Cisco ASR 9900 Series Route Processor 3

Contents

The Cisco® ASR 9900 Route Processor 3 (ASR 9900 RP3) is the next-generation system processor for the Cisco ASR 9912 Router and ASR 9922 Router, supporting high-density 100 and 400 Gigabit Ethernet line cards and provides backward compatibility with the Cisco ASR 9000 Series third generation family of line cards. The Cisco ASR 9900 RP3 system architecture is designed to accommodate new programmable deployment models and convergence of Layer 2 and Layer 3 services, as required by today's wireline, Data-Center-Interconnect (DCI), and mobile aggregation applications.

The ASR 9900 RP3 brings the time-tested and robust carrier-class capabilities of Cisco IOS® XR Software to the Carrier Ethernet edge. The operating system supports true software process modularity, and it allows each process to run in separate protected memory, including each routing protocol, along with multiple instances of control, data, and management planes supported. The software also supports distributed route processing.

Figure 1.
Cisco ASR 9900 Route Processor 3 – SE

Figure 2.
Cisco ASR 9900 Route Processor 3 – TR

The Cisco ASR 9900 RP3 is designed to deliver the high scalability, performance, and fast convergence required for today's and tomorrow's demanding video, cloud, and mobile services. These features provide exceptional scale, service flexibility, and high availability:

- Switch fabric architecture along with Cisco ASR 9900 Fabric Cards:
  - Distributed switch fabric architecture
  - Control of up to seven Cisco ASR 9900 Switch Fabric Cards to provide scalability and high availability on Cisco ASR 9922 Router and ASR 9912 Router chassis
  - Multistage low-latency nonblocking architecture
  - Service intelligence and traffic prioritization
- Superior network timing capabilities with support for:
  - Global Positioning System (GPS) via Time of Day (ToD), 10-MHz and 1-PPS interfaces
  - Centralized Building Integrated Timing Supply (BITS)
  - Precision Time Protocol (PTP), or IEEE 1588-2008, through dedicated 10-Mbps and 100-Mbps Ethernet port
  - Bidirectional Time of Day (ToD) with 10-MHz and 1-pps interface

Route-Processor types

The Cisco ASR 9900 Route Processor is available in service-edge-optimized and packet-transport-optimized models. The service-edge-optimized version offers higher amount of memory that is essential for large-scale comprehensive service deployment. Both versions of the route processor support service-optimized, as well as transport-optimized, line cards. Different line cards can be mixed on the same chassis for greater flexibility.

Features and benefits of the ASR 9900 RP3 are listed in Table 1.

Table 1. Features and Benefits of ASR 9900 RP3 in XR 6.5.15 or Later

Feature	Benefit
Highly scalable fabric	• Designed to support high 1-, 10-, 25- 40- 100- and 400-Gbps port densities • Provides built-in scalability for investment protection
Control of up to seven switch fabric cards	Offers traffic load balancing simultaneously across up to seven fabrics
Distributed-forwarding-plane architecture	Allows line cards to support independent forwarding for enhanced performance and scale
Memoryless switch fabric	Provides transparent nonblocking, low-latency packet forwarding
Virtual output queuing and arbitration	• Offers service intelligence with prioritization of traffic (unicast and multicast) • Provides efficient congestion-management mechanism and avoids problems related to head-of-line blocking
Centralized arbiter	Uses an efficient credit mechanism to help ensure transparent switchover with zero packet loss
IEEE 1588 support	Delivers timing services over the packet network efficiently and reliably
Two independent clock source connections: BITS and Synchronization Supply Unit (SSU) DTI	Offers redundant, centralized network synchronization support
Two 128-GB Solid-State Drives (SSDs)	Allows storing of core dumps and helps reduce the system Mean Time To Repair (MTTR)
Embedded Universal Series Bus (eUSB) memory port	Provides access to onboard Universal Serial Bus (USB) flash-memory devices for software image storing and upgrades
Front-panel external USB 2.0 port	Provides access to USB flash-memory devices for quick software image loading and recovery
Front-panel LEDs	Provides visual indication of route-processor status (active or standby), power management, and activity on SSD
Management ports	Provides easy access to system console
Processor	8 cores, 2 GHz

Table 2 lists all the hardware available for the ASR 9900 RP3.

Table 2. ASR 9900 RP3 Hardware

Product number	Product description
A99-RP3-TR	ASR 9900 Route Processor 3 for Packet Transport
A99-RP3-SE	ASR 9900 Route Processor 3 for Service Edge

Table 3 lists the technical specifications for the ASR 9900 RP3.

Table 3. Technical Specifications for ASR 9900 RP3 Hardware

Technical specifications
Internal Memory
• Control of up to seven Cisco ASR 9900 switch fabric cards • ASR 9900 Route Processor 3 for Packet Transport 24GB (product number: A99-RP3-TR): 24GB Error-Correcting Code (ECC)-protected DRAM • ASR 9900 Route Processor 3 for Packet Transport 16GB (product number: A99-RP3-TR): 16GB ECC-protected DRAM. Field upgradable option to 24GB • ASR 9900 Route Processor 3 for Service Edge 40GB (product number: A99-RP3-SE): 40GB ECC-protected DRAM • Solid-state disk: Two 128GB SSDs • 8GB embedded USB • USB 2.0 Type A receptacle
Timing System
• Timing: Two independent clock-source connections • IEEE 1588 support: Copper 10-Mbps and 100-Mbps RJ-45 Ethernet port
GPS
• ToD (RS-422 and RS-232) • 1-pps RS-422 or 1.0/2.3 50-ohm RF connector • 10-MHz in/out 1.0/2.3 50-ohm RF connector
Management
• Two 100/1000BASE-T (RJ-45) LAN management ports • One console port • One auxiliary port
Alarms
• Alarm outputs: Critical alarm (CR), Major alarm (MJ), and Minor alarm (MN)