



## NetVanta Unified Communications Technical Note

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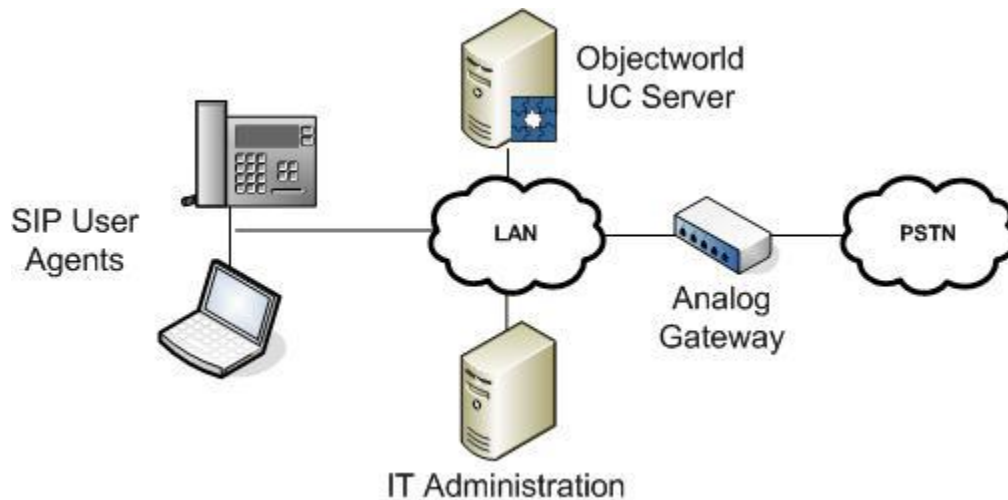
# Installing and Configuring the Quintum Tenor AS Gateway

## Introduction

The Quintum Tenor AS is a 2-4 port analog gateway used in NetVanta Unified Communications Server installations to provide a gateway between internal (SIP) phone calls and the outside phone network (PSTN). Voice communications from an internal phone have voice over IP (VoIP) signals converted into traditional analog voice, which is transmitted over the PSTN.

A gateway works in conjunction with the UC server's SIP Proxy and SIP. All telephony services are provided through the mutual cooperation of SIP gateways, SIP telephones, SIP proxy and the Core Application Service.

The following diagram illustrates the UC server's SIP architecture and its relationship with other components in a typical customer network.



## Supported Features

Feature Name	Supported
Accept Incoming Calls	✓
Accept Outgoing Calls	✓
Trunk-to-trunk connect	✓
Calling Party Name	✓
Calling Party Number	✓
Answer Supervision	✓
Disconnect detection	✓
DTMF Tone Support (RFC2833 Compliant)	✓
Conferencing with SIP Endpoints	✓
Direct Inward Dialing	✓
System Music on Hold Support	✓
Outgoing Fax Support	✓
Incoming Fax Support	✓
<b>Unified Communication Features Supported by Gateway</b>	
Active Message Delivery	✓
Paging Notification	✓
Transfer—Assisted/Supervised	✓
Transfer—Blind	✓
Multiple SIP Proxy Support	✓ *Available with survivability option

## Interoperability Software Versions

The following gateway version was tested for interoperability:

- **System Description:** Quintum Tenor AS
- **Hardware Version:** P106-02-00
- **Firmware Version:** P106-12-00

## Overview of Procedure

To provide its functionality, the **Quintum Tenor AS** must be connected to the internal LAN (a 100 Mbps connection is recommended) and from 1-4 PSTN analog phone lines.

The **Quintum Tenor AS** is primarily configured using a java configuration program. The program must be installed to configure and manage the gateway.

The basic steps for installation and configuration are:

1. Unpack the **Quintum Tenor AS**.
2. Mount the **Quintum Tenor AS**.
3. Connect cables.
4. Power up the **Quintum Tenor AS**.
5. Set a DHCP IP address reservation for the **Quintum Tenor AS** based on its MAC address.
6. Run the initial configuration wizard.
7. Configure the UC server to use the **Quintum Tenor AS**.

**Note:** Please see the instructions provided by Quintum for steps 1 to 4, and for information about running and configuring the gateway.

The rest of this document provides instructions for steps 5 to 7, which allow you to configure the **Quintum Tenor AS** for operation with the UC server.

## Address Reservation

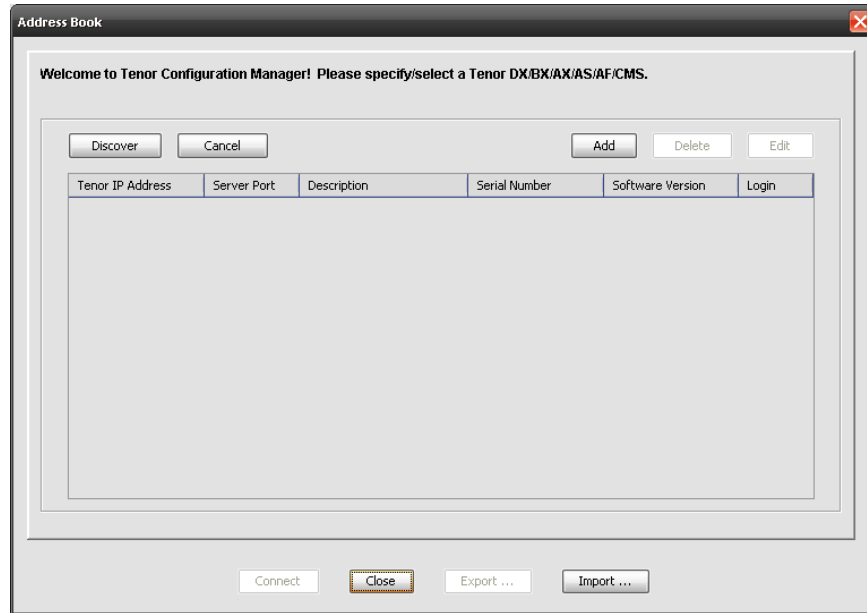
By default, the gateway is configured to use an IP address assigned by DHCP. The gateway can also be configured to use a static IP address. For routing calls out from the UC server, the **Quintum Tenor AS** must have an IP address that does not change.

# Initial Configuration

## Installing Tenor Configuration Manager

To begin configuration of the Quintum gateway, you must first install the Tenor Configuration Manager. You can either get it from the CD included with the gateway or at the Quintum support website (<http://www.quintum.com/support>).

After you have installed and run the Tenor Configuration Manager, the following screen appears.



## Adding the Gateway

If your PC is running on the same subnet as the gateway, the gateway can be added automatically. If your PC is running on a different subnet than the gateway, the gateway must be manually added.

### To add the gateway automatically

1. Select **Discover** to automatically detect the gateway.
2. When the wizard finds the gateway, select **Connect**.

## To add the gateway manually

1. Select **Add**.

The following screen appears.



The screenshot shows a dialog box titled "Add Address" with the following fields and values:

- Tenor IP ADDRESS: 192 . 168 . 8 . 29
- Tenor Server Port: 8080
- Description: (empty)
- Serial Number: (empty)
- Software Version: (empty)
- Login: admin
- Password: (masked with dots)
- Confirm Password: (masked with dots)
- Remember Password

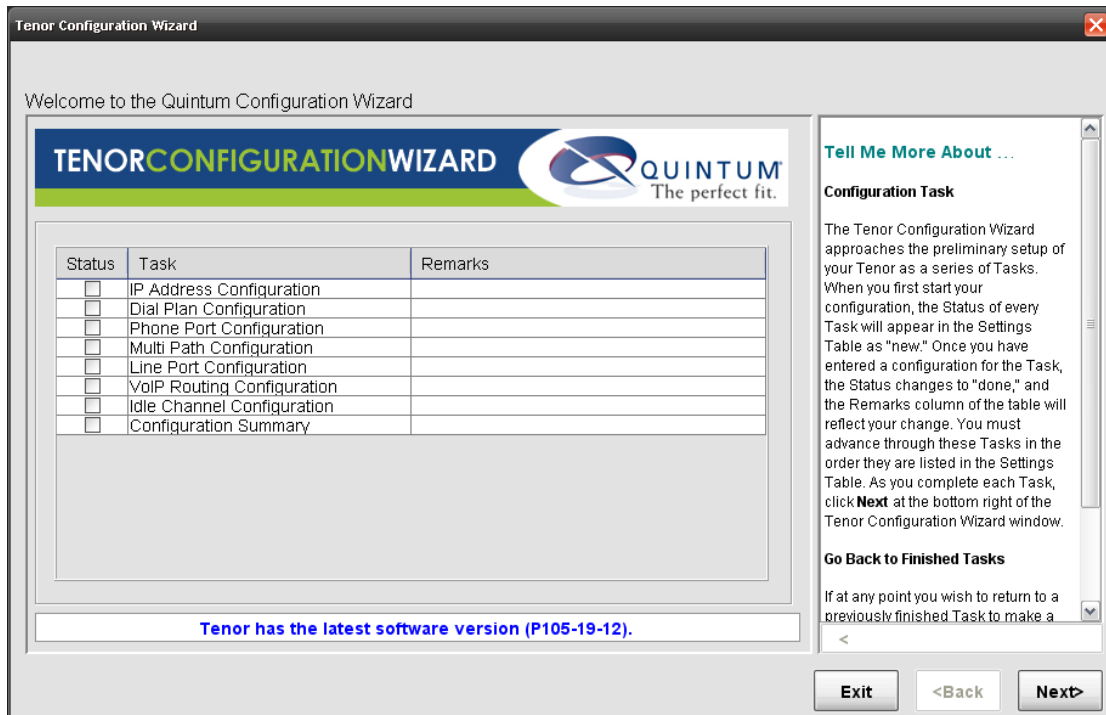
Buttons: OK, Cancel

2. Enter the IP Address of the gateway.
3. Enter **admin** as the username and password.
4. Select **OK**.
5. Select **Connect** on the *Address Book* screen.

## Running the Configuration Wizard


After you connect, a wizard opens to set up the initial configuration of the gateway.

1. Select **Next**.



The screenshot shows the "Tenor Configuration Wizard" window with the following content:

Welcome to the Quintum Configuration Wizard

**TENORCONFIGURATIONWIZARD**  **QUINTUM**  
The perfect fit.

Status	Task	Remarks
<input type="checkbox"/>	IP Address Configuration	
<input type="checkbox"/>	Dial Plan Configuration	
<input type="checkbox"/>	Phone Port Configuration	
<input type="checkbox"/>	Multi Path Configuration	
<input type="checkbox"/>	Line Port Configuration	
<input type="checkbox"/>	VoIP Routing Configuration	
<input type="checkbox"/>	Idle Channel Configuration	
<input type="checkbox"/>	Configuration Summary	

**Tell Me More About ...**

**Configuration Task**

The Tenor Configuration Wizard approaches the preliminary setup of your Tenor as a series of Tasks. When you first start your configuration, the Status of every Task will appear in the Settings Table as "new." Once you have entered a configuration for the Task, the Status changes to "done," and the Remarks column of the table will reflect your change. You must advance through these Tasks in the order they are listed in the Settings Table. As you complete each Task, click **Next** at the bottom right of the Tenor Configuration Wizard window.

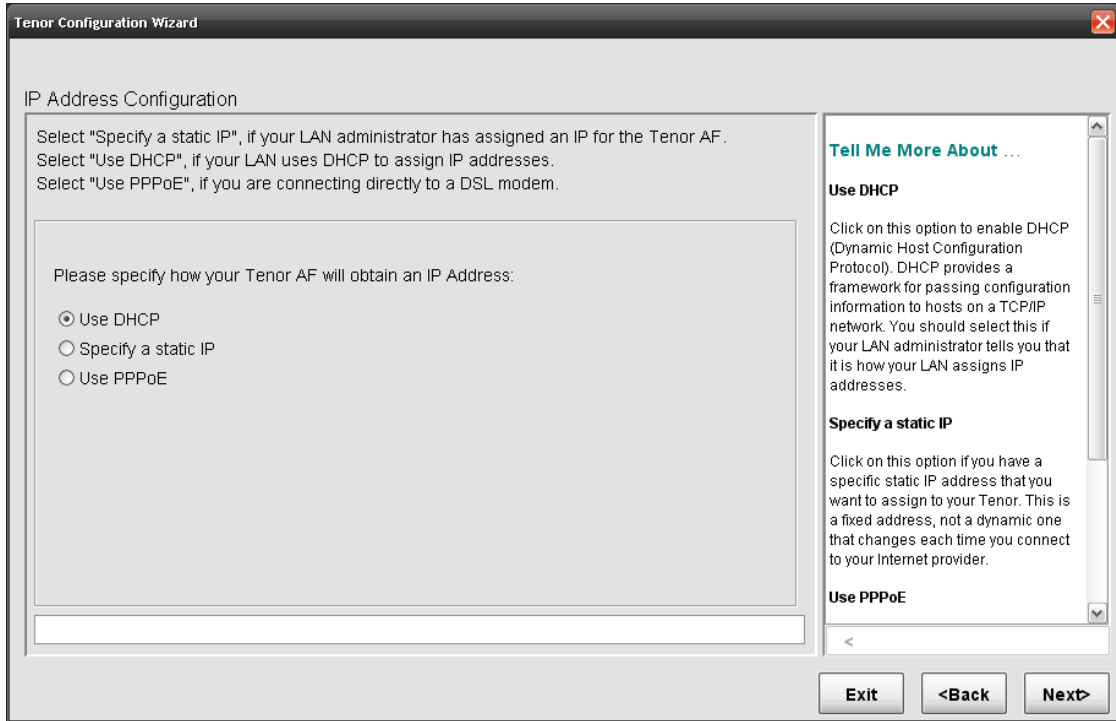
**Go Back to Finished Tasks**

If at any point you wish to return to a previously finished Task to make a

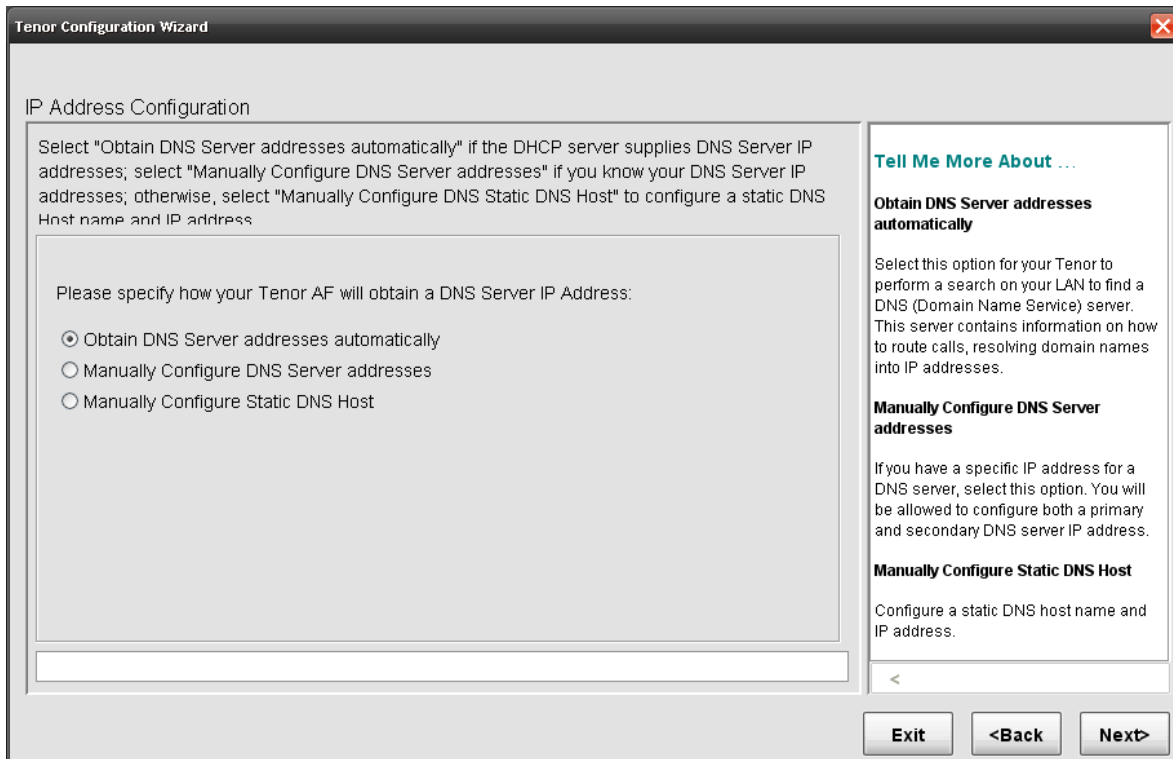
Buttons: Exit, <Back, Next>

Footer: Tenor has the latest software version (P105-19-12).

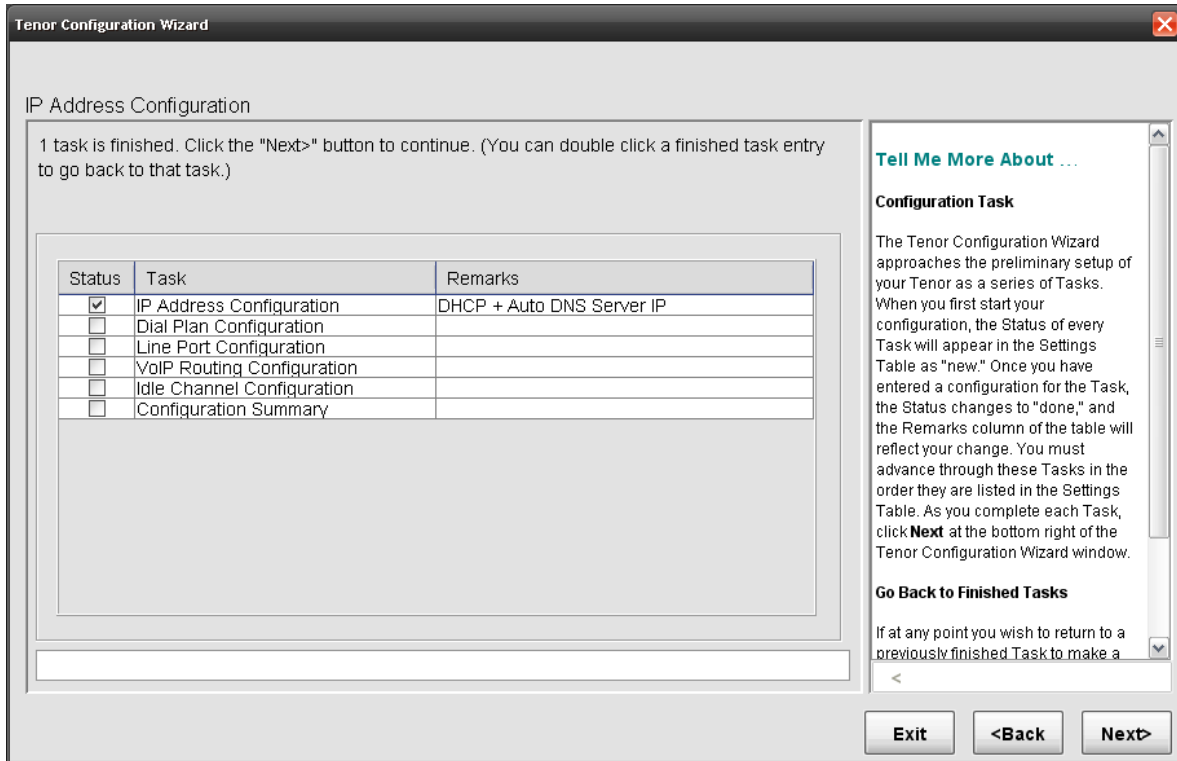
2. On the screen below, you have the option to choose how your gateway obtains its IP Address and network settings. A static IP address is recommended for a gateway.



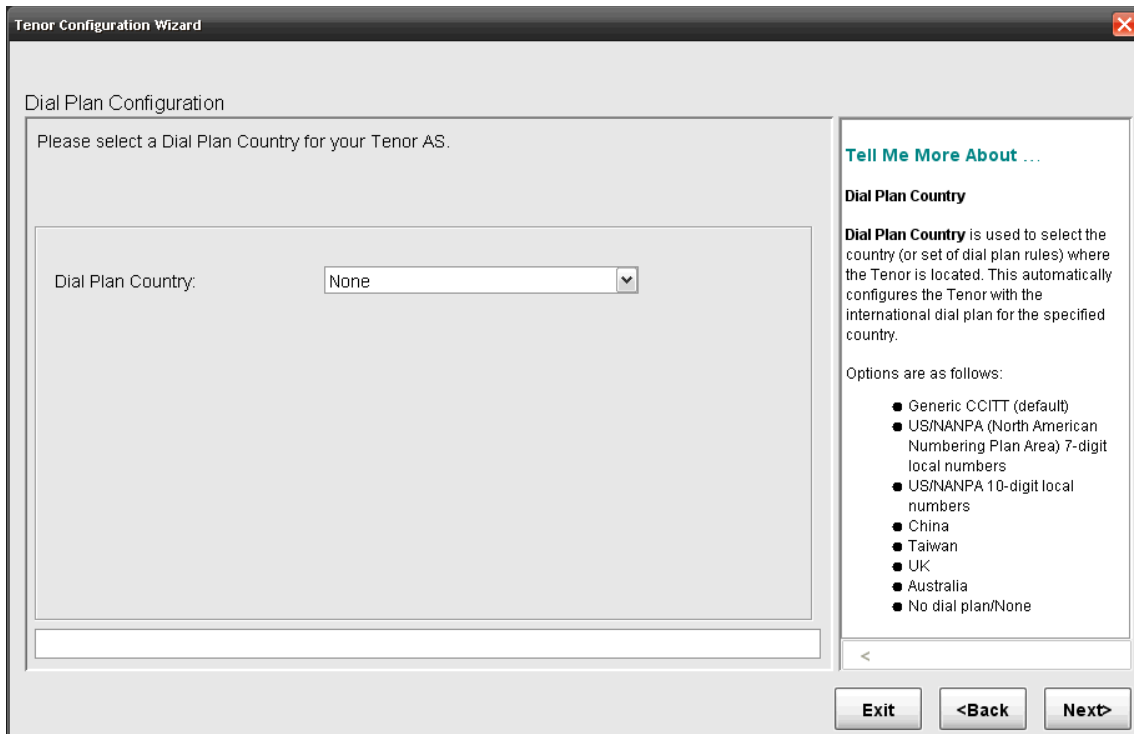
3. You can specify whether you want to obtain DNS server addresses automatically or if you want to manually configure them. If you are using DHCP, you can automatically obtain the DNS server addresses; otherwise you must manually configure them. Select **Next** to continue.



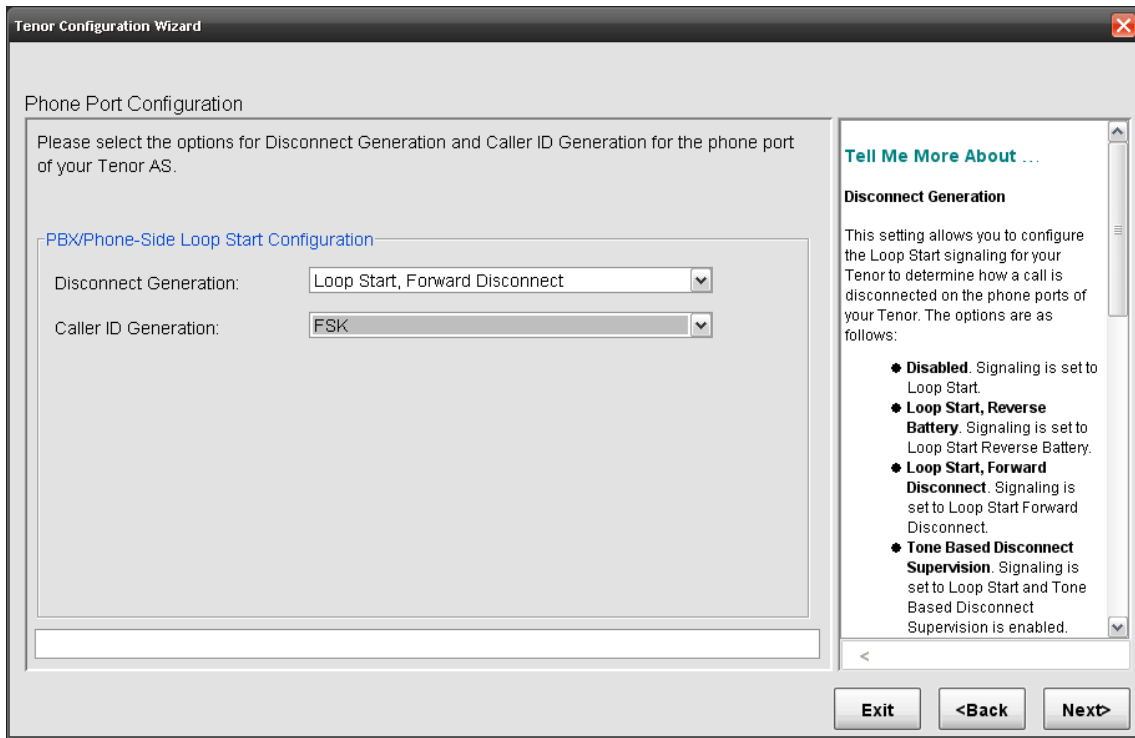
4. The first task is complete. Select **Next** to continue.



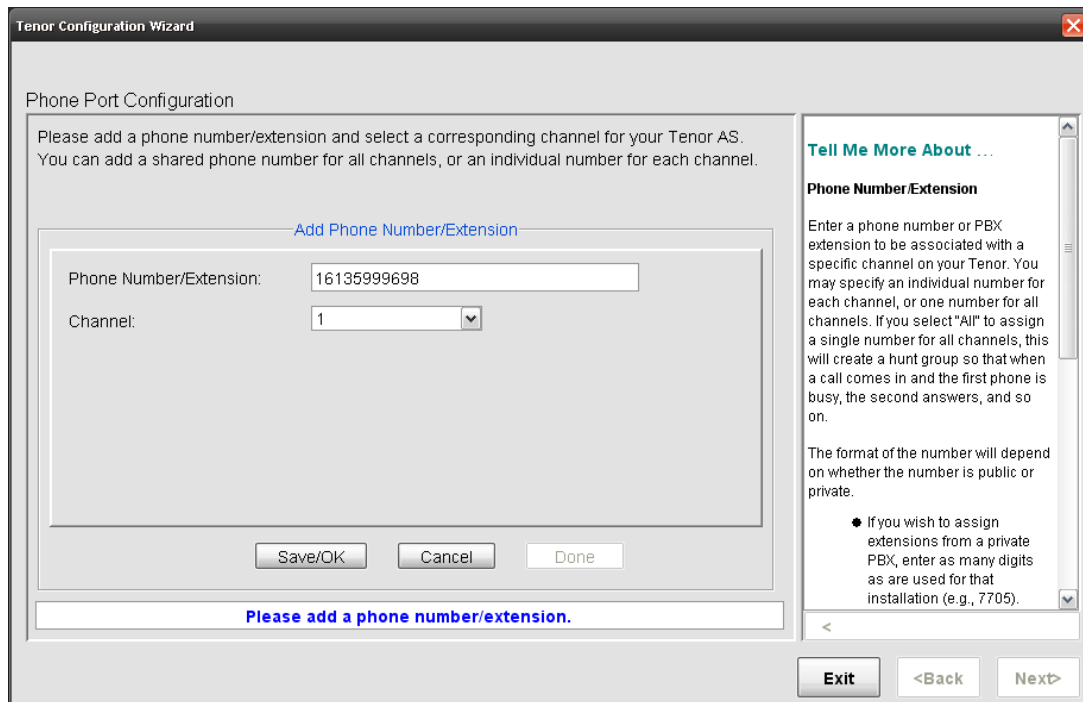
5. The **Dial Plan Configuration** screen allows you to set up the dialing plan. Choose **None** from the **Dial Plan Country** list. Currently the dial plan rules do not work and will result in outgoing calls not working. When finished, select **Next** to continue.



- On the **Phone Port Configuration** screen, choose the method for **Disconnect Generation** and **Caller ID Generation**. These settings depend on your carrier and location. When finished, select **Next** to continue.

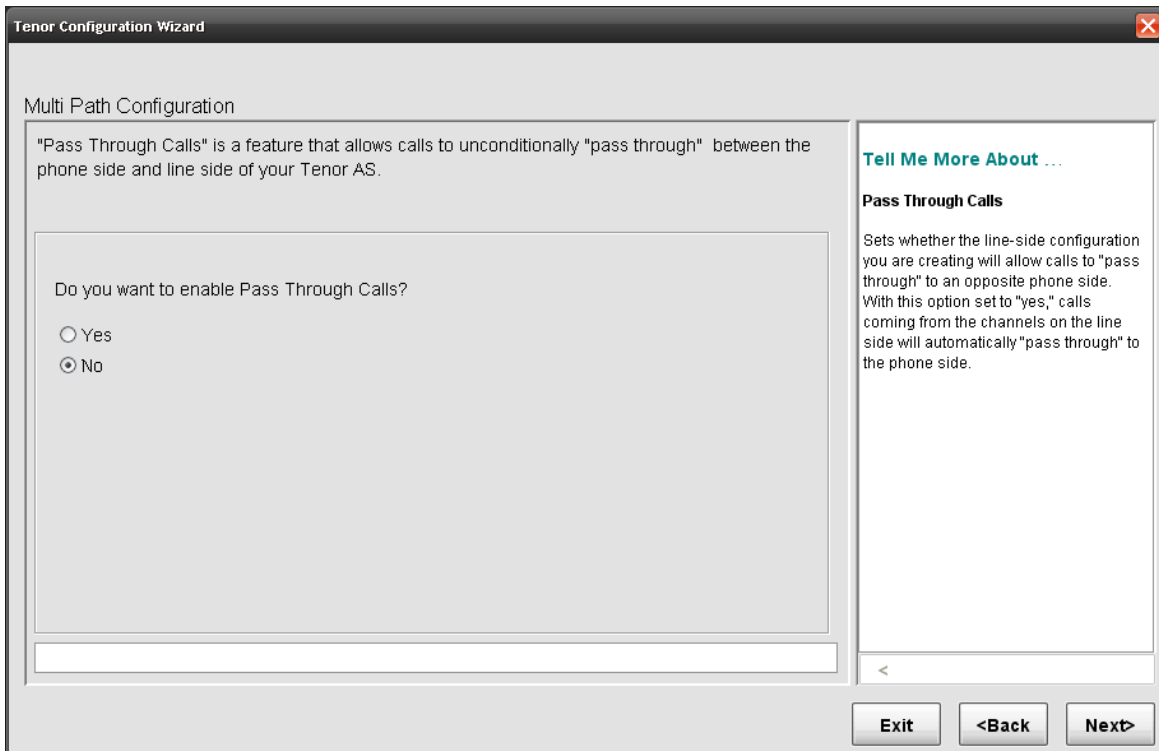


- On the **Phone Port Configuration** screen, you can map DID numbers to individual channels on the gateway. When finished, select **Next** to continue.

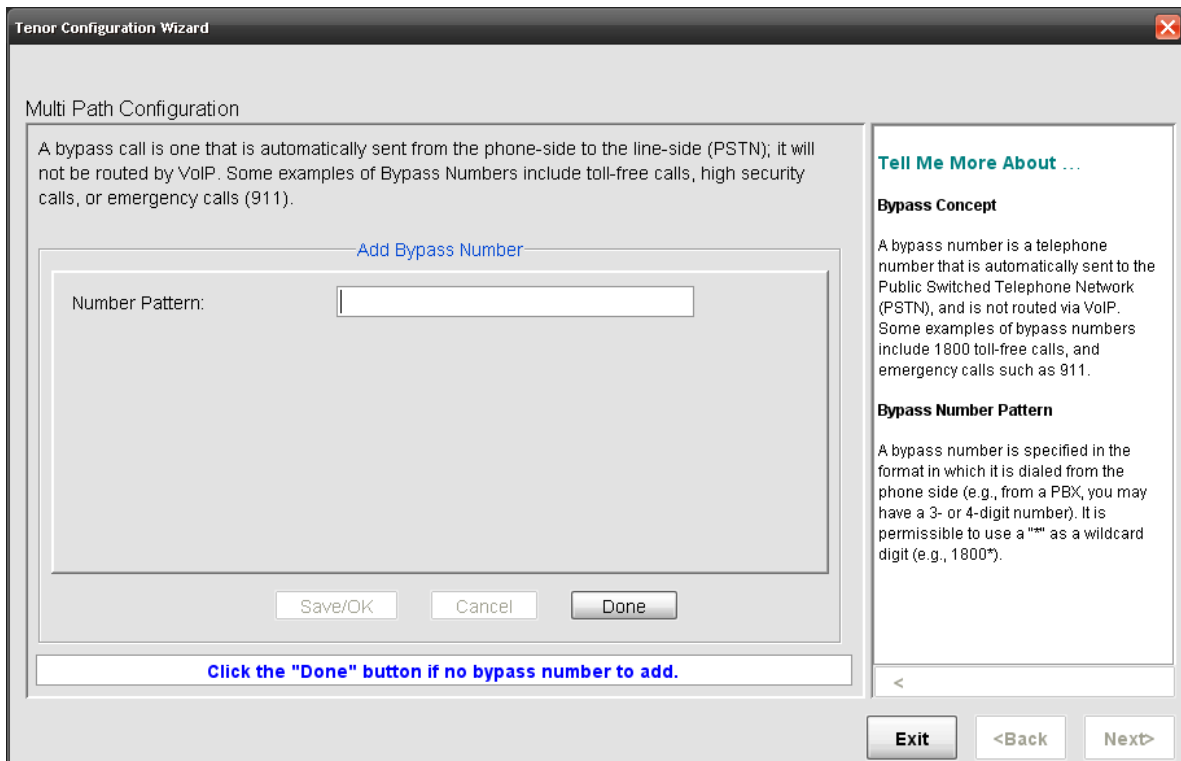




- On the **Multipath Configuration** screen, you can choose for all calls to automatically pass through between the phone side and lines. You do not need to enable Pass Through calls, so you can select **No**.



- On the **Add Bypass Number** screen, select **Done**, and then select **Next**.



10. On the **Line Port Configuration** screen, choose the method for **Disconnect Detection** and **Caller ID Detection**. These settings depend on your carrier and location. Select **Next** to continue.

The screenshot shows the 'Line Port Configuration' window of the Tenor Configuration Wizard. The main area contains three dropdown menus: 'Disconnect Detection' set to 'Loop Start, Forward Disconnect', 'Caller ID Detection' set to 'FSK or DTMF', and 'Tone Based Answer Detection' set to 'Disabled'. A right-hand pane titled 'Tell Me More About ...' provides details on 'Disconnect Detection' options, including Disabled, Loop Start, Reverse Battery, Loop Start, Forward Disconnect, and Tone Based Disconnect Supervision. At the bottom are 'Exit', '<Back', and 'Next>' buttons.

11. On the **VoIP Routing Configuration** screen, for integration with the UC server, choose **SIP only**. Select **Next** to continue.

The screenshot shows the 'VoIP Routing Configuration' window of the Tenor Configuration Wizard. The main area asks 'Which Outgoing IP Routing protocol should be used?' with two radio button options: 'H.323 only' and 'SIP only', where 'SIP only' is selected. A right-hand pane titled 'Tell Me More About ...' provides details on 'H.323 only' and 'SIP only' protocols. At the bottom are 'Exit', '<Back', and 'Next>' buttons.

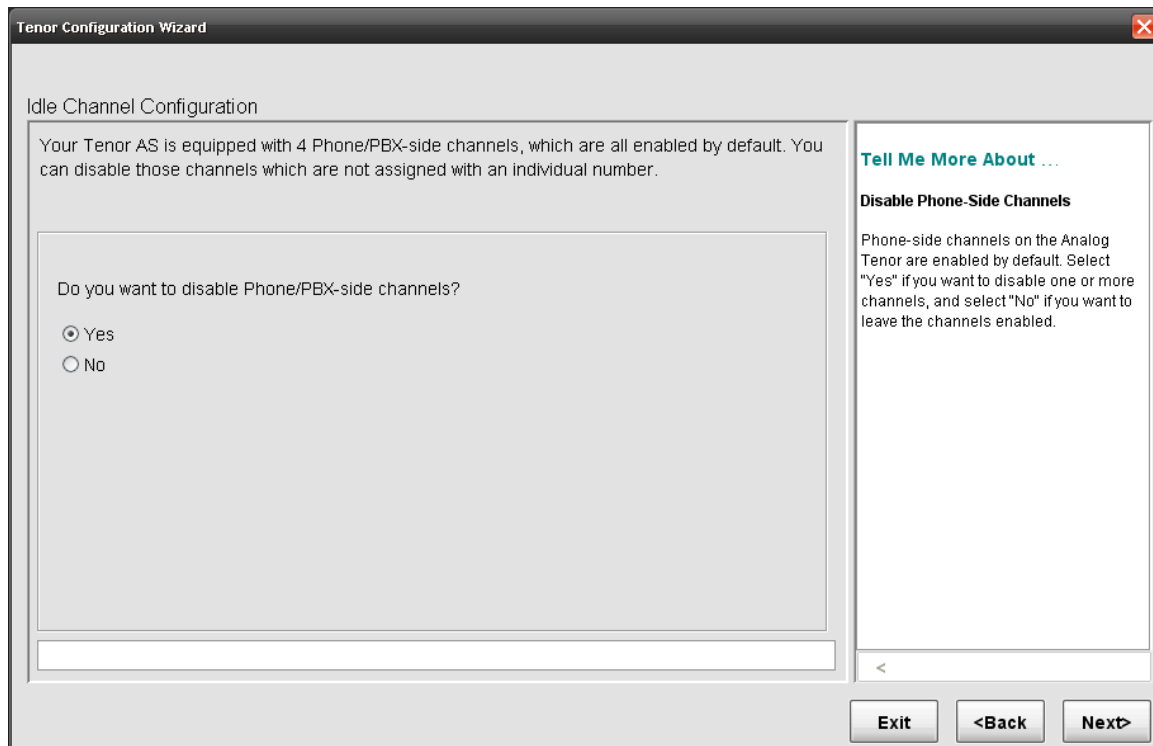
12. In the **SIP Server Information** section, change the Primary SIP Server to the IP address of your UC server. When finished, select **Next** to continue.

The screenshot shows the 'Tenor Configuration Wizard' window. The title bar reads 'Tenor Configuration Wizard'. The main content area is titled 'VoIP Routing Configuration'. Below the title, there is a paragraph: 'Your Tenor AS requires a SIP Server, or another SIP endpoint, to make outgoing SIP calls. Please specify a Primary SIP Server (or the other SIP endpoint's) IP Address or URL (only if you configured a DNS server)'. Below this is a section titled 'SIP Server Information' with three input fields: 'Primary SIP Server IP/Domain Name' containing '10.10.8.155', 'Primary SIP Server Port' containing '5060', and 'Register Expiry Time (in sec.):' containing '300'. To the right of the main form is a 'Tell Me More About ...' sidebar with three sections: 'Primary SIP Server IP/URL', 'Primary SIP Server Port', and 'Register Expiry Time', each with explanatory text. At the bottom of the window are three buttons: 'Exit', '<Back', and 'Next>'. A small '<' button is also visible in the sidebar area.

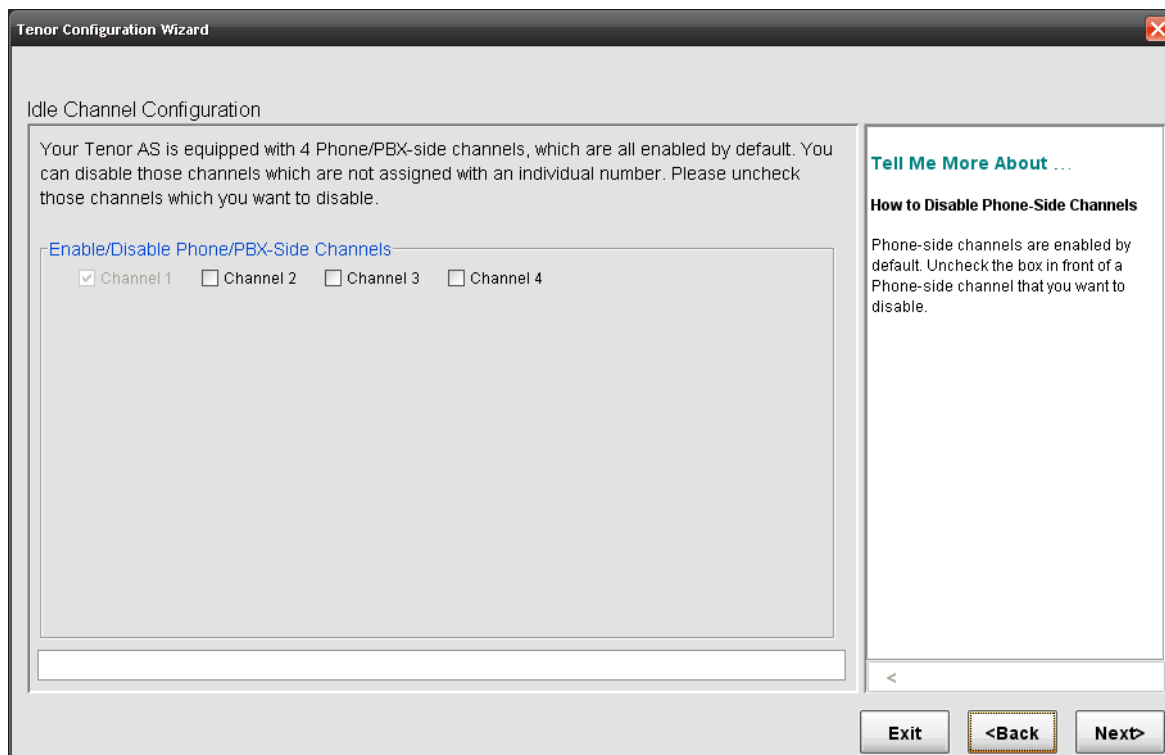
13. In the **Add SIP User Information** section, the wizard requires you to enter a User ID and Password. Enter **9999** for both fields. Select **Done** and then **Next** to continue.

The screenshot shows the 'Tenor Configuration Wizard' window. The title bar reads 'Tenor Configuration Wizard'. The main content area is titled 'VoIP Routing Configuration'. Below the title, there is a paragraph: 'Please add a SIP user ID and a password (if required by your service provider). Then, select the corresponding phone number from those which you previously configured for your Tenor AS.' Below this is a section titled 'Add SIP User Information' with three input fields: 'User ID' containing '9999', 'Password' containing '9999', and 'Phone Number' containing '16135999698'. Below these fields are three buttons: 'Save/OK', 'Cancel', and 'Done'. To the right of the main form is a 'Tell Me More About ...' sidebar with three sections: 'User ID', 'Password', and 'Phone Number', each with explanatory text. At the bottom of the window are three buttons: 'Exit', '<Back', and 'Next>'. A small '<' button is also visible in the sidebar area.

14. In the **Idle Channel Configuration** screen, select **Yes** if you are not using the maximum number of phone ports on your gateway. Select **Next** to continue.



15. If you selected **Yes** on the previous screen, you will be presented with the screen below. Clear the checkboxes of the ports that are not used. Select **Next** to continue.



16. In the **Idle Channel Configuration** screen, select **Yes** if you are not using the maximum number of PSTN ports on your gateway. Select **Next** to continue.

Tenor Configuration Wizard

Idle Channel Configuration

Your Tenor AS is equipped with 4 Trunk/PSTN-side channels, which are all enabled by default. You can disable those channels which are not physically connected to the PSTN.

Do you want to disable Trunk/PSTN-side channels?

Yes  
 No

[Tell Me More About ...](#)

**Disable Line-Side Channels**

Line-side channels on the Analog Tenor are enabled by default. Select "Yes" if you want to disable one or more channels, and select "No" if you want to leave the channels enabled.

Exit <Back Next>

17. If you selected **Yes** on the previous screen, you will be presented with the screen below. Clear the checkboxes of the ports that are not used. Select **Next** to continue.

Tenor Configuration Wizard

Idle Channel Configuration

Your Tenor AS is equipped with 4 Trunk/PSTN-side channels, which are all enabled by default. You can disable those channels which are not physically connected to the PSTN. Please uncheck those channels which you want to disable.

[Enable/Disable Trunk/PSTN-Side Channels](#)

Channel 1  Channel 2  Channel 3  Channel 4

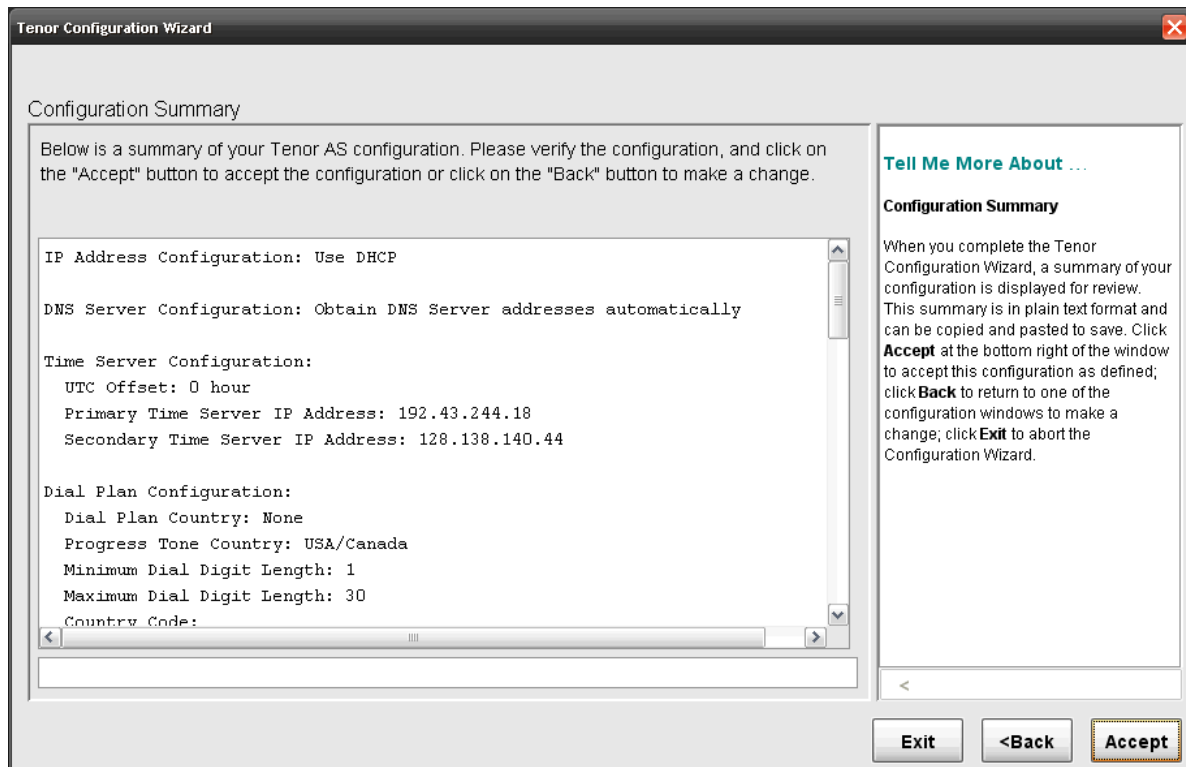
[Tell Me More About ...](#)

**How to Disable Line-Side Channels**

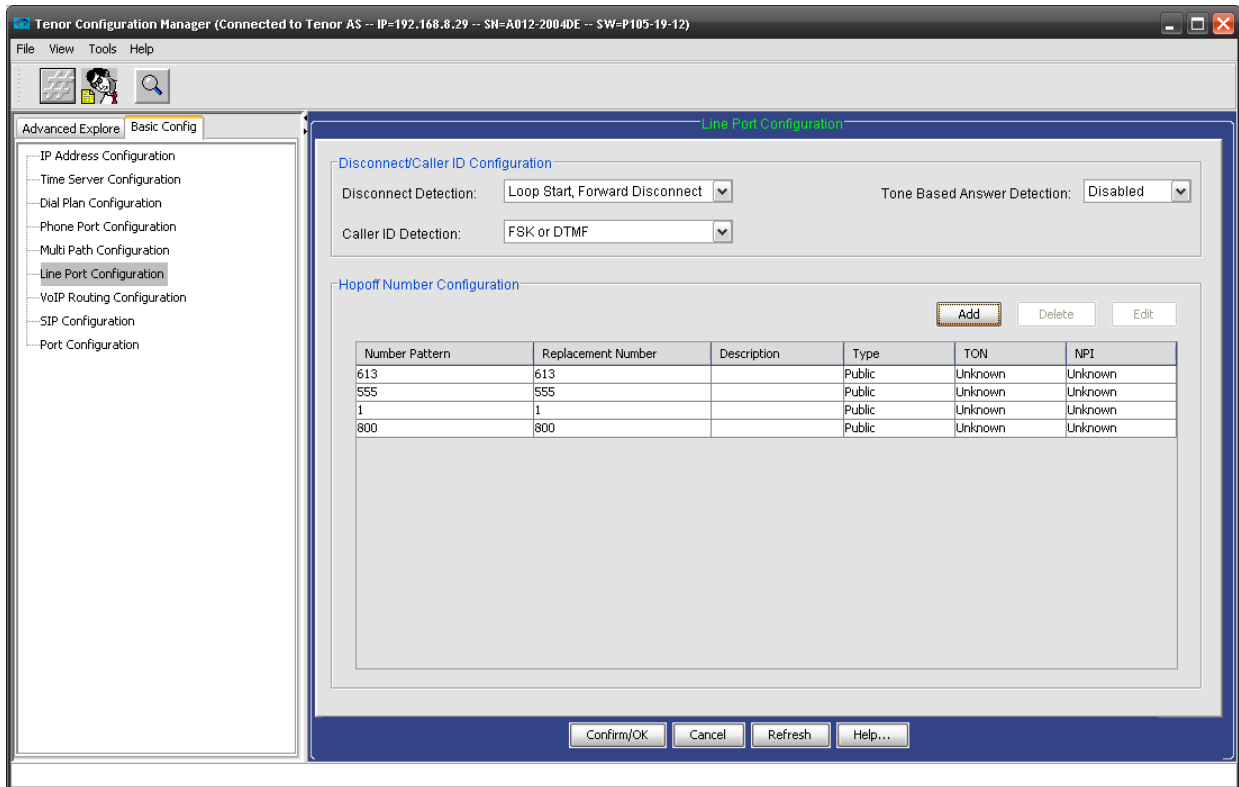
Line-side channels are enabled by default. Uncheck the box in front of a Line-side channel that you want to disable.

Exit <Back Next>

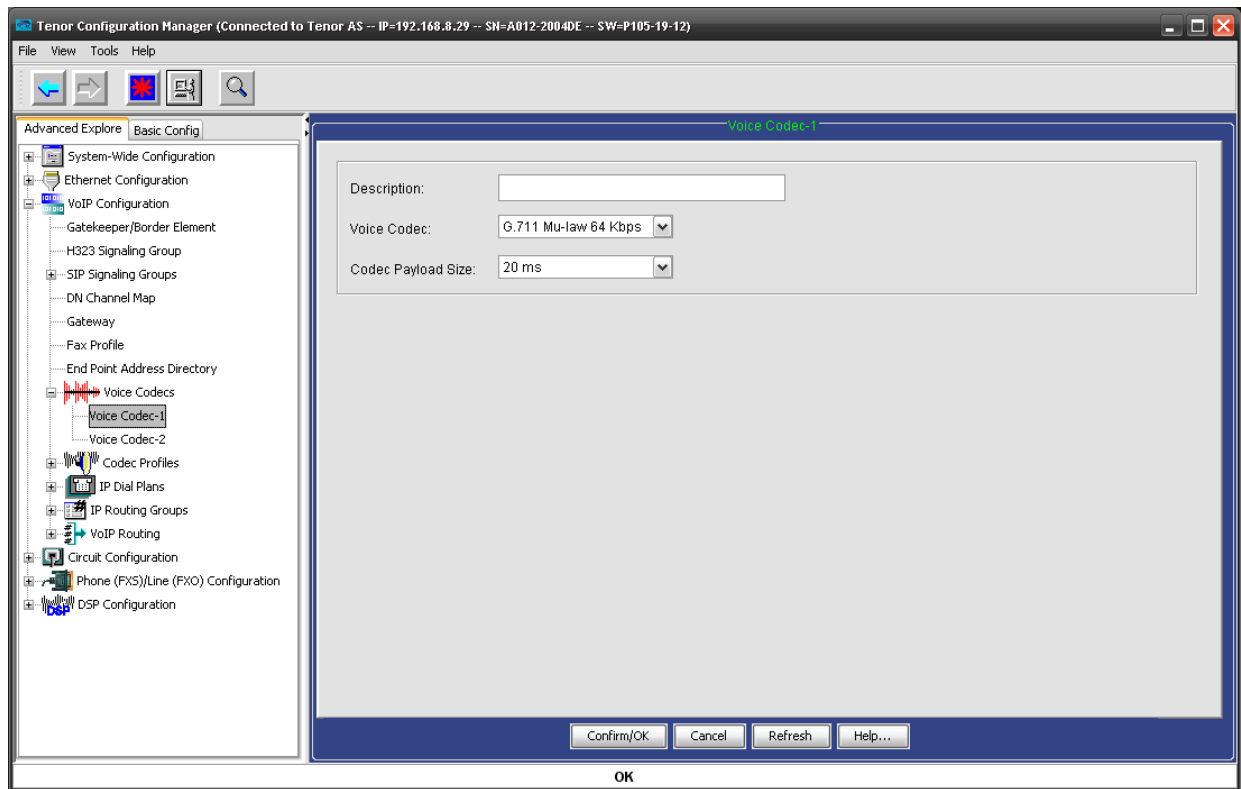
18. On the **Configuration Summary** screen, check the settings to make sure everything is correct. You can go back and make changes if necessary. When finished, select **Accept** to continue.



19. After the initial configuration is done, reboot the Quantum gateway and navigate to the **Line Port Configuration** tab. On that tab, you can set up numbers that are allowed go through to the PSTN from the SIP side. A hopoff number would usually contain the first few digits of a PSTN number based on your location. For example, to allow **local calls** you would add an entry with **613** as the **number pattern** and **replacement number** where 613 is your local area code. If you want to allow international numbers for North America then you would use **011** as the **number pattern** and **replacement number**. When finished, select **Confirm/OK**.

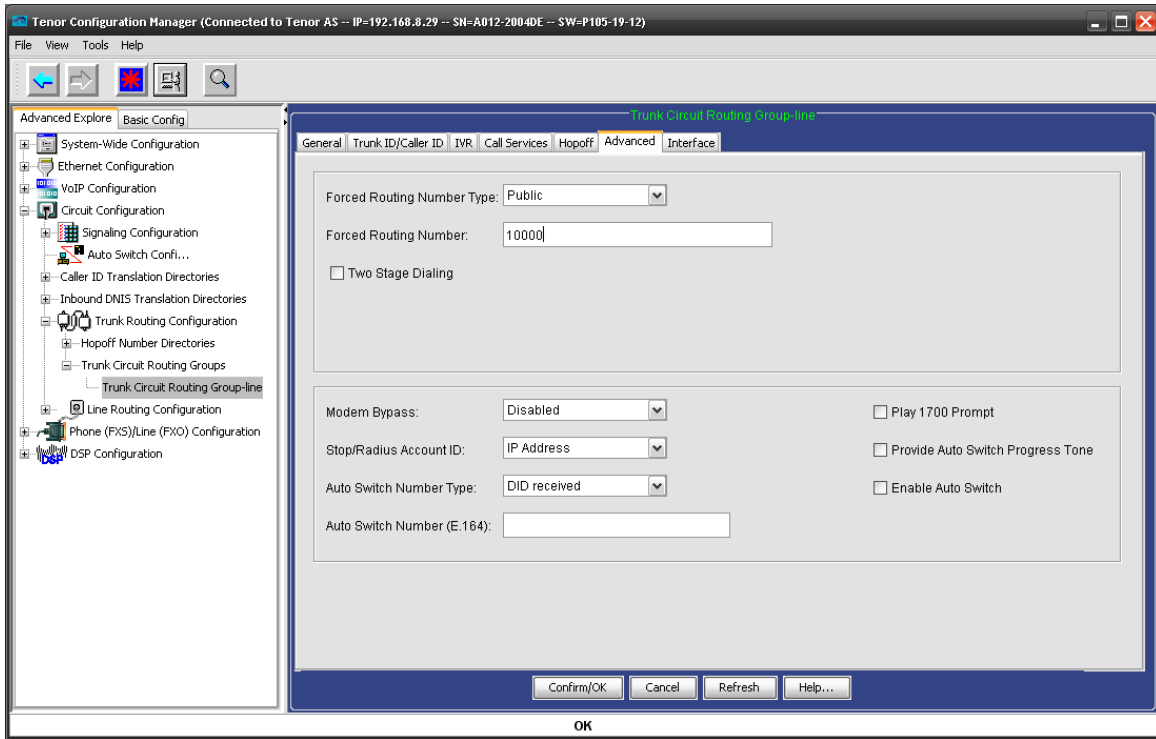


20. Select the **Advanced Explore** tab, and navigate to **VoIP Configuration > Voice Codecs > Voice Codec-1**. Set **Voice Codec** to **G.711 Mu-law 64 kb**. Select **Confirm/OK**.

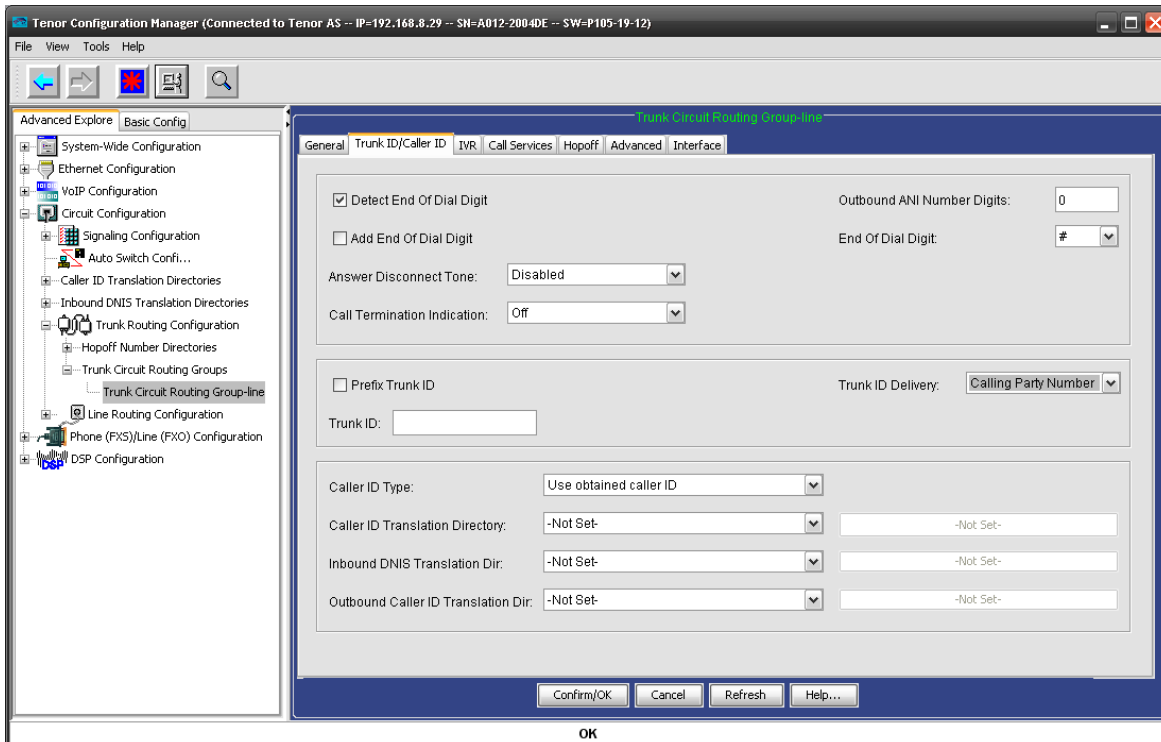




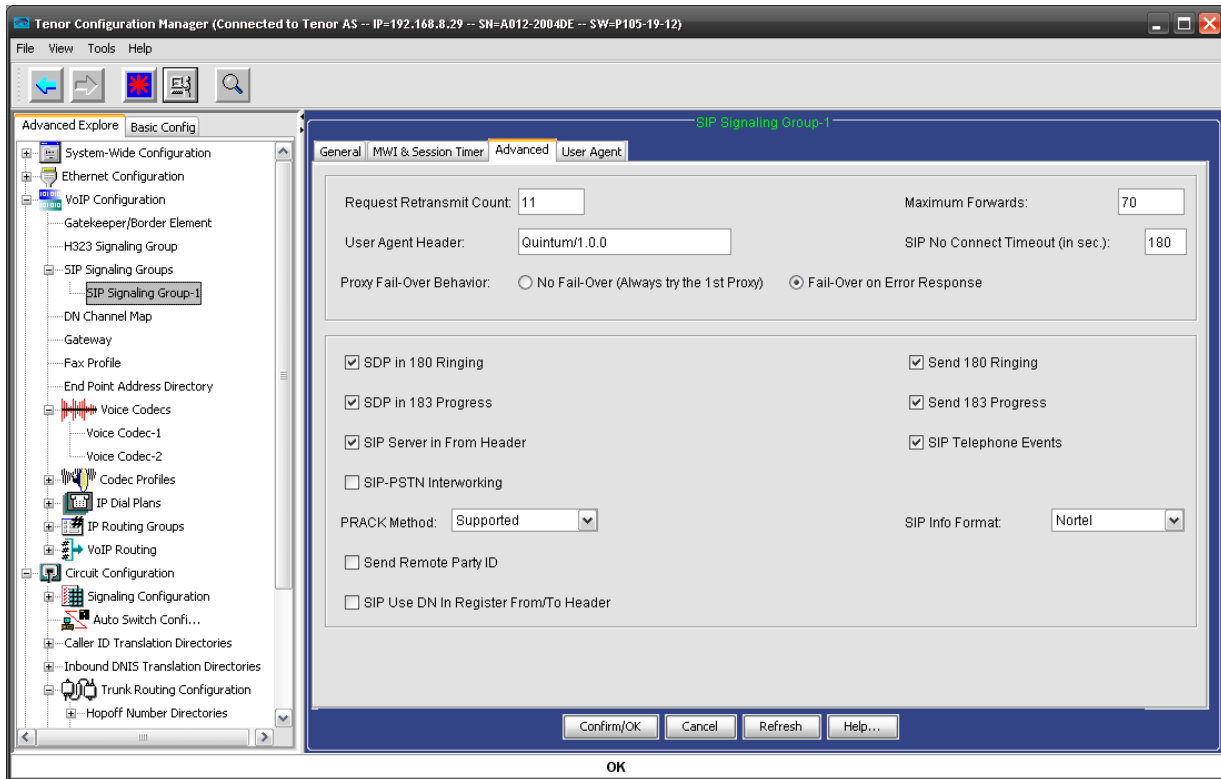
21. Navigate to **Circuit Configuration > Trunk Circuit Routing Groups > Trunk Circuit Routing Group-line**. Under the **Advanced** tab and in the **Forced Routing Number** box, enter the auto-attendant identity. Typically, this is set to **10000**.



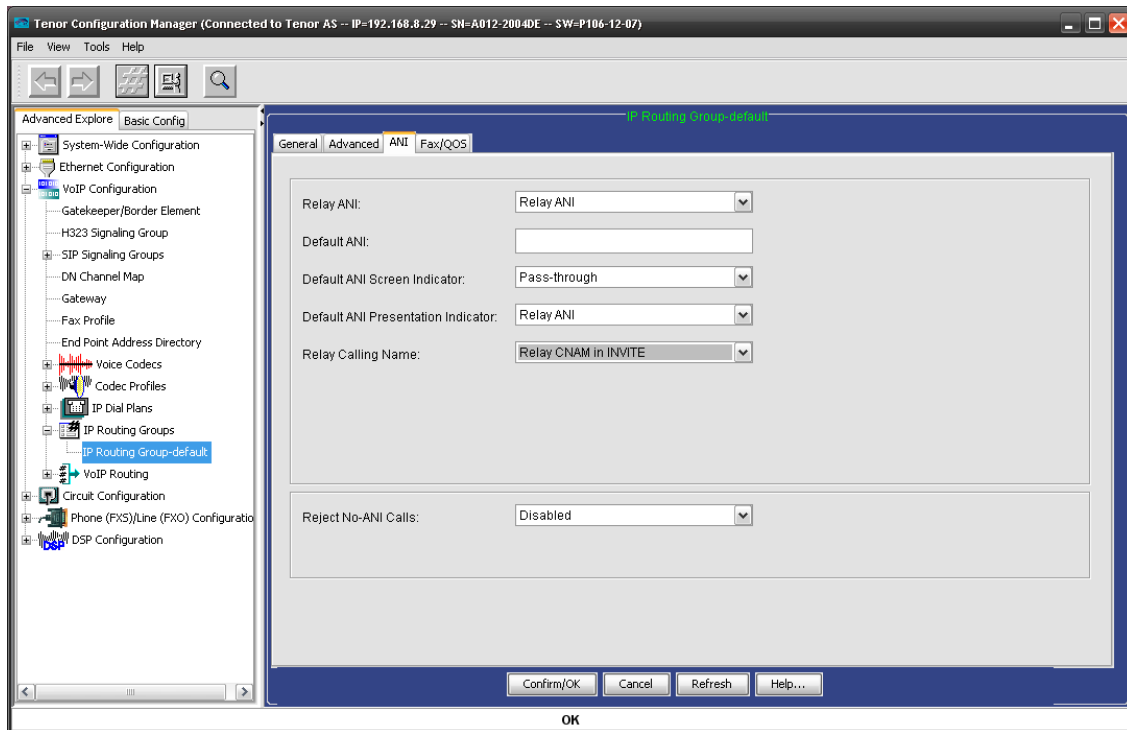
22. Under the **Trunk ID/Caller ID** tab and in the **Trunk ID Delivery** list, choose **Calling Party Number**.



23. Navigate to **VoIP Configuration > SIP Signaling Groups > SIP Signaling Group-1**. Under the **Advanced** tab, make sure that **Nortel** is selected in the **SIP Info Format** list.



24. Navigate to **VoIP Configuration > IP Routing Groups > IP Routing Group-default**. Under the **ANI** tab and in the **Relay Calling Name** list, choose **Relay CNAM in Invite**. Select **Confirm/OK**.



25. To complete the changes, select **Confirm/OK** and then select the **submit changes** button. 

## Enabling CNG Tone Detection for Faxing

By default, a Quintum gateway will not detect CNG tones used for faxing unless the call is directed at a fax service. In order to receive faxes when a call is answered by a standard service (not a fax service), you must create a file and upload it to the gateway via FTP.

### To enable CNG detection

1. Open notepad or another text editor.
2. Put in the following line: **enableCNGdetection 1**
3. Save the file as **var\_config.cfg**.
4. From your Windows PC select **Start > All Programs > Accessories > Command Prompt**. The *Command Prompt* window is displayed.
5. Use the **CD** command to change to the directory on your PC in which you saved the **var\_config.cfg** file.
6. Type **ftp** followed by the IP address of the unit. Press **Enter**.
7. Login with the username and password. The default for both is **admin**.
8. Use the **CD** command to change to the **cfg** directory (this is the directory on the Tenor into which you will copy the **var\_config.cfg** file). Depending upon the product type and software revision, the directory structure you see in your Tenor VoIP device may be different.
9. Type **bin <Enter>**.
10. Type **put var\_config.cfg <Enter>**
11. Restart the gateway from the **Tenor Configuration Manager** in **Tools > Reboot Tenor**.

## Configuring the UC Server

After you add the gateway to your network, the UC server must be configured to handle incoming and outgoing phone calls. For outgoing calls you must add: a SIP gateway, a dial plan entry to route calls out through the gateway, and a toll restriction entry to allow those calls. For incoming calls you must add a UC server identity that can answer incoming calls from the gateway. These instructions are for release 4.1 of the UC server.

### Adding a Trunk Identity

1. Go to **Identities**.
2. Right-click the right panel and select **New Identity**.
3. In the first page of the Wizard, select an **Attendant** identity. Make sure that the Identity is associated with the Admin profile.

4. On the following page, enter a descriptive name and enter **10000** for the address (assuming a standard configuration). Make sure that **Default Trunk Service** is the selected service.

## Adding a SIP Gateway

1. Select **Gateways**.
2. Right-click the right panel and select **New Gateway**.
3. Choose **Public Switched Telephone Network (PSTN)** from the gateway list.
4. In the **Host** name field, enter the IP address of the gateway.
5. Enter a descriptive name for the gateway.
6. Save.

## Configuring the Dial Plan

Incoming calls from the PSTN are already configured by having incoming calls routed to the 10000 Trunk identity. An entry or entries must be entered in the Dial Plan for outgoing calls to the PSTN.

1. Go to **Communication Service > UC Server > Routing**.
2. There are many possibilities here. If regular PSTN calls are to be routed out the gateway, add or modify an entry where the **Original Digits** are `[0-9]{7,}` and select the gateway. For example:

**Dial Plan Entry**

Routing rule

Original digits: 8[0-9]{7,}

Description: PSTN calls through gateway

Priority: 30

Destination

Gateway: Quintum

Host:

Call next member after: 0 seconds

Digit manipulation

Digits to skip: 1

Prefix to add:

Dialed number:

Suffix to add:

Options

Transport: udp

Source pattern: .\*

OK Cancel Help

## Configuring Toll Restrictions

Configure the toll restrictions to match the requirements of your organization. Consult the *NetVanta Unified Communications Server Administrator Guide*, available online at <http://kb.adtran.com>, for the correct use of regular expressions in the toll restrictions to enforce corporate dialing policy. It is explained in detail in the “Routing and Restricting Calls > Allowing and Restricting Long Distance and Other Calls > Restricting long distance calls” section.

# Glossary of Features

## **Accept Incoming Calls**

This feature allows the gateway to answer an incoming call from the PSTN. The gateway then makes a SIP call to extension 10000.

## **Accept Outgoing Calls**

An outgoing SIP call from the UC server results in an outgoing PSTN call.

## **Active Message Delivery**

The gateway must support the UC server calling out to the PSTN to deliver voice messages.

## **Answer Supervision**

The gateway must detect that a call has been answered. There are a number of techniques used for this, including loop start, battery reversal and voice detection.

## **Calling Party Name**

The gateway detects the calling party name on an incoming PSTN call and provides that name to the UC server.

## **Conferencing with SIP Endpoints**

The gateway needs to support conferencing between itself and other SIP endpoints.

## **Direct Inward Dialing**

Calls incoming from the PSTN must be automatically routed to the UC server for auto attendant functionality.

## **Disconnect Detection**

The gateway must detect that a call has been dropped. There are a number of techniques used for this, including loop start, battery reversal and no voice detection.

## **DTMF Tone Support (RFC2833 Compliant)**

Calls incoming from the PSTN to the UC server are usually handled by an auto attendant. Feature operation is implemented using DTMF tones from telephones. These tones must be sent to the UC server as SIP packets via RFC2833.

## **Incoming Fax Support**

The UC server supports the transmission of faxes to standard fax machines. The gateway must support T.38 fax transport to provide this capability. Additionally, the gateway should support CNG tones so that an incoming PSTN fax call can be distinguished from a voice call and handled appropriately.

## **Multiple SIP Proxy Support**

In high reliability applications, if the main UC server is not available the gateway routes incoming PSTN calls to an alternative SIP Proxy.

**Outgoing Fax Support**

The UC server supports the transmission of faxes to standard fax machines. The gateway must support T.38 fax transport to provide this capability.

**Paging Notification**

The gateway must support the UC server calling out to the PSTN to deliver pages.

**System Music on Hold Support**

The UC server supports music on hold. When PSTN callers are on hold they hear music, if that feature is enabled on the system.

**Transfer—Assisted/Supervised**

After a call is established between an outside PSTN call and an internal SIP device, the gateway must allow a supervised transfer to another SIP device.

**Transfer—Blind**

After a call is established between an outside PSTN call and an internal SIP device, the gateway must allow a blind transfer to another SIP device.

**Trunk-to-trunk connect**

This feature allows an established call through the gateway, which can be extended back out the gateway on another PSTN trunk.