Cisco IOS XR Software Release 4.3.0 for Cisco ASR 9000 Series Routers

Product Overview

Cisco® ASR 9000 Series Aggregation Services Routers deliver unprecedented scale, service flexibility, and high availability for data centers, cloud networks, and business and residential services transport 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 into multiple Tbps. Cisco IOS XR Software Release 4.3.0 is a feature-filled release, expanding system intelligence in many areas. The broadband network gateway (BNG) portfolio is completed with an IPv6 feature set, ready to expand into address-space-hungry residential deployments. Data center interconnections benefit from Locator/ID Separation Protocol (LISP) and Provider Backbone Bridge (PBB) Virtual Private LAN Services (VPLS) innovations, providing solutions for architectures based on Layer 3 (L3) and Layer 2 (L2).

New Hardware Features

Cisco IOS XR Software Release 4.3.0 introduces support for two new shared port adapters (SPAs) on the Cisco ASR 9000 Series SPA Interface Processor (SIP) 700. The release also introduces support for an enhanced fan, providing additional cooling capacity to the Cisco ASR 9010 chassis.

Table 1 lists the new hardware support added in Cisco IOS XR Software Release 4.3.0.

Table 1. New Hardware Supported on Cisco ASR 9000 in Cisco IOS XR Software Release 4.3.0

Part Number	Description
ASR-9010-FAN-V2 (=)	ASR 9010 Version 2 fan tray for high-power optics (1.5W+)
SPA-24CHT1-CE-ATM SPA-2CHT3-CE-ATM SPA-4XOC48POS/RPR SPA-2XOC12-POS SPA-4XOC12-POS	Cisco IOS-XR 4.3.0 adds new SPA support - SPA portfolio completion (4xOC48, 4xOC12, 2xOC12) CEM for 24T1/E1, T3/E3
XFP10GER-192IR-L	Cisco multirate XFP transceiver module for 10GBAS-ER Ethernet and OC-192/STM-64intermediate-reach (IR-2) Packet-over-SONET/SDH (POS) applications, SMF, dual LC connector

Table 2 provides license part numbers introduced with new Cisco Carrier-Grade IPv6 (CGv6) capabilities.

Table 2. New Licenses Supported on Cisco ASR 9000 in Cisco IOS XR Software Release 4.3.0

Part Number	Description
A9K-M80-V6-INLN (=)	License for Inline CGv6 Transformation features on the MOD80 Line Card
A9K-M160-V6-INLN (=)	License for Inline CGv6 Transformation features on the MOD160 Line Card
A9K-24XT-V6-INLN (=)	License for Inline CGv6 Transformation features on the 24X10G Line Card
A9K-1X100-V6- INLN (=)	License for Inline CGv6 Transformation features on the 1X100G Line Card
A9K-36XT-V6-INLN (=)	License for Inline CGv6 Transformation features on the 36X10G Line Card
A9K-NAT64-LIC-5M (=)	NAT64 License Unit for 5 million translations

New Software Features

Cisco IOS XR Software Release 4.3.0 is a comprehensive release, enhancing each of the applications where the Cisco ASR 9000 Series is deployed. Residential deployment BNG capability is enhanced with a complete IPv6 feature set. Combined with CGv6 capabilities, this provides an attractive IPv6 migration solution. Data center interconnect technology expands both Layer 2 and Layer 3 operations with the support of PBB VPLS and LISP. Typhoon line cards provide intelligent video monitoring, including metrics based on Media Delivery Index (MDI), and Real-time Transport Protocol (RTP). In addition, Stream Merge enhancements for topology independence provide the most reliable multicast solution in the market. Other significant features include a full Generic Routing Encapsulation (GRE) toolkit, Ethernet Operations, Administration, and Maintenance (OAM) Y.1731 Synthetic Loss Measurement, and Network Virtualization (nV) Satellite portfolio expansion with the Cisco ASR 901 and ASR 903 Routers.

Table 3 lists new software features in Cisco IOS XR Software Release 4.3.0 supported on the Cisco ASR 9000 Series Aggregation Services Routers.

Table 3. New Software Features Supported on Cisco ASR 9000 in Cisco IOS XR Software Release 4.3.0

Feature	Description
BNG IPv6 support and BNG features	With the 4.3.0 release, the Cisco ASR 9000 Series supports the complete integrated stack of BNG with IPv6 and dual-stack subscribers. This release also supports grouping of subscribers to provide aggregate quality of service (QoS) to the group, and it completes the BNG Lawful Intercept support with tapping based on RADIUS attributes.
Network Virtualization features	Introduced first in Cisco IOS XR 4.2.1, nV Satellite provides significant operational advantages with zero-touch provisioning, faster time to market, and simplified network design. Cisco IOS XR 4.3.0 brings additional capabilities: new Satellite platform support for Cisco ASR 901 and ASR 903, support for Satellite on Cisco ASR 9001 and ASR 9922, and nV Cluster support for Cisco ASR 9001.
Video monitoring (VidMon) features	Existing integrated video monitoring support on the Cisco ASR 9000 has been enhanced in this release. Cisco IOS XR 4.3.0 provides support for these video monitoring features: • Real-time Transport Protocol (RTP) VidMon • Media Deliver Index (MDI) (Moving Picture Expert Ggroup MPEG-2) VidMon • VidMon on Multiprotocol Label Switching (MPLS) traffic
Multicast features	Cisco IOS XR 4.3.0 provides comprehensive support for next-generation mobile VPN (mVPN) solutions with these additional capabilities: • BGP Customer-Multicast (C-MCAST) routing • Topology-Independent Multicast only Fast ReRoute (MoFRR or Stream Merge) This release also adds support for Protocol Independent Multicast (PIM) Equal Cost Multiple Path (ECMP) Redirect and Multicast Listener Discovery (MLD) snooping.
PBB-VPLS with MIRP Lite	L2 Data Center Interconnect requires very high MAC and VLAN scale, which PBB 802.1ah technology delivers. In Cisco IOS XR 4.3.0, PBB can be coupled with VPLS on the core side, benefitting from MPLS transport resiliency. Multiple I-service Registration Protocol (MIRP)-Lite function is implemented for MAC withdrawal to help ensure fast convergence.
LISP	LISP allows enterprises and service providers to simplify multihomed routing, facilitate scalable any-to-any WAN connectivity, support data center virtual machine mobility, and reduce operational complexities. LISP is a Cisco innovation that is being promoted as an open standard. In Cisco IOS XR 4.3.0, Cisco ASR 9000 provides the support for PxTR capability, together with Cisco Nexus® 7000, providing a scalable and operationally simplified L3 data center solution.
Y.1731 Synthetic Loss Measurement and DMMv1	Ethernet OAM becomes increasingly important in service provider networks as a SLA management tool. In this release, Y.1731 Performance Monitoring capabilities are expanded with Synthetic Loss Measurement to allow operators to monitor infrastructure and services frame loss. In addition, Delay Measurement is enhanced with new standard version Delay Measurement Message DMMv1, expanding the number of concurrent sessions on a single VLAN to 4000.
L2 VPN enhancements: pseudowire grouping, L2 VPN NSR for T-LDP, and MAC withdrawal	Release 4.3.0 includes multiple enhancements for L2 VPN: single-segment pseudowire grouping for enhanced convergence, Non-Stop Routing (NSR) support for Targeted-Label Discovery Protocol (T-LDP), and support for new MAC withdrawal RFC standard RFC4762 and draft-ietf-l2vpn-vpls-ldp-mac-opt.

Feature	Description
Integrated Routing Bridging (IRB) and L2 interfaces: IRB QoS, ABFv4, and IPv6 ACL on L2	IRB interfaces functionality supports QoS functions, allowing policing and marking for traffic on IRB interfaces. Additional feature support includes ABF for IPv4 and IPv6 ACL on L2 EFP.
L3 subinterface and IRB CoPP	Local Packet Transport Services (LPTS) performs the control-plane protection function on Cisco IOS XR platforms. This release enhancement to LPTS introduces awareness of individual subinterface LPTS rates and allows protection of other subinterfaces on the same physical interface.
Generalized Multi-Protocol Label Switching (GMPLS) UNI-C	GMPLS UNI-C defines a signaling interface between routers and ROADMs. Support introduced in Cisco IOS XR 4.3.0 allows routers to request establishing an end to end lightpath across the optical network.
IEEE 1588-2008 enhancements	IEEE 1588-2008 Precision Time Protocol (PTP) support is added for 40-GE and 100-GE interfaces. Also the implementation is enhanced to provide hybrid mode, ITU-T G.6561.1 Telecom Profile compliance, and doubling of the number of clients supported per line card. Further PTP and Network Time Protocol (NTP) interwork is introduced, which allows PTP to be a source when the Cisco ASR 9000 is acting as NTP master for NTP clients.
GRE feature support	GRE is a versatile IP tunneling protocol widely deployed in networks. Cisco IOS XR 4.3.0 on the Cisco ASR 9000 provides GRE features that give customers the flexibility to transport various types of traffic over IPv4 GRE tunnels, including MPLS; MPLS Virtual Private Network (VPN); Virtual Private Wire Service (VPWS) and VPLS; IPv6, 6PE, and 6VPE; Multicast Multicast-VPN; Resource Reservation Protocol – Traffic Engineering (RSVP-TE); and Bidirectional Forwarding Detection (BFD) packets. In Cisco IOS XR 4.3.0, the GRE scale has also been increased to support up to 2000 GRE tunnels per system. With the inclusion of the GRE features supported in prior releases, the Cisco ASR 9000 now supports a comprehensive set of GRE features. All the newly introduced GRE features in Cisco IOS XR 4.3.0 are powered by Typhoon line cards.
CGv6 transformation services: • Dual Stack – Lite (DS-Lite) and BNG coexistence • Destination Based Logging (DBL) for NAT44 and DS-Lite • Mapping of Address and Port-Translation (MAP-T), also known as Stateless NAT64 dIVI • Stateful NAT64 • 1:1 HA Redundancy	The following features are added to the existing CGv6 capabilities in Cisco IOS XR 4.3.0: • Integration between DS-Lite and BNG • Support for DBL for NAT44 and DS-Lite • Support for MAP-T based on the http://tools.ietf.org/html/draft-maglione-softwire-map-t-scenarios; this feature is supported inline on the New Generation Typhoon Ethernet Line Cards • Support for Stateful NAT64 up to 15 million translations on the Integrated Services Module (ISM). • Support of 1:1 Warm-Standby ISM
BFD: BFD over Logical Bundles (BLB) and multihop v6	BLB provides support for BFD over bundle interfaces, including IPv6 support. BFD enhancements in this release include IPv6 support for multihop BFD.

Ordering Information

Table 4 lists ordering information for Cisco IOS XR Software Release 4.3.0 for Cisco ASR 9000 Series Aggregation Services Routers. When future rebuilds of Cisco IOS Software Release 4.3.0 are available, the latest release is automatically shipped when this product is ordered.

Table 4. Table 4 Ordering Information for Cisco IOS XR Software Release 4.3.0 for Cisco ASR 9000 Series Aggregation Services Routers

Product Name	Part Number
XR-A9K-PX-04.03	Cisco IOS-XR IP/MPLS Core Software
XR-A9K-PXK9-04.03	Cisco IOS-XR IP/MPLS Core Software 3DES

Release 4.3 Lifecycle

The Cisco IOS XR Software release strategy is time-based, with a fixed release date and lifecycle, as opposed to being a feature-based release strategy with a variable release date. Table 5 lists the major milestones of Cisco IOS XR Software Release 4.3.0 and later.

Table 5. Major Milestones for Cisco IOS XR Software Release 4.3.0

Milestone	Definition	Date
Availability date	The date that the Cisco IOS XR Software Release 4.3.0 information is published on Cisco.com and becomes available to the general public.	Dec 14, 2012
End-of-life announcement date	The date when the official end-of-life document that announces the end of sale and end of life of Cisco IOS XR Software 4.3.x is distributed to the general public.	June 14, 2013
End-of-sale date	The last date to order Cisco IOS XR Software 4.3.x through Cisco point-of-sale mechanisms. The product is no longer for sale after this date.	June 14, 2014
End of software maintenance	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes. After this date, Cisco Engineering will no longer develop, repair, maintain, or test the product software.	Dec 14, 2015
End of software maintenance for Product Security Incident Response Team (PSIRT)	The last date that Cisco Engineering may release any final software maintenance releases or bug fixes for PSIRTs through SMU to Release 4.3. Beyond this date, PSIRT bugs become candidates for following feature releases.	Dec 14, 2017
Last date of support	The last date to receive applicable service and support for the product as entitled by active service contracts or by warranty terms and conditions. After this date, all support services for the product are unavailable, and the product becomes obsolete.	June 14, 2019

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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