# TechNote

## Avaya IP Office R9.1

April 7, 2016

XCAPI voiceoverIP

## Introduction

This document is intended to support you with the integration of XCAPI into an existing environment of the Avaya IP Office series.

Though being based on the Avaya IP Office R9.1 it should be applicable to higher or lower versions, given a few adjustments.
In the following sections we describe the essential steps of configuration to allow for optimal cooperation of both the XCAPI and the Avaya IP Office. At this point we suppose that the third party environment (including PSTN access and required licenses for appropriate SIP trunking) is in operation and the XCAPI and CAPI applications are properly installed.

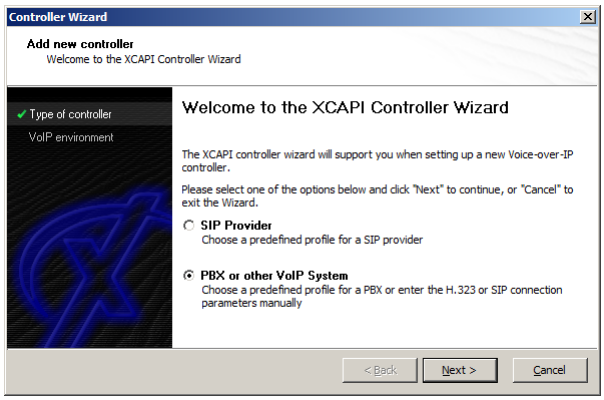
For XCAPI basics please refer to the document **XCAPI TechNote (en) - Quick Start Guide.pdf**, which is available for registered users within our community download area.

We also recommend to visit our YouTube channel for additional information and hints.

# XCAPI Configuration

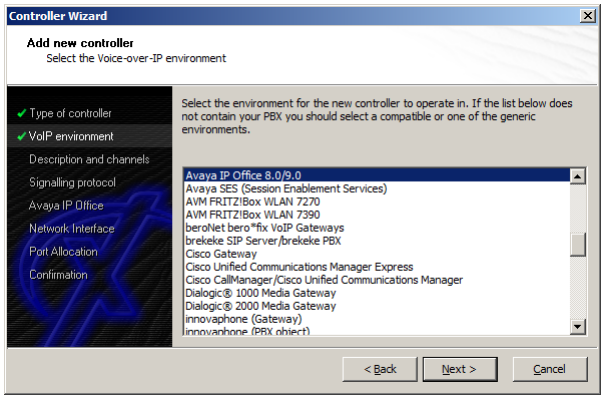
Please start up the XCAPI configuration to create a new controller that will be assigned to the Avaya IP Office. The XCAPI controller wizard will pop up automatically if you start the configuration tool for the first time, or no controller is present at all. Use the link **Click here to add a controller** for starting up the XCAPI controller wizard manually.

On the first page of the controller wizard please select **PBX or other VoIP System** and continue with the **Next** button.



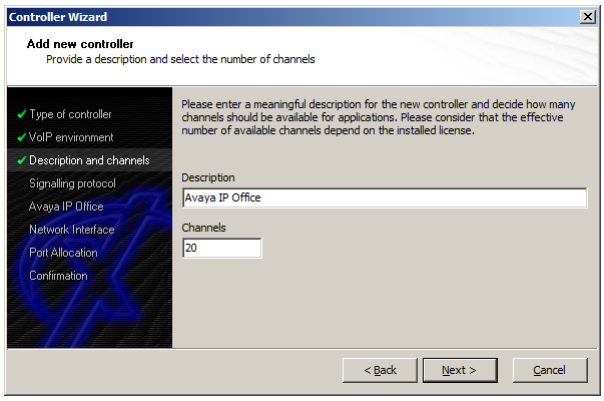

## 2.1 Voice over IP Environment

The next dialog shows a list of some common Voice-over-IP environments. Selecting one of those will configure the XCAPI with a selection of near-optimal presets for the kind of environment you have, sparing you quite a lot of manual configuration.



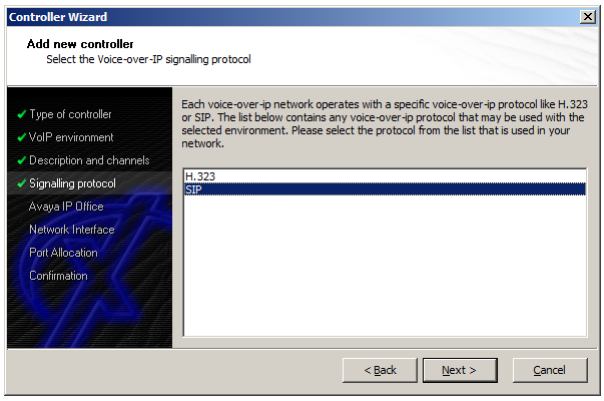
## 2.2 Description and Channels

This dialog allows you to set a meaningful description for the controller you're going to create. It also allows setting up the number of channels that the new controller will be able to provide. Please enter how many simultaneous connections the XCAPI should handle when communicating with the Avaya IP Office.



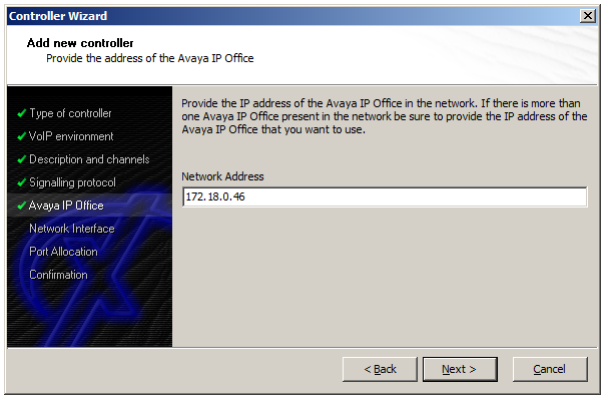

## 2.3 Voice-over-IP Signaling Protocol

Next, please select the appropriate signaling protocol used for this VoIP environment.



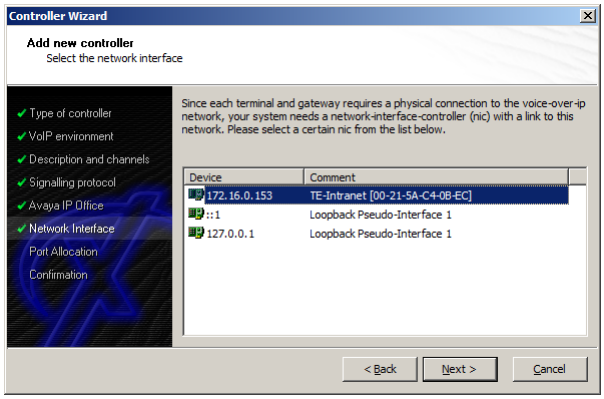
## 2.4 Gateway Address

Next, the remote address of the Avaya IP Office gateway device has to be set.



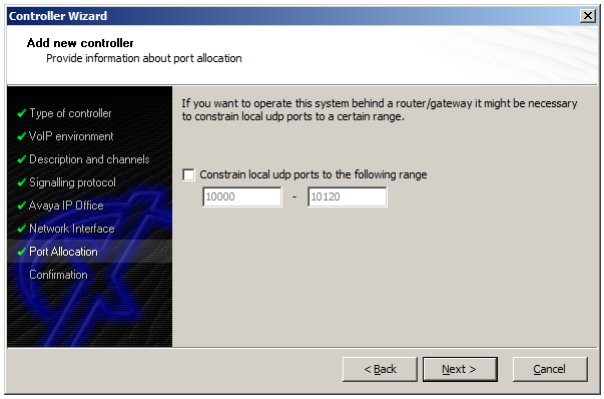

## 2.5 Network Interface

On this page of the XCAPI controller wizard you can select the network adapter you want to bind to the XCAPI controller.



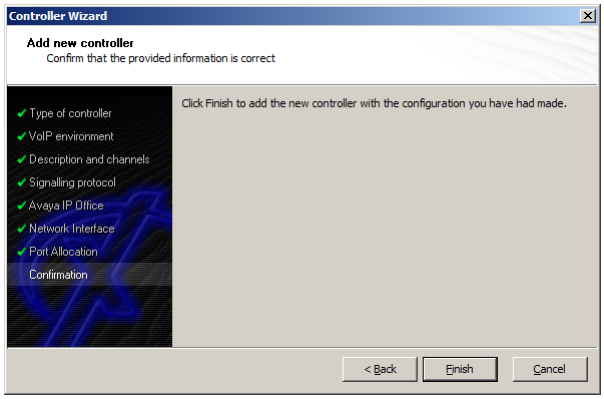
## 2.6 Port Allocation

On demand a UDP port range can be set that will be used for inbound RTP/T.38 data.

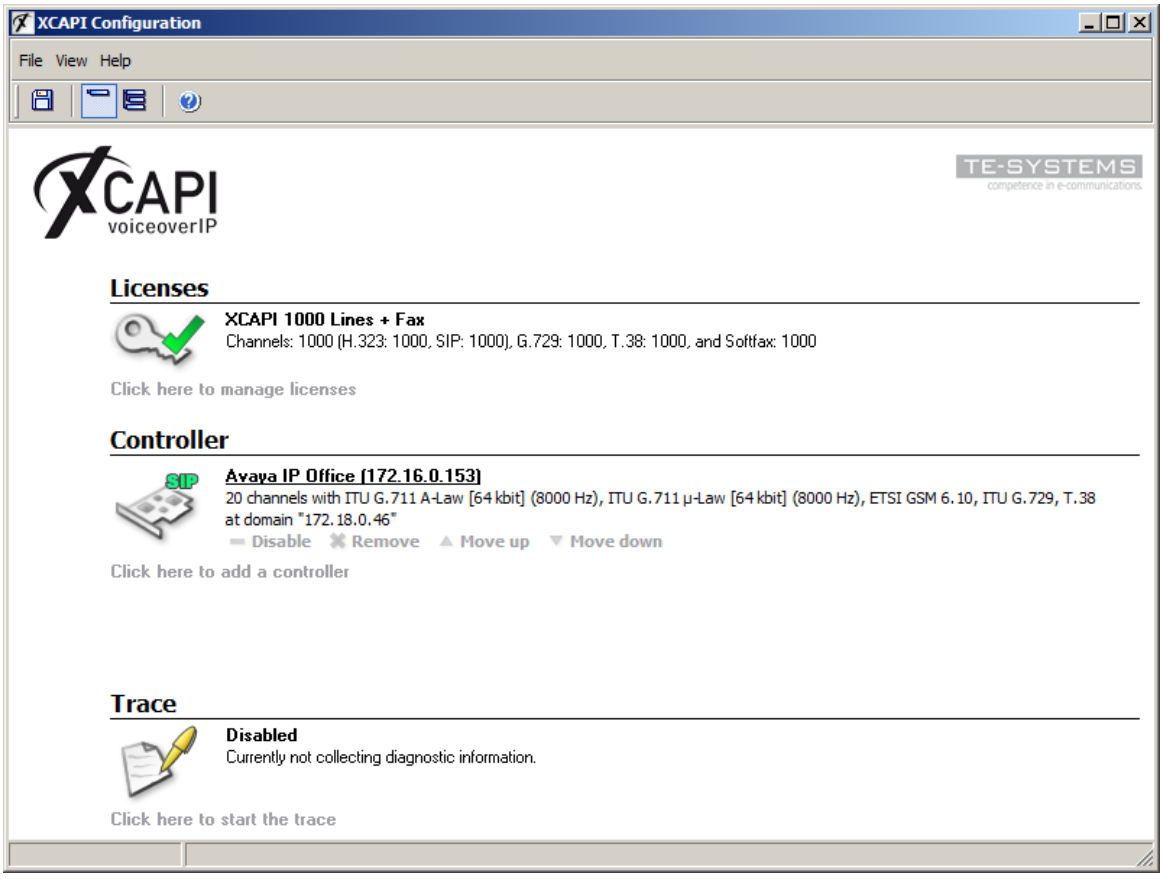



## 2.7 Confirmation

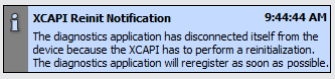
The final wizard dialog performs some checks on the configuration parameters you've made. If any errors are detected here, you can go back to the respective dialogs and correct the necessary input. If everything is correct please use the **Finish** button in order to finally create the new controller.



The controller you've just created now will appear on the main page of the XCAPI configuration. As the controller configuration is now finished with all XCAPI related configuration tasks, please save the changes you've made and exit the configuration tool.




Please keep in mind that it is required to save any XCAPI configuration changes followed by a restart of the bound **CAPI** application to take effect. Restarting the XCAPI related services won't help at all. If enabled the XCAPI diagnostic monitor will pop-up with an notification on success.



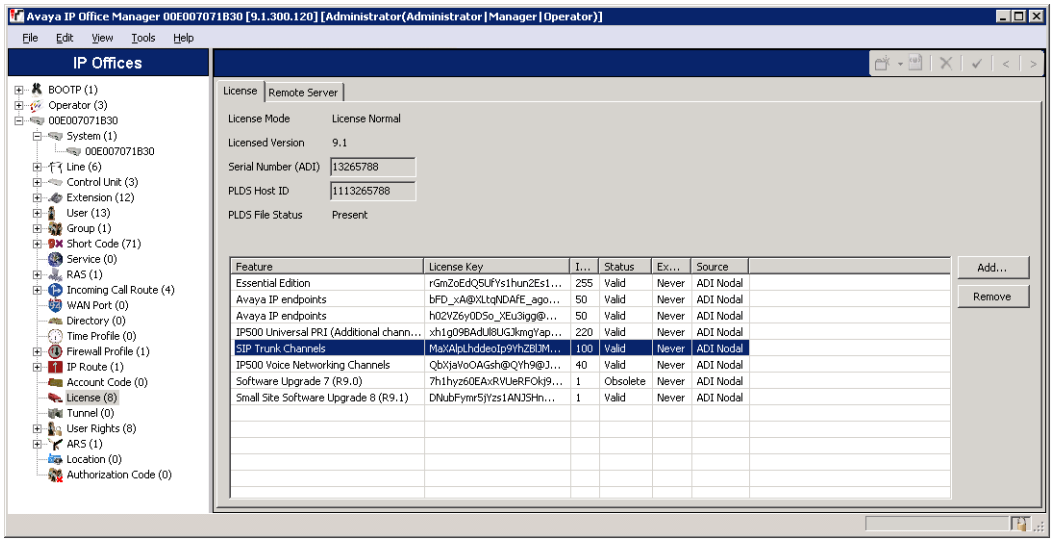
# Configuring the Avaya IP Office

In order to establish a connection between the XCAPI and the Avaya IP Office you need to setup the XCAPI as SIP trunk with all its appropriate configurations. The next chapters show a basic configuration which can't be assigned one-to-one to the environment.

The according configuration dialogs have to be adapted to the PBX environment and hardware and the according CAPI application. Especially the dialing plan and its related trunk group settings must reflect the local circumstances.

## 3.1 License

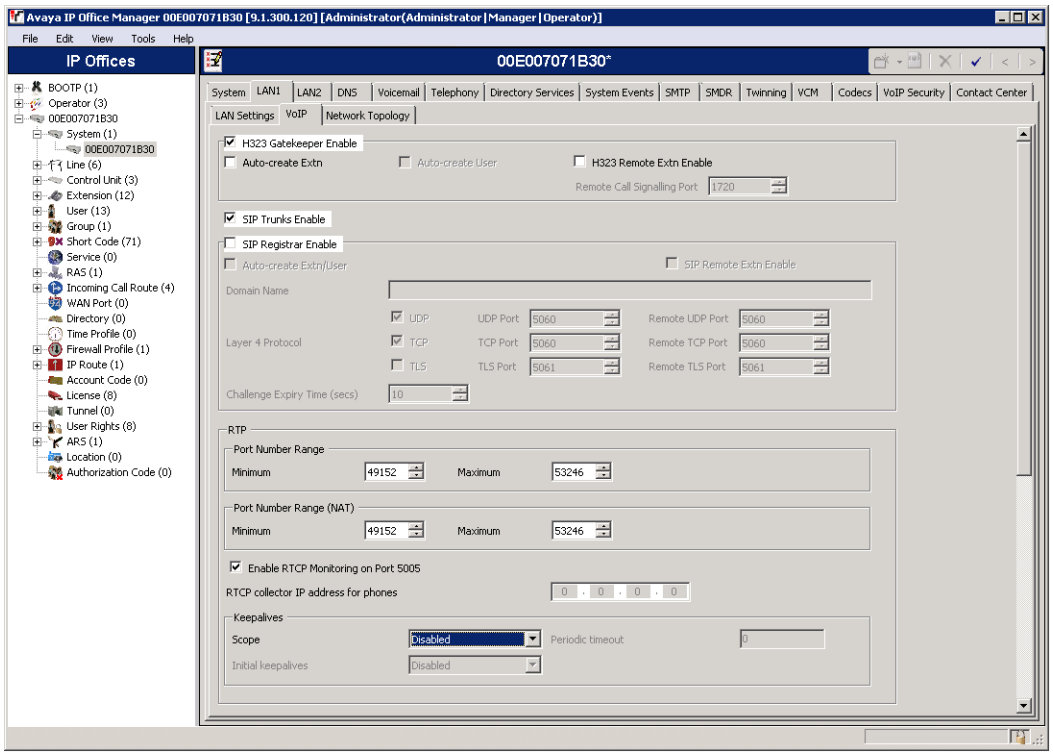
First, please ensure that the **Avaya IP Office SIP Trunk Channel** license key is available for allowing SIP trunking.



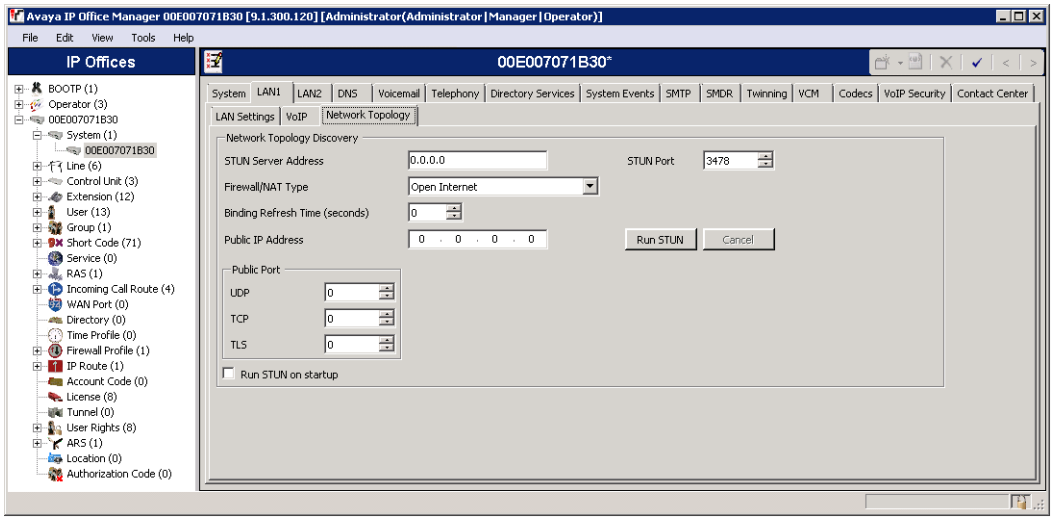

Additional voice networking channel licenses may be necessary, depending on the firmware and hardware.

## 3.2 System

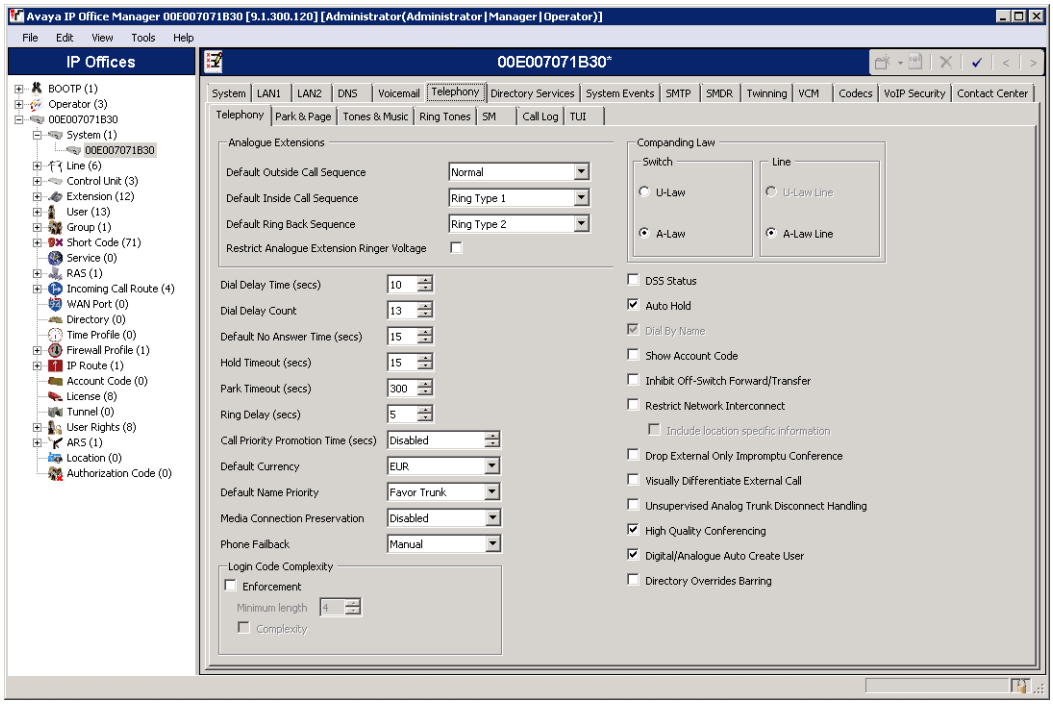
Next, the **VoIP** tab within the **System** configuration is going to be reviewed. Please ensure that the SIP trunk support is enabled.



This environment doesn't use any STUN. The **Firewall/Nat Type** is here related to the systems **Open Internet** profile.

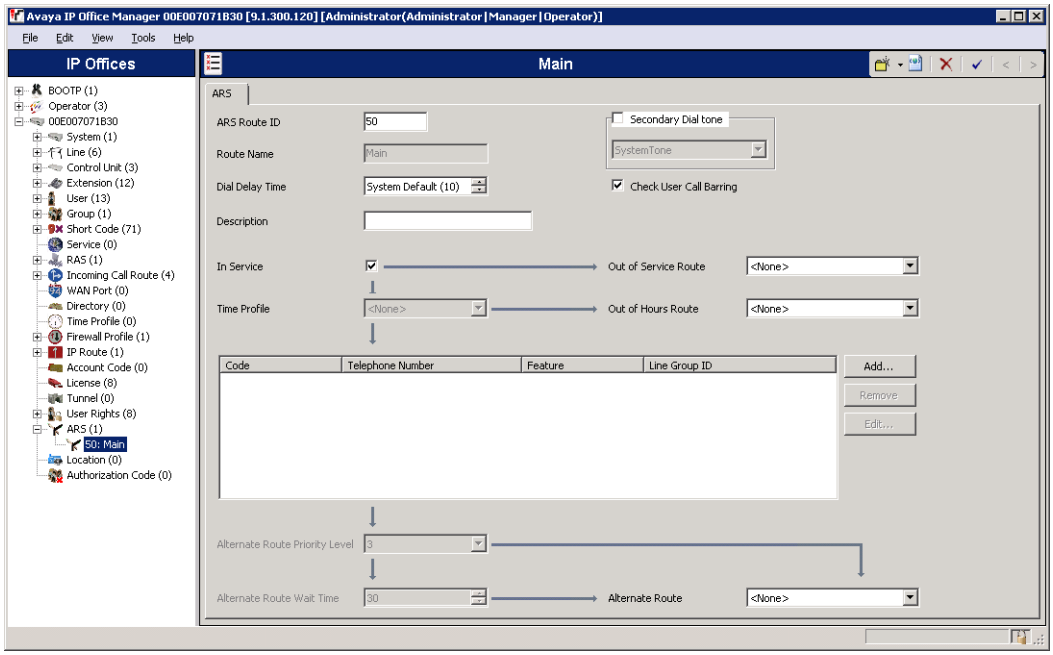



The **Telephony** settings are used with their default values. The **Inhibit Off-Switch Forward / Transfer** must be disabled for allowing call forwarding or call transfer toward PSTN.



## 3.3 ARS

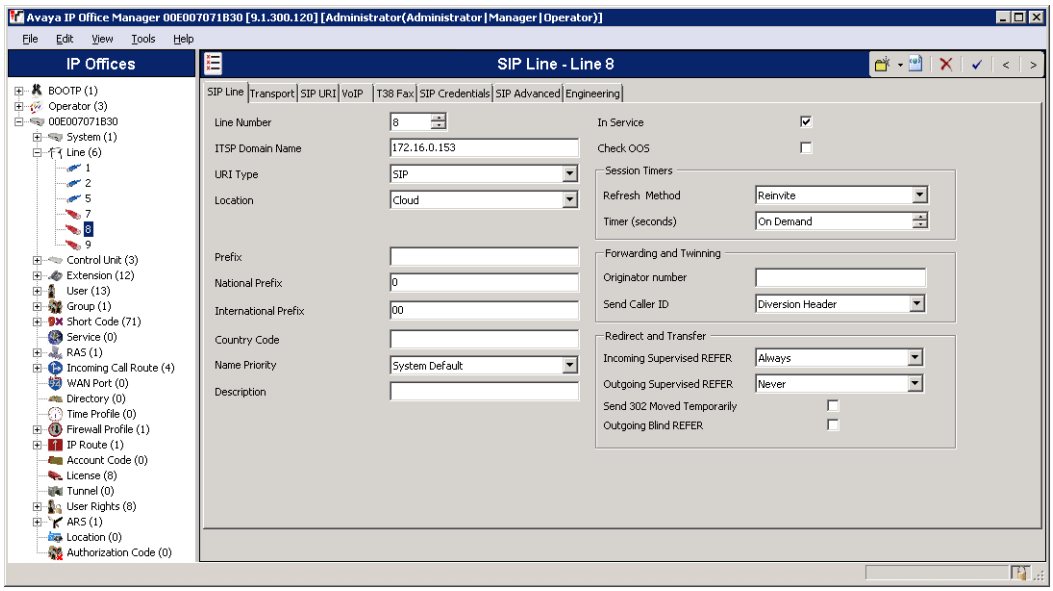
The **ARS** configuration depends on local requirements. In this test environment it's configured as shown next.



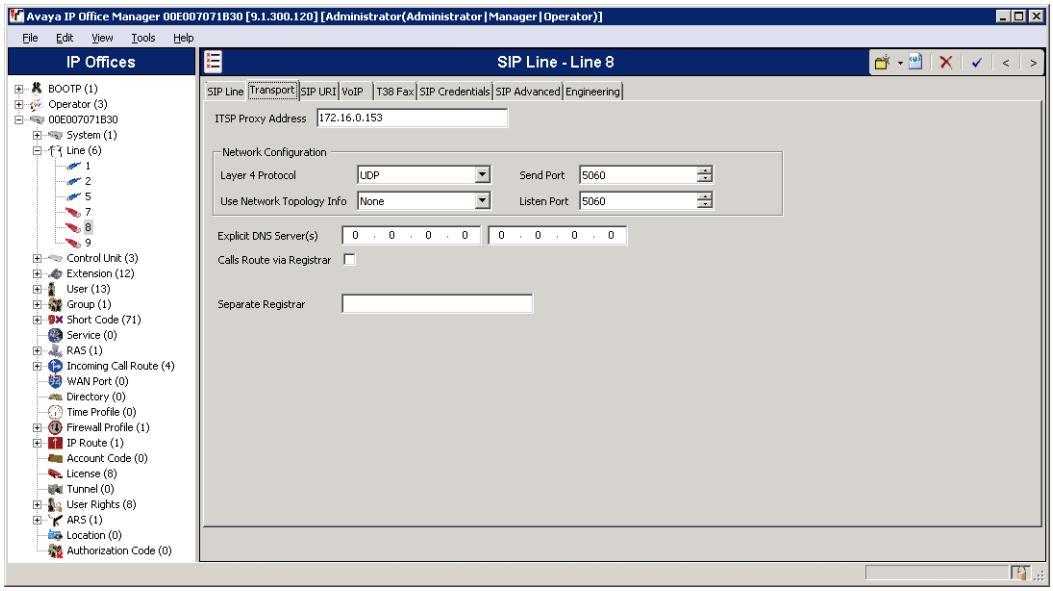
## 3.4 SIP Line

The XCAPI's related **SIP Line** is here set to line number 8 and used as follows:

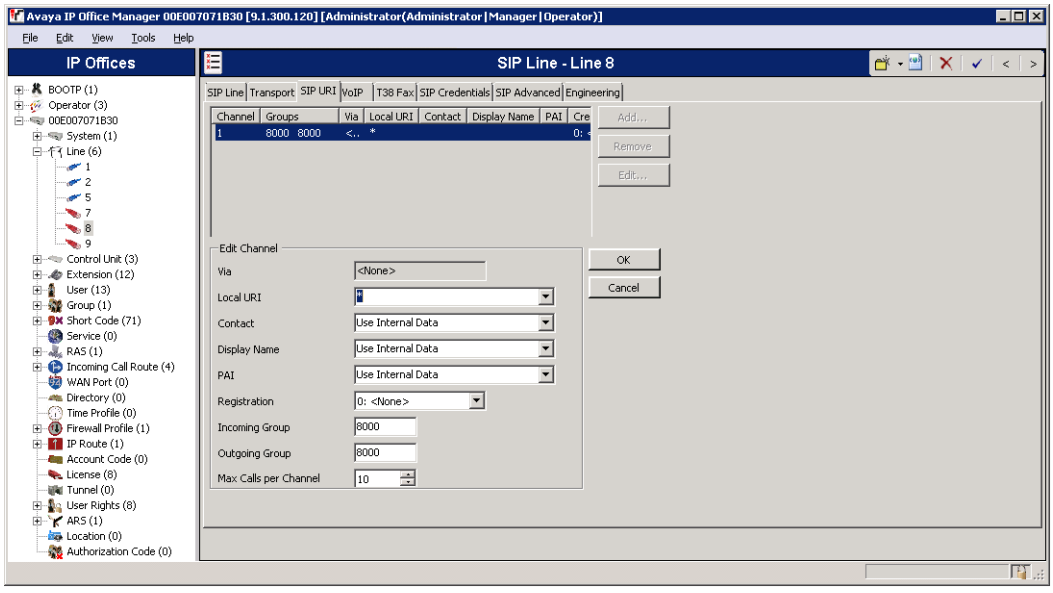
- Ensure that the **SIP Line** is **In Service**.
- On demand **Check OOS** can be set for enabling keep alive via **SIP Options**.
- The **ITSP Domain Name** is set to the IP address **172.16.0.153**, which determines the selected Ethernet interface address of the XCAPI controller which is used by its application server.
- The prefix and numbering related configurations must be set according to the local requirements.
- For the **Session Timers** part the **Refresh Method** must be set to **Reinivite**. **Timer (seconds)** is here set to the default **On Demand**.
- Also the **Forwarding and Twinning** related settings must be set according to the local requirements.
- **REFER Support** has to be enabled for call transfer via SIP refer. For this **Incoming Supervised REFER** must be set to **Always** and **Outgoing Supervised REFER** must be set to **Never**.



Within the **Transport** tab the IP address **172.16.0.153** is again related to the XCAPI controllers used Ethernet interface. The **Network Configuration** parameters are used as shown on the screenshot below.
Nevertheless, please ensure that those settings are set conform to the ones of the XCAPI controller.

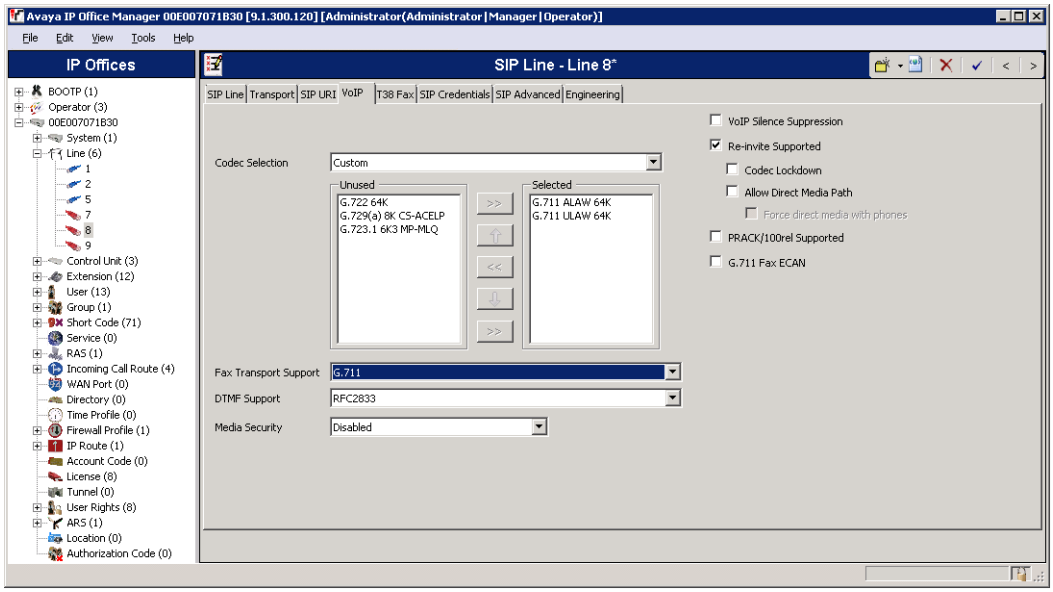



The **SIP URI** tab is configured as follows. The **Local URI** is used with wildcard * which determines that the SIP trunk will accept any incoming SIP call. **Contact**, **Display Name** and **PAI** credentials are here used with their defaults (**Use Internal Data**). The **Incoming** and **Outgoing Group** ID is set to **8000**.

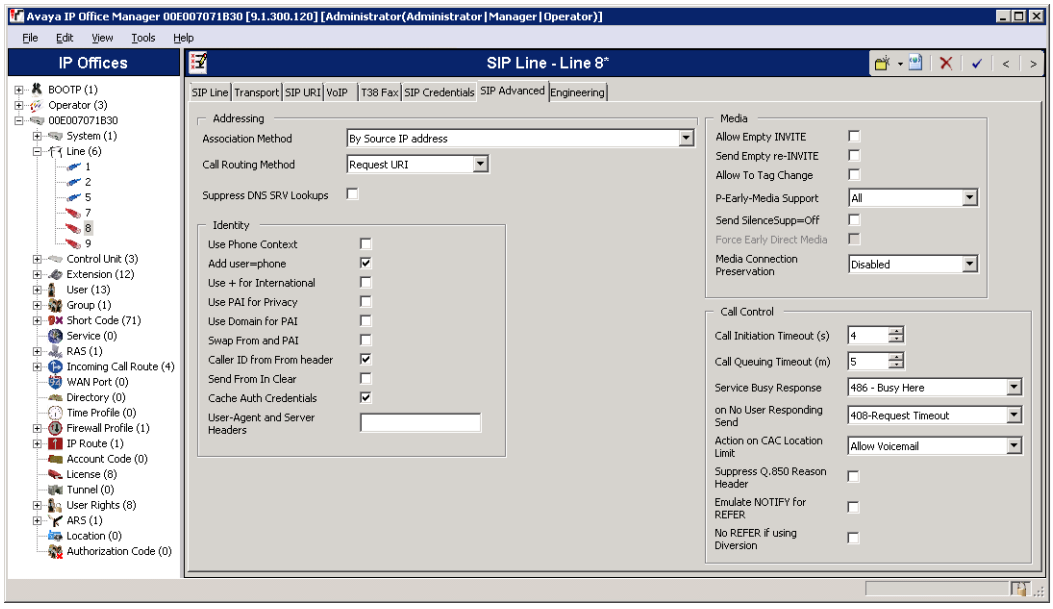


The **VoIP** tab **Codec Selection** is here used with **Custom** (G.711 only) settings. Beside of the **Re-Invite Supported** flag, all others parameters are unchecked.

According to the XCAPI controller configuration **Fax Transport Support** is set to **G.711** and **DTMF Support** is used with **RFC2833** method. Additional information about facsimile can be reviewed in the according chapters starting on page 18.




The **SIP Advanced** tab gives various new parameters. Beside of the system given defaults the parameters **Use Phone Context**, **Caller ID from From header** and **Add user=phone** are set for appropriate interworking.

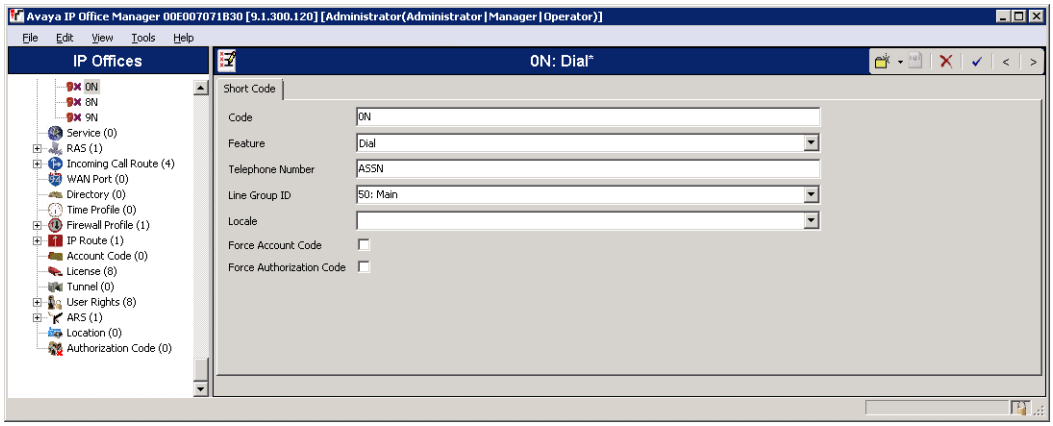


## 3.5 Short Codes

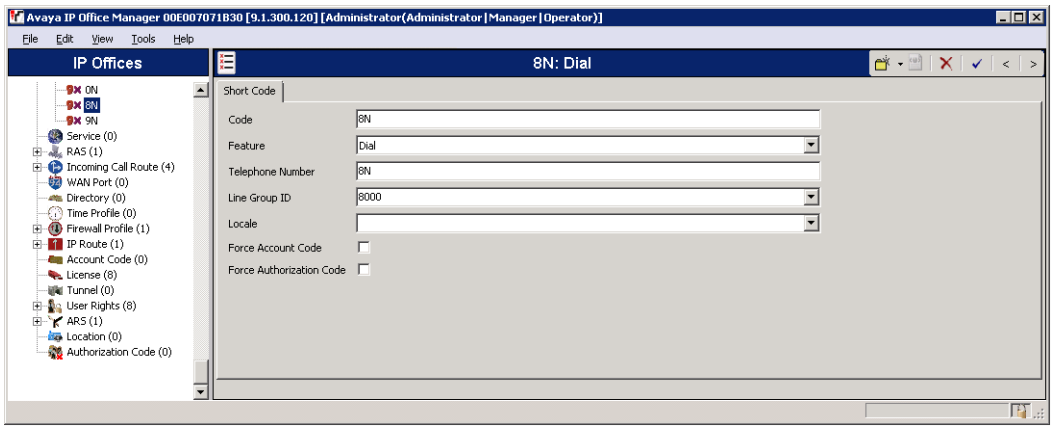
In this chapter we are going to review the most important short codes for appropriate PSTN and SIP line routing.

For matching the PSTN line (here related to **Line Group ID 50: Main**) the short code **0N** is used and set to the **Dial Feature**.

The **Telephone Number** is set to **ASSN**. In detail code **A** set an outgoing cli, **SS** pass through the calling number and **N** matches any prefix.



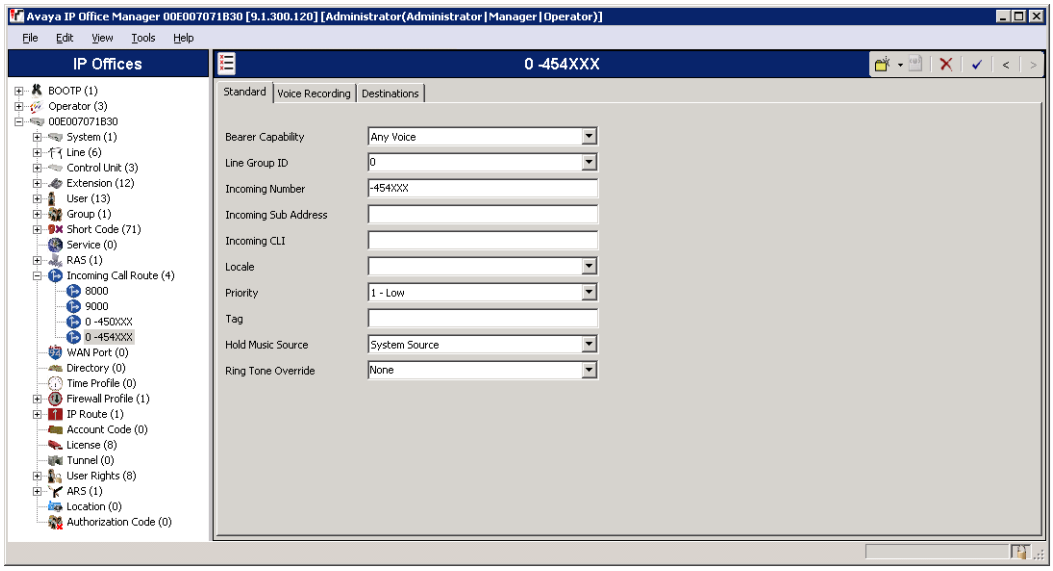

The SIP line using **Line Group ID 8000** will match any prefix starting with 8 (**Code 8N**) and uses the **Dial Feature**. Also the **Telephone Number** is here set to **8N**.



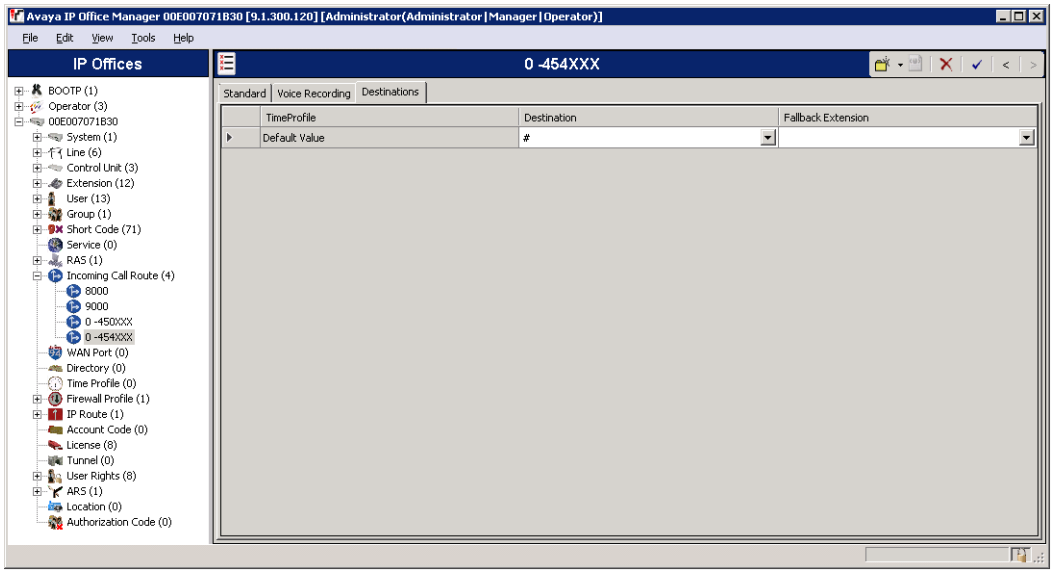
## 3.6 Incoming Call Route

This example uses two incoming call routes. The first call route is related to the main (PSTN) line.

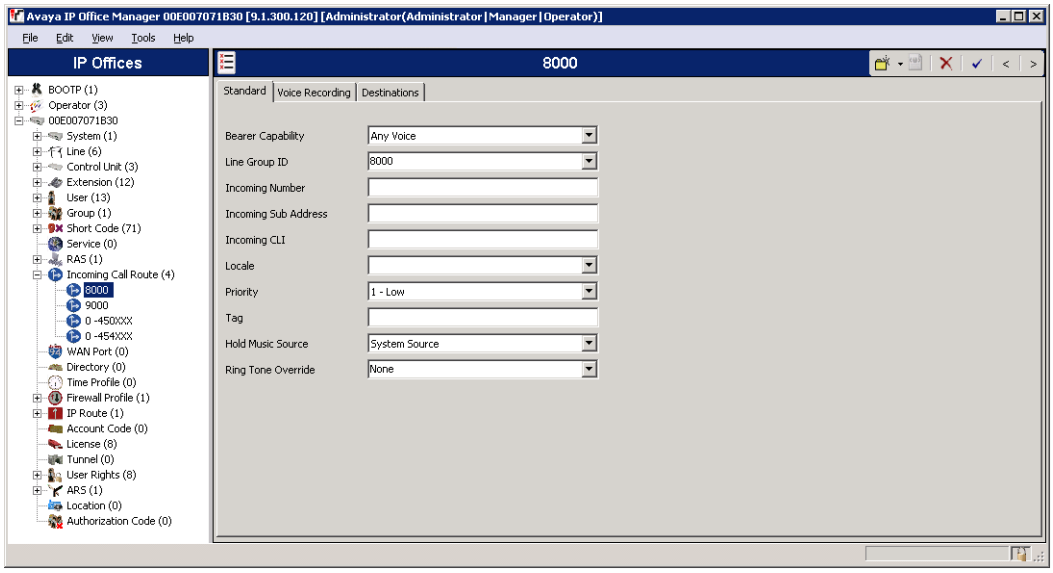
The **Incoming Number** is set in accordance with this environments used PRI interface **-454XXXX** and its prefix relations. Please replace our example prefix **454XXXX** with the real PSTN provided prefix.



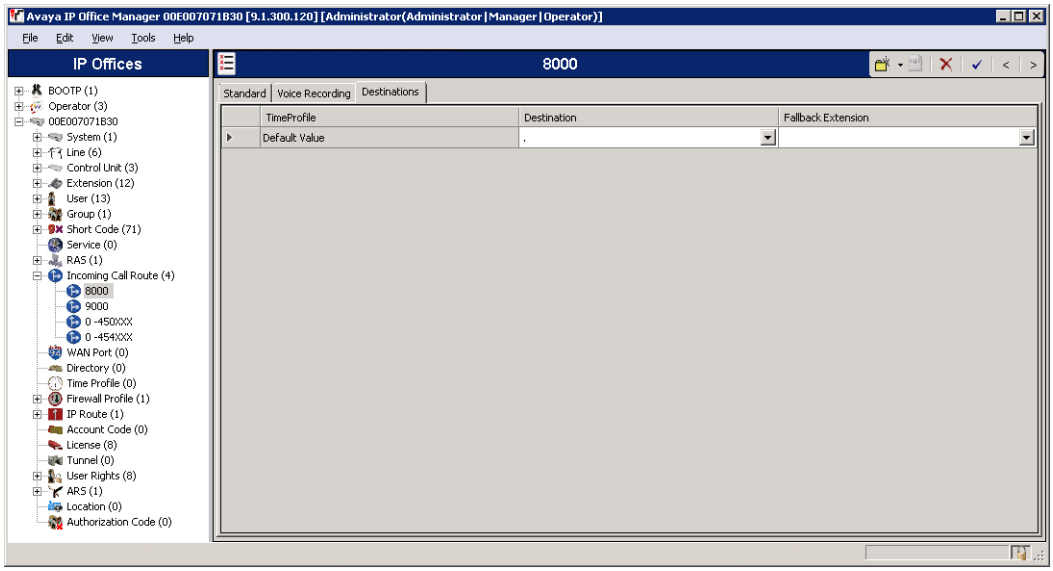

Within the **Destinations** tab the ♯ symbol is used for matching all **X** wildcards used in the incoming number field.



The second call route is related to the XCAPI's SIP line using ID 8000. **Incoming Number** and **Incoming CLI** aren't set at all for this test environment.



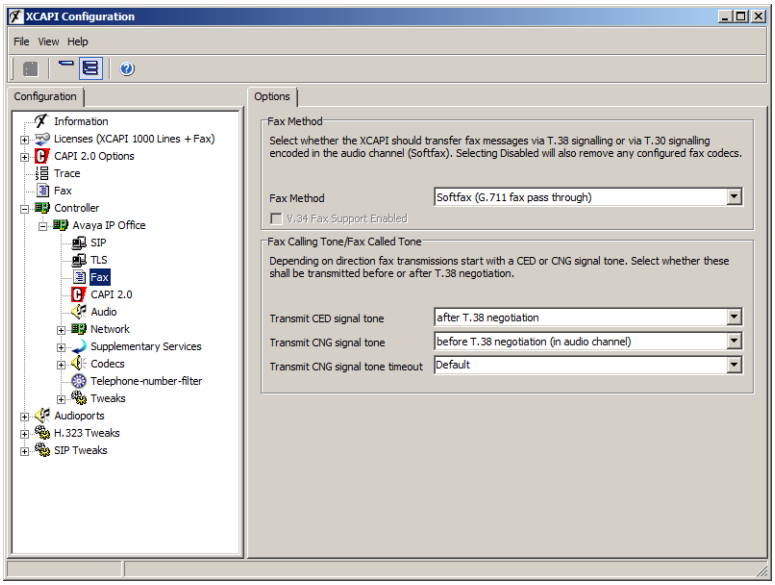

For this call route the **Destination** value is set to dot (.) for matching any value of the incoming number field.



## SoftFax

In the SoftFax mode XCAPI simulates an analog Fax device by transmitting modulated facsimile signals modem-like via audio-channels. For this **Softfax (G.711 fax pass through)** must be selected as **Fax Method**.

Ensure that the **Fax Transport Support** within the SIP line **VoIP** tab is set to **G.711** as shown in the **SIP Line** chapters screenshot starting on page 12.



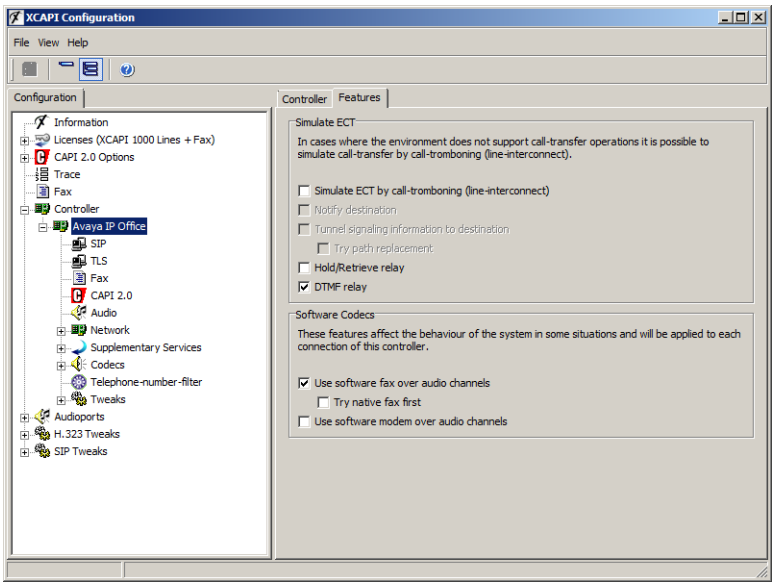

If using facsimile via G.711 you might have to set the according short code to **Dial 3K1** for appropriate interworking. This dial feature sets the ISDN bearer capabilities to 3.1KHz and improves the compatibility with specific remote devices which only allows facsimile up to such bearer capability.

## Call Transfer

Please ensure that the **Simulated ECT by call-tromboning (line-interconnect)** parameter of the XCAPI controller `Features` dialog is disabled for supporting call transfer via the SIP Refer method.

As already mentioned in the **SIP Line** chapter starting on page 12, **Incoming Supervised REFER** must be set to **Always**. Additionally you might have to disable the **Inhibit Off-Switch Forward / Transfer** parameter as mentioned in the **System** chapter starting on page 9.

Depending on the call transfer / forward scenario you might have to set the according parameters for **Restrict Network Interconnect** or **Analog Trunk to Trunk Connection**.

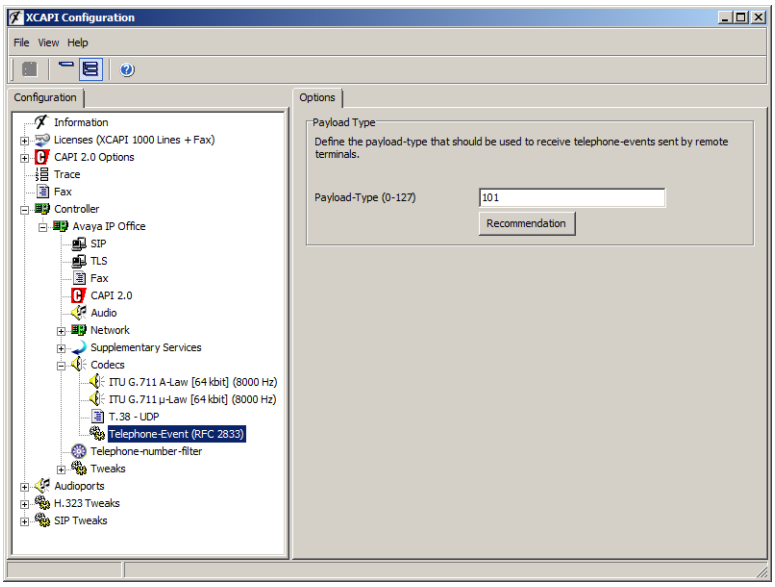


## Redirecting Number

The SIP lines **Send Caller ID** must be set to **Diversion Header** for enabling redirection numbers via SIP diversion header. In addition you might have to set some specific short code characters. More details are mentioned in the **SIP Line** and **Short Codes** chapter starting on page 12 and page 15.

## DTMF

For DTMF interoperability please ensure that **DTMF Support** is set conform to the **XCAPI** controller configuration. Here it is set to **RFC2833** as described in the previous chapter **SIP Line** starting on page 12. By default RFC2833 is set to payload value 101.



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