Deutsche Telekom DeutschlandLAN

Configuration of the Unify OpenScape Enterprise Express Servers / OpenScape Voice with OpenScape SBC

Customer Solution Lab Munich

Version 1.2 – 16th February 2020

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CSL

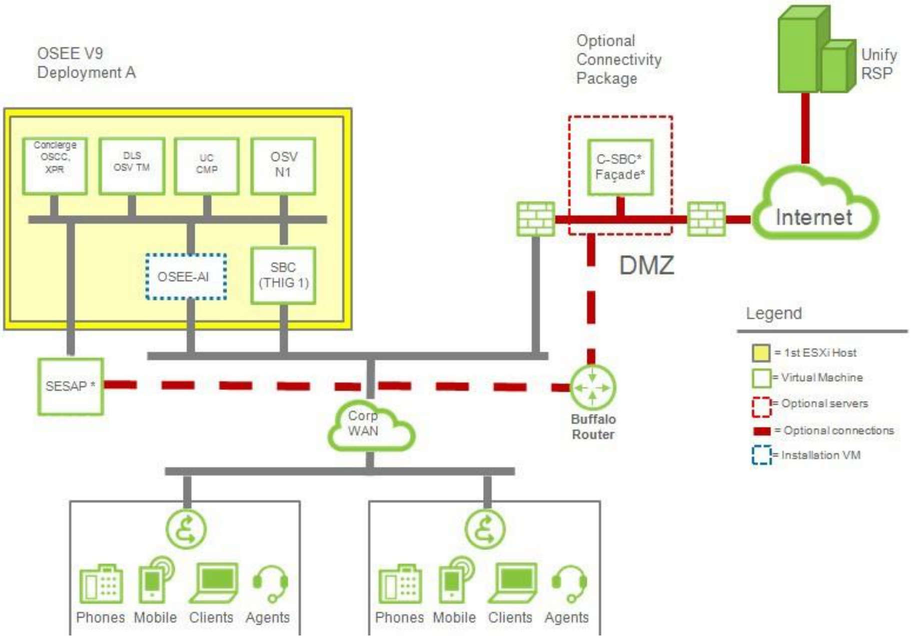
Customer Solution Lab

Table of Contents

1. Document Overview

1.1. Executive Summary

This document describes the configuration of the OpenScape Enterprise Express V9R2 servers to connect to Deutsche Telekom DeutschlandLAN via SIP trunk as they were configured during a certification test in the Deutsche Telekom certification lab. This document and the described configuration is valid also for OpenScape Voice with OpenScape SBC deployments. Deutsche Telekom is hereinafter referred to as Telekom.



1.2. Document Control

1.2.1. Authors of the Document

Name	Company - Department
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Dino Culvan	Unify Communications and Collaboration GmbH & Co. KG – PH LE PM

Only the individuals listed above are authorized to make changes to the document.

1.2.2. Version / Changes

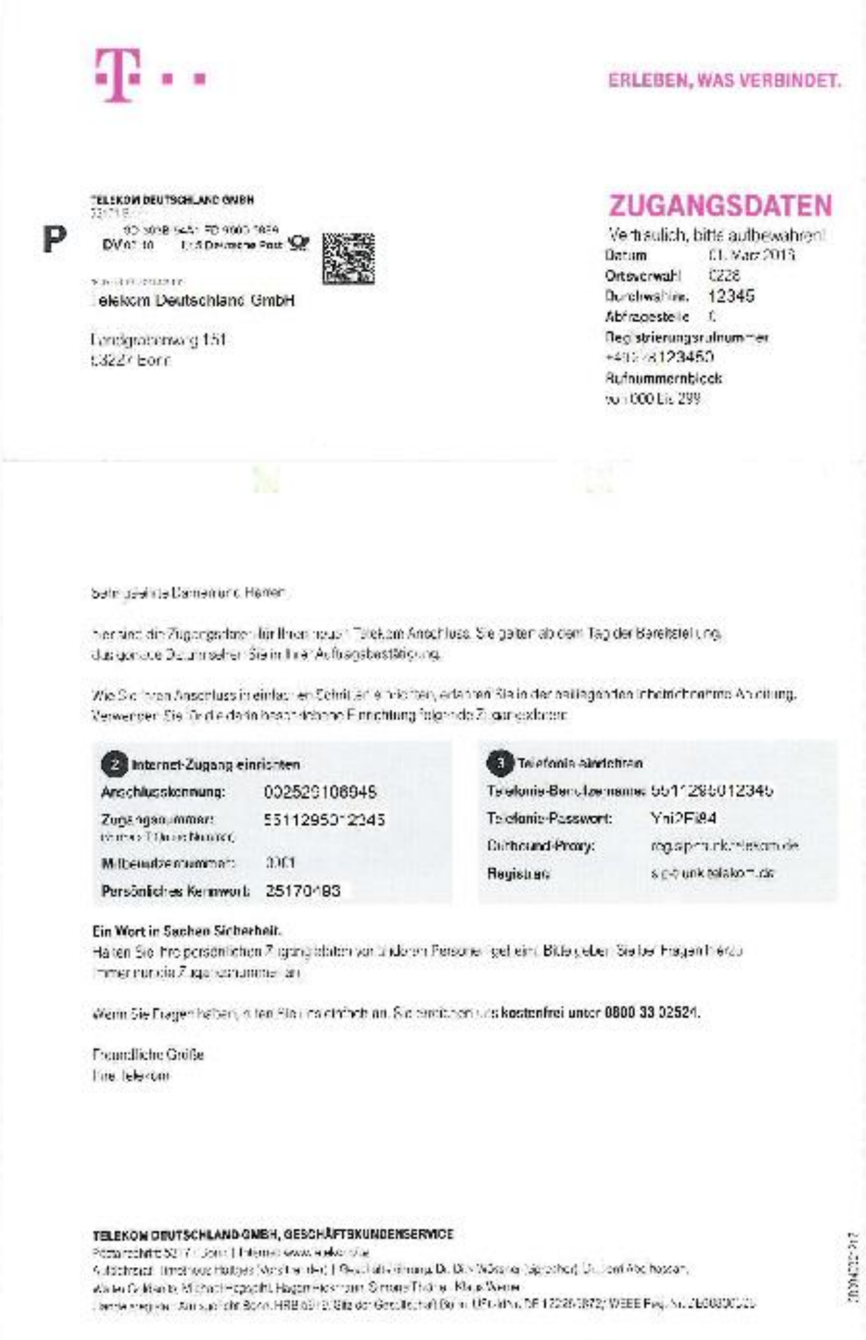
Date	Version	Author	Remarks
12th of March 2018	0.1	Rolf Lang	Initial structure
15th of May 2018	1.0	Rolf Lang	Released

18th of May 2018	1.1	Rolf Lang	Change of Digest Authentication data
06th of February 2020	1.2	Dino Culvan	Updates on certificate CA description chapter 2.7

2. OpenScape SBC Configuration

For the certification test was used SBC version 09.03.25.01-1 on the Central SBC and THIG SBC.

The configuration data has be taken out from the letter from Telekom:



ERLEBEN, WAS VERBINDET.

P

TELEKOM DEUTSCHLAND GMBH
53171 Bonn
DV 07.10 Deutsche Post

Telekom Deutschland GmbH

Landgrabenweg 151
53227 Bonn

ZUGANGSDATEN

Vertraulich, bitte aufbewahren!

Datum	01. März 2016
Ortsvorwahl	0228
Durchwahl-Nr.	12345
Abfragestelle	0
Registrierungsrufnummer	+49228123450
Rufnummernblock	von 000 bis 299

Sehr geehrte Damen und Herren,

hier sind die Zugangsdaten für Ihren neuen Telekom Anschluss. Sie gelten ab dem Tag der Bereitstellung. Das genaue Datum sehen Sie in Ihrer Auftragsbestätigung.

Wie Sie Ihren Anschluss in einfachen Schritten einrichten, erfahren Sie in der beiliegenden Inbetriebnahme-Anleitung. Verwenden Sie für die darin beschriebene Einrichtung folgende Zugangsdaten:

2 Internet-Zugang einrichten

Anschlusskennung:	002529108945
Zugangsnummer: (meine T-Online Nummer)	5511295012345
Mitbenutzernummer:	0001
Persönliches Kennwort:	25170493

3 Telefonie einrichten

Telefonie-Benutzername:	5511286012345
Telefonie-Passwort:	Yni2Fi84
Outbound-Proxy:	reg.sip-trunk.telekom.de
Registrar:	sip-trunk.telekom.de

Ein Wort in Sachen Sicherheit.
Halten Sie Ihre persönlichen Zugangsdaten vor anderen Personen geheim. Bitte geben Sie bei Fragen hierzu immer nur die Zugangsnummer an.

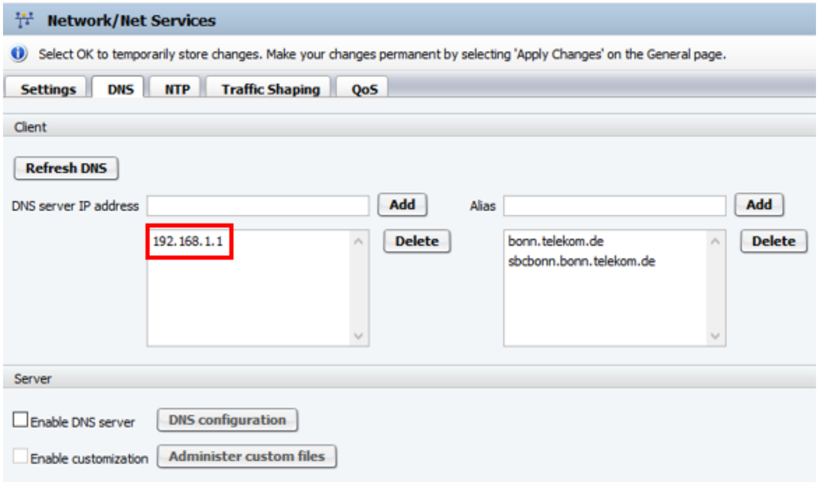
Wenn Sie Fragen haben, wenden Sie sich einfach an. Sie erreichen uns **kostenfrei unter 0800 33 02524.**

Freundliche Grüße
Ihre Telekom

TELEKOM DEUTSCHLAND GMBH, GESCHÄFTSKUNDENSERVICE
Postanschrift: 53171 Bonn | Internet: www.telekom.de
Aufsichtsrat: Timotheus Höttges (Vorsitzender) | Geschäftsführung: Dr. Dirk Wössner (Sprecher), Dr. Ferri Abolhassan,
Walter Goldenits, Michael Hagspihl, Hagen Rickmann, Simone Thiäner, Klaus Werner
Handelsregister: Amtsgericht Bonn HRB 5919, Sitz der Gesellschaft Bonn, USt-IdNr. DE 122265872, WEEE-Reg.-Nr. DE 60800328

2.1. DNS

It must be configured a DNS server which can resolve the Telekom DNS records configured in the Remote Endpoints:



Network/Net Services

Select OK to temporarily store changes. Make your changes permanent by selecting 'Apply Changes' on the General page.

Client

DNS server IP address: 192.168.1.1

Alias: bonn.telekom.de
sbcbonn.bonn.telekom.de

Server

□ Enable DNS server

□ Enable customization

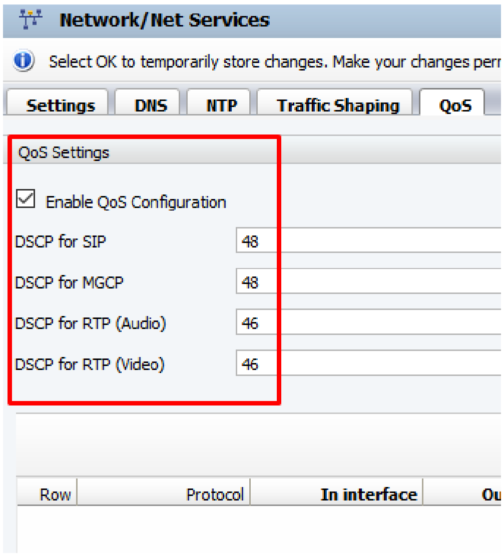
2.2. Quality of Service (QoS)

Telekom has specified in their 1TR114 document QoS requirements which must be applied on the SBC:

8.4.2 Traffic Classes in Layer 3

The UE uses the following traffic classes at Layer 3 (according to the Architecture of T-Home)

- Voice Control Class 6 (DSCP 110 000)
- Voice Bearer Class 5 (DSCP 101 110)



Network/Net Services

Select OK to temporarily store changes. Make your changes perr

QoS Settings

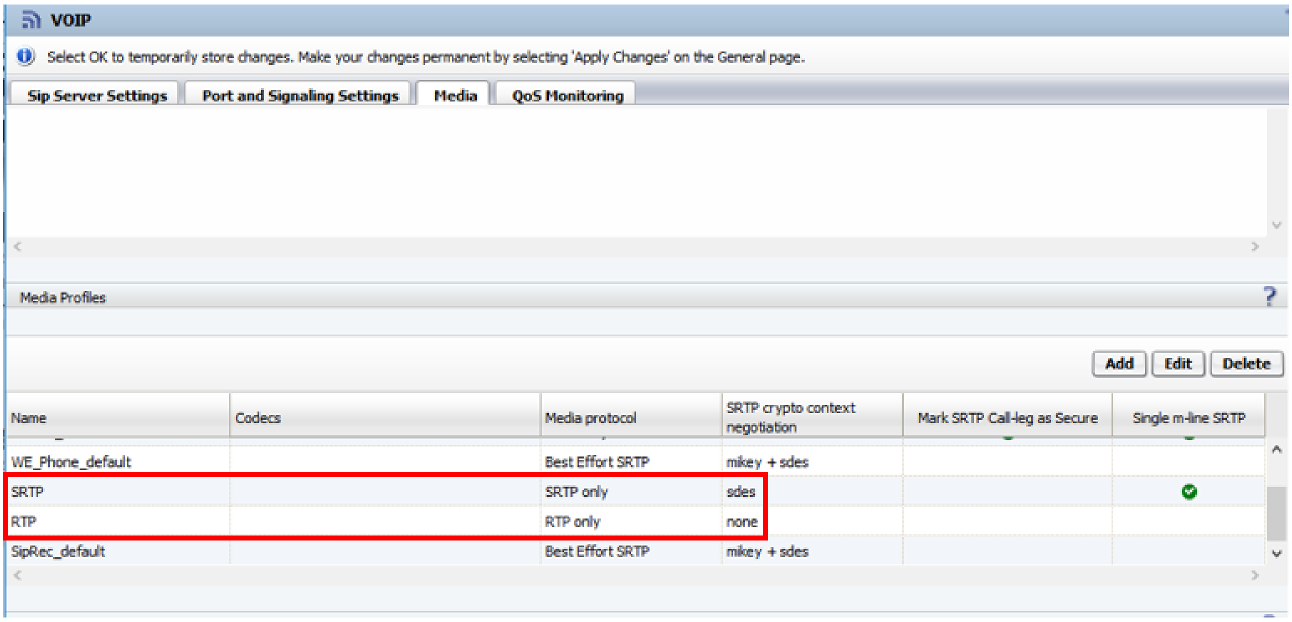
☑ Enable QoS Configuration

DSCP for SIP	48
DSCP for MGCP	48
DSCP for RTP (Audio)	46
DSCP for RTP (Video)	46

Row	Protocol	In interface	Ou

2.3. Media Profile

Depending on whether the SIP trunk is encrypted via TLS or not it were prepared two Media Profiles:



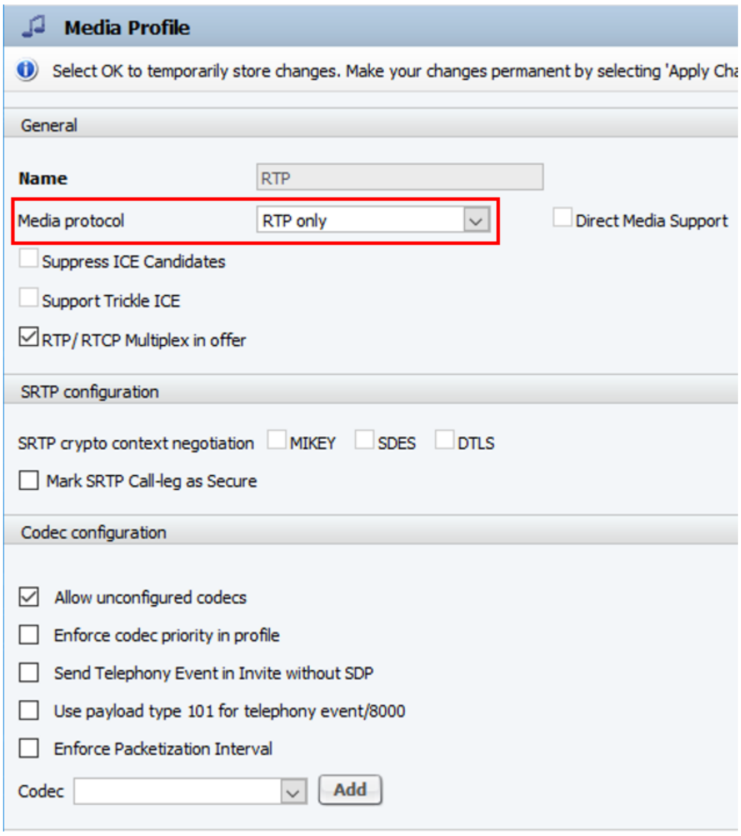
VOIP

Select OK to temporarily store changes. Make your changes permanent by selecting 'Apply Changes' on the General page.

Media Profiles

Name	Codecs	Media protocol	SRTP crypto context negotiation	Mark SRTP Call-leg as Secure	Single m-line SRTP
WE_Phone_default		Best Effort SRTP	mikey + sdes		
SRTP		SRTP only	sdes		✓
RTP		RTP only	none		
SipRec_default		Best Effort SRTP	mikey + sdes		

For an unencrypted SIP trunk the Media Protocol **RTP** was used:



Media Profile

Select OK to temporarily store changes. Make your changes permanent by selecting 'Apply Cha

General

Name: RTP

Media protocol: RTP only

□ Direct Media Support

□ Suppress ICE Candidates

□ Support Trickle ICE

☑ RTP/ RTCP Multiplex in offer

SRTP configuration

SRTP crypto context negotiation □ MIKEY □ SDES □ DTLS

□ Mark SRTP Call-leg as Secure

Codec configuration

☑ Allow unconfigured codecs

□ Enforce codec priority in profile

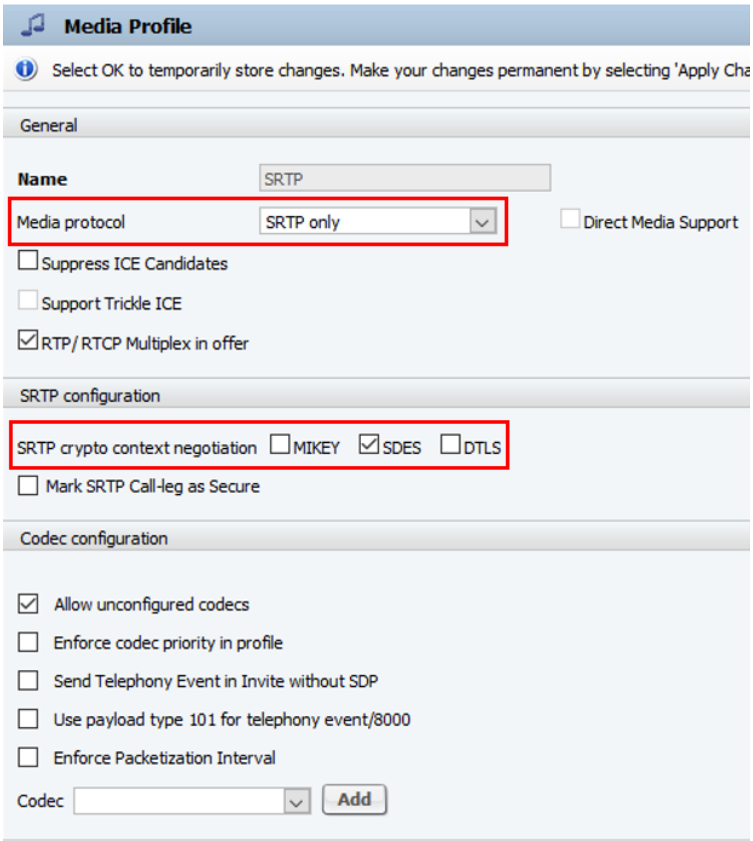
□ Send Telephony Event in Invite without SDP

□ Use payload type 101 for telephony event/8000

□ Enforce Packetization Interval

Codec:

For an encrypted SIP trunk the Media Protocol **SRTP** and **SDES** to negotiate the cryptographic parameters was used. MIKEY may not be enabled because it’s not supported by Telekom.



Media Profile

Select OK to temporarily store changes. Make your changes permanent by selecting 'Apply Cha

General

Name: SRTP

Media protocol: SRTP only

□ Direct Media Support

□ Suppress ICE Candidates

□ Support Trickle ICE

☑ RTP/ RTCP Multiplex in offer

SRTP configuration

SRTP crypto context negotiation □ MIKEY ☑ SDES □ DTLS

□ Mark SRTP Call-leg as Secure

Codec configuration

☑ Allow unconfigured codecs

□ Enforce codec priority in profile

□ Send Telephony Event in Invite without SDP

□ Use payload type 101 for telephony event/8000

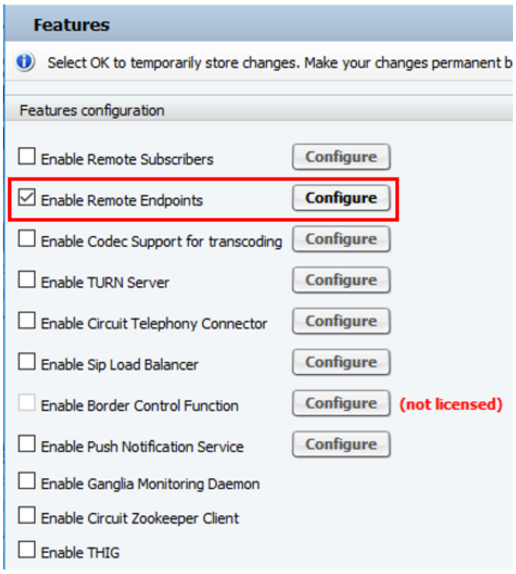
□ Enforce Packetization Interval

Codec:

The application of the Media Profile used for the SIP trunk is described in the section *Remote Endpoint* below.

2.4. Remote Endpoint

On the Central SBC must be activated *Enable Remote Endpoints*:



Features

Select OK to temporarily store changes. Make your changes permanent b

Features configuration

□ Enable Remote Subscribers

☑ Enable Remote Endpoints

□ Enable Codec Support for transcoding

□ Enable TURN Server

□ Enable Circuit Telephony Connector

□ Enable Sip Load Balancer

□ Enable Border Control Function (not licensed)

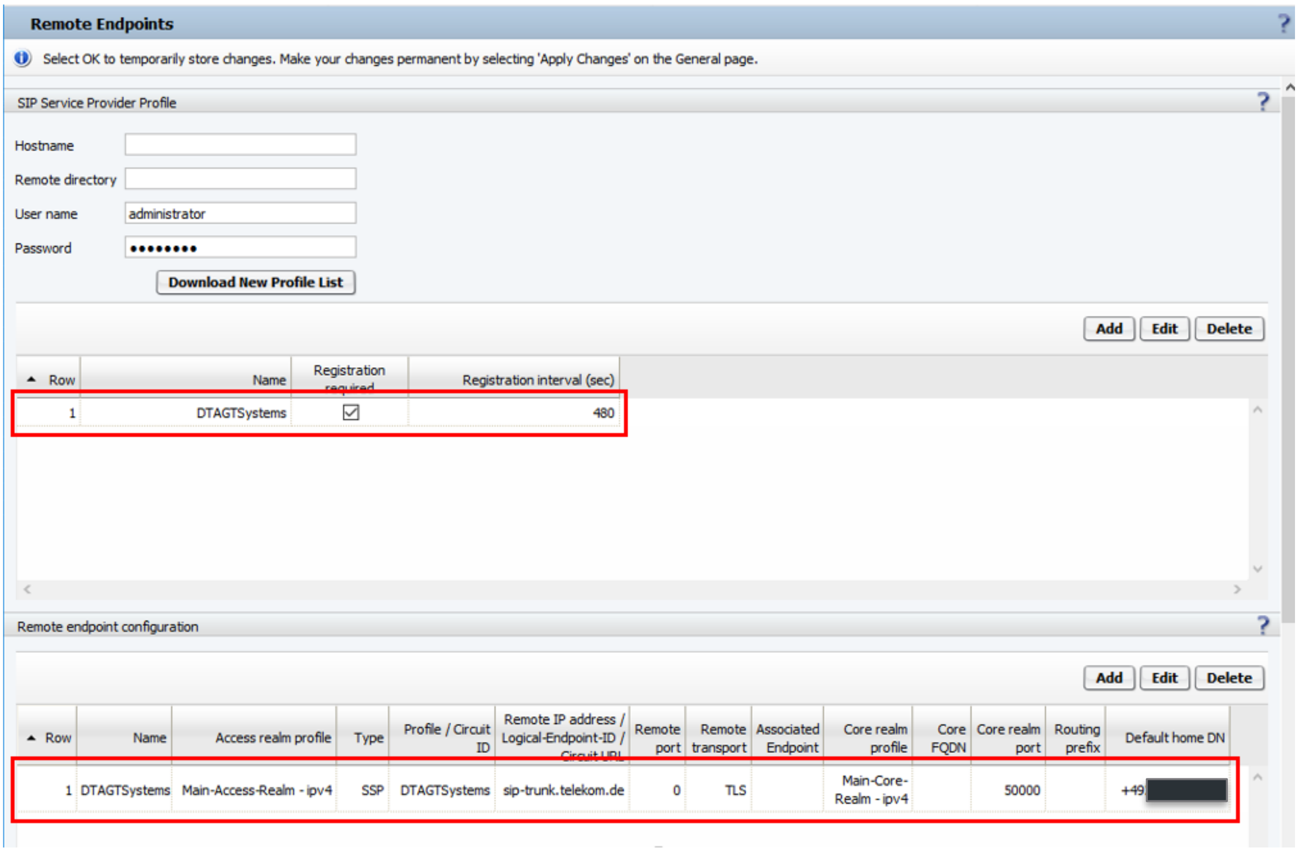
□ Enable Push Notification Service

□ Enable Ganglia Monitoring Daemon

□ Enable Circuit Zookeeper Client

□ Enable THIG

When opening the *Remote Endpoints* window the *SIP Service Provider Profile* and the *Remote Endpoint* has to be configured:



Remote Endpoints

Select OK to temporarily store changes. Make your changes permanent by selecting 'Apply Changes' on the General page.

SIP Service Provider Profile

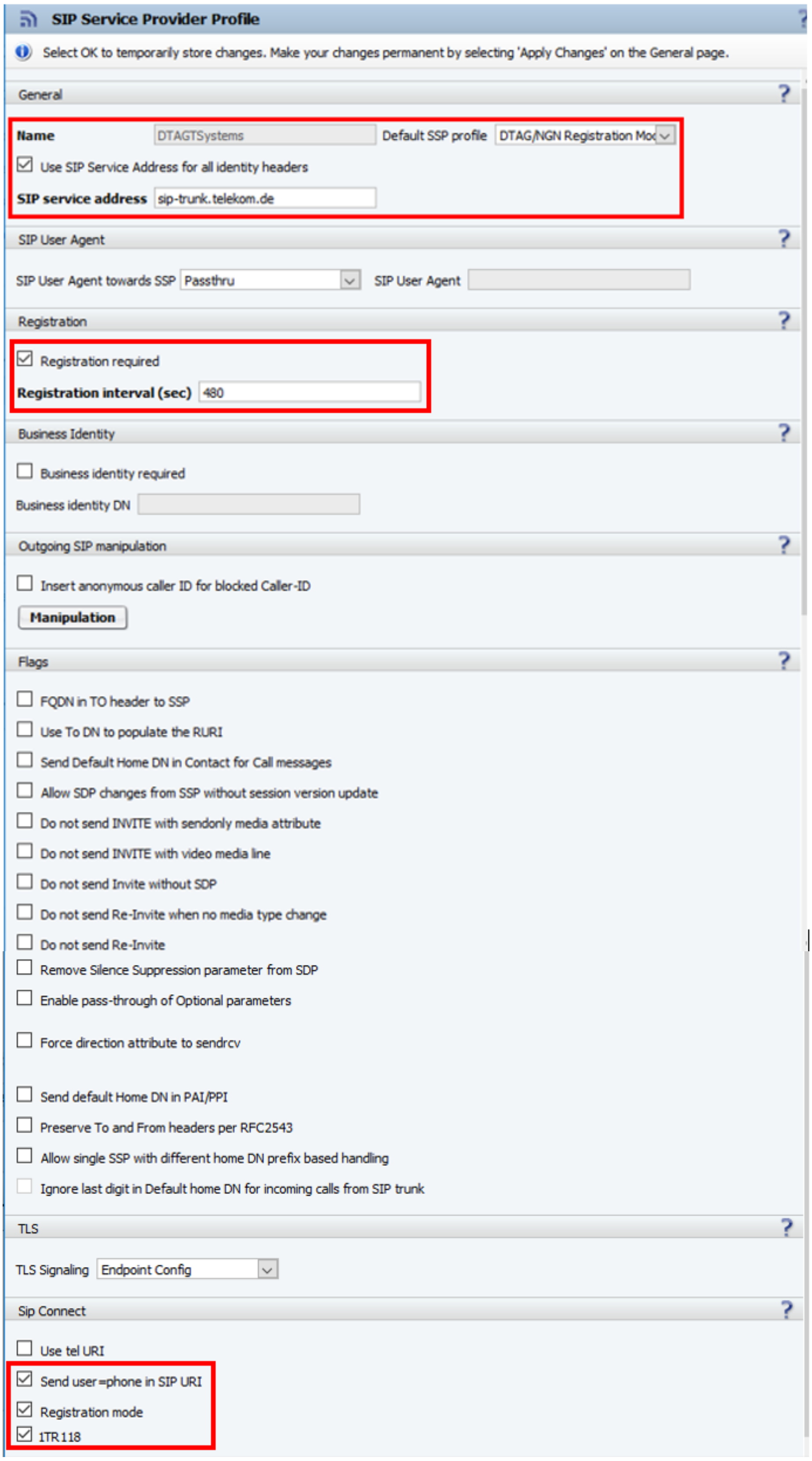
Hostname	
Remote directory	
User name	administrator
Password	••••••••

Row	Name	Registration required	Registration interval (sec)
1	DTAGTSystems	☑	480

Remote endpoint configuration

Row	Name	Access realm profile	Type	Profile / Circuit ID	Remote IP address / Logical-Endpoint-ID / Circuit URL	Remote port	Remote transport	Associated Endpoint	Core realm profile	Core FQDN	Core realm port	Routing prefix	Default home DN
1	DTAGTSystems	Main-Access-Realm - ipv4	SSP	DTAGTSystems	sip-trunk.telekom.de	0	TLS		Main-Core-Realm - ipv4		50000		+49[redacted]

In the *SIP Service Provider Profile* window must be selected as default SSP profile *DTAG/NGN Registration Mode*. The registration interval has to be set to 480 seconds:



SIP Service Provider Profile

Select OK to temporarily store changes. Make your changes permanent by selecting 'Apply Changes' on the General page.

General

Name DTAGTSystems Default SSP profile DTAG/NGN Registration Mo

☑ Use SIP Service Address for all identity headers

SIP service address sip-trunk.telekom.de

SIP User Agent

SIP User Agent towards SSP Passthru SIP User Agent

Registration

☑ Registration required

Registration interval (sec) 480

Business Identity

☐ Business identity required

Business identity DN

Outgoing SIP manipulation

☐ Insert anonymous caller ID for blocked Caller-ID

Flags

☐ FQDN in TO header to SSP

☐ Use To DN to populate the RURI

☐ Send Default Home DN in Contact for Call messages

☐ Allow SDP changes from SSP without session version update

☐ Do not send INVITE with sendonly media attribute

☐ Do not send INVITE with video media line

☐ Do not send Invite without SDP

☐ Do not send Re-Invite when no media type change

☐ Do not send Re-Invite

☐ Remove Silence Suppression parameter from SDP

☐ Enable pass-through of Optional parameters

☐ Force direction attribute to sendrcv

☐ Send default Home DN in PAI/PPI

☐ Preserve To and From headers per RFC2543

☐ Allow single SSP with different home DN prefix based handling

☐ Ignore last digit in Default home DN for incoming calls from SIP trunk

TLS

TLS Signaling Endpoint Config

Sip Connect

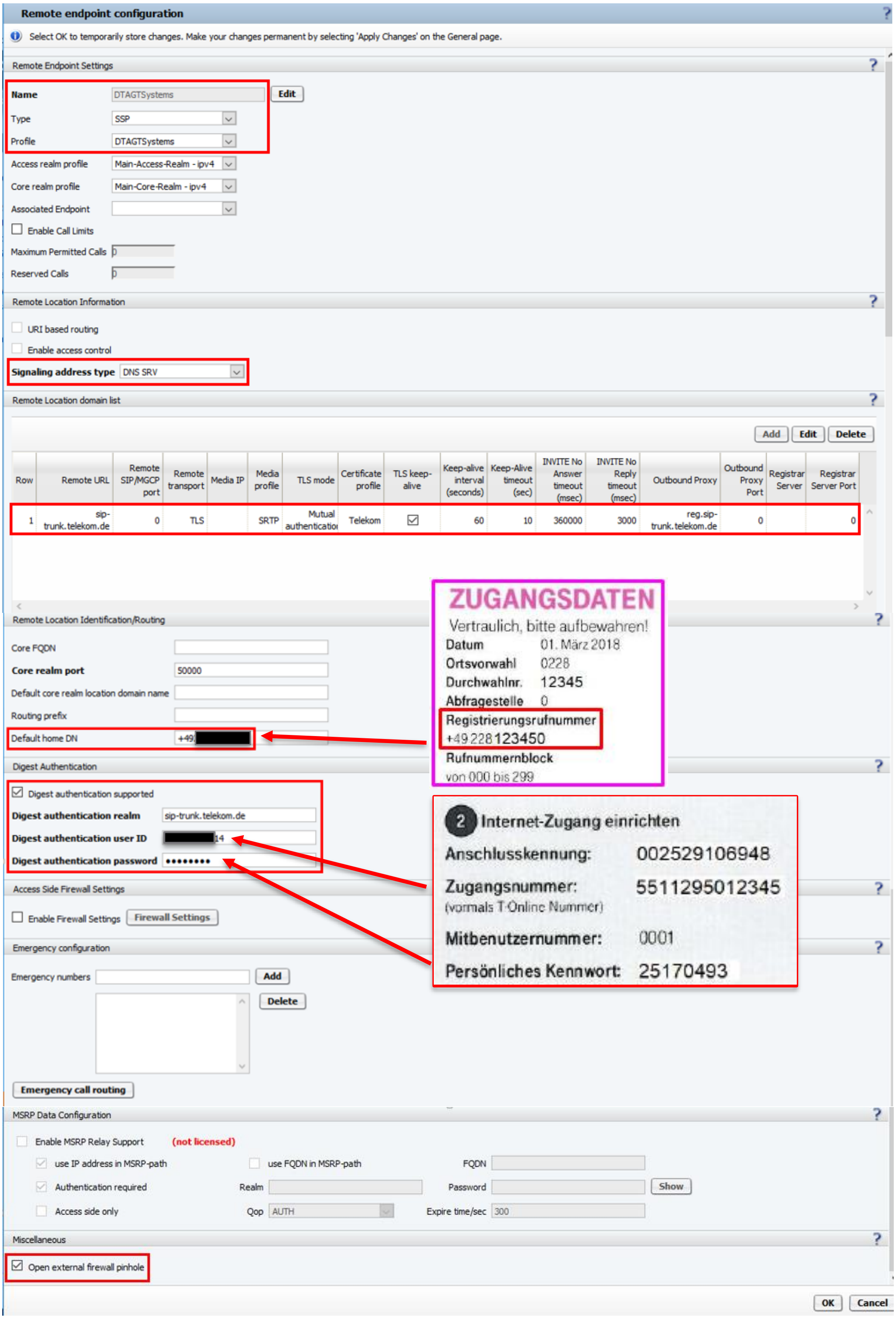
☐ Use tel URI

☑ Send user=phone in SIP URI

☑ Registration mode

☑ 1TR118

In the *Remote Endpoint Configuration* window the *SIP Service Provider Profile* shown above has to be selected:



Remote endpoint configuration

Select OK to temporarily store changes. Make your changes permanent by selecting 'Apply Changes' on the General page.

Remote Endpoint Settings

Name	DTAGTSystems
Type	SSP
Profile	DTAGTSystems
Access realm profile	Main-Access-Realm - ipv4
Core realm profile	Main-Core-Realm - ipv4
Associated Endpoint	
□ Enable Call Limits	
Maximum Permitted Calls	0
Reserved Calls	0

Remote Location Information

□ URI based routing

□ Enable access control

Signaling address type DNS SRV

Remote Location domain list

Row	Remote URL	Remote SIP/MGCP port	Remote transport	Media IP	Media profile	TLS mode	Certificate profile	TLS keep-alive	Keep-alive interval (seconds)	Keep-Alive timeout (sec)	INVITE No Answer timeout (msec)	INVITE No Reply timeout (msec)	Outbound Proxy	Outbound Proxy Port	Registrar Server	Registrar Server Port
1	sip-trunk.telekom.de	0	TLS		SRTP	Mutual authenticatio	Telekom	☑	60	10	360000	3000	reg.sip-trunk.telekom.de	0		0

Remote Location Identification/Routing

Core FQDN	
Core realm port	50000
Default core realm location domain name	
Routing prefix	
Default home DN	+49[redacted]

Digest Authentication

☑ Digest authentication supported

Digest authentication realm	sip-trunk.telekom.de
Digest authentication user ID	[redacted]14
Digest authentication password	••••••••

Access Side Firewall Settings

□ Enable Firewall Settings

Emergency configuration

Emergency numbers

MSRP Data Configuration

□ Enable MSRP Relay Support (not licensed)

☑ use IP address in MSRP-path □ use FQDN in MSRP-path FQDN

☑ Authentication required Realm Password

□ Access side only Qop AUTH Expire time/sec 300

Miscellaneous

☑ Open external firewall pinhole

ZUGANGSDATEN

Vertraulich, bitte aufbewahren!

Datum	01. März 2018
Ortsvorwahl	0228
Durchwahlnr.	12345
Abfragestelle	0

Registrierungsrufnummer
+49 228 123450

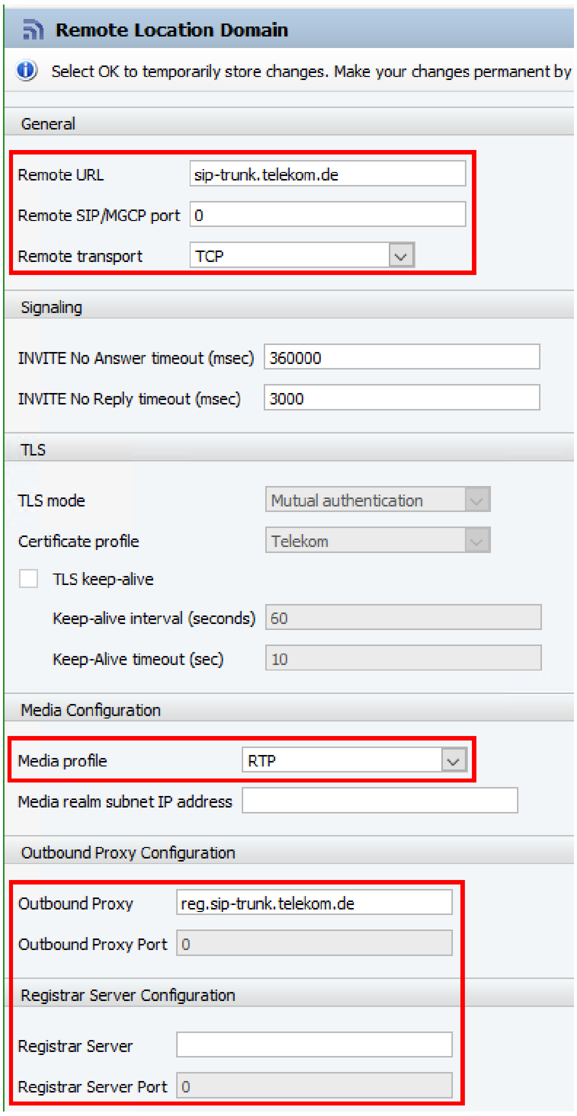
Rufnummernblock
von 000 bis 299

2 Internet-Zugang einrichten

Anschlusskennung:	002529106948
Zugangsnummer: (vormals T-Online Nummer)	5511295012345
Mitbenutzernummer:	0001
Persönliches Kennwort:	25170493

If a NAT router is in between SBC and SIP Trunk *Open external firewall pinhole* must be enabled so the SBC will open the RTP port on the NAT router by sending UDP packets to let the NAT router pass RTP packets from a PSTN phone.

The figures below show the *Remote Location Domain* window for an unencrypted SIP trunk using TCP and RTP on the left and for an encrypted SIP trunk using TLS and SRTP on the right:



Remote Location Domain

Select OK to temporarily store changes. Make your changes permanent by

General

Remote URL	sip-trunk.telekom.de
Remote SIP/MGCP port	0
Remote transport	TCP

Signaling

INVITE No Answer timeout (msec)	360000
INVITE No Reply timeout (msec)	3000

TLS

TLS mode	Mutual authentication
Certificate profile	Telekom
□ TLS keep-alive	
Keep-alive interval (seconds)	60
Keep-Alive timeout (sec)	10

Media Configuration

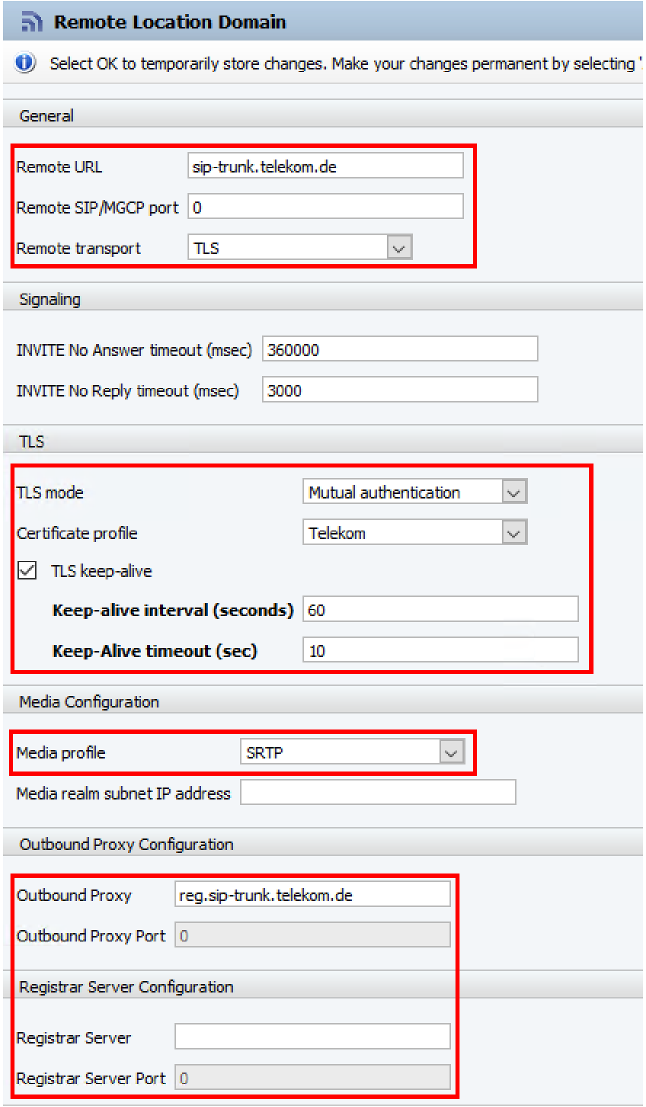
Media profile	RTP
Media realm subnet IP address	

Outbound Proxy Configuration

Outbound Proxy	reg.sip-trunk.telekom.de
Outbound Proxy Port	0

Registrar Server Configuration

Registrar Server	
Registrar Server Port	0



Remote Location Domain

Select OK to temporarily store changes. Make your changes permanent by selecting '

General

Remote URL	sip-trunk.telekom.de
Remote SIP/MGCP port	0
Remote transport	TLS

Signaling

INVITE No Answer timeout (msec)	360000
INVITE No Reply timeout (msec)	3000

TLS

TLS mode	Mutual authentication
Certificate profile	Telekom
☑ TLS keep-alive	
Keep-alive interval (seconds)	60
Keep-Alive timeout (sec)	10

Media Configuration

Media profile	SRTP
Media realm subnet IP address	

Outbound Proxy Configuration

Outbound Proxy	reg.sip-trunk.telekom.de
Outbound Proxy Port	0

Registrar Server Configuration

Registrar Server	
Registrar Server Port	0

2.7. Preparing and Installing TLS Certificates

For using TLS and SRTP over the SIP trunk, uploading and configuration of the Deutsche Telekom CA certificates on the SBC is required. The actual Telekom CA certificates can be downloaded here:

- Download the Telekom *Public Key Infrastructure* certificate **globalroot_class_2.cer** from URL https://www.telesec.de/de/public-key-infrastruktur/support/root-zertifikate/category/59-t-telesec-globalroot-class-2

- Download the Telekom ‚*Shared Business CA*' certificate named **TeleSec_Business_CA_1.der** from URL https://www.telesec.de/de/sbca/support/ca-zertifikate/category/97-telesec-business-ca-1

Important note:
Please make sure that the certificates are still valid. In case they are expired, please use the one from the public CA (Öffentliche CA) directory, e. g.

https://www.telesec.de/de/public-key-infrastruktur/support/root-zertifikate

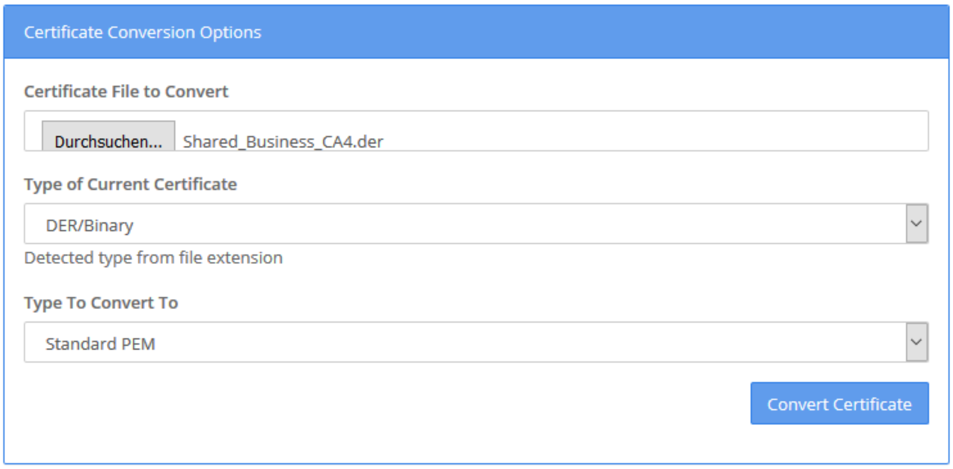
https://www.telesec.de/de/sbca/support/ca-zertifikate

Because the OpenScape SBC supports only certificates in pem format the Telekom ‚*Shared Business CA*' certificate Shared_Business_CA4.der has to be converted

- via Linux shell e.g. on the OpenScape SBC via command

```
openssl x509 -inform der -in Shared_Business_CA4.der -out Shared_Business_CA4.pem
```

- or via e.g. online converter https://www.sslshopper.com/ssl-converter.html



Certificate Conversion Options

Certificate File to Convert: Shared_Business_CA4.der

Type of Current Certificate: DER/Binary

Detected type from file extension

Type To Convert To: Standard PEM

Click on *Convert Certificate* and save the converted certificate with file extension .pem.

Create in the next step a chained certificate based on the certificates *Deutsche Telekom Root CA 1* and *Shared Business CA* named e.g. dt-chain-ca.pem and copy the content of this certificate files into it in the following order:

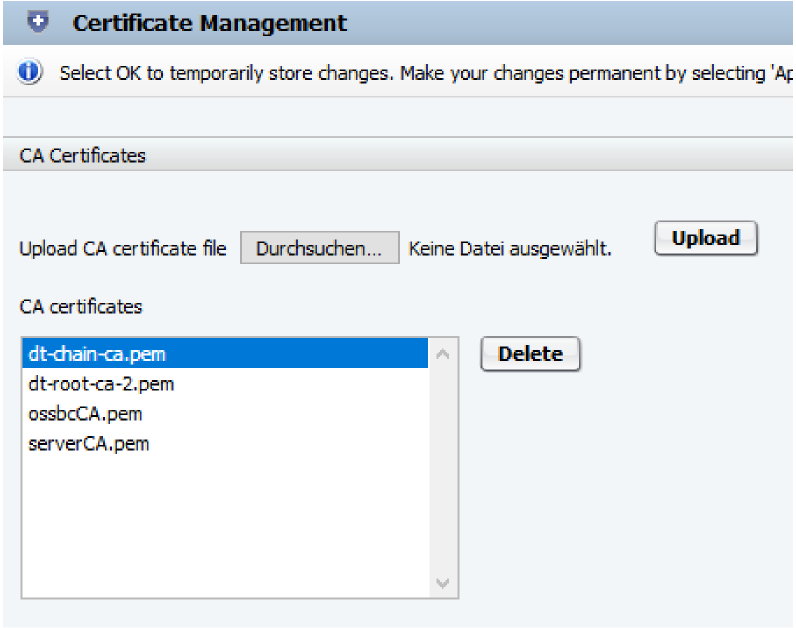
-----BEGIN CERTIFICATE-----
<dt-root-ca-2.cer>
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
<Shared_business_CA4.cer>
-----END CERTIFICATE-----

Then the chained certificate should look like as below:

```
-----BEGIN CERTIFICATE-----
```

```
MIIGiTCCBXGgAwIBAgIIMBWLWM1WMfUwDQYJKoZIhvcNAQELBQAwcTELMAkGA1UE
...
nfKouiXc6eG1ojopwckO/uEu0JVEnyMOzGoIPU2/PhFvG6aAPsB4tvv/AHzR
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIDnzCCAoegAwIBAgIBJjANBgkqhkiG9w0BAQUFADBxMQswCQYDVQQGEwJERTEc
...
Cm26OWMohpLzGITY+9HPBVZkVw==
-----END CERTIFICATE-----
```

Then upload this certificate via GUI at Security -> General -> Certificate Management into OpenScape SBC in the in section *CA Certificates* by selecting this certificate and clicking on *Upload*. Then the certificate appears in the CA certificates list:



Certificate Management

Select OK to temporarily store changes. Make your changes permanent by selecting 'Ap

CA Certificates

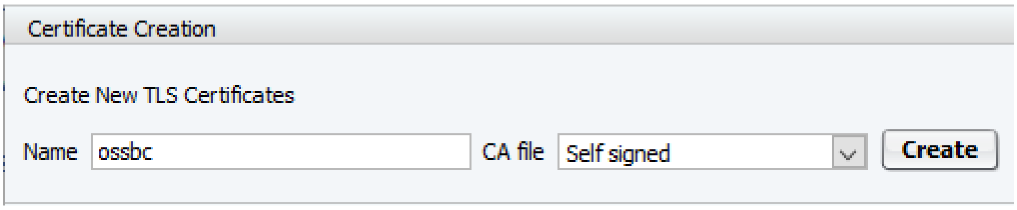
Upload CA certificate file Durchsuchen... Keine Datei ausgewählt.

CA certificates

- dt-chain-ca.pem
- dt-root-ca-2.pem
- ossbcCA.pem
- serverCA.pem

To replace the OpenScape SBC default certificates provided by installation execute the following steps:

The in *Certificate Creation* section enter e.g. ossbc in the *Name field* an click on Create leaving *Self signed* as *CA file* unchanged:

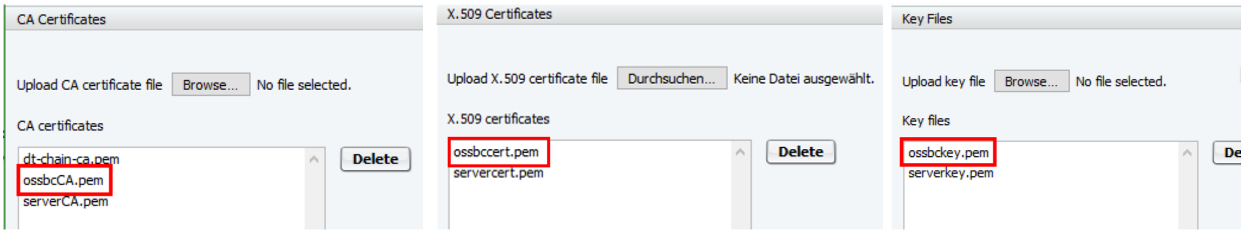


Certificate Creation

Create New TLS Certificates

Name: ossbc   CA file: Self signed

In the *CA certificates*, *X.509 Certificates* and *Key files* windows appears now the new certificates:



CA Certificates

Upload CA certificate file No file selected.

CA certificates

dt-chain-ca.pem
ossbcCA.pem
serverCA.pem

X.509 Certificates

Upload X.509 certificate file Keine Datei ausgewählt.

X.509 certificates

ossbccert.pem
servercert.pem

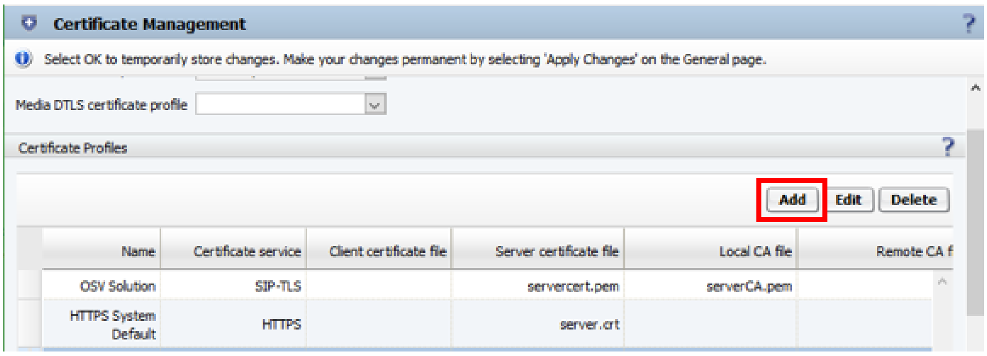
Key Files

Upload key file No file selected.

Key files

ossbckey.pem
serverkey.pem

In the *Certificate Profiles* section click on *Add*:



Certificate Management

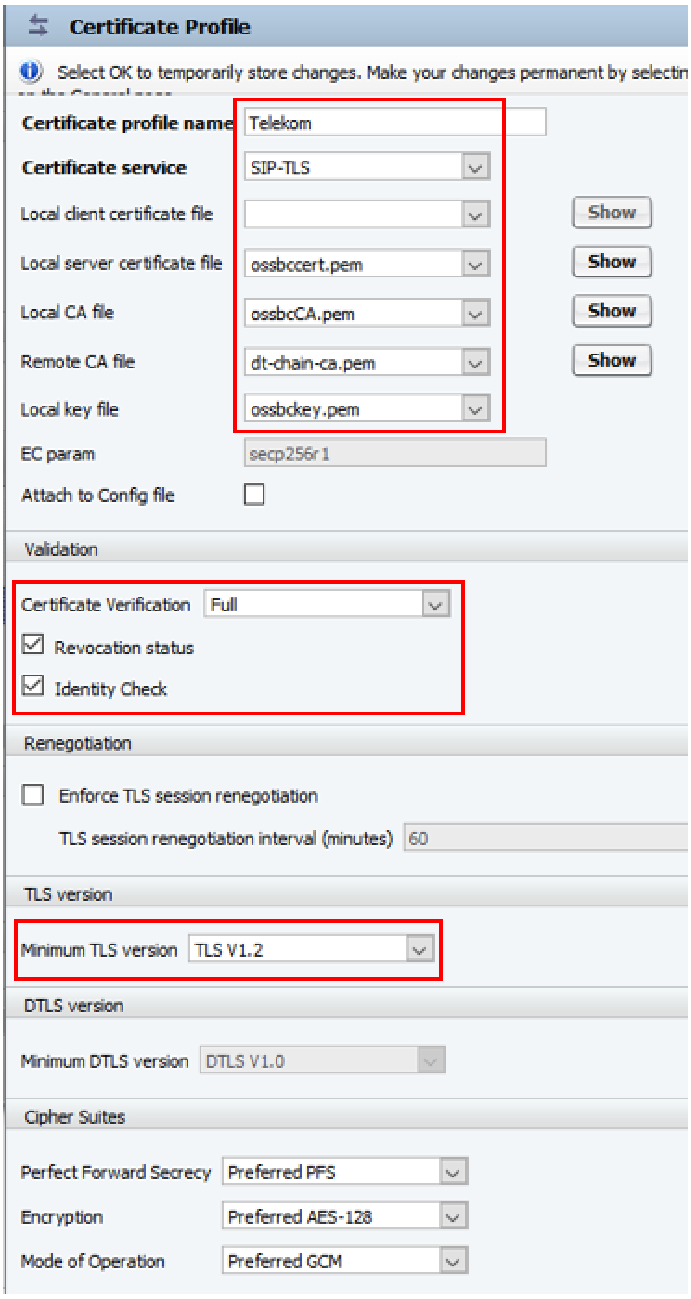
Select OK to temporarily store changes. Make your changes permanent by selecting 'Apply Changes' on the General page.

Media DTLS certificate profile

Certificate Profiles

Name	Certificate service	Client certificate file	Server certificate file	Local CA file	Remote CA f
OSV Solution	SIP-TLS		servercert.pem	serverCA.pem	
HTTPS System Default	HTTPS		server.crt		

Create a new Certificate Profile selecting the certificates created before:



Certificate Profile

Select OK to temporarily store changes. Make your changes permanent by selectin

Certificate profile name	Telekom
Certificate service	SIP-TLS
Local client certificate file	
Local server certificate file	ossbccert.pem
Local CA file	ossbcCA.pem
Remote CA file	dt-chain-ca.pem
Local key file	ossbckey.pem
EC param	secp256r1
Attach to Config file	□

Validation

Certificate Verification: Full

☑ Revocation status

☑ Identity Check

Renegotiation

□ Enforce TLS session renegotiation

TLS session renegotiation interval (minutes): 60

TLS version

Minimum TLS version: TLS V1.2

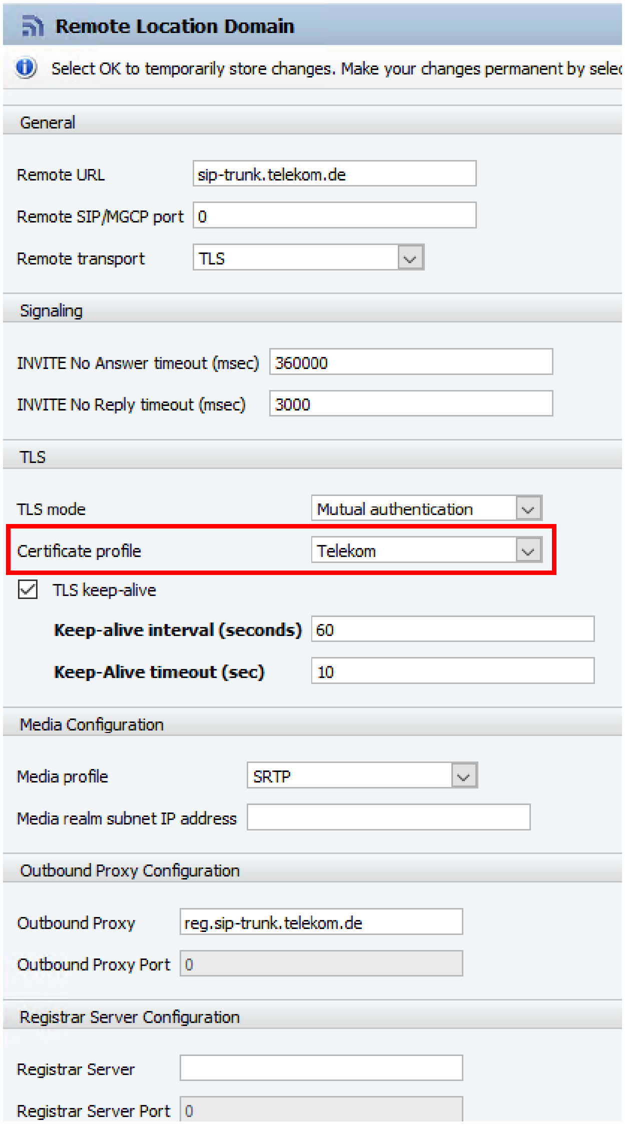
DTLS version

Minimum DTLS version: DTLS V1.0

Cipher Suites

Perfect Forward Secrecy	Preferred PFS
Encryption	Preferred AES-128
Mode of Operation	Preferred GCM

Finally the created Certificate Profile has to be configured in the *Remote Location Domain* window:



Remote Location Domain

Select OK to temporarily store changes. Make your changes permanent by selec

General

Remote URL	sip-trunk.telekom.de
Remote SIP/MGCP port	0
Remote transport	TLS

Signaling

INVITE No Answer timeout (msec)	360000
INVITE No Reply timeout (msec)	3000

TLS

TLS mode	Mutual authentication
Certificate profile	Telekom

☑ TLS keep-alive

Keep-alive interval (seconds)	60
Keep-Alive timeout (sec)	10

Media Configuration

Media profile	SRTP
Media realm subnet IP address	

Outbound Proxy Configuration

Outbound Proxy	reg.sip-trunk.telekom.de
Outbound Proxy Port	0

Registrar Server Configuration

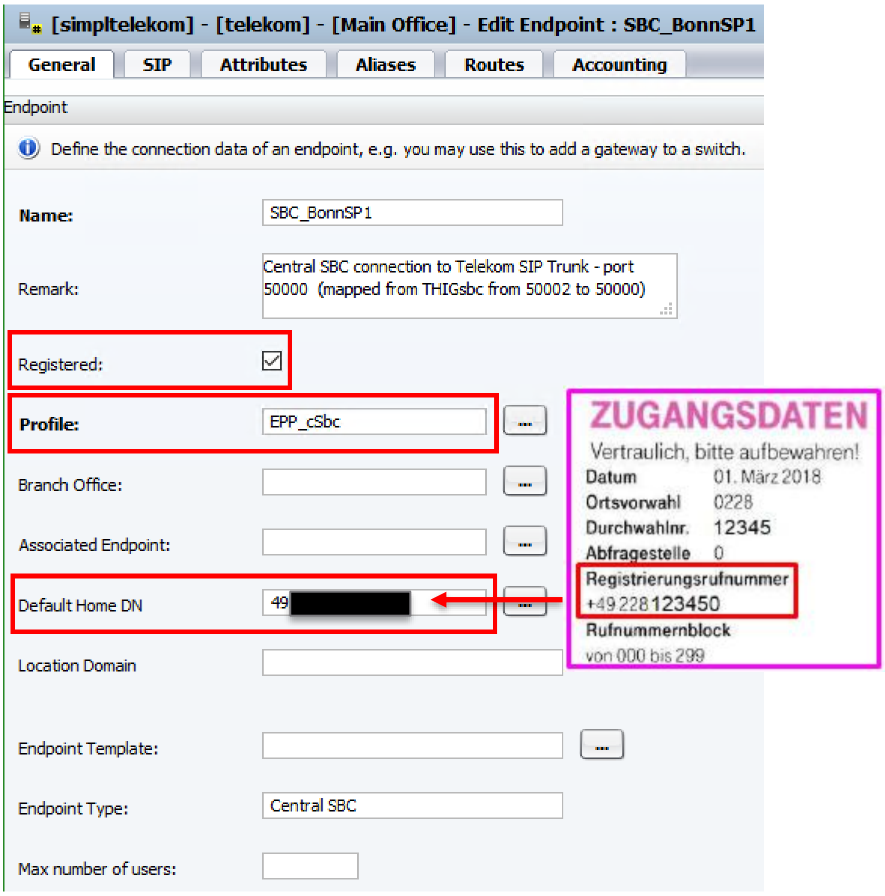
Registrar Server	
Registrar Server Port	0

4. OpenScape Voice Configuration

The following configurations are done via Voice Assistant.

4.1. Central SBC Endpoint

The following figure shows the general settings:



[simpltelekom] - [telekom] - [Main Office] - Edit Endpoint : SBC_BonnSP1

Endpoint

Define the connection data of an endpoint, e.g. you may use this to add a gateway to a switch.

Name:	SBC_BonnSP1
Remark:	Central SBC connection to Telekom SIP Trunk - port 50000 (mapped from THIGsbc from 50002 to 50000)
Registered:	☑
Profile:	EPP_cSbc
Branch Office:	
Associated Endpoint:	
Default Home DN	49[redacted]
Location Domain	
Endpoint Template:	
Endpoint Type:	Central SBC
Max number of users:	

ZUGANGSDATEN

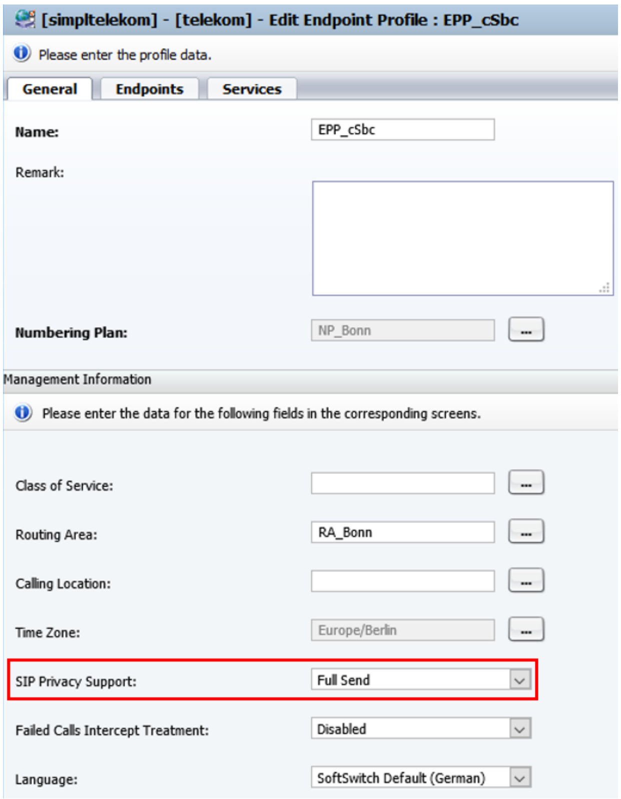
Vertraulich, bitte aufbewahren!

Datum	01. März 2018
Ortsvorwahl	0228
Durchwahlnr.	12345
Abfragestelle	0

Registrierungsrufnummer
+49 228 123450

Rufnummernblock
von 000 bis 299

Telekom specifies in INVITEs received over the SIP trunk in the P-Asserted-Identity SIP header the SIP trunk ID which has not to be displayed on the called phone. Therefore *SIP Privacy Support* has to be set to **Full Send** in the SBC Endpoint Profile. This causes the P-Asserted-Identity header to be ignored for incoming calls but supported for outgoing calls.



[simpltelekom] - [telekom] - Edit Endpoint Profile : EPP_cSbc

Please enter the profile data.

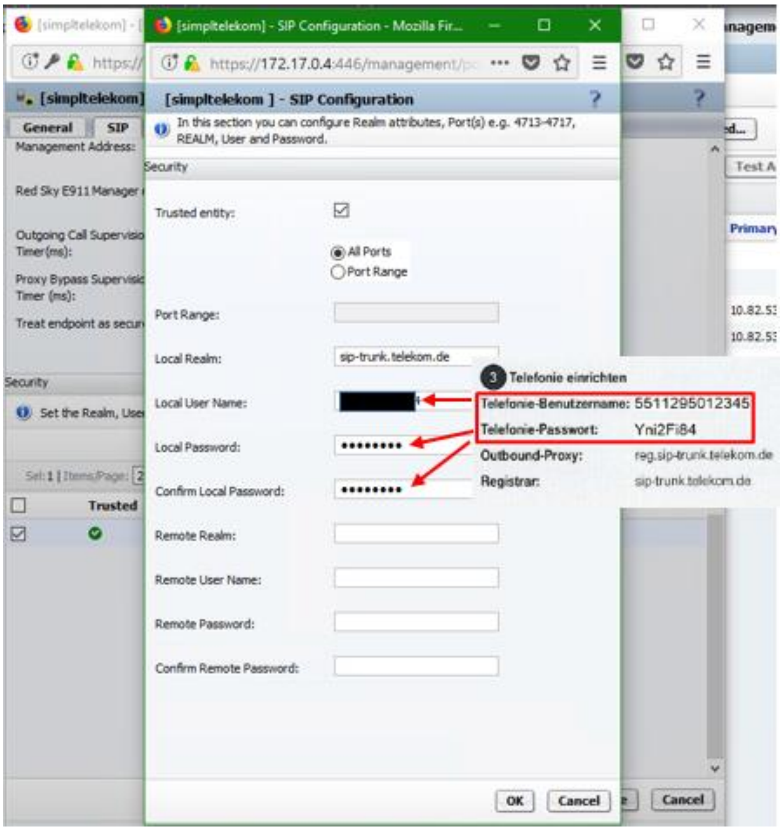
Name:	EPP_cSbc
Remark:	
Numbering Plan:	NP_Bonn

Management Information

Please enter the data for the following fields in the corresponding screens.

Class of Service:	
Routing Area:	RA_Bonn
Calling Location:	
Time Zone:	Europe/Berlin
SIP Privacy Support:	Full Send
Failed Calls Intercept Treatment:	Disabled
Language:	SoftSwitch Default (German)

In the SBC endpoint on tab *SIP* in section *Security* has be configured the telephony authentication credentials to enable Voice to reply to Digest Authentication challenges from Telekom:



[simpltelekom] - SIP Configuration - Mozilla Fir...

https://172.17.0.4:446/management/p

[simpltelekom] - SIP Configuration

In this section you can configure Realm attributes, Port(s) e.g. 4713-4717, REALM, User and Password.

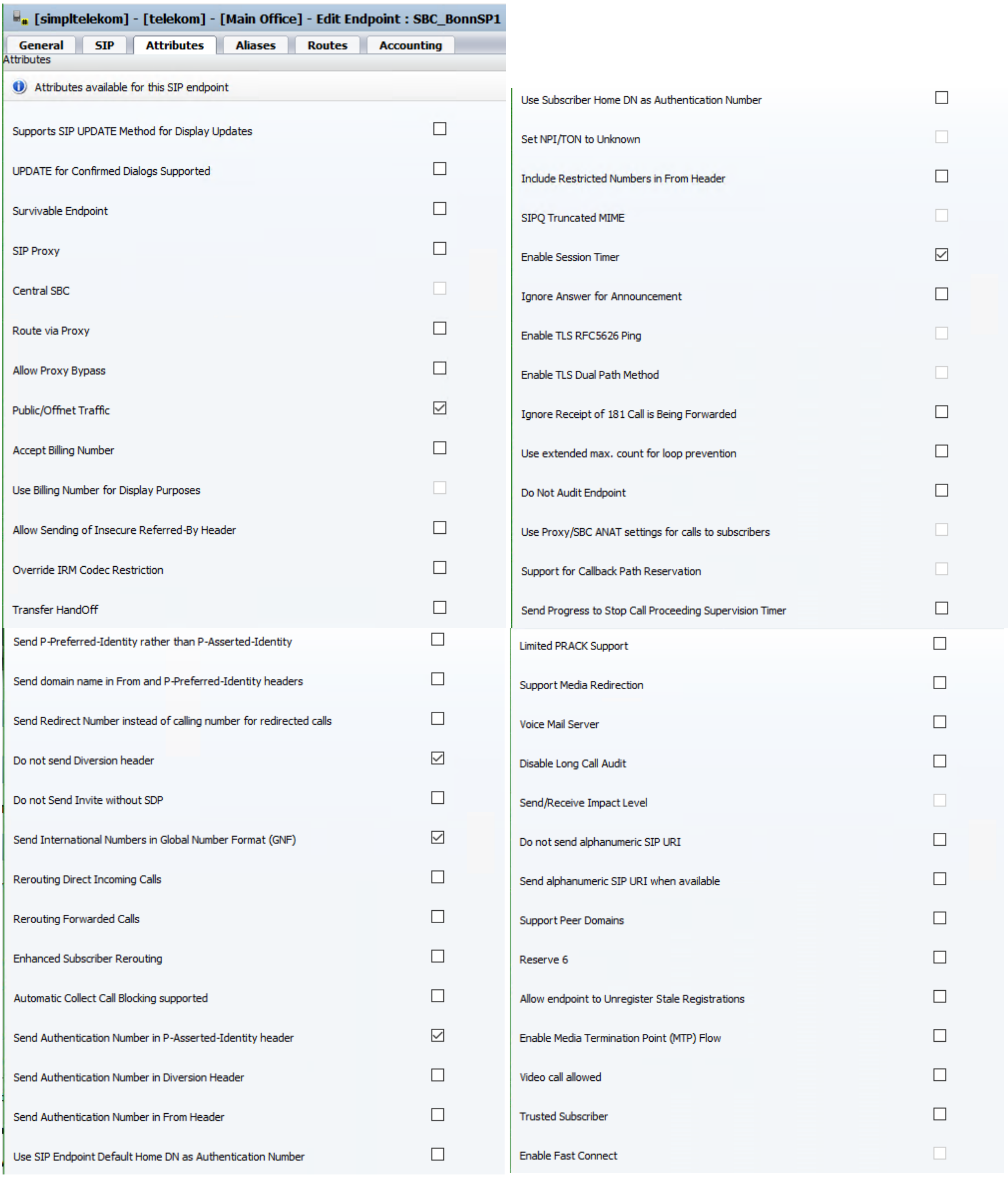
Security

Trusted entity:	☑
	● All Ports ○ Port Range
Port Range:	
Local Realm:	sip-trunk.telekom.de
Local User Name:	[redacted]
Local Password:	•••••••••
Confirm Local Password:	•••••••••
Remote Realm:	
Remote User Name:	
Remote Password:	
Confirm Remote Password:	

3 Telefonie einrichten

Telefonie-Benutzername:	5511295012345
Telefonie-Passwort:	Yni2Fi84
Outbound-Proxy:	reg.sip-trunk.telekom.de
Registrar:	sip-trunk.telekom.de

The following figures show the SBC endpoint attributes used:



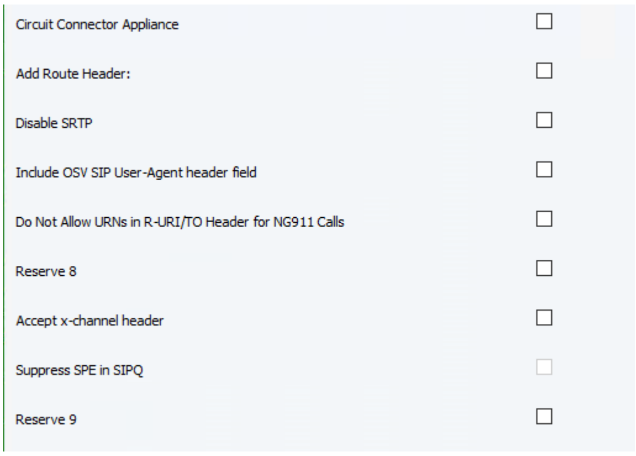
[simpltelekom] - [telekom] - [Main Office] - Edit Endpoint : SBC_BonnSP1

Attributes

Attributes available for this SIP endpoint

Supports SIP UPDATE Method for Display Updates	□
UPDATE for Confirmed Dialogs Supported	□
Survivable Endpoint	□
SIP Proxy	□
Central SBC	□
Route via Proxy	□
Allow Proxy Bypass	□
Public/Offnet Traffic	☑
Accept Billing Number	□
Use Billing Number for Display Purposes	□
Allow Sending of Insecure Referred-By Header	□
Override IRM Codec Restriction	□
Transfer HandOff	□
Send P-Preferred-Identity rather than P-Asserted-Identity	□
Send domain name in From and P-Preferred-Identity headers	□
Send Redirect Number instead of calling number for redirected calls	□
Do not send Diversion header	☑
Do not Send Invite without SDP	□
Send International Numbers in Global Number Format (GNF)	☑
Rerouting Direct Incoming Calls	□
Rerouting Forwarded Calls	□
Enhanced Subscriber Rerouting	□
Automatic Collect Call Blocking supported	□
Send Authentication Number in P-Asserted-Identity header	☑
Send Authentication Number in Diversion Header	□
Send Authentication Number in From Header	□
Use SIP Endpoint Default Home DN as Authentication Number	□

Use Subscriber Home DN as Authentication Number	□
Set NPI/TON to Unknown	□
Include Restricted Numbers in From Header	□
SIPQ Truncated MIME	□
Enable Session Timer	☑
Ignore Answer for Announcement	□
Enable TLS RFC5626 Ping	□
Enable TLS Dual Path Method	□
Ignore Receipt of 181 Call is Being Forwarded	□
Use extended max. count for loop prevention	□
Do Not Audit Endpoint	□
Use Proxy/SBC ANAT settings for calls to subscribers	□
Support for Callback Path Reservation	□
Send Progress to Stop Call Proceeding Supervision Timer	□
Limited PRACK Support	□
Support Media Redirection	□
Voice Mail Server	□
Disable Long Call Audit	□
Send/Receive Impact Level	□
Do not send alphanumeric SIP URI	□
Send alphanumeric SIP URI when available	□
Support Peer Domains	□
Reserve 6	□
Allow endpoint to Unregister Stale Registrations	□
Enable Media Termination Point (MTP) Flow	□
Video call allowed	□
Trusted Subscriber	□
Enable Fast Connect	□



Circuit Connector Appliance ☐

Add Route Header: ☐

Disable SRTP ☐

Include OSV SIP User-Agent header field ☐

Do Not Allow URNs in R-URI/TO Header for NG911 Calls ☐

Reserve 8 ☐

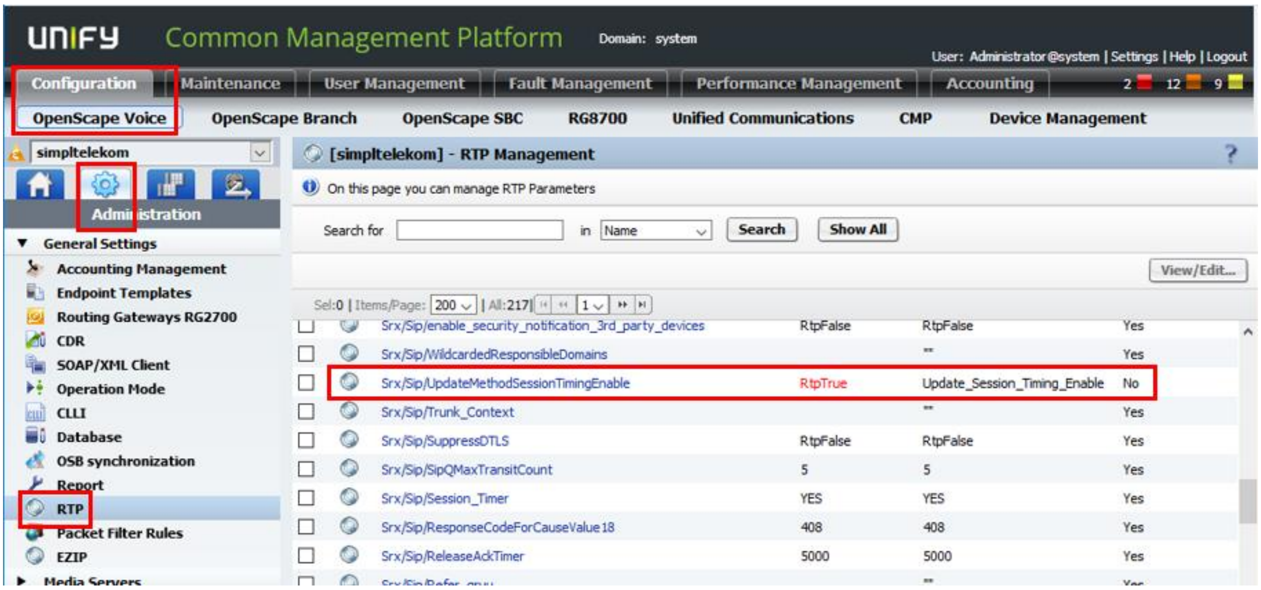
Accept x-channel header ☐

Suppress SPE in SIPQ ☐

Reserve 9 ☐

4.2. Avoiding Re-Invite during Session Refresh

When in a long duration call Voice usually send regularly INVITEs to refresh the session. If the SDP o-line version info is different between INVITE and the related 200 OK then Voice detects a change for the session so Voice needs to inform the peer by sending a re-INVITE. To avoid this Voice will send SIP UDPATE messages instead of re-INVITEs by setting the parameter Srx/Sip/UpdateMethodSessionTimingEnable to RtpTrue, as shown below:



[simpltelekom] - RTP Management

On this page you can manage RTP Parameters

Search for [ ] in Name Search Show All

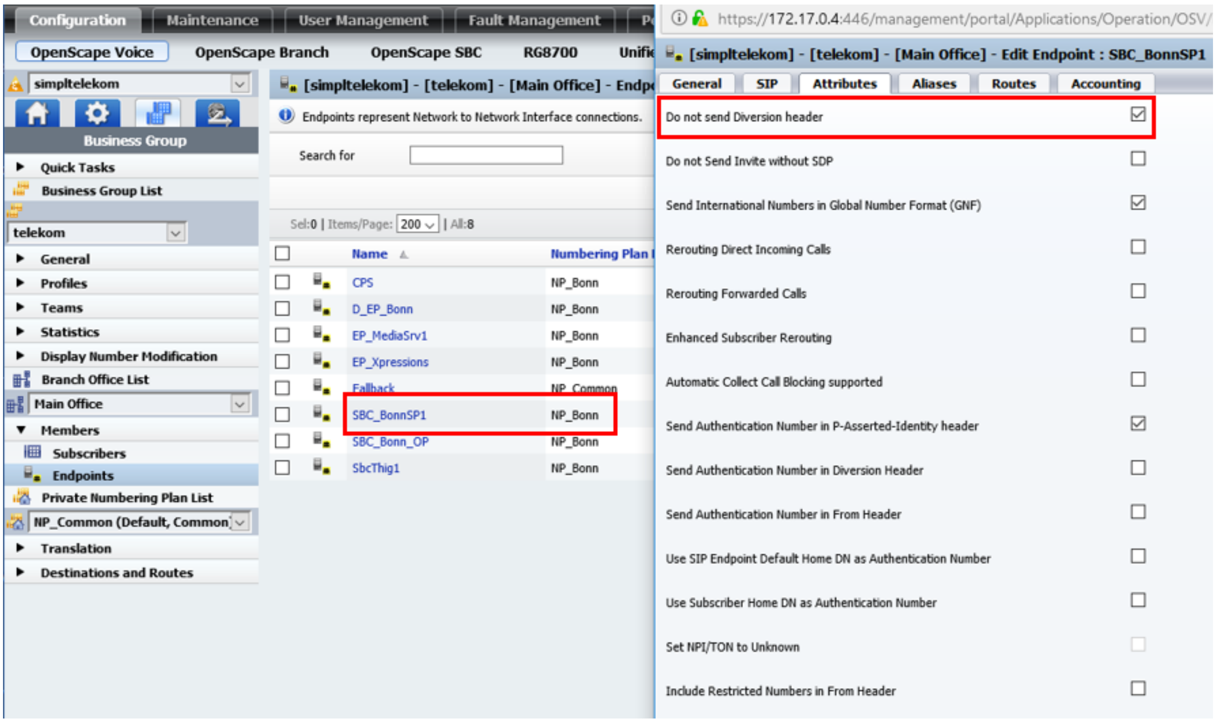
View/Edit...

Sel:0 | Items/Page: 200 | All:217| 1

☐	Srx/Sip/enable_security_notification_3rd_party_devices	RtpFalse	RtpFalse	Yes
☐	Srx/Sip/WildcardedResponsibleDomains		""	Yes
☐	Srx/Sip/UpdateMethodSessionTimingEnable	RtpTrue	Update_Session_Timing_Enable	No
☐	Srx/Sip/Trunk_Context		""	Yes
☐	Srx/Sip/SuppressDTLS	RtpFalse	RtpFalse	Yes
☐	Srx/Sip/SipQMaxTransitCount	5	5	Yes
☐	Srx/Sip/Session_Timer	YES	YES	Yes
☐	Srx/Sip/ResponseCodeForCauseValue18	408	408	Yes
☐	Srx/Sip/ReleaseAckTimer	5000	5000	Yes
☐	Srx/Sip/Refer_gruu		""	Yes

4.3. Disabling to send Diversion SIP Header

Because Telekom doesn't support the Diversion header in SIP messages, sending this header should be prevented in the SIP attributes of the SBC endpoint by enabling *Do not send Diversion header*:



[simpltelekom] - [telekom] - [Main Office] - Endp

Endpoints represent Network to Network Interface connections.

Search for

Sel:0 | Items/Page: 200 | All:8

	Name	Numbering Plan
□	CPS	NP_Bonn
□	D_EP_Bonn	NP_Bonn
□	EP_MediaSrv1	NP_Bonn
□	EP_Xpressions	NP_Bonn
□	Fallback	NP_Common
□	SBC_BonnSP1	NP_Bonn
□	SBC_Bonn_OP	NP_Bonn
□	SbcThig1	NP_Bonn

https://172.17.0.4:446/management/portal/Applications/Operation/OSV/

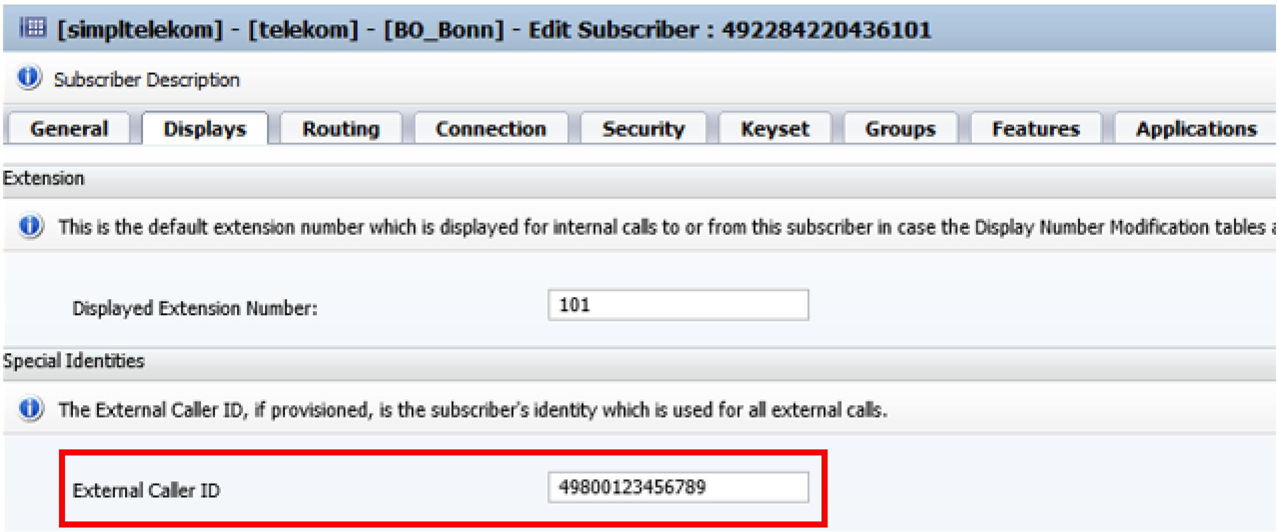
[simpltelekom] - [telekom] - [Main Office] - Edit Endpoint : SBC_BonnSP1

General | SIP | Attributes | Aliases | Routes | Accounting

Do not send Diversion header	☑
Do not Send Invite without SDP	□
Send International Numbers in Global Number Format (GNF)	☑
Rerouting Direct Incoming Calls	□
Rerouting Forwarded Calls	□
Enhanced Subscriber Rerouting	□
Automatic Collect Call Blocking supported	□
Send Authentication Number in P-Asserted-Identity header	☑
Send Authentication Number in Diversion Header	□
Send Authentication Number in From Header	□
Use SIP Endpoint Default Home DN as Authentication Number	□
Use Subscriber Home DN as Authentication Number	□
Set NPI/TON to Unknown	□
Include Restricted Numbers in From Header	□

4.4. Sending External Numbers with leading +

In Voice Assistant can be configured any phone number for a subscriber in the *External Caller ID* field to be displayed on a called phone using feature CLIP*:*



[simpltelekom] - [telekom] - [BO_Bonn] - Edit Subscriber : 492284220436101

Subscriber Description

General | Displays | Routing | Connection | Security | Keyset | Groups | Features | Applications

Extension

This is the default extension number which is displayed for internal calls to or from this subscriber in case the Display Number Modification tables a

Displayed Extension Number: 101

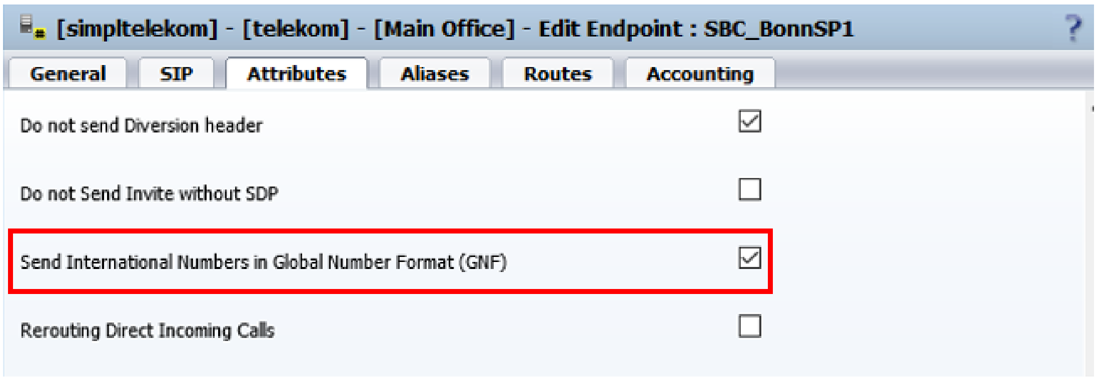
Special Identities

The External Caller ID, if provisioned, is the subscriber's identity which is used for all external calls.

External Caller ID 49800123456789

To enable Voice to send this number with a leading + via Central SBC to Telekom two preconditions must be met:

1. In the SBC endpoint must be enabled the attribute *Send International Numbers in Global Number Format (GNF)*:



[simpltelekom] - [telekom] - [Main Office] - Edit Endpoint : SBC_BonnSP1

Do not send Diversion header ☑

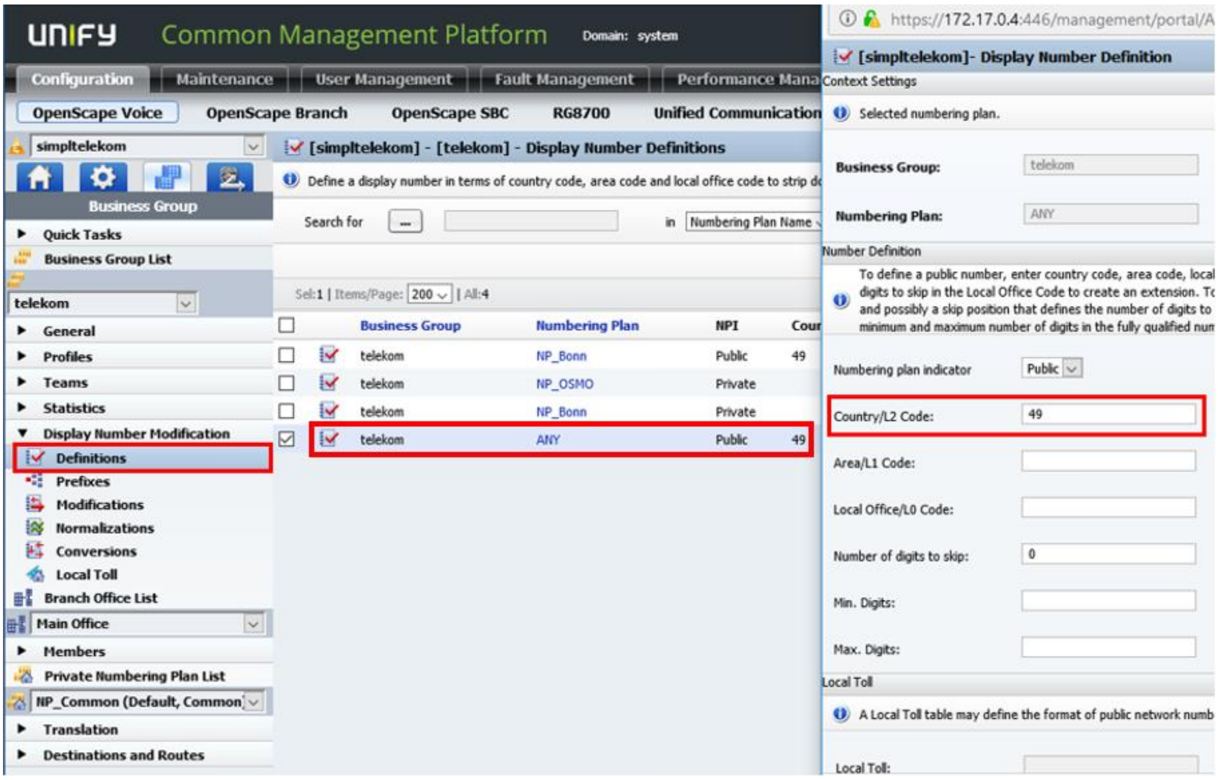
Do not Send Invite without SDP □

Send International Numbers in Global Number Format (GNF) ☑

Rerouting Direct Incoming Calls □

This cause Voice to send a number in international number format with a leading + sign.

2. To recognize an *External Caller ID* as a number in international format the country code used must be configured as a *Display Number Modification Definition*, as shown for the German country code below:



[simpltelekom] - [telekom] - Display Number Definitions

Define a display number in terms of country code, area code and local office code to strip d

Search for ... in Numbering Plan Name

Sel:1 | Items/Page: 200 | All:4

□		Business Group	Numbering Plan	NPI	Cour
□	✓	telekom	NP_Bonn	Public	49
□	✓	telekom	NP_OSMO	Private	
□	✓	telekom	NP_Bonn	Private	
☑	✓	telekom	ANY	Public	49

[simpltelekom]- Display Number Definition

Context Settings

Selected numbering plan.

Business Group: telekom

Numbering Plan: ANY

Number Definition

To define a public number, enter country code, area code, local
digits to skip in the Local Office Code to create an extension. Tc
and possibly a skip position that defines the number of digits to
minimum and maximum number of digits in the fully qualified num

Numbering plan indicator: Public

Country/L2 Code: 49

Area/L1 Code:

Local Office/L0 Code:

Number of digits to skip: 0

Min. Digits:

Max. Digits:

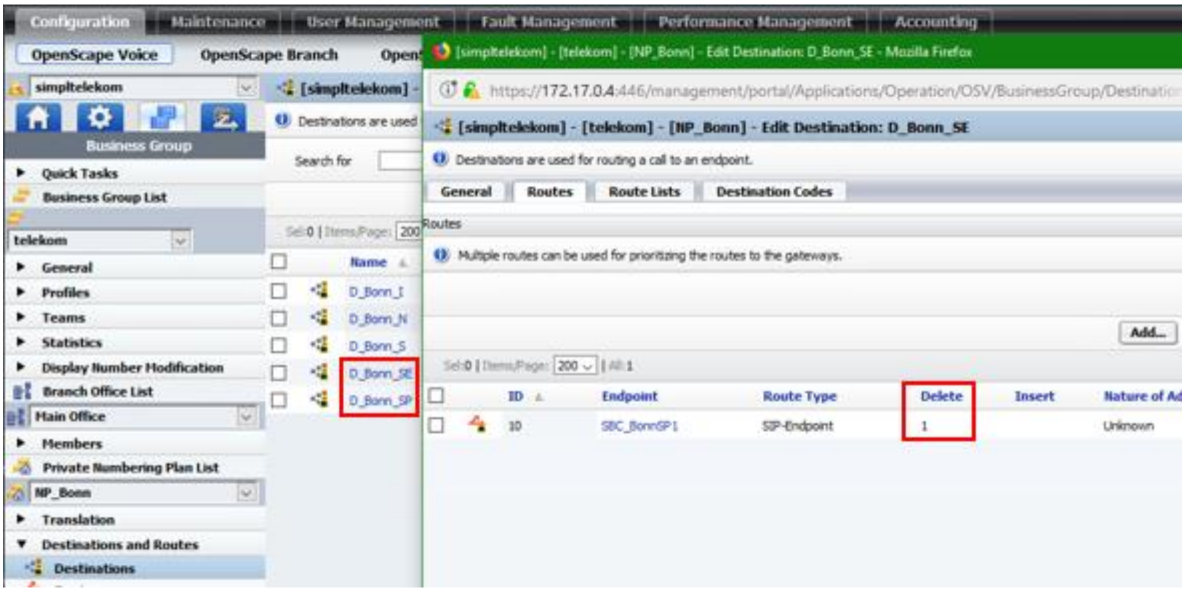
Local Toll

A Local Toll table may define the format of public network numb

Local Toll:

4.5. Sending Special Numbers without leading 0

Unless not already fixed in WebCDC in the Destinations D_xxx_SP for traffic type *Premium Rate* and D_xxx_SE for traffic type *Emergency* in the phone numbering plan in each route must be deleted the leading 0:



[simpltelekom] - [telekom] - [NP_Bonn] - Edit Destination: D_Bonn_SE - Mozilla Firefox

https://172.17.0.4:446/management/portal/Applications/Operation/OSV/BusinessGroup/Destinatio

[simpltelekom] - [telekom] - [NP_Bonn] - Edit Destination: D_Bonn_SE

Destinations are used for routing a call to an endpoint.

Routes

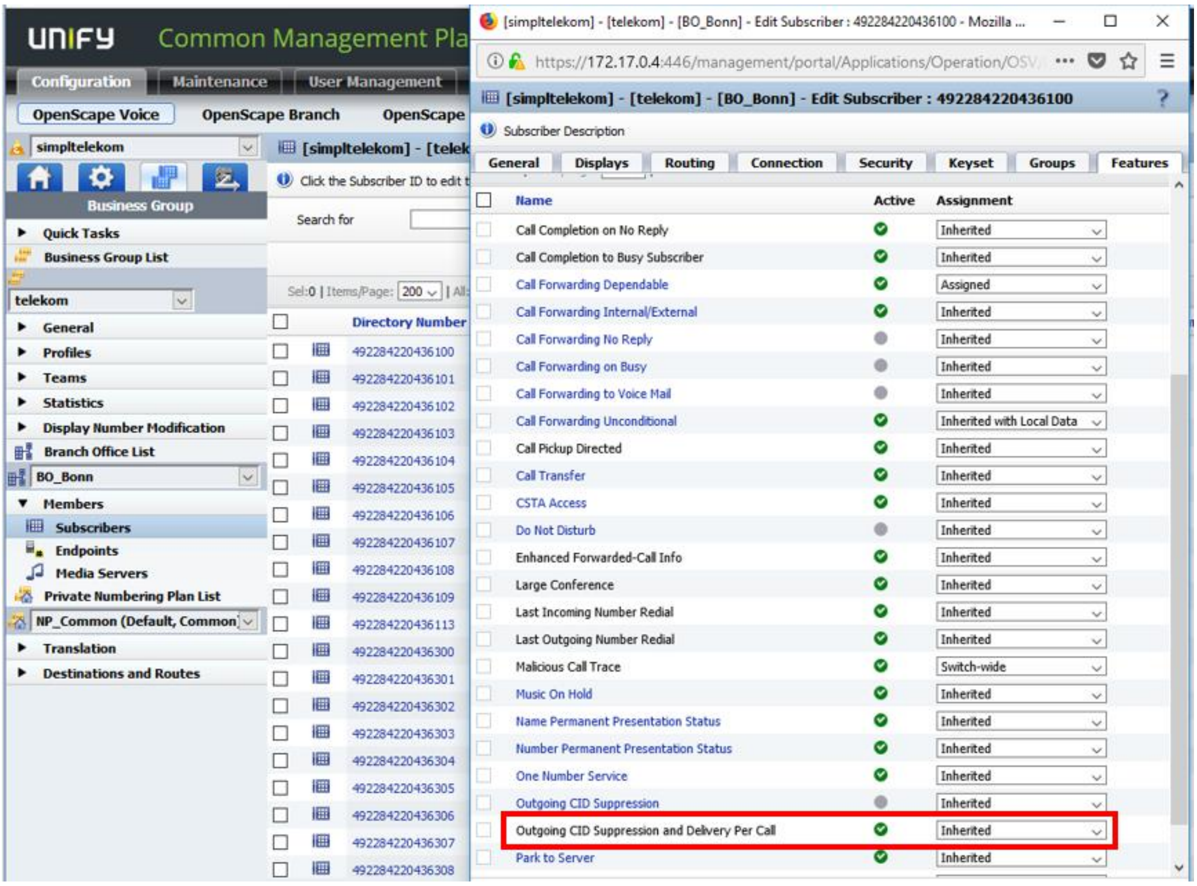
Multiple routes can be used for prioritizing the routes to the gateways.

Sel:0 | Items/Page: 200 | All: 1

ID	Endpoint	Route Type	Delete	Insert	Nature of Ad
10	SBC_BonnSP1	SIP-Endpoint	1		Unknown

4.6. Caller ID Suppression

To allow subscribers to use the feature *Caller ID Suppression* the subscribers must be assigned the feature *Outgoing CID suppression and Delivery per Call* by, which is activated by using the prefix *51 by default. This assignment can be done on subscriber level or via Feature Profile.



[simpltelekom] - [telekom] - [BO_Bonn] - Edit Subscriber : 492284220436100 - Mozilla ...

https://172.17.0.4:446/management/portal/Applications/Operation/OSV...

[simpltelekom] - [telekom] - [BO_Bonn] - Edit Subscriber : 492284220436100

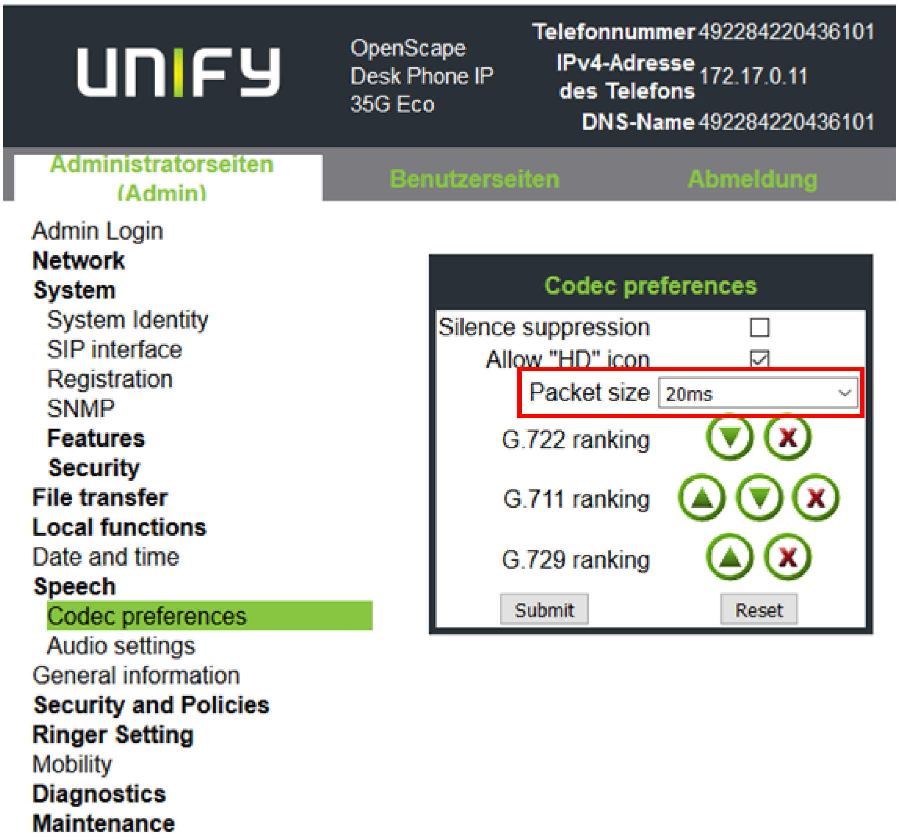
Subscriber Description

Name	Active	Assignment
Call Completion on No Reply	✓	Inherited
Call Completion to Busy Subscriber	✓	Inherited
Call Forwarding Dependable	✓	Assigned
Call Forwarding Internal/External	✓	Inherited
Call Forwarding No Reply	●	Inherited
Call Forwarding on Busy	●	Inherited
Call Forwarding to Voice Mail	●	Inherited
Call Forwarding Unconditional	✓	Inherited with Local Data
Call Pickup Directed	✓	Inherited
Call Transfer	✓	Inherited
CSTA Access	✓	Inherited
Do Not Disturb	●	Inherited
Enhanced Forwarded-Call Info	✓	Inherited
Large Conference	✓	Inherited
Last Incoming Number Redial	✓	Inherited
Last Outgoing Number Redial	✓	Inherited
Malicious Call Trace	✓	Switch-wide
Music On Hold	✓	Inherited
Name Permanent Presentation Status	✓	Inherited
Number Permanent Presentation Status	✓	Inherited
One Number Service	✓	Inherited
Outgoing CID Suppression	●	Inherited
Outgoing CID Suppression and Delivery Per Call	✓	Inherited
Park to Server	✓	Inherited

5. SIP Phones

5.1. Packet Size

It has to make sure that the Packet Size has to be set to 20 ms on the SIP phones:



Telefonnummer 492284220436101
IPv4-Adresse des Telefons 172.17.0.11
DNS-Name 492284220436101

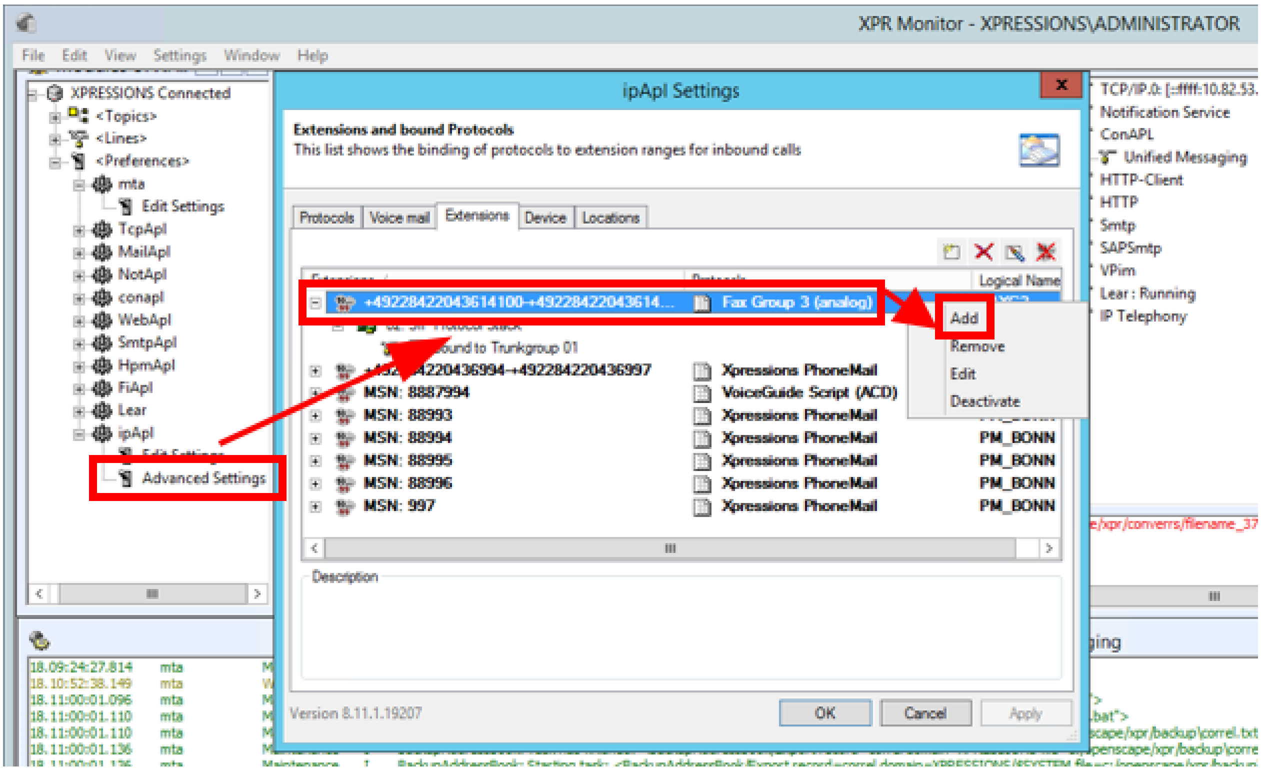
Codec preferences

Silence suppression □
Allow "HD" icon ☑
Packet size 20ms
G.722 ranking
G.711 ranking
G.729 ranking

6. OpenScape Xpressions

6.1. Adding Extension Range

The Xpressions Extension Range to be added manually:



Extensions and bound Protocols

This list shows the binding of protocols to extension ranges for inbound calls

Extensions	Protocols	Logical Name
+49228422043614100-+49228422043614...	Fax Group 3 (analog)	
Bound to Trunkgroup 01		
+492284220436994-+492284220436997	Xpressions PhoneMail	
MSN: 8887994	VoiceGuide Script (ACD)	
MSN: 88993	Xpressions PhoneMail	
MSN: 88994	Xpressions PhoneMail	PM_BONN
MSN: 88995	Xpressions PhoneMail	PM_BONN
MSN: 88996	Xpressions PhoneMail	PM_BONN
MSN: 997	Xpressions PhoneMail	PM_BONN

Version 8.11.1.19207

```
18.09:24:27.814   mta
18.10:52:38.149   mta
18.11:00:01.096   mta
18.11:00:01.110   mta
18.11:00:01.110   mta
18.11:00:01.136   mta
```

About Unify

Unify is the Atos brand for communication and collaboration solutions. At the core of the Atos Digital Workplace portfolio, Unify technology enables organizations of all sizes to transform the way they collaborate, creating a more connected and productive workforce which can dramatically improve team performance, individual engagement and business efficiency.

Unify products represent a strong heritage of technology innovation, reliability and flexibility. Their award-winning intuitive user experience can be delivered through almost any device and in any combination of cloud or on-premise deployment. Augmented by Atos' secure digital platforms, vertical solutions and transformation services, they set the global standard for a rich and reliable collaboration experience that empowers teams to deliver extraordinary results.

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