Cisco IOS XR Software Release 5.2.0 for Cisco ASR 9000 Series Routers

PB 732696

Product Overview

Cisco® ASR 9000 Series Aggregation Services Routers (ASR 9000 Series) deliver unprecedented scale, service flexibility, and high availability for service providers' 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).

With Cisco IOS XR Release 5.2.0 ushers in a new era of network innovation with Segment Routing (SR), an exceptional level of security and features such as Border Gateway Protocol FlowSpec (BGP-FS), IP Security (IPSec), and Cisco TrustSec®. The Cisco ASR 9000 Series with Cisco IOS XR Release 5.2.0 software also provides scalable interconnectivity between data centers with Virtual Extensible LAN (VXLAN) layer 2 and layer 3 gateways. It also delivers end-to-end solution enhancements for satellite network virtualization (nV Satellite), broadband network gateway (BNG). The Cisco IOS XR Release 5.2.0 software enhances service delivery with converged and programmable networks created not only for transport features but also applications.

Table 1 lists the new optics support that has been added to Cisco IOS XR Software Release 5.2.0.

Table 1. Optics Support

Part Number	Supported On - (Part Numbers)
SFP-10G-BXD-I	A9k-24x10GE-TR (SE), A9k-36x10GE-TR (SE), A9K-MOD160-TR(SE), 8x10MPA
SFP-10G-BXU-I	A9k-24x10GE-TR (SE), A9k-36x10GE-TR (SE), A9K-MOD160-TR(SE), 8x10MPA
SFP-10G-BX40D-I	A9k-24x10GE-TR (SE), A9k-36x10GE-TR (SE), A9K-MOD160-TR(SE), 8x10MPA
SFP-10G-BX40U-I	A9k-24x10GE-TR (SE), A9k-36x10GE-TR (SE), A9K-MOD160-TR(SE), 8x10MPA
QSFP-40G-SR-BD	A9K-MOD80-TR (SE) A9K-MOD160-TR (SE), 1x40MPA, 2x40MPA
GLC-FE-100BX-U	A9K-MOD80-TR (SE) A9K-MOD160-TR (SE), A9K-MPA-20X1GE, A9K-9000V
GLC-FE-100BX-D	A9K-MOD80-TR (SE) A9K-MOD160-TR (SE), A9K-MPA-20X1GE, A9K-9000V

New Software Features

Table 2 lists new software features in Cisco IOS XR Software Release 5.2.0 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 5.2.0

Feature	Description
BGP FlowSpec	BGP FlowSpec allows the dissemination of flows policies using newer BGP Network Layer Reachability Information (NLRIs). Primarily used to protect against distributed denial of service (DDoS) attacks, it could be used in many other SDN cases. Cisco IOS XR Release 5.2.0 delivered RFC5575 (BGP FlowSpec baseline) and four additional BGP FlowSpec IETF drafts, including BGP FlowSpec IPv6, IP Next Hop redirect, virtual routing and forwarding (VRF) redirect, and the BGP FlowSpec Relax Origin Check draft. The Cisco IOS XR Release 5.2.0 implementation is completed and does support all following functions: BGP FlowSpec client, route reflector, and controller. Controller allows BGP FlowSpec updates to be generated using the XR Command Line Interface (XR CLI) or the XR Extensible Markup Language (XR XML).

Feature	Description
IPSec	Encryption services are added to the Cisco ASR 9000 Series with IPSec. A Cisco ASR9000 Virtualized Service Module (VSM) will be required to turn on IPSec functionality. IPSec is supported over Generic Routing Encapsulation (GRE) on pre-shared keys only. Internet Key Exchange (IKE) Version 1 and IKEv2 are supported.
TrustSec	The Cisco ASR 9000 Series supports transporting Cisco Security Group Tag (SGT) tagged frames across an IPv4 core and extends your network Cisco TrustSec boundary across the WAN core. It can support layer 2 Cisco TrustSec tagged frames, as well as layer 3 Cisco TrustSec tagged frames.
Segment Routing	Segment Routing (SR) is an IP/MPLS architecture that seeks the right balance between distributed intelligence and centralized optimization and programming. It helps simplify the operation of Multiprotocol Label Switching (MPLS), which helps reduce operating expenses (OpEx), to allow application-based service creation (for additional revenue). It also promotes better utilization of the installed infrastructure, which helps reduce capital expenditures (CapEx). The Cisco IOS XR Release 5.2.0 introduces the following Segment Routing (SR) support: Intermediate System to Intermediate System (ISIS) IPv4 extensions for Nodal-SID, L2VPN, and L3VPN over the MPLS segment routing plane.
VXLAN gateway	VXLAN is a standards-based technology that provides scalable multitenancy in the data center, supporting any workload anywhere. To interconnect VXLANs with the rest of the network, Cisco IOS XR Software Release 5.2.0 supports VXLAN Layer-2 and Layer-3 gateways. Layer-2 gateways bridge VLANs with VXLANs. They also allow handoff of VXLAN network traffic to VPLS running in the Data Center Interconnect (DCI). Layer-3 gateways help route traffic across VXLANs and hand-off VXLAN network traffic to Layer-3 VPNs in the WAN.
Broadband Network Gateway Pseudowire Headend (BNG PWHE) support	Pseudowire Headend (PWHE) simplifies the network and reduces CapEx, by allowing a pseduowire to terminate on a virtual L3 interface. Now BNG subscribers take advantage of this technology byterminating subscribers over this virtual interface. Supports both single-tag VLANs (S-TAG) and double-tag VLANs (QinQ aka S-TAG and C-TAG) over PWHE. PWHE replaces parent VLANs (S-VLAN and C-VLAN will be carried in pseudowire). It can support 1:1, N:1, or ambiguous VLANs.
BNG enhancements	Several enhancements have been made to BNG, including: BNG Local Authentication, Multi Action COA, Outer VLAN Range with Inner Range, and QoS Parameterization (Rabapol).
FlexLSP	FlexLSP offers the best mix of static bidirectional MPLS-TP and dynamic MPLS-TE. FlexLSP provides bidirectional label switched paths (LSPs) set up dynamically through Resource Reservation Protocol - Traffic Engineering (RSVP-TE). The technology offers GAL/GACH support for LSP monitoring with BFD timers as low as 3.3 ms and Pseudowire Call Admission Control (PW CAC) to manage service QoS over the tunnel. At the same time, tunnels are set up dynamically using underlying Interior Gateway Protocol (IGP) infrastructure offering low operational complexity.
Cisco NetFlowVersion 9 VRF Table Export	Cisco NetFlow Version 9 now supports exporting of the VRF table.
nV satellite Synchronous Ethernet (SyncE)	For SyncE to work, each network element along the synchronization path must support SyncE. Although host systems in an nV satellite act as virtual line cards, they have to be treated as independent hosts for frequency and time synchronization. SyncE support on satellite hosts allows the frequency of each satellite to be synchronized to the host Cisco ASR 9000 Series. This allows frequency synchronization from the host to the satellites - and from the satellites to downstream devices. This is particularly important when satellites are deployed in mobile backhaul deployments, because it is desirable to synchronize the frequency between the satellite and host, thus providing downstream devices with a frequency reference via the satellites. The nV Satellite SyncE Offload feature allows the satellite system to synchronize the system frequency with the host Cisco ASR 9000 Series using SyncE over fabric links. It also allows it to propagate Ethernet Synchronization Messaging Channel (ESMC) messages with the QL received from the host on all access ports.
Enhanced Interior Gateway Routing Protocol (EIGRP) Bidirectional Forwarding Detection (BFD)	BFD provides a consistent failure detection method for network administrators and is now supported on EIGRP.
GRE Tunnel Enhancement	Enhancements made to GRE tunnels are also available now. They include GRE Tunnel in VRF support (v4 only), GRE/TE Tunnel support H-QoS for Policing and Marking, GRE Tunnel support for the Cisco ASR9000 Virtualized Service Module (VSM) and QoS Policy Propagation via BGP (QPPB) on GRE interfaces.
Bidirectional PIM (BIDIR-PIM)	This variant of PIM Sparse-Mode builds bidirectional shared trees connecting multicast sources and receivers. Bidirectional trees are built using a fail-safe designated forwarder (DF) election mechanism operating on each link of a multicast topology. With the assistance of the DF, multicast data is natively forwarded from sources to the rendezvous point (RP), then along the shared tree to receivers without requiring source-specific state. The DF election takes place at RP discovery time and provides the route to the RP, thus eliminating the requirement for data-driven protocol events.

Feature	Description
Multicast VPN (MVPN) with dynamic point-to-multipoint (P2MP)-TE LSP	The BGP - mVPN BGP sAFI 129 IPv4 feature provides the capability to support multicast routing in the service provider's core IPv4 network. This feature is needed to support BGP-based MVPNs. BGP MVPN provides a means for service providers to use different encapsulation methods, such as GRE, MPDP, P2MP-TE, and ingress replication, for forwarding MVPN multicast data traffic in the service provider network. When BGP is the CE-PE unicast routing protocol, the CEs may be using SAFI 2 to distribute a special set of routes that are only to be used for upstream multicast hop selection. Both BGP SAFI 2 and 129 will utilize MURIB instead of URIB in the Cisco ASR 9000 Series.
Y.1731 Performance Measurement MIB	Y.1731 Performance Management MIB provides a way to poll the statistics through SNMP for Y.1731 PM Delay and Loss measurements.
REP Access Gateway Enhancement	REP, a Cisco Ethernet Ring protocol, is supported on the Cisco ASR 9000 Series through the REP Access Gateway (REP-AG). REP-AG is a static configuration allowing an interface to REP access rings. In this release, REP-AG adds the flexibility of autodiscovery if the port is REP-AG and performs autoreconfiguration. The enhancement will also allow monitoring of the connectivity between REP-AG and REP Edge No Neighbor nodes.

Ordering Information

Table 4 lists ordering information for Cisco IOS XR Software Release 5.2.0 for Cisco ASR 9000 Series Aggregation Services Routers. When future rebuilds of Cisco IOS XR Software Release 5.2.0 are available, the latest release is automatically shipped when this product is ordered.

Table 3. Ordering Information for Cisco IOS XR Software Release 5.2.0 for Cisco ASR 9000 Series Aggregation Services Routers

Part Number	Product Name
XR-A9K-PX-05.02	Cisco IOS XR IP/MPLS Core Software
XR-A9K-PXK9-05.02	Cisco IOS XR IP/MPLS Core Software 3DES

Cisco IOS XR Software Release 5.2.0 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 5 lists the major milestones of Cisco IOS XR Software Release 5.2.0 and later.

Table 4. Major Milestones for Cisco IOS XR Software Release 5.2.0

Milestone	Definition	Date
Availability date	The date that Cisco IOS XR Software Release 5.2.0 information is published on Cisco.com and becomes available to the general public.	July 7, 2014
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 5.2 (and later versions of 5.2) are distributed to the general public.	Jan. 7, 2014
End-of-sale date	The last date to order Cisco IOS XR Software 5.2.0 through Cisco point-of-sale mechanisms. (The product is no longer for sale after this date.)	Jan. 7, 2015
End of software maintenance (Standard Maintenance Release)	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.) Applies to Standard rebuilds only. Refer to Cisco IOS XR Software Policy Guideline bulletin for more details (http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-xr-software/product_bulletin_c25-478699.html)	July 7, 2016
End of software maintenance (Extended Maintenance Release)	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.) Applies to Standard rebuilds only. Refer to Cisco IOS XR Software Policy Guideline bulletin for more details. (http://www.cisco.com/c/en/us/products/collateral/ios-nx-os-software/ios-xr-software/product_bulletin_c25-478699.html)	July 7, 2017
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.)	July 7, 2018
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.)	Jan. 7, 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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