



Nexmo SIP Trunking Configuration Guide

ShoreTel Director 14.2 and InGate SIParator 5.0.11

July 2017

1 Audience

This document is intended for the SIP trunk customer's technical staff and Value Added Retailer (VAR) having installation and operational responsibilities. This configuration guide provides steps for configuring ShoreTel Director 14.2 and InGate SIParator 5.0.11 to Nexmo SIP Trunking services.

2 SIP Trunking Network Components

The network for the SIP trunk reference configuration shown below is representative of a ShoreTel 14.2 Director and an InGate SIParator configuration to Nexmo SIP trunking.

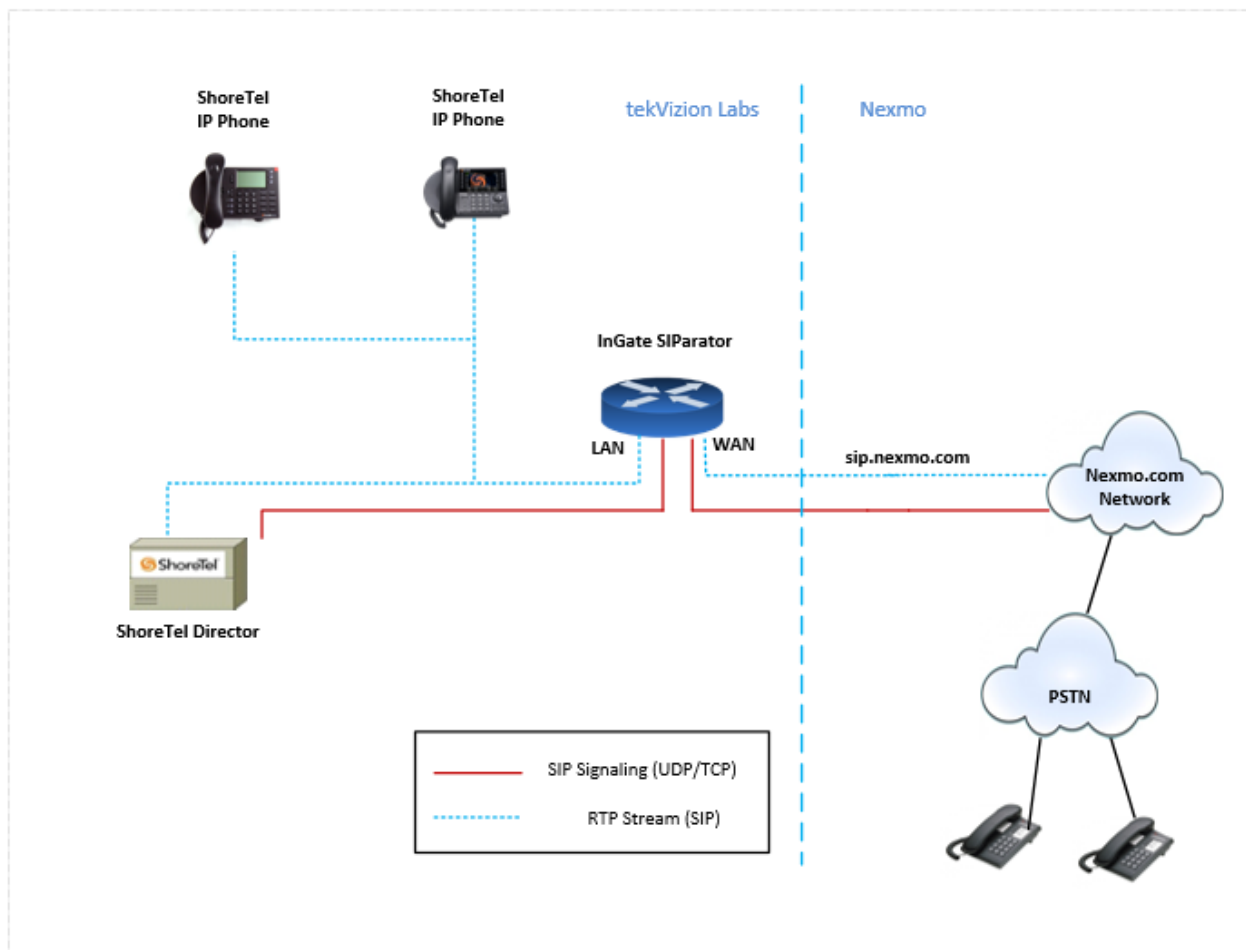


Figure 1: Topology Diagram

2.1 Hardware Components

- ShoreTel Director 14.2
- ShoreTel ShoreGear 90

- InGate SIParator
- ShoreTel phones IP 560, IP 480

2.2 Software Requirements

- ShoreTel Director, Version 14.2, Build 19.48.2600.0
- InGate SIParator, Version: 5.0.11

3 Features

3.1.1 Features Supported

- Incoming and outgoing off-net calls using G711ULAW & G711ALAW voice codecs
- Calling Line (number) Identification Presentation
- Call Hold and Resume
- Call Transfer (unattended and attended)
- Call Conference
- Call Forward (all, no answer)
- DTMF relay both directions (RFC2833)
- Media flow-through on InGate SIParator

3.1.2 Features Not Supported by PBX

- None

3.1.3 Features Not Tested

- None

3.1.4 Caveats and Limitations

- International calls were responded to with a 404 Not Found message from Nexmo

4 Configuration

4.1 IP Address Worksheet

The specific values listed in the table below and in subsequent sections used in the lab configuration described in this document, and are for **illustrative purposes only**. The customer must obtain and use the values for your deployment.

Table 2 – IP Addresses

Component	Lab Value	Customer Value
InGate SIPerator		
LAN IP Address	10.65.1.200	
LAN Subnet Mask	255.255.255.0	
WAN IP Address	192.65.79.XXX	
WAN Subnet Mask	255.255.255.128	
ShoreTel 14.2 Director IP		
System IP Address	10.65.1.9	

5 ShoreTel Configuration: ShoreWare Director 14.2



Figure 2: ShoreTel configuration

5.1 ShoreTel Configuration: Configure Site

1. Navigate to Administration → **Sites**
2. Choose site location in drop-down
3. Click **Go**



The screenshot displays the ShoreTel Director web interface. On the left, the 'Administration' menu is visible, with 'Sites' highlighted. The main content area is titled 'Sites' and features a 'Add new site' form. The form has a dropdown menu for selecting a country, currently set to 'United States of America', and a 'Go' button. Below the form, a table lists existing sites.

Site	Country	Area Code	Bandwidth	Switches	Servers
Headquarters	United States of America	214	1500	3	Headquarters

Figure 3: ShoreTel Configuration: Configure Site

1. Set **Name**: Headquarters is used for this example.
2. Set **Local Area Code**
3. Set **Time Zone**
4. Set **Bandwidth**
5. Set **Codecs**
6. Set **Proxy Switch**
7. Click **Save**

Sites
[New](#)
[Copy](#)
[Save](#)
[Delete](#)
[Reset](#)
[Help](#)

Edit Site

[Edit this record](#)
[Refresh this page](#)

Name:

Service Appliance Conference Backup Site:

Country:

Language:

Parent:

☐ Use Parent As Proxy

Local Area Code:

Additional Local Area Codes:

Caller's Emergency Service Identification (CESID):
 (e.g. +1 (408) 331-3300)

Time Zone:

Night Bell Extension:

Night Bell Switch:
 [Edit Night Bell Call Handling](#)

Paging Extension:

Paging Switch:

Operator Extension:

FAX Redirect Extension:

SMTP Relay:

Network Time Protocol Server:

Bandwidth:

Admission Control Bandwidth:
 kbps

Intra-Site Calls:

Inter-Site Calls:

FAX and Modem Calls:

SIP Proxy:

Virtual IP Address:

Proxy Switch 1:

Proxy Switch 2:

Figure 4: ShoreTel Configuration: Configure Site – Cont.

5.2 ShoreTel Configuration: Codec Lists

1. Navigate to **Administration** → **Call Control** → **Codec Lists**

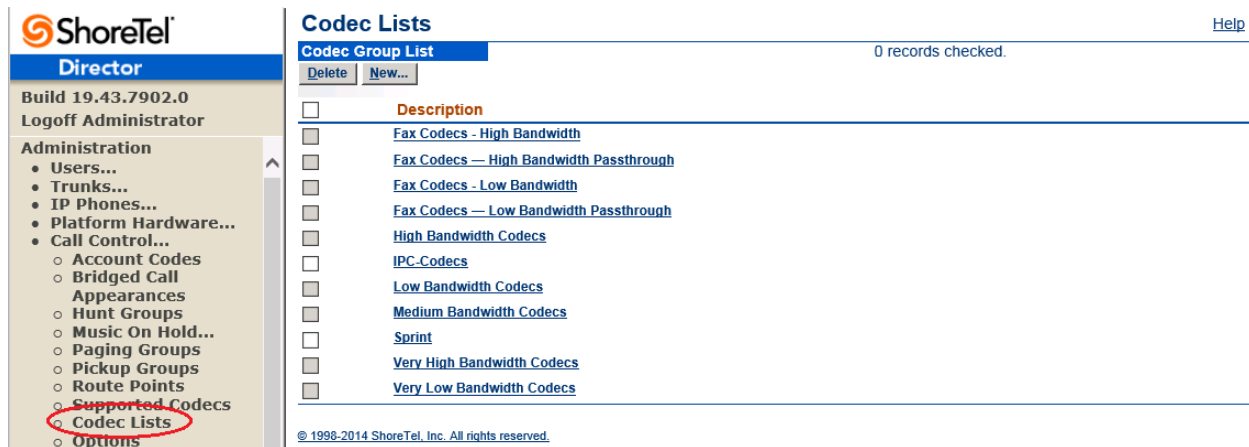


Figure 5: ShoreTel Configuration: Configuring Codecs

2. Move the Codec you want to use to the top of the list
3. Click **Save**

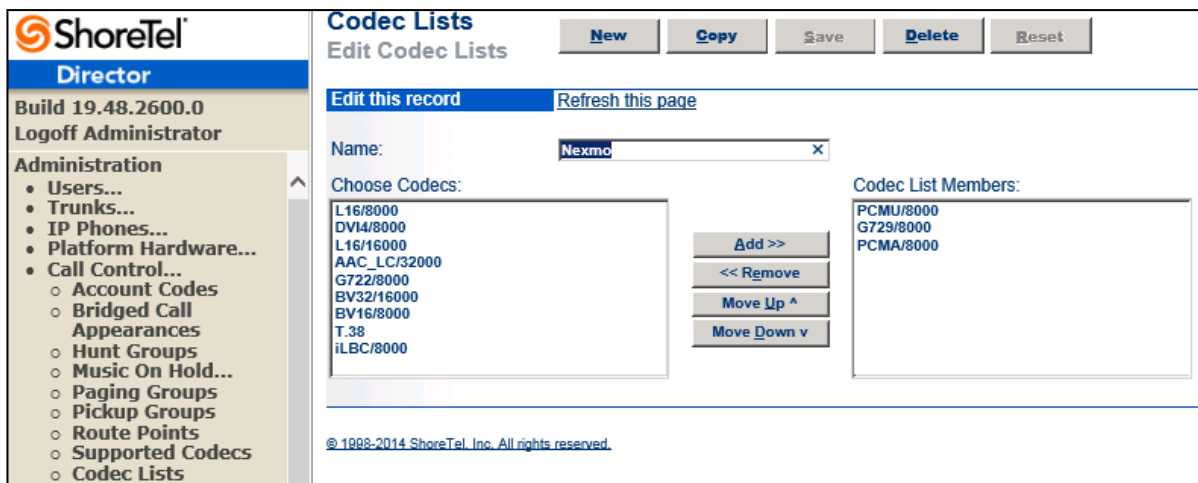


Figure 6: ShoreTel Configuration: Configuring Codecs – Cont.

5.3 ShoreTel Configuration: SIP Profiles

1. Navigate to **Trunks → SIP Profiles**
2. Click **New**

Director

Build 19.48.2600.0

Logoff Administrator

Administration

- Users...
- Trunks...
 - Individual Trunks
 - Trunk Groups
 - SIP Profiles
 - ISDN Profiles
 - Local Prefixes
- IP Phones...
- Platform Hardware...
- Call Control...
- Voice Mail...
- Auto-Attendant Menus
- Workgroups
- Schedules
- Communicator...

SIP Profiles

SIP Trunk Profiles

Delete

New...

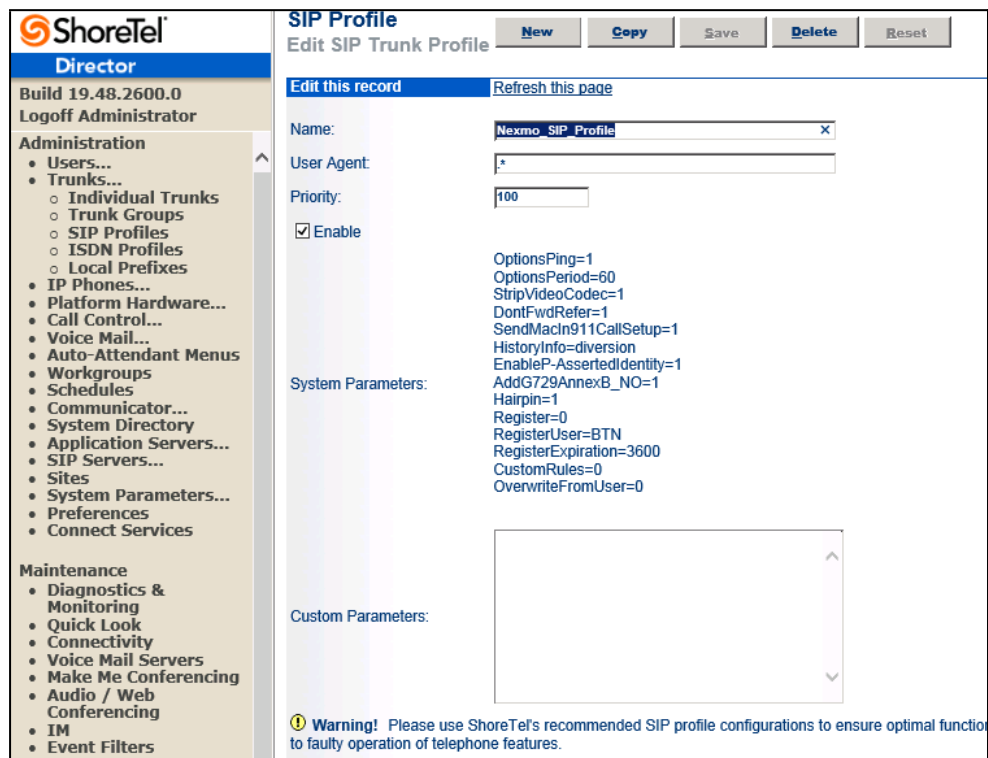
0 records checked.

<input type="checkbox"/>	Name	User Agent	Enabled	Priority
<input type="checkbox"/>	AT&T	*	Yes	10
<input type="checkbox"/>	CenturyLink	*	Yes	10
<input type="checkbox"/>	CenturyLink (formerly Qwest)	*	Yes	10
<input type="checkbox"/>	Comcast	*	Yes	100
<input type="checkbox"/>	Default ITSP	*	Yes	10
<input type="checkbox"/>	Default Tie Trunk	*	Yes	10
<input type="checkbox"/>	Mobility Router	*	Yes	10
<input type="checkbox"/>	Nexmo SIP Profile	*	Yes	100
<input type="checkbox"/>	Test SIP Profile	*	Yes	100
<input type="checkbox"/>	Verizon	*	Yes	10

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Figure 7: ShoreTel Configuration: Creating SIP Profile

3. Click on **AT&T** (ShoreTel default SIP Profile)
4. Click **Copy** at the top of the page and rename the SIP Profile
5. Change **System Parameters** in the **Custom Parameters** box as needed



SIP Profile

Edit SIP Trunk Profile

Edit this record Refresh this page

Name: Nexmo SIP Profile

User Agent: *

Priority: 100

☒ Enable

System Parameters:

OptionsPing=1
OptionsPeriod=60
StripVideoCodec=1
DontFwdRefer=1
SendMacIn911CallSetup=1
HistoryInfo=diversion
EnableP-AssertedIdentity=1
AddG729AnnexB_NO=1
Hairpin=1
Register=0
RegisterUser=BTN
RegisterExpiration=3600
CustomRules=0
OverwriteFromUser=0

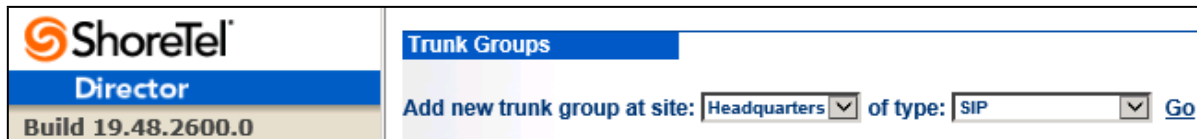
Custom Parameters:

Warning! Please use ShoreTel's recommended SIP profile configurations to ensure optimal function to faulty operation of telephone features.

Figure 8: ShoreTel Configuration: Creating SIP Profile – Cont.

5.4 ShoreTel Configuration: Configure Trunk Groups

1. Navigate to **Trunks → Trunk Groups**
2. After adding **site** and **of type**, click **Go**



The screenshot shows the ShoreTel Director web interface. On the left is a sidebar with the ShoreTel logo, the word "Director", and the build number "Build 19.48.2600.0". The main content area has a blue header bar labeled "Trunk Groups". Below this, there is a form with the text "Add new trunk group at site:" followed by a dropdown menu showing "Headquarters", then "of type:" followed by a dropdown menu showing "SIP", and finally a "Go" button.

Figure 9: ShoreTel Configuration: Configuring Trunk Group

3. Add **Name**
4. Choose **Profile** (created in previous step)
5. You will need to navigate back to this page and select the **User Group** created in the next step
6. Add **Access Code**
7. Add **Local Area Code** for outbound calls to the PSTN

NOTE: For more than one local area code click **Edit** under **Outbound → Additional Local Area**

8. **Codes** and enter the additional area codes in the dialog box then click **OK**
9. Other selections will depend on user needs
10. Click **Save**
11. To edit **DNIS** or **DID**, click on the appropriate tab

Trunk Groups		New	Copy	Save	Delete
Edit SIP Trunk Group					
Edit this record		Refresh this page			
Name:	NexmoGrp				
Site:	Headquarters				
Language:	English(US) ▼				
<input type="checkbox"/> Enable SIP Info for G.711 DTMF Signaling					
Profile:	Nexmo_SIP_Profile ▼				
Digest Authentication:	Outbound-Only ▼				
Username:	911236e3				
Password:	<input type="password"/> <input type="password"/>				
Inbound:					
Number of Digits from CO:	11				
<input checked="" type="checkbox"/> DNIS	Edit DNIS Map				
<input checked="" type="checkbox"/> DID	Edit DID Range				
<input type="checkbox"/> Extension					
<input checked="" type="radio"/> Translation Table:	<None> ▼				
<input type="radio"/> Prepend Dial In Prefix:	<input type="text"/>				
<input type="radio"/> Use Site Extension Prefix					
<input type="checkbox"/> Tandem Trunking					
User Group:	Anonymous Telephones ▼				
Prepend Dial In Prefix:	<input type="text"/>				
Destination:	700 : Default Search				
<input checked="" type="checkbox"/> Outbound:					
Network Call Routing:					
Access Code:	9				
Local Area Code:	206				
Additional Local Area Codes:	Edit				
Nearby Area Codes:	Edit				
Billing Telephone Number:	+1 (206) 312-0140 (e.g. +1 (408) 331-3300)				

Figure 10: ShoreTel Configuration: Configuring Trunk Group – Cont.

Nearby Area Codes: [Edit](#)

Billing Telephone Number: (e.g. +1 (408) 331-3300)

Trunk Services:

☒ Local

☒ Long Distance

☒ International

☒ Enable Original Caller Information

☒ n11 (e.g. 411, 611, except 911 which is specified below)

☒ Emergency (e.g. 911)

☒ Easily Recognizable Codes (ERC) (e.g. 800, 888, 900)

☒ Explicit Carrier Selection (e.g. 1010xxx)

☒ Operator Assisted (e.g. 0+)

☒ Caller ID not blocked by default

☐ Enable Caller ID (Please confirm with the Carrier(s) or the Service Provider(s) on how the end-to-end caller name is delivered)

When Site Name is used for the Caller ID, overwrite it with:

Trunk Digit Manipulation:

☐ Remove leading 1 from 1+10D
Hint: Required for some long distance service providers.

☐ Remove leading 1 for Local Area Codes (for all prefixes unless a specific local prefix list is provided below)
Hint: Required for some local service providers with overlay area codes.

☒ Dial 7 digits for Local Area Code (for all prefixes unless a specific local prefix list is provided below)
Hint: Local prefixes required for some local service providers with mixed 7D and 1+10D in the same home area.

☐ Dial in E.164 Format

Local Prefixes: [Go to Local Prefixes List](#)


Prepend Dial Out Prefix:

Off System Extensions: [Edit](#)

Translation Table:

Figure 11: ShoreTel Configuration: Configuring Trunk Group – Cont.

12. Click on **Edit DID Range**
13. Enter **Base Phone Number**
14. Enter **# Phone Numbers**
15. Click **Add this record**
16. Click **Save**


ShoreTel
Director
 Build 19.48.2600.0
 Logoff Administrator
 Administration
 • Users...
 • Trunks...
 o Individual Trunks
 o Trunk Groups
 o SIP Profiles
 o ISDN Profiles
 o Local Prefixes

DID Range

NexmoGrp

[Save](#) [Reset](#) [Help](#)

[Edit this record](#) [Refresh this page](#)

Base Phone Number	# Phone Numbers	
+1 (206) 312-0140	1	Delete
+1 (201) 464-7035	1	Delete

[Add this record](#) +1

[View DID Digit Map](#)

Figure 12: ShoreTel Configuration: Configuring Trunk Group – Cont.

5.5 ShoreTel Configuration: Create User Groups

1. Navigate to **Users → User Groups**
2. Click **Add new**

ShoreTel Director
Build 18.41.4902.0
Logoff Administrator

Administration

- Users...
 - Individual Users
 - User Groups**
 - Class of Service
 - Anonymous
 - Telephones
 - Extension Lists
 - Batch Update Utility
 - Call Handling Mode Defaults...
- Trunks...
- IP Phones...
- Platform Hardware...
- Call Control...
- Voice Mail...
- Auto-Attendant Menus
- Workgroups
- Schedules

User Groups

[Add new](#)

Name	Telephony Features	Call	Voice Mail	Voice Mail Interface	Account Codes	DID AS CESID
AccessLine Groups	Fully Featured	No Restrictions	Large Mail Box	None	Disabled	Yes
Account Code Service	Minimally Featured	No Restrictions	No Mail Box	None	Disabled	Yes
ACME-VR	Fully Featured	No Restrictions	Large Mail Box	None	Disabled	Yes
Amcom User Group	Fully Featured	No Restrictions	Large Mail Box	None	Disabled	Yes
Anonymous Telephones	Minimally Featured	Internal Only	No Mail Box	None	Disabled	Yes
Audio Conference	Minimally Featured	No Restrictions	No Mail Box	None	Disabled	Yes
Centurion User Group	Fully Featured	No Restrictions	No Mail Box	None	Disabled	Yes
Executives	Fully Featured	No Restrictions	Medium Mail Box	None	Disabled	Yes
FVX	Fully Featured	No Restrictions	Large Mail Box	None	Disabled	Yes
IP Telephones	Fully Featured	No Restrictions	No Mail Box	None	Disabled	Yes
Voice Mail Notification	Minimally Featured	No Restrictions	No Mail Box	None	Disabled	Yes

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Figure 13: ShoreTel Configuration: Configuring User Group

3. Add **Name**
4. Choose **COS** selections in the drop-down boxes
5. Choose the **Outgoing Trunk Group(s)** you created in the previous step
6. Click **Save**

ShoreTel Director
Build 19.48.2600.0
Logoff Administrator

Administration

- Users...
 - Individual Users
 - User Groups**
 - Class of Service
 - Anonymous
 - Telephones
 - Extension Lists
 - Batch Update Utility
 - Call Handling Mode Defaults...
- Trunks...
- IP Phones...
- Platform Hardware...
- Call Control...
- Voice Mail...
- Auto-Attendant Menus
- Workgroups
- Schedules
- Communicator...
- System Directory
- Application Servers...
- SIP Servers...
- Sites
- System Parameters...
- Preferences
- Connect Services

User Groups

[New](#) [Copy](#) [Save](#) [Delete](#)

Edit User Group

[Edit this record](#) [Refresh this page](#)

Name:

COS - Telephony: [Go to this Class of Service](#)

COS - Call Permissions: [Go to this Class of Service](#)

COS - Voice Mail: [Go to this Class of Service](#)

☒ Send Caller ID as Caller's Emergency Service Identification (CESID).

☒ Send DID as Caller's Emergency Service Identification (CESID).

Account Code Collection:

☒ Show ShoreTel Communicator users a list of account codes when dialing.

Outgoing Trunk Groups (Access Code):

- ☐ Analog Loop Start (9)
- ☐ Charter (9)
- ☐ Comcast (8)
- ☐ Digital Loop Start (9)
- ☐ Digital Wink Start (9)
- ☒ NexmoGrp (9)

Voice Mail Interface Mode:

Music on Hold:

User Profile:

Toolbar 1: [Go to this Toolbar](#)

Toolbar 2: [Go to this Toolbar](#)

Toolbar 3: [Go to this Toolbar](#)

Phone Application:

Figure 14: ShoreTel Configuration: Configuring User Group – Cont.

5.6 ShoreTel Configuration: Create Individual Trunks

1. Navigate to **Trunks → Individual Trunks**
2. In the drop-down boxes at the top of the page, choose **site** and the **trunk group** you created
3. Click **Go**



Figure 15: ShoreTel Configuration: Creating Individual Trunks

4. Add **Name**
5. Choose **Switch**
6. Enter **IP Address** (IP address of the PBX to which you are connecting. In this test, Ingate was used as a SBC so trunks were created between ShoreTel and Ingate.)
7. Enter **Number of Trunks** (Number of trunks is determined by user needs. [Each trunk requires a license.](#))
8. Click **Save**
9. Follow this process for each individual trunk in the trunk group

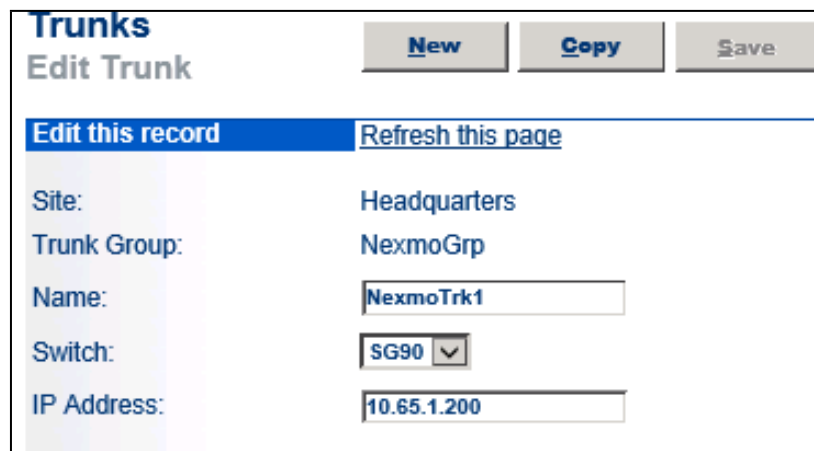


Figure 16: ShoreTel Configuration: Creating Individual Trunks – Cont.

5.7 ShoreTel Configuration: Create Individual Users

1. Navigate to **Users → Individual Users**

2. Choose your site in the drop-down box at the top of the page and click **Go**

ShoreTel Director
Build 18.61.4300.0
Logoff Administrator

Administration

- Individual Users
- User Groups
- Class of Service
- Anonymous
- Telephones

Individual Users
Add new user at site: **Headquarters** **Go**

Show page: 1: ShoreTel - VM 4 Records 25 per page

First Name	Last Name	Site	User Group	Access License	Extension	Mailbox	Switch
ShoreTel	User 1	Headquarters	Executives	Personal	1701	1701	ShoreGear90
SI	User 2	Headquarters	Executives	Personal	1702	1702	ShoreGear90
SI	User 3	Headquarters	Executives	Personal	1703	1703	220T1A
VM	VM	Headquarters	Executives	Personal	3501	3501	SoftSwitch

Figure 17: ShoreTel Configuration: Creating Individual Users

3. Enter **First Name**
4. Enter **Last Name**
5. Under **License Type** choose to create the extension with or without a voicemail box
6. Choose the **DID Range** you created in Trunk Groups
7. Choose your **User Group**
8. Choose **Site**

Users
Edit User

New Copy Save Delete Reset

General Personal Options Distribution Lists Workgroups Connect Services

First Name: user1

Last Name: nexmo

Number: 164

License Type: Extension and Mailbox

Access License: Personal ☐ Enable Contact Center Integration

Caller ID: +1 (206) 312-0140 (e.g. +1 (408) 331-3300)

☒ DID Range: +12063120140 (0 of 1 available) NexmoGrp View System Directory

DID Number: +12063120140 (Range: +12063120140 - 12063120140)

PSTN Failover: None

User Group: NexmoUserGrp Go to this User Group

Site: Headquarters

Language: English(US)

Primary Phone Port: ☒ IP Phones 00-10-49-45-62-33 ☐ Ports SG90 - 12 ☐ SoftSwitch ECC9

Current Port: 00-10-49-45-62-33 Go Primary Phone

Jack #:

Figure 18: ShoreTel Configuration: Creating Individual Users – Cont.

Mailbox Server: Headquarters Escalation Profiles and Other Mailbox Options

☒ Accept Broadcast Messages

☒ Include in System Dial By Name Directory

☐ Make Number Private

Fax Support: User - Redirect

Allow Video Calls: None

☒ Allow Telephony Presence

☐ Shared Call Appearances

Associated BCA:

☐ Allow Use of Soft Phone

☐ Allow Phone API

Mobility Options:

☐ Allow Mobile Access

☐ Allow Enhanced Mobility with Extension

☐ Delayed Ringdown

☒ Extension: Search

☐ External Number: (e.g. 9+1 (408) 331-3300)

Ringdown Delay: sec

Client Username: unexmo

Client Password: [masked] [masked]

Voice Mail Password: [masked] [masked] ☐ Must Change On Next Login

SIP Password: [masked] [masked]

Email Address: unexmo@tekvizion.com

Conferencing Settings:

Appliance: <None>

Instant Messaging Settings:

Server / Appliance: <None>

[Edit System Directory Record](#)

Figure 19: ShoreTel Configuration: Creating Individual Users – Cont.

6 Ingate Configuration

6.1 Ingate Configuration: Ingate Startup Tool

To launch Ingate

1. Download and click on the icon
2. The **Select Product Type** window appears
3. Select your Ingate Model from the drop-down box
4. Click **Next**

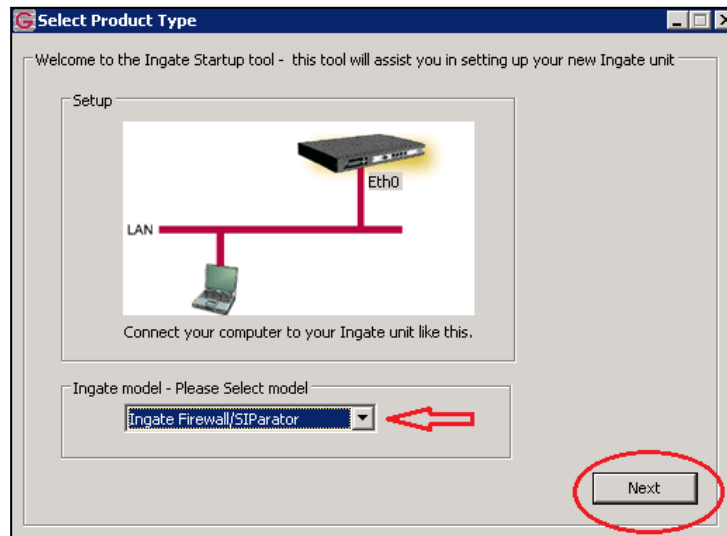


Figure 20: Ingate Configuration: Ingate Startup Tool

5. The **Ingate Startup Tool** window appears.
6. Enter **IP Address**
7. Enter **Password**
8. Click **Contact**

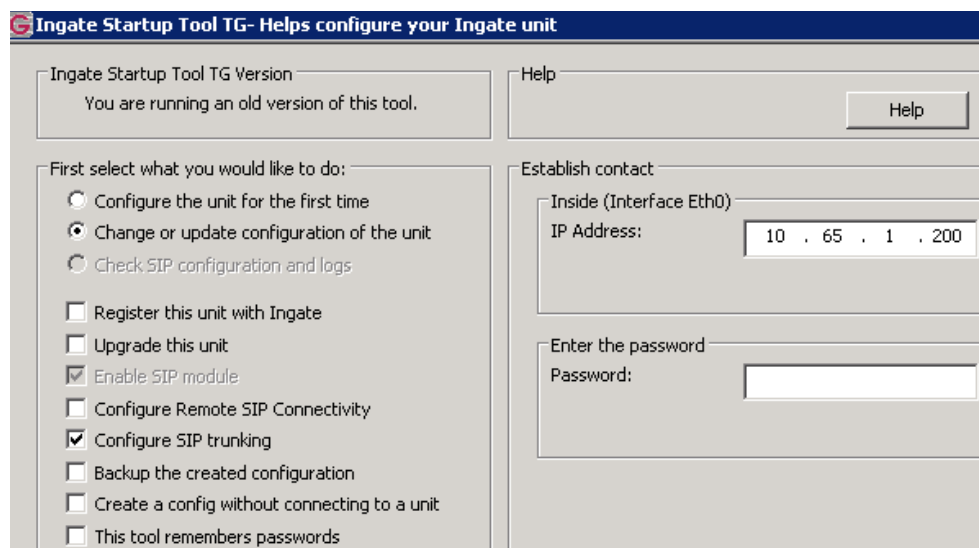


Figure 21: Ingate Configuration: Ingate Startup Tool – Cont.

9. Enter the correct **Network Topology** information

The screenshot shows the 'Ingate Startup Tool TG' window with the 'Network Topology' tab selected. The configuration fields are as follows:

- Product Type:** DMZ SIParator
- DMZ (Interface Eth0):**
 - IP address: 10 . 65 . 1 . 200
 - Netmask: 255 . 255 . 255 . 0
- LAN IP address range:**
 - Low IP: 192 . 65 . 79 . 160
 - High IP: 255 . 255 . 255 . 128
- Gateway:** 192 . 65 . 79 . 129
- ☐ Use NATing firewall
- DNS server:**
 - Primary: 8 . 8 . 8 . 8
 - Secondary: (Optional) 10 . 85 . 0 . 12

On the right, a network diagram illustrates the topology: an 'Internet' cloud is connected to an 'Existing firewall'. The firewall has a 'DMZ' interface connected to an 'Ingate SIParator' router. The router's 'LAN' interface is connected to an 'IP-PBX' server.

Figure 22: Ingate Configuration: Ingate Startup Tool – Cont.

10. Select the **IP-PBX** tab
11. Choose **Type**
12. Enter **IP Address**

The screenshot shows the 'Ingate Startup Tool TG' window with the 'IP-PBX' tab selected. The configuration fields are as follows:

- IP-PBX (should be located on the LAN):**
 - Type:** ShoreTel ShoreGear
 - IP Address:** 10 . 65 . 1 . 9
 - ☐ Use domain name
 - SIP Domain:** (empty field)

Figure 23: Ingate Configuration: Ingate Startup Tool – Cont.

13. Select the **ITSP_1** tab
14. Choose **Name**
15. Enter **IP Address**

The screenshot shows the 'ITSP_1' tab of the Ingate Startup Tool. The interface includes several input fields and checkboxes:

- Name:** A dropdown menu with 'Generic (register main)' selected.
- Provider address:** A section containing an 'IP Address' field with '173 . 193 . 199 . 24' entered, and a checkbox for 'Use domain name' which is unchecked.
- Advanced:** A section with two 'Prefix' input fields. The first is for 'Prefix to match and remove from incoming calls' and the second is for 'Prefix to add to outgoing calls'.
- DID (start of range) (user name):** An empty text input field.
- DID range size:** An empty text input field.
- PBX local numbers (start of range):** An empty text input field.
- Account authentication:** A section with a checked 'Authentication' checkbox, an 'Authentication name' field (same as DID if empty), an unchecked 'Increment authentication name for ranges' checkbox, and a 'Password' field.

Figure 24: Ingate Configuration: Ingate Startup Tool – Cont.

16. Select the **Upload Configuration** tab
17. Click **Upload**

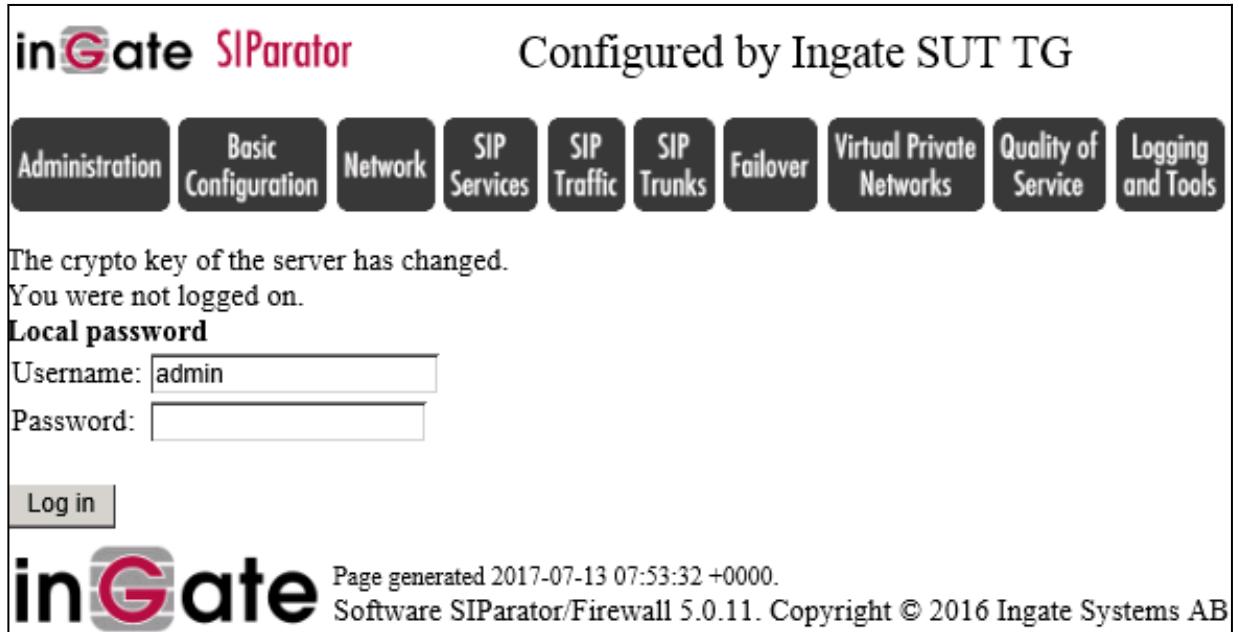
The screenshot shows the 'Upload Configuration' tab of the Ingate Startup Tool. The interface includes a disclaimer, a verbose logging section, and a final step section:

- Disclaimer:** A text box containing a disclaimer about the tool's basic settings and a contact email 'support@ingate.com'.
- Verbose Logging (SIP debug):** A section with a checked 'Enable' checkbox.
- Final step:** A section with two radio buttons: 'Logon to web GUI and apply settings' (selected) and 'Apply settings directly using serial interface'. There is also an unchecked checkbox for 'Backup the configuration'.
- Upload:** A button at the bottom right of the window.

Figure 25: Ingate Configuration: Ingate Startup Tool – Cont.

6.2 Ingate Configuration: Launching Ingate from a Browser

1. <http://< IP Address >>
2. Enter **Username**
3. Enter **Password**



The screenshot displays the Ingate SIParator web interface. At the top left is the 'inGate SIParator' logo. To the right, it says 'Configured by Ingate SUT TG'. Below this is a horizontal menu with buttons for 'Administration', 'Basic Configuration', 'Network', 'SIP Services', 'SIP Traffic', 'SIP Trunks', 'Failover', 'Virtual Private Networks', 'Quality of Service', and 'Logging and Tools'. The 'Basic Configuration' button is highlighted. Below the menu, a message states: 'The crypto key of the server has changed. You were not logged on.' Under the heading 'Local password', there are input fields for 'Username:' (containing 'admin') and 'Password:'. A 'Log in' button is positioned below these fields. At the bottom left is the 'inGate' logo, and to its right, the footer text reads: 'Page generated 2017-07-13 07:53:32 +0000. Software SIParator/Firewall 5.0.11. Copyright © 2016 Ingate Systems AB'.

Figure 26: Ingate Configuration: Launching Ingate from a Browser

6.3 Ingate Configuration: Basic Configuration

1. Add DNS Name or IP Address

inGate SIParator Configured by Ingate SUT TG Log Out

Administration **Basic Configuration** Network SIP Services SIP Traffic SIP Trunks Failover Virtual Private Networks Quality of Service Logging and Tools About

• Changes have been made to the preliminary configuration, but have not been applied.

Basic Configuration Access Control RADIUS SNMP Dynamic DNS Update Certificates Advanced SIParator Type

General

Name of this SIParator:

Default domain:

IP Policy
☒ Discard IP packets
☐ Reject IP packets

DNS Servers [\(Help\)](#)

No.	Dynamic	DNS Name or IP Address	IP Address	Delete Row
1	<input checked="" type="checkbox"/>	8.8.8.8	8.8.8.8	<input type="checkbox"/>
2	<input checked="" type="checkbox"/>	10.85.0.12	10.85.0.12	<input type="checkbox"/>

Add new rows rows.

Save Undo Look up all IP addresses again

Version of Software SIParator/Firewall

Check for new versions of Software SIParator/Firewall: ☐ Yes ☒ No
Date of last successful version check: **Not available**
Software version in use: **5.0.11**

Policy For Ping To the SIParator
☒ Never reply to ping
☐ Only reply to ping to the same interface
☐ Reply to ping to all IP addresses

inGate Page generated for 'admin' 2017-07-13 12:47:25 +0000.
Software SIParator/Firewall 5.0.11. Copyright © 2016 Ingate Systems AB.

Figure 27: Ingate Configuration: Basic Configuration

6.4 Ingate Configuration: Dial Plan

1. Configure Dial Plan as necessary
2. **SIP Traffic > Dial Plan**

SIP Methods	Filtering	Local Registrar	Authentication and Accounting	SIP Accounts	Dial Plan	Routing	Time Classes	SIP Status	IDS/IPS	IDS/IPS Status	SIP Test	SIP Test Status																								
Use Dial Plan (Help) Emergency Number (Help)																																				
<input checked="" type="radio"/> On <input type="text" value="911"/> <input type="radio"/> Off <input type="radio"/> Fallback																																				
Matching From Header (Help)																																				
<table border="1"><thead><tr><th rowspan="2">Name</th><th colspan="2">Use This ...</th><th>... Or This</th><th rowspan="2">Transport</th><th rowspan="2">Network</th><th rowspan="2">Delete Row</th></tr><tr><th>Username</th><th>Domain</th><th>Reg Expr</th></tr></thead><tbody><tr><td>ShoreTel ShoreGear</td><td>*</td><td>*</td><td></td><td>Any</td><td>ShoreTel ShoreGear</td><td><input type="checkbox"/></td></tr><tr><td>WAN</td><td>*</td><td>*</td><td></td><td>Any</td><td>WAN</td><td><input type="checkbox"/></td></tr></tbody></table> Add new rows <input type="text" value="1"/> rows.													Name	Use This Or This	Transport	Network	Delete Row	Username	Domain	Reg Expr	ShoreTel ShoreGear	*	*		Any	ShoreTel ShoreGear	<input type="checkbox"/>	WAN	*	*		Any	WAN	<input type="checkbox"/>
Name	Use This Or This	Transport	Network	Delete Row																														
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ShoreTel ShoreGear	*	*		Any	ShoreTel ShoreGear	<input type="checkbox"/>																														
WAN	*	*		Any	WAN	<input type="checkbox"/>																														
Matching Request-URI (Help)																																				
<table border="1"><thead><tr><th rowspan="2">Name</th><th colspan="5">Use This ...</th><th>... Or This</th></tr><tr><th>Prefix</th><th>Head</th><th>Tail</th><th>Min. Tail</th><th>Domain</th><th>Reg Expr</th></tr></thead><tbody><tr><td>Outbound</td><td></td><td></td><td>-</td><td></td><td></td><td>sip:(.*)@10.65.1.200</td></tr></tbody></table>													Name	Use This Or This	Prefix	Head	Tail	Min. Tail	Domain	Reg Expr	Outbound			-			sip:(.*)@10.65.1.200				
Name	Use This Or This																														
	Prefix	Head	Tail	Min. Tail	Domain	Reg Expr																														
Outbound			-			sip:(.*)@10.65.1.200																														

Figure 28: Ingate Configuration: Dial Plan

Forward To (Help)																																												
<table border="1"><thead><tr><th rowspan="2">Name</th><th rowspan="2">Subno.</th><th>Use This ...</th><th colspan="3">... Or This</th><th>... Or This</th><th>... Or This</th></tr><tr><th>Account</th><th>Replacement Domain</th><th>Port</th><th>Transport</th><th>Reg Expr</th><th>Trunk</th></tr></thead><tbody><tr><td>+ Generic (no regis</td><td>1</td><td>-</td><td></td><td></td><td>-</td><td></td><td>SIP Trunk 1: Generic (no register);ShoreTel ShoreGear</td></tr></tbody></table> Add new rows <input type="text" value="1"/> groups with <input type="text" value="1"/> rows per group.													Name	Subno.	Use This Or This			... Or This	... Or This	Account	Replacement Domain	Port	Transport	Reg Expr	Trunk	+ Generic (no regis	1	-			-		SIP Trunk 1: Generic (no register);ShoreTel ShoreGear										
Name	Subno.	Use This Or This			... Or This	... Or This																																					
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Dial Plan (Help)																																												
<table border="1"><thead><tr><th rowspan="2">No.</th><th rowspan="2">From Header</th><th rowspan="2">Request-URI</th><th rowspan="2">Action</th><th rowspan="2">Forward To</th><th colspan="2">Add Prefix</th><th rowspan="2">ENUM Root</th><th rowspan="2">Time Class</th><th rowspan="2">Com</th></tr><tr><th>Forward</th><th>ENUM</th></tr></thead><tbody><tr><td>1</td><td>ShoreTel ShoreGear</td><td>Outbound</td><td>Forward</td><td>Generic (no register)</td><td></td><td></td><td>-</td><td>-</td><td></td></tr><tr><td>2</td><td>WAN</td><td>-</td><td>Reject</td><td>-</td><td></td><td></td><td>-</td><td>-</td><td></td></tr></tbody></table> Add new rows <input type="text" value="1"/> rows.													No.	From Header	Request-URI	Action	Forward To	Add Prefix		ENUM Root	Time Class	Com	Forward	ENUM	1	ShoreTel ShoreGear	Outbound	Forward	Generic (no register)			-	-		2	WAN	-	Reject	-			-	-	
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Methods in Dial Plan (Help)																																												
The ACK, PRACK, CANCEL, BYE, UPDATE and INFO methods cannot be handled by the Dial Plan.																																												
<table border="1"><thead><tr><th>Method</th><th>Delete Row</th></tr></thead><tbody><tr><td>INVITE</td><td><input type="checkbox"/></td></tr><tr><td>OPTIONS</td><td><input type="checkbox"/></td></tr><tr><td>SUBSCRIBE</td><td><input type="checkbox"/></td></tr><tr><td>MESSAGE</td><td><input type="checkbox"/></td></tr><tr><td>REFER</td><td><input type="checkbox"/></td></tr><tr><td>NOTIFY</td><td><input type="checkbox"/></td></tr></tbody></table>													Method	Delete Row	INVITE	<input type="checkbox"/>	OPTIONS	<input type="checkbox"/>	SUBSCRIBE	<input type="checkbox"/>	MESSAGE	<input type="checkbox"/>	REFER	<input type="checkbox"/>	NOTIFY	<input type="checkbox"/>																		
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MESSAGE	<input type="checkbox"/>																																											
REFER	<input type="checkbox"/>																																											
NOTIFY	<input type="checkbox"/>																																											

REGISTER in Dial Plan (Help)

- ☒ Keep To headers for REGISTER requests passed through the Dial Plan
- ☐ Rewrite To headers for REGISTER requests passed through the Dial Plan

Figure 29: Ingate Configuration: Dial Plan – Cont.

ENUM Root (Help)			
	Name	Subno.	ENUM Root
+	e164.arpa.	1	e164.arpa.
+	e164.org.	1	e164.org.

Figure 30 “Ingate Configuration: Dial Plan (3/3)”

6.5 Ingate Configuration: SIP Trunks

1. Click **Go to SIP Trunk page**
2. Select **WAN** in the dropdown box next to **Restrict to calls from:**
3. Add the correct domain names

The screenshot shows the Ingate SIPinator web interface. At the top, it says "Configured by Ingate SUT TG". Below this is a navigation bar with buttons for Administration, Basic Configuration, Network, SIP Services, SIP Traffic, SIP Trunks (highlighted in red), Failover, Virtual Private Networks, Quality of Service, and Logging and Tools. A message states: "Changes have been made to the preliminary configuration, but have not been applied." Below the message is a "View trunk:" dropdown menu showing "SIP Trunk 1: Generic (no register);ShoreTel ShoreGear" and a "Goto SIP Trunk page" button.

Figure 31: Ingate Configuration: SIP Trunks

The screenshot shows the "SIP Trunk 1" configuration page. It has a "View trunk:" dropdown menu showing "SIP Trunk 1: Generic (no register);ShoreTel ShoreGear" and a "Goto SIP Trunk page" button. The page is divided into two sections: "SIP Trunk 1 (Help)" and "SIP Trunking Service (Help)". Under "SIP Trunk 1 (Help)", there are radio buttons for "Enable SIP Trunk" (selected) and "Disable SIP Trunk". Under "SIP Trunking Service (Help)", there are radio buttons for "Use parameters from other SIP trunk" and "Define SIP trunk parameters" (selected). The "Define SIP trunk parameters" section contains the following fields and options:

- Service name: Generic (no register) (Unique descriptive name)
- Service Provider Domain: sip.nexmo.com (FQDN or IP address)
- Restrict to calls from: WAN (No restriction)
- Outbound Proxy: (FQDN or IP address)
- Use alias IP address: - (Forces this source address from our side)
- Outbound Gateway: - (Use Default Gateway)
- Signaling Transport: - (Automatic)
- Port number: (empty)
- From header domain:
 - Provider domain
 - Enterprise domain
 - External IP address (selected)
 - as entered:
- Host name in Request-URI of incoming calls: nexmo.tekvizionlabs.com (Trunk ID - Domain name)
- Remote Trunk Group Parameters (RFC 4904): (empty)
- Used as: - (Don't use TGP)
- Local Trunk Group Parameters (RFC 4904): (empty)
- Used as: - (Don't use TGP)

Figure 32: Ingate Configuration: SIP Trunks – Cont.

Preserve Max-Forwards:	No	
Relay media for remote users:	No	
Exactly one Via header:	No	
'gin' registration (RFC 6140):	No	
Hide Record-Route:	No	
Show only one To tag:	No	
SIP 3xx redirection to provider domain:	No	
SIP 3xx redirection to caller domain:	No	
Route incoming based on:	Request-URI	
Service Provider domain is trusted:	No	(For P-Asserted-Identity)
Use P-Preferred-Identity:	No	(Instead of P-Asserted-Identity)
Max simultaneous calls:		(Call Admission Control)
Max simultaneous calls per Trunk Line:		

Main Trunk Line (Help)									
No.	Reg	Outgoing Calls			Authentication		Incoming Calls		
		Display Name	User Name	Identity	User ID	Password	Incoming Trunk Match	Forward to	
1	No			2014647035		911236e3	Change Password	2014647035	2014647035

PBX Lines (Help)									
No.	Reg	Outgoing Calls			Authentication		Incoming Calls		
		From PBX Number/User	Display Name	User Name	Identity	User ID	Password	Incoming Trunk Match	Forward to PBX Account
1	No	(*)		\$1			Change Password	(*)	\$1
2	No	anonymous		anonymous@anonymc			Change Password		

Figure 33: Ingate Configuration: SIP Trunks – Cont.

Setup for the PBX (Help)					
<input type="radio"/> Use PBX from other SIP trunk <input checked="" type="radio"/> Define PBX settings					
PBX Name:		ShoreTel ShoreGear (Unique descriptive name)			
Use alias IP address:		- (Forces this source address from our side)			
PBX Registration SIP Address	Authentication		PBX IP Address		PBX Domain Name
	User ID	Password	DNS Name or IP Address	IP Address	
		Change Password	10.65.1.9	10.65.1.9	
(At least one of PBX Registration, IP address or Domain Name is required to locate the PBX)					
PBX Network:		ShoreTel ShoreGear			
Signaling transport:		- ('*' = Automatic)			
Port number:					
Match From Number/User in field:		From URI			
		<input checked="" type="radio"/> Same as Request-URI <input type="radio"/> Copy from Trunk <input type="radio"/> Initial Request-URI <input type="radio"/> as entered:			
To header field:					
Remote Trunk Group Parameters usage:		- ('*' = Don't use TGP)			
Local Trunk Group Parameters usage:		- ('*' = Don't use TGP)			

Figure 34 "Ingate Configuration: SIP Trunks – Cont.

6.6 Configure Numbers in Nexmo Account

1. Login to the Nexmo account using the credentials provided at the time of registration. A **Key** and **Secret** is displayed on the dashboard and can be use as the username and password for Registration SIP Trunks.

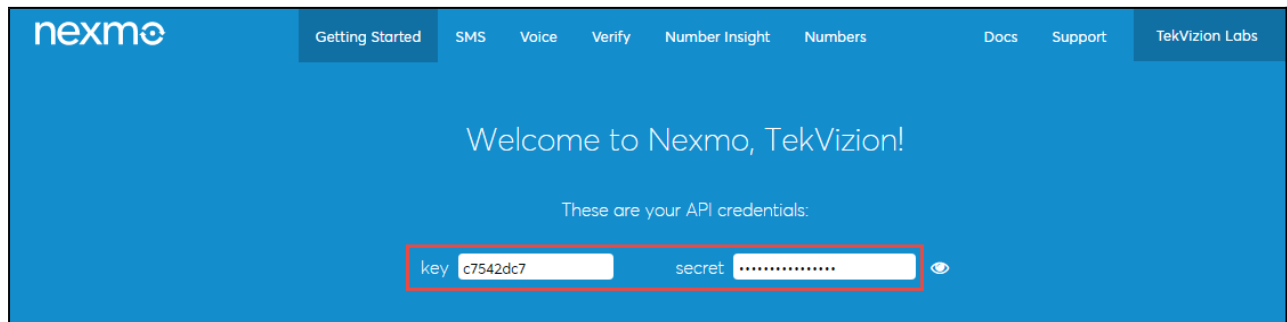


Figure 35: Nexmo Dashboard

2. In order to provide the URL to which the call has to be routed from Nexmo, navigate to the **Numbers** tab
3. Click **Edit** against each number as shown below

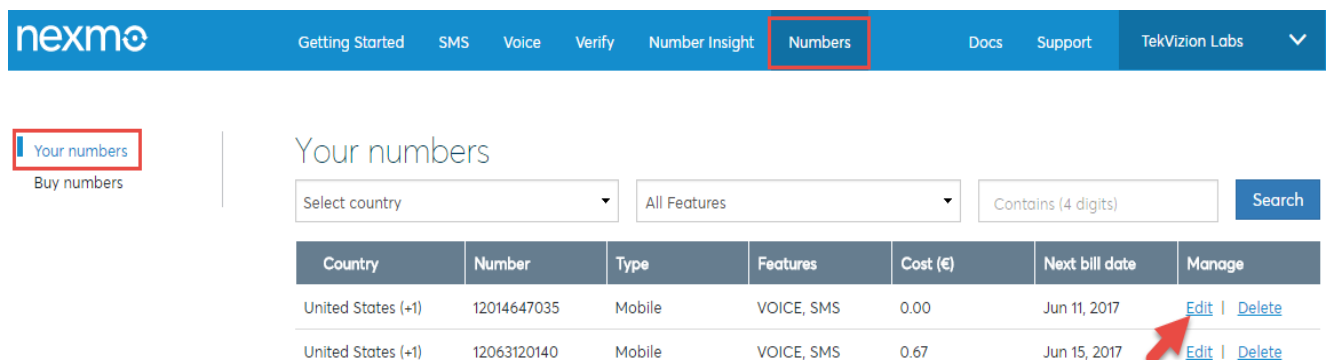


Figure 36: Nexmo DID Numbers

4. A pop-up will be displayed
5. Select **Forward to** and provide the URL to which the calls route
6. Click **Update** to save the changes

Settings for 12014647035

SMS

Webhook URL

Voice

Forward to URL

Forward to SIP 12014647035@nexmo.tekvizionlabs.ı

Status webhook URL

Cancel Update

Figure 37: Your Numbers – Cont.

7 Summary of Tests and Results

N/S = Not Supported N/T= Not Tested N/A= Not Applicable

Test Case #	Test Case Description	Result	Notes
1	Calling Party Disconnects Before Answer	PASS	
2	Calling Party Disconnects After Answer	PASS	
3	Called Party Disconnects After Answer	PASS	
4	Three Way Calling	PASS	
5	Calling Party Presentation Restricted	PASS	
6	Calling Party Disconnect Before Answer	PASS	
7	Calling Party Disconnects after Answer	PASS	
8	Called Party Disconnects after Answer	PASS	
9	Calling Party Receives Busy	PASS	
10	International Outbound Dialing	Failed	Nexmo responds to the Invite with a 404 not found
11	Outbound Call Forward Always	PASS	
12	Outbound Call Forward Not Available (Ring No Answer)	PASS	
13	Outbound Consultative Call Transfer	PASS	
14	Outbound Semi-Attended/Blind Call Transfer	PASS	
15	Outbound Call Hold	PASS	
16	Terminate Early Media Outbound Call Before Answer	PASS	
17	Early Media Forward Call	PASS	
18	Outbound, Wait for Session Audit	PASS	
19	Inbound, Wait for Session Audit	PASS	
20	Outbound DTMF (RTPevent)	PASS	
21	Inbound DTMF(RTPevent)	PASS	