

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

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 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 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 100 Gigabit Ethernet interface types across a single line card. For a complete list of supported interfaces, see the Cisco ASR 9900 Transceiver Modules: Line Card Support data sheet. |
| 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 9910, ASR 9912, and ASR 9922 chassis |
| Port density | 8 ports of 100 Gigabit Ethernet per line card |
| Ethernet | <ul style="list-style-type: none"> • 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 |

| Description | Specification |
|---|--|
| 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) |
| ETSI standards | Cisco ASR 9900 Series Routers are designed to meet: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 style="list-style-type: none"> • 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 9900 Series 8-port 100 Gigabit Ethernet line cards support the Cisco CPAK pluggable interfaces listed in Table 3. See the [Cisco ASR 9900 Transceiver Modules: Line Card Support](#) data sheet for a complete list of supported pluggable interfaces.

Table 3. Cisco CPAK Interfaces Supported by the Cisco ASR 9900 Series 8-port 100 Gigabit Ethernet Line Cards

| Part Number | 100 Gigabit Ethernet CPAK Optics | Maximum Distance |
|-----------------------|--|------------------|
| CPAK-100G-LR4 | 100 Gigabit Ethernet long-reach, 1310 nm single-mode fiber | 10 km |
| CPAK-100G-SR10 | 100 Gigabit Ethernet short-reach, 850 nm multimode fiber | 100m-150 m |
| CPAK-10x10G-LR | 10x10 Gigabit Ethernet breakout optics, long-reach 1310 nm multimode fiber; can be used with breakout cables or breakout patch panel | 10 km |
| CPAK-100G-ER4L | 100 Gigabit Ethernet extended reach single-mode fiber | 25 km |

Software Licensing

Line Card Feature Licenses

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. Feature Licenses for Cisco ASR 9900 Series 8-Port 100 Gigabit Ethernet Line Cards

| License Part Number | Feature Description |
|-------------------------|--|
| 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 |
| 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 |

Table 5 provides ordering information for the ASR 9900 Series 8-port 100 Gigabit Ethernet line cards.

Table 5. Ordering Information

| Product Description | Part Number | Minimum XR Release support |
|---|----------------|----------------------------|
| Cisco ASR 9900 8-port 100GE “LAN/WAN/OTN” Service Edge Optimized Line Card, Requires CPAK optics | A99-8X100GE-SE | XR 5.3.3 |
| Cisco ASR 9900 8-port 100GE “LAN/WAN/OTN” Packet Transport Optimized Line Card, Requires CPAK optics | A99-8X100GE-TR | XR 5.3.3 |

Downloading the Software

Visit the [Cisco Software Center](#) to download Cisco IOS Software.

Cisco Services for the Cisco ASR 9900 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 9900 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 9900 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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