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Cisco ASR 9901 Router

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Product overview

Part of the Cisco® ASR 9000 Series, the Cisco ASR 9901 Router (Figure 1) is a compact high-capacity Provider Edge (PE) router that delivers 456 Gbps of nonblocking, full-duplex fabric 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 9901 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. The Cisco ASR 9901 Router has an Integrated Route Switch Processor (RSP) and has 42 integrated ports that supports a combination of 1/10/100GE speeds, a GPS input for stratum-1 clocking, Building Integrated Timing Supply (BITS) ports, and management ports.



Figure 1.
Cisco ASR 9901 Router

Cisco ASR 9000 Series Aggregation Services Routers deliver exceptional scale, service flexibility, and high availability to Carrier Ethernet transport networks. The router is powered by widely deployed Cisco IOS XR 64 bit operating system, an innovative self-healing, distributed operating system designed for always-on operation. The ASR 9901 sets 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. The ASR 9901 also supports industry leading MAC-SEC encryption on all its port speeds. These versatile capabilities help operators qualify and stock one type of chassis 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.

Cisco ASR 9000 Series Carrier Ethernet applications include business services such as Layer 2 and Layer 3 VPN (L2VPN and L3VPN, mobile backhaul transport networks, and Broadband Network Gateway (BNG). Features supported include Ethernet Services; L2VPN; IPv4, IPv6, and L3VPN; Layer 2 and Layer 3 multicast; Synchronous Ethernet (SyncE), Ethernet Operations, Administration, and Maintenance (EOAM) and MPLS OAM, Layer 2 and Layer 3 Access Control Lists (ACLs), Hierarchical Quality of Service (HQoS), MPLS Traffic Engineering Fast Reroute (MPLS TE-FRR), Multichassis Link Aggregation (MC-LAG), Integrated Routing and Bridging (IRB) and Cisco Nonstop Forwarding (NSF) and Nonstop Routing (NSR). The System also supports the advanced features including Segment Routing, EVPN, Programmability and Telemetry and other enhancements in the IOS-XR 64 Bit Operating System.

Features and benefits of the Cisco ASR 9901 Router are listed in Table 1.

Table 1. Features and Benefits of Cisco ASR 9901 Router

Feature	Benefit
Highly Scalable fabric	Designed to support high 1/10/40/100 Gigabit densities in a 2RU form factor Provides built-in scalability for investment protection
Integrated ports	Provides 42 Integrated ports (16x1G, 24x1/10G (Dual rate), 2x100G ports)
Cisco Pluggable interfaces	Provides the capacity to mix and match 1, 10, 40 and 100 Gigabit Ethernet interface types across the ASR 9901 chassis. For a complete list of supported pluggable interfaces, see the Cisco Optics Compatibility Matrix .
Integrated route processor with 32 GB RAM	Runs Cisco IOS XR 64 Bit, a carrier-class operating system with high memory capacity suitable for all multidimensional scale applications.
Distributed forwarding plane architecture	Allows ports to support independent forwarding for enhanced performance and scale
Hardware-based IEEE 1588 support	Delivers timing services over the packet network efficiently and reliably
Two independent clock source connections: BITS and Synchronization Supply Unit (SSU) with DOCSIS® Timing Interface (DTI)	Offers redundant, centralized network synchronization support
GPS	Provides option for Stratum-1 clocking
Processor	Integrated RSP has 4 cores, 2.4 Ghz Intel CPU
Embedded USB memory (eUSB) port	Provides access to USB flash memory devices for software image loading and upgrades
Front-panel LEDs	Provides visual indication of RSP status, power management, and activity on compact flash and Hard Disk Drive (HDD)
Management ports	Provides easy access to system console
Power supply	Redundant AC or DC power supplies

Product specifications

Table 2 provides details about the Cisco ASR 9901 Router. The system is designed for high performance and high reliability. The Cisco ASR 9901 has an integrated RSP capable of supporting fabric bandwidth up to 456 Gbps.

Table 2. Specifications for Cisco ASR 9901 Router

Category	Part Number or Specification
Chassis	ASR 9901
Integrated interfaces	16x1 GE, 24x 1/10 GE, 2x100 GE
Redundancy	Power supply and Fan redundancy
Power supply part number	<ul style="list-style-type: none"> • A9K-1600W-AC • A9K-1600W-DC
Physical specifications	<ul style="list-style-type: none"> • Height: 3.43 inches (8.7 cm) • Width: 17.32 inches (44 cm) • Depth: 23.62 inches (60 cm) • Weight of chassis: 47.62 lbs (21.6 kg) • Weight of fully configured (including 2 x power modules & 3x Fan trays) chassis 55.97 lbs (25.4 kg)
Power inputs	<ul style="list-style-type: none"> • Worldwide ranging AC (90–265V; 50–60 Hz) • Worldwide ranging DC (-40V to -72V)
Power consumption	<ul style="list-style-type: none"> • 850 watts typical, 1100 watts maximum
Environmental conditions	<ul style="list-style-type: none"> • Operating temperature: 41° to 104°F (5° to 40° C) • Storage temperature: -40 to 167°F (-40 to 75° C) • Relative humidity: 10 to 85%, noncondensing • Regulatory compliance
Environmental Specifications	
Operating temperature (nominal)	41 to 104°F (5 to 40° C)
Operating temperature (short-term)	23 to 131°F (-5 to 55° C)
Operating humidity (nominal) (relative humidity)	10 to 85%
Operating humidity (short-term)	5 to 90% Note: Not to exceed 0.024 kg water or dry air

Category	Part Number or Specification
Storage temperature	-40 to 158°F (-40 to 70°C)
Storage (relative humidity)	5 to 95% Note: Not to exceed 0.024 kg water or dry air
Operating altitude	0 - 4000 m
Air flow	Front to Back
Compliance	
Network Equipment Building Standards (NEBS)	<p>Cisco ASR 9901 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 • VZ.TPR.9205: Verizon TEEER
ETSI standards	<p>Cisco ASR 9901 is designed to meet (qualification in progress):</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
EMC standards	<p>Cisco ASR 9901 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 • EN 50121-4: Railway EMC
Immunity	<p>Cisco ASR 9901 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

Category	Part Number or Specification
Safety	<p>Cisco ASR 9901 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

Ordering information

The ASR 9901 Compact 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 9901 Router with the Flexible Consumption Model.

Table 3. Ordering information for the ASR 9901 Router with the Flexible Consumption Model

Part number	Feature description
ASR-9901-FC	ASR 9901 456G Flexible Consumption Chassis
A9K-1600W-AC	ASR 9900 Series 1600W AC Power Supply for ASR-9901
A9K-1600W-DC	ASR 9900 Series 1600W DC Power Supply for ASR-9901
ASR-9901-FAN	ASR 9901 Fan Tray
ASR-9901-2P-KIT	ASR 9901 2 Post Mounting Kit for 19 & 23 in Rack
ASR-9901-4P-KIT	ASR 9901 4 Post Mounting Kit for 19 & 23 in Rack
S-A9K-LI-LIC-FC	ASR 9K Smart License Lawful Intercept - Flexible Consumption Model
S-A9K-BNG-8K-FC	ASR 9K FCM Smart License for 8,000 BNG Subscribers
S-A9K-BNG-ADV-FC	ASR 9K FCM Smart License for BNG Advance features
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

Part number	Feature description
ADN-ED-100G-RTU1	Edge Advantage w/ Essentials Software RTU License per 100G
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 hardware ordering information for the ASR 9901 Router with the Traditional Business Model.

Table 4.

Part number	Feature description
ASR-9901	ASR 9901 Chassis
ASR-9901-120G	ASR 9901 Chassis Pay-As-You-Grow 120G Base HW PID
ASR-9901-256G	ASR 9901 Chassis Pay-As-You-Grow Base HW PID
A9K-1600W-AC	ASR 9900 Series 1600W AC Power Supply for ASR-9901
A9K-1600W-DC	ASR 9900 Series 1600W DC Power Supply for ASR-9901
ASR-9901-FAN	ASR 9901 Fan Tray
ASR-9901-2P-KIT	ASR 9901 2 Post Mounting Kit for 19 & 23 in Rack
ASR-9901-4P-KIT	ASR 9901 4 Post Mounting Kit for 19 & 23 in Rack
A9K9901-UP120-256G	ASR 9901 120 - 256 Upgrade License
A9K9901-UP256-456G	ASR 9901 256 - 456 Upgrade License

The ASR 9901 Compact Router supports optional feature licenses to enable features. Table 5 lists the feature licenses.

Table 5. Feature license information for the ASR 9901 Router with the Traditional Business Model

Part number	Feature description
S-A9K-9901-VRF-LC	ASR 9K Smart License I-VRF for 9901 System, up to 8 VRFs
S-A9K-9901-AIP-LC	ASR 9K Smart License L3 VPN for NON PAYG 9901 System
S-A9K-9901-120AIP	ASR 9K Smart License L3 VPN for 120G PAYG 9901 System
S-A9K-9901-256AIP	ASR 9K Smart License L3 VPN for NON PAYG 9901 System
S-A9K-LI-LIC	ASR 9K Smart License Lawful Intercept
S-A9K-MOBILE-LIC	ASR 9K Smart License Advanced Mobile for System
S-A9K-TUNNEL-ENT	ASR 9K Smart License RTU License for Tunnel Protocols
S-A9K-SESSION-128K	ASR 9K Smart License 128000 End User Sessions
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
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 <https://www.cisco.com/go/spservices>.

Document history

Table 6. 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.	Ordering information	July 26,2021
Updated relevant features and technical specifications across document.		

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

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