserved-bandwidth**
- Random Sampled NetFlow (**flow-sampler** commands)
- These features are not supported in Release 12.2(18)SXD and later releases:
  - Apollo Domain
  - AppleTalk EIGRP
  - Banyan Vines
  - Exterior Gateway Protocol (EGP)
  - HP Probe
  - IEEE 802.10 VLANs
  - IGRP

  - LAN Extension
  - Netware Asynchronous Services Interface (NASI)
  - Next Hop Resolution Protocol (NHRP) for IPX
  - Novell Link-State Protocol (NLSP)
  - Simple Multicast Routing Protocol (SMRP) for Appletalk
  - Xerox Network Systems (XNS)
  - Xremote
- Generic routing encapsulation (GRE) tunnel IP source and destination VRF membership (the **tunnel vrf** command). (CSCee39138)
- Warm Reload (CSCef06158)
- ARP Optimization (CSCef30539)
- Exterior Border Gateway Protocol (eBGP) multihop over CSC-PE interfaces (CSCea83165)
- Ability to accept ingress traffic on SPAN destination ports (Cisco IOS software equivalent of **set span ... inpkts enable**).
- Automatic QoS
- With PFC3:
  - Unknown unicast flood protection
  - Network-based application recognition (NBAR) for LAN interfaces
- Commands to globally disable EtherChannel or trunking
- **write tech-support** command
- Cisco IOS software equivalent of the **set port host** command
- Disable port startup option
- Clear counters per port or clear QoS statistics
- System warning and error counter enhancements implemented in Catalyst software release 6.1(1)
- Option for no VTP support
- Command to display the port MAC address
- Port security timer enhancement
- System warnings on port counters
- VLAN Management Policy Server (VMPS) client or server
- Cisco IOS MAC-layer access control lists (ACLs)
- Accelerated server load balancing (ASLB)
- Hot Standby Router Protocol (HSRP) between redundant supervisor engines (the redundant supervisor engine and MSFC are in standby mode—HSRP to external routers is supported)
- Multi-Instance Spanning Tree Protocol (MISTP); IEEE 802.1s MST is supported
- Common Open Policy Server (COPS)
- Except to support tunnels, Resource ReSerVation Protocol (RSVP)
- GARP VLAN Registration Protocol (GVRP)
- GARP Multicast Registration Protocol (GMRP)

- Commands present in the CLI, but not supported:
  - ipv6 cef accounting
  - ip cef accounting
  - module provision