UNIFY Harmonize your enterprise

OpenScape Business V2

How To

Integrated SBC Function

Version1.0

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Date	Version	Changes
2016-07-01	0.1	Draft
2016-07-06	0.2	Description of the transcoding function
2016-07-20	1.0	Several enhancements

1. Introduction

A Session Border Controller (SBC) is a network component for safe coupling of different computer networks or computer networks with different security requirements. SBC are mainly used in IP telephony networks (VoIP) to connect external (insecure) data networks with internal (secure) IT structures or to implement so-called sessions.

An SBC enables control and monitoring of signaling and media streaming as well as setup, execution and termination of telephone conversations or other interactive media that are involved in a communication.

An SBC is, as the name implies, used at network boundaries and couples internal and external networks. The SBC analyzes the various data streams (sessions) and acts on the different data streams (here: media data or signaling data) depending on the configuration. Within the telecommunications area (VoIP) signaling data and voice / video data are transmitted separately.

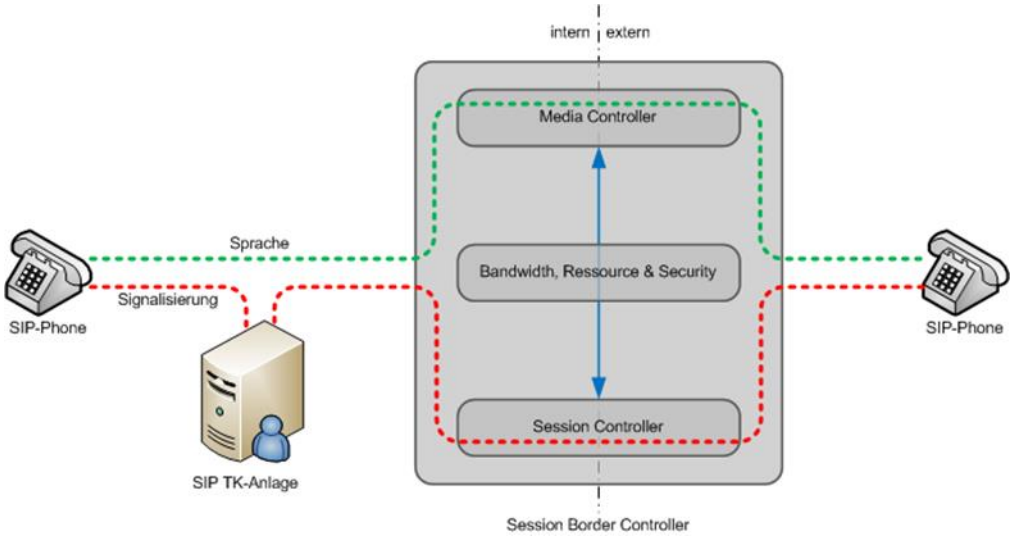

Figure 1 Operating principle of the Session Border Controller in VoIP environment.

In general a SIP-based phone sends the signaling data to the telephone system, while the voice data is usually transmitted via the shortest route directly from phone to phone. By decoupling of signaling and voice data on the one hand the advantages of IP-based data networks can be used but on the other hand, the transmission of voice (media) data cannot be affected by the telephone system.

- **Security Offloading**
  Support of encryption techniques (TLS, SRTP)
- **Media Pinholing**
  Specific activation of UDP / TCP ports for the transmission of media data
- **Transcoding**
  Transcoding of different voice / video codecs such as G.711 to G.729
- **Protocol Translation**
  Conversion and adjustments of various signaling protocols such as SIP to SIP-Q (QSIG over SIP)
- **Header Manipulation**
  Adaptation of SIP and SDP header in order to convert e.g. phone number formats (E.164) or IP addresses
- **Media Anchoring**
  Coupling of voice data of SIP terminals that can only be reached via Network Address Translation.
  Secured coupling of voice / video data.

Source: (1)

2. Integrated SBC Function

OpenScape Business provides an integrated SBC function that is activated automatically when VoIP connections have to be transmitted via an Internet telephony service provider (ITSP). The activation of the required SBC functions and their configuration is done automatically within OpenScape Business. An explicit configuration of the SBC is not necessary and is therefore not provided in the Administration Portal (WBM).

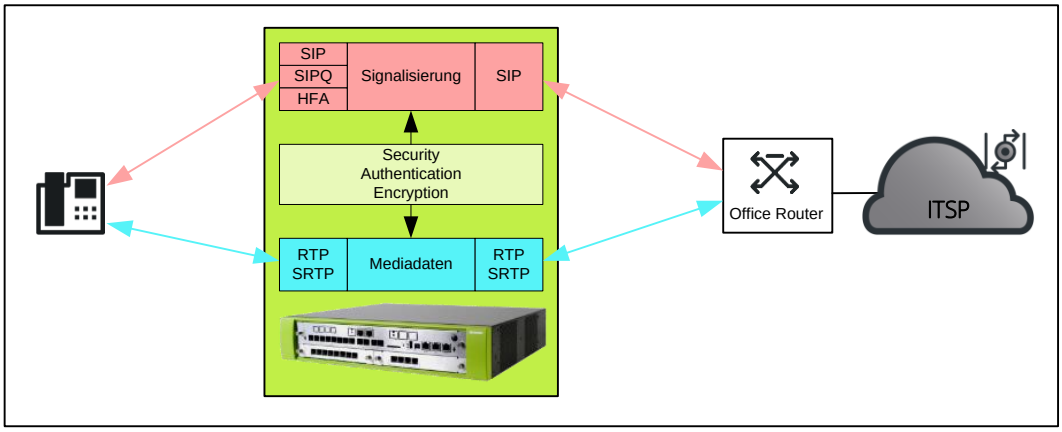

Figure 2 OpenScape Business integrated SBC function

The integrated SBC function is also activated in case of:

- System Device@Home
- myPortal to go with VoIP function via the Internet
- SIP Device@Home

OpenScape Business does not require the connection of a dedicated external SBC.

Note:

OpenScape Business ITSP certifications are always done using the integrated SBC function.

2.1. Security Offloading

In OpenScape Business the transport protocols UDP, TCP and TLS are supported. For the media transport RTP and SRTP is supported. For SRTP the transcoding function is applied as described within chapter 2.3.
As default UDP / TCP and RTP are used. In case that the TLS transport protocol is offered by an ITSP, ITSP configuration has to be configured accordingly within the Internet Telephony Setup Wizard.

The integrated SBC function provides additional security features such as:

- Network overload protection
- Address filtering with Whitelisting and Registration Blacklist

The address filter settings are derived from the configuration data for stations, trunks and/or the ITSP. There is no specific configuration required.

2.2. Media Pinholing

The integrated SBC function ensures enabling of UDP ports in the Internet router for transmitting media data. For this purpose, no specific configuration is necessary

2.3. Transcoding

The integrated SBC function is implemented as a "Routing Engine". Therefore the IP addresses and UDP ports are adjusted in the RTP packets accordingly, but the RTP data itself remains unchanged.
The RTP transcoding is performed by the activation of gateway resources within OpenScape Business, if requested.
Therefore the option "Always use DSP" has to be activated within the routing parameters configuration.
The following codecs are supported if transcoding is activated:

- G711
- G729A
- G729AB

Note:
The Voice Channel Booster Card (OCCBx) is a necessary HW requirement for the transcoding function within the OpenScape Business X models. A transcoding without additional Voice Channel Booster Card (OCCBx) only with the OpenScape Business motherboard (OCCM / Lx) resources is not recommended.
The following tables provide an overview of the maximum possible DSP channels, depending on Voice Channel Booster Card (OCCBx) and of the necessary amount of DSP channels, depending on the connection type.

Codec Type	Channel	OnBoard Only	With OCCB 1	With OCCB 3
G711 ONLY	RTP	8	48	128
	SRTP	6	38	102
G711 or G729	RTP	8	40	104
	SRTP	6	31	81

Table 1 Max. numbers of available DSP channels per HW module

Connection	Required amount of DSP channels
ITSP – TDM-Endpoint	1
ITSP – IP Endpoint (valid for myPortal to go as well)	2
ITSP – TDM Fax	1
ITSP – UC Fax (= IP-Fax)	2
ITSP - Conference	1 Channel per ITSP trunk
IP Endpoint in Conference	1 Channel per IP-Endpoint
MOH	1 Channel per Codec (3 Channels in defaujlt: G.711a/G.711u/G729a)

Table 2 Required DSP channels per connection

2.4. Protocol Translation

OpenScape Business supports the connection of IP devices with different protocols (HFA, SIP, etc.) and various IP lines with SIPQ and / or native SIP protocol. The integrated SBC function automatically performs all the necessary conversions of the protocols for a seamless data flow between the different interfaces.

2.5. Header Manipulation

The integrated SBC function adjusts all the necessary protocol elements such as IP addresses in SIP and SDP and the number formats in all SIP header fields.
All ITSP specific header parameters are stored in profiles, which are defined in the certification of the respective provider. Deviating configurations are possible by means of profile changes.

2.6. Media Anchoring

The integrated SBC function terminates all media streams of the ITSP. Doing so allows connections to internal endpoints via Network Address Translation. Only one RTP stream is supported per connection. Therefore, video connections are not supported via the integrated SBC function.
The port range for the RTP stream is preset but can be changed if necessary.

3. Bibliography

1. Wikipedia Session Border Controller. *Wikipedia Session Border Controller.* [Online] Wikipedia. [Zitat vom: 20. 07 2016.] https://de.wikipedia.org/wiki/Session_Border_Controller/.

4. List of abbreviations

DSP	Digital Signal Processor
HFA	HiPath Feature access
IP	Internet Protocol
ISP	Internet Service Provider
ITSP	Internet Telephony Service Provider
MOH	Music on Hold
OSBiz	Open Scape Business
QSIG	Q-Interface Signaling Protocol)
RTP	Realtime Protocol
SBC	Session Border Controller
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SIP-Q	QSIG over SIP
SRTP	Secure Realtime Protocol
TCP	Transmission Control Protocol
TDM	Time Division Multiplexing
TLS	Transport Layer Security
UDP	User Datagram Protocol
VoIP	Voice over IP

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