Cisco IOS XR Software Release 5.1.0 for Cisco ASR 9000 Series Routers

PB729736

Product Overview

Cisco® ASR 9000 Series Aggregation Services Routers deliver unprecedented scale, service flexibility, and high availability for service provider fixed and mobile networks, data centers, and 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 into multiple terabits per second (Tbps).

Cisco IOS XR Software Release 5.1.0 expands the existing Cisco ASR 9000 Series portfolio with the introduction of the Cisco ASR 9904 Router. Cisco IOS XR Software Release 5.1.0 also brings to market new features for Carrier Ethernet, Broadband Network Gateways, and enterprise market segments.

New Hardware Features

Cisco IOS XR Software Release 5.1.0 introduces support for the Cisco ASR 9904 Router, the newest addition to the Cisco ASR 9000 Series portfolio. It delivers up to 8 Tbps of system throughput in a compact 6-RU form factor and supports two slots for route switch processors (RSPs) and two slots for line cards. The Cisco ASR 9904 Router also features the same hardware innovations as other Cisco 9000 Series routers like the Cisco ASR 9922 Router and 9912 Router, with each slot capable of switching up to 2 Tbps of bidirectional traffic.

Table 1 lists the new hardware support added in Cisco IOS XR Software Release 5.1.0.

Table 1. New Hardware Supported on Cisco ASR 9000 Series Routers in Cisco IOS XR Software Release 5.1.0

Part Number	Description
ASR-9904-AC	ASR 9904 AC Chassis with PEM V2
ASR-9904-AC=	ASR 9904 AC Chassis with PEM V2 Spare
ASR-9904-DC	ASR 9904 DC Chassis with PEM V2
ASR-9904-DC=	ASR 9904 DC Chassis with PEM V2 Spare
ASR-9904-FAN	ASR-9904 System Fan Tray
ASR-9904-FAN=	ASR-9904 System Fan Tray Spare
ASR-9904-FILTER	ASR-9904 System Fan Filter
ASR-9904-FILTER=	ASR-9904 System Fan Filter Spare
ASR-9904-BAFFLE	ASR-9904 System Baffle
ASR-9904-BAFFLE=	ASR-9904 System Baffle Spare

New Software Features

Table 2 lists new software features in Cisco IOS XR Software Release 5.1.0 supported on Cisco ASR 9000 Series Aggregation Services Routers.

Table 2. New Software Features Supported on Cisco ASR 9000 Series Routers in Cisco IOS XR Software Release 5.1.0

Feature	Description
Broadband network gateway (BNG)	The BNG technology segment introduces a critical feature, an onboard Dynamic Host Configuration Protocol (DHCP) server, including advanced features such as RADIUS-based address allocation. Important manageability features, such as Session Switched Port Analyzer (SPAN), idle timeout, and MIBs, are also introduced in this release.
Ethernet data-plane loopback (DPL)	Service providers widely deploy Ethernet as an access and transport technology. DPL is an operational enhancement simplifying the service activation process. DPL activates loopback on specific traffic types, such as VLAN or class of service (CoS) combinations, and specific MAC addresses, without affecting other users on the same port. New customers' circuits can now be tested from local loop to the central office (CO) without interrupting traffic on other circuits, which traditional physical loopbacks would cause. Cisco IOS XR Software Release 5.1.0 supports external loopback capability in Cisco ASR 9000 Series Routers.
Virtual Private LAN Service-Label Switched Multicast (VPLS-LSM)	VPLS is a widely deployed service provider L2VPN technology that is also used for multicast transport. Although L2 technology allows snooping to be used to optimize replication of multicast traffic into L2 pseudowires, the core remains agnostic to multicast traffic. As a result, multiple copies of the same flow traverse core networks. Pairing LSM with VPLS mitigates this inefficiency by introducing LSM multicast trees over the core. In Cisco IOS-XR Software Release 5.1.0, Cisco ASR 9000 Series Routers implement VPLS LSM with point-to-multipoint traffic engineering (P2MP-TE) inclusive trees. VPLS end points are automatically discovered and P2MP-TE trees are set-up using Resource Reserve Protocol traffic engineering (RSVP-TE), without operational intervention.
Carrier Ethernet	Cisco IOS XR Software Release 5.1.0 allows multiple enhancements in Carrier Ethernet functional area. Multiprotocol Label Switching Transport Profile (MPLS-TP) MIB provides standard SNMP monitoring capabilities to MPLS-TP-based networks. Rapid Per-VLAN Spanning Tree (PVST) brings feature parity with Cisco IOS Software and allows easier integration with next-generation platforms. Layer 2 Sampled Span allows intelligent monitoring of networks where the number of flows can be excessively high by redirecting a sample of packets to an external monitoring device. Storm control bandwidth support enhances previous versions of the implementation, providing the flexibility to configure threshold in packets per second or explicit bandwidth.
Integrated routing and bridging (IRB) features: BFD, MPLS, and mVPN	IRB features continue to be enhanced in Cisco IOS XR Release 5.1.0 with bidirectional forwarding detection (BFD) and MPLS support added. With BFD, customers can monitor multiple Layer 3 end points residing on a single bridge domain by enabling BFD on the IRB interface. MPLS support allows integration of MPLS transport over Layer 2 access technology. Edge devices residing on a Resilient Ethernet Protocol (REP) or G.8032 ring can support MPLS pseudowires over Layer 2 rings. In Cisco IOS XR Release 5.1.0, the feature is supported for Ethernet and TDM pseudowires.
Multi-instance Enhance Interior Gateway Routing Protocol (EIGRP)	Multi-instance EIGRP allows Cisco ASR 9000 Series Routers to be inserted in a high-scale enterprise environment. EIGRP multi-instance provides the ability to create multiple EIGRP processes, each with its own topology and routing table. Each EIGRP process can be used to control routing on different network segments such as dynamic multipoint VPN (DMVPN).
Border Gateway Protocol (BGP) knobs	Resilient per-CE-label allocation: • Allows eiBGP multipath and BGP prefix-independent convergence (PIC) edge to work with per-CE-label. • Before this enhancement, BGP PIC edge and eiBGP multipath was restricted to per-prefix-label. User-specific Martian list check: • BGP Martian list includes all bogon prefixes (i.e., 10.0.0.0/8 or 0:0/1) and allows protection against a peering partner announcing a bogon prefix. This list is quite static and well documented by the Internet Society (RIPE, IETF, ARIN, etc.) • An ISP may want to add or remove bogon to the standard BGP Martian list, this feature allows the BGP Martian list to be customized.
Open Shortest Path First (OSPF) enhancements	• OSPFv3 Graceful Shutdown provides the ability to temporarily shut down an OSPF version 3 (OSPFv3) process or interface in the least disruptive manner and to notify its neighbors that it is going away. A graceful shutdown of a protocol can be initiated on all OSPFv3 interfaces or on a specific interface. • OSPFv3 Sham-Link support overcomes the OSPFv3 default behavior for selecting an intra-area backdoor route between VPN sites instead of an interarea (PE-to-PE) route. A sham link helps ensure that OSPFv3 client sites sharing a backdoor link can communicate over the MPLS VPN backbone and participate in VPN services.
Virtual Router Redundancy Protocol (VRRP) or Hot Standby Router Protocol (HSRP) scale increase	HSRP or VRRP scale is increased to 4K per port, 4K per line card and 4K per system.

Ordering Information

Table 3 lists ordering information for Cisco IOS XR Software Release 5.1.0 for Cisco ASR 9000 Series Aggregation Services Routers. When future rebuilds of Cisco IOS XR Software Release 5.1.0 are available, the latest release is automatically shipped when this product is ordered.

Table 3. Ordering Information for Cisco IOS XR Software Release 5.1.0 for Cisco ASR 9000 Series Aggregation Services Routers

Product Name	Part Number
XR-A9K-PX-05.01	Cisco IOS-XR IP/MPLS Core Software
XR-A9K-PXK9-05.01	Cisco IOS-XR IP/MPLS Core Software 3DES

Release 5.1.0 Lifecycle

The Cisco IOS XR Software release strategy is time-based, with a fixed release date and lifecycle, rather than being a feature-based release strategy with a variable release date. Table 4 lists the major milestones of Cisco IOS XR Software Release 5.1.0 and later.

Table 4. Major Milestones for Cisco IOS XR Software Release 5.1.0

Milestone	Definition	Date
Availability date	The date that Cisco IOS XR Software Release 5.1.0 information is published on Cisco.com and becomes available to the general public.	Sept. 11, 2013
End-of-life announcement date	The date when the official end-of-life documents announcing the end of sale and end of life of Cisco IOS XR Software 5.1 (and later versions of 5.1) are distributed to the general public.	Mar. 11, 2014
End-of-sale date	The last date to order Cisco IOS XR Software 5.1.0 through Cisco point-of-sale mechanisms (The product is no longer for sale after this date.)	Mar. 11, 2015
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.)	Sept. 11, 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 Software Maintenance Unit to Release 5.1 (Beyond this date, PSIRT bugs become candidates for following feature releases.)	Sept. 11, 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.)	Mar. 11, 2020

For More Information

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 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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