Cisco ASR 1000 Series DSP-SPA

Product Overview

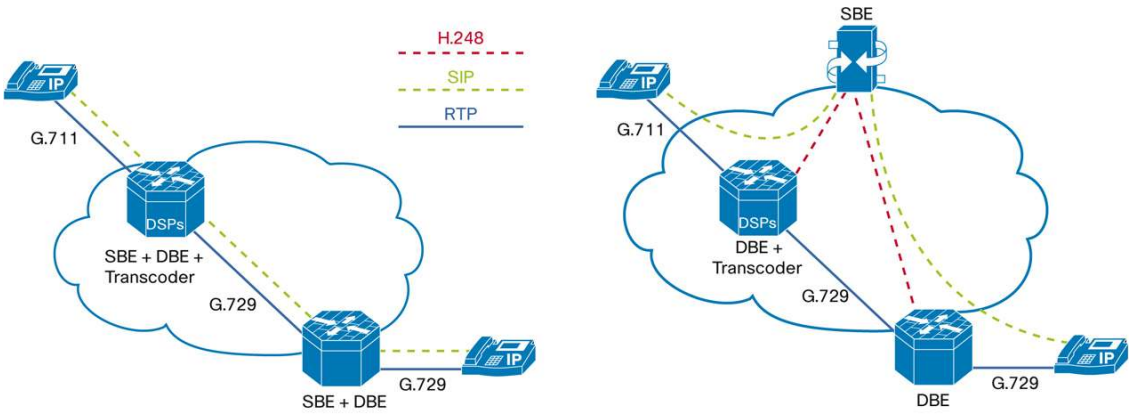
The Cisco® ASR 1000 Series DSP-SPA is a single-width, half-height, high-power shared port adaptor (SPA) digital signal processor (DSP) module that can be used in multiple Cisco platforms (Figure 1). The SPA-DSP provides voice service such as voice transcoding and transrating and dual-tone multifrequency (DTMF) interworking capability for the platforms that support SPA modules.

Figure 1. Cisco ASR 1000 Series DSP-SPA Card

The DSP-SPA helps position a peering session border controller (SBC) with another carrier's voice-over-IP (VoIP) network and helps provide access to the SBC in the service provider edge, enabling Session Initiation Protocol (SIP) trunking and aggregation of enterprise and residential customers. These cards can also be used when the Cisco ASR 1000 Series Aggregation Services Routers are deployed in Cisco Unified Border Element (CUBE) Enterprise Edition for public-switched telephone network (PSTN) access using SIP trunks. Transcoding is used for voice codec translation between two VoIP networks, as part of the data border element (DBE) functions. Transrating is used for repacketization for packets with the same codec.

Transcoding is the process of translating a media stream encoded using one codec into a media stream encoded using another codec: for example, translating a media stream encoded using G.711 into G.729. It requires DSPs. Customers take two approaches to transcoding (Figure 2). One set of customers expects SBCs to have DSPs on board to perform the transcoding when required (model 1). Another set of customers wants to centralize the DSP resources, so SBCs at the edge offload transcoding to a centralized DSP resource (model 2); this centralized DSP resource could be serving a number of SBCs and providing many other DSP-dependant services in addition to transcoding. The Cisco ASR 1000 Series SBC supports both models.

Figure 2. DSP-SPA in Unified SBC as Transcoder



Model 1: Unified SBC with on-board DSPs for transcondig

Model 2: Distributed SBC with on-board DSPs for transcondig

When deployed in an enterprise customer's network, the DSP-SPA cards can be used to transcode between a codec required by a SIP service provider and a codec used within the enterprise network. As shown in Figure 2, the DSPs can reside either in the same device (in-box transcoding) or in a different device (out-of-box transcoding).

Features and Benefits

The DSP-SPA card for the Cisco ASR 1000 Series enhances the Cisco SBC voice experience, providing both voice transcoding and transrating capabilities. Benefits include:

- Tight integration of SBE and transcoder
  - Capability for SBC to use on-board DSP-SPA as transcoder
  - Faster delivery of voice content.
  - Very low latency
  - Transrate voice codec for incompatible endpoints and gateways
- Enhanced DTMF capability
  - In-band DTMF to RFC-2833 and out-of-band DTMF interworking
- Optimized bandwidth
  - Optimized media path; no external, third transcoder needed
  - Use of less bandwidth because transcoding is on board
- Lower customer deployment and maintenance costs
  - No dedicated servers or appliances
  - Transparent operations and ease of deployment
  - Little configuration and administration
  - Investment protection; DSP-SPA can be used together with SBE or DBE

The DSP-SPA card is implemented on the industry-leading Cisco SPA design. The Cisco SPA/SIP portfolio offers the following additional advantages:

- Highly modular, flexible, intelligent interface processors
  - Pioneering programmable interface processors provide flexibility for the service diversity required in next-generation networks.
  - Innovative design supports intelligent service delivery without compromising performance.
- Increased speed-to-service revenue
  - The scalable, programmable Cisco architecture extended to 10 Gbps dramatically improves customer density, increasing potential revenue per platform.
- Dramatically improved return on routing investment
  - Improved slot economics and increased density reduce capital expenditures (CapEx).
  - The capability to easily add new interfaces as they are needed facilitates a "pay-as-you-grow" business model. SPAs are shared across multiple platforms and can easily be moved from one platform to another, providing consistent feature support, accelerated product delivery, and a significant reduction in operating expenses (OpEx) through common sparing as service needs change.

For product specifications for all Cisco SPAs, please see http://www.cisco.com/en/US/products/ps6267/prod_module_series_home.html.

Product Specifications

Product specifications are listed in Table 1.

Table 1. Product Specifications

Feature	Description
Product compatibility	• Cisco ASR 1000 Series: • Cisco ASR 1001 Router • Cisco ASR 1002 Router • Cisco ASR 1004 Router • Cisco ASR 1006 Router • Cisco ASR 1013 Router
Minimum Cisco IOS® XE Software Release	Cisco IOS XE Software Release 3.2.0
Service	Voice transcoding and transrating
Performance	For low-complexity codec such as G.711: approximately 900 sessions For medium-complexity codec such as G722, G726, and G729: approximately 580 sessions For high-complexity codec such as G723, G728, AMR, and iLBC: approximately 350 sessions
Voice codecs supported	G.711 u-law and G.711 a-law G.729, G.729A, G.729B, and G.729AB G.726 G.728 G.722 (wideband: 64 Kbps) iLBC: 13.3 and 15.2 Kbps iSAC G.723 and G.723 Rev A (only on CUBE Service Provider) GSM-AMR-nb (only on CUBE Service Provider)
SPA height and number of SPA slots used	Occupy a single bay, and half height
Memory	1 GB SDRAM
Storage	-
Reliability and availability	Online insertion and removal (OIR) On failure, restart failed DSP within 1 second
Physical dimensions	• Weight: 0.75 lb (0.34 kg) • Height: 0.8 in. (2.03 cm) (single height) • Width: 6.75 in. (17.15 cm) • Depth: 7.28 in. (18.49 cm)
Power	23.5 watts (W)
Environmental specifications	Operating temperature: 41 to 104℉ (5 to 40℃) Storage temperature: -38 to 150℉ (-40 to 70℃) Operating humidity: 5 to 85% relative humidity Storage humidity: 5 to 95% relative humidity

Feature	Description
Approvals and compliance	**Safety** • UL 60950-1 • CSA 22.2-No.60950-1 • EN60950-1 • IEC 60950-1 • AS/NZS 60950-1 • EN60825\IEC60825 laser safety (SR, IR-Class 1) (VSR-Class 1M)1 • 21CFR1040 -FDA Code of Federal Regulations (USA) laser safety (SR, IR-Class 1) (VSR-Class 1M)1 **EMC** EMI Standards • CFR 47 Part 15: (FCC) • ICES 003 • AS/NZ CISPR 22 • CISPR 22 (EN55022) • VCCI • KN22 • IEC/EN 61000-3-2 • IEC/EN 61000-3-3 ETSI and EN Standards • EN300 386: Telecommunications Network Equipment (EMC), OTC • EN55022: Information Technology Equipment (Emissions) • EN55024: Information Technology Equipment (Immunity) • EN50082-1/EN-61000-6-1: 1995-Generic Immunity Standard **Immunity** • IEC/EN-61000-4-2 • IEC/EN-61000-4-3 • IEC/EN-61000-4-4 • IEC/EN-61000-4-5 • IEC/EN-61000-4-6 • IEC/EN-61000-4-8 • IEC/EN-61000-4-11 Network Equipment Building Standards (NEBS) This product is designed to meet the following requirements (official qualification may be in progress): • SR-3580 - NEBS: Criteria levels (Level 3 compliant) • GR-63-CORE - NEBS: Physical protection • GR-1089-CORE - NEBS: EMC and safety

Table 2 lists the maximum number of DSP-SPA cards allowed on each Cisco ASR 1000 Series chassis model.

Table 2. Maximum Number of DSP-SPA Cards per Cisco ASR 1000 Series Chassis

Cisco ASR 1000 Series Model	Maximum Number of DSP-SPA Cards Allowed
Cisco ASR 1001	1
Cisco ASR 1002 Fixed Router	1
Cisco ASR 1002	3
Cisco ASR 1004	7
Cisco ASR 1006	11
Cisco ASR 1013	23

Ordering Information

To place an order, visit the Cisco Ordering homepage.

Table 3 lists the part number for the DSP-SPA card.

Table 3. Ordering Information

Product Name	Part Number
Digital Signal Processor SPA	SPA-DSP

For More Information

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

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