

# Cisco IOS Software Release 12.1(13)E for Supervisor Engines of the Cisco Catalyst 6500 Series Switch and Cisco 7600 Series Internet Router

**Use this publication if you have Cisco IOS® Software for the Cisco Catalyst® 6500 Series Switch or the Cisco 7600 Series Internet Router, which run Cisco IOS Software Release 12.1(13)E on the Supervisor Engine 1A and Supervisor Engine 2 with the Multilayer Switch Feature Card (MSFC or MSFC2).**

Note: If you are running Cisco Catalyst software on the supervisor engine and Cisco IOS Software only on the MSFC, see the release notes for Cisco IOS on the MSFC at: [www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/relnotes/index.htm](http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/relnotes/index.htm).

Note: Starting with Cisco IOS Software Release 12.1(13)E, the Cisco Catalyst 6500 and Cisco 7600 offer three new additional LAN module-only feature sets: Service Provider LAN-only, Enterprise LAN-only, and Enterprise LAN-only with Secure Shell (SSH) and 3DES. WAN interface modules (Cisco Catalyst 6500/Cisco 7600 Series Flex WAN modules and all Optical Services Modules (OSMs) are not supported.

WAN and LAN module support will continue to be offered in all customarily offered features sets with Cisco IOS Software Release 12.1(13)E. WAN module support will continue to be available as before for all non-LAN-only feature sets (signified in the feature set description including the qualifier “with VIP”) such as Service Provider with VIP, IP/IPX with VIP, Enterprise with VIP, Enterprise SSH 3DES with VIP, etc. Cisco IOS Software Release 12.1(13)E1 will include additional WAN hardware and software features not supported in Cisco IOS Software Release 12.1(13)E.

Table 1 describes the hardware features supported in Cisco IOS Software Release 12.1(13)E.

See Cisco IOS 12.1(13)E1 Product Bulletin for additional information.



**Table 1** Cisco IOS Software Release 12.1(13)E New Hardware Features

Hardware Features	Description
<b>1000BASE-TX (copper) GBIC (WS-G5483)</b>	The new Cisco 1000BASE-T Gigabit Interface Converter (GBIC), part number WS-G5483, supports high-speed connections to high-performance workstations and between wiring closets. This product is an ideal solution for customers using Cisco Catalyst 6500, 4000, 3550, 2950, and 2900 series switches providing full-duplex gigabit Ethernet over copper connectivity. See Cisco Product Bulletin 1741 for additional details.
<b>Coarse Wave Division Multiplexing GBICs</b> CWDM-GBIC-1470 CWDM-GBIC-1490 CWDM-GBIC-1510 CWDM-GBIC-1530 CWDM-GBIC-1550 CWDM-GBIC-1570 CWDM-GBIC-1590 CWDM-GBIC-1610	The Cisco Coarse Wave Division Multiplexing (CWDM) Gigabit Interface Converters (GBICs) enable the transport of up to eight Gigabit Ethernet channels over a pair of single-mode fiber. The Cisco CWDM GBIC Solution allows for a variety of network configurations, from multichannel point-to-point to hub and meshed-ring configurations. Offered in eight different wavelengths, these CWDM GBICs provide scalable and easy-to-deploy Gigabit Ethernet services and are supported by a number of Cisco Catalyst switches with GBIC slots and the Cisco 7600 series.
<b>Catalyst 6500 Series Network Analysis Module (WS-SVC-NAM-1)</b>	The new high-performance, fabric-enabled network analysis module (NAM) for the Cisco Catalyst 6500 and Cisco 7600 Series is designed to meet diverse network analysis needs in a scalable switching environment running up to gigabit speeds. NAM-1 and NAM2 are supported by NAM Software Version 2.2, which ships with the embedded, Web-based Traffic Analyzer, to provide full-scale remote monitoring (RMON) and troubleshooting capabilities.
<b>Catalyst 6500 Series Network Analysis Module (WS-SVC-NAM-2)</b>	Similar to NAM-1, NAM-2 delivers a higher level of performance by virtue of a dual-processor architecture. NAM-2 also features an additional accelerator card to boost packet-processing performance.
<b>Catalyst 6500 Firewall Services Module (WS-SVC-FWM-1-K9)</b>	Delivers 5 Gbps throughput and 100,000 connections per second, with integrated stateful inspection up to Layer 7. This extends security from the edge to internal networks, helping implement end-to-end security policies for the network.
<b>Cisco Catalyst 6500 SSL Services Module (WS-SVC-SSL-1-K9)</b>	Provides 2500 connections per second and 300 Mbps Secure Sockets Layer (SSL) encryption and decryption security for secure processing of Web-based applications and e-commerce Web sites.

#### Other Hardware Supported

The system supports all cards previously supported by the Cisco IOS Software on the Cisco Catalyst 6500 Series Supervisor Engine 1A and the Supervisor Engine 2 for the Cisco Catalyst 6500 Series and Cisco 7600 Series.

Note: Starting with Cisco IOS Software Release 12.1(13)E, the Cisco Catalyst 6500 Series and Cisco 7600 Series offer three new additional LAN module-only feature sets: Service Provider LAN only, Enterprise LAN only, and Enterprise LAN only SSH 3DES. WAN interface modules (FlexWAN, and all Optical Service Modules) are not supported in these feature sets.

WAN and LAN module support will be offered with the customarily offered feature sets in Cisco IOS Software Release 12.1(13)1. Cisco IOS Software Release 12.1(13)E1 will include additional WAN hardware and software features not supported in Cisco IOS Software Release 12.1(13)E.



See the Cisco IOS version 12.1(13)E1 Product Bulletin for additional information, when available.

**Table 2** Cisco IOS Software Release 12.1(13)E Software Features

Software Feature	Description
<b>IP WCCP Service Redirect</b>	<p>Adds Web Cache Communication Protocol (WCCP) redirection on inbound interfaces. Prior to this release, WCCP could be configured to redirect traffic on an outbound interface only. This feature offers better redirection performance as well as providing more flexibility in configuring WCCP. Inbound traffic can be configured to use Cisco Express Forwarding, distributed Cisco Express Forwarding, fast forwarding, or process forwarding.</p> <p>WCCP for redirection of inbound traffic on interfaces allows you to avoid the overhead associated with Cisco Express Forwarding for outbound traffic. Setting an output feature on any interface results in the slower switching path of the feature being taken by all packets arriving at all interfaces. Setting an input feature on an interface results in only those packets arriving at that interface taking the configured feature path; packets arriving at other interfaces will use the faster default path. Configuring WCCP for inbound traffic also allows packets to be classified before the routing table lookup, which translates into faster redirection of packets.</p>
<b>Cisco IP Phone Support</b>	<p>The Cisco Catalyst 6500 and Cisco 7600 now support connections to IP phones using various 10/100-BASE-TX Ethernet modules. This includes inline power functionality. Additional features supported include auto-detect of IP phones and PC or workstation network interface cards (NICs), voice virtual LAN (VLAN) (auxiliary VLANs) support to separate voice traffic from workstation or PC traffic, and extended trust, which can honor the Layer 2 class of service (CoS) bits frame marking used in quality of service (QoS) prioritization.</p> <p>Before this feature was introduced, IP phone support was supported exclusively on the Cisco Catalyst 6500 and Cisco 7600 using the Cisco Catalyst Operating System (CatOS).</p>
<b>Network-Based Application Recognition (NBAR)</b>	<p>NBAR is a classification engine that recognizes a wide variety of applications, including Web-based and other difficult-to-classify protocols that use dynamic TCP/UDP port assignments. When an application is recognized and classified by NBAR, a network can invoke services for that specific application. NBAR ensures that network bandwidth is used efficiently by classifying packets and then applying QoS to the classified traffic.</p> <p>NBAR is supported in software on the MSFC2. All ingress and egress traffic is processed in software on ports when NBAR is used. Prior to this release, NBAR was supported on Flex WAN line cards and associated Port Adapters only.</p>
<b>Port Security</b>	<p>Port Security restricts interface access by limiting and identifying MAC addresses of the workstations that are allowed to access the port.</p> <p>Port security allows the network administrator to restrict input to an interface by limiting and identifying MAC addresses of the workstations that are allowed to access the port. When you assign secure MAC addresses to a secure port, the port does not forward packets with source addresses outside the group of defined addresses. If you limit the number of secure MAC addresses to one and assign a single secure MAC address, the workstation attached to that port is assured the full bandwidth of the port.</p>
<b>Remote SPAN, RSPAN</b>	<p>RSPAN enables remote monitoring of multiple switch ports across the network. As an extension to the SPAN feature, Remote SPAN (RSPAN) supports source ports, source VLANs, and destination ports on different switches. The traffic for each RSPAN session is carried over a user-specified RSPAN VLAN that is dedicated for that RSPAN session in all participating switches.</p>
<b>MAC Address Filtering (MAC address-based traffic blocking)</b>	<p>Allows the network administrator to block all traffic to or from a MAC address in a specified VLAN.</p>
<b>QoS Marking with set ip Command</b>	<p>Enables marking in a MQC compliant command structure using the <b>set ip</b> command within a policymap. This function requires a <i>no-drop</i> policer in Cisco IOS Software releases prior to 12.1(12)E.</p>



**Table 2** Cisco IOS Software Release 12.1(13)E Software Features

Software Feature	Description
<b>Rapid-Per-VLAN-Spanning Tree</b>	Rapid-Per-VLAN-Spanning Tree (Rapid-PVST) provides faster convergence of the spanning tree by using Rapid Spanning Tree Protocol (RSTP) with the existing configuration for PVST+. Independent VLANs run their own RSTP instance. Dynamic entries are flushed immediately on a per-port basis upon receiving a topology change. Rapid-PVST uses the existing configuration for PVST+; however, Rapid-PVST uses RSTP to provide faster convergence. Independent VLANs run their own RSTP instance.
<b>Internal VLAN Allocation</b>	The new Internal VLAN allocation feature simplifies VLAN management by providing greater flexibility in assigning both “internal” and “customer” VLANs. Traditionally, internal VLANs have been allocated for WAN interfaces, routed interfaces, and certain other features starting from VLAN 1006 (by default); once allocated, these internal VLANs are not available for customer VLAN assignment. The new Internal VLAN Allocation feature allows internal VLAN allocation to be assigned in descending order, commencing with VLAN ID 4096 rather than ascending from VLAN ID 1006. This allows customers to assign VLAN IDs in an ascending fashion without internal VLAN ID restrictions in the middle of the ID-range.
<b>SNMP ifIndex Persistence</b>	The interface index (ifIndex) value is retained after a switch reload. The ifIndex value is a unique number associated with a physical or logical interface (see RFC 2233 for more information).
<b>Content Switching Module version 3.1—Management Enhancements, Global Server Load Balancing and More</b>	New features in the Content Switching Module (CSM) provide for improved manageability with the addition of SNMP/MIBs, Hosting Solutions Engine (HSE) support, and Scriptable Health Checking. The CSM 3.1 release provides additional advanced features such as Global Server Load Balancing (GSLB), backup server farm, and complete UDP fragment support. For more information see the Cisco CSM 3.1(1) Product Bulletin.
<b>Netflow Data Export Enhancements</b>	Netflow Data Export (NDE) is used for collecting accounting statistics on IP flow information for routed traffic. NDE makes routed-traffic statistics available for analysis by an external data collector to improve manageability of the network.  The following enhancements have been added to the Cisco Catalyst 6500 Series and Cisco 7600 Series Netflow support: <ul style="list-style-type: none"><li>• Netflow Version 5</li><li>• New NDE Fields—Although Netflow Version 5 and Version 7 records include these fields, they have not been exported in Netflow records until now</li><li>• New flowmasks—The Netflow flowmask is used to define a unique IP flow</li><li>• Sampled Netflow—By default, Netflow data export collects statistics for <i>all</i> traffic that is routed through the device, which can account for a tremendous amount data to analyze. Sampled Netflow reduces the amount of data sent to an external collector</li></ul>
<b>Jumbo Frame Enhancement</b>	This jumbo frame enhancement allows for a different maximum transmission unit (MTU) size on each Layer 3 interface and configurable MTU sizes on Layer 2 interfaces.



**Table 2** Cisco IOS Software Release 12.1(13)E Software Features

Software Feature	Description
<b>New Management Information Base (MIB) Support</b>	<p>CISCO-ENTITY-FRU-CONTROL-MIB Enhancement</p> <ul style="list-style-type: none"><li>– support inline power management</li></ul> <p>CISCO-FLASH-MIB</p> <p>Support the following additional MIB objects and traps</p> <ul style="list-style-type: none"><li>– ciscoFlashCfgDevInsNotifEnable</li><li>– ciscoFlashCfgDevRemNotifEnable</li><li>– ciscoFlashDeviceInsertedNotif</li><li>– ciscoFlashDeviceRemovedNotif</li></ul> <p>CISCO-PAE-MIB</p> <ul style="list-style-type: none"><li>– support for 802.1x</li></ul> <p>CISCO-STACK-MIB Enhancement</p> <ul style="list-style-type: none"><li>– support port flow control MIB objects defined in portTable;</li></ul> <p>CISCO-STP-EXTENSIONS-MIB Enhancement</p> <ul style="list-style-type: none"><li>– support Rapid PVST+</li></ul> <p>CISCO-VLAN-MEMBERSHIP-MIB Enhancement</p> <ul style="list-style-type: none"><li>– support voice vlan feature</li></ul> <p>CISCO-VTP-MIB Enhancement</p> <p>Support the following additional MIB objects and traps (EDCS-149023);</p> <ul style="list-style-type: none"><li>– vtpVlanCreatedNotifEnabled</li><li>– vtpVlanDeletedNotifEnabled</li><li>– vtpLocalModeChanged</li><li>– vtpVerionInUseChanged</li><li>– vtpVlanCreated</li><li>– vtpVlanDeleted</li></ul> <p>IEEE8021-PAE-MIB</p> <ul style="list-style-type: none"><li>– support for 802.1x</li></ul> <p>SMON-MIB</p> <ul style="list-style-type: none"><li>– support for RSPAN</li></ul>

#### Features Not Supported in Cisco IOS Software Release 12.1(13)E

All features that do not require WAN interface modules, supported by previous Cisco IOS Supervisor software versions, are also supported in Cisco IOS Software Release 12.1(13)E. WAN interface modules and related features will be supported in Cisco IOS Software Release 12.1(13)E1 in the applicable software images.

#### Orderable Software Images

Table 3 lists the software versions and applicable ordering information for the Cisco Catalyst 6500/Cisco 7600 Series Supervisor Engine 1A and Supervisor Engine 2. Cisco IOS Software runs on the Distributed Forwarding Card (DFC) to provide distributed Cisco Express Forwarding support. This image is bundled as part of the c6sup22 image and is not released separately.

*Caution:* Always back up the switch configuration file to a Trivial File Transfer Protocol (TFTP) server or Flash device *before* upgrading or downgrading the switch software to avoid losing all or part of the configuration stored in nonvolatile RAM (NVRAM). When downgrading switch software, the configuration will be lost.



**Table 3** Software Versions and Ordering Information

Orderable Product Number	Description	Image
<b>S6S11ALV-12113E</b>	Cisco Catalyst 6000 Supervisor 1/MSFC IOS Enterprise LAN only, Software Release 12.1(13)E	c6sup11-js-mz.121-13.E
<b>S6S11ALV-12113E=</b>	As above Spare, requires appropriate Feature License (s)	
<b>S6S11ALK2-12113E</b>	Cisco Catalyst 6000 Supervisor 1/MSFC IOS Enterprise, Secure Shell (SSH), and Triple Data Encryption Standard (3DES) LAN only, Software Release 12.1(13)E	c6sup11-jk2s-mz.121-13.E
<b>S6S11ALK2-12113E=</b>	As above Spare, requires appropriate Feature License (s)	
<b>S6S11ZLV-12113E</b>	Cisco Catalyst 6000 Supervisor 1/MSFC IOS Service Provider LAN only, Software Release 12.1(13)E	c6sup11-ps-mz.121-13.E
<b>S6S11ZLV-12113E=</b>	As above Spare, requires appropriate Feature License (s)	
<b>S6S12ALV-12113E</b>	Cisco Catalyst 6000 Supervisor 1/MSFC2 IOS Enterprise LAN only Software Release 12.1(13)E	c6sup12-js-mz.121-13.E
<b>S6S12ALV-12113E=</b>	As above Spare, requires appropriate Feature License (s)	
<b>S6S12ALK2-12113E</b>	Cisco Catalyst 6000 Supervisor 1/MSFC2 IOS, SSH, and 3DES LAN only Software Release 12.1(13)E	c6sup12-jk2s-mz.121-13.E
<b>S6S12ALK2-12113E=</b>	As above Spare, requires appropriate Feature License (s)	
<b>S6S12ZLV-12113E</b>	Cisco Catalyst 6000 Supervisor 1/MSFC2 IOS Service Provider LAN only, Software Release 12.1(13)E	c6sup12-ps-mz.121-13.E
<b>S6S12ZLV-12113E=</b>	As above Spare, requires appropriate Feature License (s)	
<b>S6S22ALV-12113E</b>	Cisco Catalyst 6000 and Cisco 7600 Supervisor 2/MSFC2 IOS Enterprise LAN only, Software Release 12.1(13)E	c6sup22-js-mz.121-13.E
<b>S6S22ALV-12113E=</b>	As above Spare, requires appropriate Feature License (s)	
<b>S6S22ALK2-12113E</b>	Cisco Catalyst 6000 and Cisco 7600 Supervisor 2/MSFC2 IOS Enterprise LAN only with 3DES Software Release 12.1(13)E	c6sup22-jk2s-mz.121-13.E
<b>S6S22ALK2-12113E=</b>	As above Spare, requires appropriate Feature License (s)	
<b>S6S22ZLV-12113E</b>	Cisco Catalyst 6000 and Cisco 7600 Supervisor 2/MSFC2 IOS Service Provider LAN only. Software Release 12.1(13)E	c6sup22-ps-mz.121-13.E
<b>S6S22ZLV-12113E=</b>	As above Spare, requires appropriate Feature License (s)	

## Additional Information

More information about Cisco IOS Software Release 12.1(13)E is available in the Cisco Catalyst 6500 Series and Cisco 7600 Series release notes at:

<http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/relnotes/>

Cisco Catalyst 6500 Series documentation is available at:

<http://www.cisco.com/warp/public/cc/pd/si/casi/ca6000/>

and

<http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/>

Cisco 7600 Series documentation is available at:

<http://www.cisco.com/warp/public/cc/pd/rt/7600osr/>



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