Cisco ASR 9000 Series 4-Port 100-Gigabit Ethernet LAN Line Card

Product overview

Cisco® ASR 9000 4-port 100 Gigabit Ethernet LAN line card delivers line-rate 100 Gigabit Ethernet ports to any slot of a Cisco ASR 9000 Series Aggregation Services Router. This line card provides carrier-class reliability and 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. This 4-port 100 Gigabit line card uses 100G Quad Small Form Factor Pluggable (QSFP) optics. It also provides the flexibility to break 100GE ports into four 10GE channels for a total of 16 10GE channels per line card. Using a “green design,” this low powered line card further allows customers put an unused slice in power-saving mode to reduce power consumption. With these capabilities, the ASR 9000 Series 4-port 100-GE LAN line card (Figure 1) provides 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 4-port 100 Gigabit Ethernet LAN line card

Features and benefits

The ASR 9000 Series 4-port 100-GE LAN line card are fully compatible with the ASR 9006, ASR 9010, ASR 9904, ASR 9906, ASR 9910, ASR 9912 and ASR 9922 Routers. These line cards are designed for transport integration in high-density 100G environments, deliver line-rate packet performance for IP and MPLS transport, and operate at an incredibly low-power profile, thereby lowering total network operating expenses.

The ASR 9000 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 9000 Series line card. Specific feature and scale support is hardware- and software-dependent.

Table 1. Features and benefits of Cisco ASR 9000 Series 4-port 100 Gigabit Ethernet LAN line card

Feature	Benefit
Interface support	
QSFP 100G pluggable interfaces	Standard QSFP28 100 Gigabit Ethernet optics. For a complete list of supported interfaces, see the Cisco ASR 9000 Transceiver Modules: Line Card Support data sheet
Layer 3 services	Combined IP, MPLS, Ethernet, and Layer 3 VPN (L3VPN) services

Feature	Benefit
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

Product specifications

Table 2 provides product specifications for the ASR 9000 Series 4-port 100 Gigabit Ethernet LAN 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	4 ports of 100 Gigabit Ethernet or 16 10GE ports via breakout 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
Reliability and availability	Line card Online Insertion and Removal (OIR) support without system impact
Physical dimensions (H x W x D); weight	4-port 100 Gigabit Ethernet LAN line card: 14.5 x 1.63 x 22.02 in.; 19.7 lb (368.3 mm x 41.4 mm x 559.3 mm; 8.9 kg)
Operating temperature	41 to 104ºF (5 to 40ºC)
Operating humidity (nominal) (relative humidity)	10 to 85%
Storage temperature	–40 to 158ºF (–40 to 70ºC)
Storage (relative humidity)	5 to 95% **Note:** Not to exceed 0.024 kg of water per kg of dry air
Operating altitude	–60 to 4000m (up to 2000m 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) • EN55032: Multimedia Equipment (Emissions) • EN55024: Information Technology Equipment (Immunity) • EN55035: Multimedia 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 • CISPR 32 (EN55032) 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

Pluggable interfaces

The ASR 9000 Series 4-port 100 Gigabit Ethernet line card supports the QSFP form factor pluggable interfaces listed in Table 3. See the Cisco ASR 9000 Transceiver Modules: Line Card Support data sheet for a complete list of supported pluggable interfaces.

Table 3. Cisco interfaces supported by the Cisco ASR 9000 Series 4-port 100 Gigabit Ethernet line card

Part number	100 Gigabit Ethernet QSFP optics	Maximum Distance
QSFP-100G-LR4-S	100 Gigabit Ethernet long-reach, 1310 nm single-mode fiber	10 km
QSFP-100G-SR4-S	100 Gigabit Ethernet short-reach, 850 nm multimode fiber	100 – 150 m
QSFP-100G-CWDM4-S	100GBASE CWDM4 QSFP Transceiver, LC, 2 km over SMF	10 km
QSFP-100G-AOC10M	100GBASE QSFP Active Optical Cable, 10m	10 m
QSFP-4X10G-LR-S*	QSFP 4x10G Transceiver Module, SM MPO, 10KM, Enterprise-Class	10 km
QSFP-100G-ER4L-S*	100GBASE QSFP Transceiver, 40KM reach over SMF, Duplex LC	40 km

* There are minimum XR release requirements to support these optics

Software licensing

Line card feature licenses

The ASR 9000 Series 4-port 100 Gigabit Ethernet LAN 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. Feature licenses for Cisco ASR 9000 Series 4-port 100 Gigabit Ethernet LAN line card

License part number	Feature description
A9K-400G-IVRF	ASR 9000 4-port 100GE Infrastructure VRF license
A9K-400G-L-AIP	ASR 9000 4-port 100GE Advanced IP license per line card

Table 5 provides ordering information for the ASR 9000 Series 4-port 100 Gigabit Ethernet LAN line card.

Table 5. Ordering information

Product description	Part number	Minimum XR Release support
Cisco ASR 9000 4-port 100GE LAN line card	A9K-4X100GE	XR 6.2.3

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.

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Printed in USA C78-740092-01 08/18