



Product Bulletin No. 364872

## Cisco IOS Software Release 12.2(31)SGA for Cisco Catalyst 4500 Series Supervisor Engines

This product bulletin describes the hardware and software features supported by Cisco IOS® Software Release 12.2(31)SGA for the Cisco® Catalyst® 4500 Series Supervisor Engine II-Plus, II-Plus-TS, II-Plus-10GE, IV, V, and V-10GE. The Cisco Catalyst 4500 Series Supervisor Engine III is not supported in this software release.

### KEY RELEASE MESSAGE

Cisco is pleased to announce the 12.2(31)SGA IOS software release, for all shipping Catalyst 4500 Series IOS Supervisor engines. With the introduction of the In-Service Software Upgrade (ISSU) feature, the Catalyst 4500 platform offers full Cisco IOS Software image upgrade and downgrade capability without having to take the switch or network out of service.

A new Catalyst 4900 fixed configuration platform—ME-4924-10GE is introduced in this release for Broadband Aggregation. ME-4924-10GE has 28 Gigabit Ethernet (SFP) and two 10 Gigabit Ethernet (X2) wire-rate ports. This new switch is 1 RU and features 1+1 redundant internal AC or DC power supplies and a hot swappable fan tray.

### NEW SOFTWARE FEATURES

#### In-Service Software Upgrade

In-Service Software Upgrade (ISSU) allows a customer to upgrade or downgrade complete IOS images with minimal to no impact on a Catalyst 4500 system with redundant supervisor engines. It enables rapid, non-disruptive software upgrades for new line cards, new power supplies, new features, or bug fixes. ISSU offers continuous packet forwarding during the supervisor engine switchover running different IOS software versions. Together with Nonstop Forwarding/Stateful Switchover (NSF/SSO), ISSU allows forwarding of data packets along known routes without any route flaps or network instabilities during the software upgrade. As a result, IP phone calls do not drop even when the IOS Software images are upgraded or downgraded. There is no impact to the overall network capacity since the switch and all the forwarding paths remain active during the entire upgrade process. ISSU is typically deployed in the enterprise wiring closet or service provider Metro Ethernet aggregation. ISSU eliminates planned downtime to maximize system and network availability. The ISSU feature is available in both IP Base and Enterprise Service packages with dual supervisor engine configurations.

#### Trunk Port Security over EtherChannel

Trunk port security over EtherChannel® is an extension of trunk port security where redundant links from a single station are connected to a Catalyst 4500/4900 using EtherChannel. The feature enables customers to block access to the Catalyst 4500/4900 by MAC addresses other than the ones specified (or learned) on EtherChannel trunk interfaces. It preserves all the advantages of port security and EtherChannel, including redundancy and load sharing. This feature is typically deployed in data center environments with dual NIC servers connecting to a Catalyst 4500/4900 using EtherChannel.

#### Match CoS for Non-IPv4 Traffic

The match class of service (CoS) feature helps a service provider to classify packets based on CoS values while preserving its customers' packet differentiated services code point (DSCP) values inside the service provider network. The match Cos for non-IPv4 feature provides uniform class-level quality-of-service (QoS) semantics irrespective of traffic type on a dot1q-tunnel and regular trunk ports. This is typically deployed in a Q-in-Q environment, where double-tagged IPv4 packets are forwarded as non-IPV4 packets.

## L2PT over Trunk

Layer 2 Protocol Tunneling (L2PT) allows customer switches to participate in L2 protocols across a Service Provider network. This is achieved by encapsulating Layer 2 protocol packets, such as Cisco Discovery Protocol (CDP), Spanning -Tree Protocol (STP), or VLAN Trunking Protocol (VTP), before sending them across the service provider network. As a result the CPE switches on either side of the SP network can continue to process the L2 protocol control packets as if they were being received from a directly connected neighboring switch. The existing implementation allowed L2PT to be used only on tunnel ports. This feature will extend the functionality so that L2PT will be available on trunk ports configured with dot1q encapsulation.

## CoS Mutation

The CoS mutation feature enables Service Providers to provide differentiated services for video, voice, and data within the SP network. In a typical L2 VPN offered by service providers, double tagged Q-in-Q traffic is forwarded with the outer tag representing service provider's VLAN and inner tag representing the customer's VLAN. SPs could either retain the CoS values from the customer tag in the service provider tag or change the CoS value of the outer service provider tag based on inner customer QoS matching and classification. As a result, Differentiated levels of service can be provided within the service provider network.

## IP Unnumbered for SVI

IP unnumbered interface configuration enables IP processing on an interface without assigning it an explicit IP address. IP Unnumbered for SVI extends the current support for point-to-point links to switched virtual interfaces (SVIs). This feature is crucial in large service provider environments where SVIs are used to terminate L2 traffic from the CPE. This feature helps to conserve IP addresses space and, simplify configuration and address management.

## CISCO IOS SOFTWARE PACKAGING FOR THE CISCO CATALYST 4500 SERIES

A new Cisco IOS Software package for Cisco Catalyst 4500 Series switches was introduced in Cisco IOS Software Release 12.2(25)SG. It is a new foundation for features and functionality and provides consistency across all Cisco Catalyst switches. The new Cisco IOS Software release train is designated as 12.2SG.

Prior Cisco IOS Software images for the Cisco Catalyst 4500 Series, formally known as "Basic Layer 3" and "Enhanced Layer 3" images, now map to "IP Base" and "Enterprise Services," respectively. BGP is now included in the "Enterprise Services" image. Unless otherwise specified, all currently shipping Cisco Catalyst 4500 software features based on Cisco IOS Software are supported in the IP Base image of Release 12.2(31)SGA, with a few exceptions:

The IP Base image does not support any enhanced routing-related features (including NSF/SSO, BGP, EIGRP, OSPF, IS-IS, Internetwork Packet Exchange [IPX] protocol, AppleTalk, VRF-lite, and PBR). The IP Base image supports EIGRP-Stub for limited routing on Cisco Catalyst 4500 Series Supervisor Engines II-Plus, II-Plus-TS, II-Plus-10GE, IV, V, and V-10GE. For more information on EIGRP-Stub functionality, go to [http://www.cisco.com/en/US/technologies/tk648/tk365/technologies\\_white\\_paper0900aecd8023df6f.shtml](http://www.cisco.com/en/US/technologies/tk648/tk365/technologies_white_paper0900aecd8023df6f.shtml).

The Enterprise Services image supports all Cisco Catalyst 4500 Series software features based on Cisco IOS Software, including enhanced routing. Customers planning to enable BGP for Supervisor Engine IV, V, or V-10GE will no longer need to purchase a separate BGP license (FR-IRC4); BGP capability is included in the Enterprises Services package. Table 1 shows a more detailed description of the feature differences between the IP Base and Enterprise Services (ES) images as they relate to the Cisco Catalyst 4500 Series Supervisor Engines.

**Table 1.** Feature Comparison for Cisco IOS Software Release 12.2(31)SGA IP Base and Enterprise Services

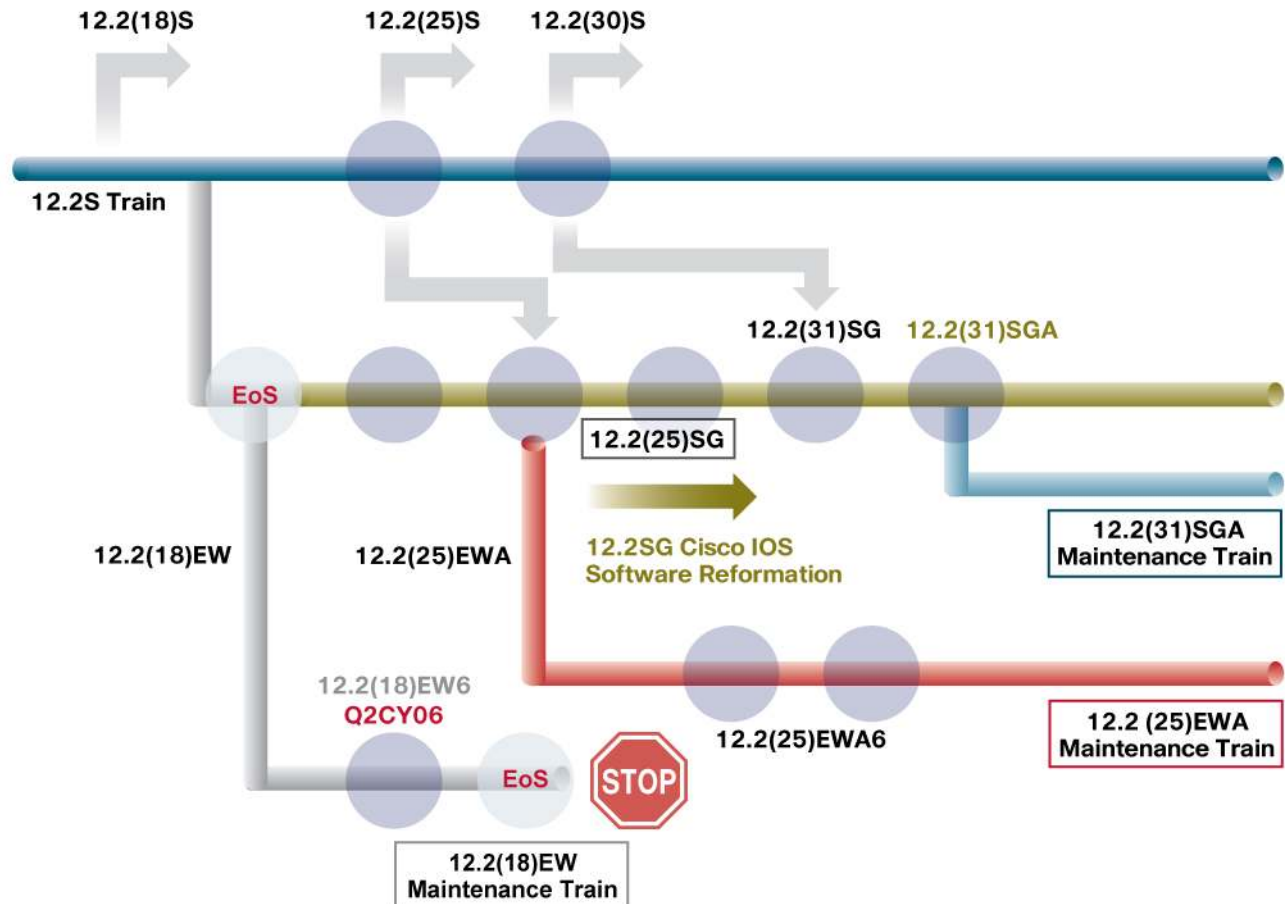
Feature	Supervisor Engine II-Plus (II-Plus-TS and II-Plus-10GE): IP Base	Supervisor Engine IV: IP Base	Supervisor Engine IV: ES	Supervisor Engine V: IP Base	Supervisor Engine V: ES	Supervisor Engine V-10GE: IP Base	Supervisor Engine V-10GE: ES
ISSU	Yes <sup>1</sup>	Yes	Yes	Yes	Yes	Yes	Yes
Network Admission Control (NAC) v2.0	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RIP and Static Route	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NetFlow v1, v5, and v8	No	Yes	Yes	Yes	Yes	Yes	Yes
EIGRP	No	No	Yes	No	Yes	No	Yes
EIGRP-Stub	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OSPF/IS-IS	No	No	Yes	No	Yes	No	Yes
BGP	No	No	Yes	No	Yes	No	Yes
NSF-aware	No	No	Yes	No	Yes	No	Yes
NSF-aware EIGRP-stub	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NSF/SSO	No	No	Yes	No	Yes	No	Yes
SSO Aware HSRP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VRF-lite	No	No	Yes	No	Yes	No	Yes
AppleTalk	No	No	Yes	No	Yes	No	Yes
IPX	No	No	Yes	No	Yes	No	Yes
PBR	No	No	Yes	No	Yes	No	Yes

<sup>1</sup> ISSU is not supported on Supervisor II-Plus-TS

## Cisco Catalyst 4500 Cisco IOS Software Migration Guide

Figure 1 displays the Cisco IOS Software Release 12.2(31)SGA plan relative to the 12.2S release train and identifies the recommended migration path. Note that 12.2(31)SGA will be the base release for a new maintenance train: the 12.2(31)SGA maintenance train. Moving forward, Catalyst 4500 will have two active maintenance trains: 12.2(25)EWA and 12.2(31)SGA.

**Figure 1.** Cisco IOS Software Release Plan for the Cisco Catalyst 4500 Series



Summary of migration plan:

- Customers requiring the latest Cisco Catalyst 4500 Series hardware and software features should migrate to Cisco IOS Software Release 12.2(31)SGA.
- Cisco IOS Software Release 12.2(25)EWA will continue offering maintenance releases. The latest release from the 12.2(25)EWA maintenance train was 12.2(25)EWA6.
- Cisco IOS Software Release 12.2(18)EW6 has reached its end of service. 12.2(18)EW was the last image from the 12.2(18) maintenance train.

## Support

Support for Cisco IOS Software Release 12.2(31)SGA follows the standard Cisco support policy, available at [http://www.cisco.com/en/US/products/products\\_end-of-life\\_policy.html](http://www.cisco.com/en/US/products/products_end-of-life_policy.html).

For more information about the Cisco Catalyst 4500 Series, visit <http://www.cisco.com/univercd/cc/td/doc/product/lan/cat4000/index.htm>.

## Ordering Information

Tables 2, and 3 provide product numbers and ordering information for Cisco IOS Software Release 12.2(31)SGA and supporting hardware.

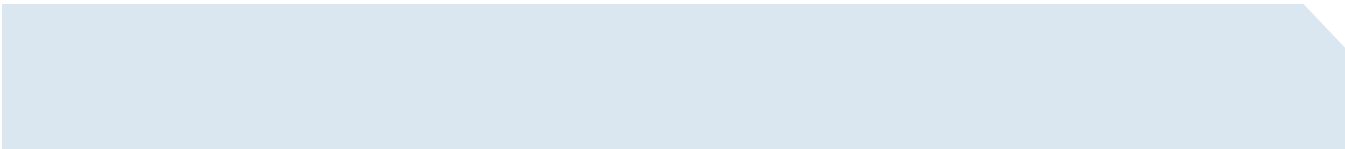
**Table 2.** Cisco IOS Software Release 12.2(31)SGA Product Numbers and Images

Product Number	Description	Image
S45IPB-12231SGA(=)	Cisco IOS Software for the Cisco Catalyst 4500 Series Supervisor Engines II-Plus, II-Plus-TS, II-Plus-10GE, IV, V, and V-10GE (IP Base image)	Cat4500-ipbase-mz
S45IPBK9-12231SGA(=)	Cisco IOS Software for the Cisco Catalyst 4500 Series Supervisor Engines II-Plus, II-Plus-TS, II-Plus-10GE, IV, V, and V-10GE (IP Base image with Triple Data Encryption Standard [3DES])	Cat4500-ipbasek9-mz
S45ES-12231SGA(=)	Cisco IOS Software for the Cisco Catalyst 4500 Series Supervisor Engines IV, V, and V-10GE (Enterprise Services image with BGP support)	Cat4500-entservices-mz
S45ESK9-12231SGA(=)	Cisco IOS Software for the Cisco Catalyst 4500 Series Supervisor Engines IV, V, and V-10GE (Enterprise Services image with 3DES and BGP support)	Cat4500-entservicesk9-mz

**Table 3.** Cisco IOS Software Release 12.2(31)SGA Hardware Support

Product Number	Description
WS-X4013+	Cisco Catalyst 4500 Series Supervisor Engine II-Plus
WS-X4013+2	Cisco Catalyst 4500 Series Redundant Supervisor Engine II-Plus
WS-X4013+TS	Cisco Catalyst 4503 Series Supervisor Engine II-Plus-TS
WS-X4013+10GE	Cisco Catalyst 4500 Series Supervisor Engine II-Plus-10GE
WS-X4013+10GE/2	Cisco Catalyst 4500 Series Redundant Supervisor Engine II-Plus-10GE
WS-X4515	Cisco Catalyst 4500 Series Supervisor Engine IV
WS-X4515/2	Cisco Catalyst 4500 Series Redundant Supervisor Engine IV
WS-X4516	Cisco Catalyst 4500 Series Supervisor Engine V
WS-X4516/2	Cisco Catalyst 4500 Series Redundant Supervisor Engine V
WS-X4516-10GE	Cisco Catalyst 4500 Series Supervisor Engine V-10GE
WS-X4516-10GE/2	Cisco Catalyst 4500 Series Redundant Supervisor Engine V-10GE
WS-C4503	Cisco Catalyst 4503 Switch chassis
WS-C4506	Cisco Catalyst 4506 Switch chassis
WS-C4507R	Cisco Catalyst 4507R Switch chassis
WS-C4510R	Cisco Catalyst 4510R Switch chassis
WS-X4124-FX-MT(=)	Cisco Catalyst 4500 Series 24-port Fast Ethernet switching module, 100BASE-FX multimode fiber (MMF), MTRJ
WS-X4124-RJ45(=)	Cisco Catalyst 4500 Series 24-port 10/100 module (RJ-45)
WS-X4148-FX-MT(=)	Cisco Catalyst 4500 Series 48-port Fast Ethernet switching module, 100BASE-FX, MMF, MTRJ
WS-X4148-FE-LX-MT(=)	Cisco Catalyst 4500 Series 48-port Fast Ethernet switching module, 100BASE-LX10 single-mode fiber, MTRJ
WS-X4148-RJ(=)	Cisco Catalyst 4500 Series 48-port 10/100 module (RJ-45)
WS-X4148-RJ21(=)	Cisco Catalyst 4500 Series 48-port 10/100 module, telco (4xRJ-21)
WS-X4148-RJ45V(=)	Cisco Catalyst 4500 Series 48-port inline power 10/100 module (RJ-45)
WS-X4148-FE-BD-LC(=)	Cisco Catalyst 4500 Series 48-port 100BASE-BX10-D line card
WS-X4224-RJ45V(=)	Cisco Catalyst 4500 Series 24-port Power over Ethernet (PoE) 10/100 module (RJ-45)
WS-X4232-GB-RJ(=)	Cisco Catalyst 4500 Series 32-port 10/100 (RJ-45), 2-port Gigabit Ethernet module (GBIC)
WS-X4232-RJ-XX(=)	Cisco Catalyst 4500 Series 32-port 10/100 (RJ-45) with modular uplink slot
WS-X4248-FE-SFP(=)	Cisco Catalyst 4500 Series 48-port 100BASE-X (SFP optics optional)

Product Number	Description
WS-X4248-RJ45V(=)	Cisco Catalyst 4500 Series 48-port PoE 10/100 (RJ-45)
WS-X4248-RJ21V(=)	Cisco Catalyst 4500 Series 48-port PoE 10/100, telco (4xRJ-21)
WS-X4424-GB-RJ45(=)	Cisco Catalyst 4500 Series 24-port 10/100/1000 module (RJ-45)
WS-X4306-GB (=)	Cisco Catalyst 4500 Series 6-port Gigabit Ethernet module (GBIC)
WS-X4302-GB (=)	Cisco Catalyst 4500 Series 2-port Gigabit Ethernet line card (GBIC)
WS-X4412-2GB-T (=)	Cisco Catalyst 4500 Series 12-port Gigabit Ethernet module, 1000BASE-T (RJ-45) with two 1000BASE-X GBICs
WS-X4418-GB (=)	Cisco Catalyst 4500 Series 18-port Gigabit Ethernet module, server switching (GBIC)
WS-X4448-GB-RJ45 (=)	Cisco Catalyst 4500 Series 48-port 10/100/1000 module (RJ45)
WS-X4448-GB-SFP (=)	Cisco Catalyst 4500 Series 48-port 1000BASE-X (SFP optics optional)
WS-X4506-GB-T (=)	Cisco Catalyst 4500 Series 6-port alternatively wired 10/100/1000 PoE or 1000BASE-X, SFP optics
WS-X4524-GB-RJ45V (=)	Cisco Catalyst 4500 Series 24-port PoE 10/100/1000 line card (RJ-45)
WS-X4548-GB-RJ45 (=)	Cisco Catalyst 4500 Series 48-port 10/100/1000 line card (RJ45)
WS-X4548-GB-RJ45V (=)	Cisco Catalyst 4500 Series 48-port PoE 10/100/1000 line card (RJ45)
WS-U4504-FX-MT (=)	Cisco Catalyst 4500 Series 4-port uplink daughter card 100BASE-FX (MTRJ)
WS-G5483=	1000BASE-T GBIC
WS-G5484 (=)	1000BASE-SX short-wavelength GBIC (multimode only)
WS-G5486 (=)	1000BASE-LX/LH long-haul GBIC (single-mode or multimode)
WS-G5487 (=)	1000BASE-ZX extended-reach GBIC (single-mode)
MEM-C4K-FLD64M (=)	Cisco Catalyst 4500 Series Compact Flash, 64-MB option
MEM-C4K-FLD128M (=)	Cisco Catalyst 4500 Series Compact Flash, 128-MB option
PWR-C45-4200ACV	Cisco Catalyst 4500 4200W AC dual input power supply (data + PoE)
PWR-C45-2800ACV	2800W AC power supply for Cisco Catalyst 4503, 4506, and 4507R chassis
PWR-C45-1400DC	Cisco Catalyst 4500 Series 1400W DC power supply
PWR-C45-1400DC-P	Cisco Catalyst 4500 Series 1400W DC power supply with integrated PEM
PWR-C45-1400AC	Cisco Catalyst 4500 Series 1400W AC power supply (data only)
PWR-C45-1300ACV	1300W AC power supply for Cisco Catalyst 4503, 4506, and 4507R chassis
PWR-C45-1000AC	1000W AC power supply for Cisco Catalyst 4503, 4506, and 4507R chassis (data only)
CWDM-GBIC-xxxx	Cisco 1000BASE coarse wavelength-division multiplexing (CWDM) xxxx nm GBIC, where xxxx is the number 1470, 1490, 1510, 1530, 1550, 1570, 1590, or 1610
DWDM-GBIC-xx.yy	Cisco 1000BASE dense wavelength-division multiplexing (DWDM) ITU 100-GHz grid 15xx.yy nm GBIC
WDM-GBIC-REC=	Cisco receive-only 1000BASE-WDM GBIC
WS-F4531(=)	NetFlow Services Card for Cisco Catalyst 4500 Series Supervisor Engines IV and V



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**Americas Headquarters**  
Cisco Systems, Inc.  
San Jose, CA

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
Singapore

**Europe Headquarters**  
Cisco Systems International BV Amsterdam,  
The Netherlands

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