

# Cisco ASR 9000 Series 32-Port 100 Gigabit Ethernet Line Card

## Product overview

The Cisco® ASR 9900 Series 32-port 100 Gigabit Ethernet Line Cards 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 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 9900 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.

**Figure 1.** Cisco ASR 9000 Series 32-Port 100 Gigabit Ethernet Line Card – TR



## Features and benefits

Both the ASR 9900 Series 32-port 100 Gigabit Ethernet line card is fully compatible with Cisco 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 cards and cooling systems, because the line card offers industry-leading, high-density 100 Gigabit Ethernet throughput. The 32-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.

Table 1 lists the features and benefits of the 32-port Cisco ASR 9900 Series 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 9900 Series 32-Port 100 Gigabit Ethernet Line Cards

Feature	Benefit
<b>Interface Support</b>	
<b>Cisco QSFP Pluggable interfaces</b>	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 <a href="#">Cisco ASR 9900 Transceiver Modules: Line Card Support</a> data sheet
<b>Evolutionary Monitoring</b>	
<b>Carrier-class Operations, Administration, and Maintenance (OAM)</b>	NetFlow, IEEE 802.1ag, IEEE 802.3ah, ITU Y.1731, IP Service-Level Agreement (IP SLA), Virtual Circuit Connectivity Verification (VCCV), ping, and traceroute
<b>Carrier-Class OS</b>	
<b>Cisco IOS® XR Software</b>	Modular, patchable, scalable, highly available, carrier-core and edge-proven operating system

## Line card types

The ASR 9900 Series 32-port 100 Gigabit Ethernet line cards 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 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 32-port 100 Gigabit Ethernet line cards.

**Table 2.** Product specifications XR 6.5.15 or later

Description	Specification
<b>Chassis compatibility</b>	Compatible with the Cisco ASR 9904, ASR 9910, ASR 9906, ASR 9912 and ASR 9922 chassis
<b>Port density</b>	32-ports of 100 Gigabit Ethernet per line card
<b>Ethernet</b>	<ul style="list-style-type: none"> <li>• 100-Gbps IEEE 802.3ba compliant</li> <li>• 100 Gigabit Ethernet PHY monitoring</li> <li>• IEEE 802.x flow control</li> <li>• Full-duplex operation</li> <li>• 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</li> </ul>
<b>Performance</b>	<ul style="list-style-type: none"> <li>• 100-Gbps line-rate throughput per port</li> </ul>
<b>Options</b>	The line card is available as a packet transport optimized line card
<b>Reliability and availability</b>	Line card Online Insertion and Removal (OIR) support without system impact
<b>Physical dimensions (includes ejector bracket/lever); (H x W x D); weight</b>	32-port 100 Gigabit Ethernet Line Card: 1.63 x 15.58 x 1.63 x 23.80 in.; 27.4 lb (est.) (41.4 mm x 395.7 mm x 604.5 mm; 12.43 kg)
<b>Operating temperature</b>	41 to 104°F (5 to 40°C)
<b>Operating humidity (nominal) (relative humidity)</b>	10 to 85%
<b>Storage temperature</b>	–40 to 158°F (–40 to 70°C)
<b>Storage (relative humidity)</b>	5 to 95% <b>Note:</b> Not to exceed 0.024 kg of water per kg of dry air
<b>Operating altitude</b>	–60 to 4000m (up to 2000m conforms to IEC, EN, UL, and CSA 60950 requirements)

Description	Specification
<b>ETSI standards</b>	Cisco ASR 9000 Series Routers are designed to meet: <ul style="list-style-type: none"> <li>● EN300 386: Telecommunications Network Equipment (EMC)</li> <li>● ETSI 300 019 Storage Class 1.1</li> <li>● ETSI 300 019 Transportation Class 2.3</li> <li>● ETSI 300 019 Stationary Use Class 3.1</li> <li>● EN55022: Information Technology Equipment (Emissions)</li> <li>● EN55024: Information Technology Equipment (Immunity)</li> <li>● EN50082-1/EN-61000-6-1: Generic Immunity Standard</li> </ul>
<b>EMC standards</b>	Cisco ASR 9000 Series Routers are designed to meet: <ul style="list-style-type: none"> <li>● FCC Class A</li> <li>● ICES 003 Class A</li> <li>● AS/NZS 3548 Class A</li> <li>● CISPR 22 (EN55022) Class A</li> <li>● VCCI Class A</li> <li>● BSMI Class A</li> <li>● IEC/EN 61000-3-2: Power Line Harmonics</li> <li>● IEC/EN 61000-3-3: Voltage Fluctuations and Flicker</li> </ul>
<b>Immunity</b>	Cisco ASR 9000 Series Routers are designed to meet: <ul style="list-style-type: none"> <li>● IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8kV Contact, 15kV Air)</li> <li>● IEC/EN-61000-4-3: Radiated Immunity (10V/m)</li> <li>● IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2kV Power, 1kV Signal)</li> <li>● IEC/EN-61000-4-5: Surge AC Port (4kV CM, 2kV DM)</li> <li>● IEC/EN-61000-4-5: Signal Ports (1kV)</li> <li>● IEC/EN-61000-4-5: Surge DC Port (1kV)</li> <li>● IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms)</li> <li>● IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30A/m)</li> <li>● IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations</li> </ul>
<b>Safety</b>	Cisco ASR 9000 Series Routers are designed to meet: <ul style="list-style-type: none"> <li>● UL/CSA/IEC/EN 60950-1</li> <li>● IEC/EN 60825 Laser Safety</li> <li>● ACA TS001</li> <li>● AS/NZS 60950</li> <li>● FDA: Code of Federal Regulations Laser Safety</li> </ul>

## Pluggable interfaces

The ASR 9900 Series 32-port 100 Gigabit Ethernet line card supports the Cisco QSFP 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 QSFP interfaces supported XR 6.5.15 or later by the Cisco ASR 9900 Series 32-Port 100 Gigabit Ethernet Line Card

Part number	100 Gigabit Ethernet QSFP Optics	Maximum Distance
<b>QSFP-100G-LR4-S</b>	100 Gigabit Ethernet long-reach, 1310 nm, SMF	10 km
<b>QSFP-100G-SR4-S</b>	100 Gigabit Ethernet short-reach, 850 nm, MMF	100m
<b>QSFP-40G-LR4-S*</b>	40 Gigabit Ethernet long-reach, 1310 nm, SMF	10 km
<b>QSFP-40G-SR4</b>	QSFP 4x10G Transceiver Module, LC, 100M	100m
<b>QSFP-4X10G-LR-S</b>	QSFP 4x10G Transceiver Module, LC, 10KM	10 km
<b>QSFP-100G-CWDM4-S*</b>	100GBASE CWDM4 QSFP Transceiver, LC, 2km over SMF	2 km

Part number	100 Gigabit Ethernet QSFP Optics	Maximum Distance
QSFP-100G-AOCxM	100GBASE QSFP Active Optical Cable, MMF	fixed 1m-30m
QSFP-100G-ER4L-S*	100 Gigabit Ethernet ER4 Lite QSFP Transceiver	25-30 km
QSFP-100G-PSM4-S*	100GBASE PSM4 QSFP Transceiver, MPO, 500 m over SMF	500m

\*There are minimum XR release requirements to support these optics

## Software licensing

### Line card feature licenses

The ASR 9900 Series 32-port 100 Gigabit Ethernet line card supports an optional per-line-card feature license to turn on advanced features. Table 4 lists the line card feature license.

**Table 4.** Feature license for Cisco ASR 9900 Series 32-port 100 Gigabit Ethernet Line Card

License part number	Feature description
S-A9K-I-VRF-LIC	Infrastructure VRF license to turn on up to 8 VRF instances per 32-port 100 Gigabit Ethernet line card

Table 5 provides ordering information for the ASR 9900 Series 32-port 100 Gigabit Ethernet line card.

**Table 5.** Ordering information

Product description	Part number	Minimum XR Release support
ASR 9900 32-port 100GE QSFP TR line card	A99-32X100GE-TR	XR 6.5.15

## 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.

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