Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 6.7.2

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Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 6.7.26.9.2

Cisco ASR 9000 Series Aggregation Services Routers (ASR 9000 Series) deliver unprecedented scale, service flexibility, and high availability for service providers' fixed and mobile networks, data centers, and transport networks. The routers are powered by Cisco IOS XR Software, an innovative, self-healing, distributed operating system designed for always-on operation while scaling system capacity into multiple terabits per second (Tbps).

For more information about ASR 9000 Series routers, see ASR 9000 Data Sheet listing page.

Note Cisco IOS XR Release 6.7.2 is an Extended Maintenance Release of Cisco IOS XR Release 6.7.1 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.

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

To migrate from legacy 32 bit and new 64 bit IOS XR OS, refer to the Migration Guide for Cisco ASR 9000 Series Routers.

This release notes describe the features provided in the Cisco IOS XR Software Release 6.7.2. See the *Software Features Introduced in Cisco IOS XR Software Release 6.7.2* section in this document for information on new software features.

Supported Packages and System Requirements

This section describes the system requirements for Cisco ASR 9000 Series Aggregation Services Router Software Release 6.7.2

Feature Set Table

The Cisco ASR 9000 Series Aggregation Services Router Software is packaged in *feature sets* (also called *software images*). Each feature set contains a specific set of features for Cisco ASR 9000 Series Aggregation Services Router IOS XR Release 6.7.2.

Cisco IOS XR

This table lists the Cisco IOS XR Software feature set matrix (TAR files) and associated filenames available for the Cisco IOS XR Software 6.7.2 supported on the Cisco ASR 9000 Series Aggregation Services Router.

Table 1: Cisco IOS XR Software Release 6.7.2 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP880 and RP systems]	ASR9K-iosxr-px-6.7.2-turboboot.tar	Contains only the mini.vm package.

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP880 and RP systems]	ASR9K-iosxr-px-6.7.2-pies.tar	• 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 FPD Package • Cisco IOS XR Diagnostic Package • Cisco IOS XR Advanced Video Package • Cisco IOS XR Optics Package • Cisco IOS XR Upgrade Package • Cisco IOS XR BNG Package • Cisco IOS XR Lawful Intercept Package • Cisco IOS XR Services Package • Cisco IOS XR Satellite Package • Cisco IOS XR Documentation Package

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software 3DES [for RSP-2, RSP880 and RP systems]	ASR9K-iosxr-px-6.7.2-k9-pies.tar	• 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 FPD Package • Cisco IOS XR Diagnostic Package • Cisco IOS XR Advanced Video Package • Cisco IOS XR Optics Package • Cisco IOS XR Upgrade Package • Cisco IOS XR BNG Package • Cisco IOS XR Lawful Intercept Package • Cisco IOS XR Services Package • Cisco IOS XR Satellite Package • Cisco IOS XR Documentation Package
Cisco IOS XR Bridge and SMUs	ASR9k-iosxr-px-6.7.2-bridge_smus.tar	Contains all bridge SMUs

This table lists the Cisco ASR 9000 Series Aggregation Services Router Software feature set matrix (PX PIE files) and associated filenames available for the Cisco IOS XR 6.7.2 supported on the Cisco ASR 9000 Series Aggregation Services Router.

Table 2: Cisco IOS XR Software Release 6.7.2 PX PIE Files

Composite Package		
Feature Set	**Filename**	**Description**
Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-px.pie-6.7.2	Contains the required core packages, including OS, Admin, Base, Forwarding, Modular Services Card, Routing, SNMP Agent, and Alarm Correlation. The mini pie file is used for upgrading to the new release

Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-px.vm-6.7.2	Contains the required core packages including OS, Admin, Base, Forwarding, Routing, SNMP Agent, Diagnostic Utilities, and Alarm Correlation. The mini VM file is used for turbobooting the device.
Individually-Installable Optional Packages		
Feature Set	**Filename**	**Description**
Cisco IOS XR Manageability Package	asr9k-mgbl-px.pie-6.7.2	CORBA2 agent, XML3 Parser, and HTTP server packages. This PIE also contains some SNMP MIB infrastructure. Certain MIBs won't work if this PIE is not installed. IPSLA and environment MIBs are part of the mgbl pie.
Cisco IOS XR CGv6 VSM Package	asr9k-services-infra.pie- 6.7.2	Contains iso images and version details of System Admin Virtual Machine (VM) and Kernel-based Virtual Machine (KVM).
Cisco IOS XR MPLS Package	asr9k-mpls-px.pie-6.7.2	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	asr9k-mcast-px.pie-6.7.2	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]), and Bidirectional Protocol Independent Multicast (BIDIR-PIM).
Cisco IOS XR Advanced Video Package	asr9k-video-px.pie-6.7.2	Software providing the vidmon and video quality monitoring feature for Cisco ASR 9000 Series Router chassis.
Cisco IOS XR Optics Package	asr9k-optic-px.pie-6.7.2	Firmware for the optics feature for Cisco ASR 9000 Series Aggregation Services Router Chassis. It enables Transport / OTN feature under interfaces.

Cisco IOS XR FPD Package	asr9k-fpd-px.pie-6.7.2	Firmware pie for all LC and RSP FPGAs and ASICs.
Cisco IOS XR Services Package	asr9k-services.pie-6.7.2	Includes binaries to support CGv6 on VSM.
Cisco IOS XR Documentation Package	asr9k-doc-px.pie-6.7.2	.man pages for Cisco IOS XR Software on the Cisco ASR 9000 Series Aggregation Services Router Chassis.
Cisco IOS XR Satellite Package - ASR9000v	asr9000v-nV-px.pie-6.7.2	Includes binaries to support Cisco ASR9000v Series Router Software and to support Cisco ASR 9000v Series Router as a satellite for Cisco ASR 9000 Series Router.
Cisco IOS XR Satellite Package - NCS 5001 and 5002	asr9k-ncs500x-nV-px.pie-6.7.2	Includes binaries to support Cisco NCS 5001/5002 Series Router Software and to support Cisco NCS 5001/5002 Series Router as a satellite for Cisco ASR 9000 Series Router.
Cisco IOS XR BNG Package	asr9k-bng-px.pie-6.7.2	Includes binaries to support BNG features.
Cisco IOS XR Lawful Intercept (LI) Package	asr9k-li-px.pie-6.7.2	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-px.pie-6.7.2	Support for Encryption, Decryption,, Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI).

Memory Requirements

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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 Cisco ASR 9000 Series Aggregation Services Router running Cisco IOS XR Software Release 6.7.2 consist of the following:

- minimum 6 GB memory on the RSP880, RSP880-LT, and RP2.
- minimum 6 GB memory on the A99-RSP-TR and A99-RSP-SE.
- minimum 2 GB compact flash on route switch processors (RSPs).
- minimum 4 GB memory on the line cards (LCs) running Cisco IOS XR 32 bit image.

Supported Hardware

The following table lists the supported hardware components on the Cisco ASR 9000 Series 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, on page 6" section.

For information on the end-of-sale and end-of-life dates for the Cisco ASR 9000 Series Router hardware, refer to the End-of-Life and End-of-Sale Notices page.

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.

Table 3: Cisco ASR 9000 Series Aggregation Services Router Supported Hardware and Minimum Software Requirements

Cisco ASR 9000 Series Aggregation Services Router Route Switch Processor Cards		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 Series Aggregation Services Router RSP880-Lite, Packet Transport Optimized	A9K-RSP880-LT-TR	Release 6.2.2
Cisco ASR 9000 Series Aggregation Services Router RSP880-Lite, Service Edge Optimized	A9K-RSP880-LT-SE	Release 6.2.2
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Service Edge Optimized for ASR 9910.	A99-RSP-SE	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Packet Transport Optimized for ASR 9910.	A99-RSP-TR	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Packet Transport Optimized for ASR 9906	A99-RSP-TR	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Service Edge Optimized for ASR 9906	A99-RSP-SE	Release 6.3.1
ASR9K Route Switch Processor with 880G/slot and 32 GB for Service Edge	A9K-RSP880-SE	Release 5.3.0
ASR9K Route Switch Processor with 880G/slot and 16 GB for Packet Transport	A9K-RSP880-TR	Release 5.3.0
ASR Route Processor 32 GB for Service Edge	A99-RP2-SE	Release 5.3.0
ASR Route Processor 16 GB for Packet Transport	A99-RP2-TR	Release 5.3.0
ASR 9001 Route Switch Processor 8 GB	ASR9001-RP	Release 4.2.1
Cisco ASR 9000 Series Aggregation Services Router 4-Slot		
Cisco ASR 9000 Series Aggregation Services Router 4-Slot 2 Line Card Slot AC Chassis w/ PEM V2	ASR-9904-AC	Release 5.1.0

Cisco ASR 9000 Series Aggregation Services Router 4-Slot 2 Line Card Slot DC Chassis w/ PEM V2	ASR-9904-DC	Release 5.1.0
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Fan Tray	ASR-9904-FAN	Release 5.1.0
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Filter	ASR-9904-FILTER	Release 5.1.0
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Baffle	ASR-9904-BAFFLE	Release 5.1.0
Cisco ASR 9000 Series Aggregation Services Router 12-Slot		
Cisco ASR 9000 Series Aggregation Services Router 12-Slot 10 Line Card Slot AC Chassis w/ PEM V2	ASR-9912-AC	Release 4.3.2
Cisco ASR 9000 Series Aggregation Services Router 12-Slot 10 Line Card Slot DC Chassis w/ PEM V2	ASR-9912-DC	Release 4.3.2
Cisco ASR 9000 Series Aggregation Services Router 12-Slot Fan Tray	ASR-9912-FAN	Release 4.3.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 Fabric Card	A99-SFC2	Release 5.3.0
Cisco ASR 9000 Series Aggregation Services Router 22-Slot 20 Line Card Slot AC Chassis w/ PEM V2	ASR-9922-AC	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot 20 Line Card Slot DC Chassis w/ PEM V2	ASR-9922-DC	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Accessory Kit with grounding locks, guide rails etc	ASR-9922-ACC-KIT	NA
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Accessory - Cover for Power Shelves and Modules	ASR-9922-PWR-COV	NA
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Reflector	ASR-9922-AIRREF	NA
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Accessory - Door (with lock) and Fan Tray Covers	ASR-9922-DOOR	NA
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Fan Tray	ASR-9922-FAN	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Filter with Media, Center	ASR-9922-FLTR-CEN	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Filter with Media, Left & Right	ASR-9922-FLTR-LR	Release 4.2.2

Cisco ASR 9000 Series Aggregation Services Router 22-Slot Route Processor Filler	ASR-9922-RP-FILR	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Switch Fabric Card Slot Filler	ASR-9922-SFC-FILR	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Version 2 Fan Tray	ASR-9922-FAN-V2	Release 5.2.2
Cisco ASR 9000 Series Aggregation Services Router 2-RU		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 Series Aggregation Services Router 2RU	ASR-9001	Release 4.2.1
Cisco ASR 9000 Series Aggregation Services Router 2-Slot Fan Tray	ASR-9001-FAN	Release 4.2.1
Cisco ASR 9000 Series Aggregation Services Router 2-Slot Line Card	ASR-9001-LC	Release 4.2.1
Cisco ASR 9000 Series Aggregation Services Router	ASR-9001-TRAY	Release 4.2.1
Cisco ASR 9000 Series Aggregation Services Router 6-Slot		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 Series Aggregation Services Router 6-Slot System	ASR-9006-SYS	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Tray	ASR-9006-FAN	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Door Kit	ASR-9006-DOOR	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot AC Chassis	ASR-9006-AC	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot DC Chassis	ASR-9006-DC	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Air		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Air Filter	ASR-9006-FILTER	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot -ASR 9906		
Cisco ASR 9000 Series Aggregation Services Router 6-Slot chassis	ASR-9906	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Tray	ASR-9906-FAN	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Filter	ASR-9906-FILTER	Release 6.3.1

Cisco ASR 9000 Series Aggregation Services Router 10-Slot		
Cisco ASR 9000 Series Aggregation Services Router 10-Slot System	ASR-9010-SYS	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Fan Tray	ASR-9010-FAN	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Door Kit	ASR-9010-DOOR	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot AC Chassis	ASR-9010-AC	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot DC Chassis	ASR-9010-DC	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 2 Post Mounting Kit	ASR-9010-2P-KIT	Release 3.7.2
Cisco ASR 9000 Series Aggregration Services Router 4 Post Mounting Kit	ASR-9010-2P-KIT	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air Filter	ASR-9010-FILTER	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot External Exhaust Air Shaper	ASR-9010-AIRSHPR	NA
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air Inlet Grill	ASR-9010-GRL	NA
Cisco ASR 9000 Series Aggregation Services Router 10-Slot 21 RU		
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) System	ASR-9910	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot(9910) Fan Tray	ASR-9910-FAN	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Accessory Kit	ASR-9910-ACC-KIT	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 4 Post Rack Mounting Kit	ASR-9910-4P-KIT	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 2 Post Rack Mounting Kit	ASR-9910-2P-KIT	Release 6.0.1

Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Reflector	ASR-9910-AIRREF	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Filter	ASR-9910-FILTER	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Switch Fabric Card	A99-SFC-S	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router Power		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 Series Aggregation Services Router 2KW DC Power Module, version 2	PWR-2KW-DC-V2	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router 3KW AC Power Module, version 2	PWR-3KW-AC-V2	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router AC Power Entry Module Version 2	A9K-AC-PEM-V2	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router DC Power Entry Module Version 2	A9K-DC-PEM-V2	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router Power Entry Module Version 2 Filler	A9K-PEM-V2-FILR	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router 1.5kW DC Power Module	A9K-1.5KW-DC	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 2kW DC Power Module	A9K-2KW-DC	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 3kW AC Power Module	A9K-3KW-AC	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router AC Power Enclosure Module Version 3	A9K-AC-PEM-V3	Release 5.3.0
Cisco ASR 9000 Series Aggregation Services Router DC Power Enclosure Module Version 3	A9K-DC-PEM-V3	Release 5.3.0
Cisco ASR 9000 Series Aggregation Services Router 6kW AC Power Module Version 3	PWR-6KW-AC-V3	Release 5.3.0
Cisco ASR 9000 Series Aggregation Services Router 4.4kW DC Power Module Version 3	PWR-4.4KW-DC-V3	Release 5.3.0
Cisco ASR 9000 Series Aggregation Services Router Line Cards		

Component	Part Number	Support Initially Provided in IOS XR Release
ASR 9000 48-port dual-rate 10G/1G Consumption Model line card	A9K-48X10GE-1G-CM	Release 6.3.2
ASR 9000 24-port dual-rate 10G/1G Consumption Model line card	A9K-24X10GE-1G-CM	Release 6.3.2
ASR 9000 4-port 100-Gigabit Ethernet Line Card	A9K-4X100GE	Release 6.2.3
ASR9000 48-port dual-rate 10G/1G service edge–optimized line card	A9K-48X10GE-1G-SE	Release 6.2.1
ASR9000 48-port dual-rate 10G/1G packet transport–optimized line card	A9K-48X10GE-1G-TR	Release 6.2.1
ASR9000 48-port dual-rate 10G/1G service edge line card	A99-48X10GE-1G-SE	Release 6.5.2
ASR9000 48-port dual-rate 10G/1G packet transport line card	A99-48X10GE-1G-TR	Release 6.5.2
ASR9000 24-port dual-rate 10G/1G service edge–optimized line card	A9K-24X10GE-1G-SE	Release 6.2.1
ASR9000 24-port dual-rate 10G/1G packet transport–optimized line card	A9K-24X10GE-1G-TR	Release 6.2.1
ASR 9900 8-port 100GE Service Edge optimized	A99-8X100GE-SE	Release 6.0.1
ASR 9900 8-port 100GE Packet Transport optimized	A99-8X100GE-TR	Release 6.0.1
ASR 9900 8-port 100GE Consumption Model	A99-8X100GE-CM	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 12-Port 100-Gigabit Ethernet Line Card	A99-12X100GE	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 12-port 100GE Ethernet Line card CM	A99-12X100GE-CM	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Consumption Model Optimized with CPAK	A9K-8X100GE-CM	Release 5.3.2
Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Service Edge Optimized	A9K-8X100GE-SE	Release 5.3.1
Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Packet Transport Optimized	A9K-8X100GE-TR	Release 5.3.1
Cisco ASR 9000 4-port 100GE LAN line card	A9K-4X100GE	Release 6.2.3
Cisco ASR 9000 Series Aggregation Services Router 4--Port 100-Gigabit Ethernet, Service Edge Optimized	A9K-4X100GE-SE	Release 5.3.1
Cisco ASR 9000 Series Aggregation Services Router 4-Port 100-Gigabit Ethernet, Packet Transport Optimized	A9K-4X100GE-TR	Release 5.3.1
Cisco ASR 9000 Series Aggregation Services Router 8-port High Density 100GE Ethernet Line Card, Service Edge Optimized	A9K-8X100GE-L-SE	Release 5.3.0

Cisco ASR 9000 Series Aggregation Services Router 8-port High Density 100GE Ethernet Line Card, Packet Transport Optimized	A9K-8X100GE-L-TR	Release 5.3.0
Cisco ASR 9000 Series Aggregation Services Router 4-Port Ten Gigabit Ethernet + Cisco ASR 9000 Series Aggregation Services Router 16-Port Gigabit Ethernet, Packet Transport Optimized	A9K-4T16GE-TR	Release 5.3.0
Cisco ASR 9000 Series Aggregation Services Router 4-Port Ten Gigabit Ethernet + Cisco ASR 9000 Series Aggregation Services Router 16-Port Gigabit Ethernet, Service Edge Optimized	A9k-4T16GE-SE	Release 5.3.0
Cisco ASR 9000 Series Aggregation Services Router Virtualized Services Module (VSM) line card	A9K-VSM-500	Release 5.1.2
Cisco ASR 9000 Series Aggregation Services Router 1-port 100GE, Service Edge Optimized	A9K-1X100GE-SE	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 1-port 100GE, Packet Transport Optimized	A9K-1X100GE-TR	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 36-port 10GE, Service Edge Optimized	A9K-36X10GE-SE	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router 36-port 10GE, Packet Transport Optimized LC	A9K-36X10GE-TR	Release 4.2.2
Cisco ASR 9000 Series Aggregation Services Router Line Card Filler	A9K-LC-FILR	Release 3.7.2
Cisco ASR 9000 Series Aggregation Services Router 24-Port Ten Gigabit Ethernet, Service Edge Optimized	A9K-24X10GE-SE	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router 24-Port Ten Gigabit Ethernet, Packet Transport Optimized	A9K-24X10GE-TR	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router 40-Port Ten Gigabit Ethernet, Packet Transport Optimized	A9K-40GE-TR	Release 5.2.2
Cisco ASR 9000 Series Aggregation Services Router 40-Port Ten Gigabit Ethernet, Service Edge Optimized	A9K-40GE-SE	Release 5.2.2
2-Port 100G + 20-Port 10 GE Combination IPoDWDM Line Card with CFP2 and SFP+, Packet Transport Optimized	A9K-400GE-DWDM-TR	Release 5.3.2
Cisco ASR 9000 Series Aggregation Services Router Modular Line Cards		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 Series Aggregation Services Router 200 Gigabit Modular Line Card, Packet Transport Optimized Cisco ASR 9000 Series Aggregation Services Router 200 Gigabit Modular Line Card, Service Edge Optimized	A9K-MOD200-TR A9K-MOD200-SE	Release 6.0.1

Cisco ASR 9000 Modular 400G Consumption Model Line Card	A9K-MOD400-CM	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Service Edge Optimized	A9K-MOD400-SE	Release 5.3.2
Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Packet Transport Optimized	A9K-MOD400-TR	Release 5.3.2
Cisco ASR 9000 Series Aggregation Services Router 80 Gig Modular Line Card, Service Edge Optimized	A9K-MOD80-SE	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router 80 Gig Modular Line Card, Packet Transport Optimized	A9K-MOD80-TR	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router 160 Gig Modular Line Card, Service Edge Optimized	A9K-MOD160-SE	Release 4.2.1
Cisco ASR 9000 Series Aggregation Services Router 160 Gig Modular Line Card, Packet Transport Optimized	A9K-MOD160-TR	Release 4.2.1
Cisco ASR 9000 Series Aggregation Services Router Modular Port Adapters (MPAs)		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 1-port 200-Gigabit Ethernet MPA	A9K-MPA-1X200GE	Release 6.6.2
Cisco ASR 9000 32-port 1-Gigabit Ethernet MPA with MACSec	A9K-MPA-32X1GE	Release 6.6.1
Cisco ASR 9000 20x10GE Consumption Model MPA	A9K-MPA20X10GE-CM	Release 6.1.2
Cisco ASR 9000 2x100GE Consumption Model MPA	A9K-MPA2X100GE-CM	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 1-port 100-Gigabit Modular Port Adapter	A9K-MPA-1X100GE	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router 2-port 100-Gigabit Modular Port Adapter	A9K-MPA-2X100GE	Release 6.0.1
20-Port 10-Gigabit Ethernet Modular Port Adapter with SFP+	A9K-MPA-20x10GE	Release 5.3.2
Cisco ASR 9000 Series Aggregation Services Router 8-port 10GE Modular Port Adapter	A9K-MPA-8X10GE	Release 4.3.1
Cisco ASR 9000 Series Aggregation Services Router 1-port 40GE Modular Port Adapter	A9K-MPA-1X40GE	Release 4.2.3
Cisco ASR 9000 Series Aggregation Services Router 4-port 10GE Modular Port Adapter	A9K-MPA-4X10GE	Release 4.2.0
Cisco ASR 9000 Series Aggregation Services Router 20-port 1GE Modular Port Adapter	A9K-MPA-20X1GE	Release 4.2.0

Cisco ASR 9000 Series Aggregation Services Router 2-port 10GE Modular Port Adapter	A9K-MPA-2X10GE	Release 4.2.1
Cisco ASR 9000 Series Aggregation Services Router 2-port 40GE Modular Port Adapter	A9K-MPA-2X40GE	Release 4.2.1
Cisco ASR 9000v Satellite Shelf		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000v Satellite Shelf Version 2 DC power ANSI chassis	A9KV-V2-DC-A=	Release 5.2.2
Cisco ASR 9000v Satellite Shelf Version 2 DC power chassis	A9KV-V2-DC-E=	Release 5.2.2
Cisco ASR 9000v Satellite Shelf AC power chassis	A9KV-V2-AC=	Release 5.2.2
Cisco ASR 9000v Satellite Shelf Version 2 Fan Tray	A9KV-V2-FAN=	Release 5.2.2
Cisco NCS 5000 Satellite Shelf		
Cisco NCS 5001 Series Router	NCS-5001	Release 6.0.1
Cisco NCS 5002 Series Router	NCS-5002	Release 6.0.1
Cisco NCS 5001 Router Accessory Kit	NCS-5001-ACSR	Release 6.0.1
Cisco NCS 5002 Router Accessory Kit	NCS-5002-ACSR	Release 6.0.1
Cisco NCS 5001 Router Fan Back to Front AirFlow	NCS-5001-FN-BK	Release 6.0.1
Cisco NCS 5002 Router Fan Back to Front AirFlow	NCS-5002-FN-BK	Release 6.0.1
Cisco NCS 5001 Air Filter Back to Front Airflow	NCS-5001-FLT-BK	Release 6.0.1
Cisco NCS 5002 Air Filter Back to Front Airflow	NCS-5002-FLT-BK	Release 6.0.1
Cisco NCS 5001 Fan Front to Back Airflow	NCS-5001-FN-FR	Release 6.0.1
Cisco NCS 5002 Fan Front to Back Airflow	NCS-5002-FN-FR	Release 6.0.1
Cisco NCS 5001 Air Filter Front to Back Airflow	NCS-5001-FLT-FR	Release 6.0.1
Cisco NCS 5002 Air Filter Front to Back Airflow	NCS-5002-FLT-FR	Release 6.0.1
Cisco ASR 9000 Series Aggregation Services Router SIP and SPA Cards		
Component	**Part Number**	**Support Initially Provided in IOS XR Release**
Cisco ASR 9000 SIP-700 SPA interface processor	A9K-SIP-700	Release 3.9.0
2-Port OC-48/STM16 SPA	SPA-2XOC48POS/RPR	Release 4.0.1

Cisco 4-Port OC-12c/STM-4 POS SPA	SPA-4XOC12-POS	Release 6.4.2
8-Port OC12/STM4 SPA	SPA-8XOC12-POS	Release 4.0.1
1-Port OC-192/STM-64 POS/RPR SPA	SPA-OC192POS-XFP	Release 4.0.1
4-Port Clear Channel T3/E3 SPA	SPA-4XT3E3	Release 4.0.1
2-Port Clear Channel T3/E3 SPA	SPA-2XT3E3	Release 4.0.1
1-Port Channelized OC-3/STM-1 SPA	SPA-1CHSTM1/OC3	Release 4.0.1
4-Port OC-3/STM-1 POS SPA	SPA-4XOC3-POS	Release 4.0.1
8-Port OC-3/STM-1 POS SPA	SPA-8XOC3-POS	Release 4.0.1
4-Port Channelized T3 to DS0 SPA	SPA-4XCT3/DS0	Release 4.1.0
8-Port Channelized T1/E1 SPA	SPA-8XCHT1/E1	Release 4.1.0

Software Compatibility

Cisco IOS XR Software Release 6.7.2 is compatible with the following Cisco ASR 9000 Series Aggregation Services Router systems.

- Cisco ASR 9900 Series Chassis
  - 22-Slot (ASR-9922) Line Card Chassis
  - 12-Slot (ASR-9912) Line Card Chassis
  - 10-Slot (ASR-9910) Line Card Chassis
  - 6-Slot (ASR-9906) Line Card Chassis
  - 4-slot (ASR-9904) Line Card Chassis
- Cisco ASR 9000 Series Chassis
  - 10-Slot (ASR-9010) Line Card Chassis
  - 6-Slot (ASR-9006) Line Card Chassis
  - 1-Slot (ASR-9001) Line Card Chassis

For Cisco license support, please contact your Cisco Sales Representative or Customer Service at 800- 553-NETS (6387) or 408-526-4000. For questions on the program other than ordering, please send e-mail to: cwm-license@cisco.com.

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 active summary** command:

Cisco IOS XR

```
RP/0/RSP0/CPU0:router#show install active summary
Default Profile:
```

```
SDRs:
  Owner
Active Packages:
  disk0:asr9k-9000v-nV-px-6.7.2
  disk0:asr9k-li-px-6.7.2
  disk0:asr9k-optic-px-6.7.2
  disk0:asr9k-bng-px-6.7.2
  disk0:asr9k-mcast-px-6.7.2
  disk0:asr9k-doc-px-6.7.2
  disk0:asr9k-mgbl-px-6.7.2
  disk0:asr9k-services-px-6.7.2
  disk0:asr9k-fpd-px-6.7.2
  disk0:asr9k-mini-px-6.7.2
  disk0:asr9k-video-px-6.7.2
  disk0:asr9k-mpls-px-6.7.2
  disk0:asr9k-k9sec-px-6.7.2
```

Software Features

GRE Tunnel Configuration in oc-interfaces Data Model

Generic Routing Encapsulation (GRE) Tunnel configuration support is added to `oc-interfaces` data model. This data model is used to manage network interfaces and subinterfaces.

In this release, oc-interfaces data model supports additional sensor paths for tunnel configuration and state parameters:

- src
- dst
- ttl (time-to-live or hop limit)
- gre-key

Obtain this data model from Github repository.

See New and Changed Programmability Features.

OCNI BGP Advertised Prefix

OCNI BGP data model has global, neighbor and peer-group containers. Under the neighbor container are the Address Family Identifier (AFI) state-related leaves. Three leaves (sent, installed and advertised prefix count) are related to the prefixes received from and advertised to the neighbor specific to that AFI. The sent count is defined as how many prefixes are sent to the neighbor for a specific AFI.

In the existing implementation, the cumulative count may not display accurate value owing to various conditions such as route-refresh out, policy changes, route-target changes, configuration changes like nexthop-self to name a few.

In this release, BGP walks through the prefix table calculating exactly how many prefixes are advertised for each neighbor. The results are collected in an array, converted and sent to MDT.

Obtain this data model from Github repository.

See New and Changed Programmability Features.

Table Connection Support in OC NI Data Model

The openconfig-network-instance (`oc-ni`) data model is defined by OpenConfig community. This model defines the network instance concept to model Layer 3 and Layer 2 network instances applicable for services such as L3VPN, L2VPN, and EVPN.

The table-conection container in the oc-ni data model contains policies that dictate how routing information base (RIB) or forwarding information base (FIB) entries are propagated between routing tables.

The leaf list consists of a list of connections between pairs of routing or forwarding tables, the leaking of entries between which is specified by the import policy. A connection connecting a source table to a destination table implies that routes that match the policy specified for the connection are available for the destination protocol to advertise, or match within its policies. It shows the configuration and state parameters that relate to the connection between tables.

The oc-ni data model is available in the Github repository.

See New and Changed Programmability Features.

EVPN IGMP L3 Synchronization

The EVPN IGMP L3 Synchronization feature enables you to synchronize IGMPv2 and IGMPv3 reports on multihomed provider edge (PE) devices over EVPN. The multihomed PE devices synchronize IGMP JOIN using BGP EVPN route-type 7. The multihomed PE devices synchronize IGMP LEAVE using BGP EVPN route-type 8. In a high-scale L2 and L3 integrated routing and bridging (IRB) deployment, you may run into ARP packet overload. The ARP process intermittently gets blocked and stops handling the ARP requests resulting in a service outage. This feature enables you to handle scaling and provide better serviceability.

See EVPN IGMP L3 Synchronization.

EVPN E-Tree Using RT Constraints

The EVPN E-Tree using RT constraints feature enables you to configure BGP route target (RT) import and export policies for an attachment circuit (AC). This feature allows you to define communication between the leaf and root nodes. The provider edge (PE) nodes can receive L2 traffic either from the attachment circuit (AC) of a bridge domain (BD) or from the remote PE node. For a given BD, L2 communication can only happen from root to leaf and leaf to root nodes. This feature does not allow any L2 communication between the ACs of two or more leafs.

This feature provides the following benefits:

- Achieve efficiency of the BGP MAC routes scale
- Reduce the consumption of hardware resources
- Utilize the link bandwidth efficiently

See EVPN E-Tree Using RT Constraints.

The command, etree rt-leaf is introduced.

File Mirroring

File mirroring feature enables the router to copy files or directories automatically from `/harddisk:/mirror` location in active RP to `/harddisk:/mirror` location in standby RP or RSP without user intervention or EEM scripts.

See Introduction to File Mirroring.

EVPN Port-Active Multihoming

The EVPN Port-Active Multhoming feature supports single-active redundancy load balancing at the port-level or at the interface-level. You can use this feature when you want to forward the traffic to a specific interface, rather that have a per-flow load balancing across multiple PE routers. This feature provides a faster convergence during a link failure. This feature enables protocol simplification as only one of the physical ports is active at a given time. You can enable this feature only on bundle interfaces.

See the EVPN Port-Active Multihoming.

Behavior Change Introduced

Behavior change refers to any modification of an existing software feature, configuration, or a command. This release introduces following behavior change:

Guidelines for Enabling FIPS

You must follow these guidelines while enabling FIPS mode:

- You must configure the session with a FIPS-approved cryptographic algorithm. A session configured with non-approved cryptographic algorithm for FIPS (such as, MD5 and HMAC-MD5) does not work. This is applicable for OSPF, BGP, RSVP, ISIS, or any application using key chain with non-approved cryptographic algorithm, and only for FIPS mode (that is, when **crypto fips-mode** command is configured).
- If you are using any HMAC-SHA algorithm for a session, then you must ensure that the configured key-string has a minimum length of 14 characters. Otherwise, the session goes down. This is applicable only for FIPS mode.
- If you try to execute the telnet configuration on a system where the FIPS mode is already enabled, then the system rejects the telnet configuration.
- If telnet configuration already exists on the system, and if FIPS mode is enabled later, then the system rejects the telnet connection. But, it does not affect the telnet configuration as such.
- It is recommended to configure the **crypto fips-mode** command first, followed by the FIPS-related commands in a separate commit. The list of commands related to FIPS with non-approved cryptographic algorithms are:
  - **key chain** *key-chain-name* **key** *key-id* **cryptographic-algorithm MD5**
  - **key chain** *key-chain-name* **key** *key-id* **cryptographic-algorithm HMAC-MD5**
  - **router ospfv3 1 authentication ipsec spi 256 md5** *md5-value*
  - **router ospfv3 1 encryption ipsec spi 256 esp des** *des-value*
  - **router ospfv3 1 encryption ipsec spi 256 esp des** *des-value* **authentication md5** *md5-value*
  - **snmp-server user** *username usergroup-name* **v3 auth md5 priv des56**
  - **ssh server algorithms key-exchange diffie-hellman-group1-sha1**
  - **telnet vrf default ipv4 server max-servers** *server-limit*

For more information, see Prerequisites for Configuring FIPS.

Guidelines for Configuring MACsec Keychain

You must follow this guideline while configuring MACsec:

- The MACsec key IDs (configured through CLI using the **macsec key** command under the key chain configuration mode) are considered to be case insensitive. These key IDs are stored as uppercase letters. Whereas, prior to this release, the key IDs were treated as case sensitive. These key IDs are now stored as uppercase letters. Whereas, prior to this release, the key IDs were treated as case sensitive. Hence, two key IDs with the same value, but of different case (one in uppercase and other in lowercase) were treated as two separate IDs in previous releases. However, the support for this case insensitive IDs is applicable only for the configurations done through CLI, and not for configurations done through Netconf protocol. Hence it is recommended to have unique strings as key IDs for a MACsec key chain to avoid flapping of MACsec sessions.

  For more information, see Guidelines for Configuring MACsec Keychain.

New Hardware

No new hardware feature is introduced in this release.

Firmware Support on Cisco IOS XR

To check the firmware code running on the Cisco ASR 9000 Series Router, run the **show fpd package** command in admin mode.

```
RP/0/RSP0/CPU0:router(admin)#show fpd package
================================ ================================================
                                        Field Programmable Device Package
                                 ================================================
                                                                          SW      Min Req   Min Req
Card Type                 FPD Description            Type Subtype   Version   SW Ver    HW Vers
========================= ========================== ==== ======= =========== ========  =========
ASR-9906-BPID2            Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
ASR-9910-BPID2            Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
                          Can Bus Ctrl (CBC) BP2     lc   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
ASR-9904-BPID2            Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
ASR-9912-BPID2            Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
                          Can Bus Ctrl (CBC) BP2     lc   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
ASR-9922-BPID2            Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
                          Can Bus Ctrl (CBC) BP2     lc   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
A9K-BPID2-E-10-SLOT       Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
A9K-BPID2-E-6-SLOT        Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
A9K-BPID2-10-SLOT         Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
                          Can Bus Ctrl (CBC) BP2     lc   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
A9K-BPID2-6-SLOT          Can Bus Ctrl (CBC) BP2     bp   cbc         7.105       0.00      0.1
                          Can Bus Ctrl (CBC) BP2     lc   cbc         7.105       0.00      0.1
-------------------------------------------------------------------------------------------------
ASR-9922-SFC110           Can Bus Ctrl (CBC) MTFC    fc   cbc        28.06        0.00      0.1
                          Fabric Ctrl0 MTFC          fc   fpga7       1.03        0.00      0.1
                          Can Bus Ctrl (CBC) MTFC    lc   cbc        28.06        0.00      0.1
-------------------------------------------------------------------------------------------------
ASR-9912-SFC110           Can Bus Ctrl (CBC) SSFC    fc   cbc        32.05        0.00      0.1
```

	Fabric Ctrl0 MTFC	fc	fpga7	1.03	0.00	0.1
A99-SFC2	Can Bus Ctrl (CBC) MTFC	fc	cbc	37.20	0.00	0.1
	Fabric Ctrl0 MTFC	fc	fcfsbl	1.100	0.00	0.1
	Fabric Ctrl0 MTFC	fc	fclnxfw	1.100	0.00	0.1
	Fabric Ctrl0 MTFC	fc	fpga8	0.37	0.00	0.1
ASR-9912-SFC220	Can Bus Ctrl (CBC) MTFC	fc	cbc	37.20	0.00	0.1
	Fabric Ctrl0 MTFC	fc	fcfsbl	1.100	0.00	0.1
	Fabric Ctrl0 MTFC	fc	fclnxfw	1.100	0.00	0.1
	Fabric Ctrl0 MTFC	fc	fpga8	0.37	0.00	0.1
A99-SFC-S	Can Bus Ctrl (CBC) SHFC	fc	cbc	44.02	0.00	0.1
	Fabric Ctrl0 SHFC	fc	fcfsbl	1.100	0.00	0.1
	Fabric Ctrl0 SHFC	fc	fclnxfw	1.100	0.00	0.1
	Fabric Ctrl0 SHFC	fc	fpga8	0.37	0.00	0.1
A99-SFC-T	Can Bus Ctrl (CBC) TWFC	fc	cbc	44.02	0.00	0.1
	Fabric Ctrl0 TWFC	fc	fcfsbl	1.100	0.00	0.1
	Fabric Ctrl0 TWFC	fc	fclnxfw	1.100	0.00	0.1
	Fabric Ctrl0 TWFC	fc	fpga8	0.37	0.00	0.1
ASR-9010-FAN	Can Bus Ctrl (CBC) FAN	ft	cbc	4.04	0.00	0.1
	Can Bus Ctrl (CBC) FAN	lc	cbc	4.03	0.00	0.1
ASR-9006-FAN	Can Bus Ctrl (CBC) FAN	ft	cbc	5.05	0.00	0.1
	Can Bus Ctrl (CBC) FAN	lc	cbc	5.04	0.00	0.1
ASR-9922-FAN	Can Bus Ctrl (CBC) MFAN	ft	cbc	29.12	0.00	0.1
	Can Bus Ctrl (CBC) MFAN	lc	cbc	29.12	0.00	0.1
ASR-9912-FAN	Can Bus Ctrl (CBC) SFAN	ft	cbc	31.06	0.00	0.1
ASR-9010-FAN-V2	Can Bus Ctrl (CBC) FAN	ft	cbc	29.12	0.00	0.1
	Can Bus Ctrl (CBC) FAN	lc	cbc	29.12	0.00	0.1
ASR-9904-FAN	Can Bus Ctrl (CBC) SFAN	ft	cbc	31.06	0.00	0.1
ASR-9922-FAN-V2	Can Bus Ctrl (CBC) MFAN	ft	cbc	40.07	0.00	0.1
	Fan Controller MFAN	ft	fpga9	2.06	0.00	0.1
ASR-9006-FAN-V2	Can Bus Ctrl (CBC) FAN	ft	cbc	5.05	0.00	0.1
	Can Bus Ctrl (CBC) FAN	lc	cbc	5.04	0.00	0.1
ASR-9910-FAN	Can Bus Ctrl (CBC) SHFAN	ft	cbc	45.02	0.00	0.1
	Fan Controller SHFAN	ft	fpga9	2.06	0.00	0.1
ASR-9906-FAN	Can Bus Ctrl (CBC) TWFAN	ft	cbc	56.01	0.00	0.1
	Fan Controller TWFAN	ft	fpga9	2.06	0.00	0.1
ASR-9001-FAN	Can Bus Ctrl (CBC) FAN	ft	cbc	24.115	0.00	0.1
	Can Bus Ctrl (CBC) FAN	lc	cbc	24.115	0.00	0.1
ASR-9001-FAN-V2	Can Bus Ctrl (CBC) FAN	ft	cbc	24.115	0.00	0.1
A9K-SIP-700	Can Bus Ctrl (CBC) LC5	lc	cbc	3.06	0.00	0.1
	CPUCtrl LC5	lc	cpld1	0.15	0.00	0.1
	QFPCPUBridge LC5	lc	fpga2	5.14	0.00	0.1
	NPUXBarBridge LC5	lc	fpga1	0.24	0.00	0.1
	ROMMONB LC5	lc	rommon	1.04	0.00	0.1
A9K-SIP-500	Can Bus Ctrl (CBC) LC5	lc	cbc	3.06	0.00	0.1
	CPUCtrl LC5	lc	cpld1	0.15	0.00	0.1
	QFPCPUBridge LC5	lc	fpga2	5.14	0.00	0.1

```
                        NPUXBarBridge LC5          lc   fpga1       0.24        0.00      0.1
                        ROMMONB LC5                lc   rommon      1.04        0.00      0.1
---------------------------------------------------------------------------------------------
A9K-SIP-700-8G          Can Bus Ctrl (CBC) LC5     lc   cbc         3.06        0.00      0.1
                        CPUCtrl LC5                lc   cpld1       0.15        0.00      0.1
                        QFPCPUBridge LC5           lc   fpga2       5.14        0.00      0.1
                        NPUXBarBridge LC5          lc   fpga1       0.24        0.00      0.1
                        ROMMONB LC5                lc   rommon      1.35        0.00      0.1
---------------------------------------------------------------------------------------------
A9K-RSP440-TR           Can Bus Ctrl (CBC) RSP3    lc   cbc        16.117       0.00      0.1
                        ClockCtrl0 RSP3            lc   fpga2       1.10        0.00      0.1
                        UTI RSP3                   lc   fpga3       4.09        0.00      0.1
                        CPUCtrl RSP3               lc   fpga1       0.11        0.00      0.1
                        ROMMONB RSP3               lc   rommon      0.76        0.00      0.1
---------------------------------------------------------------------------------------------
A9K-RSP440-SE           Can Bus Ctrl (CBC) RSP3    lc   cbc        16.117       0.00      0.1
                        ClockCtrl0 RSP3            lc   fpga2       1.10        0.00      0.1
                        UTI RSP3                   lc   fpga3       4.09        0.00      0.1
                        CPUCtrl RSP3               lc   fpga1       0.11        0.00      0.1
                        ROMMONB RSP3               lc   rommon      0.76        0.00      0.1
---------------------------------------------------------------------------------------------
ASR-9922-RP-TR          Can Bus Ctrl (CBC) MTRP    lc   cbc        25.03        0.00      0.1
                        Fabric Ctrl3 MTFC          lc   fpga10      1.03        0.00      0.1
                        Fabric Ctrl4 MTFC          lc   fpga11      1.03        0.00      0.1
                        Fabric Ctrl5 MTFC          lc   fpga12      1.03        0.00      0.1
                        Fabric Ctrl6 MTFC          lc   fpga13      1.03        0.00      0.1
                        CPUCtrl1                   lc   fpga2       1.03        0.00      0.1
                        ClkCtrl                    lc   fpga3       1.05        0.00      0.1
                        IntCtrl                    lc   fpga4       1.04        0.00      0.1
                        UTI                        lc   fpga5       4.09        0.00      0.1
                        Timex                      lc   fpga6       0.02        0.00      0.1
                        Fabric Ctrl0 MTFC          lc   fpga7       1.03        0.00      0.1
                        Fabric Ctrl1 MTFC          lc   fpga8       1.03        0.00      0.1
                        Fabric Ctrl2 MTFC          lc   fpga9       1.03        0.00      0.1
                        CPUCtrl0                   lc   fpga1       1.05        0.00      0.1
                        ROMMONB MTRP               lc   rommon      5.16        0.00      0.1
---------------------------------------------------------------------------------------------
ASR-9922-RP-SE          Can Bus Ctrl (CBC) MTRP    lc   cbc        25.03        0.00      0.1
                        Fabric Ctrl3 MTFC          lc   fpga10      1.03        0.00      0.1
                        Fabric Ctrl4 MTFC          lc   fpga11      1.03        0.00      0.1
                        Fabric Ctrl5 MTFC          lc   fpga12      1.03        0.00      0.1
                        Fabric Ctrl6 MTFC          lc   fpga13      1.03        0.00      0.1
                        CPUCtrl1                   lc   fpga2       1.03        0.00      0.1
                        ClkCtrl                    lc   fpga3       1.05        0.00      0.1
                        IntCtrl                    lc   fpga4       1.04        0.00      0.1
                        UTI                        lc   fpga5       4.09        0.00      0.1
                        Timex                      lc   fpga6       0.02        0.00      0.1
                        Fabric Ctrl0 MTFC          lc   fpga7       1.03        0.00      0.1
                        Fabric Ctrl1 MTFC          lc   fpga8       1.03        0.00      0.1
                        Fabric Ctrl2 MTFC          lc   fpga9       1.03        0.00      0.1
                        CPUCtrl0                   lc   fpga1       1.05        0.00      0.1
                        ROMMONB MTRP               lc   rommon      5.16        0.00      0.1
---------------------------------------------------------------------------------------------
ASR-9900-RP-TR          Can Bus Ctrl (CBC) MTRP    lc   cbc        25.03        0.00      0.1
                        Fabric Ctrl3 MTFC          lc   fpga10      1.03        0.00      0.1
                        Fabric Ctrl4 MTFC          lc   fpga11      1.03        0.00      0.1
                        Fabric Ctrl5 MTFC          lc   fpga12      1.03        0.00      0.1
                        Fabric Ctrl6 MTFC          lc   fpga13      1.03        0.00      0.1
                        CPUCtrl1                   lc   fpga2       1.03        0.00      0.1
                        ClkCtrl                    lc   fpga3       1.05        0.00      0.1
                        IntCtrl                    lc   fpga4       1.04        0.00      0.1
                        UTI                        lc   fpga5       4.09        0.00      0.1
                        Timex                      lc   fpga6       0.02        0.00      0.1
                        Fabric Ctrl0 MTFC          lc   fpga7       1.03        0.00      0.1
```

```
                      Fabric Ctrl1 MTFC          lc   fpga8       1.03        0.00      0.1
                      Fabric Ctrl2 MTFC          lc   fpga9       1.03        0.00      0.1
                      CPUCtrl0                   lc   fpga1       1.05        0.00      0.1
                      ROMMONB MTRP               lc   rommon      5.16        0.00      0.1
--------------------------------------------------------------------------------------------
ASR-9900-RP-SE        Can Bus Ctrl (CBC) MTRP    lc   cbc        25.03        0.00      0.1
                      Fabric Ctrl3 MTFC          lc   fpga10      1.03        0.00      0.1
                      Fabric Ctrl4 MTFC          lc   fpga11      1.03        0.00      0.1
                      Fabric Ctrl5 MTFC          lc   fpga12      1.03        0.00      0.1
                      Fabric Ctrl6 MTFC          lc   fpga13      1.03        0.00      0.1
                      CPUCtrl1                   lc   fpga2       1.03        0.00      0.1
                      ClkCtrl                    lc   fpga3       1.05        0.00      0.1
                      IntCtrl                    lc   fpga4       1.04        0.00      0.1
                      UTI                        lc   fpga5       4.09        0.00      0.1
                      Timex                      lc   fpga6       0.02        0.00      0.1
                      Fabric Ctrl0 MTFC          lc   fpga7       1.03        0.00      0.1
                      Fabric Ctrl1 MTFC          lc   fpga8       1.03        0.00      0.1
                      Fabric Ctrl2 MTFC          lc   fpga9       1.03        0.00      0.1
                      CPUCtrl0                   lc   fpga1       1.05        0.00      0.1
                      ROMMONB MTRP               lc   rommon      5.16        0.00      0.1
--------------------------------------------------------------------------------------------
A9K-RSP440-LT         Can Bus Ctrl (CBC) RSP3    lc   cbc        16.117       0.00      0.1
                      ClockCtrl0 RSP3            lc   fpga2       1.11        0.00      0.1
                      UTI RSP3                   lc   fpga3       4.09        0.00      0.1
                      CPUCtrl RSP3               lc   fpga1       0.11        0.00      0.1
                      ROMMONB RSP3               lc   rommon      0.76        0.00      0.1
--------------------------------------------------------------------------------------------
A9K-RSP880-TR         Can Bus Ctrl (CBC) RSP4    lc   cbc        34.39        0.00      0.0
                      MB CPUCtrl                 lc   fpga2       0.72        0.00      0.0
                      DBCtrl                     lc   fpga3       0.16        0.00      0.0
                      DBCtrl                     lc   fpga4       0.18        0.00      0.0
                      DBCtrl                     lc   fpga5       0.12        0.00      0.0
                      PUNT FPGA                  lc   fpga6       0.08        0.00      0.0
                      Fsbl                       lc   fsbl        1.113       0.00      0.0
                      LinuxFW                    lc   lnxfw       1.113       0.00      0.0
                      ROMMONB RSP4               lc   rommon     10.68        0.00      0.0
--------------------------------------------------------------------------------------------
A9K-RSP880-SE         Can Bus Ctrl (CBC) RSP4    lc   cbc        34.39        0.00      0.0
                      MB CPUCtrl                 lc   fpga2       0.72        0.00      0.0
                      DBCtrl                     lc   fpga3       0.16        0.00      0.0
                      DBCtrl                     lc   fpga4       0.18        0.00      0.0
                      DBCtrl                     lc   fpga5       0.12        0.00      0.0
                      PUNT FPGA                  lc   fpga6       0.08        0.00      0.0
                      Fsbl                       lc   fsbl        1.113       0.00      0.0
                      LinuxFW                    lc   lnxfw       1.113       0.00      0.0
                      ROMMONB RSP4               lc   rommon     10.68        0.00      0.0
--------------------------------------------------------------------------------------------
A9K-RSP880-LT-TR      Can Bus Ctrl (CBC) RSP4L   lc   cbc        50.02        0.00      0.0
                      MB CPUCtrl                 lc   fpga2       0.20        0.00      0.0
                      DBCtrl                     lc   fpga3       0.05        0.00      0.0
                      DBCtrl                     lc   fpga4       0.05        0.00      0.0
                      DBCtrl                     lc   fpga5       0.05        0.00      0.0
                      EOBCSwicthCtrl             lc   fpga6       1.11        0.00      0.0
                      Fsbl                       lc   fsbl        1.113       0.00      0.0
                      LinuxFW                    lc   lnxfw       1.113       0.00      0.0
                      ROMMONB RSP4L              lc   rommon     17.37        0.00      0.0
--------------------------------------------------------------------------------------------
A9K-RSP880-LT-SE      Can Bus Ctrl (CBC) RSP4L   lc   cbc        50.02        0.00      0.0
                      MB CPUCtrl                 lc   fpga2       0.20        0.00      0.0
                      DBCtrl                     lc   fpga3       0.05        0.00      0.0
                      DBCtrl                     lc   fpga4       0.05        0.00      0.0
                      DBCtrl                     lc   fpga5       0.05        0.00      0.0
                      EOBCSwicthCtrl             lc   fpga6       1.11        0.00      0.0
                      Fsbl                       lc   fsbl        1.113       0.00      0.0
```

	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB RSP4L	lc	rommon	17.37	0.00	0.0
A99-RSP-TR	Can Bus Ctrl (CBC) RSP4S	lc	cbc	43.03	0.00	0.1
	MB CPUCtrl	lc	fpga2	0.72	0.00	0.0
	DBCtrl	lc	fpga3	0.16	0.00	0.0
	DBCtrl	lc	fpga4	0.18	0.00	0.0
	DBCtrl	lc	fpga5	0.12	0.00	0.0
	PUNT FPGA	lc	fpga6	0.08	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB RSP4SHW	lc	rommon	16.17	0.00	0.0
A99-RSP-SE	Can Bus Ctrl (CBC) RSP4S	lc	cbc	43.03	0.00	0.1
	MB CPUCtrl	lc	fpga2	0.72	0.00	0.0
	DBCtrl	lc	fpga3	0.16	0.00	0.0
	DBCtrl	lc	fpga4	0.18	0.00	0.0
	DBCtrl	lc	fpga5	0.12	0.00	0.0
	PUNT FPGA	lc	fpga6	0.08	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB RSP4SHW	lc	rommon	16.17	0.00	0.0
A99-RP2-TR	Can Bus Ctrl (CBC) MTRP	lc	cbc	35.14	0.00	0.1
	MB CPUCtrl	lc	fpga2	0.72	0.00	0.0
	DBCtrl	lc	fpga3	0.16	0.00	0.0
	DBCtrl	lc	fpga4	0.18	0.00	0.0
	DBCtrl	lc	fpga5	0.12	0.00	0.0
	PUNT FPGA	lc	fpga6	0.08	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB RP2	lc	rommon	14.38	0.00	0.0
A99-RP2-SE	Can Bus Ctrl (CBC) MTRP	lc	cbc	35.14	0.00	0.1
	MB CPUCtrl	lc	fpga2	0.72	0.00	0.0
	DBCtrl	lc	fpga3	0.16	0.00	0.0
	DBCtrl	lc	fpga4	0.18	0.00	0.0
	DBCtrl	lc	fpga5	0.12	0.00	0.0
	PUNT FPGA	lc	fpga6	0.08	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB RP2	lc	rommon	14.38	0.00	0.0
ASR9001-RP	Can Bus Ctrl (CBC) IMRP	lc	cbc	22.114	0.00	0.1
	MB CPUCtrl	lc	fpga2	1.15	0.00	0.0
	ROMMONB IM RP	lc	rommon	3.04	0.00	0.1
A9K-24x10GE-SE	Can Bus Ctrl (CBC) LC6	lc	cbc	19.112	0.00	0.0
	DBCtrl LC6	lc	fpga2	1.03	0.00	0.0
	LinkCtrl LC6	lc	fpga3	1.01	0.00	0.0
	LCCPUCtrl LC6	lc	fpga4	1.07	0.00	0.0
	ROMMONB LC6	lc	rommon	3.04	0.00	0.0
A9K-2x100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	21.111	0.00	0.1
	DB IO FPGA1	lc	cpld1	1.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.08	0.00	0.0
	PortCtrl	lc	fpga3	1.05	0.00	0.0
	Imux	lc	fpga4	1.04	0.00	0.0
	Emux	lc	fpga5	1.04	0.00	0.0
	100GIGMAC	lc	fpga6	41.00	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.0
A9K-MOD80-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	20.118	0.00	0.1
	DB Ctrl	lc	fpga2	1.04	0.00	0.0

	MB CPUCtrl	lc	fpga4	1.05	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.1
A9K-MOD160-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	20.118	0.00	0.1
	DB Ctrl	lc	fpga2	1.04	0.00	0.0
	MB CPUCtrl	lc	fpga4	1.05	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.1
A9K-24x10GE-TR	Can Bus Ctrl (CBC) LC6	lc	cbc	19.112	0.00	0.0
	DBCtrl LC6	lc	fpga2	1.03	0.00	0.0
	LinkCtrl LC6	lc	fpga3	1.01	0.00	0.0
	LCCPUCtrl LC6	lc	fpga4	1.07	0.00	0.0
	ROMMONB LC6	lc	rommon	3.04	0.00	0.0
A9K-2x100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	21.111	0.00	0.1
	DB IO FPGA1	lc	cpld1	1.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.08	0.00	0.0
	PortCtrl	lc	fpga3	1.05	0.00	0.0
	Imux	lc	fpga4	1.04	0.00	0.0
	Emux	lc	fpga5	1.04	0.00	0.0
	100GIGMAC	lc	fpga6	41.00	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.0
A9K-MOD80-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	20.118	0.00	0.1
	DB Ctrl	lc	fpga2	1.04	0.00	0.0
	MB CPUCtrl	lc	fpga4	1.05	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.1
A9K-MOD160-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	20.118	0.00	0.1
	DB Ctrl	lc	fpga2	1.04	0.00	0.0
	MB CPUCtrl	lc	fpga4	1.05	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.1
A9K-36x10GE-SE	Can Bus Ctrl (CBC) LC6	lc	cbc	15.104	0.00	0.0
	DBCtrl LC6	lc	fpga2	1.01	0.00	0.0
	LinkCtrl LC6	lc	fpga3	1.00	0.00	0.0
	LCCPUCtrl LC6	lc	fpga4	1.03	0.00	0.0
	ROMMONB LC6	lc	rommon	3.03	0.00	0.0
A9K-36x10GE_SC7-SE	Can Bus Ctrl (CBC) LC6	lc	cbc	15.104	0.00	0.0
	DBCtrl LC6	lc	fpga2	1.01	0.00	0.0
	LinkCtrl LC6	lc	fpga3	1.00	0.00	0.0
	LCCPUCtrl LC6	lc	fpga4	1.03	0.00	0.0
	ROMMONB LC6	lc	rommon	3.03	0.00	0.0
A9K-36x10GE-TR	Can Bus Ctrl (CBC) LC6	lc	cbc	15.104	0.00	0.0
	DBCtrl LC6	lc	fpga2	1.01	0.00	0.0
	LinkCtrl LC6	lc	fpga3	1.00	0.00	0.0
	LCCPUCtrl LC6	lc	fpga4	1.03	0.00	0.0
	ROMMONB LC6	lc	rommon	3.03	0.00	0.0
A9K-36x10GE_SC7-TR	Can Bus Ctrl (CBC) LC6	lc	cbc	15.104	0.00	0.0
	DBCtrl LC6	lc	fpga2	1.01	0.00	0.0
	LinkCtrl LC6	lc	fpga3	1.00	0.00	0.0
	LCCPUCtrl LC6	lc	fpga4	1.03	0.00	0.0
	ROMMONB LC6	lc	rommon	3.03	0.00	0.0
A9K-1x100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	21.111	0.00	0.1
	DB IO FPGA1	lc	cpld1	1.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.08	0.00	0.0
	PortCtrl	lc	fpga3	1.05	0.00	0.0
	Imux	lc	fpga4	1.04	0.00	0.0
	Emux	lc	fpga5	1.04	0.00	0.0
	100GIGMAC	lc	fpga6	41.00	0.00	0.0

	ROMMONB LC4	lc	rommon	3.04	0.00	0.0
A9K-1x100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	21.111	0.00	0.1
	DB IO FPGA1	lc	cpld1	1.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.08	0.00	0.0
	PortCtrl	lc	fpga3	1.05	0.00	0.0
	Imux	lc	fpga4	1.04	0.00	0.0
	Emux	lc	fpga5	1.04	0.00	0.0
	100GIGMAC	lc	fpga6	41.00	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.0
A9K-VSM-500	CPUCtrl Forge	lc	cbc	33.05	0.00	0.1
	CPUCtrl Forge	lc	fpga1	1.26	0.00	0.1
	CPUCtrl Forge	lc	ibmc	5.08	0.00	0.1
	CPUCtrl Forge	lc	rommon	3.07	0.00	0.1
A99-8X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99-8X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99-4X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99-4X100GE-SE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99-4X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0

	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99-4X100GE-TR-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99-4X100GE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-4X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-4X100GE-SE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-4X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-4X100GE-TR-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-4X100GE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0

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                       DBCtrl                    lc   fpga3       1.07        0.00      0.0
                       PortCtrl                  lc   fpga4       1.09        0.00      0.0
                       CPAK LR4                  lc   fpga5       1.16        0.00      0.0
                       CPAK SR10                 lc   fpga6       2.02        0.00      0.0
                       Fsbl                      lc   fsbl        1.113       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.113       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
A99K-MOD200-SE         Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                       DBCtrl                    lc   fpga10      1.27        0.00      0.0
                       MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                       Fsbl                      lc   fsbl        1.103       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
A99K-200MOD-SE-TAA     Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                       DBCtrl                    lc   fpga10      1.27        0.00      0.0
                       MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                       Fsbl                      lc   fsbl        1.103       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
A99K-MOD200-TR         Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                       DBCtrl                    lc   fpga10      1.27        0.00      0.0
                       MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                       Fsbl                      lc   fsbl        1.103       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
A99K-MOD200-TR-TAA     Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                       DBCtrl                    lc   fpga10      1.27        0.00      0.0
                       MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                       Fsbl                      lc   fsbl        1.103       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
A9K-MOD200-SE          Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                       DBCtrl                    lc   fpga10      1.27        0.00      0.0
                       MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                       Fsbl                      lc   fsbl        1.103       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
A9K-MOD200-SE-TAA      Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                       DBCtrl                    lc   fpga10      1.27        0.00      0.0
                       MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                       Fsbl                      lc   fsbl        1.103       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
A9K-MOD200-TR          Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                       DBCtrl                    lc   fpga10      1.27        0.00      0.0
                       MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                       Fsbl                      lc   fsbl        1.103       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
A9K-MOD200-TR-TAA      Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                       DBCtrl                    lc   fpga10      1.27        0.00      0.0
                       MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                       Fsbl                      lc   fsbl        1.103       0.00      0.0
                       LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                       ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------
```

```
A9K-MOD200-TAA          Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A99K-MOD400-SE          Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A99K-MOD400-SE-TAA      Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A99K-MOD400-TR          Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A99K-MOD400-TR-TAA      Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-MOD400-SE           Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-MOD400-SE-TAA       Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-MOD400-TR           Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-MOD400-TR-TAA       Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
                        DBCtrl                     lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        0.00      0.0
                        Fsbl                       lc   fsbl        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-MOD400-TAA          Can Bus Ctrl (CBC) LC4     lc   cbc        39.09        0.00      0.0
```

	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-8X100GE-L-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-8X100GE-L-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-8X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-8X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99L-4X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99L-4X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0

	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9KL-4X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9KL-4X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-400G-DWDM-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	42.04	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	DBCtrl	lc	fpga4	1.03	0.00	0.0
	DBCtrl	lc	fpga5	1.05	0.00	0.0
	DBCtrl	lc	fpga6	3.78	0.00	1.0
	DBCtrl	lc	fpga7	49.00	0.00	0.0
	CFP2 V2	lc	fpga8	5.52	0.00	2.0
	CFP2 V1	lc	fpga8	4.40	0.00	1.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-4X100GE	Can Bus Ctrl (CBC) LC4	lc	cbc	46.06	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	DBCtrl	lc	fpga3	1.02	0.00	0.0
	PortCtrl	lc	fpga4	1.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	9.30	0.00	0.0
A99-12X100GE	Can Bus Ctrl (CBC) LC4	lc	cbc	46.06	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	DBCtrl	lc	fpga3	1.02	0.00	0.0
	PortCtrl	lc	fpga4	1.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	9.30	0.00	0.0
A99-8X100GE-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A9K-8X100GE-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.99	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0

	PortCtrl	lc	fpga4	1.09	0.00	0.0
	CPAK LR4	lc	fpga5	1.16	0.00	0.0
	CPAK SR10	lc	fpga6	2.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	8.50	0.00	0.0
A99-12X100GE-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	46.06	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	DBCtrl	lc	fpga3	1.02	0.00	0.0
	PortCtrl	lc	fpga4	1.02	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	9.30	0.00	0.0
A99-48X10GE-1G-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	47.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.11	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	18.30	0.00	0.0
A99-48X10GE-1G-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	47.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.11	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	18.30	0.00	0.0
A99-48X10GE-1G-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	47.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	fpd_lc_fpga4_0x003d02ca	lc	fpga4	1.11	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	18.30	0.00	0.0
A9K-24X10GE-1G-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	47.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.11	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	18.30	0.00	0.0
A9K-24X10GE-1G-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	47.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.11	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	18.30	0.00	0.0
A9K-24X10GE-1G-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	47.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.89	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.11	0.00	0.0
	Fsbl	lc	fsbl	1.113	0.00	0.0
	LinuxFW	lc	lnxfw	1.113	0.00	0.0
	ROMMONB LC1	lc	rommon	18.30	0.00	0.0
A9K-48X10GE-1G-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	47.03	0.00	0.0

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                        MB CPUCtrl                lc   fpga2       1.89        0.00      0.0
                        PortCtrl                  lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl            lc   fpga4       1.11        0.00      0.0
                        Fsbl                      lc   fsbl        1.113       0.00      0.0
                        LinuxFW                   lc   lnxfw       1.113       0.00      0.0
                        ROMMONB LC1               lc   rommon     18.30        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-48X10GE-1G-TR       Can Bus Ctrl (CBC) LC4    lc   cbc        47.03        0.00      0.0
                        MB CPUCtrl                lc   fpga2       1.89        0.00      0.0
                        PortCtrl                  lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl            lc   fpga4       1.11        0.00      0.0
                        Fsbl                      lc   fsbl        1.113       0.00      0.0
                        LinuxFW                   lc   lnxfw       1.113       0.00      0.0
                        ROMMONB LC1               lc   rommon     18.30        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-48X10GE-1G-CM       Can Bus Ctrl (CBC) LC4    lc   cbc        47.03        0.00      0.0
                        MB CPUCtrl                lc   fpga2       1.89        0.00      0.0
                        PortCtrl                  lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl            lc   fpga4       1.11        0.00      0.0
                        Fsbl                      lc   fsbl        1.113       0.00      0.0
                        LinuxFW                   lc   lnxfw       1.113       0.00      0.0
                        ROMMONB LC1               lc   rommon     18.30        0.00      0.0
-------------------------------------------------------------------------------------------------
A99-24X10GE-1G-SE       Can Bus Ctrl (CBC) LC4    lc   cbc        47.03        0.00      0.0
                        MB CPUCtrl                lc   fpga2       1.89        0.00      0.0
                        PortCtrl                  lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl            lc   fpga4       1.11        0.00      0.0
                        Fsbl                      lc   fsbl        1.113       0.00      0.0
                        LinuxFW                   lc   lnxfw       1.113       0.00      0.0
                        ROMMONB LC1               lc   rommon     18.30        0.00      0.0
-------------------------------------------------------------------------------------------------
A99-24X10GE-1G-TR       Can Bus Ctrl (CBC) LC4    lc   cbc        47.03        0.00      0.0
                        MB CPUCtrl                lc   fpga2       1.89        0.00      0.0
                        PortCtrl                  lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl            lc   fpga4       1.11        0.00      0.0
                        Fsbl                      lc   fsbl        1.113       0.00      0.0
                        LinuxFW                   lc   lnxfw       1.113       0.00      0.0
                        ROMMONB LC1               lc   rommon     18.30        0.00      0.0
-------------------------------------------------------------------------------------------------
A99-24X10GE-1G-CM       Can Bus Ctrl (CBC) LC4    lc   cbc        47.03        0.00      0.0
                        MB CPUCtrl                lc   fpga2       1.89        0.00      0.0
                        PortCtrl                  lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl            lc   fpga4       1.11        0.00      0.0
                        Fsbl                      lc   fsbl        1.113       0.00      0.0
                        LinuxFW                   lc   lnxfw       1.113       0.00      0.0
                        ROMMONB LC1               lc   rommon     18.30        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-MOD400-CM           Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                        DBCtrl                    lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                        Fsbl                      lc   fsbl        1.103       0.00      0.0
                        LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-MOD200-CM           Can Bus Ctrl (CBC) LC4    lc   cbc        39.09        0.00      0.0
                        DBCtrl                    lc   fpga10      1.27        0.00      0.0
                        MB CPUCtrl                lc   fpga2       1.97        0.00      0.0
                        Fsbl                      lc   fsbl        1.103       0.00      0.0
                        LinuxFW                   lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1               lc   rommon      8.50        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-40GE-SE             Can Bus Ctrl (CBC) LC4    lc   cbc        41.104       0.00      0.1
                        PortCtrl                  lc   fpga2       0.08        0.00      0.0
                        PortCtrl                  lc   fpga3       0.08        0.00      0.0
```

	MB CPUCtrl	lc	fpga4	0.06	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.1
A9K-4T16GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	41.104	0.00	0.1
	PortCtrl	lc	fpga2	0.08	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	MB CPUCtrl	lc	fpga4	0.06	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.1
A9K-40GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	41.104	0.00	0.1
	PortCtrl	lc	fpga2	0.08	0.00	0.0
	PortCtrl	lc	fpga3	0.08	0.00	0.0
	MB CPUCtrl	lc	fpga4	0.06	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.1
A9K-4T16GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	41.104	0.00	0.1
	PortCtrl	lc	fpga2	0.08	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	MB CPUCtrl	lc	fpga4	0.06	0.00	0.0
	ROMMONB LC4	lc	rommon	3.04	0.00	0.1
ASR9001-LC	Can Bus Ctrl (CBC) IMLC	lc	cbc	23.114	0.00	0.1
	DB CPUCtrl	lc	fpga2	1.18	0.00	0.0
	EP Gambit	lc	fpga3	1.01	0.00	0.0
	MB CPUCtrl	lc	fpga4	2.10	0.00	0.0
	EP Rogue	lc	fpga6	1.06	0.00	0.0
	EP I/O FPGA	lc	fpga7	1.02	0.00	0.0
	ROMMONB IM LC	lc	rommon	3.04	0.00	0.1
ASR9001-LC-S	Can Bus Ctrl (CBC) IMLC	lc	cbc	23.114	0.00	0.1
	DB CPUCtrl	lc	fpga2	1.18	0.00	0.0
	EP Gambit	lc	fpga3	1.01	0.00	0.0
	MB CPUCtrl	lc	fpga4	2.10	0.00	0.0
	EP Rogue	lc	fpga6	1.06	0.00	0.0
	EP I/O FPGA	lc	fpga7	1.02	0.00	0.0
	ROMMONB IM LC	lc	rommon	3.04	0.00	0.1
A9K-ISM-100	Can Bus Ctrl (CBC) LC6	lc	cbc	18.08	0.00	0.1
	CPUCtrl LC6	lc	cpld1	0.01	0.00	0.1
	Maintenance LC6	lc	fpga2	2.13	0.00	0.1
	Amistad LC6	lc	fpga1	0.33	0.00	0.20
	ROMMONB LC6	lc	rommon	1.02	0.00	0.1
PWR-3KW-AC-V2	Delta AC logic PM	pm	fpga11	6.04	0.00	0.1
	Delta AC primary PM	pm	fpga12	6.02	0.00	0.1
	Delta AC secondary PM	pm	fpga13	6.02	0.00	0.1
	Emerson AC logic PM	pm	fpga14	3.18	0.00	0.1
	Emerson AC primary PM	pm	fpga15	3.06	0.00	0.1
	Emerson AC secondary PM	pm	fpga16	3.12	0.00	0.1
PWR-2KW-DC-V2	Delta DC logic PM	pm	fpga11	6.03	0.00	0.1
	Delta DC primary PM	pm	fpga12	6.03	0.00	0.1
	Delta DC secondary PM	pm	fpga13	6.02	0.00	0.1
	Emerson DC logic PM	pm	fpga14	3.20	0.00	0.1
	Emerson DC primary PM	pm	fpga15	3.12	0.00	0.1
	Emerson DC secondary PM	pm	fpga16	3.21	0.00	0.1
PWR-6KW-AC-V3	Delta V3 AC logic PM	pm	fpga11	4.04	0.00	0.1
	Delta V3 AC primary PM	pm	fpga12	4.02	0.00	0.1
	Delta V3 AC secondary PM	pm	fpga13	4.03	0.00	0.1
	Acbel V3 AC logic PM MCU	pm	fpga14	3.02	0.00	0.1
	Acbel V3 AC primary PM	pm	fpga15	3.02	0.00	0.1
	Acbel V3 AC secondary PM	pm	fpga16	3.02	0.00	0.1

PWR-4.4KW-DC-V3	Delta V3 DC logic PM	pm	fpga11	3.00	0.00	0.1
	Delta V3 DC primary PM	pm	fpga12	3.00	0.00	0.1
	Delta V3 DC secondary PM	pm	fpga13	3.00	0.00	0.1
	Acbel V3 DC logic PM MCU	pm	fpga14	1.11	0.00	0.1
	Acbel V3 DC primary PM	pm	fpga15	1.03	0.00	0.1
	Acbel V3 DC secondary PM	pm	fpga16	2.13	0.00	0.1
PWR-3KW-HVDC	Delta HVDC logic PM	pm	fpga11	2.03	0.00	0.1
	Delta HVDC primary PM	pm	fpga12	2.02	0.00	0.1
	Delta HVDC secondary PM	pm	fpga13	2.02	0.00	0.1
A9K-MPA-32X1GE	EP I/O FPGA	spa	fpga11	1.09	0.00	0.0
SPA-4XT3/E3	SPA E3 Subrate FPGA	spa	fpga2	1.04	0.00	0.0
	SPA T3 Subrate FPGA	spa	fpga3	1.04	0.00	0.0
	SPA I/O FPGA	spa	fpga1	1.01	0.00	0.0
	SPA ROMMON	spa	rommon	2.12	0.00	0.0
SPA-2XT3/E3	SPA E3 Subrate FPGA	spa	fpga2	1.04	0.00	0.0
	SPA T3 Subrate FPGA	spa	fpga3	1.04	0.00	0.0
	SPA I/O FPGA	spa	fpga1	1.01	0.00	0.0
	SPA ROMMON	spa	rommon	2.12	0.00	0.0
SPA-4XCT3/DS0	SPA T3 Subrate FPGA	spa	fpga2	0.11	0.00	0.100
	SPA T3 Subrate FPGA	spa	fpga2	1.04	0.00	0.200
	SPA I/O FPGA	spa	fpga1	2.08	0.00	0.100
	SPA ROMMON	spa	rommon	2.12	0.00	0.100
SPA-OC192POS-XFP	SPA FPGA swv1.101 hwv3	spa	fpga2	1.101	0.00	3.0
	SPA FPGA swv1.2 hwv2	spa	fpga1	1.02	0.00	2.0
SPA-1XCHSTM1/OC3	SPA T3 Subrate FPGA	spa	fpga2	1.04	0.00	0.0
	SPA I/O FPGA	spa	fpga1	1.08	0.00	0.0
	SPA ROMMON	spa	rommon	2.12	0.00	0.0
SPA-1XOC48POS/RPR	SPA FPGA swv1.101 hwv3	spa	fpga2	1.101	0.00	3.0
	SPA FPGA swv1.2	spa	fpga1	1.02	0.00	0.0
SPA-24CHT1-CE-ATM	SPA T3 Subrate FPGA	spa	fpga2	1.10	0.00	1.0
	SPA I/O FPGA	spa	fpga1	2.32	0.00	1.0
	SPA ROMMON	spa	rommon	1.03	0.00	1.0
SPA-2CHT3-CE-ATM	SPA T3 Subrate FPGA	spa	fpga2	1.11	0.00	1.0
	SPA I/O FPGA	spa	fpga1	2.22	0.00	1.0
	SPA ROMMON	spa	rommon	1.04	0.00	1.0
SPA-1CHOC3-CE-ATM	SPA OC3 Subrate FPGA	spa	fpga2	2.23	0.00	0.0
	SPA I/O FPGA	spa	fpga1	2.23	0.00	2.0
	SPA ROMMON	spa	rommon	1.04	0.00	0.0
SPA-1XCHOC48/DS3	SPA I/O FPGA	spa	fpga2	1.00	0.00	0.49
	SPA I/O FPGA	spa	fpga3	1.00	0.00	0.52
	SPA I/O FPGA	spa	fpga1	1.36	0.00	0.49
	SPA ROMMON	spa	rommon	2.02	0.00	0.49
SPA-4XT-SERIAL	SPA I/O FPGA	spa	fpga2	1.04	0.00	2.0
	SPA I/O FPGA	spa	fpga1	1.02	0.00	0.0
SPA-1XOC3-ATM-V2	SPA FPGA swv2.104 hwv2	spa	fpga2	2.104	0.00	2.8
	SPA FPGA swv1.2	spa	fpga1	2.02	0.00	0.0
SPA-3XOC3-ATM-V2	SPA FPGA swv2.104 hwv2	spa	fpga2	2.104	0.00	2.8
	SPA FPGA swv1.2	spa	fpga1	2.02	0.00	0.0

SPA-1XOC12-ATM-V2	SPA FPGA swv2.104 hwv2	spa	fpga2	2.104	0.00	2.8
	SPA FPGA swv1.2	spa	fpga1	2.02	0.00	0.0
SPA-2XCHOC12/DS0	SPA FPGA2 swv1.00	spa	fpga2	1.00	0.00	0.0
	SPA FPGA swv1.36	spa	fpga1	1.36	0.00	0.49
	SPA ROMMON swv2.2	spa	rommon	2.02	0.00	0.49
A9K-MPA-20X1GE	EP I/O FPGA	spa	fpga3	1.01	0.00	0.0
A9K-MPA-20X10GE	EP I/O FPGA	spa	fpga5	1.16	0.00	0.0
A9K-MPA20X10GE-CM	EP I/O FPGA	spa	fpga5	1.16	0.00	0.0
A9K-MPA-2X10GE	EP I/O FPGA	spa	fpga6	1.06	0.00	0.0
A9K-MPA-4X10GE	EP I/O FPGA	spa	fpga6	1.06	0.00	0.0
A9K-MPA-2X40GE	EP I/O FPGA	spa	fpga7	1.03	0.00	0.0
A9K-MPA-1X40GE	EP I/O FPGA	spa	fpga7	1.03	0.00	0.0
A9K-MPA-8X10GE	EP I/O FPGA	spa	fpga8	1.09	0.00	0.0
A9K-MPA-2X100GE	EP I/O FPGA	spa	fpga9	1.04	0.00	0.0
	CFP2 DCO B0	spap	fpga7	38.26887	0.00	0.0
	CFP2 DCO	spap	fpga8	38.26887	0.00	0.0
A9K-MPA-1X100GE	EP I/O FPGA	spa	fpga9	1.04	0.00	0.0
	CFP2 DCO B0	spap	fpga7	38.26887	0.00	0.0
	CFP2 DCO	spap	fpga8	38.26887	0.00	0.0
A9K-MPA2X100GE-CM	EP I/O FPGA	spa	fpga9	1.04	0.00	0.0
	CFP2 DCO B0	spap	fpga7	38.26887	0.00	0.0
	CFP2 DCO	spap	fpga8	38.26887	0.00	0.0
A9K-MPA-1X200GE	EP I/O FPGA	spa	fpga9	1.04	0.00	0.0
	CFP2 DCO B0	spap	fpga7	38.26887	0.00	0.0
	CFP2 DCO	spap	fpga8	38.26887	0.00	0.0
SPA-8XOC12-POS	SPA FPGA swv1.0	spa	fpga1	1.00	0.00	0.5
SPA-8XCHT1/E1	SPA I/O FPGA	spa	fpga1	2.08	0.00	0.0
	SPA ROMMON	spa	rommon	2.12	0.00	0.140
SPA-2XOC48POS/RPR	SPA FPGA swv1.0	spa	fpga1	1.00	0.00	0.0
SPA-4XOC48POS/RPR	SPA FPGA swv1.0	spa	fpga1	1.00	0.00	0.0
SPA-8XOC3-POS	SPA FPGA swv1.0	spa	fpga1	1.00	0.00	0.5
SPA-2XOC12-POS	SPA FPGA swv1.0	spa	fpga1	1.00	0.00	0.5
SPA-4XOC12-POS	SPA FPGA swv1.0	spa	fpga1	1.00	0.00	0.5
SPA-10X1GE-V2	SPA FPGA swv1.10	spa	fpga1	1.10	0.00	0.0
SPA-4XOC3-POS-V2	SPA FPGA swv1.0	spa	fpga1	1.00	0.00	0.5
SPA-2XOC3-ATM-V2	SPA FPGA swv1.2	spa	fpga1	2.02	0.00	0.0
SPA-8XCHT1/E1-V2	SPA I/O FPGA	spa	fpga1	1.02	0.00	1.0
	SPA ROMMON	spa	rommon	1.00	0.00	1.0
SPA-1CHSTM1/OC3V2	SPA I/O FPGA	spa	fpga1	1.00	0.00	0.1

```
                          SPA ROMMON                spa  rommon      1.00        0.00      0.1
-------------------------------------------------------------------------------------------------
SPA-2XCT3/DS0-V2          SPA I/O FPGA              spa  fpga1       1.01        0.00      1.0
                          SPA ROMMON                spa  rommon      1.00        0.00      1.0
-------------------------------------------------------------------------------------------------
SPA-4XCT3/DS0-V2          SPA I/O FPGA              spa  fpga1       1.01        0.00      1.0
                          SPA ROMMON                spa  rommon      1.00        0.00      1.0
-------------------------------------------------------------------------------------------------
SPA-2XT3/E3-V2            SPA FPGA swv1.1 hwv3      spa  fpga1       1.01        0.00      1.0
                          SPA ROMMON                spa  rommon      1.00        0.00      1.0
-------------------------------------------------------------------------------------------------
SPA-4XT3/E3-V2            SPA FPGA swv1.1 hwv3      spa  fpga1       1.01        0.00      1.0
                          SPA ROMMON                spa  rommon      1.00        0.00      1.0
-------------------------------------------------------------------------------------------------
```

Other Important Information

- Repetitive Smart Licensing evaluation expired warning messages are displayed on the console every hour, but no functionality impact is seen on the device. To stop these repetitive messages, you should register the device again with new registration token.
- Cisco IOS XR Release 6.1.1 does not support MAP-E and MAP-T on VSM
- Cisco IOS XR Release 5.3.0 and later does not support the first and third generation Cisco ASR 9000 Line Cards to coexist in a single chassis.

  For the list of ASR 9000 Series line card types, see:
  http://www.cisco.com/c/en/us/support/docs/routers/asr-9000-series-aggregation-services-routers/116726-qanda-product-00.html#anc2
- From Release 6.0, A9K-RSP-4G, A9K-RSP-8G and the ASR 9000 Ethernet Line Cards also known as the first generation ASR 9000 LCs are not supported. For a detailed listing, see End-of-Life and End-of-Sale Notices
- From Release 6.0, the onePK toolkit is not supported.
- The line cards A9K-4X100GE-SE/TR and A9K-8X100GE-SE/TR comply with G.8273.2 Class A performance on 100G ports without breakout. These line cards comply with G.8273.2 Class B performance with 10G breakout.
- 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.
- **Card fan controller, and RSP removal**—For all card removal and replacement (including fabric cards, line cards, fan controller, and RSP) follow the instructions provided by Cisco to avoid impact to traffic. See the *Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide* 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.
- Installing a Line Card—For a fully populated 40-port high density Line Card with cable optics, maintenance time required for card replacement is higher. For more information about Line Card installation and removal, refer to the *Cisco ASR 9000 Aggregation Services Router Ethernet Line Card Installation Guide*.
- Serial Interfaces Out of Order in **`show ipv4 interface brief`** or **`show ipv6 interface brief`**command—The show ip interface brief command might display interfaces out of order if different types of serialization are used on the SPA cards.

  The serial interfaces are displayed in the show ip interface brief command output in the order shown in the example below:

The ordering is based on:

1. Slot
2. SPA
3. Type
4. T3
5. T3/T1
6. vt15-T1
7. multilink

This may be different from the usual order (as the interfaces appear out of order) for the user who is accustomed to IOS.

Example output:

With multiple cards:

```
Serial0/2/0/1/1/1:0  (t3/t1)
Serial0/2/0/1/2/1:0
Serial0/2/0/1/3/1:0
Serial0/2/0/1/4/1:0
Serial0/2/0/1/5/1:0
Serial0/2/0/1/6/1:0
Serial0/2/0/1/7/1:0
Serial0/2/0/1/8/1:0
Serial0/2/0/1/9/1:0
Serial0/2/0/1/10/1:0
Serial0/2/0/1/11/1:0
Serial0/2/0/1/12/1:0
Serial0/2/0/0/1/1/1:0  (vt15)
Serial0/2/0/0/2/1/1:0
Serial0/2/0/0/3/1/1:0
Serial0/2/0/0/4/1/1:0
Serial0/2/0/0/5/1/1:0
Serial0/2/0/0/6/1/1:0
Serial0/2/0/0/7/1/1:0
Serial0/2/0/0/8/1/1:0
Serial0/2/0/0/9/1/1:0
Serial0/2/0/0/10/1/1:0
Serial0/2/0/0/11/1/1:0
Serial0/2/0/0/12/1/1:0
Multilink 0/2/0/0/1
Serial0/2/1/0/1  (t3)
Serial0/2/1/1/1/1:0  (t3/t1)
Serial0/2/1/1/2/1:0
Serial0/2/1/1/3/1:0
Serial0/2/1/1/4/1:0
Serial0/2/1/1/5/1:0
Serial0/2/1/1/6/1:0
Serial0/2/1/1/7/1:0
Serial0/2/1/1/8/1:0
Serial0/2/1/1/9/1:0
Serial0/2/1/1/10/1:0
```

```
Serial0/2/1/1/11/1:0
Serial0/2/1/1/12/1:0
Serial0/6/0/1/1/1:0
Serial0/6/0/1/2/1:0
Serial0/6/0/1/3/1:0
Serial0/6/0/1/4/1:0
Serial0/6/0/1/5/1:0
Serial0/6/0/1/6/1:0
Serial0/6/0/1/7/1:0
Serial0/6/0/1/8/1:0
Serial0/6/0/1/9/1:0
Serial0/6/0/1/10/1:0
Serial0/6/0/1/11/1:0
Serial0/6/0/1/12/1:0
Serial0/6/0/0/1/1/1:0
Serial0/6/0/0/2/1/1:0
Serial0/6/0/0/3/1/1:0
Serial0/6/0/0/4/1/1:0
Serial0/6/0/0/5/1/1:0
Serial0/6/0/0/6/1/1:0
Serial0/6/0/0/7/1/1:0
Serial0/6/0/0/8/1/1:0
Serial0/6/0/0/9/1/1:0
Serial0/6/0/0/10/1/1:0
Serial0/6/0/0/11/1/1:0
Serial0/6/0/0/12/1/1:0
Multilink 0/6/0/0/1
Serial0/6/1/0/1
Serial0/6/1/1/1/1:0
Serial0/6/1/1/2/1:0
Serial0/6/1/1/3/1:0
Serial0/6/1/1/4/1:0
Serial0/6/1/1/5/1:0
Serial0/6/1/1/6/1:0
Serial0/6/1/1/7/1:0
Serial0/6/1/1/8/1:0
Serial0/6/1/1/9/1:0
Serial0/6/1/1/10/1:0
Serial0/6/1/1/11/1:0
Serial0/6/1/1/12/1:0
```

Supported Transceiver Modules

To determine the transceivers that Cisco hardware device supports, refer to the Transceiver Module Group (TMG) Compatibility Matrix tool.

Supported Modular Port Adapters

For the compatibility details of Modular Port Adapters (MPAs) on the line cards, see the datasheet of that specific line card.

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 the caveats for Cisco ASR 9000 Series Aggregation Services Router Software Release and the Cisco ASR 9000 Series Aggregation Services Router platform.

Cisco IOS XR Caveats

There are no caveats specific to Cisco IOS XR Software Release.

Caveats Specific to the Cisco ASR 9000 Series Router

There are no caveats in this release

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.

The upgrade document is available along with the software images.

Table 4: Upgrade Document Filename

To upgrade	Refer
Cisco IOS XR software	ASR9000_Upgrade_Downgrade_MOP_6.7.2.pdf

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.

Troubleshooting

For information on troubleshooting Cisco IOS XR Software, see the *Cisco ASR 9000 Series Aggregation Services Routers Getting Started Guide* and the *Cisco ASR 9000 Series Router Troubleshooting Feature Module*

Resolving Upgrade File Issues

Note In some very rare cases inconsistencies in the content of the internal configuration files can appear. In such situations, to avoid configuration loss during upgrade, the following steps can be optionally done before activating packages:

1. Clear the NVGEN cache:

```
RP/0/RSP0/CPU0:router# run nvgen -F 1
```

2. Create a dummy config commit:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# hostname <hostname>
RP/0/RSP0/CPU0:rotuer(config)# commit
RP/0/RSP0/CPU0:router(config)# end
```

3. Force a commit update by using the **reload** command. Press **n** when the confirmation prompt appears:

```
RP/0/RSP0/CPU0:router# reload
Updating Commit Database. Please wait...[OK]
Proceed with reload? [confirm]
```

4. Press **n**

In some cases other activity may preclude a reload. The following message may display:

```
RP/0/RSP0/CPU0:router# reload

Preparing system for backup. This may take a few minutes .....System
configuration backup in progress [Retry later]
```

If you receive this message wait and then retry the command after some time.

Related Documentation

The most current Cisco ASR 9000 router hardware documentation is located at the following URL:

https://www.cisco.com/c/en/us/support/routers/asr-9000-series-aggregation-services-routers/products-installation-guides-list.html

The Cisco IOS XR Software documentation set includes the Cisco IOS XR software configuration guides and command references.

- The configuration guides are located at this URL:

  https://www.cisco.com/c/en/us/support/routers/asr-9000-series-aggregation-services-routers/products-installation-and-configuration-guides-list.html
- The command reference guides are located at this URL:

  https://www.cisco.com/c/en/us/support/routers/asr-9000-series-aggregation-services-routers/products-command-reference-list.html

The document containing Cisco IOS XR System Error Messages (SEM) is located at this URL:

https://www.cisco.com/c/en/us/td/docs/ios_xr_sw/error/message/ios-xr-sem-guide.html

Production Software Maintenance Updates (SMUs)

A production SMU is a SMU that is formally requested, developed, tested, and released. Production SMUs are intended for use in a live network environment and are formally supported by the Cisco TAC and the relevant development teams. Software bugs identified through software recommendations or Bug Search Tools are not a basis for production SMU requests.

For information on production SMU types, refer the Production SMU Types section of the IOS XR Software Maintenance Updates (SMUs) guide.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

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