# Cisco IOS XR Software Release 3.7.0 for Cisco CRS-1 Routers and Cisco XR 12000 Series Routers

Product Bulletin No. 489718

## Product Overview

Cisco IOS® XR Software Release 3.7.0 provides additional core routing features and extends feature coverage further into edge routing. This release also introduces new features for both the Cisco® CRS-1 Carrier Routing Systems and the Cisco XR 12000 Series Routers, including multi-topology Intermediate System to Intermediate System (IS-IS) for multiple multicast tables, 6PE/6VPE with inter-autonomous system (inter-AS) for CRS-1, MVPNv6 for the Cisco XR 12000 Series Routers.

## New Hardware Features

Cisco IOS XR Software Release 3.7.0 incorporates support for all hardware modules and software features of all prior releases. See Tables 1 and 2.

Complete documentation of this release is available at http://www.cisco.com/en/US/customer/products/ps5845/tsd_products_support_series_home.html.

**Table 1.** New Hardware Supported on Cisco CRS-1 in Cisco IOS XR Software Release 3.7.0

| Part Number | Description |
|---|---|
| SPA-1XOC12-ATM-V2 | 1-Port Clear Channel OC-12 ATM SPA |
| SPA-3XOC3-ATM-V2 | 3-Port Clear Channel OC-3 ATM SPA |

**Table 2.** New Hardware Supported on Cisco XR 12000 in Cisco IOS XR Software Release 3.7.0

| Part Number | Description |
|---|---|
| SPA-1XOC12-ATM-V2 | 1-Port Clear Channel OC-12 ATM SPA |
| SPA-3XOC3-ATM-V2 | 3-Port Clear Channel OC-3 ATM SPA |
| SPA-1XOC3-ATM-V2 | 1-Port Clear Channel OC-3 ATM SPA |
| CHOC48/DS3-SR-SC | Cisco 1-Port Channelized OC-48 line card |
| SPA-2CHT3-CE-ATM | 2-Port Channelized T3/E3 ATM CEoP SPA |

Note: Cisco IOS XR Software Release 3.7.0 is supported in the following chassis: Cisco XR 12004, 12404, 12006, 12406, 12010, 12410, 12810, 12016, 12416, and 12816.

## New Software Features

Table 3 lists a new software feature in Cisco IOS XR Software Release 3.7.0 common to both the CRS-1 and XR 12000 Series Routers. Table 4 lists new software features supported in Cisco IOS XR Software Release 3.7.0 on the Cisco CRS-1 Routers. Table 5 lists new software features supported in Cisco IOS XR Software Release 3.7.0 on the Cisco XR 12000 Series Routers.

**Table 3.** New Software Feature Supported in Cisco IOS XR Software Release 3.7.0 Common to Both the CRS-1 and the XR 12000 Series Routers

| Feature | Description |
|---|---|
| Multi-Topology IS-IS | Support for multiple multicast topologies for IS-IS on IPv4 and IPv6 to allow ability to program different multicast routes in each table to create various topologies |

**Table 4.** New Software Features Supported in Cisco IOS XR Software Release 3.7.0 on the Cisco CRS-1 Routers

| Feature | Description |
|---|---|
| ATM L2VPN Port Mode | Support for Layer 2 VPNs in Port Mode on the ATM OC12 and OC3 SPAs |
| 6PE/6VPE with Inter-AS options A and B | Support for IPv6 over Multiprotocol Label Switching (MPLS) core and IPv6 VPNs over an MPLS core and the ability to use Inter-AS connectivity through Option A and Option B.<br>The feature also brings in support for external BGP (eBGP), Static and Enhanced Interior Gateway Routing Protocol (EIGRP) as Customer Edge to Provider Edge (CE-PE) protocols. |
| MPLS Traffic Engineering (MPLS TE) Support over VLANs | This feature brings in the ability to have MPLS TE tunnels over VLANs. |
| MPLS Traffic Engineering—IS-IS Overload Bit | This feature allows MPLS TE to ignore the IS-IS Overload Bit to keep the tunnels up. |
| BFD for IPv6 | Bidirectional Forwarding Detection (BFD) is a detection protocol that is designed to provide fast-forwarding path failure detection times for all media types, encapsulations, topologies, and routing protocols. In addition to fast-forwarding path failure detection, BFD provides a consistent failure detection method for network administrators. Because the network administrator can use BFD to detect forwarding path failures at a uniform rate, rather than the variable rates for different routing protocol hello mechanisms, network profiling and planning are easier, and reconvergence time is consistent and predictable. With IPv6 BFD, the router will have ability to set up BFD with IPv6 as the protocol and does not need to rely on IPv4 detection. |

**Table 5.** New Software Features Supported in Cisco IOS XR Software Release 3.7.0 on the Cisco XR 12000 Series Routers

| Feature | Description |
|---|---|
| Quality of Service (QoS) Multiaction Set/Policer | This feature extends the functionality of the Cisco IOS Software Traffic Policing feature (a single-rate policer) and the Two-Rate Policer feature. The Traffic Policing and Two-Rate Policer features are traffic policing mechanisms that allow the network administrator to control the maximum rate of traffic sent or received on an interface. Both of these traffic policing mechanisms mark packets as conforming to, exceeding, or violating a specified rate. After a packet is marked, one can specify an action to be taken on the packet based on that marking.<br>With both the Traffic Policing feature and the Two-Rate Policer features, the network administrator can specify only one conform action, one exceed action, and one violate action. With the Policer Enhancement: Multiple Actions feature, one can specify multiple conform, exceed, and violate actions for the marked packets.<br>One can specify multiple actions by using the action argument of the police command. |
| QoS Ingress Hierarchical Policer | Three-level Hierarchical Policer extends the traffic policing functionality by allowing the network administrator to configure traffic policing at *three* levels of policy map hierarchies; a primary level, a secondary level, and a tertiary level. Traffic policing may be configured at any or all of these levels, depending on the needs of the network. Configuring traffic policing in a three-level hierarchical structure provides a high degree of granularity for traffic policing. |
| VPLS (with MIB support) | Virtual Private LAN Service is a VPN technology that enables Ethernet Multipoint Services (EMS) over a packet-switched network infrastructure. VPN users get an emulated LAN segment that offers a Layer 2 broadcast domain. The end user perceives the service as a virtual private Ethernet switch that forwards frames to their respective destinations within the VPN. Ethernet is the technology of choice for LANs due to its relative low cost and simplicity.<br>The VPLS MIB is also supported in this release. |
| Lawful Intercept | Lawful Intercept is the process by which law enforcement agencies (LEAs) conduct electronic surveillance as authorized by judicial or administrative order. Increasingly, legislation is being adopted and regulations are being enforced that require service providers (SPs) and Internet service providers (ISPs) to implement their networks to explicitly support authorized electronic surveillance. |

| Feature | Description |
|---|---|
| Policy-Based Tunnel Selection | Policy-based tunnel selection (PBTS) provides a mechanism that lets the network administrator direct traffic into specific TE tunnels based on different criteria. PBTS will benefit ISPs that carry voice and data traffic through their MPLS networks and MPLS VPNs and that want to route this traffic to provide optimized voice service.<br>PBTS works by selecting tunnels based on the classification criteria of the incoming packets, which are based on the IP precedence, EXP, or type of service (ToS) field in the packet. When there are no paths with a default class configured, this traffic is forwarded using the paths with the lowest class value. |
| Netflow Enhancements<br>Destination-based accounting in hardware for IPv4 with BGP next-hop reporting<br>MPLS-aware IPv6 | Destination-based accounting in hardware, also known as the NetFlow Border Gateway Protocol (BGP) Next Hop Export feature, lets the network administrator measure network traffic on a per BGP next-hop basis.<br>With MPLS-aware IPv6 NetFlow, the functionality allows the collection of IPv6 flows that are being transported over MPLS. The traffics of the likes of 6PE and 6VPE can be tracked this way. |
| Multicast VPN for IPv6 over IPv4 core | Support for VPNs for IPv6 multicast traffic over an IPv4 core using IPv4 multicast to transport IPv6 traffic. This solution is based on draft-rosen-vpn-mcast-08.txt. |
| Pseudowire Preferred Path over TE with Enable Fallback | Preferred tunnel path functionality lets the network administrator map pseudowires to specific TE tunnels. Attachment circuits are cross-connected to specific MPLS TE tunnel interfaces instead of remote PE router IP addresses (reachable using Interior Gateway Protocol [IGP] or Label Distribution Protocol [LDP]).<br>Using preferred tunnel path, it is always assumed that the TE tunnel that transports the Layer 2 traffic runs between the two PE routers (that is, its head starts at the imposition PE router and its tail terminates on the disposition PE router). |
| Additional SNMP enhancements for Fan and Power Supply | Simple Network Management Protocol (SNMP) support was added to indicate the health of the fan trays and the power supplies. |
| Pseudowire Like-to-Like and local switching with L2TPv3 (Layer 2 Tunneling Protocol v3) | Local switching allows the network administrator to switch Layer 2 data between two interfaces of the same type (for example, ATM to ATM, or Frame Relay to Frame Relay) or between interfaces of different types (for example, Frame Relay to ATM) on the same router. The interfaces can be on the same line card or on two different cards. During these kinds of switching, the Layer 2 address is used, not any Layer 3 address.<br>Additionally, same-port local switching allows one to switch Layer 2 data between two circuits on the same interface. |
| SBC Enhancements<br>• SNMP MIBs<br>• VRF-aware DNS support<br>• Option Ping | Support for:<br>CISCO-SESSION-BORDER-CONTROLLER-EVENT-MIB: Defines SNMP notifications and alarms that are generated by Session Border Controller (SBC). This MIB sends the notifications and traps that are generated by SBC to the SNMP manager.<br>CISCO-SESSION-BORDER-CONTROLLER-STATS-MIB: Defines the SNMP statistics information for SBC. The two types are call statistics and media statistics. The calls are categorized as Session Initiation Protocol (SIP) calls and H.248 calls.<br>The support for Virtual Route Forwarding (VRF) awareness to DNS has been added.<br>In addition, Ping for Options packets is supported. |

## Ordering Information

Table 6 lists ordering information for Cisco IOS XR Software Release 3.7.0 for Cisco CRS-1 Carrier Routing Systems and Cisco XR 12000 Series Routers. These are the only part numbers that will be orderable. When rereleases of Cisco IOS Software Release 3.7.0 are available, ordering these part numbers will automatically result in the latest release being shipped.

**Table 6.** Ordering Information for Cisco IOS XR Software Release 3.7.0 for Cisco CRS-1 Routers and Cisco XR 12000 Series Routers

| Part Number | Description |
|---|---|
| XC-RP-03.07 | Cisco CRS-1 All Packages except Cryptographic Support |
| XC-RPK9-03.07 | Cisco CRS-1 All Packages with Cryptographic Support |
| XC-XR12K-03.07 | Cisco XR 12000 All Packages except Cryptographic Support |
| XC-XR12KK9-03.07 | Cisco XR 12000 All Packages with Cryptographic Support |

## Release 3.7 Lifecycle

The Cisco IOS XR Software release strategy is time-based, with a fixed release date and life cycle, as opposed to being a feature-based release strategy with a variable release date. Table 7 lists the major milestones of Cisco IOS XR Software Release 3.7.

**Table 7.** Major Milestones for Cisco IOS XR Software Release 3.7

| Milestone | Definition | Date |
|---|---|---|
| Availability date | The date that the Cisco IOS XR Software Release 3.7.0 information is published on Cisco.com and becomes available to the general public. | July 17, 2008 |
| End-of-life announcement date | The official end-of-life document that announces the end of sale and end of life of Cisco IOS XR Software 3.7 is distributed to the general public. | April 17, 2009 |
| End-of-sale date and end-of-maintenance date | The last date to order Cisco IOS XR Software 3.6 through Cisco point-of-sale mechanisms. The product is no longer for sale after this date.<br>This also marks end of engineering, maintenance rebuilds, and software fixes through rebuilds of Cisco IOS XR Software 3.7.x. After this date, maintenance rebuilds and software-fix support will be provided only through rebuilds of Cisco IOS XR Software 3.7.x or later. | January 17, 2010 |
| End of software maintenance releases through migration: OS software | The last date that Cisco Engineering may release any final software maintenance releases or bug fixes through Software Maintenance Upgrade (SMU). From January 22, 2010, until January 21, 2011, maintenance rebuilds and software fixes through SMU support for Cisco IOS XR Software 3.7.x will be provided only through migration to rebuilds of Cisco IOS XR Software 3.7.x and later. After January 21, 2011, Cisco Engineering will no longer develop, repair, maintain, or test Cisco IOS XR Software 3.7.x. | January 17, 2011 |
| Last date of support | The last date to receive service and support for the product. After this date, all support services for the product are unavailable and the product becomes obsolete. | January 17, 2015 |

For official end-of-life and end-of-sale announcements for Cisco IOS XR Software, please visit http://www.cisco.com/en/US/products/ps5845/prod_eol_notices_list.html or contact your local account representative.

## For More Information

For more information about the Cisco CRS-1 Carrier Routing System, Cisco 12000 Series Router, Cisco XR 12000 Series Router, or Cisco IOS XR Software, visit http://www.cisco.com/ or contact your local Cisco account representative.

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