

Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 24.2.21

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IOS XR 64-bit on Cisco ASR 9000 Series is the next generation operating system running in a virtualized environment with an underlying 64-bit Linux kernel. Cisco IOS XR operating system delivers greater agility, automation, and simplicity while reducing the cost of operating the networks.

References

For more information about Cisco ASR 9000 Series, see:

- Cisco ASR 9000 Data Sheet listing page
- Migration Guide for Cisco ASR 9000 Series Routers

What's New in Cisco IOS XR Release 24.2.21

Cisco IOS XR Release 24.2.21 is a service pack release for Cisco ASR 9000 Series routers. There are no new software features or hardware introduced in this release.

For more details on the Cisco IOS XR release model and associated support, see Software Lifecycle Support Statement - IOS XR.

Caveats

There are no caveats in this release.

Supported Packages and System Requirements

Feature Set (Software Images)

Visit the Cisco Software Download page to download the Cisco IOS XR Service Pack.

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

Table 1: Cisco IOS XR 64 bit Software Release 24.2.21 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP and RP systems]	ASR9K-x64-iosxr-px-24.2.21.tar	• Cisco IOS XR Manageability Package • Cisco IOS XR MPLS Package • Cisco IOS XR MPLS -TE and RSVP Package • Cisco IOS XR Multicast Package • Cisco IOS XR 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 Service Package
Cisco IOS XR IP/MPLS Core Software 3DES [for RSP and RP systems]	ASR9K-x64-iosxr-px-k9-24.2.21.tar	• Cisco IOS XR Manageability Package • Cisco IOS XR MPLS Package • Cisco IOS XR MPLS -TE and RSVP Package • Cisco IOS XR Multicast Package • Cisco IOS XR Optics Package • Cisco IOS XR BNG Package • Cisco IOS XR Lawful Intercept Package • Cisco IOS XR Satellite Package • Cisco IOS XR Security Package • Cisco IOS XR EIGRP Package • Cisco IOS XR ISIS Package • Cisco IOS XR OSPF Package • Cisco IOS XR Service Package

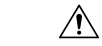
Feature Set	Filename	Description
Cisco IOS XR IP Unicast Routing Core Bundle and Migration to IOS XR 64 bit tar image	asr9k-mini-x64-migrate_to_eXR.tar-24.2.21	Contains the required core packages, including OS, Admin, Base,Forwarding, Modular Services Card, Routing, FPD, SNMP Agent, and Alarm Correlation. Contains mini.iso file for XR 64 bit 24.3.2 and additional software for migration to 64 bit.

Table 2: Cisco IOS XR 64 bit Software Release 24.2.21 ISO and RPM Files

Composite Package		
Feature Set	**Filename**	**Description**
Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-x64-24.2.21.iso	Contains the required core packages, including OS, Admin, Base,Forwarding, Modular Services Card, Routing, FPD, 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-r24221.x86_64.rpm	Includes EIGRP protocol support software
Cisco IOS XR BNG Package	asr9k-bng-x64-1.1.0.0-r24221.x86_64.rpm	Includes binaries to support BNG features.
Cisco IOS XR 64 bit ISIS package	asr9k-isis-x64-1.1.0.0-r24221.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-r24221.x86_64.rpm	Includes OSPF link state protocol support software
Cisco IOS XR Manageability Package	asr9k-mgbl-x64-3.0.0.0-r24221.x86_64.rpm	CORBA2 agent, XML3 Parser, and HTTP server packages. This RPM 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-r24221.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-r24221.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-r24221.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-r24221.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-r24221.x86_64.rpm	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-x64-3.1.0.0-r24221.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-r24221.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
Cisco IOS XR 64 bit Services Package	asr9k-services-x64-1.0.0.0-r24221.x86_64.rpm	Includes RPM to support Cisco IOS XR 64-bit inline MAP-T function

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 consist of the following:

- 32 GB memory on the A99-RP-F
- 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 RP3-X transport optimised (TR) variant and 48 GB memory on the RP3-X 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
- 24 GB memory on the RSP5-X transport optimised (TR) variant and 48 GB memory on the RSP5-X service edge (SE) variant
- 2 GB compact flash on route switch processors (RSPs)
- 8 GB memory on the line cards (LCs) running Cisco IOS XR 64-bit image

Software Compatibility

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

- Cisco ASR 9900 Series Chassis
  - Cisco ASR 9922 Chassis
  - Cisco ASR 9912 Chassis
  - Cisco ASR 9910 Chassis
  - Cisco ASR 9906 Chassis
  - Cisco ASR 9904 Chassis
  - Cisco ASR 9903 Chassis
  - Cisco ASR 9902 Chassis
  - Cisco ASR 9901 Chassis
- Cisco ASR 9000 Series Chassis
  - Cisco ASR 9010 Chassis
  - Cisco ASR 9006 Chassis

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

Determining Installed Packages

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

Cisco IOS XR 64 bit

```
Router# show install active summary
Label : 24.2.21

    Active Packages: 18
        asr9k-xr-24.2.21 version=24.2.21 [Boot image]
        asr9k-9000v-nV-x64-1.0.0.0-r24221
        asr9k-bng-ipoe-x64-1.0.0.0-r24221
        asr9k-bng-supp-x64-1.0.0.0-r24221
        asr9k-bng-x64-1.0.0.0-r24221
        asr9k-bng-pppoe-x64-1.0.0.0-r24221
        asr9k-eigrp-x64-1.0.0.0-r24221
        asr9k-isis-x64-1.0.0.0-r24221
```

```
asr9k-k9sec-x64-1.0.0.0-r24221
asr9k-li-x64-1.0.0.0-r24221
asr9k-m2m-x64-1.0.0.0-r24221
asr9k-mcast-x64-1.0.0.0-r24221
asr9k-mgbl-x64-1.0.0.0-r24221
asr9k-mpls-x64-1.0.0.0-r24221
asr9k-mpls-te-rsvp-x64-1.0.0.0-r24221
asr9k-optic-x64-1.0.0.0-r24221
asr9k-ospf-x64-1.0.0.0-r24221
asr9k-services-x64-1.0.0.0-r24221
```

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:



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

```
(sysadmin-vm)# show fpd package
================================ ================================================
                                          Field Programmable Device Package
                                 ================================================
                                           Req     SW        Min Req     Min Req
Card Type            FPD Description       Reload  Ver       SW Ver    Board Ver
================== ========================= ====== =======  ==========  =========
A99-10X400GE-X-CM    Aldrin-FPGA             YES     1.05        1.05      0.0
                     Beachcomber-0           YES     0.01        0.01      0.0
                     Beachcomber-1           YES     0.01        0.01      0.0
                     CBC                     NO     62.05       62.05      0.0
                     IPU-DDR4                YES     1.06        1.06      0.0
                     Primary-BIOS            YES    25.31       25.31      0.0
                     Sunstreaker             YES     0.19        0.19      0.0
                     TAMFW-Sunstreaker       YES     2.72        2.72      0.0
                     Trailbreaker-0          YES     0.24        0.24      0.0
                     Trailbreaker-1          YES     0.24        0.24      0.0
-------------------------------------------------------------------------------
A99-10X400GE-X-SE    Aldrin-FPGA             YES     1.05        1.05      0.0
                     Beachcomber-0           YES     0.01        0.01      0.0
                     Beachcomber-1           YES     0.01        0.01      0.0
                     CBC                     NO     62.05       62.05      0.0
                     IPU-DDR4                YES     1.06        1.06      0.0
                     Primary-BIOS            YES    25.31       25.31      0.0
                     Sunstreaker             YES     0.19        0.19      0.0
                     TAMFW-Sunstreaker       YES     2.72        2.72      0.0
                     Trailbreaker-0          YES     0.24        0.24      0.0
                     Trailbreaker-1          YES     0.24        0.24      0.0
-------------------------------------------------------------------------------
A99-10X400GE-X-TR    Aldrin-FPGA             YES     1.05        1.05      0.0
                     Beachcomber-0           YES     0.01        0.01      0.0
                     Beachcomber-1           YES     0.01        0.01      0.0
                     CBC                     NO     62.05       62.05      0.0
                     IPU-DDR4                YES     1.06        1.06      0.0
                     Primary-BIOS            YES    25.31       25.31      0.0
                     Sunstreaker             YES     0.19        0.19      0.0
                     TAMFW-Sunstreaker       YES     2.72        2.72      0.0
                     Trailbreaker-0          YES     0.24        0.24      0.0
                     Trailbreaker-1          YES     0.24        0.24      0.0
-------------------------------------------------------------------------------
A99-12X100GE         CBC                     NO     46.06       46.06      0.1
                     IPU-FPGA                YES     1.90        1.90      0.1
```

	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Morra-0	YES	1.05	1.05	0.1
	Morra-1	YES	1.05	1.05	0.1
	Primary-BIOS	YES	9.33	9.33	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	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Morra-0	YES	1.05	1.05	0.1
	Morra-1	YES	1.05	1.05	0.1
	Primary-BIOS	YES	9.33	9.33	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	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
A99-16X100GE-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
A99-16X100GE-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
A99-16X100GE-X-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
A99-24HG-FLEX-CM	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	57.04	57.04	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0

	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-24HG-FLEX-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	57.04	57.04	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-24HG-FLEX-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	57.04	57.04	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-24X10GE-1G-CM	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A99-24X10GE-1G-SE	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A99-24X10GE-1G-TR	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A99-32X100GE-CM	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0

	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
A99-32X100GE-DENS	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	57.04	57.04	0.0
	Grapple-0	YES	0.12	0.12	0.0
	Grapple-1	YES	0.12	0.12	0.0
	IPU-DDR4	YES	1.08	1.08	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.08	0.08	0.0
	Skylynx-1	YES	0.08	0.08	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-32X100GE-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
A99-32X100GE-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
A99-32X100GE-X-CM	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	57.04	57.04	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-32X100GE-X-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	57.04	57.04	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0

	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-32X100GE-X-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	57.04	57.04	0.0
	Grapple-0	YES	0.15	0.15	0.0
	Grapple-1	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Mixmaster-1	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-48X10GE-1G-CM	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A99-48X10GE-1G-SE	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A99-48X10GE-1G-TR	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A99-4HG-FLEX-FC	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	63.03	63.03	0.0
	IPU-DDR4	YES	1.05	1.05	0.0
	Moonracer	YES	0.14	0.14	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-4HG-FLEX-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	63.03	63.03	0.0
	IPU-DDR4	YES	1.05	1.05	0.0
	Moonracer	YES	0.14	0.14	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-4HG-FLEX-TR	Aldrin-FPGA	YES	1.05	1.05	0.0

	CBC	NO	63.03	63.03	0.0
	IPU-DDR4	YES	1.05	1.05	0.0
	Moonracer	YES	0.14	0.14	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A99-4X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-4X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-4X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-4X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-4X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-8X100GE-CM	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-8X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-8X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-8X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-8X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-8X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0

	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99-RP-F	Aldrin-0-FPGA	YES	1.06	1.06	0.0
	CBC	NO	59.13	59.13	0.0
	Lionheart-FPGA	YES	0.30	0.30	0.0
	Longshot	YES	2.16	2.16	0.0
	Primary-BIOS	YES	33.31	33.31	0.0
	TamFW-Longshot	YES	2.65	2.65	0.0
	Wolfpack-FPGA	YES	0.19	0.19	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	0.09	0.09	0.0
	IPU-FPGA	YES	0.72	0.72	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Omega-FPGA	YES	0.20	0.20	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	14.39	14.39	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	0.09	0.09	0.0
	IPU-FPGA	YES	0.72	0.72	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Omega-FPGA	YES	0.20	0.20	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	14.39	14.39	0.0
A99-RP3-SE	Aldrin-0-FPGA	YES	1.03	1.03	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	0.20	0.20	0.0
	Orion-FPGA	YES	0.23	0.23	0.0
	Primary-BIOS	YES	30.37	30.37	0.0
	Zenith-FPGA	YES	0.12	0.12	0.0
A99-RP3-TR	Aldrin-0-FPGA	YES	1.03	1.03	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	0.20	0.20	0.0
	Orion-FPGA	YES	0.23	0.23	0.0
	Primary-BIOS	YES	30.37	30.37	0.0

	Zenith-FPGA	YES	0.12	0.12	0.0
A99-RP3-X-SE	Aldrin-0-FPGA	YES	1.00	1.00	0.0
	Aldrin-1-FPGA	YES	32.00	32.00	0.0
	Beta-FPGA	YES	2.02	2.02	0.0
	CBC-0	NO	12.04	12.04	0.0
	CBC-1	NO	51.12	51.12	0.0
	IPU-DDR4	YES	3.04	3.04	0.0
	Orion-FPGA	YES	2.03	2.03	0.0
	Primary-BIOS	YES	35.12	35.12	0.0
	Sigma	YES	3.34	3.34	0.0
	TamFW-Sigma	YES	2.07	2.07	0.0
	Zenith-FPGA	YES	2.08	2.08	0.0
A99-RP3-X-TR	Aldrin-0-FPGA	YES	1.00	1.00	0.0
	Aldrin-1-FPGA	YES	32.00	32.00	0.0
	Beta-FPGA	YES	2.02	2.02	0.0
	CBC-0	NO	12.04	12.04	0.0
	CBC-1	NO	51.12	51.12	0.0
	IPU-DDR4	YES	3.04	3.04	0.0
	Orion-FPGA	YES	2.03	2.03	0.0
	Primary-BIOS	YES	35.12	35.12	0.0
	Sigma	YES	3.34	3.34	0.0
	TamFW-Sigma	YES	2.07	2.07	0.0
	Zenith-FPGA	YES	2.08	2.08	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	0.09	0.09	0.0
	IPU-FPGA	YES	0.72	0.72	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Omega-FPGA	YES	0.20	0.20	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	16.18	16.18	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	0.09	0.09	0.0
	IPU-FPGA	YES	0.72	0.72	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Omega-FPGA	YES	0.20	0.20	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	16.18	16.18	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	0.25	0.25	0.0

A99-SFC3-S	CBC	NO	44.02	44.02	0.0
	IPU-DDR4	YES	0.25	0.25	0.0
A99-SFC3-T	CBC	NO	44.02	44.02	0.0
	IPU-DDR4	YES	0.25	0.25	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99L-4X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A99L-8X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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

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A9K-16X100GE-CM      Aldrin-FPGA              YES     1.05        1.05      0.0
                     CBC                      NO     48.09       48.09      0.0
                     Grapple-0                YES     0.15        0.15      0.0
                     IPU-DDR4                 YES     1.09        1.09      0.0
                     Mixmaster-0              YES     0.13        0.13      0.0
                     Primary-BIOS             YES    21.43       21.43      0.0
                     Scamper                  YES     0.23        0.23      0.0
                     Skylynx-0                YES     0.12        0.12      0.0
-------------------------------------------------------------------------------
A9K-16X100GE-SE      Aldrin-FPGA              YES     1.05        1.05      0.0
                     CBC                      NO     48.09       48.09      0.0
                     Grapple-0                YES     0.15        0.15      0.0
                     IPU-DDR4                 YES     1.09        1.09      0.0
                     Mixmaster-0              YES     0.13        0.13      0.0
                     Primary-BIOS             YES    21.43       21.43      0.0
                     Scamper                  YES     0.23        0.23      0.0
                     Skylynx-0                YES     0.12        0.12      0.0
-------------------------------------------------------------------------------
A9K-16X100GE-TR      Aldrin-FPGA              YES     1.05        1.05      0.0
                     CBC                      NO     48.09       48.09      0.0
                     Grapple-0                YES     0.15        0.15      0.0
                     IPU-DDR4                 YES     1.09        1.09      0.0
                     Mixmaster-0              YES     0.13        0.13      0.0
                     Primary-BIOS             YES    21.43       21.43      0.0
                     Scamper                  YES     0.23        0.23      0.0
                     Skylynx-0                YES     0.12        0.12      0.0
-------------------------------------------------------------------------------
A9K-16X100GE-TR      Aldrin-FPGA              YES     1.05        1.05      0.0
                     CBC                      NO     48.09       48.09      0.0
                     Grapple-0                YES     0.15        0.15      0.0
                     IPU-DDR4                 YES     1.09        1.09      0.0
                     Mixmaster-0              YES     0.13        0.13      0.0
                     Primary-BIOS             YES    21.43       21.43      0.0
                     Scamper                  YES     0.23        0.23      0.0
                     Skylynx-0                YES     0.12        0.12      0.0
-------------------------------------------------------------------------------
A9K-20HG-FLEX-CM     Aldrin-FPGA              YES     1.05        1.05      0.0
                     CBC                      NO     58.09       58.09      0.0
                     IPU-DDR4                 YES     1.18        1.18      0.0
                     Primary-BIOS             YES    25.31       25.31      0.0
                     Sunstreaker              YES     0.19        0.19      0.0
                     TAMFW-Sunstreaker        YES     2.72        2.72      0.0
                     Trailbreaker-0           YES     0.24        0.24      0.0
                     Trailbreaker-1           YES     0.24        0.24      0.0
                     Windcharger-0            YES     0.08        0.08      0.0
                     Windcharger-1            YES     0.08        0.08      0.0
-------------------------------------------------------------------------------
A9K-20HG-FLEX-SE     Aldrin-FPGA              YES     1.05        1.05      0.0
                     CBC                      NO     58.09       58.09      0.0
                     IPU-DDR4                 YES     1.18        1.18      0.0
                     Primary-BIOS             YES    25.31       25.31      0.0
                     Sunstreaker              YES     0.19        0.19      0.0
                     TAMFW-Sunstreaker        YES     2.72        2.72      0.0
                     Trailbreaker-0           YES     0.24        0.24      0.0
                     Trailbreaker-1           YES     0.24        0.24      0.0
                     Windcharger-0            YES     0.08        0.08      0.0
                     Windcharger-1            YES     0.08        0.08      0.0
-------------------------------------------------------------------------------
A9K-20HG-FLEX-TR     Aldrin-FPGA              YES     1.05        1.05      0.0
                     CBC                      NO     58.09       58.09      0.0
                     IPU-DDR4                 YES     1.18        1.18      0.0
                     Primary-BIOS             YES    25.31       25.31      0.0
                     Sunstreaker              YES     0.19        0.19      0.0
                     TAMFW-Sunstreaker        YES     2.72        2.72      0.0
```

	Trailbreaker-0	YES	0.24	0.24	0.0
	Trailbreaker-1	YES	0.24	0.24	0.0
	Windcharger-0	YES	0.08	0.08	0.0
	Windcharger-1	YES	0.08	0.08	0.0
A9K-24X10GE-1G-CM	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A9K-24X10GE-1G-SE	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A9K-24X10GE-1G-TR	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	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	8.51	8.51	0.1
A9K-400GE-LSP	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	63.03	63.03	0.0
	IPU-DDR4	YES	1.05	1.05	0.0
	Moonracer	YES	0.14	0.14	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A9K-48X10GE-1G-CM	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A9K-48X10GE-1G-SE	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1

	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A9K-48X10GE-1G-TR	CBC	NO	47.03	47.03	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Leadfoot-0	YES	1.00	1.00	0.1
	Leadfoot-1	YES	1.00	1.00	0.1
	Lewis	YES	1.11	1.11	0.1
	Primary-BIOS	YES	18.33	18.33	0.1
A9K-4HG-FLEX-FC	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	63.03	63.03	0.0
	IPU-DDR4	YES	1.05	1.05	0.0
	Moonracer	YES	0.14	0.14	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A9K-4HG-FLEX-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	63.03	63.03	0.0
	IPU-DDR4	YES	1.05	1.05	0.0
	Moonracer	YES	0.14	0.14	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A9K-4HG-FLEX-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	63.03	63.03	0.0
	IPU-DDR4	YES	1.05	1.05	0.0
	Moonracer	YES	0.14	0.14	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A9K-4X100GE	CBC	NO	46.06	46.06	0.1
	IPU-FPGA	YES	1.90	1.90	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Morra-0	YES	1.05	1.05	0.1
	Primary-BIOS	YES	9.33	9.33	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A9K-4X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0

```
                    Meldun-0                YES     1.07        1.07      0.0
                    Meldun-1                YES     1.07        1.07      0.0
                    Primary-BIOS            YES     8.51        8.51      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     1.99        1.99      0.0
                    IPU-FSBL                YES     1.113       1.113     0.0
                    IPU-Linux               YES     1.113       1.113     0.0
                    Meldun-0                YES     1.07        1.07      0.0
                    Meldun-1                YES     1.07        1.07      0.0
                    Primary-BIOS            YES     8.51        8.51      0.0
-------------------------------------------------------------------------------
A9K-4X100GE-TAA     CBC                     NO     38.23       38.23      0.0
                    Dalla                   YES     1.09        1.09      0.0
                    IPU-FPGA                YES     1.99        1.99      0.0
                    IPU-FSBL                YES     1.113       1.113     0.0
                    IPU-Linux               YES     1.113       1.113     0.0
                    Meldun-0                YES     1.07        1.07      0.0
                    Meldun-1                YES     1.07        1.07      0.0
                    Primary-BIOS            YES     8.51        8.51      0.0
-------------------------------------------------------------------------------
A9K-4X100GE-TR      CBC                     NO     38.23       38.23      0.0
                    Dalla                   YES     1.09        1.09      0.0
                    IPU-FPGA                YES     1.99        1.99      0.0
                    IPU-FSBL                YES     1.113       1.113     0.0
                    IPU-Linux               YES     1.113       1.113     0.0
                    Meldun-0                YES     1.07        1.07      0.0
                    Meldun-1                YES     1.07        1.07      0.0
                    Primary-BIOS            YES     8.51        8.51      0.0
-------------------------------------------------------------------------------
A9K-4X100GE-TR      CBC                     NO     38.23       38.23      0.0
                    Dalla                   YES     1.09        1.09      0.0
                    IPU-FPGA                YES     1.99        1.99      0.0
                    IPU-FSBL                YES     1.113       1.113     0.0
                    IPU-Linux               YES     1.113       1.113     0.0
                    Meldun-0                YES     1.07        1.07      0.0
                    Meldun-1                YES     1.07        1.07      0.0
                    Primary-BIOS            YES     8.51        8.51      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     1.99        1.99      0.0
                    IPU-FSBL                YES     1.113       1.113     0.0
                    IPU-Linux               YES     1.113       1.113     0.0
                    Meldun-0                YES     1.07        1.07      0.0
                    Meldun-1                YES     1.07        1.07      0.0
                    Primary-BIOS            YES     8.51        8.51      0.0
-------------------------------------------------------------------------------
A9K-4X100GE-TR-V2   Aldrin-FPGA             YES     1.05        1.05      0.0
                    CBC                     NO     48.09       48.09      0.0
                    Grapple-0               YES     0.15        0.15      0.0
                    IPU-DDR4                YES     1.09        1.09      0.0
                    Mixmaster-0             YES     0.13        0.13      0.0
                    Primary-BIOS            YES    21.43       21.43      0.0
                    Scamper                 YES     0.23        0.23      0.0
                    Skylynx-0               YES     0.12        0.12      0.0
-------------------------------------------------------------------------------
A9K-8HG-FLEX-CM     Aldrin-FPGA             YES     1.05        1.05      0.0
                    CBC                     NO     58.09       58.09      0.0
                    IPU-DDR4                YES     1.18        1.18      0.0
                    Primary-BIOS            YES    25.31       25.31      0.0
                    Sunstreaker             YES     0.19        0.19      0.0
                    TAMFW-Sunstreaker       YES     2.72        2.72      0.0
```

	Trailbreaker-0	YES	0.24	0.24	0.0
	Windcharger-0	YES	0.08	0.08	0.0
A9K-8HG-FLEX-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	58.09	58.09	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
	Trailbreaker-0	YES	0.24	0.24	0.0
	Windcharger-0	YES	0.08	0.08	0.0
A9K-8HG-FLEX-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	58.09	58.09	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
	Trailbreaker-0	YES	0.24	0.24	0.0
	Windcharger-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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A9K-8X100GE-SE	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0

	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A9K-8X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A9K-8X100GE-TR	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A9K-8X100GE-X-CM	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
A9K-8X100GE-X-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
A9K-8X100GE-X-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0

A9K-8X100GE-X-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	48.09	48.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.09	1.09	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	21.43	21.43	0.0
	Scamper	YES	0.23	0.23	0.0
	Skylynx-0	YES	0.12	0.12	0.0
A9K-8X100GE-X2-CM	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	58.09	58.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A9K-8X100GE-X2-SE	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	58.09	58.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A9K-8X100GE-X2-TR	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	58.09	58.09	0.0
	Grapple-0	YES	0.15	0.15	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Mixmaster-0	YES	0.13	0.13	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
A9K-8X100GELSE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A9K-8X100GELTR-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	0.0
A9K-MOD200-CM	Blaster	YES	1.27	1.27	0.1
	CBC	NO	39.09	39.09	0.1
	IPU-FPGA	YES	1.101	1.101	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Primary-BIOS	YES	8.51	8.51	0.1

A9K-MOD200-SE	Blaster	YES	1.27	1.27	0.1
	CBC	NO	39.09	39.09	0.1
	IPU-FPGA	YES	1.101	1.101	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Primary-BIOS	YES	8.51	8.51	0.1
A9K-MOD200-TR	Blaster	YES	1.27	1.27	0.1
	CBC	NO	39.09	39.09	0.1
	IPU-FPGA	YES	1.101	1.101	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Primary-BIOS	YES	8.51	8.51	0.1
A9K-MOD400-CM	Blaster	YES	1.27	1.27	0.1
	CBC	NO	39.09	39.09	0.1
	IPU-FPGA	YES	1.101	1.101	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Primary-BIOS	YES	8.51	8.51	0.1
A9K-MOD400-SE	Blaster	YES	1.27	1.27	0.1
	CBC	NO	39.09	39.09	0.1
	IPU-FPGA	YES	1.101	1.101	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Primary-BIOS	YES	8.51	8.51	0.1
A9K-MOD400-TR	Blaster	YES	1.27	1.27	0.1
	CBC	NO	39.09	39.09	0.1
	IPU-FPGA	YES	1.101	1.101	0.1
	IPU-FSBL	YES	1.113	1.113	0.1
	IPU-Linux	YES	1.113	1.113	0.1
	Primary-BIOS	YES	8.51	8.51	0.1
A9K-RSP5-SE	Aldrin-0-FPGA	YES	1.06	1.06	0.0
	Beta-FPGA	YES	0.07	0.07	0.0
	CBC	NO	53.10	53.10	0.0
	IPU-DDR4	YES	0.20	0.20	0.0
	Orion-FPGA	YES	0.23	0.23	0.0
	Primary-BIOS	YES	31.37	31.37	0.0
	Zenith-FPGA	YES	0.12	0.12	0.0
A9K-RSP5-TR	Aldrin-0-FPGA	YES	1.06	1.06	0.0
	Beta-FPGA	YES	0.07	0.07	0.0
	CBC	NO	53.10	53.10	0.0
	IPU-DDR4	YES	0.20	0.20	0.0
	Orion-FPGA	YES	0.23	0.23	0.0
	Primary-BIOS	YES	31.37	31.37	0.0
	Zenith-FPGA	YES	0.12	0.12	0.0
A9K-RSP5-X-SE	Aldrin-0-FPGA	YES	51.00	51.00	0.0
	Beta-FPGA	YES	2.02	2.02	0.0
	CBC	NO	14.04	14.04	0.0
	IPU-DDR4	YES	3.04	3.04	0.0
	Orion-FPGA	YES	2.03	2.03	0.0
	Primary-BIOS	YES	35.12	35.12	0.0
	Sigma	YES	3.34	3.34	0.0
	TamFW-Sigma	YES	2.07	2.07	0.0
	Zenith-FPGA	YES	2.08	2.08	0.0
A9K-RSP5-X-TR	Aldrin-0-FPGA	YES	51.00	51.00	0.0
	Beta-FPGA	YES	2.02	2.02	0.0

	CBC	NO	14.04	14.04	0.0
	IPU-DDR4	YES	3.04	3.04	0.0
	Orion-FPGA	YES	2.03	2.03	0.0
	Primary-BIOS	YES	35.12	35.12	0.0
	Sigma	YES	3.34	3.34	0.0
	TamFW-Sigma	YES	2.07	2.07	0.0
	Zenith-FPGA	YES	2.08	2.08	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	50.03	50.03	0.0
	IPU-FPGA	YES	0.20	0.20	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Omega-FPGA	YES	0.07	0.07	0.0
	Optimus-FPGA	YES	0.05	0.05	0.0
	Primary-BIOS	YES	17.40	17.40	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	50.03	50.03	0.0
	IPU-FPGA	YES	0.20	0.20	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Omega-FPGA	YES	0.07	0.07	0.0
	Optimus-FPGA	YES	0.05	0.05	0.0
	Primary-BIOS	YES	17.40	17.40	0.0
A9K-RSP880-SE	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	34.40	34.40	0.0
	Cha-FPGA	YES	0.09	0.09	0.0
	IPU-FPGA	YES	0.72	0.72	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Omega-FPGA	YES	0.20	0.20	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	10.69	10.69	0.0
A9K-RSP880-TR	Alpha-FPGA	YES	0.16	0.16	0.0
	CBC	NO	34.40	34.40	0.0
	Cha-FPGA	YES	0.09	0.09	0.0
	IPU-FPGA	YES	0.72	0.72	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Omega-FPGA	YES	0.20	0.20	0.0
	Optimus-FPGA	YES	0.12	0.12	0.0
	Primary-BIOS	YES	10.69	10.69	0.0
A9K-TEST_LSQ_DX1	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	58.09	58.09	0.0
	IPU-DDR4	YES	1.18	1.18	0.0
	Primary-BIOS	YES	25.31	25.31	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
	Trailbreaker-0	YES	0.24	0.24	0.0
	Windcharger-0	YES	0.08	0.08	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0

	Primary-BIOS	YES	8.51	8.51	0.0
A9KL-4X100GE-TAA	CBC	NO	38.23	38.23	0.0
	Dalla	YES	1.09	1.09	0.0
	IPU-FPGA	YES	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	1.99	1.99	0.0
	IPU-FSBL	YES	1.113	1.113	0.0
	IPU-Linux	YES	1.113	1.113	0.0
	Meldun-0	YES	1.07	1.07	0.0
	Meldun-1	YES	1.07	1.07	0.0
	Primary-BIOS	YES	8.51	8.51	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	5.06	5.06	0.0
ASR-9006-FAN-V2	CBC	NO	5.06	5.06	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	1.10	1.10	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Primary-BIOS	YES	23.24	23.24	0.1
ASR-9901-RP	CBC	NO	54.11	54.11	0.1
	Drax-FPGA	YES	0.38	0.38	0.1
	IPU-FPGA	YES	2.05	2.05	0.1
	IPU-FSBL	YES	1.104	1.104	0.1
	IPU-Linux	YES	1.104	1.104	0.1
	Primary-BIOS	YES	22.29	22.29	0.1
ASR-9902	FAN-CBC	NO	61.25	61.25	0.0
ASR-9902-LC	Aldrin-FPGA	YES	1.05	1.05	0.0
	CBC	NO	17.03	17.03	0.0
	Chromia	YES	0.14	0.14	0.0
	IPU-DDR4	YES	1.17	1.17	0.0
	Primary-BIOS	YES	34.31	34.31	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.19	0.19	0.0
	TAMFW-Sunstreaker	YES	2.72	2.72	0.0
ASR-9903	FAN-CBC	NO	61.25	61.25	0.0

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ASR-9903-LC          Aldrin-0-FPGA             YES     1.05        1.05      0.0
                     CBC                       NO     60.12       60.12      0.0
                     Harpoon-0                 YES     0.11        0.11      0.0
                     Harpoon-1                 YES     0.11        0.11      0.0
                     IPU-DDR4                  YES     1.25        1.25      0.0
                     Metalmaster-0             YES     0.02        0.02      0.0
                     Metalmaster-1             YES     0.02        0.02      0.0
                     Primary-BIOS              YES    34.31       34.31      0.0
                     Scattershot               YES     0.14        0.14      0.0
                     Sunstreaker               YES     0.19        0.19      0.0
                     Supernaut                 YES     0.14        0.14      0.0
                     TAMFW-Sunstreaker         YES     2.72        2.72      0.0
                     Warstar-0                 YES     0.02        0.02      0.0
                     Warstar-1                 YES     0.02        0.02      0.0
-------------------------------------------------------------------------------
ASR-9903-PXC800G-LC  Harpoon-0                 YES     0.11        0.11      0.0
                     Harpoon-1                 YES     0.11        0.11      0.0
-------------------------------------------------------------------------------
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-1.6KW-AC         PO-PriMCU                 NO     17.20       17.20      0.0
                     QCS-PriMCU                NO      3.02        3.02      0.1
                     QCS-SecMCU                NO      4.04        4.04      0.1
-------------------------------------------------------------------------------
PWR-1.6KW-DC         PO-PriMCU                 NO      1.03        1.03      0.0
                     QCS-PriMCU                NO      1.05        1.05      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      3.13        3.13      0.12
                     EM-Sec54vMCU              NO      3.21        3.21      0.12
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                    EM-Sec5vMCU               NO      3.20        3.20      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-3KW-HVDC        DT-PriMCU                 NO      2.02        2.02      1.0
                    DT-Sec54vMCU              NO      2.02        2.02      1.0
                    DT-Sec5vMCU               NO      2.03        2.03      1.0
-------------------------------------------------------------------------------
PWR-4.4KW-DC-V3     AB-Pri0MCU                NO      3.02        3.02      0.1
                    AB-Pri1MCU                NO      3.02        3.02      0.1
                    AB-Sec054vMCU             NO      3.04        3.04      0.1
                    AB-Sec154vMCU             NO      3.04        3.04      0.1
                    AB-Sec5vMCU               NO      3.06        3.06      0.1
                    DT-Pri0MCU                NO      3.01        3.01      0.1
                    DT-Pri1MCU                NO      3.01        3.01      0.1
                    DT-Sec054vMCU             NO      3.03        3.03      0.1
                    DT-Sec154vMCU             NO      3.03        3.03      0.1
                    DT-Sec5vMCU               NO      3.02        3.02      0.1
                    QCS-Pri0MCU               NO      1.04        1.04      0.1
                    QCS-Pri1MCU               NO      1.04        1.04      0.1
                    QCS-Sec054vMCU            NO      1.10        1.10      0.1
                    QCS-Sec154vMCU            NO      1.10        1.10      0.1
                    QCS-Sec5vMCU              NO      1.06        1.06      0.1
-------------------------------------------------------------------------------
PWR-6KW-AC-V3       AB-Pri0MCU                NO      3.02        3.02      0.1
                    AB-Pri1MCU                NO      3.02        3.02      0.1
                    AB-Sec054vMCU             NO      3.02        3.02      0.1
                    AB-Sec154vMCU             NO      3.02        3.02      0.1
                    AB-Sec5vMCU               NO      3.05        3.05      0.1
                    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
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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 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 3: Cisco ASR 9000 Series Aggregation Services Router Supported Hardware and Minimum Software Requirements

Cisco ASR 9000 Series Aggregation Services Router - Route Switch Processor Cards		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
A9K-RSP5-X-SE	ASR 9000 Series Route Switch Processor 5 for Service Edge, Premium	Release 7.6.2

A9K-RSP5-X-TR	ASR 9000 Series Route Switch Processor 5 for Packet Transport, Premium	Release 7.6.2
A9K-RSP5-SE	ASR 9000 Route Switch Processor 5 for Service Edge	Release 6.5.15
A9K-RSP5-TR	ASR 9000 Route Switch Processor 5 for Packet Transport	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router - Route Processor Cards		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
A99-RP3-X-SE	ASR 9900 Route Processor 3 for Service Edge, Premium	Release 7.6.2
A99-RP3-X-TR	ASR 9900 Route Processor 3 for Packet Transport, Premium	Release 7.6.2
A99-RP3-SE	ASR 9900 Route Processor 3 for Service Edge	Release 6.5.15
A99-RP3-TR	ASR 9900 Route Processor 3 for Packet Transport	Release 6.5.15
Cisco ASR 9901 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9901	Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port	Release 6.4.1
ASR-9901-FAN	Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port Fan Tray	Release 6.4.1
A9K-1600W-AC	Cisco ASR 9000 Series Aggregation Services Router 2-RU 1600W AC Power Module	Release 6.4.1
A9K-1600W-DC	Cisco ASR 9000 Series Aggregation Services Router 2-RU 1600W DC Power Module	Release 6.4.1
Cisco ASR 9902 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9902	Cisco ASR 9902 2RU Chassis with fixed ports	Release 7.4.1
A99-RP-F	Cisco ASR 9900 Fixed Chassis Route Processor	Release 7.1.3
ASR-9902-4P-KIT	Cisco ASR 9902 4-Post Mounting Kit for 19-Inch and 23-Inch Rack	Release 7.4.1
ASR-9902-4P-KIT-L	ASR 9902 4-Post Mounting Kit for 19 & 23 inch Rack – Long	Release 7.4.1
ASR-9902-2P-KIT	Cisco ASR 9902 2-Post Mounting Kit for 19-Inch and 23-Inch Rack	Release 7.4.1
ASR-9902-CAB-MGMT	Cisco ASR 9902 Cable Management	Release 7.4.1
ASR-9902-FILTER	Cisco ASR 9902 Air Filter	Release 7.4.1
ASR-9902-FAN	Cisco ASR 9902 Fan Tray	Release 7.4.1

Cisco ASR 9903 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9903	Cisco ASR 9903 Compact High-Performance Router with fixed ports and PEC (Port Expansion Card) slot.	Release 7.1.3
A99-RP-F	Cisco ASR 9900 Fixed Chassis Route Processor	Release 7.1.3
ASR-9903-FAN	Cisco ASR 9903 Router Fan Tray	Release 7.1.3
ASR-9903-4P-KIT	ASR 9903 4-Post Mounting Kit for 19-inch Rack	Release 7.1.3
ASR-9903-CAB-MGMT	ASR 9903 Cable Management Brackets	Release 7.1.3
ASR-9903-FILTER	ASR 9903 Air Filter	Release 7.1.3
Cisco ASR 9904 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9904	Cisco ASR 9000 Series Aggregation Services Router 4-Slot 2 Line Card Slot Chassis, 6 RU	Release 6.1.2
ASR-9904-AC	Cisco ASR 9000 Series Aggregation Services Router 4-Slot 2 Line Card Slot AC Chassis w/ PEM V2	Release 6.1.2
ASR-9904-DC	Cisco ASR 9000 Series Aggregation Services Router 4-Slot 2 Line Card Slot DC Chassis w/ PEM V2	Release 6.1.2
ASR-9904-FAN	Cisco ASR 9000 Series Aggregation Services Router 4-Slot Fan Tray	Release 6.1.2
ASR-9904-FILTER	Cisco ASR 9000 Series Aggregation Services Router 4-Slot Filter	Release 6.1.2
ASR-9904-BAFFLE	Cisco ASR 9000 Series Aggregation Services Router 4-Slot Baffle	Release 6.1.2
Cisco ASR 9912 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9912	Cisco ASR 9000 Series Aggregation Services Router 12-Slot 10 Line Card Slot Chassis	Release 6.1.2
ASR-9912-AC	Cisco ASR 9000 Series Aggregation Services Router 12-Slot 10 Line Card Slot AC Chassis w/ PEM V2	Release 6.1.2
ASR-9912-DC	Cisco ASR 9000 Series Aggregation Services Router 12-Slot 10 Line Card Slot DC Chassis w/ PEM V2	Release 6.1.2
A99-SFC3	Cisco ASR 9900 Switch Fabric Card 3	Release 6.5.15
ASR-9912-FAN	Cisco ASR 9000 Series Aggregation Services Router 12-Slot Fan Tray	Release 6.1.2

Cisco ASR 9922 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9922	Cisco ASR 9922 20 Line Card Slot Chassis, 44 RU	Release 6.1.2
ASR-9922-AC	Cisco ASR 9000 Series Aggregation Services Router 22-Slot 20 Line Card Slot AC Chassis w/ PEM V2	Release 6.1.2
ASR-9922-DC	Cisco ASR 9000 Series Aggregation Services Router 22-Slot 20 Line Card Slot DC Chassis w/ PEM V2	Release 6.1.2
A99-SFC3	Cisco ASR 9900 Switch Fabric Card 3	Release 6.5.15
ASR-9922-FAN-V3	Cisco ASR 9000 Series Aggregation Services Router 22-Slot Fan Tray version 3	Release 6.5.15
ASR-9922-FLTR-CV2	Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Filter with Media, Center	Release 6.1.2
ASR-9922-FLTR-LR	Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Filter with Media, Left & Right	Release 6.1.2
ASR-9922-RP-FILR	Cisco ASR 9000 Series Aggregation Services Router 22-Slot Route Processor Filler	Release 6.1.2
ASR-9922-FAN-V2	Cisco ASR 9000 Series Aggregation Services Router 22-Slot Version 2 Fan Tray	Release 6.1.2
Cisco ASR 9006 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9006-SYS	Cisco ASR 9000 Series Aggregation Services Router 6-Slot System	Release 6.1.2
ASR-9006-AC-V2	Cisco ASR 9000 Series Aggregation Services Router 6-Slot AC Chassis Version 2	Release 6.1.2
ASR-9006-DC-V2	Cisco ASR 9000 Series Aggregation Services Router 6-Slot DC Chassis Version 2	Release 6.1.2
ASR-9006-FAN	Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Tray	Release 6.1.2
ASR-9006-FAN-V2	Cisco ASR 9000 Series Aggregation Services Router 6-Slot Version 2 Fan Tray	Release 6.1.2
ASR-9006-DOOR	Cisco ASR 9000 Series Aggregation Services Router 6-Slot Door Kit	Release 6.1.2
ASR-9006-FILTER	Cisco ASR 9000 Series Aggregation Services Router 6-Slot Air Filter	Release 6.1.2
Cisco ASR 9906 Router		

Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
ASR-9906	Cisco ASR 9000 Series Aggregation Services Router 6-Slot chassis	Release 6.3.1
ASR-9906-FAN	Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Tray	Release 6.3.1
ASR-9906-FILTER	Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Filter	Release 6.3.1
A99-SFC3-T	ASR 9906 Switch Fabric Card	Release 6.5.15
Cisco ASR 9010 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9010-SYS	Cisco ASR 9000 Series Aggregation Services Router 10-Slot System	Release 6.1.2
ASR-9010-AC-V2	Cisco ASR 9000 Series Aggregation Services Router 10-Slot AC Chassis Version 2	Release 6.1.2
ASR-9010-DC-V2	Cisco ASR 9000 Series Aggregation Services Router 10-Slot DC Chassis Version 2	Release 6.1.2
ASR-9010-FAN	Cisco ASR 9000 Series Aggregation Services Router 10-Slot Fan Tray	Release 6.1.2
ASR-9010-FAN-V2	Cisco ASR 9000 Series Aggregation Services Router 10-Slot Version 2 Fan Tray	Release 6.1.2
ASR-9010-DOOR	Cisco ASR 9000 Series Aggregation Services Router 10-Slot Door Kit	Release 6.1.2
ASR-9010-2P-KIT	Cisco ASR 9000 Series Aggregation Services Router 2 Post Mounting Kit	Release 6.1.2
ASR-9010-4P-KIT	Cisco ASR 9000 Series Aggregration Services Router 4 Post Mounting Kit	Release 6.1.2
ASR-9010-FILTER	Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air Filter	Release 6.1.2
Cisco ASR 9910 Router		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
ASR-9910	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) System	Release 6.2.1
ASR-9910-FAN	Cisco ASR 9000 Series Aggregation Services Router 10-Slot(9910) Fan Tray	Release 6.2.1
ASR-9910-ACC-KIT	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Accessory Kit	Release 6.2.1

ASR-9910-4P-KIT	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 4 Post Rack Mounting Kit	Release 6.2.1
ASR-9910-2P-KIT	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 2 Post Rack Mounting Kit	Release 6.2.1
ASR-9910-AIRREF	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Reflector	Release 6.2.1
ASR-9910-FILTER	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Filter	Release 6.2.1
A99-SFC3-S	ASR 9910 Switch Fabric Card 3	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router - Power Modules		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
PWR-2KW-DC-V2	Cisco ASR 9000 Series Aggregation Services Router 2KW DC Power Module, version 2	Release 6.1.2
PWR-3KW-AC-V2	Cisco ASR 9000 Series Aggregation Services Router 3KW AC Power Module, version 2	Release 6.1.2
A9K-AC-PEM-V2	Cisco ASR 9000 Series Aggregation Services Router AC Power Entry Module Version 2	Release 6.1.2
A9K-DC-PEM-V2	Cisco ASR 9000 Series Aggregation Services Router DC Power Entry Module Version 2	Release 6.1.2
A9K-PEM-V2-FILR	Cisco ASR 9000 Series Aggregation Services Router Power Entry Module Version 2 Filler	Release 6.1.2
A9K-AC-PEM-V3	Cisco ASR 9000 Series Aggregation Services Router AC Power Enclosure Module Version 3	Release 6.1.2
A9K-DC-PEM-V3	Cisco ASR 9000 Series Aggregation Services Router DC Power Enclosure Module Version 3	Release 6.1.2
PWR-6KW-AC-V3	Cisco ASR 9000 Series Aggregation Services Router 6kW AC Power Module Version 3	Release 6.1.2
PWR-4.4KW-DC-V3	Cisco ASR 9000 Series Aggregation Services Router 4.4kW DC Power Module Version 3	Release 6.1.2
PWR-1.6KW-AC	ASR 9900 Fixed Chassis AC Power Supply	Release 7.1.25
PWR-1.6KW-DC	ASR 9900 Fixed Chassis DC Power Supply	Release 7.1.25
Cisco ASR 9000 Series Aggregation Services Router - Line Cards		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**

A9K-4HG-FLEX-SE	ASR 9000 400GE Combo Service Edge Line Card - 5th Generation	Release 7.4.1
A9K-4HG-FLEX-TR	ASR 9000 400GE Combo Packet Transport Line Card - 5th Generation	Release 7.4.1
A99-4HG-FLEX-SE	ASR 9900 400GE Combo Service Edge Line Card - 5th Generation	Release 7.4.1
A99-4HG-FLEX-TR	ASR 9900 400GE Combo Packet Transport Line Card - 5th Generation	Release 7.4.1
A9903-8HG-PEC	ASR 9903 800G Multi-rate Port Expansion Card	Release 7.4.1
A99-10X400GE-X-SE	ASR 9900 4T Service Edge Line Card - 5th Generation	Release 7.3.1
A99-10X400GE-X-TR	ASR 9900 4T Packet Transport Line Card - 5th Generation	Release 7.3.1
A9903-20HG-PEC	ASR 9903 2T Multi-rate Port Expansion Card	Release 7.1.3
A99-32X100GE-X-SE	ASR 9000 32-Port 100GE QSFP28/QSFP+ Service Edge optimized Line Card - 5th Generation	Release 7.1.15
A99-32X100GE-X-TR	ASR 9000 32-Port 100GE QSFP28/QSFP+ Packet Transport optimized Line Card - 5th Generation	Release 7.1.15
A9K-20HG-FLEX-SE A9K-20HG-FLEX-TR	ASR 9000 2T Combo Line Card - 5th Generation	Release 7.1.15
A9K-8HG-FLEX-SE A9K-8HG-FLEX-TR	ASR 9000 800G Combo Line Card - 5th Generation	Release 7.1.15
A9K-16X100GE-TR	ASR 9000 16-port 100GE QSFP TR line card	Release 6.5.15
A99-32X100GE-TR	ASR 9900 32-port 100GE QSFP TR line card	Release 6.5.15
A99-48X10GE-1G-SE	ASR 9000 48 port dual rate 10G/1G Service Edge line card	Release 6.5.2
A99-48X10GE-1G-TR	ASR 9000 48 port dual rate 10G/1G Transport Optimised line card	Release 6.5.2
A99-16X100GE-X-SE	ASR 9900 16-port 100GE QSFP SE	Release 6.5.3
A9K-48X10GE-1G-CM	ASR 9000 48-port dual-rate 10G/1G Consumption Model line card	Release 6.4.1
A9K-24X10GE-1G-CM	ASR 9000 24-port dual-rate 10G/1G Consumption Model line card	Release 6.4.1
A9K-48X10GE-1G-SE	ASR9000 48-port dual-rate 10G/1G service edge–optimized line card	Release 6.3.2
A9K-48X10GE-1G-TR	ASR9000 48-port dual-rate 10G/1G packet transport–optimized line card	Release 6.3.2
A9K-24X10GE-1G-SE	ASR9000 24-port dual-rate 10G/1G service edge–optimized line card	Release 6.3.2
A9K-24X10GE-1G-TR	ASR9000 24-port dual-rate 10G/1G packet transport–optimized line card	Release 6.3.2
Cisco ASR 9000 Series Aggregation Services Router - Modular Line Cards		

Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
A9K-MOD400-CM	Cisco ASR 9000 Modular 400G Consumption Model Line Card	Release 6.2.1
A9K-MOD400-SE	Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Service Edge Optimized	Release 6.2.1
A9K-MOD400-TR	Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Packet Transport Optimized	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router - Modular Port Adapters (MPAs)		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
A9K-MPA-1X200GE	Cisco ASR 9000 1-port 200-Gigabit Ethernet MPA, requires CFP2-DCO optics	Release 6.6.2
A9K-MPA-32X1GE	Cisco ASR 9000 32-port 1-Gigabit Ethernet MPA with MACSec	Release 6.6.2
A9K-MPA20X10GE-CM	Cisco ASR 9000 20x10GE Consumption Model MPA	Release 6.5.1
A9K-MPA2X100GE-CM	Cisco ASR 9000 2x100GE Consumption Model MPA	Release 6.5.1
A9K-MPA-1X100GE	Cisco ASR 9000 Series Aggregation Services Router 1-port 100-Gigabit Modular Port Adapter	Release 6.3.1
A9K-MPA-2X100GE	Cisco ASR 9000 Series Aggregation Services Router 2-port 100-Gigabit Modular Port Adapter	Release 6.2.2
A9K-MPA-20x10GE	20-Port 10-Gigabit Ethernet Modular Port Adapter with SFP+	Release 6.2.1
A9K-MPA-8X10GE	Cisco ASR 9000 Series Aggregation Services Router 8-port 10GE Modular Port Adapter	Release 6.3.2
A9K-MPA-4X10GE	Cisco ASR 9000 Series Aggregation Services Router 4-port 10GE Modular Port Adapter	Release 6.2.1
A9K-MPA-20X1GE	Cisco ASR 9000 Series Aggregation Services Router 20-port 1GE Modular Port Adapter	Release 6.2.1
A9K-MPA-2X40GE	Cisco ASR 9000 Series Aggregation Services Router 2-port 40GE Modular Port Adapter	Release 6.3.1
Cisco ASR 9000v Satellite Shelf		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
A9KV-V2-DC-A=	Cisco ASR 9000v Satellite Shelf Version 2 DC power ANSI chassis	Release 6.2.1
A9KV-V2-DC-E=	Cisco ASR 9000v Satellite Shelf Version 2 DC power chassis	Release 6.2.1
A9KV-V2-AC=	Cisco ASR 9000v Satellite Shelf AC power chassis	Release 6.2.1

A9KV-V2-FAN=	Cisco ASR 9000v Satellite Shelf Version 2 Fan Tray	Release 6.2.1
Cisco NCS 5000 Satellite Shelf		
Part Number	**Description**	**Support Initially Provided in IOS XR 64 bit Release**
NCS-5001	Cisco NCS 5001 Series Router	Release 6.2.1
NCS-5002	Cisco NCS 5002 Series Router	Release 6.2.1
NCS-5001-ACSR	Cisco NCS 5001 Router Accessory Kit	Release 6.2.1
NCS-5002-ACSR	Cisco NCS 5002 Router Accessory Kit	Release 6.2.1
NCS-5001-FN-BK	Cisco NCS 5001 Router Fan Back to Front AirFlow	Release 6.2.1
NCS-5002-FN-BK	Cisco NCS 5002 Router Fan Back to Front AirFlow	Release 6.2.1
NCS-5001-FLT-BK	Cisco NCS 5001 Air Filter Back to Front Airflow	Release 6.2.1
NCS-5002-FLT-BK	Cisco NCS 5002 Air Filter Back to Front Airflow	Release 6.2.1
NCS-5001-FN-FR	Cisco NCS 5001 Fan Front to Back Airflow	Release 6.2.1
NCS-5002-FN-FR	Cisco NCS 5002 Fan Front to Back Airflow	Release 6.2.1
NCS-5001-FLT-FR	Cisco NCS 5001 Air Filter Front to Back Airflow	Release 6.2.1
NCS-5002-FLT-FR	Cisco NCS 5002 Air Filter Front to Back Airflow	Release 6.2.1

Compatibility Matrix for EPNM and Crosswork with Cisco IOS XR Software

The compatibility matrix lists the version of EPNM and Crosswork that are supported with Cisco IOS XR Release in this release.

Table 4: Compatibility Matrix

Cisco IOS XR	Crosswork	EPNM
Release 24.2.21	Crosswork Optimization Engine 7.0	Evolved Programmable Network Manager 8.0

Important Notes

- Repetitive Smart Licensing evaluation expired warning messages are displayed on the console every hour, but no functionality impact is observed on the device. To stop these repetitive messages, you should register the device again with a new registration token.
- From IOS XR Release 7.0, 1st and 2nd generation of Ethernet ASR 9000 line cards are not supported.
- 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.

- Exceeding Cisco testing—If you intend to test beyond the combined maximum configuration tested and published by Cisco, contact your Cisco Account Team or Technical Support representative to discuss how to engineer a large-scale configuration for your purpose.
- Starting Cisco IOS XR Software Release 24.1.1, ISSU upgrades and ISSU SMU are not supported for ASR 9000 third-generation line cards.
- For ZTP, In Cisco IOS XR Release 7.3.1 and earlier, the system accepts the device sending **user-class = "exr-config"**; however starting Cisco IOS XR Release 7.3.2 and later, you must use only **user-class = "xr-config"**.

  In Cisco IOS XR Release 7.3.2 and later, use:

```
host cisco-rp0 {
   hardware ethernet e4:c7:22:be:10:ba;
   fixed-address 172.30.12.54;
   if exists user-class and option user-class = "iPXE" {
      filename = "http://172.30.0.22/boot.ipxe";
   } elsif exists user-class and option user-class = "xr-config" {
      filename = "http://172.30.0.22/scripts/cisco-rp0_ztp.sh";
   }
}
```

- The auto FPD upgrade may result in certain intentional exceptions, which may need manual upgrades or reloading for a few FPDs. We recommend you use the **show hw-module fpd** command to check the hardware module status immediately after the FPD auto upgrade is complete and take necessary action in both admin and XR VM mode. That is, if any FPD displays a **NEED UPGD** status, then upgrade those FPDs individually by the manual upgrade and follow it with a reload in admin mode, and if any FPDs show a **RLOAD REQ** status, perform a hardware module reload from admin mode.

Licensing

Starting with Cisco IOS XR Release 24.1.1, Smart Licensing Using Policy (SLP) is the default Licensing model. When you upgrade to the Cisco IOS XR Release 24.1.1 release or later, the Smart Licensing Using Policy is enabled by default.

You can migrate your devices to Smart Licensing with Policy model, see *Migrating from Smart Licensing to Smart Licensing Using Policy*, Smart Licensing Using Policy on Cisco IOS XR Routers.

We recommend that you update to the latest version of SSM On-Prem or Cisco Smart Licensing Utility.



Note SSM On-Prem and CSSM both support SLP devices and SL devices. SLP devices and SL devices can coexist in a network. The Smart Licensing (SL) model is available in releases Cisco IOS XR Release 7.11.1 and earlier.

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.

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.

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 Route Processor Module (RPM) files that contain one or more software components.

The upgrade document is available along with the software images.

Note If you have mLACP/ICCP Redundancy Model setup, ensure that you upgrade the active and standby nodes to the same IOS XR version while upgrading to a newer version of the ASR 9000 router.

Cisco IOS XR Error messages

To view, search, compare, and download Cisco IOS XR Error Messages, refer to the Cisco IOS XR Error messages tool.

Cisco IOS XR MIBs

To determine the MIBs supported by platform and release, refer to the Cisco IOS XR MIBs tool.

Related Documentation

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

https://www.cisco.com/c/en/us/td/docs/iosxr/asr-9000-series-routers.html

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