Cisco ASR 9000 Series 16-Port 100 Gigabit Ethernet Packet Transport Line Card

Contents

Product overview

The Cisco® ASR 9000 Series 16-port 100 Gigabit Ethernet Packet Transport Line Card delivers industry-leading high density, with line-rate 100 Gigabit Ethernet ports, to any slot of a Cisco ASR 9000 Series Aggregation Services Router. These high-capacity line cards are 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. A single 100 Gigabit Ethernet port can now replace large 10 Gigabit Ethernet link aggregation bundles to simplify network operations. Based on QSFP technology, this line card has flexible interfaces that support 100 Gigabit Ethernet, 40 Gigabit Ethernet, 50 Gigabit Ethernet, 25 Gigabit Ethernet and 10 Gigabit Ethernet modes, so it gives customers the flexibility to mix and match interface types on the same line card.

These different interface modes can be configured easily through the Command Line Interface (CLI) without resetting or restarting the line card. Using a "green design," these line cards also let customers put an unused slice in power-saving mode to reduce power consumption. 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.

Features and benefits

The ASR 9000 Series 16-port 100 Gigabit Ethernet Packet Transport line card is fully compatible with Cisco ASR 9006 Router, ASR 9010 Router, ASR 9904 Router, ASR 9906 Router, ASR 9910 Router, ASR 9912 Router, and ASR 9922 Router. However, the chassis may require a hardware update for the fabric cards, RP/RSP card and cooling systems, because the line card offers industry-leading, high-density 100 Gigabit Ethernet throughput. The 16-port line card is designed to support full line rate, non-oversubscribed.

This power optimized line card, at such 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. The Cisco QSFP breakout option further increases the capability of each line card to support large-scale aggregation, and the 10 Gigabit Ethernet Satellite Network Virtualization (nV) System mode on the ASR 9000 Series Router.

Figure 1.
Cisco ASR 9900 Series 16-Port 100 Gigabit Ethernet Line Card – TR

Table 1 lists the features and benefits of the 16-port Cisco ASR 9000 Series Packet Transport line card. Specific feature and scale support is hardware and software dependent.

Table 1. Features and benefits XR 6.5.15 or later of Cisco ASR 9000 Series 16-Port 100 Gigabit Ethernet Packet Transport Line Card

Feature	Benefit
Interface Support	
Cisco QSFP Pluggable interfaces	Provide the capacity to mix and match 100 Gigabit Ethernet interface types across a single line card (for a complete list of supported pluggable interfaces, see the Cisco Optics 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), ping, and traceroute
Carrier-Class OS	
Cisco IOS® XR Software (64-bit)	Modular, patchable, scalable, highly available, carrier-core and edge-proven operating system

Line card types

The ASR 9000 Series 16-port 100 Gigabit Ethernet line card is available in the packet transport optimized variant.

- The packet transport optimized line card is designed for customer deployments requiring enhanced Quality of Service (QoS).

Feature licenses are also available to turn on features on the line cards, as described in the “Software Licensing” section later in this document.

Product specifications

Table 2 provides product specifications for the ASR 9000 Series 16-port 100 Gigabit Ethernet Packet Transport line card.

Table 2. Product specifications

Description	Specification
Chassis compatibility	Compatible with the Cisco ASR 9006, ASR 9010, ASR 9904, ASR 9906, ASR 9910, ASR 9912 and ASR 9922 chassis
Port density	16-ports of 100 Gigabit Ethernet per line card

Description	Specification
Ethernet	• 100-Gbps IEEE 802.3ba compliant • 100 Gigabit Ethernet PHY monitoring • IEEE 802.x 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 port
Options	The line card is available as a packet transport 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	16-port 100 Gigabit Ethernet Line Card: 1.63 x 15.58 x 1.63 x 23.80 in.; 21.73 lb (est.) (41.4 mm x 395.7 mm x 604.5 mm; 9.86 kg)
Operating temperature	41 to 104°F (5 to 40°C)
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 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) • EN55024: Information Technology Equipment (Immunity) • EN50082-1/EN-61000-6-1: Generic Immunity Standard
EMC standards	Cisco ASR 9000 Series Routers are designed to meet: • FCC Class A • ICES 003 Class A • AS/NZS 3548 Class A • CISPR 22 (EN55022) Class A • VCCI Class A • BSMI Class A • IEC/EN 61000-3-2: Power Line Harmonics • IEC/EN 61000-3-3: Voltage Fluctuations and Flicker

Description	Specification
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
Safety	Cisco ASR 9000 Series Routers are designed to meet: • UL/CSA/IEC/EN 60950-1 • IEC/EN 60825 Laser Safety • ACA TS001 • AS/NZS 60950 • FDA: Code of Federal Regulations Laser Safety

Ordering information

The ASR 9000 Series 16-port 100 Gigabit Ethernet Packet Transport line card is available to order through two commercial models, the Flexible Consumption Model (FCM) and the Traditional Business Model.

The Flexible Consumption Model offers a built-in “pay-as-you-grow” structure that lowers initial start-up 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.

Table 3 provides ordering information for the ASR 9000 Series 16-port 100 Gigabit Ethernet Packet Transport line card with the Flexible Consumption Model

Table 3. Ordering information for the ASR 9000 Series 16-port 100 Gigabit Ethernet Packet Transport line card with the Flexible Consumption Model

Part number	Feature description
A9K-16X100GE-FC	ASR 9000 16-port 100GE Flexible Consumption Model Line Card
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-100G-SIA5	Edge Essentials SIA per 100G 60-120 months

Part number	Feature description
ESS-ED-100G-SIA3	Edge Essentials SIA per 100G 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
ADN-ED-100G-SIA5	Edge Advantage w/ Essentials SIA per 100G for 60-120 months
ADN-ED-100G-SIA3	Edge Advantage w/ Essentials SIA per 100G 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 ASR 9000 Series 16-port 100 Gigabit Ethernet Packet Transport line card with the Traditional Business Model.

Table 4. Ordering information for the ASR 9000 Series 16-port 100 Gigabit Ethernet Packet Transport line card with the Traditional Business Model

Part number	Feature description
A9K-16X100GE-TR	ASR 9000 16-port 100GE QSFP TR line card
S-A9K-I-VRF-LIC	ASR 9K Smart Infrastructure VRF LC License

Downloading the Software

Visit the Cisco Software Center to download Cisco IOS Software.

Cisco Services for the Cisco ASR 9000 Series

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.

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 "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

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

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

For more information

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

Document history

Table 5. Document history

New or Revised Topic	Described In	Date
Updated the Ordering information section with new license SKU content for both Traditional and FCM models. **Updated relevant features and technical specifications across document.**	Ordering information	August 12,2021

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at **https://www.cisco.com/go/offices**.

Printed in USA C78-741100-03 08/21