

Cisco ASR 1000 Series Aggregation Services Router Route Processor

Product Overview

The Cisco® ASR 1000 Series Route Processor 1 (RP1) addresses the route-processing requirements of carrier-grade IP and Multiprotocol Label Switching (MPLS) packet infrastructures. Not only does it provide advanced routing capabilities, but it also monitors and manages the other components in the Cisco ASR 1000 Series Aggregation Services Router. The first-generation Cisco ASR 1000 (see Figure 1) Series Route Processor (part number ASR1000-RP1) offers additional embedded features:

- Integrates full range of industry-leading Cisco IOS® Software features and services
- Runs with the modular Cisco IOS XE Software for the Cisco ASR 1000 Series
- Provides optional redundant-processor support and dual Cisco IOS Software support for single route-processor solutions for the industry's most compact, fully redundant, high-availability solution, improving network resiliency, management, and costs
- Provides 40-GB hard disk drive (HDD) for code storage, boot, configuration, logs, etc.
- Provides USB port for 1-GB Compact Flash memory support
- Offers built-in eUSB memory support (1GB on ASR1000-RP1; 8 GB on the built-in RP1 on the Cisco ASR 1002 Router (partitioned: 1 GB for bootflash; 7 GB for mass storage)
- Offers field-replaceable and hot-swappable capabilities to help ensure minimal service disruption
- Offers Stratum-3 clock circuitry and input ports
- Offers memory scalability up to 4 GB DRAM

Features and Benefits

Figure 1. Cisco ASR-1000 Series Route Processor 1 (RP1)



Because of the advanced capabilities in the Cisco ASR 1000 Series Route Processor 1 (RP1), many additional features are performed in line with routing, including:

- Building and distributing forwarding information to the Cisco ASR 1000 Series Embedded Services Processor (ESP)
- Implementing session border controller (SBC) setup and teardown and applying per-session policies for voice and video streams
- Offering a portal for stateful firewall policy configuration and distribution to the ESP forwarding engine
- Negotiating and maintaining IP Security (IPsec) authentication, encryption methods, and encryption keys (Internet Key Exchange [IKE])

As the management processor for the Cisco ASR 1000 Series Router, the Cisco ASR 1000 Series Route Processor 1 (RP1) automatically performs the following system management functions:

- Loads the operating system software system images to all installed line cards upon powering up or through operator commands
- Synchronizes the dynamic state conditions for the redundant Cisco IOS[®] XE Operating System, the route processor, and embedded services processor components
- Performs high-availability failover for redundant solutions
- Provides out-of-band system console and auxiliary ports, a USB, and an Ethernet port for router configuration and maintenance
- Allows direct system access through the operating-system kernel if catastrophic Cisco IOS Software failure occurs
- Monitors and manages the power and temperature of system components such as line cards, power supplies, and fans

Table 1 gives features and benefits of the Cisco ASR 1000 Series Router Processor 1 (RP1).

Table 1. Features and Benefits of Cisco ASR 1000 Series Router Processor 1 (RP1)

Feature	Benefit
Support for Cisco IOS XE Software	<ul style="list-style-type: none"> • Supports a breadth of IP network services, including quality of service (QoS), MPLS, Layer 2 virtual private network (L2VPN), Layer 3 virtual private network (L3VPN), and IPv6 • Uses the field-proven Cisco IOS Software for all IP network services
High Availability	<ul style="list-style-type: none"> • Provides optional redundant-processor support and dual Cisco IOS Software support for single route-processor solutions for a highly compact, fully redundant, high-availability solution, improving network resiliency, management, and costs
Stratum-3 clock circuitry and BITS input ports	<ul style="list-style-type: none"> • Facilitates support of clocking for synchronous services such as SONET and SDH
Memory scalability of up to 4 GB	<ul style="list-style-type: none"> • Allows pay-as-you-grow scalability so memory can increase as more users or features are added; the scalability offered through memory upgrades includes: <ul style="list-style-type: none"> ◦ Routing-table growth ◦ Additional MPLS VPN routing and forwarding instances ◦ Feature additions such as SBC and broadband aggregation (BBA)
Hard-drive support	<ul style="list-style-type: none"> • Allows for greater storage area for code storage, boot, configurations, billing, logs, etc.
USB Compact Flash support	<ul style="list-style-type: none"> • (USB ports) Allow for easier manageability for code storage, boot, configurations, logs, etc.
Modularity	<ul style="list-style-type: none"> • Offers maximum investment protection and flexibility by allowing customers to upgrade to future Cisco ASR 1000 Series Route Processors • Note: Cisco ASR1002 Routers (part numbers ASR1002) have an integrated Route Processor RP1 built into the chassis which is not upgradeable.

Product Architecture

High Availability

The Cisco ASR 1000 Series consists of three different routers: the Cisco ASR 1002 router, the Cisco ASR 1004 router, and the Cisco ASR 1006 router, which use an innovative and powerful processor: the Cisco QuantumFlow Processor. The Cisco ASR 1006 router is a 12-slot, 6-rack-unit (RU), hardware-redundant (2 ESP and 2 route-processor slots) chassis, the Cisco ASR 1004 router is an 8-slot, 4RU chassis with one embedded services processor and one route-processor slot, and the Cisco ASR 1002 is a 3-slot, 2RU chassis that has the route processor and Cisco ASR 1000 Series Shared Port Adapter Interface Processor Card and 4 Gigabit Ethernet ports built in and comes with one embedded services-processor slot.

The Cisco ASR 1006 Router supports fully redundant route processors that allow for full route-processor hardware redundancy, In Service Software Upgrade (ISSU), Nonstop Forwarding (NSF), and future route-processor service upgrades.

For single-route-processor Cisco ASR 1000 platforms, the Cisco ASR 1002 and ASR 1004, the route processor has a dual Cisco IOS Software option that allows these routers to use the Cisco industry-leading high-availability features, Cisco IOS Software redundancy, ISSU, and NSF. These features require the first-generation Cisco ASR 1000 Series Route Processor to have 4 GB of DRAM memory.

LAN Ports

The first-generation Cisco ASR 1000 Series Route Processor 1 (RP1) has a single copper (RJ-45) 10/100 management Ethernet port.

SDRAM

The first-generation Cisco ASR 1000 Series Route Processor 1 (RP1) can support either 2 GB or 4 GB of synchronous dynamic RAM (SDRAM). Because the card holds 2 SDRAM slots, a route processor with 2 GB can hold two 1-GB dual in-line memory modules (DIMMs), whereas a route processor with 4 GB can hold two 2-GB DIMMs.

Hard Disk Drive

The first-generation Cisco ASR 1000 Series Route Processor 1 (RP1) has a 40-GB hard disk drive (HDD) for the storage and portability of code storage, boot, configurations, logs, etc.

USB Port

The first-generation Cisco ASR 1000 Series Route Processor 1 (RP1), part number ASR-1000-RP1, has a built-in USB port to support 1-GB USB Compact Flash memory for the storage and portability of code storage, boot, configurations, logs, etc.

Console and Auxiliary Ports

The first-generation Cisco ASR 1000 Series Route Processor 1 (RP1) has built-in console and auxiliary ports.

Product Specifications

Table 2 gives specifications of the Cisco ASR 1000 Series Route Processor 1 (RP1).

Table 2. Product Specifications

Item	Details
Chassis Support	Cisco ASR 1004 and ASR 1006 chassis (Note: The Cisco ASR 1002 chassis comes with the Cisco ASR 1000 Series Route Processor 1 (RP1) built to the chassis.)
Software Compatibility	Cisco IOS XE Operating System, which is based on Cisco IOS Software Release 12.2SR (Please consult your Cisco account representative for additional details.)
Software Protocols	Refer to Cisco IOS 12.2SR protocol support
Connectivity	<ul style="list-style-type: none"> • Console port (RJ-45 connector) • Auxiliary port (RJ-45 connector) • 10/100 Ethernet port (RJ-45 connector) • Two RJ-48 connectors for BITS input clocks
Memory Options	<ul style="list-style-type: none"> • Two 1-GB Double Data Rate 2 (DDR2) mini-DIMMs • Two 2-GB DDR2 mini-DIMMs • Memory is upgradeable from 2-GB to 4-GB DRAM
Storage Options	<ul style="list-style-type: none"> • 40-GB HDD • 1-GB USB Compact Flash memory
Performance	<ul style="list-style-type: none"> • Scalability to 1,000,000 IPv4 or 250,000 IPv6 routes
Reliability and Availability	<ul style="list-style-type: none"> • 1 + 1 redundancy in dual-route-processor configuration • Support for online insertion and removal (OIR) • Support for NSF and Stateful Switchover (SSO) • Support for ISSU
MIBs	<ul style="list-style-type: none"> • RFC 2737 compliant
Network Management	<ul style="list-style-type: none"> • Telnet and Secure Shell (SSH) Protocol (command-line interface [CLI]) • Console port (through the CLI) • Simple Network Management Protocol (SNMP) • (RFC 2665)
LEDs	<ul style="list-style-type: none"> • PWR – Power Green – All power rails are within specifications • STAT – Status Green – Cisco IOS Software has booted Yellow – BootROM has successfully loaded Red – System failure or during boot process • ACTV– Active Green – Active route processor • STBY – Standby Yellow – Standby route processor • CRIT – Critical Red – Critical alarm or during boot process • MAJ – Major Red – Major alarm • MIN – Minor Amber – Minor alarm • LINK – Management Ethernet link status Solid green – Link with no activity FLASH green – Link with activity Off – No link • DISK0 – Internal Compact Flash FLASH Green – Activity indicator Off – No activity • DISK1 – External Compact Flash FLASH green – Activity indicator Off – No activity • DISK2 – Internal HDD FLASH green – Activity indicator Off – No activity • CARRIER – BITS interface Off – Out of service Green – In frame and in service Amber – Fault or loop condition
Physical Dimensions (H x W x D)	0.92 x 16.7 x 14.19 in. (0.02 x 0.428 x 0.36m)
Weight	5.0 lb (2.3 kg)

Item	Details
Approvals and Compliance	<p>Safety</p> <ul style="list-style-type: none"> • UL60950-1 & CAN/CSA-C22.2 No. 60950-1-03 Information technology equipment • AS/NZS 60950-1 • IEC/EN 60950-1 Information technology equipment • 73/23/EEC <p>Electromagnetic Emissions Certification</p> <ul style="list-style-type: none"> • AS/NZ 3548: 1995 (including AMD I + II) Class B • EN55022: 1998 Class B • CISPR 22: 1997 • EN55022: 1994 (including AMD I + II) • 47 CFR Part 15: 2000 (FCC) Class B • VCCI V-3/01.4 Class 2 • CNS-13438: 1997 Class B • GR1089: 1997 (including Rev. 1: 1999) <p>Immunity</p> <ul style="list-style-type: none"> • EN300386: 2000-TNE EMC requirements; product family standard; high priority of service; central office and noncentral office locations • EN50082-1: 1992/1997 • EN50082-2: 1995-Generic Immunity Standard, Heavy Industrial • CISPR24: 1997 • EN55024: 1998-Generic ITE immunity standard • EN61000-4-2: 1995 + AMD I + II ESD, Level 4/8 kV contact, 15 kV air • IEC-1000-4-3: 1995 + AMD 1-Radiated Immunity, 10 V/m • IEC-1000-4-4: 1995-Electrical Fast Transients, Level 4/4 kV/B • IEC-1000-4-5: 1995 + AMD 1-DC Surge-Class 3; AC Surge-Class 4 • EN61000-4-6: 1996 + AMD 1-RF conducted immunity, 10 Vrms • EN61000-4-11: 1995-Voltage Dips and Sags • ETS300 132-2: 1996 + corrigendum, December 1996 • GR1089:1997 (including Rev1: 1999) <p>Network Equipment Building Standards</p> <p>The module meets the following Networking Equipment Building Standards (NEBS):</p> <ul style="list-style-type: none"> • GR-1089-CORE • GR-63-CORE <p>European Telecommunication Standards Institute (ETSI)</p> <ul style="list-style-type: none"> • ETSI 300 386-1—Levels for equipment with a "high priority of service" that is installed in "locations other than telecommunication centers" • ETSI 300 386-2:1997—Levels for equipment with a "high priority of service" that is installed in "locations other than telecommunication centers" • ETSI 300 132-2: December 1994—Power supply interfaces at the input to telecommunications equipment Sections 4.8 and 4.9
Environmental	<ul style="list-style-type: none"> • Storage temperature: –38 to 150°F (–40 to 70°C) • Operating temperature, nominal: 41 to 104°F (5 to 40°C) • Operating temperature, short-term: 23 to 131°F (–5 to 55°C) • Storage relative humidity: 5 to 95% relative humidity (RH) • Operating humidity, nominal: 5 to 85% RH • Operating humidity, short-term: 5 to 90% RH • Operating altitude: –60 to 4000m (up to 2000m conforms to IEC/EN/UL/CSA 60950 requirements)

System Requirements

Table 3 gives specifications of the Cisco ASR 1000 Series Route Processor 1 (RP1). For ordering information, see Table 4.

Table 3. System Requirements

Item	Details
Hardware	<ul style="list-style-type: none"> Cisco ASR 1000 Series Router chassis with at least one instance of Cisco ASR 1000 Series Route Processor 1 (RP1) and one instance of Cisco ASR 1000 Series Shared Port Adapter Interface Processor (ASR1000-SIP1)
Memory	<ul style="list-style-type: none"> 2 GB (default for Cisco ASR 1000 Series Route Processor 1 [RP1]) 4 GB (maximum for Cisco ASR 1000 Series Route Processor 1 [RP1]) Note: You can upgrade the memory from 2 GB to 4 GB at the time of order or in the field.
Minimum Software Release	Cisco IOS XE Operating System Release 2

Table 4. Ordering Information

Product Name	Part Number
Cisco ASR1000 Route Processor 1, 2GB DRAM	ASR1000-RP1
Cisco ASR 1000 RP1 Memory	
Cisco ASR1000 RP1 2GB DRAM	M-ASR1K-RP1-2GB
Cisco ASR1000 RP1 2GB DRAM, spare	M-ASR1K-RP1-2GB=
Cisco ASR1000 RP1 4GB DRAM	M-ASR1K-RP1-4GB
Cisco ASR1000 RP1 4GB DRAM, spare	M-ASR1K-RP1-4GB=
Cisco ASR1000 RP1 40GB HDD	M-ASR1K-HDD-40GB
Cisco ASR1000 RP1 40GB HDD, spare	M-ASR1K-HDD-40GB=
1GB USB Flash Token for Cisco ASR 1000 Series	MEMUSB-1024FT
1GB USB Flash Token for Cisco ASR 1000 Series, spare	MEMUSB-1024FT =
Compatible Hardware	
Cisco ASR 1000 Series Router chassis (4RU or 6RU)	ASR1004 or ASR1006
Cisco ASR-1000 Embedded Services Processor 10Gbps	ASR1000-ESP10
Cisco ASR-1000 SPA Interface Processor 10	ASR1000-SIP1
Compatible Software	
Cisco ASR 1000 1 (RP1) IP Base w/o crypto	SASR1R1-IPB
Cisco ASR 1000 1 (RP1) IP Base	SASR1R1-IPBK9
Cisco ASR 1000 1 (RP1) Advanced IP Services	SASR1R1-AISK9
Cisco ASR 1000 1 (RP1) Advanced Enterprise Services	SASR1R1-AESK9

Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, refer to [Cisco Technical Support Services](#) or [Cisco Advanced Services](#).

For More Information

For more information about the Cisco ASR 1000 Series, visit <http://www.cisco.com/go/asr1000> or contact your local Cisco account representative.



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

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

CCDF, CCENT, Cisco Eos, Cisco StadiumVision, the Cisco logo, DCE, and Welcome to the Human Network are trademarks. Changing the Way We Work, Live, Play, and Learn is a service mark and Access Registrar, Altnet, AsyncOS, Bringing the Meeting To You, Catalyst, CCBA, CDDP, CCSE, CCSP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, Enterprise/Solera, EtherChannel, EtherFast, EtherSwitch, Event Center, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, IQ Experience, the IQ logo, IQ Net, Readiness Scorecard, iQuickStudy, IronPort, the IronPort logo, LightStream, Linksys, MediaTone, MeetingPlace, MBX, NetScouters, Networking Academy, Network Registrar, PCNow, PIX, PowerPanels, ProConnect, ScriptShare, SenderBase, SNAF Filnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TransPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (080239)