



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.

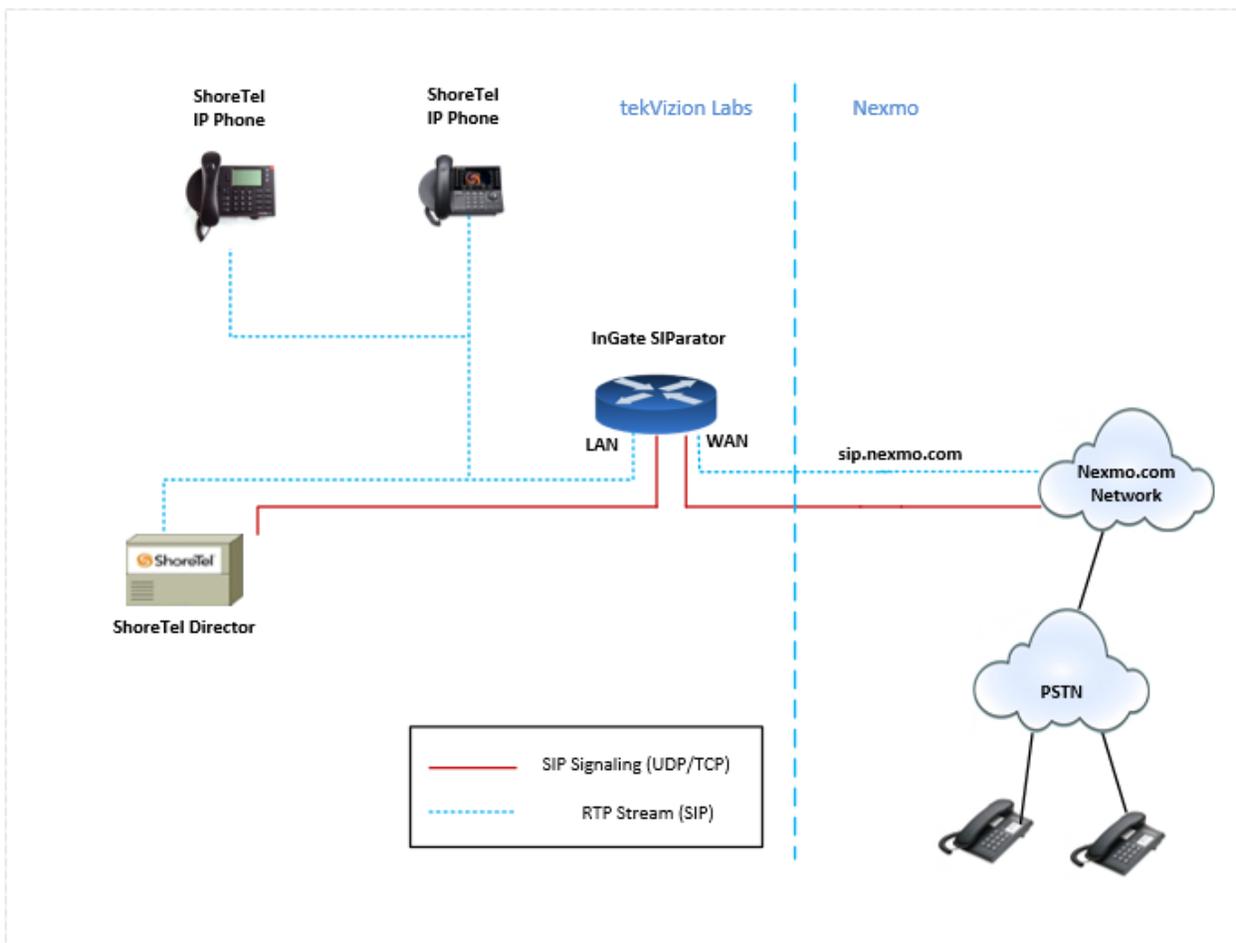


Figure 1: Topology Diagram

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 SIParator		
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	

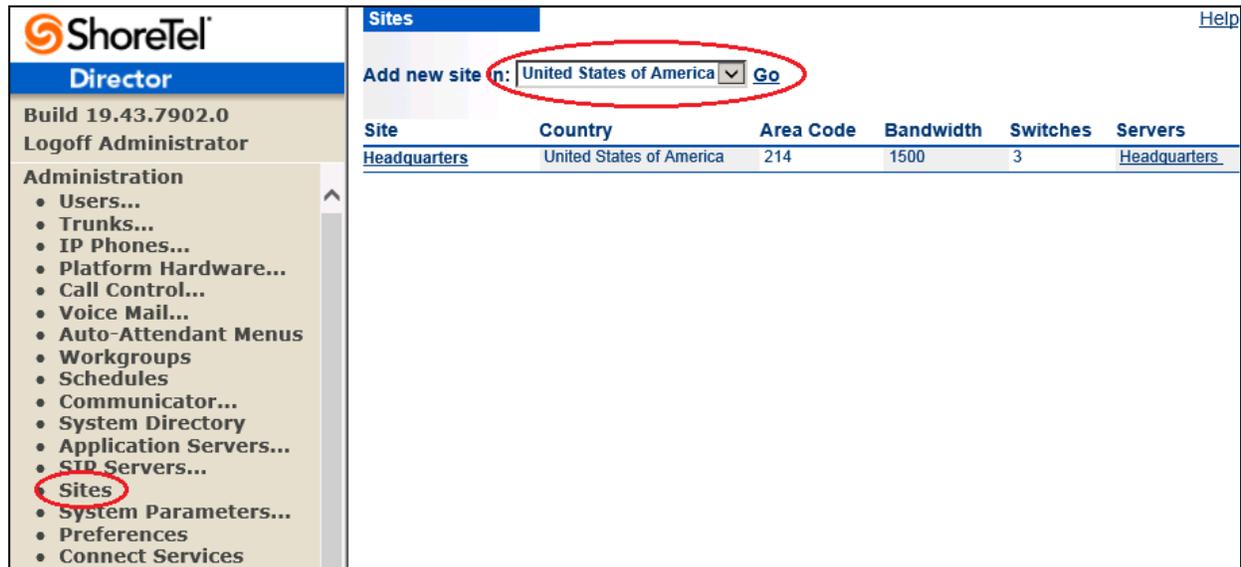
5 ShoreTel Configuration: ShoreWare Director 14.2



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 Administration interface. On the left, the 'Administration' menu is visible, with 'Sites' highlighted and circled in red. The main content area is titled 'Sites' and features a table of existing sites and a form to add a new site. The table has columns for Site, Country, Area Code, Bandwidth, Switches, and Servers. The existing site is 'Headquarters' with a Country of 'United States of America', Area Code of '214', Bandwidth of '1500', and 3 Switches. The 'Add new site' form includes a dropdown menu for 'Country' set to 'United States of America' and a 'Go' button, both circled in red.

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		Help
Edit Site		<input type="button" value="New"/> <input type="button" value="Copy"/> <input type="button" value="Save"/> <input type="button" value="Delete"/> <input type="button" value="Reset"/>
Edit this record		Refresh this page
Name:	<input type="text" value="Headquarters"/>	
Service Appliance Conference Backup Site:	<None> ▾	
Country:	United States of America ▾	
Language:	English(US) ▾	
Parent:	Top of Tree	
<input type="checkbox"/> Use Parent As Proxy		
Local Area Code:	<input type="text" value="206"/>	
Additional Local Area Codes:	<input type="button" value="Edit"/>	
Caller's Emergency Service Identification (CESID):	<input type="text"/> (e.g. +1 (408) 331-3300)	
Time Zone:	(UTC-06:00) Central America, Central America Standard Time ▾	
Night Bell Extension:	<input type="text"/>	
Night Bell Switch:	None ▾ Edit Night Bell Call Handling	
Paging Extension:	<input type="text"/>	
Paging Switch:	None ▾	
Operator Extension:	<input type="text"/> <input type="button" value="Search"/>	
FAX Redirect Extension:	<input type="text"/> <input type="button" value="Search"/>	
SMTP Relay:	<input type="text"/> <input type="button" value="Ping"/>	
Network Time Protocol Server:	<input type="text"/>	
Bandwidth:		
Admission Control Bandwidth:	<input type="text" value="1024"/> kbps	
Intra-Site Calls:	Nexmo ▾	
Inter-Site Calls:	Nexmo ▾	
FAX and Modem Calls:	Fax Codecs — Low Bandwidth Passthrough ▾	
SIP Proxy:		
Virtual IP Address:	<input type="text"/>	
Proxy Switch 1:	SG90 ▾	
Proxy Switch 2:	None ▾	

Figure 4: ShoreTel Configuration: Configure Site – Cont.

5.2 ShoreTel Configuration: Codec Lists

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

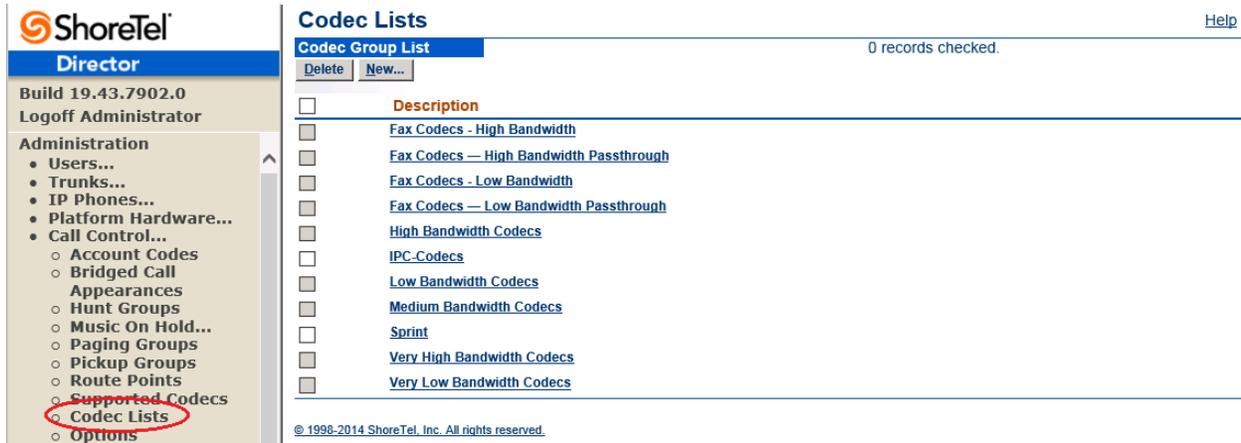


Figure 5: ShoreTel Configuration: Configuring Codecs

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

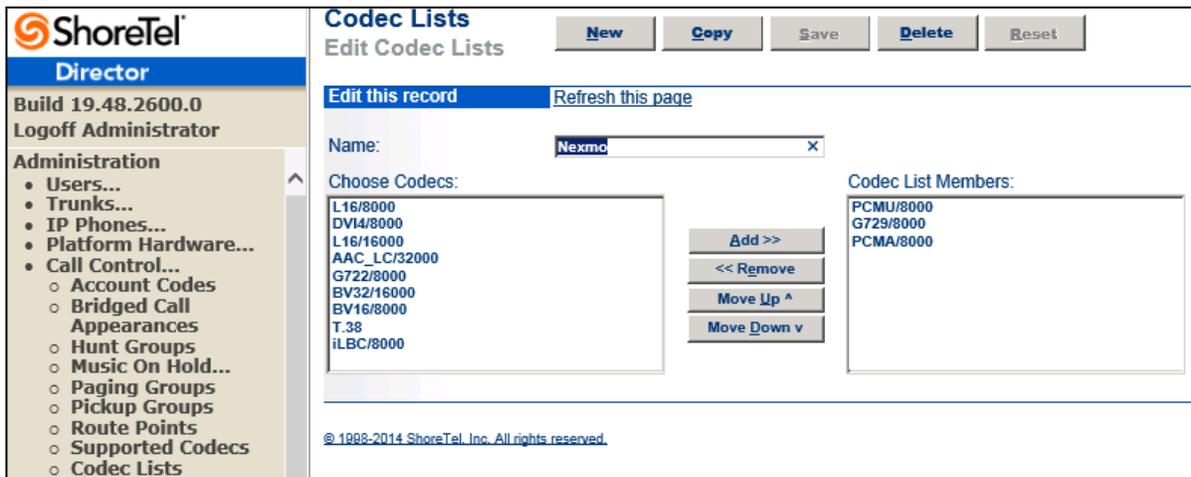


Figure 6: ShoreTel Configuration: Configuring Codecs – Cont.

5.3 ShoreTel Configuration: SIP Profiles

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

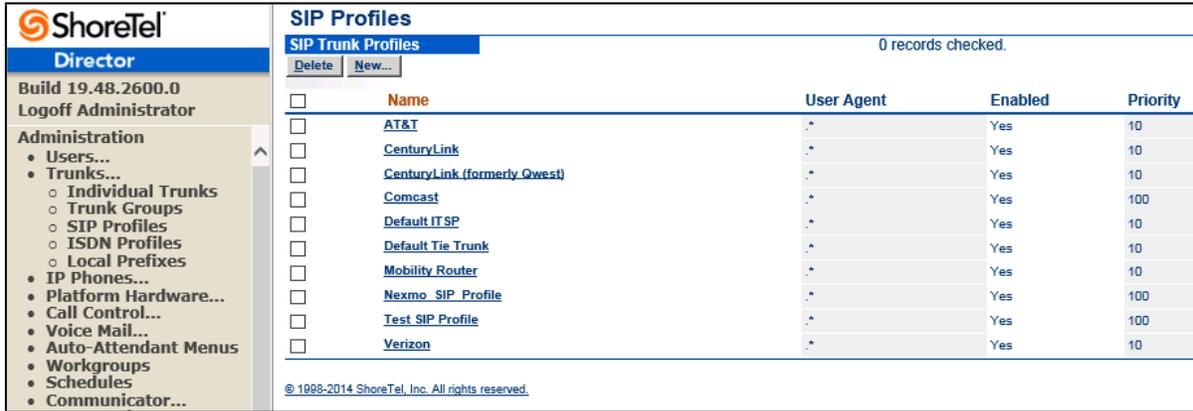


Figure 7: ShoreTel Configuration: Creating SIP Profile

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

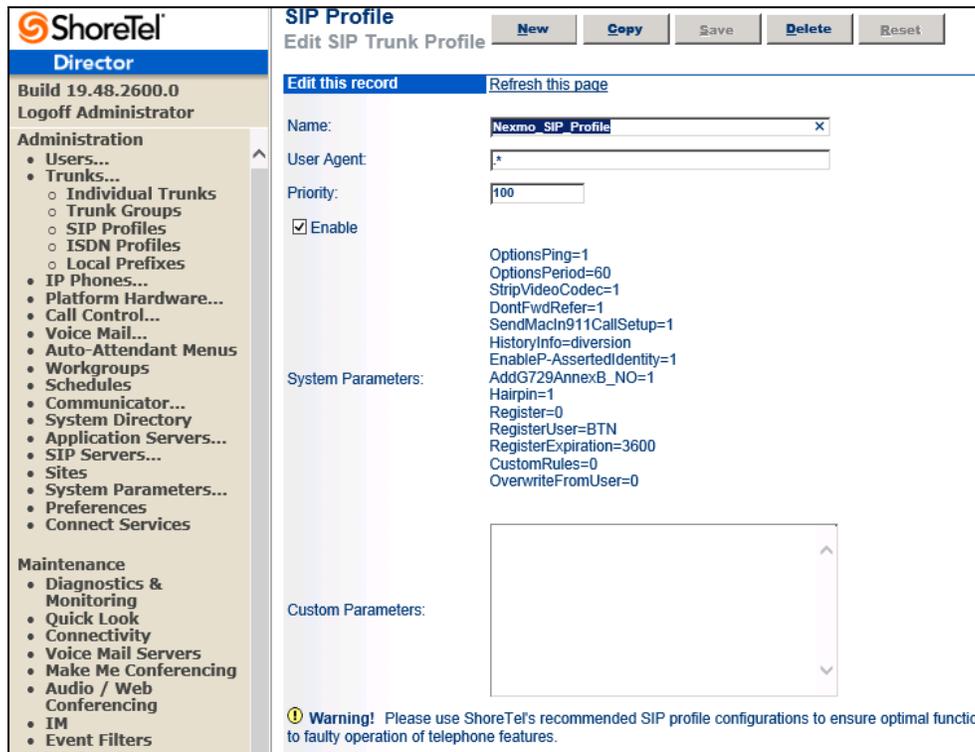


Figure 8: ShoreTel Configuration: Creating SIP Profile – Cont.

5.4 ShoreTel Configuration: Configure Trunk Groups

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



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	
Edit SIP Trunk Group	
<input type="button" value="New"/> <input type="button" value="Copy"/> <input type="button" value="Save"/> <input type="button" value="Delete"/>	
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:
Inbound:	
Number of Digits from CO:	11
<input checked="" type="checkbox"/> DNIS	<input type="button" value="Edit DNIS Map"/>
<input checked="" type="checkbox"/> DID	<input type="button" value="Edit DID Range"/>
<input type="checkbox"/> Extension	
<input checked="" type="radio"/> Translation Table: <None> ▼	
<input type="radio"/> Prepend Dial In Prefix: _____	
<input type="radio"/> Use Site Extension Prefix	
<input type="checkbox"/> Tandem Trunking	
User Group:	Anonymous Telephones ▼
Prepend Dial In Prefix:	_____
Destination:	700 : Default <input type="button" value="Search"/>
<input checked="" type="checkbox"/> Outbound:	
Network Call Routing:	
Access Code:	9
Local Area Code:	206
Additional Local Area Codes:	<input type="button" value="Edit"/>
Nearby Area Codes:	<input type="button" value="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:

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:

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...
 - Individual Trunks
 - Trunk Groups
 - SIP Profiles
 - ISDN Profiles
 - Local Prefixes

DID Range [Help](#)
NexmoGrp

[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 Digits 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

Permissions

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

Edit User Group

Edit this record Refresh this page

Name: NexmoUserGrp

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

COS - Call Permissions: No Restrictions [Go to this Class of Service](#)

COS - Voice Mail: Small Mail Box [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: Disabled

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: None

Music on Hold: ShoreTel

User Profile:

Toolbar 1: <None> [Go to this Toolbar](#)

Toolbar 2: <None> [Go to this Toolbar](#)

Toolbar 3: <None> [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**

Trunks by Group

Add new trunk at site: in trunk group:

Show page: 6 Records per page

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

Trunks

Edit Trunk

Edit this record

Site: Headquarters

Trunk Group: NexmoGrp

Name:

Switch:

IP Address:

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**

The screenshot shows the ShoreTel Director interface. On the left is a navigation menu with 'Individual Users' selected. The main area is titled 'Individual Users' and contains a form to 'Add new user at site' with a dropdown menu set to 'Headquarters' and a 'Go' button. Below this is a table showing a list of users:

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**

The screenshot shows the 'Users' configuration page in ShoreTel. The 'General' tab is selected, and the 'Edit User' form is displayed. The fields are filled with the following information:

- First Name: user1
- Last Name: nexmo
- Number: 164
- License Type: Extension and Mailbox
- Access License: Personal
- Caller ID: +1 (206) 312-0140
- DID Range: +12063120140 (0 of 1 available NexmoGrp)
- DID Number: +12063120140
- PSTN Failover: None
- User Group: NexmoUserGrp
- Site: Headquarters
- Language: English(US)
- Primary Phone Port: IP Phones (00-10-49-45-62-33)
- Current Port: 00-10-49-45-62-33

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:

Client Password:

Voice Mail Password: Must Change On Next Login

SIP Password:

Email Address:

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**

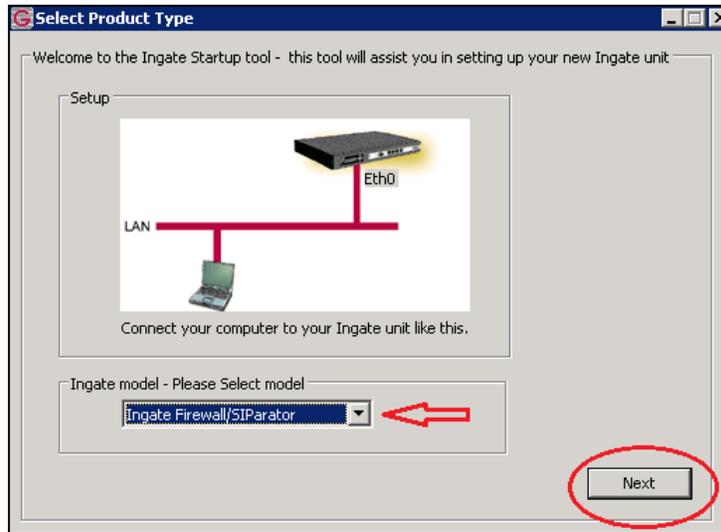


Figure 20: Ingate Configuration: Ingate Startup Tool

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

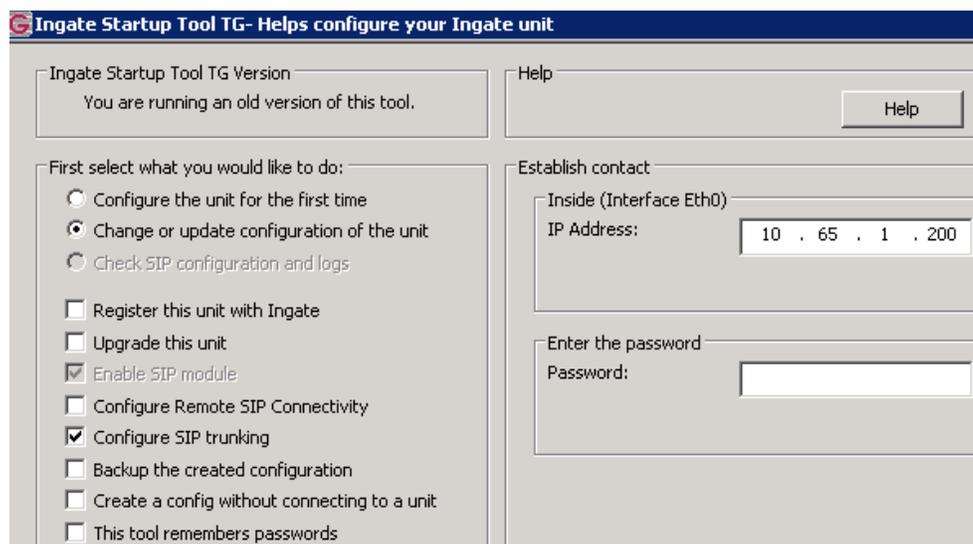


Figure 21: Ingate Configuration: Ingate Startup Tool – Cont.

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

The screenshot shows the 'Ingate Startup Tool TG' interface with the 'Network Topology' tab selected. The configuration is for a DMZ SIParator. The IP address is 10.65.1.200 and the netmask is 255.255.255.0. The LAN IP address range is 192.65.79.160 to 192.65.79.128. The gateway is 192.65.79.129. The 'Use NATing firewall' checkbox is unchecked. The DNS server primary is 8.8.8.8 and the secondary is 10.85.0.12. A network diagram on the right shows an Ingate SIParator connected to a LAN with an IP-PBX and to a DMZ with an existing firewall, which is connected to the Internet.

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

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' interface with the 'IP-PBX' tab selected. The configuration is for a ShoreTel ShoreGear IP-PBX. The IP address is 10.65.1.9. The 'Use domain name' checkbox is unchecked. The SIP Domain field is empty.

IP-PBX (should be located on the LAN)

Type: **ShoreTel ShoreGear**

IP Address: 10 . 65 . 1 . 9

Use domain name

SIP Domain:

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

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

Network Topology | IP-PBX | ITSP_1 | Upload Configuration

Name:

Provider address
 IP Address:
 Use domain name

Advanced
 Prefix to match and remove from incoming calls
 Prefix:
 Prefix to add to outgoing calls
 Prefix:

DID (start of range) (user name):
 DID range size:
 PBX local numbers (start of range) (same as DID if empty):

Account authentication
 Authentication
 Authentication name: (same as DID if empty)
 Increment authentication name for ranges
 Password:

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

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

Network Topology | IP-PBX | ITSP_1 | Upload Configuration

Disclaimer
 Please note that this tool generates basic settings for the Ingate product. Further configuration of the Ingate product and the PBX may be required in order to ensure interoperability and security in a specific installation.
 For technical assistance regarding end-to-end interoperability issues, please contact support@ingate.com.

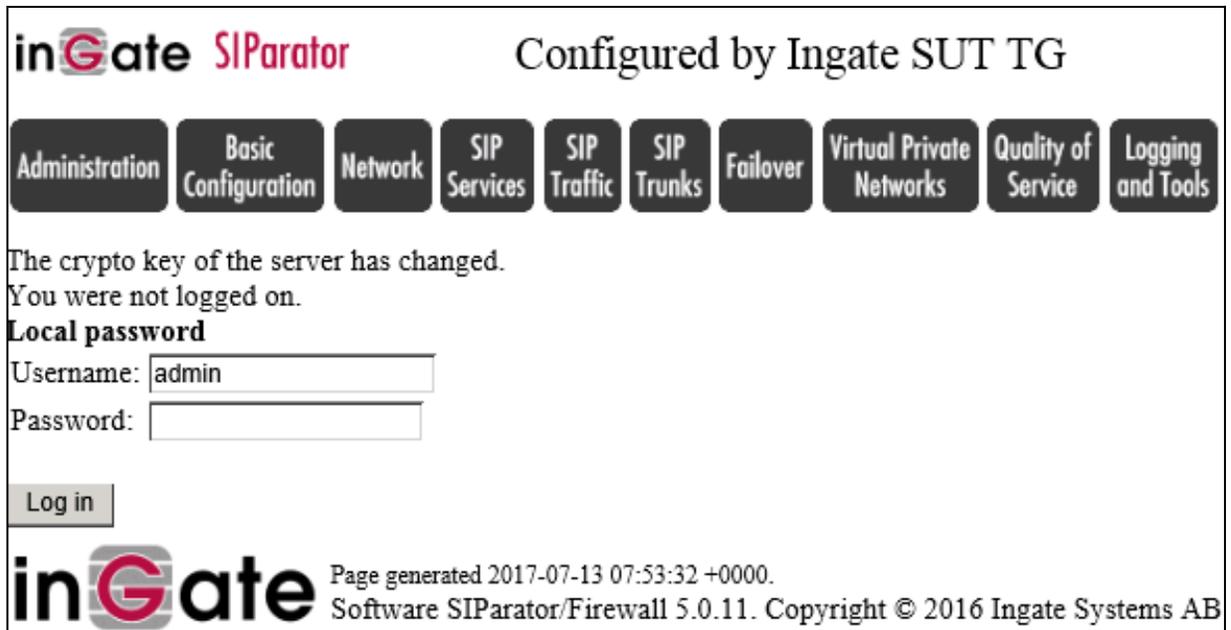
Verbose Logging (SIP debug)
 Enable

Final step
 Logon to web GUI and apply settings
 Apply settings directly using serial interface
 Backup the configuration

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 shows the Ingate SIParator web interface. At the top left is the logo "inGate SIParator" and at the top right is the text "Configured by Ingate SUT TG". Below this is a horizontal navigation menu with ten buttons: "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 reads: "The crypto key of the server has changed. You were not logged on." Underneath, the text "Local password" is followed by a "Username:" label and a text input field containing "admin". Below that is a "Password:" label and an empty password input field. A "Log in" button is positioned below the password field. At the bottom left is the "inGate" logo, and at the bottom right is the footer text: "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



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

The screenshot shows the 'Basic Configuration' page. The top navigation bar includes 'Basic Configuration' (highlighted), 'Access Control', 'RADIUS', 'SNMP', 'Dynamic DNS Update', 'Certificates', 'Advanced', and 'SIParator Type'. The main content area is divided into several sections:

- General**: Includes 'Name of this SIParator:' (text input: 'Configured by In...'), 'Default domain:' (text input: '.'), and 'Version of Software SIParator/Firewall' (radio buttons: 'Yes' and 'No', with 'No' selected).
- IP Policy**: Includes 'Discard IP packets' (radio button, selected) and 'Reject IP packets' (radio button, unselected).
- Policy For Ping To the SIParator**: Includes 'Never reply to ping' (radio button, selected), 'Only reply to ping to the same interface' (radio button, unselected), and 'Reply to ping to all IP addresses' (radio button, unselected).
- DNS Servers (Help)**: A table with columns 'No.', 'Dynamic', 'DNS Name or IP Address', 'IP Address', and 'Delete Row'. It contains two rows of data.

At the bottom, there is an 'Add new rows' button with a text input '1' and the text 'rows.', and a 'Save' button.

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

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																																												
<p>Use Dial Plan (Help) Emergency Number (Help)</p> <p> <input checked="" type="radio"/> On <input type="text" value="911"/> <input type="radio"/> Off <input type="radio"/> Fallback </p> <p>Matching From Header (Help)</p> <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 ShoreC</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> <p>Add new rows <input type="text" value="1"/> rows.</p> <p>Matching Request-URI (Help)</p> <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	Transport	Network	Delete Row	Username	Domain	Reg Expr	ShoreTel ShoreC	*	*		Any	ShoreTel ShoreGear	<input type="checkbox"/>	WAN	*	*		Any	WAN	<input type="checkbox"/>	Name	Use This Or This	Prefix	Head	Tail	Min. Tail	Domain	Reg Expr	Outbound						sip.(.*)@10.65.1.200
Name	Use This Or This	Transport	Network	Delete Row																																																		
	Username	Domain	Reg Expr																																																					
ShoreTel ShoreC	*	*		Any	ShoreTel ShoreGear	<input type="checkbox"/>																																																		
WAN	*	*		Any	WAN	<input type="checkbox"/>																																																		
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									
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		<input checked="" type="checkbox"/>

Add new rows groups with rows per group.

No.	From Header	Request-URI	Action	Forward To	Add Prefix		ENUM Root	Time Class	Con
					Forward	ENUM			
1	ShoreTel ShoreGear	Outbound	Forward	Generic (no register)			-	-	
2	WAN	-	Reject	-			-	-	

Add new rows rows.

Methods in Dial Plan (Help)

The ACK, PRACK, CANCEL, BYE, UPDATE and INFO methods cannot be handled by the Dial Plan.

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"/>

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			
Name	Subno.	ENUM Root	Delete Row
+ e164.arpa.	1	e164.arpa.	<input type="checkbox"/>
+ e164.org.	1	e164.org.	<input type="checkbox"/>

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

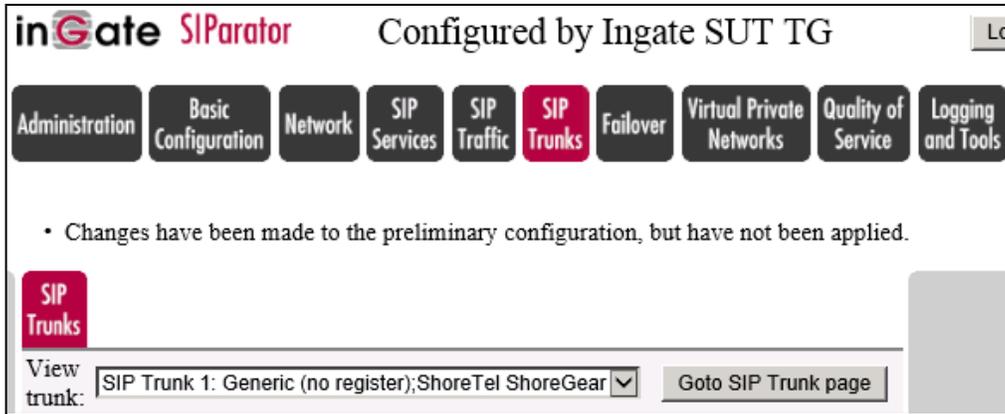


Figure 31: Ingate Configuration: SIP Trunks

The screenshot shows the detailed configuration page for "SIP Trunk 1". At the top, it says "View trunk: SIP Trunk 1: Generic (no register);ShoreTel ShoreGear" and has a "Goto SIP Trunk page" button. The configuration is organized into sections:

- SIP Trunk 1 (Help)**
 - Enable SIP Trunk
 - Disable SIP Trunk
- SIP Trunking Service (Help)**
 - Use parameters from other SIP trunk
 - Define SIP trunk parameters

Configuration fields include:

- 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
 - 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:
 Service Provider domain is trusted: No *(For P-Asserted-Identity)*
 Use P-Preferred-Identity: No *(Instead of P-Asserted-Identity)*
 Max simultaneous calls:
 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	<input type="checkbox"/> 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	<input type="checkbox"/> No	(*)		\$1			Change Password	(*)	\$1
2	<input type="checkbox"/> No	anonymous		anonymous@anonymc			Change Password		

Figure 33: Ingate Configuration: SIP Trunks – Cont.

Setup for the PBX [\(Help\)](#)

Use PBX from other SIP trunk
 Define PBX settings

PBX Name: *(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:
 Signaling transport: *('-' = Automatic)*
 Port number:
 Match From Number/User in field:
 Same as Request-URI
 Copy from Trunk
 Initial Request-URI
 as entered:

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.

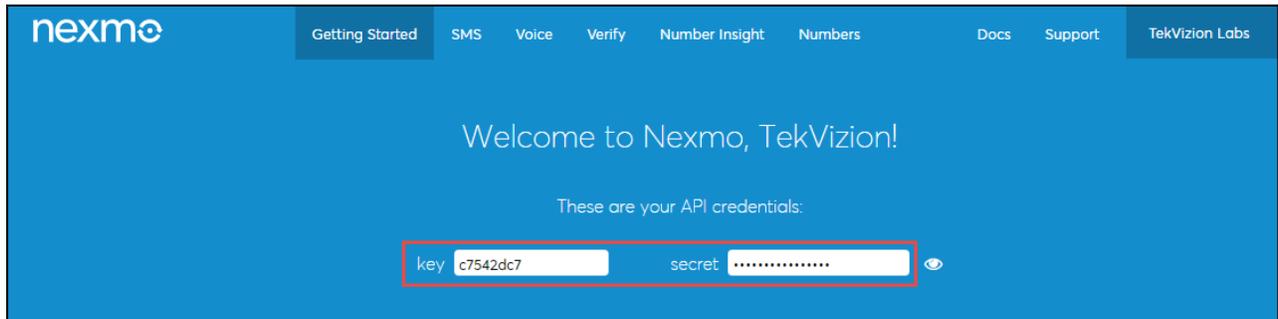


Figure 35: Nexmo Dashboard

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

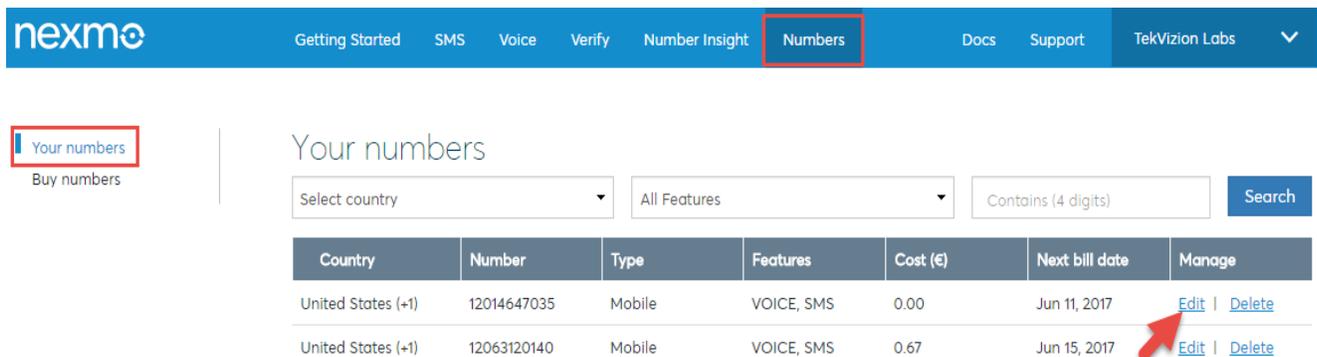


Figure 36: Nexmo DID Numbers

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.†

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	