Cisco ASR 9000 Series 24-Port and 48-Port Dual-Rate 10GE/1GE Line Card

Contents

Product overview

The Cisco® ASR 9000 Series 24-port and 48-port dual-rate 10 Gigabit and 1 Gigabit Ethernet line cards deliver industry-leading high density and high 10 Gigabit/1 Gigabit Ethernet performance 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, all with an incredibly low power profile.

Fully populating an ASR 9922 chassis with the 48-port line card delivers 960 ports of 10 Gigabit Ethernet or 960 ports of 1 Gigabit Ethernet in a single chassis. Such configurations are ideal for networks in which density, performance, and low-latency operations are critical. The 24-port and the 48-port line cards are designed for throughput of 200G and 400G, respectively, but can operate in oversubscription mode up to 240G for the 24-port card and 480G for the 48-port card. There will be a graceful redistribution of packets across all ports in case of oversubscription. All the ports on the line card can be configured to be all in 10G or all in 1G mode. The line card also offers the flexibility to support certain mixed 1G and 10G configurations.

The physical interfaces on these line cards support both Small Form-Factor Pluggable (SFP) and Enhanced SFP (SFP+) optics for long- and short-haul applications, enabling migration and support for numerous deployment scenarios requiring different media types and flexible interface modes. With these capabilities, the ASR 9000 Series line cards (Figure 1 and Figure 2) 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 Series 24-Port Dual-Rate 10GE/1GE Line Card

Figure 2.
Cisco ASR 9000 Series 48-Port Dual-Rate 10GE/1GE Line Card

Features and benefits

Both the ASR 9000 Series 24-port and 48-port dual-rate 10GE/1GE line cards are fully compatible with all ASR 9000 Series modular chassis. Powered by the proven and the widely deployed Cisco IOS® XR Software OS, these line cards set a new standard for Layer 2 and Layer 3 10GE/1GE service density and scale to support large-scale aggregation, Data Center Interconnect (DCI), and Satellite Network Virtualization (nV) System mode on the ASR 9000 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.

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

Table 1. Features and benefits of Cisco ASR 9000 Series 24-Port and 48-Port Dual-Rate 10GE/1GE Line Cards

Feature	Benefit
Interface Support	
Cisco SFP and SFP+ interfaces	Provide the capacity to mix and match 1 and 10 Gigabit Ethernet 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. Only LAN mode is supported.
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 9000 Series 24-port and 48-port dual-rate 10GE/1GE 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.
- Both optimized versions of the line card support only LAN mode.

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 9000 Series 24-port and 48-port dual-rate 10GE/1GE line cards.

Table 2. Product specifications

Description	Specification
Chassis compatibility	Compatible with the Cisco ASR 9922, ASR 9912, ASR 9910, ASR 9906, ASR 9904, ASR 9010 and ASR 9006 chassis. • **A99-48X10GE-1G-FC, A99-48X10GE-1G-SE, A99-48X10GE-1G-TR** PIDs – compatible with the ASR 9922, ASR 9912, ASR 9910, ASR 9906, ASR 9904 chassis • **A9K-48X10GE-1G-FC, A9K-48X10GE-1G-SE, A9K-48X10GE-1G-TR, A9K-24X10GE-1G-FC, A9K-24X10GE-1G-SE, A9K-24X10GE-1G-TR** PIDs – compatible with the ASR 9922, ASR 9912, ASR 9910, ASR 9906, ASR 9904, ASR 9010, ASR 9006 chassis
Port density	24 ports and 48 ports of 10 Gigabit/1 Gigabit Ethernet ports per line card
Ethernet	• 10-Gbps IEEE 802.3ba compliant • 10 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	• 24-port dual-rate 10GE/1GE line card: 200-Gbps line-rate throughput, 240:200 oversubscription • 48-port dual-rate 10GE/1GE line card: 400-Gbps line-rate throughput, 480:400 oversubscription
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 effects
Physical dimensions (H x W x D); weight	24-port 10 Gigabit Ethernet Line Card: 14.5 x 1.63 x 22.02 in.; 18.3 lb (est.) (368.3 mm x 41.4 mm x 559.3 mm; 8.3 kg) 48-port 10 Gigabit Ethernet Line Card: 14.5 x 1.63 x 22.02 in.; 20 lb (est.)

Description	Specification
	(368.3 mm x 41.4 mm x 559.3 mm; 9.1 kg)

Description	Specification
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
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 24-port and 48-port dual-rate 10 Gigabit and 1 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 9000 Series 24-port and 48-port dual-rate 10 Gigabit and 1 Gigabit Ethernet line cards with the Flexible Consumption Model

Table 3. Ordering information for the ASR 9000 Series 24-port and 48-port dual-rate 10 Gigabit and 1 Gigabit Ethernet line cards with the Flexible Consumption Model

Part number	Feature description
Hardware	
A9K-48X10GE-1G-FC	ASR 9000 48-port 10G & 1G Flexible Consumption model Line Card
A99-48X10GE-1G-FC	ASR 9900 48-port 10G & 1G Flexible Consumption model Line Card
A9K-24X10GE-1G-FC	ASR 9000 24-port 10GE & 1GE Flexible Consumption Model Line Card
Software RTU Licenses	
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
Subscriptions	
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 9000 Series 24-port and 48-port dual-rate 10 Gigabit and 1 Gigabit Ethernet line cards with the Traditional Business Model. Optional per-line-card feature licenses are available 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. Ordering information for ASR 9000 Series 24-port and 48-port dual-rate 10 Gigabit and 1 Gigabit Ethernet line cards with the Traditional Business Model

Part number	Feature description
Hardware	
A9K-48X10GE-1G-SE	ASR 9000 48-port dual-rate 10G/1G service edge-optimized line card
A9K-48X10GE-1G-TR	ASR 9000 48-port dual-rate 10G/1G packet transport-optimized line card
A9K-24X10GE-1G-SE	ASR 9000 24-port dual-rate 10G/1G service edge-optimized line card
A9K-24X10GE-1G-TR	ASR 9000 24-port dual-rate 10G/1G packet transport-optimized line card
A99-48X10GE-1G-SE	ASR 9900 48-port dual-rate 10G/1G service edge line card
A99-48X10GE-1G-TR	ASR 9900 48-port dual-rate 10G/1G packet transport line card
Smart Licenses	
S-A9K-48P10G-IVRF	Infra. VRF lic. for up to 8 VRF instances per 48-port 10G/1G
S-A9K-24P10G-IVRF	Infra. VRF lic. for up to 8 VRF instances per 24-port 10G/1G
S-A9K-48P10GAIPSE	Adv IP License for full scale VRFs for 48-port 10G/1G SE LC
S-A9K-48P10GAIPTR	Adv IP License for full scale VRFs for 48-port 10G/1G TR LC
S-A9K-24P10GAIPSE	Adv IP License for full scale VRFs for 24-port 10G/1G SE LC
S-A9K-24P10GAIPTR	Adv IP License for full scale VRFs for 24-port 10G/1G TR LC
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-48P10G-IVRF	Infra. VRF lic. for up to 8 VRF instances per 48-port 10G/1G
A9K-24P10G-IVRF	Infra. VRF lic. for up to 8 VRF instances per 24-port 10G/1G LC
A9K-48P10G-AIP-SE	Adv. IP license for full-scale VRFs for 48-port 10G/1G SE LC

Part number	Feature description
A9K-48P10G-AIP-TR	Adv. IP license for full-scale VRFs for 48-port 10G/1G TR LC
A9K-24P10G-AIP-SE	Adv. IP license for full-scale VRFs for 24-port 10G/1G SE LC
A9K-24P10G-AIP-TR	Adv. IP license for full-scale VRFs for 24-port 10G/1G TR LC
A9K-BNG-LIC-8K	BNG License Unit for 8,000 subscribers

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
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Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

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For more information

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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
Updated the Product specifications section for Chassis compatibility to specify chassis compatibility with various types of 24-port and 48-port dual-rate 10 Gigabit and 1 Gigabit Ethernet line cards.	Product Information	March 21, 2022

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