Cisco ASR 1000 Series Aggregation Services Routers

Product Overview

Cisco® ASR 1000 Series Aggregation Services Routers aggregate multiple WAN connections and network services including encryption and traffic management, and forward them across WAN connections at line speeds from 2.5 to 200 Gbps. The routers contain both hardware and software redundancy in an industry-leading high-availability design.

The latest additions to the Cisco ASR 1000 Series are the Cisco ASR 1006-X chassis, ASR 1009-X chassis, 100-Gbps Modular Interface Processor (MIP), and 100 Gigabit Ethernet port adapter. The new chassis support 100-Gbps-per-slot bandwidth and are ready for future higher system capacity. The 100-Gbps Modular Interface Processor is an Ethernet line card that is capable of hosting up to two Ethernet port adapters.

The Cisco ASR 1000 Series supports Cisco IOS® XE Software, a modular operating system with modular packaging, feature velocity, and powerful resiliency. The Cisco ASR 1000 Series Embedded Services Processors (ESPs), which are based on Cisco Flow Processor™ technology, accelerate many advanced features such as crypto-based access security; Network Address Translation (NAT), thread defense with Cisco Zone-Based Firewall (ZBFW), deep packet inspection (DPI), Cisco Unified Border Element (CUBE), and a diverse set of data-center-interconnect (DCI) features. These services are implemented in Cisco IOS XE Software without the need for additional hardware support.

Cisco ASR 1000 Routers sit at the edge of your enterprise data center or large office connecting to the WAN, as well as in service provider points of presence (POPs). The Cisco ASR 1000 Series will benefit the following types of customers:

- Enterprises experiencing explosive network traffic as mobility, cloud networking, and video and collaboration usage increase: Cisco ASRs consolidate these various traffic streams and apply traffic management and redundancy properties to them to maintain consistent performance among enterprise sites and cloud locations.
- Network service providers needing to deliver high-performance services, such as DCI and branch-office server aggregation, to business customers: Service providers can also use the multiservice routers to deploy hosted and managed services to business and multimedia services to residential customers.
- Existing Cisco 7200 Series Router (end-of-sale) customers looking for simple migration to a new multiservice platform that delivers greater performance with the same design

Features and Benefits

The Cisco ASR 1000 Series Routers carry a modular yet integrated design, so network operators can increase their network capacity and services without a hardware upgrade. With flexibility in the number of connections, speed maximums, and price, you don't have to under- or overprovision for any network location. Alternatively, you also have the option to buy an "-X" model, so you can increase throughput by simply purchasing upgrade licenses as you grow to increase your network speed dynamically.

Table 1 summarizes the features and benefits of the Cisco ASR 1000 Series Routers.

Table 1.   Features and Benefits of Cisco ASR 1000 Series Routers

Feature	Benefit
High Availability	
Redundant hardware components and power supplies	• These components provide system and business continuity. • The ASR 1006, ASR 1006-X, ASR 1009-X, and ASR 1013 have redundant route processors and ESPs. • The ASR 1001, ASR 1001-X, ASR 1002, ASR 1002-X, and ASR1004 have redundant instances of Cisco IOS XE Software.
Stateful intrachassis redundancy	• Redundant hardware combined with modular software contains faults to prevent systemwide failure. • Redundancy across routers is enabled by pairing routers that act as backup for each other. The routers offer 99.999-percent ("five-nines") availability for consistent, high-performance user application experiences.
In-Service Software Upgrade (ISSU) support	• You don't need to schedule downtime windows; changes are made while the system keeps on working, with nonstop routing availability.
Cisco IOS XE Software Sub-package Mode	• You can upgrade individual software components in less time.
Scalable Capacity and Throughput	
Cisco Flow Processor-based platform	• Advanced services can operate at high speeds without the need for additional hardware or blades.
Hardware acceleration	• Features such as quality of service (QoS), cryptography, and access control lists (ACLs) are processed in hardware.
Control- and forwarding-plane separation	• You can scale control and data planes independently of each other.
Investment Protection	
Software modularity	• You can mix and match the services that best meet your business needs; you won't "waste" investments on capabilities you don't need.
Pay-as-you-grow licensing with "-X" models	• When you need greater throughput, you simply activate it with a change in software license, rather than having to expend capital for additional hardware.
Cisco Shared Port Adapters (SPAs)	• You can reuse your investment in network I/O across platforms.
Cisco Network Interface Modules (NIMs)	• You can reuse your investment in network I/O across platforms.

Product Portfolio

The Cisco ASR 1000 Series contains 10 models with varying types of I/O connectivity and slots and different maximum throughput rates (Figure 1). All models use the innovative and powerful Cisco Flow Processor and support the same feature set based on the Cisco IOS XE Operating System. All platforms use the same hardware shared port adapters (SPAs). All this commonality simplifies management and operations.

- Cisco ASR 1001 Router
- Cisco ASR 1001-X Router (Figure 2)
- Cisco ASR 1002 Fixed Router
- Cisco ASR 1002 Router
- Cisco ASR 1002-X Router

- Cisco ASR 1004 Router
- Cisco ASR 1006 Router
- Cisco ASR 1006-X Router
- Cisco ASR 1009-X Router
- Cisco ASR 1013 Router

Figure 1.   Cisco ASR 1000 Series Aggregation Services Routers

Figure 2.   Cisco ASR 1001-X Router

Software Licensing

Software feature licenses are required to activate services on Cisco ASR 1000 Series Routers. Currently, two types of feature licenses are available. Certain services require only a right-to-use (RTU) license, whereas other services require both an RTU license and one or more number-of-sessions licenses. All the licenses on the Cisco ASR 1000 Series are honor-based, meaning that the licenses are not enforced through a product activation or license key.

For the fixed-platform Cisco ASR 1001, ASR 1001-X, and ASR 1002-X Routers, one of the following five packages is required:

- Cisco ASR 1001 IOS XE UNIVERSAL - NO ENCRYPTION
- Cisco ASR 1001 IOS XE UNIVERSAL - NO PAYLOAD ENCRYPTION
- Cisco ASR 1001 IOS XE UNIVERSAL
- Cisco ASR 1001 IOS XE UNIVERSAL W/O Lawful Intercept
- Cisco ASR 1001 IOS XE UNIVERSAL - NO PAYLOAD ENCRYPTION W/O Lawful Intercept

   To enable a set of required features, one of the following three technology packages is required:

   ◦ Cisco ASR 1000 IP Base License
   ◦ Cisco ASR 1000 Advanced IP Services License
   ◦ Cisco ASR 1000 Advanced Services License

For modular platforms Cisco ASR 1004, ASR 1006, and ASR 1013, you can choose from six supported consolidated packages in each Cisco IOS XE Software release:

- IP Base without Crypto
- IP Base
- Advanced IP Services

- Advanced IP Services without Crypto
- Advanced Enterprise Services
- Advanced Enterprise Services without Crypto

Cisco ASR 1000 Series Use Cases

Tables 2 and 3 describe enterprise and service provider application examples, respectively.

Table 2.   Cisco ASR 1000 Series Enterprise Applications

Deployment Scenario	Description	System Characteristics
WAN edge: Guarantee high-priority applications by creating a virtual "glass ceiling" for lower-priority applications. Improve user experiences.	• Applies Modular QoS CLI (MQC) policies on VLANs or tunnels • Limits an arbitrary collection of low-priority traffic to a certain bandwidth • Classifies based on differentiated services code point (DSCP), Network-Based Application Recognition (NBAR), and Cisco IOS Cisco IOS FPM (FPM) into numerous hierarchies, one for high priority and one for low priority	• Implements flexible hierarchies • Supports 464,000 queues • Allows all queues to have a minimum, maximum, and excess bandwidth with priority propagation
Multiservice, scalable, and secure headend: **IP Security (IPsec) VPN aggregation scales to meet the new bandwidth demands of service provider IP VPNs.**	• Reduces capital expenditures (CapEx) and operating expenses (OpEx) by migrating and consolidating to fewer Cisco ASR 1000 Series Routers • Protects investment through easy transition to much higher encryption support, offering encryption support of up to 78 Gbps with the 200-Gbps Cisco ASR 1000 Series ESP (ASR1000-ESP200) • Offers easier management through embedded security services in the Cisco Flow Processor, with no additional service modules or blades required • Optimized for QoS and IP Multicast applications	• Supports thousands of sites • Supports 8,000 IPsec tunnels • Offers up to 78-Gbps encryption performance and up to 200-Gbps noncryptographic throughput support with the Cisco ASR 1000 Series 200-Gbps Embedded Services Processor (ASR1000-ESP200) engine
Embedded high-speed firewall: **With the Zone-Based Policy Firewall, the Cisco ASR 1000 Series acts as an implicit and complete barrier between any interfaces not members of the same zone. An explicit zone-pair policy must be specified (using Cisco Policy Language; that is, MQC) in each direction between each zone pair. The policy establishes within the router the kind of stateful inspection (Layer 4, Layer 7, or application) and session parameters to apply to each zone pairing.** **Example: An explicit policy allowing HTTP and Domain Name System (DNS) to traverse the Internet-demilitarized zone (DMZ) zone boundary would be required.**	• The firewall is embedded in the Cisco Flow Processor; no additional service blades or modules are required. • Multiple gigabits of bandwidth are routed while at the same time the router performs Zone-Based Policy Firewall and other baseline features such as QoS, IPv4, IPv6, NetFlow, and others. • The Cisco ASR 1000 Series provides logging of all firewall session states off to network management applications capable of accepting relatively huge amounts of flow data. Third-party applications can handle the session data.	• Provides firewall performance of 2.5 to 200 Gbps, depending on the ESP used • Offers high-speed logging of 40,000 sessions per second with NetFlow Version 9

Deployment Scenario	Description	System Characteristics
Managed CPE: This implementation of branch-office architecture offers powerful investment protection with services and scale.	• Managed customer premises equipment (CPE) helps branch offices route correctly over various types of Ethernet to comply with service-level agreements (SLAs). • This application encrypts multiple gigabits of bandwidth without any additional service blades or modules. • Managed CPE optimizes the WAN to route around brownouts in the service provider network to further guarantee mission-critical applications. • This application offers small form factors (1 rack unit [1RU] for the Cisco ASR 1001 and 2RUs for the Cisco ASR 1002 Fixed, ASR 1002, and ASR 1002-X Routers), including software modularity and ISSU. • Note: ISSU is not supported on Cisco ASR 1001, ASR 1002-F, ASR 1002, ASR 1002-X, or ASR 1004. Managed CPE offers accessibility even when the Cisco IOS Software is down.	• Offers first-in-industry software redundancy support, without any additional hardware module, on Cisco ASR 1001, ASR 1001-X, ASR 1002, ASR 1002-X, and ASR 1004; hardware redundancy and ISSU are supported on the Cisco ASR 1006 and ASR 1013. • Offers powerful firewall and NAT performance of 2.5 to 200 Gbps and 1.8- to 78-Gbps encryption support in addition to WAN optimization and voice features

Table 3.   Cisco ASR 1000 Series Service Provider Applications

Deployment Scenario	Description	System Characteristics
Broadband L2TP Access Concentrator (LAC) or L2TP Network Server (LNS): **The solution offers Layer 2 Tunneling Protocol (L2TP) endpoint-to-tunnel Point-to-Point Protocol (PPPoX) or IP sessions with bandwidth demands in the STM-1 ATM, Fast Ethernet, Gigabit Ethernet, and 10 Gigabit Ethernet range.**	• The application is ideal for triple-play (data, voice, and video) wholesale deployments. • It offers integral service delivery. • Per-user firewall, session border controller (SBC), etc. are supported.	• Provides very high scalability of up to 64,000 subscribers and up to 64,000 tunnels
Service provider edge: Layer 3 VPN (L3VPN) provider edge: **Example: You can deploy the solution at the distributed provider edge or provider edge in global VPN networks for bandwidth demands such as asymmetric DSL (ADSL), T1/E1, STM-1, STM-4, Fast Ethernet, Gigabit Ethernet, etc.**	• The application provides integral services in the Cisco Flow Processor. • It provides encryption, FPM, NBAR, SBC, IP Multicast, etc.	• Offers excellent multicast performance • Scales to 8,000 Virtual Route Forwarding (VRF) instances, 1 million Label Distribution Protocol (LDP) labels, and 4,000 access control lists (ACLs) • Supports up to 4 million IPv4 routes • Supports up to 4 million IPv6 routes
Service provider edge: High-end route reflector: **You can use the solution as a route reflector for bandwidth support of 40 Gbps.**	• The application provides high scalability. • It offers a modular design of the route processor and ESP with hardware and software redundancy.	• Scales up to 29 million IPv4 routes • Supports 64,000 Layer 3 adjacencies • Offers default memory 4-GB DRAM (on Cisco ASR 1001 and ASR 1002-X) and 8-GB DRAM (on Cisco ASR 1000-RP2 and ASR 1001-X) • Offers optional upgrade to 16-GB DRAM (on Cisco ASR 1001, ASR 1001-X, ASR 1002-X, and ASR 1000-RP2) **Note:** The Cisco ASR 1001, ASR 1002, and ASR 1002-X Routers ship by default with 4-GB DRAM. The Cisco ASR 1001 and ASR 1002-X are upgradable to 8- or 16-GB DRAM.

Deployment Scenario	Description	System Characteristics
Next-generation voice and multimedia example: Cisco Unified Border Element Enterprise Edition (ENT Edition): **The SBC application (named Cisco Unified Border Element [ENT Edition]) performs the voice and video gateway functions simultaneously with regular IP data services. No appliance or additional service blade is required. The control protocols and media protocols work transparently within a complex voice architecture. For more information, refer to the CUBE data sheet at http://www.cisco.com/go/cube.**	• Secure and authenticated Session Initiation Protocol (SIP) trunk connections enable service providers to offer real-time voice and video services. • The WAN edge is simpler to manage because there is only one egress and one ingress point for access to Internet or service provider services. • The control plane is separated from the data-forwarding plane, so the signaling and control processes are separate from media processing. • The CUBE SBC application can be used for SIP trunk video and/or audio services provided by service providers or for Internet-accessible SIP line-side services to Cisco Unified Communications Manager.	• Facilitates SBC with security, QoS, IPv4, and IPv6 (IP Unicast and IP Multicast simultaneously) • Supports 16,000 simultaneous voice calls and multimedia data of up to 200 Gbps with accounting, firewall, and call quality enabled • Integrated with inbox high-availability infrastructure and Dynamic Host Configuration Protocol (DHCP) Relay

Product Specifications

Table 4 compares the different Cisco ASR 1000 Series Routers, and Table 5 compares the different processor module specifications. For comparisons of Cisco ASR ESPs, refer to the ESP datasheet. For comparisons of the ASR route processors, refer to the RP datasheet. For comparisons of the SPAs and SPA interface processors, refer to the SPA/SIP datasheet.

Table 4. Cisco ASR 1000 Series: Chassis Comparison and Specifications

Model	Cisco ASR 1001-X	Cisco ASR 1002-X	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1006-X	Cisco ASR 1009-X	Cisco ASR 1013
Physical specifications Note: Depth applies to chassis edge-to-edge dimension and does not include protrusions such as card handles, power-supply handles, and cable management brackets. Refer to the applicable hardware installation guide for additional details.	Height: 1.71 in. (43.43 mm) Width: 17.3 in. (439.42 mm) Depth: 18.17 in. (461.5 mm) Weight: • 25 lb (11.35 kg) fully loaded **Note:** The Cisco ASR 1001-X Router has the route processor, ESP, and SIP integrated.	Height: 3.5 in. (88.9 mm) Width: 17.2 in. (437.4 mm) Depth: 18.15 in. (461.0 mm) Weight: • 38.25 lb (17.36 kg) (with dual AC power supply and SPA blank covers) • 39.05 lb (17.72 kg) (with dual DC power supply and blank covers) • No SPAs included **Note**: The Cisco ASR 1002-X has the route processor, ESP, and SIP integrated.	Height: 7 in. (177.8 mm) Width: 17.2 in. (437.4 mm) Depth: 18.15 in. (461.0 mm) Weight: • 68.7 lb (31.16 kg) (with dual AC power supply, SPA blank covers, Cisco ASR 1000 Series 10-Gbps ESP [ASR1000-ESP10] or ASR 1000 Series 40-Gbps ESP [ASR1000-ESP-40], Cisco ASR 1000 Series Route Processor 1 [RP1] [ASR1000-RP1], two Cisco ASR 1000 Series 10-Gbps SIPs	Height: 10.5 in. (266.7 mm) Width: 17.2 in. (437.4 mm) Depth: 18.15 in. (461.0 mm) Weight: • 98.70 lb (44.77 kg) (with dual AC power supply, SPA, route processor, two Cisco ASR 1000 Series 10-Gbps ESPs [ASR1000-ESP10] or ASR 1000 Series 40-Gbps ESPs [ASR1000-ESP-40] or ASR1000 Series 100-Gbps ESPs [ASR1000-ESP100], two Cisco ASR 1000 Series RP1s [ASR1000-RP1], three Cisco ASR	Height: 10.47 in. (265.9 mm) Width: 17.2 in. (437.4 mm) Depth: 18.15 in. (461.0 mm) Weight: • 36.5 lb empty • 112 lb (50.91 kg) (with two fan modules, three AC power supplies, three power bay blanks, two Cisco ASR1000 Series 100-Gbps ESPs [ASR1000-ESP100], two Cisco ASR 1000 Series RP2s [ASR1000-RP2], two Cisco ASR 1000 Series 100-Gbps MIPs [ASR1000-MIP100],	Height: 15.72 in. (399.3 mm) Width: 17.2 in. (437.4 mm) Depth: 18.15 in. (461.0 mm) Weight: • 50 lb empty • 154 lb (70 kg) (with three fan modules, four AC power supplies, two power bay blanks, two Cisco ASR1000 Series 200-Gbps ESPs [ASR1000-ESP200], two Cisco ASR 1000 Series RP2s [ASR1000-RP2], three Cisco ASR 1000 Series 100-Gbps MIPs [ASR1000-MIP100], six EPA blanks,	Height: 22.8 in. (579.1 mm) Width: 17.2 in. (437.4 mm) Depth: 18.15 in. (461.0 mm) Weight: • 184.0 lb (83.46 kg) (with redundant AC power supply, SPA, route processor, SIP blank covers, two Cisco ASR 1000 Series 40-Gbps ESPs [ASR1000-ESP40] or ASR1000 Series 100-Gbps ESPs [ASR1000-ESP100] or ASR1000 Series 200-Gbps ESPs [ASR1000-ESP200], two Cisco ASR 1000 Series RP2s

Model	Cisco ASR 1001-X	Cisco ASR 1002-X	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1006-X	Cisco ASR 1009-X	Cisco ASR 1013
			[ASR1000-SIP10] or ASR1000 Series 40-Gbps SIPs [ASR1000-SIP-40], and no SPAs)	1000 Series 10-Gbps SIPs [ASR1000-SIP10] or ASR1000 Series 40-Gbps SIPs [ASR1000-SIP-40], and no SPAs)	four EPA blanks, and no EPAs)	and no EPAs)	[ASR1000-RP2], six Cisco ASR 1000 Series 40-Gbps SIPs [ASR1000-SIP40], and no SPAs)
Default memory	8-GB DRAM shared across route processor, ESP, and SIP	4-GB DRAM shared across route processor, ESP, and SIP	4-GB DRAM RP1 8-GB DRAM RP2	4-GB DRAM RP1 8-GB DRAM RP2	8-GB DRAM RP2	8-GB DRAM RP2	8-GB DRAM RP2
Number of SIPs or Ethernet line cards supported	Integrated in chassis	Integrated in chassis	2	3	2	3	6
Shared port adapters	1 single-height SPA slot	3 SPA slots	8 SPA slots	12 SPA slots	8 SPA slots	12 SPA slots	24 SPA slots
Ethernet port adapters	N/A	N/A	N/A	N/A	4 EPA slots	6 EPA slots	12 EPA slots
Cisco ASR 1000 Series ESP	Integrated in chassis	Integrated in chassis	1 ESP slot	2 ESP slots	2 ESP slots	2 ESP slots	2 ESP slots
Route processor	Integrated in the chassis: Cisco ASR 1001-X Series Route Processor with Quad Core Processor	Integrated in the chassis: Cisco ASR 1002-X Series Route Processor with Quad Core Processor	1 route-processor slot	2 route-processor slots	2 route-processor slots	2 route-processor slots	2 route-processor slots
Redundancy	Software: Yes	Software: Yes	Software: Yes	Hardware: Yes	Hardware: Yes	Hardware: Yes	Hardware: Yes
Built-in Gigabit Ethernet ports	Yes: 6 Gigabit Ethernet Small Form-Factor Pluggable (SFP) ports	Yes: 6 Gigabit Ethernet SFP ports	0	0	0	0	0
Built-in 10 Gigabit Ethernet port	Yes: Two 10 Gigabit Ethernet Small Form-Factor Plus Pluggable (SFP+) ports Note: Built-in 10-GB ports cannot be reduced to 1-GB speed.	No	No	No	No	No	No
Network interface module	Yes	No	No	No	No	No	No
Integrated daughter card (IDC)	No	No	No	No	No	No	No

Table 5.   Cisco ASR 1000 Series Processor Module Comparison and Specifications

Cisco ASR 1000 Series	Cisco ASR 1001-X	Cisco ASR 1002-X	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1006-X	Cisco ASR 1009-X	Cisco ASR 1013
ESP support	Cisco ASR 1000 Series 2.5-Gbps ESP (default) Upgradable through a software-activated feature license to 5,10, or 20 Gbps	Cisco ASR 1002-X ESP with 5-Gbps (default) Upgradable through software-activated feature license to 10, 20, or 36 Gbps	Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10), noncrypto Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10-N), Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20), and Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40)	Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10), noncrypto Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10-N), Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20), Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40), and Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100)	Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40) and Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100)	Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40), Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100), and Cisco ASR 1000 Series 200-Gbps ESP (ASR1000-ESP200)	Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40), Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100), and Cisco ASR 1000 Series 200-Gbps ESP (ASR1000-ESP200)
ESP bandwidth	2.5 to 20 Gbps	5 to 36 Gbps	10 to 40 Gbps	10 to 100 Gbps	40 to 100 Gbps	40 to 200 Gbps	40 to 200 Gbps
ESP memory	• Share the same control memory on route processor	Share the same control memory on route processor	Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10) and ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10): 2-GB DRAM default; 2-GB DRAM maximum Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20): 4-GB DRAM default; 4-GB DRAM maximum	Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10) and ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10): 2-GB DRAM default; 2-GB DRAM maximum Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20): 4-GB DRAM default; 4-GB DRAM maximum Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40): 8-GB DRAM Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100): 16-GB DRAM	Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40): 8-GB DRAM Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100): 16-GB DRAM	Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40): 8-GB DRAM Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100): 16-GB DRAM Cisco ASR 1000 Series 200-Gbps ESP (ASR1000-ESP200): 32-GB DRAM	Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40): 8-GB DRAM Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100): 16-GB DRAM Cisco ASR 1000 Series 200-Gbps ESP (ASR1000-ESP200): 32-GB DRAM

Cisco ASR 1000 Series	Cisco ASR 1001-X	Cisco ASR 1002-X	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1006-X	Cisco ASR 1009-X	Cisco ASR 1013
SIPs and Ethernet line cards	Integrated in chassis; not upgradable	Integrated in chassis: not upgradable	Supports Cisco ASR 1000 Series 10-Gbps SIP Carrier Card (ASR1000-SIP10), Cisco ASR 1000 Series 40-Gbps SIP Carrier Card (ASR1000-SIP40), and ASR 1000 Fixed Ethernet Line Cards; two 10 GE + twenty 1 GE line cards (ASR1000-2T+20X1GE); and six 10 GE line cards (ASR1000-6TGE)	Supports Cisco ASR 1000 Series 10-Gbps SIP Carrier Card (ASR1000-SIP10), Cisco ASR 1000 Series 40-Gbps SIP Carrier Card (ASR1000-SIP40), and ASR 1000 Fixed Ethernet Line Card; two 10 GE + twenty 1 GE line cards (ASR1000-2T+20X1GE); and six 10 GE line cards (ASR1000-6TGE)	Supports Cisco ASR 1000 Series 40-Gbps SIP Carrier Card (ASR1000-SIP40), Cisco ASR1000 Series MIP 100-Gbps Carrier Card (ASR1000-MIP100), and ASR 1000 Fixed Ethernet Line Card; two 10 GE + twenty 1 GE line cards (ASR1000-2T+20X1GE); and six 10 GE line cards (ASR1000-6TGE)	Supports Cisco ASR 1000 Series 40-Gbps SIP Carrier Card (ASR1000-SIP40), Cisco ASR1000 Series MIP 100-Gbps Carrier Card (ASR1000-MIP100), and ASR 1000 Fixed Ethernet Line Card; two 10 GE + twenty 1 GE (ASR1000-2T+20X1GE) line cards; and six 10 GE line cards (ASR1000-6TGE)	Supports Cisco ASR 1000 Series 40-Gbps SIP Carrier Card (ASR1000-SIP40), Cisco ASR1000 Series MIP 100-Gbps Carrier Card (ASR1000-MIP100), and ASR 1000 Fixed Ethernet Line Card; two 10 GE + twenty 1 GE (ASR1000-2T+20X1GE) line cards; and six 10 GE line cards (ASR1000-6TGE)
Embedded hardware-based encryption	Yes: Up to 8-Gbps crypto support throughput	Yes: Up to 4-Gbps crypto support throughput	Yes: On Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10) with up to 4 Gbps and on Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20) with up to 8-Gbps crypto support throughput **Note:** No support on noncrypto Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10-N)	Yes: On Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10) with up to 4-Gbps crypto support throughput, Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20) with up to 8-Gbps crypto support throughput, Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40) with up to 11-Gbps crypto support throughput, and Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100) with up to 29-Gbps crypto support throughput **Note:** No support on noncrypto Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10-N)	Yes: On Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40) with up to 11-Gbps crypto support throughput and Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100) with up to 29-Gbps crypto support throughput	Yes: On Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40) with up to 11-Gbps crypto support throughput, Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100) with up to 29-Gbps crypto support throughput, and Cisco ASR 1000 Series 200-Gbps ESP (ASR1000-ESP200) with up to 78-Gbps crypto support throughput	Yes: On Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40) with up to 11-Gbps crypto support throughput, Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100) with up to 29-Gbps crypto support throughput, and Cisco ASR 1000 Series 200-Gbps ESP (ASR1000-ESP200) with up to 78-Gbps crypto support throughput

Cisco ASR 1000 Series	Cisco ASR 1001-X	Cisco ASR 1002-X	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1006-X	Cisco ASR 1009-X	Cisco ASR 1013
Minimum Cisco IOS XE Software release	Cisco IOS XE Software Release 3.12.0	Cisco IOS XE Software Release 3.7.0S	Cisco IOS XE Software Release 2.1	Same as for Cisco ASR 1002 except Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40) requires Cisco IOS XE Software Release 3.1.0S **Note:** Cisco ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100) requires Cisco IOS XE Software Release 3.7.0S.	Cisco IOS XE Software Release 3.16.0	Cisco IOS XE Software Release 3.16.0	Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40) requires Cisco IOS XE Software Release 3.1.0S, ASR 1000 Series 100-Gbps ESP (ASR1000-ESP100) requires Cisco IOS XE Software Release 3.7.0S, and ASR 1000 Series 200-Gbps ESP (ASR1000-ESP200) requires Cisco IOS XE Software Release 3.10.0S
Rack-mounting	Yes: 19-inch	Yes: 19-inch	Yes: 19-inch	Yes: 19-inch	Yes: 19-inch	Yes: 19-inch	Yes: 19-inch
Wall-mounting	No	No	No	No	No	No	No
External USB flash memory	1-GB USB flash-memory support	4-GB USB flash-memory support	1-GB USB flash-memory support	1-GB USB flash-memory support	1-GB USB flash-memory support	1-GB USB flash-memory support	1-GB USB flash-memory support
Redundant power supply	Yes: Dual power supplies by default; option of either AC or DC power supply **Note:** A mix of one AC and one DC power supply is not supported.	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Yes: Dual power supplies by default, expandable up to a total of six, depending on configuration and redundancy preferences; option of either 1100W AC or 950W DC **Note:** A mix of AC and DC power supplies is not supported.	Yes: Dual power supplies by default, expandable up to a total of six, depending on configuration and redundancy preferences; option of either 1100W AC or 950W DC **Note:** A mix of AC and DC power supplies is not supported.	Yes: Quad power supplies (redundant pairs) by default; option of either AC or DC power supplies **Note:** A mix of AC and DC power supplies is not supported.
Power input	Worldwide ranging AC input range (85 to 264 VAC) Worldwide ranging DC (- 40 to - 72V; 48V nominal)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Worldwide ranging AC input range (85 to 264 VAC) Worldwide ranging DC (- 40 to - 72; - 48V nominal)	Worldwide ranging AC input range (85 to 264 VAC) Worldwide ranging DC (- 40 to - 72; - 48V nominal)	Worldwide ranging AC (180 to 264V; 240V; 60 or 50 Hz nominal) Worldwide ranging DC (- 40.5 to - 72; - 48V nominal)

Cisco ASR 1000 Series	Cisco ASR 1001-X	Cisco ASR 1002-X	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1006-X	Cisco ASR 1009-X	Cisco ASR 1013
Power consumption	• Maximum (DC): 242W • Maximum (AC): 250W • Maximum (out): 250W	• Maximum (DC): 590W • Maximum (AC): 560W • Maximum (out): 470W	• Maximum (DC): 1020W • Maximum (AC): 960W • Maximum (out): 765W	• Maximum (DC): 1700W • Maximum (AC): 1600W • Maximum (out): 1275W • Or • Maximum (DC): 2100W • Maximum (AC - high line): 2000W • Maximum (out): 1695W	• Maximum (DC): 4600W • Maximum (AC): 4500W • Maximum (out): 4030W	• Maximum (DC): 5200W • Maximum (AC): 5100W • Maximum (out): 4575W	• Maximum (DC): 4200W • Maximum (AC - high line): 4000W • Maximum (out): 3390W
Airflow	Front-to-back	Front-to-back	Front-to-back	Front-to-back	Front-to-back	Front-to-back	Front-to-back
Operating temperature (nominal)	32 to 104°F (0 to 40°C)	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X
Operating temperature (short-term)	32 to 122°F (0 to 50°C)	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X
Operating humidity (nominal) (relative humidity)	10 to 85%	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X
Operating humidity (short-term)	5 to 90%	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1002
Storage temperature	- 40 to 150°F (- 40 to 70°C)	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X
Storage humidity (relative humidity)	5 to 95%	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X
Operating altitude	- 500 to 10,000 feet (152 to 3048 meters)	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X
Network Equipment Building Standards (NEBS)	GR-1089 and GR-63 (in progress)	GR-1089 and GR-63	GR-1089 and GR-63	GR-1089 and GR-63	GR-1089 and GR-63 (in progress)	GR-1089 and GR-63 (in progress)	GR-1089 and GR-63

Cisco ASR 1000 Series	Cisco ASR 1001-X	Cisco ASR 1002-X	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1006-X	Cisco ASR 1009-X	Cisco ASR 1013
EMC standards	• FCC 47 CFR Part 15 Class A • VCCI Class A • AS/NSZ Class A • ICES-003 Class A • EN55022/CISPR 22 Information Technology Equipment • (Emissions) • EN55024/CISPR 24 Information Technology Equipment • (Immunity) • EN300 386 Telecommunications Network Equipment • (EMC) • EN50082-1/EN61000-6-1 Generic Immunity Standard	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X	Same as for Cisco ASR 1001-X
Safety Standard	UL60950-1 CSA C22.2 No. 60950-1-03 EN 60950-1 IEC 60950-1 AS/NZS 60950.1	UL60950-1 CSA C22.2 No. 60950-1-03 EN 60950-1 IEC 60950-1 AS/NZS 60950.1	UL60950-1 CSA C22.2 No. 60950-1-03 EN 60950-1 IEC 60950-1 AS/NZS 60950.1	UL60950-1 CSA C22.2 No. 60950-1-03 EN 60950-1 IEC 60950-1 AS/NZS 60950.1	UL60950-1 CSA C22.2 No. 60950-1-03 EN 60950-1 IEC 60950-1 AS/NZS 60950.1	UL60950-1 CSA C22.2 No. 60950-1-03 EN 60950-1 IEC 60950-1 AS/NZS 60950.1	UL60950-1 CSA C22.2 No. 60950-1-03 EN 60950-1 IEC 60950-1 AS/NZS 60950.1

Ordering Information

To place an order, visit the Cisco Commerce Workspace.

To get started with the Cisco ASR 1000 Series, refer to the detailed product part numbers and descriptions in the following tables:

- Table 6: Chassis
- Table 7: Processor Modules
- Table 8: Interfaces and Modules

For software image, feature and upgrade license, and more details about the Cisco ASR 1000 Series bundles and how to order the Cisco ASR 1000 Series, please refer to the Cisco ASR 1000 Ordering Guide.

Table 6.   Ordering Information for Cisco ASR 1000 Series Chassis

Product Number	Product Description
Cisco ASR 1000 Series Chassis	
ASR1001	Cisco ASR1001 System, 4 Built-In GE, Dual P/S
ASR1001=	Cisco ASR1001 System, 4 Built-In GE, Dual P/S, Spare
ASR1001-2XOC3POS	Cisco ASR1001 System, 4 Built-In GE, OC3 IDC, Dual P/S
ASR1001-2OC3POS=	Cisco ASR1001 System, 4 Built-In GE, OC3 IDC, Dual P/S, Spare
ASR1001-4X1GE	Cisco ASR1001 System, 4 Built-In GE, 4X1GE IDC, Dual P/S

Product Number	Product Description
ASR1001-4X1GE=	Cisco ASR1001 System, 4 Built-In GE, 4X1GE IDC, Dual P/S, Spare
ASR1001-X	Cisco ASR1001-X System, Crypto, 6 built-in GE, Dual P/S
ASR1001-X=	Cisco ASR1001-X System, Crypto, 6 built-in GE, Dual P/S, Spare
ASR1002	Cisco ASR1002 Chassis, 4 Built-In GE, Dual P/S, 4GB DRAM
ASR1002=	Cisco ASR1002 Chassis, 4 Built-In GE, Dual P/S, 4GB DRAM, Spare
ASR1002-X	Cisco ASR1002-X System, Crypto, 6 Built-In GE, Dual P/S
ASR1002-X=	Cisco ASR1002-X System, Crypto, 6 Built-In GE, Dual P/S, Spare
ASR1004	Cisco ASR1004 Chassis, Dual P/S
ASR1004=	Cisco ASR1004 Chassis, Dual P/S, Spare
ASR1006	Cisco ASR1006 Chassis, Dual P/S
ASR1006=	Cisco ASR1006 Chassis, Dual P/S, Spare
ASR1006-X	Cisco ASR1006-X Chassis
ASR1006-X=	Cisco ASR1006-X Chassis, Spare
ASR1009-X	Cisco ASR1009-X Chassis
ASR1009-X=	Cisco ASR1009-X Chassis, Spare
ASR1013	Cisco ASR1013 Chassis, Redundant P/S
ASR1013=	Cisco ASR1013 Chassis, Redundant P/S, Spare
Cisco ASR 1000 Series USB Memory Options	
MEMUSB-1024FT	1GB USB Flash Token for Cisco ASR 1000 Series
MEMUSB-1024FT=	1GB USB Flash Token for Cisco ASR 1000 Series, Spare

Table 7.   Ordering Information for Processor Modules

Product Number	Product Description
Cisco ASR 1000 Series Embedded Services Processor	
ASR1000-ESP5	ASR1K Embedded Services Processor, 5 Gbps, Crypto, ASR1002 Only
ASR1000-ESP5=	ASR1K Embedded Services Processor, 5G, Crypto, 1002 only, Spare
ASR1000-ESP10	Cisco ASR1000 Embedded Services Processor, 10G
ASR1000-ESP10=	Cisco ASR1000 Embedded Services Processor, 10G, Spare
ASR1000-ESP10-N	Cisco ASR1000 Embedded Services Processor, 10G, Non Crypto
ASR1000-ESP10-N=	Cisco ASR1000 Embedded Services Processor, 10G, Non Crypto, Spare
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20G
ASR1000-ESP20=	Cisco ASR1000 Embedded Services Processor, 20G, Spare
ASR1000-ESP40	Cisco ASR1000 Embedded Services Processor, 40G
ASR1000-ESP40=	Cisco ASR1000 Embedded Services Processor, 40G Spare
ASR1000-ESP100	Cisco ASR1000 Embedded Services Processor, 100G
ASR1000-ESP100=	Cisco ASR1000 Embedded Services Processor, 100G Spare
ASR1000-ESP200	Cisco ASR1000 Embedded Services Processor, 200G
ASR1000-ESP200=	Cisco ASR1000 Embedded Services Processor, 200G Spare
Cisco ASR 1000 Series Route Processor	
ASR1000-RP1	Cisco ASR1000 Route Processor 1, 2GB DRAM
ASR1000-RP1=	Cisco ASR1000 Route Processor 1, 2GB DRAM, Spare
ASR1000-RP2	Cisco ASR1000 Route Processor 2, 8GB DRAM
ASR1000-RP2=	Cisco ASR1000 Route Processor 2, 8GB DRAM, Spare

Table 8.　　Ordering Information for Interfaces and Modules

Product Number	Product Description
Cisco ASR 1000 Series SPA Interface Processor and Ethernet Line Cards	
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10
ASR1000-SIP10=	Cisco ASR1000 SPA Interface Processor 10, Spare
ASR1000-SIP40	Cisco ASR1000 SPA Interface Processor 40
ASR1000-SIP40=	Cisco ASR1000 SPA Interface Processor 40, SPARE
ASR1000-6TGE	Cisco ASR 1000 Fixed Ethernet Line Card, 6X10GE
ASR1000-6TGE=	Cisco ASR 1000 Fixed Ethernet Line Card, 6X10GE, Spare
ASR1000-2T+20X1GE	Cisco ASR 1000 Fixed Ethernet Line Card, 2X10GE + 20X1GE
ASR1000-2T+20X1GE=	Cisco ASR 1000 Fixed Ethernet Line Card, 2X10GE + 20X1GE, Spare
ASR1000-MIP100	Cisco ASR 1000 Ethernet Line Card, 100G Modular Interface Processor
ASR1000-MIP100=	Cisco ASR 1000 Ethernet Line Card, 100G Modular Interface Processor, spare
EPA-1X100GE	Cisco ASR 1000 1x100GE Ethernet Port Adapter
EPA-1X100GE=	Cisco ASR 1000 1x100GE Ethernet Port Adapter, spare

Upgrade Paths

Cisco ASR 1000 Series Routers are included in the standard Cisco Technology Migration Program (TMP). Refer to http://www.cisco.com/go/tmp and contact your local Cisco account representative for program details.

Cisco Services

Cisco Services make networks, applications, and the people who use them work better together.

Cisco and our certified partners can help make your enterprise WAN edge deployment a success with a broad portfolio of services based on proven methodologies. We can help you establish a secure, resilient WAN architecture and successfully integrate security and Cisco Unified Communications technologies with bandwidth to support video, collaboration, branch-office solutions, and growth in alignment with your business goals.

The Cisco Lifecycle approach to services defines the requisite activities at each phase of the solution lifecycle. Planning and design services expedite solution adoption. Award-winning technical support increases operational efficiency. Optimization services improve performance, resiliency, stability, and predictability and prepare your network and teams for change. For more information, please visit http://www.cisco.com/go/services.

Cisco Capital

Financing to Help You Achieve Your Objectives

Cisco Capital can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce CapEx. Accelerate your growth. Optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. Learn more.

For More Information

For more information about the Cisco ASR 1000 Series, visit http://www.cisco.com/go/asr1000 or contact your local Cisco account representative. For information about the Cisco ASR 1000 Series bundles, please refer to the Cisco ASR 1000 Ordering Guide.