Cisco ASR 9900 Series 8-Port 100 Gigabit Ethernet Line Cards with 7-Fabric Support

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Product overview

The Cisco® ASR 9900 Series 8-Port 100 Gigabit Ethernet Line Cards with support for 7- fabric connectors deliver industry-leading high density, with line-rate 100 Gigabit Ethernet ports, to any slot of a Cisco ASR 9900 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 Cisco CPAK® technology, these line cards have flexible interfaces that support 100 Gigabit Ethernet, 40 Gigabit Ethernet, and 10 Gigabit Ethernet modes, giving customers the flexibility to mix and match interface types on the same line card.

For example, with the help of Cisco CPAK 10x10G-LR optics, a single 100 Gigabit Ethernet port can be divided into ten 10 Gigabit Ethernet ports using breakout cables or patch panels for unprecedented density and scale. 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 9900 Series line cards (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 9900 Series 8-Port 100 Gigabit Ethernet Line Card

The ASR 9900 Series 8-port 100 Gigabit Ethernet line cards are fully compatible with the Cisco ASR 9904, ASR 9906, ASR 9910, ASR 9912, and ASR 9922 Routers. They are not compatible with the Cisco ASR 9006 and ASR 9010 Routers.

The line cards set a new standard for Layer 2 and Layer 3 service density and scale, allowing operators to offer highly predictable, managed transport services while optimizing the use of network assets. The 10x10G Cisco CPAK breakout option further increases the capability of each line card to support large-scale aggregation, Data Center Interconnect (DCI), and the 10 Gigabit Ethernet Satellite Network Virtualization (nV) System mode on the ASR 9900 Series router. These versatile capabilities help operators qualify and stock one type of line card that can be deployed in any combination of Layer 2, Layer 3, DCI, or aggregation applications, thereby reducing capital expenditures (CapEx) and operating expenses (OpEx), as well as reducing the time required to develop and deploy new services.

The ASR 9900 Series can extend 100 Gigabit Ethernet transport over an IP-over-dense-wave-division-multiplexing (IPoDWDM) network when used with the Cisco ONS 15454 DWDM transponder solution. Distances of up to 3000 kilometers can be achieved while using the optical protection capabilities of the DWDM network.

Table 1 lists the features and benefits of the Cisco ASR 9900 Series 8-port 100 Gigabit Ethernet line cards. Specific feature and scale support is hardware and software dependent.

Table 1. Features and benefits

Feature	Benefit
Interface Support	
Cisco CPAK pluggable interfaces	Provide the capacity to mix and match interface types across a single line card (for a complete list of supported pluggable interfaces, see the Cisco Optics Compatibility Matrix)
Scalable and Integrated Multiservice Support	
Layer 2 and Layer 3 services	Combined IP, MPLS, Ethernet, Layer 2 VPN (L2VPN), and Layer 3 VPN (L3VPN) services
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	Modular, patchable, scalable, highly available, carrier-core and edge-proven operating system

Line Card Types

The ASR 9900 Series 8-port 100 Gigabit Ethernet line cards are available in service-edge-optimized and packet-transport-optimized variants.

- The service-edge-optimized line cards are designed for customer deployments requiring enhanced Quality of Service (QoS).
- The packet-transport-optimized line cards are designed for network deployments where basic QoS is required.

Different line card types can be used in the same system.

Feature licenses are also available to turn on advanced 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 9900 Series 8-Port 100 Gigabit Ethernet Line Cards.

Table 2. Product specifications

Description	Specification
Chassis compatibility	Compatible with the Cisco ASR 9904, ASR 9906, ASR 9910, ASR 9912, and ASR 9922 chassis
Port density	8 ports of 100 Gigabit Ethernet per line card
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	Each line card is available as either a service-edge-optimized (enhanced QoS) or packet-transport-optimized (basic QoS) line card
Reliability and availability	Line card Online Insertion and Removal (OIR) support without system impact
Physical dimensions (H x W x D); weight	14.5 x 1.63 x 22.02 in.; 28 lb (est.) (368.3 mm x 41.4 mm x 559.3 mm; 12.7 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)

Description	Specification
ETSI standards	Cisco ASR 9900 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 9900 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
Immunity	Cisco ASR 9900 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 9900 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 9900 Series 8-Port 100 Gigabit Ethernet Line Cards are 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 9900 Series 8-Port 100 Gigabit Ethernet Line Card with the Flexible Consumption Model.

Table 3. Ordering information for the ASR 9900 Series 8-Port 100 Gigabit Ethernet Line Card with the Flexible Consumption Model

Part number	Feature description
A99-8X100GE-FC	ASR 9900 8-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
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 9900 Series 8-Port 100 Gigabit Ethernet Line Cards with the Traditional Business Model.

Both optimized versions of the ASR 9900 Series 8-port 100 Gigabit Ethernet line cards support optional per-line-card feature licenses to turn on advanced features. Layer 3 VPN licenses provide access to VPN Routing and Forwarding (VRF) instances on a per-line-card basis. They include the Infrastructure VRF license to support up to eight VRF instances and Advanced IP licenses to support up to full-scale VRF instances. Table 4 lists the line card feature licenses

Table 4. Ordering information for the ASR 9900 Series 8-Port 100 Gigabit Ethernet Line Cards with the Traditional Business Model

Part number	Feature description
A99-8X100GE-SE	ASR 9900 8-port 100GE Line Card - Service Edge Optimized OTN, Requires CPAK optics
A99-8X100GE-TR	ASR 9900 8-port 100GE Line Card - Packet Transport Optimized OTN, Requires CPAK optics
Smart Licenses	
S-A9K-800G-IVRF	ASR 9K Smart License Infrastructure VRF for 8x100GE Line Card
S-A9K-800G-AIP-SE	ASR 9K Smart License L3 VPN for 8x100GE – Service Edge Optimized Line Card
S-A9K-800G-AIP-TR	ASR 9K Smart License L3 VPN for 8x100GE - Packet Transport Optimized Line Card
S-A9K-800G-CGN	ASR 9K Smart License In-line CGv6 Transformation for 8x100GE
S-A9K-800G-OPTLIC	ASR 9K Smart License Advanced Optical for 8x100GE Line Card
S-A9K-MACSEC-100	ASR 9000 MACSEC 100G Right to use license
S-A9K-MACSEC-40	ASR 9000 MACSEC 40G Right to use license
S-A9K-MACSEC-10	ASR 9000 MACSEC 10G Right to use license
S-A9K-BNG-LIC-8K	ASR 9K Smart License BNG 8K Sessions
S-A9K-BNG-ADV-8K	ASR 9K Smart License BNG license for Advance Features
Standard Licenses	
A9K-800G-IVRF	Infrastructure VRF license to turn on up to 8 VRF instances per 8-port 100 Gigabit Ethernet line card
A9K-800G-AIP-SE	Advanced IP license to activate full-scale VRF instances per service-edge-optimized 8-port 100 Gigabit Ethernet line card
A9K-800G-AIP-TR	Advanced IP license to turn on full-scale VRF instances per packet-transport-optimized 8-port 100 Gigabit Ethernet line card

Part number	Feature description
A9K-800G-CGN-LIC	IPv6 inline carrier-grade NAT license for 8-port 100 Gigabit Ethernet line card
A9K-800G-OPT-LIC	Advanced Optical license per 8-port 100 Gigabit Ethernet line card
A9K-MACSEC-10	ASR 9000 MACSEC 10G Right to Use License - PAK
A9K-MACSEC-40	ASR 9000 MACSEC 40G Right to Use License - PAK
A9K-MACSEC-100	ASR 9000 MACSEC 100G Right to Use License - PAK
S-A9K-BNG-LIC-8K	ASR 9K Smart License BNG 8K Sessions

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 you successfully deploy, operate, and optimize your 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 return on investment, 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.

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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.

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	July 26,2021

Americas Headquarters
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