



Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 7.5.2

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Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 7.5.2

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



Note Cisco IOS XR Release 7.5.2 is an Extended Maintenance Release of [Cisco IOS XR Release 7.5.1](#) for Cisco ASR 9000 Series routers. For more details on the Cisco IOS XR release model and associated support, see [Guidelines for Cisco IOS XR Software](#).

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](#)
- [Cisco Software Manager User Guide](#)

What's New in Cisco IOS XR Release 7.5.2

Software Features Introduced and Enhanced

To learn about features introduced in other Cisco IOS XR releases, select the release from the [Documentation Landing Page](#).

Feature	Description
Programmability	
OpenConfig YANG Model:dscp-set	This model allows you to configure a minimum and maximum Differentiated Services Code Point (DSCP) value in the dscp-set leaf-list. When you send these values in your request to the NETCONF agent, it filters the traffic by matching the values in the list with the incoming packet header. This ensures that your network is not vulnerable to unwanted traffic. You can access the OC data model from the Github repository.
OpenConfig YANG Model:procmon	This model provides data definitions to monitor the health of one or more processes running on a system, delivering insights into the performance of critical processes and helping remediate performance bottlenecks. For example, the stress tool that is part of the Linux distribution may be consuming high CPU. The openconfig-procmon model pulls this information and sends it to you when you query the node. As a remediation measure, you can then restart the process. You can access the OC data model from the Github repository.

Feature	Description
Interface and Hardware Component	
4x25GE Breakout Ports on Cisco ASR 9903 Router	You can now configure 4x25GE breakout ports on all QSFP28 ports of the Cisco ASR 9903 fixed port router with QSFP-100G-SR4-S hot-pluggable transceiver module.
Multicast	
Flexible Algorithm for Loop-Free Alternative Fast Reroute	<p>You can build disjoint live-live paths or create specific paths with flexible algorithm constraints, have low-latency routing without IGP constraints.</p> <p>MLDP route-policy supporting flexible algorithm-based filtering, which provides more granular enablement of FRR for LSPs, is also available.</p>
Flexible Algorithm for multicast VPN profiles	<p>Flexible Algorithm is now available for the following profiles:</p> <ul style="list-style-type: none"> Profile 12: Default MDT - MLDP - P2MP - BGP-AD - BGP C-Mcast Signaling Profile 14: Partitioned MDT - MLDP P2MP - BGP-AD - BGP C-Mcast Signaling
Naming Data MDTs	You can deterministically control the multicast flows by assigning the flows to the named data MDTs.
Routing	
BGP AS Path Replacement with Custom Values	<p>You can now configure to replace the AS Path in BGP with custom values, based on route policy. While selecting the BGP best path, a shorter AS Path makes the selection process simple and flexible.</p> <p>This feature introduces the following command:</p> <p>replace as-path all</p>
RIPng	RIPng (RIP next generation) is a RIPv2 extension that supports IPv6 which is the next-generation Internet Protocol. RIPng provides routing functionalities for an IPv6-based network. RIPng functions as an interior gateway protocol (IGP) in moderate-sized autonomous systems. RIPng uses Bellman-Ford distance-vector algorithm to determine the best route to an IPv6 destination. RIP enhancements for IPv6 include support for IPv6 addresses and prefixes; and the use of the all-RIP-devices multicast group address FF02::9 as the destination address for RIP update messages.
Segment Routing	
BGP Best Path Computation using SR Policy Paths	<p>BGP best-path selection is modified for a prefix when at least one of its paths resolves over the next hop using SR policies (SR policy in “up” state). Under this condition, paths not steered over an SR policy (those using native next-hop resolution) are considered ineligible during best-path selection.</p> <p>You can thus control the best path selection in order to steer traffic, preferably or exclusively, over SR policies with the desired SLA.</p> <p>This feature introduces the bgp bestpath sr-policy {force prefer} command.</p>

Feature	Description
Flexible Algorithm Prefix-SID Redistribution for External Route Propagation	<p>You can now propagate flexible algorithm prefix-SIDs and their algorithm-specific metric between different IGP domains, such as OSPF to IS-IS RIP to OSPF. With this functionality enabling interdomain traffic engineering, you can export flexible algorithm labels from the OSPF domain to other domains and import the labels from other domains into OSPF.</p> <p>The show ospf route flex-algo command has been modified to include additional attributes to indicate the external routes.</p>
Flexible Algorithm to Exclude SRLGs for OSPF	<p>You can now configure the flexible algorithm to exclude any link belonging to the Shared Risk Link Groups (SRLGs) from the path computation for OSPF. The ability to exclude the at-risk links ensures that the rest of the links in the network remain unaffected.</p>
SRv6: Ultimate Segment Decapsulation (USD) behavior	<p>This feature supports the Ultimate Segment Decapsulation (USD) variant on SRv6 endpoint nodes using full-length SIDs. Previously, USD variant was supported on SRv6 endpoint nodes using Micro SIDs (uSIDs).</p> <p>The USD variant enables interworking with SRv6 underlay headend nodes that push SIDs using H.Encaps (SR Headend Behavior with Encapsulation in an SRv6 Policy) or H.Encaps.Red (H.Encaps with reduced Encapsulation) instead of H.Insert (SR Headend with insertion of an SRv6 Policy) or H.Insert.Red (H.Insert with reduced insertion).</p> <p>One of the applications of the USD variant is the case of TI-LFA in P routers with encapsulation with H.Encaps. The USD variant allows the last Segment Endpoint Node in the repair path list to decapsulate the IPv6 header added at the TI-LFA Point of Local Repair and forward the inner packet.</p>
System Management	
Transparent PDH over Packet (TPoP) and Channelized SDH over Packet (CSoP) Smart SFPs	<p>Cisco TPoP (Transparent PDH over Packet) and Cisco CSoP (Channelized SDH over Packet) Smart SFPs now support transparent forwarding of Synchronous Digital Hierarchy (SDH) signals on the following Cisco ASR 9000 Series variant:</p> <ul style="list-style-type: none"> • A99-48X10GE-1G-SE

Hardware Introduced

Cisco IOS XR Release 7.5.2 introduces the following hardware support:

Hardware Feature	Description
Optics	<p>Note Optics support varies across devices (routers, line cards, RPs, and so on). To know if an optics is compatible with a specific Cisco device, refer to the Transceiver Module Group (TMG) Compatibility Matrix.</p> <p>This release introduces the following transceiver:</p> <ul style="list-style-type: none"> • Cisco 1000BASE Small Form-Factor Pluggable (SFP) <ul style="list-style-type: none"> • SFP-1G-SX • SFP-1G-LH • Cisco 400GBASE Quad Small Form-Factor Pluggable Double Density (QSFP-DD) <ul style="list-style-type: none"> • QDD-4X100G-FR-S • QDD-4X100G-LR-S • Cisco 40GBASE Quad Small Form-Factor Pluggable (QSFP) <ul style="list-style-type: none"> • QSFP-4X10G-LR-S • Cisco 25GBASE Small Form-Factor Pluggable (SFP) <ul style="list-style-type: none"> • SFP-25G-ER-I • Cisco 10GBASE Dense Wavelength-Division Multiplexing Small Form-Factor Pluggable (DWDM-SFP) <ul style="list-style-type: none"> • DWDM-SFP10G-30.33 • DWDM-SFP10G-31.12

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 software.

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

Table 1: Cisco IOS XR 64 bit Software Release 7.5.2 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP and RP systems]	ASR9K-x64-iosxr-px-7.5.2.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 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-k9-7.5.2.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 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-7.5.2	<p>Contains the required core packages, including OS, Admin, Base,Forwarding, Modular Services Card, Routing, FPD, SNMP Agent, and Alarm Correlation.</p> <p>Contains mini.iso file for XR 64 bit 7.3.1 and additional software for migration to 64 bit.</p>

Table 2: Cisco IOS XR 64 bit Software Release 7.5.2 ISO and RPM Files

Composite Package		
Feature Set	Filename	Description
Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-x64-7.5.2.iso	<p>Contains the required core packages, including OS, Admin, Base,Forwarding, Modular Services Card, Routing, FPD, SNMP Agent, and Alarm Correlation.</p> <p>The mini iso file is used for upgrading to the new release.</p>
Individually-Installable Optional Packages		
Feature Set	Filename	Description
Cisco IOS XR 64 bit EIGRP package	asr9k-eigrp-x64-1.0.0.0-r752.x86_64.rpm	Includes EIGRP protocol support software
Cisco IOS XR BNG Package	asr9k-bng-x64-1.1.0.0-r752.x86_64.rpm	Includes binaries to support BNG features.
Cisco IOS XR 64 bit ISIS package	asr9k-isis-x64-1.1.0.0-r752.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-r752.x86_64.rpm	Includes OSPF link state protocol support software
Cisco IOS XR Manageability Package	asr9k-mgbl-x64-3.0.0.0-r752.x86_64.rpm	<p>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.</p> <p>IPSLA and environment MIBs are part of the mgbl rpm.</p>
Cisco IOS XR 64 bit MPLS-TE and RSVP package	asr9k-mpls-te-rsvp-x64-1.2.0.0-r752.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-r752.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-r752.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-r752.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-r752.x86_64.rpm	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-x64-3.1.0.0-r752.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-r752.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-r752.x86_64.rpm	Includes rpm to support Cisco IOS XR 64-bit inline MAP-T function

Memory Requirements



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

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

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

- minimum 16 GB memory on the RP3 transport optimised (TR) variant and 40 GB memory on the RP3 service edge (SE) variant
- minimum 16 GB memory on the RSP5 transport optimised (TR) variant and 40 GB memory on the RSP5 service edge (SE) variant
- minimum 2 GB compact flash on route switch processors (RSPs)
- minimum 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 (ASR-9922) Chassis
 - Cisco ASR 9912 (ASR-9912) Chassis
 - Cisco ASR 9910 (ASR-9910) Chassis
 - Cisco ASR 9906 (ASR-9906) Chassis
 - Cisco ASR 9904 (ASR-9904) Chassis
 - Cisco ASR 9903 (ASR-9903) Chassis
 - Cisco ASR 9902 (ASR-9902) Chassis
 - Cisco ASR 9901 (ASR-9901) Chassis
- Cisco ASR 9000 Series Chassis
 - Cisco ASR 9010 (ASR-9010) Chassis
 - Cisco ASR 9006 (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 : 7.5.2

Active Packages: 16
asr9k-xr-7.5.2 version=7.5.2 [Boot image]
asr9k-k9sec-x64-2.2.0.0-r752
asr9k-li-x64-1.1.0.0-r752
asr9k-9000v-nV-x64-1.0.0.0-r752
asr9k-mcast-x64-2.1.0.0-r752
asr9k-mpls-te-rsvp-x64-2.1.0.0-r752
asr9k-ospf-x64-1.0.0.0-r752
```

```

asr9k-services-x64-1.0.0.0-r752
asr9k-eigrp-x64-1.0.0.0-r752
asr9k-bng-supp-x64-1.0.0.0-r752
asr9k-m2m-x64-2.0.0.0-r752
asr9k-mgbl-x64-2.0.0.0-r752
asr9k-optic-x64-1.0.0.0-r752
asr9k-isis-x64-1.1.0.0-r752
asr9k-mpls-x64-2.0.0.0-r752
asr9k-bng-x64-1.0.0.0-r752

```

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.

Field Programmable Device Package					
Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req 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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.23	0.23	0.0
	Trailbreaker-1	YES	0.23	0.23	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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.23	0.23	0.0
	Trailbreaker-1	YES	0.23	0.23	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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.23	0.23	0.0
	Trailbreaker-1	YES	0.23	0.23	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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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	25.30	25.30	0.0

	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	25.30	25.30	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	25.30	25.30	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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	25.30	25.30	0.0
	Skylynx-0	YES	0.08	0.08	0.0
	Skylynx-1	YES	0.08	0.08	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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
<hr/>					
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
<hr/>					
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	25.30	25.30	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	25.30	25.30	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0

	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	25.30	25.30	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Skylynx-1	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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	0.13	0.13	0.0
	Primary-BIOS	YES	25.30	25.30	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.15	0.15	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	0.13	0.13	0.0
	Primary-BIOS	YES	25.30	25.30	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.15	0.15	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	0.13	0.13	0.0
	Primary-BIOS	YES	25.30	25.30	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.15	0.15	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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
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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
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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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
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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
<hr/>					
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
<hr/>					
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
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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
<hr/>					
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
<hr/>					
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
<hr/>					
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
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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	33.30	33.30	0.0
	TamFW-Longshot	YES	2.65	2.65	0.0
	Wolfpack-FPGA	YES	0.19	0.19	0.0
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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	0.72	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
<hr/>					
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	0.72	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
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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	30.36	30.36	0.0
	Zenith-FPGA	YES	0.10	0.10	0.0
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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	30.36	30.36	0.0
	Zenith-FPGA	YES	0.10	0.10	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	0.72	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	0.08	0.08	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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
A9K-1600W-AC	PO-PriMCU	NO	17.137	17.137	0.0
<hr/>					
A9K-1600W-DC	PO-PriMCU	NO	1.09	1.09	0.0
<hr/>					
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
<hr/>					
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
<hr/>					
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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.21	0.21	0.0
	Trailbreaker-1	YES	0.21	0.21	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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.21	0.21	0.0
	Trailbreaker-1	YES	0.21	0.21	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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.21	0.21	0.0
	Trailbreaker-1	YES	0.21	0.21	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
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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
<hr/>					
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	0.13	0.13	0.0
	Primary-BIOS	YES	25.30	25.30	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.15	0.15	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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	0.13	0.13	0.0
	Primary-BIOS	YES	25.30	25.30	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.15	0.15	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	0.13	0.13	0.0
	Primary-BIOS	YES	25.30	25.30	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.15	0.15	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	0.13	0.13	0.0
	Primary-BIOS	YES	25.30	25.30	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.15	0.15	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
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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
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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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.21	0.21	0.0
	Windcharger-0	YES	0.08	0.08	0.0
<hr/>					
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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.21	0.21	0.0
	Windcharger-0	YES	0.08	0.08	0.0
<hr/>					
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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.21	0.21	0.0
	Windcharger-0	YES	0.08	0.08	0.0
<hr/>					
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
<hr/>					
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
<hr/>					
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
<hr/>					
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
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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
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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
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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
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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
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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
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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
<hr/>					
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
<hr/>					
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
<hr/>					
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
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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	25.30	25.30	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	25.30	25.30	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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	25.30	25.30	0.0
	Skylynx-0	YES	0.12	0.12	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
<hr/>					
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
<hr/>					
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
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A9K-MOD200-CM	Blaster	YES	1.27	1.27	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	8.51	8.51	0.1
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A9K-MOD200-SE	Blaster	YES	1.27	1.27	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	8.51	8.51	0.1
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A9K-MOD200-TR	Blaster	YES	1.27	1.27	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	8.51	8.51	0.1
<hr/>					
A9K-MOD400-CM	Blaster	YES	1.27	1.27	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	8.51	8.51	0.1
<hr/>					
A9K-MOD400-SE	Blaster	YES	1.27	1.27	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	8.51	8.51	0.1
<hr/>					
A9K-MOD400-TR	Blaster	YES	1.27	1.27	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	8.51	8.51	0.1
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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	31.36	31.36	0.0
	Zenith-FPGA	YES	0.10	0.10	0.0
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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	31.36	31.36	0.0
	Zenith-FPGA	YES	0.10	0.10	0.0
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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	0.05	0.05	0.0
	Optimus-FPGA	YES	0.05	0.05	0.0
	Primary-BIOS	YES	17.40	17.40	0.0
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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	0.05	0.05	0.0
	Optimus-FPGA	YES	0.05	0.05	0.0
	Primary-BIOS	YES	17.40	17.40	0.0
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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	0.72	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
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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	0.72	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
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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	25.30	25.30	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
	Trailbreaker-0	YES	0.21	0.21	0.0
	Windcharger-0	YES	0.08	0.08	0.0
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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
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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
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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
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ASR-9006-AC	CBC	NO	7.105	7.105	0.0
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ASR-9006-AC-V2	CBC	NO	7.105	7.105	0.0
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ASR-9006-FAN	CBC	NO	5.04	5.04	0.0
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ASR-9006-FAN-V2	CBC	NO	5.05	5.05	0.0
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ASR-9010-AC	CBC	NO	7.105	7.105	0.0
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ASR-9010-AC-V2	CBC	NO	7.105	7.105	0.0
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ASR-9010-FAN	CBC	NO	4.03	4.03	0.0
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ASR-9010-FAN-V2	CBC	NO	29.12	29.12	0.0
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ASR-9901-LC	CBC	NO	55.07	55.07	0.1
	Gamora-FPGA	YES	0.36	0.36	0.1
	IPU-FFGA	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	23.22	23.22	0.1
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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	22.26	22.26	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	34.30	34.30	0.0
	Skywarp-0	YES	0.11	0.11	0.0
	Skywarp-1	YES	0.11	0.11	0.0
	Sunstreaker	YES	0.15	0.15	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	0.0
ASR-9903	FAN-CBC	NO	61.25	61.25	0.0
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	34.30	34.30	0.0
	Scattershot	YES	0.14	0.14	0.0
	Sunstreaker	YES	0.14	0.14	0.0
	Supernaut	YES	0.14	0.14	0.0
	TAMFW-Sunstreaker	YES	2.65	2.65	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 PSOC	NO NO	40.07 2.06	40.07 2.06	0.0 0.0
ASR-9922-FAN-V3	CBC PSOC	NO NO	40.07 2.06	40.07 2.06	0.0 0.0
PWR-1.6KW-AC	PriMCU	NO	17.20	17.20	0.0
PWR-1.6KW-DC	PriMCU	NO	1.03	1.03	0.0
PWR-2KW-DC-V2	DT-PriMCU DT-Sec54vMCU DT-Sec5vMCU EM-PriMCU EM-Sec54vMCU EM-Sec5vMCU	NO NO NO NO NO NO	6.03 6.02 6.03 3.12 3.21 3.20	6.03 6.02 6.03 3.12 3.21 3.20	0.12 0.12 0.12 0.12 0.12 0.12
PWR-3KW-AC-V2	DT-PriMCU DT-Sec54vMCU DT-Sec5vMCU EM-Sec54vMCU EM-Sec5vMCU	NO NO NO NO NO	6.02 6.02 6.04 3.12 3.18	6.02 6.02 6.04 3.12 3.18	1.0 1.0 1.0 0.21 0.21
PWR-3KW-HVDC	DT-PriMCU DT-Sec54vMCU DT-Sec5vMCU	NO NO NO	2.02 2.02 2.03	2.02 2.02 2.03	1.0 1.0 1.0
PWR-4.4KW-DC-V3	DT-Pri0MCU DT-Pri1MCU DT-Sec054vMCU DT-Sec154vMCU DT-Sec5vMCU	NO NO NO NO NO	3.01 3.01 3.01 3.01 3.02	3.01 3.01 3.01 3.01 3.02	0.1 0.1 0.1 0.1 0.1
PWR-6KW-AC-V3	AB-Pri0MCU AB-Pri1MCU AB-Sec054vMCU AB-Sec154vMCU AB-Sec5vMCU DT-Pri0MCU DT-Pri1MCU DT-Sec054vMCU DT-Sec154vMCU DT-Sec5vMCU	NO NO NO NO NO NO NO NO NO NO	3.02 3.02 3.02 3.02 3.05 4.02 4.02 4.03 4.03 4.04	3.02 3.02 3.02 3.02 3.05 4.02 4.02 4.03 4.03 4.04	0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

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

Component	Part Number	Support Initially Provided in IOS XR 64 bit Release
ASR 9000 Route Switch Processor 5 for Service Edge	A9K-RSP5-SE	Release 6.5.15
ASR 9000 Route Switch Processor 5 for Packet Transport	A9K-RSP5-TR	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router RSP880-Lite, Packet Transport Optimized	A9K-RSP880-LT-TR	Release 6.4.1
Cisco ASR 9000 Series Aggregation Services Router RSP880-Lite, Service Edge Optimized	A9K-RSP880-LT-SE	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 6.2.1
Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Packet Transport Optimized for ASR 9910 from Release 6.0.1.	A99-RSP-TR	Release 6.2.1
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
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
ASR9K Route Switch Processor with 880G/slot and 32 GB for Service Edge	A9K-RSP880-SE	Release 6.1.2
ASR9K Route Switch Processor with 880G/slot and 16 GB for Packet Transport	A9K-RSP880-TR	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router Route Processor Cards		
Component	Part Number	Support Initially Provided in IOS XR 64 bit Release
ASR 9900 Route Processor 3 for Service Edge	A99-RP3-SE	Release 6.5.15
ASR 9900 Route Processor 3 for Packet Transport	A99-RP3-TR	Release 6.5.15
ASR Route Processor 32 GB for Service Edge	A99-RP2-SE	Release 6.1.2
ASR Route Processor 16 GB for Packet Transport	A99-RP2-TR	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port – ASR 9901		
Component	Part Number	Support Initially Provided in IOS XR 64 bit Release
Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port	ASR-9901	Release 6.4.1

Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port Fan Tray	ASR-9901-FAN	Release 6.4.1
Cisco ASR 9000 Series Aggregation Services Router 2-RU 1600W AC Power Module	A9K-1600W-AC	Release 6.4.1
Cisco ASR 9000 Series Aggregation Services Router 2-RU 1600W DC Power Module	A9K-1600W-DC	Release 6.4.1
Cisco ASR 9902 Router		
Cisco ASR 9902 2RU Chassis with fixed ports	ASR-9902	Release 7.4.1
Cisco ASR 9902 4-Post Mounting Kit for 19-Inch and 23-Inch Rack	ASR-9902-4P-KIT	Release 7.4.1
Cisco ASR 9902 2-Post Mounting Kit for 19-Inch and 23-Inch Rack	ASR-9902-2P-KIT	Release 7.4.1
Cisco ASR 9902 Cable Management	ASR-9902-CAB-MGMT	Release 7.4.1
Cisco ASR 9902 Air Filter	ASR-9902-FILTER	Release 7.4.1
Cisco ASR 9902 Fan Tray	ASR-9902-FAN	Release 7.4.1
Cisco ASR 9903 Router		
Cisco ASR 9903 Compact High-Performance Router with fixed ports and PEC (Port Expansion Card) slot.	ASR-9903	Release 7.1.3
Cisco ASR 9900 Fixed Chassis Route Processor	A99-RP-F	Release 7.1.3
Cisco ASR 9903 Router Fan Tray	ASR-9903-FAN	Release 7.1.3
ASR 9903 4-Post Mounting Kit for 19-inch Rack	ASR-9903-4P-KIT	Release 7.1.3
ASR 9903 Cable Management Brackets	ASR-9903-CAB-MGMT	Release 7.1.3
ASR 9903 Air Filter	ASR-9903-FILTER	Release 7.1.3
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 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 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Fan Tray	ASR-9904-FAN	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Filter	ASR-9904-FILTER	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4-Slot Baffle	ASR-9904-BAFFLE	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot		

Component	Part Number	Support Initially Provided in IOS XR 64 bit Release
Cisco ASR 9900 Switch Fabric Card 3	A99-SFC3	Release 6.5.15
Cisco ASR 9000 Fabric Card	A99-SFC2	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 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 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Fan Tray	ASR-9922-FAN	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Fan Tray version 3	ASR-9922-FAN-V3	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Filter with Media, Center	ASR-9922-FLTR-CV2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Air Filter with Media, Left & Right	ASR-9922-FLTR-LR	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Route Processor Filler	ASR-9922-RP-FILR	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 22-Slot Version 2 Fan Tray	ASR-9922-FAN-V2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot		
Component	Part Number	Support Initially Provided in IOS XR 64 bit Release
Cisco ASR 9000 Series Aggregation Services Router 6-Slot System	ASR-9006-SYS	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Tray	ASR-9006-FAN	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Door Kit	ASR-9006-DOOR	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot AC Chassis	ASR-9006-AC	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot DC Chassis	ASR-9006-DC	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Air		
Component	Part Number	Support Initially Provided in IOS XR 64 bit Release

Cisco ASR 9000 Series Aggregation Services Router 6-Slot Air Filter	ASR-9006-FILTER	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
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Tray	ASR-9906-FAN	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 6-Slot Fan Filter	ASR-9906-FILTER	Release 6.3.1
ASR 9906 Switch Fabric Card 3	A99-SFC3-T	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 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Fan Tray	ASR-9010-FAN	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Door Kit	ASR-9010-DOOR	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot AC Chassis	ASR-9010-AC	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot DC Chassis	ASR-9010-DC	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 2 Post Mounting Kit	ASR-9010-2P-KIT	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4 Post Mounting Kit	ASR-9010-2P-KIT	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air		
Component	Part Number	Support Initially Provided in IOS XR 64 bit Release
Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air Filter	ASR-9010-FILTER	Release 6.1.2
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 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot(9910) Fan Tray	ASR-9910-FAN	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Accessory Kit	ASR-9910-ACC-KIT	Release 6.2.1

Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 4 Post Rack Mounting Kit	ASR-9910-4P-KIT	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 2 Post Rack Mounting Kit	ASR-9910-2P-KIT	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Reflector	ASR-9910-AIRREF	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Filter	ASR-9910-FILTER	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Switch Fabric Card	A99-SFC-S	Release 6.2.1
ASR 9910 Switch Fabric Card 3	A99-SFC3-S	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router Power		
Component	Part Number	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 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 3KW AC Power Module, version 2	PWR-3KW-AC-V2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router AC Power Entry Module Version 2	A9K-AC-PEM-V2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router DC Power Entry Module Version 2	A9K-DC-PEM-V2	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router Power Entry Module Version 2 Filler	A9K-PEM-V2-FILR	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 1.5kW DC Power Module	A9K-1.5KW-DC	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 2kW DC Power Module	A9K-2KW-DC	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 3kW AC Power Module	A9K-3KW-AC	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router AC Power Enclosure Module Version 3	A9K-AC-PEM-V3	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router DC Power Enclosure Module Version 3	A9K-DC-PEM-V3	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 6kW AC Power Module Version 3	PWR-6KW-AC-V3	Release 6.1.2

Cisco ASR 9000 Series Aggregation Services Router 4.4kW DC Power Module Version 3	PWR-4.4KW-DC-V3	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router Line Cards		
Component	Part Number	Support Initially Provided in IOS XR 64 bit Release
ASR 9000 400GE Combo Service Edge Line Card - 5th Generation	A9K-4HG-FLEX-SE	Release 7.4.1
ASR 9000 400GE Combo Packet Transport Line Card - 5th Generation	A9K-4HG-FLEX-TR	Release 7.4.1
ASR 9900 400GE Combo Service Edge Line Card - 5th Generation	A99-4HG-FLEX-SE	Release 7.4.1
ASR 9900 400GE Combo Packet Transport Line Card - 5th Generation	A99-4HG-FLEX-TR	Release 7.4.1
ASR 9903 800G Multi-rate Port Expansion Card	A9903-8HG-PEC	Release 7.4.1
ASR 9900 4T Service Edge Line Card - 5th Generation	A99-10X400GE-X-SE	Release 7.3.1
ASR 9900 4T Packet Transport Line Card - 5th Generation	A99-10X400GE-X-TR	Release 7.3.1
ASR 9903 2T Multi-rate Port Expansion Card	A9903-20HG-PEC	Release 7.1.3
ASR 9000 32-Port 100GE QSFP28/QSFP+ Service Edge optimized Line Card - 5th Generation	A99-32X100GE-X-SE	Release 7.1.15
ASR 9000 32-Port 100GE QSFP28/QSFP+ Packet Transport optimized Line Card - 5th Generation	A99-32X100GE-X-TR	Release 7.1.15
ASR 9000 2T Combo Line Card - 5th Generation	A9K-20HG-FLEX-SE A9K-20HG-FLEX-TR	Release 7.1.15
ASR 9000 800G Combo Line Card - 5th Generation	A9K-8HG-FLEX-SE A9K-8HG-FLEX-TR	Release 7.1.15
ASR 9000 16-port 100GE QSFP TR line card	A9K-16X100GE-TR	Release 6.5.15
ASR 9900 32-port 100GE QSFP TR line card	A99-32X100GE-TR	Release 6.5.15
ASR 9000 48 port dual rate 10G/1G Service Edge line card	A99-48X10GE-1G-SE	Release 6.5.2
ASR 9000 48 port dual rate 10G/1G Transport Optimised line card	A99-48X10GE-1G-TR	Release 6.5.2
ASR 9900 16-port 100GE QSFP SE	A99-16X100GE-X-SE	Release 6.5.3
ASR 9000 48-port dual-rate 10G/1G Consumption Model line card	A9K-48X10GE-1G-CM	Release 6.4.1
ASR 9000 24-port dual-rate 10G/1G Consumption Model line card	A9K-24X10GE-1G-CM	Release 6.4.1
ASR 9000 4-port 100-Gigabit Ethernet Line Card	A9K-4X100GE	Release 6.4.1
ASR9000 48-port dual-rate 10G/1G service edge-optimized line card	A9K-48X10GE-1G-SE	Release 6.3.2

ASR9000 48-port dual-rate 10G/1G packet transport-optimized line card	A9K-48X10GE-1G-TR	Release 6.3.2
ASR9000 24-port dual-rate 10G/1G service edge-optimized line card	A9K-24X10GE-1G-SE	Release 6.3.2
ASR9000 24-port dual-rate 10G/1G packet transport-optimized line card	A9K-24X10GE-1G-TR	Release 6.3.2
ASR 9900 8-port 100GE Service Edge optimized	A99-8X100GE-SE	Release 6.1.2
ASR 9900 8-port 100GE Packet Transport optimized	A99-8X100GE-TR	Release 6.1.2
ASR 9900 8-port 100GE Consumption Model	A99-8X100GE-CM	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 12-Port 100-Gigabit Ethernet Line Card	A99-12X100GE	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 12-port 100GE Ethernet Line card CM	A99-12X100GE-CM	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 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Service Edge Optimized	A9K-8X100GE-SE	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Packet Transport Optimized	A9K-8X100GE-TR	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4--Port 100-Gigabit Ethernet, Service Edge Optimized	A9K-4X100GE-SE	Release 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 4-Port 100-Gigabit Ethernet, Packet Transport Optimized	A9K-4X100GE-TR	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 6.1.2
Cisco ASR 9000 Series Aggregation Services Router 8-port High Density 100GE Ethernet Line Card, Packet Transport Optimized	A9K-8X100GE-L-TR	Release 6.1.2
2-Port 100G + 20-Port 10 GE Combination IPoDWDM Line Card with CFP2 and SFP+, Packet Transport Optimized	A9K-400G-DWDM-TR	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router Modular Line Cards		
Component	Part Number	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 A9K-MOD200-SE	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 200 Gigabit Modular Line Card, Service Edge Optimized		

Cisco ASR 9000 Modular 400G Consumption Model Line Card	A9K-MOD400-CM	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Service Edge Optimized	A9K-MOD400-SE	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Packet Transport Optimized	A9K-MOD400-TR	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router Modular Port Adapters (MPAs)		
Component	Part Number	Support Initially Provided in IOS XR 64 bit Release
Cisco ASR 9000 1-port 200-Gigabit Ethernet MPA, requires CFP2-DCO optics	A9K-MPA-1X200GE	Release 6.6.2
Cisco ASR 9000 32-port 1-Gigabit Ethernet MPA with MACSec	A9K-MPA-32X1GE	Release 6.6.2
Cisco ASR 9000 20x10GE Consumption Model MPA	A9K-MPA20X10GE-CM	Release 6.5.1
Cisco ASR 9000 2x100GE Consumption Model MPA	A9K-MPA2X100GE-CM	Release 6.5.1
Cisco ASR 9000 Series Aggregation Services Router 1-port 100-Gigabit Modular Port Adapter	A9K-MPA-1X100GE	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 2-port 100-Gigabit Modular Port Adapter	A9K-MPA-2X100GE	Release 6.2.2
20-Port 10-Gigabit Ethernet Modular Port Adapter with SFP+	A9K-MPA-20x10GE	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 8-port 10GE Modular Port Adapter	A9K-MPA-8X10GE	Release 6.3.2
Cisco ASR 9000 Series Aggregation Services Router 1-port 40GE Modular Port Adapter	A9K-MPA-1X40GE	Release 6.3.1
Cisco ASR 9000 Series Aggregation Services Router 4-port 10GE Modular Port Adapter	A9K-MPA-4X10GE	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 20-port 1GE Modular Port Adapter	A9K-MPA-20X1GE	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router 2-port 10GE Modular Port Adapter	A9K-MPA-2X10GE	Release 6.3.2
Cisco ASR 9000 Series Aggregation Services Router 2-port 40GE Modular Port Adapter	A9K-MPA-2X40GE	Release 6.3.1
Cisco Digital Pluggable Optical Modules		
200G, 100G, WDM Digital CFP2 pluggable Licensed for 100G only – TOF	CFP2-WDM-DET-1HL=	Release 6.6.2

200G, 100G, WDM Digital CFP2 pluggable Licensed for 100G only – NON TOF	CFP2-WDM-D-1HL=	Release 6.6.2
Cisco ASR 9000v Satellite Shelf		
Component	Part Number	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 6.2.1
Cisco ASR 9000v Satellite Shelf Version 2 DC power chassis	A9KV-V2-DC-E=	Release 6.2.1
Cisco ASR 9000v Satellite Shelf AC power chassis	A9KV-V2-AC=	Release 6.2.1
Cisco ASR 9000v Satellite Shelf Version 2 Fan Tray	A9KV-V2-FAN=	Release 6.2.1
Cisco NCS 5000 Satellite Shelf		
Cisco NCS 5001 Series Router	NCS-5001	Release 6.2.1
Cisco NCS 5002 Series Router	NCS-5002	Release 6.2.1
Cisco NCS 5001 Router Accessory Kit	NCS-5001-ACSR	Release 6.2.1
Cisco NCS 5002 Router Accessory Kit	NCS-5002-ACSR	Release 6.2.1
Cisco NCS 5001 Router Fan Back to Front AirFlow	NCS-5001-FN-BK	Release 6.2.1
Cisco NCS 5002 Router Fan Back to Front AirFlow	NCS-5002-FN-BK	Release 6.2.1
Cisco NCS 5001 Air Filter Back to Front Airflow	NCS-5001-FLT-BK	Release 6.2.1
Cisco NCS 5002 Air Filter Back to Front Airflow	NCS-5002-FLT-BK	Release 6.2.1
Cisco NCS 5001 Fan Front to Back Airflow	NCS-5001-FN-FR	Release 6.2.1
Cisco NCS 5002 Fan Front to Back Airflow	NCS-5002-FN-FR	Release 6.2.1
Cisco NCS 5001 Air Filter Front to Back Airflow	NCS-5001-FLT-FR	Release 6.2.1
Cisco NCS 5002 Air Filter Front to Back Airflow	NCS-5002-FLT-FR	Release 6.2.1

Important Notes

- Repetitive Smart Licensing evaluation expired warning messages are displayed on the console every hour, but there is no functionality impact 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 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 Technical Support representative to discuss how to engineer a large-scale configuration for your purpose.

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.

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 using CSM, see [Installation Guide for Cisco Software Manager Server](#).

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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