



## **Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 7.5.1**

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# Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 7.5.1

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 7.5.1

### 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
<b>Programmability</b>	
<a href="#">Add Multiple Events In a Policy Map With a Single EEM Script</a>	With this feature, you can add multiple events to a policy map with boolean (AND or OR) correlation. EEM triggers the script when the correlation defined in the policy map for the events is true. Using EEM scripts, you can create a logical correlation of events in the policy map and configure multiple actions for detectors such as timer, object-tracking, and telemetry events via sensor path.
<a href="#">Debug Automation Scripts</a>	Use this feature to collect logs that contain debug information for ltraces and tech-support data. These logs aid in troubleshooting whenever the scripts are not working as expected.  This feature introduces the <b>show tech-support script</b> command.
<a href="#">Github Repository for Automation Scripts</a>	You now have access to sample scripts and templates published on the <a href="#">Github</a> repository. You can leverage these samples to use the python packages and libraries developed by Cisco to build your custom automation scripts for your network
<a href="#">Manage Common Script Actions Using YANG RPCs</a>	This feature enables you to use YANG remote procedure calls (RPCs) on <code>Cisco-IOS-XR-infra-script-mgmt-act.yang</code> data model to perform actions on the automation scripts such as add or remove script from the script repository, run, or stop script from running.
<a href="#">Update Automation Scripts from Remote Server</a>	This feature lets you update automation scripts across routers by accessing the master script from a remote site. This eases script management, where you make changes to the master script and then copy it to routers where it is deployed.  This feature introduces the <b>auto-update</b> keyword in the <b>script exec</b> command.

Feature	Description
Upgraded IOS XR Python from Version 3.5 to Version 3.9	This upgrade adds new modules and capabilities to create Python scripts and execute the scripts on routers running Cisco IOS XR software. Some of the modules added as part of the upgraded IOS XR Python 3.9 are: hashlib, idna, packaging, pyparsing, six, yaml.
Validate Pre-configuration Using Config Scripts	This feature allows you to use config scripts to validate pre-configuration during a commit or validate operation. Any active config scripts can read and validate (accept, reject or modify) pre-configuration. The pre-configuration is only applied to the system later on, when the relevant hardware is inserted, and does not require further script validation at that point. Previously, config scripts did not allow validating configuration until the corresponding hardware was present.
<b>Telemetry</b>	
Target-Defined Mode for Cached Generic Counters Data	<p>This feature streams telemetry data for cached generic counters using a TARGET_DEFINED subscription. This subscription ensures that any change to the cache streams the latest data to the collector as an event-driven telemetry notification.</p> <p>This feature introduces support for the following sensor path:</p> <pre>Cisco-IOS-XR-infra-statsd-oper:infra- statistics/interfaces/interface/cache/generic-counters</pre>
<b>System Setup and Software Installation</b>	
Check Integrity of Golden ISO (GISO) Files	This feature enables an automated check during <b>install [package] replace</b> operations to ensure the files in GISO has not been corrupted. It does so by calculating the md5sum of the files and comparing it against md5sum value contained within the GISO that was calculated when the image was built.
Enhanced Golden ISO Build Tool	This enhancement provides you with the flexibility to use the <code>gisobuild.py</code> tool to build GISO images using Cisco IOS XR software commands, YAML-based template file, or Docker capability to suit your customized install requirements. When you build a GISO, you can also specify Zero Touch Provisioning (ZTP) initialization file, script initialization file, Cisco IOS XR configuration file, and SMUs in addition to using the base image and optional RPMs to automatically provision the router.
Stream Model-Driven Telemetry (MDT) Data for Install Operations	<p>This feature allows you to stream MDT data—both cadence-driven telemetry (CDT) and event-driven telemetry (EDT) data—for changes detected during install operation. After the install operation is complete, this functionality streams telemetry data such as the GISO label, image version, the status of install operation, and potential information about rectifying the installation process for all the active and committed packages.</p> <p>With this feature, you can stream telemetry data from the following sensor paths:</p> <pre>Cisco-IOS-XR-install-oper:install/request Cisco-IOS-XR-install-oper:install/packages/committed/summary Cisco-IOS-XR-install-oper:install/packages/active/summary Cisco-IOS-XR-install-oper:install/version</pre>

Feature	Description
Supported Software Upgrade or Downgrade IOS XR Versions	<p>You can determine whether a software version can be upgraded or downgraded to another version using this functionality. Before an actual upgrade or downgrade process, you can also view the hardware or software limitations that could cause the upgrade or downgrade to fail. This feature helps you plan successful software upgrades or downgrades.</p> <p>This feature introduces the <b>show install upgrade-matrix</b> command.</p>
<b>Interface and Hardware Component</b>	
SPAN support for bundle as a destination interface	<p>This feature adds the ability to configure a bundle destination for SPAN. Bundle interfaces increase the bandwidth by allowing forwarding across all available members of the bundle.</p> <p>Additionally, they provide redundancy in the case of link failure.</p>
<b>L2VPN and Ethernet Services</b>	
AC-based Virtual Ethernet Segment	<p>This feature allows you to extend the physical links to have VLANs (ACs) that act as Ethernet Virtual Circuits (EVCs). Many such EVCs can be aggregated on a single main interface called Virtual Ethernet Segment (vES). The main interface aggregates many vESs and creates a group to identify these vESs. This mechanism helps to minimize service disruption by mass withdrawal for main peering at the vES level.</p>
Centralized Anycast Gateway for EVPN IRB	<p>This feature enables configuring the IRB interface in a central location called the Centralized Anycast Gateway. Such a centralized, single-point makes it easier to configure and maintain, reducing the overall operational cost. It also makes it easy to configure the IRB because it's configured only on the centralized gateway of edge L2 devices.</p> <p>This feature is supported only on Single-active mode and this feature introduces <b>virtual access-evi</b> command.</p>
EVPN E-TREE Per-AC (Scenario 2)	<p>This feature allows a provider edge (PE) device to have both root and leaf sites for a given EVI. This feature increases the granularity of leaf designation from the entire bridge to AC bridge ports; ACs under a bridge may be root or leaf.</p>
EVPN E-Tree Per-PE (Scenario 1b)	<p>This feature allows you to configure an attachment circuit on a PE device either as a root site or a leaf site using the <b>etree leaf</b> label for a given bridge-domain. By preventing communication among leaf ACs connected to the same PE and belonging to the same bridge-domain, you can segregate traffic received and sent from different geographical locations. This segregation helps in securing traffic and Denial of Service Prevention (DoS).</p> <p>This feature is compliant with RFC 8317.</p>
EVPN IGMPv2 Selective Multicast	<p>Using this feature, you can now forward multicast traffic over the EVPN network only to the receivers in the multicast groups. This targeted and selective forwarding helps eliminate unnecessary flooding of traffic. This feature also helps in optimal forwarding and efficient bandwidth utilization.</p>
<b>MPLS</b>	

Feature	Description
<a href="#">Bandwidth Protection Functions to Enhance auto-tunnel backup Capabilities</a>	<p>This feature introduces bandwidth protection functions for auto-tunnel backups, such as signaled bandwidth, bandwidth protection, and soft-preemption. These functions provide better bandwidth usage and prevent traffic congestion and traffic loss.</p> <p>In earlier releases, auto-tunnel backups provided only link protection and node protection. Backup tunnels were signaled with zero bandwidth, causing traffic congestion when FRR went active.</p> <p>This feature introduces the following commands and keywords:</p> <ul style="list-style-type: none"> <li>• <b>bandwidth-protection maximum-aggregate</b></li> <li>• <b>signalled-bandwidth</b></li> <li>• <b>soft-preemption</b></li> </ul>
<b>Multicast</b>	
<a href="#">Flexible Algorithm for MLDP</a>	<p>This feature gives you the flexibility to customize the metrics that IGP uses to route traffic for MLDP tunnels. With this feature, your router can generate two multicast streams for the same feed, thus ensuring low latency and high availability of multicast traffic.</p> <p>This feature introduces the <b>flex-algo</b> keyword.</p>
<b>Modular QoS</b>	
<a href="#">Separate Token Buckets for Percentage Policers</a>	<p>From this release, configuring a percent policer value on a class allocates separate token buckets for each bundle member. In other words, the policer percentage value is calculated on each single bundle member's bandwidth after configuring <b>hw-module all qos-mode bundle-agg policer</b> .</p> <p>This functionality allows you to use both aggregated absolute policers and nonaggregated percent policers. Plus, the percent policers span the entire bundle bandwidth (from 0 through 100%), allowing for better and efficient control over traffic flow.</p> <p>In earlier releases, the policer percentage for the entire bundle was calculated based on the bundle member's bandwidth that you added first. Such a calculation dragged down the traffic rate for the entire bundle.</p>
<b>System Security</b>	
<a href="#">Command Authorization Using Local User Account</a>	<p>This feature allows locally authenticated users—authenticated by the AAA server internal to the router—to run all XR VM commands even if a remote TACACS+ AAA server is not reachable for authorization. It prevents a complete router lockdown. The feature also prevents remotely authenticated users—authenticated using a remote AAA server (say, TACACS+ server)—from running any non-permitted commands on the router, and thus prevents misuse of user privileges.</p> <p>This feature modifies the <b>aaa authorization commands default</b> command to include the <b>local</b> option for XR VM command authorization.</p>
<a href="#">SSD Encryption</a>	<p>This feature enables trust and security in the system's steady state by encrypting data at the disk level. The encrypted data can be accessed <i>only</i> with a specific key stored in the TAM.</p>
<b>Segment Routing</b>	

<b>Feature</b>	<b>Description</b>
<a href="#">BGP Route Leaking</a>	This feature adds support for importing routes from default-VRF to non-default VRF and routes from non-default VRF to default VRF.
<a href="#">IS-IS Flexible Algorithm: Exclude-SRLG Constraint</a>	This feature allows the Flexible Algorithm definition to specify Shared Risk Link Groups (SRLGs) that the operator wants to exclude during the Flex-Algorithm path computation.  This allows the setup of disjoint paths between two or more Flex Algos by leveraging deployed SRLG configurations.
<a href="#">Per-Prefix SRv6 Locator Assignment</a>	This feature provides the ability to assign a specific SRv6 locator for a given prefix or a set of prefixes (IPv4/IPv6 GRT, IPv4/IPv6 VPN).  The egress PE advertises the prefix with the specified locator. This allows for per-prefix steering into desired transport behaviors, such as Flex Algo.
<a href="#">Prefix Metric support for OSPF Flexible Algorithm</a>	This feature extends the current OSPF Flexible Algorithm functionality to support Flex-Algo Prefix Metric.  This feature introduces a Flexible Algorithm-specific prefix-metric in the OSPF prefix advertisement. The prefix-metric provides a way to compute the best end-to-end Flexible Algorithm optimized paths across multiple areas or domains.
<a href="#">SR-PCE: Single PCE scale enhancement</a>	With this feature, support for a single PCE is enhanced to 50000 nodes, 100000 LSPs, 500000 links, and 2000 PCEP sessions.
<a href="#">SR-PCE: Stateful North-Bound API for Tree-SID</a>	The SR-PCE provides a north-bound HTTP-based API to allow communication between SR-PCE and external clients and applications. The Cisco Crosswork Optimization Engine is an application that leverages the SR-PCE.  This release adds support for the following: <ul style="list-style-type: none"> <li>• Stateful North-Bound API for Tree-SID using a subscription model</li> <li>• SR-PCE continuous notifications of modified or deleted Tree-SIDs as they occur</li> </ul>
<a href="#">Support for iBGP as PE-CE protocol</a>	This feature introduces support for iBGP as PE-CE protocol.
<b>Netflow</b>	
<a href="#">Sampled Flow</a>	Sampled flow (sFlow) allows you to monitor real-time traffic in data networks that contain switches and routers. It uses the sampling mechanism in the sFlow agent software on routers to monitor traffic and to forward the sample data to the central data collector.  sFlow uses version 5 export format to forward sampled data.

## Hardware Introduced

Cisco IOS XR Release 7.5.1 introduces the following hardware support:

Hardware Feature	Description
Support of QSFP-100G-ERL-S Optical Module	<p>This release introduces support for the QSFP-100G-ERL-S optical module on the following Cisco ASR 9000 Series line cards and routers:</p> <ul style="list-style-type: none"> <li>• A9K-8HG-FLEX-SE/TR</li> <li>• A9K-20HG-FLEX-SE/TR</li> <li>• A99-32X100GE-X-SE/TR</li> <li>• A99-12X100GE, A9K-4X100GE</li> <li>• ASR-9903(Base)</li> <li>• A9903-20HG-PEC</li> <li>• ASR-9902</li> </ul> <p>When combined with routers optimized with 100G port bandwidth, this optical module significantly increases router scale and capacity at improved cost points. This module also supports link lengths of up to 25 km over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors.</p> <p>For more information, see the <a href="#">Cisco 100GBASE QSFP-100G Modules Data Sheet</a>.</p>
Support of QDD-2X100G-LR4-S Optical Module	<p>This release introduces support for the QDD-2X100G-LR4-S optical module on the following Cisco ASR 9000 Series line cards:</p> <ul style="list-style-type: none"> <li>• A99-10X400GE-X-TR</li> <li>• A99-10X400GE-X-SE</li> </ul> <p>When combined with routers optimized with 100G port bandwidth, this optical module significantly increases router scale and capacity at improved cost points. This module also supports link lengths of up to 10 km over a Single-Mode Fiber (SMF) and uses a dual duplex CS connector.</p> <p>For more information, see the <a href="#">Cisco 400G QSFP-DD Cable and Transceiver Modules Data Sheet</a>.</p>

Hardware Feature	Description
Support for QSFP-100G-SM-SR Optical Module on Cisco 9901 Routers	<p>This release introduces support for the QSFP-100G-SM-SR optical module on Cisco ASR 9901 routers. When combined with routers optimized with 100G port bandwidth, this optical module significantly increases router scale and capacity at improved cost points. This module also supports link lengths of up to 2 km over a standard pair of G.652 Single-Mode Fiber (SMF) with duplex LC connectors.</p> <p>For more information, see the <a href="#">Cisco 100GBASE QSFP-100G Modules Data Sheet</a>.</p> <p>To see the interoperability and support matrix for this module, visit <a href="https://tmgmatrix.cisco.com/">https://tmgmatrix.cisco.com/</a> and search for QSFP-100G-SM-SR.</p>

## Caveats

**Table 1: Cisco ASR 9000 Series Router Specific Bugs**

Bug ID	Headline
<a href="#">CSCvz53722</a>	Commit replace failed with message " 'OSPFV3' detected the 'resource not available' condition".
<a href="#">CSCwa19042</a>	Login banner text leaf (line) is missed on Cisco-IOS-XR-um-banner-cfg when the total characters in text exceeds 1015.

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



**Table 2: Cisco IOS XR 64 bit Software Release 7.5.1 TAR Files**

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP and RP systems]	ASR9K-x64-iosxr-px-7.5.1.tar	<ul style="list-style-type: none"> <li>• Cisco IOS XR Manageability Package</li> <li>• Cisco IOS XR MPLS Package</li> <li>• Cisco IOS XR MPLS -TE and RSVP Package</li> <li>• Cisco IOS XR Multicast Package</li> <li>• Cisco IOS XR Optics Package</li> <li>• Cisco IOS XR BNG Package</li> <li>• Cisco IOS XR Lawful Intercept Package</li> <li>• Cisco IOS XR Satellite Package</li> <li>• Cisco IOS XR EIGRP Package</li> <li>• Cisco IOS XR ISIS Package</li> <li>• Cisco IOS XR OSPF Package</li> <li>• Cisco IOS XR Service Package</li> </ul>
Cisco IOS XR IP/MPLS Core Software 3DES [for RSP and RP systems]	ASR9K-x64-iosxr-px-k9-7.5.1.tar	<ul style="list-style-type: none"> <li>• Cisco IOS XR Manageability Package</li> <li>• Cisco IOS XR MPLS Package</li> <li>• Cisco IOS XR MPLS -TE and RSVP Package</li> <li>• Cisco IOS XR Multicast Package</li> <li>• Cisco IOS XR Optics Package</li> <li>• Cisco IOS XR BNG Package</li> <li>• Cisco IOS XR Lawful Intercept Package</li> <li>• Cisco IOS XR Satellite Package</li> <li>• Cisco IOS XR Security Package</li> <li>• Cisco IOS XR EIGRP Package</li> <li>• Cisco IOS XR ISIS Package</li> <li>• Cisco IOS XR OSPF Package</li> <li>• Cisco IOS XR Service Package</li> </ul>

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-7.5.1.tar	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 7.3.1 and additional software for migration to 64 bit.

**Table 3: Cisco IOS XR 64 bit Software Release 7.5.1 ISO and RPM Files**

Composite Package		
Feature Set	Filename	Description
Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-x64-7.5.1.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-r751.x86_64.rpm	Includes EIGRP protocol support software
Cisco IOS XR BNG Package	asr9k-bng-x64-1.1.0.0-r7512.x86_64.rpm	Includes binaries to support BNG features.
Cisco IOS XR 64 bit ISIS package	asr9k-isis-x64-1.1.0.0-r751.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-r751.x86_64.rpm	Includes OSPF link state protocol support software
Cisco IOS XR Manageability Package	asr9k-mgbl-x64-3.0.0.0-r751.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-r751.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-r751.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-r751.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-r751.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-r751.x86_64.rpm	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-x64-3.1.0.0-r751.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-r751.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-r751.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
- 16 GB memory on the RSP880, RSP880-LT, RP2, A99-RSP-TR and A99-RSP-SE
- 16 GB memory on the RP2 transport optimised (TR) variant and 32 GB memory on the RP2 service edge (SE) variant

- 24 GB memory on the RP3 transport optimised (TR) variant and 40 GB memory on the RP3 service edge (SE) variant
- 24 GB memory on the RSP5 transport optimised (TR) variant and 40 GB memory on the RSP5 service edge (SE) variant
- 2 GB compact flash on route switch processors (RSPs)
- 8 GB memory on the line cards (LCs) running Cisco IOS XR 64-bit image

## Software Compatibility

Cisco IOS XR Software Release 7.5.1 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](mailto: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 : 7.5.1

Active Packages: 16
  asr9k-xr-7.5.1 version=7.5.1 [Boot image]
  asr9k-bng-supp-x64-1.0.0.0-r751
  asr9k-bng-x64-1.0.0.0-r751
  asr9k-mgbl-x64-2.0.0.0-r751
  asr9k-9000v-nV-x64-1.0.0.0-r751
  asr9k-mpls-x64-2.0.0.0-r751
  asr9k-eigrp-x64-1.0.0.0-r751
  asr9k-isis-x64-1.1.0.0-r751
```

```

asr9k-mpls-te-rsvp-x64-2.1.0.0-r751
asr9k-ospf-x64-1.0.0.0-r751
asr9k-services-x64-1.0.0.0-r751
asr9k-mcast-x64-2.0.0.0-r751
asr9k-li-x64-1.1.0.0-r751
asr9k-optic-x64-1.0.0.0-r751
asr9k-k9sec-x64-2.1.0.0-r751
asr9k-m2m-x64-2.0.0.0-r751

```

## 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
                                =====
Card Type          FPD Description          Req   SW   Min Req   Min Req
=====          =====          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  25.30  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
-----					
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	25.30	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
-----					
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
-----					
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
-----					
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	25.30	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
-----					
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	25.30	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
-----					
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
-----					
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
-----					
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	0.13	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
-----					
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
-----					
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
-----					
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	33.30	33.30	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	0.08	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	0.18	0.18	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	0.08	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	0.18	0.18	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	30.36	30.36	0.0
	Zenith-FPGA	YES	0.10	0.10	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	30.36	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	0.18	0.18	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	0.18	0.18	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
-----					
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	25.30	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
-----					
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	0.13	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
-----					
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	0.13	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
-----					
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
-----					
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
-----					
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	25.30	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
-----					
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
-----					
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
-----					
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	25.30	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
-----					
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
-----					
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
-----					
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	1.97	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
-----					
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
-----					
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
-----					
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
-----					
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
-----					
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
-----					
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
-----					
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
-----					
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
-----					
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
-----					
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	0.18	0.18	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	34.39	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	0.18	0.18	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	25.30	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
-----					
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	5.04	5.04	0.0
-----					
ASR-9006-FAN-V2	CBC	NO	5.05	5.05	0.0
-----					
ASR-9010-AC	CBC	NO	7.105	7.105	0.0
-----					
ASR-9010-AC-V2	CBC	NO	7.105	7.105	0.0
-----					
ASR-9010-FAN	CBC	NO	4.03	4.03	0.0
-----					
ASR-9010-FAN-V2	CBC	NO	29.12	29.12	0.0
-----					
ASR-9901-LC	CBC	NO	55.07	55.07	0.1
	Gamora-FPGA	YES	0.36	0.36	0.1
	IPU-FPGA	YES	1.10	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
-----					
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	61.24	61.24	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	61.24	61.24	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	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	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	NO	6.03	6.03	0.12
	DT-Sec54vMCU	NO	6.02	6.02	0.12
	DT-Sec5vMCU	NO	6.03	6.03	0.12
	EM-PriMCU	NO	3.12	3.12	0.12
	EM-Sec54vMCU	NO	3.21	3.21	0.12
	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	DT-Pri0MCU	NO	3.01	3.01	0.1
	DT-Pri1MCU	NO	3.01	3.01	0.1
	DT-Sec054vMCU	NO	3.01	3.01	0.1
	DT-Sec154vMCU	NO	3.01	3.01	0.1
	DT-Sec5vMCU	NO	3.02	3.02	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

## 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 4: Cisco ASR 9000 Series Aggregation Services Router Supported Hardware and Minimum Software Requirements**

### Cisco ASR 9000 Series Aggregation Services Router - Route Switch Processor Cards

<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
A9K-RSP880-LT-SE	Cisco ASR 9000 Series Aggregation Services Router RSP880-Lite, Service Edge Optimized	Release 6.4.1
A9K-RSP880-LT-TR	Cisco ASR 9000 Series Aggregation Services Router RSP880-Lite, Packet Transport Optimized	Release 6.4.1
A99-RSP-SE	Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Service Edge Optimized for ASR 9910 from Release 6.0.1.	Release 6.2.1
A99-RSP-TR	Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Packet Transport Optimized for ASR 9910 from Release 6.0.1.	Release 6.2.1
A99-RSP-SE	Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Service Edge Optimized for ASR 9906 from Release 6.3.1.	Release 6.3.1
A99-RSP-TR	Cisco ASR 9000 Series Aggregation Services Router RSP4-S, Packet Transport Optimized for ASR 9906 supported from Release 6.3.1	Release 6.3.1
A9K-RSP880-SE	ASR9K Route Switch Processor with 880G/slot and 32 GB for Service Edge	Release 6.1.2
A9K-RSP880-TR	ASR9K Route Switch Processor with 880G/slot and 16 GB for Packet Transport	Release 6.1.2
<b>Cisco ASR 9000 Series Aggregation Services Router - Route Processor Cards</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
A99-RP2-SE	ASR Route Processor 32 GB for Service Edge	Release 6.1.2
A99-RP2-TR	ASR Route Processor 16 GB for Packet Transport	Release 6.1.2
<b>Cisco ASR 9901 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
<b>Cisco ASR 9902 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
<b>Cisco ASR 9903 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
<b>Cisco ASR 9904 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
<b>Cisco ASR 9912 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
A99-SFC2	Cisco ASR 9000 Fabric Card	Release 6.1.2
ASR-9912-FAN	Cisco ASR 9000 Series Aggregation Services Router 12-Slot Fan Tray	Release 6.1.2
<b>Cisco ASR 9922 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
A99-SFC2	Cisco ASR 9000 Fabric Card	Release 6.1.2
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
<b>Cisco ASR 9006 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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-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
<b>Cisco ASR 9906 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
A99-SFC-T	ASR 9906 Switch Fabric Card 3	Release 6.3.1
<b>Cisco ASR 9010 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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-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-9010-2P-KIT	Cisco ASR 9000 Series Aggregation 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
<b>Cisco ASR 9910 Router</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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-SFC-S	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Switch Fabric Card	Release 6.2.1
A99-SFC3-S	ASR 9910 Switch Fabric Card 3	Release 6.5.15
<b>Cisco ASR 9000 Series Aggregation Services Router - Power Modules</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
<b>Cisco ASR 9000 Series Aggregation Services Router - Line Cards</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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-4X100GE	ASR 9000 4-port 100-Gigabit Ethernet 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
A99-8X100GE-SE	ASR 9900 8-port 100GE Service Edge optimized	Release 6.1.2
A99-8X100GE-TR	ASR 9900 8-port 100GE Packet Transport optimized	Release 6.1.2
A99-8X100GE-CM	ASR 9900 8-port 100GE Consumption Model	Release 6.1.2
A99-12X100GE	Cisco ASR 9000 Series Aggregation Services Router 12-Port 100-Gigabit Ethernet Line Card	Release 6.1.2
A99-12X100GE-CM	Cisco ASR 9000 Series Aggregation Services Router 12-port 100GE Ethernet Line card CM	Release 6.1.2
A9K-8X100GE-CM	Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Consumption Model Optimized with CPAK	Release 6.1.2
A9K-8X100GE-SE	Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Service Edge Optimized	Release 6.1.2
A9K-8X100GE-TR	Cisco ASR 9000 Series Aggregation Services Router 8-Port 100-Gigabit Ethernet, Packet Transport Optimized	Release 6.1.2
A9K-4X100GE-SE	Cisco ASR 9000 Series Aggregation Services Router 4--Port 100-Gigabit Ethernet, Service Edge Optimized	Release 6.1.2
A9K-4X100GE-TR	Cisco ASR 9000 Series Aggregation Services Router 4-Port 100-Gigabit Ethernet, Packet Transport Optimized	Release 6.1.2
A9K-8X100GE-L-SE	Cisco ASR 9000 Series Aggregation Services Router 8-port High Density 100GE Ethernet Line Card, Service Edge Optimized	Release 6.1.2
A9K-8X100GE-L-TR	Cisco ASR 9000 Series Aggregation Services Router 8-port High Density 100GE Ethernet Line Card, Packet Transport Optimized	Release 6.1.2



A9K-400G-DWDM-TR	2-Port 100G + 20-Port 10 GE Combination IPoDWDM Line Card with CFP2 and SFP+, Packet Transport Optimized	Release 6.2.1
<b>Cisco ASR 9000 Series Aggregation Services Router - Modular Line Cards</b>		
<b>Part Number</b>	Cisco ASR 9000 Series Aggregation Services Router 200 Gigabit Modular Line Card, Packet Transport Optimized Cisco ASR 9000 Series Aggregation Services Router 200 Gigabit Modular Line Card, Service Edge Optimized	<b>Support Initially Provided in IOS XR 64 bit Release</b>
A9K-MOD200-TR A9K-MOD200-SE	Cisco ASR 9000 Modular 400G Consumption Model Line Card	Release 6.3.1
A9K-MOD400-CM	Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Service Edge Optimized	Release 6.2.1
A9K-MOD400-SE	Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Packet Transport Optimized	Release 6.2.1
A9K-MOD400-TR	Cisco ASR 9000 Series Aggregation Services Router 200 Gigabit Modular Line Card, Packet Transport Optimized Cisco ASR 9000 Series Aggregation Services Router 200 Gigabit Modular Line Card, Service Edge Optimized	Release 6.2.1
<b>Cisco ASR 9000 Series Aggregation Services Router - Modular Port Adapters (MPAs)</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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-1X40GE	Cisco ASR 9000 Series Aggregation Services Router 1-port 40GE Modular Port Adapter	Release 6.3.1

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-2X10GE	Cisco ASR 9000 Series Aggregation Services Router 2-port 10GE Modular Port Adapter	Release 6.3.2
A9K-MPA-2X40GE	Cisco ASR 9000 Series Aggregation Services Router 2-port 40GE Modular Port Adapter	Release 6.3.1
<b>Cisco Digital Pluggable Optical Modules</b>		
CFP2-WDM-DET-1HL=	200G, 100G, WDM Digital CFP2 pluggable Licensed for 100G only – TOF	Release 6.6.2
CFP2-WDM-D-1HL=	200G, 100G, WDM Digital CFP2 pluggable Licensed for 100G only – NON TOF	Release 6.6.2
<b>Cisco ASR 9000v Satellite Shelf</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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
<b>Cisco NCS 5000 Satellite Shelf</b>		
<b>Part Number</b>	<b>Description</b>	<b>Support Initially Provided in IOS XR 64 bit Release</b>
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

## 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.
- Installing a Line Card—For a fully populated Line Card with cable optics, maintenance time required for card replacement is higher. For more information about Line Card installation and removal, refer to the *Cisco ASR 9000 Aggregation Services Router Ethernet Line Card Installation Guide*.
- 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";
  } elseif exists user-class and option user-class = "xr-config" {
    filename = "http://172.30.0.22/scripts/cisco-rp0_ztp.sh";
  }
}
```

## 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.

## Cisco IOS XR MIBs

To determine the MIBs supported by platform and release, refer to the [Cisco IOS XR MIBs](#) tool.

## 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.

## 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.



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**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.

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## Use user-class Option 'xr-config' Instead Of 'exr-config' To Provision 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";
  } elseif exists user-class and option user-class = "xr-config" {
    filename = "http://172.30.0.22/scripts/cisco-rp0_ztp.sh";
  }
}
```

## 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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