Cisco ASR 9000 Series 5th Generation 400 Gigabit Ethernet Enhanced Multi-Rate Line Card

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Product overview

The Cisco® ASR 9000 Series 5th Generation 400 Gigabit Ethernet Enhanced Multi-Rate Line Card delivers industry-leading high density, with line-rate 1, 10, 25, 40, and 100 Gigabit Ethernet (GE) ports, to any slot of a Cisco ASR 9000 Series Aggregation Services Router. This multi-rate line card is designed to remove bandwidth bottlenecks in the network that are caused by a large increase in Video-on-Demand (VoD), IPTV, point-to-point video, internet video, and cloud services traffic. The physical interfaces support QSFP28, SFP28, QSFP+, SFP+, and SFP optics, giving customers the flexibility to mix and match interface types on the same line card.

Multiple interface modes can be configured easily through the Command-Line Interface (CLI) without resetting or restarting the line card. With these capabilities, the ASR 9000 Series line card (Figure 1) and routers provide the fundamental infrastructure for scalable Carrier Ethernet and IP/Multiprotocol Label Switching (IP/MPLS) networks, promoting profitable business, residential, and mobile services.

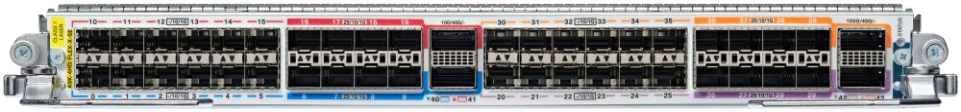


Figure 1.
Cisco ASR 9000 400GE service edge line card enhanced – 5th generation

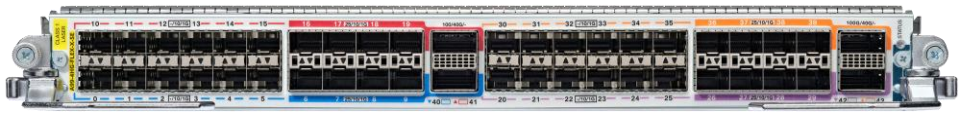


Figure 2.
Cisco ASR 9900 400GE service edge line card enhanced – 5th generation

Features and benefits

The ASR 9000 Series 5th Generation 400 Gigabit Ethernet Enhanced Line Card is fully compatible with the Cisco ASR 9922, 9912, 9910, 9906, 9904, 9010, and 9006 routers. However, the chassis may require a hardware update for the fabric cards, Route Processor/Route Switch Processor (RP/RSP) cards, and cooling systems. This line card is designed to support full line-rate, non-oversubscribed Ethernet traffic.

This power-optimized line card, with its high density and scale, allows customers to reduce Capital Expenditures (CapEx) and Operating Expenses (OpEx) while offering highly predictable managed transport services for core and peering applications. It supports a 10GE Satellite Network Virtualization (nV) system mode on the ASR 9000 Series Router.

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Table 1 lists the features and benefits of the ASR 9000 Series 5th Generation 400 Gigabit Ethernet Enhanced Line Cards. Specific features and scale support are hardware and software dependent.

Table 1. Features and benefits

Feature	Benefits
Interface support	
Cisco pluggable interfaces	Provide the capacity to mix and match 1, 10, 25, 40, and 100 Gigabit Ethernet interface types across a single line card (for a complete list of supported pluggable interfaces, see the Cisco Optics-to-Device Compatibility Matrix)
Evolutionary monitoring	
Carrier-class Operations, Administration, and Maintenance (OAM)	NetFlow, IEEE 802.1ag, IEEE 802.3ah, ITU Y.1731, IP service-level agreement (IP SLA), Virtual Circuit Connectivity Verification (VCCV), link auto-negotiation, ping, and trace route
Carrier-class OS	
Cisco IOS® XR Software	Modular, patchable, scalable, highly available, carrier core and edge-proven operating system

Line card types

The ASR 9000 Series 5th Generation 400 Gigabit Ethernet Enhanced Line Card is available in a service edge-optimized variant. The service edge-optimized line card is designed for customer deployments requiring enhanced service scale.

Feature licenses are also available for basic and advanced features on the line cards, as described in Tables 3 and 4.

Product specifications

Table 2 provides product specifications for the ASR 9000 Series 5th Generation 400 Gigabit Ethernet Enhanced Line Cards.

Table 2. Product specifications

Description	Specification
Chassis compatibility	Compatible with the Cisco ASR 9922, 9912, 9910, 9906, 9904, 9010 and 9006 chassis. • **A99-4HG-FLEX-X-FC and A99-4HG-FLEX-X-SE** product IDs are compatible with the ASR 9922, 9912, 9910, 9906, and 9904 chassis. • **A9K-4HG-FLEX-X-FC and A9K-4HG-FLEX-X-SE** product IDs are compatible with the ASR 9922, 9912, 9910, 9906, 9904, 9010, and 9006 chassis.
Port density	• 4x QSFP28 ports capable of 100GE and 40GE • 16x SFP28 ports capable of 25GE, 10GE, and 1GE • 24x SFP+ ports capable of 10GE and 1GE

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Description	Specification
Ethernet	• 10-Gbps IEEE 802.3ae compliant • 40/100-Gbps IEEE 802.3ba compliant • 25-Gbps IEEE 802.3by compliant • IEEE 802.3x flow control • Full-duplex operation • Per-port byte and packet counters for policy drops; oversubscription drops; Cyclic Redundancy Check (CRC) error drops; packet sizes; and unicast, multicast, and broadcast packets
Performance	• 100-Gbps line-rate throughput per QSFP28 port • 40-Gbps line-rate throughput per QSFP28 port • 25-Gbps line-rate throughput per SFP28 port • 10-Gbps line-rate throughput per SFP+ port • 1-Gbps line-rate throughput per SFP+ port
Options	Available as a service edge-optimized line card
Reliability and availability	Line card Online Insertion and Removal (OIR) support without system impact
Physical dimensions (includes ejector bracket/lever); (H x W x D); weight	1.68 x 15.87 x 24.00 in.; 20.66 lb (42.67 x 403.10 x 609.60 mm; 9.37 kg)
Operating temperature	41° to 104°F (5 to 40°C) **Note:** Limitations may apply when using high-power optics
Operating humidity (nominal) (relative humidity)	10% to 85%
Storage temperature	–40° to 158°F (–40° to 70°C)
Storage (relative humidity)	5% to 95% **Note:** Not to exceed 0.024 kg of water per kg of dry air
Operating altitude	–60 to 4000 m (up to 2000 m conforms to IEC, EN, UL, and CSA 60950 requirements)
ETSI/EN standards	Cisco ASR 9000 Series Routers are designed to meet: • EN300 386: Telecommunications Network Equipment (EMC) • ETSI 300 019 Storage Class 1.1 • ETSI 300 019 Transportation Class 2.3 • ETSI 300 019 Stationary Use Class 3.1 • EN55022: Information Technology Equipment (Emissions) • EN55032: Multimedia Equipment (Emissions) • EN55024: Information Technology Equipment (Immunity) • EN55035: Multimedia Equipment (Immunity) • EN50082-1/EN-61000-6-1: Generic Immunity Standard

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Description	Specification
EMC standards	Cisco ASR 9000 Series Routers are designed to meet: • FCC Class A • ICES 003 Class A • AS/NZS CISPR 32 Class A • CISPR 22/CISPR 32 Class A • EN55022/EN55032 Class A • VCCI Class A • CNS-13438 Class A • KN32 Class A • IEC/EN 61000-3-2: Power Line Harmonics • IEC/EN 61000-3-3: Voltage Fluctuations and Flicker • EN50121-4 Railway applications Part 4: Emission and immunity of the signaling and telecommunications apparatus
Immunity	Cisco ASR 9000 Series Routers are designed to meet: • IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8kV Contact, 15kV Air) • IEC/EN-61000-4-3: Radiated Immunity (10V/m) • IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2kV Power, 1kV Signal) • IEC/EN-61000-4-5: Surge AC Port (4kV CM, 2kV DM) • IEC/EN-61000-4-5: Signal Ports (1kV) • IEC/EN-61000-4-5: Surge DC Port (1kV) • IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms) • IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30A/m) • IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations • KN35
Safety	Cisco ASR 9000 Series Routers are designed to meet: • ANSI / UL 60950-1 • CAN/CSA C22.2 No. 60950-1 • ANSI / UL 62368-1 • CAN/CSA C22.2 No. 62368-1 • EN / IEC 62368-1
Network Equipment Building System (NEBS)	Designed to meet: • SR-3580: NEBS Criteria Levels (Level 3) • GR-1089-CORE: NEBS EMC and Safety • GR-63-CORE: NEBS Physical Protection

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Ordering information

The ASR 9000 Series 5th Generation 400 Gigabit Ethernet Enhanced Line Cards are available to order through two commercial models, the Flexible Consumption Model and the Traditional Business Model.

The Flexible Consumption Model offers a built-in “pay-as-you-grow” structure that lowers initial startup costs with the ability to add more capacity overtime as needed. Software subscription provides feature upgrades and helps defer the payment of software value for the initial purchase. The Flexible Consumption Model-based line cards are service edge optimized.

Table 3 provides ordering information for the line cards with the Flexible Consumption Model

Table 3. Ordering information for the Flexible Consumption Model

Part number	Description
A9K-4HG-FLEX-X-FC	ASR 9000 400GE Flexible Consumption Line Card Enhanced - 5th Generation
A99-4HG-FLEX-X-FC	ASR 9900 400GE Flexible Consumption Line Card Enhanced - 5th Generation
ESS-ED-100G-RTU1	Edge Essentials Software RTU License per 100G
ADV-ED-100G-RTU1	Edge Advantage w/o Essentials Software RTU License per 100G
ADN-ED-100G-RTU1	Edge Advantage w/ Essentials Software RTU License per 100G
ESS-ED-400G-RTU1	Edge Essentials Software RTU License per 400G
ADV-ED-400G-RTU1	Edge Advantage w/o Essentials Software RTU License per 400G
ADN-ED-400G-RTU1	Edge Advantage w/ Essentials Software RTU License per 400G
ESS-ED-100G-SIA5	Edge Essentials SIA per 100G 60-120 months
ESS-ED-100G-SIA3	Edge Essentials SIA per 100G 36-59 months
ESS-ED-400G-SIA5	Edge Essentials SIA per 400G 60-120 months
ESS-ED-400G-SIA3	Edge Essentials SIA per 400G 36-59 months
ADV-ED-100G-SIA5	Edge Advantage w/o Essentials SIA per 100G for 60-120 months
ADV-ED-100G-SIA3	Edge Advantage w/o Essentials SIA per 100G for 36-59 months
ADV-ED-400G-SIA5	Edge Advantage w/o Essentials SIA per 400G for 60-120 months
ADV-ED-400G-SIA3	Edge Advantage w/o Essentials SIA per 400G for 36-59 months
ADN-ED-100G-SIA5	Edge Advantage w/ Essentials SIA per 100G for 60-120 months

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Part number	Description
ADN-ED-100G-SIA3	Edge Advantage w/ Essentials SIA per 100G for 36-59 months
ADN-ED-400G-SIA5	Edge Advantage w/ Essentials SIA per 400G for 60-120 months
ADN-ED-400G-SIA3	Edge Advantage w/ Essentials SIA per 400G for 36-59 months

For more information, please refer to the Cisco IOS XR Software Flexible Consumption Model Data Sheet.

Table 4 provides ordering information for the line cards with the Traditional Business Model.

Table 4. Ordering information for the Traditional Business Model

Part number	Description
A9K-4HG-FLEX-X-SE	ASR 9000 400GE Service Edge Line Card Enhanced - 5th Generation
A99-4HG-FLEX-X-SE	ASR 9900 400GE Service Edge Line Card Enhanced - 5th Generation
S-A9K-4HG-IVRF	ASR 9000 infrastructure VRF (up to 8) license for 400GB Line Card- 5th Generation
S-A9K-4HG-AIP-SE	ASR 9000 full-scale VRF license for 400GB SE Line Card- 5th Generation
S-A9K-4HG-CGN	ASR 9000 In-Line CGv6 Translation License for 400GB Line Card - 5th Generation
S-A9K-MACSEC-10	ASR 9000 MACSec 10G Right to Use License
S-A9K-MACSEC-40	ASR 9000 MACSec 40G Right to Use License
S-A9K-MACSEC-100	ASR 9000 MACSec 100G Right to Use License

Downloading the software

Visit the Cisco Software Center to download Cisco IOS XR software.

Cisco Services

Through a lifecycle services approach, Cisco delivers comprehensive support to service providers to help them successfully deploy, operate, and optimize their Cisco IP next-generation networks. Cisco Services for the Cisco ASR 9000 Series Aggregation Services Routers provide services and proven methodologies that help ensure service deployment with substantial ROI, operational excellence, optimal performance, and high availability. These services are delivered using leading practices, tools, processes, and lab environments developed specifically for ASR 9000 Series deployments and post-implementation support. The Cisco Services team addresses your specific requirements, mitigates risk to existing revenue-generating services, and helps accelerate time to market for new network services.

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Product sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environmental Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environmental Sustainability" section of the CSR Report) are provided in the following table.

Table 5. Links to sustainability topics

Sustainability topic		Reference
General	Information on product material content laws and regulations	Materials
	Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
	Sustainability Inquiries	Contact: csr_inquiries@cisco.com
Material	Product packaging weight and materials	Contact: environment@cisco.com

Cisco Capital

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For more information

For more information about Cisco Services, contact your local Cisco account representative or visit https://www.cisco.com/go/spservices

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Document history

New or Revised Topic	Described In	Date
New datasheet introducing the Cisco® ASR 9000 Series 5th Generation 400 Gigabit Ethernet Enhanced Multi-Rate Line Card.	Datasheet	May 2, 2025

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