# Spectrum Enterprise SIP Trunking Service
# Avaya (Nortel) BCM50 Firmware 10.0.1.52.176
# IP PBX Configuration Guide

About Spectrum Enterprise:

Spectrum Enterprise is a division of Charter Communications following a merger with Time Warner Cable and acquisition of Bright House Networks. Spectrum Enterprise is a national provider of scalable, fiber technology solutions. The Spectrum Enterprise portfolio includes networking and managed services solutions, including Internet access, Ethernet and Managed Network Services, Voice, TV and Cloud solutions. Our industry-leading team of experts works closely with clients to achieve greater business success.

About this document:

Spectrum Enterprise assures IP PBX compatibility by conducting interoperability testing to ensure any potential compatibility issues have been resolved prior to installation. Please review the IP PBX configuration instructions in this guide prior to your installation date.

Be advised that this document may contain references to Time Warner Cable Business Class. All references to Time Warner Cable Business Class, TWCBC or TWC should be read as Spectrum Enterprise.

**Thank you,**

**Spectrum Enterprise**

## Document Purpose and Target Audience

This document will serve as a reference guide to configure the Avaya BCM 50 IP PBX to interoperate with Time Warner Cable (TWC) SIP Trunk Service.

**This guide is not intended to be a replacement of the PBX manufacture's user or configuration guide. It is intended to provide additional guidance on configuring the PBX in preparation to receive voice service from the SIP Trunk. It provides detailed instructions and best practices for a successful installation with TWC SIP Trunks.**

There are many options for establishing and maintaining service using the Avaya BCM 50 series. This guide focuses on the minimum configurations essential for successful interoperability with Time Warner Cable Business Class SIP Trunks.

This configuration guide is based on:

**Customer Premise Equipment:**

| | |
|---|---|
| Model | Avaya BCM 50 |
| Firmware | 10.0.1.52.16<br><br>Business Element Mgr v.62.0.3 |

**TWC Network Equipment:**

| | |
|---|---|
| ESG | InnoMedia ESBC 9378-4B |

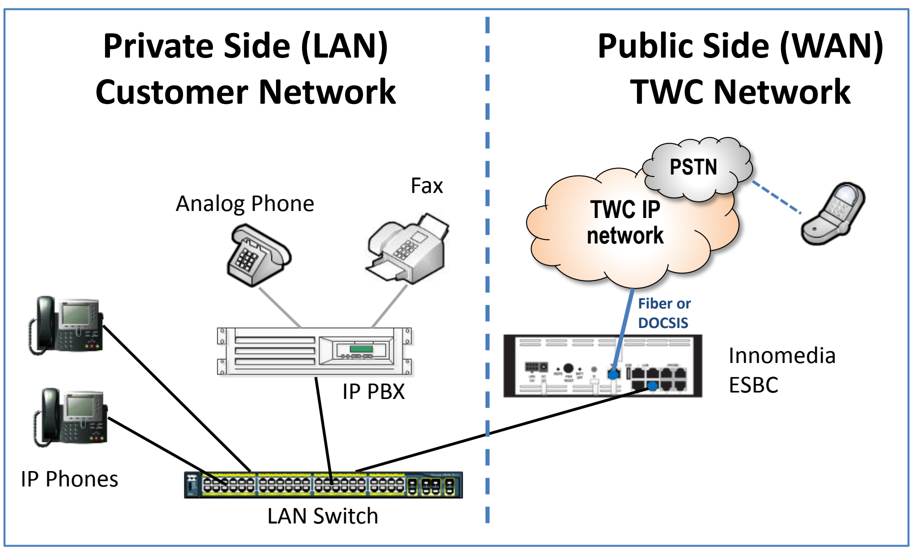
## SIP Trunk Components

The Time Warner Cable Business Class (TWCBC) SIP Trunks product is an IP-based, voice only trunk that uses Session Initiation Protocol (SIP) to connect an IP PBX to the PSTN. The IP PBX uses SIP to exchange signaling information with the service provider and to deliver and receive voice in IP packets.

The IP PBX is connected to the TWC Enterprise SIP Gateway (ESG), which provides network access for voice traffic. The customer is responsible for the LAN infrastructure and configuration, including the physical connection to the LAN port 2 on the ESG.

The ESG is the demarcation point to the TWC network. The ESG is connected to a dedicated router for SIP Trunks delivered over a fiber connection or to a cable modem when delivered over a DOCSIS connection.

SIP Trunk components located on the customer premise, including connections to the TWC network, are illustrated below.




All TWC SIP Trunk calls are routed over Time Warner Cable's IP network and are not routed over the public internet.

## Getting Started

You will need to have the TWC "**SIP Trunk Questionnaire**" and "**Business Class (BC) SIP Trunks: Customer Cut Sheet**" in order to configure your IP PBX for TWC Business Class SIP Trunk service.

Confirm that your **IP PBX model number and software versions** recorded on the **Customer Cut Sheet** match those associated with your current equipment. If they do not, be sure to alert your TWC sales engineer or TWC project manager as this can impact how TWC designs your service configuration.

***Example*** **from** ***Customer Cut Sheet for Cisco UC 560***:

| SERVICE INFORMATION | |
|---|---|
| PRODUCT | Business Class SIP TRUNK |
| IP-PBX MAKE | Cisco |
| IP-PBX MODEL | UC560 |
| IP-PBX SOFTWARE VERSION | 15.1(4) |

While configuring your IP PBX for BC SIP Trunk service, you will need to know your Lead Telephone Number and the IP address of your IP PBX.

The **Lead Number** is confirmed on the **Customer Cut Sheet** as seen below:

| Trunk Groups | | | | |
|---|---|---|---|---|
| TWC TRUNK Group ID | DID Range | Lead Number | Inbound Call Blocking | Outbound Call Blocking |

The **IP Address** of the IP PBX was recorded on the **SIP Trunk Questionnaire**, Section 5. Signaling and Media as shown below:

| 5- Signaling and Media | | |
|---|---|---|
| IP Address for PBX or SBC<br>To setup LAN configuration for signaling of voice traffic to the ESG | IP: xxx.xxx.xxx.xxx<br>Subnet: 255.255.xxx.xxx | |

This document is intended as an aid to help configure a customer's IP PBX for interoperability with TWCBC SIP Trunk Service.

## BCM Configurations

The instructions provided in this section are intended to configure the Avaya BCM50 to connect to the TWC ESG. They are not intended for advanced functionality setups. It is further assumed that there is a working knowledge of BCM Operations.

Once logged into the BCM50 GUI as an Administrator, follow these steps to configure SIP Trunk Service.

## BCM50 Version

Check version and patches – the following version and patches are using during IOT

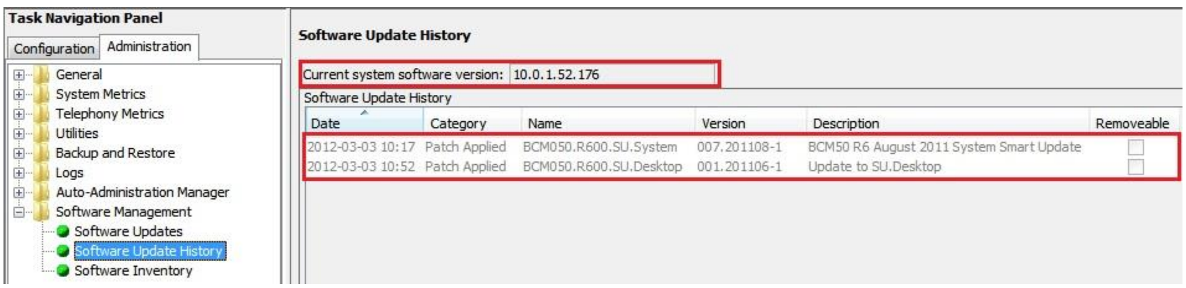



**Figure 1** Avaya BCM50 Version Information

## BCM50 Settings

- Click "**General Settings**" tab under **Configuration → System → IP Subsystem**

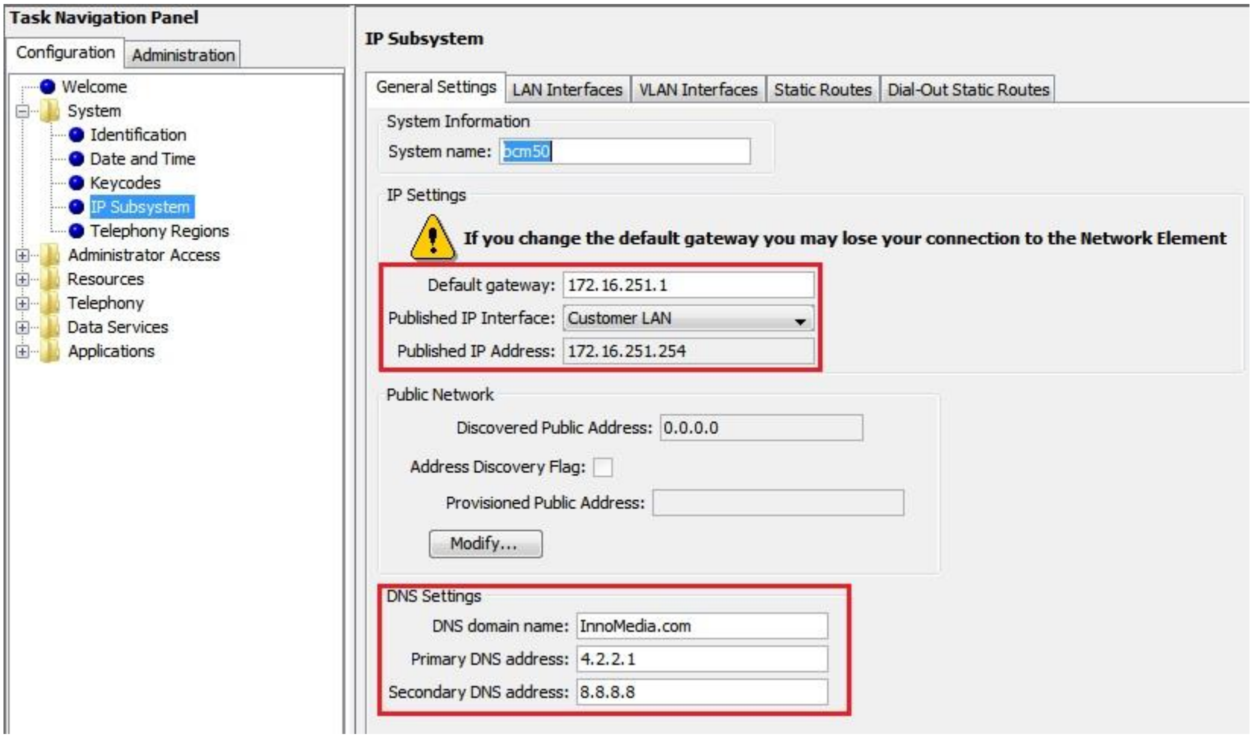



**Figure 2** BCM50 IP System Settings-1

- Click "**LAN Interfaces**" tab under **Configuration → System → IP Subsystem**, and edit IP address.

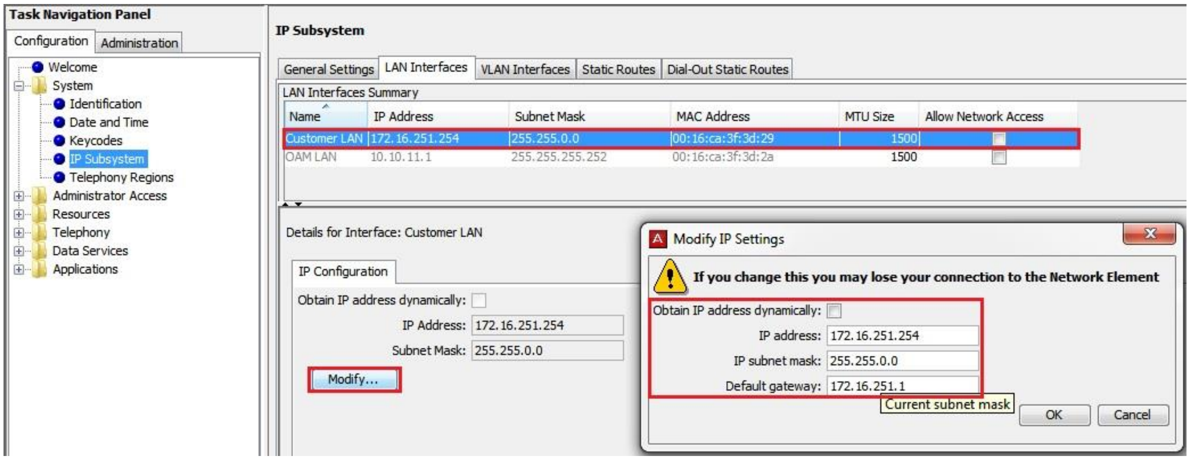



**Figure 3** BCM50 IP System Settings-2

## BCM50 SIP Trunk LIcense

### *Check license*

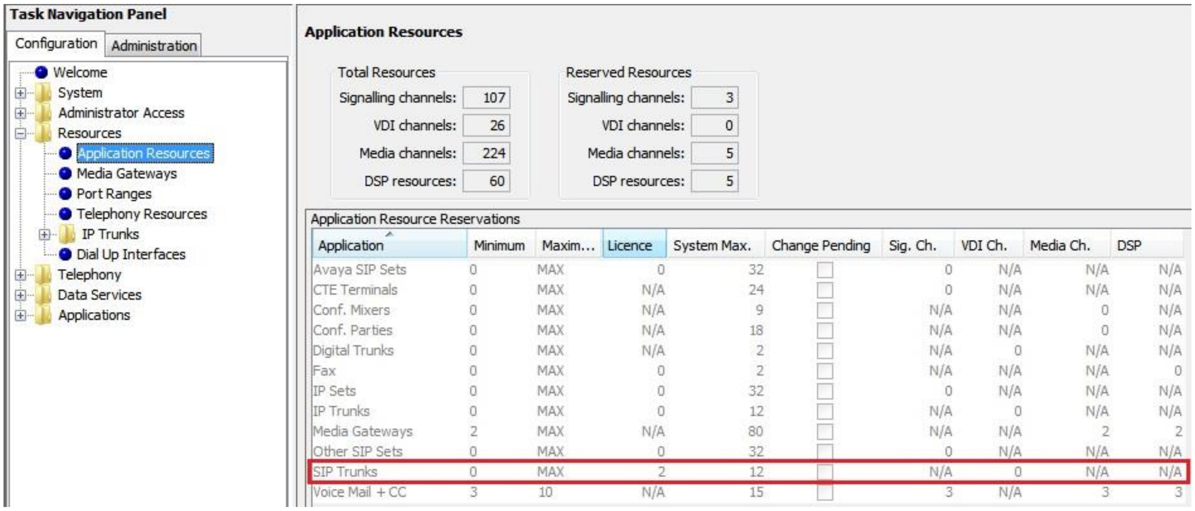



**Figure 4** BCM50 SIP License Information

## Provision SIP Trunk

A SIP Trunk is created on BCM50 to use pilot number registering to the ESG. In our LAB example, the trunk description is "ESBC" and the Proxy IP address is 172.16.251.1.

- Click "**Global Settings**" tab under **Configuration → Resources → IP Trunks → SIP Trunking**


**Figure 5** SIP Trunking Configuration-1

- Click "**Global Settings**" tab under **Configuration → Resources → IP Trunks → SIP Trunking**

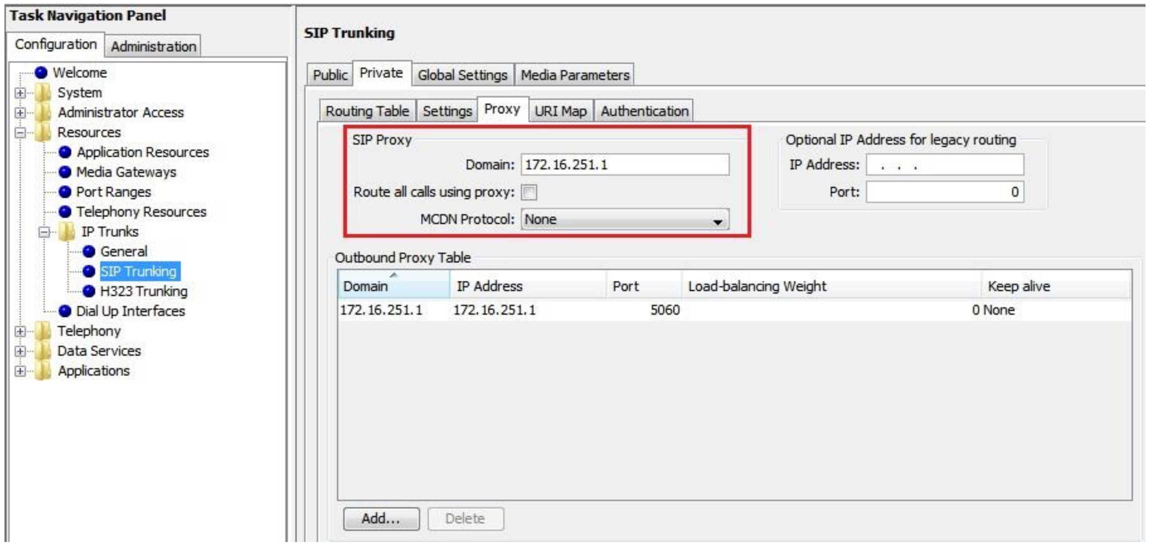



**Figure 6** SIP Trunking Configuration-1

## Configure SIP Trunk Accounts and Authentication Credential

For challenges received on SIP trunks (from the ESG), i.e., when BCM50 acts as user agent, you configure a SIP realm, which includes the realm (SIP Domain), username (device or application user), and digest credentials. To add or update a SIP Realm, perform the following procedure:

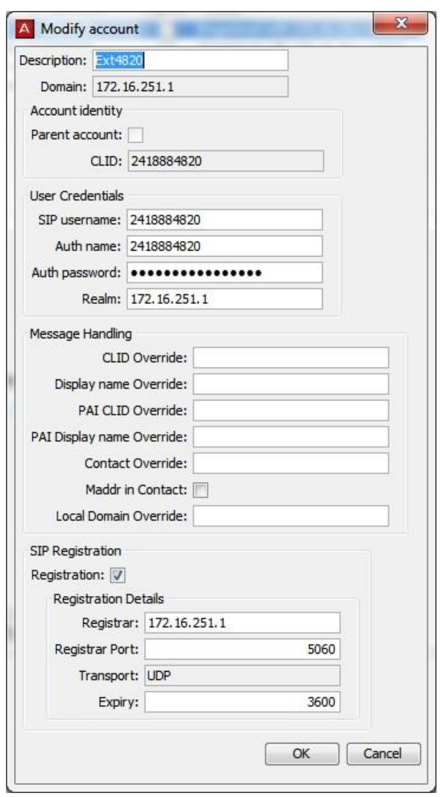



**Figure 7** Configuration SIP Accounts and Credentials-1

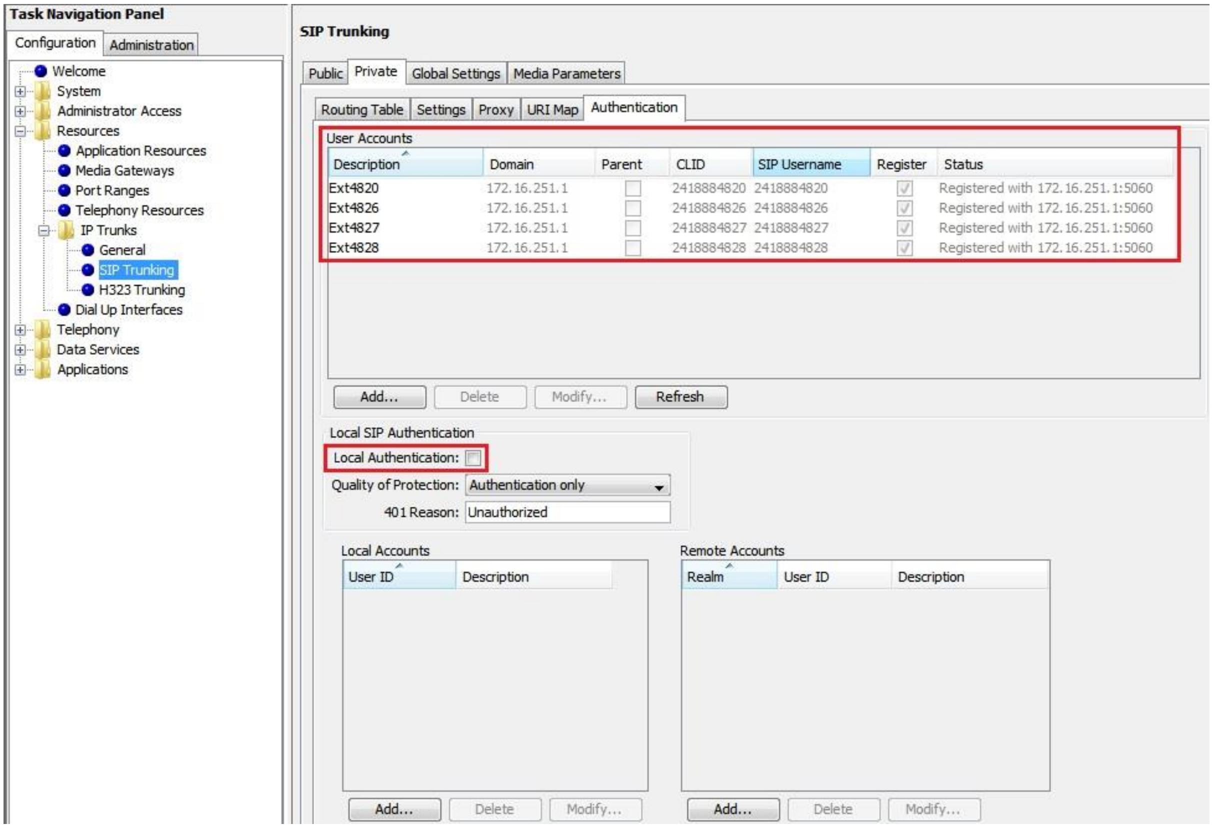



**Figure 8** SIP Trunking Configuration-2

## Setup Routes

- Selected "**BlocA**" under **Configuration** → **Telephony** → **Dialing Plan** → "**Line Pools**" →"**DNs**" tab. Add DNs to BlocA

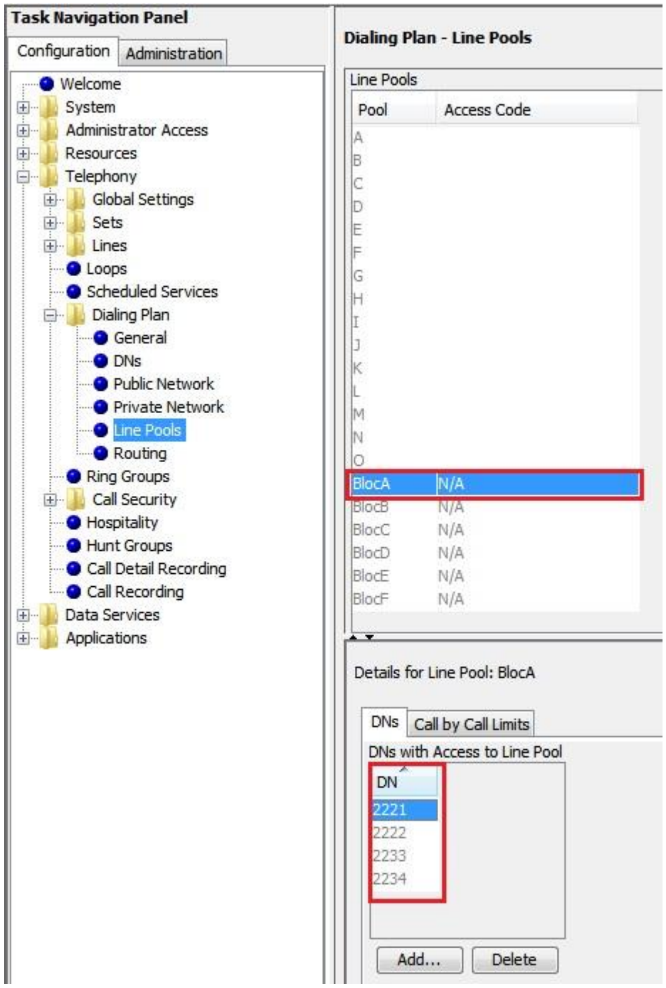



**Figure 9** Setup Routes

- Define the DN length to 4 digits under **Configuration→Telephony→Dialing Plan → General**.

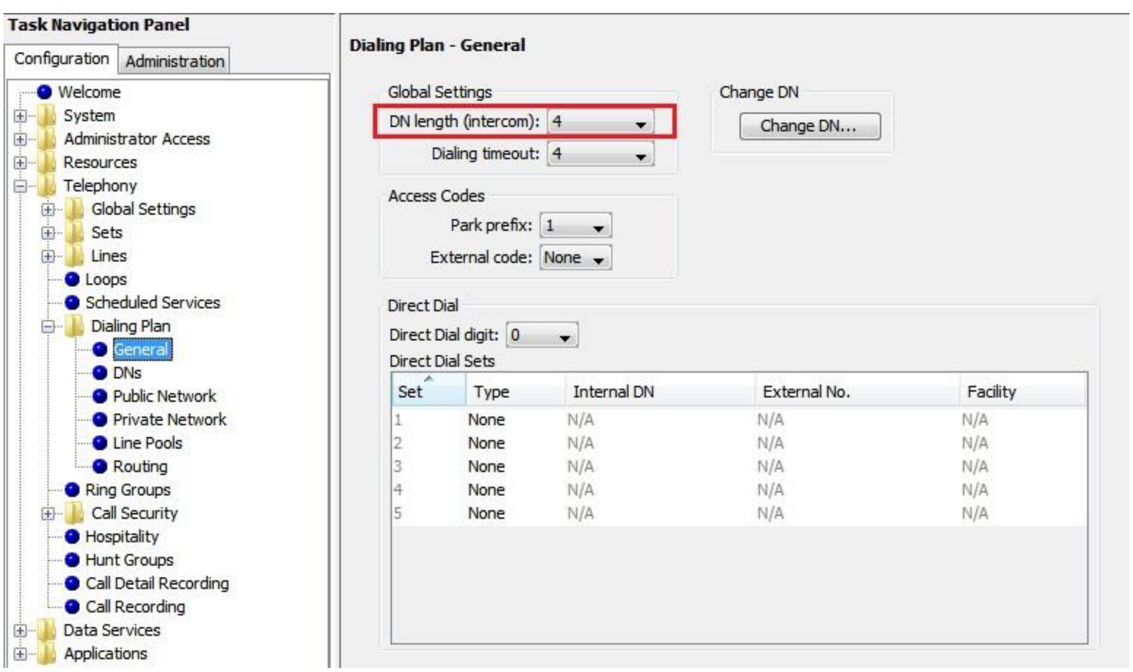


**Figure 10 Setup** Dial Plan-1

- Define the Public Received number length to "**4**" digits and Public network dialing plan to "**National**" under **Configuration → Telephony → Dialing Plan → Public Network**

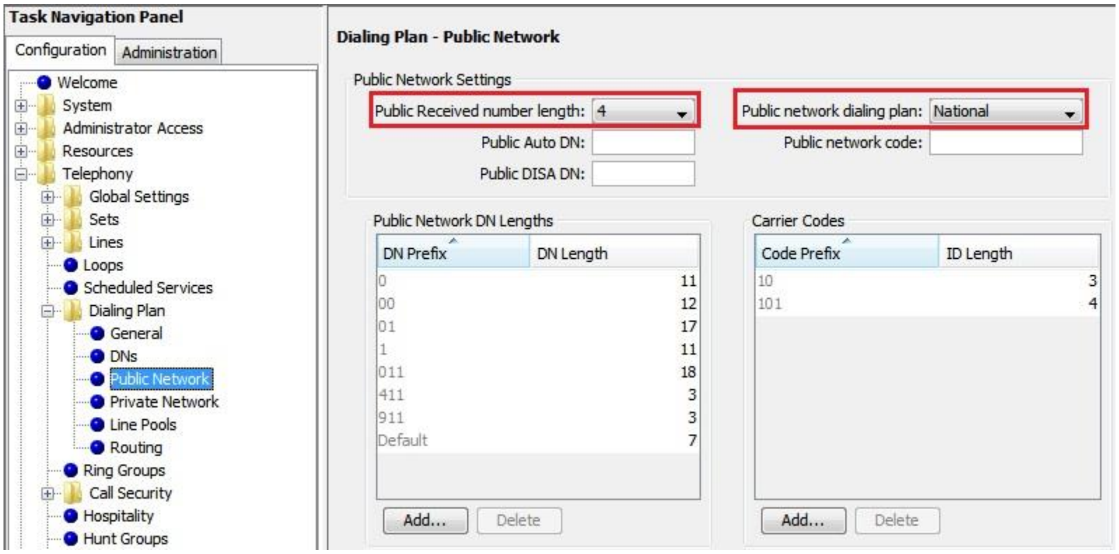


**Figure 11** Dial Plan-2

- Define the Private Received number length to "**4**" digits Under **Configuration → Telephony → Dialing Plan → Private Network**

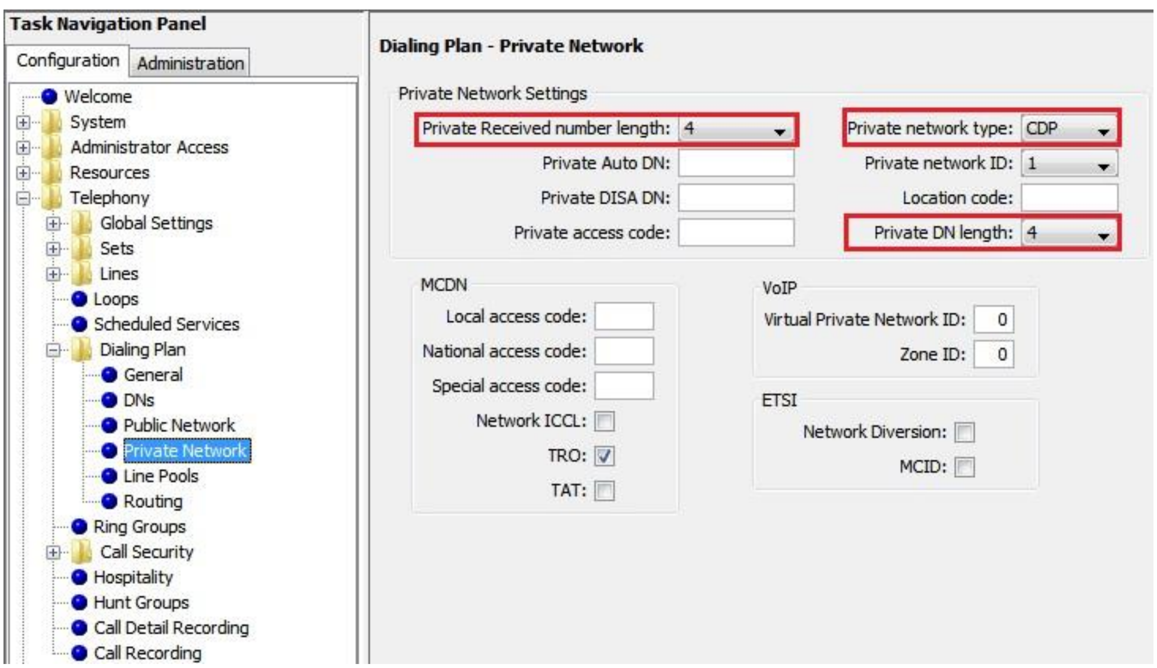


**Figure 12** Dial Plan-3

## Media Parameters

- Select module type "**IP Trunks**", click on the "**SIP Media Parameters**" tab under **Configuration → Resources → Telephony Resources**, select CODECs for provided voice service as well as packet time.

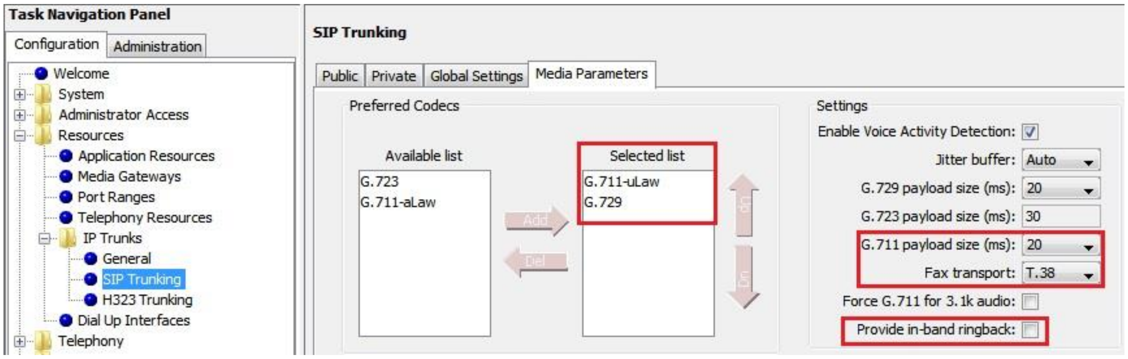



**Figure 13** Configuring Media Parameters

## SIP URI Map

- Select module type "**URI Map**" tab, clear "e.164/National" field under **Configuration → Resources → Telephony → Resources → SIP Trunking** and "**Private**" tab, select CODECs for provided voice service as well as packet time.

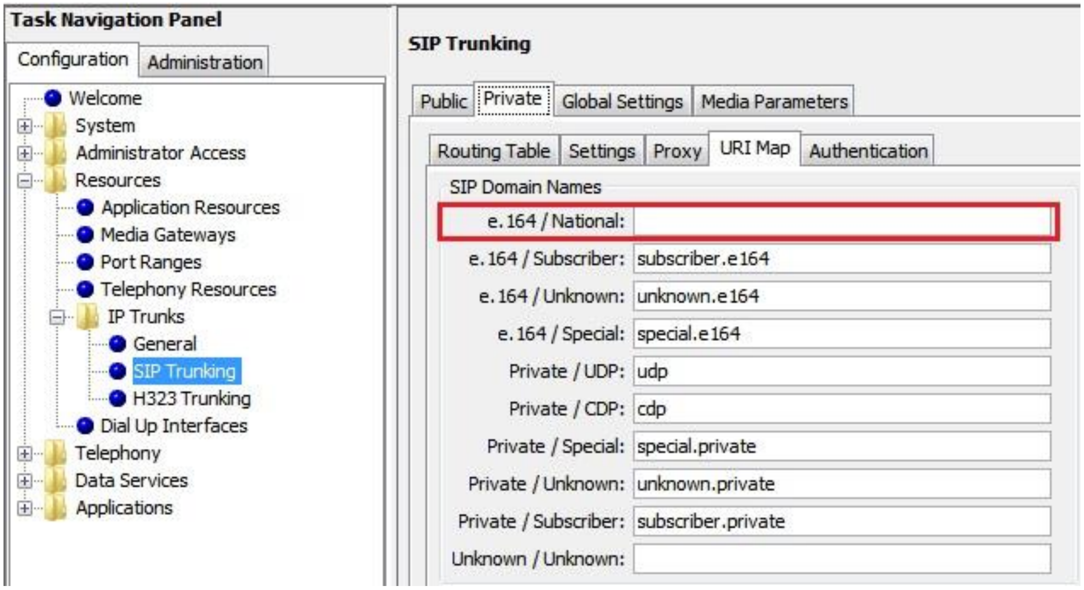



**Figure 14** Configuring SIP URI Map-1

- Select **Configuration → Telephony → Dialing Plan → Routing →** "**Routes**" tab, add route "**001**". Edit route "**001**" column "**Use Pool**" entry to "**BlocA**." and the "**DN type**" column to "**National**".

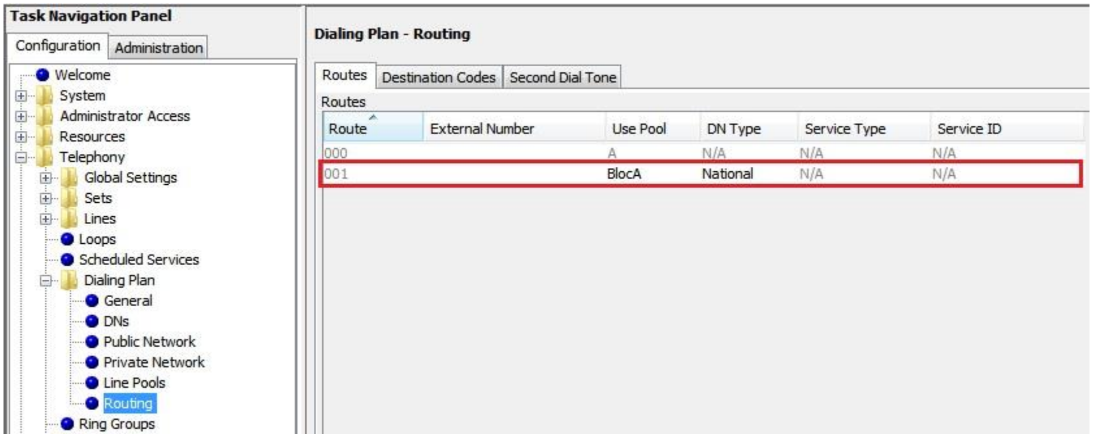



**Figure 15** Dial Plan-Routes-1

- Select the "**Destination Codes**" tab to assign a destination code for the IP trunks Under **Configuration → Telephony → Dialing Plan → Routing**. Configure a destination code "**9**" to access outside (IP off-net) calls.

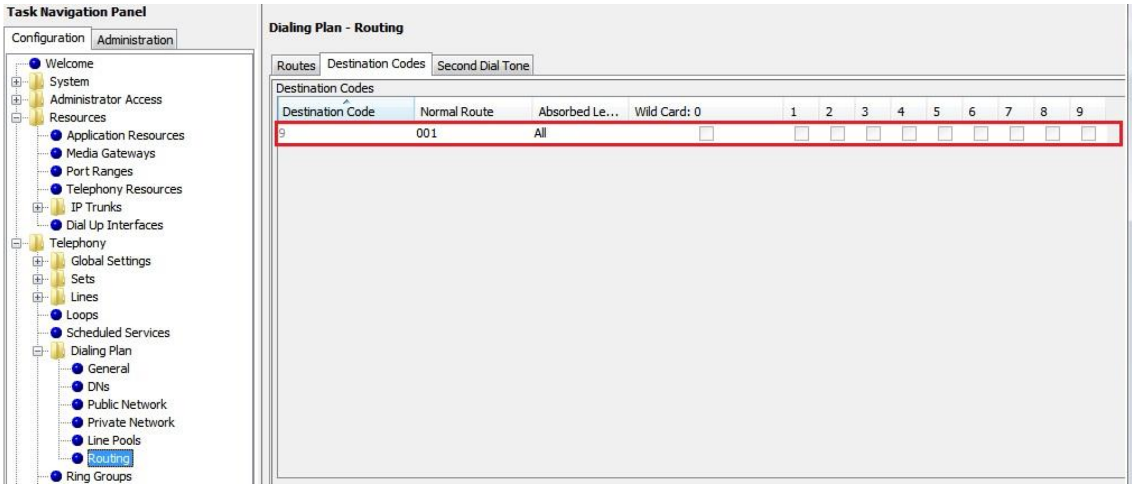
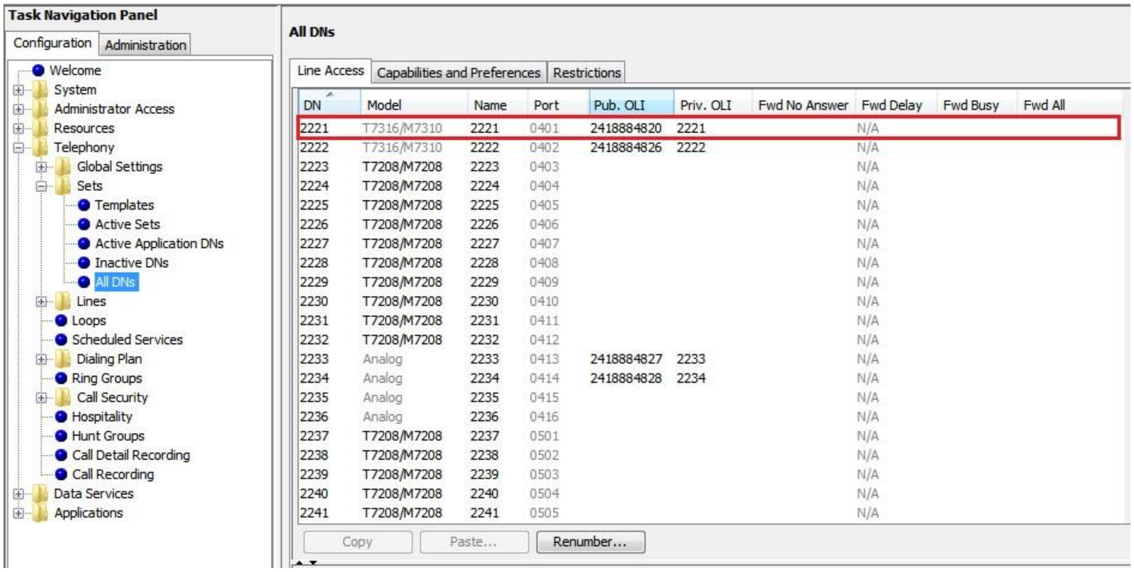



**Figure 16** Dial Plan-Routes-2

## Configure Outgoing Calls from BCM50

- Associate a private DN number with a DID number under **Configuration → Telephony → Sets → All DNs.** Enter in the "**Private OLI**" field with a DN and in the "**Public OLI**" field with a DID. This enables "calling number translation" (outgoing) for this particular DN number as illustrated in the figure below.

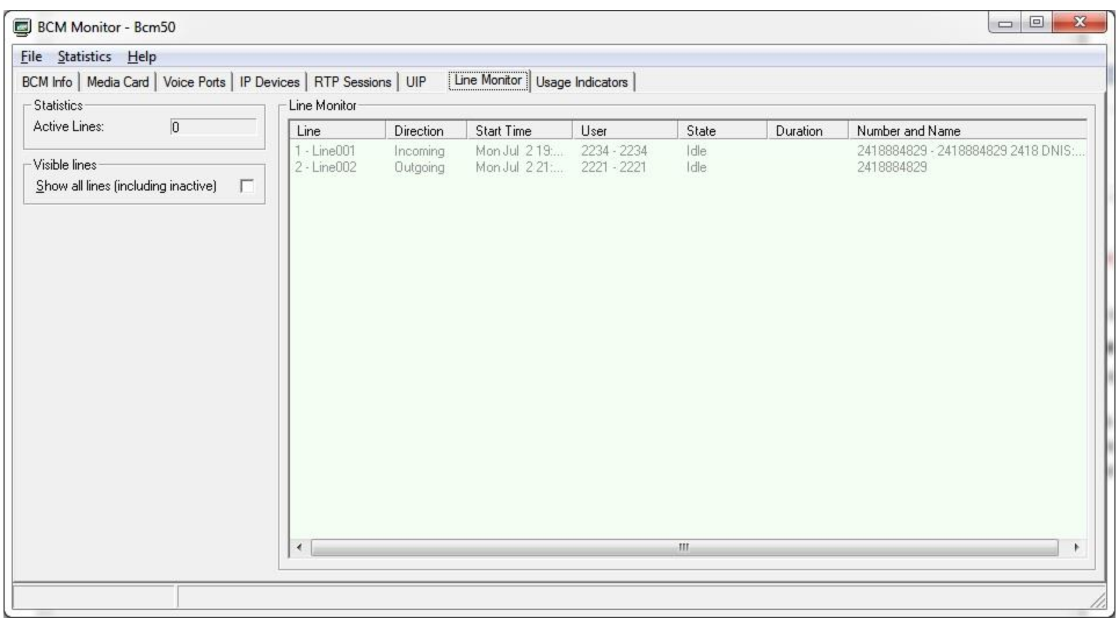



| DN | Model | Name | Port | Pub. OLI | Priv. OLI | Fwd No Answer | Fwd Delay | Fwd Busy | Fwd All |
|---|---|---|---|---|---|---|---|---|---|
| 2221 | T7316/M7310 | 2221 | 0401 | 2418884820 | 2221 | | N/A | | |
| 2222 | T7316/M7310 | 2222 | 0402 | 2418884826 | 2222 | | N/A | | |
| 2223 | T7208/M7208 | 2223 | 0403 | | | | N/A | | |
| 2224 | T7208/M7208 | 2224 | 0404 | | | | N/A | | |
| 2225 | T7208/M7208 | 2225 | 0405 | | | | N/A | | |
| 2226 | T7208/M7208 | 2226 | 0406 | | | | N/A | | |
| 2227 | T7208/M7208 | 2227 | 0407 | | | | N/A | | |
| 2228 | T7208/M7208 | 2228 | 0408 | | | | N/A | | |
| 2229 | T7208/M7208 | 2229 | 0409 | | | | N/A | | |
| 2230 | T7208/M7208 | 2230 | 0410 | | | | N/A | | |
| 2231 | T7208/M7208 | 2231 | 0411 | | | | N/A | | |
| 2232 | T7208/M7208 | 2232 | 0412 | | | | N/A | | |
| 2233 | Analog | 2233 | 0413 | 2418884827 | 2233 | | N/A | | |
| 2234 | Analog | 2234 | 0414 | 2418884828 | 2234 | | N/A | | |
| 2235 | Analog | 2235 | 0415 | | | | N/A | | |
| 2236 | Analog | 2236 | 0416 | | | | N/A | | |
| 2237 | T7208/M7208 | 2237 | 0501 | | | | N/A | | |
| 2238 | T7208/M7208 | 2238 | 0502 | | | | N/A | | |
| 2239 | T7208/M7208 | 2239 | 0503 | | | | N/A | | |
| 2240 | T7208/M7208 | 2240 | 0504 | | | | N/A | | |
| 2241 | T7208/M7208 | 2241 | 0505 | | | | N/A | | |

**Figure 17** Configuring Outgoing Calls: calling number translation

## BCM Monitor

Use Line Monitor from the provided BCM Monitor Utility monitor incoming or outgoing calls.




| Line | Direction | Start Time | User | State | Duration | Number and Name |
|---|---|---|---|---|---|---|
| 1 - Line001 | Incoming | Mon Jul 2 19:... | 2234 - 2234 | Idle | | 2418884829 - 2418884829 2418 DNIS:... |
| 2 - Line002 | Outgoing | Mon Jul 2 21:... | 2221 - 2221 | Idle | | 2418884829 |

**Figure 18** Monitoring inbound and outbound calls on BCM50 admin GUI

## Configure Incoming Calls from the ESG

### *Line Assignment and Access*

- Click “**Line Assignment**” tab under **Configuration → Telephony → Sets → All DNs** to configure the “called number translation” (incoming) for a DN number  Add line of a DN in “**Line Assignment**”. Enter the DN selected in “**Line Access**” in the “**Priv. Received #**” field, and the last four digits of the DID (Public number) in the “**Pub. Received #**”. Incoming DID calls will be routed to telephones, based on the trailing portion of the digits received by the network. The BCM50 will route the call using the last four digits, e.g. 3478.

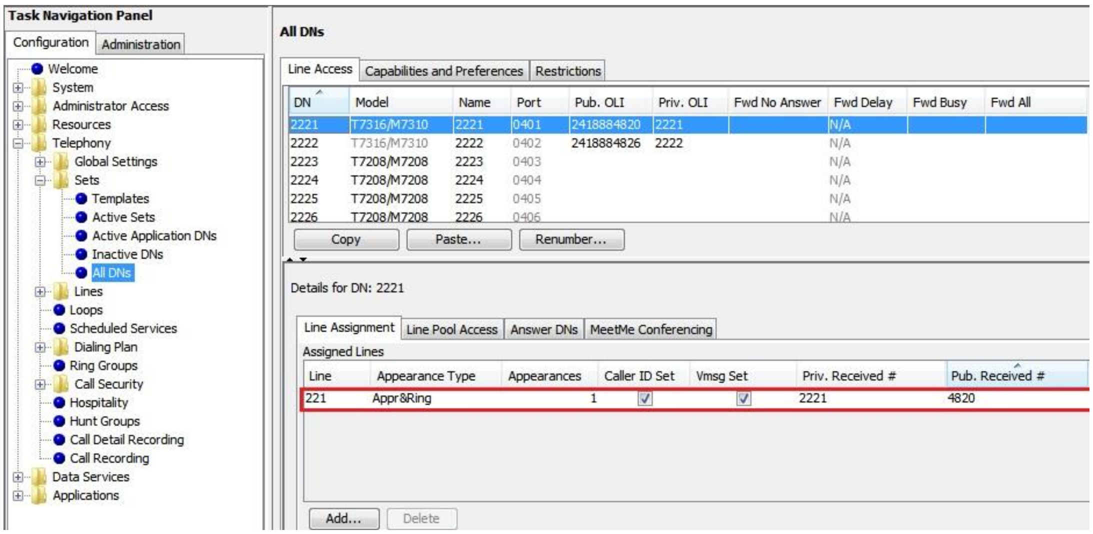


**Figure 19** Line Assignment and Access-1

### *Target Lines*

- Click “**Assigned DNs**” tab and assign a DN to the selected “**Line**” number of the DN desired to program under **Configuration→ Telephony →Lines → Target Lines.** To display the DID number on the IP phone LCD screen, enter DID number in the “**Name**” field “**Target Lines**”.

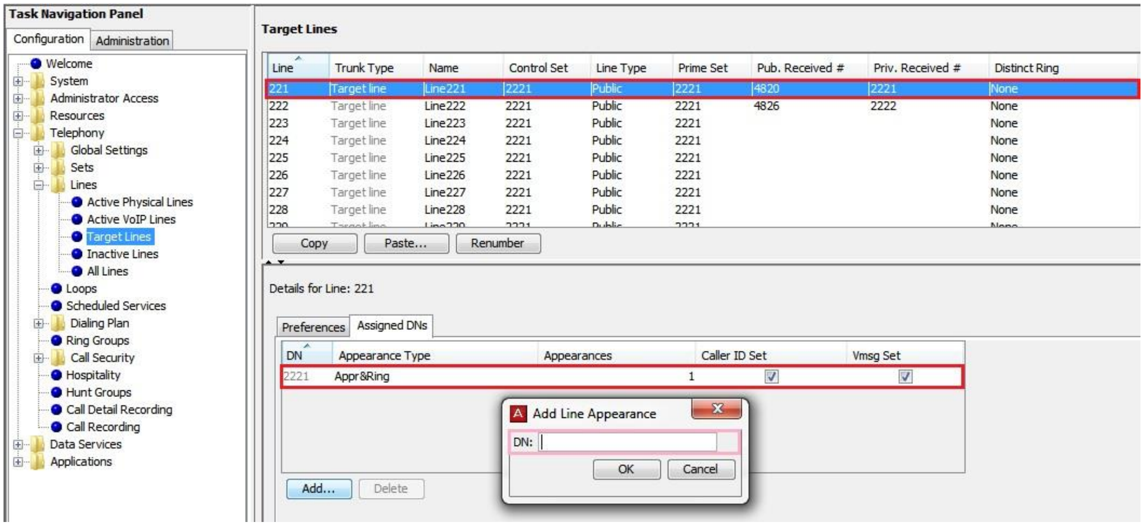



**Figure 20** Line Assignment and Access-2

### *Line Pool*

- Click “**Line Pool Access**” tab under **Configuration → Telephony → Active Sets** and “**Line Access**” tab on the top and. Then add “**BlocA**” as configured in route previously. All telephone sets need to be configured with the designated “**Line Pool” code** in order to access the VoIP.

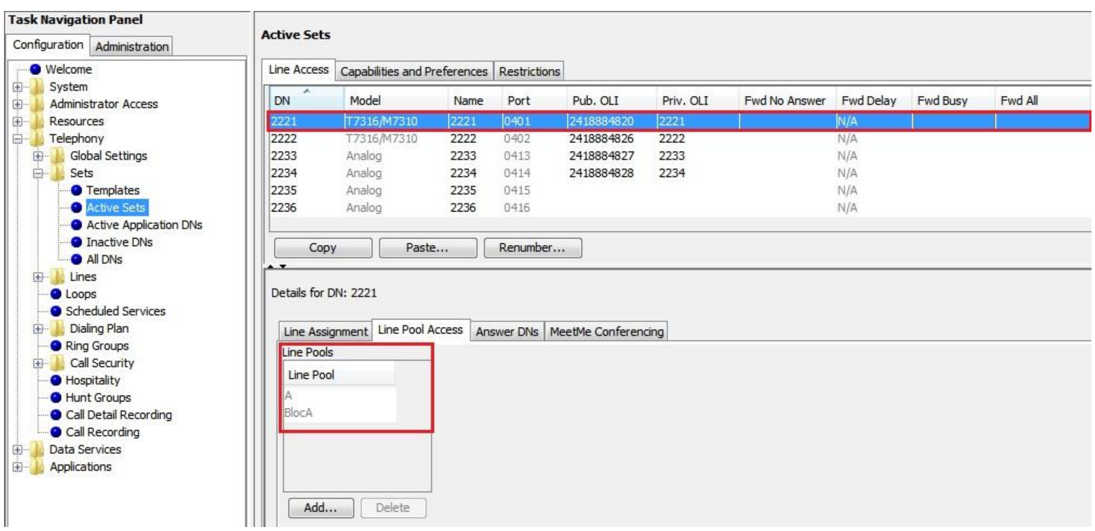



**Figure 21** Line Assignment and Access-3

## Appendix

### TWC Turn-up Testing Procedure

To ensure proper service between the IP PBX and the TWC network, test calls from the IP PBX will be made. Typically, the following call types will be used (call testing varies depending on service configuration)

1. Outbound/Inbound call to a local number
2. Outbound/Inbound call to a long distance number
3. Calls to 411 and 611
4. Outbound calls to a blocked number to verify call blocking settings
5. Other calls based on customer request , e.g. FAX testing using T.38 or calls to an auto-attendant to verify DTMF

## Questions

If you have questions, please contact your Time Warner Cable Business Class Account Executive.