



Cisco IOS XR Software Release 4.1.0 for Cisco ASR 9000 Series Routers

Product Overview

The Cisco® ASR 9000 Series Aggregation Services Routers deliver unprecedented scale, service flexibility, and high availability into Carrier Ethernet, mobile, and service edge networks. The routers are powered by Cisco IOS® XR Software – an innovative, self-healing, distributed operating system designed for always-on operation while scaling system capacity up to 6.4 Tbps.

Cisco IOS XR Software Release 4.1.0 provides new software and hardware feature support for Cisco ASR 9000 Series Routers. The release opens a new era for services integration with the Cisco Integrated Service Module (ISM) and Cisco TV Content Delivery System (CDS) video streaming. Release 4.1.0 provides the next-generation infrastructure for video delivery, providing video contribution market features. The Carrier Ethernet solution is further strengthened with sub-50-ms G.8032 resiliency mechanisms in addition to Ethernet Operations, Administration, and Maintenance (EOAM) and management capabilities. Time-division multiplexing (TDM) platform capabilities are enhanced by new hardware support and critical capabilities such as Cisco Virtual Private LAN Services (VPLS).

New Hardware Features

Cisco IOS XR Software Release 4.1.0 introduces support for two new Shared Port Adapters (SPAs) on the Cisco ASR 9000 Series SPA Interface Processor (SIP) 700 Line Card and the Cisco ASR 9000 Series ISM. The Cisco ISM, with the industry-proven Cisco CDS application, provides a highly scalable modular video delivery platform with the streaming capacity of up to 240 Gbps per system.

Table 1 lists the new hardware support added in Cisco IOS XR Software Release 4.1.0.

Table 1. New Hardware Supported on Cisco ASR 9000 Series in Cisco IOS XR Software Release 4.1.0

Part Number	Description
SPA-8XCHT1/E1	8-port T1/E1 SPA
SPA-4XCT3/DS0	4-port T3/DS0 SPA
A9K-ISM-100	Cisco ASR 9000 Series Integrated Service Module
A9K-SAM-2B	ASR9K 2TB Flash Storage Service Application Module

New Software Features

Cisco IOS XR Software Release 4.1.0 also adds new software features for the Cisco ASR 9000 Series, including Point-to-Multipoint Traffic Engineering (P2MP-TE), IPv4 Lawful Intercept (LI), Ethernet Ring Protection Switching (ERPS) G.8032, Border Gateway Protocol (BGP) Policy Accounting (PA), Ethernet Local Management Interface (ELMI) at Provider Edge (PE), Link Layer Discovery Protocol (LLDP), Multi-Gigabit Service Control Platform (MGSCP), and Smart Call Home (SCH).

Table 2 lists new software features in Cisco IOS XR Software Release 4.1.0 supported on the Cisco ASR 9000 Series Aggregation Services Routers.

Table 2. New Software Features Supported on Cisco ASR 9000 Series in Cisco IOS XR Software Release 4.1.0

Feature	Description
P2MP-TE	P2MP-TE provides forwarding of multicast traffic over Multiprotocol Label Switching (MPLS). The MPLS core routers perform label replication to support transport of multicast traffic and thus optimize link utilization. In addition, the multicast traffic benefits from MPLS-TE Fast Reroute (FRR) sub-5-ms protection.
Lawful Intercept Layer 3 IPv4	Lawful Intercept is a process that allows a Law Enforcement Agency (LEA) to perform electronic surveillance on an individual (a target) as authorized by a judicial or administrative order. Cisco IOS XR 4.1.0 allows a user to configure and execute lawful intercepts on IPv4 traffic streams that flow through the Cisco ASR 9000 Series.
ERPS G.8032	ERPS is an ITU-T standard to provide sub-50-ms protection for Ethernet traffic in a ring topology and Ethernet loop prevention mechanism. Cisco IOS XR 4.1.0 introduces the ITU-T G.8032 in the Cisco ASR 9000 Series, allowing deployment of the platform in Carrier Ethernet ring topologies.
BGP PA	Cisco IOS XR 4.1.0 introduces BGP PA functionality on the Cisco ASR 9000 Series, which allows accounting of IP traffic differentially by assigning counters based on community list, AS (Autonomous System) number, and AS_PATH (Autonomous System Path) on a per-input-interface basis.
ELMI at PE	ELMI, defined by the Metro Ethernet Forum, is an asymmetric protocol that runs on the PE to Customer Edge (CE) link, used to communicate community status and configuration parameters. The Cisco ASR 9000 Series supports the PE aspects of the protocol by gathering relevant data from configuration and interworking with other operations, administration, and maintenance (OAM) tools, and propagating it to peer CE devices through ELMI.
LLDP	LLDP, defined in IEEE standard 802.1ab, is a device discovery protocol that allows directly connected devices in multivendor environments to discover information about each other. The Cisco ASR 9000 Series supports the protocol on a main interface, subinterfaces, bundle, and bundle subinterfaces.
MGSCP	Cisco IOS XR 4.1.0 introduces MGSCP, which delivers a scalable solution based on multiple Service Control Engine (SCE) platforms. MGSCP provides the ability to monitor, control, and report the traffic of subscribers within this environment. The MGSCP solution uses Link Aggregation Control Protocol (LACP) 802.3ad to support scaling the Cisco Service Control Engine (SCE) platforms by connecting SCEs with member links of bundles on dispatcher platforms such as the Cisco ASR 9000 Series.
Cisco SCH	Cisco SCH is an award-winning, embedded support feature available on a broad range of Cisco products. SCH-enabled devices continuously perform proactive diagnostics on their own components to provide real-time alerts and remediation advice when an issue is detected. The SCH feature on the Cisco ASR 9000 Series helps customers to gain higher availability and operational efficiency. Problems can be identified before they affect business, allowing operators to spend less time troubleshooting, experience a speedier resolution to network issues, and gain higher network availability.
IPv6 enhancements	Cisco IOS XR 4.1.0 introduces IPv6 support for the following functionality: • Virtual Router Redundancy Protocol (VRRP) v6 • Open Shortest Path First (OSPF) v3 for PE-CE peering
Dynamic Host Configuration Protocol (DHCP) v6 Relay Agent Notification	DHCP relay agents are used to forward DHCP requests and replies between clients and servers when they are not on the same physical subnet. Cisco IOS XR 4.1.0 introduces Relay Agent Notification for DHCPv6.
Link Noise Monitoring (LNM) on Cisco ASR 9000 Series SIP 700 Line Card	LNM provides the ability to signal events on T1/E1 links with noise above a configured threshold. The operator can configure the option for notification and automatic removal of the span from a bundle if link noise exceeds the configured threshold. A separate threshold can be configured to notify when the noise has subsided for a given period of time, and the operator can receive notification and reintroduce the span into the bundle.
Two Rate Three Color (2R3C) policing on Cisco ASR 9000 Series SIP 700 Line Card	2R3C, elaborated in RFC 2698, enables dual policing rates and marking under conform, exceed, and violate actions within the Modular quality-of-service (QoS) command-line interface (CLI) (MQC).
Internet Group Management Protocol (IGMP) snooping on Cisco ASR 9000 Series SIP 700 Line Card	IGMP snooping supports listening to the IGMP network traffic between downstream hosts and upstream routers. This feature allows the line card to maintain a map of which links need which IP multicast streams.
VPLS (core side) on Cisco ASR 9000 SIP 700 Line Card	VPLS (core-facing interface) functionality allows the line card to be used as a BFI (Backbone-Facing Interface) or an uplink interface for a VPLS bridge domain.
Integrated Routing and Bridging (IRB) (limited) on Cisco ASR 9000 SIP 700 Line Card	Cisco IOS XR 4.1.0 introduces support for IRB and Bridge-Group Virtual Interface (BVI). The supported forwarding model is between Network Node Interface (NNI) Layer 3 interfaces on the line card toward Layer 2 interfaces on the User-Network Interface (UNI).

Ordering Information

Table 3 lists ordering information for Cisco IOS XR Software Release 4.1.0 for Cisco ASR 9000 Series Aggregation Services Routers. Only these part numbers are orderable. When future releases of Cisco IOS Software Release 4.1.0 are available, if you order these part numbers we will automatically ship the latest release.

Table 3. Ordering Information for Cisco IOS XR Software Release 4.1.0 for Cisco ASR 9000 Series Routers

Product Name	Part Number
Cisco IOS XR IP/MPLS Core Software	A9K-04.10
Cisco IOS XR IP/MPLS Core Software 3DES	A9K-K9-04.10

Release 4.1 Lifecycle

The Cisco IOS XR Software release strategy is time-based, with a fixed release date and lifecycle, rather than a feature-based release strategy with a variable release date. Table 4 lists the major milestones of Cisco IOS XR Software Release 4.1.0 and later.

Table 4. Major Milestones for Cisco IOS XR Software Release 4.1.0 and Later

Milestone	Definition	Date
Availability date	The date that the Cisco IOS XR Software Release 4.1.0 information is published on Cisco.com and becomes available to the general public.	April 30, 2011
End-of-life announcement date	The official end-of-life document that announces the end of sale and end of life of Cisco IOS XR Software 4.1 is distributed to the general public.	October 30, 2011
End-of-sale date and end-of-maintenance date	The last date to order Cisco IOS XR Software 4.1 through Cisco point-of-sale mechanisms. The product is no longer for sale after this date. This also marks end of engineering, maintenance rebuilds, and software fixes through rebuilds of Cisco IOS XR Software 4.1.x. After this date, maintenance rebuilds and software-fix support will be provided only through rebuilds of Cisco IOS XR Software 4.1.x or later.	October 30, 2012
End of software maintenance releases through migration: OS software	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes through the Software Maintenance Unit (SMU). From March 13, 2012 until March 13, 2013, maintenance rebuilds and software fixes through SMU support will be provided only through migration to rebuilds of Cisco IOS XR Software 4.1.x. After March 14, 2013, Cisco Engineering will no longer develop, repair, maintain, or test Cisco IOS XR Software 4.1.x.	April 30, 2013
Last date of support	The last date to receive service and support for the product. After this date, all support services for the product are unavailable and the product becomes obsolete.	April 30, 2015

For official end-of-life and end-of-sale announcements for Cisco IOS XR Software, please visit http://www.cisco.com/en/US/products/ps5845/prod_eol_notices_list.html or contact your local Cisco account representative.

For More Information

For more information about the Cisco ASR 9000 Series or Cisco IOS XR Software, visit <http://www.cisco.com/> or contact your local Cisco account representative.



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