Release Notes for Cisco ASR 9000 Series Routers, IOS XR Release 25.4.1

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Cisco ASR 9000 Series Routers, IOS XR Release 25.4.1

Cisco IOS XR Release 25.4.1 is a new feature and hardware release for Cisco ASR 9000 Series routers. Key highlights include a gRPC-based BGP-LS API for real-time topology export, percentage-based QoS allocation for streamlined shared policy instances management, SRG warm-standby for rapid subscriber restoration, and geographical redundancy for L2TP sessions. Additional enhancements include EVPN IRB over SRv6, MPLS-TE IPv6-only autoroute announce, automated container management with gNOI RemoveContainer RPC, proactive syslog security warnings, and TLS RFC 5289 compliance.

New software features

Table 1. New software features for ASR 9000 Series Aggregation Services Routers, Release 25.4.1

Product impact	Feature	Description
BGP		
Ease of Use	gRPC based Northbound API for BGP-LS objects	This gRPC-based API exports BGP-LS topology objects, which include nodes, links, IPv4 and IPv6 prefixes, SRv6 SIDs, and SR policy candidate paths. The API is designed to provide real-time updates to external controllers and applications, enabling them to perform tasks such as re-optimization, service placement, and network visualization. For more information, refer to the Cisco Crosswork Optimization Engine User Guides .
Cloud Native BNG User Plane		
Software Reliability	Percentage-based QoS allocation for shared policy instances	You can now streamline QoS policy management and ensure consistent rate enforcement across subscriber sessions with different port speeds by configuring shaping or policing rates as percentages in QoS policies for both ingress and egress directions. This enhancement allows a single policy map to be applied across multiple interfaces.
Software reliability	SRG warm-standby mode	You can now reduce failover recovery time and lower costs by using a single standby UP node for multiple UP instances. The standby node keeps subscriber session context in memory (without programming hardware), then quickly replays it to hardware during switchover, enabling fast service restoration, better hardware utilisation, and improved scalability.
API Experience	Enhanced subscriber routing with Framed-Route Tag and Preference attributes	You can now get automatic route prioritization and failover to a backup path, ensuring reliable subscriber connectivity. This is achieved by using RADIUS attributes to assign static IPv4 or IPv6 routes with preference and tag values.
Software reliability	Geographical redundancy for L2TP sessions	You can now ensure continuous service and session availability for L2TP users during cnBNG CP failovers, minimizing disruption for end users. When a failover occurs, the CP automatically synchronizes critical L2TP tunnel and session state with the cnBNG User Plane (UP), keeping tunnels and sessions operational without manual intervention.
IP Addresses and Services		
Software Reliability	DHCPv6 relay subscriber ID	You can now configure DHCPv6 relay subscriber ID option 38 in the DHCPv6 replay profile. This feature allows DHCPv6 relay

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Product impact	Feature	Description
		agents to send a relay subscriber ID, also known as option 38, to the DHCPv6 server. You can configure unique IDs on L2 sub-interfaces. When a client request arrives on a DHCPv6 relay, the relay agent adds option 38 into the relay-forward message, providing the server with the client's originating interface for efficient address assignment.
Interfaces		
Ease of Use	Application select code provisioning	You can now configure application select codes directly on a QDD module by using a CLI. This simplifies provisioning by allowing the selection of advertised application modes such as 400ZR, OpenZR+ and others. The router activates the selected code to ensure compatibility and reduce configuration complexity
L2VPN		
Software Reliability	EVPN IRB over SRv6 core	EVPN IRB enhances network flexibility by enabling seamless Layer 3 connectivity between hosts on different subnets over an SRv6 network. This feature allows Layer 3 forwarding among hosts across IP subnets, maintains EVPN's multi-homing capabilities, and facilitates communication between EVPN hosts or subnets and IP VPNs. Leveraging SRv6's programmable and flexible transport, this solution streamlines the integration and management of modern, diverse network environments.
Licensing		
Licensing Process	Smart Licensing Perpetual Mode	Smart Licensing Perpetual Mode simplifies licensing operations for customers with full-capacity perpetual licenses that cover the entire chassis or all line cards. These customers do not need to enable Smart Licensing Using Policy or report usage, which reduces administrative overhead across these deployments.
MPLS		
Software Reliability	Event history for MPLS-TE headend tunnels	This feature introduces a granular and configurable event tracking mechanism for operational visibility into MPLS-TE tunnels. You can enable event history with the **mpls traffic-eng event-history tunnel** command and set the number of tracked events with the **mpls traffic-eng event-history tunnel event-count** command.
Ease of use	MPLS-TE IPv6-only autoroute announce	This feature allows you to disable IPv4 autoroute announce without turning off autoroute announce entirely. To achieve IPv6-only announcements over MPLS-TE tunnels, use the new exclude-ipv4 option along with the include-ipv6 option in the autoroute announce configuration.
Programmability		
API Experience	gNOI RemoveContainer RPC	We have introduced support for RemoveContainer RPC to give you direct, automated control over the removal of application

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Product impact	Feature	Description
		containers managed by App Manager, allowing you to efficiently decommission unneeded or malfunctioning containers and maintain a clean, resource-optimized system.
Routing		
Ease of use	IS-IS auto-cost reference bandwidth	The IS-IS auto-cost reference bandwidth feature automates IS-IS metric provisioning based on physical link bandwidth, optimizing path selection and reducing operational overhead. This feature allows you to configure a reference bandwidth, which IS-IS then uses to automatically calculate interface metrics. It also dynamically adjusts metrics for bundle interfaces when member links change, ensuring accurate and efficient routing without manual intervention.
System Monitoring		
Software reliability	Insecure features warning syslog messages	Cisco IOS XR software warns you with a syslog message each time you use an insecure command and repeats the warning every 30 days until you remove the command. This helps you identify potential security risks and suggests safer alternatives to improve your network security. Cisco will systematically deprecate and eventually remove these insecure features and protocols in future IOS XR releases. For more information on insecure commands and their alternatives, see Feature deprecation phasing out insecure capabilities.
System Security		
Ease of Setup	TLS RFC 5289 compliance for security template framework	The security template framework is based on RFC 5289 , which specifies new cipher suites for the Transport Layer Security (TLS) protocol. This feature supports Common Criteria (CC) mode which is an enhanced security mode that enforces stricter compliance-focused behavior. It enhances TLS security by introducing stronger Elliptic Curve Cryptography (ECC) algorithms.
Ease of Setup	Security template framework for TLS enabled applications	Security templates reduce misconfiguration risks and operational overhead by centralizing and standardizing security policy configuration for TLS-enabled applications. A security template bundles certificate authentication policy, TLS controls, and compliance mode settings. It acts as a single source of truth that applications reference, avoiding local embedding of security settings. This template defines how certificates are handled and controls various aspects of the TLS handshake.

New hardware features

There are no new hardware introduced in this release.

Changes in behavior

- **Deprecation and phasing out features with insecure capabilities and its secure alternatives**
  From Release 25.4.1, Cisco IOS XR software displays warning messages when you configure features or protocols that lack sufficient security, such as those that transmit sensitive data without encryption or use outdated encryption mechanisms. The software also shows warnings when you do

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not follow security best practices, and it provides suggestions for secure alternatives.

This list may change, but Cisco plans to generate warnings for the following features and protocols from Release 25.4.1. Each Release Notes will describe the exact changes for that version. These documents list all features planned for removal, including insecure commands, and provide recommended secure alternatives to help you maintain network security and compliance.

- **Feature deprecation phasing out insecure capabilities**
- **Feature deprecation and removal details**
- **Feature removal and suggested alternatives**

Table 2. Deprecation and phasing out features with insecure capabilities and its secure alternatives

If you are using the following insecure features...	Then follow these secure alternatives...
HTTP	Use HTTPS.
FTP client install FTP install TFTP	Use SFTP.
IPV4 source route	There is no alternative. Do not enable IPv4 source routing.
Telnet client Telnet dscp	There is no alternative. Do not use Telnet client.
Telnet server	Use SSH.
TFTP client	Use SFTP.
TFTP server	Use SSH.
copy ftp copy ftp running-config copy running-config ftp copy running-config tftp copy tftp copy tftp running-config copy xml-schema tftp	Use SFTP or SCP.
install FTP install TFTP	Use SFTP.
TCP or UDP small_servers	There is no alternative. Do not use TCP or UDP small_servers.
SSHv1	Use ssh server v2.
SSH host-key DSA algorithm	Use ECDSA, ED25519, or RSA and so on.
Syslog TLS Version 1.1 (server1)	Configure TLS Version 1.2 or higher.
TLS 1.0 TLS 1.1	Use TLS 1.2 or TLS 1.3.

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If you are using the following insecure features...	Then follow these secure alternatives...
utility mv ftp utility mv tftp	There is no alternative. Do not use utility mv ftp and utility mv tftp.
load ftp load tftp load script ftp load script tftp load diff ftp load diff tftp load diff reverse ftp load diff reverse tftp	Use scp or sftp
tacacs and radius server with type-7 shared secret	Use type 6 secret.
NTPv2 NTPv3	Use NTPv4.

Open issues

There are no open issues in this release.

Known issues

- During a software upgrade to IOS XR Release 25.4.1, the system may not complete the Auto-FPD upgrade as expected. After the upgrade, the FPD status shows 'RLOAD REQ', indicating that you must perform an additional reload to activate the updated FPD.

Compatibility

Compatibility matrix for EPNM and Crosswork with Cisco IOS XR software

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

Table 3. Compatibility Matrix

Cisco IOS XR	Crosswork	EPNM
Release 25.4.1	Crosswork Optimization Engine 6.0	Evolved Programmable Network Manager 8.1.1

Memory

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

- 32 GB memory on the A99-RP-F
- 24 GB memory on the RP3 transport optimised (TR) variant and 40 GB memory on the RP3 service edge (SE) variant
- 24 GB memory on the RP3-X transport optimized (TR) variant and 48 GB memory on the RP3-X service edge (SE) variant

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- 24 GB memory on the RSP5 transport optimized (TR) variant and 40 GB memory on the RSP5 service edge (SE) variant
- 24 GB memory on the RSP5-X transport optimized (TR) variant and 48 GB memory on the RSP5-X service edge (SE) variant
- 2 GB compact flash on route switch processors (RSPs)
- 8 GB memory on the line cards (LCs) running Cisco IOS XR 64-bit image

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

Software compatibility

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

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

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

Supported hardware

Table of supported hardware components and the minimum required software versions.

Table 4. Supported Hardware

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

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Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
A9K-RSP5-X-TR	ASR 9000 Series Route Switch Processor 5 for Packet Transport, Premium	Release 7.6.2
A9K-RSP5-SE	ASR 9000 Route Switch Processor 5 for Service Edge	Release 6.5.15
A9K-RSP5-TR	ASR 9000 Route Switch Processor 5 for Packet Transport	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router - Route Processor Cards		
A99-RP3-X-SE	ASR 9900 Route Processor 3 for Service Edge, Premium	Release 7.6.2
A99-RP3-X-TR	ASR 9900 Route Processor 3 for Packet Transport, Premium	Release 7.6.2
A99-RP3-SE	ASR 9900 Route Processor 3 for Service Edge	Release 6.5.15
A99-RP3-TR	ASR 9900 Route Processor 3 for Packet Transport	Release 6.5.15
Cisco ASR 9901 Router		
ASR-9901	Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port	Release 6.4.1
ASR-9901-FAN	Cisco ASR 9000 Series Aggregation Services Router 2-RU Fixed Port Fan Tray	Release 6.4.1
A9K-1600W-AC	Cisco ASR 9000 Series Aggregation Services Router 2-RU 1600W AC Power Module	Release 6.4.1
A9K-1600W-DC	Cisco ASR 9000 Series Aggregation Services Router 2-RU 1600W DC Power Module	Release 6.4.1
Cisco ASR 9902 Router		
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 and 23 inch Rack – Long	Release 7.4.1
ASR-9902-2P-KIT	Cisco ASR 9902 2-Post Mounting Kit for 19-Inch and 23-Inch Rack	Release 7.4.1
ASR-9902-CAB-MGMT	Cisco ASR 9902 Cable Management	Release 7.4.1
ASR-9902-FILTER	Cisco ASR 9902 Air Filter	Release 7.4.1
ASR-9902-FAN	Cisco ASR 9902 Fan Tray	Release 7.4.1
Cisco ASR 9903 Router		

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Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
ASR-9903	Cisco ASR 9903 Compact High-Performance Router with fixed ports and PEC (Port Expansion Card) slot.	Release 7.1.3
A99-RP-F	Cisco ASR 9900 Fixed Chassis Route Processor	Release 7.1.3
ASR-9903-FAN	Cisco ASR 9903 Router Fan Tray	Release 7.1.3
ASR-9903-4P-KIT	ASR 9903 4-Post Mounting Kit for 19-inch Rack	Release 7.1.3
ASR-9903-CAB-MGMT	ASR 9903 Cable Management Brackets	Release 7.1.3
ASR-9903-FILTER	ASR 9903 Air Filter	Release 7.1.3
Cisco ASR 9904 Router		
ASR-9904	Cisco ASR 9000 Series Aggregation Services Router 4-Slot 2 Line Card Slot Chassis, 6 RU	Release 6.1.2
ASR-9904-AC	Cisco ASR 9000 Series Aggregation Services Router 4-Slot 2 Line Card Slot AC Chassis w/ PEM V2	Release 6.1.2
ASR-9904-DC	Cisco ASR 9000 Series Aggregation Services Router 4-Slot 2 Line Card Slot DC Chassis w/ PEM V2	Release 6.1.2
ASR-9904-FAN	Cisco ASR 9000 Series Aggregation Services Router 4-Slot Fan Tray	Release 6.1.2
ASR-9904-FILTER	Cisco ASR 9000 Series Aggregation Services Router 4-Slot Filter	Release 6.1.2
ASR-9904-BAFFLE	Cisco ASR 9000 Series Aggregation Services Router 4-Slot Baffle	Release 6.1.2
Cisco ASR 9912 Router		
ASR-9912	Cisco ASR 9000 Series Aggregation Services Router 12-Slot 10 Line Card Slot Chassis	Release 6.1.2
ASR-9912-AC	Cisco ASR 9000 Series Aggregation Services Router 12-Slot 10 Line Card Slot AC Chassis w/ PEM V2	Release 6.1.2
ASR-9912-DC	Cisco ASR 9000 Series Aggregation Services Router 12-Slot 10 Line Card Slot DC Chassis w/ PEM V2	Release 6.1.2
A99-SFC3	Cisco ASR 9900 Switch Fabric Card 3	Release 6.5.15
ASR-9912-FAN	Cisco ASR 9000 Series Aggregation Services Router 12-Slot Fan Tray	Release 6.1.2
Cisco ASR 9922 Router		
ASR-9922	Cisco ASR 9922 20 Line Card Slot Chassis, 44 RU	Release 6.1.2

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

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Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
Cisco ASR 9010 Router		
ASR-9010-SYS	Cisco ASR 9000 Series Aggregation Services Router 10-Slot System	Release 6.1.2
ASR-9010-AC-V2	Cisco ASR 9000 Series Aggregation Services Router 10-Slot AC Chassis Version 2	Release 6.1.2
ASR-9010-DC-V2	Cisco ASR 9000 Series Aggregation Services Router 10-Slot DC Chassis Version 2	Release 6.1.2
ASR-9010-FAN	Cisco ASR 9000 Series Aggregation Services Router 10-Slot Fan Tray	Release 6.1.2
ASR-9010-FAN-V2	Cisco ASR 9000 Series Aggregation Services Router 10-Slot Version 2 Fan Tray	Release 6.1.2
ASR-9010-DOOR	Cisco ASR 9000 Series Aggregation Services Router 10-Slot Door Kit	Release 6.1.2
ASR-9010-2P-KIT	Cisco ASR 9000 Series Aggregation Services Router 2 Post Mounting Kit	Release 6.1.2
ASR-9010-4P-KIT	Cisco ASR 9000 Series Aggregration Services Router 4 Post Mounting Kit	Release 6.1.2
ASR-9010-FILTER	Cisco ASR 9000 Series Aggregation Services Router 10-Slot Air Filter	Release 6.1.2
Cisco ASR 9910 Router		
ASR-9910	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) System	Release 6.2.1
ASR-9910-FAN	Cisco ASR 9000 Series Aggregation Services Router 10-Slot(9910) Fan Tray	Release 6.2.1
ASR-9910-ACC-KIT	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Accessory Kit	Release 6.2.1
ASR-9910-4P-KIT	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 4 Post Rack Mounting Kit	Release 6.2.1
ASR-9910-2P-KIT	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) 2 Post Rack Mounting Kit	Release 6.2.1
ASR-9910-AIRREF	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Reflector	Release 6.2.1
ASR-9910-FILTER	Cisco ASR 9000 Series Aggregation Services Router 10-Slot (9910) Air Filter	Release 6.2.1
A99-SFC3-S	ASR 9910 Switch Fabric Card 3	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router - Route Switch Processor Cards		
A9K-RSP5-X-SE	ASR 9000 Series Route Switch Processor 5 for Service Edge, Premium	Release 7.6.2

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Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
A9K-RSP5-X-TR	ASR 9000 Series Route Switch Processor 5 for Packet Transport, Premium	Release 7.6.2
A9K-RSP5-SE	ASR 9000 Route Switch Processor 5 for Service Edge	Release 6.5.15
A9K-RSP5-TR	ASR 9000 Route Switch Processor 5 for Packet Transport	Release 6.5.15
Cisco ASR 9000 Series Aggregation Services Router - Power Modules		
PWR-2KW-DC-V2	Cisco ASR 9000 Series Aggregation Services Router 2KW DC Power Module, version 2	Release 6.1.2
PWR-3KW-AC-V2	Cisco ASR 9000 Series Aggregation Services Router 3KW AC Power Module, version 2	Release 6.1.2
A9K-AC-PEM-V2	Cisco ASR 9000 Series Aggregation Services Router AC Power Entry Module Version 2	Release 6.1.2
A9K-DC-PEM-V2	Cisco ASR 9000 Series Aggregation Services Router DC Power Entry Module Version 2	Release 6.1.2
A9K-PEM-V2-FILR	Cisco ASR 9000 Series Aggregation Services Router Power Entry Module Version 2 Filler	Release 6.1.2
A9K-AC-PEM-V3	Cisco ASR 9000 Series Aggregation Services Router AC Power Enclosure Module Version 3	Release 6.1.2
A9K-DC-PEM-V3	Cisco ASR 9000 Series Aggregation Services Router DC Power Enclosure Module Version 3	Release 6.1.2
PWR-6KW-AC-V3	Cisco ASR 9000 Series Aggregation Services Router 6kW AC Power Module Version 3	Release 6.1.2
PWR-4.4KW-DC-V3	Cisco ASR 9000 Series Aggregation Services Router 4.4kW DC Power Module Version 3	Release 6.1.2
PWR-1.6KW-AC	ASR 9900 Fixed Chassis AC Power Supply	Release 7.1.25
PWR-1.6KW-DC	ASR 9900 Fixed Chassis DC Power Supply	Release 7.1.25
Cisco ASR 9000 Series Aggregation Services Router - Line Cards		
A99-4HG-FLEX-X-SE	ASR 9900 400GE Combo Service Edge Line Card Enhanced - 5th Generation	Release 25.2.1
A9K-4HG-FLEX-X-SE	ASR 9000 400GE Combo Service Edge Line Card Enhanced - 5th Generation	Release 25.1.1
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

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Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
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	ASR 9000 2T Service Edge Combo Line Card - 5th Generation	Release 7.1.15
A9K-20HG-FLEX-TR	ASR 9000 2T Packet Transport Combo Line Card - 5th Generation	Release 7.1.15
A9K-8HG-FLEX-SE	ASR 9000 800G Service Edge Combo Line Card - 5th Generation	Release 7.1.15
A9K-8HG-FLEX-TR	ASR 9000 800G Packet Transport 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

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Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
A9K-48X10GE-1G-CM	ASR 9000 48-port dual-rate 10G/1G Consumption Model line card	Release 6.4.1
A9K-24X10GE-1G-CM	ASR 9000 24-port dual-rate 10G/1G Consumption Model line card	Release 6.4.1
A9K-48X10GE-1G-SE	ASR9000 48-port dual-rate 10G/1G service edge-optimized line card	Release 6.3.2
A9K-48X10GE-1G-TR	ASR9000 48-port dual-rate 10G/1G packet transport-optimized line card	Release 6.3.2
A9K-24X10GE-1G-SE	ASR9000 24-port dual-rate 10G/1G service edge-optimized line card	Release 6.3.2
A9K-24X10GE-1G-TR	ASR9000 24-port dual-rate 10G/1G packet transport-optimized line card	Release 6.3.2
Cisco ASR 9000 Series Aggregation Services Router - Modular Line Cards		
A9K-MOD400-CM	Cisco ASR 9000 Modular 400G Consumption Model Line Card	Release 6.2.1
A9K-MOD400-SE	Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Service Edge Optimized	Release 6.2.1
A9K-MOD400-TR	Cisco ASR 9000 Series Aggregation Services Router 400 Gigabyte Modular Line Card, Packet Transport Optimized	Release 6.2.1
Cisco ASR 9000 Series Aggregation Services Router - Modular Port Adapters (MPAs)		
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

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Part Number	Description	Support Initially Provided in IOS XR 64 bit Release
A9K-MPA-4X10GE	Cisco ASR 9000 Series Aggregation Services Router 4-port 10GE Modular Port Adapter	Release 6.2.1
A9K-MPA-20X1GE	Cisco ASR 9000 Series Aggregation Services Router 20-port 1GE Modular Port Adapter	Release 6.2.1
A9K-MPA-2X40GE	Cisco ASR 9000 Series Aggregation Services Router 2-port 40GE Modular Port Adapter	Release 6.3.1

Supported software packages

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

Table 5. Cisco IOS XR 64 bit Software Release 25.4.1 TAR Files

Feature Set	Filename	Description
Cisco IOS XR IP/MPLS Core Software [for RSP and RP systems]	ASR9K-x64-iosxr-px-25.4.1.tar	Cisco IOS XR Manageability Package Cisco IOS XR MPLS Package Cisco IOS XR MPLS -TE and RSVP Package Cisco IOS XR Multicast Package Cisco IOS XR Optics Package Cisco IOS XR BNG Package Cisco IOS XR Lawful Intercept Package Cisco IOS XR Satellite Package Cisco IOS XR EIGRP Package Cisco IOS XR ISIS Package Cisco IOS XR OSPF Package Cisco IOS XR Service Package
Cisco IOS XR IP/MPLS Core Software 3DES [for RSP and RP systems]	ASR9K-x64-iosxr-px-k9-25.4.1.tar	Cisco IOS XR Manageability Package Cisco IOS XR MPLS Package Cisco IOS XR MPLS -TE and RSVP Package Cisco IOS XR Multicast Package Cisco IOS XR Optics Package Cisco IOS XR BNG Package Cisco IOS XR Lawful Intercept Package Cisco IOS XR Satellite Package Cisco IOS XR Security Package Cisco IOS XR EIGRP Package Cisco IOS XR ISIS Package Cisco IOS XR OSPF Package Cisco IOS XR Service Package
Cisco IOS XR IP Unicast Routing Core Bundle and Migration to IOS XR 64 bit tar image	asr9k-mini-x64-migrate_to_eXR.tar-25.4.1	Contains the required core packages, including OS, Admin, Base,Forwarding, Modular Services Card, Routing, FPD, SNMP Agent, and Alarm Correlation. Contains mini.iso file for XR 64 bit 24.3.2 and additional software for migration to 64 bit.

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Table 6. Cisco IOS XR 64 bit Software Release 25.4.1 ISO and RPM Files

Feature Set	Filename	Description
Composite Package		
Cisco IOS XR IP Unicast Routing Core Bundle	asr9k-mini-x64-25.4.1.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		
Cisco IOS XR 64 bit EIGRP package	asr9k-eigrp-x64-1.0.0.0-r2541.x86_64.rpm	Includes EIGRP protocol support software
Cisco IOS XR BNG Package	asr9k-bng-x64-1.1.0.0-r2541.x86_64.rpm	Includes binaries to support BNG features.
Cisco IOS XR 64 bit ISIS package	asr9k-isis-x64-1.1.0.0-r2541.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-r2541.x86_64.rpm	Includes OSPF link state protocol support software
Cisco IOS XR Manageability Package	asr9k-mgbl-x64-3.0.0.0-r2541.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-r2541.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-r2541.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-r2541.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-r2541.x86_64.rpm	Firmware for the optics feature for Cisco ASR 9000 Series Aggregation Services Router Chassis. It enables Transport / OTN feature under interfaces.

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Feature Set	Filename	Description
Cisco IOS XR 64 bit Lawful Intercept (LI) Package	asr9k-li-x64-1.1.0.0-r2541.x86_64.rpm	Includes LI software images.
Cisco IOS XR Security Package	asr9k-k9sec-x64-3.1.0.0-r2541.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-r2541.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-r2541.x86_64.rpm	Includes RPM to support Cisco IOS XR 64-bit inline MAP-T function

Related resources

Table 7. Related resources

Resource	Description
Cisco feature finder	Assists in locating features introduced across Cisco IOS XR releases and platforms.
Smart licensing	Provides information about Smart Licensing Using Policy solutions and their deployment on IOS XR routers.
Cisco ASR 9000 documentation	Provides CDC documentation for Cisco ASR 9000 series routers.
Transceiver Module Group (TMG) compatibility matrix	Allows searching by product family, product ID, data rate, reach, cable type, or form factor to determine the transceivers that Cisco hardware device supports.
Cisco IOS XR Error messages	Allows searching by release number, error strings, or comparing release numbers to view a detailed repository of error messages and descriptions.
Cisco IOS XR MIBs	Allows selecting the MIB of your choice from a drop-down to explore an extensive repository of MIB information.
Yang data models in GitHub	Provides yang data models introduced and enhanced in every IOS XR release.
Recommended release	Provides a general guide in case of upgrading IOS XR routers or new deployments that involve IOS XR routers.

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