OpenScape Voice V9

How to Configure SIP Trunk for TWT

Tested Scenario: Provider <–> OpenScape SBC <–> OpenScape Voice
Provider Topology: Static Trunk

Table of Contents

Trunk Configuration Data provided by TWT 4
OpenScape Voice Configuration 5
Endpoint Profile 5
Endpoint 6
General Tab 6
SIP Tab 6
Attributes Tab 6
Alias Tab 6
Digest Authentication 6
Gateway Numbering Plan 7
PrefixAccessCodes 7
DNM Prefix 7
DNM Modification 7
DNM Normalization 7
Subscriber Numbering Plan 8
PrefixAccessCodes 8
DestinationCodes 8
Destination 8
OpenScape SBC Configuration 9
Media Profile 9
Enable Codec Support for transcoding 9
Remote Endpoint Configuration 11
Known limitations, restrictions and things to know: 12
Appendix 13
Supported Numbering Formats 13
Call examples: 14

Table of History

Date	Version	Changes
02.04.2020	0.1	First version
09.04.2020	0.9	Ready for review
13.05.2020	1.0	Released

Trunk Configuration Data provided by TWT

Trunk connection: Static Trunk. The trunk is linked to the SBC public Access IP.

Transport Protocol: UDP

Signaling IP: 77.239.128.6; **Signaling Port**: 5060

Media IP: 77.239.128.6; **Media Ports**: 25000-60000

Provider settings: The trunk has no Openscape specific settings.

Documentation: NGN TWT Documento di supporto tecnico

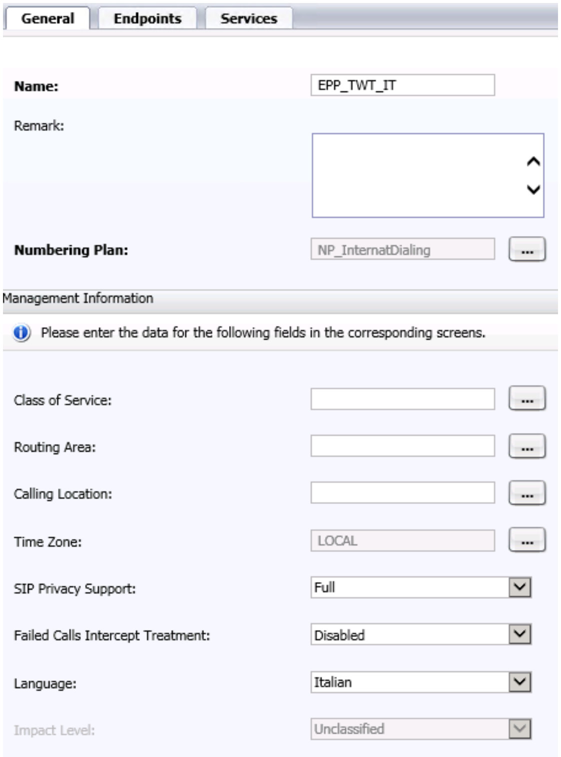
The configuration data needed to setup the SIP trunk will be provide via email.
The email can look like this:

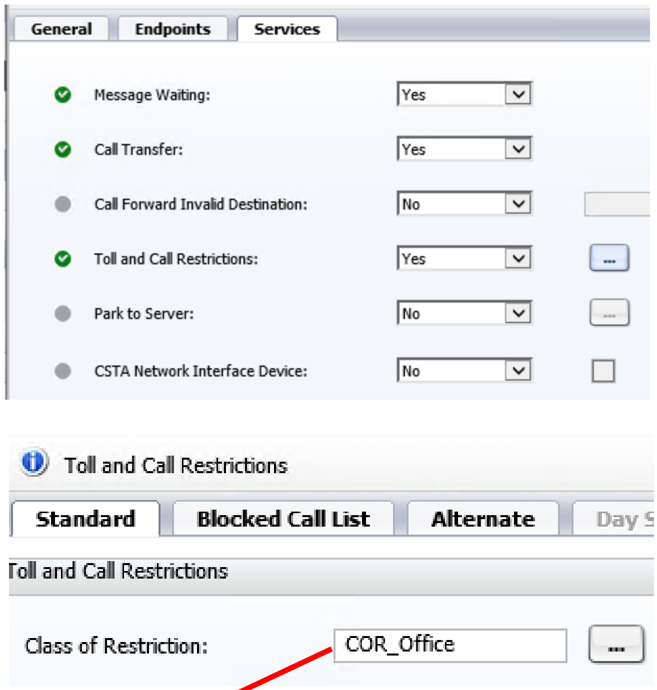
	TWT		OPERATOR	
City	**Milano**			
Platform				
SBC or Gateway type	RIBBON C20			
Software Revision	R19			
Signalling IP				
IP address (Signalling) – 1 (IP1)	77.239.128.6			
IP address (Media) – 1	77.239.128.6			
Location IP	V.e jenner, 33 - Milano - Italia			
Owner IP	TWT SPA			
Transport				
Protocol	SIP		SIP	
Port	5060 (Provider Port)		5060 (Customer SBC Port)	
OPTION	no			
Codecs and Packetization				
Incoming (Operator to TWT)				
G,729 a	*First Priority*	*20 ms*		
G,711 A	*Second Priority*	*20 ms*		
G,711 µ	*Third Priority*	*20 ms*		
Outgoing (TWT to Operator)				
G,729 a	*First Priority*	*20 ms*		
G,711 A	*Second Priority*	*20 ms*		
G,711 µ	*Third Priority*	*20 ms*		
Other Services				
DTMF	*RFC 2833*			
Fax Services	*T.38 Fax Relay*			
Numbering Format				
E.164	*Preferred*			
CALLING PARTY NUMBER	+cc+number			
CALLED PARTY NUMBER	+cc+number			
Prefixes				
Technical Prefixes				
Capacity (Amount of sessions)				
TWT to *Operator*				
TRAFFIC PROFILE				
IP active				
Operator to TWT				
TRAFFIC PROFILE				
IP active				

OpenScape Voice Configuration

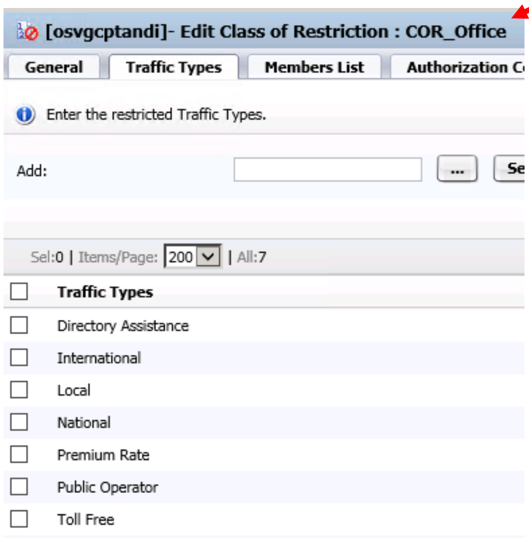
Endpoint Profile

- **Numbering Plan**: create a specific gateway numbering plan. This helps you to be flexible for incoming routing and DNM rules based on the numbering plan.
- **SIP Privacy Support**: “Full”
- **Language**: select the country language
- **Toll and Call Restrictions**: use a COR which doesn’t allows external to external transit calls.





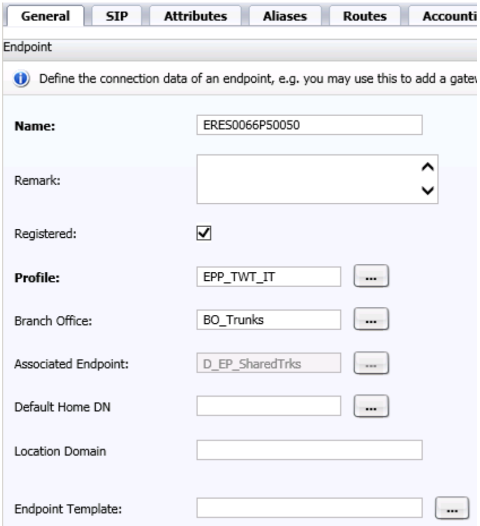
COR_Office must have all external Traffic Types assigned



Endpoint

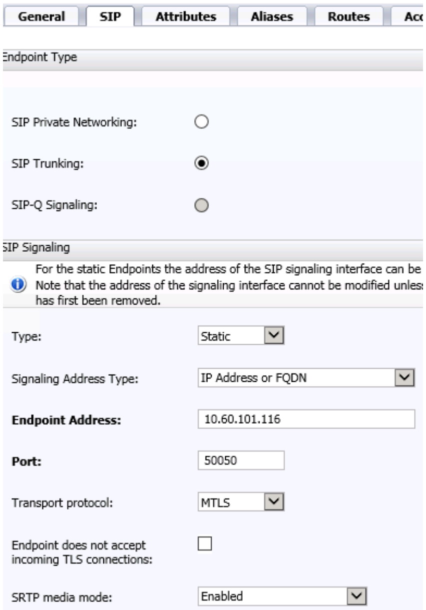
General Tab

- **Registered**: enable
- **Profile**: use the endpoint Profile configured before
- **Default Home DN**: use one number of the DID range



SIP Tab

- **Endpoint Type**: “SIP Trunking”
- **Type**: “Static”
- **Endpoint Address**: enter SBC IP Address
- **Port**: enter the SBC RemoteEndpoint Core Port
- **Transport protocol**: select “TCP” or “MTLS”



Attributes Tab

- **Public/Offnet Traffic**: enable
- **Send Redirect Number instead of calling number for redirected calls**: enable (Provider doesn’t support CLI numbers which are not owned by the customer)
- **Do not send Diversion header**: enable
- **Send International Numbers in Global Number Format (GNF)**: enable
- **Enable Session Timer**: optional

Alias Tab

- Enter <SBC-IP>:<CorePort>

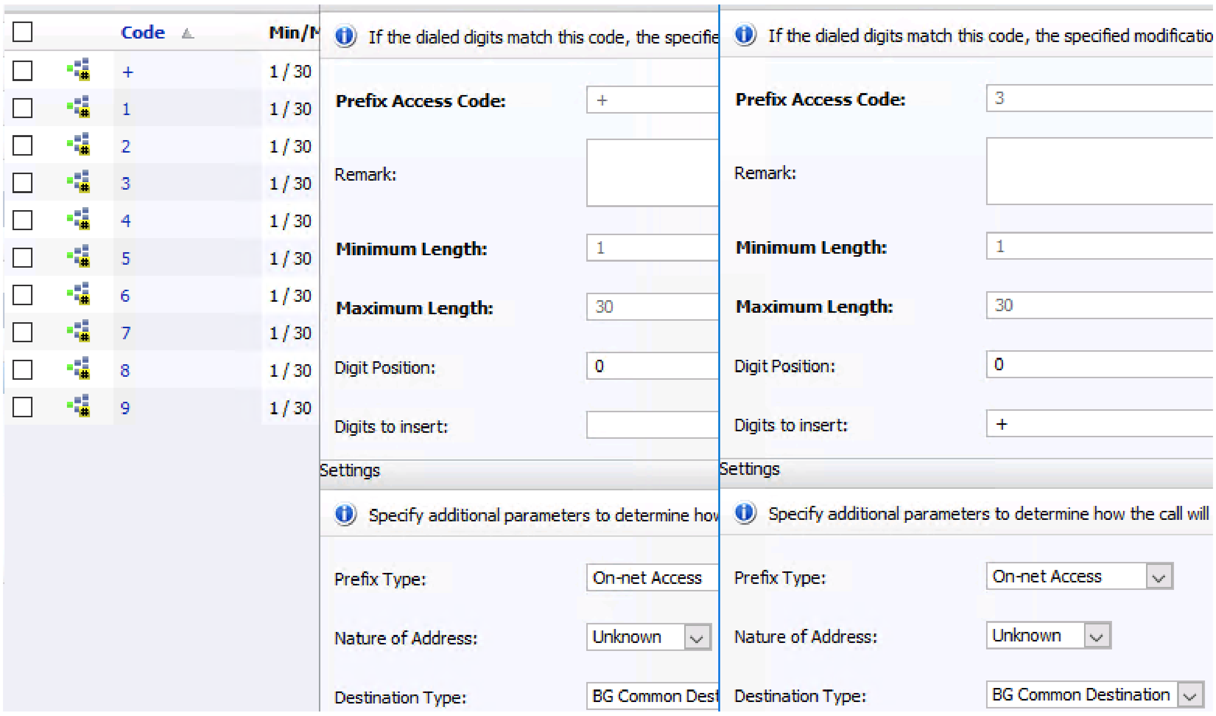
Digest Authentication

- Not used for this provider

Gateway Numbering Plan

PrefixAccessCodes

- **+**: delete 0 , don’t add
- **00**: delete 2, add +
- **0-9**: delete 0 , add +<CountryCode>
- In this example all numbers will be routed in GNF format to the CNP

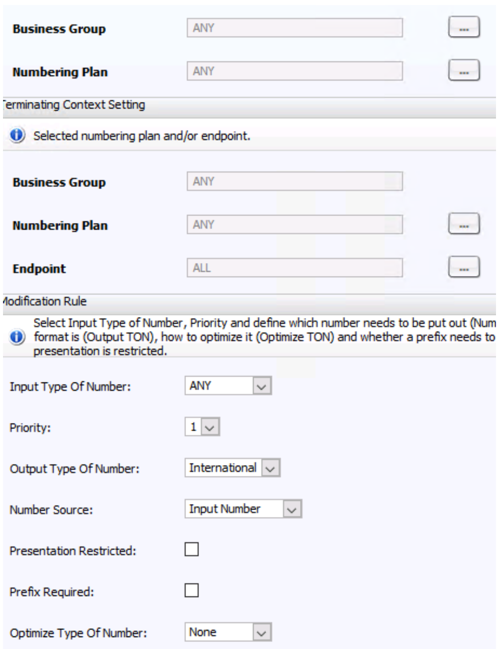


DNM Prefix

- No Gateway specific rule needed

DNM Modification

- **Input Type Of Number**: ANY
- **Priority**: 1
- **Output Type Of Number**: International
- **Number Source**: Input Number
- **Presentation Restricted**: none
- **Prefix Required**: none
- **Optimize Type Of Number**: select “None”



DNM Normalization

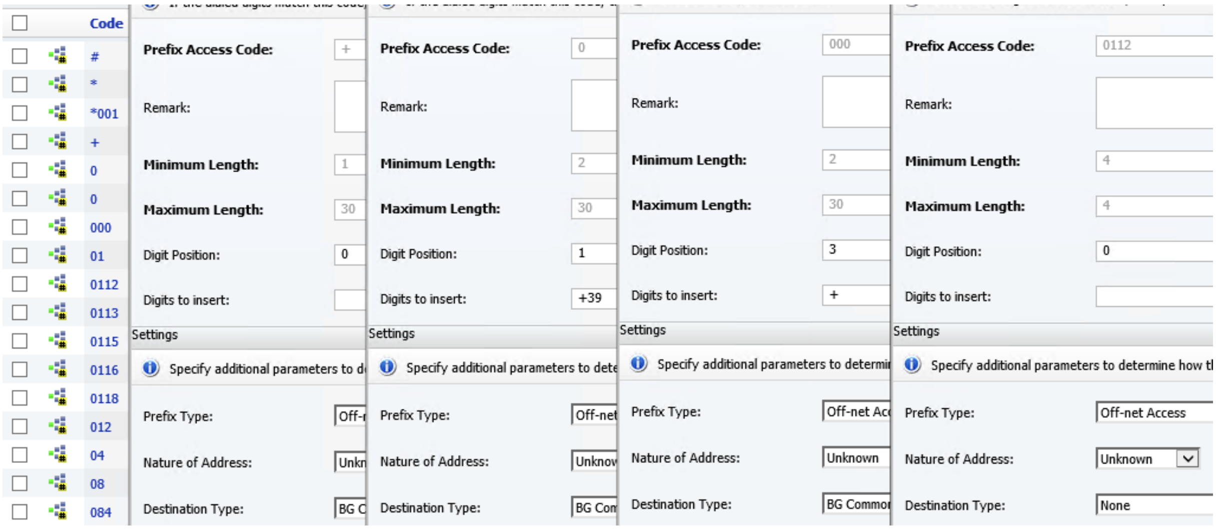
- **International rule**: Input Pattern= [1-9] , Normalized TON= International, NormalizedExpression= {1}

Business Group	Numbering Plan	Endpoint	Input TON	Input Pattern	Normalized TON	Normalized Expression
ANY	ANY		Unknown	[1-9]Z	International	{1}

Subscriber Numbering Plan

PrefixAccessCodes

- **+**: delete 0 , don’t add and route it to the Common Numbering Plan (CNP)
- **0**: delete 1, add +<CountryCode> and route it to the CNP
- **00**: don’t create this rule as Italy not has a national prefix
- **000**: delete 3, add + and route it to the CNP
- **Non E.164 numbers**: <PNAC><non E.164 numbers> e.g. emergency must be routed directly to the local DestinationCode



DestinationCodes

- **1-9**: NoA=International , TrafficType=BasedOnLocalToll, Destination= D_xxx_T

  e.g.: 

- **Other numbers which need specific TrafficType**: enter International numbers and route to Destination D_xxx_T

  e.g.: 

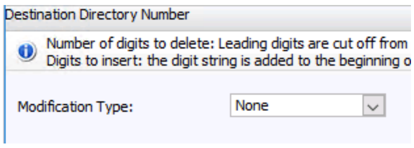
- **Non E.164 numbers**: <PNAC><non E.164 numbers> route it to Destination D_xxx_S

  e.g.: 

Destination

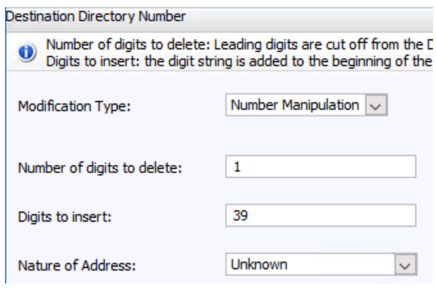
D_xxx_T

- **Modification Type**: “None”



D_xxx_S

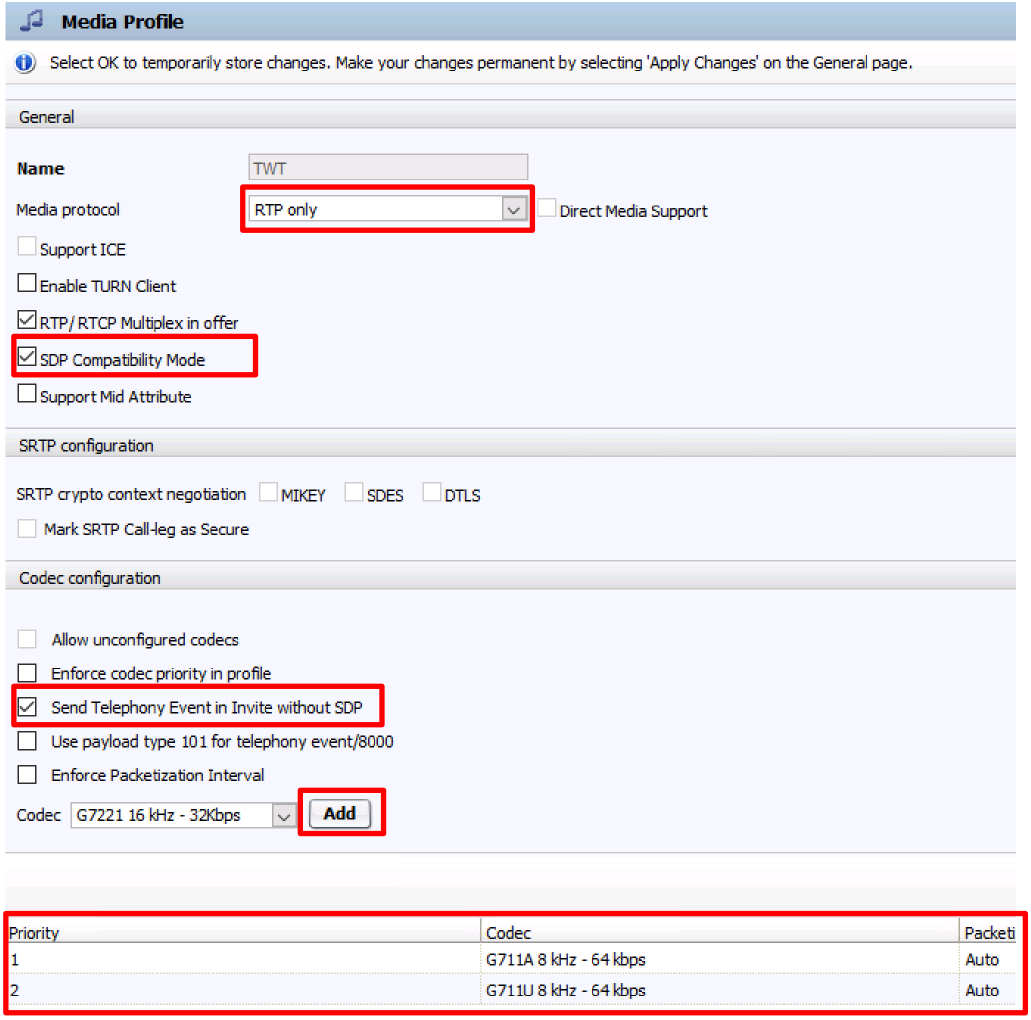
- **Modification Type**: “Number Manipulation”
- **Number of digits to delete**: enter “1” (delete PNAC)
- **Digits to insert**: <CountryCode>
- **Nature of Address**: select “Unknown”



OpenScape SBC Configuration

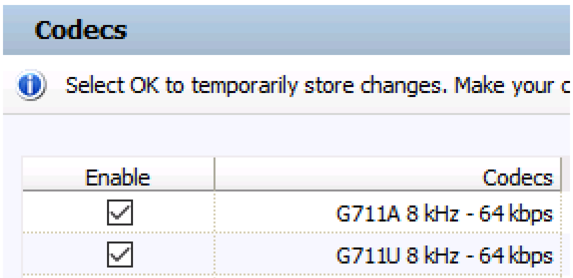
Media Profile

- **Media protocol**: RTP only
- **RTP/ RTCP Multiplex in offer**: enable
- **SDP Compatibility Mode**: enable (This allow us to eliminate unsupported codec in the SDP)
- **Send Telephony Event in Invite without SDP**: enable
- **Codec List**: G.711A, G711U, G729 (This is the preferred codec for TWT)



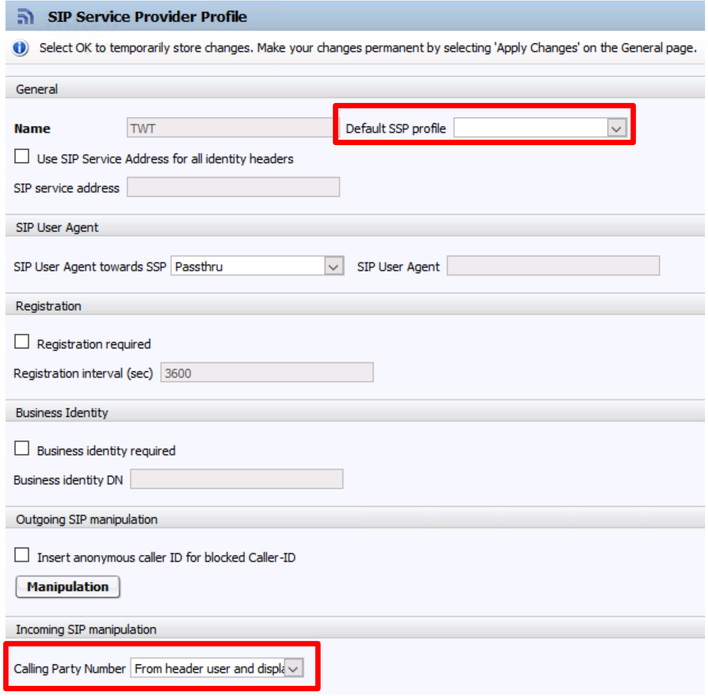
Enable Codec Support for transcoding

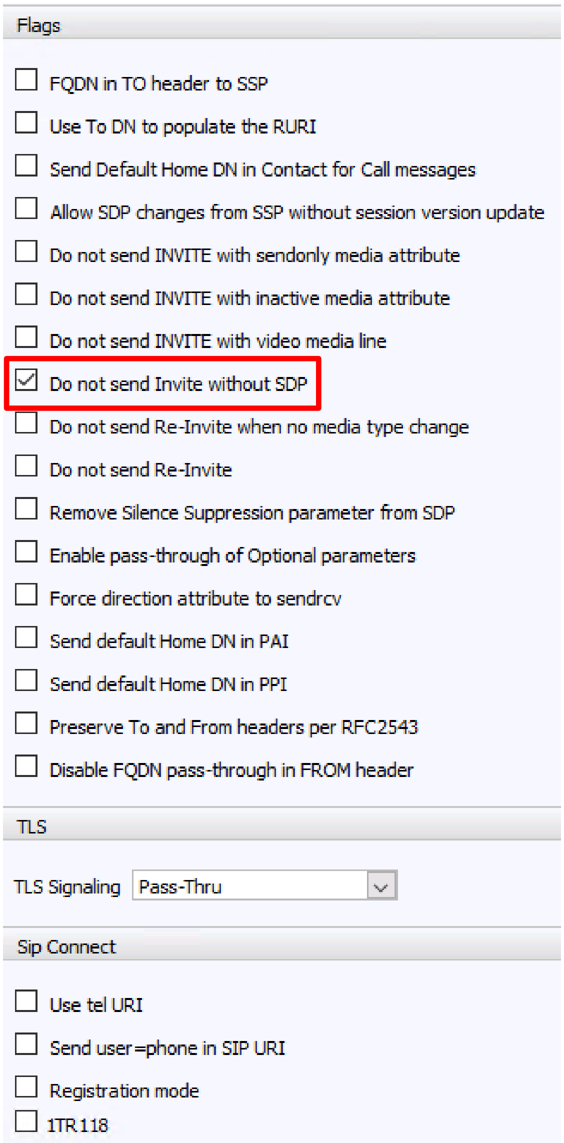
Enable all needed Codecs. At minimum G711



SIP Service Provider Profile

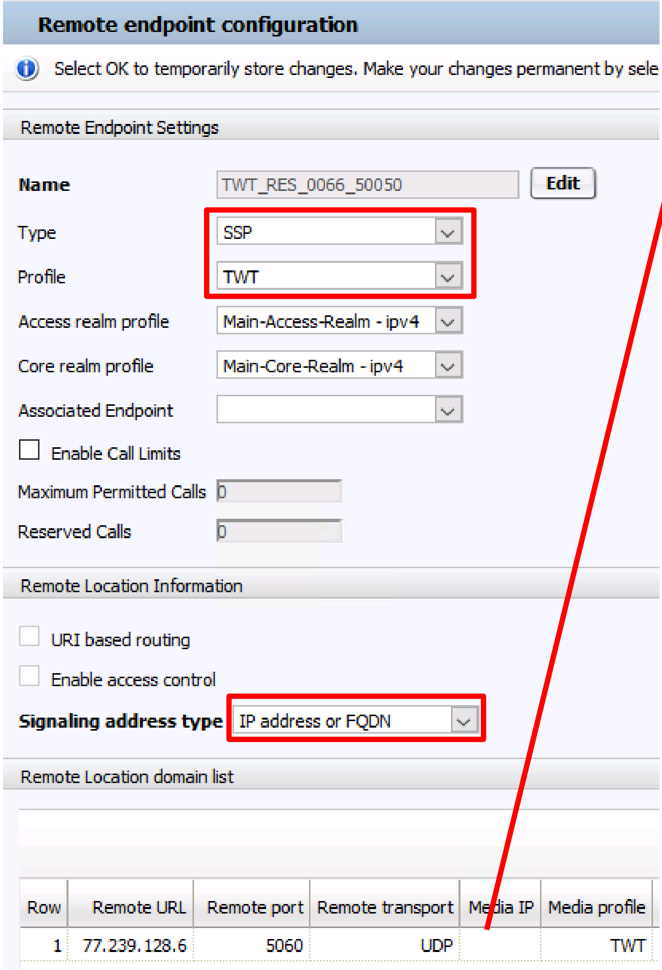
- **Default SSP profile:** empty
- **Incoming SIP manipulation - Calling Party Number:** From header user and display name part
- **Flag - Do not send Invite without SDP:** enable

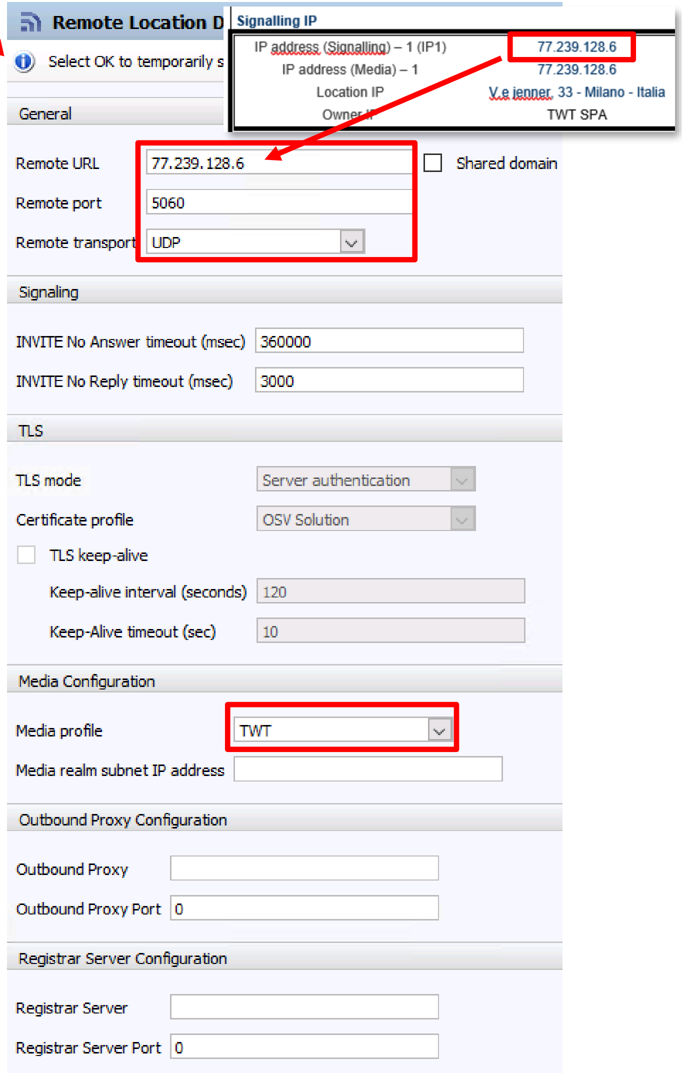


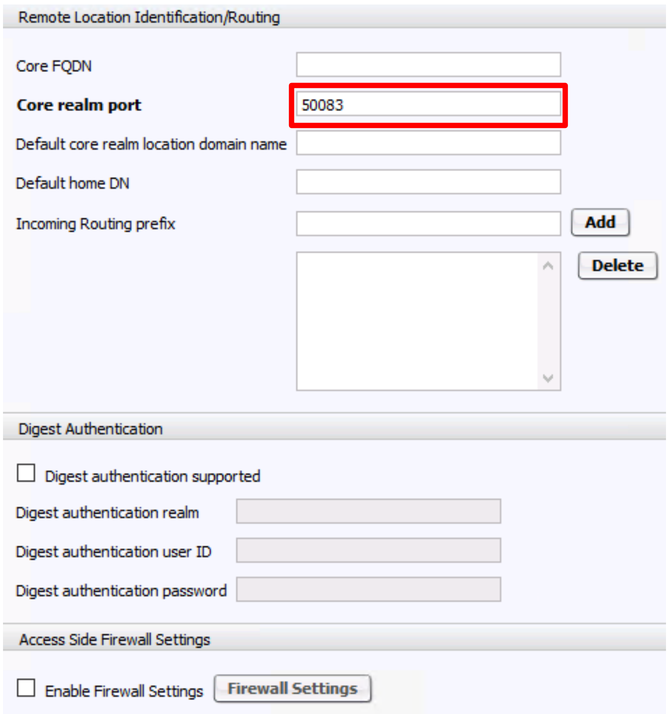


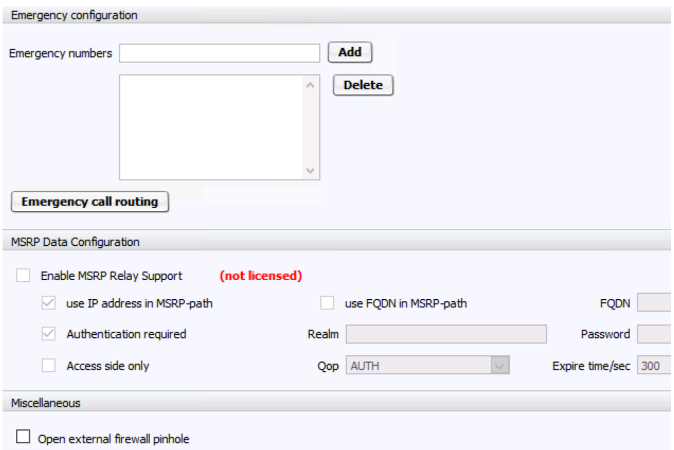
Remote Endpoint Configuration

Fill all red marked fields.









Known limitations, restrictions and things to know:

- FROM and PAI number should not be differ
- CLIP no screening is not supported by Italian law

Appendix

Supported Numbering Formats

Incoming: Called Party (REQUEST, TO): E.164 number
Incoming: Calling Party (FROM, PAI, Diversion): E.164 number

Outgoing: Called Party (REQUEST, TO): GNF
Outgoing: Calling Party (FROM, PAI, Diversion): GNF

Outgoing Emergency Call - Called Party (REQUEST, TO): 39<emergency number>
Outgoing Emergency Call - Calling Party (FROM, PAI, Diversion): GNF

Outgoing OPTIONs: supported (answer: 200 OK)

Incoming OPTIONs: Provider doesn’t monitor the trunk via OPTION per default

Call examples:

International Incoming Call:

```
> User Datagram Protocol, Src Port: 5060, Dst Port: 5652
v Session Initiation Protocol (INVITE)
  > Request-Line: INVITE sip:3909311790820@35.225.252.67:5652;user=phone SIP/2.0
  v Message Header
    > Via: SIP/2.0/UDP 77.239.128.6:5060;branch=z9hG4bKd085qdu36fqmdtq432ot1u6cu2
    > From: <sip:498970070@10.39.31.20:5060;user=phone>;tag=SD0hjof01-c4-65014-a4b041-4f098425-a4b041
    > To: <sip:3909311790820@10.39.6.16:5060;user=phone>
      Call-ID: SD0hjof01-173775e94e0ce695724c0797f115c686-ao92gd1
      [Generated Call-ID: SD0hjof01-173775e94e0ce695724c0797f115c686-ao92gd1]
    > CSeq: 1 INVITE
      User-Agent: CS2000_NGSS/8.0
      Max-Forwards: 69
      Allow: ACK,BYE,CANCEL,INVITE,OPTIONS,INFO,SUBSCRIBE,REFER,NOTIFY,PRACK
    > Contact: <sip:77.239.128.6:5060;transport=UDP>
      Supported: 100rel,resource-priority
      Content-Type: application/sdp
      Content-Length: 231
  v Message Body
    v Session Description Protocol
        Session Description Protocol Version (v): 0
      > Owner/Creator, Session Id (o): PVG 1584617210260 1584617210260 IN IP4 77.239.128.6
        Session Name (s): -
        Phone Number (p): +1 6135555555
      > Connection Information (c): IN IP4 77.239.128.6
      > Time Description, active time (t): 0 0
      > Media Description, name and address (m): audio 57306 RTP/AVP 18 8 0 101
      > Media Attribute (a): rtpmap:101 telephone-event/8000
      > Media Attribute (a): fmtp:101 0-15
      > Media Attribute (a): ptime:20
      > Media Attribute (a): fmtp:18 annexb=no
        [Generated Call-ID: SD0hjof01-173775e94e0ce695724c0797f115c686-ao92gd1]
```

National Incoming Call:

```
> User Datagram Protocol, Src Port: 5060, Dst Port: 5652
v Session Initiation Protocol (INVITE)
  > Request-Line: INVITE sip:3909311790820@35.225.252.67:5652;user=phone SIP/2.0
  v Message Header
    > Via: SIP/2.0/UDP 77.239.128.6:5060;branch=z9hG4bKn0m9r3c86fht92ecr6mc5auu94
    > From: <sip:390654578634@10.39.31.20:5060;user=phone>;tag=SDb4s9f01-3c4-65014-c02858-d67af55-c02858
    > To: <sip:3909311790820@10.39.6.16:5060;user=phone>
      Call-ID: SDb4s9f01-eec0607a0bd13693d9e0cc09552fe85b-ao92gd1
      [Generated Call-ID: SDb4s9f01-eec0607a0bd13693d9e0cc09552fe85b-ao92gd1]
    > CSeq: 1 INVITE
      User-Agent: CS2000_NGSS/8.0
      Max-Forwards: 69
      Allow: ACK,BYE,CANCEL,INVITE,OPTIONS,INFO,SUBSCRIBE,REFER,NOTIFY,PRACK
    > Contact: <sip:77.239.128.6:5060;transport=UDP>
      Supported: 100rel,resource-priority
      Content-Type: application/sdp
      Content-Length: 231
  v Message Body
    v Session Description Protocol
        Session Description Protocol Version (v): 0
      > Owner/Creator, Session Id (o): PVG 1586432268030 1586432268030 IN IP4 77.239.128.6
        Session Name (s): -
        Phone Number (p): +1 6135555555
      > Connection Information (c): IN IP4 77.239.128.6
      > Time Description, active time (t): 0 0
      > Media Description, name and address (m): audio 46714 RTP/AVP 18 8 0 101
      > Media Attribute (a): rtpmap:101 telephone-event/8000
      > Media Attribute (a): fmtp:101 0-15
      > Media Attribute (a): ptime:20
      > Media Attribute (a): fmtp:18 annexb=no
        [Generated Call-ID: SDb4s9f01-eec0607a0bd13693d9e0cc09552fe85b-ao92gd1]
```

International Outgoing Call:

```
> User Datagram Protocol, Src Port: 5652, Dst Port: 5060
v Session Initiation Protocol (INVITE)
  > Request-Line: INVITE sip:+4989700711355@77.239.128.6:5060;transport=udp SIP/2.0
  v Message Header
    > Via: SIP/2.0/UDP 35.225.252.67:5652;branch=z9hG4bKf593.c2d9d567c64cf41346ed104c4aae7509.0;i=3166
      Max-Forwards: 69
    > Contact: <sip:+3909311790820@35.225.252.67:5652;transport=udp>
    > To: <sip:+4989700711355@77.239.128.6:5060;transport=udp>
    > From: <sip:+3909311790820@35.225.252.67;transport=udp>;tag=snl_ayF90UPi86
      Call-ID: SEC11-1e653c0a-1f653d0a-1-6D0sJq92JhW3
      [Generated Call-ID: SEC11-1e653c0a-1f653d0a-1-6D0sJq92JhW3]
    > CSeq: 1235 INVITE
      Accept-Language: en;q=0.0
      Allow: REGISTER, INVITE, ACK, BYE, CANCEL, NOTIFY, REFER, INFO
      Content-Type: application/sdp
      Date: Thu, 09 Apr 2020 10:16:56 GMT
      Supported: resource-priority
      Privacy: none
    > P-Asserted-Identity: <sip:+3909311790820@35.225.252.67>
    > X-Siemens-Call-Type: Org-NWid-external-public
      Content-Length: 319
    > X-Siemens-OSS: OpenScape SBC V9 R4.14.04-99
  v Message Body
    v Session Description Protocol
        Session Description Protocol Version (v): 0
      > Owner/Creator, Session Id (o): SBC-WebRTC 1021745738972081581 2 IN IP4 10.60.100.11
        Session Name (s): SBC-WebRTC
      > Connection Information (c): IN IP4 35.238.247.221
      > Time Description, active time (t): 0 0
      > Media Description, name and address (m): audio 17704 RTP/AVP 0 8 106 105 13 126
      > Media Attribute (a): rtpmap:0 PCMU/8000
      > Media Attribute (a): rtpmap:8 PCMA/8000
      > Media Attribute (a): rtpmap:106 CN/32000
      > Media Attribute (a): rtpmap:105 CN/16000
      > Media Attribute (a): rtpmap:13 CN/8000
      > Media Attribute (a): rtpmap:126 telephone-event/8000
        Media Attribute (a): sendrecv
        Media Attribute (a): rtcp-mux
        [Generated Call-ID: SEC11-1e653c0a-1f653d0a-1-6D0sJq92JhW3]
```

National Outgoing Call:

```
> User Datagram Protocol, Src Port: 5652, Dst Port: 5060
v Session Initiation Protocol (INVITE)
  > Request-Line: INVITE sip:+390654578634@77.239.128.6:5060;transport=udp SIP/2.0
  v Message Header
    > Via: SIP/2.0/UDP 35.225.252.67:5652;branch=z9hG4bK911e.db4c5461ed04218d39f40cd35023f295.0;i=3166
      Max-Forwards: 69
    > Contact: <sip:+3909311790820@35.225.252.67:5652;transport=udp>
    > To: <sip:+390654578634@77.239.128.6:5060;transport=udp>
    > From: <sip:+3909311790820@35.225.252.67;transport=udp>;tag=snl_13Yc7y13s8
      Call-ID: SEC11-1e653c0a-1f653d0a-1-8HE0h5fDx67m
      [Generated Call-ID: SEC11-1e653c0a-1f653d0a-1-8HE0h5fDx67m]
    > CSeq: 1235 INVITE
      Accept-Language: en;q=0.0
      Allow: REGISTER, INVITE, ACK, BYE, CANCEL, NOTIFY, REFER, INFO
      Content-Type: application/sdp
      Date: Thu, 09 Apr 2020 10:29:54 GMT
      Supported: resource-priority
      Privacy: none
    > P-Asserted-Identity: <sip:+3909311790820@35.225.252.67>
    > X-Siemens-Call-Type: Org-NWid-external-public
      Content-Length: 318
    > X-Siemens-OSS: OpenScape SBC V9 R4.14.04-99
  v Message Body
    v Session Description Protocol
        Session Description Protocol Version (v): 0
      > Owner/Creator, Session Id (o): SBC-WebRTC 329283763948432992 2 IN IP4 10.60.100.11
        Session Name (s): SBC-WebRTC
      > Connection Information (c): IN IP4 35.238.247.221
      > Time Description, active time (t): 0 0
      > Media Description, name and address (m): audio 11948 RTP/AVP 0 8 106 105 13 126
      > Media Attribute (a): rtpmap:0 PCMU/8000
      > Media Attribute (a): rtpmap:8 PCMA/8000
      > Media Attribute (a): rtpmap:106 CN/32000
      > Media Attribute (a): rtpmap:105 CN/16000
      > Media Attribute (a): rtpmap:13 CN/8000
      > Media Attribute (a): rtpmap:126 telephone-event/8000
        Media Attribute (a): sendrecv
        Media Attribute (a): rtcp-mux
        [Generated Call-ID: SEC11-1e653c0a-1f653d0a-1-8HE0h5fDx67m]
```

Emergency Call:

```
⌄ Session Initiation Protocol (INVITE)
  › Request-Line: INVITE sip:39118@77.239.128.6:5060;transport=udp SIP/2.0
  ⌄ Message Header
    › Via: SIP/2.0/UDP 5.10.65.38:5101;branch=z9hG4bKac55.ecb9a543450936945995c38c1935eefd.0;i=d602
      Max-Forwards: 67
    › Contact: <sip:+3909311790820@5.10.65.38:5101;transport=udp>
    › To: <sip:39118@77.239.128.6:5060;transport=udp>
    › From: <sip:+3909311790820@5.10.65.38;transport=udp>;tag=snl_jA92T48T7q
      Call-ID: SEC11-471a440a-481a440a-1-e7D78p8W79qP
      [Generated Call-ID: SEC11-471a440a-481a440a-1-e7D78p8W79qP]
    › CSeq: 1235 INVITE
      Accept-Language: en;q=0.0
      Allow: REGISTER, INVITE, ACK, BYE, CANCEL, NOTIFY, REFER, INFO
      Content-Type: application/sdp
      Date: Thu, 21 Jun 2018 07:50:12 GMT
      Privacy: none
    › P-Asserted-Identity: <sip:+3909311790820@5.10.65.38>
    › X-Siemens-Call-Type: Org-NWid-external-public
      Content-Length: 362
    › X-Siemens-OSS: OpenScape SBC V9 R3.26.00-2
  › Message Body
```

Outgoing OPTION:

OSV -> Provider

```
⌄ Session Initiation Protocol (OPTIONS)
  › Request-Line: OPTIONS sip:77.239.128.6:5060;transport=udp SIP/2.0
  ⌄ Message Header
      Call-ID: SEC11-1e653c0a-1f653d0a-1-Iu6ekxMg61Hp
      [Generated Call-ID: SEC11-1e653c0a-1f653d0a-1-Iu6ekxMg61Hp]
    › CSeq: 1 OPTIONS
    › To: <sip:77.239.128.6:5060;transport=udp>
    › From: <sip:ERES0066P50050@35.225.252.67;transport=udp>;tag=snl_K6682w1Ojw
      Content-Length: 0
      Max-Forwards: 70
    › Via: SIP/2.0/UDP 35.225.252.67:5652;branch=z9hG4bK080f.b90001217e3608d1adde6e2422d4f24d.0;i=24879
```

Provider -> OSV

```
⌄ Session Initiation Protocol (OPTIONS)
  › Request-Line: OPTIONS sip:35.225.252.67:5652 SIP/2.0
  ⌄ Message Header
    › Via: SIP/2.0/UDP 77.239.128.6:5060;branch=z9hG4bK0gira310980h9j8ut6e0
    › To: sip:ping@35.225.252.67
    › From: <sip:ping@77.239.128.6>;tag=rg58100fik300-77m1000
      Call-ID: rg58100fik30gap99ihi5718nqn2khdch9c0jpk6ehc4jqo5i9d43no6n1-77m1000@77.239.128.6
      [Generated Call-ID: rg58100fik30gap99ihi5718nqn2khdch9c0jpk6ehc4jqo5i9d43no6n1-77m1000@77.239.128.6]
    › CSeq: 55527 OPTIONS
      Max-Forwards: 70
      Content-Length: 0
```