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Cisco ASR 9902 Compact High-Performance Router

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Product overview

Part of the Cisco® ASR 9000 Series, the Cisco ASR 9902 Router (Figure 1) is a compact, high-performance router that delivers up to 800 Gbps of nonblocking, full-duplex capacity in a Two-Rack-Unit (2RU) form factor. Based on the same Cisco IOS® XR software image as the other routers in the Cisco ASR 9000 Series, the Cisco ASR 9902 Router delivers the features and services found on the ASR 9000 Series platforms, allowing customers to standardize on the same Cisco IOS XR operating system. Multiple port rates are supported by ASR 9902: 100/40 Gigabit Ethernet, 25 Gigabit Ethernet, and 10 Gigabit Ethernet, providing customers the flexibility to mix and match interface types on the same chassis and offering operators the readiness for mass-scale networking.

As a redundant, high-performance, multipurpose platform, the ASR 9902 Router can be used in a wide range of customer scenarios and use cases: business PE, metro aggregation, cloud edge, internet peering, Data Center Interconnect (DCI), Broadband Network Gateway (BNG), internet edge, and others. The compact size (depth is 19 in., 483 mm), front-to-back airflow, support of PTP Telecom profiles, and different port rates make this platform very efficient and flexible for using at the mobile edge in 4G/5G networks. Enterprise customers can deploy the ASR 9902 as WAN Core, WAN Edge, and WAN Aggregation, as well as a border router at the edge of the enterprise network and as a peering router for communication with internet service providers.

Features and benefits

The ASR 9902 Router offers power-optimized architecture with high density of multi-rate ports and super service scales. This allows customers to reduce Capital Expense (CapEx) and Operating Expense (OpEx) while providing highly predictable, flexibly managed service infrastructure.

The Cisco ASR 9902 Router is a compact router that supports two redundant Route Processors (RPs), an integrated switch fabric, 2 AC or DC power supply modules, and 3 fans in redundant configuration. The router consists of the fixed board, with 2 integrated QSFP-DD-based 100GE ports, 6 integrated QSFP28-based 100GE ports, and 16 integrated SFP28-based 25GE/10GE dual-rate ports, plus 24 integrated SFP+-based LAN/WAN (OTN) ports. All ports also support MACSec.

The ASR 9902 fixed board supports maximum 800G data bandwidth. The integrated physical ports on its faceplate can operate in many different combinations.

The Cisco ASR 9902 Route Processor (Figure 2) is available in a service edge-optimized version to meet customer requirements for large-scale, comprehensive service deployment and also features a powerful 64-bit Intel CPU and 32GB memory. A set of external interfaces on the front panel includes: console and auxiliary serial ports, 2 management Ethernet interfaces, a Class A USB port, GPS interface (10Mhz, 1PPS, ToD ports), and 2 BITS interfaces.

Transceivers that are applicable to the ASR 9902 are compatible with the ASR 9000 Series of modular and compact chassis.

The QSFP-DD optics have the same mechanical characteristics and cage size as the QSFP28 optics, and the same ports can act as 10 GE, 25 GE, and 40/100 GE. 1GE can be supported via smart SFP or nV Satellite.



Figure 1.
Cisco ASR 9902 chassis

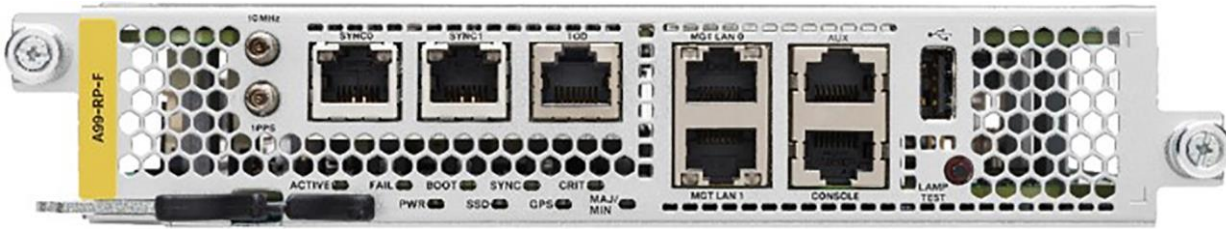


Figure 2.
Cisco ASR 9902 Route Processor

Table 1 lists the features and benefits of the ASR 9902 Router. Specific features and scale support are hardware and software dependent.

Table 1. Features and benefits of the Cisco ASR 9902 Compact High-Performance Router

Feature	Benefit
Interface support	
Cisco Pluggable interfaces	Provides the capacity to mix and match 10, 25, 40, and 100 Gigabit Ethernet interface types across the ASR 9902 chassis. For a complete list of supported pluggable interfaces, see the Cisco Optics Compatibility Matrix .
DWDM	DWDM support based on the Optical Transport Network (OTN) protocol that is specified in ITU-T G.709. This standard combines the benefits of SONET/SDH technology with the multi-wavelength networks of DWDM. It also provides for Forward Error Correction (FEC) that can allow a reduction in network costs by reducing the number of regenerators used.
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

Feature	Benefit
Timing capability	
Hardware-based IEEE 1588, GPS/BITS interfaces, and SyncE support	Delivers timing services over the packet network. Support of PTP Telecom profiles (G.8265.1, G.8275.1, G.8275.2). SyncE on Ethernet ports across the ASR 9902 chassis, support of GPS and BITS interfaces to provide redundant network synchronization.
Carrier-grade redundancy	
Fully redundant configuration	Support of redundant configuration: 2 RPs, 2 power supply modules, 3 fan modules
Carrier-class OS	
Cisco IOS XR Software (64-bit)	Modular, patchable, scalable, highly available, carrier-core, and edge-proven operating system

The ASR 9902 Compact High-Performance Router is available in the service edge variant.

Feature licenses are also available to turn on features on the ASR 9902, as described in Table 5.

Product specifications

Table 2 provides product specifications for the ASR 9902 Compact High-Performance Router.

Table 2. Product specifications

Description	Specification
Physical dimensions (includes ejector bracket/lever); (H x W x D); weight	ASR 9902 chassis (including 2 RPs, 2 PSUs, 3 FANs): H x W x D: 3.45 x 17.3 x 19 in.; 46.39 lb (87.63 x 439.74 x 482.60 mm; 21.04 kg) Note: Excluding ejector, the depth is 19 in./482.6 mm
Redundancy	Route processor redundancy Power supply redundancy Fan redundancy Software redundancy
Port density	ASR 9902 chassis with integrated ports: <ul style="list-style-type: none"> • 2 QSFP-DD ports capable of 10Gb, 40Gb, and 100Gb Ethernet • 6 QSFP28 ports capable of 10Gb, 40Gb, and 100Gb Ethernet • 16 SFP28 dual-rate ports capable of 25Gb and 10Gb Ethernet • 24 SFP+ ports capable of 10Gb Ethernet (LAN) and WAN (OTN)
RP CPU memory	SDRAM DDR4 - 32GB
Rack mounting	2-post and 4-post 19-in. and 23-in.
Airflow	Front to back

Description	Specification
Power	<ul style="list-style-type: none"> • 1.6 kW DC power module (up to 2 modules), redundancy: 1+1 • 1.6 kW AC power module (up to 2 modules), redundancy: 1+1 <p>Note: Mixing of AC and DC modules is not supported.</p>
Ethernet	<ul style="list-style-type: none"> • 10-Gbps IEEE 802.3ae compliant • 25-Gbps IEEE 802.3by and IEEE 802.3cc compliant • 40/100-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	<ul style="list-style-type: none"> • 10-Gbps line-rate throughput per SFP+ port • 25-Gbps line-rate throughput per SFP28 port • 100-Gbps line-rate throughput per QSFP28 or QSFP-DD port
Operating temperature	<p>41 to 104°F (5 to 40°C)</p> <p>Note: Limitations may apply when using high-power optics</p>
Operating humidity (nominal) (relative humidity)	<p>10 to 85%</p>
Storage temperature	<p>-40 to 158°F (-40 to 70°C)</p>
Storage (relative humidity)	<p>5 to 95%</p> <p>Note: Not to exceed 0.024 kg of water per kg of dry air</p>
Operating altitude	<p>0 to 4000 m</p> <p>Note: Limitations may apply when using high-power optics</p>
ETSI/EN standards	<p>The Cisco ASR 9902 Router is designed to meet:</p> <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

Description	Specification
EMC standards	<p>The Cisco ASR 9902 Router is designed to meet:</p> <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 • EN50121-4 Railway Applications Part 4: Emission and immunity of the signaling and telecommunications apparatus
Immunity	<p>The Cisco ASR 9902 Router is designed to meet:</p> <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 • EN 50121-4: Railway EMC
Safety	<p>The Cisco ASR 9902 Router is designed to meet:</p> <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
Network Equipment Building Systems (NEBS)	<p>The Cisco ASR 9902 Router is designed to meet:</p> <ul style="list-style-type: none"> • SR-3580: NEBS Criteria Levels (Level 3) • GR-1089-CORE: NEBS EMC and Safety • GR-63-CORE: NEBS Physical Protection

Ordering information

The ASR 9902 Compact High-Performance Router is available to order through the Flexible Consumption Model (FCM) and 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 9902 Router with the Flexible Consumption Model.

Table 3. Ordering information for the ASR 9902 Router with the Flexible Consumption Model

Part number	Feature description
ASR-9902-FC	ASR 9902, 2RU, Flexible Consumption Chassis
A99-RP-F-FC	ASR 9900 Fixed Chassis Route Processor - Flexible Consumption Model
PWR-1.6KW-AC	ASR 9900 Fixed Chassis AC Power Supply
PWR-1.6KW-DC	ASR 9900 Fixed Chassis DC Power Supply
ASR-9902-FAN	ASR 9902 Fan Tray
ASR-9902-2P-KIT	ASR 9902 2-Post Mounting Kit for 19-Inch and 23-Inch Rack
ASR-9902-4P-KIT	ASR 9902 4-Post Mounting Kit for 19-Inch and 23-Inch Rack
ASR-9902-CAB-MGMT	ASR 9902 Cable Management
ASR-9902-FILTER	ASR 9902 Air Filter
S-A9K-LI-LIC-FC	ASR 9K Smart License Lawful Intercept - Flexible Consumption Model
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-400G-RTU1	Edge Essentials Software RTU License per 400G
ADV-ED-400G-RTU1	Edge Advantage w/o Essentials Software RTU License per 400G
ADN-ED-400G-RTU1	Edge Advantage w/ Essentials Software RTU License per 400G
ESS-ED-100G-SIA5	Edge Essentials SIA per 100G 60-120 months
ESS-ED-100G-SIA3	Edge Essentials SIA per 100G 36-59 months
ESS-ED-400G-SIA5	Edge Essentials SIA per 400G 60-120 months
ESS-ED-400G-SIA3	Edge Essentials SIA per 400G 36-59 months

Part number	Feature description
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
ADV-ED-400G-SIA5	Edge Advantage w/o Essentials SIA per 400G for 60-120 months
ADV-ED-400G-SIA3	Edge Advantage w/o Essentials SIA per 400G 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
ADN-ED-400G-SIA5	Edge Advantage w/ Essentials SIA per 400G for 60-120 months
ADN-ED-400G-SIA3	Edge Advantage w/ Essentials SIA per 400G for 36-59 months

For more information, please refer to the [Cisco IOS XR Software Flexible Consumption Model Data Sheet](#).

Table 4 provides hardware ordering information for the ASR 9902 Router with the Traditional Business Model.

Table 4. Hardware ordering information for the ASR 9902 Router with the Traditional Business Model

Part number	Feature description
ASR-9902	ASR 9902 Chassis, 2RU
A99-RP-F	ASR 9900 Fixed Chassis Route Processor
PWR-1.6KW-AC	ASR 9900 Fixed Chassis AC Power Supply
PWR-1.6KW-DC	ASR 9900 Fixed Chassis DC Power Supply
ASR-9902-FAN	ASR 9902 Fan Tray
ASR-9902-2P-KIT	ASR 9902 2-Post Mounting Kit for 19-Inch and 23-Inch Rack
ASR-9902-4P-KIT	ASR 9902 4-Post Mounting Kit for 19-Inch and 23-Inch Rack
ASR-9902-CAB-MGMT	ASR 9902 Cable Management
ASR-9902-FILTER	ASR 9902 Air Filter

The ASR 9902 Compact High-Performance Router supports optional feature licenses to enable features. Table 5 lists the feature licenses.

Table 5. Feature license information for the ASR 9902 Router with the Traditional Business Model

Part number	Feature description
S-A9902-IVRF	ASR 9902 License to Activate up to 8 VRFs for Fixed Ports
S-A9902-AIP	ASR 9902 Full-Scale VRF License for Fixed Ports
S-A9902-CGN	ASR 9902 In-Line CGv6 Translation License for Fixed Port
S-A9902-OPTLIC	ASR 9902 License to Activate Advanced Optical
S-A9K-MACSEC-10	ASR 9000 MACSec 10G Right to Use license
S-A9K-MACSEC-40	ASR 9000 MACSec 40G Right to Use license
S-A9K-MACSEC-100	ASR 9000 MACSec 100G Right to Use license
S-A9K-LI-LIC	ASR 9K Smart License Lawful Intercept
S-A9K-TUNNEL-ENT	ASR 9K Smart License RTU License for Tunnel Protocols
S-A9K-MOBILE-LIC	ASR 9K Smart License Advanced Mobile for System
S-A9K-NVSAT1-LIC	NV Host License for 1 nV Client
S-A9K-NVSAT5-LIC	NV Host License for Up to 5 nV Clients
S-A9K-NVSAT20-LIC	NV Host License for Up to 20 nV Clients

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 Return On Investment (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
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

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For more information

For more information about Cisco Services, contact your local Cisco account representative or visit www.cisco.com/go/spservices.

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

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