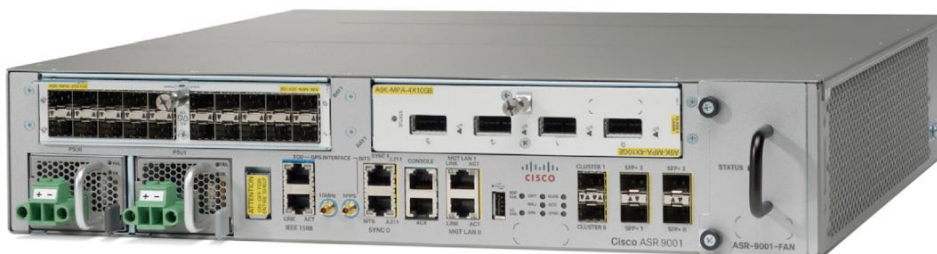# Cisco ASR 9001 Router

Product Overview

Part of the Cisco® ASR 9000 Series, the Cisco ASR 9001 Router (Figure 1) is a compact high-capacity Provider Edge (PE) router that delivers 120 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 9001 Router delivers the features and services found on the ASR 9000 Series platforms, allowing customers to standardize on the same Cisco IOS XR image. The Cisco ASR 9001 Router has an Integrated Route Switch Processor (RSP) and two modular bays that support 1 GE, 10 GE, and 40 GE Modular Port Adapters (MPAs). The base chassis has four integrated 10 GE Enhanced Small Form-Factor Pluggable (SFP+) ports, a GPS input for stratum-1 clocking, Building Integrated Timing Supply (BITS) ports, and management ports.

Figure 1.   Cisco ASR 9001 Router

Cisco ASR 9000 Series Aggregation Services Routers deliver exceptional scale, service flexibility, and high availability to Carrier Ethernet transport networks. The routers are powered by Cisco IOS XR Software, an innovative self-healing, distributed operating system designed for always-on operation. This is the same operating system that powers industry-leading routers such as the Cisco CRS Carrier Routing System, bringing the same reliability, scalability, performance, and comprehensive features that have made the Cisco CRS the dominant entity in the service provider core. Cisco IOS XR Software also allows for an end-to-end IP/MPLS solution to service provider requirements based on the same software, thereby reducing the operational complexity of managing multiple operating systems. The Cisco ASR 9000 Series further enhances the IP Next-Generation Network (IP NGN) Carrier Ethernet design for converged, resilient, intelligent, and scalable transport of consumer, business, wholesale, and mobile services.

Cisco ASR 9000 Series Carrier Ethernet applications include business services such as Layer 2 and Layer 3 VPN (L2VPN and L3VPN), IPTV, Content Delivery Networks (CDNs), 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; IP over dense wavelength-division multiplexing (IPoDWDM), 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).

Note: Site to Site IPSec VPN is not currently supported on the ASR 9001 platform.

The integrated RSP has 8 GB RAM and is capable of holding serveral millions of routes, which makes the Cisco ASR 9001 Router useful as a dedicated route-reflector appliance.

Cisco ONE Software

Cisco ONE™ Software offers a valuable and flexible way to buy software for the WAN, access, and data center domains. At each stage in the product lifecycle, Cisco ONE Software helps make buying, managing, and upgrading your network and infrastructure software easier. Cisco ONE Software provides:

- Flexible licensing models to smoothly distribute customers' software spending over time
- Investment protection for software purchases through software services–enabled license portability
- Access to updates, upgrades, and new technology from Cisco through Cisco® Software Support Services (SWSS)

Cisco ONE for WAN gives organizations broad capabilities for branch offices and the enterprise edge. Cisco ONE Foundation for WAN connects and secures your branch office while optimizing for cost. Cisco ONE WAN Collaboration integrates voice and video into your branch office and network edge.

Features and benefits of the Cisco ASR 9001 Router are listed in Table 1.

Table 1.   Features and Benefits of Cisco ASR 9001 Router

Feature	Benefit
Scalable fabric	Designed to support high 1/10/40 Gigabit densities in a 2RU form factor Provides built-in scalability for investment protection
Integrated port	Four 10 GE services-enabled SFP+ ports
Integrated route processor with 8 GB RAM	Runs Cisco IOS XR, a carrier-class operating system with high memory capacity suitable for a dedicated route-reflector application
Distributed forwarding plane architecture	Allows MPA cards to support independent forwarding for enhanced performance and scale
Control plane extension ports	Two 10 G out-of-band Ethernet communications ports support Network Virtualization (nV) technology for high-availability cluster applications
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
Embedded USB memory (eUSB) port	Provides access to USB flash memory devices for software image loading and recovery
Front-panel LEDs	Provides visual indication of RSP status (active or standby), 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 9001 Router. The system is designed for high performance and high reliability. The Cisco ASR 9001 has an integrated RSP capable of supporting fabric bandwidth up to 120 Gbps.

Table 2.   Specifications for Cisco ASR 9001 Router

Category	Part Number or Specification
Chassis	ASR 9001
Integrated interfaces	4 x 10 GE SFP+
Modular port adapters	20 x 1 GE, 2 x 10 GE, 4 x 10 GE, 1 x 40 GE

Category	Part Number or Specification
Redundancy	Power supply redundancy
Power supply part number	● A9K-750W-AC ● A9K-750W-DC
Physical specifications	● Height: 3.472 inches (88.2 mm) ● Width: 17.42 inches (442 mm) ● Depth: 18.5 inches (470 mm) ● Weight of chassis: 30.2032 lbs (13.7 kg) ● Weight of chassis with two MPAs: 36.37623 lbs (16.5 kg)
Power inputs	● Worldwide ranging AC (90-265V; 50-60 Hz) ● Worldwide ranging DC (-40V to -72V)
Power consumption	425 watts typical, 525 watts maximum
Environmental conditions	● Operating temperature: 32 to 104°F (0 to 40°C) ● Storage temperature: -40 to 167°F (-40 to 75°C) ● Relative humidity: 10 to 90%, 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
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	-1800m
Air flow	Side to side
Compliance	
Network Equipment Building Standards (NEBS)	Cisco ASR 9001 is designed to meet: ● 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	Cisco ASR 9001 is designed to meet (qualification in progress): ● 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 9001 is designed to meet: ● 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

Category	Part Number or Specification
Immunity	Cisco ASR 9001 is 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 ● EN 50121-4: Railway EMC
Safety	Cisco ASR 9001 is 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

Ordering Information

Cisco ONE Software for WAN is available for the ASR 9000 Series

Cisco ONE Software offers a complete solution that delivers an optimal experience over any connection while helping you get the most from your WAN investment with secure, fault-tolerant connectivity.

Benefits:

- Connect branch offices and your campus securely at an optimal cost by improving application performance through application protocol acceleration and optimization techniques that offload the WAN.
- Integrate voice and video across branch offices and your campus to increase productivity.

For ordering information for Cisco ONE Software for the ASR 9000 Series, go to https://www.cisco.com/c/en/us/products/software/one-wan/wan-part-numbers.html.

Table 3 provides ordering information for the Cisco ASR 9001 Router.

Table 3.   Ordering Information

Product Description	Supported Software Release	Part Number
ASR 9001 Router with 4 x 10 GE	Cisco IOS XR Software Release 4.2.1 or later	ASR-9001
AC Power Entry module	Cisco IOS XR Software Release 4.2.1 or later	A9K-750W-AC
DC Power Entry module	Cisco IOS XR Software Release 4.2.1 or later	A9K-750W-DC
20 x 1 GE Modular Port Adapter	Cisco IOS XR Software Release 4.2.1 or later	A9K-MPA-20x1GE
2 x 10 GE Modular Port Adapter	Cisco IOS XR Software Release 4.2.1 or later	A9K-MPA-2x10GE
4 x 10 GE Modular Port Adapter	Cisco IOS XR Software Release 4.2.1 or later	A9K-MPA-4x10GE
1 x 40 GE Modular Port Adapter	Cisco IOS XR Software Release 4.2.3 or later	A9K-MPA-1x40GE