Cisco ASR 1000 Series Route Processors

Advanced routing services combined with component monitoring and management come in both modular and fixed form factors.
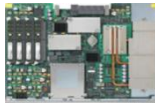
Product Overview

The Cisco® ASR 1000 Series Route Processors address the stringent route-processing requirements of carrier-grade IP and Multiprotocol Label Switching (MPLS) packet network infrastructures. They are the central control processors that run the network operating system, provide advanced routing capabilities, and also monitor and manage the other components of the Cisco ASR 1000 Series Aggregation Services Router.

Cisco ASR 1000 Series Route Processors fall into two main categories:

- **Modular Cisco ASR 1000 Series Route Processors for modular chassis,** including the ASR 1004, ASR 1006, ASR 1006-X, ASR 1009-X and ASR 1013 models. These are the Cisco ASR 1000 Series Route Processor 1 (RP1; part number ASR1000-RP1), Cisco ASR 1000 Series Route Processor 2 (RP2; part number ASR1000-RP2), and Cisco ASR 1000 Series Route Processor 3 (RP3; part number ASR1000-RP3)
- **Fixed or built-in Cisco ASR 1000 Series Route Processors for fixed chassis,** including the ASR 1001, ASR 1001-X, ASR 1002, ASR 1002-F, and ASR 1002-X models. ASR 1002 and ASR 1002-F contain an embedded RP1 (part number ASR1000-RP1).

Table 1 lists the characteristics and chassis support of Cisco ASR 1000 Series RP1, RP2, and RP3.

Table 1. ASR 1000 Series Route Processors

	Modular Route Processors		
	RP1	**RP2**	**RP3**
Chassis support	ASR1004 ASR1006	ASR1004, ASR1006, ASR1006-X, ASR1009-X, and ASR1013	ASR1006-X ASR1009-X ASR1013
Cisco IOS® XE operating system	32 bit	64 bit	64 bit
CPU	General-purpose CPU based on 1.5-GHz processor	Dual-core processor, 2.66 GHz	Quad-core processor, 2.2 GHz
Memory	4 GB	8 GB (default) 16 GB	8 GB (default) 16 GB 32 GB 64 GB
Built-in eUSB/eMMC bootflash	1 GB (8 GB on ASR 1002)	2 GB	8 GB
Storage	40 GB HDD and external USB	80 GB HDD and external USB	100 GB SSD (default) 200 GB SSD 400 GB SSD External USB

Features and Benefits

Cisco ASR 1000 Series Route Processors offer the following embedded features:

- Full range of industry-leading Cisco IOS XE Software features and services
- Optional redundant-processor and dual Cisco IOS XE Software support for single-route-processor solutions to improve network resiliency
- Hard disk drive (HDD) or solid state drive (SSD) for code storage, boot, configuration, logs, and so on (HDD or SSD are optional on Cisco ASR 1001, 1001-X, 1001-HX, 1002-X, and 1002-HX)
- USB ports for 1-GB compact flash memory support
- Built-in embedded flash memory (eUSB or eMMC) support:
  - 1 GB on RP1; 8 GB on the built-in RP1 on the ASR 1002 router partitioned: 1 GB for bootflash; 7 GB for mass storage
  - 2 GB on RP2; 8 GB on RP3
  - 8 GB on the built-in route processor on the Cisco ASR 1001, 1001-X and 1002-X, partitioned: 1 GB for bootflash; 7 GB for mass storage
- Field-replaceable and hot-swappable capabilities with modular route processors for minimal service disruption
- Stratum-3 clock circuitry, building integrated timing supply (BITS) input and output (BITS output available on ASR1000-RP2 and on the chassis of ASR1002-X that has a built-in RP)
- Memory scalability up to 4 GB DRAM on the RP1; up to 16 GB DRAM on the RP2, ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-X, and ASR 1002-HX; up to 64 GB DRAM on the RP3

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[1]) authentication, encryption methods, and encryption keys (Internet Key Exchange [IKE])

As the management processor for the Cisco ASR 1000 Series Router, the RPs automatically perform the following system management functions:

- Load the operating system software images to all installed line cards upon powering up or through operator commands
- Synchronize the dynamic state conditions for the redundant Cisco IOS XE Software, the route processor, and ESP components
- Perform high-availability failover for redundant solutions
- Provide out-of-band system console and auxiliary ports, USB, and Ethernet ports for router configuration and maintenance

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[1] This product includes software developed by Cavium Networks.

- Allow direct system access through the operating-system kernel if catastrophic Cisco IOS Software failure occurs
- Monitor and manage the power and temperature of system components such as line cards, power supplies, and fans

Table 2 describes features and benefits of the Cisco ASR 1000 Series RP1, RP2, RP3, and built-in RP of the ASR 1001, 1001-X, 1002, 1002-F, and1002-X.

Table 2. Route Processor Features, Benefits, Descriptions

Feature	Description
Support for Cisco IOS XE Software	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), Application Visibility and Control, Performance Routing (PfR), AppNav infrastructure, Data Center Interconnect, Crypto and IPv6
High availability	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
Stratum-3 clock circuitry and BITS input ports	Facilitates support of clocking for synchronous services such as SONET and SDH. BITS input ports are available on RP1, RP2 and ASR1002-X only.
Memory scalability of up to 16 GB; up to 64 GB for RP3	Allows pay-as-you-grow scalability so memory can increase as you add more users or features; the scalability offered through memory upgrades includes: • Routing-table growth • Additional MPLS VPN routing and forwarding instances • Feature additions such as SBC and broadband aggregation (BBA)
Solid state drive support	Allows for greater storage area for code storage, boot, configurations, billing, logs, etc.
USB compact flash support	Allows for easier manageability for code storage, boot, configurations, logs, etc.
Modularity	Offers maximum investment protection and flexibility by allowing customers to upgrade to future Cisco ASR 1000 Series Route Processors **Note**: Cisco ASR 1002,and ASR1002-F have an integrated RP1 built into the chassis that is not upgradable. **Note**: Cisco ASR 1001, ASR 1001-X, and ASR 1002-X (part numbers ASR 1001, ASR 1001-X, ASR 1002-X) have an integrated RP2 built in to the chassis that is not upgradable.

Architecture

All platforms use an innovative and powerful processor: the Cisco QuantumFlow Processor (QFP). The QFP combines a high-performance forwarding engine with the service flexibility of the general-purpose processor. It is the industry's first fully integrated and programmable flow processor designed to unify massive parallel processing, integrated quality of service (QoS), and advanced memory management while offering integral service delivery and programmability.

The Cisco ASR 1000 Series consists of:

- ASR 1001 (end of sale)
- ASR 1001-X
- ASR 1001-HX
- ASR 1002 (end of sale)
- ASR 1002-X
- ASR 1002-HX
- ASR 1004
- ASR 1006
- ASR 1006-X

- ASR 1009-X
- ASR 1013

The Cisco ASR 1001, 1001-X, 1002 Fixed (1002-F), 1002, and 1002-X have integrated route processors. The ASR 1004 has a single slot for one route processor. 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, Integrated Software Service Upgrade (ISSU), and Nonstop Forwarding (NSF). These features require the Cisco ASR 1000 Series RP1 to have 4 GB of DRAM memory. The Cisco ASR 1000 Series RP2 and RP3 support Cisco IOS Software redundancy, ISSU, and NSF with its default memory of 8 GB of DRAM. The built-in route processor of the Cisco ASR 1001, 1001-X, and 1002-X supports Cisco IOS Software redundancy and NSF with 4 GB of DRAM default memory on the ASR 1001 and 1002-X and 8 GB of DRAM default on the ASR 1001-X.

The Cisco ASR 1006, 1006-X, 1009-X, and 1013 routers support fully redundant route processors that allow for full route-processor hardware redundancy, ISSU, NSF, and route-processor service upgrades.

Table 3 specifies some of the architectural aspects of the ASR 1000 Series Route Processors.

Table 3.   Architectural Specifications

Item	Details
LAN ports	The Cisco ASR 1000 Series RP1, RP2, and RP3 have a single copper (RJ-45) 10/100/1000 management Ethernet port.
	For ASR 1001, 1001-X, 1001-HX, 1002, 1002-F, 1002-X, and 1002-HX, the single copper (RJ-45) 10/100/1000 management Ethernet ports are built into the chassis.
SDRAM	The Cisco ASR 1000 Series RP1 can support either 2 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.
	The Cisco ASR 1000 Series RP2 can support either 8 or 16 GB of SDRAM. Because the card holds 4 SDRAM slots, a route processor with 8 GB can hold four 2-GB DIMMs, whereas a route processor with 16 GB can hold four 4-GB DIMMs.
	The Cisco ASR 1000 Series RP3 can support either 8, 16, 32, or 64 GB of SDRAM.
	The Cisco ASR 1001 and 1002-X built-in route processors support 4, 8, or 16 GB of SDRAM. The Cisco ASR 1001-X built-in route processor supports either 8 GB or 16 GB of SDRAM.
Hard disk drive (HDD)	The Cisco ASR 1000 Series RP1 and RP2 have a HDD for code storage, system configurations, and log files. The RP1 provides a 40-GB HDD mounted on the board itself. The RP1 HDD is field-replaceable, but not hot-swappable. The RP2 provides an 80-GB HDD that is front-mounted, field-replaceable, and hot-swappable. The RP3 provides a 100-GB SSD by default, which is upgradable to 200-GB or 400-GB. The Cisco ASR 1001, 1001-X, 1002, 1002-F, and 1002-X support built-in embedded USB (eUSB) 8 GB memory for code storage, system configurations, and log files. The ASR 1001-X supports an optional solid state drive, and the ASR 1002-X supports an optional HDD for additional code storage, system configurations, and log files.
Solid state drive (SSD)	The Cisco ASR 1001-X supports an optional SSD for additional code storage, system configurations, and log files.
USB port	One USB port is provided on the Cisco ASR 1000 Series RP1, and 2 ports are provided on the RP2 and RP3. All three route processors support 1-GB USB compact flash memory for the storage and portability of operating system software, system configurations, and log files.
Console and auxiliary ports	The Cisco ASR 1000 Series RP1, RP2, and RP3have built-in console and auxiliary ports. The ASR 1001, 1001-X, 1002, 1002-F, and 1002-X have built-in console and auxiliary ports on their respective chassis.

General Product Specifications

Tables 4, 5, and 6 provide specifications for the Cisco ASR 1000 Series RP1, RP2, and RP3, respectively. Tables 7 and 8 provide specifications for the Cisco ASR 1001 and ASR 1001-X integrated route processors, respectively, and Table 9 provides Cisco ASR 1002-X route processor specifications.

Table 4.   Cisco ASR 1000 Series RP1 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 RP1 built into the chassis.) (**Note**: Cisco ASR 1001, ASR 1001-X, and ASR 1002-X (part numbers ASR1001, ASR1001-X, ASR1002-X) have an integrated Route Processor built in to the chassis that is not upgradable)
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 Software 12.2SR protocol support
Connectivity	● Console port (RJ-45 connector) ● Auxiliary port (RJ-45 connector) ● 10/100/1000 Ethernet port (RJ-45 connector) ● Two RJ-48 connectors for BITS input clocks
Memory options	● Two 1-GB Double Data Rate 2 (DDR2) mini-DIMMs ● Two 2-GB DDR2 mini-DIMMs ● Upgradable memory from 2-GB to 4-GB DRAM
Storage options	● 40-GB HDD (RP1 only) ● 1-GB USB Compact Flash memory
Performance	● Scalability up to 1,000,000 IPv4 routes or 500,000 IPv6 routes ● BGP RR Scalability up to 5,000,000 IPv4 routes or 3,000,000 IPv6 routes
Reliability and availability	● 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	● RFC 2737 compliant
Network management	● Telnet and Secure Shell (SSH) Protocol (command-line interface [CLI]) ● Console port (through the CLI) ● Simple Network Management Protocol (SNMP) ● RFC 2665

LEDs	● 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

Item	Details
	• 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)
Approvals and compliance	**Safety** • UL60950-1 and 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 **Electromagnetic Emissions Certification** • 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) **Immunity** • 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) **Network Equipment Building Standards** The module meets the following Networking Equipment Building Standards (NEBS): • GR-1089-CORE • GR-63-CORE **European Telecommunication Standards Institute (ETSI)** • 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

Item	Details
Environmental	● 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)

Table 5. Cisco ASR 1000 Series RP2 Product Specifications

Item	Details
Chassis support	Cisco ASR 1004, ASR 1006, ASR 1006-X, ASR 1009-X and ASR 1013 chassis (**Note**: The Cisco ASR 1002 and ASR 1002 Fixed chassis come with the Cisco ASR 1000 Series RP1 built into the chassis.) (**Note**: Cisco ASR 1001, ASR 1001-X, and ASR 1002-X (part numbers ASR1001, ASR1001-X, ASR1002-X) have an integrated Route Processor built in to the chassis that is not upgradable)
Software compatibility	Cisco IOS XE Software, 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 Software 12.2SR protocol support
Connectivity	● Console port (RJ-45 connector) ● Auxiliary port (RJ-45 connector) ● 10/100/1000 Ethernet port (RJ-45 connector) ● RJ-48 connector for BITS input clock and output source
Memory options	● Four 2-GB DDR2 mini-DIMMs ● Four 4 GB DDR2 mini-DIMMs ● Upgradable memory from 8-GB to 16-GB DRAM
Storage options	● 80-GB HDD (hot-swappable) ● 1-GB USB Compact Flash memory
Performance	**With 8-GB memory:** ● Up to 1,000,000 IPv4 routes or 1,000,000 IPv6 routes ● BGP RR Scalability up to 8,000,000 IPv4 routes or 6,000,000 IPv6 routes **With 16-GB memory:** ● Up to 4,000,000 IPv4 routes or 4,000,000 IPv6 routes ● BGP RR Scalability up to 24,000,000 IPv4 routes or 17,000,000 IPv6 routes
Reliability and availability	● 1 + 1 redundancy in dual-route-processor configuration ● Support for OIR ● Support for NSF and SSO ● Support for ISSU
MIBs	● RFC 2737 compliant
Network management	● Telnet and SSH (CLI) ● Console port (through the CLI) ● SNMP ● RFC 2665

LEDs	● 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

Item	Details
	• CRIT - Critical Alarm Red - Critical alarm or during boot process • MAJ - Major Alarm Red - Major alarm • MIN - Minor Alarm Amber - Minor alarm • HD - Internal HDD FLASH Green - Activity indicator Off - No activity • USB - External Compact Flash FLASH green - Activity indicator • BF - Boot Flash (Internal) FLASH green - Activity indicator Off - No activity • CARRIER BITS I/F Mode Off - Out of service or not configured Green - Normal or Bridging Amber - Fast • DTI Mode Off - Warm-up, free-run, or holdover Green - In service or working properly Amber - Fault or loop condition • LINK - Management Ethernet link status Solid green - Link with no activity FLASH green - Link with activity Off - No link • 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)
Approvals and compliance	**Safety** • UL60950-1 and 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 **Electromagnetic Emissions Certification** • CFR 47 Part 15: (FCC) Class A • ICES 003 Class A • AS/NZ CISPR 22: Class A • CISPR 22 (EN55022) Class A • VCCI Class A • KN22 • IEC/EN 61000-3-2 (or 3-12 as applicable): AC Power Line Harmonics • IEC/EN 61000-3-3 (or 3-11 as applicable): AC Voltage Fluctuations and Flicker **Immunity** • IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV Contact, 15-kV Air) • IEC/EN-61000-4-3: Radiated Immunity (10 V/m) • IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2-kV Power, 1-kV Signal) • IEC/EN-61000-4-5: Surge AC Port (4-kV CM, 2-kV DM) • IEC/EN-61000-4-5: Surge Signal Ports (1-kV indoor, 2-kV outdoor) • IEC/EN-61000-4-5: Surge DC Port 1-kV

Item	Details
	● IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms)
	● IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m)
	● IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations
	Network Equipment Building Standards
	The module meets the following NEBS:
	● GR-1089-CORE
	● GR-63-CORE
	ETSI and EN Standards
	● EN300 386: Telecommunications Network Equipment (EMC), OTC
	● EN55022: Information Technology Equipment (Emissions)
	● EN55024: Information Technology Equipment (Immunity)
	● EN50082-1/EN-61000-6-1: 1995-Generic Immunity Standard
Environmental	● 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% 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)

Table 6.   Cisco ASR 1000 Series RP3 Product Specifications

Chassis support	Cisco ASR 1006-X, 1009-X, and 1013 chassis
Software compatibility	Minimum Cisco IOS XE 16.3.1 Software
	(Please consult your Cisco account representative for additional details.)
Software protocols	Refer to Cisco IOS XE 16.3.1 and later versions for protocol support
Connectivity	● Console port (RJ-45 connector)
	● Auxiliary port (RJ-45 connector)
	● 10/100/1000 Ethernet port (RJ-45 connector)
	● RJ-48 connector for BITS input clock and output source
Memory options	● 8-GB memory default; upgradable to 16-GB, 32-GB, or 64-GB memory
Storage options	● 100-GB SSD (hot-swappable); upgradable to 200-GB or 400-GB SSD
	● 1-GB USB compact flash memory
Performance	**With 8-GB memory:**
	● Up to 1,000,000 IPv4 routes or 1,000,000 IPv6 routes
	● BGP RR scalability up to 8,000,000 IPv4 routes or 6,000,000 IPv6 routes
	With 16-GB memory:
	● Up to 4,000,000 IPv4 routes or 4,000,000 IPv6 routes
	● BGP RR scalability up to 24,000,000 IPv4 routes or 17,000,000 IPv6 routes
	With 32-GB memory:
	● Up to 8,500,000 IPv4 routes or 7,500,000 IPv6 routes
	● BGP RR scalability up to 24,000,000 IPv4 routes or 17,000,000 IPv6 routes
Reliability and availability	● 1 + 1 redundancy in dual-route-processor configuration
	● Support for OIR
	● Support for NSF and SSO
	● Support for ISSU
MIBs	● RFC 2737 compliant
Network management	● Telnet and SSH (CLI)
	● Console port (through the CLI)
	● SNMP
	● RFC 2665
LEDs	● 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 alarm
	Red - Critical alarm or during boot process
	● MAJ - Major alarm
	Red - Major alarm
	● MIN - Minor alarm
	Amber - Minor alarm
	● HD - Internal HDD
	FLASH Green - Activity indicator
	Off - No activity
	● USB - External compact flash
	FLASH green - Activity indicator
	● BF - Boot flash (Internal)
	FLASH green - Activity indicator
	Off - No activity
	● CARRIER
	BITS I/F Mode
	Off - Out of service or not configured
	Green - Normal or bridging
	Amber - Fast
	● DTI Mode
	Off - Warm-up, free-run, or holdover
	Green - In service or working properly
	Amber - Fault or loop condition
	● LINK - Management Ethernet link status
	Solid green - Link with no activity
	FLASH green - Link with activity
	Off - No link
	● 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	7 lb (3.2 kg)
Approvals and compliance	**Safety**
	● UL60950-1 and 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
	Electromagnetic Emissions Certification
	● CFR 47 Part 15: (FCC) Class A
	● ICES 003 Class A
	● AS/NZ CISPR 22: Class A

	● CISPR 22 (EN55022) Class A ● VCCI Class A ● KN22 ● IEC/EN 61000-3-2 (or 3-12 as applicable): AC Power Line Harmonics ● IEC/EN 61000-3-3 (or 3-11 as applicable): AC Voltage Fluctuations and Flicker **Immunity** ● IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV Contact, 15-kV Air) ● IEC/EN-61000-4-3: Radiated Immunity (10 V/m) ● IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2-kV Power, 1-kV Signal) ● IEC/EN-61000-4-5: Surge AC Port (4-kV CM, 2-kV DM) ● IEC/EN-61000-4-5: Surge Signal Ports (1-kV indoor, 2-kV outdoor) ● IEC/EN-61000-4-5: Surge DC Port 1-kV ● IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms) ● IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m) ● IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations **Network Equipment Building Standards** The module meets the following NEBS: ● GR-1089-CORE ● GR-63-CORE **ETSI and EN Standards** ● EN300 386: Telecommunications Network Equipment (EMC), OTC ● EN55022: Information Technology Equipment (Emissions) ● EN55024: Information Technology Equipment (Immunity) ● EN50082-1/EN-61000-6-1: 1995-Generic Immunity Standard
Environmental	● 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% 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)

Table 7.   Cisco ASR 1001 Integrated Route Processor Product Specifications

Item	Details
Chassis support	Cisco ASR 1001 chassis
Software compatibility	Cisco IOS XE Software Release 3.2.0S and later versions
Software protocols	Refer to Cisco IOS XE 3.2.0S and later versions for protocol support
Connectivity	Not applicable - route processor is integrated inside the chassis
Memory options	● Cisco ASR 1001 ships with 4-GB memory by default. It can be upgraded to 8- or 16-GB memory ● Cisco ASR 1001 has 4 DRAM memory slots, which can take either 2- or 4-GB DRAM each ● When shipped with 4-GB DRAM (M-ASR1K-1001-4 GB), 2 slots are filled with 2 GB each ● When shipped with 8-GB DRAM (M-ASR1K-1001-8 GB), 4 slots are filled with 2 GB each ● When shipped with 16-GB DRAM (M-ASR1K-1001-16 GB), 4 slots are filled with 4 GB each
Storage options	● 8-GB eUSB is partitioned as two 32-MB of memory for nonvolatile RAM (NVRAM) and the rest for mass storage ● The Cisco ASR 1001-HDD model includes 160-GB HDD for storage
Performance	**With 4-GB memory:** ● Up to 500,000 IPv4 or 500,000 IPv6 routes **With 8-GB or 16-GB memory:** ● Up to 1,000,000 IPv4 or 1,000,000 IPv6 routes ● BGP RR Scalability up to 5,250,000 IPv4 or 4,250,000 IPv6 routes - 8 GB Memory ● BGP RR Scalability up to 11,500,000 IPv4 or 10,000,000 IPv6 routes - 16 GB Memory
Reliability and availability	● No route-processor hardware redundancy

Item	Details
	● Software redundancy available (requires software redundancy license and 8-GB memory)
MIBs	● RFC 2737 compliant
Network management	● Telnet and SSH Protocol (CLI) ● Console port (through the CLI) ● SNMP ● RFC 2665
LEDs	● 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 Alarm Red - Critical alarm or during boot process ● MAJ - Major Alarm Red - Major alarm ● MIN - Minor Alarm Amber - Minor alarm ● HD - Internal HDD FLASH Green - Activity indicator Off - No activity ● USB - External Compact Flash FLASH green - Activity indicator ● BF - Boot Flash (Internal) FLASH green - Activity indicator Off - No activity ● CARRIER BITS I/F Mode Off- Out of service or not configured Green - Normal or Bridging Amber - Fast ● DTI Mode Off- Warm-up, free-run, or holdover Green - In service or working properly Amber - Fault or loop condition ● LINK - Management Ethernet link status Solid green - Link with no activity FLASH green - Link with activity Off - No link ● 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
Approvals and compliance	**Safety** ● UL60950-1 and 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 **Electromagnetic Emissions Certification** ● CFR 47 Part 15: (FCC) Class A ● ICES 003 Class A ● AS/NZ CISPR 22: Class A ● CISPR 22 (EN55022) Class A ● VCCI Class A

Item	Details
	● KN22
	● IEC/EN 61000-3-2 (or 3-12 as applicable): AC Power Line Harmonics
	● IEC/EN 61000-3-3 (or 3-11 as applicable): AC Voltage Fluctuations and Flicker
	Immunity
	● IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV Contact, 15-kV Air)
	● IEC/EN-61000-4-3: Radiated Immunity (10 V/m)
	● IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2-kV Power, 1-kV Signal)
	● IEC/EN-61000-4-5: Surge AC Port (4-kV CM, 2-kV DM)
	● IEC/EN-61000-4-5: Surge Signal Ports (1-kV indoor, 2-kV outdoor)
	● IEC/EN-61000-4-5: Surge DC Port 1-kV
	● IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms)
	● IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m)
	● IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations
	ETSI and EN Standards
	● EN300 386: Telecommunications Network Equipment (EMC), OTC
	● EN55022: Information Technology Equipment (Emissions)
	● EN55024: Information Technology Equipment (Immunity)
	● EN50082-1/EN-61000-6-1: 1995-Generic Immunity Standard
Environmental	● 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% 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)

Table 8. Cisco ASR 1001-X Integrated Route Processor Product Specifications

Chassis support	Cisco ASR 1001-X chassis
Software compatibility	Cisco IOS XE Software Release 3.12.0S and later versions
Software protocols	Refer to Cisco IOS XE 3.12.0S and later versions for protocol support
Connectivity	Not applicable - route processor is integrated inside the chassis
Memory options	● Cisco ASR 1001-X ships with 8-GB memory by default. It can be upgraded 16-GB memory
	● Cisco ASR 1001-X has 2 DRAM memory slots, which can take either 4- or 8-GB DRAM each
	● When shipped with 8-GB DRAM (M-ASR1001X-8 GB), 2 slots are filled with 4 GB each
	● When shipped with 16-GB DRAM (M-ASR1001X-16 GB), 2 slots are filled with 8 GB each
Storage options	● 8-GB eUSB is partitioned as two 32-MB of memory for nonvolatile RAM (NVRAM) and the rest for mass storage
	● The Cisco ASR 1001-XI includes an optional SSD-SATA-200G, SSD-SATA-400G for storage
Performance	**With 8-GB or 16-GB memory:**
	● Up to 1,000,000 IPv4 or 1,000,000 IPv6 routes - 8 GB Memory
	● Up to 3,500,000 IPv4 or 3,000,000 IPv6 routes - 16 GB Memory
	● BGP RR Scalability up to 5,250,000 IPv4 or 4,250,000 IPv6 routes - 8 GB Memory
	● BGP RR Scalability up to 11,500,000 IPv4 or 10,000,000 IPv6 routes - 16 GB Memory
Reliability and availability	● No route-processor hardware redundancy
	● Software redundancy available (requires software redundancy license and 8-GB memory)
MIBs	● RFC 2737 compliant
Network management	● Telnet and SSH Protocol (CLI)
	● Console port (through the CLI)
	● SNMP
	● RFC 2665
LEDs	● 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 Alarm Red - Critical alarm or during boot process
	● MAJ - Major Alarm Red - Major alarm
	● MIN - Minor Alarm Amber - Minor alarm
	● HD - Internal HDD FLASH Green - Activity indicator Off - No activity
	● USB - External Compact Flash FLASH green - Activity indicator
	● BF - Boot Flash (Internal) FLASH green - Activity indicator Off - No activity
	● CARRIER BITS I/F Mode Off- Out of service or not configured Green - Normal or Bridging Amber - Fast
	● DTI Mode Off- Warm-up, free-run, or holdover Green - In service or working properly Amber - Fault or loop condition
	● LINK - Management Ethernet link status Solid green - Link with no activity FLASH green - Link with activity Off - No link
	● 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
Approvals and compliance	**Safety** ● UL60950-1 and 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 **Electromagnetic Emissions Certification** ● CFR 47 Part 15: (FCC) Class A ● ICES 003 Class A ● AS/NZ CISPR 22: Class A ● CISPR 22 (EN55022) Class A ● VCCI Class A ● KN22 ● IEC/EN 61000-3-2 (or 3-12 as applicable): AC Power Line Harmonics ● IEC/EN 61000-3-3 (or 3-11 as applicable): AC Voltage Fluctuations and Flicker **Immunity** ● IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV Contact, 15-kV Air) ● IEC/EN-61000-4-3: Radiated Immunity (10 V/m) ● IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2-kV Power, 1-kV Signal) ● IEC/EN-61000-4-5: Surge AC Port (4-kV CM, 2-kV DM)

Environmental	● IEC/EN-61000-4-5: Surge Signal Ports (1-kV indoor, 2-kV outdoor) ● IEC/EN-61000-4-5: Surge DC Port 1-kV ● IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms) ● IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m) ● IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations **ETSI and EN Standards** ● EN300 386: Telecommunications Network Equipment (EMC), OTC ● EN55022: Information Technology Equipment (Emissions) ● EN55024: Information Technology Equipment (Immunity) ● EN50082-1/EN-61000-6-1: 1995-Generic Immunity Standard ● Storage temperature: -38 to 150°F (-40 to 70°C) ● Operating temperature, nominal: 32 to 104°F (0 to 40°C) ● Operating temperature, short-term: 32 to 131°F (0 to 55°C) ● Storage relative humidity: 5 to 95% RH ● Operating humidity, nominal: 10 to 90% RH ● Operating humidity, short-term: 5 to 95% RH ● Operating altitude: -60 to 4000m (up to 2000m conforms to IEC/EN/UL/CSA 60950 requirements)

Table 9. Cisco ASR 1002-X Integrated Route Processor Product Specifications

Chassis support	Cisco ASR 1002-X chassis
Software compatibility	Cisco IOS XE Software Release 3.7.0S and later versions
Software protocols	Refer to Cisco IOS XE 3.7.0S and later versions for protocol support
Connectivity	Not applicable - route processor is integrated inside the chassis
Memory options	● Cisco ASR 1002-X ships with 4-GB memory by default. It can be upgraded to 8- or 16-GB memory ● Cisco ASR 1002-X has 4 DRAM memory slots, which can take either 2- or 4-GB DRAM each ● When shipped with 4-GB DRAM (M-ASR1002X-4 GB), 2 slots are filled with 2 GB each ● When shipped with 8-GB DRAM (M-ASR1002X-8 GB), 4 slots are filled with 2 GB each ● When shipped with 16-GB DRAM (M-ASR1002X-16 GB), 4 slots are filled with 4 GB each
Storage options	● 8-GB eUSB memory is partitioned as two 32-MB of memory for NVRAM and the rest for mass storage ● The Cisco ASR 1002-X has an optional 160-GB HDD for storage
Performance	**With 4-GB memory:** ● Up to 500,000 IPv4 or 500,000 IPv6 routes **With 8-GB or 16-GB memory:** ● Up to 1,000,000 IPv4 or 1,000,000 IPv6 routes - 8 GB Memory ● Up to 3,500,000 IPv4 or 3,000,000 IPv6 routes - 16 GB Memory ● BGP RR Scalability up to 5,250,000 IPv4 or 4,250,000 IPv6 routes - 8 GB Memory ● BGP RR Scalability up to 11,500,000 IPv4 or 10,000,000 IPv6 routes - 16 GB Memory
Reliability and availability	● No route-processor hardware redundancy ● Software redundancy available (requires software redundancy license and 8-GB memory)
MIBs	● RFC 2737 compliant
Network management	● Telnet and SSH Protocol (CLI) ● Console port (through the CLI) ● SNMP ● RFC 2665
LEDs	● 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 ● CRIT - Critical Alarm Red - Critical alarm or during boot process

	- MAJ - Major Alarm Red - Major alarm - MIN - Minor Alarm Amber - Minor alarm - LINK - Management Ethernet link status Solid green - Link with no activity FLASH green - Link with activity Off - No link - BOOT FLASH Green - Activity indicator Off - No activity - BITS Off- Out of service or not configured Green - In frame and In service Amber - Fault condition - HDD FLASH green - Activity indicator - GPS Off- Port not connected Green - In service or working properly Amber - Fault condition
Approvals and compliance	**Safety** - UL60950-1 and 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 **Electromagnetic Emissions Certification** - CFR 47 Part 15: (FCC) Class A - ICES 003 Class A - AS/NZ CISPR 22: Class A - CISPR 22 (EN55022) Class A - VCCI Class A - KN22 - IEC/EN 61000-3-2 (or 3-12 as applicable): AC Power Line Harmonics - IEC/EN 61000-3-3 (or 3-11 as applicable): AC Voltage Fluctuations and Flicker **Immunity** - IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV Contact, 15-kV Air) - IEC/EN-61000-4-3: Radiated Immunity (10 V/m) - IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2-kV Power, 1-kV Signal) - IEC/EN-61000-4-5: Surge AC Port (4-kV CM, 2-kV DM) - IEC/EN-61000-4-5: Surge Signal Ports (1-kV indoor, 2-kV outdoor) - IEC/EN-61000-4-5: Surge DC Port 1-kV - IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms) - IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m) - IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations **Network Equipment Building Standards** The module meets the following NEBS: - GR-1089-CORE - GR-63-CORE **ETSI and EN Standards** - EN300 386: Telecommunications Network Equipment (EMC), OTC - EN55022: Information Technology Equipment (Emissions) - EN55024: Information Technology Equipment (Immunity) - EN50082-1/EN-61000-6-1: 1995-Generic Immunity Standard
Environmental	- 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)

[*] Route-reflector numbers were tested with the BGP selective download feature for IPv4 and IPv6 for dedicated RR application. This feature prevents IPv4 and IPv6 BGP routes from being installed in the Routing Information Base (RIB) and Forwarding Information Base (FIB). It reduces memory usage per IPv4 and IPv6 prefix and CPU usage.

System Requirements

Table 10 specifies the system requirements of the Cisco ASR 1000 Series RP1, RP2, and RP3. For ordering information, refer to Table 11.

Table 10.   Cisco ASR 1000 Series RP1, RP2, and RP3 System Requirements

Hardware	Cisco ASR 1000 Series RP1 ● Cisco ASR 1004 and 1006 Cisco ASR 1000 Series RP2 ● Cisco ASR 1004, 1006, 1006-X, 1009-X, and 1013 Cisco ASR 1000 Series RP3 ● Cisco ASR 1006-X, 1009-X, and 1013
Memory	Cisco ASR 1000 Series RP1 ● 4 GB (default for RP1) Cisco ASR 1000 Series RP2 ● 8 GB (default for RP2) ● 16 GB (maximum RP2) **Note:** Memory is field-upgradable from 8 to 16 GB. Cisco ASR 1000 Series RP3 ● 8 GB (default for RP3) ● 16 GB ● 32 GB ● 64 GB (maximum for RP3) **Note:** Memory is field-upgradable from 8 to 64 GB.
Minimum software release	Cisco ASR 1000 Series RP1 ● Cisco IOS XE Software Release 2.1.0 Cisco ASR 1000 Series RP2 ● Cisco IOS XE Software Release 2.3.0 Cisco ASR 1000 Series RP3 ● Cisco IOS XE Software Release 16.3.1

Table 11.   Ordering Information

Cisco ASR 1000 Series Route Processor 1	
ASR1000-RP1	Cisco ASR1000 Series Route Processor 1
ASR1000-RP1=	Cisco ASR1000 Series Route Processor 1, Spare
Cisco ASR 1000 Series Route Processor 2	
ASR1000-RP2	Cisco ASR1000 Series Route Processor 2
ASR1000-RP2=	Cisco ASR1000 Series Route Processor 2, Spare
Cisco ASR 1000 Series Route Processor 3	
ASR1000-RP3	Cisco ASR1000 Series Route Processor 3
ASR1000-RP3=	Cisco ASR1000 Series Route Processor 3, Spare
ASR1000-RP3-32G-2P	Cisco ASR1000 Series RP3 w/ 32 GB, 2 Pack
ASR1000-RP3-64G-2P	Cisco ASR1000 Series RP3 w/ 64 GB, 2 Pack

Cisco ASR 1000 RP1 Memory	
M-ASR1K-RP1-4GB	Cisco ASR1000 Series RP1 4 GB DRAM
M-ASR1K-RP1-4GB=	Cisco ASR1000 Series RP1 4 GB DRAM, Spare
M-ASR1K-HDD-40GB	Cisco ASR1000 Series RP1 40 GB HDD
M-ASR1K-HDD-40GB=	Cisco ASR1000 RP1 40 GB HDD, Spare
Cisco ASR 1000 RP2 Memory	
M-ASR1K-RP2-8GB	Cisco ASR1000 Series RP2 8 GB DRAM
M-ASR1K-RP2-8GB=	Cisco ASR1000 Series RP2 8 GB DRAM, Spare
M-ASR1K-RP2-16GB	Cisco ASR1000 Series RP2 16 GB DRAM
M-ASR1K-RP2-16GB=	Cisco ASR1000 Series RP2 16 GB DRAM, Spare
M-ASR1K-HDD-80GB	Cisco ASR1000 Series RP2 80 GB HDD
M-ASR1K-HDD-80GB=	Cisco ASR1000 Series RP2 80 GB HDD, spare
M-ASR1K-EUSB-2GB=	Cisco ASR1000 Series RP2 2 GB EUSB+ FLASH, Spare
Cisco ASR 1000 RP3 Memory	
M-ASR1K-RP3-8GB	Cisco ASR1000 Series RP3 8 GB DRAM
M-ASR1K-RP3-8GB=	Cisco ASR1000 Series RP3 8 GB DRAM, Spare
M-ASR1K-RP3-16GB	Cisco ASR1000 Series RP3 8 GB DRAM
M-ASR1K-RP3-16GB=	Cisco ASR1000 Series RP3 8 GB DRAM, Spare
M-ASR1K-RP3-32GB	Cisco ASR1000 Series RP3 8 GB DRAM
M-ASR1K-RP3-32GB=	Cisco ASR1000 Series RP3 8 GB DRAM, Spare
M-ASR1K-RP3-64GB	Cisco ASR1000 Series RP3 8 GB DRAM
M-ASR1K-RP3-64GB=	Cisco ASR1000 Series RP3 8 GB DRAM, Spare
M-ASR1K-SSD-100GB	Cisco ASR1000 Series RP3 100 GB SSD
M-ASR1K-SSD-100GB=	Cisco ASR1000 Series RP3 100 GB SSD, Spare
M-ASR1K-SSD-200GB	Cisco ASR1000 Series RP3 200 GB SSD
M-ASR1K-SSD-200GB=	Cisco ASR1000 Series RP3 200 GB SSD, Spare
M-ASR1K-SSD-400GB	Cisco ASR1000 Series RP3 400 GB SSD
M-ASR1K-SSD-400GB=	Cisco ASR1000 Series RP3 400 GB SSD, Spare
Cisco ASR 1000 Series USB Flash Memory Options	
MEMUSB-1024FT	1 GB USB Flash Token for Cisco ASR 1000 Series
MEMUSB-1024FT=	1 GB USB Flash Token for Cisco ASR 1000 Series, Spare

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For More Information

For more information about the Cisco ASR 1000 Series RP1, RP2, and RP3, and the ASR 1000 Series, visit http://www.cisco.com/go/asr1000 or contact your local Cisco account representative.