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 RPs 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 Route Processor 1 (RP1; part number ASR1000-RP1) and the second-generation Cisco ASR 1000 Series Route Processor 2 (RP2; part number ASR1000-RP2).

- **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 RP1 and RP2.

**Table 1. ASR 1000 Route Processors**

<table>
<thead>
<tr>
<th>Chassis Support</th>
<th>Integrated Route Processors</th>
<th>Modular Route Processors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Integrated in ASR1001 chassis</td>
<td>Integrated in ASR1001-X chassis</td>
</tr>
<tr>
<td>Cisco IOS XE</td>
<td>64 bit</td>
<td>64 bit</td>
</tr>
<tr>
<td>Operating System</td>
<td>Dual core, 2.2GHz</td>
<td>Quad-Core 2.0GHz Processor</td>
</tr>
<tr>
<td>CPU</td>
<td>8 GB (4x1 GB)</td>
<td>8 GB default (4x2 GB)</td>
</tr>
<tr>
<td>Memory</td>
<td>16 GB (4x4 GB)</td>
<td>16 GB maximum (4x4 GB)</td>
</tr>
<tr>
<td>Built-In eUSB Bootflash</td>
<td>8 GB</td>
<td>8 GB</td>
</tr>
<tr>
<td>Storage</td>
<td>External USB</td>
<td>SSD (200G or 400G)</td>
</tr>
</tbody>
</table>
Features and Benefits

Cisco ASR 1000 Route Processors offer the following embedded features:

- Full range of industry-leading Cisco IOS® Software features and services
- Modular Cisco IOS XE Software support
- Optional redundant-processor and dual Cisco IOS Software support for single-RP solutions to improve network resiliency
- Hard disk drive (HDD), flash drive, and an optional solid state drive (SSD) on ASR1001-X for code storage, boot, configuration, logs, and so on
- USB ports for 1 GB compact flash memory support
- Built-in embedded USB (eUSB) memory support:
  - 1 GB 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
  - 8 GB on the built-in RP on the Cisco ASR 1001, ASR1001-X and ASR 1002-X, partitioned: 1 GB for bootflash; 7 GB for mass storage
- Field-replaceable and hot-swappable capabilities with modular RPs 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 Cisco ASR 1000 Series RP1, 16-GB DRAM on the Cisco ASR 1000 Series RP 2, and 16 GB DRAM on the Cisco ASR 1001, ASR1001-X, and ASR 1002-X

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

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, and built-in RP of ASR 1001, ASR1001-X, ASR1002, ASR1002-F and ASR 1002-X

Table 2. Route Processor Features, Benefits, Descriptions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for Cisco IOS XE Software</td>
<td>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</td>
</tr>
<tr>
<td>High availability</td>
<td>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</td>
</tr>
<tr>
<td>Stratum-3 clock circuitry and BITS input ports</td>
<td>Facilitates support of clocking for synchronous services such as SONET and SDH. BITS input ports are available on RP1, RP2 and ASR1002-X only.</td>
</tr>
</tbody>
</table>
| Memory scalability of up to 16 GB | 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, ASR1002-F and ASR 1002-X Fixed Routers (part numbers ASR 1002, ASR 1002-F, and ASR 1002-X, respectively) 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](https://www.cisco.com/c/en/us/products/switches/routers/asa-5500-series/index.html) (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 nine different routers:

- ASR 1001
- ASR 1001-X
- ASR 1002
- ASR 1002-X
- ASR 1004
- ASR 1006
- ASR 1006-X
- ASR 1009-X
- ASR 1013
The Cisco ASR 1001, ASR 1001-X, ASR 1002 Fixed (ASR 1002-F), ASR 1002, and ASR1002-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 supports Cisco IOS Software redundancy, ISSU, and NSF with its default memory of 8 GB of DRAM. The built-in RP of Cisco ASR 1001, ASR1001-X, and ASR1002-X supports Cisco IOS Software redundancy, and NSF with 4 GB of DRAM default memory on ASR 1001, ASR 1002-X and 8-GB of DRAM default on ASR1001-X.

The Cisco ASR 1006, ASR 1006-X, ASR 1009-X and ASR 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 Route Processors.

### Table 3.  Architectural Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN Ports</td>
<td>Both the Cisco ASR 1000 Series RP1 and Cisco ASR 1000 Series RP2 have a single copper (RJ-45) 10/100/1000 management Ethernet port.</td>
</tr>
<tr>
<td></td>
<td>For ASR 1001, ASR 1001-X, ASR1002, ASR1002-F and ASR 1002-X, single copper (RJ45) 10/100/1000 managementEthernet ports are built in to the chassis.</td>
</tr>
<tr>
<td>SDRAM</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>The Cisco ASR 1001 and ASR1002-X built-in Route Processors support either 4 or 8 or 16 GB of SDRAM. Cisco ASR 1001-X built-in Route processor support either 8 or 16G of SDRAM.</td>
</tr>
<tr>
<td>Hard Disk Drive</td>
<td>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 Cisco ASR 1000 Series RP2 provides an 80-GB HDD that is front-mounted, field-replaceable, and hot-swappable. The Cisco ASR1001, ASR 1001-X, ASR1002, ASR1002-F, ASR1002-X supports built-in embedded USB (eUSB) 8G memory for code storage, system configurations, and log files. The Cisco ASR1001-X supports an optional Solid State Drive and Cisco ASR1002-X supports an optional hard disk drive for additional code storage, system configurations, and log files.</td>
</tr>
<tr>
<td>Solid State Drive</td>
<td>The Cisco ASR1001-X supports an optional Solid State Drive for additional code storage, system configurations, and log files.</td>
</tr>
<tr>
<td>USB Port</td>
<td>One USB port is provided on the Cisco ASR 1000 Series RP1, and 2 ports are provided on the Cisco ASR 1000 Series RP2. Both route processors support 1-GB USB Compact Flash memory for the storage and portability of operating system software, system configurations, and log files.</td>
</tr>
<tr>
<td>Console and Auxiliary Ports</td>
<td>The Cisco ASR 1000 Series RP1 and RP2 have built-in console and auxiliary ports. CiscoASR1001, ASR1001-X, ASR 1002, ASR 1002-F and ASR1002-X have built-in console and auxiliary ports on their respective chassis.</td>
</tr>
</tbody>
</table>

### General Product Specifications

Tables 4 and 5 provide specifications of the Cisco ASR 1000 Series RP1 and RP2, respectively. Tables 6 and 7 provide specifications of the Cisco ASR 1001 and ASR 1001-X integrated Route Processors, respectively, and table 8 provides Cisco ASR 1002-X RP specifications.

### Table 4.  Cisco ASR 1000 Series RP1 Product Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis support</td>
<td>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.)</td>
</tr>
<tr>
<td></td>
<td>(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)</td>
</tr>
<tr>
<td>Software compatibility</td>
<td>Cisco IOS XE Operating System, which is based on Cisco IOS Software Release 12.2SR (Please consult your Cisco account representative for additional details.)</td>
</tr>
<tr>
<td>Item</td>
<td>Details</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Software protocols</strong></td>
<td>Refer to Cisco IOS Software 12.2SR protocol support</td>
</tr>
</tbody>
</table>
| **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  
                              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 |
<p>| <strong>Physical dimensions</strong>    | (H x W x D) 0.92 x 16.7 x 14.19 in. (0.02 x 0.428 x 0.36m) |
| <strong>Weight</strong>                | 5.0 lb (2.3 kg) |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
</table>
| 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)  
  ● 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  
  ● 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  
  ● 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  
| 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
</table>
| 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) |
<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software compatibility</td>
<td>Cisco IOS XE Software, which is based on Cisco IOS Software Release 12.2SR (Please consult your Cisco account representative for additional details.)</td>
</tr>
<tr>
<td>Software protocols</td>
<td>Refer to Cisco IOS Software 12.2SR protocol support</td>
</tr>
</tbody>
</table>
| 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  
Yellow - BootROM has successfully loaded  
Red - System failure or during boot process  
ACTV - 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  
Off - No activity  
● 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  |
<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINK - Management</td>
<td>Ethernet link status</td>
</tr>
<tr>
<td>LINK - Link with no</td>
<td>activity</td>
</tr>
<tr>
<td>FLASH green - Link</td>
<td>with activity</td>
</tr>
<tr>
<td>Off - No link</td>
<td></td>
</tr>
<tr>
<td>DISK2 - Internal HDD</td>
<td>FLASH green - Activity indicator</td>
</tr>
<tr>
<td>Off - No activity</td>
<td></td>
</tr>
<tr>
<td>CARRIER - BITS</td>
<td>interface</td>
</tr>
<tr>
<td>Off - Out of service</td>
<td></td>
</tr>
<tr>
<td>Green - In frame and</td>
<td>in service</td>
</tr>
<tr>
<td>Amber - Fault or loop</td>
<td>condition</td>
</tr>
</tbody>
</table>

| Physical dimensions   | 0.92 x 16.7 x 14.19 in. (0.02 x 0.428 x 0.36m)                         |
| Weight                | 5.0 lb (2.3 kg)                                                        |

| 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                                                     |
| 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 4000 m (up to 2000m conforms to IEC/EN/UL/CSA 60950 requirements) |
Table 6. Cisco ASR 1001 Integrated Route Processor Product Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis support</td>
<td>Cisco ASR 1001 chassis</td>
</tr>
<tr>
<td>Software compatibility</td>
<td>Cisco IOS XE Software Release 3.2.0S and later versions</td>
</tr>
<tr>
<td>Software protocols</td>
<td>Refer to Cisco IOS XE 3.2.0S and later versions for protocol support</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Not applicable - route processor is integrated inside the chassis</td>
</tr>
<tr>
<td>Memory options</td>
<td>● Cisco ASR 1001 ships with 4-GB memory by default. It can be upgraded to 8- or 16-GB memory.</td>
</tr>
<tr>
<td></td>
<td>● Cisco ASR 1001 has 4 DRAM memory slots, which can take either 2- or 4-GB DRAM each.</td>
</tr>
<tr>
<td></td>
<td>● When shipped with 4-GB DRAM (M-ASR1K-1001-4 GB), 2 slots are filled with 2 GB each.</td>
</tr>
<tr>
<td></td>
<td>● When shipped with 8-GB DRAM (M-ASR1K-1001-8 GB), 4 slots are filled with 2 GB each.</td>
</tr>
<tr>
<td></td>
<td>● When shipped with 16-GB DRAM (M-ASR1K-1001-16 GB), 4 slots are filled with 4 GB each.</td>
</tr>
<tr>
<td>Storage options</td>
<td>● 8-GB eUSB is partitioned as two 32-MB of memory for nonvolatile RAM (NVRAM) and the rest for mass storage.</td>
</tr>
<tr>
<td></td>
<td>● The Cisco ASR 1001-HDD model includes 160-GB HDD for storage.</td>
</tr>
<tr>
<td>Performance</td>
<td><strong>With 4-GB memory:</strong></td>
</tr>
<tr>
<td></td>
<td>● Up to 500,000 IPv4 or 500,000 IPv6 routes</td>
</tr>
<tr>
<td></td>
<td><strong>With 8-GB or 16-GB memory:</strong></td>
</tr>
<tr>
<td></td>
<td>● Up to 1,000,000 IPv4 or 1,000,000 IPv6 routes</td>
</tr>
<tr>
<td></td>
<td>● BGP RR Scalability up to 5,250,000 IPv4 or 4, 250,000 IPv6 routes - 8 GB Memory</td>
</tr>
<tr>
<td></td>
<td>● BGP RR Scalability up to 11,500,000 IPv4 or 10,000,000 IPv6 routes - 16 GB Memory</td>
</tr>
<tr>
<td>Reliability and availability</td>
<td>● No route-processor hardware redundancy</td>
</tr>
<tr>
<td></td>
<td>● Software redundancy available (requires software redundancy license and 8-GB memory)</td>
</tr>
<tr>
<td>MIBs</td>
<td>● RFC 2737 compliant</td>
</tr>
<tr>
<td>Network management</td>
<td>● Telnet and SSH Protocol (CLI)</td>
</tr>
<tr>
<td></td>
<td>● Console port (through the CLI)</td>
</tr>
<tr>
<td></td>
<td>● SNMP</td>
</tr>
<tr>
<td></td>
<td>● RFC 2665</td>
</tr>
<tr>
<td>LEDs</td>
<td>● PWR - Power</td>
</tr>
<tr>
<td></td>
<td>Green - All power rails are within specifications</td>
</tr>
<tr>
<td></td>
<td>● STAT - Status</td>
</tr>
<tr>
<td></td>
<td>Green - Cisco IOS Software has booted</td>
</tr>
<tr>
<td></td>
<td>Yellow - BootROM has successfully loaded</td>
</tr>
<tr>
<td></td>
<td>Red - System failure or during boot process</td>
</tr>
<tr>
<td></td>
<td>● ACTV- Active</td>
</tr>
<tr>
<td></td>
<td>Green - Active route processor</td>
</tr>
<tr>
<td></td>
<td>● STBY - Standby</td>
</tr>
<tr>
<td></td>
<td>Yellow - Standby route processor</td>
</tr>
<tr>
<td></td>
<td>● CRIT - Critical Alarm</td>
</tr>
<tr>
<td></td>
<td>Red - Critical alarm or during boot process</td>
</tr>
<tr>
<td></td>
<td>● MAJ - Major Alarm</td>
</tr>
<tr>
<td></td>
<td>Red - Major alarm</td>
</tr>
<tr>
<td></td>
<td>● MIN - Minor Alarm</td>
</tr>
<tr>
<td></td>
<td>Amber - Minor alarm</td>
</tr>
<tr>
<td></td>
<td>● HD - Internal HDD</td>
</tr>
<tr>
<td></td>
<td>FLASH Green - Activity indicator</td>
</tr>
<tr>
<td></td>
<td>Off - No activity</td>
</tr>
<tr>
<td></td>
<td>● USB - External Compact Flash</td>
</tr>
<tr>
<td></td>
<td>FLASH green - Activity indicator</td>
</tr>
<tr>
<td></td>
<td>● BF - Boot Flash (Internal)</td>
</tr>
<tr>
<td></td>
<td>FLASH green - Activity indicator</td>
</tr>
<tr>
<td></td>
<td>Off - No activity</td>
</tr>
<tr>
<td></td>
<td>● CARRIER BITs I/F Mode</td>
</tr>
<tr>
<td></td>
<td>Off- Out of service or not configured</td>
</tr>
<tr>
<td></td>
<td>Green - Normal or Bridging</td>
</tr>
<tr>
<td></td>
<td>Amber - Fast</td>
</tr>
<tr>
<td>Item</td>
<td>Details</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>● DTI Mode</td>
<td>Off - Warm-up, free-run, or holdover</td>
</tr>
<tr>
<td></td>
<td>Green - In service or working properly</td>
</tr>
<tr>
<td></td>
<td>Amber - Fault or loop condition</td>
</tr>
<tr>
<td>● LINK - Management</td>
<td>Solid green - Link with no activity</td>
</tr>
<tr>
<td></td>
<td>FLASH green - Link with activity</td>
</tr>
<tr>
<td></td>
<td>Off - No link</td>
</tr>
<tr>
<td>● DISK2 - Internal HDD</td>
<td>FLASH green - Activity indicator</td>
</tr>
<tr>
<td></td>
<td>Off - No activity</td>
</tr>
<tr>
<td>● CARRIER - BITS interface</td>
<td>Off - Out of service</td>
</tr>
<tr>
<td></td>
<td>Green - In frame and in service</td>
</tr>
<tr>
<td></td>
<td>Amber - Fault or loop condition</td>
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<tr>
<td>Approvals and compliance</td>
<td>Safety</td>
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<td>UL60950-1 and CAN/CSA-C22.2 No. 60950-1-03 Information technology</td>
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<td>Certification</td>
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<td>CISPR 22 (EN55022) Class A</td>
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<td>VCCI Class A</td>
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<td></td>
<td>KN22</td>
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<td></td>
<td>IEC/EN 61000-3-2 (or 3-12 as applicable): AC Power Line Harmonics</td>
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<td></td>
<td>IEC/EN 61000-3-3 (or 3-11 as applicable): AC Voltage Fluctuations and</td>
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<td>Flicker</td>
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<tr>
<td>Immunity</td>
<td>IEC/EN/61000-4-2: Electrostatic Discharge Immunity (8-kV Contact,</td>
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<td>15-kV Air</td>
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<td>IEC/EN/61000-4-3: Radiated Immunity (10 V/m)</td>
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<td>IEC/EN/61000-4-4: Electrical Fast Transient Immunity (2-kV Power, 1-kV</td>
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<td>Signal</td>
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<td>IEC/EN/61000-4-5: Surge AC Port (4-kV CM, 2-kV DM)</td>
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<td>IEC/EN/61000-4-6: Surge Signal Ports (1-kV indoor, 2-kV outdoor)</td>
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<td>IEC/EN/61000-4-7: Surge DC Port 1-kV</td>
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<td></td>
<td>IEC/EN/61000-4-6: Immunity to Conducted Disturbances (10Vrms)</td>
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<tr>
<td></td>
<td>IEC/EN/61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m)</td>
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<tr>
<td></td>
<td>IEC/EN/61000-4-11: Voltage Dips, Short Interruptions, and Voltage</td>
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<td>Variations</td>
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<td>EN55022: Information Technology Equipment (Emissions)</td>
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<td></td>
<td>EN55024: Information Technology Equipment (Immunity)</td>
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<td></td>
<td>EN50082-1/EN-61000-6-1: 1995-Generic Immunity Standard</td>
</tr>
<tr>
<td>Environmental</td>
<td>Storage temperature: -38 to 150°F (-40 to 70°C)</td>
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<tr>
<td></td>
<td>Operating temperature, nominal: 41 to 104°F (5 to 40°C)</td>
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<tr>
<td></td>
<td>Operating temperature, short-term: 23 to 131°F (-5 to 55°C)</td>
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<tr>
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<td>Storage relative humidity: 5 to 95% RH</td>
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<tr>
<td></td>
<td>Operating humidity, nominal: 5 to 85% RH</td>
</tr>
<tr>
<td></td>
<td>Operating humidity, short-term: 5 to 90% RH</td>
</tr>
<tr>
<td></td>
<td>Operating altitude: -60 to 4000m (up to 2000m conforms to IEC/EN/UL/CSA</td>
</tr>
<tr>
<td></td>
<td>60950 requirements)</td>
</tr>
</tbody>
</table>
Table 7. Cisco ASR 1001-X Integrated Route Processor Product Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis support</td>
<td>Cisco ASR 1001-X chassis</td>
</tr>
<tr>
<td>Software compatibility</td>
<td>Cisco IOS XE Software Release 3.12.0S and later versions</td>
</tr>
<tr>
<td>Software protocols</td>
<td>Refer to Cisco IOS XE 3.12.0S and later versions for protocol support</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Not applicable - route processor is integrated inside the chassis</td>
</tr>
</tbody>
</table>
| 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                                        |
### Item Details

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINK</td>
<td>- Management Ethernet link status</td>
</tr>
<tr>
<td></td>
<td>Solid green - Link with no activity</td>
</tr>
<tr>
<td></td>
<td>FLASH green - Link with activity</td>
</tr>
<tr>
<td></td>
<td>Off - No link</td>
</tr>
<tr>
<td>DISK2</td>
<td>- Internal HDD</td>
</tr>
<tr>
<td></td>
<td>FLASH green - Activity indicator</td>
</tr>
<tr>
<td></td>
<td>Off - No activity</td>
</tr>
<tr>
<td>CARRIER</td>
<td>- BITS interface</td>
</tr>
<tr>
<td></td>
<td>Off - Out of service</td>
</tr>
<tr>
<td></td>
<td>Green - In frame and in service</td>
</tr>
<tr>
<td></td>
<td>Amber - Fault or loop condition</td>
</tr>
</tbody>
</table>

### 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

**ETSI and EN Standards**

- EN300 386: Telecommunications Network Equipment (EMC), OTC
- EN55022: Information Technology Equipment (Emissions)
- EN55024: Information Technology Equipment (Immunity)
- EN60082-1/EN-61000-6-1: 1995-General Immunity Standard

**Environmental**

- 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 8. Cisco ASR 1002-X Integrated Route Processor Product Specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis support</td>
<td>Cisco ASR 1002-X chassis</td>
</tr>
<tr>
<td>Software compatibility</td>
<td>Cisco IOS XE Software Release 3.7.0S and later versions</td>
</tr>
<tr>
<td>Software protocols</td>
<td>Refer to Cisco IOS XE 3.7.0S and later versions for protocol support.</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Not applicable - route processor is integrated inside the chassis</td>
</tr>
<tr>
<td>Item</td>
<td>Details</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Memory options</strong></td>
<td>● Cisco ASR 1002-X ships with 4-GB memory by default. It can be upgraded to 8- or 16-GB memory.</td>
</tr>
<tr>
<td></td>
<td>● Cisco ASR 1002-X has 4 DRAM memory slots, which can take either 2- or 4-GB DRAM each.</td>
</tr>
<tr>
<td></td>
<td>● When shipped with 4-GB DRAM (M-ASR1002X-4 GB), 2 slots are filled with 2 GB each.</td>
</tr>
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<td>● When shipped with 8-GB DRAM (M-ASR1002X-8 GB), 4 slots are filled with 2 GB each.</td>
</tr>
<tr>
<td></td>
<td>● When shipped with 16-GB DRAM (M-ASR1002X-16 GB), 4 slots are filled with 4 GB each.</td>
</tr>
<tr>
<td><strong>Storage options</strong></td>
<td>● 8-GB eUSB memory is partitioned as two 32-MB of memory for NVRAM and the rest for mass storage.</td>
</tr>
<tr>
<td></td>
<td>● The Cisco ASR 1002-X has an optional 160-GB HDD for storage.</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td>With 4-GB memory:</td>
</tr>
<tr>
<td></td>
<td>● Up to 500,000 IPv4 or 500,000 IPv6 routes.</td>
</tr>
<tr>
<td></td>
<td>With 8-GB or 16-GB memory:</td>
</tr>
<tr>
<td></td>
<td>● Up to 1,000,000 IPv4 or 1,000,000 IPv6 routes - 8 GB Memory</td>
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<td>● Up to 3,500,000 IPv4 or 3,000,000 IPv6 routes - 16 GB Memory</td>
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<td>● BGP RR Scalability up to 5,200,000 IPv4 or 4,250,000,000 IPv6 routes - 8 GB Memory</td>
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<tr>
<td></td>
<td>● BGP RR Scalability up to 11,400,000,000 IPv4 or 10,000,000 IPv6 routes - 16 GB Memory</td>
</tr>
<tr>
<td><strong>Reliability and availability</strong></td>
<td>● No route-processor hardware redundancy</td>
</tr>
<tr>
<td></td>
<td>● Software redundancy available (requires software redundancy license and 8-GB memory)</td>
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<tr>
<td><strong>MIBs</strong></td>
<td>● RFC 2737 compliant</td>
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<td>● Telnet and SSH Protocol (CLI)</td>
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<td><strong>LEDs</strong></td>
<td>● PWR - Power</td>
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<td></td>
<td>FLASH green - Link with activity</td>
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<td>Off - No link</td>
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<td>● BOOT</td>
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<td>FLASH Green - Activity indicator</td>
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<td>Off - No activity</td>
</tr>
<tr>
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<td>● BITS</td>
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<tr>
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<td>Off - Out of service or not configured</td>
</tr>
<tr>
<td></td>
<td>Green - In frame and In service</td>
</tr>
<tr>
<td></td>
<td>Amber - Fault condition</td>
</tr>
<tr>
<td></td>
<td>● HDD</td>
</tr>
<tr>
<td></td>
<td>FLASH green - Activity indicator</td>
</tr>
<tr>
<td></td>
<td>● GPS</td>
</tr>
<tr>
<td></td>
<td>Off- Port not connected</td>
</tr>
<tr>
<td></td>
<td>Green - In service or working properly</td>
</tr>
<tr>
<td></td>
<td>Amber - Fault condition</td>
</tr>
<tr>
<td><strong>Approvals and compliance</strong></td>
<td>Safety</td>
</tr>
<tr>
<td></td>
<td>● UL60950-1 and CAN/CSA-C22.2 No. 60950-1-03 Information technology equipment</td>
</tr>
<tr>
<td></td>
<td>● AS/NZS 60950-1</td>
</tr>
<tr>
<td></td>
<td>● IEC/EN 60950-1 Information technology equipment</td>
</tr>
<tr>
<td></td>
<td>● 73/23/EEC</td>
</tr>
<tr>
<td></td>
<td><strong>Electromagnetic Emissions Certification</strong></td>
</tr>
<tr>
<td></td>
<td>● CFR 47 Part 15: (FCC) Class A</td>
</tr>
<tr>
<td></td>
<td>● ICES 003 Class A</td>
</tr>
<tr>
<td></td>
<td>● AS/NZ CISPR 22: Class A</td>
</tr>
<tr>
<td>Item</td>
<td>Details</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>• CISPR 22 (EN55022) Class A</td>
</tr>
<tr>
<td></td>
<td>• VCCI Class A</td>
</tr>
<tr>
<td></td>
<td>• KN22</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN 61000-3-2 (or 3-12 as applicable): AC Power Line Harmonics</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN 61000-3-3 (or 3-11 as applicable): AC Voltage Fluctuations and Flicker</td>
</tr>
<tr>
<td>Immunity</td>
<td>• IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8-kV Contact, 15-kV Air)</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN-61000-4-3: Radiated Immunity (10 V/m)</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2-kV Power, 1-kV Signal)</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN-61000-4-5: Surge AC Port (4-kV CM, 2-kV DM)</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN-61000-4-5: Surge Signal Ports (1-kV indoor, 2-kV outdoor)</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN-61000-4-5: Surge DC Port 1-kV</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10Vrms)</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m)</td>
</tr>
<tr>
<td></td>
<td>• IEC/EN-61000-4-11: Voltage Dips, Short Interruptions, and Voltage Variations</td>
</tr>
<tr>
<td>Network Equipment Building Standards</td>
<td>The module meets the following NEBS:</td>
</tr>
<tr>
<td></td>
<td>• GR-1089-CORE</td>
</tr>
<tr>
<td></td>
<td>• GR-63-CORE</td>
</tr>
<tr>
<td>ETSI and EN Standards</td>
<td>• ENS00 386: Telecommunications Network Equipment (EMC), OTC</td>
</tr>
<tr>
<td></td>
<td>• EN5022: Information Technology Equipment (Emissions)</td>
</tr>
<tr>
<td></td>
<td>• EN5024: Information Technology Equipment (Immunity)</td>
</tr>
<tr>
<td></td>
<td>• EN50082-1/EN-61000-6-1: 1995-Generic Immunity Standard</td>
</tr>
<tr>
<td>Environmental</td>
<td>• Storage temperature: -38 to 150°F (-40 to 70°C)</td>
</tr>
<tr>
<td></td>
<td>• Operating temperature, nominal: 41 to 104°F (5 to 40°C)</td>
</tr>
<tr>
<td></td>
<td>• Operating temperature, short-term: 23 to 131°F (-5 to 55°C)</td>
</tr>
<tr>
<td></td>
<td>• Storage relative humidity: 5 to 95% relative humidity (RH)</td>
</tr>
<tr>
<td></td>
<td>• Operating humidity, nominal: 5 to 85% RH</td>
</tr>
<tr>
<td></td>
<td>• Operating humidity, short-term: 5 to 90% RH</td>
</tr>
<tr>
<td></td>
<td>• Operating altitude: -60 to 4000m (up to 2000m conforms to IEC/EN/UL/CSA 60950 requirements)</td>
</tr>
</tbody>
</table>

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

**Table 9. Cisco RP1 and RP2 System Requirements**

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>• Cisco ASR 1004, Cisco ASR 1006, Cisco ASR 1006-X, Cisco ASR 1009-X and Cisco ASR 1013 Series Router chassis with at least one instance of Cisco ASR 1000 Series Route Processor, one instance of Cisco ASR 1000 Embedded Services Processor, and one instance of Cisco ASR 1000 Series Shared Port Adapter Interface Processor or Ethernet Linecard</td>
</tr>
<tr>
<td>Memory</td>
<td>• Cisco ASR 1000 Series RP1</td>
</tr>
<tr>
<td></td>
<td>• 4 GB (default for Cisco ASR 1000 Series RP1)</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Memory is field-upgradable from 2 to 4 GB.</td>
</tr>
<tr>
<td></td>
<td>• Cisco ASR 1000 Series RP2</td>
</tr>
<tr>
<td></td>
<td>• 8 GB (default for Cisco ASR 1000 Series RP2)</td>
</tr>
<tr>
<td></td>
<td>• 16 GB (maximum for Cisco ASR 1000 Series RP2)</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Memory is field-upgradable from 8 to 16 GB.</td>
</tr>
<tr>
<td>Item</td>
<td>Details</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 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 |

Table 10. Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASR1000-RP1</td>
<td>Cisco ASR1000 Route Processor 1, 4 GB DRAM</td>
</tr>
<tr>
<td>ASR1000-RP1=</td>
<td>Cisco ASR1000 Route Processor 1, 4 GB DRAM Spare</td>
</tr>
<tr>
<td>ASR1000-RP2</td>
<td>Cisco ASR1000 Route Processor 2, 8 GB DRAM</td>
</tr>
<tr>
<td>ASR1000-RP2=</td>
<td>Cisco ASR1000 Route Processor 2, 8 GB DRAM, Spare</td>
</tr>
<tr>
<td>M-ASR1K-RP1-4 GB</td>
<td>Cisco ASR1000 RP1 4 GB DRAM</td>
</tr>
<tr>
<td>M-ASR1K-RP1-4 GB=</td>
<td>Cisco ASR1000 RP1 4 GB DRAM, spare</td>
</tr>
<tr>
<td>M-ASR1K-HDD-40 GB</td>
<td>Cisco ASR1000 RP1 40 GB HDD</td>
</tr>
<tr>
<td>M-ASR1K-HDD-40 GB=</td>
<td>Cisco ASR1000 RP1 40 GB HDD, spare</td>
</tr>
<tr>
<td>M-ASR1K-RP2-8 GB</td>
<td>Cisco ASR1000 RP2 8 GB DRAM</td>
</tr>
<tr>
<td>M-ASR1K-RP2-8 GB=</td>
<td>Cisco ASR1000 RP2 8 GB DRAM, spare</td>
</tr>
<tr>
<td>M-ASR1K-RP2-16 GB</td>
<td>Cisco ASR1000 RP2 16 GB DRAM</td>
</tr>
<tr>
<td>M-ASR1K-RP2-16 GB=</td>
<td>Cisco ASR1000 RP2 16 GB DRAM, spare</td>
</tr>
<tr>
<td>M-ASR1K-HDD-80 GB</td>
<td>Cisco ASR1000 RP2 80 GB HDD, spare</td>
</tr>
<tr>
<td>M-ASR1K-EUSB-2 GB=</td>
<td>Cisco ASR1000 RP2 2 GB EUSB+ FLASH, SPARE</td>
</tr>
<tr>
<td>MEMUSB-1024FT</td>
<td>1 GB USB Flash Token for Cisco ASR 1000 Series</td>
</tr>
<tr>
<td>MEMUSB-1024FT=</td>
<td>1 GB USB Flash Token for Cisco ASR 1000 Series, spare</td>
</tr>
<tr>
<td>ASR1000-ESP10</td>
<td>Cisco ASR-1000 Embedded Services Processor 10 GBps</td>
</tr>
<tr>
<td>ASR1000-ESP10-N</td>
<td>Cisco ASR-1000 Embedded Services Processor 10 GBps Non Crypto</td>
</tr>
<tr>
<td>ASR1000-ESP20</td>
<td>Cisco ASR-1000 Embedded Services Processor 20 GBps</td>
</tr>
<tr>
<td>ASR1000-ESP40</td>
<td>Cisco ASR 1000 Embedded Services Processor, 40 GBps</td>
</tr>
<tr>
<td>ASR1000-ESP100</td>
<td>Cisco ASR 1000 Embedded Services Processor, 100 GBps</td>
</tr>
<tr>
<td>ASR1000-ESP200</td>
<td>Cisco ASR 1000 Embedded Services Processor, 200 GBps</td>
</tr>
<tr>
<td>ASR1000-SIP10</td>
<td>Cisco ASR1000 SPA Interface Processor 10</td>
</tr>
<tr>
<td>ASR1000-SIP40</td>
<td>Cisco ASR1000 SPA Interface Processor 40</td>
</tr>
<tr>
<td>ASR1000-6TGE</td>
<td>Cisco ASR 1000 Fixed Ethernet Line Card 6x10GE</td>
</tr>
<tr>
<td>ASR1000-2T+20X1GE</td>
<td>Cisco ASR 1000 Fixed Ethernet Line Card 2x10GE + 20x1GE</td>
</tr>
<tr>
<td>ASR1000-MIP100</td>
<td>Cisco ASR 1000 Ethernet Line Card, 100G Modular Interface Processor</td>
</tr>
<tr>
<td>EPA-1X100GE</td>
<td>Cisco ASR 1000 1x100GE Ethernet Port Adapter</td>
</tr>
</tbody>
</table>
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For More Information

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