



Release Notes for Cisco CRS Routers, IOS XR Release 6.7.4

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Release Notes for Cisco CRS Routers, IOS XR Release 6.7.4



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The Cisco Carrier Routing System (CRS) offers industry-leading performance, advanced services intelligence, environmentally conscious design, and system longevity. The Cisco CRS is powered by a chipset architecture based on multidimensional engineering and Cisco IOS XR Software, a unique self-healing, distributed operating system.

Cisco IOS XR Software is a distributed operating system designed for continuous system operation combined with service flexibility and higher performance.



Note Cisco IOS XR Release 6.7.4 is an Extended Maintenance Release of [Cisco IOS XR Release 6.7.2](#) for Cisco ASR 9000 Series routers. For more details on the Cisco IOS XR release model and associated support, see [Guidelines for Cisco IOS XR Software](#).

You can find the most current Cisco IOS XR software documentation at:

http://www.cisco.com/en/US/products/ps5763/tsd_products_support_series_home.html

For a list of software caveats that apply to Cisco IOS XR Software Release see the Caveats section. The caveats are updated for every release and are described at <http://www.cisco.com/c/en/us/products/routers/carrier-routing-system/index.html>.

We recommend that you view the field notices for this release located at the following URL to see if your software or hardware platforms are affected:

<http://www.cisco.com/c/en/us/support/routers/carrier-routing-system/products-field-notices-list.html>

This release notes describe the features provided in the Cisco IOS XR Software Release . See the *Software Features Introduced in Cisco IOS XR Software Release 6.7.4* section in this document for information on new software features.

What's New in Cisco IOS XR Release

Cisco is continuously enhancing the product with every release and this section covers a brief description of key features and enhancements. It also includes links to detailed documentation, where available.

Feature	Description
Multicast	

Feature	Description
mLDP Loop-Free Alternative Fast Reroute	In the event of link failure, this feature enables the router to switch traffic quickly to a precomputed loop-free alternative (LFA) path by allocating a label to the incoming traffic. Thus minimizes the traffic loss ensuring fast convergence.

Caveats

Caveats describe unexpected behavior in Cisco IOS XR Software releases. Severity-1 caveats are the most critical caveats; severity-2 caveats are less critical.

This section contains caveats that are generic to the Cisco IOS XR Software Release and those specific to the Cisco CRS-1 router and the Cisco CRS-3 router.

Cisco IOS XR Caveats

Caveat	Description
CSCvt15185	show bgp flap-statistics limited to 10 or 20 prefixes

Caveats Specific to the CRS Routers

Caveat	Description
CSCvw90724	cfgmgr-rp traceback seen on RP after physical RP OIR
CSCvw96852	ipv4_io traceback seen on multiple FP-140G LCs while CRS MC system booting up

Supported Packages and System Requirements

This section describes the system requirements for Cisco IOS XR Software Release 6.7.4 supported on the Cisco CRS Router.

Feature Set Table

This table lists the Cisco IOS XR Software feature set matrix (TAR files) and associated filenames available for the Cisco IOS XR Software Release 6.7.4 supported on the Cisco CRS router.

Table 1: Cisco IOS XR Software Release 6.7.4 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software	CRS-iosxr-px-6.7.4.tar	<ul style="list-style-type: none"> • Cisco IOS XR IP Unicast Routing Core Bundle • Cisco IOS XR Manageability Package • Cisco IOS MPLS Package • Cisco IOS XR Multicast Package • Cisco IOS XR Diagnostic Package • Cisco IOS XR FPD Package • Cisco IOS XR Lawful Intercept Package • Cisco IOS XR Services Package • Cisco IOS XR Documentation Package • Cisco IOS XR Video Package • Cisco IOS XR Satellite Package
Cisco IOS XR IP/MPLS Core Software 3DES	CRS-iosxr-px-k9-6.7.4.tar	<ul style="list-style-type: none"> • Cisco IOS XR IP Unicast Routing Core Bundle • Cisco IOS XR Manageability Package • Cisco IOS XR MPLS Package • Cisco IOS XR Multicast Package • Cisco IOS XR Security Package • Cisco IOS XR Diagnostic Package • Cisco IOS XR FPD Package • Cisco IOS XR Lawful Intercept Package • Cisco IOS XR Services Package • Cisco IOS XR Documentation Package • Cisco IOS XR Video Package • Cisco IOS XR Satellite Package

This table lists the Cisco IOS XR Software feature set matrix (PIE files) and associated filenames available for the Cisco IOS XR Software Release 6.7.4 supported on the Cisco CRS router.

Table 2: Cisco IOS XR Software Release 6.7.4 PIE Files

Feature Set	Filename	Description
Composite Package		
Cisco IOS XR IP Unicast Routing Core Bundle	hfr-mini-px.pie-6.7.4	Contains the required core packages, including OS, Admin, Base, Forwarding, Modular Services Card, Routing, SNMP Agent, and Alarm Correlation.
Cisco IOS XR IP Unicast Routing Core Bundle	hfr-mini-px.vm-6.7.4	Contains the required core packages including OS, Admin, Base, Forwarding, Modular Services Card, Routing, SNMP Agent, and Alarm Correlation.
Optional Individual Packages (Packages are installed individually)		
Cisco IOS XR Manageability Package	hfr-mgbl-px.pie-6.7.4	Common Object Request Broker Architecture (CORBA) agent, Extensible Markup Language (XML) Parser, and HTTP server packages.
Cisco IOS XR MPLS Package	hfr-mpls-px.pie-6.7.4	MPLS Traffic Engineering (MPLS-TE), Label Distribution Protocol (LDP), MPLS Forwarding, MPLS Operations, Administration, and Maintenance (OAM), Link Manager Protocol (LMP), Optical User Network Interface (OUNI), Resource Reservation Protocol (RSVP), and Layer-3 VPN.
Cisco IOS XR Multicast Package	hfr-mcast-px.pie-6.7.4	Multicast Routing Protocols (PIM, Multicast Source Discovery Protocol [MSDP], Internet Group Management Protocol [IGMP], Auto-RP), Tools (SAP, MTrace), and Infrastructure [(Multicast Routing Information Base [MRIB], Multicast-Unicast RIB [MURIB], Multicast forwarding [MFWD]).
Cisco IOS XR Security Package	hfr-k9sec-px.pie-6.7.4	Support for Encryption, Decryption, IP Security (IPSec), Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI) (Software based IPSec support—maximum of 500 tunnels)
Cisco IOS XR Services Package	hfr-services-px.pie-6.7.4	Includes binaries to support CGSE and CGSE PLUS cards.

Cisco IOS XR FPD Package	hfr-fpd-px.pie-6.7.4	Firmware for Fixed Physical layer interface module (PLIM) and Shared port adapters (SPA) modules as well as ROM monitor (ROMMON) images for Cisco CRS chassis.
Cisco IOS XR Diagnostic Package	hfr-diags-px.pie-6.7.4	Diagnostic utilities for Cisco IOS XR routers.
Cisco IOS XR Documentation Package	hfr-doc-px.pie-6.7.4	.man pages for Cisco IOS XR Software on the Cisco CRS chassis.
Cisco IOS XR Video Package	hfr-video-px.pie-6.7.4	Support for Video Monitoring on Cisco CRS routers.
Cisco IOS XR Satellite Package	hfr-asr9000v-nV-px.pie-6.7.4	Includes binaries to support Cisco ASR9000v Series Router Software.
Cisco IOS XR Lawful Intercept (LI) Package	hfr-li-px.pie-6.7.4	Includes LI software images.

Memory Requirements



Caution If you remove the media in which the software image or configuration is stored, the router may become unstable and fail.

The minimum memory requirements for a Cisco CRS running Cisco IOS XR Software Release 6.7.4 consist of the following:

- 6 GB memory on route processors (RPs)

Supported Hardware

The following tables lists the supported hardware components on the Cisco CRS Router and the minimum required software versions. For more information, see the *Firmware Support* section.

All hardware features are supported on Cisco IOS XR Software, subject to the memory requirements specified in the *Memory Requirements* section.

Table 3: Cisco CRS Supported Hardware and Minimum Software Requirements

Component	Part Number	Support from version
Cisco CRS Series 16-Slot Line Card Chassis		
Cisco CRS 16-Slot Line Card Chassis	CRS-16-LCC	3.2
Cisco CRS Fan Tray for 16-Slot LCC	CRS-16-LCC-FAN-TR	3.2
Cisco CRS Fan Controller for 16-Slot Line Card Chassis	CRS-16-LCC-FAN-CT	3.2
Cisco CRS 16-Slot Alarm Board	CRS-16-ALARM	3.2
Cisco CRS AC Delta Power Shelf for 16-Slot LCC	CRS-16-LCC-PS-ACD	3.2

Cisco CRS AC Wye Power Shelf for 16-Slot LCC	CRS-16-LCC-PS-ACW	3.2
Cisco CRS DC Power Shelf for 16-Slot LCC	CRS-16-LCC-PS-DC	3.2
Cisco CRS LCC Front AC Power Panel	CRS-16-ACGRILLE	3.2
Cisco CRS LCC Front DC Power Panel	CRS-16-DCGRILLE	3.2
Cisco CRS Line Card Chassis Front Doors	CRS-16-LCC-DRS-F	3.2
Cisco CRS Line Card Chassis Front Cable Mgmt	CRS-16-LCC-FRNT	3.2
Cisco CRS LCC Expanded Front Cable Mgmt	CRS-16-LCC-FRNT-E	3.2
Cisco CRS Line Card Chassis Rear Cable Mgmt	CRS-16-LCC-BCK-CM	3.2
Cisco CRS Line Card Chassis Rear Doors	CRS-16-LCC-DRS-R	3.2
Cisco CRS Lift for LCC 16 and FCC	CRS-16-LIFT/B	3.2
Cisco CRS DC PEM for 16 slot LCC and FCC	CRS-16-DC-PEM	3.2
Cisco CRS 16 Slot System Reduced-Noise DC PEM	CRS-16-DC-PEM-B	3.8
Cisco CRS 16 Slot System Reduced-Noise Fan Tray	CRS-16-LCC-FNTR-B	3.8
Cisco CRS Series LC Chassis Fan Controller	CRS-16-LCC-F-CT-B	4.0.1PX
Cisco CRS 16-Slot Enhanced Line Card Chassis	CRS-16-LCC-B	4.0.3
Cisco CRS Modular Power Alarm for 16 slots and FCC	CRS-16-ALARM-C	3.9
Cisco CRS Modular Power Grill For 16 Slots and FCC	CRS-16-PW-GRILL	3.9
Cisco CRS Modular DC Power Shelf for 16 slots LCC	CRS-16LCC-PSH-DC	3.9
Cisco CRS Modular AC Power Shelf for 16 slots LCC	CRS-16LCC-PSH-AC	3.9
Cisco CRS Modular AC Power Module	CRS-PM-AC	3.9
Cisco CRS Series 8-Slot Line Card Chassis		
Cisco CRS 8-Slot Install Kit	CRS-8-INSTALL-KT	N/A
Cisco CRS 8-Slot Fork Lift Tube	CRS-8-LIFT-TUBE	N/A
Cisco CRS 8-Slot Front Badge Panel	CRS-8-BDG-PANEL	N/A
Cisco CRS 8-Slot Front Inlet Grill	CRS-8-FRNT-GRILL	N/A
Cisco CRS 8-Slot Horizontal Install Rails	CRS-8-HRZ-RAILS	N/A
Cisco CRS 8-Slot Line Card Chassis	CRS-8-LCC	3.2
Cisco CRS Fan Tray for 8-Slot Line Card Chassis	CRS-8-LCC-FAN-TR	3.2
Cisco CRS Line Card Chassis Filter Pack	CRS-8-LCC-FILTER	3.2

Cisco CRS AC Pwr Rectifier for 8-Slot LCC	CRS-8-AC-RECT	3.2
Cisco CRS DC Power Entry Module for 8-Slot LCC	CRS-8-DC-PEM	3.2
Cisco CRS AC & DC Power Module Filter for 8-Slot LCC	CRS-8-PWR-FILTER	3.2
Cisco CRS AC Delta PDU for CRS-8 LCC	CRS-8-LCC-PDU-ACD	3.2
Cisco CRS AC Wye PDU for CRS-8 LCC	CRS-8-LCC-PDU-ACW	3.2
Cisco CRS DC PDU for CRS-8 LCC	CRS-8-LCC-PDU-DC	3.2
Cisco CRS 8-Slot Enhanced Line Card Chassis	CRS-8-LCC-B You must use CRS-8-FANTRAY-B fan tray when CRS-MSC-X, CRS-LSP-X and CRS-FP-X line cards are installed.	4.2.0
Cisco CRS Modular DC Power Shelf for 8 slots Chassis	CRS-8-PSH-DC	3.9
Cisco CRS Modular DC Power Module	CRS-PM-DC	3.9
Cisco CRS Modular AC Power Shelf for 8 slots Chassis	CRS-8-PSH-AC	3.9
Cisco CRS Modular AC Power Module	CRS-PM-AC	3.9
Cisco CRS 8 slot Fan Tray for CRS-8/S-B	CRS-8-FANTRAY-B	--
Cisco CRS Series 4-Slot Line Card Chassis		
Cisco CRS 4-Slot Line Card Chassis	CRS-4-CH	3.4
Cisco CRS 4-Slot AC supply	CRS-4-AC-SUPPLY	3.4
Cisco CRS 4-Slot AC Shelf	CRS-4-AC-SHELF	3.4
Cisco CRS 4 slot Fan Tray	CRS-4-FAN-TR	3.4
Cisco CRS Fabric Chassis Hardware		
Cisco CRS-1 Series Fabric Card Chassis Only	CRS-FCC=	3.2
CRS-1 Fabric Chassis AC Delta Power Kit	CRS-FCC-ACD-KIT	3.2
CRS-1 Fabric Chassis AC Grille	CRS-FCC-ACGRILLE	3.2
CRS-1 Fabric Chassis AC-Wye Power Kit	CRS-FCC-ACW-KIT	3.2
CRS Fabric Chassis DC Power Kit	CRS-FCC-DC-KIT	3.2
CRS-1 Fabric Chassis DC Power Grille	CRS-FCC-DCGRILLE	3.2
CRS Fabric Chassis Lift Bracket	CRS-FCC-LIFT-BRKT	3.2
CRS Fabric Chassis OIM Modules	CRS-FCC-OIM-1S=	3.2

Cisco CRS-1 Series FC Chassis Shelf/Fan/Enet cntr	CRS-FCC-SC-GE=	3.2
CRS-1 Fabric Chassis AC Intake Grille	CRS-FCC-ACGRILLE=	3.2
CRS-1 Fabric Chassis DC Intake Grille	CRS-FCC-DCGRILLE=	3.2
Cisco CRS-1 Series Fan Tray for FCC	CRS-FCC-FAN-TR=	3.2
CRS-1 Fabric Card Chassis Fan Tray Filters	CRS-FCC-FILTER=	3.2
CRS-1 Fabric Chassis Front Cosmetic Kit	CRS-FCC-FRNT-CM=	3.2
Cisco CRS-1 Series Fabric Card Chassis Fiber Module LED	CRS-FCC-LED=	3.2
Cisco CRS-1 Series DC Power Shelf for FCC	CRS-FCC-PS-DC=	3.2
CRS-1 Fabric Chassis Rear Cosmetic Kit	CRS-FCC-REAR-CM=	3.2
CRS-LIFT Brackets for Fabric Chassis	CRS-FCC-LIFT-BRKT=	3.2
CRS Fabric Chassis OIM Module	CRS-FCC-OIM-1S	3.2
CRS-1 Fabric Chassis AC Delta Power Supply	CRS-FCC-PS-ACD	3.2
CRS-1 Fabric Chassis AC Wye Option	CRS-FCC-PS-ACW	3.2
CRS-1 Fabric Chassis DC Power Option	CRS-FCC-PS-DC	3.2
Cisco CRS-1 Series Fabric Card Chassis Switch Fabric Card	CRS-FCC-SFC=	3.2
CRS-1 Fabric Chassis Integrated Switch Controller Card	CRS-FCC-SC-22GE Integrated Switch	3.4.1
Cisco CRS-3 Series Fabric Card Chassis Switch	CRS-FCC-SFC-140	4.0.3
CRS-1 Fabric Chassis Integrated Switch Controller Card - B	CRS-FCC-SC-22GE-B	5.1.3
Cisco CRS-X Fabric Card Chassis Switch Fabric Card (400G)	CRS-FCC-SFC-400	5.1.3
Cisco CRS-X Fabric Card Chassis Switch Fabric Card (400G)-B	CRS-FCC-SFC-400-B	5.3.3 with hfr-px-5.3.3.CRS.tar SMU tar file
Cisco CRS General Chassis Hardware		
Cisco CRS PCMCIA Flash Disk 4 GB	CRS-FLASH-DISK-4G	3.8
Cisco CRS PCMCIA Flash Disk 16 GB	CRS-FLASH-DISK-16G	4.2
Cisco CRS Modular Service Card	CRS-MSC	3.2
Cisco CRS Modular Service Card B	CRS-MSC-B	3.6
Cisco CRS-1 Series Forwarding Processor 40G	CRS-FP40	3.8.1
Cisco CRS Series Modular Services Card 140G	CRS-MSC-140G	4.0.0 PX

Cisco CRS Series Forwarding Processor Card 140G	CRS-FP140	4.0.0 PX
Cisco CRS-3 Label Switch Processor	CRS-LSP	4.3.0
Cisco CRS-X Label Switch Processor	CRS-LSP-X	5.1.2
Cisco CRS Series Modular Services Card 400G	CRS-MSX	5.1.1
Cisco CRS Series Forwarding Processor 400G	CRS-FP-X	5.1.1
Cisco CRS 8-Slot Fabric Card/Single	CRS-8-FC/S	3.2
Cisco CRS 8-Slot Fabric Card Blank	CRS-8-FC-BLANK	3.2
Cisco CRS 8-Slot Fabric Handle	CRS-8-FC-HANDLE	3.2
Cisco CRS 16-Slot Fabric Card/Single	CRS-16-FC/S	3.2
Cisco CRS Series 4 Slots Fabric Card / Single (140G)	CRS-4-FC140/S	4.0.0 PX
Cisco CRS Series 8 Slots Fabric Card / Single (140G)	CRS-8-FC140/S	4.0.0 PX
Cisco CRS Series 16 Slots Fabric Card / Single (140G)	CRS-16-FC140/S	4.0.0 PX
Cisco CRS Series 16 Slots Fabric Card / Multi (140G)	CRS-16-FC140/M	4.0.3
Cisco CRS Series 8 Slots Fabric Card / Single Chassis (400G)	CRS-8-FC400/S	5.1.1
Cisco CRS Series 16 Slots Fabric Card / Single Chassis (400G)	CRS-16-FC400/S	5.1.1
Cisco CRS Series 8-Slot Back-to-Back Fabric Card	CRS-8-FC140/M	4.3.1
Cisco CRS-X 16-Slot Line Card Chassis Fabric Card / Multi (400G)	CRS-16-FC400/M	5.1.3
Cisco CRS Series Modular Services Card 200G	CRS-MSX-L	5.1.4
Cisco CRS Series Forwarding Processor 200G	CRS-FP-X-L	5.1.4
Cisco CRS Series 8 Slots Fabric Card / Multi (400G)	CRS-8-FC400/M	5.3.1
Cisco CRS Interface and Route Processor Cards		
Cisco Carrier 1 Series SPA Interface Processor 40G	CRS1-SIP-800	3.2
Cisco CRS-1 Distributed Route Processor	CRS-DRP	3.3
Cisco CRS-1 Distributed Route Processor CPU Module	CRS-DRP-B-CPU	3.4.1
Cisco CRS-1 Distributed Route Processor PLIM Module	CRS-DRP-B-PLIM	3.4.1
Cisco CRS Series 14x10GbE LAN/WAN-PHY Interface Module	14X10GBE-WL-XFP	4.0.0 PX
Cisco CRS Series 20x10GbE LAN/WAN-PHY Interface Module	20X10GBE-WL-XFP	4.0.0 PX

Cisco CRS 1-port 100-GE CFP PLIM	1x100-GE CFP PLIM	4.0.1 PX
Cisco CRS 2-port 100-GE and 5-port 40-GE QSFP+combination PLIM	2X100GE-FLEX-40	5.1.3
Cisco CRS Series 4x100GbE LAN/OTN Interface Module	4X100GE-LO	5.1.1
Cisco CRS Series 40x10GbE LAN/WAN/OTN Interface Module	40X10GE-WLO	5.1.1
Cisco CRS-1 Series 8 Slots 6 Gb Performance Route Processor	CRS-8-PRP-6G	4.1
Cisco CRS-1 Series 8 Slots 12 Gb Performance Route Processor	CRS-8-PRP-12G	4.1
Cisco CRS-1 Series 16 Slots 6 Gb Performance Route Processor	CRS-16-PRP-6G	4.1
Cisco CRS-1 Series 16 Slots 12 Gb Performance Route Processor	CRS-16-PRP-12G	4.1
Cisco CRS Series 4x40GbE OTU3 Interface Module	4-40GE-L/OTN	4.2.3
Cisco CRS Series 2x40GbE OTU3 Interface Module	2-40GE-L/OTN	4.2.3
Cisco CRS Series 1x100GbE IPoDWDM Interface Module	1-100GE-DWDM/C	4.2.3
Cisco CRS Flexible SPA and 6-port 10GE PLIM	6-10GE-WLO-FLEX	4.3.0
Cisco CRS 80 Gbps Carrier Grade Services Engine PLIM	CRS-CGSE-PLUS	4.3.1
Cisco CRS SONET Interface Modules and SPAs		
Cisco CRS 4xOC-192c/STM64c POS/DPT Interface Module/VS	4OC192-POS/DPT-VS	3.2
Cisco CRS 4xOC-192c/STM64c POS/DPT Interface Module/SR	4OC192-POS/DPT-SR	3.2
Cisco CRS 4xOC-192c/STM64c POS/DPT Interface Module/IR	4OC192-POS/DPT-IR	3.2
Cisco CRS 4xOC-192c/STM64c POS/DPT Interface Module/LR	4OC192-POS/DPT-LR	3.2
Cisco CRS 16xOC-48c/STM16c POS/DPT Interface Module	16OC48-POS/DPT	3.2
Cisco CRS 1xOC-768c/STM256c POS Interface Module/SR	1OC768-POS-SR	3.2
Cisco CRS 8-Port OC-12c/STM-4c Shared Port Adapter	SPA-8XOC12-POS	3.3 on CRS1-SIP-800 4.3.1 on 6-10GE-WLO-FLEX
Cisco CRS 2-Port OC-48c/STM-16c POS/RPR Shared Port Adapter	SPA-2XOC48-POS/RPR	3.4 on CRS1-SIP-800 4.3.0 on 6-10GE-WLO-FLEX
Cisco CRS 4-Port OC-48c/STM-16c POS/RPR Shared Port Adapter	SPA-4XOC48-POS/RPR	3.4 on CRS1-SIP-800 4.3.0 on 6-10GE-WLO-FLEX

Cisco CRS 1-Port OC-192c/STM-64c POS/RPR Shared Port Adapter with XFP Optics	SPA-OC192POS-XFP	3.2 on CRS1-SIP-800 4.3.0 on 6-10GE-WLO-FLEX
Cisco CRS 4-Port OC-3c/STM-1c Shared Port Adapter	SPA-4XOC3-POS	3.2 on CRS1-SIP-800 4.3.1 on 6-10GE-WLO-FLEX
Cisco CRS 1-Port OC-192/STM-64 POS/RPR SPA VSR Optics	SPA-OC192POS-VSR	3.4.1 on CRS1-SIP-800
Cisco CRS 4-Port OC-12c/STM-4 Packet over SONET SPA	SPA-4XOC12-POS	4.0.1 on CRS1-SIP-800 4.3.1 on 6-10GE-WLO-FLEX
Cisco CRS 8-Port OC-3c/STM-1 Packet over SONET SPA	SPA-8XOC3-POS	4.0.1 on CRS1-SIP-800 4.3.1 on 6-10GE-WLO-FLEX
Cisco CRS 4-Port OC-3c/STM-1 Packet over SONET SPA	SPA-4XOC3-POS-V2	4.0.1 on CRS1-SIP-800 4.3.2 on 6-10GE-WLO-FLEX
Cisco CRS 1-Port OC-768c/STM-256c (C-band) DWDM PLIM	1OC768-ITU/C	3.3
Cisco CRS 1-Port OC-768c/STM-256c (C-band) DPSK+ DWDM PLIM	1OC768-DPSK/C	3.6
Cisco CRS ATM Modules and SPAs		
3-Port Clear Channel OC-3 ATM SPA	SPA-3XOC3-ATM-V2	3.7 on CRS1-SIP-800
1-Port Clear Channel OC-12 ATM SPA	SPA-1XOC12-ATM-V2	3.7 on CRS1-SIP-800
Cisco CRS Serial Interface Modules and SPAs		
Cisco CRS 4-Port Clear Channel T3/E3 Serial Shared Port Adapter	SPA-4XT3/E3	3.4.1 on CRS1-SIP-800
Cisco CRS 2-Port Clear Channel T3/E3 Serial Shared Port Adapter	SPA-2XT3/E3	3.4.1 on CRS1-SIP-800
Cisco CRS Ethernet Interface Modules and SPAs		
Cisco CRS 8x10 GbE Interface Module LR/ER	8-10GBE	3.2
Cisco 5-Port Gigabit Ethernet Shared Port Adapter, Version 2	SPA-5X1GE-V2	3.4 on CRS1-SIP-800
Cisco 8-Port Gigabit Ethernet Shared Port Adapter, Version 2	SPA-8X1GE-V2	3.4 on CRS1-SIP-800 4.3.0 on 6-10GE-WLO-FLEX
Cisco 8-Port Gigabit Ethernet Shared Port Adapter	SPA-8X1GE	3.2 on CRS1-SIP-800
Cisco 10-Port Gigabit Ethernet Shared Port Adapter, Version 2	SPA-10X1GE-V2	3.4 on CRS1-SIP-800 4.3.2 on 6-10GE-WLO-FLEX

Cisco 1-Port Ten Gigabit Ethernet Shared Port Adapter, Version 2	SPA-1X10GE-L-V2	3.4 on CRS1-SIP-800 4.3.2 on 6-10GE-WLO-FLEX
Cisco 4-Port Ten Gigabit Ethernet (C-band) DWDM PLIM	4-10GE-ITU/C	3.3
Cisco 1-port 10GbE SPA WAN/LAN PHY	SPA-1X10GE-WL-V2	3.5.2 on CRS1-SIP-800 4.3.2 on 6-10GE-WLO-FLEX
Cisco CRS-1 Series 4x10GE Interface Module	4-10GE	3.8.1
Cisco CRS-1 Series 42x1GE Interface Module	42-1GE	3.8.1
Cisco CRS-1 Series 8-Port Ten Gigabit Ethernet Interface Module	8-10GBE-WL-XFP	3.9.1
Cisco CRS-1 Series 4-Port Ten Gigabit Ethernet Interface Module	4-10GBE-WL-XFP	3.8.4
Cisco CRS-1 Series 20x1GE Flexible Interface Module	20-1GE-FLEX	3.8.1
Cisco CRS-1 Series 2x10GE WAN/LAN Flexible Interface Module	2-10GE-WL-FLEX	3.8.1
Cisco CRS 10GE Optical to Electrical Modules		
10GBASE-LR XENPAK Module for Cisco CRS	XENPAK-10GB-LR+	3.4
10GBASE-DWDM XENPAK	XENPAK-10GB-DWDM	3.2.2
10GBASE-ER XENPAK Modular for Cisco CRS-1	XENPAK-10GB-ER	3.4
10GBASE-ER XENPAK Modular for Cisco CRS-1	XENPAK-10GB-ER+	3.4
Cisco 10GBASE-SR XFP Module for MMF	XFP-10G-MM-SR	3.8
Cisco Multirate 10GBASE-LR/-LW and OC-192/STM-64 SR-1 XFP Module for SMF	XFP-10GLR-OC192SR	3.4
Cisco Multirate 10GBASE-LR/-LW and OC-192/STM-64 SR-1 XFP Module for SMF, low power (1.5W)	XFP10GLR-192SR-L	3.8.4, 3.9.1
Cisco Multirate 10GBASE-ER/-EW and OC-192/STM-64 IR-2 XFP Module for SMF	XFP-10GER-192IR+	3.4
Cisco Multirate 10GBASE-ER/-EW and OC-192/STM-64 IR-2 XFP Module for SMF, low power (2.5W)	XFP10GER-192IR-L	3.8.4, 3.9.1
Cisco Multirate 10GBASE-ZR/-ZW and OC-192/STM-64 IR-2 XFP Module for SMF	XFP-10GZR-OC192LR	3.4
Cisco fixed rate Dense Wavelength-Division Multiplexing XFP Modules	DWDM-XFP-30.33 through DWDM-XFP-59.79	NA

Cisco 10GBASE Dense Wavelength-Division Multiplexing XFP Module	DWDM-XFP-C	4.2.3
10GBASE-SR SFP Module	SFP-10G-SR	5.1.1
10GBASE-SR SFP Module for Extended Temp range	SFP-10G-SR-X	5.1.1
10GBASE-LR SFP Module	SFP-10G-LR	5.1.1
10GBASE-LR SFP Module for Extended Temp range	SFP-10G-LR-X	5.1.1
10GBASE-ER SFP Module	SFP-10G-ER	5.1.1
10GBASE-ZR SFP10G Module for SMF	SFP-10G-ZR	5.1.1
Cisco CRS SFPs and CFPs		
Optics module for 3-Port 100-GE LAN and 1-Port 100-GE IPoDWDM PLIM	ONS-CFP2-WDM	6.1.2
Cisco CRS 2.5 G SFP LR Optic	POM-OC48-LR2-LC-C	3.2
Cisco CRS 2.5 G SFP SR Optic	POM-OC48-SR-LC-C	3.2
GE SFP, LC connector LX/LH transceiver	GLC-LH-SM	3.2
1000BASE-SX SFP transceiver module, MMF, 850nm, DOM	GLC-SX-MMD	3.6
1000BASE-LX/LH SFP transceiver module, MMF/SMF, 1310nm, DOM	GLC-LH-SMD	3.6
1000BASE-LX/LH SFP	SFP-GE-L	3.4
1000BASE-SX SFP (DOM)	SFP-GE-S	3.4
1000BASE-T SFP (NEBS 3 ESD)	SFP-GE-T	3.4
1000BASE-ZX Gigabit Ethernet SFP (DOM)	SFP-GE-Z	3.4
100GBASE-LR4 CFP transceiver module for SMF, 1310-nm wavelength, SC duplex connector	CFP-100G-LR4	4.0
100 Gigabit Ethernet over 10 short-reach optical lanes (SR10) optics (multimode fiber)	CFP-100G-SR10	4.2.1
CPAK-100G-LR4 Transceiver module, 10 km SMF	CPAK-100G-LR4	5.1.1
CPAK-100G-SR10 Transceiver module, 100 m OM3 MMF	CPAK-100G-SR10	5.1.1
CPAK optical transceiver module, 100GBASE-SR4, 100m OM4	CPAK-100G-SR4	6.1.2
100-Gigabit Ethernet C Form-factor Pluggable (CFP) optics module - CFP-100G-ER4	CFP-100G-ER4	5.1.2

40-Gigabit Ethernet C Form-factor Pluggable (CFP) optics module - 40GBASE-LR4	CFP-40G-LR4	4.2.3
40-Gigabit Ethernet C Form-factor Pluggable (CFP) optics module - 40GBASE-SR4	CFP-40G-SR4	4.2.3
40-Gigabit Ethernet C Form-factor Pluggable (CFP) optics module - 40GBASE-FR	CFP-40G-FR	4.2.3
Cisco 40GBASE-SR4 QSFP Module	QSFP-40G-SR4	5.1.3
Cisco 40GBASE-LR4 QSFP Module	QSFP-40G-LR4	5.1.3
Cisco 40GBASE-ER4 QSFP Module	QSFP-40G-ER4	5.3.1

Hardware Not Supported

The following hardware are not supported:

Component	Part Number
Cisco CRS-1 16-Slot Line-Card Chassis Route Processor	CRS-16-RP
Cisco CRS PCMCIA Flash Disk 2 GB	CRS-FLASH-DISK-2G
Cisco CRS 8-Slot Route Processor	CRS-8-RP
Cisco CRS-1 16-slot Route Processor, revision B	CRS-16-RP-B



Note

- The fixed configuration DC power system is not supported for CRS-X 8-slot legacy chassis (CRS-8-LCC) and CRS-X 16-slot single/multichassis system legacy chassis (CRS-16-LCC). We recommend to replace the fixed configuration DC power system with modular configuration DC power system. The product ID for modular DC power systems are CRS-8-DCKIT-M= and CRS-16-DCKIT-M= respectively for 8 slots system and 16 slots system.
- CRS supports PRP for all Single chassis and Multichassis configurations, due to its significant advantages in improving boot time, performance, and scale. For information on End-of-Sale and End-of-Life Announcement for the Cisco CRS 8-Slot and 16-slot Line Card Chassis Route Processors:
 - http://www.cisco.com/en/US/prod/collateral/routers/ps5763/end_of_life_notice_c51-695816.html
 - http://www.cisco.com/en/US/prod/collateral/routers/ps5763/end_of_life_notice_c51-695817.html
- Cisco Session Border Controller (SBC) is not supported. Cisco IOS XR Software Release 3.7 is the last release that supports SBC.
- Cisco CRS-1 Series Forwarding Processor 40G (CRS-FP40) is not supported on Cisco CRS 16-Slot chassis.

CRS-FP140 Licenses

The following licenses apply to the CRS-FP140:

Licence	Description
XC-ENH-NF-140G	Cisco CRS Series Enhanced Netflow Performance License 140G
XC-L2L3VPN-140G	Cisco CRS Series L2 and L3 VPN Peering Edge License 140G
XC-RTE-SCL-140G	Cisco CRS Series Route Scale License 140G
XC-TE-SCL-140G	Cisco CRS Series Traffic Engineering Scale License 140G
XC-MC-LIC-140G	Cisco CRS Series Multichassis License 140G

CRS-FP140 also supports eDelivery licenses, which can be downloaded as the License Certificates in PDF format.

eDelivery PID	Description
L-XC-ENH-NF-140G=	Cisco CRS Series Enhanced NetFlow License 140G
L-XC-RTE-SCL-140G=	Cisco CRS Series Route Scale License 140G
L-XC-MC-LIC-140G=	Cisco CRS Series Multichassis License 140G
L-XC-TE-SCL-140G=	Cisco CRS Series Traffic Engineering Scale License 140G
L-XC-L2L3VPN-140G=	Cisco CRS Series L2 L3 VPN Peering Edge License 140G

CRS-FP400G Licenses

The following licenses apply to the CRS-FP400G:

Licence	Description
XC-ENH-NF-400G	Cisco CRS Series Enhanced Netflow Performance License 400G
XC-L2L3VPN-400G	Cisco CRS Series L2 and L3 VPN Peering Edge License 400G
XC-RTE-SCL-400G	Cisco CRS Series Route Scale License 400G
XC-TE-SCL-400G	Cisco CRS Series Traffic Engineering Scale License 400G

CRS-FP400G also supports eDelivery licenses, which can be downloaded as the License Certificates in PDF format.

For further information or questions, please visit <http://www.cisco.com/web/partners/tools/edelivery.html>.

eDelivery PID	Description
L-XC-ENH-NF-400G=	Cisco CRS Series Enhanced NetFlow License 400G
L-XC-RTE-SCL-400G=	Cisco CRS Series Route Scale License 400G
L-XC-TE-SCL-400G=	Cisco CRS Series Traffic Engineering Scale License 400G
L-XC-L2L3VPN-400G=	Cisco CRS Series L2 L3 VPN Peering Edge License 400G

Minimum Firmware Requirement

The following table provides the procedures and resources for minimum firmware requirements:

After completing an RMA, upgrade the firmware as per the matrix in this link, which also links to PDF copies of the IOS XR Firmware Upgrade Guides	http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html
For the upgrade CLI, refer to the <i>Hardware Redundancy and Node Administration Commands</i> on <i>Cisco IOS XR Software</i> chapter of the <i>Cisco IOS XR System Management Command Reference for the Cisco CRS router</i>	http://www.cisco.com/en/US/products/ps5763/prod_command_reference_list.html



Note P image is discontinued from Cisco IOS XR Software Release 4.2 onwards. For more information about this, see the discontinuation of P image for Cisco CRS in Cisco IOS XR Software Release 4.2 and later at http://www.cisco.com/en/US/prod/collateral/routers/ps5763/product_bulletin_c25-663499.html.

Software Compatibility

Cisco IOS XR Software Release 6.7.4 is compatible with the following Cisco CRS-1 and CRS-3 systems:

- Cisco CRS 4-Slot Single Chassis System
- Cisco CRS 8-Slot Single Chassis System
- Cisco CRS 16-Slot Single Chassis System
- Cisco CRS Multichassis Systems

Cisco IOS XR Software Release 6.7.4 is compatible with the following Cisco CRS-3 system:

- Cisco CRS-3 Multichassis System, maximum configuration of 8+2
- Cisco CRS-3 16-slot Back-to-Back System
- Cisco CRS-3 8-slot Back-to-Back System

Cisco IOS XR Software Release 6.7.4 is compatible with the following Cisco CRS-X systems:

- Cisco CRS 8-Slot Single Chassis System. You must use CRS-8-FANTRAY-B fan tray with Cisco CRS-X system.
- Cisco CRS 16-Slot Single Chassis System
- Cisco CRS-X Multichassis System, maximum configuration of 8+2
- Cisco CRS-X 16-slot Back-to-Back System
- Cisco CRS-X 8-slot Back-to-Back System

Determining Installed Packages

To determine the version of Cisco IOS XR Software packages installed on your router, log in to the router and enter the **show install committed summary** command:

Firmware Support

To check the firmware code running on the Cisco CRS Router, run the **show fpd package** command in admin mode.



Note The show command output lists supported and EOL hardware PIDs. To know the PIDs that are supported in this release, see the Supported Hardware section in this Release Notes.

Other Important Information

- Starting with Cisco IOS XR Release 6.7.2, the output for **show mpls traffic-eng tunnels xx role head** command is missing protocol and area ID information for path-option dynamic tunnels in area 0.
- Starting with Cisco IOS XR Release 6.3.1, the SNMP walk for any OSPF Metric OID returns only the metric of the highest area ID from either MADJ interface or primary interface. That is, if the highest area ID is for MADJ interface then the OID returns the MADJ interface metric, or if the highest area ID is for primary interface, it will return primary interface metric. Prior to this release, the OID would return primary interface metric and highest area ID MADJ interface metric.
- From Release 6.0, the onePK toolkit is not supported.
- Default timestamp setting—The timestamp prompt that precedes console output is enabled by default. To disable the timestamp prompt, use the **no service timestamp** command. For more information, refer to the *Cisco IOS XR System Management Command Reference for the Cisco CRS Router*.
- Country-specific laws, regulations, and licenses—In certain countries, use of these products may be prohibited and subject to laws, regulations, or licenses, including requirements applicable to the use of the products under telecommunications and other laws and regulations; customers must comply with all such applicable laws in the countries in which they intend to use the products.
- Field replaceable unit (FRU) removal—For all card removal and replacement (including fabric cards, line cards, fan controller, and RP) follow the instructions provided by Cisco to avoid impact to traffic. See the *Cisco IOS XR Getting Started Guide for the Cisco CRS Router* for procedures.
- Exceeding Cisco testing—If you intend to test beyond the combined maximum configuration tested and published by Cisco, contact your Cisco Technical Support representative to discuss how to engineer a large-scale configuration for your purpose.
- **mpls traffic engineering igp-intact** command—This command must be used only when policy based tunnel selection is configured for all tunnels originating on the device. This CLI needs to be turned on under IGP (OSPF/ISIS) under the respective AFI.
- The following TE Path option attribute commands are not supported on the Cisco CRS-1 Series Router:
 - affinity location set
 - affinity location type
 - affinity program

- affinity self

- BFD IPv6 UDP Checksum Calculation—Starting Cisco IOS XR Software Release 3.9, you turn the BFD IPv6 UDP checksum calculation on and off:

- To disable the BFD IPv6 UDP checksum calculation:

```
RP/0/RP0/CPU0:router(config)#bfd
RP/0/RP0/CPU0:router(config-bfd)#ipv6 checksum disable
RP/0/RP0/CPU0:router(config-bfd)#end
```

- To enable BFD IPv6 UDP checksum calculation:

```
RP/0/RP0/CPU0:router(config)#bfd
RP/0/RP0/CPU0:router(config-bfd)#no ipv6 checksum disable
RP/0/RP0/CPU0:router(config-bfd)#end
```

- When upgrading a system from a release prior to 3.8.4, the MAC address assigned to physical interfaces changes. This is required because prior to Cisco IOS XR Software Release 3.8.4 the MAC address assigned to the bundle interface was taken from the first member's MAC address. If this bundle member is removed from the bundle, the bundle gets a new MAC address, which results in traffic loss due to ARP resolution. Beginning in Cisco IOS XR Software Release 3.8.4, a pool of MAC addresses are assigned to the bundle interfaces by the bundlemgr process during bundle interface creation.
- Deactivation of os-mpi dependent (Nonreload) SMU fails—Backing out the non reload os-mpi SMU fails because deactivation runs out of memory (activation did not release some memory, which stayed at 38 MB). This failure to activate or deactivate the SMU due to insufficient SP resources impacts SP cards on CRS.
- When configuring the Label Distribution Protocol (LDP) graceful restart (GR) process in a network with multiple [link and/or targeted] LDP hello adjacencies with the same neighbor, make sure that GR is activated on the session before any hello adjacency times out due to neighbor control plane failures. One way of achieving this is by configuring a lower session hold time between neighbors such that session time out always occurs before hello adjacency can time out. Cisco recommends setting LDP session hold time using the following formula:

$LDP \text{ session hold time} \leq (\text{Hello hold time} - \text{Hello interval}) * 3$

This means that for default values of 15/5 seconds respectively for the link Hello hold time and the Hello interval, the LDP session hold time should be set to 30 seconds or less.

For more information, refer to the *Implementing MPLS Label Distribution Protocol on Cisco IOS XR Software* section of the *MPLS Configuration Guide for the Cisco CRS Routers*.

- For information about upgrading from a Cisco CRS-1 to a Cisco CRS-3 chassis, refer to the *Cisco CRS-1 Carrier Routing System to Cisco CRS-3 Carrier Routing System Upgrade Guide* at the following URL:

http://www.cisco.com/en/US/products/ps5763/prod_installation_guides_list.html

- The following commands have been modified to support Cisco CRS-3 and CRS-X routers:

- **show environment**
- **hw-module reload**
- **show controllers egressq client location <>**
- **show controllers egressq queue drr [max | min] location <>**

- **show controllers egressq queue drr [max | min] location** <>
- **show controllers egressq group ntb [max | min] location** <>
- **show controllers egressq port bmap location** <>
- **show controllers egressq statistics detail location** <>
- **show controllers egressq resources location** <>

For information about these commands, refer to the *Commands* section of the *Cisco CRS-1 Carrier Routing System to Cisco CRS-3 Carrier Routing System Upgrade Guide*:

http://www.cisco.com/en/US/products/ps5763/prod_installation_guides_list.html

- This release supports the following fixed DWDM XFPs with CRS-3 and certain CRS-1 10GE interface modules:
 - DWDM-XFP-30.33
 - DWDM-XFP-60.61
 - DWDM-XFP-50.92
 - DWDM-XFP-50.12
 - DWDM-XFP-31.12
 - DWDM-XFP-31.90
 - DWDM-XFP-32.68
 - DWDM-XFP-34.25
 - DWDM-XFP-35.04
 - DWDM-XFP-35.82
 - DWDM-XFP-36.61
 - DWDM-XFP-38.19
 - DWDM-XFP-38.98
 - DWDM-XFP-39.77
 - DWDM-XFP-40.56
 - DWDM-XFP-42.14
 - DWDM-XFP-42.94
 - DWDM-XFP-43.73
 - DWDM-XFP-44.53
 - DWDM-XFP-46.12
 - DWDM-XFP-46.92
 - DWDM-XFP-47.72
 - DWDM-XFP-48.51

- DWDM-XFP-51.72
- DWDM-XFP-52.52
- DWDM-XFP-54.13
- DWDM-XFP-54.94
- DWDM-XFP-55.75
- DWDM-XFP-56.55
- DWDM-XFP-58.17
- DWDM-XFP-58.98
- DWDM-XFP-59.79

Migrating Cisco CRS-1 and CRS-3 to CRS-X

For information about migrating from a Cisco CRS-1 and Cisco CRS-3 to a Cisco CRS-X chassis, refer to the URL http://www.cisco.com/en/US/products/ps5763/prod_installation_guides_list.html

DWDM Configuration Management



Note This section describes the new DWDM configuration requirements in Cisco IOS XR 3.9.0 and later releases. It does not describe all updates to the DWDM feature. For more information about DWDM configuration, refer to the *Configuring Dense Wavelength Division Multiplexing Controllers on Cisco IOS XR Software* module in the *Cisco IOS XR Interface and Hardware Component Configuration Guide for the Cisco CRS Router*.

Cisco IOS XR Software Release 3.9.0 introduced new commands in addition to an important change to the default laser state for all of the DWDM physical layer interface modules (PLIMs) supported on the Cisco CRS-1 and CRS-3 routers, which impacts the required configuration to support those cards.

This change affects all models of the following hardware on the Cisco CRS-1 router:

- Cisco 1-Port OC-768c/STM-256c DWDM PLIM
- Cisco 4-Port 10-Gigabit Ethernet DWDM PLIM

This change affects all models of the following hardware on the Cisco CRS-3 router:

- Cisco 1-Port 100GE OTU4 IPoDWDM PLIM
- Cisco 4-Port 40-GE OTU3 OTN/LAN PLIM
- Cisco 2-Port 40-GE OTU3 OTN/LAN PLIM

The **g709 fec high-gain** and **g709 fec long-haul** commands are added under DWDM configuration to configure the new high-gain FEC mode and long-haul FEC mode for Cisco 1-Port 100GE OTU4 IPoDWDM PLIM.

The following is an example of configuring the **g709 fec high-gain** command under DWDM configuration to configure the new high-gain FEC mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# controller dwdm <>
RP/0/RP0/CPU0:router(config)# g709 fec high-gain
RP/0/RP0/CPU0:router(config)# commit
```

The following is an example of configuring the **g709 fec long-haul** command under DWDM configuration to configure the new long-haul FEC mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# g709 fec long-haul
RP/0/RP0/CPU0:router(config)# commit
```

Upgrading Cisco IOS XR Software

Cisco IOS XR Software is installed and activated from modular packages, allowing specific features or software patches to be installed, upgraded, or downgraded without affecting unrelated processes. Software packages can be upgraded or downgraded on all supported card types, or on a single card (node).

Software packages are installed from package installation envelope (PIE) files that contain one or more software components.

Before starting the software upgrade, use the **show install health** command in the admin mode. This command validates if the statuses of all relevant parameters of the system are ready for the software upgrade without interrupting the system.

The upgrade document is available along with the software images.

The upgrade document [CRS_Upgrade_Downgrade_MOP_6.7.4.pdf](#) is available along with the Release 6.7.4 software images downloaded from the [software download page](#).

Cisco Software Manager (CSM) application provides an intuitive user interface to manage Cisco IOS XR installations, with pre-installation and post-installation checks and reports. CSM helps manage the process of software maintenance upgrades (SMUs) and service packs (SPs) on devices that run the Cisco IOS XR Software.

For information on how to use CSM, see [Cisco Software Manager User Guide](#).

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