

## Cisco Unified Border Element (SP Edition) for Cisco ASR 1000 Series

### Product Overview

The Cisco® Unified Border Element (SP Edition) is a high-scale, carrier-grade session border controller (SBC) that is integrated into Cisco routing platforms; it can be integrated with many router functions to provide a very feature-rich and intelligent SBC application. Formerly known only as Session Border Controller, Cisco Unified Border Element (SP Edition) provides a network-to-network demarcation interface for signaling interworking, media interworking, address and port translations, billing, security, quality of service (QoS), Call Admission Control (CAC), and bandwidth management.

Cisco Unified Border Element (SP Edition) allows service providers and large enterprises to connect isolated voice, video, and unified communications networks directly over IP-IP interconnections, avoiding public switched telephone networks (PSTNs). End-to-end IP enables services such as Session Initiation Protocol (SIP) trunking, service provider voice-over-IP (VoIP) peering, residential triple play (data, voice, and video), and business-to-business Cisco TelePresence™ conferencing. It also provides new revenue opportunities, enhances quality, increases scalability, lowers costs, and reduces network complexities.

Cisco Unified Border Element (SP Edition) is a critical element of the Cisco Service Exchange Framework (SEF) for service provider next-generation networks and large enterprise unified communications networks. As part of the Cisco SEF, it supports IP Multimedia Subsystem (IMS) and non-IMS services.

Cisco Unified Border Element (SP Edition) on the Cisco ASR 1000 Series Aggregation Services Routers builds on the continuous operation and service aggregation that these powerful and flexible routers provide. With media-forwarding performed on a Cisco ASR 1000 Series Embedded Services Processor (ESP) and control functions performed on a Cisco ASR 1000 Series Route Processor (RP), the Cisco ASR 1000 Series delivers an extensible pay-as-you-grow SBC solution through modular ESPs and RPs. Cisco Unified Border Element (SP Edition) on the Cisco ASR 1000 Series completely integrates the SBC with other Layer 2 and Layer 3 Cisco IOS® XE Software services without requiring additional application-specific hardware (service blades). Following are some benefits of Cisco Unified Border Element (SP Edition) integration on the Cisco ASR 1000 Series:

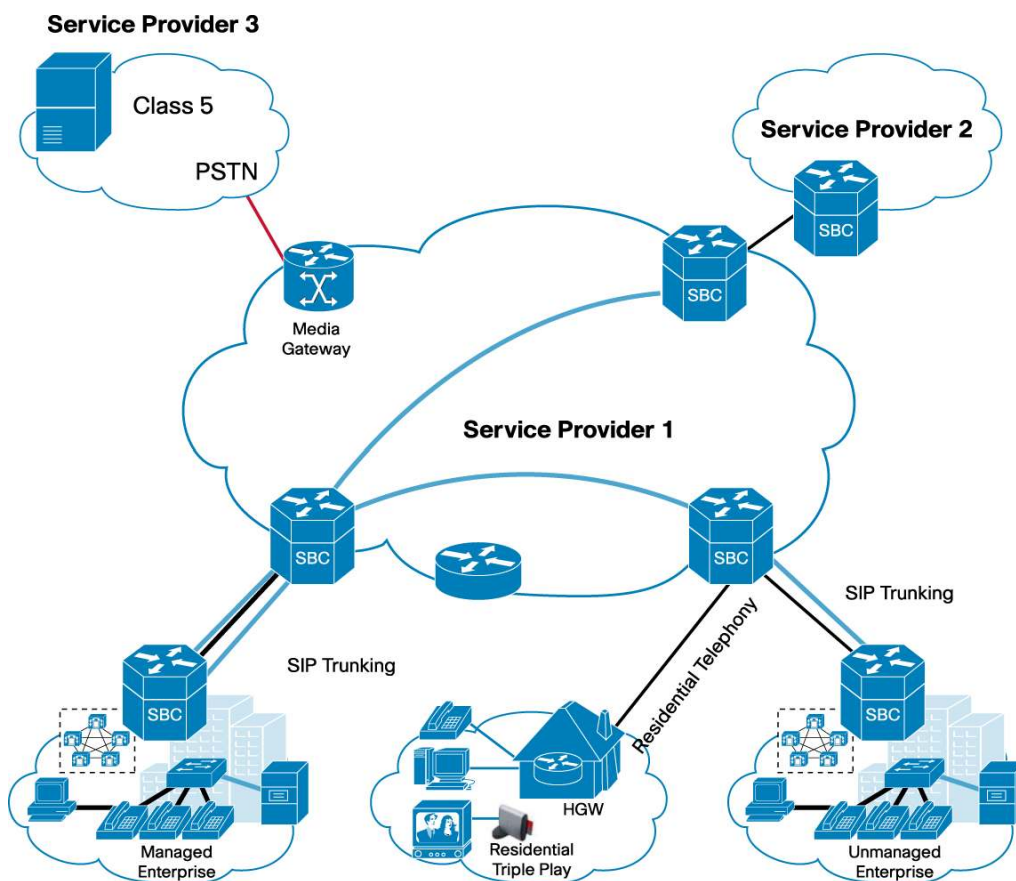
- Total cost of ownership (TCO):
  - Capital expenditures (CapEx) and operating expenses (OpEx) savings by eliminating overlay networks and additional interfaces on routers
  - Environmental benefits with lower power and cooling requirements
- Video and Cisco TelePresence™ conferencing:
  - Scalable video and Cisco TelePresence support; allows business-to-business Cisco TelePresence support
  - Compatibility with Unified Communications solutions
- Pay-as-you-grow model:
  - Choice of 1-rack-unit (1RU), 2RU, 4RU, 6RU or 13RU chassis
  - Performance of 2.5, 5, 10, or 20 or 40 Gbit/sec. Upgrade as scalability needs grow
  - T1/E1 to 10-GE modular interfaces
- Carrier-grade high availability:
  - High availability within a single chassis or across chassis

- Redundancy with Stateful Switchover and Nonstop Forwarding
- In-Service Software Upgrade (ISSU)
- Many deployment options:
  - Standalone or integrated in the networking infrastructure
  - Unified or distributed SBC models
  - IMS or non-IMS deployments
- Advanced services and support

## Applications

Cisco Unified Border Element (SP Edition) supports applications such as SIP trunking, VoIP peering, residential telephony, and business-to-business Cisco TelePresence conferencing by supporting numerous service provider and large enterprise deployments. (Refer to Figure 1.)

**Figure 1.** Where SBCs are Deployed in VoIP Networks



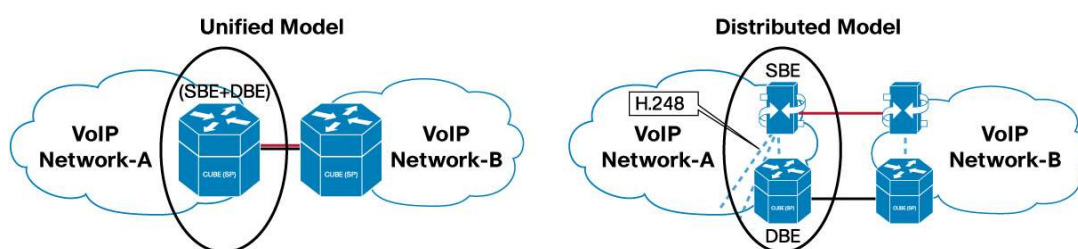
- Service provider to service provider: Interconnecting IP networks enhances the quality of VoIP and other realtime IP multimedia services and reduces the cost and complexity of traditional time-division multiplexing (TDM) interconnections. In addition, direct IP-IP interconnection enables new services (converged voice and data, or voice and video, for example) that are not possible with TDM-based interconnections.
- Service provider to enterprise, or residential access: Deploy Cisco Unified Border Element (SP Edition) at the edge of the service provider network to interact with, manage, and control the incoming VoIP or video traffic from enterprise or residential customers. This incoming traffic might need to be modified to handle any

Network Address Translation (NAT) or firewall devices in between and might need to be policed or modified to handle any interprotocol communication from IP private branch exchanges (PBXs) or end-user devices.

- Enterprise edge: SBCs are deployed at the enterprise premises to provide interprotocol communication and management of VoIP and video traffic to and from the enterprise toward the service provider or other enterprises.

The Cisco Unified Border Element (SP Edition) gives a choice of a unified or distributed SBC deployment model (Figure 2). In the unified SBC deployment model, the Cisco Unified Border Element (SP Edition) hosts both media and signaling-related functions (for example, SIP). In the distributed deployment model, the Cisco Unified Border Element (SP Edition) hosts the media-related functions and communicates with an external signaling element (for example, softswitch) using the industry-standard H.248 Protocol. The Cisco Unified Border Element (SP Edition) design allows for either deployment model using the same hardware and software.

**Figure 2.** SBC Deployment Models





In Figure 2, DBE refers to the data-border element that handles media, and SBE refers to the signaling-border element that handles signaling.

## Features and Benefits

Table 1 lists the features and benefits of the Cisco Unified Border Element (SP Edition) on the Cisco ASR 1000 Series.

**Table 1.** Features and Benefits of Cisco Unified Border Element (SP Edition) on Cisco ASR 1000 Series

Feature	Benefit
<b>Deployment models</b>	<ul style="list-style-type: none"> <li>• Unified signaling model</li> <li>• Distributed signaling model</li> </ul>
<b>High availability</b>	<ul style="list-style-type: none"> <li>• Full hardware and software redundancy</li> <li>• Stateful Switchover to preserve active sessions</li> <li>• In-Service Software Upgrade (ISSU)</li> </ul>
<b>Network hiding</b>	<ul style="list-style-type: none"> <li>• Network Address Port Translation (NAPT)</li> <li>• IP network privacy and topology hiding</li> </ul>
<b>Media support</b>	<ul style="list-style-type: none"> <li>• Dual-tone multifrequency (DTMF) interworking between any of these methods: RFC 2833, SIP-info, and SIP-notify</li> <li>• Multiple voice and video codecs</li> <li>• Fax and modem pass-through and up-speed</li> <li>• Secure Real-Time Transport Protocol (SRTP) Media Relay</li> <li>• Transcoding and Transrating using onboard SPA-DSP card</li> <li>• Dynamic codec configurations</li> <li>• SRTP to RTP interworking</li> </ul>
<b>CAC and QoS</b>	<ul style="list-style-type: none"> <li>• Per-session policing for bandwidth management</li> <li>• Per-session differentiated-services-code-point (DSCP) remarking</li> <li>• Various CAC mechanisms: Maximum bandwidth, maximum channels, maximum in- and out-of-call message rate, maximum call rate, maximum registration rate, maximum number of calls, maximum number of registrations, and maximum number of media renegotiations in a call</li> <li>• CAC bypass for emergency calls, subscriber-level policy</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• Bandwidth (theft) protection</li> </ul>

Feature	Benefit
	<ul style="list-style-type: none"> <li>• Denial-of-service (DoS) protection</li> <li>• H.248 interim authentication header</li> <li>• SIP authentication</li> <li>• Transport Layer Security (TLS) and Datagram TLS (DTLS)</li> <li>• SRTP</li> <li>• VPN awareness with Multi-Virtual Route Forwarding (VRF)</li> <li>• Black and white listing</li> <li>• Privacy (P-headers) Lawful Intercept</li> <li>• URI/E.164 triggered Lawful intercept (based on Cisco Service Independent Intercept [SII](RFC 3924) architecture)</li> </ul>
<b>Protocols</b>	<ul style="list-style-type: none"> <li>• SIP-to-SIP, H.323-to-H.323, and SIP-to-H.323 interworking</li> <li>• IPv4-to-IPv4, IPv6-to-IPv6, and IPv4-to-IPv6 interworking</li> <li>• SIP-I and SIP-T support</li> <li>• Delayed Offer (DO) ↔ Early Offer (EO) support</li> <li>• SIP header manipulation</li> <li>• Supplementary services</li> <li>• Registration forwarding and aggregated and delegated registration</li> <li>• Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPN)</li> <li>• Ia" interface (H.248) and Border Gateway Function (BGF) support.</li> <li>• Support for BFCP protocol and H.239 pass-through</li> <li>• Instant Messaging and SIP for Instant Messaging and Presence Leveraging Extensions (SIMPLE)</li> <li>• ENUM client Support</li> </ul>
<b>3GPP IMS</b>	<ul style="list-style-type: none"> <li>• IBCF processing Support</li> <li>• IP Multimedia Subsystem (IMS) Proxy Call Session Control Function (P-CSCF) support</li> <li>• Diameter Rx interface</li> </ul>
<b>Billing</b>	<ul style="list-style-type: none"> <li>• Multiple RADIUS server support</li> <li>• XML Based Billing</li> </ul>
<b>Routing</b>	<ul style="list-style-type: none"> <li>• Routing based on number manipulation, hunting, destination address table, category table, least-cost table, timebased tables, regular expression, and Trunk Group ID</li> <li>• Number analysis policies - Number validation, number categorization, and source number analysis</li> <li>• Telephone Uniform Resource Identifier (TEL URI) support</li> <li>• IP → Fully-qualified domain name (FQDN) URI translation (for both IPv4 and IPv6)</li> </ul>
<b>Voice-quality statistics</b>	<ul style="list-style-type: none"> <li>• Packet loss, jitter, and round-trip time</li> </ul>
<b>Range of hardware options to fit various size, scale, and performance needs</b>	<ul style="list-style-type: none"> <li>• Range of interfaces: Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, T1/E1, T3/E3, and OC-3/OC-12 Packet over SONET/SDH (PoS)</li> <li>• Range of sizes: Cisco ASR 1001 (1RU), Cisco ASR 1002 or ASR 1002-F (2RU), Cisco ASR 1004 (4RU), Cisco ASR 1006 (6RU) and Cisco ASR1013 (13 RU)</li> <li>• Range of route processors: Cisco ASR 1000 Series RP1 and ASR 1000 Series RP2</li> <li>• Range of ESPs: Cisco ASR 1000 Series ESP5, Cisco ASR 1000 Series ESP10, and Cisco ASR 1000 Series ESP20</li> </ul>
<b>SIPconnect compliance</b>	 <ul style="list-style-type: none"> <li>• The product is SIPconnect-compliant.</li> <li>• SIPconnect is a certification mark of the SIP Forum, LLC. It is an industrywide, standards-based approach to direct IP peering between SIP-enabled IP PBXs and VoIP service provider networks.</li> </ul>
<b>Pathfinder Certified partner</b>	 <ul style="list-style-type: none"> <li>• The product is certified Partner for PathFinder, GSMAGSMA managed service operated by Neustar</li> <li>• PathFinder provides an off-the-shelf, one-stop-shop approach to multilateral ENUM data publishing allowing rapid expansion of interconnect arrangement and global partner reachability</li> </ul>

## Ordering Information

Ordering the Cisco Unified Border Element (SP Edition) for Cisco ASR 1000 Series involves three steps:

1. Select a router from the Cisco ASR 1000 Series with the required route-processor and ESP modules.
2. Select a Cisco IOS XE Software image with Cisco Unified Border Element (SP Edition) support.
3. Select the appropriate feature licenses. Optional:
4. If Transcoding/Transrating is required Select DSP-SPA card.

To place an order, visit the [Cisco Ordering homepage](#). Table 2 gives information about feature licenses.

**Table 2.** Feature Licenses

Product Name	Part Number
CUBE(SP) 250 Session License for ASR 1000 Series	FLASR1-CUBES-250P
CUBE(SP) 2K Session License for ASR 1000 Series	FLASR1-CUBES-2KP
CUBE(SP) 4K Session License for ASR 1000 Series	FLASR1-CUBES-4KP
CUBE(SP) 16K Session License for ASR 1000 Series	FLASR1-CUBES-16KP
CUBE(SP) 32K Session License for ASR 1000 Series	FLASR1-CUBES-32KP
CUBE(SP) RTU Lic for ASR 1000 Series in Video/B2BTP Exchange	FLASR1-CUBES-TPEX

Cisco Unified Border Element (SP Edition) licenses authorize the use of both distributed and unified SBC deployment models. Two kinds of licenses are available: Session licenses and Right-to-Use (RTU) licenses.

For the purpose of Session license ordering, a voice call handled by the SBC uses one session from the license (a voice call includes bidirectional media flow and associated signaling for the call). A video call handled by the SBC uses one session for the voice channel and as many sessions for video as the multiples of 200 kbps used by the video-channel bandwidth. For example, one video call that uses 1-Mbps video bandwidth will use 6 sessions (1 session for audio and 1 Mbps/200 kbps = 5 sessions for video). An Instant Messaging session consists of signaling between two endpoints through the SBC; there is generally no associated media. You can combine multiple Session licenses in a system for the total session count desired.

You can use the RTU License (FLASR1-CUBES-TPEX) for video and Cisco TelePresence sessions up to the maximum possible number with the interface, ESP, and route-processor combination in the selected Cisco ASR 1000 system.

**Table 3.** Redundancy Feature Licenses

License Description (Redundant Feature License)	Part Numbers
CUBE(SP) B2B redundant TP Session Lic	CUBESP-TPEX-RED
CUBE(SP) redundant 32k Session Perp Lic	CUBESP-32KP-RED
CUBE(SP) redundant 16k Session Perp Lic	CUBESP-16KP-RED
CUBE(SP) redundant 10k Session Perp LIC	CUBESP-10KP-RED
CUBE(SP) redundant 4k Session Perp Lic	CUBESP-4KP-RED
CUBE(SP) redundant 2k Session Perp Lic	CUBESP-2KP-RED
CUBE(SP) redundant 250 Session Perp Lic	CUBESP-250P-RED

\* Redundancy licenses are only valid on single RP systems

## To Download the Software

To download the software section, visit the Cisco Software Center. Table 4 lists Cisco IOS XE Software images with support for the Cisco Unified Border Element (SP Edition).

**Table 4.** Cisco ASR 1000 Series Software Images with Cisco Unified Border Element (SP Edition) Support

Software feature Set	Part Number
Cisco ASR 1000 Series RP1 ADVANCED IP SERVICES	SASR1R1-AISK9
Cisco ASR 1000 Series RP1 ADVANCED ENTERPRISE SERVICES	SASR1R1-AESK9
Cisco ASR 1000 Series RP1 ADVANCED IP SERVICES w/ o CRYPTO	SASR1R1-AIS
Cisco ASR 1000 Series RP1 ADVANCED ENTERPRISE SERVICES w/ o CRYPTO	SASR1R1-AES
Cisco ASR 1000 Series RP2 ADVANCED IP SERVICES	SASR1R2-AISK9
Cisco ASR 1000 Series RP2 ADVANCED ENTERPRISE SERVICES	SASR1R2-AESK9
Cisco ASR 1000 Series RP2 ADVANCED IP SERVICES w/ o CRYPTO	SASR1R2-AIS
Cisco ASR 1000 Series RP2 ADVANCED ENTERPRISE SERVICES w/ o CRYPTO	SASR1R2-AES

## Cisco Services and Support

Cisco and our partners offer a broad portfolio of end-to-end services to accelerate customer success. Based on proven methodologies for deploying, operating, and optimizing IP communications solutions, these services successfully integrate Cisco Unified Communications, Cisco TelePresence, security, and mobility technologies with bandwidth to support video, collaboration, and growth in alignment with your business goals. Planning and design services align technology with business goals and can increase the accuracy, speed, and efficiency of deployment. Technical services help maintain operational health, strengthen software application functions, solve performance problems, and lower expenses. Optimization services are designed to continually improve performance and help your team succeed with new technologies. For more information, please visit <http://www.cisco.com/go/services>.

## For More Information

For more information about the Cisco ASR 1000 Series or the Cisco ASR 1000 Series Embedded Services Processors, visit <http://www.cisco.com/go/asr1000> or contact your local Cisco account representative.



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