OpenScape Voice V10
OpenScape SBC V10
OpenScape Branch V10

How to Configure SIP Trunk of Deutsche Telekom Company Flex

Tested Scenario: Provider <–> OS SBC / OS Branch <–> OS Voice
Provider Connectivity: TCP or encrypted TLS SIP Trunk
Provider Registration: Registration Mode

Foreword

This ‘How to’ Guide describes the configuration of different setups in different chapters:

- Unencrypted TCP SIP Trunk between OS SBC / OS Branch and Deutsche Telekom CompanyFlex
- TLS encrypted SIP Trunk between OS SBC / OS Branch and Deutsche Telekom CompanyFlex

Table of Contents

Table of History

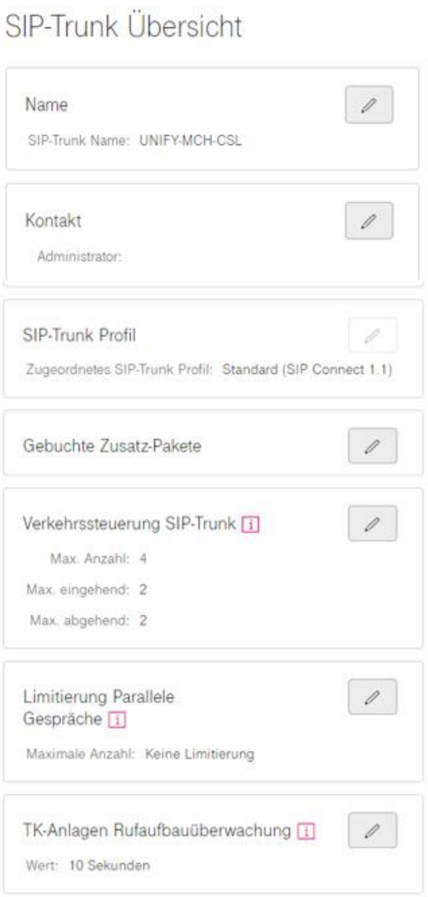
Date	Version	Changes
08.11.2022	0.1	Initial version
16.11.2022	0.9	Ready for review
25.11.2022	1.0	Final release

Trunk Configuration Data provided by Deutsche Telekom

Configuration Documents:

- Technical Specification of the SIP-Trunking Interface of CompanyFlex of Deutsche Telekom, 1TR119, https://www.telekom.de/hilfe/downloads/1tr119.pdf
- How to Configure SIP Trunk for CompanyFlex (Telekom Deutschland GmbH), CompanyFlex-OSV-OSSBC-Trunk-Configuration.pdf by Deutsche Telekom

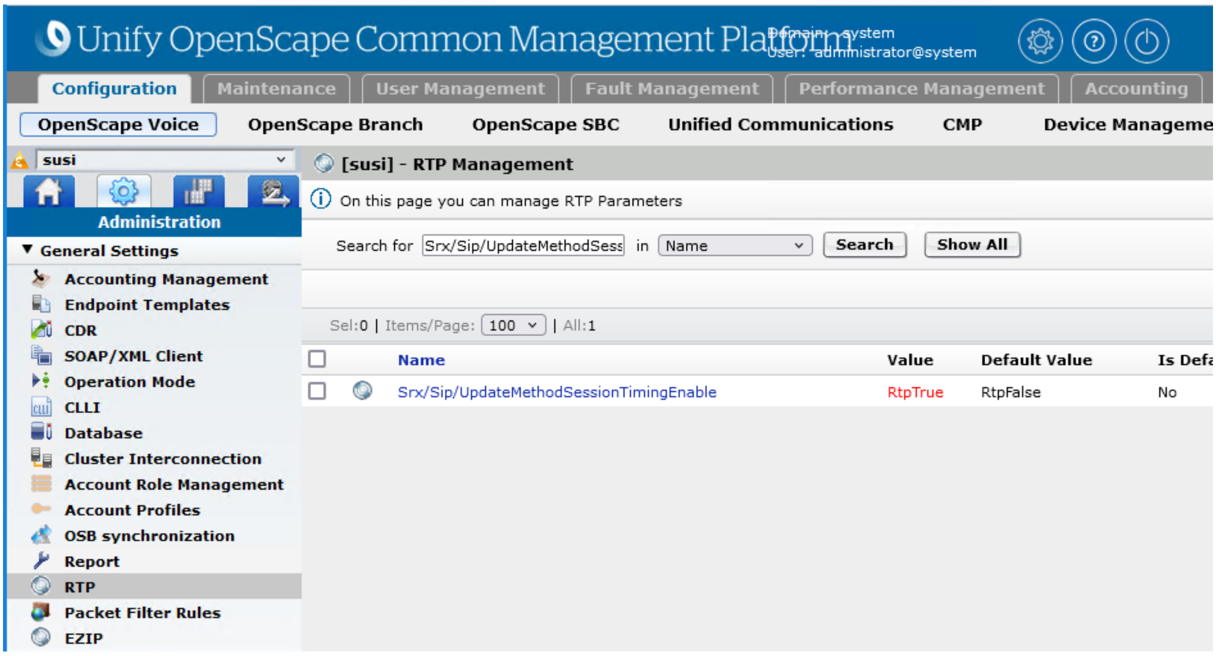
The configuration data required to setup the SIP trunk can be seen in the Business Service Portal of Deutsche Telekom as it looks like below:



The advanced parameter 'Rufaufbauüberwachung' should be increased e. g. to 10 seconds. It specifies the time the provider waits for a response from a called PSTN phone. For mobile phones the default value 3 is a too short time span.

OpenScape Voice Resilient Telco Platform (RTP) Parameter

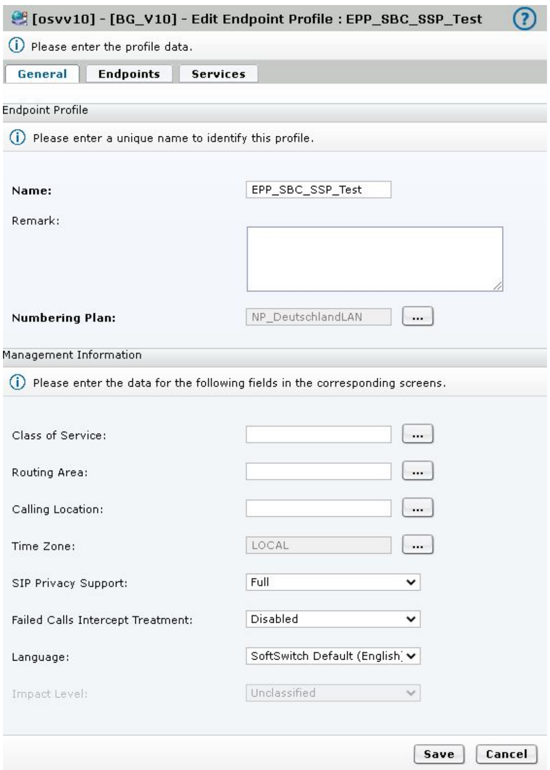
The OpenScape Voice RTP parameter Srx/Sip/UpdateMethodSessionTimingEnable has to be set to RtpTrue. This cause OSV to send UPDATE SIP messages instead of INVITE for Session Updates.

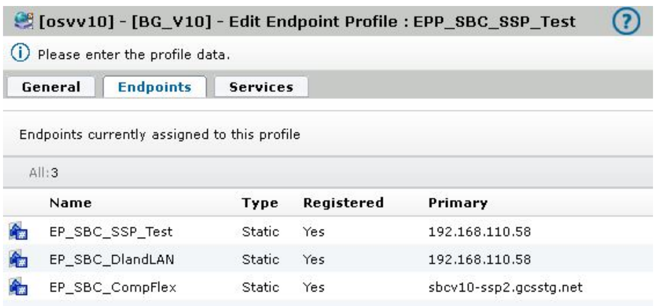


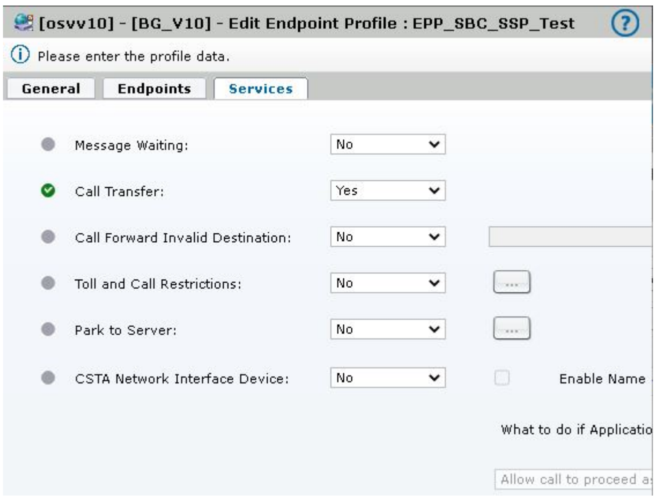
Configuration of unencrypted SIP Trunk

OpenScape Voice Configuration

OpenScape SBC Endpoint Profile

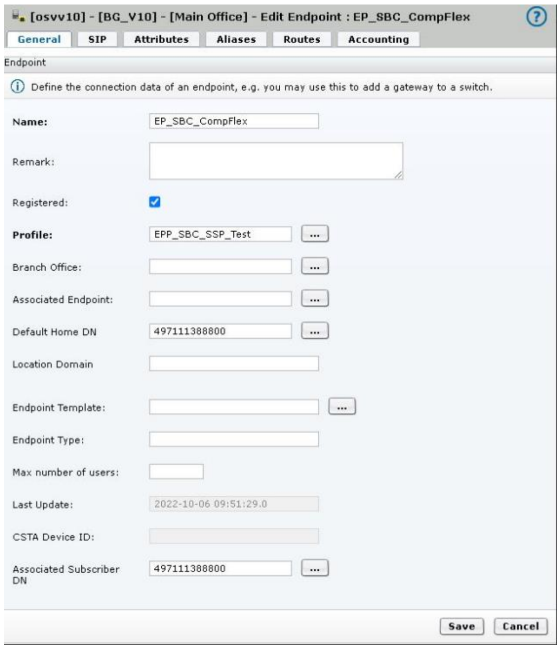






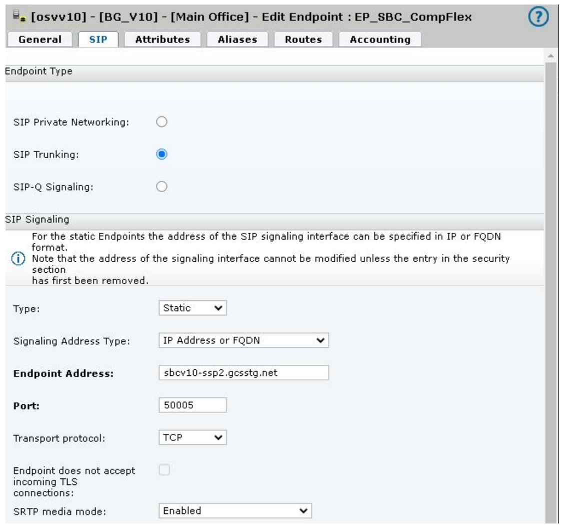
General Tab

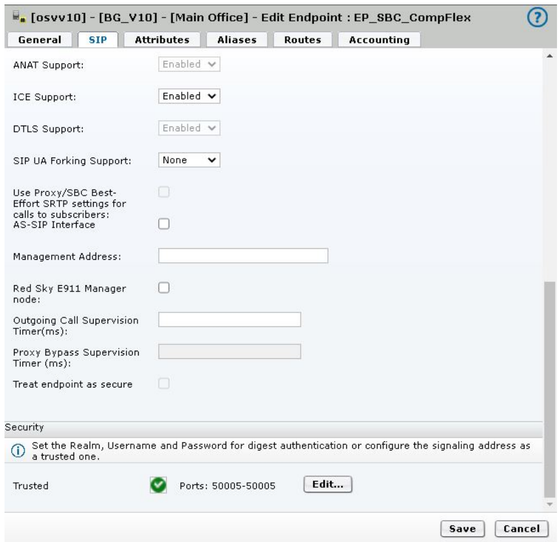
- **Profile**: Use the Endpoint Profile configured before
- **Default Home DN**: Specify one number of the DID range, best use the first number from this range



SIP Tab

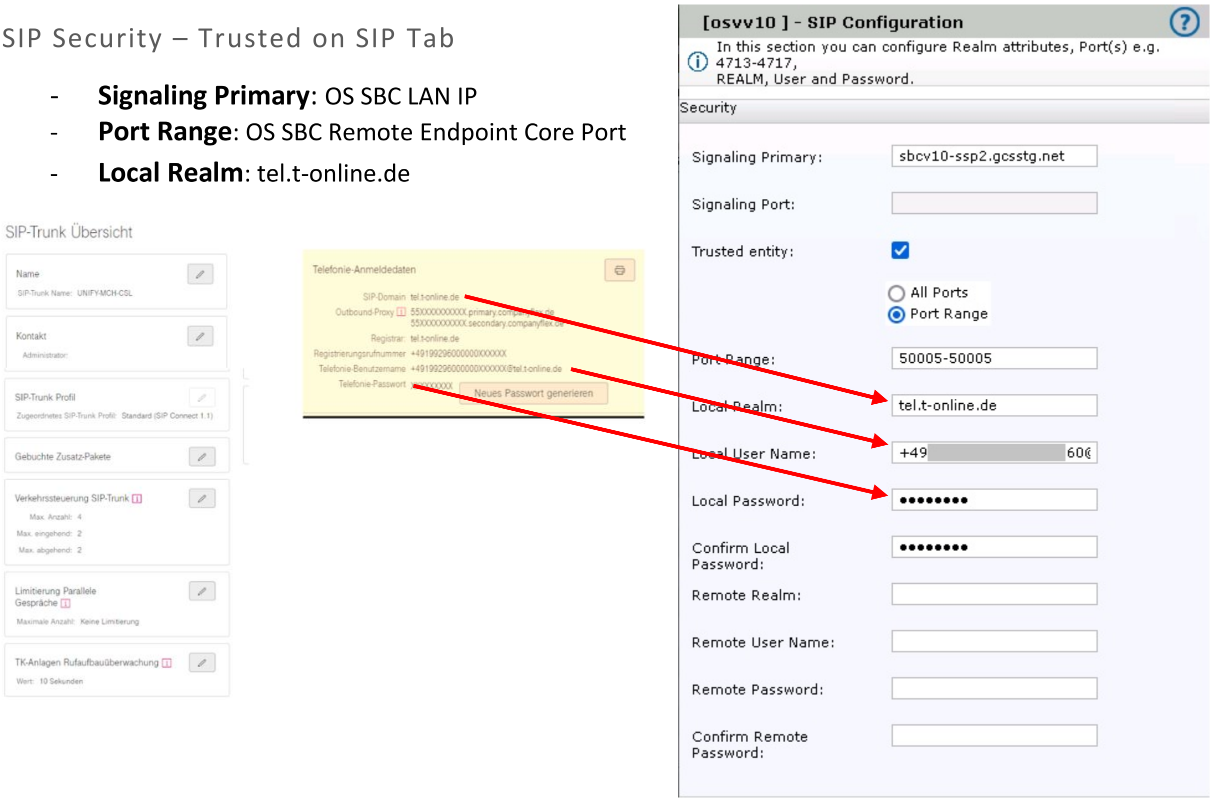
- **Endpoint Address**: OS SBC LAN IP or FQDN
- **Port**: OS SBC Remote Endpoint Core Port
- **Transport protocol**: TCP
- **Trusted**: OS SBC Remote Endpoint Core Port





SIP Security – Trusted on SIP Tab

- **Signaling Primary**: OS SBC LAN IP
- **Port Range**: OS SBC Remote Endpoint Core Port
- **Local Realm**: tel.t-online.de



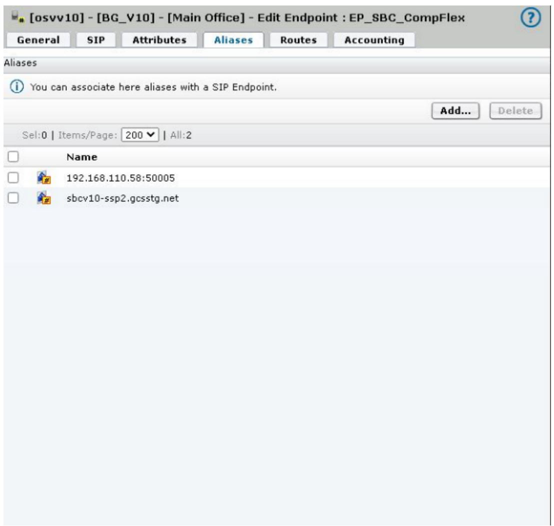
Attributes Tab

Enabled SIP Attributes:

- **Public/Offnet Traffic**
- **Send International Numbers in Global Number Format (GNF)**
- **Send Authentication Number in P-Asserted-Identity header**
- **Use Subscriber Home DN as Authentication Number**
- **Enable Session Timer**

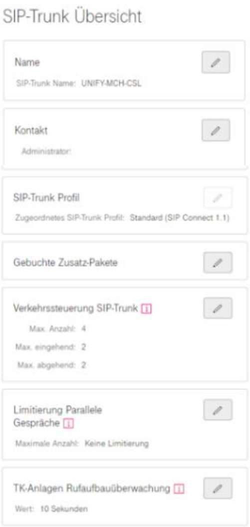
Aliases Tab

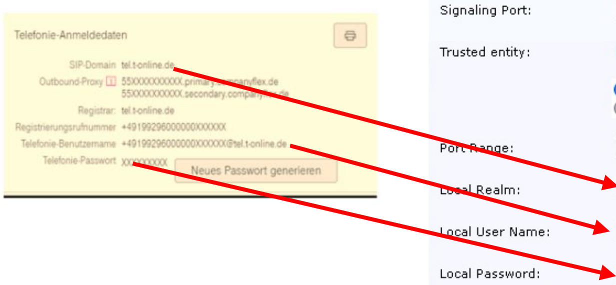
- OS SBC LAN IP or FQDN, optional additional OS SBC Remote Endpoint Core Port

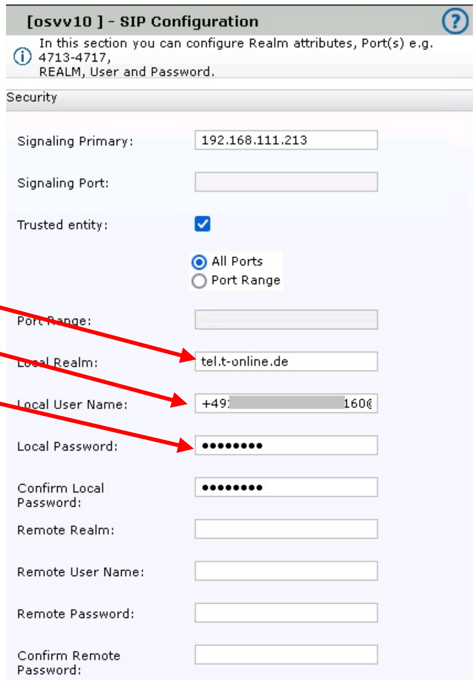


SIP Security – Trusted on SIP Tab

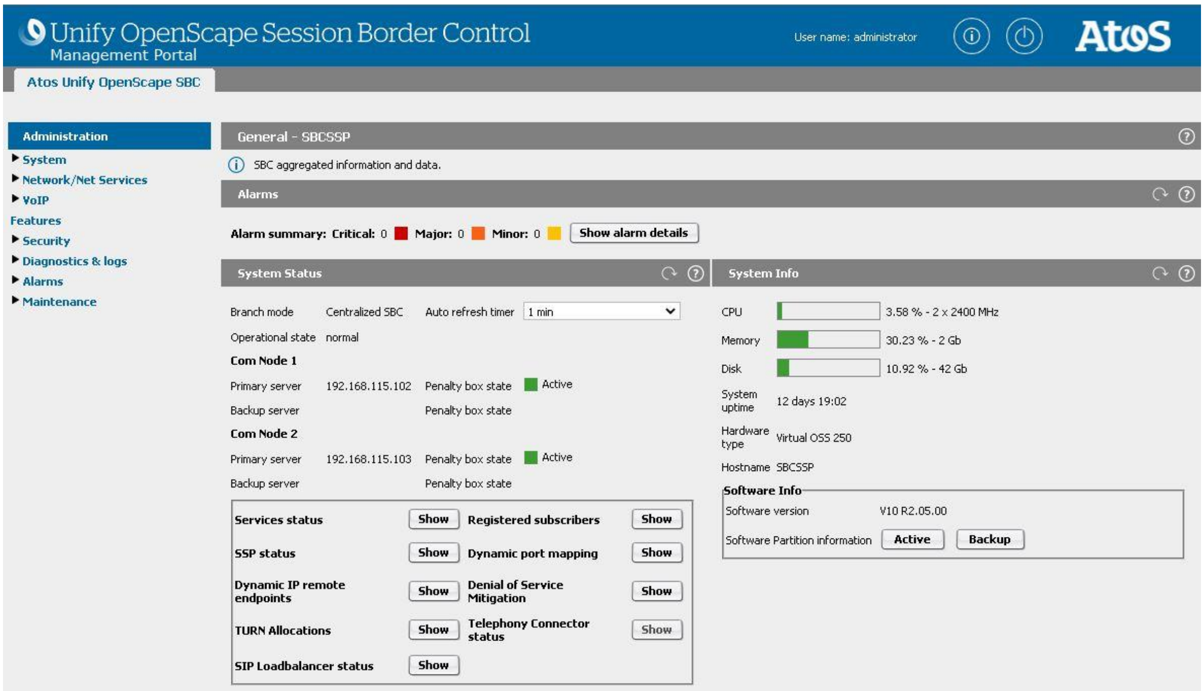
- **Signaling Primary**: OS Branch LAN IP
- **Port Range**: All Ports
- **Local Realm**: tel.t-online.de





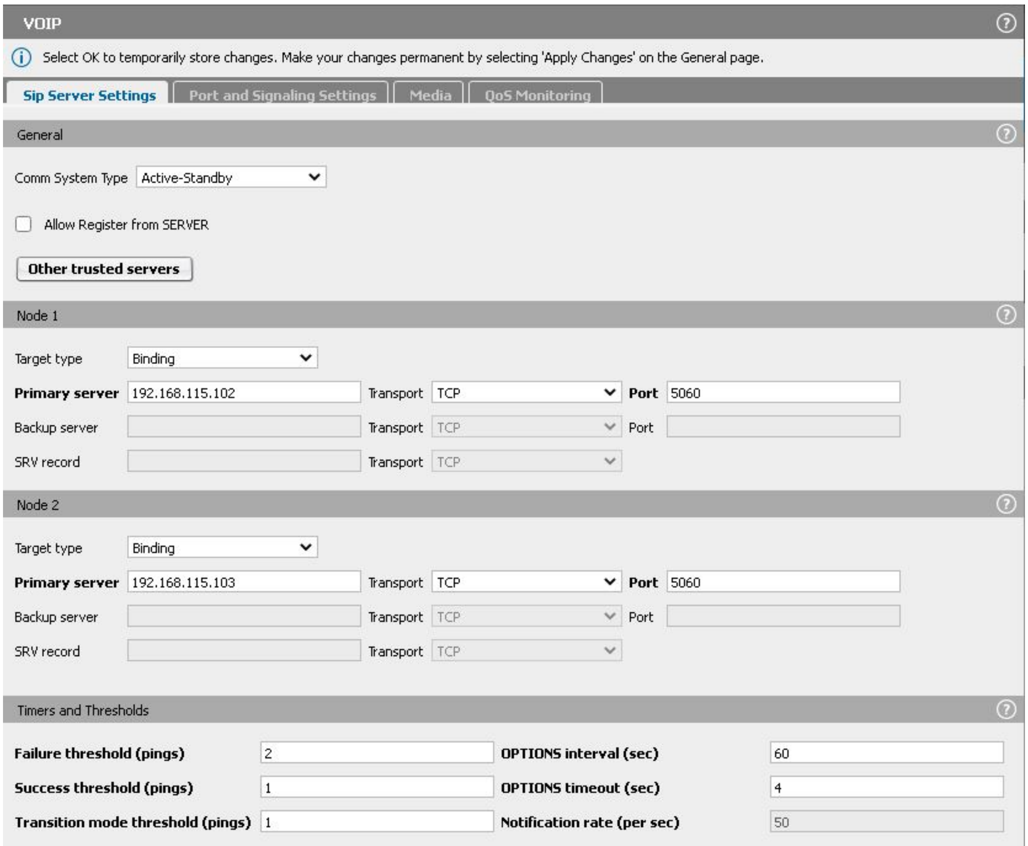


OpenScape SBC Configuration

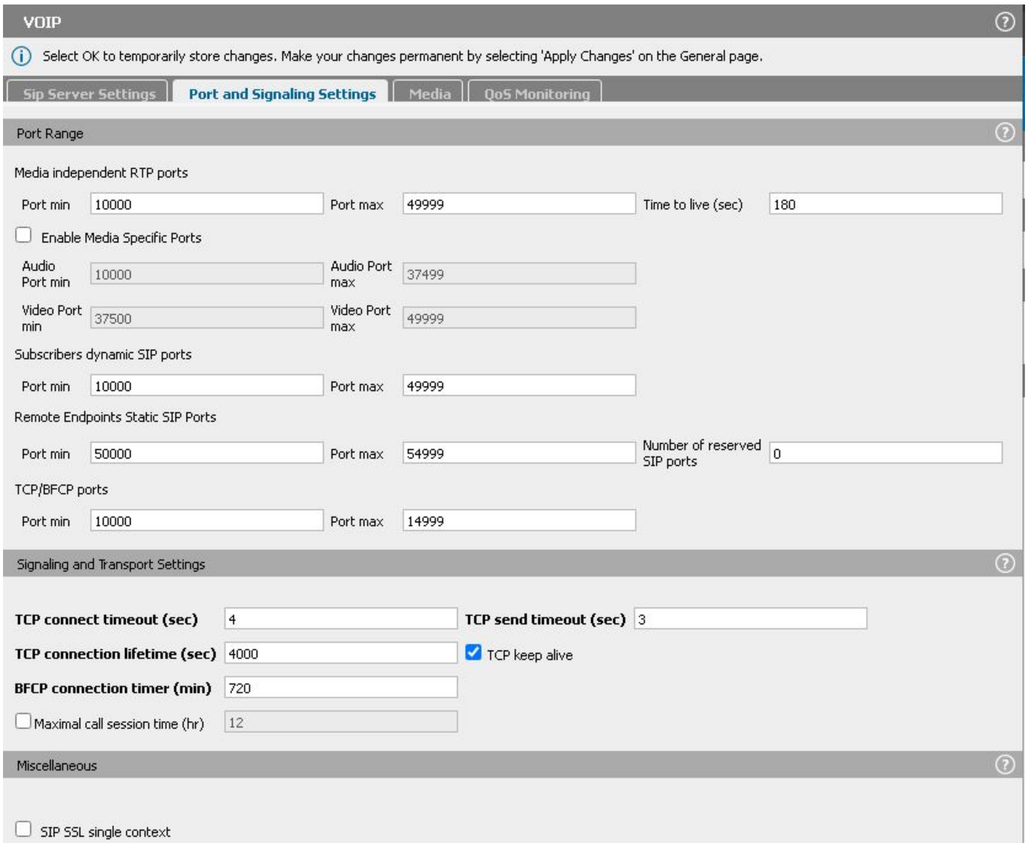


VOIP – Sip Server Settings Tab

- **Primary server:** OSV SIP TCP IP
- **Transport:** TCP
- **Port:** 5060

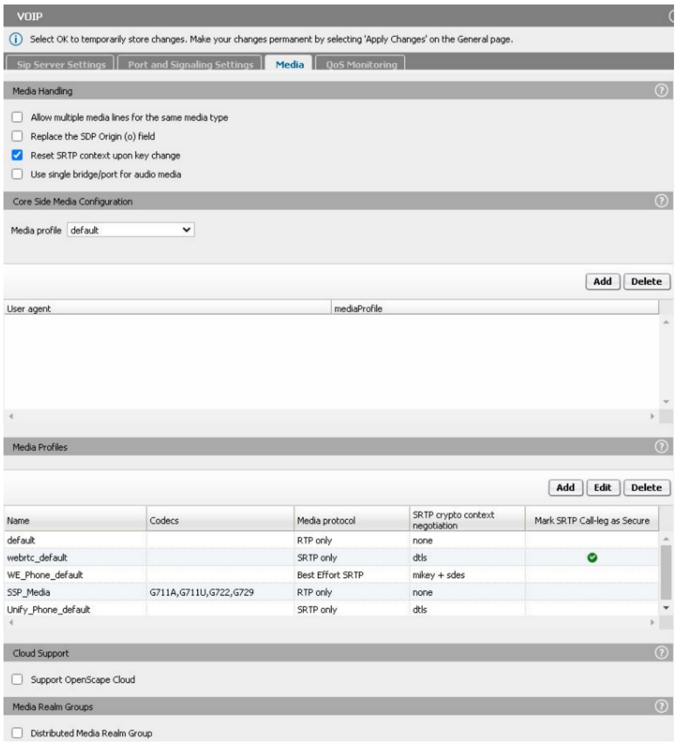


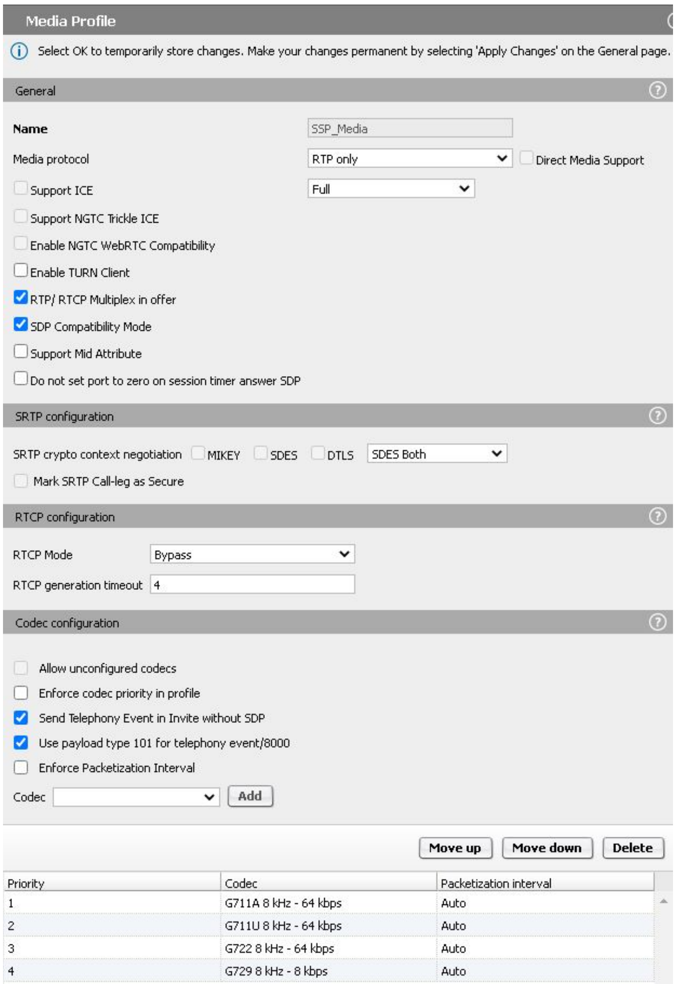
VOIP – Port and Signaling Settings Tab



VOIP – Media Profile Tab

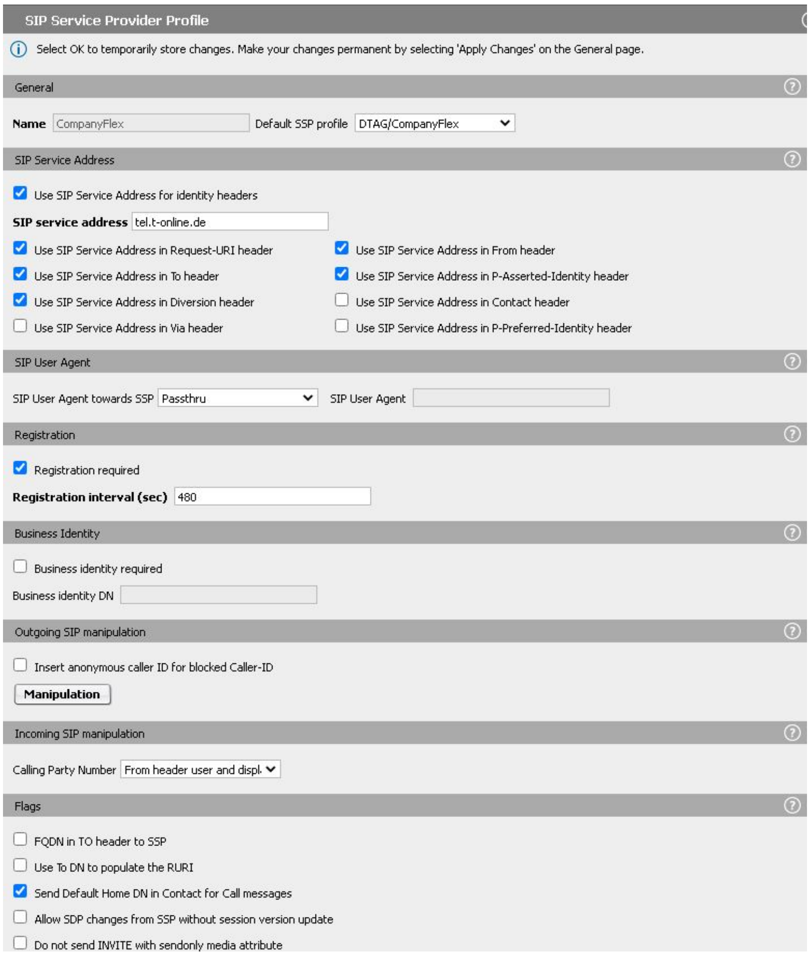
- **Core Media Protocol:** RTP only
- **Codecs Access Side:** At least G.711A and one additional codec

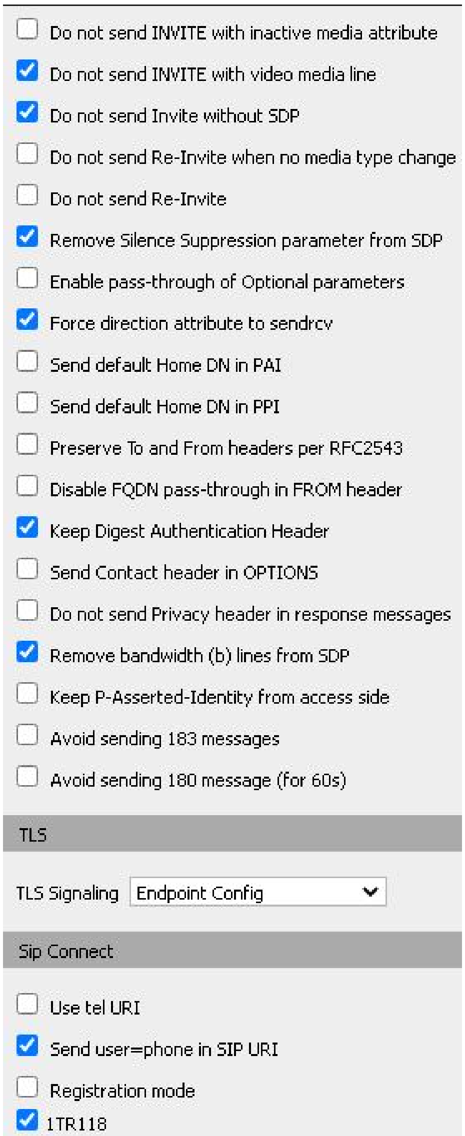




SIP Service Provider Profile

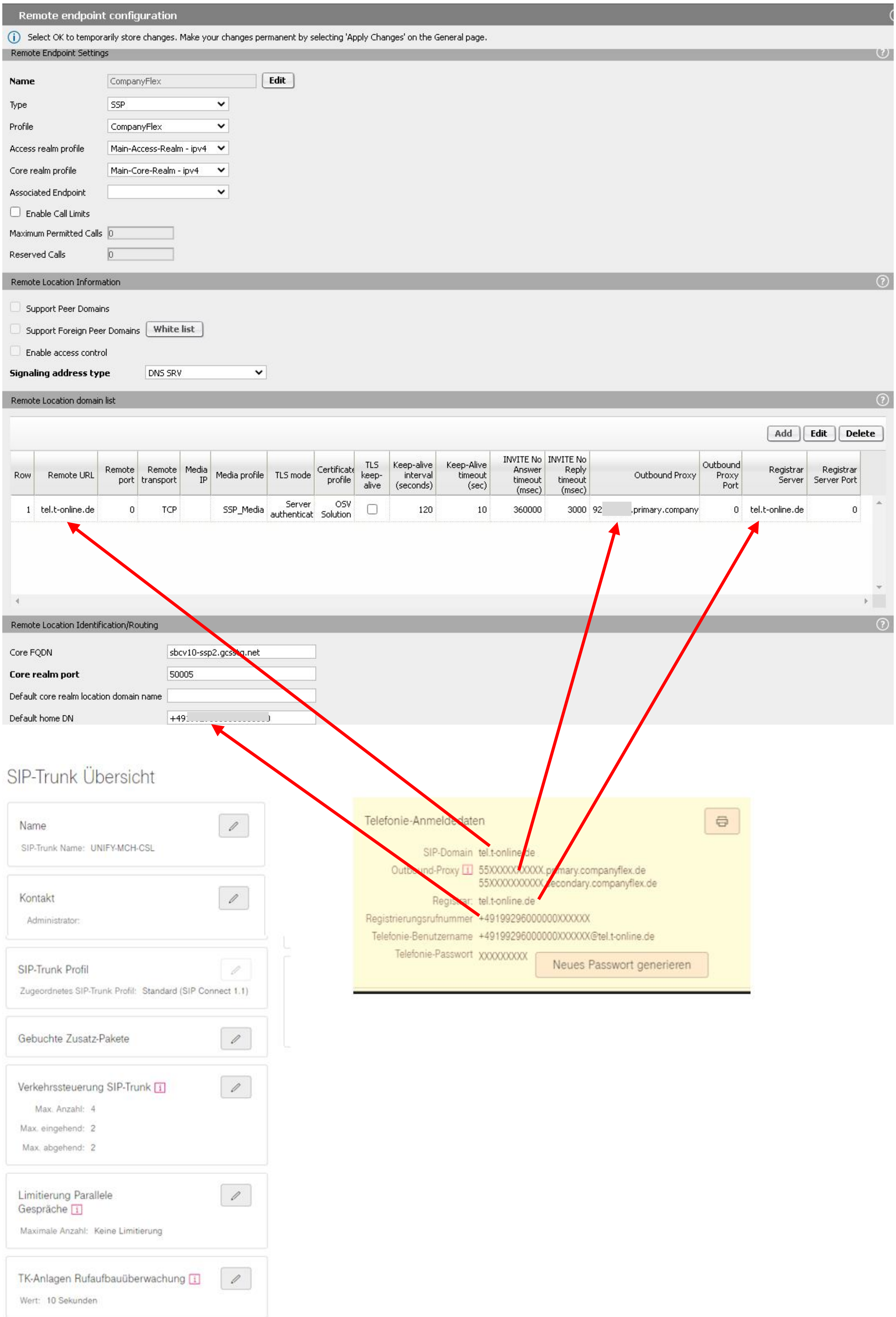
- **Default SSP profile:** DTAG/CompanyFlex





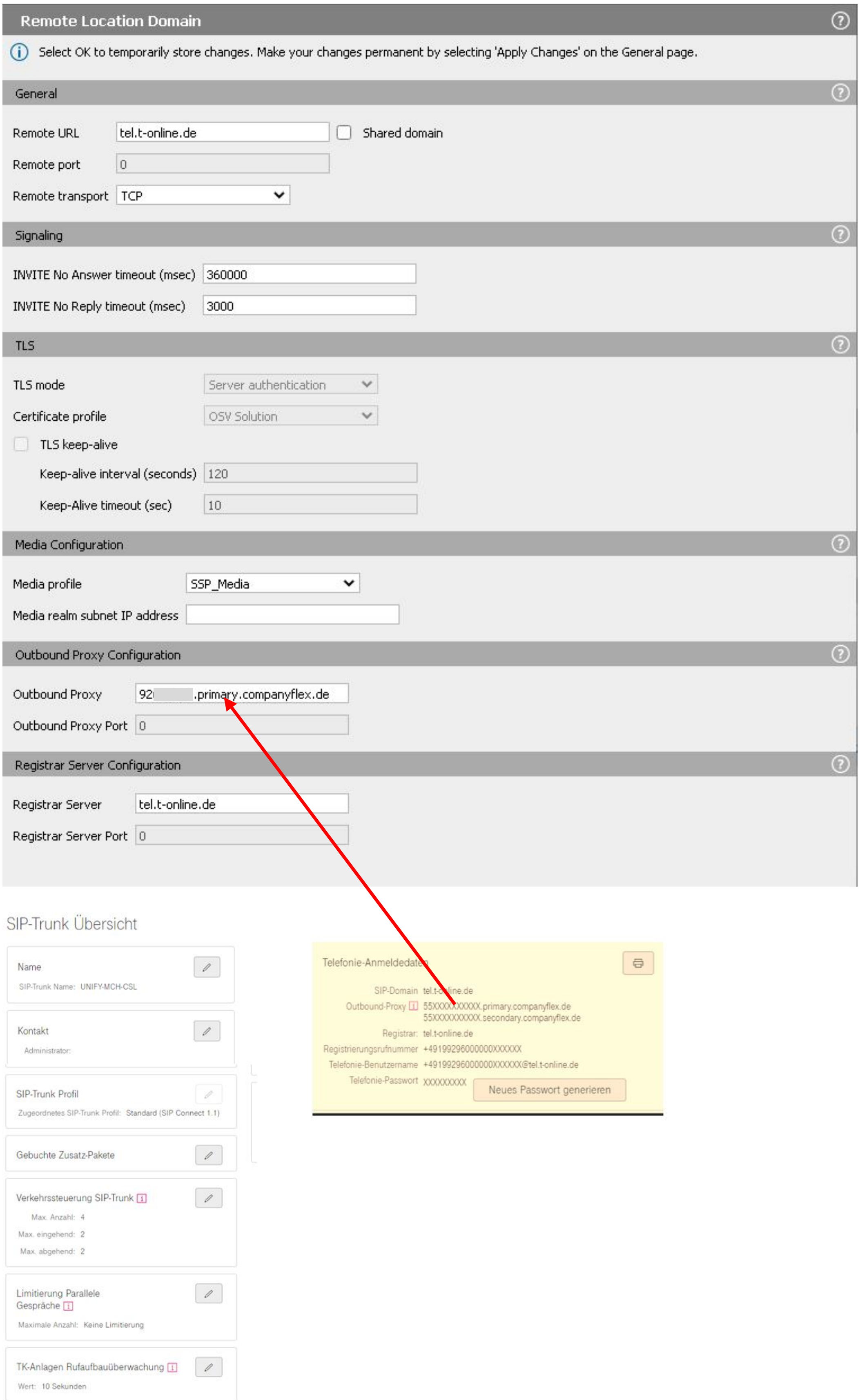
Remote Endpoint Configuration

- **Profile: SIP Service**: Provider Profile configured before
- **Signaling address type**: DNS SRV



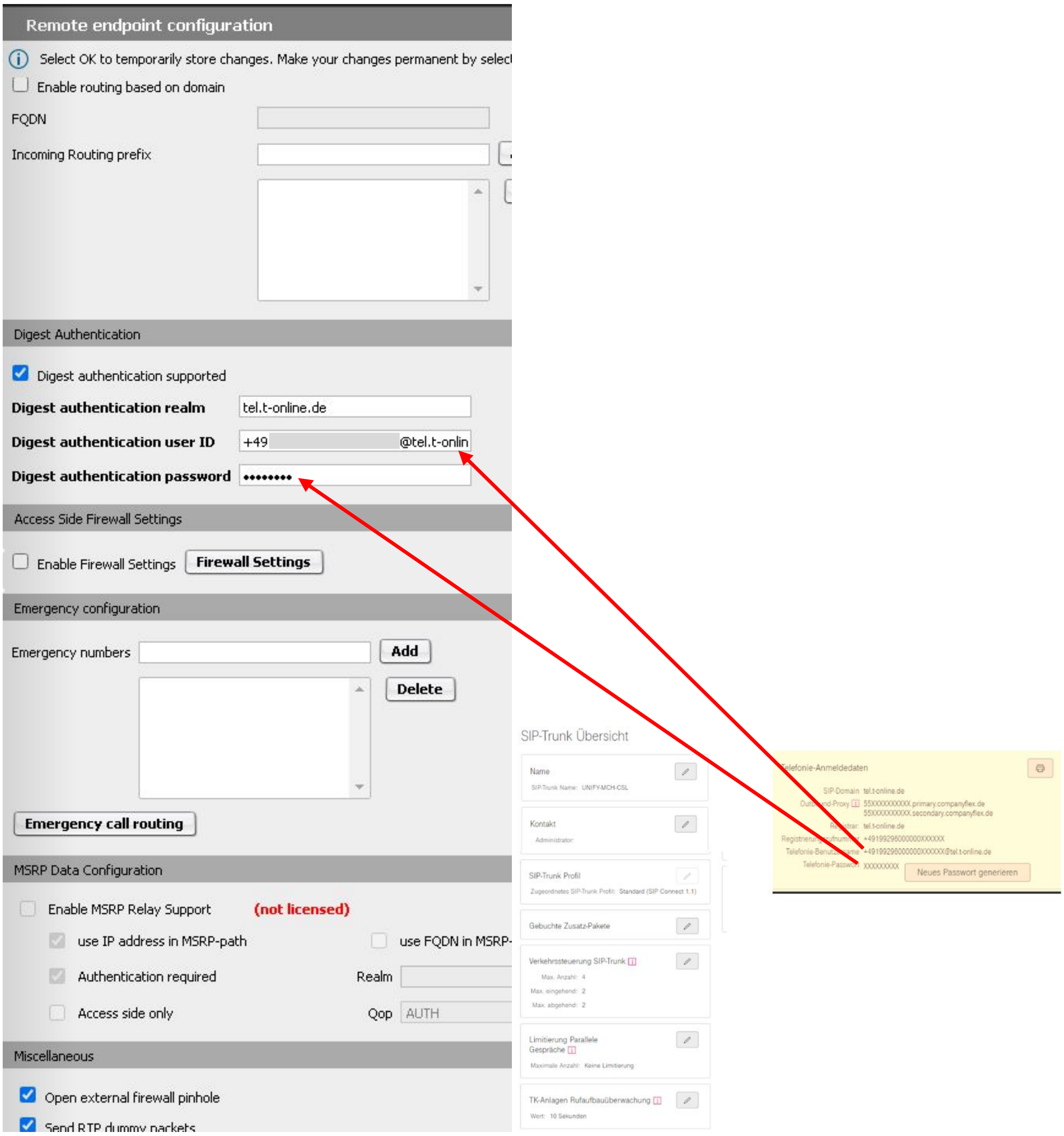
Remote Location Domain

- **Remote URL:** tel.t-online.de
- **Media profile:** Media profile for access side configured before
- **Registrar Server:** tel.t-online.de



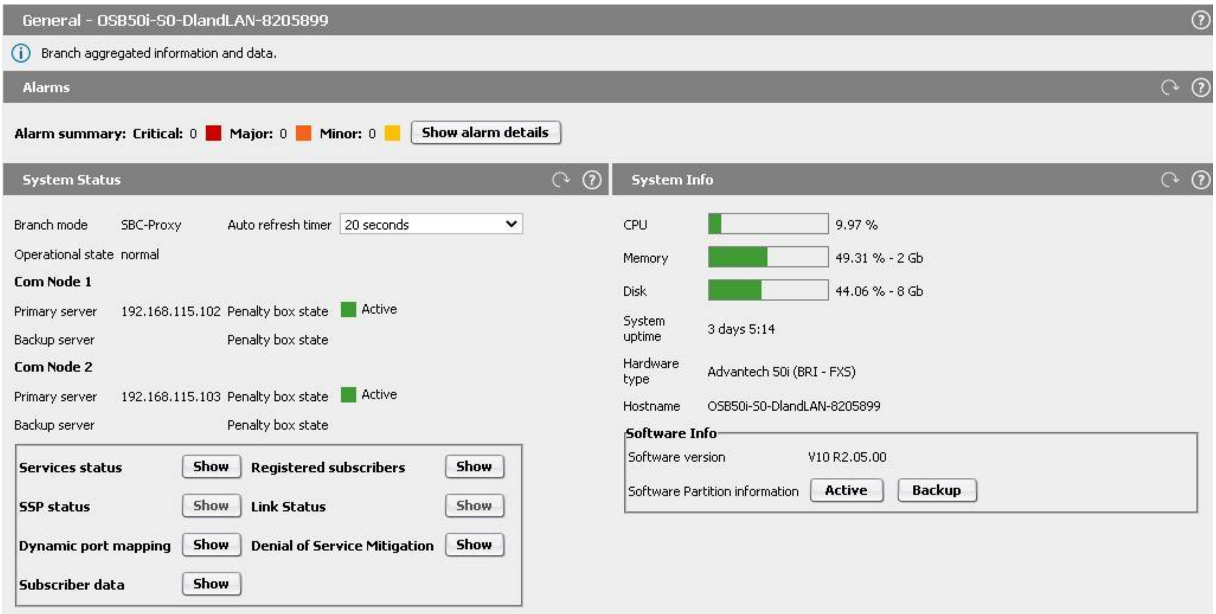
Remote Endpoint Configuration (cont'd)

- **Send RTP dummy packets**: Enabled



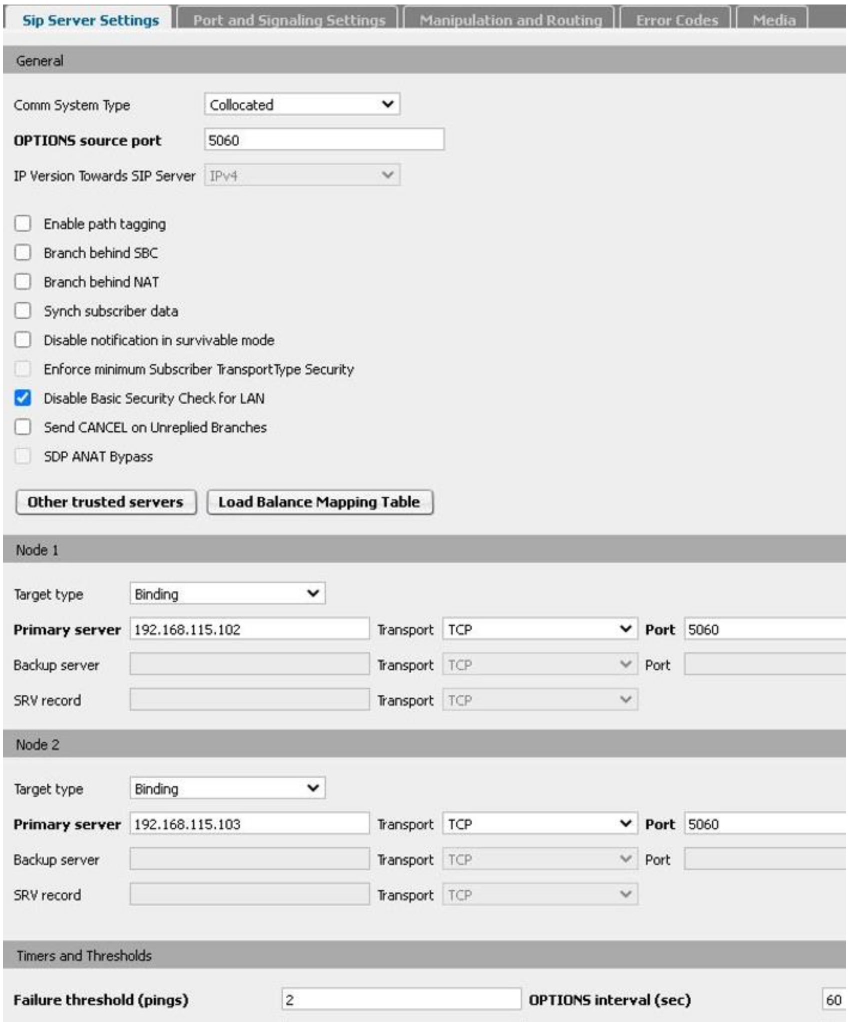
OpenScape Branch Configuration

OpenScape Branch is configured to run in SBC-Proxy mode.

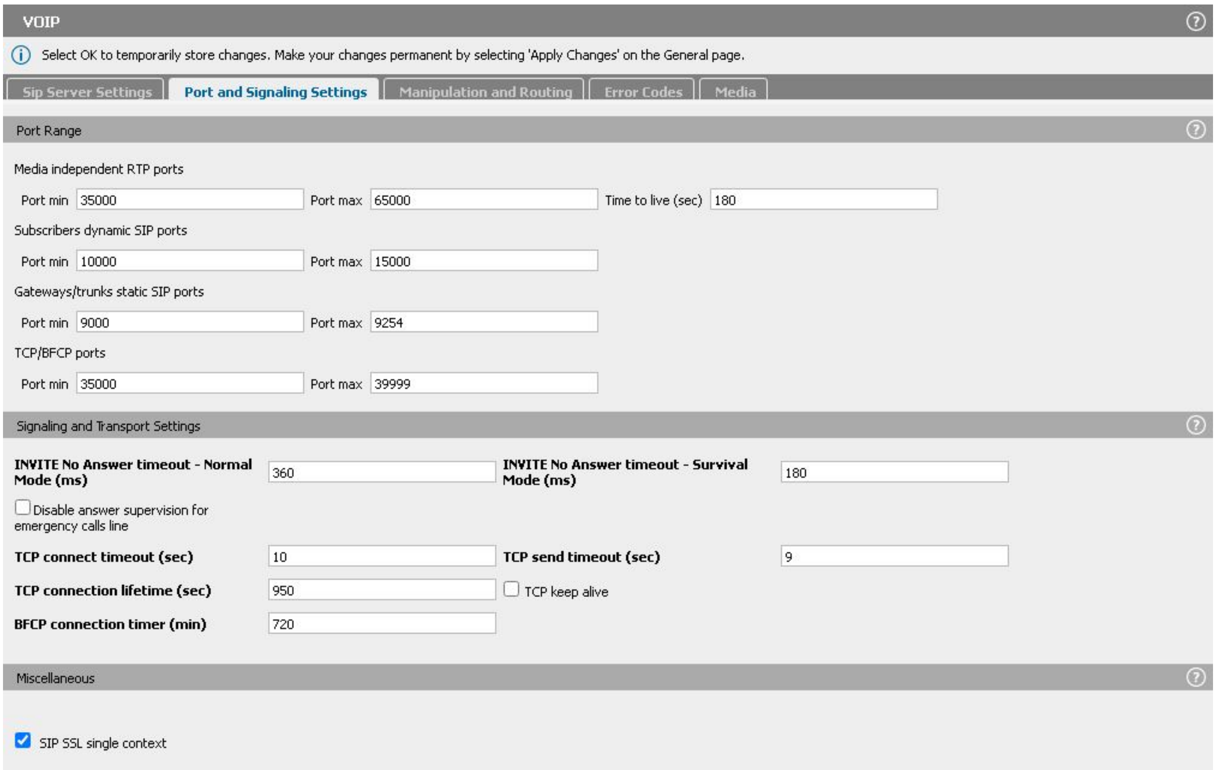


VOIP – SIP Server Settings Tab

- **Primary server:** OSV SIP TCP IP
- **Transport:** TCP
- **Port:** 5060

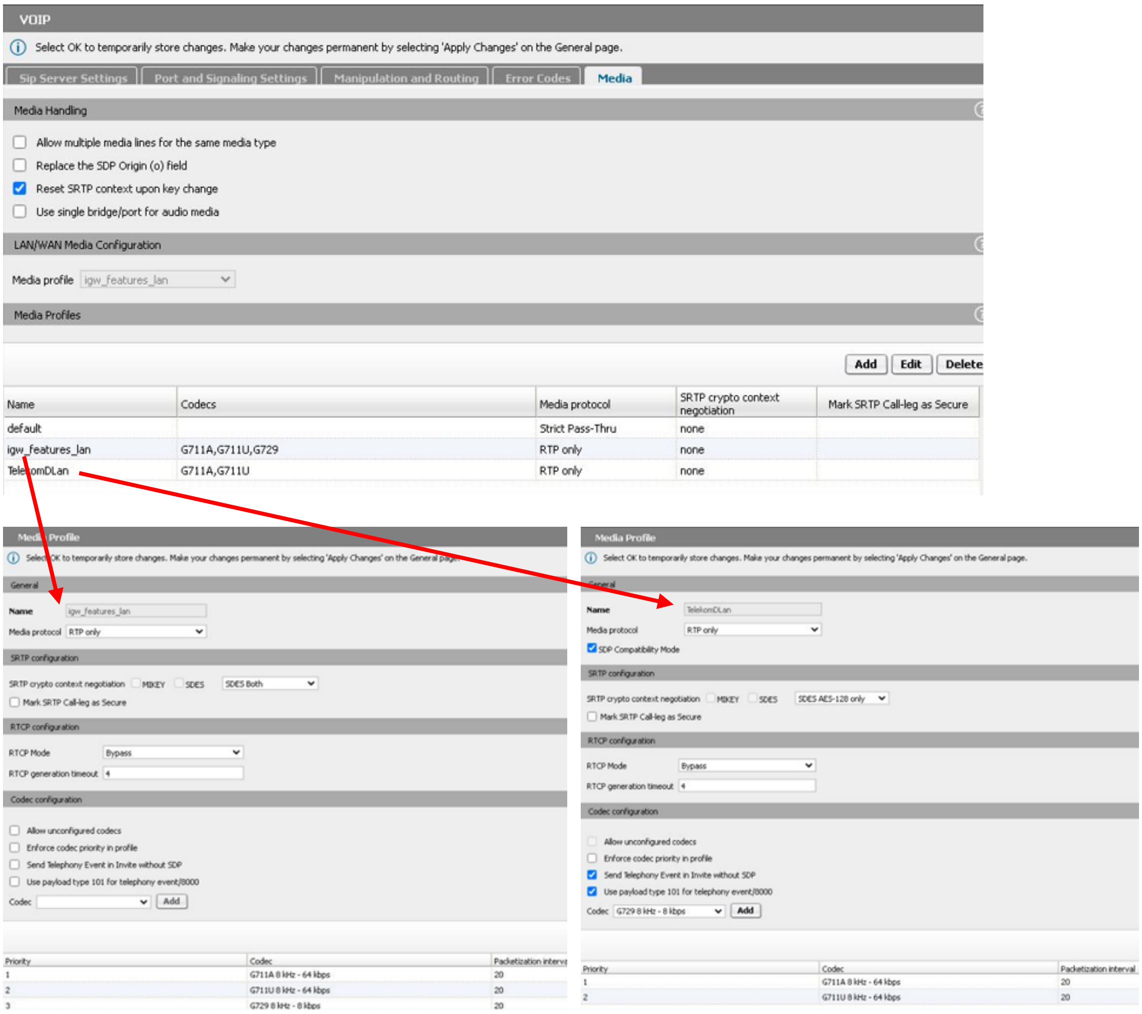


VOIP – Port and Signaling Settings Tab

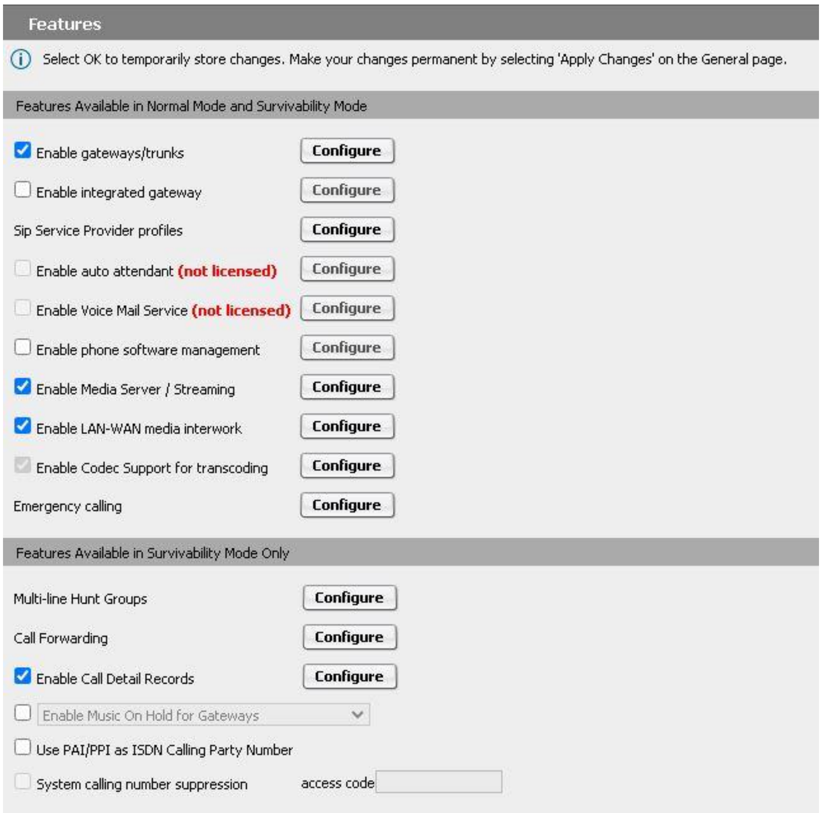


VOIP – Media Tab

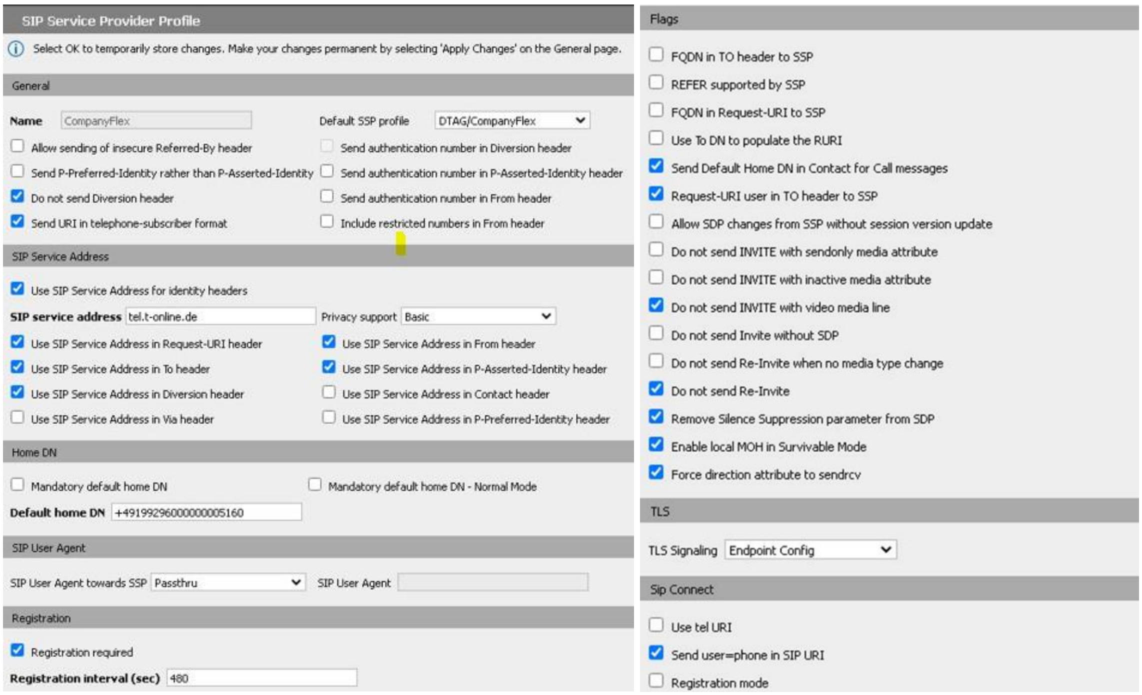
- **Media protocol**: For Media Profile igw_features_lan RTP only
- **Codec List**: At least G.711A on core and G.711A on access side



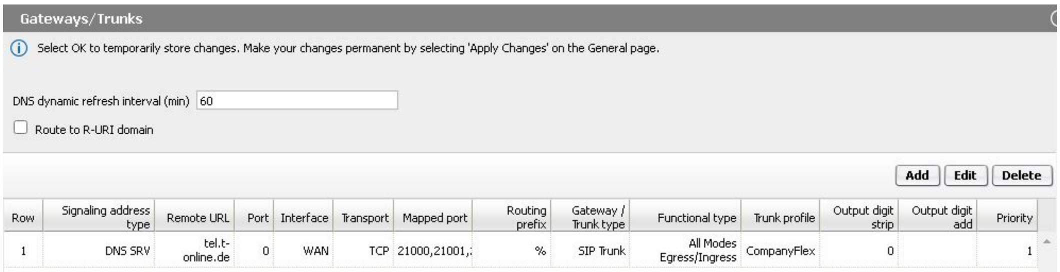
Features



SIP Service Provider Profile



Gateways/Trunks



Gateways/Trunks

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

DNS dynamic refresh interval (min) 60

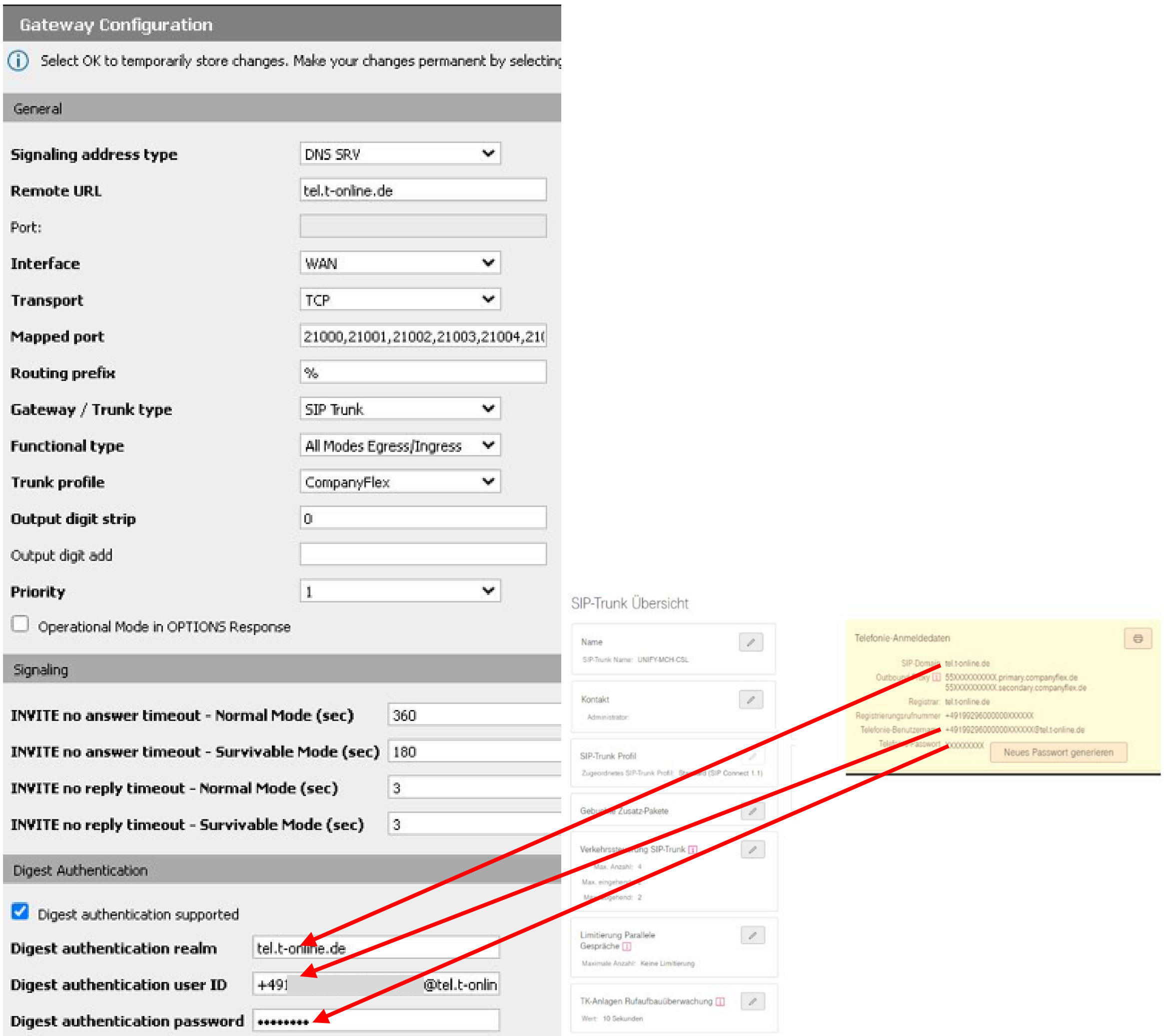
Route to R-URI domain

Add Edit Delete

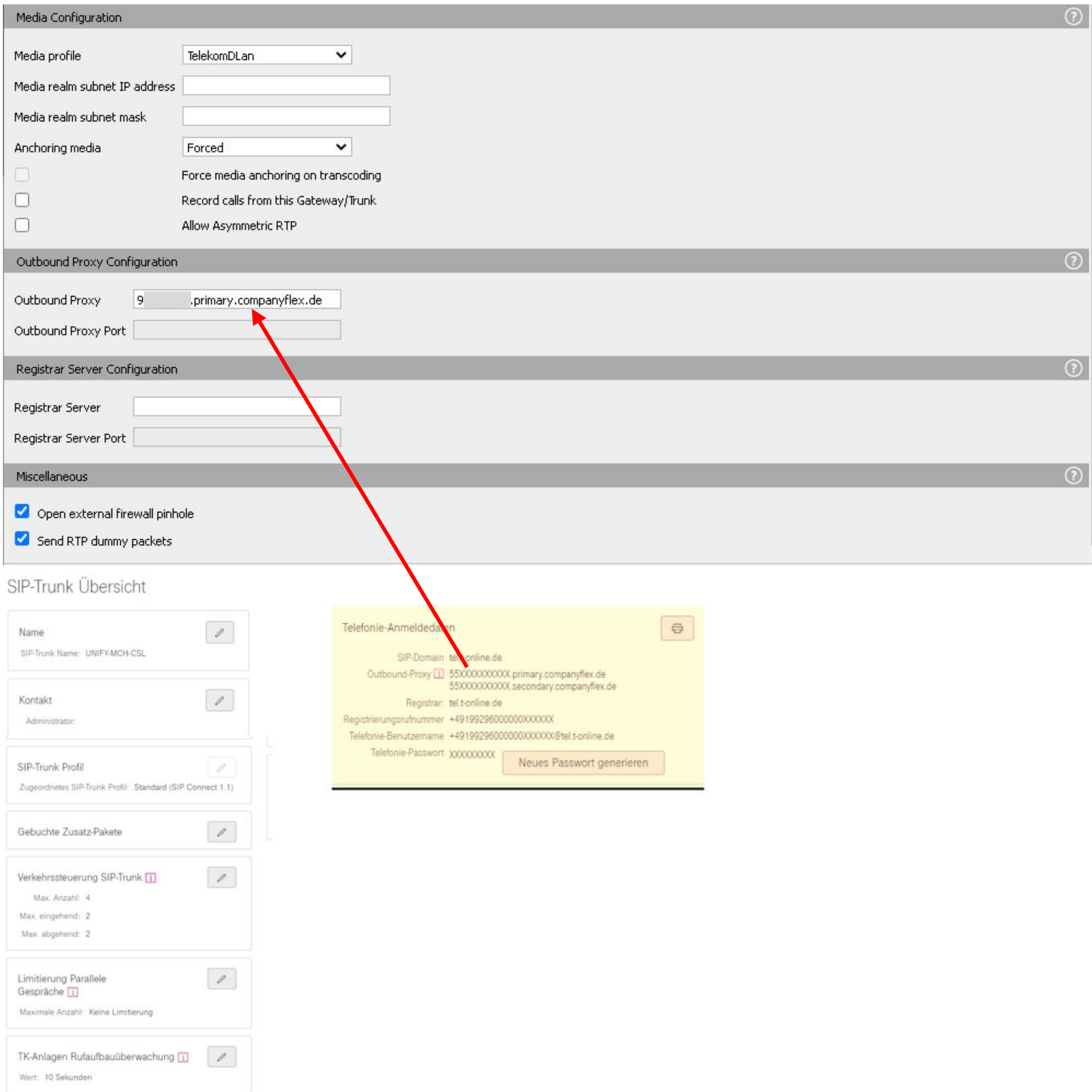
Row	Signaling address type	Remote URL	Port	Interface	Transport	Mapped port	Routing prefix	Gateway / Trunk type	Functional type	Trunk profile	Output digit strip	Output digit add	Priority
1	DNS SRV	tel.t-online.de	0	WAN	TCP	21000,21001,:	%	SIP Trunk	All Modes Egress/Ingress	CompanyFlex	0		1

Gateway Configuration

- **Signaling address type**: DNS SRV
- **Remote URL**: tel.t-online.de
- **Transport**: TCP
- **Mapped port**: 10 ports in a row



Gateway Configuration (cont'd)



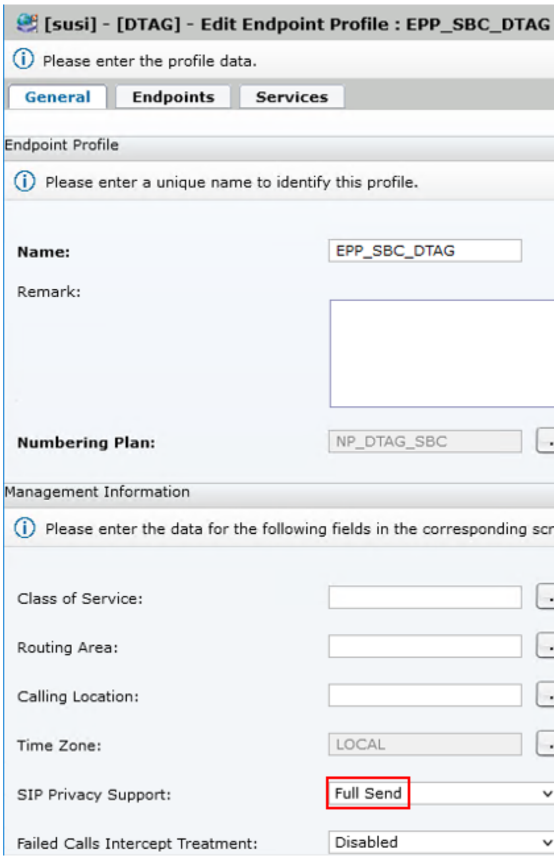
Configuration of TLS encrypted SIP Trunk

OpenScape Voice Configuration

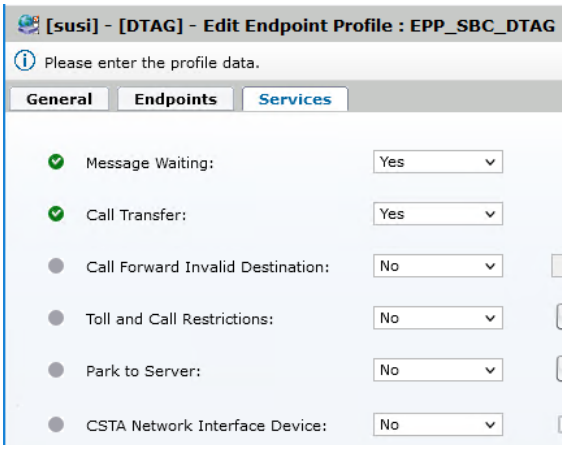
OpenScape SBC Endpoint Profile

General Tab

- **SIP Privacy Support**: Full Send



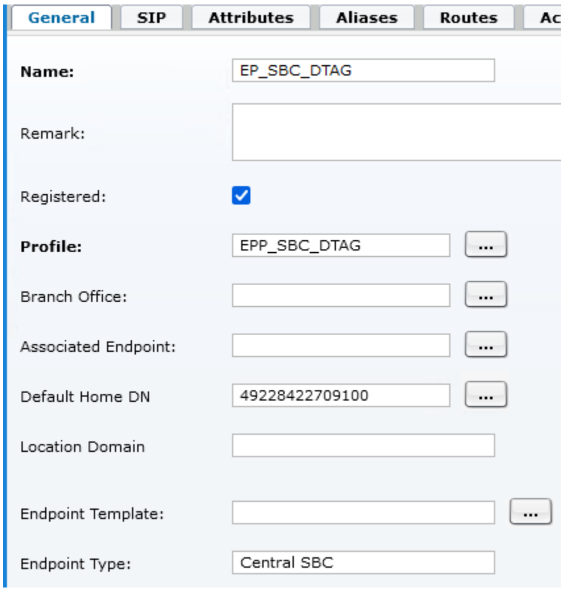
Services Tab



OpenScape SBC Signaling Endpoint

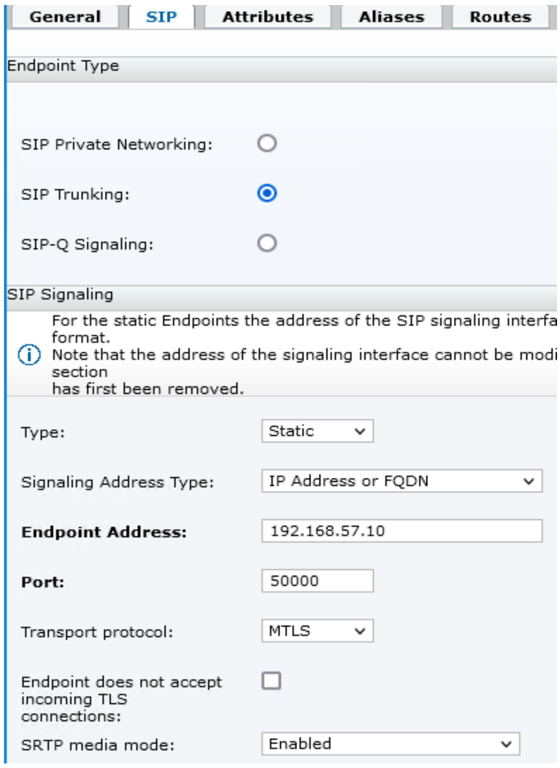
General Tab

- **Profile**: Endpoint Profile configured before
- **Default Home DN**: A number from the DID range, most suitable use the first number from the DID range



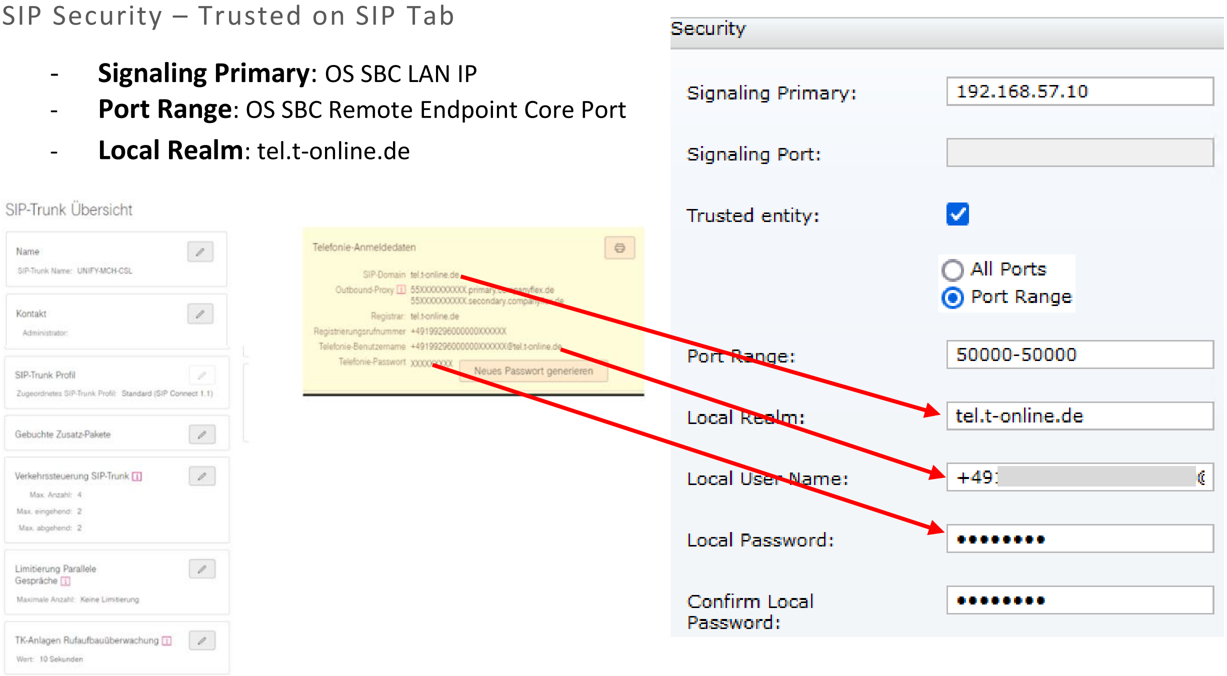
SIP Tab

- **Endpoint Address**: OS SBC LAN IP
- **Port**: SBC Remote Endpoint Core Port
- **Transport protocol**: TCP for unencrypted or MTLS for encrypted connection to OS SBC
- **SRTP media mode**: Must be enabled for MTLS



SIP Security – Trusted on SIP Tab

- **Signaling Primary**: OS SBC LAN IP
- **Port Range**: OS SBC Remote Endpoint Core Port
- **Local Realm**: tel.t-online.de



Attributes Tab

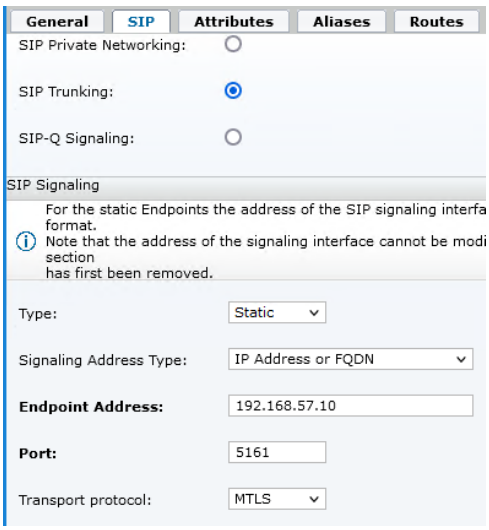
Enabled SIP Attributes:

- **SIP Proxy**
- **Central SBC**
- **Route via Proxy**
- **Public/Offnet Traffic**
- **Do not send Diversion header**
- **Send International Numbers in Global Number Format (GNF)**
- **Send Authentication Number in P-Asserted-Identity header**
- **Use Subscriber Home DN as Authentication Number**
- **Enable Session Timer**

OpenScape SBC OPTIONS Endpoint

General Tab

- **Endpoint Address**: OS SBC LAN IP
- **Port**: 5060 for TCP or 5161 for MTLS
- **Transport protocol**: TCP for unencrypted or MTLS for encrypted connection to OS SBC



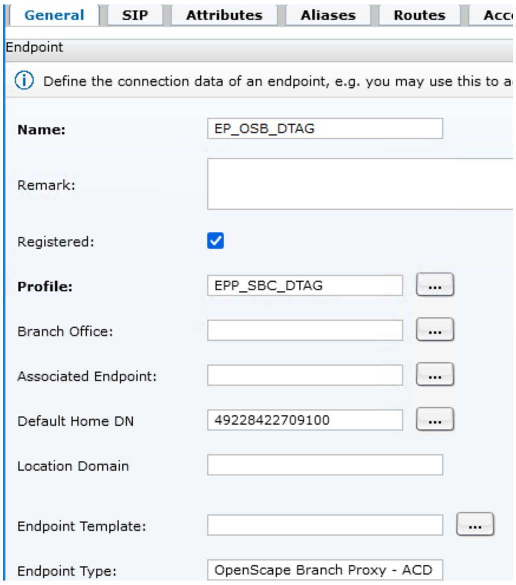
Aliases Tab

<SBC LAN IP>:5060 for TCP
<SBC LAN IP>:5161 for MTLS

OpenScape Branch Endpoint

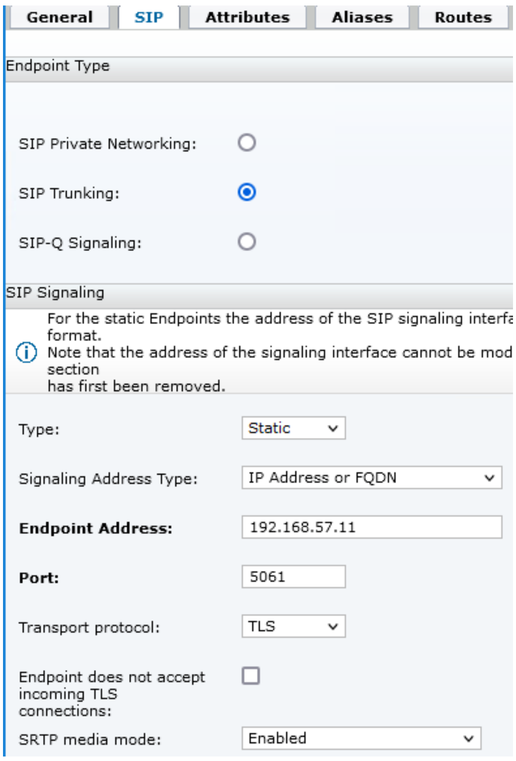
General Tab

- **Profile**: Endpoint Profile configured before
- **Default Home DN**: One number from the DID range, most suitable use the first number from the DID range



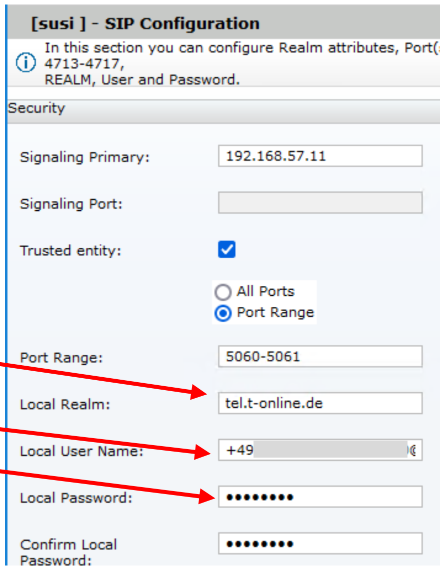
SIP Tab

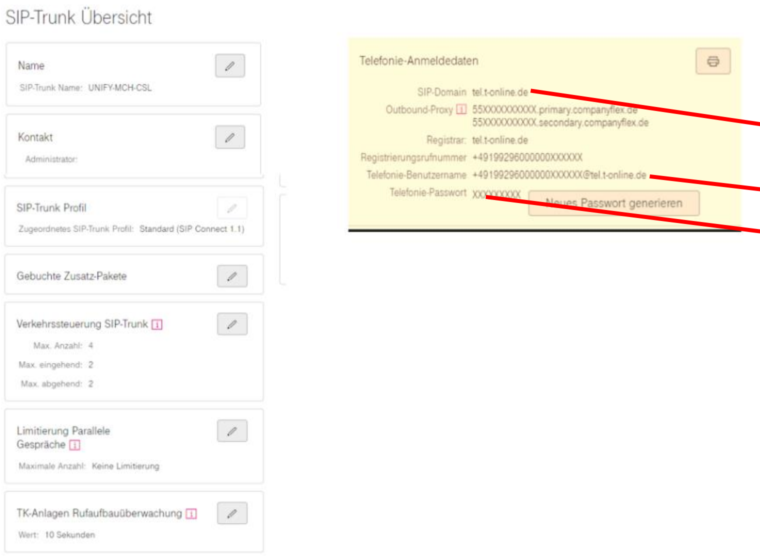
- **Endpoint Address**: OS Branch LAN IP
- **Port**: 5060 for TCP or 5061 for TLS
- **Transport protocol**: TCP for unencrypted or TLS for encrypted connection to OS Branch
- **SRTP media mode**: Must be enabled for TLS



SIP Security – Trusted on SIP Tab

- **Signaling Primary**: OS Branch LAN IP
- **Port Range**: 5060 for TCP or 5061 for TLS or All Ports
- **Local Realm**: tel.t-online.de





Attributes Tab

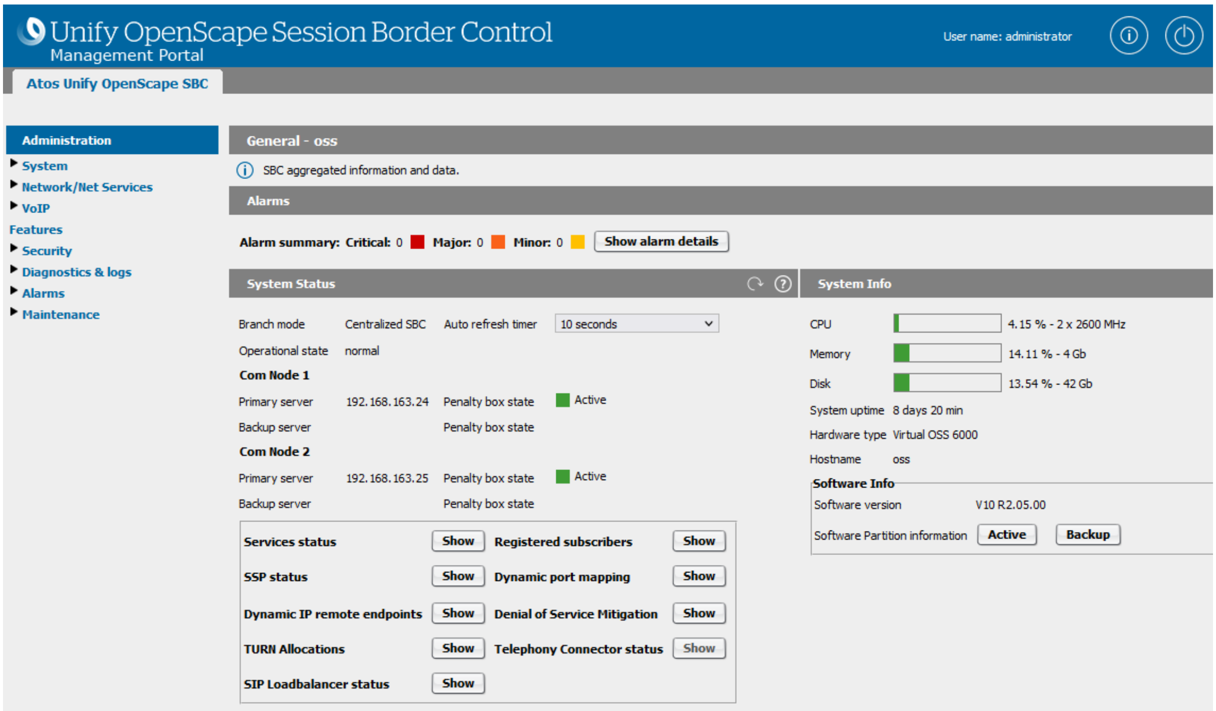
Enabled SIP Attributes:

- **Survivable Endpoint**
- **SIP Proxy**
- **Central SBC**
- **Route via Proxy**
- **Public/Offnet Traffic**
- **Do not send Diversion header**
- **Send International Numbers in Global Number Format (GNF)**
- **Send Authentication Number in P-Asserted-Identity header**
- **Use Subscriber Home DN as Authentication Number**
- **Enable Session Timer**

Aliases Tab

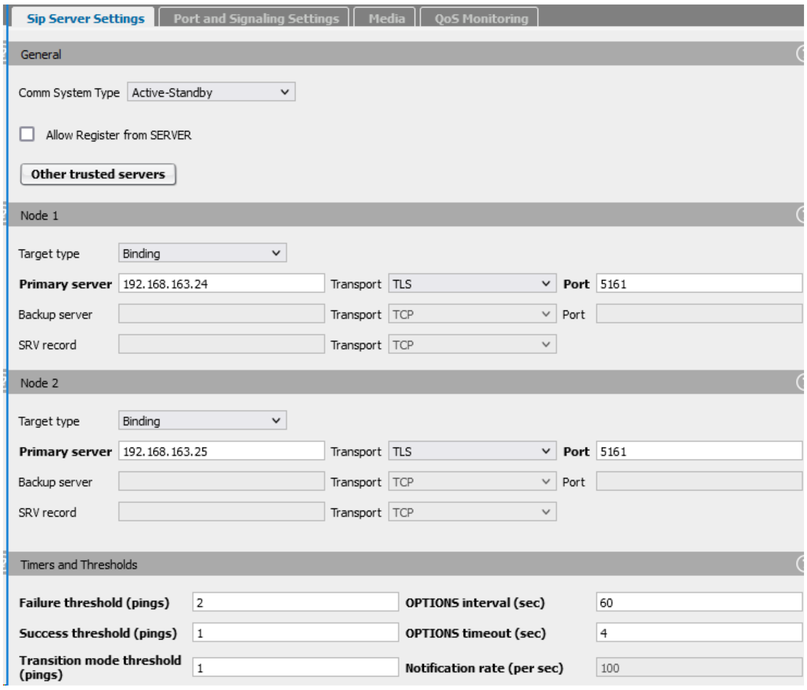
<SBC LAN IP>

OpenScape SBC Configuration



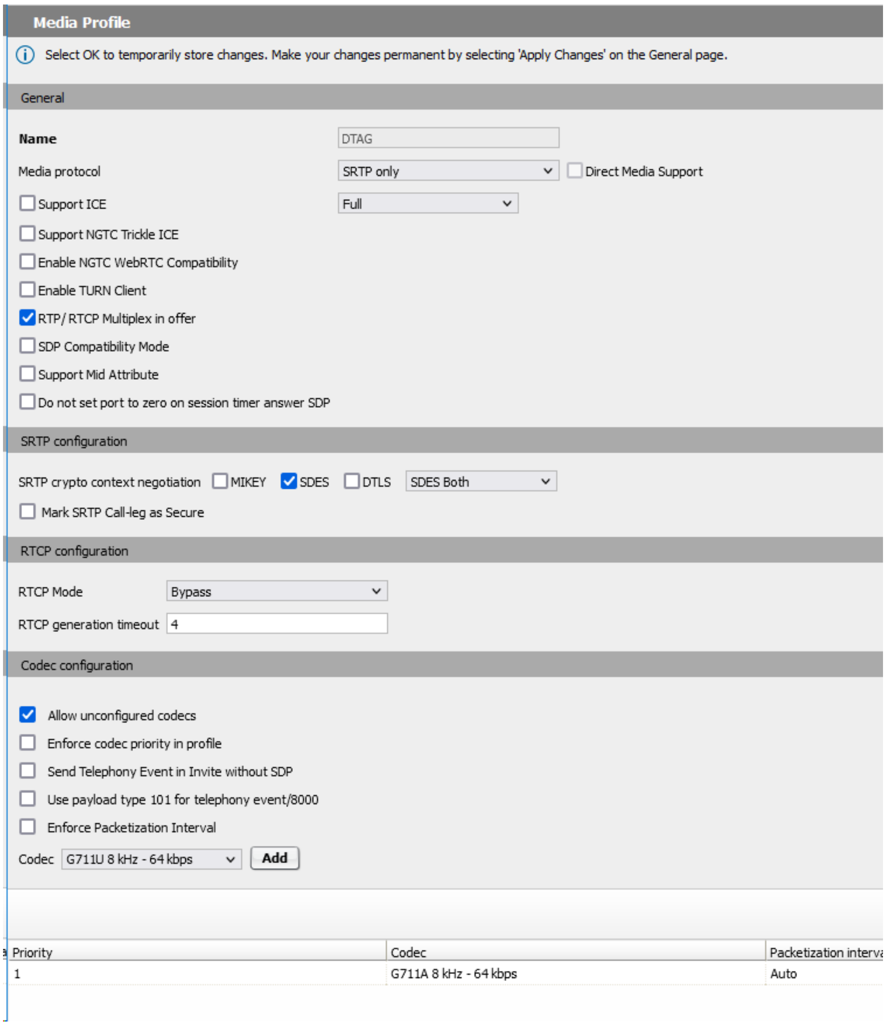
VOIP – Sip Server Settings Tab

- **Primary server**: OSV SIP TCP IP for TCP or OSV Mutual TLS IP for TLS
- **Transport**: TCP or TLS
- **Port**: 5060 for TCP or 5161 for TLS



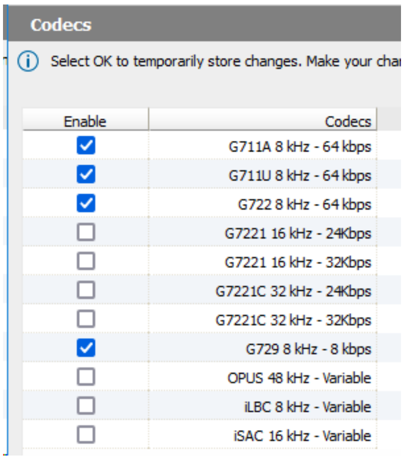
VOIP – Profile Media Tab

- **Media protocol**: RTP only for TCP or SRTP only for TLS
- **SRTP crypto context negotiation**: SDES for SRTP usage
- **Codec List**: At least G.711A



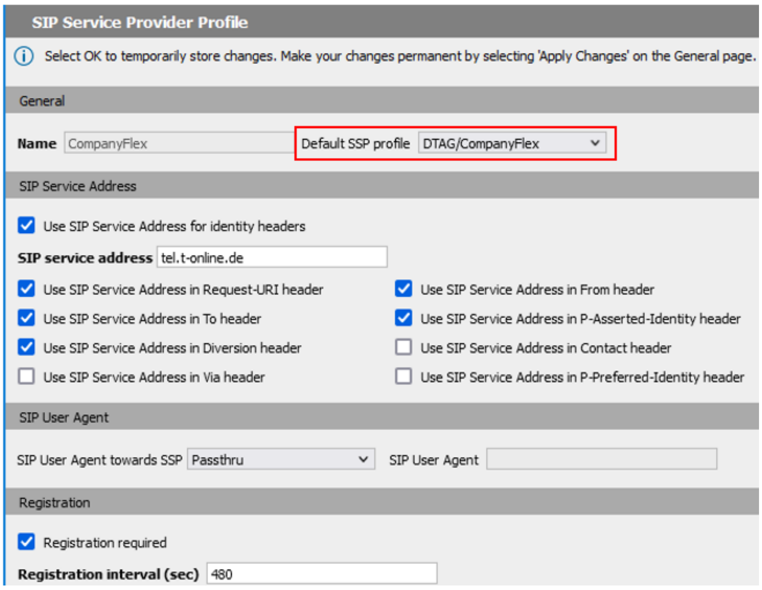
Codec Support for transcoding

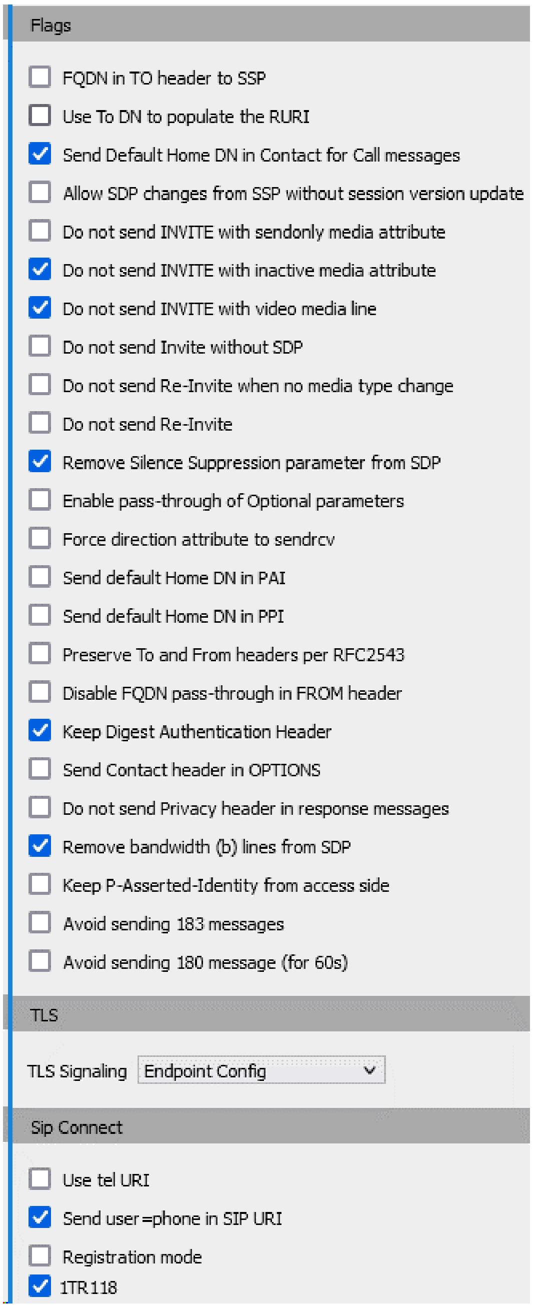
Enable at least G711A



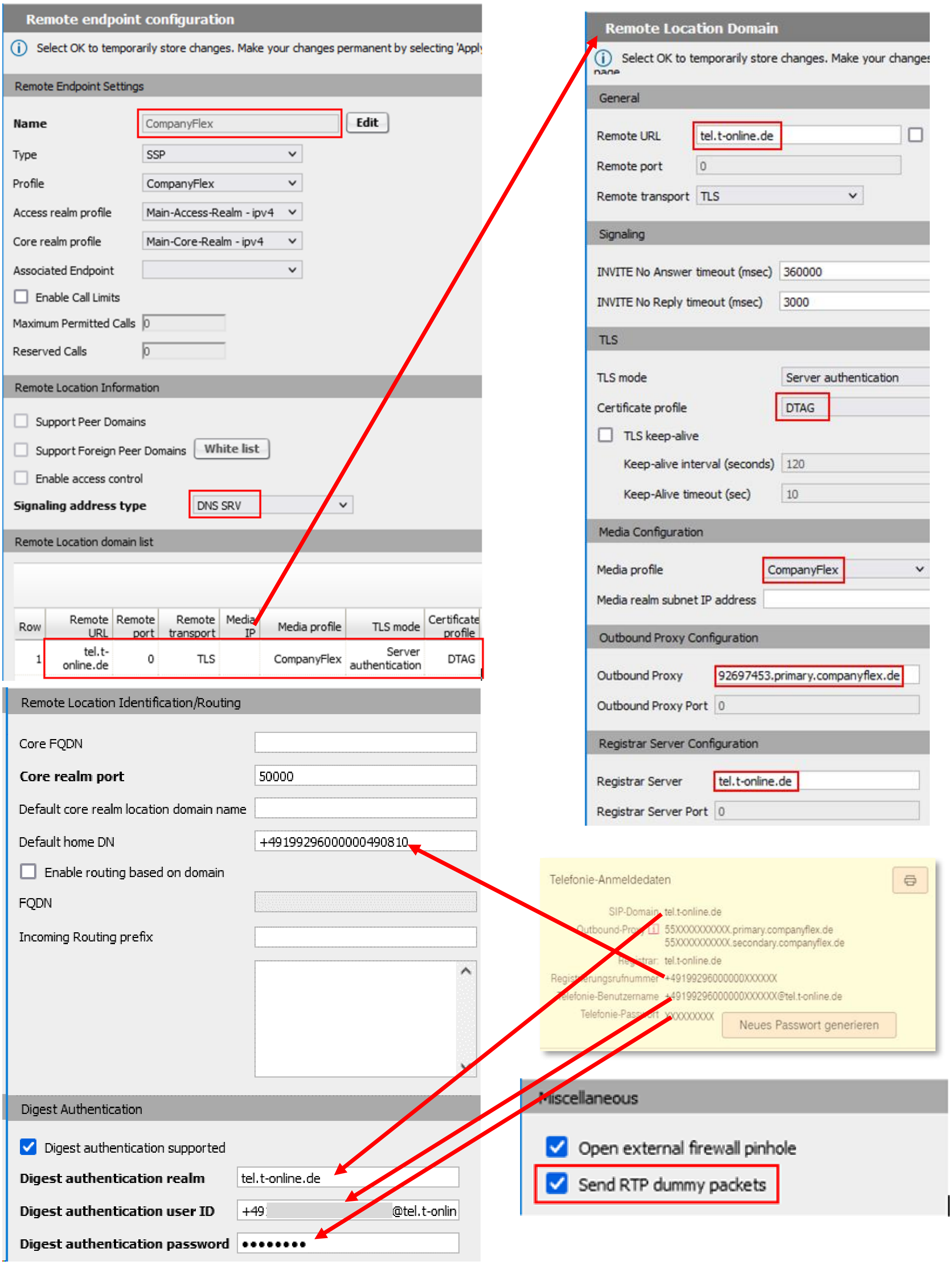
SIP Service Provider Profile

- **Default SSP profile:** DTAG/CompanyFlex

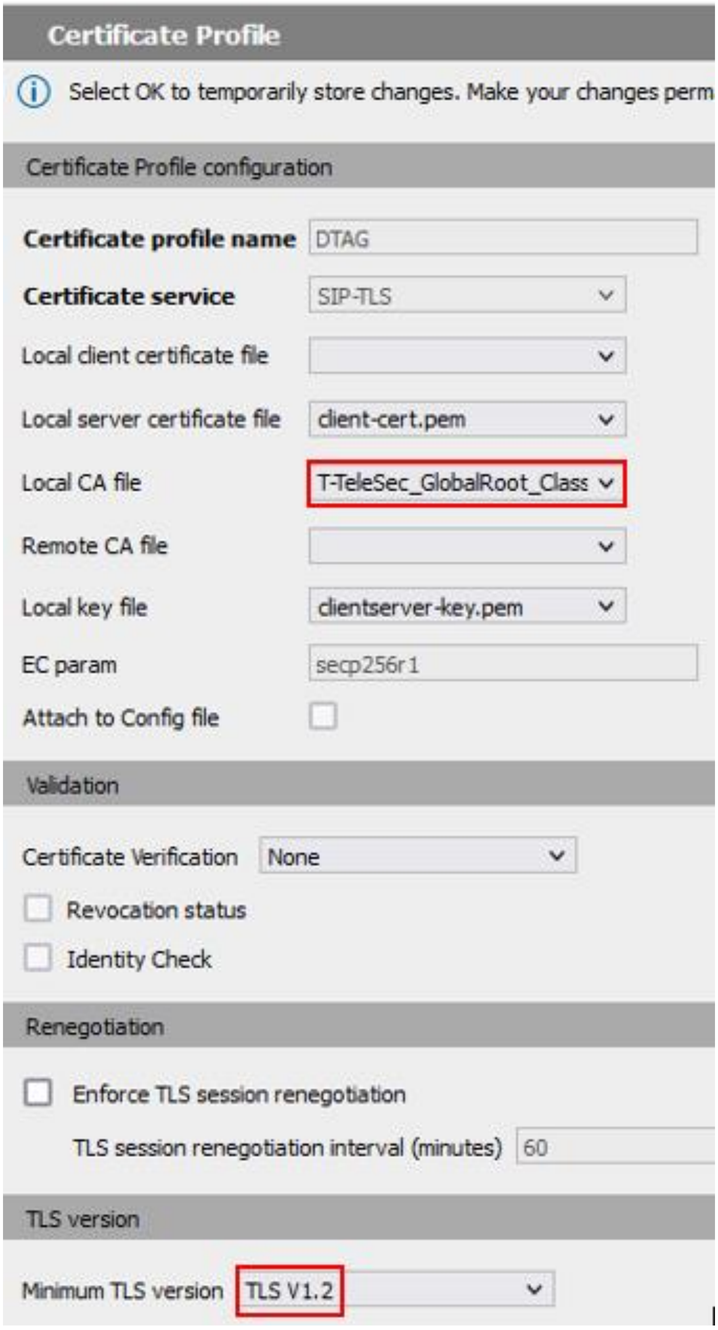




Remote Endpoint Configuration



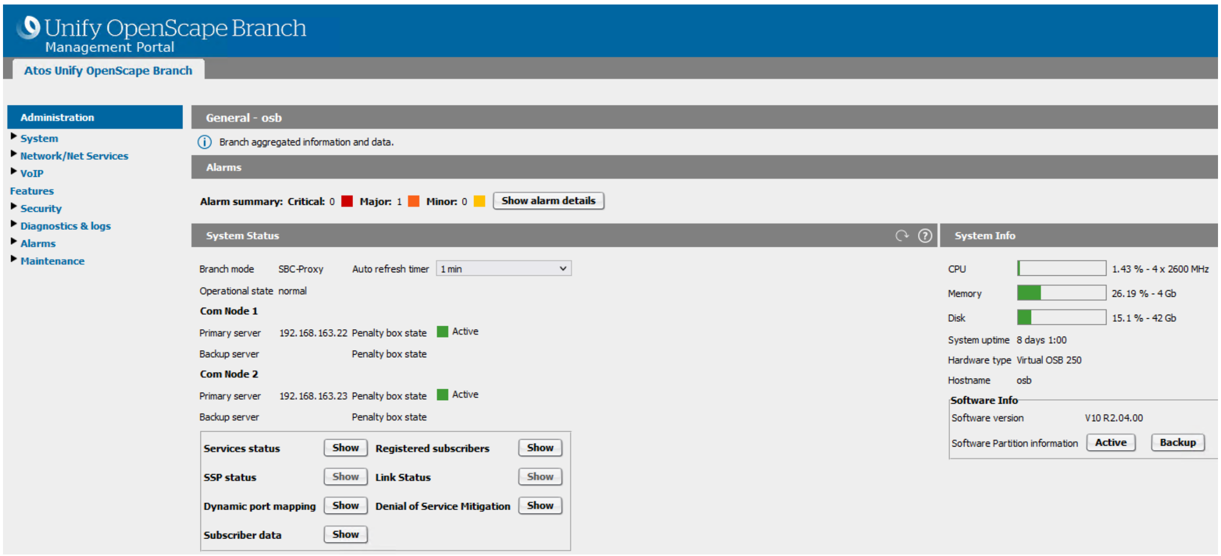
- **Local CA file:** Specify the installed Telekom *Root-CA-Certificate* **T-TeleSec GlobalRoot Class 2** downloaded from URL https://www.telesec.de/assets/downloads/PKI-Repository/T-TeleSec_GlobalRoot_Class_2.cer
- **Minimum TLS version**: Only TLS version 1.2 is supported by Deutsche Telekom CompanyFlex



This Certificate Profile is specified in the Remote Location Domain.

OpenScape Branch Configuration

OpenScape Branch is configured to run in SBC-Proxy mode.



It must be verified that two configuration parameters on OpenScape Branch are set correctly. This can't be verified/done via GUI interface, but via export of the configuration file. To do so select in the GUI Maintenance > Import/Export and click on the Export button in the Export section. Save and open the exported configuration file in a text editor. Search for

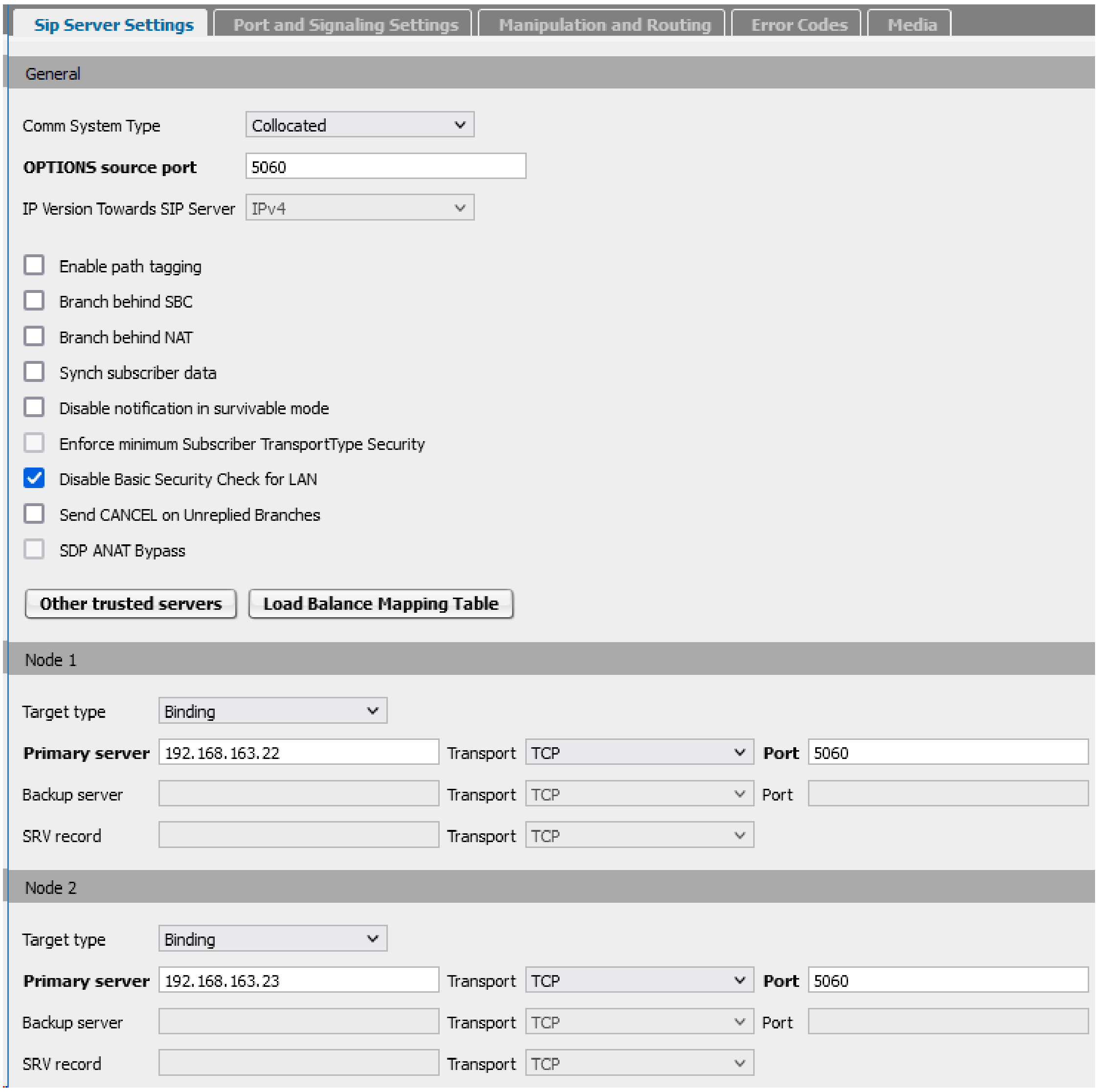
<removeRRfromWAN>0</removeRRfromWAN>

<removeRRfromLAN>0</removeRRfromLAN>

and ensure that both parameters are set to 0. In case of a parameter change save the configuration file and import it in the GUI via Maintenance > Browse and Import in the Import section, and click on Apply afterwards.

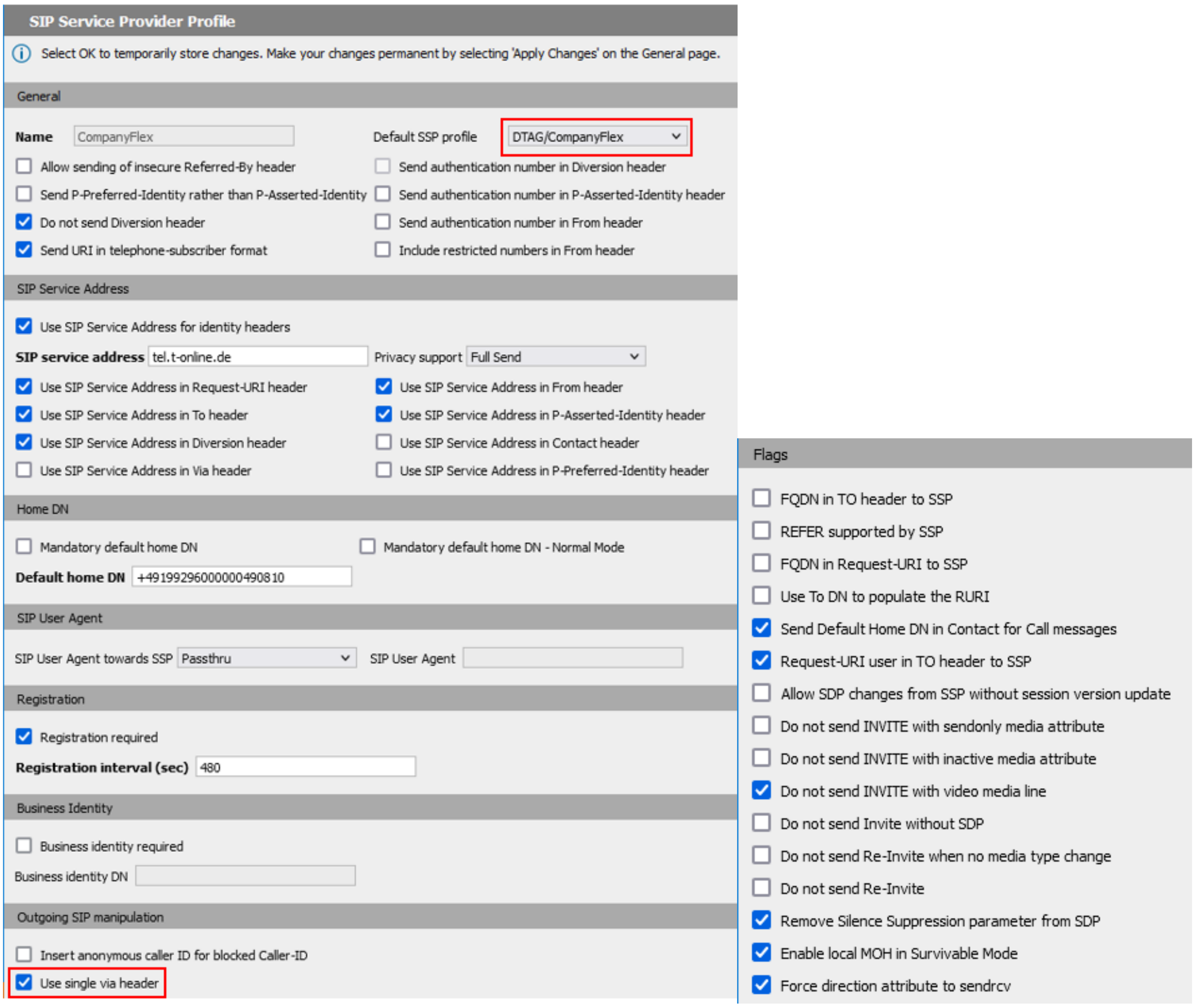
VOIP – Sip Server Settings Tab

- **Primary server:** OSV SIP TCP/TLS IP
- **Transport:** TCP or TLS
- **Port** 5060 for TCP or 5061 for TLS



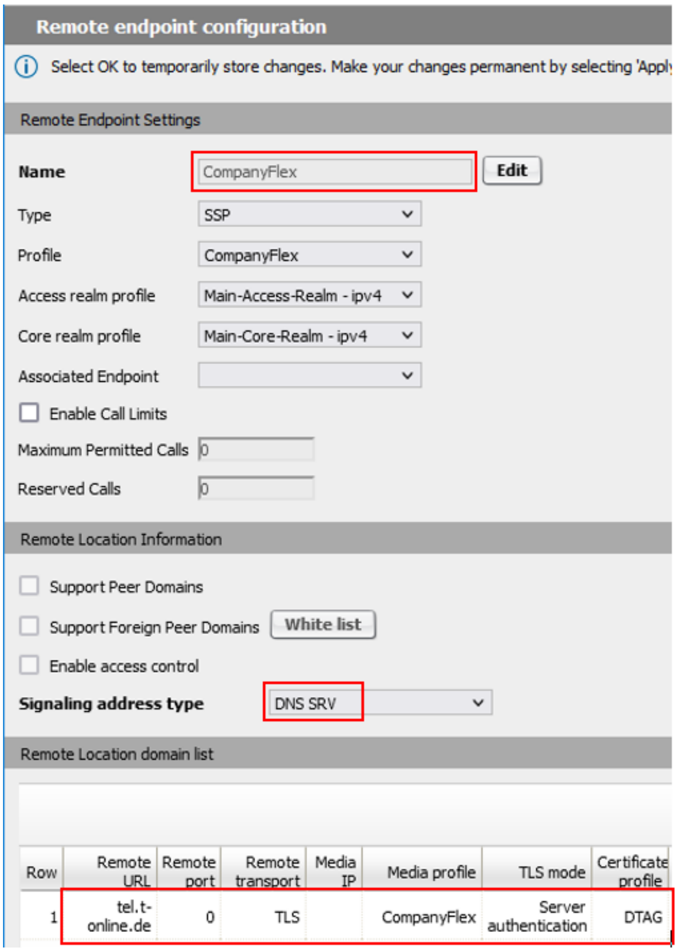
SIP Service Provider Profile

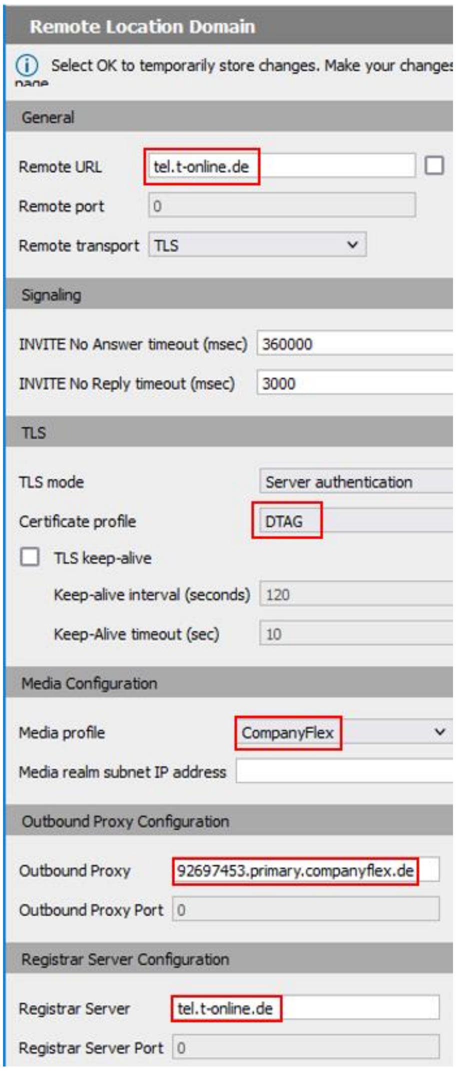
- **Default SSP profile:** DTAG/CompanyFlex

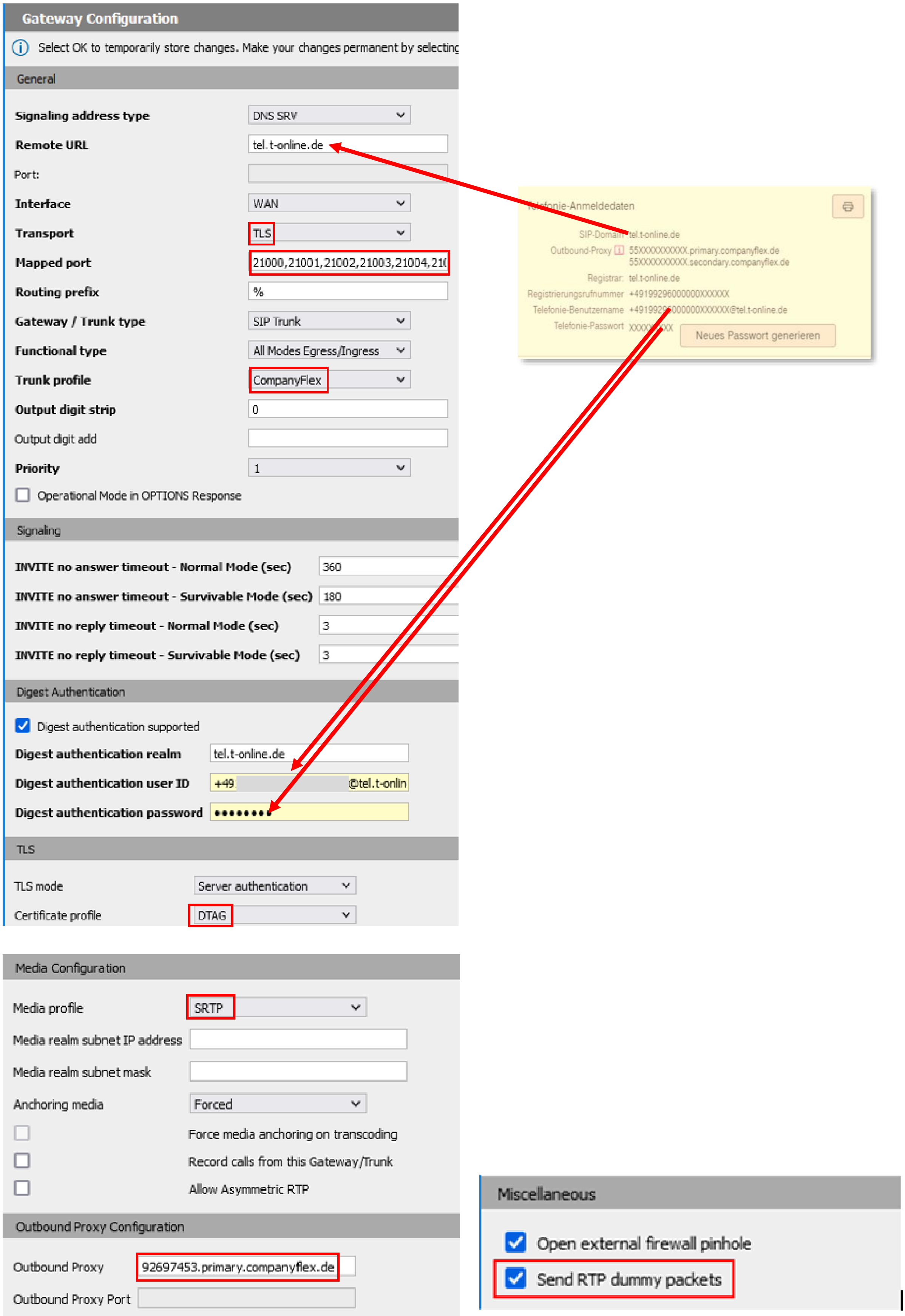


Remote Endpoint Configuration

- **Signaling address type:** DNS SRV

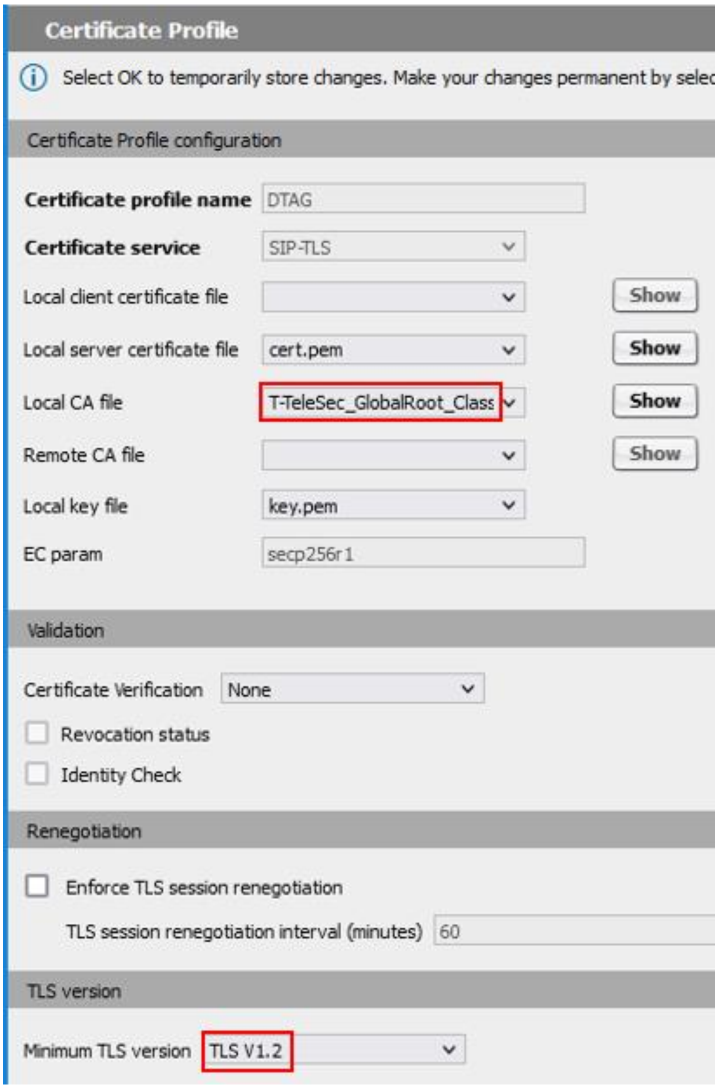






Gateway Configuration
Select OK to temporarily store changes. Make your changes permanent by selecting
General
Signaling address type
DNS SRV
Remote URL
tel.t-online.de
Port:
Interface
WAN
Transport
TLS
Mapped port
21000,21001,21002,21003,21004,21
Routing prefix
%
Gateway / Trunk type
SIP Trunk
Functional type
All Modes Egress/Ingress
Trunk profile
CompanyFlex
Output digit strip
0
Output digit add
Priority
1
Operational Mode in OPTIONS Response
Signaling
INVITE no answer timeout - Normal Mode (sec)
360
INVITE no answer timeout - Survivable Mode (sec)
180
INVITE no reply timeout - Normal Mode (sec)
3
INVITE no reply timeout - Survivable Mode (sec)
3
Digest Authentication
Digest authentication supported
Digest authentication realm
tel.t-online.de
Digest authentication user ID
+49
@tel.t-onlin
Digest authentication password
TLS
TLS mode
Server authentication
Certificate profile
DTAG
SIP-Domain
tel.t-online.de
Outbound-Proxy
55XXXXXXXXXX.primary.companyflex.de
55XXXXXXXXXX.secondary.companyflex.de
Registrar:
tel.t-online.de
Registrierungsrufnummer
+4919929600000XXXXXX
Telefonie-Benutzername
Telefonie-Passwort
Neues Passwort generieren
Media Configuration
Media profile
SRTP
Media realm subnet IP address
Media realm subnet mask
Anchoring media
Forced
Force media anchoring on transcoding
Record calls from this Gateway/Trunk
Allow Asymmetric RTP
Outbound Proxy Configuration
Outbound Proxy
92697453.primary.companyflex.de
Outbound Proxy Port
Miscellaneous
Open external firewall pinhole
Send RTP dummy packets

- **Local CA file:** Specify the installed Telekom *Root-CA-Certificate* **T-TeleSec GlobalRoot Class 2** downloaded from URL https://www.telesec.de/assets/downloads/PKI-Repository/T-TeleSec_GlobalRoot_Class_2.cer
- **Minimum TLS version**: Only TLS version 1.2 is supported by Deutsche Telekom



Appendix

Call examples for unencrypted SIP Trunk

Incoming Call

```
Session Initiation Protocol (INVITE)
  Request-Line: INVITE sip:+49615135996868821@192.168.10.202:5060;transport=tcp SIP/2.0
  Message Header
    Via: SIP/2.0/TCP 217.0.149.48:5060;branch=z9hG4bKmavodi-0-264-e9d-5-1000000-110c0000-5e9b2064cc9aa-a84-ffffffffffffffff-16-90c40000-5e9b206466336-3281320023-4374
    Max-Forwards: 68
    From: <sip:+497111399014800@sip-trunk.telekom.de;user=phone>;tag=2115586986-1665041842852-
    To: <sip:+49615135996868821@tel.t-online.de;user=phone>;cscf
    Call-ID: BW0937228520610221497534635@62.156.74.66
    [Generated Call-ID: BW0937228520610221497534635@62.156.74.66]
    CSeq: 371007827 INVITE
    Min-SE: 900
    Session-Expires: 1800
    Supported: 100rel
    Supported: timer
    Contact: <sip:mavodi-0-266-4e0-5-fffffff1-cd790000-5e9b2064cc644-a84-ffffffffffffffff-@217.0.149.48:5060>
    Accept: application/dtmf-relay
    Accept: application/emergencycall.providerinfo+xml
    Accept: application/EmergencyCallData.ProviderInfo+xml
    Accept: application/media_control+xml
    Accept: application/pidf+xml
    Accept: application/sdp
    P-Early-Media: supported
    Allow: ACK,BYE,CANCEL,INFO,INVITE,OPTIONS,PRACK,REFER,NOTIFY,UPDATE
    Privacy: none
    Accept-Contact: *;description="<sip:+49199296000000005160@tel.t-online.de>";explicit;require
    Feature-Caps: *;+g.3gpp.trf="<unused.invalid>"
    Session-ID: a2a2e5d0dade02768d0f2817cbecd540; remote=00000000000000000000000000000000
    Recv-Info: x-broadworks-client-session-info
    Record-Route: <sip:mavodi-0-266-4e0-5-ffffffff-cd790000-5e9b2064cc644-a84-ffffffffffffffff-mavsipodi-0-26c-16-5-90c40000-5e9b206466336-a84@217.0.149.48:5060;trans
    P-Asserted-Identity: <sip:+497111399010@sip-trunk.telekom.de;user=phone>
    Content-Type: application/sdp
    Content-Length: 304
  Message Body
    Session Description Protocol
      Session Description Protocol Version (v): 0
      Owner/Creator, Session Id (o): ccs-0-615-5 061251380231846 1830855368 IN IP4 217.0.172.142
      Session Name (s): -
      Connection Information (c): IN IP4 217.0.172.142
      Time Description, active time (t): 0 0
      Media Description, name and address (m): audio 56850 RTP/AVP 8 0 101
      Bandwidth Information (b): AS:80
      Bandwidth Information (b): RS:1000
      Bandwidth Information (b): RR:3000
      Media Attribute (a): sendrecv
      Media Attribute (a): ptime:20
      Media Attribute (a): maxptime:20
      Media Attribute (a): rtpmap:8 PCMA/8000
      Media Attribute (a): rtpmap:0 PCMU/8000
      Media Attribute (a): rtpmap:101 telephone-event/8000
      Media Attribute (a): fmtp:101 0-15,36
      [Generated Call-ID: BW094008073061022-1136912692@62.156.74.66]
```

Registration OpenScape Branch -> Provider

```
Session Initiation Protocol (REGISTER)
  Request-Line: REGISTER sip:tel.t-online.de;transport=tcp SIP/2.0
  Message Header
    Route: <sip:92697453.primary.companyflex.de;transport=tcp;lr>
    Via: SIP/2.0/TCP 192.168.10.213;branch=z9hG4bK9ba1.86759abda64490d8ccaf14363f8cdc11.0;i=1
    Via: SIP/2.0/TCP 192.168.10.213:41797;branch=z9hG4bK78d377e6
    Expires: 300
    Call-ID: 328fbcae
    [Generated Call-ID: 328fbcae]
    From: <sip:+49199296000000005160@tel.t-online.de;user=phone>;tag=8597ac8d
    CSeq: 4 REGISTER
    Max-Forwards: 70
    To: <sip:+49199296000000005160@tel.t-online.de;user=phone>
    User-Agent: OpenScape Branch
    Contact: <sip:+49199296000000005160@192.168.10.213:5060;transport=tcp;user=phone>
    Content-Length: 0
     [truncated]Authorization: Digest username="+49199296000000005160@tel.t-online.de", realm="tel.t-online.de"
```

Outgoing Call via OpenScape SBC

```
Session Initiation Protocol (INVITE)
  Request-Line: INVITE sip:+497111399014800@tel.t-online.de;transport=tcp;user=phone SIP/2.0
  Message Header
    Via: SIP/2.0/TCP 192.168.10.202:5060;branch=z9hG4bKd536.b222a321dd9afc180ab716c7fe66566d.0;i=11
    Max-Forwards: 68
    Route: <sip:92697453.primary.companyflex.de;transport=tcp;lr>
    Contact: <sip:+4919929600000000005160@192.168.10.202:5060;transport=tcp;user=phone>
    To: <sip:+497111399014800@tel.t-online.de;transport=tcp>
    From: "Stefan"<sip:+49615135996868821@tel.t-online.de;transport=tcp;user=phone>;tag=snl_09Lx1Au3sg
    Call-ID: SEC11-1e70a8c0-1f70a8c0-1-21J7519cOdNG
    [Generated Call-ID: SEC11-1e70a8c0-1f70a8c0-1-21J7519cOdNG]
    CSeq: 1236 INVITE
    Accept-Language: en;q=0.0
    Allow: REGISTER, INVITE, ACK, BYE, CANCEL, NOTIFY, INFO, REFER
    Content-Type: application/sdp
    Date: Thu, 06 Oct 2022 07:33:48 GMT
     [truncated]Proxy-Authorization: Digest username="+4919929600000000005160@tel.t-online.de", realm="tel.t-online.de",
    Supported: histinfo, resource-priority, replaces
    Privacy: none
    P-Asserted-Identity: <sip:+49615135996868821@tel.t-online.de;user=phone>
    X-Siemens-Call-Type: Org-NWid-external-public
    Content-Length: 342
    X-Siemens-OSS: OpenScape SBC V10 R2.05.00-2
  Message Body
    Session Description Protocol
      Session Description Protocol Version (v): 0
      Owner/Creator, Session Id (o): OpenStage-Line_0-0_mline 1856032541 339306010 IN IP4 192.168.100.31
      Session Name (s): SIP Call
      Connection Information (c): IN IP4 192.168.10.202
      Time Description, active time (t): 0 0
      Media Description, name and address (m): audio 17756 RTP/AVP 8 0 18 101 9
      Media Attribute (a): rtpmap:8 PCMA/8000
      Media Attribute (a): rtpmap:0 PCMU/8000
      Media Attribute (a): rtpmap:18 G729/8000
      Media Attribute (a): fmtp:18 annexb=no
      Media Attribute (a): rtpmap:101 telephone-event/8000
      Media Attribute (a): fmtp:101 0-15
      Media Attribute (a): rtpmap:9 G722/8000
      Media Attribute (a): sendrecv
      Media Attribute (a): rtcp-mux
      [Generated Call-ID: SEC11-1e70a8c0-1f70a8c0-1-JGAfz9BFq5v6]
```

Call examples for TLS encrypted SIP Trunk

Incoming Call

```
Session Initiation Protocol (INVITE)
  Request-Line: INVITE sip:+49228422709102@88.217.251.182:5061;transport=tls SIP/2.0
  Message Header
    Via: SIP/2.0/TLS 217.0.138.239:5061;branch=z9hG4bKmavodi-0-264-c98-3-1000000-8fd70000-5df2cc7c965bb-a9f-fffffffffffffff-8e-54f40000-5df2cc7c4ed2d-1093163325-7252
    Max-Forwards: 68
    From: <sip:+4989700720823@ims.colt.net;user=phone>;tag=42063386-1663231473466-
    To: <sip:+49228422709102@tel.t-online.de;user=phone>;cscf
    Call-ID: BW104433466150922266653898@62.156.74.66
    [Generated Call-ID: BW104433466150922266653898@62.156.74.66]
    CSeq: 539564958 INVITE
    Min-SE: 900
    Session-Expires: 1800
    Supported: 100rel
    Supported: timer
    Contact: <sip:mavodi-0-266-15-3-ffffff1-76c60000-5df2cc7c962ba-a9f-fffffffffffffff-@217.0.138.239:5061>
    Accept: application/dtmf-relay
    Accept: application/emergencycall.providerinfo+xml
    Accept: application/EmergencyCallData.ProviderInfo+xml
    Accept: application/media_control+xml
    Accept: application/pidf+xml
    Accept: application/sdp
    P-Early-Media: supported
    Allow: ACK,BYE,CANCEL,INFO,INVITE,OPTIONS,PRACK,REFER,NOTIFY,UPDATE
    Privacy: none
    Accept-Contact: *;description="<sip:+491992960000004908l0@tel.t-online.de>";explicit;require
    Feature-Caps: *;+g.3gpp.trf="<unused.invalid>"
    Session-ID: 75030690055b6f6ad9bebeecd01f8621;remote=00000000000000000000000000000000
    Recv-Info: x-broadworks-client-session-info
    Record-Route: <sip:mavodi-0-266-15-3-ffffffff-76c60000-5df2cc7c962ba-a9f-fffffffffffffff-mavsipodi-0-26c-8e-3-54f40000-5df2cc7c4ed2d-a9f@217.0.138.239:5061;transport=tls
    History-Info: <sip:+498970070@telekom.de>;index=1
    History-Info: <sip:+49228422709102@tel.t-online.de;cause=404>;index=1.1
    P-Asserted-Identity: <sip:+4989700720823@ims.colt.net:5060;user=phone>
    Content-Type: application/sdp
    Content-Length: 457
  Message Body
    Session Description Protocol
      Session Description Protocol Version (v): 0
      Owner/Creator, Session Id (o): ccs-0-615-3 06123994795318 1710879831 IN IP4 217.0.8.71
      Session Name (s): -
      Connection Information (c): IN IP4 217.0.8.71
      Time Description, active time (t): 0 0
      Media Description, name and address (m): audio 21348 RTP/SAVP 8 101
      Bandwidth Information (b): AS:80
      Bandwidth Information (b): RS:1000
      Bandwidth Information (b): RR:3000
      Media Attribute (a): sendrecv
      Media Attribute (a): ptime:20
      Media Attribute (a): 3ge2ae:applied
      Media Attribute (a): crypto:1 AES_CM_128_HMAC_SHA1_80 inline:uwZr8+0XtuiKtu+cXv6ZjcBE9M9Cu2aYRms4zmB2
      Media Attribute (a): crypto:2 AES_CM_128_HMAC_SHA1_32 inline:SBt8sw5py8VRVXtA8dk+imb/z1rOEBU1qVug4SkA
      Media Attribute (a): maxptime:20
      Media Attribute (a): rtpmap:8 PCMA/8000
      Media Attribute (a): rtpmap:101 telephone-event/8000
      Media Attribute (a): fmtp:101 0-15
```

Outgoing Call via OpenScape Branch

```
v Session Initiation Protocol (INVITE)
  > Request-Line: INVITE sip:+497111399014800@tel.t-online.de;transport=tcp;user=phone SIP/2.0
  v Message Header
    > Record-Route: <sip:192.168.10.213:5060;transport=tcp;ftag=snl_suJInkV0AR;lr;otg=NM;twan>
    > Via: SIP/2.0/TCP 192.168.10.213;branch=z9hG4bKf979.1e5dcd9046033271c741d9598dcc583d.0;i=1422
    > Via: SIP/2.0/TCP 192.168.10.213:5060;branch=z9hG4bKSEC-1e70a8c0-1f70a8c0-1-Bj1cR6GjZr
      Max-Forwards: 69
    > Route: <sip:92697453.primary.companyflex.de;transport=tcp;lr>
    > Contact: <sip:+4919929600000000005160@192.168.10.213:5060;user=phone>
    > To: <sip:+497111399014800@tel.t-online.de;user=phone>
    > From: "Stefan"<sip:+49615135996868821@tel.t-online.de;user=phone>;tag=snl_suJInkV0AR
      Call-ID: SEC11-1e70a8c0-1f70a8c0-1-Id5h4DkTv15P
      [Generated Call-ID: SEC11-1e70a8c0-1f70a8c0-1-Id5h4DkTv15P]
    > CSeq: 1236 INVITE
      Session-Expires: 900;refresher=uac
      Min-SE: 900
      Accept-Language: en;q=0.0
      Allow: REGISTER, INVITE, ACK, BYE, CANCEL, NOTIFY, INFO, REFER, UPDATE
      Content-Type: application/sdp
      Date: Tue, 08 Nov 2022 06:45:23 GMT
    >  [truncated]Proxy-Authorization: Digest username="+4919929600000000005160@tel.t-online.de", realm="tel.t-online.de"
      Supported: timer, histinfo, resource-priority, replaces
      Privacy: none
    > P-Asserted-Identity: <sip:+49615135996868821@tel.t-online.de;user=phone>
    > X-Siemens-Call-Type: Org-NWid-external-public
      Content-Length: 269
  v Message Body
    v Session Description Protocol
        Session Description Protocol Version (v): 0
      > Owner/Creator, Session Id (o): OpenStage-Line_0-0_mline 30198770 143224517 IN IP4 192.168.100.31
        Session Name (s): SIP Call
      > Connection Information (c): IN IP4 192.168.10.213
      > Time Description, active time (t): 0 0
      > Media Description, name and address (m): audio 58020 RTP/AVP 8 0 101
      > Media Attribute (a): rtpmap:8 PCMA/8000
      > Media Attribute (a): rtpmap:0 PCMU/8000
      > Media Attribute (a): rtpmap:101 telephone-event/8000
      > Media Attribute (a): fmtp:101 0-15
        Media Attribute (a): sendrecv
      > Media Attribute (a): ptime:20
        [Generated Call-ID: SEC11-1e70a8c0-1f70a8c0-1-vzSCICpa3vVi]
```

Outgoing Call via OpenScape SBC

```
Session Initiation Protocol (INVITE)
  Request-Line: INVITE sip:+4989700720823@tel.t-online.de;user=phone SIP/2.0
  Message Header
    Via: SIP/2.0/TLS 88.217.251.182:5061;branch=z9hG4bK5bee.f731665d668f73dd4dd9d64f9cd93e5e.0;i=1274
    Max-Forwards: 68
    Route: <sip:92697453.primary.companyflex.de;transport=tls;lr>
    Proxy-Require: mediasec
    Require: mediasec
    Contact: <sip:+4919929600000490810@88.217.251.182:5061;user=phone>
    To: <sip:+4989700720823@tel.t-online.de;user=phone>
    From: "+ 49(228)422709102"<sip:+49228422709102@tel.t-online.de;transport=tls;user=phone>;tag=snl_Of099uwnNt
    Call-ID: SEC11-aa3a8c0-ba3a8c0-1-TJKsL0p4K5OF
    [Generated Call-ID: SEC11-aa3a8c0-ba3a8c0-1-TJKsL0p4K5OF]
    CSeq: 1236 INVITE
    Accept-Language: en;q=0.0
    Allow: REGISTER, INVITE, ACK, BYE, CANCEL, NOTIFY, INFO, REFER
    Content-Type: application/sdp
    Date: Thu, 15 Sep 2022 07:44:10 GMT
     [truncated]Proxy-Authorization: Digest username="+4919929600000490810@tel.t-online.de", realm="tel.t-online.de", nonce="b286c26
    Supported: histinfo, resource-priority, replaces
    Security-Verify: msrp-tls;mediasec, sdes-srtp;mediasec, dtls-srtp;mediasec
    Privacy: none
    P-Asserted-Identity: <sip:+49228422709102@tel.t-online.de;user=phone>
    X-Siemens-Call-Type: ST-insecure
    Content-Length: 559
    X-Siemens-OSS: OpenScape SBC V10 R2.05.00-2
  Message Body
    Session Description Protocol
      Session Description Protocol Version (v): 0
      Owner/Creator, Session Id (o): OpenStage-Line_0 1049361843 66159503 IN IP4 192.168.140.167
      Session Name (s): SIP Call
      Connection Information (c): IN IP4 88.217.251.182
      Time Description, active time (t): 0 0
      Media Description, name and address (m): audio 44012 RTP/SAVP 9 8 0 18 101
      Media Attribute (a): rtpmap:9 G722/8000
      Media Attribute (a): rtpmap:8 PCMA/8000
      Media Attribute (a): rtpmap:0 PCMU/8000
      Media Attribute (a): rtpmap:18 G729/8000
      Media Attribute (a): fmtp:18 annexb=no
      Media Attribute (a): rtpmap:101 telephone-event/8000
      Media Attribute (a): fmtp:101 0-15
      Media Attribute (a): sendrecv
      Media Attribute (a): rtcp-mux
      Media Attribute (a): crypto:1 AES_256_CM_HMAC_SHA1_80 inline:BCNdIIU9mRH5taBYeohKIZaLltxxzk7lmAJ/3gU8b2nGe0mjSuocBnDhY1Cnow==
      Media Attribute (a): crypto:2 AES_CM_128_HMAC_SHA1_80 inline:inmw5Ou5R9sdqrcppy+xGg1H62BnxS3g8QNZfFXr
      Media Attribute (a): ptime:20
      Media Attribute (a): 3ge2ae:requested
      [Generated Call-ID: SEC11-aa3a8c0-ba3a8c0-1-TJKsL0p4K5OF]
```

Outgoing Call via OpenScape Branch

```
Session Initiation Protocol (INVITE)
  Request-Line: INVITE sip:+4989700720823@tel.t-online.de;user=phone SIP/2.0
  Message Header
    Record-Route: <sip:88.217.251.182:5061;transport=tcp;ftag=snl_ulOqAmkdAR;lr;otg=NM;twan;tls=yes>
    Via: SIP/2.0/TLS 88.217.251.182:5061;branch=z9hG4bKf977.6df7fb9de7f07afe86f421a3bfd327f7.0;i=287
    Via: SIP/2.0/TCP 88.217.251.182:5061;branch=z9hG4bKSEC-aa3a8c0-ba3a8c0-1-41efTC3vKz
    Max-Forwards: 69
    Route: <sip:92697453.primary.companyflex.de;transport=tls;lr>
    Contact: <sip:+4919929600000490810@88.217.251.182:5061;user=phone>
    To: <sip:+4989700720823@tel.t-online.de;user=phone>
    From: "CompanyFlex 9103"<sip:+49228422709103@tel.t-online.de;user=phone>;tag=snl_ulOqAmkdAR
    Call-ID: SEC11-aa3a8c0-ba3a8c0-1-RuO1tbcSf02y
    [Generated Call-ID: SEC11-aa3a8c0-ba3a8c0-1-RuO1tbcSf02y]
    CSeq: 1236 INVITE
    Accept-Language: en;q=0.0
    Allow: REGISTER, INVITE, ACK, BYE, CANCEL, NOTIFY, INFO, REFER
    Content-Type: application/sdp
    Date: Thu, 22 Sep 2022 13:00:00 GMT
     [truncated]Proxy-Authorization: Digest username="+4919929600000490810@tel.t-online.de", realm="tel.t-online.de", nonce="2aa85d1
    Supported: histinfo, resource-priority, replaces
    Privacy: none
    P-Asserted-Identity: <sip:+49228422709103@tel.t-online.de;user=phone>
    X-Siemens-Call-Type: Org-NWid-external-public, ST-insecure
    Content-Length: 454
  Message Body
    Session Description Protocol
      Session Description Protocol Version (v): 0
      Owner/Creator, Session Id (o): OpenStage-Line_0 1820595761 1113031392 IN IP4 192.168.140.169
      Session Name (s): SIP Call
      Connection Information (c): IN IP4 88.217.251.182
      Time Description, active time (t): 0 0
      Media Description, name and address (m): audio 54420 RTP/SAVP 8 101
      Media Attribute (a): rtpmap:8 PCMA/8000
      Media Attribute (a): rtpmap:101 telephone-event/8000
      Media Attribute (a): fmtp:101 0-15
      Media Attribute (a): sendrecv
      Media Attribute (a): crypto:1 AES_256_CM_HMAC_SHA1_80 inline:KdK1SYG1LJYofg98GqmG8vHDClXDVYefovvOdnYkzBAmbzuHIrQlGmUwfzHb5Q==
      Media Attribute (a): crypto:2 AES_CM_128_HMAC_SHA1_80 inline:jvDku3d3kGL1zjEuVRKuEeXRn7TXjnNagBD5UEv9
      Media Attribute (a): ptime:20
      Media Attribute (a): 3ge2ae:requested
      [Generated Call-ID: SEC11-aa3a8c0-ba3a8c0-1-RuO1tbcSf02y]
```

Emergency Call

```
Session Initiation Protocol (INVITE)
  Request-Line: INVITE sip:112@tel.t-online.de SIP/2.0
  Message Header
    Via: SIP/2.0/TLS 88.217.251.182:65061;branch=z9hG4bK2a77.54f98cc017a196dc531e0225a7d8db46.0;i=93
    Max-Forwards: 68
    Route: <sip:92697453.primary.companyflex.de;transport=tls;lr>
    Proxy-Require: mediasec
    Require: mediasec
    Contact: <sip:+4919929600000490810@88.217.251.182:65061;user=phone>
    To: <sip:112@tel.t-online.de>
    From: "CompanyFlex 9103"<sip:+49228422709103@tel.t-online.de;transport=tls;user=phone>;tag=snl_9235Yys05p
    Call-ID: SEC11-aa3a8c0-ba3a8c0-1-qW4T042giYJU
    [Generated Call-ID: SEC11-aa3a8c0-ba3a8c0-1-qW4T042giYJU]
    CSeq: 1236 INVITE
    Session-Expires: 1800;refresher=uac
    Min-SE: 1800
    Accept-Language: en;q=0.0
    Allow: REGISTER, INVITE, ACK, BYE, CANCEL, NOTIFY, INFO, REFER, UPDATE
    Content-Type: application/sdp
    Date: Thu, 13 Oct 2022 12:27:24 GMT
     [truncated]Proxy-Authorization: Digest username="+4919929600000490810@tel.t-online.de", realm="tel.t-online.de", nonce="341d53b
    Supported: timer, histinfo, resource-priority, replaces
    Security-Verify: msrp-tls;mediasec, sdes-srtp;mediasec, dtls-srtp;mediasec
    Privacy: none
    P-Asserted-Identity: <sip:+49228422709103@tel.t-online.de;user=phone>
    X-Siemens-Call-Type: Org-NWid-external-public, ST-insecure
    Content-Length: 466
    X-Siemens-OSS: OpenScape SBC V10 R2.05.00-2
  Message Body
    Session Description Protocol
      Session Description Protocol Version (v): 0
      Owner/Creator, Session Id (o): OpenStage-Line_0 1576473781 1760896674 IN IP4 192.168.140.169
      Session Name (s): SIP Call
      Connection Information (c): IN IP4 88.217.251.182
      Time Description, active time (t): 0 0
      Media Description, name and address (m): audio 42012 RTP/SAVP 8 101
      Media Attribute (a): rtpmap:8 PCMA/8000
      Media Attribute (a): rtpmap:101 telephone-event/8000
      Media Attribute (a): fmtp:101 0-15
      Media Attribute (a): sendrecv
      Media Attribute (a): rtcp-mux
      Media Attribute (a): crypto:1 AES_256_CM_HMAC_SHA1_80 inline:hkm/ZIGfSgaHqEWMdGt+PsBXfMep1EPfSk+yi4SieTNvzbJSAYKDF6DpghpjhA==
      Media Attribute (a): crypto:2 AES_CM_128_HMAC_SHA1_80 inline:h3tgWCKTnn+2qp7f2TuR0nslRsnWW7ybxGAymYii
      Media Attribute (a): ptime:20
      Media Attribute (a): 3ge2ae:requested
      [Generated Call-ID: SEC11-aa3a8c0-ba3a8c0-1-qW4T042giYJU]
```

Registration OpenScape SBC -> Provider

```
Session Initiation Protocol (REGISTER)
  Request-Line: REGISTER sip:tel.t-online.de SIP/2.0
  Message Header
    Security-Client: sdes-srtp;mediasec
    Proxy-Require: mediasec
    Require: mediasec
    Security-Verify: msrp-tls;mediasec
    Security-Verify: sdes-srtp;mediasec
    Security-Verify: dtls-srtp;mediasec
    Via: SIP/2.0/TLS 88.217.251.182:5061;branch=z9hG4bK9ae.010066bbb0a0042cdace7a354bf8e1cb.0;i=62
    Expires: 480
    Route: <sip:92697453.primary.companyflex.de;transport=tls;lr>
    Call-ID: 5891cba3
    [Generated Call-ID: 5891cba3]
    From: <sip:+4919929600000490810@tel.t-online.de>;tag=efe7605
    CSeq: 11 REGISTER
    Max-Forwards: 70
    To: <sip:+4919929600000490810@tel.t-online.de>
    User-Agent: OpenScape Branch
    Contact: <sip:+4919929600000490810@88.217.251.182:5061;transport=tls>;expires=480
    Content-Length: 0
    [truncated]Authorization: Digest username="+4919929600000490810@tel.t-online.de", realm="tel.
      Authentication Scheme: Digest
      Username: "+4919929600000490810@tel.t-online.de"
      Realm: "tel.t-online.de"
      Nonce Value: "7d39b6ffee6fdcd3f6091bf0627696f1"
      Authentication URI: "sip:tel.t-online.de;transport=tls"
      Digest Authentication Response: "b03547982ac8faa0a6831b41ef175a6a"
      Algorithm: MD5
      CNonce Value: "a5aabd1a5515aaf09145957c8038dfc0"
      QOP: auth
      Nonce Count: 00000001
```

Provider -> SBC (OK)

```
Session Initiation Protocol (200)
  Status-Line: SIP/2.0 200 OK
  Message Header
    Via: SIP/2.0/TLS 88.217.251.182:5061;received=88.217.251.182;branch=z9hG4bK9ae.010066bbb0a0042cdace7a354bf8e1cb.0;i=62
    From: <sip:+4919929600000490810@tel.t-online.de>;tag=efe7605
      SIP from address: sip:+4919929600000490810@tel.t-online.de
      SIP from tag: efe7605
    To: <sip:+4919929600000490810@tel.t-online.de>;tag=mavodi-0-4b-5-3-ffffffc7-9be-ffffffffffffffff-489d0000-62424da7-_02D9D4FB0C9A
      SIP to address: sip:+4919929600000490810@tel.t-online.de
      SIP to tag: mavodi-0-4b-5-3-ffffffc7-9be-ffffffffffffffff-489d0000-62424da7-_02D9D4FB0C9A-1897-c2c72700-221578-632459a9-ca70b
    Call-ID: 5891cba3
    [Generated Call-ID: 5891cba3]
    CSeq: 11 REGISTER
    Contact: <sip:+4919929600000490810@88.217.251.182:5061;transport=tls>;expires=480;+sip.instance="<urn:uuid:aa11a3c9-470a-c6e5-97
      Contact URI: sip:+4919929600000490810@88.217.251.182:5061;transport=tls
      Contact parameter: expires=480
      Contact parameter: +sip.instance="<urn:uuid:aa11a3c9-470a-c6e5-97a3-c4a336a8f179>"
      Contact parameter: description="<sip:+4919929600000490810@tel.t-online.de>"\r\n
    Authentication-Info: nc=00000007,cnonce="a5aabd1a5515aaf09145957c8038dfc0",rspauth="b03547982ac8faa0a6831b41ef175a6a",qop=auth
      Nonce Count: 00000007
      CNonce Value: "a5aabd1a5515aaf09145957c8038dfc0"
      Response auth: "b03547982ac8faa0a6831b41ef175a6a"
      QOP: auth
    Reason: SIP;cause=200;text="CC_NO_ERROR"
    Session-ID: 00000000000000000000000000000000; remote=cd30173edc0f0b0d2f53e729655d92c2
    Security-Server: sdes-srtp;mediasec
    Content-Length: 0
```

Annotations

- SIP OPTIONS sent by OpenScape Voice to the SSP are sent by the OpenScape SBC to the SSP Registrar Server wrongly and therefore not answered. The OpenScape SBC endpoint in OpenScape Voice changes therefore it's state to *Inaccessible*.
- For the test were used the Deutsche Telekom DNS servers 194.25.0.68, 194.25.0.60 and 194.25.0.52.
- Special numbers like emergency numbers shall be sent as dialled and not in E.164 format