Cisco ASR 1000 Series Aggregation Services Routers

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Overview

This guide provides an overview and guidance for ordering and configuring the Cisco® ASR 1000 Series Aggregation Services Routers with their respective hardware components, Cisco IOS® XE Software, and feature licenses. It first addresses ordering of individual components, including hardware, software, and licenses. Then several ordering examples are presented, as well as a step-by-step walk-through of the Cisco Dynamic Configuration Tool, and of a typical deployment, including bundles. Finally, a list of part numbers, also referred to as Product Identifiers (PIDs), is included.

The Cisco ASR 1000 Series consists of nine platforms:

- Cisco ASR 1001-X Router
- Cisco ASR 1001-HX Router
- Cisco ASR 1002-HX 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

The Cisco ASR 1000 Series delivers multiple services embedded in the Cisco QuantumFlow Processor™ at wire speeds from 2.5 to 200 Gbps. The services supported on the Cisco QuantumFlow Processor include security services (for example, up to 78-Gbps [78G] encryption throughput and up to 6M firewall sessions), Quality of Service (QoS), Application Visibility and Control (AVC), Cisco Performance Routing (PfR), broadband aggregation, Cisco Unified Border Element (SP Edition), and Cisco Unified Border Element (Enterprise Edition). Additionally, the Cisco ASR 1000 offers feature-rich scalable Data Center Interconnect (DCI) solutions that include Cisco Overlay Transport Virtualization (OTV) and Virtual Private Label Switching (VPL) to connect geographically dispersed data centers. Advanced routing techniques such as the Locator Identity Separation Protocol (LISP) allow host mobility within and across subnets.

With separation of the control and data planes in the Cisco ASR 1000 Series Router architecture, software redundancy (on the Cisco ASR 1001-X, ASR 1001-HX, ASR 1002-HX, ASR 1002-X, and ASR 1004 Routers), and hardware redundancy (on the Cisco ASR 1006, ASR 1006-X, ASR 1009-X, and ASR 1013 Routers), the highly reliable Cisco ASR 1000 Series demonstrates a consistently high throughput, even when new services are added. Additionally, the modular Cisco IOS XE Software that is introduced with the Cisco ASR 1000 Series facilitates In-Service Software Upgrade (ISSU) on the ASR 1006, ASR 1006-X, ASR 1009-X, and ASR 1013 models.

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Getting started

To ensure that you order the correct Cisco ASR 1000, you must first know the answers to the following questions:

- Is this deployment for a service provider or an enterprise network?
- Do you have a form factor requirement? How many Rack Units (RUs) do you need?
- What total throughput do you need in the router?
- Do you need hardware or software redundancy?
- What types of interfaces do you need, and how many?
- What services need to be enabled, and how many services do you need to be running concurrently?

Cisco ASR 1000 Series high-level overview and part numbers

This section gives a brief overview of the Cisco ASR 1000 Series Router components.

- **Chassis**
  - The chassis houses all of the router components.
- **Processor modules**
  - Cisco ASR 1000 Series Route Processors: Route processors provide advanced routing features and also monitor and manage other resources on the router. They comprise the memory, hard disk, and USB flash memory token.
  - Cisco ASR 1000 Series Embedded Services Processor (ESP): Based on the Cisco QuantumFlow Processor, the ESP performs forwarding, network security, deep packet inspection, firewalling, data center interconnect, and many other advanced features.
- **Interfaces and modules**
  - Cisco ASR 1000 Series Shared Port Adapters (SPAs): These media modules connect to a variety of service provider and enterprise media types. All SPAs connect to the Cisco ASR 1000 Series Routers through the SPA Interface Processor (SIP) modules.
  - Cisco ASR 1000 Series SPA Interface Processors (SIPs): The SIPs house and interconnect up to 4 SPAs each, depending on the router model.
  - Cisco ASR 1000 Series Ethernet Line Cards (ELCs): ELCs come in two different types: two 10G and twenty 1G, and six 10G. Both of these Ethernet line cards have built-in SIP.
  - Cisco ASR 1000 Series Modular Interface Processor (MIP): 100-Gbps carrier card to house and interconnect up to 2 Ethernet port adapters
  - Cisco ASR 1000 Series Ethernet Port Adapters (EPAs): EPAs connect to the Cisco ASR 1000 Series routers through the MIP modules.

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- **Cisco IOS XE Software images**
  - Software feature licenses are required to turn on 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 a RTU license and one or more number-of-sessions licenses. All the licenses on the Cisco ASR 1000 Series are honor-based and are not enforced through a Product Activation Key (PAK).
  - For ASR 1000 Series routers, one of the following packages is required:
    - Cisco ASR 1001 IOS XE UNIVERSAL - NO PAYLOAD ENCRYPTION
    - Cisco ASR 1001 IOS XE UNIVERSAL
    - Cisco ASR 1001 IOS XE UNIVERSAL without Lawful Intercept
    - Cisco ASR 1001 IOS XE UNIVERSAL - NO PAYLOAD ENCRYPTION without 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
- **Cisco IOS XE Software feature licenses**
  - Certain functions supported on the Cisco ASR 1000 Series require feature licenses.
  - All Cisco ASR 1000 feature and performance upgrade licenses are honor-based; that is, they are not enforced through a Product Activation Key (PAK). **Note:** Prior to Cisco IOS XE Software Release 3.7S, performance upgrade licenses that are required to upgrade the Cisco ASR 1001 from 2.5 to 5 Gbps or the Cisco ASR 1002-X from 5 to 10 to 20 to 36 Gbps are enforced through a PAK. Similarly, prior to Cisco IOS XE Software Release 3.6S, technology package licenses are enforced through a PAK.
- **Cisco ASR 1000 application part numbers**
  - When ordering a Cisco ASR 1000 Series Router, please choose the application part number from Table 1 that most closely matches the type of deployment for the Cisco ASR 1000 Series Router. **Note:** Although you must make a selection, your choice of application part number has no effect on the Cisco ASR 1000 Series Routers. This part number is used only for Cisco internal tracking purposes in order to better understand the customer use cases for the platform.

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Table 1. Application part numbers

Application	
Name	**Part number**
ASR1000 BNG/LNS	ASR1K-BB
ASR1000 DCI - including LISP, OTV, VXLAN, VPLS, etc.	ASR1K-DCI
ASR1000 Internet Edge/Peering - including BGP/NAT/ZBFW	ASR1K-INTERNET
ASR1000 Multi-Service Edge - including MPLS, L2/L3VPN	ASR1K-MSE
ASR1000 Managed Services	ASR1K-MSP
ASR1000 Route Reflector	ASR1K-RR
ASR1000 SP Wi-Fi	ASR1K-SP-WIFI
ASR1000 WAN Aggregation - with or without Encryption	ASR1K-WAN-AGGR
ASR1000 Other	ASR1K-OTHER

Table 2 lists system part numbers for chassis, route processors, ESPs, SIPs, and SPAs.

Table 2. Chassis, route processor, ESP, SIP, and SPA part numbers

Chassis	
Name	**Part number**
Cisco ASR 1001-X	ASR1001-X
Cisco ASR 1001-HX	ASR1001-HX
Cisco ASR 1002-HX	ASR1002-HX
Cisco ASR 1002-X	ASR1002-X
Cisco ASR 1004	ASR1004
Cisco ASR 1006	ASR1006
Cisco ASR 1006-X	ASR1006-X
Cisco ASR 1009-X	ASR1009-X
Cisco ASR 1013	ASR1013
Route Processors (RP)	
Route Processor 2	ASR1000-RP2
Route Processor 3	ASR1000-RP3

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Chassis	
Embedded Services Processors (ESP)	
ESP20, 20 Gbps	ASR1000-ESP20
ESP40, 40 Gbps	ASR1000-ESP40
ESP100, 100 Gbps	ASR1000-ESP100
ESP100-X, 100 Gbps	ASR1000-ESP100-X
ESP200, 200 Gbps	ASR1000-ESP200
ESP200-X, 200 Gbps	ASR1000-ESP200-X
SPA Interface Processors (SIP) and Ethernet line cards	
SIP40, 40 Gbps	ASR1000-SIP40
Fixed Ethernet Line Card, 6x10GE	ASR1000-6TGE
Fixed Ethernet Line Card, 2x10GE + 20x1GE	ASR1000-2T+20X1GE
Modular Ethernet Line Card, 100G Modular Interface Processor (EPA carrier card)	ASR1000-MIP100
1-port 100 Gigabit Ethernet Port Adapter	EPA-1X100GE
Cisco ASR 1000 2x40GE Ethernet Port Adapter (Native QSFP)	EPA-2X40GE
Cisco ASR 1000 1x40GE Ethernet Port Adapter **(2 physical QSFP ports - optional license to enable 2nd port)**	EPA-1X40GE
Cisco ASR 1000 1x40GE e-Delivery Port License for EPA-1X40GE	L-FLA1-EPA-1X40GE
2-port 40 Gigabit Ethernet Port Adapter	EPA-CPAK-2X40GE
10-port 10 Gigabit Ethernet Port Adapter	EPA-10X10GE
18-port 1 Gigabit Ethernet Port Adapter	EPA-18X1GE
Shared Port Adapters (SPA)	
8-port Channelized T1/E1 to DS0	SPA-8XCHT1/E1-V2
4-port Channelized T3 to DS0	SPA-4XCT3/DS0-V2
2-port Channelized T3 to DS0	SPA-2XCT3/DS0-V2
2-port Clear Channel T3/E3	SPA-2XT3/E3-V2
4-port Clear Channel T3/E3	SPA-4XT3/E3-V2
Cisco 4-Port Fast Ethernet (TX)	SPA-4X1FE-TX-V2
Cisco 8-Port Fast Ethernet (TX)	SPA-8X1FE-TX-V2

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Chassis	
Cisco 2-Port Gigabit Ethernet	SPA-2X1GE-V2
Cisco 5-Port Gigabit Ethernet	SPA-5X1GE-V2
Cisco 8-Port Gigabit Ethernet	SPA-8X1GE-V2
Cisco 10-Port Gigabit Ethernet	SPA-10X1GE-V2
Cisco 1-Port 10GE LAN-PHY	SPA-1X10GE-L-V2
2-port OC3/STM1 POS	SPA-2XOC3-POS-V2
4-port OC3/STM1 POS	SPA-4XOC3-POS-V2
1-port OC12/STM4 POS	SPA-1XOC12-POS-V2
Cisco 4 port serial SPA	SPA-4XT-SERIAL
Shared Port Adapters (SPA)	
1-port Channelized STM-1/OC-3c to DS0	SPA-CHSTM1/OC3V2
2-port OC48/STM16 POS/RPR	SPA-2XOC48POS/RPR
4-port OC48/STM16 POS/RPR	SPA-4XOC48POS/RPR
Cisco SPA, WebEx Node	SPA-WMA-K9
1 port OC-3c/STM-1 ATM	SPA-1XOC3-ATM-V2
3 port OC-3c/STM-1 ATM	SPA-3XOC3-ATM-V2
1-port OC48/STM16 POS/RPR	SPA-1XOC48POS/RPR
2-port OC12/STM4 POS	SPA-2XOC12-POS
4-port OC-12/STM-4 POS	SPA-4XOC12-POS
8-port OC12/STM4 POS	SPA-8XOC12-POS
8-port OC-3/STM-1 POS	SPA-8XOC3-POS
1-port OC192/STM64 POS/RPR XFP Optics	SPA-OC192POS-XFP
1 port OC12 STM	SPA-1XOC12-ATM-V2
Synchronous Ethernet	SPA-2X1GE-SYNCE
Digital Signal Processor	SPA-DSP
1-port Channelized OC12 to DS0	SPA-1XCHOC12/DS0
Cisco 1-port 10GE LAN/WAN-PHY	SPA-1X10GE-WL-V2

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Chassis	
1 Port Channelized OC3/STM-1 ATM and Circuit Emulation	SPA-1CHOC3-CE-ATM
2 Port Channelized T3/E3 ATM and Circuit Emulation	SPA-2CHT3-CE-ATM
24 Port Channelized T1/E1/J1 ATM and Circuit Emulation	SPA-24CHT1-CE-ATM

Cisco ASR 1000 Series router hardware

This section discusses Cisco ASR 1000 hardware rules, including the default and maximum values for chassis, modules, power supplies, and accessories.

Chassis

Cisco ASR 1000 Series routers have six form factors (1RU, 2RU, 4RU, 6RU, 9RU, and 13RU). Table 3 lists the rack-unit (RU) height for the Cisco ASR 1000 chassis.

Table 3. Cisco ASR 1000 Chassis rack-unit sizes

Form Factor	
Chassis part number	**Rack Units (RU)**
ASR1001-X	1
ASR1001-HX	1
ASR1002-HX	2
ASR1002-X	2
ASR1004	4
ASR1006	6
ASR1006-X	6
ASR1009-X	9
ASR1013	13

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Embedded services processor

Depending on the Cisco ASR 1000 Series model, the ESP is either integrated into the chassis or modular.

Depending on the overall throughput or encryption performance needed, you can choose among four different modular ESP versions: 20-, 40-, 100-, and 200-Gbps ESPs.

Table 4 lists relevant ESP specifics.

Table 4. ESP specifics

Chassis part number	Bandwidth	Max ESP	ESP40	ESP100	ESP200	ESP100-X*	ESP200-X*
ASR1001-X**	2.5, upgradable to 5, 10 or 20 Gbps	1					
SR1001-HX	60 Gbps	1					
ASR1002-HX	100 Gbps	1		Integrated			
ASR1002-X*	5, upgradable to 10, 20, or 36 Gbps	1					
ASR1004	10-40 Gbps	1	Module				
ASR1006	10-100 Gbps	2: Redundant	Module	Module			
ASR1006-X	40-100 Gbps	2: Redundant	Module	Module		Module	Module
ASR1009-X	40-200 Gbps	2: Redundant	Module	Module	Module	Module	Module
ASR1013	40-200 Gbps	2: Redundant	Module	Module	Module	Module	

* ESP100-X and ESP200-X are highly recommended to be deployed on RP3 systems

** ASR1001-X and ASR1002-X have their own built-in ESP; you can upgrade the Cisco ASR1001-X throughput from 2.5 to 5, 10, or 20 Gbps (includes 2x10G ports) or the Cisco ASR1002-X throughput from 5 to 10, 20, or 36 Gbps by purchasing one of the following licenses:

Part number	Description
FLSA1-1X-2.5-5G	Upgrade from 2.5 Gbps to 5 Gbps License for ASR 1001-X
FLSA1-1X-2.5-5G=	Upgrade from 2.5 Gbps to 5 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-2.5-5G=	Upgrade from 2.5 Gbps to 5 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-2.5-10G	Upgrade from 2.5 Gbps to 10 Gbps License for ASR 1001-X
FLSA1-1X-2.5-10G=	Upgrade from 2.5 Gbps to 10 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-2.5-10G=	Upgrade from 2.5 Gbps to 10 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-2.5-20G	Upgrade from 2.5 Gbps to 20 Gbps License for ASR 1001-X
FLSA1-1X-2.5-20G=	Upgrade from 2.5 Gbps to 20 Gbps Paper PAK for ASR 1001-X

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Part number	Description
L-FLA1-1X-2.5-20G=	Upgrade from 2.5 Gbps to 20 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-5-10G	Upgrade from 5 Gbps to 10 Gbps License for ASR 1001-X
FLSA1-1X-5-10G=	Upgrade from 5 Gbps to 10 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-5-10G=	Upgrade from 5 Gbps to 10 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-5-20G	Upgrade from 5 Gbps to 20 Gbps License for ASR 1001-X
FLSA1-1X-5-20G=	Upgrade from 5 Gbps to 20 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-5-20G=	Upgrade from 5 Gbps to 20 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-10-20G	Upgrade from 10 Gbps to 20 Gbps License for ASR 1001-X
FLSA1-1X-10-20G=	Upgrade from 10 Gbps to 20 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-10-20G=	Upgrade from 10 Gbps to 20 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-2X-5-10G	Upgrade from 5 Gbps to 10 Gbps License for ASR 1002-X
FLSA1-2X-5-10G=	Upgrade from 5 Gbps to 10 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-5-10G=	Upgrade from 5 Gbps to 10 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-5-20G	Upgrade from 5 Gbps to 20 Gbps License for ASR 1002-X
FLSA1-2X-5-20G=	Upgrade from 5 Gbps to 20 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-5-20G=	Upgrade from 5 Gbps to 20 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-5-36G	Upgrade from 5 Gbps to 36 Gbps License for ASR 1002-X
FLSA1-2X-5-36G=	Upgrade from 5 Gbps to 36 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-5-36G=	Upgrade from 5 Gbps to 36 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-10-20G	Upgrade from 10 Gbps to 20 Gbps License for ASR 1002-X
FLSA1-2X-10-20G=	Upgrade from 10 Gbps to 20 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-10-20G=	Upgrade from 10 Gbps to 20 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-10-36G	Upgrade from 10 Gbps to 36 Gbps License for ASR 1002-X
FLSA1-2X-10-36G=	Upgrade from 10 Gbps to 36 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-10-36G=	Upgrade from 10 Gbps to 36 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-20-36G	Upgrade from 20 Gbps to 36 Gbps License for ASR 1002-X
FLSA1-2X-20-36G=	Upgrade from 20 Gbps to 36 Gbps Paper PAK for ASR 1002-X

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Part number	Description
L-FLSA1-2X-20-36G=	Upgrade from 20 Gbps to 36 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-HX-2X10GE	Upgrade for ASR1000-HX Built-In 10GE 2-port License for ASR 1002-HX, ASR 1001-HX
FLSA1-HX-2X10GE=	Upgrade for ASR1000-HX Built-In 10GE 2-port License for ASR 1002-HX, ASR 1001-HX
FLSA1-HX-2X1GE	Upgrade for ASR1000-HX Built-In 1GE 2-port License for ASR 1002-HX, ASR 1001-HX
FLSA1-HX-2X1GE=	Upgrade for ASR1000-HX Built-In 1GE 2-port License for ASR 1002-HX, ASR 1001-HX
L-FLSA1-HX-2X10GE=	Upgrade for E-Delivery PAK for ASR1000-HX Built-In 10GE 2-port License
L-FLSA1-HX-2X1GE=	Upgrade for E-Delivery PAK for ASR1000-HX Built-In 1GE 2-port License

Release Information:

The ASR 1001-HX is supported on the following software release:

- Cisco ASR 1001-HX support begins as of Cisco IOS XE Software Release 16.3S.

The ASR 1002-HX is supported on the following software release:

- Cisco ASR 1002-HX support begins as of Cisco IOS XE Software Release 16.2S.

The Cisco ASR 1001-X is supported on the following software release:

- Cisco ASR 1001-X support begins as of Cisco IOS XE Software Release 3.12S.

The 200-Gbps ESP is supported only on the following software releases:

- Cisco ASR 1013 support begins as of Cisco IOS XE Software Release 3.10S.
- Cisco ASR 1009-X support begins as of Cisco IOS XE Software Release 3.16S.

The 100-Gbps ESP is supported only on the following software releases:

- Cisco ASR 1006 and ASR 1013 support begins as of Cisco IOS XE Software Release 3.7S.
- Cisco ASR 1009-X support begins as of Cisco IOS XE Software Release 3.16S.

The 40-Gbps ESP is supported only on the following software releases:

- Cisco ASR 1004 support begins as of Cisco IOS XE Software Release 3.2S.
- Cisco ASR 1006 and ASR 1013 support begins as of Cisco IOS XE Software Release 3.1S.
- Cisco ASR 1009-X support begins as of Cisco IOS XE Software Release 3.16S.

Route processor

The disk drive on the route processor is used for storage purposes, such as for the Cisco IOS XE Software consolidated package, logs, and core dump files.

Route processor types

Route processors come in two main categories, integrated and modular. Depending on the chassis type, one or two can be running in a redundant mode. Table 5 lists relevant route processor specifics.

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Table 5. Route processor specifics

Route processor specifics						
Chassis part number	**Maximum number of route processors**	**ASR 1001-X Route Processor**	**ASR 1000-HX Route Processor**	**ASR 1002-X Route Processor**	**Route Processor 2**	**Route Processor 3**
ASR1001-X	1	Integrated*				
ASR1001-HX	1		Integrated*			
ASR1002-HX	1		Integrated*			
ASR1002-X	1			Integrated*		
ASR1004	1				Module	
ASR1006	2				Module	
ASR1006-X	2				Module	Module
ASR1009-X	2				Module	Module
ASR1013	2				Module	Module

* Because the Cisco ASR 1001-HX, ASR 1002-HX, ASR1001-X, and ASR 1002-X have integrated route processors, configuring or adding a separate route processor at the time of ordering is not necessary.

Route processor memory and storage

When ordering a route processor module, please consider the following components: memory, storage device, and USB flash memory token.

Table 6 lists relevant route processor memory and storage specifics.

Table 6. Route processor memory and storage specifics

Route processor memory			
Chassis part number	**Default memory**	**Maximum memory**	**Default and maximum storage**
ASR1001-X	8 GB	16 GB	8 GB EUSB
ASR1001-HX	8 GB	16 GB	32 GB EUSB
ASR1002-HX	16 GB	32 GB	32 GB EUSB
ASR1002-X	4 GB	16 GB	8 GB EUSB*
ASR1004	8 GB with RP2	8 GB with RP2	80 GB HDD with RP2
ASR1006	8 GB with RP2	8 GB with RP2	80 GB HDD with RP2
ASR1006-X	8 GB with RP2 8 GB with RP3	16 GB with RP2 64 GB with RP3	80 GB HDD with RP2 100 GB SSD default with RP3; upgradable

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Route processor memory			
			to 200 GB SSD or 400 GB SSD
ASR1009_X	8 GB with RP2 8 GB with RP3	16 GB with RP2 64 GB with RP3	80 GB HDD with RP2 100 GB SSD default with RP3; upgradable to 200 GB SSD or 400 GB SSD
ASR1013	8 GB with RP2 8 GB with RP3	16 GB with RP2 64 GB with RP3	80 GB HDD with RP2 100 GB SSD default with RP3; upgradable to 200 GB SSD or 400 GB SSD

* The ASR 1002-X also comes with an 8-GB EUSB flash drive; in addition, the ASR 1002-X has an optional 160-GB hard-disk drive (HDD), orderable with part number MASR1002X-HD-160G or MASR1002X-HD-160G=.

Note: All of the Cisco ASR 1000 spare route processors (ASR1000-RP2=) and the route processors in spare chassis orders (ASR1001-X=, ASR1001-HX, ASR1002-HX, and ASR1002-X=) are not configurable at the time of order, and they ship without any software.

Note: For Internet peering and edge and route reflector deployments, we highly recommend that you configure the Cisco ASR 1002-X with 8G of shared memory instead of the default 4G of shared memory. The Cisco ASR 1001-X and ASR 1001-HX come with 8G of shared memory as a default. The Cisco ASR 1002-HX comes with 16G of shared memory as a default.

Route processor redundancy

The Cisco ASR 1000 is a highly redundant router; the type of redundancy depends on the model. Table 7 lists relevant route processor memory redundancy requirements.

Table 7. Memory requirements for route processor redundancy

Redundancy requirements				
Chassis part number	**Inbox redundancy type**	**Default memory**	**Minimum memory for redundancy**	**Redundancy feature license**
ASR1001-X	SW No ISSU*	8 GB	8 GB	FLSASR1-IOSRED(=) or L-FLSASR1-IOSRED=
ASR1001-HX	SW No ISSU*	8 GB	8 GB	FLSASR1-IOSRED(=) or L-FLSASR1-IOSRED=
ASR1002-HX	SW No ISSU*	16 GB	16 GB	FLSASR1-IOSRED(=) or L-FLSASR1-IOSRED=
ASR1002-X	SW No ISSU*	4 GB	8 GB	FLSASR1-IOSRED(=) or L-FLSASR1-IOSRED=
ASR1004	SW No ISSU*	8 GB with RP2	8 GB with RP2	FLASR1-IOSRED-RTU(=)
ASR1006	HW ISSU**	8 GB with RP2	8 GB with RP2	N/A
ASR1006-X	HW ISSU	8 GB with RP2 or RP3	8 GB with RP2 or RP3	N/A

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Redundancy requirements				
ASR1009-X	HW ISSU	8 GB with RP2 or RP3	8 GB with RP2 or RP3	N/A
ASR1013	HW ISSU**	8 GB with RP2 or RP3	8 GB with RP2 or RP3	N/A

* Supports dual Cisco IOS Software redundancy.

** Supports hardware route processor and ESP redundancies, but does not support software redundancy.

USB flash memory token

You can order a 1-GB USB flash memory token (MEMUSB-1024FT) separately for Cisco ASR 1000 Series Routers to store configurations or Cisco IOS XE Software consolidated packages.

Ports and media interface modules: SIP and SPA

The media port adapter SPAs are housed by the SIP modules. The maximum number of SPA modules depends on both the type and number of SIPs supported by each router. SPA cards on the same SIP card do not need to be of the same type. Please refer to the Cisco ASR 1000 Series Shared Port Adapter Support data sheet for details about supported SPAs.

Certain routers have built-in Gigabit Ethernet ports. These built-in ports require Small Form-Factor Pluggable (SFP) optic or copper media. An SFP is a hot-swappable input/output device that plugs into a Gigabit Ethernet port, linking the port with the network. You can order the SFP at the same time you order the SPAs or later as a spare.

Table 8 lists relevant port specifics.

Table 8. Port specifics

Chassis part number	Maximum SPA slots	Maximum NIM slots	Maximum EPA slots	Maximum SIP40 slots	Maximum MIP100 slots	Built-in GE/SFP	Built-in 10GE/SFP+
ASR1001-X	1	1	N/A	N/A	N/A	6	2*
ASR1002-X	3	N/A	N/A	N/A	N/A	6	0
ASR1001-HX	N/A	N/A	N/A	N/A	N/A	up to 12	Up to 8
ASR1002-HX	N/A	1	1	N/A	N/A	8	8
ASR1004	8	N/A	N/A	2	N/A	N/A	N/A
ASR1006	12	N/A	N/A	3	N/A	N/A	N/A
ASR1006-X	8	N/A	4	2	2	N/A	N/A
ASR1009-X	12	N/A	6	3	3	N/A	N/A
ASR1013	24	N/A	12	6	6	N/A	N/A

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* ASR1001-X built-in 10 GE ports are turned on using port-based licenses. However, if the ASR1001-X is upgraded to 20G, then the two built-in ports are automatically included.

Release information follows:

- Cisco ASR 1000 Series 100-Gbps Modular Interface Processor (ASR1000-MIP100) as of Cisco IOS XE Software Release 3.16.1S
- Cisco ASR 1000 Series 1-port 100 Gigabit Ethernet Port Adapter (EPA-1X100GE) as of Cisco IOS XE Software Release 3.16.1S on ASR1000-MIP100 and XE 16.4.1 for ASR1002-HX
- Cisco ASR 1000 Series 2-port 40 Gigabit Ethernet port Adapter (EPA-2X40GE) as of Cisco IOS XE 16.6.2S
- Cisco ASR 1000 Series 1-port 40 Gigabit Ethernet port Adapter (EPA-1X40GE) as of Cisco IOS XE 16.6.2S
- Cisco ASR 1000 Series 2-port 40 Gigabit Ethernet Port Adapter (EPA-CPAK-2X40GE) as of Cisco IOS XE Software Release 3.16.2S on ASR1000-MIP100 and XE 16.4.1 for ASR1002-HX
- Cisco ASR 1000 Series 10-port 10 Gigabit Ethernet Port Adapter (EPA-10X10GE) as of Cisco IOS XE Software Release XE 16.2.1 on ASR1000-MIP100 and XE 16.3.1 for ASR1002-HX
- Cisco ASR 1000 Series 18-port 1 Gigabit Ethernet Port Adapter (EPA-18X1GE) as of Cisco IOS XE Software Release XE 16.2.1 on ASR1002-HX and XE 16.3.1 for ASR1000-MIP100

Power supplies

All Cisco ASR 1000 chassis come by default with either dual AC or dual DC power supplies. At the time of ordering, you can choose between dual AC and dual DC power supplies. **AC and DC in the same chassis is not supported**. Table 9 lists relevant power-supply specifics.

Table 9. Power-supply specifics

Power supplies					
Chassis part number	**Default number**	**Maximum number**	**AC**	**DC**	**Mix of AC and DC**
ASR1001-X	2: Redundant	2: Redundant	Yes	Yes	No
ASR1001-HX	2: Redundant	2: Redundant	Yes	Yes	No
ASR1002-HX	2: Redundant	2: Redundant	Yes	Yes	No
ASR1002-X	2: Redundant	2: Redundant	Yes	Yes	No
ASR1004	2: Redundant	2: Redundant	Yes	Yes	No
ASR1006	2: Redundant	2: Redundant	Yes	Yes	No
ASR1006-X	2: Nonredundant	4: Redundant	Yes	Yes	No
ASR1009-X	2: Nonredundant	6: Redundant	Yes	Yes	No
ASR1013	4: 2 redundant pairs	4: 2 redundant pairs	Yes	Yes	No

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Note: The dual power supplies for a spare chassis are optional, and they must either be configured with the spare chassis or ordered separately as power-supply spares.

Accessories

Every router chassis comes by default with an accessory kit. The accessory kit for a spare chassis is optional, and you must configure the spare chassis with it at the time of purchase or order it separately as a spare. The Cisco ASR 1000 accessory kit comes as a default on all Cisco ASR 1000 models and can be bought as a spare.

The Federal Information Processing Standards (FIPS) kits are sold only as spares. FIPS140-2 requires that routers have tamper-evident labels affixed across all removable component seams. In addition to tamper-evident labels, FIPS specifies that the view of internal components where cryptography is processed must be obscured.

Table 10 lists the accessories that come with the routers.

Table 10. Accessories

Accessories	
Description	**Part number**
Cisco ASR1001-HX Accessory Kit	ASR1001HX-ACS
Cisco ASR1001-HX Accessory Kit, spare	ASR1001HX-ACS=
Cisco ASR1001-HX Fan Module	ASR1001HX-FAN
Cisco ASr1001-HX Fan Module, spare	ASR1001HX-FAN=
Cisco ASR1002-HX Accessory Kit	ASR1002HX-ACS
Cisco ASR1002-HX Accessory Kit, spare	ASR1002HX-ACS=
Cisco ASR1002-HX Fan Module	ASR1002HX-FAN
Cisco ASR1002-HX Fan Module, spare	ASR1002HX-FAN=
Cisco ASR 1006-X Accessory Kit	ASR1006X-ACS
Cisco ASR 1006-X Accessory Kit, Spare	ASR1006X-ACS=
Cisco ASR 1009-X Accessory Kit	ASR1009X-ACS
Cisco ASR 1009-X Accessory Kit, Spare	ASR1009X-ACS=
Cisco ASR 1000-X Fan Module	ASR1000X-FAN
Cisco ASR 1000-X Fan Module, Spare	ASR1000X-FAN=
Blank Cover for ASR 1000-X Chassis Power Supply	ASR1KX-PWR-BLANK
Blank Cover for ASR 1000-X Chassis Power Supply, Spare	ASR1KX-PWR-BLANK=
Cisco ASR 1006 Accessory Kit, Spare	ASR1006-ACS=

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Accessories	
Cisco ASR 1004 Accessory Kit, Spare	ASR1004-ACS=
Cisco ASR 1001-X Accessory Kit	ASR1001X-ACS
Cisco ASR 1001-X Accessory Kit, Spare	ASR1001X-ACS=
NIM Carrier Card for SSD Drives	NIM-SSD
NIM Carrier Card for SSD Drives, Spare	NIM-SSD=
Blank faceplate for NIM slot on Cisco ISR 4400*	NIM-BLANK=
Cisco ASR 1006 FIPS Opacity Kit	ASR1006-FIPS-KIT=
Cisco ASR 1004 FIPS Opacity Kit	ASR1004-FIPS-KIT=
Cisco ASR 1002 FIPS Opacity Kit	ASR1002-FIPS-KIT=
Cisco ASR 1001 FIPS Opacity Kit, Spare	ASR1001-FIPS-KIT=
Cisco ASR 1013 Accessory Kit, Spare	ASR1013-ACS=
Cisco ASR 1013 Accessory Kit	ASR1013-ACS
Blank Cover ASR 1000 SIP, Spare	ASR1000-SIP-BLANK=
Blank Cover for ASR 1000 ESP, spare	ASR1000-ESP-BLANK=
Blank Cover for ASR 1000 RP, spare	ASR1000-RP-BLANK=
Blank Cover for regular SPA	SPA-BLANK=
Blank Cover for Ethernet Port Adapter (EPA), spare	EPA-BLANK=
Cisco ASR 1002-X Accessory Kit	ASR1002X-ACS

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Accessories	
Cisco ASR 1002-X Accessory Kit, Spare	ASR1002X-ACS=
Blank Cover for ASR 1002-X HDD	ASR1002X-HD-BLANK
Blank Cover for ASR 1002-X HDD, Spare	ASR1002X-HD-BLANK=

Note: * NIM-BLANK= (spare) is the same hardware component/product identified supported on Cisco ASR1001-X and ASR 4451-X Integrated Services Routers.

Note: Please note that ASR 1002-HX Network Interface Module (NIM) support will come after First Customer Shipment (FCS).

Ordering Cisco ASR 1000 Series Router Software

With the Cisco ASR 1000 Series, beginning with release 16.2, the concept of a universal software image in combination with an honor-based technology package license was introduced.

In summary:

- A PAK or license key enforces two types of licenses on the Cisco ASR 1001 prior to Cisco IOS XE Software Release 3.6S:
  - Technology package licenses (feature set licenses); part numbers and descriptions follow:
    - 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
  - Performance Upgrade license; part number FLS-ASR1001-5G to upgrade from 2.5 to 5 Gbps
- To enable a certain feature set on the Cisco ASR 1001, ASR 1001-X, or ASR 1002-X, you must order a universal image in combination with a technology package license.

Note: As of Cisco IOS XE Software Release 3.7S, the technology package licenses, the performance upgrade licenses, and all other licenses required for certain features on the Cisco ASR 1000 are not enforced.

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Table 11 lists the part numbers you must purchase to enable feature sets; Table 12 lists the part numbers for universal Cisco IOS XE Software consolidated packages with an integrated route processor; and Table 13 gives part numbers for the technology package licenses.

Table 11. Part numbers for Cisco ASR 1000 Series Software feature set enablement

For the equivalent feature set on ASR 1000 Series (Cisco ASR 1002/ASR1004/ASR1006/ASR1013)	To order universal software image part number	With technology package license part number
IP Base (IPBK9)	SASR1001NPEK9/SASR1K2XNPEK9	SLASR1-IPB
IP Base (IPBK9) W/O LI	SASR1001NP9NLI/SASR1K2XNP9NLI	SLASR1-IPB
Advanced IP Services (AISK9)	SASR1001UK9/SASR1K2XUK9	SLASR1-AIS
Advanced IP Services (AISK9) W/O LI	SASR1001UK9NLI/SASR1K2XUK9NLI	SLASR1-AIS
Advanced Enterprise Services (AESK9)	SASR1001UK9/SASR1K2XUK9	SLASR1-AES
Advanced Enterprise Services (AESK9) W/O LI	SASR1001UK9NLI/SASR1K2XUK9NLI	SLASR1-AES

Table 12. Descriptions of Universal Cisco IOS XE Software consolidated packages for ASR 1000 Series

Cisco IOS XE consolidated package	Part number	Description
Cisco IOS XE UNIVERSAL ASR1001/ASR 1002-X	SASR1001U/SASR1K2XU	• Provides low-cost base consolidated package • Offers only basic IP feature support - in combination with IPB Technology Package License • Satisfies export requirements for noncryptographic software
Cisco IOS XE - NO PAYLOAD ENCRYPTION UNIVERSAL ASR1001/ASR 1002-X	SASR1001NPEK9/SASR1K2XNPEK9	• 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 - in combination with IPB Technology Package License
Cisco IOS XE - NO PAYLOAD ENCRYPTION UNIVERSAL W/O LI ASR1001/ASR 1002-X	SASR1001NP9NLI/SASR1K2XNP9NLI	• 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 - in combination with IPB Technology Package License • Without Lawful Intercept
Cisco IOS XE - ENCRYPTION UNIVERSAL ASR1001/ASR 1002-X	SASR1001UK9/SASR1k2XUK9	• Supports all features, including encryption (IPsec, Triple Digital Encryption Standard [3DES], Advanced Encryption Standard [AES], and SSH), Lawful Intercept, and SBC as well as older protocols - in combination with AIS or AES Technology Package License (with AES Technology Package License, older protocols are supported, e.g. AppleTalk, etc.)

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Cisco IOS XE consolidated package	Part number	Description
Cisco IOS XE - ENCRYPTION UNIVERSAL W/O LI ASR1001/ASR 1002-X	SASR1001UK9NLI/SASR1k2XUK9NLI	• Supports all features, including encryption (IPsec, Triple Digital Encryption Standard [3DES], Advanced Encryption Standard [AES], and SSH), Lawful Intercept, and SBC as well as older protocols – in combination with AIS or AES Technology Package License (with AES Technology Package License, older protocols are supported, e.g. AppleTalk, etc.) • Without Lawful Intercept

Table 13. Descriptions of Cisco ASR 1000 Technology package licenses

ASR1000 technology package licenses	
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
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

Ordering Cisco ASR 1000 Series Router feature licenses

Software feature licenses are required to turn on services on Cisco ASR 1000 Series Routers, in addition to the appropriate Cisco IOS XE Software as described in the previous section.

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 (with some exceptions for the Cisco ASR 1001 licenses prior to Cisco IOS XE Software Release 3.6S; refer to the section “Ordering Cisco ASR 1001, ASR1001-X, and ASR 1002-X Series Feature Licenses”) are honor-based; that is, the licenses are not enforced through a product activation or license key.

Alternatively, you can choose to order solution bundles that are for targeted use cases. APP and SEC solution licenses are available.

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Services that require only an RTU license include the following:

- IP Security (IPsec) service: The Cisco ASR 1000 Series Router IPsec application requires an RTU license (FLASR1-IPSEC-RTU(=), and FLSA1-2X-IPS4G(=) on ASR 1002-X), which allows you to enable IPsec Triple Digital Encryption Standard (3DES) and Advanced Encryption Standard (AES), Dynamic Multipoint VPN (DMVPN), and Easy VPN.

  The ASR1002-HX and ASR1001-HX each require a special encryption HW module (ASR1002HX-IPSECHW(=) and ASR1001HX-IPSECW(=)), along with RTU tier-based license(s), to enable IPsec Triple Digital Encryption Standard (3DES), Advanced Encryption Standard (AES), Dynamic Multipoint VPN (DMVPN), and Easy VPN.

  IPsec licenses for ASR1002-HX are offered in three tiers or levels: 8G, 16G, and 25G

  FLSA1-2HXIPS8G(=): 8-Gbps crypto throughput base license

  FLSA1-2HX8G16G(=): 8-Gbps to 16-Gbps crypto throughput upgrade license

  FLSA1-2HX8G25G(=): 8-Gbps to 25-Gbps crypto throughput upgrade license

  FLSA1-2HX16G25G(=): 16-Gbps to 25-Gbps crypto throughput upgrade license

  L-FLSA1-2HXIPS8G=: 8-Gbps crypto throughput base license, e-delivery

  L-FLSA1-2HX8G16G=: 8-Gbps to 16-Gbps crypto throughput upgrade license, e-delivery

  L-FLSA1-2HX8G25G=: 8-Gbps to 25-Gbps crypto throughput upgrade license, e-delivery

  L-FLSA1-2HX16G25G=: 16-Gbps to 25-Gbps crypto throughput upgrade license, e-delivery

  IPsec licenses for ASR1001-HX are offered in two tiers or levels: 8G and 16G

  FLSA1-1HXIPS8G(=): 8-Gbps crypto throughput base license

  FLSA1-1HX8G16G(=): 8-Gbps to 16-Gbps crypto throughput upgrade license

  L-FLSA1-1HXIPS8G=: 8-Gbps crypto throughput base license, e-delivery

  L-FLSA1-1HX8G16G=: 8-Gbps to 16-Gbps crypto throughput upgrade license, e-delivery

- Firewall service: The Cisco ASR 1000 Series Router Firewall application requires an RTU license (FLASR1 FW-RTU(=)), which allows you to enable Firewall Services at Layer 4. Additionally:
  - To enable per-subscriber or -user firewall in broadband and enterprise deployments, the firewall RTU license as well as the number-of-sessions licenses listed in the “Broadband and Service Provider Wi-Fi Service” bullet later in this list are required.
- Firewall or Network Address Translation (NAT) stateful interchassis redundancy: Enabling interchassis redundancy for firewall and NAT requires an RTU license (FLASR1-FWNAT-RED(=)) on any Cisco ASR 1000 Router that supports interchassis redundancy.
- Stateful Network Address Translation 64 (Stateful NAT64) service (available as of Cisco IOS XE Software Release 3.4S): The Cisco ASR 1000 Series Router NAT64 service helps solve the IPv4 exhaust problem, enables IPv6 adoption, and requires an RTU license (FLASR1-NAT64-2M (=)) that enables up to 2M translations depending on the selected ESP (for example, ESP20 or ESP40 supports 2M translations, whereas ESP10 supports 1M). Stateless NAT64 service that is available as of Cisco IOS XE Software Release 3.2S does not require any license. Stateful NAT64 service is available as of Cisco IOS XE Software Release 3.4S.

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- Carrier Grade Network Address Translation 44 (CGN) service (available as of Cisco IOS XE Software Release 3.6S): The Cisco ASR 1000 Series Router CGN is positioned between a private and public IP network and uses nonglobal, private IP addresses and a public IP address for translation. Carrier Grade NAT dynamically maps one or more private IP addresses into one or more public (globally routable) IP addresses that use Network Address and Port Translation (NAPT) techniques. Traditionally, NAT boxes are deployed in residential Home Gateways (HGWs) to translate multiple private IP addresses that are configured on multiple devices inside the home to a single public IP address that is configured and provisioned on the HGW by the service provider. Service providers deploy NAT in such a way that multiple subscribers can share a single global IP address. The Carrier Grade NAT scales to several millions of NAT translations. CGN on the Cisco ASR 1000 Series Router requires an RTU license (FLASR1-CGN-2M (=)) that enables up to 2M translations or (FLASR1-CGN-6M (=)) that enables up to 6M translations depending on the selected ESP. For hardware models that support more than 2M or 6M translations, you can order more than one license. For example, with the Cisco ASR 1000 ESP100, you can have up to 12M translations, so you can order 2 x FLASR1-CGN-6M(=) to give you RTU of up to 12M translations. You can configure CGN by using the ipnat settings mode cgn command. Use the ipnat settings mode default command to change to the default or traditional NAT operating mode. In the default mode, you do not need any license. In CGN mode, you will need one of the following part numbers: FLASR1-CGN-2M (=) or FLASR1-CGN-6M (=).
- Cisco IOS Flexible Packet Inspection (FPI) service: The Cisco ASR 1000 Series Router FPI application requires an RTU license (FLASR1-FPI-RTU(=)), which allows you to enable Flexible Packet Matching (FPM). As of Cisco IOS XE Software Release 3.4S, Network-Based Application Recognition (NBAR) requires the Application Visibility and Control license and is no longer covered under the FPI license.
- Cisco Application Visibility and Control (AVC) (available as of Cisco IOS XE Software Release 3.4S): Cisco AVC provides a powerful pervasive, integrated service management solution based on stateful Deep Packet Inspection (DPI). With Cisco AVC, instead of processing packets as individual events, the Cisco ASR 1000 Series Router fully reconstructs flows and the Layer 7 state of each application flow for application- and session-based classification and management of IP traffic.
    - The Cisco ASR 1000 Series Router Application Visibility and Control RTU license (FLASR1-AVC-RTU(=)) enables you to configure NBAR and advanced application awareness on the Cisco ASR 1000 Series Routers or application reporting (visibility) and usage in application control in QoS policies.
    - The Cisco ASR 1000 Series Router Application Visibility and Control Upgrade license (FLASR1-AVC-UPG(=)) enables you to upgrade from your current existing FPI license to the new advanced Application Visibility and Control (AVC) license.
    - The Cisco Insight reporting RTU license ((FLASR1-NSIGHT-RTU(=)) is a complementary external software component to the Cisco ASR 1000 Series Router Application Visibility and Control RTU license; Cisco Insight is an external web-based reporting tool that you can install on any external generic server that complies to its prerequisites; the license is per Cisco ASR 1000 unit.

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- Cisco IOS Software redundancy: The Cisco ASR 1000 Series Router software redundancy requires an RTU license (FLASR1-IOSRED-RTU(=) on ASR 1002; and FLSASR1-IOSRED(=) on ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, and ASR 1002-X), which allows you to enable software redundancy on the Cisco ASR 1001, ASR 1002, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, ASR 1002-X, and ASR 1004 chassis. Software redundancy requires 4-GB DRAM on the RP1, and minimum 8-GB DRAM on the ASR 1001, ASR 1001-X, ASR 1001-HX, or ASR 1002-X. The Cisco ASR 1001, ASR 1002, and ASR 1002-X come by default with 4-GB DRAM on the built-in route processor, the ASR 1001-X and ASR 1001-HX come by default with 8 GB DRAM, and the ASR 1002-HX comes by default with 16-GB DRAM.

In addition, solution licenses are available for specific use cases. The following two types of solution licenses are orderable: APP and SEC. The APP solution license is a license bundle including AVC-RTU, while the SEC solution license is a license bundle for FW-RTU and IPSEC-RTU.

- APP solution license: SL-ASR1-APP is a license bundle that includes FLASR1-AVC-RTU.
- SEC solution license has two variants:
  - SL-ASR1-SEC is a license bundle that includes FLASR1-FW-RTU and FLASR1-IPSEC-RTU.
  - SL-ASR1-SEC-HX is a license bundle specifically for ASR1001-HX and ASR1002-HX. SL-ASR1-SEC-HX includes FLSASR1-FW and FLSA1-2HXIPS8G on ASR1002-HX; SL-ASR1-SEC-HX includes FLSASR1-FW and FLSA1-1HXIPS8G on ASR1001-HX.

Cisco ONE Software

Cisco ONE™ Software is a new software subscription model that allows you to transfer software from one generation to the next, provided that you are subscribed to the annual Cisco Software Support Service (SWSS). This subscription model offers software portability and lowers customer Total Cost of Ownership (TCO). The SWSS charge is applied only to the Cisco ONE software suite. Cisco Smart Net Total Care™ support is optional.

Cisco ONE comprises hardware and software PIDs. When you enter a hardware PID beginning with “C1-”, you need to then configure the Foundation and/or AUC suites (refer to Tables 14 and 15).

Table 14. Hardware PIDs

Part number	Description
C1-ASR1001-X/K9	Cisco ONE ASR 1001-X Chassis, IP Base, APIC EM, APIs
C1-ASR1002-X/K9	Cisco ONE ASR 1002-X Chassis, IP Base, APIC EM, APIs
C1-ASR1001-HX/K9	Cisco ONE ASR 1001-HX Chassis, IP Base, APIC EM, APIs
C1-ASR1002-HX/K9	Cisco ONE ASR 1002-HX Chassis, IP Base, APIC EM, APIs
C1-ASR1004/K9	Cisco ONE ASR 1004 Chassis, IP Base, APIC EM, APIs
C1-ASR1006/K9	Cisco ONE ASR 1006 Chassis, IP Base, APIC EM, APIs
C1-ASR1006X/K9	Cisco ONE ASR 1006-X Chassis, IP Base, APIC EM, APIs
C1-ASR1009X/K9	Cisco ONE ASR 1009-X Chassis, IP Base, APIC EM, APIs
C1-ASR1013/K9	Cisco ONE ASR 1013 Chassis, IP Base, APIC EM, APIs

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Table 15. Software PIDs

Part number	Description
C1F1PASR1K9[1]	Cisco ONE FND Perpetual Suite AES IPsec FW AVC Prime
C1AUPASR1K9	Cisco ONE AUC Perpetual AES CUBE Ent 100 Session
C1AUPASR1100RK9	Cisco ONE AUC Perpetual AES CUBE Ent 100 Ssn Redund Upgrade
C1AUPASR1500SK9	Cisco ONE AUC Perpetual AES CUBE Ent 500 Session Upgrade
C1AUPASR1500RK9	Cisco ONE AUC Perpetual AES CUBE Ent 500 Ssn Redund Upgrade
C1AUPASR11KSK9	Cisco ONE AUC Perpetual AES CUBE Ent 1000 Session Upgrade
C1AUPASR11KRK9	Cisco ONE AUC Perpetual AES CUBE Ent 1000 Ssn Redund Upgrade
C1AUPASR14KSK9	Cisco ONE AUC Perpetual AES CUBE Ent 4000 Session Upgrade
C1AUPASR14KRK9	Cisco ONE AUC Perpetual AES CUBE Ent 4000 Ssn Redund Upgrade
C1AUPASR116KSK9	Cisco ONE AUC Perpetual AES CUBE Ent 16,000 Session Upgrade
C1AUPASR116KRK9	Cisco ONE AUC Perpetual AES CUBE Ent 16,000 Ssn Redund

Broadband and Service Provider Wi-Fi Service

You must order an RTU license to enable Broadband, Service Provider Wi-Fi (SP Wi-Fi), Intelligent Services Gateway (ISG), and Intelligent Wireless Access Gateway (iWAG) applications on the Cisco ASR 1000 Series Router. The **FLASR1-BB-RTU(=)** license allows you to enable Broadband, SP Wi-Fi, ISG, and iWAG applications for up to 500 sessions. To increase the number of sessions, you must order one or more number-of-sessions licenses. Part numbers for these licenses follow:

- FLASR1-BB-4K(=)
- FLASR1-BB-16K(=)
- FLASR1-BB-32K(=)
- FLASR1-BB-48K(=)
- FLASR1-BB-64K(=)

[1] For ASR1002-HX, the base IPsec license (8G crypto) FLSA1C1-2HXIPS8G is mandatory with Cisco ONE Foundation Suite.

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For example, the FLASR1-BB-4K(=)license allows you to enable up to 4,000 sessions (+500 from RTU), whereas the FLASR1-BB-64K(=) license allows you to enable up to 64,000 (+500 from RTU) sessions.

- You can combine multiple session licenses for the session count desired; for example, you can purchase two 4,000-session licenses for 8,000 additional sessions, and you can combine a 16,000-session license with a 4,000-session license for 20,000 additional sessions.
- The maximum number of sessions supported with a particular Cisco ASR1000 RP-ESP combination depends on the features enabled with those sessions. Please refer to the Broadband scaling document for further details:

  https://www.cisco.com/en/US/docs/routers/asr1000/configuration/guide/chassis/scaling_ps9343_TSD_Products_Configuration_Guide.html - wp1115111.

Cisco ASR 1000 broadband bundles are created to provide ordering convenience. Depending on the number of users supported, you can choose the following bundles:

- Part number ASR1006-10G-B16/K9: Supports 16,000 sessions
- Part number ASR1006-10G-B24/K9: Supports 24,000 sessions
- Part number ASR1K6R2-20G-B32/K9: Supports 32,000 sessions

  Note: For Cisco ASR 1000 Series bundles, please refer to the Cisco ASR 1000 Series Price List or contact your local Cisco representative.

Features sets provided in the above bundles include:

- LAC and LNS: For Layer 2 Tunneling Protocol Access Concentrator (LAC) and L2TP Network Server (LNS) functions, sessions are counted as the number of Point-to-Point Protocol (PPP) sessions. The numbers of Layer 2 Tunneling Protocol (L2TP) tunnels are not counted as sessions and do not require an additional license.L2TS: For L2TP Tunnel Switch (L2TS) functions, session licenses required are based on the number of L2TP tunnels being switched. For example, if the Cisco ASR 1000 Series Router is used to switch 8,000 L2TP tunnels, you must order two 4,000-session licenses (FLASR1-BB-4K(=)).
- ISG: The ISG feature set is covered under the Broadband RTU license. Session licenses apply similar to LAC and LNS based on PPP or IP over Ethernet (IPoE) sessions being enabled.
- PMIPv6 MAG: The PMIPv6 MAG feature set is covered under the Broadband RTU license. Session licenses are required in addition, based on the number of subscribers tunneled using PMIPv6.
- iWAG: The iWAG feature set is covered under the Broadband RTU license. Session licenses are required in addition, based on the number of subscribers supported by iWAG. The number of tunnels coming in and out of the Cisco ASR 1000 as iWAGs are not counted toward the sessions or licenses. For example, if the Cisco ASR 1000 Series Router is aggregating 8,000 subscribers, then you must order two 4,000-session licenses (FLASR1-BB-4K(=)). In cases where the ISG Walk-By subscriber management feature is used, the required session count is based only on the maximum number of active subscriber sessions being supported.
- Per-Subscriber Firewall: The Cisco ASR 1000 Series Router per-subscriber or per-user firewall service requires both an RTU license (FLA SR1-FW-RTU(=)) and one or more session licenses.

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Services that require only number-of-sessions licenses follow:

- Cisco Unified Border Element (SP Edition) service: Cisco Unified Border Element (SP Edition) is a highly scalable, carrier-grade SBC integrated into Cisco ASR 1000 Series Routers.
  - Cisco Unified Border Element (SP Edition) licenses authorize the use of both distributed and unified SBC deployment models.
  - For the purpose of session license ordering, an SBC session is a bidirectional media flow and associated signaling. A session represents a complete voice call through the SBC: two call legs consisting of two media legs for a bidirectional media flow and associated signaling on both call legs.
  - A videophone call uses two sessions: one session for a bidirectional media flow and associated signaling (as in a voice call) and one more session for the second bidirectional media flow for video.
  - An instant messaging session consists of signaling between two endpoints through the SBC; there is typically no associated media.
- You can combine multiple session licenses for the session count desired. Part numbers for these licenses follow:
  - FLASR1-CUBES-250P(=)
  - FLASR1-CUBES-2KP(=)
  - FLASR1-CUBES-4KP(=)
  - FLASR1-CUBES-16KP(=)
  - FLASR1-CUBES-32KP(=)
  - FLASR1-CUBES-LAB(=)
  - FLASR1-CUBES-TPEX(=)

  When using an ACTIVE/STANDBY pair of routers, a single license for both is required for redundancy:
  - CUBESP-250P-RED (=)
  - CUBESP-2K-RED (=)
  - CUBESP-4K-RED (=)
  - CUBESP-10K-RED (=)
  - CUBESP-16K-RED (=)
  - CUBESO-32K-RED (=)
  - CUBESP-TPEX-RED (=)
- Cisco Unified Border Element (Enterprise Edition) service: For this service the SBC functions are integrated into Cisco ASR 1000 Series Routers. Cisco Unified Border Element (Enterprise Edition) licenses authorize the use of SBC for enterprise deployments. These licenses are session-count-based licenses.

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- Part numbers for these licenses follow:
  - FLASR1-CUBEE-100P
  - FLASR1-CUBEE-100P=
  - FLASR1-CUBEE-500P
  - FLASR1-CUBEE-500P=
  - FLASR1-CUBEE-1KP
  - FLASR1-CUBEE-1KP=
  - FLASR1-CUBEE-4KP
  - FLASR1-CUBEE-4KP=
  - FLASR1-CUBEE-16KP
  - FLASR1-CUBEE-16KP=
- When using an ACTIVE/STANDBY pair of routers, a single license for both is required for redundancy:
  - FLASR1-CUBEE-100R
  - FLASR1-CUBEE-100R=
  - FLASR1-CUBEE-500R
  - FLASR1-CUBEE-500R=
  - FLASR1-CUBEE-1K-R
  - FLASR1-CUBEE-1K-R=
  - FLASR1-CUBEE-4K-R
  - FLASR1-CUBEE-4K-R=
  - FLASR1-CUBEE-16K-R
  - FLASR1-CUBEE-16K-R=

Note: For Cisco ASR 1000 demo licenses to test the Cisco ASR 1000 in the lab, please contact your local Cisco representative.

Note: No feature license is required to run Cisco Overlay Transport Virtualization (OTV), Virtual Private LAN Services (VPLS), or LISP on Cisco ASR 1000 Series.

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Ordering Cisco ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, and ASR 1002-X Series feature licenses

In order to turn on services on the Cisco ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, or ASR 1002-X Router, software feature licenses are required as on the other Cisco ASR 1000 Series Routers (part numbers ASR1002, ASR1004, ASR1006, and ASR1013).

However, with the Cisco ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, and ASR 1002-X, the concept of a universal software image and a feature license to enable and enforce a certain feature set through a license (referred to as a technology package license) is introduced.

The technology package licenses as well as the performance upgrade license to upgrade from 2.5 to 5 Gbps on the Cisco ASR 1001 are enforced through a PAK prior to Cisco IOS XE Software Release 3.6S. All the other feature licenses that are required on the rest of the Cisco ASR 1000 Series are also required on the Cisco ASR 1001, but those licenses are all honor-based; that is, there is no enforcement. For ASR 1001-X and ASR 1002-X, all licenses, including technology package licenses, performance upgrade licenses from 2.5 to 5, 10, or 20 Gbps (on ASR 1001-X) and 5 to 10, 20, or 36 Gbps (on ASR 1002-X), are honor-based.

- Please note, though, that for the feature licenses on the Cisco ASR 1001, you must order different part numbers for the same type of functions. All the Cisco ASR 1001 feature set license part numbers are listed on the Cisco ASR 1000 Series Price List.

Following is also an example related to the part numbers: If you want to deploy firewall on a Cisco ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, or ASR 1002-X, you must order part number FLSASR1-FW when you purchase the router.

The part number for deployment of firewall on the other Cisco ASR 1000 chassis (part numbers ASR1002, ASR1004, ASR1006, and ASR1013) is FLASR1-FW-RTU.

If you want to upgrade to firewall after the time of purchase of the router, for the Cisco ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, or ASR 1002-X you must order either part number FLSASR1-FW= or L-FLSASR1-FW=.

For the other Cisco ASR 1000 chassis (part numbers ASR1002, ASR1004, ASR1006, ASR 1006-X, ASR 1009-X, and ASR1013), you must order part number FLASR1-FW-RTU. All of the Cisco ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, and ASR 1002-X feature license part numbers are listed on the Cisco ASR 1000 Price List.

If a customer needs to purchase a Cisco ASR 1001, ASR 1001-X, ASR 1001-HX, ASR 1002-HX, or ASR 1002-X spare license (for example, for a technology package upgrade from IP Base to Advanced Enterprise Services, for a performance upgrade from 2.5 to 5 Gbps on the Cisco ASR 1001 chassis, or for a feature that requires a license and the license was not purchased at the time of order), two types of spare licenses are available. The SLASR1-xxx-= license provides a PAK or license file with paper delivery, and the L-SLASR1-xxx-= license provides a PAK or license file through e-delivery.

- The spares can also be purchased as a “multiuse PAK”, by ordering either SLFL-ASR1= (for paper delivery) or L-SLFL-ASR1= (for e-delivery).

Note: For Cisco ASR 1001 demo licenses to test the Cisco ASR 1001 in the lab, please contact your local Cisco representative.

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Ordering Cisco ASR 1000 Series bundles

Numerous Cisco ASR 1000 bundle part numbers are available to ease the ordering process. All bundles come by default with dual power supplies and power cable (if AC power supply is chosen), an ESP, a route processor module, and a SIP. The ESP, route processor, or SIP is either fixed in the chassis or added as a default component to the bundle, depending on the type of chassis.

All bundles are in general further configurable and related to hardware components:

- Additional route processor and ESP (applicable only to the Cisco ASR 1006 and ASR 1013 bundles)
- Additional SIP (applicable only to Cisco ASR 1004, ASR 1006, and ASR 1013 bundles)
- SPAs
- Additional feature licenses
- Dual AC or DC power supplies
- Type of power cord
- USB flash memory

Following are the categories of Cisco ASR 1000 bundles:

- Base bundles: No feature license included
- HA bundles: Software redundancy license for Cisco ASR 1002, ASR 1001-X, ASR 1002-X, and ASR 1004, or redundant route processors and ESPs for Cisco ASR 1006 and ASR 1013
- VPN bundles: IPsec license
- Security bundles: IPsec and firewall licenses
- FPI bundles: Cisco IOS Flexible Packet Inspection license
- SHA (Security + HA) bundles: IPsec, firewall, FPI, and software redundancy license for Cisco ASR 1002, ASR 1002-X, and ASR 1004, or redundant route processors and ESPs for Cisco ASR 1006 and ASR 1013
- Broadband bundles: Broadband RTU license (covers up to 500 broadband sessions) and broadband session licenses

The Cisco IOS XE Software in the Cisco ASR 1000 bundles is not configurable. In general the bundles come with the latest Cisco IOS XE Software release, but it is subject to change without further notice.

All Cisco ASR 1000 bundles except the broadband bundles come with the AESK9 consolidated package; the broadband bundles come with the AISK9 consolidated package.

Note: For the Cisco ASR 1001, ASR 1001-X, and ASR 1002-X, one universal software image and one technology package license is included in the bundle. For example, the “equivalent” of the software image AESK9 on the Cisco ASR 1002, ASR 1004, ASR 1006, and ASR 1013 is obtained for the Cisco ASR 1001 or ASR 1002-X with the UK9 universal image and the Advanced Encryption Standard (AES) technology package license.

Please go to the “Ordering Information” section of this document for the complete listing of available bundles.

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Configuration examples

The following examples describe the products you need for certain network deployments, and they list the part numbers to order.

Note: These examples are not exhaustive, and you should not follow them exactly as presented. You should customize your order based on your needs.

Example 1: Cisco ASR 1000 Series Router for application experience (ASR1000-AX)

The ASR 1000-AX bundles offer optimal application experience from anywhere. Cisco is enabling customers to deploy application-centric networking, designed to help IT deliver applications from anywhere the business requires, with an optimal user experience that results in greater employee productivity and customer satisfaction.

- Your business applications can run faster: We work with leading application vendors to tune their applications to run more efficiently on a Cisco network, automatically... reducing bandwidth by up to 70 percent and supporting more sessions and a better user experience. The business investment on mission-critical applications will be more productive with Cisco, giving a better Return on their Investment (ROI).
- IT gains pervasive visibility to more than 1000 apps across the network, without expensive or difficult-to-deploy probes that are often deployed in selective areas of the network: Thus IT can quickly answer why an application is running slowly, validate service-level agreements (SLAs), and verify the ROI on network services.

All of these benefits are available at **lower TCO**, with lower operating expenses (OpEx) for maintenance and troubleshooting.

The ASR 1000 Application Experience (AX) bundles consist of the following items:

- AVC license with NBAR2 DPI, Flexible NetFlow (FNF) and Performance Monitoring
- AppNav for WAN optimization
- Option to purchase heavily discounted Cisco Virtual Wide Area Application (vWAAS) licenses, to be run on a standalone server

Table 16 lists the part numbers associated with the new Cisco ASR 1000-AX offering.

Table 16. Cisco ASR 1000 Series Router for application experience

Part number	Product description	Quantity
ASR1001X-AES-AX	ASR1001X AX, AVC, AES, vWAAS, Bundle	1
ASR1001X-AIS-AX	ASR1001X AX, AVC, AIS, vWAAS, Bundle	1
ASR1002X-AES-AX	ASR1002X AX, AVC, AES, vWAAS Bundle	1
ASR1002X-AIS-AX	ASR1002X AX, AVC, AIS, vWAAS Bundle	1
FLASR1-AX-IPB-AES	Cisco ASR 1000 Series IP BASE to ADV ENT SERVICES Upg For AX	1
FLASR1-AX-IPB-AIS	Cisco ASR 1000 Series IP BASE to ADV IP SERVICES Upg For AX	1

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Part number	Product description	Quantity
SLASR1-2XAX-AES=	ASR1002X AX Upg with AVC, AES Licenses	1
SLASR1-2XAX-AIS=	ASR1002X AX Upg with AVC, AIS Licenses	1
SLASR1-2XAX-AVC=	ASR1002X AX Upg with AVC	1
FLASR1-AX-VWAAS12K	Cisco ASR 1000 Series vWAAS License with 12K sessions	1
FLASR1-AX-VWAAS50K	Cisco ASR 1000 Series vWAAS License with 50K sessions	1

Table 17 lists the part numbers associated with the Cisco ASR 1000 Series Router bundles. Note that with each of the bundles, Cisco is providing the option to purchase discounted vWAAS licenses (FLASR1-AX-VWAAS12K and FLASR1-AX-VWAAS50K).

Table 17. Cisco ASR 1000 Series Router bundles for application experience

Part number	Product description	Quantity
ASR1001-5G-AES-AX	**ASR1001 AX, AVC, AES, 5G, vWAAS, Bundle, includes:**	
	ASR1001	1
	SLASR1-AES	1
	FLS-ASR1001-5G	1
	FLSASR1-AVC	1
ASR1001-5G-AIS-AX	**ASR1001 AX, AVC, AIS, 5G, vWAAS, Bundle, includes:**	
	ASR1001	1
	SLASR1-AIS	1
	FLS-ASR1001-5G	1
	FLSASR1-AVC	1
ASR1002X-AES-AX	**ASR1002X AX, AVC, AES, vWAAS Bundle, includes:**	
	ASR1002-X	1
	SLASR1-AES	1
	FLSASR1-AVC	1
ASR1002X-AIS-AX	**ASR1002X AX, AVC, AIS, vWAAS Bundle, includes:**	
	ASR1002-X	1
	SLASR1-AES	1
	FLSASR1-AVC	1

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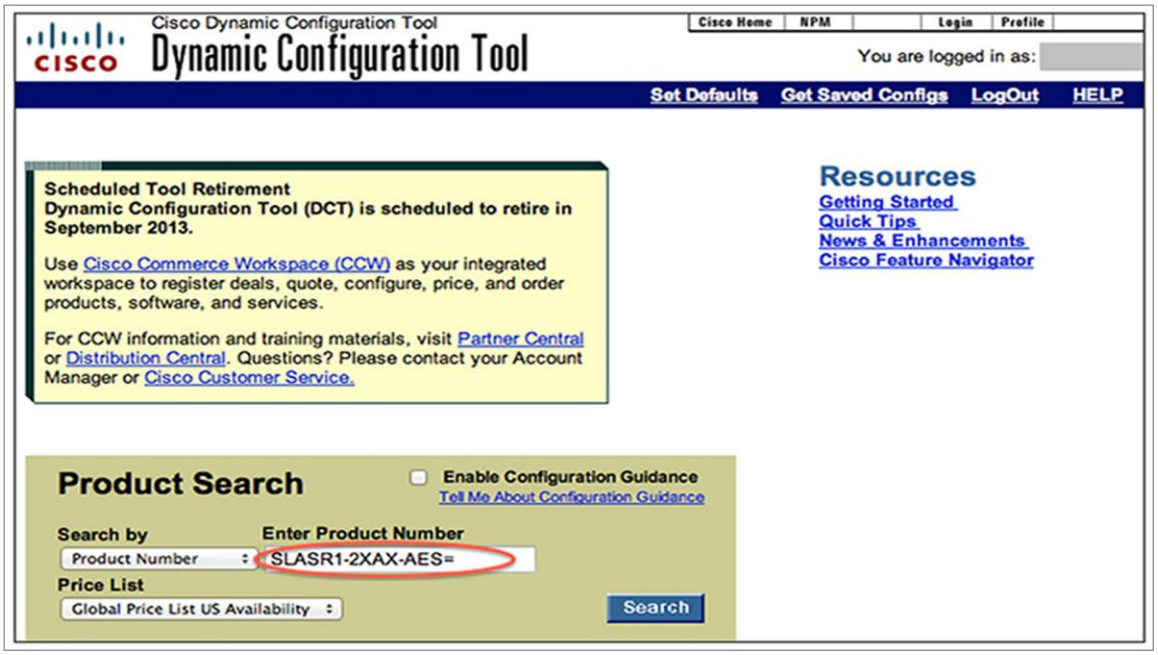
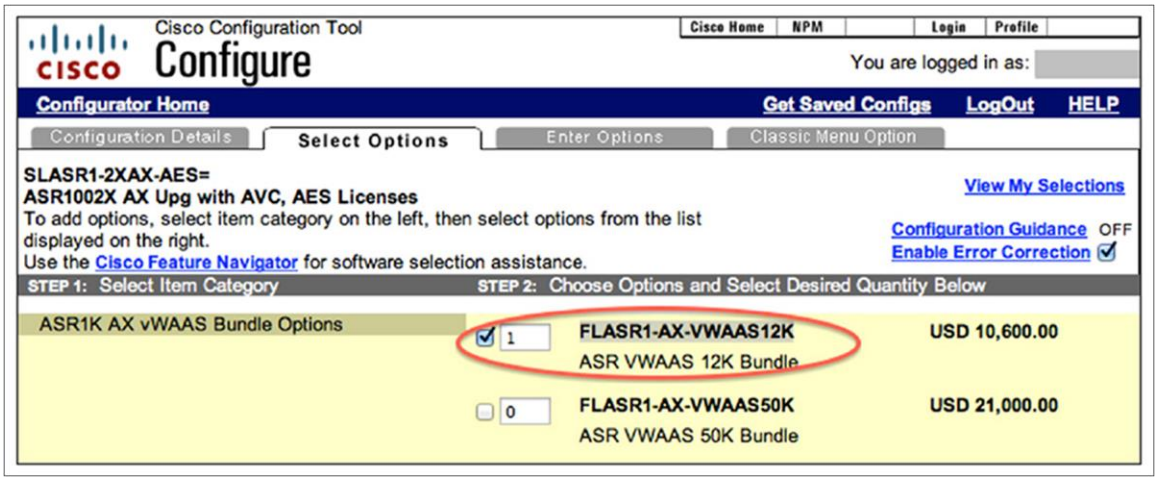
Following is a walk-through example of an AX upgrade license using the Cisco Dynamic Configuration Tool found at: https://apps.cisco.com/qtc/config/jsp/configureHome.jsp.

Step 1. Enter SLASR1-2XAX-AES= in the dynamic configuration tool homepage and select the AX upgrade license.



Step 2. Select the Options tab and click “ASR1K AX vWAAS Bundle Options”.



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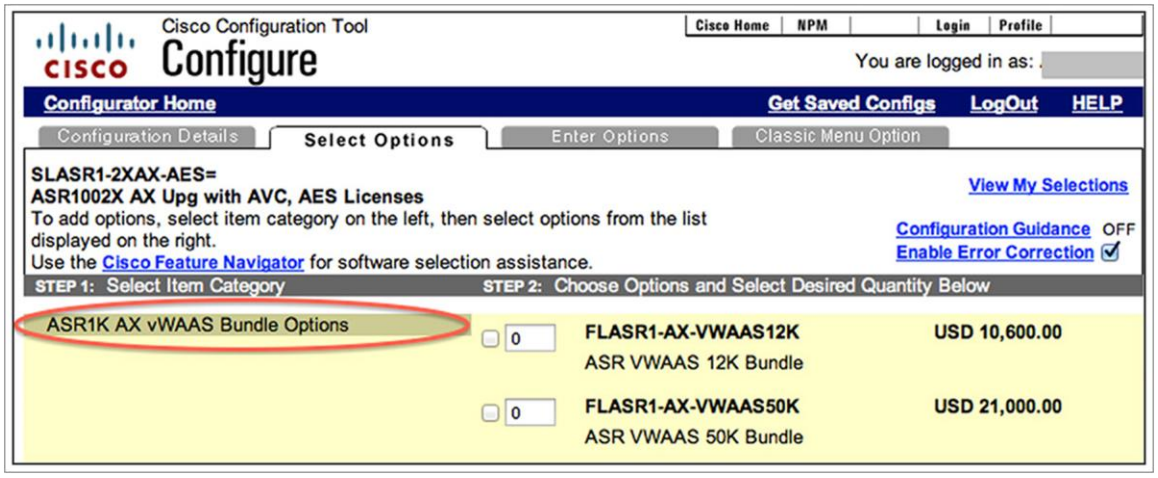
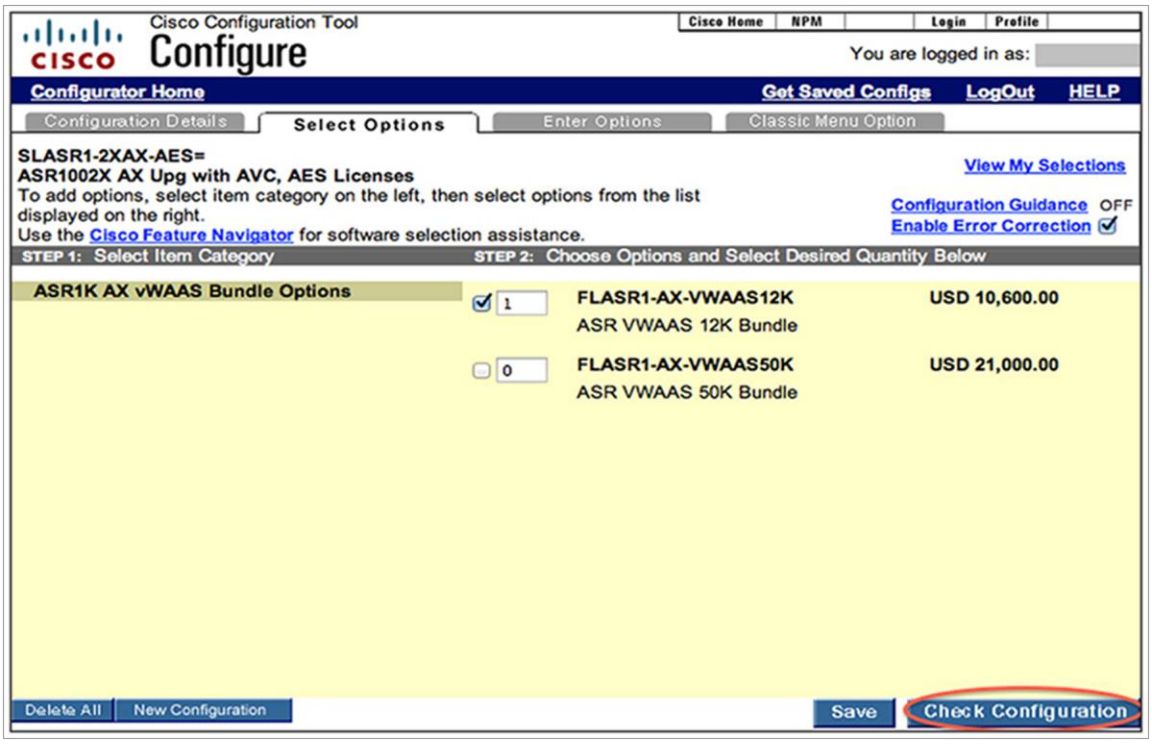
Step 3. [Optional] Select the quantity and type of the vWAAS license bundle to be purchased with the bundle.



Step 4. Click “Check Configuration” to see the selected configuration.



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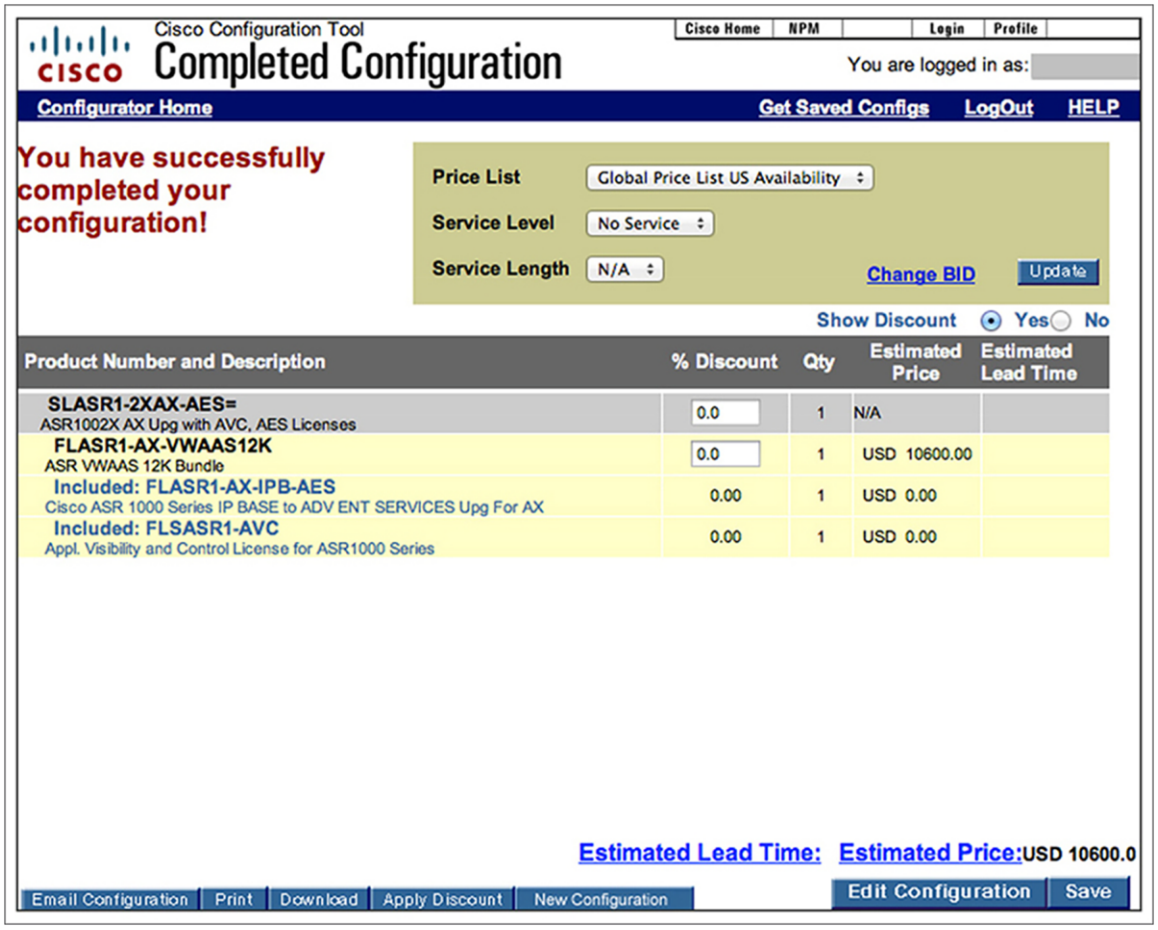
Step 5. The selected configuration with the price is as shown in the following screenshot.



Example 2: Cisco ASR 1000 Series Router as a broadband aggregation Router

In this example, a Cisco ASR 1000 Series Router is used for broadband aggregation, such as a Point-to-Point Termination and Aggregation (PTA) device or as a(n):

- IP-over-Ethernet (IPoE) broadband remote access server
- LAC
- LNS
- L2TS

A 6RU chassis (Cisco ASR 1006) with redundant RP2s and 20-Gbps ESPs is configured in order to achieve five-nines availability. The Cisco ASR 1000 Series RP2 comes by default with an 80-GB hard disk. You should select RP2 16-GB DRAM memory (part number M-ASR1K-RP2-16GB). Additional memory is required when the broadband RTU license (part number FLASR1-BB-RTU) is selected with RP2 (part number ASR1000-RP2). You need three SIP cards to host two double-height, 10 Gigabit Ethernet SPA cards and four single-height, 8-Gigabit Ethernet SPA cards.

The Cisco IOS XE Advanced IP Services consolidated package facilitates broadband and Multiprotocol Label Switching (MPLS) features on the router.

A 32,000-subscriber broadband number-of-sessions license and the broadband RTU license allow you to scale up to 32,000 subscribers on the system.

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Table 18 lists the part numbers to order for this scenario.

Table 18. Cisco ASR 1000 Series Router as a broadband aggregation router

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP2	Cisco ASR1000 Route Processor 2, 8GB DRAM	2
M-ASR1K-RP2-16GB	Cisco ASR1000 RP2 16GB DRAM	2
M-ASR1K-HDD-80GB	Cisco ASR1000 RP2 80GB HDD	2
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20Gbps	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	3
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	2
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	2
SPA-8X1GE-V2	Cisco 8-Port Gigabit Ethernet Shared Port Adapter	4
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	32
SASR1R2-AISK9-23	Cisco ASR1000 Series RP2 Advanced IP SERVICES	1
FLASR1-BB-RTU	Broadband Right-To-Use with 500 BB Sessions Lic for ASR1000	1
FLASR1-BB-32K	Broadband 32K Sessions Feature License for ASR1000 Series	1

Following is a walk-through using the Cisco Dynamic Configuration Tool found at: https://apps.cisco.com/qtc/config/jsp/configureHome.jsp.

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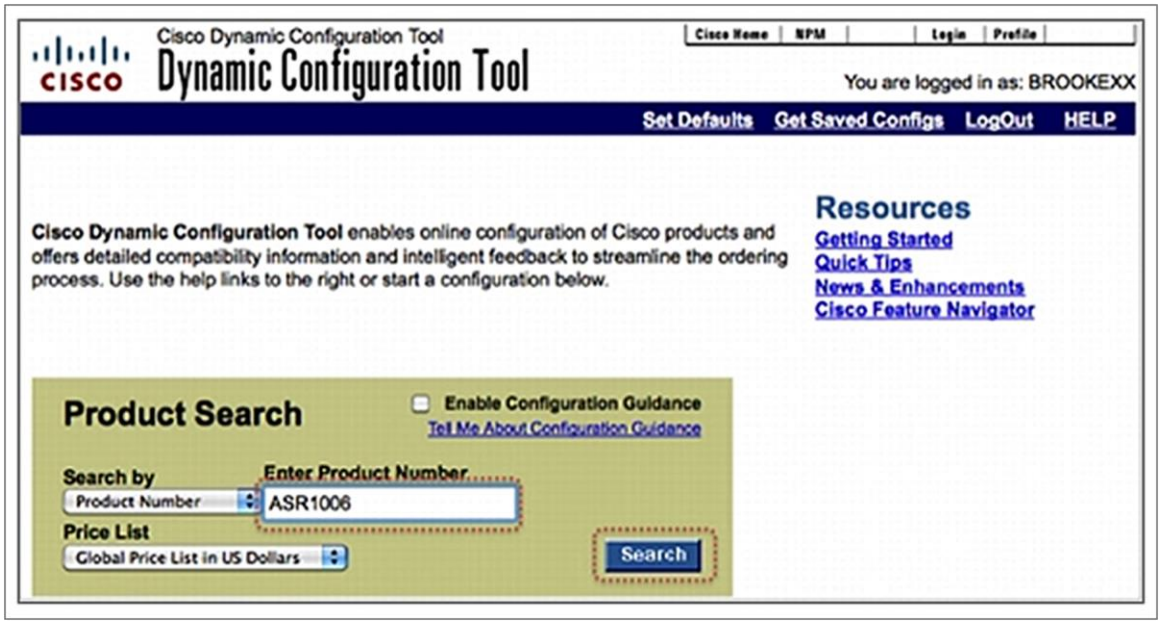
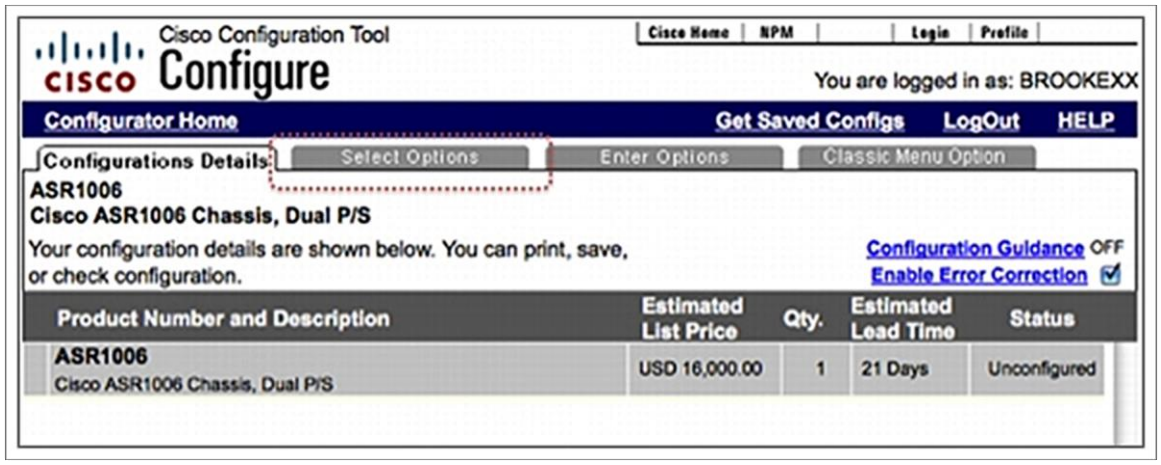
Step 1. Enter ASR1006 in the config tool homepage and select the Search button.



Step 2. At the next screen select the Select Options tab.



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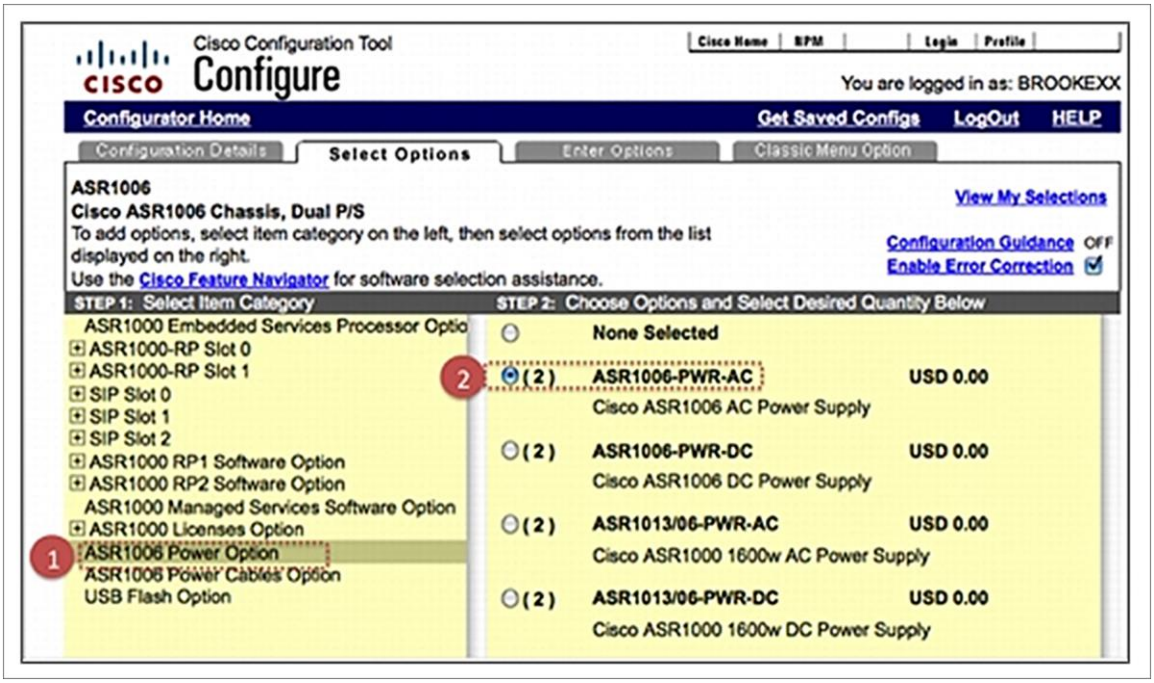
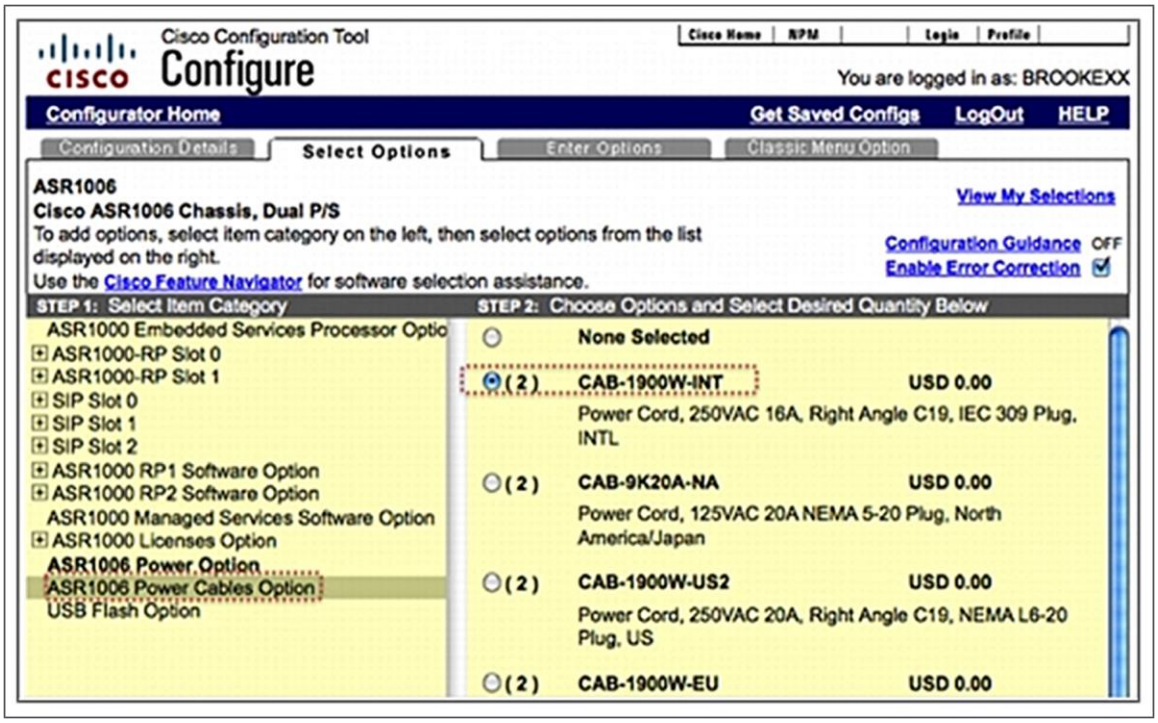
Step 3.

1. Select ASR1006 Power Option.
2. Select ASR1006-PWR-AC.



Step 4.

1. Select ASR1006 Power Cables Option.
2. Select the appropriate power cable.



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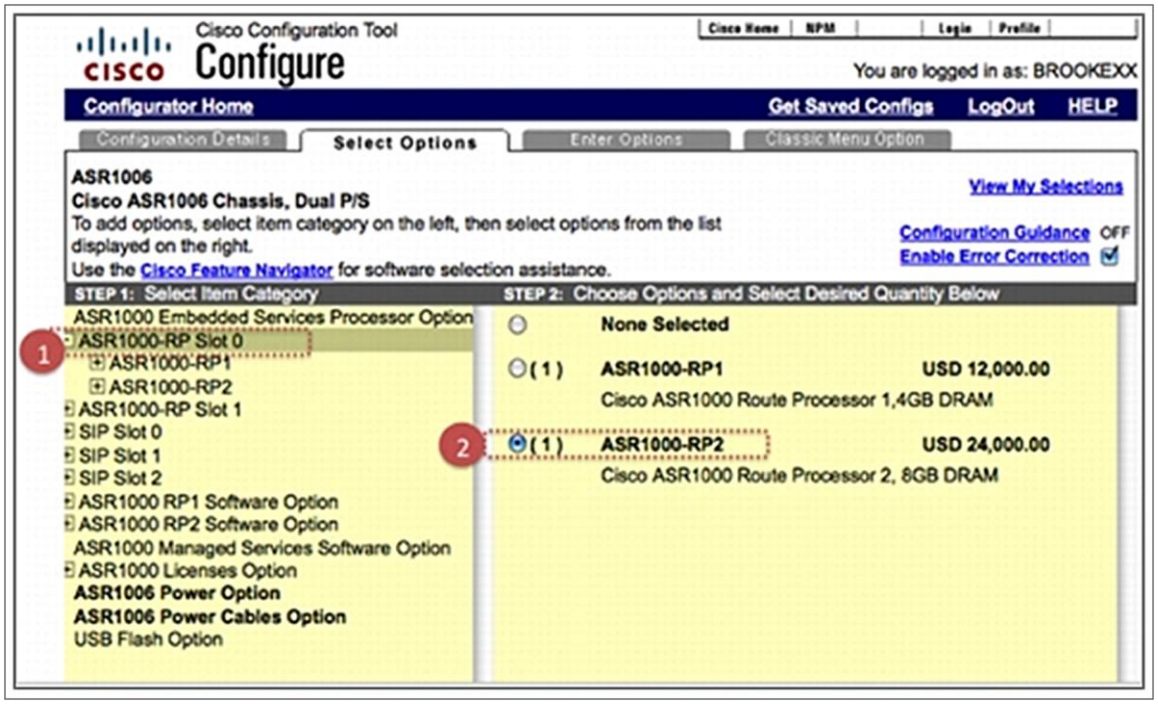
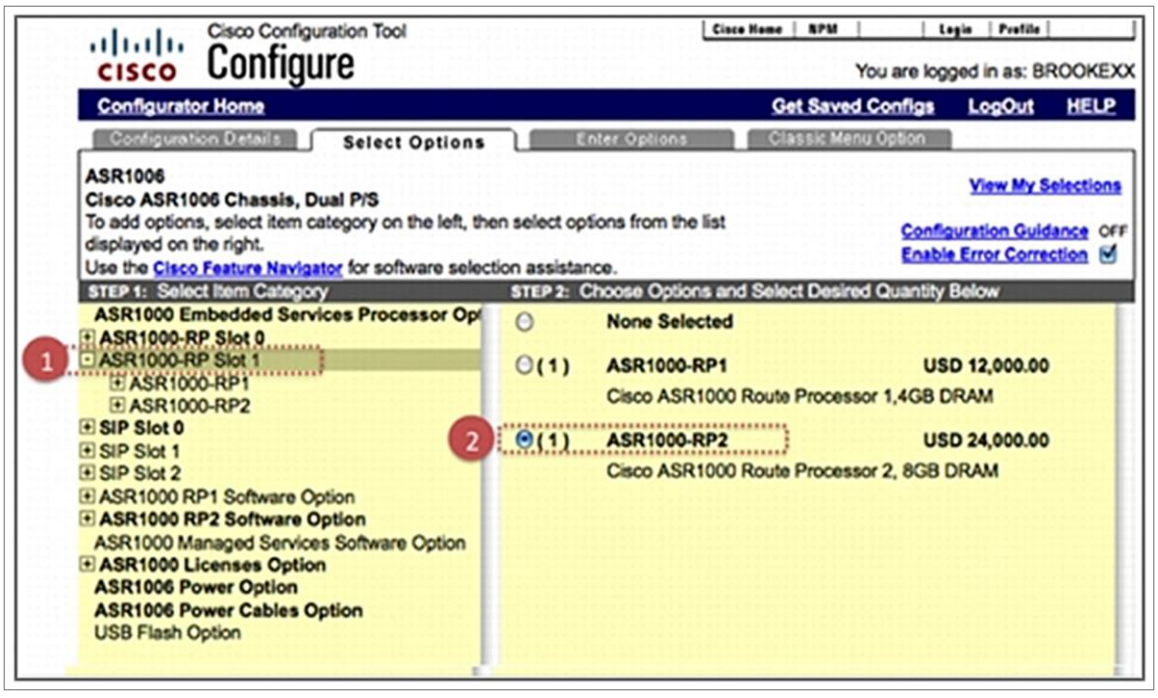
Step 5.

1. Select ASR1000-RP Slot 0 and it should expand.
2. Select ASR1000-RP2.



Step 6.

1. Select ASR1000-RP Slot 1 and it should expand.
2. Select ASR1000-RP2.



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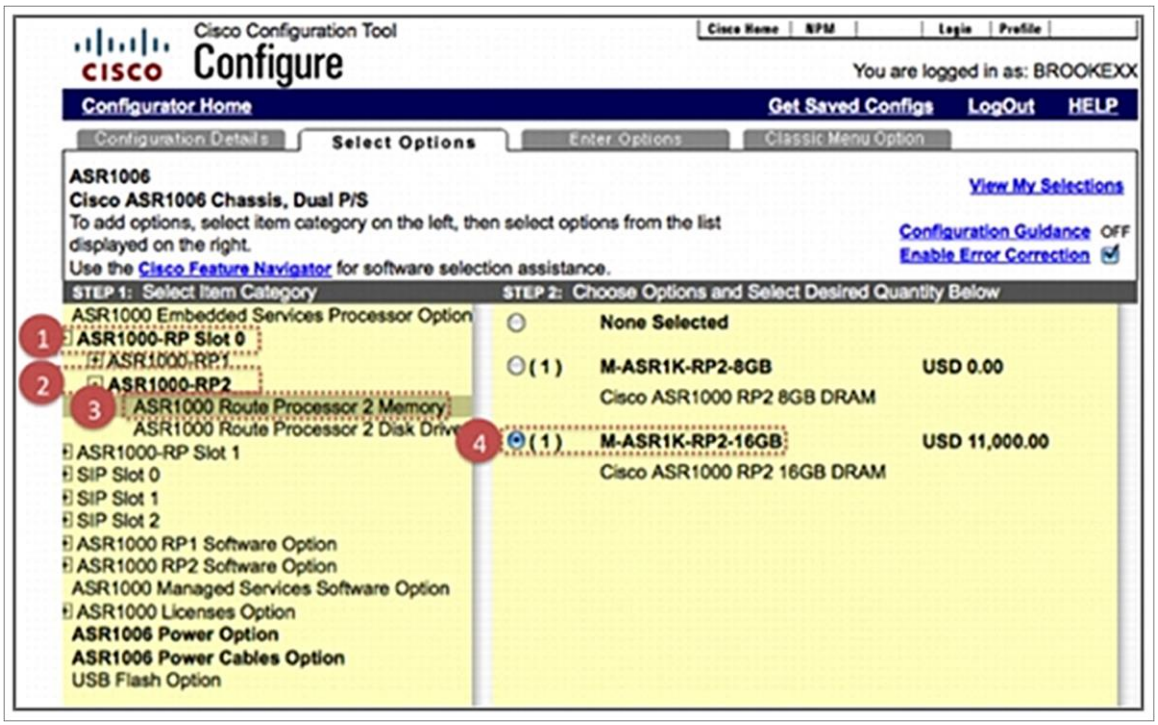
Step 7.

1. Select ASR1000-RP Slot 0.
2. Select ASR1000-RP2.
3. Select ASR1000 Route Processor 2 Memory.
4. Select M-ASR1K-RP2-16GB.



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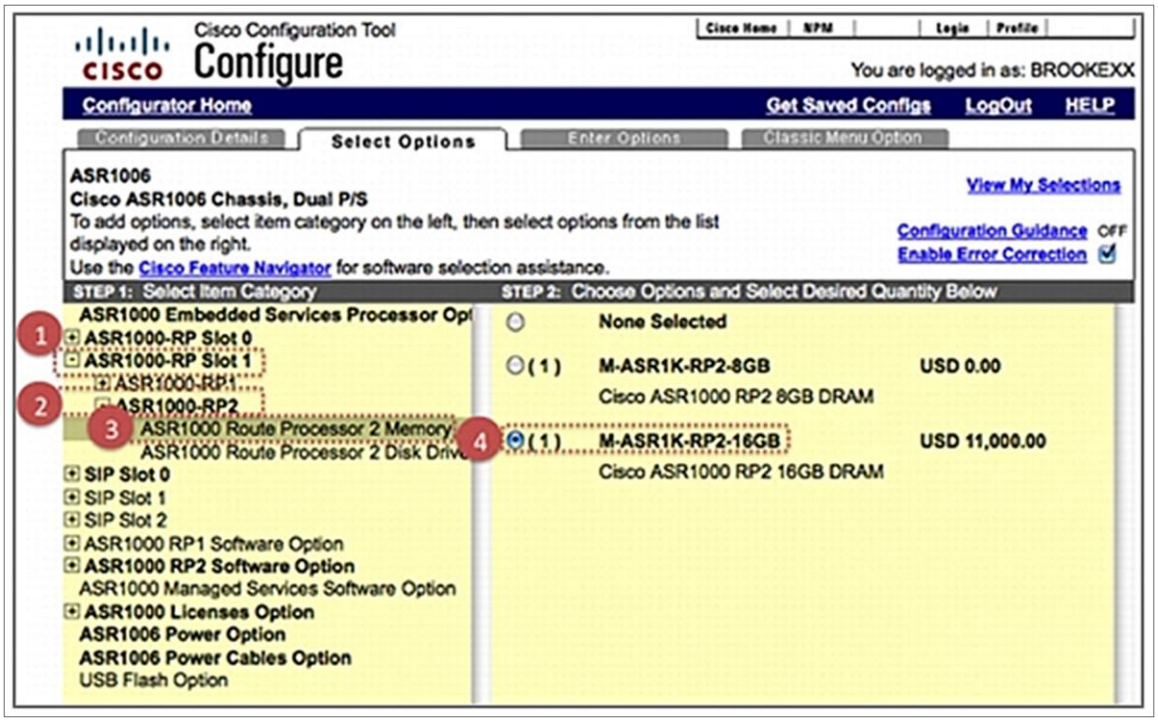
Step 8.

1. Select ASR1000-RP Slot 1.
2. Select ASR1000-RP2.
3. Select ASR1000 Route Processor 2 Memory.
4. Select M-ASR1K-RP2-16GB.



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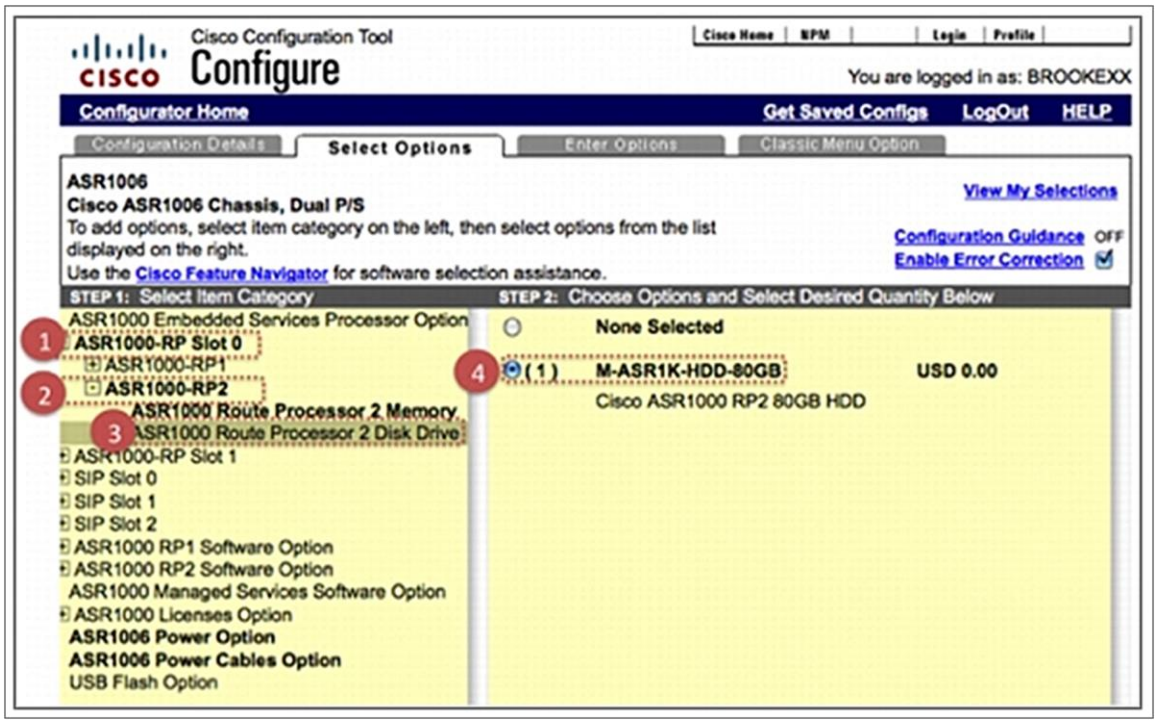
Step 9.

1. Select ASR1000-RP Slot 0.
2. Select ASR1000-RP2.
3. Select ASR1000 Route Processor 2 Disk Drive.
4. Select M-ASR1K-HDD-80GB.



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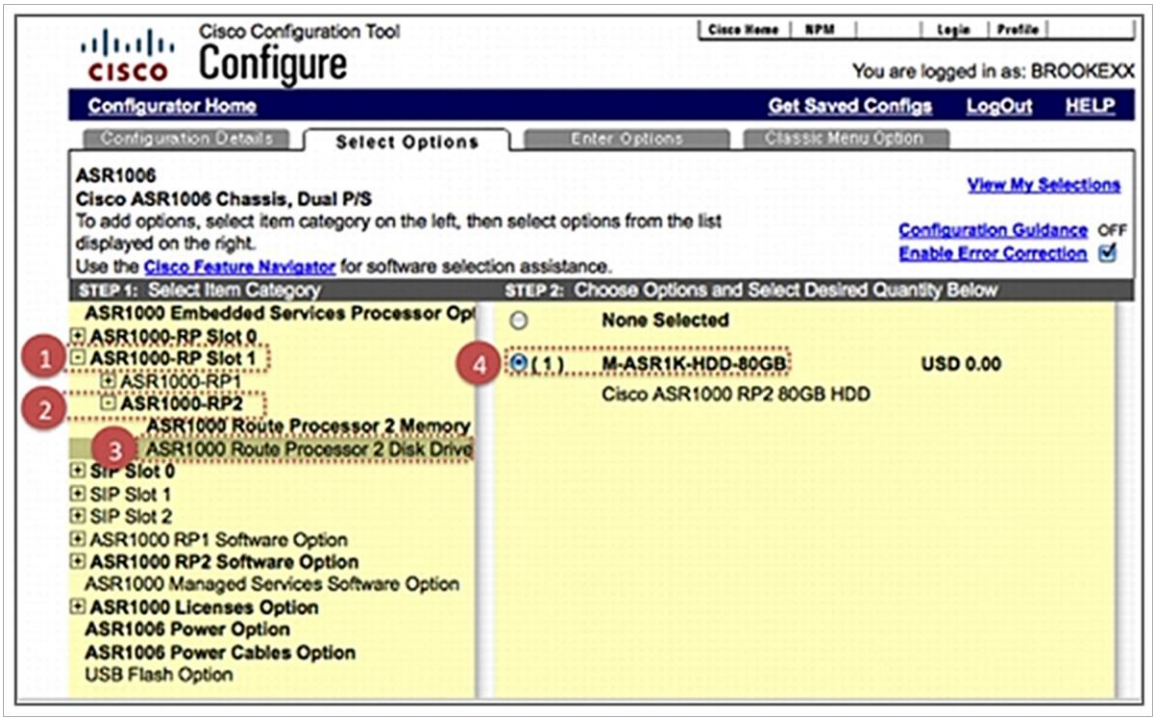
Step 10.

1. Select ASR1000-RP Slot 1.
2. Select ASR1000-RP2.
3. Select ASR1000 Route Processor 2 Disk Drive.
4. Select M-ASR1K-HDD-80GB.



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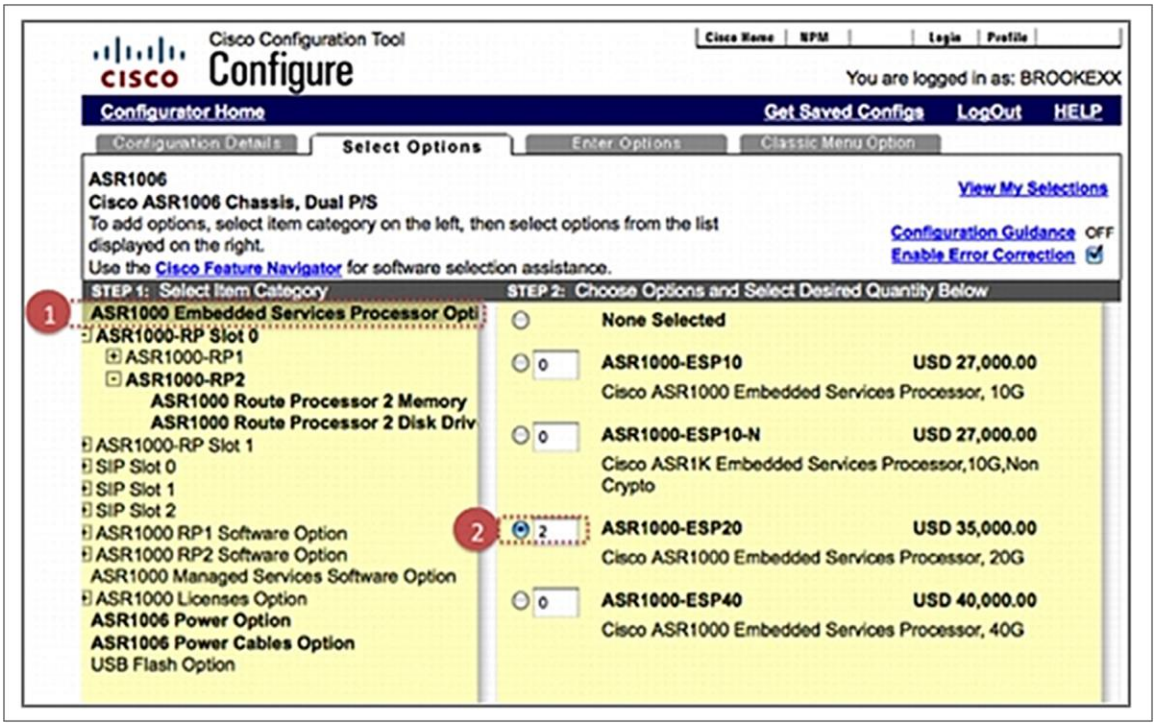
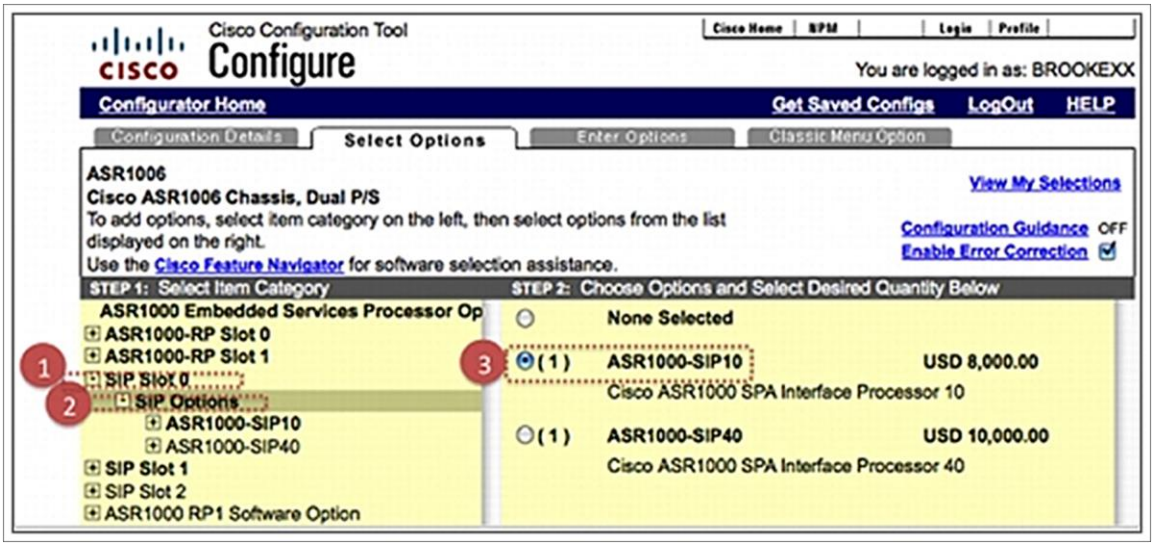
Step 11.

1. Select ASR1000 Embedded Services Processor Option.
2. Select ASR1000-ESP20 and enter a value of 2.



Step 12.

1. Select SIP Slot 0 and it should expand.
2. Select SIP Options.
3. Select ASR1000-SIP10.



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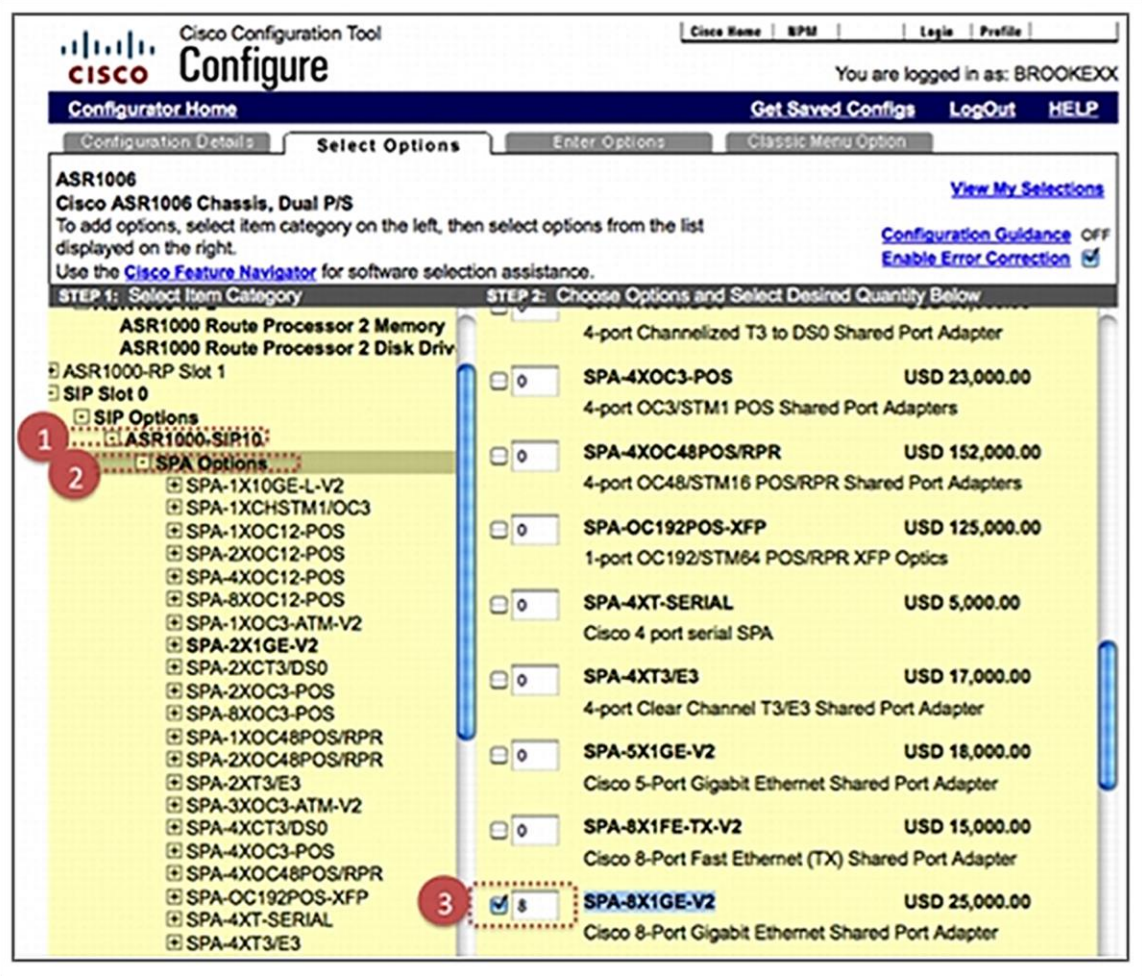
Step 13.

1. Select ASR1000-SIP10.
2. Select SPA Options.
3. Select the type of SPA and enter quantity.



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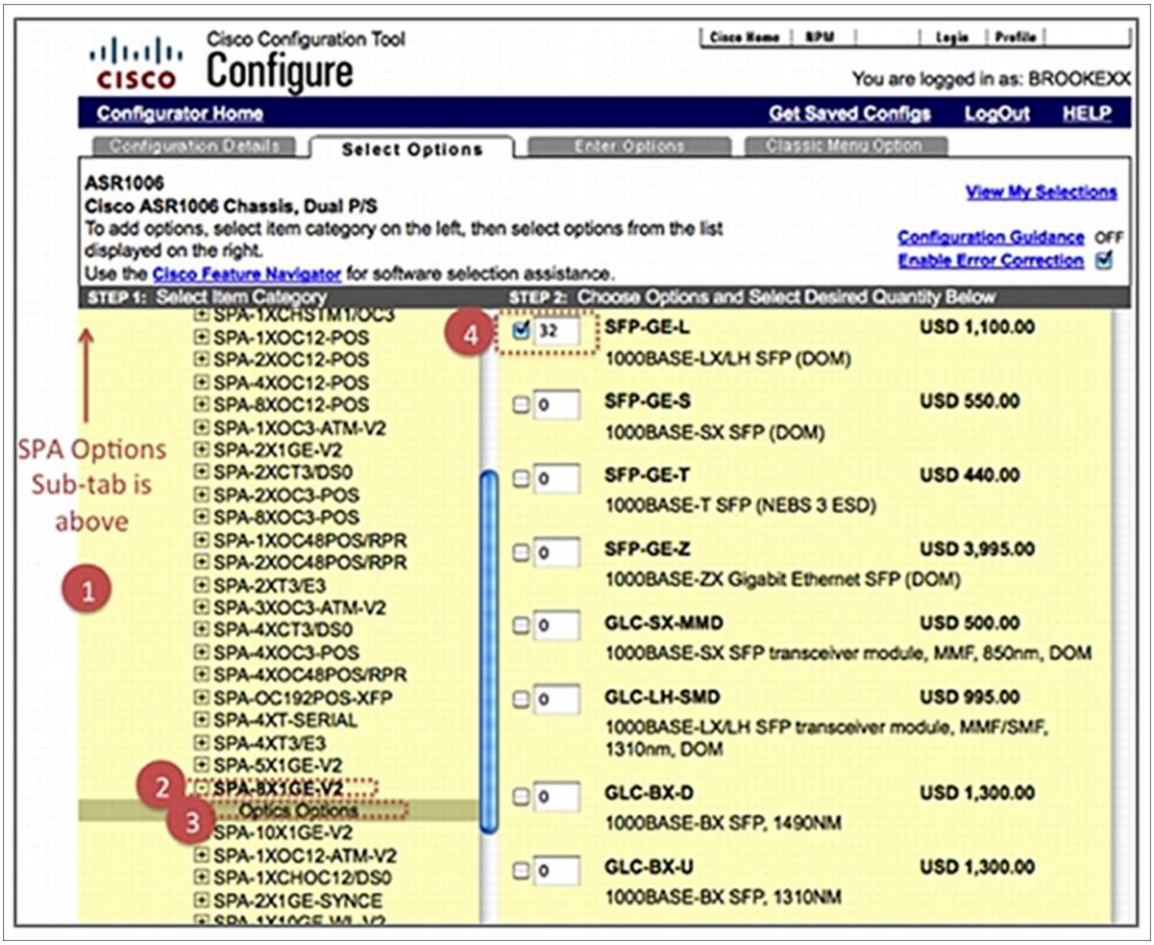
Step 14.

1. You are still under the SPA Options Sub-tab.
2. Select SPA-8X1GE-V2.
3. Select Optics Options.
4. Select SFP-GE-L and enter quantity 32.



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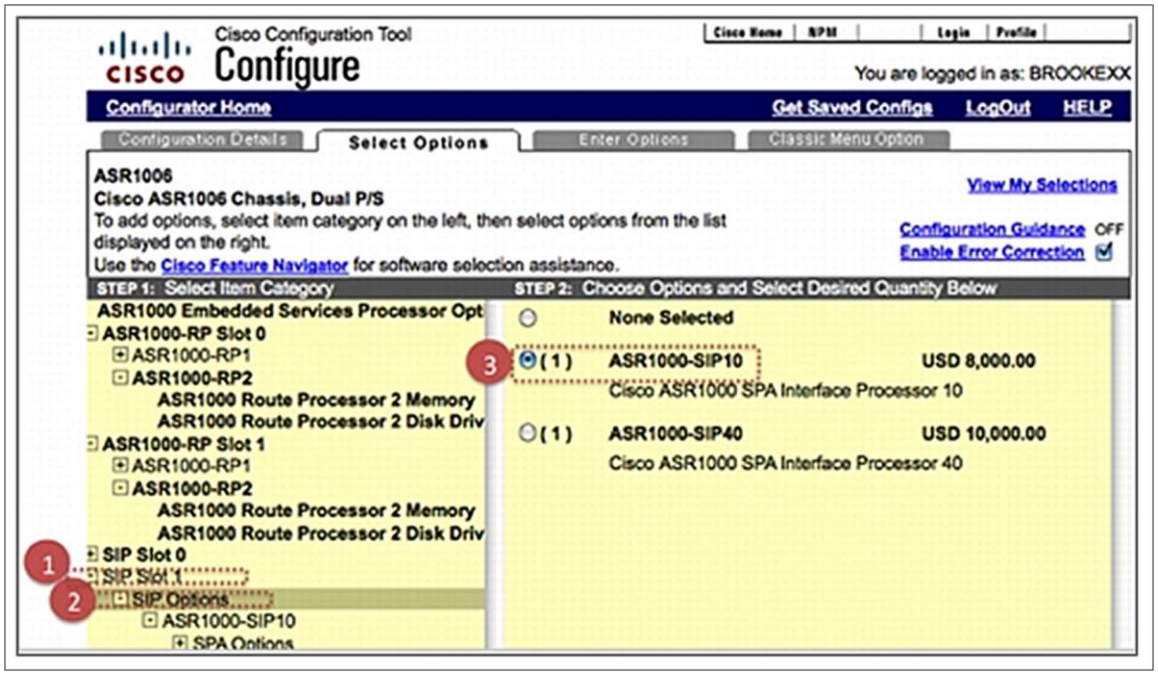
Step 15.

1. Select SIP Slot 1.
2. Select SIP Options.
3. Select ASR1000-SIP10.



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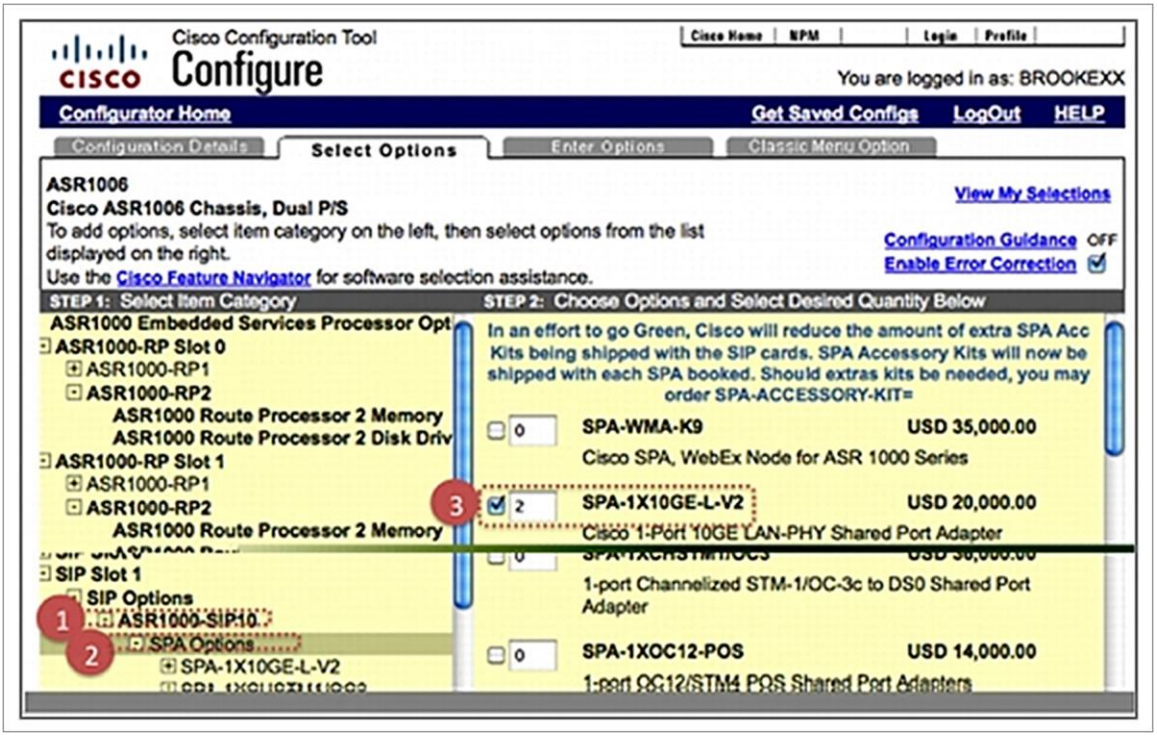
Step 16.

1. Select ASR1000-SIP10.
2. Select SPA Options.
3. Select SPA-1X10GE-L-V2 and enter quantity 2.



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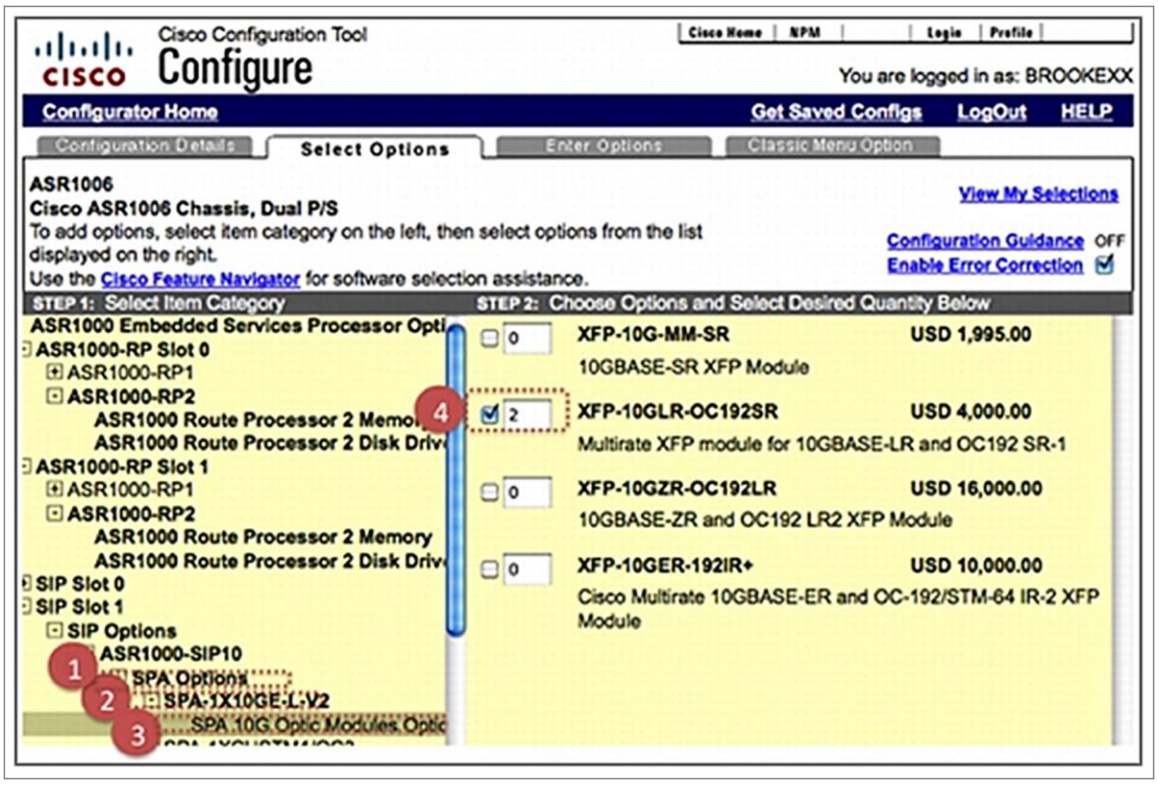
Step 17.

1. Select SPA Options.
2. Select SPA-1X10GE-L-V2.
3. Select SPA 10G Optic Modules Option.
4. Select XFP-10GLR-OC192SR and enter quantity 2.



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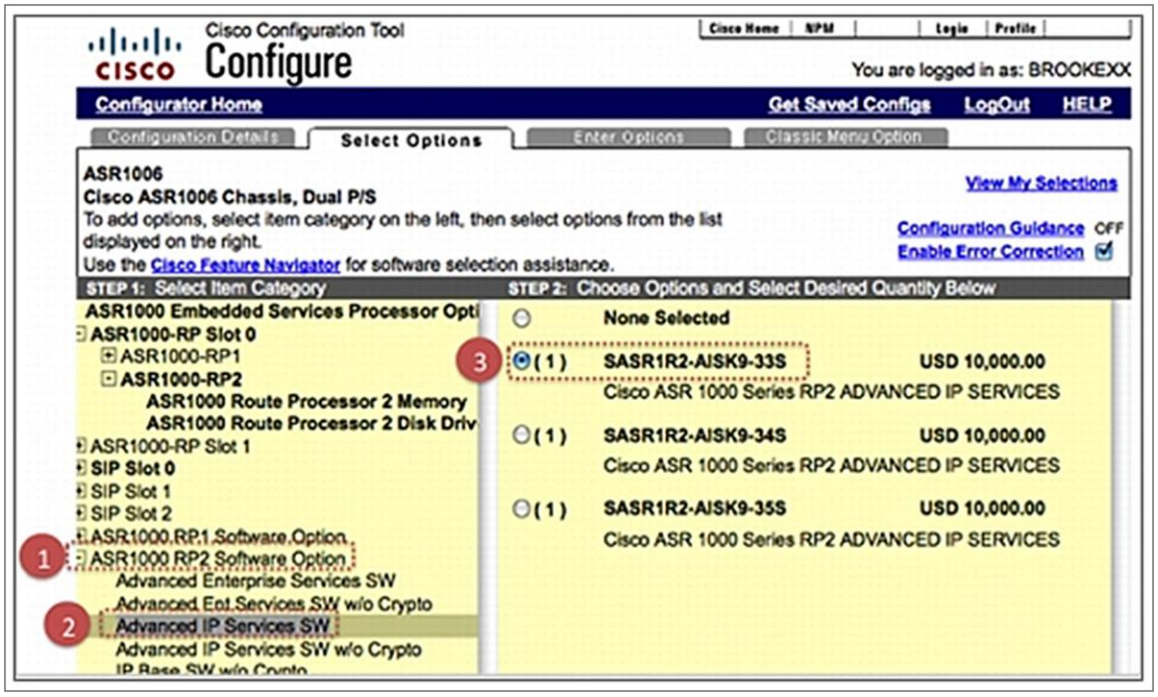
Step 18.

1. Select ASR1000 RP2 Software Option.
2. Select Advanced IP Services SW.
3. Select SASR1R2-AISK9-33S.



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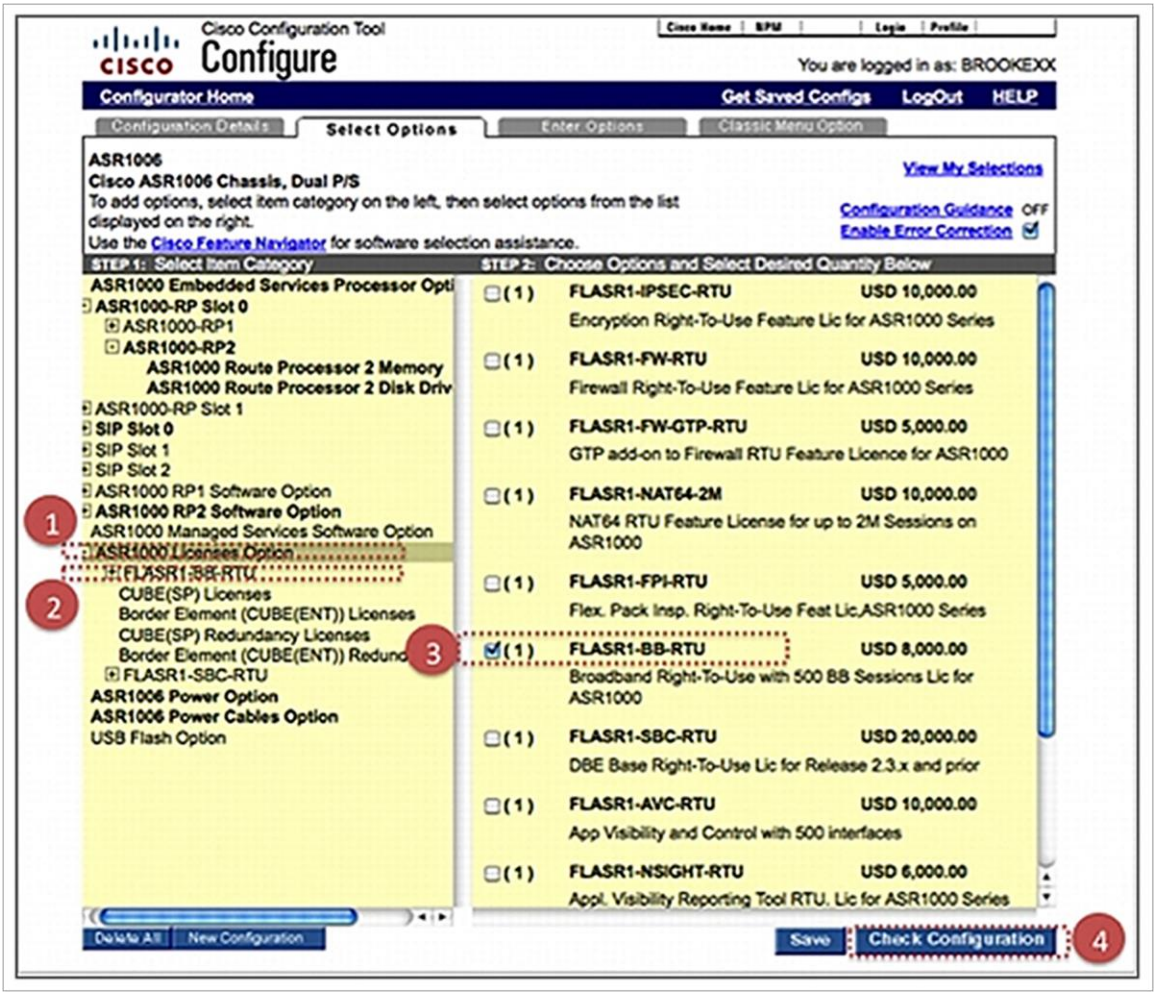
Step 19.

1. Select ASR1000 RP2 Software Option.
2. Select ASR1000 Licenses Option.
3. Select FLASR1-BB-RTU.
4. Select Check Configuration.



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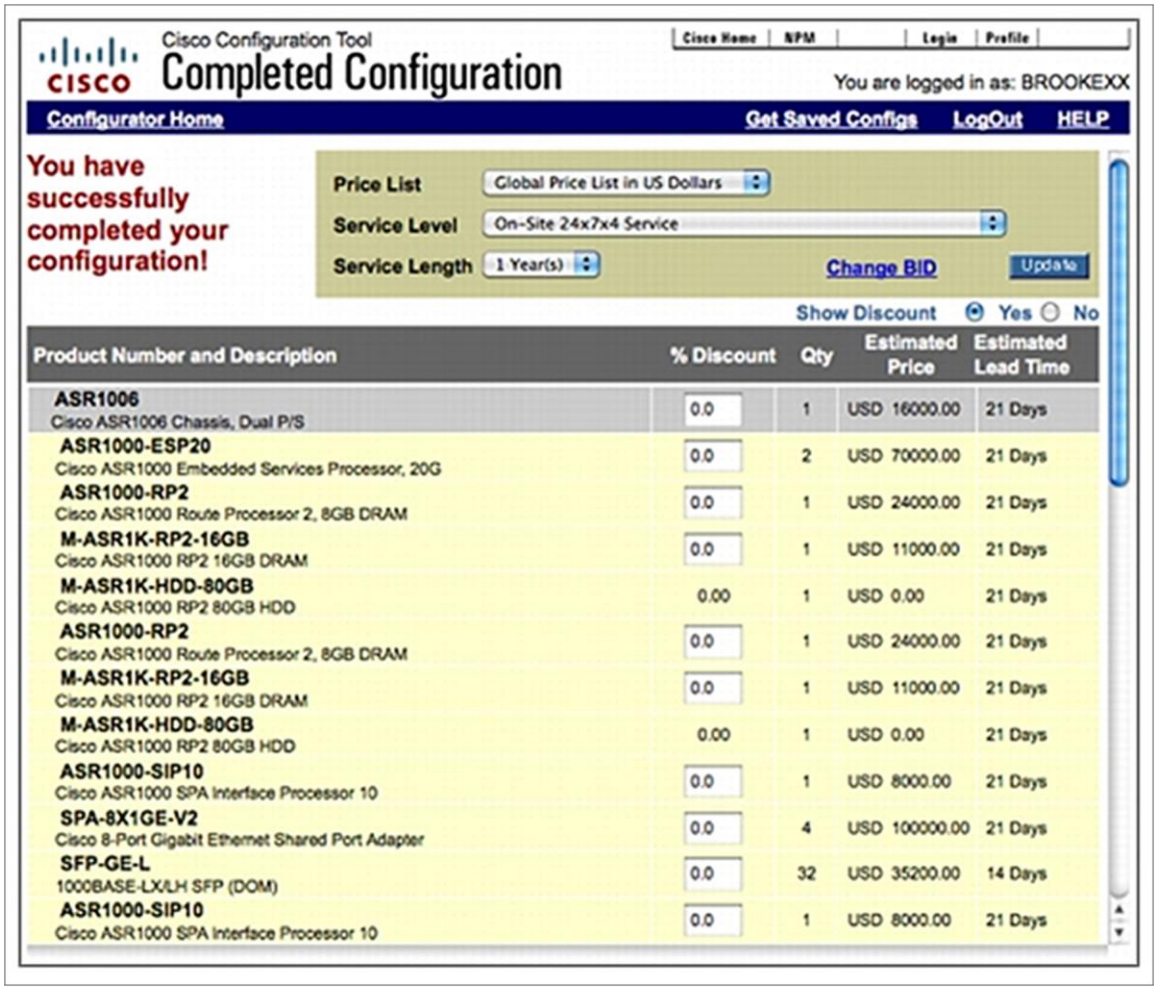
Step 20. The finished configuration is shown in the following screenshot:



Alternatively, you can use the Cisco ASR 1006 broadband bundles to build the same Bill Of Materials (BOM) as shown in Table 19.

Table 19. Cisco ASR 1000 Series Router as a broadband aggregation router (with bundle PID)

Part number	Product description	Quantity
ASR1K6R2-20-B32/K9	ASR1006 BB Bundle w/2xESP-20G, 2xRP2, SIP10, AISK9, 32K BB Lic	1
M-ASR1K-RP2-16GB	Cisco ASR1000 RP2 16GB DRAM	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	2
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	2
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	2
SPA-8X1GE-V2	Cisco 8-Port Gigabit Ethernet Shared Port Adapter	4
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	32

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The only difference, in terms of navigating the Cisco Dynamic Configuration Tool, is that for the route processor and SIP modules the PID you select will end in "-BUN".

Example 3: Cisco ASR 1000 Series Router as a quadruple-play edge router

In this example, a Cisco ASR 1000 Series Router provides quadruple-play (data, voice, video, and mobility) services, including Voice Over IP (VoIP), video conferencing, Internet Protocol Television (IPTV), and Internet, to subscribers. A Cisco ASR 1006 chassis with redundant route processors and 20-Gbps ESPs is configured in order to achieve five-nines availability. The Cisco ASR 1000 Series RP2 comes with an 80-GB hard disk. You should select RP2 16-GB DRAM memory (part number M-ASR1K-RP2-16GB). Additional memory is required when the broadband RTU license (part number FLASR1-BB-RTU) is selected with RP2 (part number ASR1000-RP2).

You need three SIP cards to host two full-height 10 Gigabit Ethernet SPA cards and four half-height 8 Gigabit Ethernet SPA cards.

The Cisco IOS XE Advanced IP Services consolidated package facilitates broadband, Cisco Unified Border Element (SP Edition), and Multiprotocol Label Switching (MPLS) features on the router.

You need a 16,000-subscriber broadband number-of-sessions license and a broadband RTU license to scale up to 16,000 broadband subscribers on the Cisco ASR 1000 Series Router. In addition, you must order Cisco Unified Border Element (SP Edition) licenses to enable the SBC services: You need a 16,000-subscriber Cisco Unified Border Element number-of-sessions license to scale up to 16,000 SBC sessions. Table 20 lists the components you need for using a Cisco ASR 1000 Series Router as a quadruple-play edge router.

Table 20. Cisco ASR 1000 Series Router as a quadruple-play edge router

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP2	Cisco ASR1000 Route Processor 2, 8GB DRAM	2
M-ASR1K-RP2-16GB	Cisco ASR1000 RP2 16GB DRAM	2
M-ASR1K-HDD-80GB	Cisco ASR1000 RP2 80GB HDD	2
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20G, Crypto	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	3
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	2
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	2
SPA-8X1GE-V2	Cisco 8-Port Gigabit Ethernet Shared Port Adapter	4
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	32
SASR1R1-AISK9	Cisco ASR1000 Series RP1 Advanced IP Services	1

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Part number	Product description	Quantity
FLASR1-BB-RTU	Broadband Right-To-Use with 500 BB Sessions Lic for ASR1000	1
FLASR1-BB-16K	Broadband 16K Sessions Feature Lic for ASR1000 Series	1
FLASR1-CUBES-16KP	CUBE(SP) 16K Calls Perpetual Lic for ASR 1000 Series	1

Example 4: Cisco ASR 1000 Series Router as an LNS Router with per-subscriber firewall

In this example, a Cisco ASR 1000 Series Router provides per-subscriber firewall service to end users on an LNS router. A Cisco ASR 1006 chassis with redundant route processors and 10-Gbps ESPs is configured in order to achieve six-nines high availability. The Cisco ASR 1000 Series RP1 comes with a 40-GB hard disk. You need three SIP cards to host two full-height 10 Gigabit Ethernet SPA cards and four half-height 8 Gigabit Ethernet SPA cards.

The Cisco IOS XE Advanced IP Services consolidated package facilitates broadband, firewall, and MPLS features on the router.

You need a 16,000-subscriber broadband number-of-sessions license, in addition to the broadband and firewall RTU license, to scale up to 16,000 broadband subscribers and provide per-subscriber firewall services to the end users on the Cisco ASR 1000 Series Router.

Table 21 lists the components for using a Cisco ASR 1000 Series Router as an LNS router with per-subscriber firewall.

Table 21. Cisco ASR 1000 Series Router as an LNS Router with per-subscriber firewall

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP1	Cisco ASR1000 Route Processor 1, 2GB DRAM	2
M-ASR1K-HDD-40GB	Cisco ASR1000 RP1 40GB HDD	2
ASR1000-ESP10	Cisco ASR1000 Embedded Services Processor, 10G, Crypto	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	3
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	2
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	2
SPA-8X1GE-V2	Cisco 8-Port Gigabit Ethernet Shared Port Adapter	4
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	32
SASR1R1-AISK9	Cisco ASR1000 Series RP1 Advanced IP Services	1

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Part number	Product description	Quantity
FLASR1-BB-RTU	Broadband Right-To-Use with 500 BB Sessions Lic for ASR1000	1
FLASR1-FW-RTU	Firewall Right-To-Use Feature Lic for ASR1000 Series	1
FLASR1-BB-16K	Broadband 16K Sessions Feature Lic for ASR1000 Series	1

Alternatively, you can use the Cisco ASR 1006 broadband bundles to build the same BOM, as shown in Table 22.

Table 22. Cisco ASR 1000 Series Router as an LNS Router with per-subscriber firewall (with bundle PID)

Part number	Product description	Quantity
ASR1006-10G-B16/K9	ASR1006 BB Bundle w/2xESP-10G, 2xRP1, SIP10, AISK9, 16K BB Lic	1
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	2
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	2
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	2
SPA-8X1GE-V2	Cisco 8-Port Gigabit Ethernet Shared Port Adapter	4
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	32
FLASR1-FW-RTU	Firewall Right-To-Use Feature Lic for ASR1000 Series	1

Example 5: Cisco ASR 1000 Series Router as high-end customer premises equipment

In this example, a Cisco ASR 1000 Series Router is used as managed high-end customer premises equipment (CPE). A 2RU chassis with a 5-Gbps ESP is configured, offering a great price-performance ratio.

The Cisco ASR 1002 comes with four built-in Gigabit Ethernet ports and 4-GB DRAM by default. The SIP card and the route processor are built into the chassis. The 3-slot 2RU chassis can host up to three SPAs; for example, it can host two single-height Channelized T3-to-DS-0 SPA cards and one single-height 8-port Fast Ethernet SPA card.

The Cisco IOS XE Advanced Enterprise Services consolidated package facilitates IPsec, firewall, and other advanced features on the router.

IPsec and firewall RTU licenses allow service providers to provide advanced services such as IPsec and firewall service to their end customers.

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Table 23 lists the part numbers for deployment of this scenario. Alternatively, you can use the Cisco ASR 1002 security bundles to build the same BOM, as shown in Table 24. Another great high-end branch-office router solution is the compact-form-factor 1RU Cisco ASR 1001. Table 25 lists the part numbers for a possible deployment based on the Cisco ASR 1001 chassis with four built-in Gigabit Ethernet ports and an additional four integrated T3 ports (example listed is with the ASR1001-4XT3).

Table 23. Cisco ASR 1000 Series Router as high-end customer premises equipment

Part number	Product description	Quantity
ASR1002	Cisco ASR1002 Chassis, 4 built-in GE, Dual P/S, 4GB DRAM	1
ASR1002-PWR-AC	Cisco ASR1002 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-ESP5	ASR1K Embedded Services Processor, 5Gbps, Crypto, ASR1002 only	1
SPA-4XCT3/DS0	4-port Channelized T3 to DS0 Shared Port Adapter	2
SPA-8X1FE-TX-V2	Cisco 8-Port Fast Ethernet (TX) Shared Port Adapter	1
SASR1R1-AESK9	Cisco ASR1000 Series RP1 Advanced Enterprise Services	1
FLASR1-IPSEC-RTU	Encryption Right-To-Use Feature Lic for ASR1000 Series	1
FLASR1-FW-RTU	Firewall Right-To-Use Feature Lic for ASR1000 Series	1

Table 24. Cisco ASR 1000 Series Router as high-end customer premises equipment (with bundle PID)

Part number	Product description	Quantity
ASR1002-5G-SEC/K9	ASR1002 VPN+FW Bundle w/ESP-5G, AESK9, License, 4GB DRAM	1
SPA-4XCT3/DS0	4-port Channelized T3 to DS0 Shared Port Adapter	2
SPA-8X1FE-TX-V2	Cisco 8-Port Fast Ethernet (TX) Shared Port Adapter	1

Table 25. Cisco ASR 1000 Series Router as high-end customer premises equipment (example based on chassis with part number ASR1001-4XT3)

Part number	Product description	Quantity
ASR1001-4XT3	Cisco ASR1001 System, Crypto, 4 built-in GE, T3 IDC, Dual P/S	1
ASR1001-PWR-AC	Cisco ASR1001 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
SASR1001UK9-32S	Cisco ASR 1001 IOS XE - ENCRYPTION UNIVERSAL	1
SLASR1-AES	Cisco ASR 1000 Advanced Enterprise Services License****	1

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Part number	Product description	Quantity
FLS-ASR1001-5G	Upgrade from 2.5 Gbps to 5 Gbps License for ASR 1001****	1
FLSASR1-IPSEC	IPSEC License for ASR1000 Series	1
FLSASR1-FW	FW License for ASR1000 Series	1
FLSASR1-FWNAT-R	Firewall/NAT Stateful Inter-Chassis Redundancy License	1

**** Enforced licenses on ASR1001

Example 6: Cisco ASR 1000 Series Router as a provider-edge router

In this example, a Cisco ASR 1000 Series Router is used as a provider-edge router in a service provider network. A 6RU chassis with redundant route processors and ESPs is configured in order to achieve five-nines high availability. The Cisco ASR 1000 Series RP2 comes with an 80-GB hard disk.

You need three SIP cards to host two full-height 10 Gigabit Ethernet SPA cards and four half-height 8-port Gigabit Ethernet SPA cards.

A Cisco IOS XE Advanced IP Services consolidated package facilitates MPLS and other advanced features on the router.

Table 26 lists the part numbers for deployment of this scenario.

Table 26. Cisco ASR 1000 Series Router as a provider-edge router

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP2	Cisco ASR1000 Route Processor 2, 8GB DRAM	2
M-ASR1K-HDD-80GB	Cisco ASR1000 RP2 80GB HDD	2
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20G, Crypto	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	3
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	2
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	2
SPA-8X1GE-V2	Cisco 8-Port Gigabit Ethernet Shared Port Adapter	4

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Part number	Product description	Quantity
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	32
SASR1R1-AISK9	Cisco ASR1000 Series RP1 Advanced IP Services	1

Note: It is not recommended to configure ESP10 with RP2. RP2 has a much faster control CPU than ESP 10; it could over-program ESP10 to exhaust system resources (for example, memory).

Example 7: Cisco ASR 1000 Series Router as a route reflector

In this example, a Cisco ASR 1000 Series Router is used as a route reflector because of its high and scalable control-plane performance. A Cisco ASR 1001 chassis with an integrated route processor is chosen because of its great control-plane scaling and great price-performance ratio.

The performance upgrade license allows you to upgrade the Cisco ASR 1001 chassis to 5-Gbps total aggregate throughput without any hardware module exchange.

A Cisco IOS XE Advanced Enterprise Services technology package license in combination with the Cisco ASR 1001 universal K9 software image facilitates Border Gateway Protocol (BGP), Multiprotocol BGP (MBGP), MPLS, and other advanced features on the router.

Table 27 lists the part numbers for deployment of this scenario.

Table 27. Cisco ASR 1000 Series Router as a route reflector

Part number	Product description	Quantity
ASR1001	Cisco ASR1001 System, Crypto, 4 built-in GE, Dual P/S	1
ASR1001-PWR-AC	Cisco ASR1001 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ESP is integrated into the ASR1001 chassis-upgradeable from 2.5-Gbps to 5-Gbps via a license	NA	NA
RP is integrated into the ASR1001	NA	NA
SIP is integrated into the ASR1001 chassis	NA	NA
M-ASR1K-1001-16GB	Cisco ASR1001 16GB DRAM	1
SPA-5X1GE-V2	Cisco 5-Port Gigabit Ethernet Shared Port Adapter	1
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	9

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Part number	Product description	Quantity
SASR1001UK9-32S	Cisco ASR 1001 IOS XE UNIVERSAL - ENCRYPTION	1
SLASR1-AES	Cisco ASR 1000 Advanced Enterprise Services License	1
FLS-ASR1001-5G	Upgrade from 2.5 Gbps to 5 Gbps License for ASR 1001	1

Example 8: Cisco ASR 1000 Series Router as a secure head-end router

In this example, a Cisco ASR 1000 Series Router is used as a secure head-end router in an enterprise network. A 6RU chassis with redundant route processors and ESPs is configured in order to achieve five-nines high availability. The Cisco ASR 1000 Series RP1 comes with a 40-GB hard disk.

You need one SIP card to host one single-height, 5-port Gigabit Ethernet SPA card and one single-height Packet over SONET/SDH (PoS) OC-12 SPA card.

A Cisco IOS XE Advanced Enterprise consolidated package facilitates advanced security features on the router.

Table 28 lists the part numbers for deployment of this scenario.

Table 28. Cisco ASR 1000 Series Router as a secure head-end router

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP1	Cisco ASR1000 Route Processor 1, 2GB DRAM	2
M-ASR1K-HDD-40GB	Cisco ASR1000 RP1 40GB HDD	2
ASR1000-ESP10	Cisco ASR1000 Embedded Services Processor, 10G, Crypto	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	2
SPA-1XOC12-POS	1-port OC12/STM4 POS Shared Port Adapters	1
SFP-OC12-LR1	OC-12/STM-4 SFP, Long Reach (40km)	1
SPA-5X1GE-V2	Cisco 5-Port Gigabit Ethernet Shared Port Adapter	1
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	5
SASR1R1-AESK9	Cisco ASR1000 Series RP1 Advanced Enterprise Services	1
FLASR1-IPSEC-RTU	Encryption Right-To-Use Feature Lic for ASR1000 Series	1

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Example 9: Cisco ASR 1000 Series Router as an internet gateway router

In this example, a Cisco ASR 1000 Series Router is used as an Internet gateway router in an enterprise network. A 1RU router (Cisco ASR 1001-X) and a 2RU router (Cisco ASR 1002-X) are configured as Internet gateway routers. The minimum route processor memory for an Internet gateway router is 8 GB; 4-GB memory cannot support Internet gateway deployments. In addition, software redundancy (FLSASR1-IOSRED) is not recommended for Internet gateway deployments.

Cisco ASR 1001 comes with 4 built-in Gigabit Ethernet ports, and the Cisco ASR 1002-X comes with 6 built-in Gigabit Ethernet ports. SPAs can be configured if more ports are required. A Cisco IOS XE Advanced Enterprise consolidated package facilitates advanced security features on the router.

Firewall, IPsec, and FPI RTU licenses facilitate firewall, IPsec, and FPM functions on the router.

Table 29 lists the part numbers for Cisco ASR 1001 deployment of this scenario.

Table 29. Cisco ASR 1001 as an internet gateway router

Part number	Product description	Quantity
ASR1001	Cisco ASR1001 System, Crypto, built-in GE, Dual P/S	1
ASR1001-PWR-AC	Cisco ASR1001 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
M-ASR1K-1001-8GB	Cisco ASR1001 8GB DRAM	1
GLC-SX-MMD	1000Base-SX SFP transceiver module, MMF, 850nm, DOM	4
SASR1001UK9	Cisco ASR1001 IOS XE UNIVERSAL	1
SLASR1-AES	Cisco ASR 1000 Advanced Enterprise Services License	1
FLSASR1-FW	FW License for ASR1000 Series	1
FLSASR1-IPSEC	IPSEC License for ASR1000 Series	1
FLSASR1-FPI	Flex. Pack. Insp License for ASR1000 Series	1

Alternatively, you can use the Cisco ASR 1002-X to build the same BOM, as shown in Table 30.

Table 30. Cisco ASR 1002-X as an internet gateway router

Part number	Product description	Quantity
ASR1002-X	Cisco ASR1002-X Chassis, 6 built-in GE, Dual P/S	1
ASR1002-PWR-AC	Cisco ASR1002 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
M-ASR1002X-8GB	Cisco ASR1002-X 8GB DRAM	1

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Part number	Product description	Quantity
GLC-SX-MMD	1000Base-SX SFP transceiver module, MMF, 850nm, DOM	5
SASR1K2XUK9	Cisco ASR1002-X IOS XE UNIVERSAL	1
SLASR1-AES	Cisco ASR 1000 Advanced Enterprise Services License	1
FLSASR1-FW	FW License for ASR1000 Series	1
FLSASR1-IPSEC	IPSEC License for ASR1000 Series	1
FLSASR1-FPI	Flex. Pack. Insp License for ASR1000 Series	1

Example 10: Cisco ASR 1000 Series Router as an SBC in a centralized SIP trunking data center deployment

In this example, a Cisco ASR 1006 Series Router is used as an SBC in an enterprise data center, where it performs session control and security, demarcation, and interworking with a SIP trunk service provider to support the real-time voice transmission of the enterprise user for up to 16,000 SIP sessions.

The router uses a 6RU chassis with redundant route processors and ESPs in order to achieve high availability. The Cisco ASR 1000 Series RP2 comes with an 80-GB hard disk.

You need two SIP cards to host two full-height 10 Gigabit Ethernet SPA cards.

A Cisco IOS XE Advanced IP Services consolidated package facilitates the Cisco Unified Border Element (SP Edition) feature on the router.

For other variations on ASR configurations as a session border controller based on Cisco Unified Border Element (Enterprise Edition), please refer to the configuration guide at: https://www.cisco.com/en/US/prod/collateral/voicesw/ps6790/gatecont/ps5640/order_guide_c07_462222.pdf.

Table 31 lists the part numbers for deployment of this scenario.

Table 31. Cisco ASR 1000 Series Router deployed as an enterprise session border controller

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP2	Cisco ASR1000 Route Processor 2, 8GB DRAM	2
M-ASR1K-HDD-80GB	Cisco ASR1000 RP2 80GB HDD	2
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20G, Crypto	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	2

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Part number	Product description	Quantity
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	2
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	2
SASR1R2-AISK9	Cisco ASR1000 Series RP2 ADVANCED IP SERVICES	1
FLASR1-CUBEE-16KP	CUBE(ENT) Perpetual Lic for ASR 1000 Series	1

Example 11: Cisco ASR 1000 Series Router as an SBC in an Intercompany Telepresence Solution deployed in a service provider data center

In this example, a Cisco ASR 1000 Series Router is used as an SBC in a service provider data center (also referred to as a Cisco TelePresence® Intercompany Exchange), where it enables business-to-business telepresence service provided by the service provider to its enterprise customers. The router uses a 6RU chassis with redundant route processors and ESPs in order to achieve high availability. The Cisco ASR 1000 Series RP2 comes with an 80-GB hard disk.

You need two SIP cards to host two full-height 10 Gigabit Ethernet SPA cards.

A Cisco IOS XE Advanced IP Services consolidated package facilitates the Cisco Unified Border Element (SP Edition) feature on the router.

Table 32 lists the part numbers for deployment of this scenario.

Table 32. Cisco ASR 1000 Series Router as a provider-edge router

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP2	Cisco ASR1000 Route Processor 2, 8GB DRAM	2
M-ASR1K-HDD-80GB	Cisco ASR1000 RP2 80GB HDD	2
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20G, Crypto	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	2
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	2
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	2
SASR1R2-AISK9	Cisco ASR1000 Series RP2 ADVANCED IP SERVICES	1
FLASR1-CUBES-TPEX	CUBE(SP) Perpetual Lic for ASR 1000 Series in B2BTP Exchange	1

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Example 12: Cisco ASR 1000 Series Router as a Stateful NAT64 translator (cloud provider edge)

In this example, a Cisco ASR 1000 Series Router is used as a provider-edge router in a cloud provider network. The Stateful NAT64 translation solution allowed the cloud provider to deploy new enterprises with IPv6 networks (helps IPv6 adoption) and enable them to reach the IPv4 Internet or networks (helps IPv4 exhaust through Port Address Translation [PAT]). A 6RU chassis with redundant route processors and ESPs is configured in order to achieve six-nines high availability. The Cisco ASR 1000 Series RP2 comes with an 80-GB hard disk.

A Cisco IOS XE IP Base consolidated package facilitates the NAT64 feature on the router.

Table 33 lists the part numbers for deployment of this scenario.

Table 33. Cisco ASR 1000 Series Router as a Cloud provider-edge router

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP2	Cisco ASR1000 Route Processor 2, 8GB DRAM	2
M-ASR1K-HDD-80GB	Cisco ASR1000 RP2 80GB HDD	2
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20G, Crypto	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	1
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	1
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	1
SPA-8X1GE-V2	Cisco 8-Port Gigabit Ethernet Shared Port Adapter	1
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	8
SASR1R2-IPBK9-31S	Cisco ASR 1000 Series RP2 IP BASE	1
FLASR1-NAT64-2M	NAT64 RTU Feature License for up to 2M Sessions on ASR1000	1

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Example 13: Cisco ASR 1000 Series Router as a Carrier-Grade NAT router

In this example, a Cisco ASR 1000 Series Router is used as a CGN router in a service provider network. A 6RU chassis with redundant route processors and ESPs is configured in order to achieve six-nines high availability. The Cisco ASR 1000 Series RP2 comes with an 80-GB hard disk.

A Cisco IOS XE IP Base consolidated package and CGN license facilitate the CGN feature on the router.

Table 34 lists the part numbers for deployment of this scenario.

Table 34. Cisco ASR 1000 Series Router as a CGN router

Part number	Product description	Quantity
ASR1006	Cisco ASR1006 Chassis, Dual P/S	1
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply	2
Part number depends on required power cable	Power Cable	2
ASR1000-RP2	Cisco ASR1000 Route Processor 2, 8GB DRAM	2
M-ASR1K-HDD-80GB	Cisco ASR1000 RP2 80GB HDD	2
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20G, Crypto	2
ASR1000-SIP10	Cisco ASR1000 SPA Interface Processor 10	1
SPA-1X10GE-L-V2	Cisco 1-Port 10GE LAN-PHY Shared Port Adapter	1
XFP-10GLR-OC192SR	Multirate XFP module for 10GBASE-LR and OC192 SR-1	1
SPA-8X1GE-V2	Cisco 8-Port Gigabit Ethernet Shared Port Adapter	1
SFP-GE-L	1000BASE-LX/LH SFP (DOM)	8
SASR1R2-IPBK9-36S	Cisco ASR 1000 Series RP2 IP BASE	1
FLASR1-CGN-2M	CGN RTU Feature License for up to 2M Sessions on ASR1000	2

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Example 14: Cisco ASR 1000 Series Router as a Secure WAN router

In this example, a Cisco ASR 1000 Series Router is used as a secure WAN router in an enterprise network. A 1RU router (Cisco ASR 1001-X) is configured as a secure WAN router.

Cisco ASR 1001-X comes with 6 built-in Gigabit Ethernet ports, and built-in 10G Ethernet ports to allow connectivity to 1G or 10G LAN or WAN circuits. The support SPA slot can be installed with additional Gigabit Ethernet, 10G, or older connectivity ports. A Cisco IOS XE Advanced Enterprise consolidated package facilitates advanced security features such as Crypto and Zone-Based Firewall on the router.

To improve user experience, you can add value-add services such as Application Visibility and Control. You can further use this application visibility to enable advance features such as Performance Routing and dynamically route traffic on a desired WAN link based on its live performance (for example, latency, delay, and jitter measurements).

Table 35 lists the part numbers for Cisco ASR 1001-X deployment of this scenario.

Table 35. Cisco ASR 1001-X as a secure WAN router

Part number	Product description	Quantity
ASR1001-X	Cisco ASR1001-X System, Crypto, 6 built-in GE, Dual P/S	1
ASR1001-X-PWR-AC	Cisco ASR1001-X AC Power Supply	2
Part number depends on required power cable	Power Cable	2
SFP-10G-LR	Cisco 10GBASE-LR SFP+ Module for SMF	2
GLC-LH-SMD	1000BASE-LX/LH long-wavelength; with DOM	6
SASR1K1XUK9	Cisco ASR1001-X IOS XE UNIVERSAL	1
SLASR1-AES	Cisco ASR 1000 Advanced Enterprise Services License	1
FLSASR1-FW	FW License for ASR1000 Series	1
FLSASR1-IPSEC	IPSEC License for ASR1000 Series	1
FLSASR1-AVC	Appl. Visibility and Control License for ASR1000 Series	1
FLSA1-1X-2.5-20G	2.5G to 20Gbps upgrade License for ASR 1001-X, Built-in 2X10	-

Note: The ASR 1001-X comes with 8G default control-plane memory that is shared with the Cisco ASR Route Processor, ESP, and SPA Interface Processor modules.

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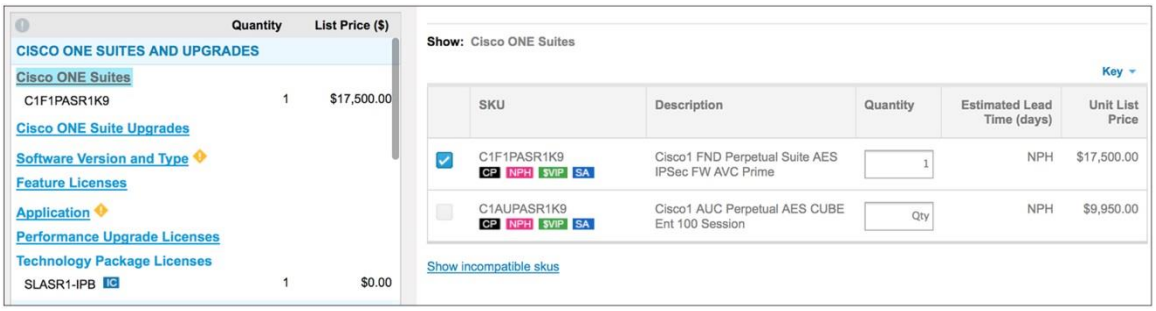
Example 15: Cisco ASR 1000 Series Router with Cisco ONE Software suites

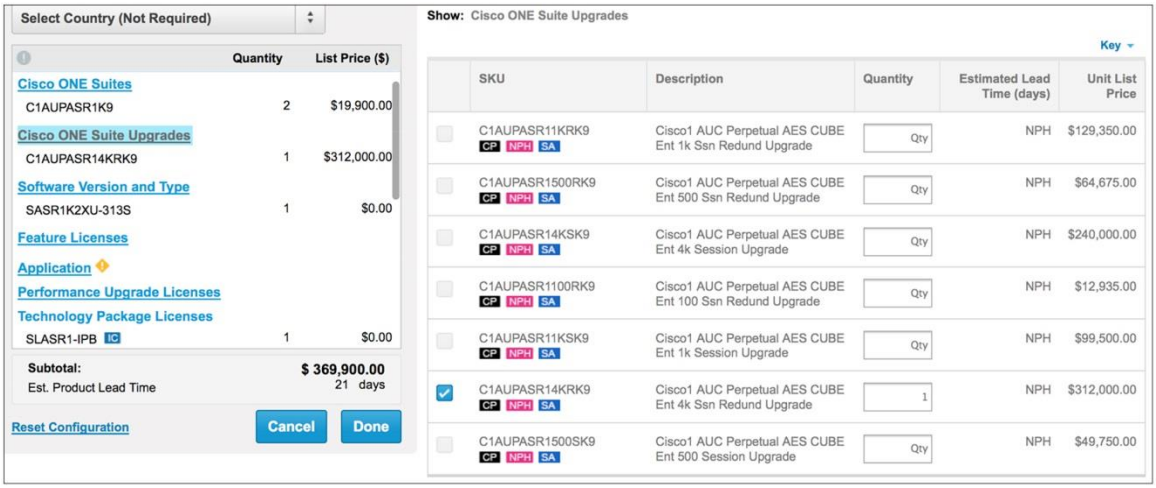
The difference in ordering Cisco ONE PIDs is how you order feature sets. You must order at least one Cisco ONE PID, and then you can choose none or many of the traditional feature sets.

The first example shows Cisco ASR 1002-X with C1-ASR1002-X/K9 with the Foundation Suite. You can order only quantity 1. This suite contains AES, FW, AVC, and IPsec, so there is no need to select it in the “Feature License” section. For the rest of the configuration, you can configure it as you would any other ASR 1002-X.



The next example shows the customer ordering an ASR 1000 router with AUC using 700 CUBEE licenses. The general rule is that you use the same session rules and guidelines when ordering the AUC Suite that you use to order existing CUBEE licenses. However, you must always order the base C1AU*ASR1K9 license. This license comes with 100 nonredundant CUBE sessions. In this example you want AUC with 700 nonredundant CUBEE sessions.

Step 1. Start by ordering two of the base licenses. Add 500 more sessions by selecting “CISCO ONE Suite Upgrades” in the left window and then choose the 500-session nonredundant license, where 200 + 500 = 700 sessions.



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Ordering information

Table 36 lists the part numbers of the hardware components you need for a Cisco ASR 1000 Series Router.

For more details and available bundles, please contact your local Cisco account representative. The Cisco ASR 1000 Series supports most Cisco SPAs. For details about the supported SPAs on the Cisco ASR 1000 Series, please refer to the Cisco ASR 1000 Series Shared Port Adapter Support data sheet.

Table 37 lists the Cisco ASR 1000 software and software licenses (except for the Cisco ASR 1001 and ASR 1002 X); Table 38 lists the Cisco ASR 1001 and ASR 1002-X software and software licenses; and Table 39 lists the Cisco ASR 1000 bundles.

Table 36. Ordering Information for Cisco ASR 1000 Series Hardware

Product number	Product description
Cisco ASR 1000 Series chassis	
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
ASR1001-HX	Cisco ASR1001-HX System,8x10GE+8x1GE,2xP/S, optional crypto
ASR1001-HX=	Cisco ASR1001-HX System,8x10GE+8x1GE,2xP/S, optional crypto, spare
ASR1002-HX	Cisco ASR1002-HX System, 4x10GE+4x1GE built-in, Dual P/S, optional crypto
ASR1002-HX=	Cisco ASR1002-HX System, 4x10GE+4x1GE built-in, Dual P/S, optional crypto, 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, spare
ASR1006	Cisco ASR1006 Chassis, Dual P/S
ASR1006=	Cisco ASR1006 Chassis, spare
ASR1006-X	Cisco ASR 1006-X Chassis
ASR1006-X=	Cisco ASR 1006-X Chassis, Spare
ASR1009-X	Cisco ASR 1009-X Chassis
ASR1009-X=	Cisco ASR 1009-X Chassis, Spare
ASR1013	Cisco ASR1013 Chassis, Quad P/S
ASR1013=	Cisco ASR1013 Chassis, spare

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Product number	Product description
Cisco ASR 1000 Series embedded services processor	
ASR1000-ESP20	Cisco ASR1000 Embedded Services Processor, 20G, Crypto
ASR1000-ESP20=	Cisco ASR1000 Embedded Services Processor, 20G, Crypto, Spare
ASR1000-ESP40	Cisco ASR1000 Embedded Services Processor, 40G, Crypto
ASR1000-ESP40=	Cisco ASR1000 Embedded Services Processor, 40G, Crypto, Spare
ASR1000-ESP100	Cisco ASR1000 Embedded Services Processor, 100G, Crypto
ASR1000-ESP100=	Cisco ASR1000 Embedded Services Processor, 100G, Crypto, Spare
ASR1000-ESP100-X	Cisco ASR1000 Embedded Services Processor X, 100G, Crypto
ASR1000-ESP100-X=	Cisco ASR1000 Embedded Services Processor X, 100G, Crypto, Spare
ASR1000-ESP200	Cisco ASR1000 Embedded Services Processor, 200G, Crypto
ASR1000-ESP200=	Cisco ASR1000 Embedded Services Processor, 200G, Crypto, Spare
ASR1000-ESP200-X	Cisco ASR1000 Embedded Services Processor X, 200G, Crypto
ASR1000-ESP200-X=	Cisco ASR1000 Embedded Services Processor X, 200G, Crypto, Spare
Cisco ASR 1000 Series route processor	
ASR1000-RP2	Cisco ASR1000 Route Processor 2
ASR1000-RP2=	Cisco ASR1000 Route Processor 2,Spare
ASR1000-RP3	Cisco ASR1000 Route Processor 3
ASR1000-RP3=	Cisco ASR1000 Route Processor 3, Spare
ASR1000-RP3-32G-2P	Cisco ASR1000 RP3 w/ 32GB, 2 Pack
ASR1000-RP3-64G-2P	Cisco ASR1000 RP3 w/ 64GB, 2 Pack
Cisco ASR 1000 Series SPA interface processor and Ethernet line cards	
ASR1000-SIP40	Cisco ASR1000 SPA Interface Processor 40
ASR1000-SIP40=	Cisco ASR1000 SPA Interface Processor 40, Spare
ASR1000-6TGE	Cisco ASR1000 Fixed Ethernet Line Card, 6x10GE
ASR1000-6TGE=	Cisco ASR1000 Fixed Ethernet Line Card, 6x10GE, Spare
ASR1000-2T+20X1GE	Cisco ASR1000 Fixed Ethernet Line Card, 2x10GE + 20x1GE
ASR1000-2T+20X1GE	Cisco ASR1000 Fixed Ethernet Line Card, 2x10GE + 20x1GE, Spare

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Product number	Product description
ASR1000-MIP100	Cisco ASR1000 Modular Ethernet Line Card, 100G Modular Interface Processor
ASR1000-MIP100=	Cisco ASR1000 Modular Ethernet Line Card, 100G Modular Interface Processor, spare
EPA-1X100GE	Cisco ASR1000 1x100GE Ethernet Line Card
EPA-1X100GE=	Cisco ASR1000 1x100GE Ethernet Line Card, spare
EPA-2X40GE	Cisco ASR 1000 2x40GE Ethernet Port Adapter (Native QSFP)
EPA-2X40GE=	Cisco ASR 1000 2x40GE Ethernet Port Adapter (Native QSFP), spare
EPA-1X40GE	Cisco ASR 1000 1x40GE Ethernet Port Adapter (2 physical QSFP ports – optional license to enable 2nd port)
EPA-1X40GE=	Cisco ASR 1000 1x40GE Ethernet Port Adapter (2 physical QSFP ports – optional license to enable 2nd port), spare
L-FLA1-EPA-1X40GE	Cisco ASR 1000 1x40GE e-Delivery Port License for EPA-1X40GE
EPA-CPAK-2X40GE	Cisco ASR1000 2x40GE Ethernet Line Card
EPA-CPAK-2X40GE=	Cisco ASR1000 2x40GE Ethernet Line Card, spare
EPA-10X10GE	Cisco ASR1000 10x10GE Ethernet Line Card
EPA-10X10GE=	Cisco ASR1000 10x10GE Ethernet Line Card, spare
EPA-18X1GE	Cisco ASR1000 18x1GE Ethernet Line Card
EPA-18X1GE=	Cisco ASR1000 18x1GE Ethernet Line Card, spare
Cisco ASR 1000 Series RP2 memory	
M-ASR1K-RP2-8GB	Cisco ASR1000 RP2 8GB DRAM
M-ASR1K-RP2-8GB=	Cisco ASR1000 RP2 8GB DRAM, Spare
M-ASR1K-RP2-16GB	Cisco ASR1000 RP2 16GB DRAM
M-ASR1K-RP2-16GB=	Cisco ASR1000 RP2 16GB DRAM, Spare
M-ASR1K-HDD-80GB=	Cisco ASR1000 RP2 80GB HDD, Spare
M-ASR1K-EUSB-2GB=	Cisco ASR1000 RP2 2GB EUSB+ FLASH, Spare

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Product number	Product description
Cisco ASR 1000 Series RP3 memory	
M-ASR1K-RP3-8GB	Cisco ASR1000 RP3 8 GB DRAM
M-ASR1K-RP3-8GB=	Cisco ASR1000 RP3 8 GB DRAM, Spare
M-ASR1K-RP3-16GB	Cisco ASR1000 RP3 8 GB DRAM
M-ASR1K-RP3-16GB=	Cisco ASR1000 RP3 8 GB DRAM, Spare
M-ASR1K-RP3-32GB	Cisco ASR1000 RP3 8 GB DRAM
M-ASR1K-RP3-32GB=	Cisco ASR1000 RP3 8 GB DRAM, Spare
M-ASR1K-RP3-64GB	Cisco ASR1000 RP3 8 GB DRAM
M-ASR1K-RP3-64GB=	Cisco ASR1000 RP3 8 GB DRAM, Spare
M-ASR1K-SSD-100GB	Cisco ASR1000 RP3 100 GB SSD
M-ASR1K-SSD-100GB=	Cisco ASR1000 RP3 100 GB SSD, Spare
M-ASR1K-SSD-200GB	Cisco ASR1000 RP3 200 GB SSD
M-ASR1K-SSD-200GB=	Cisco ASR1000 RP3 200 GB SSD, Spare
M-ASR1K-SSD-400GB	Cisco ASR1000 RP3 400 GB SSD
M-ASR1K-SSD-400GB=	Cisco ASR1000 RP3 400 GB SSD, Spare
Cisco ASR 1001-HX Series RP memory	
M-ASR1001HX-8GB	Cisco ASR1001-HX 8GB DRAM
M-ASR1001HX-8GB=	Cisco ASR1001-HX 8GB DRAM, spare
M-ASR1001HX-16GB	Cisco ASR1001-HX 16GB DRAM
M-ASR1001HX-16GB=	Cisco ASR1001-HX 16GB DRAM, spare
Cisco ASR 1002-HX Series RP memory	
M-ASR1002HX-16GB	Cisco ASR1002-HX 16GB DRAM
M-ASR1002HX-16GB=	Cisco ASR1002-HX 16GB DRAM, spare
M-ASR1002HX-32GB	Cisco ASR1002-HX 32GB DRAM
M-ASR1002HX-32GB=	Cisco ASR1002-HX 32GB DRAM, spare

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Product number	Product description
Cisco ASR 1002-X Series RP memory	
M-ASR1002X-4GB	Cisco ASR1002-X 4GB DRAM
M-ASR1002X-4GB=	Cisco ASR1002-X 4GB DRAM, Spare
M-ASR1002X-8GB	Cisco ASR1002-X 8GB DRAM
M-ASR1002X-8GB=	Cisco ASR1002-X 8GB DRAM, Spare
M-ASR1002X-16GB	Cisco ASR1002-X 16GB DRAM
M-ASR1002X-16GB=	Cisco ASR1002-X 16GB DRAM, Spare
MASR1002X-HD-160G	Cisco ASR1002-X 160GB Hard Disk Drive
MASR1002X-HD-160G=	Cisco ASR1002-X 160GB Hard Disk Drive, Spare
Cisco ASR 1000 Series USB flash 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
Cisco ASR 1000 Series power supply	
ASR1001-X-PWR-AC	Cisco ASR1001-X AC Power Supply
ASR1001-X-PWR-AC=	Cisco ASR1001-X AC Power Supply, Spare
ASR1KX-AC-750W	Cisco ASR1000-X 750W AC Power Supply
ASR1KX-AC-750W=	Cisco ASR1000-X 750W AC Power Supply, spare
ASR1KX-AC-750W-R	Cisco ASR1000-X 750W AC Power Supply, Reverse Air
ASR1KX-AC-750W-R=	Cisco ASR1000-X 750W AC Power Supply, Reverse Air, spare
ASR1KX-DC-950W-R	Cisco ASR1000-X 950W DC Power Supply, Reverse Air
ASR1KX-DC-950W-R=	Cisco ASR1000-X 950W DC Power Supply, Reverse Air, spare
ASR1004-PWR-AC	Cisco ASR1004 AC Power Supply
ASR1004-PWR-AC=	Cisco ASR1004 AC Power Supply, Spare
ASR1006-PWR-AC	Cisco ASR1006 AC Power Supply
ASR1006-PWR-AC=	Cisco ASR1006 AC Power Supply, Spare
ASR1000X-AC-1100W	Cisco ASR 1000-X 1100W AC Power Supply
ASR1000X-AC-1100W=	Cisco ASR 1000-X 1100W AC Power Supply, Spare

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Product number	Product description
ASR1000X-DC-950W	Cisco ASR 1000-X 950W DC Power Supply
ASR1000X-DC-950W=	Cisco ASR 1000-X 950W DC Power Supply, Spare
ASR1013/06-PWR-AC*	Cisco ASR1000 1600w AC Power Supply
ASR1013/06-PWR-AC=	Cisco ASR1000 1600w AC Power Supply, Spare
ASR1001-X-PWR-DC	Cisco ASR1001-X DC Power Supply
ASR1001-X-PWR-DC=	Cisco ASR1001-X DC Power Supply, Spare
ASR1002-PWR-DC	Cisco ASR1002 DC Power Supply
ASR1002-PWR-DC=	Cisco ASR1002 DC Power Supply, Spare
ASR1004-PWR-DC	Cisco ASR1004 DC Power Supply
ASR1004-PWR-DC=	Cisco ASR1004 DC Power Supply, Spare
ASR1006-PWR-DC	Cisco ASR1006 DC Power Supply
ASR1006-PWR-DC=	Cisco ASR1006 DC Power Supply, Spare
ASR1013/06-PWR-DC	Cisco ASR1000 1600w DC Power Supply
ASR1013/06-PWR-DC=	Cisco ASR1000 1600w DC Power Supply, Spare
Cisco ASR 1000 Series accessories	
ASR1013-ACS=	Cisco ASR1013 Accessory Kit, Spare
ASR1006-ACS=	Cisco ASR1006 Accessory Kit, Spare
ASR1006X-ACS=	Cisco ASR 1006-X Accessory Kit, Spare
ASR1009X-ACS=	Cisco ASR 1009-X Accessory Kit, Spare
ASR1004-ACS=	Cisco ASR1004 Accessory Kit, Spare
ASR1002X-ACS=	Cisco ASR1002-X Accessory Kit, Spare
ASR1002-ACS=	Cisco ASR1002 Accessory Kit, Spare
ASR1001X-ACS=	Cisco ASR1001-X Accessory Kit, Spare
ASR1001HX-ACS	Cisco ASR1001-HX Accessory Kit
ASR1001HX-ACS=	Cisco ASR1001-HX Accessory Kit, spare
ASR1002HX-ACS	Cisco ASR1002-HX Accessory Kit
ASR1002HX-ACS=	Cisco ASR1002-HX Accessory Kit, spare

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Product number	Product description
SPA-BLANK=	Blank Cover for regular SPA, spare
EPA-BLANK=	Blank Cover for Ethernet Port Adapter (EPA), spare
ASR1000-SIP-BLANK=	Blank Cover ASR1000 SIP, Spare
ASR1000-ESP-BLANK=	Blank Cover for ASR1000 ESP, spare
ASR1000-RP-BLANK=	Blank Cover for ASR1000 RP, spare
ASR1002X-HD-BLANK=	Blank Cover for ASR1002-X HDD, Spare
ASR1002-FIPS-KIT=	ASR1002 FIPS Opacity Kit
ASR1004-FIPS-KIT=	ASR1004 FIPS Opacity Kit
ASR1006-FIPS-KIT=	ASR1006 FIPS Opacity Kit

Table 37. Ordering information for Cisco ASR 1000 Series Software and Software Licenses (except for Cisco ASR 1001 and ASR 1002-X)

Product number	Product description
Cisco ASR 1000 Series licenses - Security	
FLASR1-IPSEC-RTU=	Encryption Right-to-Use Feature Lic for ASR1000 Series, spare
FLASR1-IPSEC-RTU	Encryption Right-to-Use Feature Lic for ASR1000 Series
FLASR1-FW-RTU=	Firewall Right-to-Use Feature Lic for ASR1000 Series, spare
FLASR1-FW-RTU	Firewall Right-to-Use Feature Lic for ASR1000 Series
FLASR1-FPI-RTU=	Flex. Pack Insp. Right-to-Use Feat Lic, ASR1000 Series, spare
FLASR1-FPI-RTU	Flex. Pack. Insp. Right-to-Use Feat Lic for ASR1000 Series
FLASR1-NAT64-2M=	NAT64 RTU Feature License for up to 2M Sessions on ASR1000
FLASR1-NAT64-2M	NAT64 RTU Feature License for up to 2M Sessions on ASR1000
FLASR1-CGN-2M	CGN RTU Feature License for up to 2M Sessions on ASR1000
FLASR1-CGN-6M	CGN RTU Feature License for up to 6M Sessions on ASR1000
FLASR1-FWNAT-RED=	Firewall/NAT Stateful Inter-Chassis Redundancy License, spare
FLASR1-FWNAT-RED	Firewall/NAT Stateful Inter-Chassis Redundancy License

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Product number	Product description
Cisco ASR 1000 Series licenses - Application Visibility and Control***	
FLASR1-AVC-RTU=	Appl. Visibility & Control RTU Feat. Lic for ASR1000 Series, spare
FLASR1-AVC-RTU	Appl. Visibility & Control RTU Feat. Lic for ASR1000 Series
FLASR1-AVC-UPG=	Upgrade from FPI to AVC
FLASR1-NSIGHT-RTU=	Appl. Visibility Reporting Tool RTU. Lic for ASR1000 Series, spare
FLASR1-NSIGHT-RTU	Appl. Visibility Reporting Tool RTU. Lic for ASR1000 Series
Cisco ASR 1000 Series licenses - High Availability	
FLASR1-IOSRED-RTU=	SW Redundancy Right-To-Use Feat Lic for ASR1000 Series, spare
FLASR1-IOSRED-RTU	SW Redundancy Right-To-Use Feat Lic for ASR1000 Series
Cisco ASR 1000 Series licenses - Broadband	
FLASR1-BB-RTU=	Broadband Right-To-Use with 500 BB Sessions Lic for ASR1000, spare
FLASR1-BB-RTU	Broadband Right-To-Use with 500 BB Sessions Lic for ASR1000
FLASR1-BB-4K=	Broadband 4K Sessions Feature Lic for ASR1000 Series, spare
FLASR1-BB-4K	Broadband 4K Sessions Feature Lic for ASR1000 Series
FLASR1-BB-16K=	Broadband 16K Sessions Feature Lic for ASR1000 Series, spare
FLASR1-BB-16K	Broadband 16K Sessions Feature Lic for ASR1000 Series
FLASR1-BB-32K=	Broadband 32K Sessions Feature Lic for ASR1000 Series, spare
FLASR1-BB-32K	Broadband 32K Sessions Feature Lic for ASR1000 Series
FLASR1-BB-48K=	Broadband 48K Sessions Feature Lic for ASR1000 Series, spare
FLASR1-BB-48K	Broadband 48K Sessions Feature Lic for ASR1000 Series
FLASR1-BB-64K=	Broadband 64K Sessions Feature Lic for ASR1000 Series, spare
FLASR1-BB-64K	Broadband 64K Sessions Feature Lic for ASR1000 Series
Cisco ASR 1000 Series licenses - Cisco Unified Border Element (SP Edition)	
FLASR1-CUBES-250P	CUBE(SP) 250 Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-250P=	CUBE(SP) 250 Calls Perpetual Lic for ASR 1000 Series, Spare
FLASR1-CUBES-2KP	CUBE(SP) 2K Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-2KP=	CUBE(SP) 2K Calls Perpetual Lic for ASR 1000 Series, Spare

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Product number	Product description
FLASR1-CUBES-4KP	CUBE(SP) 4K Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-4KP=	CUBE(SP) 4K Calls Perpetual Lic for ASR 1000 Series, Spare
FLASR1-CUBES-10KP	CUBE(SP) 10K Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-10KP=	CUBE(SP) 10K Calls Perpetual Lic for ASR 1000 Series, spare
FLASR1-CUBES-16KP	CUBE(SP) 16K Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-16KP=	CUBE(SP) 16K Calls Perpetual Lic for ASR 1000 Series, Spare
FLASR1-CUBES-32KP	CUBE(SP) 32K Calls Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-32KP=	CUBE(SP) 32K Calls Perpetual Lic for ASR 1000 Series, Spare
FLASR1-CUBES-LAB	CUBE(SP) Lab Use Only Perpetual Lic for ASR 1000 Series
FLASR1-CUBES-LAB=	CUBE(SP) Lab Use Only Perpetual Lic for ASR 1000 Series, Spare
FLASR1-CUBES-TPEX	CUBE(SP) Perpetual Lic for ASR 1000 Series in B2BTP Exchange
FLASR1-CUBES-TPEX=	CUBE(SP) Perpetual Lic for ASR 1000 Series in B2BTP Exchange, Spare
CUBESP-250P-RED	CUBE(SP) redundant 250 Session Perpetual Lic for ASR1k Series
CUBESP-250P-RED=	CUBE(SP) redundant 250 Session Perpetual Lic for ASR1k Series, Spare
CUBESP-2K-RED	CUBE(SP) redundant 2k Session Perpetual Lic for ASR1k Series
CUBESP-2K-RED=	CUBE(SP) redundant 2k Session Perpetual Lic for ASR1k Series, Spare
CUBESP-4K-RED	CUBE(SP) redundant 4k Session Perpetual Lic for ASR1k Series
CUBESP-4K-RED=	CUBE(SP) redundant 4k Session Perpetual Lic for ASR1k Series, Spare
CUBESP-10K-RED	CUBE(SP) redundant 10k Session Perpetual Lic for ASR1k Series
CUBESP-10K-RED=	CUBE(SP) redundant 10k Session Perpetual Lic for ASR1k Series, Spare
CUBESP-16K-RED	CUBE(SP) redundant 16k Session Perpetual Lic for ASR1k Series
CUBESP-16K-RED=	CUBE(SP) redundant 16k Session Perpetual Lic for ASR1k Series, Spare
CUBESO-32K-RED	CUBE(SP) redundant 32k Session Perpetual Lic for ASR1k Series
CUBESO-32K-RED=	CUBE(SP) redundant 32k Session Perpetual Lic for ASR1k Series, Spare
CUBESP-TPEX-RED	CUBE(SP) B2B redundant TP Session Perpetual Lic for ASR1k Series
CUBESP-TPEX-RED=	CUBE(SP) B2B redundant TP Session Perpetual Lic for ASR1k Series, Spare

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Product number	Product description
Cisco ASR 1000 Series licenses - Cisco Unified Border Element (Enterprise Edition)	
FLASR1-CUBEE-100P	Unified Border Element - Enterprise Edition 100 Sessions
FLASR1-CUBEE-100P=	Unified Border Element - Enterprise Edition 100 Sessions, Spare
FLASR1-CUBEE-500P	Unified Border Element - Enterprise Edition 500 Sessions
FLASR1-CUBEE-500P=	Unified Border Element - Enterprise Edition 500 Sessions, Spare
FLASR1-CUBEE-1KP	Unified Border Element - Enterprise Edition 1000 Sessions
FLASR1-CUBEE-1KP=	Unified Border Element - Enterprise Edition 1000 Sessions, Spare
FLASR1-CUBEE-4KP	Unified Border Element - Enterprise Edition 4000 Sessions
FLASR1-CUBEE-4PP=	Unified Border Element - Enterprise Edition 4000 Sessions, Spare
FLASR1-CUBEE-100R	Unified Border Element EntLic, 100 Sessions, Redundancy
FLASR1-CUBEE-100R=	Unified Border Element EntLic, 100 Sessions, Redundancy, Spare
FLASR1-CUBEE-500R	Unified Border Element EntLic, 500 Sessions, Redundancy
FLASR1-CUBEE-500R=	Unified Border Element EntLic, 500 Sessions, Redundancy, Spare
FLASR1-CUBEE-1K-R	Unified Border Element EntLic, 1000 Sessions, Redundancy
FLASR1-CUBEE-1K-R=	Unified Border Element EntLic, 1000 Sessions, Redundancy, Spare
FLASR1-CUBEE-4K-R	Unified Border Element EntLic, 4000 Sessions, Redundancy
FLASR1-CUBEE-4K-R=	Unified Border Element EntLic, 4000 Sessions, Redundancy, Spare
FLASR1-CUBEE-16K-R	Unified Border Element EntLic, 16000 Sessions, Redundancy
FLASR1-CUBEE-16K-R=	Unified Border Element EntLic, 16000 Sessions, Redundancy, Spare
Cisco ASR 1000 Series licenses - Lawful Intercept license	
FLASR1-LI	Cisco ASR1000 Lawful Intercept License

* For part numbers of specific releases, please refer to Cisco ASR 1000 Series Global Price List.

** These software part numbers are for Cisco IOS XE Software Release 3.2S - as examples of software part numbers to order for the Cisco ASR 1000 Series, with the exception of the Cisco ASR 1001, ASR 1001-X, and ASR 1002-X. For Cisco ASR 1001, ASR 1001-X, and ASR 1002-X software part numbers, please refer to Table 39.

***** The application visibility and control feature licenses for the Cisco ASR 1000 (ASR1002, ASR1004, ASR1006, and ASR1013) and Cisco ASR 1001 are available as of Cisco IOS XE Software Release 3.4S.

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Table 38. Ordering information for Cisco ASR 1001-X, ASR 1002-HX, and ASR 1002-X Software and Software licenses

Product number	Product description
Cisco ASR1001-X IOS XE Software universal software	
SASR1K1XU-312S	Cisco ASR1001-X IOS XE UNIVERSAL - NO ENCRYPTION
SASR1K1XNPEK9-312S	Cisco ASR1001-X IOS-XE UNIVERSAL - NO PAYLOAD ENCRYPTION
SASR1K1XUK9-312S	Cisco ASR1001-X IOS XE UNIVERSAL
Cisco ASR1002-X IOS XE Software universal software	
SASR1K2XU-37S	Cisco ASR1002-X IOS XE UNIVERSAL
SASR12KXNPEK9-37S	Cisco ASR1002-X IOS XE - NO PAYLOAD ENCRYPTION UNIVERSAL
SASR1K2XUK9-37S	Cisco ASR1002-X IOS XE - ENCRYPTION UNIVERSAL
Cisco ASR1001 IOS XE software activation technology package licenses - enforced via software activation prior to 3.6S release	
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
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-X IOS XE software activation feature licenses	
FLSA1-BIN-1X10GE	ASR1001-X Built-in 10GE 1-port License
FLSA1-BIN-1X10GE=	ASR1001-X Built-in 10GE 1-port License
FLSA1-1X-2.5-5G	Upgrade from 2.5 Gbps to 5 Gbps License for ASR 1001-X
FLSA1-1X-2.5-5G=	Upgrade from 2.5 Gbps to 5 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-2.5-5G=	Upgrade from 2.5 Gbps to 5 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-2.5-10G	Upgrade from 2.5 Gbps to 10 Gbps License for ASR 1001-X

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Product number	Product description
FLSA1-1X-2.5-10G=	Upgrade from 2.5 Gbps to 10 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-2.5-10G=	Upgrade from 2.5 Gbps to 10 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-2.5-20G	Upgrade from 2.5 Gbps to 20 Gbps License for ASR 1001-X
FLSA1-1X-2.5-20G=	Upgrade from 2.5 Gbps to 20 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-2.5-20G=	Upgrade from 2.5 Gbps to 20 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-5-10G	Upgrade from 5 Gbps to 10 Gbps License for ASR 1001-X
FLSA1-1X-5-10G=	Upgrade from 5 Gbps to 10 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-5-10G=	Upgrade from 5 Gbps to 10 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-5-20G	Upgrade from 5 Gbps to 20 Gbps License for ASR 1001-X
FLSA1-1X-5-20G=	Upgrade from 5 Gbps to 20 Gbps Paper PAK for ASR 1001-X
L-FLA1-1X-5-20G=	Upgrade from 5 Gbps to 20 Gbps E-Deliver PAK for ASR 1001-X
FLSA1-1X-10-20G	Upgrade from 10 Gbps to 20 Gbps License for ASR 1001-X
FLSA1-1X-10-20G=	Upgrade from 10 Gbps to 20 Gbps Paper PAK for ASR 1001-X
L-FLSA1-1X-10-20G=	Upgrade from 10 Gbps to 20 Gbps E-Deliver PAK for ASR 1001-X
Cisco ASR1002-X IOS XE software activation feature licenses	
FLSA1-2X-5-10G	Upgrade from 5 Gbps to 10 Gbps License for ASR 1002-X
FLSA1-2X-5-10G=	Upgrade from 5 Gbps to 10 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-5-10G=	Upgrade from 5 Gbps to 10 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-5-20G	Upgrade from 5 Gbps to 20 Gbps License for ASR 1002-X
FLSA1-2X-5-20G=	Upgrade from 5 Gbps to 20 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-5-20G=	Upgrade from 5 Gbps to 20 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-5-36G	Upgrade from 5 Gbps to 36 Gbps License for ASR 1002-X
FLSA1-2X-5-36G=	Upgrade from 5 Gbps to 36 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-5-36G=	Upgrade from 5 Gbps to 36 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-10-20G	Upgrade from 10 Gbps to 20 Gbps License for ASR 1002-X
FLSA1-2X-10-20G=	Upgrade from 10 Gbps to 20 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-10-20G=	Upgrade from 10 Gbps to 20 Gbps E-Delivery PAK for ASR 1002-X

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Product number	Product description
FLSA1-2X-10-36G	Upgrade from 10 Gbps to 36 Gbps License for ASR 1002-X
FLSA1-2X-10-36G=	Upgrade from 10 Gbps to 36 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-10-36G=	Upgrade from 10 Gbps to 36 Gbps E-Delivery PAK for ASR 1002-X
FLSA1-2X-20-36G	Upgrade from 20 Gbps to 36 Gbps License for ASR 1002-X
FLSA1-2X-20-36G=	Upgrade from 20 Gbps to 36 Gbps Paper PAK for ASR 1002-X
L-FLSA1-2X-20-36G=	Upgrade from 20 Gbps to 36 Gbps E-Delivery PAK for ASR 1002-X
Cisco ASR1002-HX and ASR1001-HX IOS XE software activation built-in port licenses	
FLSA1-HX-2X10GE	Upgrade for ASR1000-HX Built-In 10GE 2-port License
FLSA1-HX-2X1GE	Upgrade for ASR1000-HX Built-In 1GE 2-port License
FLSA1-HX-2X10GE=	Upgrade for ASR1000-HX Built-In 10GE 2-port License, spare
FLSA1-HX-2X1GE=	Upgrade for ASR1000-HX Built-In 1GE 2-port License, spare
L-FLSA1-HX-2X10GE=	Upgrade for E-Delivery PAK for ASR1000-HX Built-In 10GE 2-port License
L-FLSA1-HX-2X1GE=	Upgrade for E-Delivery PAK for ASR1000-HX Built-In 1GE 2-port License
Cisco ASR1002-HX and ASR1001-HX encryption module	
ASR1002HX-IPSECHW	Cisco ASR1002-HX Crypto Module with no default throughput
ASR1002HX-IPSECHW=	Cisco ASR1002-HX Crypto Module with no default throughput, spare
ASR1001HX-IPSECHW	Cisco ASR1001-HX Crypto Module with no default throughput
ASR1001HX-IPSECHW=	Cisco ASR1001-HX Crypto Module with no default throughput, spare
Cisco ASR1001 IOS XE feature licenses - not enforced via software activation	
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

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Product number	Product description
FLSA1-2X-IPS4G	IPSEC License for ASR1002-X 4G Crypto BW
FLSA1-2X-IPS4G=	IPSEC Paper PAK for ASR1002-X 4G Crypto BW
L-FLSA1-2X-IPS4G=	IPSEC E-Delivery PAK for ASR1002-X 4G Crypto BW
FLSA1-2HXIPS8G	Crypto throughput License for ASR1002-HX 8G
FLSA1-2HXIPS8G=	Crypto throughput License for ASR1002-HX 8G
L-FLSA1-2HXIPS8G=	Crypto throughput License E-Delivery PAK for ASR1002-HX 8G
FLSA1C1-2HXIPS8G[2]	Crypto throughput License for ASR1002-HX 8G – FOR CISCO ONE CUSTOMERS ONLY
FLSA1-2HX8G16G	Crypto throughput upgrade from 8G to 16G for ASR1002-HX
FLSA1-2HX8G16G=	Crypto throughput upgrade from 8G to 16G for ASR1002-HX
L-FLSA1-2HX8G16G=	Crypto throughput upgrade: from 16G to 25G for ASR1002-HX E-delivery PAK
FLSA1-2HX8G25G	Crypto throughput upgrade from 8G to 25G for ASR1002-HX
FLSA1-2HX8G25G=	Crypto throughput upgrade from 8G to 25G for ASR1002-HX
L-FLSA1-2HX8G25G=	Crypto throughput upgrade: from 8G to 25G for ASR1002-HX E-delivery PAK
FLSA1-2HX16G25G=	Crypto throughput upgrade from 16G to 25G for ASR1002-HX
L-FLSA1-2HX16G25G=	Crypto throughput upgrade: from 16G to 25G for ASR1002-HX E-delivery PAK
FLSA1-1HXIPS8G	Crypto throughput License for ASR1001-HX 8G
FLSA1-1HXIPS8G=	Crypto throughput License for ASR1001-HX 8G
L-FLSA1-1HXIPS8G=	Crypto throughput License E-Delivery PAK for ASR1001-HX 8G
FLSA1C1-1HXIPS8G[3]	Crypto throughput License for ASR1001-HX 8G – FOR CISCO ONE CUSTOMERS ONLY
FLSA1-1HX8G16G	Crypto throughput upgrade from 8G to 16G for ASR1001-HX
FLSA1-1HX8G16G=	Crypto throughput upgrade from 8G to 16G for ASR1001-HX
L-FLSA1-1HX8G16G=	Crypto throughput upgrade: from 16G to 25G for ASR1001-HX E-delivery PAK
FLSASR1-FW	FW License for ASR1000 Series
FLSASR1-FW=	FW Paper PAK for ASR1000 Series
L-FLSASR1-FW=	FW E-Delivery PAK for ASR1000 Series

[2] Mandatory with Cisco ONE Foundation suite for ASR1002-HX or ASR1001-HX.

[3] Mandatory with Cisco ONE Foundation suite for ASR1002-HX or ASR1001-HX.

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Product number	Product description
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-NAT64-2M	NAT64 RTU Feature License for up to 2M Sessions on ASR1000
FLSASR1-NAT64-2M=	NAT64 RTU Feature License for up to 2M Sessions on ASR1000
L-FLSASR1-NAT64-2M	NAT64 2M Session RTU E-Delivery PAK for ASR1001 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
FLSA1-MACSEC1G[4]	MACsec license per 1GE port
L-FLA1-MACSEC1G=	MACsec license per 1GE port, spare
FLSA1-MACSEC10G[5]	MACsec license per 10GE port
L-FLA1-MACSEC10G=	MACsec license per 10GE port, spare
FLSA1-MACSEC40G[6]	MACsec license per 40GE port
L-FLA1-MACSEC40G=	MACsec license per 40GE port, spare
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

[4] Applicable to EPA-18X1GE, ASR1001-HX, ASR1002-HX.

[5] Applicable to EPA-10X10GE, ASR1001-HX, ASR1002-HX.

[6] Applicable to EPA-1X40GE, EPA-2X40GE.

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Product number	Product description
Broadband	
FLSASR1-BB	Broadband License for ASR1000 Series
FLSASR1-BB=	Broadband Paper PAK for ASR1000 Series
L-FLSASR1-BB=	Broadband 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 Feature Licenses not enforced via Software Activation, please consult the Cisco ASR 1000 Price List since new licenses might be made available and this table does not represent the complete list.	

*** These software part numbers are for Cisco IOS XE Software Release 3.2S for the Cisco ASR 1001- as examples of software part numbers to order for the Cisco ASR 1001.

***** The Application Visibility and Control feature licenses for the Cisco ASR 1000 Series (ASR1002, ASR1004, ASR1006, and ASR1013) and Cisco ASR 1001 are available as of Cisco IOS XE Software Release 3.4S.

The following bundles are available for the Cisco ASR 1000 Series:

- Base bundles
- VPN bundles
- Security bundles
- Security and High Availability
- High Availability bundles
- Broadband Bundles
- Application Experience Bundles

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Table 39. Ordering information for Cisco ASR 1000 bundles

Part number	Default components
Cisco ASR 1000 Series base bundles	
ASR1001X-2.5G-K9	**Hardware** • Chassis: ASR1001-X with 6-built-in GE ports • ESP • RP **Software** • Consolidated Package: SASR
ASR1001X-5G-K9	**Hardware** • Chassis: ASR1001-X with 6-built-in GE ports • ESP • RP **Software** • Consolidated Package: SASR
ASR1001X-10G-K9	**Hardware** • Chassis: ASR1001-X with 6-built-in GE ports • ESP • RP **Software** • Consolidated Package: SASR
ASR1001X-20G-K9	**Hardware** • Chassis: ASR1001-X with 6-built-in GE ports • ESP • RP **Software** • Consolidated Package: SASR
ASR1002X-5G-K9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES
ASR1002X-10G-K9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-10G

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Part number	Default components
ASR1002X-20G-K9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-20G
ASR1002X-36G-K9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-36G
ASR1002X-36G-NB	**Hardware** • ASR1002-X with 4GB memory M-ASR1002X-4GB • SPA-1X10GE-L-V2 (Qty: 2) **Software & Licenses** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASE1-IPB • Performance Upgrade License: FLSA1-2X-5-36G
ASR1004-40G-NB	**Hardware** • ASR1004 • ASR1000-RP2 • ASR1000-ESP40 • ASR1000-SIP40 • SPA-1X10GE-L-V2 (Qty: 4) **Software** • SASR1R2-AESK9-XYS
Cisco ASR 1000 Series VPN bundles	
ASR1001X-2.5G-VPN	**Hardware** • ASR1001-X • ESP: Integrated at default of 2.5-Gbps • RP and SIP are an integral part of the ASR1001-X chassis **Software** • Universal Image: SASR1K1XUK9-XYS • Technology Package License: FLASR1-AES • Feature License: FLSASR1-IPSEC

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Part number	Default components
ASR1001X-5G-VPN	**Hardware** • ASR1001-X • ESP: Integrated and performance is enforced to up to 5-Gbps via license • RP and SIP are an integral part of the ASR1001-X chassis **Software** • Universal Image: SASR1K1XUK9-XYS • Technology Package License: FLASR1-AES • System Throughput Upgrade License: FLSA1-1X-2.5-5G • Feature License: FLSASR1-IPSEC
ASR1001X-10G-VPN	**Hardware** • ASR1001-X • ESP: Integrated and performance is enforced to up to 10-Gbps via license • RP and SIP are an integral part of the ASR1001-X chassis **Software** • Universal Image: SASR1K1XUK9-XYS • Technology Package License: FLASR1-AES • System Throughput Upgrade License: FLSA1-1X-2.5-10G • Feature License: FLSASR1-IPSEC
ASR1001X-20G-VPN	**Hardware** • Includes 2x10G ports for 20G configuration • ASR1001-X • ESP: Integrated and performance is enforced to up to 20-Gbps via license • RP and SIP are an integral part of the ASR1001-X chassis **Software** • Universal Image: SASR1K1XUK9-XYS • Technology Package License: FLASR1-AES • System Throughput Upgrade License: FLSA1-1X-2.5-20G • Feature License: FLSASR1-IPSEC
ASR1002X-5G-VPNK9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Feature License: FLSA1-2X-IPS4G
ASR1002X-10G-VPNK9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-10G • Feature License: FLSA1-2X-IPS4G

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Part number	Default components
ASR1002X-20G-VPNK9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-20G • Feature License: FLSA1-2X-IPS4G
ASR1002X-36G-VPNK9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-36G • Feature License: FLSA1-2X-IPS4G
ASR1K4R2-40G-VPNK9	**Hardware** • Chassis: ASR1004 • ESP: ASR1000-ESP40; RP: ASR1000-RP2; SIP: 1XASR1000-SIP40 **Software** • Consolidated Package: SASR1R1-AESK9-XYS • Feature License: FLASR1-IPSEC-RTU
ASR1K6R2-40G-VPNK9	**Hardware** • Chassis: ASR1006 • ESP: 1XASR1000-ESP40; RP: 1XASR1000-RP2; SIP: 1XASR1000-SIP40 **Software** • Consolidated Package: SASR1R1-AESK9-XYS • Feature License: FLASR1-IPSEC-RTU
ASR1K6R2-100G-VPNK9	**Hardware** • Chassis: ASR1006 • ESP: 1XASR1000-ESP100; RP: 1XASR1000-RP2; SIP: 1XASR1000-SIP40 **Software** • Consolidated Package: SASR1R1-AESK9-39S • Feature License: FLASR1-IPSEC-RTU

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Part number	Default components
Cisco ASR 1001-X Series security bundles	
ASR1001X-2.5G-SEC	**Hardware** • ASR1001-X • ESP: Integrated at default of 2.5-Gbps • RP and SIP are an integral part of the ASR1001-X chassis **Software** • Universal Image: SASR1K1XUK9-XYS • Technology Package License: FLASR1-AES • Feature License: FLSASR1-IPSEC, FLSASR1-FW
ASR1001X-5G-SEC	**Hardware** • ASR1001-X • Integrated and performance is enforced to up to 5-Gbps via license • RP and SIP are an integral part of the ASR1001-X chassis **Software** • Universal Image: SASR1K1XUK9-XYS • Technology Package License: FLASR1-AES • System Throughput Upgrade License: FLSA1-1X-2.5-5G • Feature License: FLSASR1-IPSEC, FLSASR1-FW
ASR1001X-10G-SEC	**Hardware** • ASR1001-X • Integrated and performance is enforced to up to 10-Gbps via license • RP and SIP are an integral part of the ASR1001-X chassis **Software** • Universal Image: SASR1K1XUK9-XYS • Technology Package License: FLASR1-AES • System Throughput Upgrade License: FLSA1-1X-2.5-10G • Feature License: FLSASR1-IPSEC, FLSASR1-FW
ASR1001X-20G-SEC	**Hardware** • Includes 2x10G ports for 20G configuration • ASR1001-X • Integrated and performance is enforced to up to 20-Gbps via license • RP and SIP are an integral part of the ASR1001-X chassis **Software** • Universal Image: SASR1K1XUK9-XYS • Technology Package License: FLASR1-AES • System Throughput Upgrade License: FLSA1-1X-2.5-20G • Feature License: FLSASR1-IPSEC, FLSASR1-FW

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Part number	Default components
Cisco ASR 1002-X Series security bundles	
ASR1002X-5G-SECK9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Feature Licenses: FLSA1-2X-IPS4G; FLSASR1-FW
ASR1002X-10G-SECK9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-10G • Feature Licenses: FLSA1-2X-IPS4G; FLSASR1-FW
ASR1002X-20G-SECK9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-20G • Feature Licenses: FLSA1-2X-IPS4G; FLSASR1-FW
ASR1002X-36G-SECK9	**Hardware** • ASR1002-X **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-36G • Feature Licenses: FLSA1-2X-IPS4G; FLSASR1-FW
Cisco ASR 1000 Series security bundles	
ASR1K6R2-100G-SECK9	**Hardware** • Chassis: ASR1006 • ESP: 1XASR1000-ESP100; RP:1XASR1000-RP2; SIP: 1XASR1000-SIP40 **Software** • Consolidated Package: SASR1R1-AESK9-39S • Feature License: FLASR1-IPSEC-RTU, FLASR1-FW-RTU

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Part number	Default components
ASR1K4R2-40G-SECK9	**Hardware** • Chassis: ASR1004 • ESP: ASR1000-ESP40; RP: ASR1000-RP2; SIP: 1XASR1000-SIP40 **Software** • Consolidated Package: SASR1R1-AESK9-XYS • Feature License: FLASR1-IPSEC-RTU, FLASR1-FW-RTU
ASR1K6R2-40G-SECK9	**Hardware** • Chassis: ASR1006 • ESP: 1XASR1000-ESP40; RP:1X ASR1000-RP2; SIP: 1XASR1000-SIP40 **Software** • Consolidated Package: SASR1R1-AESK9-XYS • Feature License: FLASR1-IPSEC-RTU, FLASR1-FW-RTU
Cisco ASR 1002-X Series Security + High Availability bundles	
ASR1002X-5G-SHAK9	**Hardware** • ASR1002-X with 8GB memory M-ASR1002X-8GB **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Feature Licenses: FLSA1-2X-IPS4G; FLSASR1-FW; FLSASR1-FPI; FLSASR1-IOSRED
ASR1002X-10G-SHAK9	**Hardware** • ASR1002-X with 8GB memory M-ASR1002X-8GB **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-10G • Feature Licenses: FLSA1-2X-IPS4G; FLSASR1-FW; FLSASR1-FPI; FLSASR1-IOSRED
ASR1002X-20G-SHAK9	**Hardware** • ASR1002-X with 8GB memory M-ASR1002X-8GB **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-20G • Feature Licenses: FLSA1-2X-IPS4G; FLSASR1-FW; FLSASR1-FPI; FLSASR1-IOSRED

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Part number	Default components
ASR1002X-36G-SHAK9	**Hardware** • ASR1002-X with 8GB memory M-ASR1002X-8GB **Software** • Universal Image: SASR1K2XUK9-XYS • Technology Package License: FLASR1-AES • Performance Upgrade License: FLSA1-2X-5-36G • Feature Licenses: FLSA1-2X-IPS4G; FLSASR1-FW; FLSASR1-FPI; FLSASR1-IOSRED
Cisco ASR 1000 Series Security + High Availability Bundles	
ASR1K6R2-40G-SHAK9	**Hardware** • Chassis: ASR1006 • ESP: 2XASR1000-ESP40; RP: 2XASR1000-RP2; SIP: 1XASR1000-SIP40 **Software** • Consolidated Package: SASR1R1-AESK9-XYS • Feature License: FLASR1-IPSEC-RTU, FLASR1-FW-RTU, FLASR1-FPI-RTU
ASR1K6R2-100G-SHAK9	**Hardware** • Chassis: ASR1006 • ESP: 2XASR1000-ESP100; RP: 2XASR1000-RP2; SIP: 1XASR1000-SIP40 **Software** • Consolidated Package: SASR1R1-AESK9-39S • Feature License: FLASR1-IPSEC-RTU, FLASR1-FW-RTU, FLASR1-FPI-RTU

* The letters “XY” in the image name (for example, SASR1R1-AESK9-XYS and SASR1001UK9-XYS) are denoted as the latest major Cisco IOS XE Software release (for example, 32 means Cisco IOS XE Software Release 3.2S). However, the actual release is subject to change without notice.

** Available with Cisco IOS XE Software Release 3.3S.

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Cisco ASR 1000 Application Experience

The Cisco ASR 1000 Application Experience (AX) bundles consist of the following items:

- AVC License with NBAR2 DPI, Flexible NetFlow (FNF), and Performance Monitoring
- AppNav for WAN optimization
- Option to purchase heavily discounted vWAAS licenses, to be run on a standalone server

Table 40 lists part numbers for Cisco ASR AX Router bundles.

Table 40. Cisco ASR AX Router bundles

Part number	Product description	Quantity
ASR1001X-AES-AX	**ASR1001X AX, AVC, AES, vWAAS Bundle, includes:**	
	ASR1001-X	1
	SLASR1-AES	1
	FLSASR1-AVC	1
ASR1001X-AIS-AX	**ASR1001X AX, AVC, AIS, vWAAS Bundle, includes:**	
	ASR1001-X	1
	SLASR1-AIS	1
	FLSASR1-AVC	1
ASR1002X-AES-AX	**ASR1002X AX, AVC, AES, vWAAS Bundle, includes:**	
	ASR1002-X	1
	SLASR1-AES	1
	FLSASR1-AVC	1
ASR1002X-AIS-AX	**ASR1002X AX, AVC, AIS, vWAAS Bundle, includes:**	
	ASR1002-X	1
	SLASR1-AES	1
	FLSASR1-AVC	1

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Virtual WAAS ordering option with Cisco ASR AX bundles

With each of the ASR bundles in Table 40, Cisco is providing the option to purchase a discounted vWAAS license; these licenses may then be deployed on a standalone server; product IDs are shown in Table 41.

Table 41. vWAAS Product IDs for specific ASR AX configurations only

Part number	Product description
FLASR1-AX-VWAAS12K	License for Virtual WAAS 12000 Connections
FLASR1-AX-VWAAS50K	License for Virtual WAAS 50000 Connections

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