Cisco ASR 1000 Series Aggregation Services Routers

Cisco is reinventing edge routing with the Cisco® ASR 1000 Series Aggregation Services Routers, a portfolio of midrange routers that establish a new price-to-performance class offering, benefiting both service providers and enterprises alike:

- For service providers, the Cisco ASR 1000 Series Routers facilitate more flexible, efficient, and cost-effective delivery of complex consumer and business services.
- For enterprises, the Cisco ASR 1000 Series Routers deliver a highly reliable, high-performance WAN edge solution where information, communication, collaboration, and commerce converge.

The Cisco ASR 1000 Series Routers:

- Accelerate services by offering outstanding performance and resiliency with optimized, intelligent services.
- Establish a new benchmark for price-to-performance offerings in the enterprise advanced routing, service provider edge, and broadband aggregation segments.
- Facilitate significant network architectural innovations in areas such as WAN aggregation, managed customer-premises-equipment (CPE) services, service provider edge services, etc.
- Reduce operating expenses (OpEx) and capital expenditures (CapEx) by facilitating managed or hosted services over identical architectures and operating environments.

Product Overview

The Cisco ASR 1000 Series consists of six different versions (Figure 1): the Cisco ASR 1001 Router, the Cisco ASR 1002 Fixed Router, the Cisco ASR 1002 Router, the Cisco ASR 1004 Router, the Cisco ASR 1006 Router, and the Cisco ASR 1013 Router. All six models use the innovative and powerful Cisco QuantumFlow Processor, which provides a huge leap in performance and resiliency for network processors.

Figure 1. Cisco ASR 1000 Series Aggregation Services Routers

The Cisco ASR 1000 Series provides a significant enhanced value compared to prior generations of Cisco midrange routing solutions by providing more than tenfold performance improvement with services running. Additionally, the routers have hardware and software redundancy, as well as an industry-leading high-availability design.

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The Cisco ASR 1000 Series delivers multiple services embedded in the Cisco QuantumFlow Processor at wire speeds from 2.5 Gbps to 40 Gbps. The services supported on the Cisco QuantumFlow Processor include security services (for example, encryption and firewall), quality of service (QoS), Network-Based Application Recognition (NBAR), Cisco IOS® Flexible Packet Matching (FPM), broadband aggregation, and Cisco Unified Border Element (SP Edition) (formerly called Session Border Controller, or SBC), among others.

With the separation of the control and data planes in the Cisco ASR 1000 Series Router architecture, software redundancy (on the Cisco ASR 1001, ASR 1002 Fixed, ASR 1002, and ASR 1004 Routers) and hardware redundancy (on the Cisco ASR 1006 and ASR 1013 Routers) are provided. Additionally, the modular Cisco IOS XE Software that is introduced with the Cisco ASR 1000 Series facilitates In-Service Software Upgrade (ISSU).

The Cisco ASR 1001 Router also introduces the concept of integrated daughter cards (IDCs). There is one ASR 1001 base model without an integrated daughter card and five models with integrated daughter cards offering different additional I/O connectivity or an integrated hard disk drive; their part numbers follow:

As of IOS XE 3.2S:

- ASR1001: Base version without an IDC
- ASR1001-2XOC3POS: Delivered with an IDC that provides 2 OC-3 Packet-over-SONET/SDH (PoS) ports
- ASR1001-4XT3: Delivered with an IDC that provides 4 T3 ports (no E3 circuitry)

As of IOS XE 3.3S:

- ASR1001-4X1GE: Delivered with an IDC that provides 4 GE ports
- ASR1001-8CHT1E1: Delivered with an IDC that provides 8 channelized T1/E1 ports
- ASR1001-HDD: Delivered with an integrated hard disk drive (HDD)

Note: The IDCs are not field-upgradable.

At FCS of the Cisco ASR 1001 Router, Cisco Software Activation is supported for some select software licenses on the Cisco ASR 1000 Router, specifically the enforcement of the feature sets IP Base (K9 (SSH only) and non-K9), Advanced IP Services (K9 and non-K9), and Advanced Enterprise Services (K9 and non-K9), as well as the performance upgrade from 2.5 Gbps (default) to 5 Gbps.

From a price-to-performance perspective, the Cisco ASR 1000 Series Router solution fits well between the Cisco 7200 Series and Cisco 7300 Series and the Cisco 7600 Series, Cisco ASR 9000 Series and Cisco Catalyst® 6000 Series Routers, thus dramatically enhancing the Cisco midrange routing portfolio (Figure 2).

Figure 2. Cisco Midrange Routing Portfolio

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More details about the individual Cisco ASR 1000 Series components, such as the Cisco ASR 1000 Series Embedded Services Processors (ESPs), the Cisco ASR 1000 Series Route Processors, and the Cisco ASR 1000 Series SPA Interface Processor (SIP) cards, are available in the respective data sheets:

- Cisco ASR 1000 Series ESPs: http://www.cisco.com/go/asr1000
- Cisco ASR 1000 Series Route Processor: http://www.cisco.com/go/asr1000
- Cisco ASR 1000 Series SIP: http://www.cisco.com/go/asr1000

Applications

Tables 1 and 2 describe enterprise and service provider application examples, respectively.

Table 1. Cisco ASR 1000 Series Enterprise Applications

Applications	Benefits	Implementations
Superior application availability at the WAN edge: Guarantee high-priority applications by creating a virtual "glass ceiling" for lower-priority applications.	• Applies Modular QoS CLI (MQC) policies on VLANs or tunnels • Clamps an arbitrary collection of low-priority traffic to a certain bandwidth • Classifies based on differentiated services code point (DSCP), NBAR, and Cisco IOS FPM into numerous hierarchies, one for high priority and one for low priority	• Implements flexible hierarchies • Supports 128,000 queues • Allows all queues to have a minimum, maximum, and excess bandwidth with priority propagation
Multiservice, scalable, and secure headend: The Cisco ASR 1000 Series offers full-service IP Security (IPsec*) VPN aggregation that scales to meet the new bandwidth demands of service provider IP VPNs.	• Reduces CapEx and 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 11 Gbps with the 40-Gbps Cisco ASR 1000 Series ESP (ASR1000-ESP40) • Offers easier management through embedded security services in the Cisco QuantumFlow Processor, with no additional service modules or blades required • Optimized for QoS and IP Multicast applications	• Supports thousands of sites • Supports 4000 IPsec tunnels • Offers up to 11-Gbps encryption performance and up to 29-Gbps noncryptographic throughput support with the Cisco ASR 1000 Series 40-Gbps Embedded Services Processor (ASR1000-ESP40) engine
Embedded high-speed firewall: With the Zone-Based Policy Firewall, the Cisco ASR 1000 Series acts as an implicit 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-DMZ zone boundary would be required.	• The firewall is embedded in the Cisco QuantumFlow Processor; no additional service blades or modules are required • Multigigabits 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, etc. • 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 40 Gbps, depending on the embedded services processor • Offers high-speed logging of 40,000 sessions per second with NetFlow Version 9
Managed CPE: This implementation of branch-office architecture offers powerful investment protection with services and scale.	• Managed CPE helps branch offices route correctly over various types of Ethernet service-level agreements (SLAs) • This application encrypts multigigabits 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 2 rack units [2RUs] for the Cisco ASR 1002 Fixed and ASR 1002 Routers), including software modularity and ISSU. NOTE: ISSU is not supported on ASR1001, ASR1002-F, ASR1002 and ASR1004. 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 ASR1001, ASR1002-F, ASR1002, and ASR1004. Hardware redundancy and ISSU is supported on ASR1006 and ASR1013 • Offers powerful firewall and Network Address Translation (NAT) performance of 2.5 to 40 Gbps and 1.8- to 11-Gbps encryption support in addition to WAN optimization and voice features

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* This product includes software developed by Cavium Networks.

Table 2. Cisco ASR 1000 Series Service Provider Applications

Applications	Benefits	Implementations
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, SBC, etc. are supported	• Provides very high scalability of up to 32,000 subscribers and up to 16,000 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 QuantumFlow 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 embedded services processor with hardware and software redundancy	• Scales up to 29 million IPv4 routes • Supports 64,000 Layer 3 adjacencies • Offers sufficient memory (8-GB DRAM) (on ASR1000-RP2) • Offers optional upgrade to 16-GB DRAM (on ASR1000-RP2) **Note:** The Cisco ASR 1001, ASR 1002 Fixed, and ASR 1002 Routers ship by default with 4-GB DRAM. The Cisco ASR 1001 is upgradable to 8-GB DRAM. • Offers extensive Border Gateway Protocol (BGP) feature support
Next-generation voice and multimedia example: Cisco Unified Border Element (SP Edition): The SBC application (named Cisco Unified Border Element (SP 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.	• The WAN edge is simpler to manage because only one egress and one ingress point need management and policy application • With the distributed control plane and separate data-forwarding plane, the signaling and control processing remain separate from media processing • ISSU support allows for easy addition of new-use cases • You can use a single SBC application on the Cisco ASR 1000 Series for residential, enterprise, and service provider peering applications	• Facilitates SBC with security, QoS, IPv4, and IPv6 (IP Unicast and IP Multicast simultaneously) • Supports 32,000 simultaneous voice calls and multimedia data of up to 40 Gbps with accounting, firewall, and call quality enabled • Integrated with inbox high-availability infrastructure and Dynamic Host Configuration Protocol (DHCP) Relay

Software

The Cisco ASR 1000 Series is supported in Cisco IOS XE Software, which was introduced with the Cisco ASR 1000 Series Routers as a modular operating system. Based on Cisco IOS Software (Cisco IOS Software Release 12.2SR for Cisco IOS XE Software Releases 2.1.0 through 2.6.0 and Cisco IOS Software Release 15S starting with Cisco IOS XE Software Release 3.1.0S), Cisco IOS XE Software is designed to provide modular packaging, feature velocity, and powerful resiliency. Because of the extreme flexibility and robust performance of the Cisco ASR 1000 Series ESPs - which are based on the Cisco QuantumFlow Processor technology, network security, deep packet inspection, Cisco IOS Firewall, and many other advanced features - are implemented in Cisco IOS XE Software without the need for additional hardware support (for example, in the form of a service blade).

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One of the most innovative features is that the Cisco IOS XE Software supports dual Cisco IOS Software consolidated packages in a single Cisco ASR 1000 Series Route Processor for software redundancy in the Cisco ASR 1001, ASR 1002 Fixed, ASR 1002, and ASR 1004 Routers. This dual Cisco IOS Software consolidated package could be the same consolidated package for backup, or a different consolidated package also on a different Cisco IOS XE Software release for resilient upgrade. Information about the compatibility of supported dual consolidated packages is available in the release notes (IOS XE Release Notes 2: http://www.cisco.com/en/US/docs/ios/ios_xe/2/release/notes/rnasr21.html and IOS XE Release Notes 3: http://www.cisco.com/en/US/docs/ios/ios_xe/3/release/notes/asr1k_rn_3s_rel_notes.html). The (optional) hardware-redundant route processor and ESP configuration in the Cisco ASR 1006 or ASR 1013 Router does not support Cisco IOS Software redundancy in a single route processor because each of the two route processors supports one Cisco IOS XE Software image.

For ease of ordering, 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

All Cisco IOS XE Software Route Processor 1 (RP1) consolidated packages are compatible across the entire Cisco ASR 1000 Series with the Cisco ASR 1000 Series Route Processor 1 (ASR1000-RP1). Similar compatibility exists for the Cisco ASR 1000 Series Route Processor 2 (ASR1000-RP2) across Cisco ASR 1004, ASR 1006, and ASR 1013 Routers and for ASR 1001 with the Route Processor integrated. Table 3 describes each of the Cisco IOS XE consolidated packages supported on the Cisco ASR 1000 Series Route Processor 1 (ASR1000-RP1) as an example. With the Cisco ASR 1001 Router supported as of Cisco IOS XE Software Release 3.2.0S, the concept of Cisco Software Activation is introduced for the Cisco ASR 1000 Series - on the Cisco ASR 1001 only. Table 4 describes the three Cisco IOS XE universal consolidated packages supported on the Cisco ASR 1001 with functionality supported in each of these universal images and enforced via respective technology package licenses. Table 5 lists the ASR 1001 universal consolidated package and technology package license combinations in correspondence to the equivalent software feature sets on the other ASR 1000 Series chassis.

Table 3. Descriptions of Cisco IOS XE Software Consolidated Packages for Cisco ASR 1000 Series RP1 (ASR1000-RP1), ASR 1002 (ASR1002), and ASR 1002 Fixed (ASR1002-F) Routers with Integrated Cisco ASR 1000 Series RP1 (ASR1000-RP1)

Cisco IOS XE Consolidated Package	Part Number	Description
Cisco ASR 1000 Series RP1 IP Base without Crypto	SASR1R1-IPB	• Provides low-cost base consolidated package • Offers only basic IP feature support • Satisfies export requirements for noncryptographic software
Cisco ASR 1000 Series RP1 IP Base	SASR1R1-IPBK9	• Provides low-cost base consolidated package • Offers only basic IP feature support, including Secure Shell (SSH) Protocol and Simple Network Management Protocol Version 3 (SNMPv3) support • Does not support IPsec*, Triple Digital Encryption Standard 3DES], or Advanced Encryption Standard [AES]

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Cisco IOS XE Consolidated Package	Part Number	Description
Cisco ASR 1000 Series RP1 Advanced IP Services	SASR1R1-AISK9	• Targeted for service provider customers • Supports all features, including encryption (IPsec, 3DES, AES, and SSH), Lawful Intercept, and SBC • Does not support older protocols
Cisco ASR 1000 Series RP1 Advanced IP Services without Crypto	SASR1R1-AIS	• Targeted for export-restricted customers • Supports all features, including Lawful Intercept and SBC • Does not support older protocols • Does not support encryption services
Cisco ASR 1000 Series RP1 Advanced Enterprise Services	SASR1R1-AESK9	• Supports all features included in the Advanced IP Services image as well as older protocols
Cisco ASR 1000 Series RP1 Advanced Enterprise Services without Crypto	SASR1R1-AES	• Does not support encryption services • Supports all other features included in the Advanced IP Services image as well as older protocols

* This product includes software developed by Cavium Networks.

Table 4. Descriptions of Universal Cisco IOS XE Software Consolidated Packages for Cisco ASR 1001 with an Integrated Route Processor

Cisco IOS XE Consolidated Package	Part Number	Description
Cisco ASR1001 IOS XE UNIVERSAL	SASR1001U	• Provides low-cost base consolidated package • Offers only basic IP feature support • Satisfies export requirements for noncryptographic software
Cisco ASR1001 IOS XE - NO PAYLOAD ENCRYPTION UNIVERSAL	SASR1001NPEK9	• Provides low-cost base consolidated package • Offers only basic IP feature support, including SSH and SNMPv3 support
Cisco ASR1001 IOS XE - ENCRYPTION UNIVERSAL	SASR1001UK9	• Supports all features, including encryption (IPsec, 3DES, AES, and SSH), Lawful Intercept, and SBC as well as older protocols

Table 5. Part Numbers for Cisco ASR 1001 Software Feature Set Enablement

For the equivalent feature set on ASR 1000 Series (Cisco ASR 1002 Fixed/ASR1002/ASR1004/ASR1006/ASR1013)	To order Universal Software Image Part Number	In Combination	with Technology Package License Part Number
IP Base without crypto (IPB)	SASR1001U		SLASR1-IPB
IP Base (IPBK9)	SASR1001NPEK9		SLASR1-IPB
Advanced IP Services without crypto (AIS)	SASR1001U		SLASR1-AIS
Advanced IP Services (AISK9)	SASR1001UK9		SLASR1-AIS
Advanced Enterprise Services without crypto (AES)	SASR1001U		SLASR1-AES
Advanced Enterprise Services (AESK9)	SASR1001UK9		SLASR1-AES

Each of the Cisco IOS XE Software consolidated packages consists of seven different subpackages. You can download each Cisco IOS XE consolidated package from Cisco.com. For upgrades for support of new features, you can upgrade the consolidated package as a whole or each of the seven subpackages as an individual subpackage. Compatibility of the different subpackages in each consolidated package is checked with a compatibility matrix.

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Table 6 lists the seven software subpackages that make up each of the Cisco IOS XE Software consolidated packages.

Table 6. Cisco IOS XE Software Subpackages

Cisco IOS XE Subpackages	Function of Each Subpackage
RPBase	This subpackage provides the operating system software for the route processor.
RPControl	This subpackage controls the control-plane processes that interface between the Cisco IOS Software and the rest of the platform.
RPAccess (non-K9)	This subpackage is required for router access. It is included only in the Cisco IOS XE consolidated packages that do not have cryptographic or SSH support.
RPAccess (K9)	This subpackage is required for router access. It includes restricted components (Secure Sockets Layer [SSL] and SSH). The Cisco IOS XE Software consolidated packages with this subpackage are subject to export controls.
RPIOS	This subpackage provides the Cisco IOS Software kernel, which is where Cisco IOS Software features are stored and run. Each Cisco IOS XE Software consolidated package has a different Cisco IOS Software image (for example, the Cisco IOS XE Software consolidated package Cisco ASR 1000 Series RP 1 IP Base without Crypto contains the Cisco IOS IP Base without Crypto image).
ESPBase	This subpackage provides the ESP operating system and control processes and the ESP software.
SIPSPA	This subpackage provides the shared-port-adaptor (SPA) driver and associated field-programmable device (FPD) images.
SIPBase	This subpackage controls the SIP carrier-card operating system and control processes.

Product Specifications

Table 7 compares the different Cisco ASR 1000 Series Routers, and Table 8 provides further Cisco ASR 1000 Series product specifications. Table 9 lists the SPAs supported; this list will be extended over time, so please check with your local Cisco account representative for information about the latest SPAs offered.

Table 7. Cisco ASR 1000 Series: Chassis Comparison and Specifications

Model	Cisco ASR 1001	Cisco ASR 1002 Fixed	Cisco ASR 1002	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1013
Physical specifications	Height: 1.71 in. (43.43 mm) Width: 17.3 in. (439.42 mm) Depth: 18.5 in. (470 mm) Weight: • 23.30 lb (10.59 kg) (with dual AC power and integrated daughter card) • 22.70 lb (8.94 kg) (with dual DC power and integrated daughter card) • No SPA included **Note:** The Cisco ASR 1001 Router has the route processor, ESP, and SIP integrated.	Height: 3.5 in. (88.9 mm) Width: 17.2 in. (437.4 mm) Depth: 22 in. (558.8 mm) Weight: • 33.65 lb (15.23 kg) (with dual AC power supply and SPA blank covers) • 36.85 lb (16.75 kg) (with dual AC power supply, blank covers, and Cisco ASR 1000 Series 2.5-Gbps ESP) • No SPA included **Note:** The Cisco ASR 1002 Fixed Router has the route processor, ESP, and SIP	Height: 3.5 in. (88.9 mm) Width: 17.2 in. (437.4 mm) Depth: 22 in. (558.8 mm) Weight: • 33.65 lb (15.23 kg) (with dual AC power supply and SPA blank covers) • 36.85 lb (16.75 kg) (with dual AC power supply, blank covers, and Cisco ASR 1000 Series 5-Gbps ESP [ASR1000-ESP5]) • No SPAs included **Note:** The Cisco ASR 1002 has the route processor and SIP integrated.	Height: 7 in. (177.8 mm) Width: 17.2 in. (437.4 mm) Depth: 22 in. (558.8 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), Cisco ASR 1000 Series Route Processor 1 (RP1) (ASR1000-RP1), Cisco ASR 1000 Series 10-Gbps SIP (ASR1000-SIP10) (two), and no SPAs)	Height: 10.5 in. (266.7 mm) Width: 17.2 in. (437.4 mm) Depth: 22 in. (558.8 mm) Weight: 98.70 lb (44.77 kg) (with dual AC power supply, SPA, route processor, SIP blank covers, two Cisco ASR 1000 Series 10-Gbps ESPs (ASR1000-ESP10), two Cisco ASR 1000 Series RP1s (ASR1000-RP1), three Cisco ASR 1000 Series 10-Gbps SIPs (ASR1000-SIP10), and no SPAs)	Height: 22.8 in. (579.1 mm) Width: 17.2 in. (437.4 mm) Depth: 22 in. (558.8 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), two Cisco ASR 1000 Series RP2s (ASR1000-RP2), six Cisco ASR 1000 Series 40-Gbps SIPs (ASR1000-SIP40), and no SPAs)

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Model	Cisco ASR 1001	Cisco ASR 1002 Fixed	Cisco ASR 1002	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1013
		integrated.				
Shared port adapters	1 single-height SPA slot	1 single-height SPA slot	3 SPA slots	8 SPA slots	12 SPA slots	24 SPA slots
Cisco ASR 1000 Series ESP	Integrated in chassis	Integrated in chassis	1 ESP slot	1 ESP slot	2 ESP slots	2 ESP slots
Route processor	Integrated in the chassis: Cisco ASR 1001 Series Route Processor with Intel Duo Core Processor	Integrated in chassis	Integrated in chassis	1 route-processor slot	2 route-processor slots	2 route-processor slots
Number of SIPs supported	Integrated in chassis	Integrated in chassis	Integrated in chassis	2	3	6
Redundancy	Software: Yes	Software: Yes	Software: Yes	Software: Yes	Hardware: Yes	Hardware: Yes
Built-in Gigabit Ethernet ports	Yes: 4-Gigabit Ethernet Small Form-Factor Pluggable (SFP) ports	Yes: 4-Gigabit Ethernet SFP ports	Yes: 4-Gigabit Ethernet SFP ports	0	0	0
Integrated Daughter Card (IDC)	Yes: • ASR1001-4XT3 provides an IDC with four built-in T3 ports. **Note**: E3 circuitry is not supported. • ASR1001-2XOC3POS provides an IDC with 2 built-inOC3 POS ports. **Note**: The functions of these ports are the same as on the SPA module SPA-2XOC3-POS. • ASR1001-4X1GE provides an IDC with 4 built-in Gigabit Ethernet ports. **Note**: The functions of these ports are the same as on the SPA module SPA-5X1GE-V2 • ASR1001-8XCHT1E1 provides an IDC with 8 built-in channelized E1/T1 ports. **Note**: The functions of these ports are the same as on the SPA module SPA-8XCHT1/E1 • ASR1001-HDD provides an IDC in form of a hard disk drive. Default size is 160 Gigabyte (GB).	No	No	No	No	No

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Model	Cisco ASR 1001	Cisco ASR 1002 Fixed	Cisco ASR 1002	Cisco ASR 1004	Cisco ASR 1006	Cisco ASR 1013
	Note: IDCs are not field-upgradable with the exception of the hard disk drive on the ASR1001-HDD model.					
Airflow	Front-to-back	Front-to-back	Front-to-back	Front-to-back	Front-to-back	Front-to-back

Note: The 1RU, 2RU, and 2RU-F chassis (ASR1001, ASR1002, and ASR1002-F, respectively) come by default with 4-GB DRAM. In the ASR1002 and ASR1002-F, 4 GB is required for the software-redundancy implementation, which is also of high interest for the managed CPE application. In the ASR1001, 8 GB is required for the software redundancy implementation.

Table 8. Cisco ASR 1000 Series: Detailed Specifications

Cisco ASR 1000 Series	Cisco ASR 1001	Cisco ASR 1002 Fixed Router	Cisco ASR 1002 Router	Cisco ASR 1004 Router	Cisco ASR 1006 Router	Cisco ASR 1013 Router
Embedded Services Processor						
ESP support	Cisco ASR 1000 Series 2.5-Gbps ESP (default) Upgradable through a software activated feature license to 5 Gbps (FLS-ASR1001-5G)	Cisco ASR 1000 Series 2.5-Gbps ESP	Cisco ASR 1000 Series 5-Gbps ESP (ASR1000-ESP5), Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10), and noncrypto Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10-N)	Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10), noncrypto Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10-N), and Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20)	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 40-Gbps ESP (ASR1000-ESP40)
ESP bandwidth	2.5 to 5 Gbps	2.5 Gbps	5 to 10 Gbps	10 to 20 Gbps	10 to 40 Gbps	40 Gbps
ESP memory	Cisco ASR 1000 Series 2.5-Gbps ESP: 1-GB DRAM default; 1-GB DRAM maximum	Cisco ASR 1000 Series 2.5-Gbps ESP: 1-GB DRAM default; 1-GB DRAM maximum	Cisco ASR 1000 Series 5-Gbps ESP (ASR1000-ESP5): 1-GB DRAM default; 1-GB DRAM maximum Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10) and Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10): 2-GB DRAM default; 2-GB DRAM maximum	Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10) and Cisco 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 Cisco 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 default: 8-GB DRAM maximum	Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40): 8-GB DRAM default: 8-GB DRAM maximum

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Cisco ASR 1000 Series	Cisco ASR 1001	Cisco ASR 1002 Fixed Router	Cisco ASR 1002 Router	Cisco ASR 1004 Router	Cisco ASR 1006 Router	Cisco ASR 1013 Router
Route Processors						
Route processor	Integrated in the chassis: Cisco ASR 1001 Series Route Processor with Intel Duo Core Processor; not upgradable	Integrated in the chassis: Cisco ASR 1000 Series Route Processor 1 (ASR1000-RP1); the Cisco ASR 1000 Series RP2 (ASR1000-RP2) is not supported on the Cisco ASR 1002 Fixed Router (ASR1002-F)	Integrated in the chassis: Cisco ASR 1000 Series Route Processor 1 (ASR1000-RP1)	Cisco ASR 1000 Series Route Processor 1 (ASR1000-RP1): Supported as a module on the Cisco ASR 1004 and ASR 1006 Cisco ASR 1000 Series Route Processor 2 (ASR1000-RP2): Supported as a module on the Cisco ASR 1004, ASR 1006, and ASR 1013	Same as for Cisco ASR 1004	Cisco ASR 1000 Series Route Processor 2 (ASR1000-RP2): Supported as a module on the Cisco ASR 1004, ASR 1006, and ASR 1013
Route-processor memory	• Cisco ASR 1001 Route Processor: Comes with 4-GB DRAM (default); upgradeable to 8-GB and 16-GB DRAM. 16-GB DRAM is maximum. • Cisco ASR 1001: Offers 8-GB embedded USB memory (EUSB) support (partitioned: two 32-MB for nonvolatile RAM [NVRAM] and the rest for mass storage)	• Cisco ASR 1000 Series Route Processor 1 (ASR1000-RP1): Is integrated in the chassis of the Cisco ASR 1002 Fixed Router • Cisco ASR 1002 Fixed Router: Comes with 4-GB DRAM (default and maximum) • Cisco ASR 1002 Fixed Router: Offers 8-GB EUSB support (partitioned: two 32-MB for NVRAM and the rest for mass storage)	• Cisco ASR 1000 Series Route Processor 1 (ASR1000-RP1): Is integrated in the chassis of the Cisco ASR 1002 • Cisco ASR 1002: Comes with 4-GB DRAM (default and maximum) • Cisco ASR 1002: Offers 8-GB EUSB support (partitioned: two 32-MB for NVRAM and the rest for mass storage)	• Cisco ASR 1000 Series Route Processor (ASR1000-RP1): 2-GB DRAM default; 4-GB DRAM maximum • 1-GB EUSB memory support (partitioned: two 32-MB for NVRAM and the rest for mass storage) • For mass storage: Hard-disk drive (40-GB) or solid-state drive (32-GB) support (will be offered later)	Same as for Cisco ASR 1004	• Cisco ASR 1000 Series Route Processor 2 (ASR1000-RP2): 8-GB DRAM default; 16-GB DRAM maximum • 2-GB EUSB memory support • For mass storage: Hard disk drive(80-GB)
SIPs	Integrated in chassis; not upgradable	Integrated in chassis: Cisco ASR 1000 Series 10-Gbps SIP Carrier Card (ASR1000-SIP10); not upgradable	Integrated in chassis: Cisco ASR 1000 Series 10-Gbps SIP Carrier Card (ASR1000-SIP10); not upgradable	Cisco ASR 1000 Series 10-Gbps SIP Carrier Card (ASR1000-SIP10): Supported as a module on the Cisco ASR 1004 and ASR 1006	Cisco ASR 1000 Series 10-Gbps SIP Carrier Card (ASR1000-SIP10): Supported as a module on the Cisco ASR 1004, ASR 1006, and ASR 1013 Cisco ASR 1000 Series 40-Gbps SIP Carrier Card (ASR1000-SIP40): Supported as a module on the Cisco ASR 1006 and ASR 1013	Same as for Cisco ASR 1006

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Cisco ASR 1000 Series	Cisco ASR 1001	Cisco ASR 1002 Fixed Router	Cisco ASR 1002 Router	Cisco ASR 1004 Router	Cisco ASR 1006 Router	Cisco ASR 1013 Router
Embedded hardware-based encryption	Yes: On Cisco ASR 1000 Series 2.5-Gbps and 5-Gbps ESP with up to 1.8-Gbps crypto throughput support	Yes: On Cisco ASR 1000 Series 2.5-Gbps ESP with up to 1.0-Gbps crypto throughput support	Yes: On Cisco ASR 1000 Series 5-Gbps ESP (ASR1000-ESP5) with up to 1.8-Gbps crypto throughput support and on Cisco ASR 1000 Series 10-Gbps ESP (ASR1000-ESP10) with up to 4-Gbps crypto throughput support 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 and on Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20) with up to 8-Gbps crypto throughput support 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, Cisco ASR 1000 Series 20-Gbps ESP (ASR1000-ESP20) with up to 8 Gbps, and Cisco ASR 1000 Series 40-Gbps ESP (ASR1000-ESP40) with up to 11-Gbps crypto throughput support 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 throughput support No support on noncrypto Cisco ASR 1000 Series ESP
Minimum Cisco IOS XE Software Release	Cisco IOS XE Software Release 3.2.0S (ASR1001, ASR1001-4XT3, ASR1001-2XOC3POS). Cisco IOS XE Software Release 3.3.0S (ASR1001-4X1GE, ASR1001-8XCHT1E1, ASR1001-HDD)	Cisco IOS XE Software Release 2.4.0	Cisco IOS XE Software Release 2.1	Same as for Cisco ASR 1002	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	Cisco IOS XE Software Release 3.1.0S
Rack-mounting	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
External USB flash memory	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	1-GB USB flash-memory support
Power Requirements						
Redundant power supply	Same as for Cisco ASR 1002	Yes: Dual power supply by default; option of either AC or DC power supply **Note:** A mix of one AC and one DC power supply is not supported. The spare AC and DC power supplies for Cisco ASR 1002 Fixed Router (ASR1002-F) are the same as those for Cisco ASR 1002 (ASR1002) (ASR1002-PWR-AC= and ASR1002-PWR-DC=, respectively).	Yes: Dual power supply 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	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.

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Cisco ASR 1000 Series	Cisco ASR 1001	Cisco ASR 1002 Fixed Router	Cisco ASR 1002 Router	Cisco ASR 1004 Router	Cisco ASR 1006 Router	Cisco ASR 1013 Router
Power input	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Worldwide ranging AC (85 to 264V; 120 or 240V; 60 or 50 Hz nominal) Worldwide ranging DC (-40.5 to -72: -48V nominal)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Worldwide ranging AC (180 to 264V; 240V; 60 or 50 Hz nominal) Worldwide ranging DC (-40.5 to -72; -48V nominal)
Power consumption	• Maximum (DC): 500W • Maximum (AC): 471W • Maximum (out): 400W	• Maximum (DC): 590W • Maximum (AC): 560W • Maximum (out): 470W	• 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	• 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
Environmental Specifications						
Operating temperature (nominal)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	41 to 104ºF (5 to 40ºC)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002
Operating temperature (short-term)	-	Same as for Cisco ASR 1002	23 to 131℉ (-5 to 55℃)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002
Operating humidity (nominal) (relative humidity)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	10 to 85%	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002
Operating humidity (short-term)	-	Same as for Cisco ASR 1002	5 to 90%	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002
Storage temperature	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	-38 to 150℉ (-39 to 70℃)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002
Storage humidity (relative humidity)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	5 to 95%	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002
Operating altitude	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	-60 to 4000m (up to 2000m conforms to IEC/EN/UL/CSA 60950 requirements)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002
Regulatory Compliance						
Network Equipment Building Standards (NEBS)	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	GR-1089 and GR-63	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002
EMC standards	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	• 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	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002

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Cisco ASR 1000 Series	Cisco ASR 1001	Cisco ASR 1002 Fixed Router	Cisco ASR 1002 Router	Cisco ASR 1004 Router	Cisco ASR 1006 Router	Cisco ASR 1013 Router
			(Immunity) • EN300 386 Telecommunications Network Equipment (EMC) • EN50082-1/EN61000-6-1 Generic Immunity Standard • KN22 Class A			
CE marking	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	• UL60950-1 • CSA C22.2 No. 60950-1-03 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950.1	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002	Same as for Cisco ASR 1002

Table 9. Supported SPAs on the Cisco ASR 1000 Series

Product Description	Form Factor	Product Number
Serial and Channelized SPA		
Cisco 8-Port Channelized T1/E1 Shared Port Adapter	Single height	SPA-8XCHT1/E1
Cisco 4-Port Channelized T3 (DS-0) Shared Port Adapter	Single height	SPA-4XCT3/DS0
Cisco 2-Port Channelized T3 (DS-0) Shared Port Adapter	Single height	SPA-2XCT3/DS0
Cisco 2-Port Clear Channel T3/E3 Shared Port Adapter	Single height	SPA-2XT3/E3
Cisco 4-Port Clear Channel T3/E3 Shared Port Adapter	Single height	SPA-4XT3/E3
Cisco 1-Port Channelized STM-1/OC-3c to DS-0 Shared Port Adapter	Single height	SPA-1XCHSTM1/OC3
Cisco 1-Port Channelized OC-12/STM-4 SPA	Double height	SPA-1XCHOC12/DS0
Cisco 4 Port Serial SPA	Single height	SPA-4XT-SERIAL
Ethernet SPA		
Cisco 4-Port 10BASE-T/100BASE Fast Ethernet Shared Port Adapter, V-2	Single height	SPA-4X1FE-TX-V2
Cisco 8-Port 10BASE-T/100BASE Fast Ethernet Shared Port Adapter, V-2	Single height	SPA-8X1FE-TX-V2
Cisco 2-Port Gigabit Ethernet Shared Port Adapter, Version 2	Single height	SPA-2X1GE-V2
Cisco 5-Port Gigabit Ethernet Shared Port Adapter, Version 2	Single height	SPA-5X1GE-V2
Cisco 8-Port Gigabit Ethernet Shared Port Adapter, Version 2	Single height	SPA-8X1GE-V2
Cisco 10-Port Gigabit Ethernet Shared Port Adapter, Version 2	Double height	SPA-10XGE-V2
Cisco 1-Port 10 Gigabit Ethernet Shared Port Adapter, Version 2	Single height	SPA-1X10GE-L-V2
Cisco 1-Port 10 Gigabit Ethernet LAN/WAN-PHY Shared Port Adapter	Single height	SPA-1X10GE-WL-V2
Packet over SONET/SDH (PoS)		
Cisco 2-Port OC3-c/STM-1c PoS Shared Port Adapter	Single height	SPA-2XOC3-POS
Cisco 4-Port OC3-c/STM-1c PoS Shared Port Adapter	Single height	SPA-4XOC3-POS
Cisco 8-Port OC3-c/STM-1c PoS Shared Port Adapter	Single height	SPA-8XOC3-POS
Cisco 1-Port Channelized STM-1/OC-3c to DS-0 Shared Port Adapter	Single height	SPA-1XCHSTM1/OC3
Cisco 4-Port OC-3/STM-1 POS Shared Port Adapters	Single height	SPA-4XOC3-POS-V2
Cisco 1-Port OC-12c/STM-4c PoS Shared Port Adapter	Single height	SPA-1XOC12-POS
Cisco 2-Port OC-12c/STM-4 PoS Shared Port Adapter	Single height	SPA-2XOC12-POS
Cisco 4-Port OC-12c/STM-4 PoS Shared Port Adapter	Single height	SPA-4XOC12-POS

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Product Description	Form Factor	Product Number
Cisco 8-Port OC-12c/STM-4 PoS Shared Port Adapter	Single height	SPA-8XOC12-POS
Cisco 1-Port OC-48/STM-16 POS/RPR Shared Port Adapter	Single height	SPA-1XOC48POS/RPR
Cisco 2-Port OC-48/STM-16 POS/RPR Shared Port Adapter	Single height	SPA-2XOC48POS/RPR
Cisco 4-Port OC-48/STM-16 POS/RPR Shared Port Adapter	Single height	SPA-4XOC48POS/RPR
Cisco 1-Port OC-192c/STM-64c POS/RPR Shared Port Adapter with XFP Optics	Single height	SPA-OC192POS-XFP
ATM SPA		
Cisco 1-Port OC3c/STM1c ATM Shared Port Adapter	Single height	SPA-1XOC3-ATM-V2
Cisco 3-Port OC3c/STM1c ATM Shared Port Adapter	Single height	SPA-3XOC3-ATM-V2
Cisco 1-Port OC12c/STM4c ATM Shared Port Adapter	Single height	SPA-1XOC12-ATM-V2
Clocking/Sync SPA		
Synchronous Ethernet SPA	Single height	SPA-2X1GE-SYNCE
Service SPA		
Cisco SPA, WebEx Node for ASR 1000 Series	Double height	SPA-WMA-K9
Digital Signal Processor SPA	Single height	SPA-DSP
CEOP (Circuit Emulation Over Packet) SPA		
1 Port Channelized OC3/STM-1 ATM and Circuit Emulation SPA	Single height	SPA-1CHOC3-CE-ATM

This list will be extended over time. Please check with your local Cisco account representative for information about the latest SPA, SFP, and optics support on the Cisco ASR 1000 Series Routers or check the Cisco ASR 1000 price list.

Availability

The Cisco ASR 1000 Series is orderable and shipping.

Ordering Information

To place an order, visit the Cisco Ordering Home Page and refer to Tables 10 through 13.

Table 10 gives hardware component ordering information, and Table 11 gives software (consolidated packages) and license ordering information for the Cisco ASR 1000 Series with the exception of the Cisco ASR 1001 Router.

For the Cisco ASR 1001, this information is provided in Table 12. Table 13 gives the respective software spare ordering information. If a customer needs to purchase a Cisco ASR 1001 spare license (e.g. for a technology package upgrade from IP Base to Advanced Enterprise Services, and/or for a performance upgrade from 2.5-Gbps to 5-Gbps on the ASR 1001 chassis, and/or for a feature which requires a license and the license had not been purchased at time of order), there are two types of spare licenses available. The “SLASR1-xxx-=” which provides a PAK or licence file via paper delivery or the “L-SLASR1-xxx-=” providing a PAK or license file via E-delivery. The spares can also be purchased as a ‘multi-use PAK’ by either ordering SLFL-ASR1= (for paper delivery) or L-SLFL-ASR1= (for E-delivery).

Not all of the available product numbers are listed in Tables 10, 11 and 12. For additional product numbers, including the Cisco ASR 1000 Series bundle offerings, please check the Cisco price list or contact your local Cisco account representative. More details on the Cisco ASR 1000 Series Bundles and on how to order the Cisco ASR 1000 Series is also provided in the Cisco ASR 1000 Ordering Guide.

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Table 10. Ordering Information for Cisco ASR 1000 Series Hardware

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
ASR1001-4XT3	Cisco ASR1001 System, 4 built-in GE, T3 IDC, Dual P/S
ASR1001-4XT3=	Cisco ASR1001 System, 4 built-in GE, T3 IDC, Dual P/S, spare
ASR1001-4X1GE	Cisco ASR1001 System, 4 built-in GE, 4X1GE IDC, Dual P/S
ASR1001-4X1GE=	Cisco ASR1001 System, 4 built-in GE, 4X1GE IDC, Dual P/S, spare
ASR1001-8XCHT1E1	Cisco ASR1001 System, 4 built-in GE, CHT1 IDC, Dual P/S
ASR1001-8XCHT1E1=	Cisco ASR1001 System, 4 built-in GE, CHT1 IDC, Dual P/S, spare
ASR1001-HDD	Cisco ASR1001 System, 4 built-in GE, HDD, Dual P/S
ASR1001-HDD=	Cisco ASR1001 System, 4 built-in GE, HDD, Dual P/S, spare
ASR1002-F	Cisco ASR1002 System, Fixed ESP, 4 built-in GE, 4GB DRAM
ASR1002-F=	Cisco ASR1002 System, Fixed ESP, 4 built-in GE, 4GB DRAM, 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
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
ASR1013	Cisco ASR1013 Chassis, Redundant P/S
ASR1013=	Cisco ASR1013 Chassis, Redundant P/S, spare
Cisco ASR 1000 Series Embedded Services Processor	
ASR1000-ESP5	ASR1K Embedded Services Processor, 5Gbps, 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
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
Cisco ASR 1000 Series SPA Interface Processor	
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10
ASR1000-SIP10=	Cisco ASR1000 SPA Interface Processor 10, spare

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Product Number	Product Description
ASR1000-SIP40	Cisco ASR1000 SPA Interface Processor 40
ASR1000-SIP40=	Cisco ASR1000 SPA Interface Processor 40, 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 11. Ordering Information for Cisco ASR 1000 Series Software Consolidated Packages and Licenses with the Exception of the Cisco ASR 1001

Product Number	Product Description
Cisco ASR 1000 Series Consolidated Packages	
SASR1R1-IPB	Cisco ASR 1000 Series RP1 IP Base without Crypto
SASR1R1-IPBK9	Cisco ASR 1000 Series RP1 IP BASE
SASR1R1-AISK9	Cisco ASR 1000 Series RP1 Advanced IP Services
SASR1R1-AIS	Cisco ASR 1000 Series RP1 Advanced IP Services without Crypto
SASR1R1-AESK9	Cisco ASR 1000 Series RP1 Advanced Enterprise Services
SASR1R1-AES	Cisco ASR 1000 Series RP1 Advanced Enterprise Services without Crypto
SASR1R2-IPB	Cisco ASR 1000 Series RP2 IP Base without Crypto
SASR1R2-IPBK9	Cisco ASR 1000 Series RP2 IP Base
SASR1R2-AISK9	Cisco ASR 1000 Series RP2 Advanced IP Services
SASR1R2-AIS	Cisco ASR 1000 Series RP2 Advanced IP Services without Crypto
SASR1R2-AESK9	Cisco ASR 1000 Series RP2 Advanced Enterprise Services
SASR1R2-AES	Cisco ASR 1000 Series RP2 Advanced Enterprise Services without Crypto
Cisco ASR 1000 Series Licenses	
Cisco ASR 1000 Series Licenses-Security	
FLASR1-IPSEC-RTU	Encryption Right-To-Use Feature Lic for ASR1000 Series
FLASR1-FPI-RTU	Flex. Pack. Insp. Right-To-Use Feat Lic for ASR1000 Series
FLASR1-FW-RTU	Firewall Right-To-Use Feature Lic for ASR1000 Series
FLASR1-FWNAT-RED	Firewall/NAT Stateful Inter-Chassis Redundancy License
Cisco ASR 1000 Series Licenses-Software Redundancy	
FLASR1-IOSRED-RTU	SW Redundancy Right-To-Use Feat Lic for ASR1000 Series
Cisco ASR 1000 Series Licenses-Application Visibility and Control	
FLASR1-AVC-RTU	Appl. Visibility & Control RTU Feat. Lic for ASR1000 Series
Cisco ASR 1000 Series Licenses-Lawful Intercept	
FLASR1-LI-RTU	ASR1000 Lawful Intercept RTU
Cisco ASR 1000 Series Licenses-Broadband	
FLASR1-BB-RTU	Broadband Right-To-Use Feature Lic for ASR1000 Series
FLASR1-BB-4K	Broadband 4K Sessions Feature Lic for ASR1000 Series
FLASR1-BB-16K	Broadband 16K Sessions Feature Lic for ASR1000 Series
FLASR1-BB-32K	Broadband 32K Sessions Feature Lic for ASR1000 Series
Cisco ASR 1000 Series Licenses-Cisco Unified Border Element - Service Provider Edition	
FLASR1-CUBES-250P	CUBE(SP) 250 Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-2KP	CUBE(SP) 2K Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-4KP	CUBE(SP) 4K Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-10KP	CUBE(SP) 10KCalls Perpetual Lic for ASR 1000 Series

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Product Number	Product Description
FLASR1-CUBES-16KP	CUBE(SP) 16KCalls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-32KP	CUBE(SP) 32K Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-LAB	CUBE(SP) Lab Use Only Lic for ASR 1000 Series
FLASR1-CUBES-TPEX	CUBE(SP) Perpetual Lic for ASR 1000 Series in B2BTP Exchange
NOTE: For the complete list of Cisco ASR 1000 Feature Licenses including Product Numbers for the Cisco Unified Border Element - Enterprise Edition, please consult the Cisco ASR 1000 Price List. For Cisco ASR 1000 demo licenses to test the Cisco ASR 1000 Series in the lab, please contact your local Cisco representative.	

Table 12. Ordering Information for Cisco ASR 1001 Router Software Consolidated Packages and Licenses - Note: For the complete list of Feature Licenses enforced via Software Activation, please consult the Cisco ASR 1000 Price List.

Product Number	Product Description
Cisco ASR1001 IOS XE Software Universal Software	
SASR1001UK	Cisco ASR1001 IOS XE UNIVERSAL
SASR1001NPEK9	Cisco ASR1001 IOS XE - NO PAYLOAD ENCRYPTION UNIVERSAL
SASR1001UK9	Cisco ASR1001 IOS XE - ENCRYPTION UNIVERSAL
ASR1001 Technology Package Licenses: Enforced with PAK	
SLASR1-IPB	Cisco ASR 1000 IP BASE License
SLASR1-AIS	Cisco ASR 1000 Advanced IP Services License
SLASR1-AES	Cisco ASR 1000 Advanced Enterprise Services License
SLASR1-IPB=	Cisco ASR 1000 IP BASE Paper PAK
L-SLASR1-IPB	Cisco ASR 1000 IP BASE E-Delivery PAK
ASR1001 Technology Upgrade Licenses: Enforced with PAK	
SLASR1-IPB-AIS=	Cisco ASR 1000 IPB to AIS Upgrade Paper PAK
SLASR1-IPB-AES=	Cisco ASR 1000 IPB to AES Upgrade Paper PAK
SLASR1-AIS-AES=	Cisco ASR 1000 AIS to AES Upgrade Paper PAK
L-SLASR1-IPB-AIS=	Cisco ASR 1000 IPB to AIS Upgrade E-Delivery PAK
L-SLASR1-IPB-AES=	Cisco ASR 1000 IPB to AES Upgrade E-Delivery PAK
L-SLASR1-AIS-AES=	Cisco ASR 1000 AIS to AES Upgrade E-Delivery PAK
Cisco ASR1001 Feature Licenses: Enforced with PAK	
FLSASR1001-5G	Upgrade from 2.5 Gbps to 5Gbps License for ASR 1001
FLSASR1001-5G=	Upgrade from 2.5 Gbps to 5Gbps Paper PAK for ASR 1001
L-FLSASR1001-5G=	Upgrade from 2.5 Gbps to 5Gbps E-Delivery PAK for ASR 1001
Cisco ASR1001 IOS XE Feature Licenses: Not Enforced	
Software Redundancy	
FLSASR1-IOSRED	SW Redundancy License for ASR1000 Series
FLSASR1-IOSRED=	SW Redundancy Paper PAK for ASR1000 Series
L-FLSASR1-IOSRED=	SW Redundancy E-Delivery PAK for ASR1000 Series
Security	
FLSASR1-IPSEC	IPSEC License for ASR1000 Series
FL-ASR1-IPSEC=	IPSEC Paper PAK for ASR1000 Series
L-FL-ASR1-IPSEC=	IPSEC E-Delivery PAK for ASR1000 Series
FLSASR1-FPI	Flex. Pack. Insp License for ASR1000 Series
FLSASR1-FPI=	Flex. Pack. Insp Paper PAK for ASR1000 Series
L-FLSASR1-FPI=	Flex. Pack. Insp E-Delivery PAK for ASR1000 Series
FLSASR1-FW	FW License for ASR1000 Series

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Product Number	Product Description
FLSASR1-FW=	FW Paper PAK for ASR1000 Series
L-FLSASR1-FW=	FW E-Delivery PAK for ASR1000 Series
FLSASR1-FWNAT-R	Firewall/NAT Stateful Inter-Chassis Redundancy License
FLSASR1-FWNAT-R=	Firewall/NAT Stateful Inter-Chassis Redundancy Paper PAK for ASR1000 Series
L-FLSASR1-FWNAT-R=	Firewall/NAT Stateful Inter-Chassis Redundancy E-Delivery PAK for ASR1000 Series
Application Visibility and Control	
FLSASR1-AVC	Appl. Visibility & Control License for ASR1000 Series
FLSASR1-AVC=	Appl. Visibility & Control Paper PAK for ASR1000 Series
L-FLSASR1-AVC=	Appl. Visibility & Control E-Delivery PAK for ASR1000 Series
Lawful Intercept	
FLSASR1-LI	Lawful Intercept License for ASR1000 Series
FLSASR1-LI=	Lawful Intercept Paper PAK for ASR1000 Series
L-FLSASR1-LI=	Lawful Intercept E-Delivery PAK for ASR1000 Series
Broadband	
FLSASR1-BB	Broadband RTU and 500 Sessions License for ASR1000 Series
FLSASR1-BB=	BB RTU and 500 Sessions Paper PAK for ASR1000 Series
L-FLSASR1-BB=	BB RTU and 500 Sessions E-Delivery PAK for ASR1000 Series
FLSASR1-BB-4K	Broadband 4K Sessions for ASR1000 Series
FLSASR1-BB-4K=	Broadband 4K Sessions Paper PAK for ASR1000 Series
L-FLSASR1-BB-4K=	Broadband 4K Sessions E-Delivery PAK for ASR1000 Series
FLSASR1-BB-16K	Broadband 16K Sessions for ASR1000 Series
FLSASR1-BB-16K=	Broadband 16K Sessions Paper PAK for ASR1000 Series
L-FLSASR1-BB-16K=	Broadband 16K Sessions E-Delivery PAK for ASR1000 Series
FLSASR1-BB-32K	Broadband 32K Sessions for ASR1000 Series
FLSASR1-BB-32K=	Broadband 32K Sessions Paper PAK for ASR1000 Series
L-FLSASR1-BB-32K=	Broadband 32K Sessions E-Delivery PAK for ASR1000 Series
NOTE: For the complete list of Cisco ASR 1001 Feature Licenses not enforced via Software Activation including Product Numbers for the Cisco Unified Border Element - Service Provider Edition and Enterprise Edition, please consult the Cisco ASR 1000 Price List. For Cisco ASR 1000 demo licenses to test the Cisco ASR 1000 Series in the lab, please contact your local Cisco representative.	

All Cisco IOS XE Software Route Processor 1 consolidated packages are compatible across the entire Cisco ASR 1000 Series with the Cisco ASR 1000 Series RP1 (ASR1000-RP1), and the Cisco IOS XE Software Route Processor 2 consolidated packages are compatible across the entire Cisco ASR 1000 Series with the Cisco ASR 1000 Series RP2 (ASR1000-RP2).

For the Cisco ASR 1001, you must select one of the Cisco ASR 1001 universal consolidated packages as well as one of the technology package licenses (SLASR1-IPB, SLASR1-AIS, or SLASR1-AES).

Example 1 for Cisco ASR 1001: For the IP Base software feature set, you must select the universal image SASR1001U and the technology package license “SLASR1-IPB”, which enforces the IP Base feature set.

Example 2 for Cisco ASR 1001: For the AESK9 software feature set, you must select the universal image SASR1001UK9 and the technology package license SLASR1-AES, which enforces the AESK9 feature set. Please note that some functions, for example, IPsec or Firewall, require selection of an additional feature license, that is if a customer wants to deploy, for example encryption, he needs to purchase the universal software image and

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respective technology package license which contains the support for encryption as well as the IPSec feature license. Using this example, the customer needs to purchase the following part numbers:

- SASR1001UK9-32S (universal K9 software image-here: for IOS XE 3.2S)
- SLASR1-AES (technology package license - enforced)
- FLSASR1-IPSEC (feature license - honor based)

Note: All licenses on the Cisco ASR 1001 with the exception of the technology package licenses (for IP Base, Advanced IP Services, and Advanced Enterprise Services) and the performance upgrade license from 2.5 to 5 Gbps are not enforced but are honor-based. To download any of the Cisco ASR 1000 Series consolidated packages and Cisco ASR 1001 universal images of a specific Cisco IOS XE Software release, go to Download Software, click “Router Software”, and go to Cisco ASR 1000 Series Aggregation Services Routers.

Table 13. Ordering Information for Cisco ASR 1000 Series Software Spares

Product Number	Product Description
Cisco ASR 1000 Series Software Spare	
ASR1000-SW-SPARECD	Cisco ASR 1000 Series Software Spare CD
CDASR1000R1-IPB=	Cisco ASR 1000 RP1 IP Base without crypto, spare
CDASR1000R1-IPBK9=	Cisco ASR 1000 RP1 IP Base, spare
CDASR1000R1-AISK9=	Cisco ASR 1000 RP1 Advanced IP Services, spare
CDASR1000R1-AESK9=	Cisco ASR 1000 RP1 Advanced Enterprise Services, 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 for the Enterprise WAN Edge

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.

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 on the Cisco ASR 1000 Series bundles, please take a look at the Cisco ASR 1000 Ordering Guide.

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