

Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 6.4.2

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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.

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

From Release 6.1.1 onwards, Cisco introduces support for the 64 bit Linux-based IOS XR operating system. Extensive feature parity is maintained between legacy 32 bit and new 64 bit environments.

For information on operational enhancements introduced in new 64 bit IOS XR OS, refer to the Introduction to Operational Enhancements in Cisco IOS XR guide.

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 . See the *Software Features Introduced in Cisco IOS XR Software Release 6.4.2* 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

Feature Set Table

Cisco IOS XR

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 .

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 Release 6.4.2 supported on the Cisco ASR 9000 Series Aggregation Services Router.

Table 1: Cisco IOS XR Software Release 6.4.2 PX PIE Files

Composite Package		
Feature Set	**Filename**	**Description**
Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-px.pie-6.4.2	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-6.4.2	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-6.4.2	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- 6.4.2	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-6.4.2	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), Layer-2 VPN, VPLS and Layer-3 VPN.

Cisco IOS XR Multicast Package	asr9k-mcast-px.pie-6.4.2	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-6.4.2	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-6.4.2	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-6.4.2	Firmware pie for all LC and RSP FPGAs and ASICs.
Cisco IOS XR Services Package	asr9k-services.pie-6.4.2	Includes binaries to support CGv6 on VSM.
Cisco IOS XR Documentation Package	asr9k-doc-px.pie-6.4.2	.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-6.4.2	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-6.4.2	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-6.4.2	Includes binaries to support BNG features.
Cisco IOS XR Lawful Intercept (LI) Package	asr9k-li-px.pie-6.4.2	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-px.pie-6.4.2	Support for Encryption, Decryption,, Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI).

This table lists the Cisco IOS XR Software feature set matrix (TAR files) and associated filenames available for the Cisco IOS XR Software Release 6.4.2 supported on the Cisco ASR 9000 Series Aggregation Services Router.

Table 2: Cisco IOS XR Software Release 6.4.2 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP440, RSP880 and RP systems]	ASR9K-iosxr-px-6.4.2-turboboot.tar	Contains only the mini.vm package.
Cisco IOS XR IP/MPLS Core Software [for RSP440, RSP880 and RP systems]	ASR9K-iosxr-px-6.4.2-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, RSP440, RSP880 and RP systems]	ASR9K-iosxr-px-6.4.2-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-6.4.2-bridge_smus.tar	Contains all bridge SMUs

Cisco IOS XR 64 bit

This table lists the feature set matrix (ISO and RPM files) and associated filenames available for the Cisco IOS XR 64 bit Release 6.4.2 supported on the Cisco ASR 9000 Series Aggregation Services Router.

Table 3: Cisco IOS XR 64 bit Software Release 6.4.2 ISO and RPM Files

Composite Package		
Feature Set	**Filename**	**Description**

Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-x64-6.4.2.iso	Contains the required core packages, including OS, Admin, Base,Forwarding, Modular Services Card, Routing, SNMP Agent, and Alarm Correlation. The mini iso file is used for upgrading to the new release. The mini iso package also includes Cisco IOS XR 64-bit BGP package (asr9k-bgp-x64-2.0.0.0-r64216I.x86_64.rpm).
Individually-Installable Optional Packages		
Feature Set	**Filename**	**Description**
Cisco IOS XR 64-bit EIGRP package	asr9k-eigrp-x64-1.0.0.0-r642.x86_64.rpm	Includes EIGRP protocol support software
Cisco IOS XR BNG Package	asr9k-bng-x64-1.0.0.0-r642.x86_64.rpm	Includes binaries to support BNG features.
Cisco IOS XR 64-bit ISIS package	asr9k-isis-x64-1.1.0.0-r642.x86_64.rpm	Includes IS-IS Link state protocol support software
Cisco IOS XR 64-bit OSPF package	asr9k-ospf-x64-1.0.0.0-r642.x86_64.rpm	Includes OSPF link state protocol support software
Cisco IOS XR 64-bit M2M package	asr9k-m2m-x64-2.0.0.0-r642.x86_64.rpm	Machine to Machine communication software
Cisco IOS XR Manageability Package	asr9k-mgbl-x64-2.0.0.0-r642.x86_64.rpm	CORBA2 agent, XML3 Parser, and HTTP server packages. This PIE also contains some SNMP MIB infrastructure. Certain MIBs won't work if this RPM is not installed. IPSLA and environment MIBs are part of the mgbl rpm.
Cisco IOS XR 64-bit MPLS-TE and RSVP package	asr9k-mpls-te-rsvp-x64-2.2.0.0-r642.x86_64.rpm	MPLS Traffic Engineering (MPLS-TE), Resource Reservation Protocol (RSVP).
Cisco IOS XR 64-bit MPLS Package	asr9k-mpls-x64-2.0.0.0-r642.x86_64.rpm	Label Distribution Protocol (LDP), MPLS Forwarding, MPLS Operations, Administration, and Maintenance (OAM), Link Manager Protocol (LMP), Optical User Network Interface (OUNI), Layer-2 VPN, VPLS and Layer-3 VPN.

Cisco IOS XR 64-bit Multicast Package	asr9k-mcast-x64-2.0.0.0-r642.x86_64.rpm	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 64-bit Optics Package	asr9k-optic-x64-1.0.0.0-r642.x86_64.rpm	Firmware for the optics feature for Cisco ASR 9000 Series Aggregation Services Router Chassis. It enables Transport / OTN feature under interfaces.
Cisco IOS XR 64-bit Lawful Intercept (LI) Package	asr9k-li-x64-1.1.0.0-r642.x86_64.rpm	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-x64-3.1.0.0-r642.x86_64.rpm	Support for Encryption, Decryption,, Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI).
Cisco IOS XR Satellite Package -ASR9000v	asr9k-9000v-nV-x64-1.0.0.0-r642.x86_64.rpm	Includes rpm to support Cisco ASR9000v Series Router Software and to support Cisco ASR 9000v Series Router as a satellite for Cisco ASR 9000 Series Router.

Table 4: Cisco IOS XR 64 bit Software Release Release 6.4.2 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP880 and RP systems]	ASR9K-x64-iosxr-px-6.4.2.tar	• Cisco IOS XR Manageability Package • Cisco IOS XR MPLS Package • Cisco IOS XR MPLS -TE and RSVP Package • Cisco IOS XR Multicast Package • Cisco IOS XR FPD Package • Cisco IOS XR Diagnostic Package • Cisco IOS XR Optics Package • Cisco IOS XR BNG Package • Cisco IOS XR Lawful Intercept Package • Cisco IOS XR Satellite Package • Cisco IOS XR EIGRP Package • Cisco IOS XR ISIS Package • Cisco IOS XR OSPF Package • Cisco IOS XR M2M Package

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software 3DES [for RSP880 and RP systems]	ASR9K-x64-iosxr-px-k9-6.4.2.tar	• Cisco IOS XR Manageability Package • Cisco IOS XR MPLS Package • Cisco IOS XR MPLS -TE and RSVP Package • Cisco IOS XR Multicast Package • Cisco IOS XR FPD Package • Cisco IOS XR Diagnostic Package • Cisco IOS XR Optics Package • Cisco IOS XR BNG Package • Cisco IOS XR Lawful Intercept Package • Cisco IOS XR Satellite Package • Cisco IOS XR EIGRP Package • Cisco IOS XR ISIS Package • Cisco IOS XR OSPF Package • Cisco IOS XR M2M Package
Cisco IOS XR IP Unicast Routing Core Bundle and Migration to IOS XR 64-bit tar image	asr9k-mini-x64-migrate_to_eXR.tar-6.4.2	Contains the required core packages, including OS, Admin, Base,Forwarding, Modular Services Card, Routing, SNMP Agent, and Alarm Correlation. Contains mini.iso file for XR 64-bit 6.4.2 and additional software for migration to 64-bit.

Memory Requirements



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

The minimum memory requirements for Cisco ASR 9000 Series Aggregation Services Router running Cisco IOS XR Software Release 6.4.2 consist of the following:

- minimum 16 GB memory on the RSP880, RSP880-LT, RP2, A99-RSP-TR and A99-RSP-SE
- minimum 16 GB memory on the RP2 transport optimised (TR) variant and 32 GB memory on the RP2 service edge (SE) variant
- 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

- minimum 8 GB memory on the line cards (LCs) running Cisco IOS XR 64 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 10" 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.

Table 5: 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**	**Support Initially Provided in IOS XR 64 bit Release**
ASR 9000 Route Switch Processor 5 for Service Edge	A9K-RSP5-SE	Not Supported	Release 6.5.15
ASR 9000 Route Switch Processor 5 for Packet Transport	A9K-RSP5-TR	Not Supported	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router RSP880-Lite, Packet Transport Optimized	A9K-RSP880-LT-TR	Release 6.2.2	Release 6.4.1
Cisco ASR 9000 Series Aggregation Services Router RSP880-Lite, Service Edge Optimized	A9K-RSP880-LT-SE	Release 6.2.2	Release 6.4.1
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Service Edge Optimized for ASR 9910 from Release 6.0.1.	A99-RSP-SE	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Packet Transport Optimized for ASR 9910 from Release 6.0.1.	A99-RSP-TR	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Packet Transport Optimized for ASR 9906 supported from Release 6.3.1	A99-RSP-TR	Release 6.3.1	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Service Edge Optimized for ASR 9906 from Release 6.3.1.	A99-RSP-SE	Release 6.3.1	Release 6.3.1
ASR9K Route Switch Processor with 880G/slot and 32 GB for Service Edge	A9K-RSP880-SE	Release 5.3.0	Release 6.1.2
ASR9K Route Switch Processor with 880G/slot and 16 GB for Packet Transport	A9K-RSP880-TR	Release 5.3.0	Release 6.1.2
ASR Route Processor 32 GB for Service Edge	A99-RP2-SE	Release 5.3.0	Release 6.1.2

ASR Route Processor 16 GB for Packet Transport	A99-RP2-TR	Release 5.3.0	Release 6.1.2
ASR 9001 Route Switch Processor 8 GB	ASR9001-RP	Release 4.2.1	Unsupported
Cisco ASR 9000 Series Aggregation Services Router Next Generation Route Switch Processor, Service Edge Optimized	A9K-RSP-440-SE	Release 4.2.0	Unsupported
Cisco ASR 9000 Series Aggregation Services Router Next Generation Route Switch Processor, Service Edge Optimized	A9K-RSP-440-TR	Release 4.2.0	Unsupported
ASR 9900 Route Processor 12 GB for Service Edge	ASR-9900-RP-SE	4.3.2	Unsupported
ASR 9900 Route Processor 6 GB for Packet Transport	ASR-9900-RP-TR	4.3.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port – ASR 9901			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port	ASR-9901	Unsupported	Release 6.4.1
Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port Fan Tray	ASR-9901-FAN	Unsupported	Release 6.4.1
Cisco ASR 9000 Series Aggregation Services Router 2-RU 1600W AC Power Module	A9K-1600W-AC	Unsupported	Release 6.4.1
Cisco ASR 9000 Series Aggregation Services Router 2-RU 1600W DC Power Module	A9K-1600W-DC	Unsupported	Release 6.4.1
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	Release 6.1.2
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	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Fan Tray	ASR-9904-FAN	Release 5.1.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Filter	ASR-9904-FILTER	Release 5.1.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Baffle	ASR-9904-BAFFLE	Release 5.1.0	Release 6.1.2
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	Release 6.1.2

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	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 12-Slot Fan Tray	ASR-9912-FAN	Release 4.3.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 Fabric Card	A99-SFC2	Release 5.3.0	Release 6.1.2
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	Release 6.1.2
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	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Accessory Kit with grounding locks, guide rails etc	ASR-9922-ACC-KIT	NA	NA
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Accessory - Cover for Power Shelves and Modules	ASR-9922-PWR-COV	NA	NA
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Reflector	ASR-9922-AIRREF	NA	NA
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Accessory - Door (with lock) and Fan Tray Covers	ASR-9922-DOOR	NA	NA
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Fan Tray	ASR-9922-FAN	Release 4.2.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Filter with Media, Center	ASR-9922-FLTR-CEN	Release 4.2.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Filter with Media, Left & Right	ASR-9922-FLTR-LR	Release 4.2.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Route Processor Filler	ASR-9922-RP-FILR	Release 4.2.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Route Processor 12GB for Service Edge	ASR-9922-RP-SE	Release 4.2.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Route Processor 6GB for Packet Transport	ASR-9922-RP-TR	Release 4.2.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Switch Fabric Card Slot Filler	ASR-9922-SFC-FILR	Release 4.2.2	Unsupported

Cisco ASR 9000 Series Aggregation Services Router 22-Slot Switch Fabric Card/110G	ASR-9922-SFC110	Release 4.2.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Version 2 Fan Tray	ASR-9922-FAN-V2	Release 5.2.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 2-RU			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 Series Aggregation Services Router 2RU	ASR-9001	Release 4.2.1	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 2-Slot Fan Tray	ASR-9001-FAN	Release 4.2.1	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 2-Slot Line Card	ASR-9001-LC	Release 4.2.1	Unsupported
Cisco ASR 9000 Series Aggregation Services Router	ASR-9001-TRAY	Release 4.2.1	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 6-Slot			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 Series Aggregation Services Router 6-Slot System	ASR-9006-SYS	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Tray	ASR-9006-FAN	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Door Kit	ASR-9006-DOOR	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot AC Chassis	ASR-9006-AC	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot DC Chassis	ASR-9006-DC	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Air			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Air Filter	ASR-9006-FILTER	Release 3.7.2	Release 6.1.2
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	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Tray	ASR-9906-FAN	Release 6.3.1	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Filter	ASR-9906-FILTER	Release 6.3.1	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	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Fan Tray	ASR-9010-FAN	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Door Kit	ASR-9010-DOOR	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot AC Chassis	ASR-9010-AC	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot DC Chassis	ASR-9010-DC	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 2 Post Mounting Kit	ASR-9010-2P-KIT	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregration Services Router 4 Post Mounting Kit	ASR-9010-2P-KIT	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air Filter	ASR-9010-FILTER	Release 3.7.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot External Exhaust Air Shaper	ASR-9010-AIRSHPR	NA	NA
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air Inlet Grill	ASR-9010-GRL	NA	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	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot(9910) Fan Tray	ASR-9910-FAN	Release 6.0.1	Release 6.2.1

Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Accessory Kit	ASR-9910-ACC-KIT	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 4 Post Rack Mounting Kit	ASR-9910-4P-KIT	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 2 Post Rack Mounting Kit	ASR-9910-2P-KIT	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Reflector	ASR-9910-AIRREF	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Filter	ASR-9910-FILTER	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Switch Fabric Card	A99-SFC-S	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router Power			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 Series Aggregation Services Router 2KW DC Power Module, version 2	PWR-2KW-DC-V2	Release 4.2.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 3KW AC Power Module, version 2	PWR-3KW-AC-V2	Release 4.2.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router AC Power Entry Module Version 2	A9K-AC-PEM-V2	Release 4.2.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router DC Power Entry Module Version 2	A9K-DC-PEM-V2	Release 4.2.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router Power Entry Module Version 2 Filler	A9K-PEM-V2-FILR	Release 4.2.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 1.5kW DC Power Module	A9K-1.5KW-DC	Release 3.7.2	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 2kW DC Power Module	A9K-2KW-DC	Release 3.7.2	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 3kW AC Power Module	A9K-3KW-AC	Release 3.7.2	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router AC Power Enclosure Module Version 3	A9K-AC-PEM-V3	Release 5.3.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router DC Power Enclosure Module Version 3	A9K-DC-PEM-V3	Release 5.3.0	Release 6.1.2

Cisco ASR 9000 Series Aggregation Services Router 6kW AC Power Module Version 3	PWR-6KW-AC-V3	Release 5.3.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4.4kW DC Power Module Version 3	PWR-4.4KW-DC-V3	Release 5.3.0	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router Line Cards			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
ASR 9000 48-port dual-rate 10G/1G Consumption Model line card	A9K-48X10GE-1G-CM	Release 6.3.2	Release 6.4.1
ASR 9000 24-port dual-rate 10G/1G Consumption Model line card	A9K-24X10GE-1G-CM	Release 6.3.2	Release 6.4.1
ASR 9000 4-port 100-Gigabit Ethernet Line Card	A9K-4X100GE	Release 6.2.3	Release 6.4.1
ASR9000 48-port dual-rate 10G/1G service edge–optimized line card	A9K-48X10GE-1G-SE	Release 6.2.1	Release 6.3.2
ASR9000 48-port dual-rate 10G/1G packet transport–optimized line card	A9K-48X10GE-1G-TR	Release 6.2.1	Release 6.3.2
ASR9000 24-port dual-rate 10G/1G service edge–optimized line card	A9K-24X10GE-1G-SE	Release 6.2.1	Release 6.3.2
ASR9000 24-port dual-rate 10G/1G packet transport–optimized line card	A9K-24X10GE-1G-TR	Release 6.2.1	Release 6.3.2
ASR 9900 8-port 100GE Service Edge optimized	A99-8X100GE-SE	Release 6.0.1	Release 6.1.2
ASR 9900 8-port 100GE Packet Transport optimized	A99-8X100GE-TR	Release 6.0.1	Release 6.1.2
ASR 9900 8-port 100GE Consumption Model	A99-8X100GE-CM	Release 6.0.1	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 12-Port 100-Gigabit Ethernet Line Card	A99-12X100GE	Release 6.0.1	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 12-port 100GE Ethernet Line card CM	A99-12X100GE-CM	Release 6.0.1	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 8-Port 100- Gigabit Ethernet, Consumption Model Optimized with CPAK	A9K-8X100GE-CM	Release 5.3.2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 8-Port 100- Gigabit Ethernet, Service Edge Optimized	A9K-8X100GE-SE	Release 5.3.1	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Packet Transport Optimized	A9K-8X100GE-TR	Release 5.3.1	Release 6.1.2

Cisco ASR 9000 Series Aggregation Services Router 4--Port 100-Gigabit Ethernet, Service Edge Optimized	A9K-4X100GE-SE	Release 5.3.1	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4-Port 100- Gigabit Ethernet, Packet Transport Optimized	A9K-4X100GE-TR	Release 5.3.1	Release 6.1.2
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	Release 6.1.2
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	Unsupported
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	Unsupported
Cisco ASR 9000 Series Aggregation Services Router Virtualized Services Module (VSM) line card	A9K-VSM-500	Release 5.1.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 1-port 100GE, Service Edge Optimized	A9K-1X100GE-SE	Release 4.2.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 1-port 100GE, Packet Transport Optimized	A9K-1X100GE-TR	Release 4.2.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 36-port 10GE, Service Edge Optimized	A9K-36X10GE-SE	Release 4.2.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 36-port 10GE, Packet Transport Optimized LC	A9K-36X10GE-TR	Release 4.2.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router Line Card Filler	A9K-LC-FILR	Release 3.7.2	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 2-Port Hundred Gigabit Ethernet, Service Edge Optimized	A9K-2X100GE-SE	Release 4.2.0	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 2-Port Hundred Gigabit Ethernet, Packet Transport Optimized	A9K-2X100GE-TR	Release 4.2.0	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 24-Port Ten Gigabit Ethernet, Service Edge Optimized	A9K-24X10GE-SE	Release 4.2.0	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 24-Port Ten Gigabit Ethernet, Packet Transport Optimized	A9K-24X10GE-TR	Release 4.2.0	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 40-Port Ten Gigabit Ethernet, Packet Transport Optimized	A9K-40GE-TR	Release 5.2.2	Unsupported

Cisco ASR 9000 Series Aggregation Services Router 40-Port Ten Gigabit Ethernet, Service Edge Optimized	A9K-40GE-SE	Release 5.2.2	Unsupported
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	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router Modular Line Cards			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit 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	Release 6.3.1
Cisco ASR 9000 Modular 400G Consumption Model Line Card Bundle	A9K-MOD400-CM-BUN	Release 6.1.2	Release 6.2.1
Cisco ASR 9000 Modular 400G Consumption Model Line Card	A9K-MOD400-CM	Release 6.1.2	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Service Edge Optimized	A9K-MOD400-SE	Release 5.3.2	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Packet Transport Optimized	A9K-MOD400-TR	Release 5.3.2	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 80 Gig Modular Line Card, Service Edge Optimized	A9K-MOD80-SE	Release 4.2.0	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 80 Gig Modular Line Card, Packet Transport Optimized	A9K-MOD80-TR	Release 4.2.0	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 160 Gig Modular Line Card, Service Edge Optimized	A9K-MOD160-SE	Release 4.2.1	Unsupported
Cisco ASR 9000 Series Aggregation Services Router 160 Gig Modular Line Card, Packet Transport Optimized	A9K-MOD160-TR	Release 4.2.1	Unsupported
Cisco ASR 9000 Series Aggregation Services Router Modular Port Adapters (MPAs)			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 20x10GE Consumption Model MPA	A9K-MPA20X10GE-CM	Release 6.1.2	Release 6.5.1
Cisco ASR 9000 2x100GE Consumption Model MPA	A9K-MPA2X100GE-CM	Release 6.1.2	Release 6.5.1
Cisco ASR 9000 Series Aggregation Services Router 1-port 100-Gigabit Modular Port Adapter	A9K-MPA-1X100GE	Release 6.0.1	Release 6.3.1

Cisco ASR 9000 Series Aggregation Services Router 2-port 100-Gigabit Modular Port Adapter	A9K-MPA-2X100GE	Release 6.0.1	Release 6.2.2
20-Port 10-Gigabit Ethernet Modular Port Adapter with SFP+	A9K-MPA-20x10GE	Release 5.3.2	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 8-port 10GE Modular Port Adapter	A9K-MPA-8X10GE	Release 4.3.1	Release 6.3.2
Cisco ASR 9000 Series Aggregation Services Router 1-port 40GE Modular Port Adapter	A9K-MPA-1X40GE	Release 4.2.3	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 4-port 10GE Modular Port Adapter	A9K-MPA-4X10GE	Release 4.2.0	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 20-port 1GE Modular Port Adapter	A9K-MPA-20X1GE	Release 4.2.0	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 2-port 10GE Modular Port Adapter	A9K-MPA-2X10GE	Release 4.2.1	Release 6.3.2
Cisco ASR 9000 Series Aggregation Services Router 2-port 40GE Modular Port Adapter	A9K-MPA-2X40GE	Release 4.2.1	Release 6.3.1
Cisco ASR 9000v Satellite Shelf			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000v Satellite Shelf Version 2 DC power ANSI chassis	A9KV-V2-DC-A=	Release 5.2.2	Release 6.2.1
Cisco ASR 9000v Satellite Shelf Version 2 DC power chassis	A9KV-V2-DC-E=	Release 5.2.2	Release 6.2.1
Cisco ASR 9000v Satellite Shelf AC power chassis	A9KV-V2-AC=	Release 5.2.2	Release 6.2.1
Cisco ASR 9000v Satellite Shelf Version 2 Fan Tray	A9KV-V2-FAN=	Release 5.2.2	Release 6.2.1
Cisco NCS 5000 Satellite Shelf			
Cisco NCS 5001 Series Router	NCS-5001	Release 6.0.1	Release 6.2.1
Cisco NCS 5002 Series Router	NCS-5002	Release 6.0.1	Release 6.2.1
Cisco NCS 5001 Router Accessory Kit	NCS-5001-ACSR	Release 6.0.1	Release 6.2.1
Cisco NCS 5002 Router Accessory Kit	NCS-5002-ACSR	Release 6.0.1	Release 6.2.1
Cisco NCS 5001 Router Fan Back to Front AirFlow	NCS-5001-FN-BK	Release 6.0.1	Release 6.2.1
Cisco NCS 5002 Router Fan Back to Front AirFlow	NCS-5002-FN-BK	Release 6.0.1	Release 6.2.1
Cisco NCS 5001 Air Filter Back to Front Airflow	NCS-5001-FLT-BK	Release 6.0.1	Release 6.2.1

Cisco NCS 5002 Air Filter Back to Front Airflow	NCS-5002-FLT-BK	Release 6.0.1	Release 6.2.1
Cisco NCS 5001 Fan Front to Back Airflow	NCS-5001-FN-FR	Release 6.0.1	Release 6.2.1
Cisco NCS 5002 Fan Front to Back Airflow	NCS-5002-FN-FR	Release 6.0.1	Release 6.2.1
Cisco NCS 5001 Air Filter Front to Back Airflow	NCS-5001-FLT-FR	Release 6.0.1	Release 6.2.1
Cisco NCS 5002 Air Filter Front to Back Airflow	NCS-5002-FLT-FR	Release 6.0.1	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router SIP and SPA Cards			
Component	**Part Number**	**Support Initially Provided in IOS XR Release**	**Support Initially Provided in IOS XR 64 bit Release**
Cisco ASR 9000 SIP-700 SPA interface processor	A9K-SIP-700	Release 3.9.0	Unsupported
2-Port Channelized OC-12/DS0 SPA	SPA-2XCHOC12/DS0	Release 3.9.0	Unsupported
1-Port Channelized OC48/STM16 DS3 SPA	SPA-1XCHOC48/DS3	Release 4.0.1	Unsupported
2-Port OC-48/STM16 SPA	SPA-2XOC48POS/RPR	Release 4.0.1	Unsupported
Cisco 4-Port OC-12c/STM-4 POS SPA	SPA-4XOC12-POS	Release 6.4.2	Unsupported
8-Port OC12/STM4 SPA	SPA-8XOC12-POS	Release 4.0.1	Unsupported
1-Port OC-192/STM-64 POS/RPR SPA	SPA-OC192POS-XFP	Release 4.0.1	Unsupported
4-Port Clear Channel T3/E3 SPA	SPA-4XT3E3	Release 4.0.1	Unsupported
2-Port Clear Channel T3/E3 SPA	SPA-2XT3E3	Release 4.0.1	Unsupported
1-Port Channelized OC-3/STM-1 SPA	SPA-1XCHSTM1/OC3	Release 4.0.1	Unsupported
4-Port OC-3/STM-1 POS SPA	SPA-4XOC3	Release 4.0.1	Unsupported
8-Port OC-3/STM-1 POS SPA	SPA-8XOC3	Release 4.0.1	Unsupported
4-Port Channelized T3 to DS0 SPA	SPA-4XCT3/DS0	Release 4.1.0	Unsupported
8-Port Channelized T1/E1 SPA	SPA-8XCHT1/E1	Release 4.1.0	Unsupported
1-Port and 3-Port Clear Channel OC-3 ATM SPA	SPA-1/3XOC3ATM	Release 4.2.0	Unsupported
1-Port Clear Channel OC-12 ATM SPA	SPA-1XOC12ATM	Release 4.2.0	Unsupported
1-Port Channelized OC-3 ATM CEoP SPA	SPA-1XOC3-CE-ATM	Release 4.2.0	Unsupported
1000BASE-BX40-D for Single-Fiber Bidirectional Applications	GLC-BX40-DA-I GLC-BX40-D-I	Release 5.1.2	Release 6.3.2
1000BASE-BX40-U for Single-Fiber Bidirectional Applications	GLC-BX40-U-I	Release 5.1.2	Unsupported

1000BASE-BX80-D for Single-Fiber Bidirectional Applications	GLC-BX80-D-I	Release 5.1.2	Unsupported
1000BASE-BX80-U for Single-Fiber Bidirectional Applications	GLC-BX80-U-I	Release 5.1.2	Unsupported
The Cisco 10GBASE Coarse Wavelength-Division Multiplexing (CWDM) Small Form-Factor Pluggable (SFP+)	CWDM-SFP10G-1470 CWDM-SFP10G-1490 CWDM-SFP10G-1510 CWDM-SFP10G-1530 CWDM-SFP10G-1550 CWDM-SFP10G-1570 CWDM-SFP10G-1590 CWDM-SFP10G-1610	Release 5.2.2	Unsupported
The Cisco Dense Wavelength-Division Multiplexing (DWDM) Tunable SFP+ 10 Gigabit Ethernet Transceiver Module	DWDM-SFP10G-C	Release 5.2.2	Unsupported
1000BASE-TX Extended Temperature SFP	GLC-TE	Release 5.2.2	Release 7.0.1
10GBASE-DWDM single wavelength Edge Performance XFP , dual LC connector, individual wavelength pluggable module	ONS-XC-10G-EPXX.Y	Release 5.2.2	Unsupported
10GBASE-DWDM single wavelength Edge Performance SFP+ pluggable module	ONS-SC-10G-EPXX.Y	Release 5.2.2	Unsupported
Dual Rate SFP	GLC-GE-DR-LX Dual Rate 100M/1G)	Release 5.2.2	Unsupported
1-Port 40G CPAK adapter module	CVR-CPAK-QSFP40	Release 5.3.2	Unsupported

Software Compatibility

Cisco IOS XR Software Release 6.4.2 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
  - 1-Slot (ASR-9901) 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 committed summary** command:

Cisco IOS XR

```
RP/0/RSP0/CPU0:router# show install committed summary

Default Profile:
  SDRs:
    Owner
  Committed Packages:
    disk0:asr9k-services-infra-6.4.2
    disk0:asr9k-li-px-6.4.2
    disk0:asr9k-bng-px-6.4.2
    disk0:asr9k-mcast-px-6.4.2
    disk0:asr9k-doc-px-6.4.2
    disk0:asr9k-mgbl-px-6.4.2
    disk0:asr9k-fpd-px-6.4.2
    disk0:asr9k-mini-px-6.4.2
    disk0:asr9k-services-px-6.4.2
    disk0:asr9k-k9sec-px-6.4.2
    disk0:asr9k-mpls-px-6.4.2
    disk0:asr9k-optic-px-6.4.2
```

Cisco IOS XR 64 bit

```
RP/0/RSP0/CPU0:router# show install committed summary
    Committed Packages: 14
        asr9k-xr-6.4.2 version=6.4.2 [Boot image]
        asr9k-eigrp-x64-1.0.0.0-r642
        asr9k-isis-x64-1.1.0.0-r642
        asr9k-mpls-x64-2.0.0.0-r642
        asr9k-ospf-x64-1.0.0.0-r642
        asr9k-mpls-te-rsvp-x64-2.2.0.0-r642
        asr9k-mgbl-x64-2.0.0.0-r642
        asr9k-mcast-x64-2.0.0.0-r642
        asr9k-m2m-x64-2.0.0.0-r642
        asr9k-li-x64-1.1.0.0-r642
        asr9k-optic-x64-1.0.0.0-r642
        asr9k-bng-x64-1.0.0.0-r642
        asr9k-k9sec-x64-2.2.0.0-r642
        asr9k-9000v-nV-x64-1.0.0.0-r642
```

Software Features Introduced in Cisco IOS XR Release 6.4.2

PPPoE LAC Support for Line Card Subscribers

PPPoE LAC (L2TP Access Concentrator) support for line card subscribers enables the creation of PPPoE LAC sessions on line card based access interfaces. This feature allows you to increase the scale of the BNG subscriber sessions that can be configured on the Cisco ASR 9000 Series Router.

Enhanced Object Tracking

This feature enhances the object tracking function to implement the interface error-disable action that is based on the status changes of a track configuration. If you error-disable an interface based on the state of a track, you can optionally auto-recover the interface when the track state changes to the original state. This feature helps us to track objects more efficiently and enables us to error-disable and auto-recover an interface based on status of a track configuration.

For more information about the feature, see the chapter *Configuring Object Tracking* in the *System Management Configuration Guide for Cisco ASR 9000 Series Routers*.

For more information on the commands on this feature, see the chapter *Object Tracking Commands* in the *System Management Command Reference for Cisco ASR 9000 Series Routers*.

XIPC Tail Drop Detection and Correction

Congestion avoidance techniques monitor network traffic loads in an effort to anticipate and avoid congestion at common network bottlenecks. Congestion avoidance is achieved through packet dropping. Extended IPC (XIPC) Tail drop is one of the more commonly used congestion avoidance mechanisms.

This feature improves the serviceability of the XIPC queues. To perform this, the TCP monitors and identifies the sessions that are receiving more data. TCP revisits the statistics at regular intervals, and based on the data, it decides whether the sessions need to be policed or added to default policer rate. Therefore, other sessions are given a fair chance to use the XIPC queue, and high-data sessions are throttled down at hardware.

For more information, see Configuring Transports chapter of the *IP Addresses and Services Configuration Guide for Cisco ASR 9000 Series Routers*.

Behavior Change Introduced

If the calculated queue-limit in a QoS class applied to an interface is less than 1kB, the queue-limit is automatically adjusted in hardware to 1kB.

New Hardware Introduced in Cisco IOS XR Software Release 6.4.2

This release introduces following new hardware:

- CFP2-WDM-DET-1HL and CFP2-WDM-D-1HL pluggable optical modules—The Cisco digital CFP2 pluggable optical modules are the latest addition to the Cisco pluggables portfolio. With the Cisco digital CFP2 pluggable optical module, the Digital Signal Processor (DSP) chip resides directly on the pluggable module, providing a more complete and compact solution that can be used across all platforms with the CFP2 interfaces. The CFP2-WDM-DET-1HL pluggable optical module contains a tunable optics filter (TOF) that allows the pluggable to also be used in DWDM systems.

The Cisco digital CFP2 pluggable optical modules are supported on Cisco IOS XR 32 bit operating system in the following modular port adapters (MPAs):

Line Card PID	MPA PID	MPA Hardware Version (VID)
A9K-MOD200-TR A9K-MOD200-SE A9K-MOD400-TR A9K-MOD400-SE	A9K-MPA-1x100GE	V03
	A9K-MPA-2x100GE	V04
A9K-MOD200-CM A9K-MOD400-CM	A9K-MPA-2x100GE-CM	V02



Note Use the **show diag** *rack/slot/bay* command to display the MPA hardware version (VID).

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        31.05        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        31.05        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
-------------------------------------------------------------------------------------------------
```

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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
```

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                        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        34.38        0.00      0.0
                        MB CPUCtrl                  lc   fpga2       0.66        0.00      0.0
                        DBCtrl                      lc   fpga3       0.16        0.00      0.0
                        DBCtrl                      lc   fpga4       0.16        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        1.108       0.00      0.0
                        LinuxFW                     lc   lnxfw       1.108       0.00      0.0
                        ROMMONB RSP4                lc   rommon     10.59        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-RSP880-SE           Can Bus Ctrl (CBC) RSP4     lc   cbc        34.38        0.00      0.0
                        MB CPUCtrl                  lc   fpga2       0.66        0.00      0.0
                        DBCtrl                      lc   fpga3       0.16        0.00      0.0
                        DBCtrl                      lc   fpga4       0.16        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        1.108       0.00      0.0
                        LinuxFW                     lc   lnxfw       1.108       0.00      0.0
                        ROMMONB RSP4                lc   rommon     10.59        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-RSP880-LT-TR        Can Bus Ctrl (CBC) RSP4L    lc   cbc        50.01        0.00      0.0
                        MB CPUCtrl                  lc   fpga2       0.17        0.00      0.0
                        DBCtrl                      lc   fpga3       0.05        0.00      0.0
                        DBCtrl                      lc   fpga4       0.04        0.00      0.0
                        DBCtrl                      lc   fpga5       0.04        0.00      0.0
                        EOBCSwicthCtrl              lc   fpga6       1.11        0.00      0.0
                        Fsbl                        lc   fsbl        1.108       0.00      0.0
                        LinuxFW                     lc   lnxfw       1.108       0.00      0.0
                        ROMMONB RSP4L               lc   rommon     17.31        0.00      0.0
-------------------------------------------------------------------------------------------------
A9K-RSP880-LT-SE        Can Bus Ctrl (CBC) RSP4L    lc   cbc        50.01        0.00      0.0
                        MB CPUCtrl                  lc   fpga2       0.17        0.00      0.0
                        DBCtrl                      lc   fpga3       0.05        0.00      0.0
                        DBCtrl                      lc   fpga4       0.04        0.00      0.0
```

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                      DBCtrl                    lc   fpga5       0.04        0.00      0.0
                      EOBCSwicthCtrl            lc   fpga6       1.11        0.00      0.0
                      Fsbl                      lc   fsbl        1.108       0.00      0.0
                      LinuxFW                   lc   lnxfw       1.108       0.00      0.0
                      ROMMONB RSP4L             lc   rommon     17.31        0.00      0.0
--------------------------------------------------------------------------------------------
A99-RSP-TR            Can Bus Ctrl (CBC) RSP4S  lc   cbc        43.02        0.00      0.1
                      MB CPUCtrl                lc   fpga2       0.66        0.00      0.0
                      DBCtrl                    lc   fpga3       0.16        0.00      0.0
                      DBCtrl                    lc   fpga4       0.16        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        1.108       0.00      0.0
                      LinuxFW                   lc   lnxfw       1.108       0.00      0.0
                      ROMMONB RSP4SHW           lc   rommon     16.08        0.00      0.0
--------------------------------------------------------------------------------------------
A99-RSP-SE            Can Bus Ctrl (CBC) RSP4S  lc   cbc        43.02        0.00      0.1
                      MB CPUCtrl                lc   fpga2       0.66        0.00      0.0
                      DBCtrl                    lc   fpga3       0.16        0.00      0.0
                      DBCtrl                    lc   fpga4       0.16        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        1.108       0.00      0.0
                      LinuxFW                   lc   lnxfw       1.108       0.00      0.0
                      ROMMONB RSP4SHW           lc   rommon     16.08        0.00      0.0
--------------------------------------------------------------------------------------------
A99-RP2-TR            Can Bus Ctrl (CBC) MTRP   lc   cbc        35.12        0.00      0.1
                      MB CPUCtrl                lc   fpga2       0.66        0.00      0.0
                      DBCtrl                    lc   fpga3       0.16        0.00      0.0
                      DBCtrl                    lc   fpga4       0.16        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        1.108       0.00      0.0
                      LinuxFW                   lc   lnxfw       1.108       0.00      0.0
                      ROMMONB RP2               lc   rommon     14.29        0.00      0.0
--------------------------------------------------------------------------------------------
A99-RP2-SE            Can Bus Ctrl (CBC) MTRP   lc   cbc        35.12        0.00      0.1
                      MB CPUCtrl                lc   fpga2       0.66        0.00      0.0
                      DBCtrl                    lc   fpga3       0.16        0.00      0.0
                      DBCtrl                    lc   fpga4       0.16        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        1.108       0.00      0.0
                      LinuxFW                   lc   lnxfw       1.108       0.00      0.0
                      ROMMONB RP2               lc   rommon     14.29        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      3.03        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      3.03        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	3.03	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	3.03	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	3.03	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	3.03	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	3.03	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	3.03	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	3.03	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	3.03	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	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A99-8X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A99-4X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	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	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A99-4X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	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	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A99-4X100GE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A9K-4X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	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	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A9K-4X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	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	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0

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A9K-4X100GE-TAA          Can Bus Ctrl (CBC) LC4     lc   cbc         38.23        0.00       0.0
                         MB CPUCtrl                 lc   fpga2        1.97        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         1.103       0.00       0.0
                         LinuxFW                    lc   lnxfw        1.103       0.00       0.0
                         ROMMONB LC1                lc   rommon       8.43        0.00       0.0
---------------------------------------------------------------------------------------------
A99K-MOD200-SE           Can Bus Ctrl (CBC) LC4     lc   cbc         39.08        0.00       0.0
                         DBCtrl                     lc   fpga10       1.25        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       8.43        0.00       0.0
---------------------------------------------------------------------------------------------
A99K-200MOD-SE-TAA       Can Bus Ctrl (CBC) LC4     lc   cbc         39.08        0.00       0.0
                         DBCtrl                     lc   fpga10       1.25        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       8.43        0.00       0.0
---------------------------------------------------------------------------------------------
A99K-MOD200-TR           Can Bus Ctrl (CBC) LC4     lc   cbc         39.08        0.00       0.0
                         DBCtrl                     lc   fpga10       1.25        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       8.43        0.00       0.0
---------------------------------------------------------------------------------------------
A99K-MOD200-TR-TAA       Can Bus Ctrl (CBC) LC4     lc   cbc         39.08        0.00       0.0
                         DBCtrl                     lc   fpga10       1.25        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       8.43        0.00       0.0
---------------------------------------------------------------------------------------------
A9K-MOD200-SE            Can Bus Ctrl (CBC) LC4     lc   cbc         39.08        0.00       0.0
                         DBCtrl                     lc   fpga10       1.25        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       8.43        0.00       0.0
---------------------------------------------------------------------------------------------
A9K-MOD200-SE-TAA        Can Bus Ctrl (CBC) LC4     lc   cbc         39.08        0.00       0.0
                         DBCtrl                     lc   fpga10       1.25        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       8.43        0.00       0.0
---------------------------------------------------------------------------------------------
A9K-MOD200-TR            Can Bus Ctrl (CBC) LC4     lc   cbc         39.08        0.00       0.0
                         DBCtrl                     lc   fpga10       1.25        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       8.43        0.00       0.0
---------------------------------------------------------------------------------------------
A9K-MOD200-TR-TAA        Can Bus Ctrl (CBC) LC4     lc   cbc         39.08        0.00       0.0
                         DBCtrl                     lc   fpga10       1.25        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	8.43	0.00	0.0
A9K-MOD200-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A99K-MOD400-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A99K-MOD400-SE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A99K-MOD400-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A99K-MOD400-TR-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A9K-MOD400-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A9K-MOD400-SE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A9K-MOD400-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A9K-MOD400-TR-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A9K-MOD400-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	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	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	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	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A9K-8X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A9K-8X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A99L-4X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A99L-4X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A9KL-4X100GE-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0
A9KL-4X100GE-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	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	1.06	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	3.72	0.00	1.0
	DBCtrl	lc	fpga7	49.00	0.00	0.0
	CFP2 V2	lc	fpga8	5.23	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	8.43	0.00	0.0
A9K-4X100GE	Can Bus Ctrl (CBC) LC4	lc	cbc	46.06	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.85	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	1.100	0.00	0.0
	LinuxFW	lc	lnxfw	1.100	0.00	0.0
	ROMMONB LC1	lc	rommon	9.23	0.00	0.0
A99-12X100GE	Can Bus Ctrl (CBC) LC4	lc	cbc	46.06	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.85	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	1.100	0.00	0.0
	LinuxFW	lc	lnxfw	1.100	0.00	0.0
	ROMMONB LC1	lc	rommon	9.23	0.00	0.0
A99-8X100GE-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.43	0.00	0.0

```
A9K-8X100GE-CM          Can Bus Ctrl (CBC) LC4     lc   cbc        38.23        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.97        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        1.103       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.103       0.00      0.0
                        ROMMONB LC1                lc   rommon      8.43        0.00      0.0
-------------------------------------------------------------------------------------------------
A99-12X100GE-CM         Can Bus Ctrl (CBC) LC4     lc   cbc        46.06        0.00      0.0
                        MB CPUCtrl                 lc   fpga2       1.85        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        1.100       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.100       0.00      0.0
                        ROMMONB LC1                lc   rommon      9.23        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       1.87        0.00      0.0
                        PortCtrl                   lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl             lc   fpga4       1.10        0.00      0.0
                        Fsbl                       lc   fsbl        1.104       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.104       0.00      0.0
                        ROMMONB LC1                lc   rommon     18.24        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       1.87        0.00      0.0
                        PortCtrl                   lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl             lc   fpga4       1.10        0.00      0.0
                        Fsbl                       lc   fsbl        1.104       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.104       0.00      0.0
                        ROMMONB LC1                lc   rommon     18.24        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       1.87        0.00      0.0
                        PortCtrl                   lc   fpga3       1.00        0.00      0.0
                        fpd_lc_fpga4_0x003d02ca    lc   fpga4       1.10        0.00      0.0
                        Fsbl                       lc   fsbl        1.104       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.104       0.00      0.0
                        ROMMONB LC1                lc   rommon     18.24        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       1.87        0.00      0.0
                        PortCtrl                   lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl             lc   fpga4       1.10        0.00      0.0
                        Fsbl                       lc   fsbl        1.104       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.104       0.00      0.0
                        ROMMONB LC1                lc   rommon     18.24        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       1.87        0.00      0.0
                        PortCtrl                   lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl             lc   fpga4       1.10        0.00      0.0
                        Fsbl                       lc   fsbl        1.104       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.104       0.00      0.0
                        ROMMONB LC1                lc   rommon     18.24        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       1.87        0.00      0.0
                        PortCtrl                   lc   fpga3       1.00        0.00      0.0
                        EOBCSwicthCtrl             lc   fpga4       1.10        0.00      0.0
                        Fsbl                       lc   fsbl        1.104       0.00      0.0
                        LinuxFW                    lc   lnxfw       1.104       0.00      0.0
```

	ROMMONB LC1	lc	rommon	18.24	0.00	0.0
A9K-48X10GE-1G-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	47.03	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.87	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.10	0.00	0.0
	Fsbl	lc	fsbl	1.104	0.00	0.0
	LinuxFW	lc	lnxfw	1.104	0.00	0.0
	ROMMONB LC1	lc	rommon	18.24	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	1.87	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.10	0.00	0.0
	Fsbl	lc	fsbl	1.104	0.00	0.0
	LinuxFW	lc	lnxfw	1.104	0.00	0.0
	ROMMONB LC1	lc	rommon	18.24	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	1.87	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.10	0.00	0.0
	Fsbl	lc	fsbl	1.104	0.00	0.0
	LinuxFW	lc	lnxfw	1.104	0.00	0.0
	ROMMONB LC1	lc	rommon	18.24	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	1.87	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.10	0.00	0.0
	Fsbl	lc	fsbl	1.104	0.00	0.0
	LinuxFW	lc	lnxfw	1.104	0.00	0.0
	ROMMONB LC1	lc	rommon	18.24	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	1.87	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.10	0.00	0.0
	Fsbl	lc	fsbl	1.104	0.00	0.0
	LinuxFW	lc	lnxfw	1.104	0.00	0.0
	ROMMONB LC1	lc	rommon	18.24	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	1.87	0.00	0.0
	PortCtrl	lc	fpga3	1.00	0.00	0.0
	EOBCSwicthCtrl	lc	fpga4	1.10	0.00	0.0
	Fsbl	lc	fsbl	1.104	0.00	0.0
	LinuxFW	lc	lnxfw	1.104	0.00	0.0
	ROMMONB LC1	lc	rommon	18.24	0.00	0.0
A9K-MOD400-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	0.00	0.0
A9K-MOD200-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	39.08	0.00	0.0
	DBCtrl	lc	fpga10	1.25	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	8.43	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	3.03	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	3.03	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	3.03	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	3.03	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	3.19	0.00	0.1
	Emerson DC primary PM	pm	fpga15	3.12	0.00	0.1
	Emerson DC secondary PM	pm	fpga16	3.19	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	2.05	0.00	0.1

	Acbel V3 AC primary PM	pm	fpga15	1.25	0.00	0.1
	Acbel V3 AC secondary PM	pm	fpga16	2.29	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
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	1.07	0.00	0.0
A9K-MPA-2X100GE	EP I/O FPGA	spa	fpga9	1.04	0.00	0.0
	CFP2 DCO	spap	fpga8	38.02	0.00	0.0
A9K-MPA-1X100GE	EP I/O FPGA	spa	fpga9	1.04	0.00	0.0
	CFP2 DCO	spap	fpga8	38.02	0.00	0.0
A9K-MPA2X100GE-CM	EP I/O FPGA	spa	fpga9	1.04	0.00	0.0
	CFP2 DCO	spap	fpga8	38.02	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
-------------------------------------------------------------------------------------------------
```

Firmware Support on Cisco IOS XR 64 bit

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
                                 ==============================================
                                                Req     SW      Min Req   Min Req
Card Type            FPD Description           Reload  Ver     SW Ver  Board Ver
================== ========================== ====== ======= ======== =========
A99-12X100GE         CBC                        NO     46.06     46.06      0.1
                     IPU-FPGA                   YES     1.85      1.85      0.1
                     IPU-FSBL                   YES     1.100     1.100     0.1
                     IPU-Linux                  YES     1.100     1.100     0.1
                     Morra-0                    YES     1.02      1.02      0.1
                     Morra-1                    YES     1.02      1.02      0.1
                     Primary-BIOS               YES     9.23      9.23      0.1
                     Sideswipe-0                YES     1.02      1.02      0.1
                     Sideswipe-1                YES     1.02      1.02      0.1
-------------------------------------------------------------------------------
A99-12X100GE-CM      CBC                        NO     46.06     46.06      0.1
                     IPU-FPGA                   YES     1.85      1.85      0.1
                     IPU-FSBL                   YES     1.100     1.100     0.1
                     IPU-Linux                  YES     1.100     1.100     0.1
                     Morra-0                    YES     1.02      1.02      0.1
                     Morra-1                    YES     1.02      1.02      0.1
                     Primary-BIOS               YES     9.23      9.23      0.1
                     Sideswipe-0                YES     1.02      1.02      0.1
                     Sideswipe-1                YES     1.02      1.02      0.1
-------------------------------------------------------------------------------
A99-4X100GE-SE       CBC                        NO     38.23     38.23      0.0
                     Dalla                      YES     1.09      1.09      0.0
                     IPU-FPGA                   YES     1.97      1.97      0.0
                     IPU-FSBL                   YES     1.103     1.103     0.0
                     IPU-Linux                  YES     1.103     1.103     0.0
                     Meldun-0                   YES     1.07      1.07      0.0
                     Meldun-1                   YES     1.07      1.07      0.0
                     Primary-BIOS               YES     8.43      8.43      0.0
-------------------------------------------------------------------------------
A99-4X100GE-SE       CBC                        NO     38.23     38.23      0.0
                     Dalla                      YES     1.09      1.09      0.0
                     IPU-FPGA                   YES     1.97      1.97      0.0
                     IPU-FSBL                   YES     1.103     1.103     0.0
                     IPU-Linux                  YES     1.103     1.103     0.0
                     Meldun-0                   YES     1.07      1.07      0.0
                     Meldun-1                   YES     1.07      1.07      0.0
                     Primary-BIOS               YES     8.43      8.43      0.0
-------------------------------------------------------------------------------
A99-4X100GE-SE-TAA   CBC                        NO     38.23     38.23      0.0
```

	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-4X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-4X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-4X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-4X100GE-TR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-8X100GE-CM	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-8X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-8X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0

	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-8X100GE-SE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-8X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-8X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-8X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-8X100GE-TR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99-RP2-SE	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC-0	NO	35.12	35.12	0.0
	CBC-1	NO	35.12	35.12	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.108	1.108	0.0
	IPU-Linux	YES	1.108	1.108	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	14.29	14.29	0.0
A99-RP2-TR	Alpha-FPGA	YES	0.16	0.16	0.0

	CBC-0	NO	35.12	35.12	0.0
	CBC-1	NO	35.12	35.12	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.108	1.108	0.0
	IPU-Linux	YES	1.108	1.108	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	14.29	14.29	0.0
A99-RSP-SE	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	43.02	43.02	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.108	1.108	0.0
	IPU-Linux	YES	1.108	1.108	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	16.08	16.08	0.0
A99-RSP-TR	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	43.02	43.02	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.108	1.108	0.0
	IPU-Linux	YES	1.108	1.108	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	16.08	16.08	0.0
A99-SFC-S	CBC	NO	44.02	44.02	0.0
	IPU-FPGA	YES	0.37	0.37	0.0
	IPU-FSBL	YES	1.100	1.100	0.0
	IPU-Linux	YES	1.100	1.100	0.0
A99-SFC-T	CBC	NO	44.02	44.02	0.0
	IPU-FPGA	YES	0.37	0.37	0.0
	IPU-FSBL	YES	1.100	1.100	0.0
	IPU-Linux	YES	1.100	1.100	0.0
A99-SFC2	CBC	NO	37.20	37.20	0.0
	IPU-FPGA	YES	0.37	0.37	0.0
	IPU-FSBL	YES	1.100	1.100	0.0
	IPU-Linux	YES	1.100	1.100	0.0
A99K-24X10GE-1G-CM	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A99K-24X10GE-1G-SE	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A99K-24X10GE-1G-TR	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1

	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A99K-48X10GE-1G-CM	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A99K-48X10GE-1G-SE	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A99K-48X10GE-1G-TR	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A99L-4X100GE-SE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99L-4X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99L-4X100GE-TR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99L-8X100GE-SE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0

	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99L-8X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A99L-8X100GE-TR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-1600W-AC	PO-PriMCU	NO	17.137	17.137	0.0
A9K-1600W-DC	PO-PriMCU	NO	1.08	1.08	0.0
A9K-24X10GE-1G-CM	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A9K-24X10GE-1G-SE	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A9K-24X10GE-1G-TR	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.10	1.10	0.1
	Primary-BIOS	YES	18.24	18.24	0.1
A9K-400G-DWDM-TR	CBC	NO	42.04	42.04	0.0
	Doran	YES	1.05	1.05	0.0
	Frenzy	YES	49.00	49.00	0.0
	IPU-FPGA	YES	1.97	1.97	0.1
	IPU-FSBL	YES	1.103	1.103	0.1
	IPU-Linux	YES	1.103	1.103	0.1
	Martell	YES	1.03	1.03	0.0
	Meldun	YES	1.06	1.06	0.1
	Primary-BIOS	YES	8.43	8.43	0.1
A9K-48X10GE-1G-CM	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.87	1.87	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1

```
                    Leadfoot-0                YES     1.00      1.00      0.1
                    Leadfoot-1                YES     1.00      1.00      0.1
                    Lewis                     YES     1.10      1.10      0.1
                    Primary-BIOS              YES    18.24     18.24      0.1
--------------------------------------------------------------------------------
A9K-48X10GE-1G-SE   CBC                       NO     47.03     47.03      0.1
                    IPU-FPGA                  YES     1.87      1.87      0.1
                    IPU-FSBL                  YES     1.104     1.104     0.1
                    IPU-Linux                 YES     1.104     1.104     0.1
                    Leadfoot-0                YES     1.00      1.00      0.1
                    Leadfoot-1                YES     1.00      1.00      0.1
                    Lewis                     YES     1.10      1.10      0.1
                    Primary-BIOS              YES    18.24     18.24      0.1
--------------------------------------------------------------------------------
A9K-48X10GE-1G-TR   CBC                       NO     47.03     47.03      0.1
                    IPU-FPGA                  YES     1.87      1.87      0.1
                    IPU-FSBL                  YES     1.104     1.104     0.1
                    IPU-Linux                 YES     1.104     1.104     0.1
                    Leadfoot-0                YES     1.00      1.00      0.1
                    Leadfoot-1                YES     1.00      1.00      0.1
                    Lewis                     YES     1.10      1.10      0.1
                    Primary-BIOS              YES    18.24     18.24      0.1
--------------------------------------------------------------------------------
A9K-4X100GE         CBC                       NO     46.06     46.06      0.1
                    IPU-FPGA                  YES     1.85      1.85      0.1
                    IPU-FSBL                  YES     1.100     1.100     0.1
                    IPU-Linux                 YES     1.100     1.100     0.1
                    Morra-0                   YES     1.02      1.02      0.1
                    Primary-BIOS              YES     9.23      9.23      0.1
                    Sideswipe-0               YES     1.02      1.02      0.1
--------------------------------------------------------------------------------
A9K-4X100GE-SE      CBC                       NO     38.23     38.23      0.0
                    Dalla                     YES     1.09      1.09      0.0
                    IPU-FPGA                  YES     1.97      1.97      0.0
                    IPU-FSBL                  YES     1.103     1.103     0.0
                    IPU-Linux                 YES     1.103     1.103     0.0
                    Meldun-0                  YES     1.07      1.07      0.0
                    Meldun-1                  YES     1.07      1.07      0.0
                    Primary-BIOS              YES     8.43      8.43      0.0
--------------------------------------------------------------------------------
A9K-4X100GE-SE      CBC                       NO     38.23     38.23      0.0
                    Dalla                     YES     1.09      1.09      0.0
                    IPU-FPGA                  YES     1.97      1.97      0.0
                    IPU-FSBL                  YES     1.103     1.103     0.0
                    IPU-Linux                 YES     1.103     1.103     0.0
                    Meldun-0                  YES     1.07      1.07      0.0
                    Meldun-1                  YES     1.07      1.07      0.0
                    Primary-BIOS              YES     8.43      8.43      0.0
--------------------------------------------------------------------------------
A9K-4X100GE-SE-TAA  CBC                       NO     38.23     38.23      0.0
                    Dalla                     YES     1.09      1.09      0.0
                    IPU-FPGA                  YES     1.97      1.97      0.0
                    IPU-FSBL                  YES     1.103     1.103     0.0
                    IPU-Linux                 YES     1.103     1.103     0.0
                    Meldun-0                  YES     1.07      1.07      0.0
                    Meldun-1                  YES     1.07      1.07      0.0
                    Primary-BIOS              YES     8.43      8.43      0.0
--------------------------------------------------------------------------------
A9K-4X100GE-TAA     CBC                       NO     38.23     38.23      0.0
                    Dalla                     YES     1.09      1.09      0.0
                    IPU-FPGA                  YES     1.97      1.97      0.0
                    IPU-FSBL                  YES     1.103     1.103     0.0
                    IPU-Linux                 YES     1.103     1.103     0.0
                    Meldun-0                  YES     1.07      1.07      0.0
```

	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-4X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-4X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-4X100GE-TR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-CM	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-L-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-L-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-L-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0

	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-SE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GE-TR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GELSE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9K-8X100GELTR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0

A9K-MOD200-SE	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.08	39.08	0.1
	IPU-FPGA	YES	1.97	1.97	0.1
	IPU-FSBL	YES	1.103	1.103	0.1
	IPU-Linux	YES	1.103	1.103	0.1
	Primary-BIOS	YES	8.43	8.43	0.1
A9K-MOD200-TR	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.08	39.08	0.1
	IPU-FPGA	YES	1.97	1.97	0.1
	IPU-FSBL	YES	1.103	1.103	0.1
	IPU-Linux	YES	1.103	1.103	0.1
	Primary-BIOS	YES	8.43	8.43	0.1
A9K-MOD400-CM	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.08	39.08	0.1
	IPU-FPGA	YES	1.97	1.97	0.1
	IPU-FSBL	YES	1.103	1.103	0.1
	IPU-Linux	YES	1.103	1.103	0.1
	Primary-BIOS	YES	8.43	8.43	0.1
A9K-MOD400-SE	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.08	39.08	0.1
	IPU-FPGA	YES	1.97	1.97	0.1
	IPU-FSBL	YES	1.103	1.103	0.1
	IPU-Linux	YES	1.103	1.103	0.1
	Primary-BIOS	YES	8.43	8.43	0.1
A9K-MOD400-TR	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.08	39.08	0.1
	IPU-FPGA	YES	1.97	1.97	0.1
	IPU-FSBL	YES	1.103	1.103	0.1
	IPU-Linux	YES	1.103	1.103	0.1
	Primary-BIOS	YES	8.43	8.43	0.1
A9K-RSP5-64G	Aldrin-0-FPGA	YES	1.00	1.00	0.0
	Beta-FPGA	YES	0.01	0.01	0.0
	CBC	NO	53.02	53.02	0.0
	IPU	YES	0.01	0.01	0.0
	Orion-FPGA	YES	0.06	0.06	0.0
	Primary-BIOS	YES	30.10	30.10	0.0
	Zenith-FPGA	YES	0.01	0.01	0.0
A9K-RSP5-SE	Aldrin-0-FPGA	YES	1.00	1.00	0.0
	Beta-FPGA	YES	0.01	0.01	0.0
	CBC	NO	53.02	53.02	0.0
	IPU	YES	0.01	0.01	0.0
	Orion-FPGA	YES	0.06	0.06	0.0
	Primary-BIOS	YES	30.10	30.10	0.0
	Zenith-FPGA	YES	0.01	0.01	0.0
A9K-RSP5-TR	Aldrin-0-FPGA	YES	1.00	1.00	0.0
	Beta-FPGA	YES	0.01	0.01	0.0
	CBC	NO	53.02	53.02	0.0
	IPU	YES	0.01	0.01	0.0
	Orion-FPGA	YES	0.06	0.06	0.0
	Primary-BIOS	YES	30.10	30.10	0.0
	Zenith-FPGA	YES	0.01	0.01	0.0
A9K-RSP880-LT-SE	Aldrin-FPGA	YES	1.11	1.11	0.0
	Alpha-FPGA	YES	0.05	0.05	0.0
	CBC	NO	50.01	50.01	0.0
	IPU-FPGA	YES	0.17	0.17	0.0

	IPU-FSBL	YES	1.108	1.108	0.0
	IPU-Linux	YES	1.108	1.108	0.0
	Omega-FPGA	YES	0.04	0.04	0.0
	Optimus-FPGA	YES	0.04	0.04	0.0
	Primary-BIOS	YES	17.31	17.31	0.0
A9K-RSP880-LT-TR	Aldrin-FPGA	YES	1.11	1.11	0.0
	Alpha-FPGA	YES	0.05	0.05	0.0
	CBC	NO	50.01	50.01	0.0
	IPU-FPGA	YES	0.17	0.17	0.0
	IPU-FSBL	YES	1.108	1.108	0.0
	IPU-Linux	YES	1.108	1.108	0.0
	Omega-FPGA	YES	0.04	0.04	0.0
	Optimus-FPGA	YES	0.04	0.04	0.0
	Primary-BIOS	YES	17.31	17.31	0.0
A9K-RSP880-SE	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	34.38	34.38	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.108	1.108	0.0
	IPU-Linux	YES	1.108	1.108	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	10.59	10.59	0.0
A9K-RSP880-TR	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	34.38	34.38	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.108	1.108	0.0
	IPU-Linux	YES	1.108	1.108	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	10.59	10.59	0.0
A9KL-4X100GE-SE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9KL-4X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
A9KL-4X100GE-TR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.97	1.97	0.0
	IPU-FSBL	YES	1.103	1.103	0.0
	IPU-Linux	YES	1.103	1.103	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.43	8.43	0.0
ASR-9006-AC	CBC	NO	7.105	7.105	0.0

ASR-9006-AC-V2	CBC	NO	7.105	7.105	0.0
ASR-9006-FAN	CBC	NO	5.04	5.04	0.0
ASR-9006-FAN-V2	CBC	NO	5.05	5.05	0.0
ASR-9010-AC	CBC	NO	7.105	7.105	0.0
ASR-9010-AC-V2	CBC	NO	7.105	7.105	0.0
ASR-9010-FAN	CBC	NO	4.03	4.03	0.0
ASR-9010-FAN-V2	CBC	NO	29.12	29.12	0.0
ASR-9901-LC	CBC	NO	55.07	55.07	0.1
	Gamora-FPGA	YES	0.36	0.36	0.1
	IPU-FPGA	YES	1.08	1.08	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Primary-BIOS	YES	23.15	23.15	0.1
ASR-9901-RP	CBC	NO	54.09	54.09	0.1
	Drax-FPGA	YES	0.31	0.31	0.1
	IPU-FPGA	YES	2.04	2.04	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Primary-BIOS	YES	22.16	22.16	0.1
ASR-9904-AC	CBC	NO	7.105	7.105	0.0
ASR-9904-FAN	CBC	NO	31.05	31.05	0.0
ASR-9906	CBC	NO	7.105	7.105	0.0
ASR-9906-FAN	CBC	NO	56.01	56.01	0.0
	PSOC	NO	2.06	2.06	0.0
ASR-9910	CBC	NO	7.105	7.105	0.0
ASR-9910-FAN	CBC	NO	45.02	45.02	0.0
	PSOC	NO	2.06	2.06	0.0
ASR-9912-AC	CBC	NO	7.105	7.105	0.0
ASR-9912-FAN	CBC	NO	31.05	31.05	0.0
ASR-9912-SFC220	CBC	NO	37.20	37.20	0.0
	IPU-FPGA	YES	0.37	0.37	0.0
	IPU-FSBL	YES	1.100	1.100	0.0
	IPU-Linux	YES	1.100	1.100	0.0
ASR-9922-AC	CBC-0	NO	7.105	7.105	0.0
	CBC-1	NO	7.105	7.105	0.0
ASR-9922-FAN	CBC	NO	29.12	29.12	0.0
ASR-9922-FAN-V2	CBC	NO	40.07	40.07	0.0
	PSOC	NO	2.06	2.06	0.0
ASR-9922-FAN-V3	CBC	NO	40.07	40.07	0.0
	PSOC	NO	2.06	2.06	0.0
PWR-2KW-DC-V2	DT-PriMCU	NO	6.03	6.03	0.12

```
                    DT-Sec54vMCU              NO      6.02      6.02      0.12
                    DT-Sec5vMCU               NO      6.03      6.03      0.12
                    EM-PriMCU                 NO      3.12      3.12      0.12
                    EM-Sec54vMCU              NO      3.19      3.19      0.12
                    EM-Sec5vMCU               NO      3.19      3.19      0.12
--------------------------------------------------------------------------------
PWR-3KW-AC-V2       DT-PriMCU                 NO      6.02      6.02      1.0
                    DT-Sec54vMCU              NO      6.02      6.02      1.0
                    DT-Sec5vMCU               NO      6.04      6.04      1.0
                    EM-Sec54vMCU              NO      3.12      3.12      0.21
                    EM-Sec5vMCU               NO      3.18      3.18      0.21
--------------------------------------------------------------------------------
PWR-4.4KW-DC-V3     DT-Pri0MCU                NO      3.00      3.00      0.1
                    DT-Pri1MCU                NO      3.00      3.00      0.1
                    DT-Sec054vMCU             NO      3.00      3.00      0.1
                    DT-Sec154vMCU             NO      3.00      3.00      0.1
                    DT-Sec5vMCU               NO      3.00      3.00      0.1
--------------------------------------------------------------------------------
PWR-6KW-AC-V3       DT-Pri0MCU                NO      4.02      4.02      0.1
                    DT-Pri1MCU                NO      4.02      4.02      0.1
                    DT-Sec054vMCU             NO      4.03      4.03      0.1
                    DT-Sec154vMCU             NO      4.03      4.03      0.1
                    DT-Sec5vMCU               NO      4.04      4.04      0.1
--------------------------------------------------------------------------------
```

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 5.3.0 and later does not support combination of Cisco ASR 9000 High Density 100GE Ethernet Line Card and Cisco ASR 9000 Ethernet Line Card 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
```

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

Bug ID	Headline
CSCvj45017	EMSD crashes with seg fault in VTS environment
CSCvk28944	EVPN should not drop routes with non-zero etag
CSCvk48096	EVPN with mLACP hot-standby downloading remote mac with local bp as nexthop

Caveats Specific to the Cisco ASR 9000 Series Router

Caveats describe unexpected behavior in Cisco IOS XR Software releases.

Bug ID	Headline
CSCvk14255	BFD session continuously flapping on 64 member 10GE bundle.
CSCvk27286	NP lockup RFD Double free with netflow.
CSCvk28053	New subscribers could not dial due to platform DLL returned "Not enough memory".
CSCvk35163	GX CCRT is not sent to 23 Subscribers when 8K subscribers are logged out.
CSCvk41051	PPPoE LC LAC session Fail to come up on process restart of pppoe_ma.
CSCvj87682	SSH remote inline command failed when mix the admin/xr clis if xr cli include "|"
CSCvk11737	More Fragment bit not set properly when fragmenting again.
CSCvk44594	wdsysmon reports prm_server_ty deadlock during reload.
CSCvj39484	PARSE_DROP_INJ_IN_UIDB_NO_MATCH drops IPv6 packets if NH is static reachable via recursive.
CSCvk57614	PLATFORM-ETHER_CTRL-3-OPERATION_FAIL : unknown message not handled error message on Upgrade/boot up.
CSCvk56182	RSP4L board booting rommon image from "backup" flash after Switchover performed.

Bug ID	Headline
CSCvj60378	Traffic is passing through the back-up bundle-ether instead of Primary bundle-ether.

Caveats Specific to the ASR 9001 Router

There are no caveats for ASR 9001 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.

Before starting the software upgrade, use the **show install health** command in the admin mode. This command validates if the statuses of all relevant parameters of the system are ready for the software upgrade without interrupting the system. The command is supported in Cisco IOS XR 64-bit OS.

The upgrade document is available along with the software images.

Table 6: Upgrade Document Filename

To upgrade	Refer
Cisco IOS XR software	
Cisco IOS XR 64 bit software	

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.

Note After upgrading to the latest release, the upgraded CHA FPD fails to activate on some of the RSP-880 TR/SE , A99-RSP TR/SE and RP2 cards even after RSP or RP is reloaded. The issue is observed in Cisco IOS XR 32-bit and Cisco IOS XR 64-bit image. The **show hw-module fpd** command output from the Cisco IOS XR 64-bit image displays the device status as **Reload Req**. However, there is no functionality impact seen during the normal operation of the router.

Please install the following SMUs and force upgrade CHA FPDs:

- AA14629 and AA16631

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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