



Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 6.6.1

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Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 6.6.1



Note This software release has reached end-of-life status. For more information see the [End-of-Life and End-of-Sale Notices](#).



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Cisco IOS XR Release 6.6.1 is a limited availability (LA) release. All Cisco IOS XR Release 6.6.1 features are available in Cisco IOS XR Release 6.6.2, which is a general availability (GA) release. For more information on IOS XR Release 6.6.2 see [Release Notes for Cisco ASR 9000 Series Routers, Release 6.6.2](#)

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

For more information about ASR 9000 Series routers, see [ASR 9000 Data Sheet listing page](#).

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 6.6.1* section in this document for information on new software features.

Supported Packages and System Requirements

This section describes the system requirements for Cisco ASR 9000 Series Aggregation Services Router Software Release 6.6.1

Feature Set Table

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

Cisco IOS XR

This table lists the Cisco IOS XR Software feature set matrix (TAR files) and associated filenames available for the Cisco IOS XR Software Release 6.6.1 supported on the Cisco ASR 9000 Series Aggregation Services Router.

Table 1: Cisco IOS XR Software Release 6.6.1 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP880 and RP systems]	ASR9K-iosxr-px-6.6.1-turboboot.tar	Contains only the mini.vm package.
Cisco IOS XR IP/MPLS Core Software [for RSP880 and RP systems]	ASR9K-iosxr-px-6.6.1-pies.tar	<ul style="list-style-type: none"> • Cisco IOS XR IP Unicast Routing Core Bundle • Cisco IOS XR Manageability Package • Cisco IOS XR MPLS Package • Cisco IOS XR Multicast Package • Cisco IOS XR FPD Package • Cisco IOS XR Diagnostic Package • Cisco IOS XR Advanced Video Package • Cisco IOS XR Optics Package • Cisco IOS XR Upgrade Package • Cisco IOS XR BNG Package • Cisco IOS XR Lawful Intercept Package • Cisco IOS XR Services Package • Cisco IOS XR Satellite Package • Cisco IOS XR Documentation Package

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software 3DES [for RSP-2, RSP880 and RP systems]	ASR9K-iosxr-px-6.6.1-k9-pies.tar	<ul style="list-style-type: none"> • Cisco IOS XR IP Unicast Routing Core Bundle • Cisco IOS XR Manageability Package • Cisco IOS XR MPLS Package • Cisco IOS XR Multicast Package • Cisco IOS XR Security Package • Cisco IOS XR 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-6.6.1-bridge_smus.tar	Contains all bridge SMUs

This table lists the Cisco ASR 9000 Series Aggregation Services Router Software feature set matrix (PX PIE files) and associated filenames available for the Cisco IOS XR Release 6.6.1 supported on the Cisco ASR 9000 Series Aggregation Services Router.

Table 2: Cisco IOS XR Software Release 6.6.1 PX PIE Files

Composite Package		
Feature Set	Filename	Description
Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-px.pie-6.6.1	<p>Contains the required core packages, including OS, Admin, Base, Forwarding, Modular Services Card, Routing, SNMP Agent, and Alarm Correlation.</p> <p>The mini pie file is used for upgrading to the new release</p>

Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-px.vm-6.6.1	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-6.6.1	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- 6.6.1	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-6.6.1	MPLS Traffic Engineering (MPLS-TE), Label Distribution Protocol (LDP), MPLS Forwarding, MPLS Operations, Administration, and Maintenance (OAM), Link Manager Protocol (LMP), Optical User Network Interface (OUNI), Resource Reservation Protocol (RSVP), and Layer-3 VPN.
Cisco IOS XR Multicast Package	asr9k-mcast-px.pie-6.6.1	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-6.6.1	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-6.6.1	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-6.6.1	Firmware pie for all LC and RSP FPGAs and ASICs.
Cisco IOS XR Services Package	asr9k-services.pie-6.6.1	Includes binaries to support CGv6 on VSM.
Cisco IOS XR Documentation Package	asr9k-doc-px.pie-6.6.1	.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-6.6.1	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-6.6.1	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-6.6.1	Includes binaries to support BNG features.
Cisco IOS XR Lawful Intercept (LI) Package	asr9k-li-px.pie-6.6.1	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-px.pie-6.6.1	Support for Encryption, Decryption, Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI).

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 6.6.1 supported on the Cisco ASR 9000 Series Aggregation Services Router.

Table 3: Cisco IOS XR 64 bit Software Release 6.6.1 ISO and RPM Files

Composite Package		
Feature Set	Filename	Description
Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-x64-6.6.1.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
Individually-Installable Optional Packages		
Feature Set	Filename	Description
Cisco IOS XR 64 bit EIGRP package	asr9k-eigrp-x64-1.0.0.0-r661.x86_64.rpm	Includes EIGRP protocol support software

Cisco IOS XR BNG Package	asr9k-bng-x64-1.1.0.0-r661.x86_64.rpm	Includes binaries to support BNG features.
Cisco IOS XR 64 bit ISIS package	asr9k-isis-x64-1.1.0.0-r661.x86_64.rpm	Includes IS-IS Link state protocol support software
Cisco IOS XR 64 bit OSPF package	asr9k-ospf-x64-1.1.0.0-r661.x86_64.rpm	Includes OSPF link state protocol support software
Cisco IOS XR 64 bit M2M package	asr9k-m2m-x64-2.0.0.0-r661.x86_64.rpm	Machine to Machine communication software
Cisco IOS XR Manageability Package	asr9k-mgbl-x64-3.0.0.0-r661.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-x64-1.2.0.0-r661.x86_64.rpm	MPLS Traffic Engineering (MPLS-TE), Resource Reservation Protocol (RSVP).
Cisco IOS XR 64 bit MPLS Package	asr9k-mpls-x64-2.1.0.0-r661.x86_64.rpm	Label Distribution Protocol (LDP), MPLS Forwarding, MPLS Operations, Administration, and Maintenance (OAM), Link Manager Protocol (LMP), Optical User Network Interface (OUNI) and Layer-3 VPN.
Cisco IOS XR 64 bit Multicast Package	asr9k-mcast-x64-2.0.0.0-r661.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-r661.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-r661.x86_64.rpm	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-x64-3.1.0.0-r661.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-r661.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
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Table 4: Cisco IOS XR 64 bit Software Release 6.6.1 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP880 and RP systems]	ASR9K-x64-iosxr-px-6.6.1.tar	<ul style="list-style-type: none"> • 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-k9-6.6.1.tar	<ul style="list-style-type: none"> • 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-6.6.1	<p>Contains the required core packages, including OS, Admin, Base, Forwarding, Modular Services Card, Routing, SNMP Agent, and Alarm Correlation.</p> <p>Contains mini.iso file for XR 64 bit 6.6.1 and additional software for migration to 64 bit.</p>

Memory



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

The available memory for Cisco ASR 9000 Series Aggregation Services Router running Cisco IOS XR Software Release 6.6.1 consist of the following:

- 16 GB memory on the RSP880, RSP880-LT, RP2, A99-RSP-TR and A99-RSP-SE
- 16 GB memory on the RP2 transport optimised (TR) variant and 32 GB memory on the RP2 service edge (SE) variant
- 24 GB memory on the RP3 transport optimised (TR) variant and 40 GB memory on the RP3 service edge (SE) variant
- 24 GB memory on the RSP5 transport optimised (TR) variant and 40 GB memory on the RSP5 service edge (SE) variant

- 2 GB compact flash on route switch processors (RSPs)
- 4 GB memory on the line cards (LCs) running Cisco IOS XR 32 bit image
- 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, on page 9](#)" 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
ASR 9900 Route Processor 3 for Service Edge	A99-RP3-SE	Not Supported	Release 6.5.15
ASR 9900 Route Processor 3 for Packet Transport	A99-RP3-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 9900 Switch Fabric Card 3	A99-SFC3	Not Supported	Release 6.5.15
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 Fan Tray version 3	ASR-9922-FAN-V3	Not Supported	Release 6.5.15
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
ASR 9906 Switch Fabric Card 3	A99-SFC3-T	Not Supported	Release 6.5.15
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 Aggregation 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
ASR 9910 Switch Fabric Card 3	A99-SFC3-S	Not Supported	Release 6.5.15
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 16-port 100GE QSFP TR line card	A9K-16X100GE-TR	Not Supported	Release 6.5.15
ASR 9900 32-port 100GE QSFP TR line card	A99-32X100GE-TR	Not Supported	Release 6.5.15
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	A9K-MOD200-TR	Release 6.0.1	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 200 Gigabit Modular Line Card, Service Edge Optimized	A9K-MOD200-SE		
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 6.6.1 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
```

```
Fri Dec 21 10:19:45.988 PDT
Default Profile:
SDRs:
  Owner
Committed Packages:
  disk0:asr9k-services-infra-6.6.1
  disk0:asr9k-9000v-nV-px-6.6.1
  disk0:asr9k-bng-px-6.6.1
  disk0:asr9k-doc-px-6.6.1
  disk0:asr9k-fpd-px-6.6.1
  disk0:asr9k-k9sec-px-6.6.1
  disk0:asr9k-li-px-6.6.1
  disk0:asr9k-mcast-px-6.6.1
  disk0:asr9k-mgbl-px-6.6.1
  disk0:asr9k-mini-px-6.6.1
  disk0:asr9k-mpls-px-6.6.1
  disk0:asr9k-optic-px-6.6.1
  disk0:asr9k-services-px-6.6.1
  disk0:asr9k-video-px-6.6.1
```

Cisco IOS XR 64 bit

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

```
Fri Dec 21 09:21:53.343 PST
Committed Packages: 14
  asr9k-xr-6.6.1 version=6.6.1 [Boot image]
  asr9k-bng-x64-1.0.0.0-r661
  asr9k-optic-x64-1.0.0.0-r661
  asr9k-mcast-x64-2.0.0.0-r661
  asr9k-ospf-x64-1.0.0.0-r661
  asr9k-eigrp-x64-1.0.0.0-r661
  asr9k-isis-x64-1.1.0.0-r661
  asr9k-mpls-x64-2.0.0.0-r661
  asr9k-mpls-te-rsvp-x64-2.1.0.0-r661
  asr9k-mgbl-x64-2.0.0.0-r661
  asr9k-k9sec-x64-2.1.0.0-r661
  asr9k-li-x64-1.1.0.0-r661
  asr9k-m2m-x64-2.0.0.0-r661
  asr9k-9000v-nV-x64-1.0.0.0-r661
```

Software Features Introduced in this Release

BGP Flow Specification

The fourth generation of the ASR 9000 Series Ethernet Line Cards support BGP flow specification (Flowspec) feature with the following limitations:

- BGP Flow Specification supports only ingress traffic.
- BGP Flow Specification is supported on physical interfaces, sub-interfaces, bundle sub-interfaces, and bundle interfaces, and not on subscriber interfaces.
- BGP Flow Specification does not support MPLS or multicast traffic.
- BGP Flow Specification does not support packets that take the slow path.

BGP EVPN Integration with Legacy L3VPN

EVPN PEs now support both EVPN and L3VPN protocols. North South VPN PEs support L3VPN protocols. A local import of host IP routes is performed from the EVI Bridge Domain to the L3VPN VRF and advertised as an L3VPN route to the host.

For more information about the configuration procedures, see the L2VPN and Ethernet Services Configuration Guide for Cisco ASR 9000 Series Routers, IOS XR Release 6.6.1.

SRv6 L3VPNv4 OAM

This feature enables to use the existing Internet Control Message Protocol version 6 (ICMPv6) mechanism for basic Operations, Administration, and Maintenance (OAM) functionality to address the OAM requirements for SRv6 enabled L3VPN networks.

SRv6 Base

Segment routing can be applied on both MPLS and IPv6 data planes. In a SR-MPLS enabled network, an MPLS label is used as the segment identifier and the source router chooses a path to the destination and encodes the path in the packet header as a stack of

labels. However, in a segment routing over IPv6 (SRv6) network, an IPv6 address serves as the segment identifier (SID). The source router encodes the path to destination as an ordered list of segments (list of IPv6 addresses) in the IP packet. This release introduces base support for Segment Routing using IPv6 data plane.

SRv6 OAM with Segment Routing Header

SRv6 OAM with segment routing header (SRH) feature enables to test reachability and isolate faults in a segment routing over IPv6 (SRv6) network using ping and traceroute commands.

SRv6 IS-IS

Intermediate System-to-Intermediate System (IS-IS) protocol already supports segment-routing with MPLS data plane (SR-MPLS). This feature enables extensions in ISIS to support segment-routing with IPv6 data plane (SRv6). The extensions include exchanging a node's SRv6 capabilities and node and adjacency segments as SRv6 SIDs.

Segment Routing with OSPFv2

This feature contains the following sub-features for segment routing with OSPFv2:

- segment routing local block (SRLB)
- microloop avoidance
- local unequal cost multipath (UCMP)
- extended traffic engineering (TE) metric type-length-value (TLV)

The segment routing local block (SRLB) feature introduces support for configuring adjacency segment ID (SID) statically for segment routing with OSPFv2. The static adjacency SID helps to force the traffic over a specific link while implementing SR-TE. The segment routing microloop avoidance feature detects if microloops can occur following a topology change. With this enhancement, SRTE tunnel for microloop avoidance is created only if number of labels required for microloop avoidance exceeds the number of labels the router can impose.

Bandwidth based local unequal cost multipath (UCMP) feature allows OSPF to perform load sharing on ECMP or UCMP paths based on configured weights on interface or interface bandwidth.

The extended traffic engineering (TE) metric TLV feature allows OSPF to distribute network performance information including link delay and bandwidth parameters.

SR-TE: FIB Programming of Best Candidate-path Only

In the current implementation of SR-TE policy, segment-lists of all candidate paths are pre-programmed in FIB. However, this may limit the number of SR-TE policies possible on the router. This feature enables to include only the segment list of best path in FIB.

Automatic Anycast VTEP

The Automatic Anycast VTEP feature enables top-of-racks to recognize the Data Centre Interface's source loopback IP for VXLAN traffic. The EVPN type 3 IMET route advertisement takes place when the source loopback interface and anycast loopback interface are configured for the Network Virtual Interface (NVE). This feature prevents traffic from being dropped due to unrecognized source loopback IP.

L3VPN Support in Segment Routing IPv6

This feature enables Layer 3 Virtual Private Network in Segment Routing in an IPv6 network.

G.8273.2 Profile Support

G.8273.2 Telecom profile is supported on Cisco ASR 9901 Series Routers, A9K-RSP5-SE, A9K-RSP5-TR, A99-RP3-SE, A99-RP3-TR, A9K-8X100GE-X-TR, A9K-16X100GE-TR and A9K-32X100GE-TR from Release 6.6.1

ISSU Support for Third Generation Cisco ASR 9000 Series Ethernet Line cards

In-Service Software Upgrade (ISSU) for Cisco IOS XR 64-bit operating system is supported with third generation of the Cisco ASR 9000 Series Ethernet line cards. Apart from other functionalities, ISSU for Cisco IOS XR 64-bit operating system also supports, M:N bundle redundancy feature.

ISSU Support for Layer 2 Access Control Lists

In-Service Software Upgrade (ISSU) for ASR 9000 with IOS XR 64 Bit supports Layer 2 access control lists (ACLs).

ISSU Support for L2VPN flow based load-balancing

In-Service Software Upgrade (ISSU) for ASR 9000 with IOS XR 64 Bit supports L2VPN flow based load-balancing.

For more information about ISSU for ASR 9000 with IOS XR 64 Bit, see the System Management Configuration Guide for Cisco ASR 9000 Series Routers.

ISSU Support for Link Layer Discovery Protocol

In-Service Software Upgrade (ISSU) for ASR 9000 with IOS XR 64 Bit is supported for Link Layer Discovery Protocol (LLDP).

Smart Licensing support for ASR 9901

Smart Licensing for Non-Consumption Model Line Cards S-A9K-9901-AIP-LC, S-A9K-9901-VRF-LC, S-A9K-9901-120AIP, S-A9K-9901-256AIP and S-A9K-BNG-LIC-8K is supported on Cisco ASR 9901 Router from Release 6.6.1

L3VPN QoS Traffic-class Marking in Segment Routing IPv6

The L3VPN QoS traffic-class marking in Segment Routing IPv6 feature enables the marking of traffic-class headers and propagates the traffic-class from the IPv4 header of incoming traffic. This enables prioritization of traffic for Segment Routing in an IPv6 network.

To enable this feature use the **hw-module profile segment-routing srv6 encapsulation traffic-class** command and reload the router for the configuration to take effect.

MAC Security Recovery

MAC security recovery feature enables you to recover the bridge port or Ethernet flow point (EFP) that is shut down due to MAC security violation. This is achieved by configuring shutdown recovery timer using the **mac secure shutdown-recovery-timeout** command, where the bridge port or EFP that is shut down is up after the timer expires.

Safe Libraries

During product development, safe libraries are used to prevent security defects by applying appropriate security rules. The SafeC programming libraries are enhanced to provide better protection from buffer-overflow vulnerabilities. These libraries provide API for buffer, string, and memory operations such as copy, concatenate, zero-out, and compare.

PWHE Load Balancing Support using FAT Label

The PWHE Load Balancing Support using FAT Label feature enables flow hashing-based load balancing across egress interfaces defined in the generic interface list. This feature also enables Flow Aware Transport (FAT) label that can be utilized for load balancing by downstream P-routers.

OpFlex using Loopback Interface

The OpFlex using Loopback Interface feature prevents flapping of OpFlex session when one of the physical connections from the Data Center Interconnect (DCI) to the spine goes down. The loopback IP address which serves as the identity of the OpFlex session is used to establish the connection to the spine.

ARP Throttling

When remote devices scan for destinations that do not exist in the locally connected network, the unresolved ARP for these packets keeps the ARP process busy. ARP resolution failure for these destinations impacts forwarding and performance of routers because ARP is flooded with traffic for resolution. ARP throttling prevents such huge traffic load for ARP by adding drop adjacencies for such destinations.

You can enable ARP throttling for an interface and if ARP resolution fails for any destination for that interface, the entry is added as drop adjacency in the forwarding plane. Therefore, till the configured time, data traffic hitting drop adjacency is dropped and not queued for ARP for resolution.

IMA in Measurement Mode

Integrity Measurement Architecture (IMA) is an open-source trusted computing component. IMA is enabled in the kernel by default. IMA feature ensures the integrity of files or executables on the system, by measuring files or executables at runtime. It captures the measured values (hash values) in a measurement list that can be used to detect any modifications to files or executables at runtime and take corrective measures.

Duplicate IP Address Detection

The Duplicate IP Address Detection feature automatically detects any host with a duplicate IP address and blocks all MAC-IP routes that have a duplicate IP address.

This feature protects the network from hosts that are assigned duplicate IP addresses unintentionally or by malicious intent in an EVPN fabric. Hosts with duplicate IP address cause unnecessary churn in a network and causes traffic loss to either or both the hosts with the same IP address.

SE Linux on Cisco IOS XR 64 Bit

Trustworthy systems are Cisco products and solutions developed with multilayered security, ensuring verifiable trust.

Security Enhanced (SE) Linux is the integrated security enhancement to the Linux operating system. It provides a mechanism to enforce security policies for access controls, including mandatory access control (MAC). These policies confine user programs and system services as well as access to system resources and network resources.

Revised OC-platform model version

Support for openconfig-platform.yang (OC-platform) model is revised from version 0.4.0 to version 0.11.0. In addition to retrieving basic component information, this revised version of the model extracts additional details such as operational state, available and utilized memory, allocated and used power, temperature, power-supply, fan, linecard and so on.

Support for new XR NETCONF actions

IOS-XR and System admin actions are RPC statements that trigger an operation or execute a command on the router. The following NETCONF actions are introduced in this release:

- copy
- delete

Telemetry support for OC LACP

The OpenConfig-Link Aggregation Control Protocol (OC-LACP) model defined by the OC community, helps manage LACP-enabled bundles and member interfaces. Cisco IOS XR supports OC-LACP version 1.0.2. Currently, the support is extended to version 1.1.0. Telemetry support for (OC-LACP) is provided only for LACP state data at global, bundle and member level.

Software Feature Enhancements Introduced in this Release

nV Satellite Scale

ASR 9000 host running Cisco IOS XR 64 Bit OS supports up to 64 satellites.

Behavior Change Introduced in this release

Deprecated Command

From this release onwards the **ispf** command is deprecated.

This command was used to calculate network topology using the incremental shortest path first (iSPF) algorithm.

Hardware Features Introduced in this Release

This

This release introduces following hardware features:

- 32X1GE MPA — This MPA provides MACsec security and is supported on MOD 200 and MOD 400 line cards.
- Cisco digital CFP2 pluggable optical modules (ONS-C2-WDM-DE-1HL, CFP2-WDM-D-1HL) are supported on Cisco IOS XR 64-bit operating system in the following modular port adapters (MPAs):
 - A9K-MPA-1x100GE
 - A9K-MPA-2x100GE
 - A9K-MPA-2x100GE-CM
- The Cisco QSFP-100G-SM-SR QSFP module supports link lengths of up to 2 kilometers over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors. The 100 Gigabit Ethernet signal is carried over four wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. The operating temperature range is from +10 to +60°C with an optical link budget of 4.2 decibels. This 4.2-decibel link budget offers the ability to support the loss from patch panels

in the link in a data center environment. QSFP-100G-SM-SR is interoperable with QSFP-100G-CWDM4-S and is supported on the following line cards:

- A99-12X100GE=
- A99-12X100GE=
- A9K-4X100GE=

- Support for CPAK-100GE-LR4 is extended to the following line cards:
 - A9K-MPA-1x100GE
 - A9K-MPA-2x100GE
 - A9K-MPA-2x100GE-CM

 - A9K-MPA-1x100GE
 - A9K-MPA-2x100GE
 - A9K-MPA-2x100GE-CM

-
-
- Support for QSFP-40G-SR-BD , QSFP-40G-SR4-S, QSFP-40G-LR4-S and QSFP-4X10G-LR-S optics is added for the following line cards :
 - A99-12X100GE=
 - A99-12X100GE-CM=
 - A9K-4X100GE=

- Support for QSFP-100G-ER4L-S and QSFP-100G-PSM4-S is now extended to the following line cards:
 - A9K-8X100GE-X
 - A9K-16X100GE-X
 - A9K-32X100GE-X

- QSFP-100G-PSM4-S optics support is extended for the following line cards:
 - A99-12X100GE=
 - A99-12X100GE-CM=
 - A9K-4X100GE=

- The Cisco CPAK-100G-PSM4 Module supports link lengths of up to 500 meters over Single-Mode Fiber (SMF) with MPO connectors. The 100 Gigabit Ethernet signal is carried over 12-fiber parallel fiber terminated with MPO multifiber connectors. This module is now supported on following MPAs:
 - A9K-MPA-1x100GE
 - A9K-MPA-2x100GE

- A9K-MPA-2x100GE-CM
- The ASR 9901 router now supports the following transceivers:
 - QSFP-40G-SR-BD
 - QSFP-40G-SR4-S
 - QSFP-40G-LR4-S

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
```

```
Fri Dec 21 10:19:58.095 PDT
```

```
=====
```

Field Programmable Device Package								
Card Type	FPD Description	Type	Subtype	SW Version	Min Req SW Ver	Min Req HW Vers		
ASR-9906-BPID2	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
ASR-9910-BPID2	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
	Can Bus Ctrl (CBC) BP2	lc	cbc	7.105	0.00	0.1		
ASR-9904-BPID2	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
ASR-9912-BPID2	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
	Can Bus Ctrl (CBC) BP2	lc	cbc	7.105	0.00	0.1		
ASR-9922-BPID2	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
	Can Bus Ctrl (CBC) BP2	lc	cbc	7.105	0.00	0.1		
A9K-BPID2-E-10-SLOT	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
A9K-BPID2-E-6-SLOT	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
A9K-BPID2-10-SLOT	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
	Can Bus Ctrl (CBC) BP2	lc	cbc	7.105	0.00	0.1		
A9K-BPID2-6-SLOT	Can Bus Ctrl (CBC) BP2	bp	cbc	7.105	0.00	0.1		
	Can Bus Ctrl (CBC) BP2	lc	cbc	7.105	0.00	0.1		
ASR-9922-SFC110	Can Bus Ctrl (CBC) MTFC	fc	cbc	28.06	0.00	0.1		
	Fabric Ctrl0 MTFC	fc	fpga7	1.03	0.00	0.1		
	Can Bus Ctrl (CBC) MTFC	lc	cbc	28.06	0.00	0.1		
ASR-9912-SFC110	Can Bus Ctrl (CBC) SSFC	fc	cbc	32.05	0.00	0.1		
	Fabric Ctrl0 MTFC	fc	fpga7	1.03	0.00	0.1		
A99-SFC2	Can Bus Ctrl (CBC) MTFC	fc	cbc	37.20	0.00	0.1		
	Fabric Ctrl0 MTFC	fc	fcfsbl	1.100	0.00	0.1		
	Fabric Ctrl0 MTFC	fc	fclnxfw	1.100	0.00	0.1		
	Fabric Ctrl0 MTFC	fc	fpga8	0.37	0.00	0.1		
ASR-9912-SFC220	Can Bus Ctrl (CBC) MTFC	fc	cbc	37.20	0.00	0.1		

```
=====
```

	Fabric Ctrl0 MTFC		fc	fcfsbl	1.100	0.00	0.1
	Fabric Ctrl0 MTFC		fc	fclnxfw	1.100	0.00	0.1
	Fabric Ctrl0 MTFC		fc	fpga8	0.37	0.00	0.1
A99-SFC-S	Can Bus Ctrl (CBC) SHFC		fc	cbc	44.02	0.00	0.1
	Fabric Ctrl0 SHFC		fc	fcfsbl	1.100	0.00	0.1
	Fabric Ctrl0 SHFC		fc	fclnxfw	1.100	0.00	0.1
	Fabric Ctrl0 SHFC		fc	fpga8	0.37	0.00	0.1
A99-SFC-T	Can Bus Ctrl (CBC) TWFC		fc	cbc	44.02	0.00	0.1
	Fabric Ctrl0 TWFC		fc	fcfsbl	1.100	0.00	0.1
	Fabric Ctrl0 TWFC		fc	fclnxfw	1.100	0.00	0.1
	Fabric Ctrl0 TWFC		fc	fpga8	0.37	0.00	0.1
ASR-9010-FAN	Can Bus Ctrl (CBC) FAN		ft	cbc	4.04	0.00	0.1
	Can Bus Ctrl (CBC) FAN		lc	cbc	4.03	0.00	0.1
ASR-9006-FAN	Can Bus Ctrl (CBC) FAN		ft	cbc	5.05	0.00	0.1
	Can Bus Ctrl (CBC) FAN		lc	cbc	5.04	0.00	0.1
ASR-9922-FAN	Can Bus Ctrl (CBC) MFAN		ft	cbc	29.12	0.00	0.1
	Can Bus Ctrl (CBC) MFAN		lc	cbc	29.12	0.00	0.1
ASR-9912-FAN	Can Bus Ctrl (CBC) SFAN		ft	cbc	31.06	0.00	0.1
ASR-9010-FAN-V2	Can Bus Ctrl (CBC) FAN		ft	cbc	29.12	0.00	0.1
	Can Bus Ctrl (CBC) FAN		lc	cbc	29.12	0.00	0.1
ASR-9904-FAN	Can Bus Ctrl (CBC) SFAN		ft	cbc	31.06	0.00	0.1
ASR-9922-FAN-V2	Can Bus Ctrl (CBC) MFAN		ft	cbc	40.07	0.00	0.1
	Fan Controller MFAN		ft	fpga9	2.06	0.00	0.1
ASR-9006-FAN-V2	Can Bus Ctrl (CBC) FAN		ft	cbc	5.05	0.00	0.1
	Can Bus Ctrl (CBC) FAN		lc	cbc	5.04	0.00	0.1
ASR-9910-FAN	Can Bus Ctrl (CBC) SHFAN		ft	cbc	45.02	0.00	0.1
	Fan Controller SHFAN		ft	fpga9	2.06	0.00	0.1
ASR-9906-FAN	Can Bus Ctrl (CBC) TWFAN		ft	cbc	56.01	0.00	0.1
	Fan Controller TWFAN		ft	fpga9	2.06	0.00	0.1
ASR-9001-FAN	Can Bus Ctrl (CBC) FAN		ft	cbc	24.115	0.00	0.1
	Can Bus Ctrl (CBC) FAN		lc	cbc	24.115	0.00	0.1
ASR-9001-FAN-V2	Can Bus Ctrl (CBC) FAN		ft	cbc	24.115	0.00	0.1
A9K-SIP-700	Can Bus Ctrl (CBC) LC5		lc	cbc	3.06	0.00	0.1
	CPUCtrl LC5		lc	cpld1	0.15	0.00	0.1
	QFPCPUBridge LC5		lc	fpga2	5.14	0.00	0.1
	NPUXBarBridge LC5		lc	fpgal	0.24	0.00	0.1
	ROMMONB LC5		lc	rommon	1.04	0.00	0.1
A9K-SIP-500	Can Bus Ctrl (CBC) LC5		lc	cbc	3.06	0.00	0.1
	CPUCtrl LC5		lc	cpld1	0.15	0.00	0.1
	QFPCPUBridge LC5		lc	fpga2	5.14	0.00	0.1
	NPUXBarBridge LC5		lc	fpgal	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	fpgal	0.24	0.00	0.1
	ROMMONB LC5		lc	rommon	1.35	0.00	0.1

A9K-RSP440-TR	Can Bus Ctrl1 (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 Ctrl1 (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 Ctrl1 (CBC) MTRP	lc	cbc	25.03	0.00	0.1	
	Fabric Ctrl13 MTFC	lc	fpga10	1.03	0.00	0.1	
	Fabric Ctrl14 MTFC	lc	fpga11	1.03	0.00	0.1	
	Fabric Ctrl15 MTFC	lc	fpga12	1.03	0.00	0.1	
	Fabric Ctrl16 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 Ctrl10 MTFC	lc	fpga7	1.03	0.00	0.1	
	Fabric Ctrl11 MTFC	lc	fpga8	1.03	0.00	0.1	
	Fabric Ctrl12 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 Ctrl1 (CBC) MTRP	lc	cbc	25.03	0.00	0.1
		Fabric Ctrl13 MTFC	lc	fpga10	1.03	0.00	0.1
Fabric Ctrl14 MTFC		lc	fpga11	1.03	0.00	0.1	
Fabric Ctrl15 MTFC		lc	fpga12	1.03	0.00	0.1	
Fabric Ctrl16 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 Ctrl10 MTFC		lc	fpga7	1.03	0.00	0.1	
Fabric Ctrl11 MTFC		lc	fpga8	1.03	0.00	0.1	
Fabric Ctrl12 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 Ctrl1 (CBC) MTRP	lc	cbc	25.03	0.00	0.1
		Fabric Ctrl13 MTFC	lc	fpga10	1.03	0.00	0.1
	Fabric Ctrl14 MTFC	lc	fpga11	1.03	0.00	0.1	
	Fabric Ctrl15 MTFC	lc	fpga12	1.03	0.00	0.1	
	Fabric Ctrl16 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 Ctrl10 MTFC	lc	fpga7	1.03	0.00	0.1	
	Fabric Ctrl11 MTFC	lc	fpga8	1.03	0.00	0.1	
	Fabric Ctrl12 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 Ctrl1 (CBC) MTRP	lc	cbc	25.03	0.00	0.1
		Fabric Ctrl13 MTFC	lc	fpga10	1.03	0.00	0.1
Fabric Ctrl14 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 Ctrl10 MTFC	lc	fpga7	1.03	0.00	0.1
	Fabric Ctrl11 MTFC	lc	fpga8	1.03	0.00	0.1
	Fabric Ctrl2 MTFC	lc	fpga9	1.03	0.00	0.1
	CPUCtrl0	lc	fpga1	1.05	0.00	0.1
	ROMMONB MTRP	lc	rommon	5.16	0.00	0.1

A9K-RSP440-LT	Can Bus Ctrl (CBC) RSP3	lc	cbc	16.117	0.00	0.1
	ClockCtrl0 RSP3	lc	fpga2	1.11	0.00	0.1
	UTI RSP3	lc	fpga3	4.09	0.00	0.1
	CPUCtrl RSP3	lc	fpga1	0.11	0.00	0.1
	ROMMONB RSP3	lc	rommon	0.76	0.00	0.1

A9K-RSP880-TR	Can Bus Ctrl (CBC) RSP4	lc	cbc	34.39	0.00	0.0
	MB CPUCtrl	lc	fpga2	0.66	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	1.109	0.00	0.0
	LinuxFW	lc	lnxfw	1.109	0.00	0.0
	ROMMONB RSP4	lc	rommon	10.63	0.00	0.0

A9K-RSP880-SE	Can Bus Ctrl (CBC) RSP4	lc	cbc	34.39	0.00	0.0
	MB CPUCtrl	lc	fpga2	0.66	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	1.109	0.00	0.0
	LinuxFW	lc	lnxfw	1.109	0.00	0.0
	ROMMONB RSP4	lc	rommon	10.63	0.00	0.0

A9K-RSP880-LT-TR	Can Bus Ctrl (CBC) RSP4L	lc	cbc	50.02	0.00	0.0
	MB CPUCtrl	lc	fpga2	0.18	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	1.109	0.00	0.0
	LinuxFW	lc	lnxfw	1.109	0.00	0.0
	ROMMONB RSP4L	lc	rommon	17.33	0.00	0.0

A9K-RSP880-LT-SE	Can Bus Ctrl (CBC) RSP4L	lc	cbc	50.02	0.00	0.0
	MB CPUCtrl	lc	fpga2	0.18	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	1.109	0.00	0.0
	LinuxFW	lc	lnxfw	1.109	0.00	0.0
	ROMMONB RSP4L	lc	rommon	17.33	0.00	0.0

A99-RSP-TR	Can Bus Ctrl (CBC) RSP4S	lc	cbc	43.03	0.00	0.1
	MB CPUCtrl	lc	fpga2	0.66	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	1.109	0.00	0.0
	LinuxFW	lc	lnxfw	1.109	0.00	0.0
	ROMMONB RSP4SHW	lc	rommon	16.12	0.00	0.0

A99-RSP-SE	Can Bus Ctrl (CBC) RSP4S	lc	cbc	43.03	0.00	0.1
	MB CPUctrl	lc	fpga2	0.66	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	1.109	0.00	0.0
	LinuxFW	lc	lnxfw	1.109	0.00	0.0
	ROMMONB RSP4SHW	lc	rommon	16.12	0.00	0.0

A99-RP2-TR	Can Bus Ctrl (CBC) MTRP	lc	cbc	35.14	0.00	0.1
	MB CPUctrl	lc	fpga2	0.66	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	1.109	0.00	0.0
	LinuxFW	lc	lnxfw	1.109	0.00	0.0
	ROMMONB RP2	lc	rommon	14.33	0.00	0.0

A99-RP2-SE	Can Bus Ctrl (CBC) MTRP	lc	cbc	35.14	0.00	0.1
	MB CPUctrl	lc	fpga2	0.66	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	1.109	0.00	0.0
	LinuxFW	lc	lnxfw	1.109	0.00	0.0
	ROMMONB RP2	lc	rommon	14.33	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	cp1d1	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	0.00	0.0

A9K-4X100GE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	38.23	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	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	8.46	0.00	0.0

A99K-MOD200-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A99K-200MOD-SE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A99K-MOD200-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A99K-MOD200-TR-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD200-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD200-SE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD200-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD200-TR-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD200-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx_fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A99K-MOD400-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0

	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A99K-MOD400-SE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A99K-MOD400-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A99K-MOD400-TR-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD400-SE	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD400-SE-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD400-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD400-TR-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD400-TAA	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnx fw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	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	8.46	0.00	0.0

A9K-400G-DWDM-TR	Can Bus Ctrl (CBC) LC4	lc	cbc	42.04	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	DBCtrl	lc	fpga3	1.07	0.00	0.0
	DBCtrl	lc	fpga4	1.03	0.00	0.0
	DBCtrl	lc	fpga5	1.05	0.00	0.0
	DBCtrl	lc	fpga6	3.77	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	8.46	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	1.101	0.00	0.0
	LinuxFW	lc	lnxfw	1.101	0.00	0.0
	ROMMONB LC1	lc	rommon	9.26	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	1.101	0.00	0.0
	LinuxFW	lc	lnxfw	1.101	0.00	0.0
	ROMMONB LC1	lc	rommon	9.26	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	8.46	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	8.46	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	1.101	0.00	0.0
	LinuxFW	lc	lnxfw	1.101	0.00	0.0
	ROMMONB LC1	lc	rommon	9.26	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
	EOBCSwiathCtrl	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
	EOBCSwiathCtrl	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
	EOBCSwiathCtrl	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
	EOBCSwiathCtrl	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
	EOBCSwiathCtrl	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
	EOBCSwiathCtrl	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	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	0.00	0.0

A9K-MOD200-CM	Can Bus Ctrl (CBC) LC4	lc	cbc	39.09	0.00	0.0
	DBCtrl	lc	fpga10	1.27	0.00	0.0
	MB CPUCtrl	lc	fpga2	1.97	0.00	0.0
	Fsbl	lc	fsbl	1.103	0.00	0.0
	LinuxFW	lc	lnxfw	1.103	0.00	0.0
	ROMMONB LC1	lc	rommon	8.46	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
A9K-MPA-32X1GE	EP I/O FPGA	spa	fpga11	1.08	0.00	0.0
SPA-4XT3/E3	SPA E3 Subrate FPGA	spa	fpga2	1.04	0.00	0.0
	SPA T3 Subrate FPGA	spa	fpga3	1.04	0.00	0.0
	SPA I/O FPGA	spa	fpga1	1.01	0.00	0.0
	SPA ROMMON	spa	rommon	2.12	0.00	0.0
SPA-2XT3/E3	SPA E3 Subrate FPGA	spa	fpga2	1.04	0.00	0.0
	SPA T3 Subrate FPGA	spa	fpga3	1.04	0.00	0.0
	SPA I/O FPGA	spa	fpga1	1.01	0.00	0.0
	SPA ROMMON	spa	rommon	2.12	0.00	0.0
SPA-4XCT3/DS0	SPA T3 Subrate FPGA	spa	fpga2	0.11	0.00	0.100
	SPA T3 Subrate FPGA	spa	fpga2	1.04	0.00	0.200
	SPA I/O FPGA	spa	fpga1	2.08	0.00	0.100
	SPA ROMMON	spa	rommon	2.12	0.00	0.100
SPA-OC192POS-XFP	SPA FPGA swv1.101 hww3	spa	fpga2	1.101	0.00	3.0
	SPA FPGA swv1.2 hww2	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 hww3	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-1XCHOC3-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 hww2	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 hww2	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 hww2	spa	fpga2	2.104	0.00	2.8
	SPA FPGA swv1.2	spa	fpga1	2.02	0.00	0.0
SPA-2XCHOC12/DS0	SPA FPGA2 swv1.00	spa	fpga2	1.00	0.00	0.0
	SPA FPGA swv1.36	spa	fpga1	1.36	0.00	0.49
	SPA ROMMON swv2.2	spa	rommon	2.02	0.00	0.49
A9K-MPA-20X1GE	EP I/O FPGA	spa	fpga3	1.01	0.00	0.0

A9K-MPA-20X10GE	EP I/O FPGA	spa fpga5	1.16	0.00	0.0
A9K-MPA20X10GE-CM	EP I/O FPGA	spa fpga5	1.16	0.00	0.0
A9K-MPA-2X10GE	EP I/O FPGA	spa fpga6	1.06	0.00	0.0
A9K-MPA-4X10GE	EP I/O FPGA	spa fpga6	1.06	0.00	0.0
A9K-MPA-2X40GE	EP I/O FPGA	spa fpga7	1.03	0.00	0.0
A9K-MPA-1X40GE	EP I/O FPGA	spa fpga7	1.03	0.00	0.0
A9K-MPA-8X10GE	EP I/O FPGA	spa fpga8	1.09	0.00	0.0
A9K-MPA-2X100GE	EP I/O FPGA	spa fpga9	1.04	0.00	0.0
	CFP2 DCO B0	spap fpga7	38.26887	0.00	0.0
	CFP2 DCO	spap fpga8	38.518	0.00	0.0
A9K-MPA-1X100GE	EP I/O FPGA	spa fpga9	1.04	0.00	0.0
	CFP2 DCO B0	spap fpga7	38.26887	0.00	0.0
	CFP2 DCO	spap fpga8	38.518	0.00	0.0
A9K-MPA2X100GE-CM	EP I/O FPGA	spa fpga9	1.04	0.00	0.0
	CFP2 DCO B0	spap fpga7	38.26887	0.00	0.0
	CFP2 DCO	spap fpga8	38.518	0.00	0.0
A9K-MPA-1X200GE	EP I/O FPGA	spa fpga9	1.04	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 hww3	spa fpgal	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:

```
(sysadmin-vm) #show fpd package
```

```
Fri Dec 21 17:22:00.350 UTC+00:00
```

```
=====
```

Field Programmable Device Package					
Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
A99-12X100GE	CBC	NO	46.06	46.06	0.1
	IPU-FPGA	YES	1.85	1.85	0.1
	IPU-FSBL	YES	1.101	1.101	0.1
	IPU-Linux	YES	1.101	1.101	0.1
	Morra-0	YES	1.02	1.02	0.1
	Morra-1	YES	1.02	1.02	0.1
	Primary-BIOS	YES	9.26	9.26	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	1.101	1.101	0.1
	IPU-Linux	YES	1.101	1.101	0.1
	Morra-0	YES	1.02	1.02	0.1
	Morra-1	YES	1.02	1.02	0.1
	Primary-BIOS	YES	9.26	9.26	0.1
	Sideswipe-0	YES	1.02	1.02	0.1
	Sideswipe-1	YES	1.02	1.02	0.1
A99-16X100GE-CM	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0
A99-16X100GE-SE	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0
A99-16X100GE-TR	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0

```
=====
```

	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0

A99-24X10GE-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

A99-24X10GE-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

A99-24X10GE-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

A99-32X100GE-CM	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	Grapple-1	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Mixmaster-1	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0
	Skylynx-1	YES	0.08	0.08	0.0

A99-32X100GE-SE	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	Grapple-1	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Mixmaster-1	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0
	Skylynx-1	YES	0.08	0.08	0.0

A99-32X100GE-TR	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	Grapple-1	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Mixmaster-1	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0
	Skylynx-1	YES	0.08	0.08	0.0

A99-48X10GE-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

A99-48X10GE-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

A99-48X10GE-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

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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	0.0

A99-RP2-SE	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC-0	NO	35.14	35.14	0.0
	CBC-1	NO	35.14	35.14	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.109	1.109	0.0
	IPU-Linux	YES	1.109	1.109	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	14.33	14.33	0.0

A99-RP2-TR	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC-0	NO	35.14	35.14	0.0
	CBC-1	NO	35.14	35.14	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.109	1.109	0.0
	IPU-Linux	YES	1.109	1.109	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	14.33	14.33	0.0

A99-RP3-SE	Aldrin-0-FPGA	YES	1.02	1.02	0.0
	Aldrin-1-FPGA	YES	1.00	1.00	0.0
	Beta-FPGA	YES	0.07	0.07	0.0
	CBC-0	NO	51.12	51.12	0.0
	CBC-1	NO	51.12	51.12	0.0
	IPU-DDR4	YES	0.17	0.17	0.0
	Orion-FPGA	YES	0.21	0.21	0.0
	Primary-BIOS	YES	30.20	30.20	0.0

	Zenith-FPGA	YES	0.07	0.07	0.0

A99-RP3-TR	Aldrin-0-FPGA	YES	1.02	1.02	0.0
	Aldrin-1-FPGA	YES	1.00	1.00	0.0
	Beta-FPGA	YES	0.07	0.07	0.0
	CBC-0	NO	51.12	51.12	0.0
	CBC-1	NO	51.12	51.12	0.0
	IPU-DDR4	YES	0.17	0.17	0.0
	Orion-FPGA	YES	0.21	0.21	0.0
	Primary-BIOS	YES	30.20	30.20	0.0
	Zenith-FPGA	YES	0.07	0.07	0.0

A99-RSP-SE	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	43.03	43.03	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.109	1.109	0.0
	IPU-Linux	YES	1.109	1.109	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	16.12	16.12	0.0

A99-RSP-TR	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	43.03	43.03	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.109	1.109	0.0
	IPU-Linux	YES	1.109	1.109	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	16.12	16.12	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

A99-SFC3	CBC	NO	49.03	49.03	0.0
	IPU-DDR4	YES	0.22	0.22	0.0

A99-SFC3-S	CBC	NO	44.02	44.02	0.0
	IPU-DDR4	YES	0.22	0.22	0.0

A99-SFC3-T	CBC	NO	44.02	44.02	0.0
	IPU-DDR4	YES	0.22	0.22	0.0

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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	0.0

A9K-1600W-AC	PO-PriMCU	NO	17.137	17.137	0.0

A9K-1600W-DC	PO-PriMCU	NO	1.09	1.09	0.0

A9K-16X100GE-CM	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0

A9K-16X100GE-SE	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0

	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0

A9K-16X100GE-TR	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0

A9K-16X100GE-TR	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	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	1.07	1.07	0.1
	Primary-BIOS	YES	8.46	8.46	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	1.101	1.101	0.1
	IPU-Linux	YES	1.101	1.101	0.1
	Morra-0	YES	1.02	1.02	0.1
	Primary-BIOS	YES	9.26	9.26	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	0.0

A9K-4X100GE-TR-V2	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	0.0

A9K-8X100GE-X-CM	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0

A9K-8X100GE-X-SE	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0

	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0

A9K-8X100GE-X-TR	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	0.0

A9K-8X100GE-X-TR	Aldrin-FPGA	YES	1.03	1.03	0.0
	CBC	NO	48.07	48.07	0.0
	Grapple-0	YES	0.11	0.11	0.0
	IPU-DDR4	YES	1.02	1.02	0.0
	Mixmaster-0	YES	0.08	0.08	0.0
	Primary-BIOS	YES	21.27	21.27	0.0
	Scamper	YES	0.21	0.21	0.0
	Skylynx-0	YES	0.08	0.08	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	8.46	8.46	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	8.46	8.46	0.0

A9K-MOD200-CM	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.09	39.09	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	8.46	8.46	0.1

A9K-MOD200-SE	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.09	39.09	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	8.46	8.46	0.1

A9K-MOD200-TR	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.09	39.09	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	8.46	8.46	0.1

A9K-MOD400-CM	Blaster	YES	1.25	1.25	0.1

	CBC	NO	39.09	39.09	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	8.46	8.46	0.1

A9K-MOD400-SE	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.09	39.09	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	8.46	8.46	0.1

A9K-MOD400-TR	Blaster	YES	1.25	1.25	0.1
	CBC	NO	39.09	39.09	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	8.46	8.46	0.1

A9K-RSP5-SE	Aldrin-0-FPGA	YES	1.04	1.04	0.0
	Beta-FPGA	YES	0.07	0.07	0.0
	CBC	NO	53.10	53.10	0.0
	IPU-DDR4	YES	0.17	0.17	0.0
	Orion-FPGA	YES	0.21	0.21	0.0
	Primary-BIOS	YES	31.17	31.17	0.0
	Zenith-FPGA	YES	0.07	0.07	0.0

A9K-RSP5-TR	Aldrin-0-FPGA	YES	1.04	1.04	0.0
	Beta-FPGA	YES	0.07	0.07	0.0
	CBC	NO	53.10	53.10	0.0
	IPU-DDR4	YES	0.17	0.17	0.0
	Orion-FPGA	YES	0.21	0.21	0.0
	Primary-BIOS	YES	31.17	31.17	0.0
	Zenith-FPGA	YES	0.07	0.07	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	50.02	50.02	0.0
	IPU-FPGA	YES	0.18	0.18	0.0
	IPU-FSBL	YES	1.109	1.109	0.0
	IPU-Linux	YES	1.109	1.109	0.0
	Omega-FPGA	YES	0.04	0.04	0.0
	Optimus-FPGA	YES	0.04	0.04	0.0
	Primary-BIOS	YES	17.33	17.33	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	50.02	50.02	0.0
	IPU-FPGA	YES	0.18	0.18	0.0
	IPU-FSBL	YES	1.109	1.109	0.0
	IPU-Linux	YES	1.109	1.109	0.0
	Omega-FPGA	YES	0.04	0.04	0.0
	Optimus-FPGA	YES	0.04	0.04	0.0
	Primary-BIOS	YES	17.33	17.33	0.0

A9K-RSP880-SE	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	34.39	34.39	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.109	1.109	0.0
	IPU-Linux	YES	1.109	1.109	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0

	Primary-BIOS	YES	10.63	10.63	0.0

A9K-RSP880-TR	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	34.39	34.39	0.0
	Cha-FPGA	YES	0.08	0.08	0.0
	IPU-FPGA	YES	0.66	0.66	0.0
	IPU-FSBL	YES	1.109	1.109	0.0
	IPU-Linux	YES	1.109	1.109	0.0
	Omega-FPGA	YES	0.16	0.16	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	10.63	10.63	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	8.46	8.46	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	8.46	8.46	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	8.46	8.46	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	23.17	23.17	0.1

ASR-9901-RP	CBC	NO	54.10	54.10	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	22.20	22.20	0.1
ASR-9904-AC	CBC	NO	7.105	7.105	0.0
ASR-9904-FAN	CBC	NO	31.06	31.06	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	31.06	31.06	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

- BFD over MPLS-TP session feature is not supported on the Fourth Generation of Cisco ASR 9000 Series Ethernet line cards.
- 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 the first and third generation Cisco ASR 9000 Line Cards to coexist in a single chassis.

For the list of ASR 9000 Series line card types, see:

<http://www.cisco.com/c/en/us/support/docs/routers/asr-9000-series-aggregation-services-routers/116726-qanda-product-00.html#anc2>

- From Release 6.0, A9K-RSP-4G, A9K-RSP-8G and the ASR 9000 Ethernet Line Cards also known as the first generation ASR 9000 LCs are not supported. For a detailed listing, see [End-of-Life and End-of-Sale Notices](#)
- From Release 6.0, the onePK toolkit is not supported.
- The line cards A9K-4X100GE-SE/TR and A9K-8X100GE-SE/TR comply with G.8273.2 Class A performance on 100G ports without breakout. These line cards comply with G.8273.2 Class B performance with 10G breakout.
- Country-specific laws, regulations, and licenses—In certain countries, use of these products may be prohibited and subject to laws, regulations, or licenses, including requirements applicable to the use of the products under telecommunications and other laws and regulations; customers must comply with all such applicable laws in the countries in which they intend to use the products.
- **Card fan controller, and RSP removal**—For all card removal and replacement (including fabric cards, line cards, fan controller, and RSP) follow the instructions provided by Cisco to avoid impact to traffic. See the *Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide* for procedures.
- Exceeding Cisco testing—If you intend to test beyond the combined maximum configuration tested and published by Cisco, contact your Cisco Technical Support representative to discuss how to engineer a large-scale configuration for your purpose.
- Installing a Line Card—For a fully populated 40-port high density Line Card with cable optics, maintenance time required for card replacement is higher. For more information about Line Card installation and removal, refer to the *Cisco ASR 9000 Aggregation Services Router Ethernet Line Card Installation Guide*.
- Serial Interfaces Out of Order in **show ipv4 interface brief** or **show ipv6 interface brief** command—The show ip interface brief command might display interfaces out of order if different types of serialization are used on the SPA cards.

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

The ordering is based on:

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

7. multilink

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

Example output:

With multiple cards:

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

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

Supported Transceiver Modules

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

Supported Modular Port Adapters

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

Caveats

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

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

Cisco IOS XR Caveats

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

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

Caveats Specific to the Cisco ASR 9000 Series Router

There are no caveats in this release.

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](#).

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:router(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.

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