# Alcatel-Lucent OXO Connect R2



March 1, 2018





### Introduction

This document is intended to support you with the integration of XCAPI into an existing environment of the Alcatel-Lucent OXO Connect. In the following sections we describe the essential configuration steps for SIP trunking to allow optimal interworking of both, the XCAPI and the Alcatel-Lucent OXO Connect. Though being based on the Alcatel-Lucent OXO Connect R2 series, this document is applicable with other versions given a few adjustments.

At this point we suppose that the Alcatel-Lucent OXO Connect environment and the physical or virtual application server is available and accessible through the network. Application server in this context mean, a server with a recent available Microsoft Windows operating system with latest updates and patches included. Further, that the XCAPI and the CAPI 2.0 voice or fax application is properly installed.

Independent of the deployed application, the SIP trunk configuration can be tested with the XCAPI's included test application (xtest.exe) that is available within the XCAPI's installation folder (by default \\Program Files (x86)\TE-SYSTEMS\XCAPI\). This test tool allows to check with inbound and outbound calls, fax and testing several supplementary services.

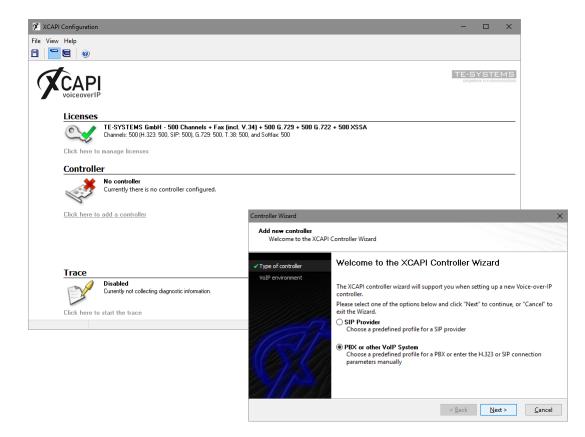
However, we recommend to visit our YouTube channel frequently for XCAPI related tutorials about licensing, the test tool, line monitor, tracing, analyzing and others. Registered community users can check about latest XCAPI documents, TechNotes and versions.



### **XCAPI Configuration**

Please start up the XCAPI configuration to create a new controller assigned to the Alcatel-Lucent OXO Connect. If you've just installed the XCAPI and start the configuration tool for the first time or no controller is available at all, the XCAPI controller wizard will pop up automatically. To start up the XCAPI controller wizard manually, the hyperlink labeled **Click here to add a controller** on the main page has to be clicked.

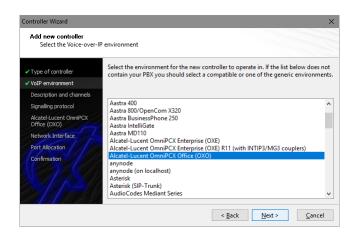
However, select **PBX or other VoIP System** in the initial **Type of controller** dialog and proceed with the **Next** button.





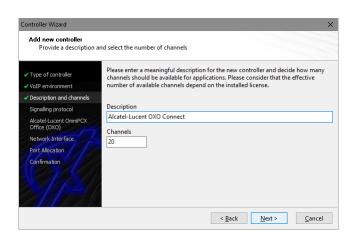
#### 2.1 Voice-over-IP Environment

The next dialog lists some common Voice-over-IP environments. Selecting one of those will setting up the XCAPI controller with a selection of near-optimal presets and sparing you a lot of manual configuration.



#### 2.2 Description and Channels

When the VoIP environment was selected, the next dialog allows to set a meaningful description for the controller. Also the number of channels that the new controller will be able to provide can be set. So enter how many simultaneous connections the XCAPI controller should handle when communicating with the Alcatel-Lucent OXO Connect and the bound CAPI 2.0 application.





#### 2.3 Signaling Protocol

The next dialog shows a list of signaling protocols which are supported for the given Voiceover-IP environment. According to this example the SIP protocol is selected.

	Each voice-over-ip network operates with a specific voice-over-ip protocol like H.32
Type of controller	or SIP. The list below contains any voice-over-ip protocol that may be used with the
VoIP environment	selected environment. Please select the protocol from the list that is used in your network.
Description and channels	
Signalling protocol	H.323 SIP
Alcatel-Lucent OmniPCX Office (OXO)	
Network Interface	
Port Allocation	
Confirmation	

#### 2.4 IP Address of the Alcatel-Lucent OXO Connect Gateway

Next the IP address or host name of the Alcatel-Lucent OXO Connect gateway must be provided, in this example IP address 172.18.1.235.

Controller Wizard	×
Add new controller Provide the hostname	e or the ip address of the voice-over-ip remote peer
<ul> <li>✓ Type of controller</li> <li>✓ VoIP environment</li> </ul>	Please provide the hostname or the ip address of the voice-over-ip remote peer (pbx) that should be used.
<ul> <li>Description and channels</li> <li>Signalling protocol</li> </ul>	Alcatel-Lucent OmniPCX Office (OXO)
<ul> <li>Alcatel-Lucent OmniPCX Office (OXO)</li> </ul>	172.18.1.235
Network Interface Port Allocation Confirmation	
	< <u>Back</u> <u>Next &gt;</u> <u>Cancel</u>



#### 2.5 Network Interface

Afterwards, select the network interface that will be used for the inbound and outbound communications for this controller. Note that this is the XCAPI controllers used Ethernet interface which is related to the according **Gateway Parameters** of the Alcatel-Lucent OXO Connect, which is described from page 13.

Controller Wizard Add new controller Select the network inte	erface	
<ul> <li>✓ Type of controller</li> <li>✓ VoIP environment</li> <li>✓ Description and channels</li> </ul>	network, your syster	and gateway requires a physical connection to the voice-over-ip m needs a network-interface-controller (nic) with a link to this ct a certain nic from the list below.
✓ Signalling protocol	Device	Comment
<ul> <li>Alcatel-Lucent OmniPCX Office (OXO)</li> </ul>	<b>#2</b> 172.16.0.153 <b>#2</b> ::1	Ethernet [B8-AE-ED-22-33-C3] Loopback Pseudo-Interface 1
Network Interface     Port Allocation     Confirmation	■27.0.0.1	Loopback Pseudo-Interface 1
		< Back Next > Cancel

#### 2.6 Port Allocation

On demand and in the case of any router or firewall restrictions for UDP (RTP/T.38) a port range can be specified. In this example no range will be set which allows the XCAPI controller using a random port range between 1024 and 65535.

Controller Wizard						×
Add new controller Provide information a	bout port allocation					
<ul> <li>Type of controller</li> <li>VoIP environment</li> <li>Description and channels</li> </ul>	If you want to o constrain local o	idp port	s to a certair	-	eway it might be	necessary to
Signaling protocol     Alcatel-Lucent OmnPCX     Office (XO)     Network Interface.     Port Allocation     Confirmation	10000	-	10120			
				< <u>B</u> ack	<u>N</u> ext >	<u>C</u> ancel



#### 2.7 Confirmation

The final wizard dialog performs some checks on the configuration parameters you've made. If errors will be detected, use the **Back** button to the respective erroneous dialogs and correct them. Use the **Finish** button in order to finally create the new controller if everything is correct.

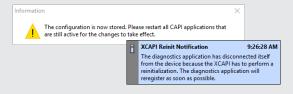
Type of controller	Click Finish to add the new controller with the configuration you have had made.
VoIP environment	
Description and channels	
Signalling protocol	
Alcatel-Lucent OmniPCX Office (OXO)	
Network Interface	
Port Allocation	
Confirmation	

The newly created XCAPI controller for the Alcatel-Lucent OXO Connect is now listed on the main page of XCAPI configuration. Push the **Save** button and exit the configuration tool.

-		
X XCA	PI Configuratio	m — 🗆 🗙
File Vie	w Help	
8 5		
_		
6	t	TE-SYSTEMS
	CΔF	competence in e-communications.
	voiceover	IP
-		
	License	s
	0	TE-SYSTEMS GmbH - 500 Channels + Fax (incl. V.34) + 500 G.729 + 500 G.722 + 500 XSSA
	Carlos a	Channels: 500 (H.323: 500, SIP: 500), G.729: 500, T.38: 500, and Settfax: 500
	Clink hour	to manage licenses
	CIICK Here	to manage acenses
	Control	ler
		Alcatel-Lucent 0X0 Connect (172.16.0.153)
	100	20 channels with ITU G.711 A-Law [64 kbit] (8000 Hz), ITU G.711 µ-Law [64 kbit] (8000 Hz), ETSI GSM 6.10, ITU G.729, T.38 - UDP, and Telephone-Event (RFC 2833)
	S	at Alcatel-Lucent OmniPCX Office (OXO) at domain *172.18.1.235* Disable III Remove A Move up IV Move down
	Click here	Disable in remove in move up in move down to add a controller
	GIIGK HEIG	
	Trace	
	muce	Disabled
	EN S	Currently not collecting diagnostic information.
	2	
	Click here	to start the trace



Note that the bound CAPI 2.0 application with its services must always be restarted to take effect on the XCAPI controller changes. Restarting any of the XCAPI services won't help at all. If enabled, the XCAPI diagnostic monitor pop-up with a re-initialization notification on success.





## **Configuring the OXO Connect Gateway**

In order to establish a connection between XCAPI and the Alcatel-Lucent OXO Connect gateway, you need to setup XCAPI as VoIP trunk with appropriate settings for using line and direction channels.

A valid amount of **IP Trunks** and **VoIP channels** which has to be allocated to XCAPI's SIP Trunk has to be available, activated and authorized via **Software Key**.

CXO Connect Management Console				- 🗆
File Comm View Options ?				
🗅 📽 🛃 🛱 🚔 👹 関 💡	Software Key Features			
M OMC	Software Key Features			
- 🎸 Tools				
E-SYSTEMS GmbH				
Customer/Supplier Info				
👯 Installation typical				
👯 Modification typical				
O3 Numbering	Software Key Features		X Software Key Features	×
Collective Speed Dialing	Voice communication Multi-site System features Call facilitie	s Network Management CTI	Voice communication Multi-site System features Call facilities	Network Management CTI
Emergency     Directory				
	OXO Model Type	Standard		Authorized by Really software key activated
Subscribers/Basestations List		Authorized by Really software key activated	Call handling ISVPN service	Disabled Disabled
🗉 👸 Voice Processing	Universal telephony	10 10	Call handling QSIG+ protocol	Disabled Disabled
Time Ranges	Open SIP Phone users	0 0	B channels	0 0
Attendant Groups			IP Trunks	
- 🦚 Hunting Groups	VoIP channels	12 12	IF TRUNKS	8 8
	My IC Mobile users (DTCV)	0 0		
Pickup Groups	My IC Web users	0	2 B channels for mixed boards	48 48
- 🔤 Manager-Secretary Relations	Hot Desking users	2 2		
🐵 🏠 Subscribers Misc	Hot Desking users	2		
🗄 😤 External Lines	0K Cancel		0K Cancel	
🖃 😎 Hardware and Limits	UK Cancer		UK Lancei	
Main Cabinet				
- Auxiliary Interfaces				
- IP Configuration				
Software Key Features				



#### 3.1 VoIP Parameters

For this example the **VOIP Parameters** are mainly used with their defaults and the focus is set to the most relevant parameters in conjunction with XCAPI and SIP trunking. However, note that the DHCP parameters are not enabled for this example and thus not shown in detail here.

- For SIP trunking the OXO system must be enabled for the SIP VoIP Protocol within the General tab and a Number of VoIP-Trunk channels must be available and set.
- The Gateway configurations are used with the OXO given defaults. The SIP Trunk Signal Source Port is set to port number 5060, what is also used by default of the XCAPI controller wizard. If this port will be changed, it must be set accordingly as local listening within the XCAPI controller. If required check with Local port for UDP/TCP in the XCAPI controllers protocol tab of the SIP settings.

VolP: Parameters X	VolP: Parameters ×
General Guterray DSP DHCP Far SPTrivek SPThree Codect Topology       WIP Device nock       Hallowster 110       Hallowster STP       Hallowster STP       Hallowster STP       Billowster STP       General Service       General Haute House In StP	General       General         B       1       RAD Report Tread         BO       1       RAD Damp Present Tread         BO       2       RAD Damp Present Tread         BO       2       L22 Fragment Tread         BO       2       K122 Fragment Tread         BO       2       L22 Fradment Tread         BO
OK Cancel	OK Cancel

- Also the DSP settings are used with their defaults (Echo Cancellation enabled and Voice Activity Detection disabled).
- The Fax settings are only referring to the T.38 protocol, so if T.38 is used as fax method it is required and recommended enabling the **Error Correction Mode**. For additional information about fax, please check with the according chapters in the **Appendix** starting on page 18.

olP: Parameters X	VolP: Parameters ×
General Gateway DSP DHCP Fax SIP Trunk SIP Phone Codecs Topology	General Gateway DSP DHCP Fax SIPTrunk SIPPhone Codeco Topology
Law Mode A-baw	T38 Parameters
Echo Cancellation	UDP Redundency 1
Vice Active Detection	Franing 2
	Enor Correction Mode
OK Cancel	OK Cancel



- Page 10
- The **SIP Trunk** parameters are used as shown in the screenshot below. For QoS support, please check with our document **XCAPI TechNote (en) Quality of Service** for additional information which is available in the download section of our community for registered users. The system given **Blacklist Behavior** defaults might be adjusted up to the local requirements.
- The **SIP Phone** related configurations are custom and just shown for completeness here. We are not aware about any impact of these settings in relation of XCAPI's SIP trunk configurations.

VoIP: Parameters ×	VolP: Parameters X
General Gateway DSP DHCP Fax SIP Trunk SIP Phone Codecs Topology	General Gateway DSP DHCP Fax SIP Trunk SIP Phone Codecs Topology
1000° mit Time 11     Bie Nunder of Relies:       4000° mit Time 12     0000000 DIFFSERV_PHB_BL     P Gusky of Service for Signal       Image: Service for Synal     Image: Service for Synal       Registration     Image: Service for Synal       Registration     Authentication       Registration     Authentication       Registration     Authentication       Registration     Authentication       Registration     Storage       Point     5000       Point SRV     Registration       Registration Reage     5000       Outhout Pew JP     0.0.0       Disclust Behavior     1000       2000° *     Period Peak Number       100° *     Provide Peak Mumber       100° *     Provide Peak Mumber	Defaul Torrupot Mode UUP ▼ Deman Name 1772.181.225 Authenication Readm 1772.181.225 SIP Prices Signal Source Port 5059 Registration 100 € = Registre Reity Time 120 € = Registre Explore Time
OK Cancel	OK Cancel

- The **Default Codecs List** is here used with G.711 codecs and a **Default Framing** of 20 milliseconds. As this are global settings, you may prefer using the OXO defaults or other customized settings. However, if using Softfax (G.711 Fax pass through) a G.711 alaw or ulaw codec must be available with a framing of 20 or 30 milliseconds. Even though SIP allows a proper codec negotiation, we recommend using conform codecs, framing and payload settings for the XCAPI SIP trunk and its controller configuration and all participating SIP and VoIP instances used in the OXO Connect environment. Some additional information can be found in the referring **Codec** and **Fax** chapters in the **Appendix** starting on page 18 of this document.
- The **Topology** settings are used as shown below.

X VoIP: Parameters X
VoliP Parameter     X      General Edenny DSP DHCP Fax SIP Trunk SIP Phone Codecs Topology      Static NUT(public data)      IP Addets:     I72181.28      SIP Pont(UDP/TCP)      5666
Range Ports for RTP (LOP)         2000         -         22255           Range Ports for T38 (LOP)         5556         -         £751
OK Cancel



#### 3.2 External Lines

For this example only the XCAPI related external line configurations List of Accesses and List of Trunk Groups will be reviewed. Additional configurations for the Protocol, Analog Protocol Selection or Incoming Call Handling dialogs might be required for local purposes.

#### 3.2.1 List of Accesses and List Trunk Groups

The belonging List of Accesses and List of Trunk Groups configurations of the XCAPI SIP trunk is here used as shown next. Ensure that these entries are in service and the required link categories are given.

List of Accesses X	VolP-Trunk ×	Link Category X
Prov. Add         O Acc. Type         Identifier         No of Chan.           01:003:01         T0         N001         2           01:01:01         T0         N003         2           01:01:01         T0         N003         2           01:01:01         T0         N003         2           01:01:01         T0         N003         2           03:001:01         T2         P001         30           95:001:01         VolP         V001         6	Phy. Add.     Type     Identifier     VolP-Trunk Ch.     Speed Dial       95:001-01     VolP     V001     6     CalkDist.       Metering Counters     Reset     Link-Cat.     Link-Cat.       Meter total     0     Out of Service (logical)     Public trunk       Alternative CLIP/COLP Number     Image: Clip Coll P Number     Image: Clip Coll P Number	Phy. Add.         Type         Identifier           95:001:01         VolP         V001           Traffic Sharing         Barring         Voice           Mode         LC No         Mode         VLC           Norm.         2         Norm.         1           Rest.         2         Rest.         1
Return	OK Cancel	OK Cancel
Vananaanaanaa		
List of Trunk Groups X Tru	unk Groups : Details X	Link Category X
Index     ONa     OType     OName     Ona     Otype     Oname     Oname	Ank Groups : Details × dex No. Type Name 2 51 Cyclic VolP Phy. Add. Acc. Type Identifier No of Chan. 6 55:001-01 VolP V001 6 Modify Up Down Link: Cat.	Link Category × Traffic Sharing Baning Voice Non V. Mode LC No Mode VLC NLC NLC Norm. 16 Norm. 1 1 Rest. 16 Rest. 1 1



#### 3.3 Numbering

The **Numbering** configurations for this showcase are here used as described in the following sections. Ensure that numbering plan matches the local requirements and the global defined installation numbers, also under consideration with the ARS and the XCAPI indexed SIP Public Numbering settings.

The Installation Numbers are here used as shown next.

Installation Numbers	×
Installation Numbers	
Installation Number	8195
International Prefix	
International Code	49
Intercity Prefix	
Intercity Code	5363
Recall Prefix	
Alternative System CLIP	
Private Installation Number	
Private Level2 Prefix	
Private Level2 Code	
Private Level1 Prefix	
Private Level1 Code	
VPN Escape Prefix to remove	
OK Cancel	

#### 3.3.1 Numbering Plans

The configurations of the **Numbering Plans** consist of the Internal, Public, Restricted and Private Numbering Plan. The VoIP trunk has to be declared as Secondary Trunk Group. Depending on your numbering you may have to declare different rules for allowing inbound and outbound calls. However, this example uses the ARS related numbering range 300-399 for SIP trunking and numbering schemas as shown next. This example doesn't use any numbering plan restrictions. The Private Numbering Plan is used as shown next.

Numbering Plans X	Numbering Plans X
Internal Numbering Plan Public Numbering Plan Restricted Public Numbering Plan Private Numbering Plan	Internal Numbering Plan Public Numbering Plan Restricted Public Numbering Plan Private Numbering Plan
Function         Start         End         Base         NMT         Fix         Fix         SIP Acc Index           Seconday Tunk Group         0         0         0         Dorp         No         Delete           Man Tunk Group         0         0         Dorp         No         Seconday Tunk Group         End         Media           Seconday Tunk Group         2.00         0.00         Deep         No         Media           Seconday Tunk Group         2.00         4.02         Add         Media           Seconday Tunk Group         4.00         4.02         Add         Media           Seconday Tunk Group         6.1         1         Deep         No         Seconday Tunk Group         5.00         959         ARS         Keep         Yes         Deen         Seconday Tunk Group         5.00         Seconday Tunk Group         5.0	Function         Staft         End         Base         NMT         Prix         Fax         SIP Acclindes         Add           Activate Meet Meet Meet Meet Meet Meet Meet M
DK Concel	OK Cancel Numbering Plans X
Internal Numbering Plan Public Numbering Plan Restricted Public Numbering Plan Private Numbering Plan	Internal Numbering Plan Public Numbering Plan Restricted Public Numbering Plan Private Numbering Plan
Function     Statt     End     Base     NMT     Priv     Fax     SIP Acc. Index       Activate Meet Me     Image: Comparison of the state of	Function         Start         End         Base         NMT         Priv         Fax         SIP Acc.Index         Add           Actived Meet Meet         0         0         Doop         No         Image: Control of the control o
OK Cancel	OK Cancel



#### 3.4 Automatic Route Selection

Within the **Automatic Route Selection** configuration dialog you have to add the trunk group for the Trunk Group Lists, setting up the prefix and the according values for the SIP trunking.

#### 3.4.1 Automatic Routing: Prefixes

The required range of dialing numbers that is here used for the XCAPI SIP trunk is used as shown next. The **Gateway Parameter Index** is set to the according entry which will be shown and described in the next section.

State OXO Connect Management Console														-	
<u>File Comm View Options ?</u>															
0 🖬 🗟 🖀 🎽 🎒 🚺 🕈															
OMC	Automatic	Routing: Pr	efixes												
CMC	^ Activation	Network	Prefix	Ranges	Substitute	TrGpList	Called(ISVPN/H450)	User comment	Metering	Calling	Called/PP	Destination	Gateway Alive Status	Gateway Para	meters Inde
👋 Tools	Yes	priv	4543	00-99	3	1	het	VolP Trunk	Blank	default	default	SIP Gate	Alive	1 XCAPI	
🗄 🔄 TE-SYSTEMS GmbH	Yes	priv	4503	00-99	3	1	het	VolP Trunk	Blank	default	default	SIP Gate	Alive	1 XCAPI	
🍏 Customer/Supplier Info	Yes	priv	454	000-9	3	1	het		Blank	default	default	Not IP			
🔣 Installation typical	Yes	priv	4549	9-9	9	1	het	VolP Trunk	Blank	default	default	Not IP			
🅰 Modification typical	Yes	priv	3	00-99	3	1	het	VolP Trunk	Blank	default	default	SIP Gate	Alive	1 XCAPI	
	Yes	priv	9	9-9	9	1	het	VolP Trunk	Blank	default	default	Not IP			
Installation Numbers     Installation Numbers     Numbering Plans     Fatures in Conversation     DUNumber Modification Table     Number Modification Table     Number Modification Table     Sumber Modification Table															
Automatic Routing Selection	•														-0-

#### 3.4.2 Gateway Parameters

The XCAPI related Gateway Parameters details are used as follows.

teway P	arameters					
Gatewa	y Parameters Lis	t				
Index	Index Label	IP Type	IP Address	Hostname	Domain Name	
1	XCAPI	Static	172.18.0.152			
						Create
						Details
						Delete
						Сору
						Paste



The **Domain Proxy** configuration has to be related to the IP address of the XCAPI controllers bound Ethernet Interface as shown in the chapter **Network Interface** of the XCAPI controller configuration on **page 6**. This showcase uses the **Default Transport Mode UDP** and **Remote Signaling Port 5060**.

For the **Media** settings the **Fax** method is set to **G.711**, **Codec/Framing** of 20 milliseconds and **Out-Of-Band [RFC 4733]** as **DTMF Method**. The **Gateway Bandwidth** has to be set to the local requirements and channel availability for the SIP trunk.

The **Identity** configurations can be used with their defaults.

For the settings of the **Protocol** tab using the OXO's given defaults is fine, just the **Alive Protocol** must be set to **SIP Options**. Nevertheless for this showcase all protocol related settings are disabled.

Gateway Parameters Details ×	Gateway Parameters Details	Gateway Parameters Details
General Domain Proxy Registration Media DNS Identity Protocol	General Domain Proxy Registration Media DNS Identity Protocol	General Domain Proxy Registration Media DNS Identity Protocol
Index 1 Index Label XCAPI SIP Numbers Format Index 1	IP Type Static	Fax G711 V T38 additional signaling No Signal Caled Identification Tone (CED) Codeo/Franing G711_20 V Gateway Bandwidth >=1024 kBk/s (p 20 cale) V DTMF Out-Of-Band (RFC 4733) V
Gateway Parameters Details General Domain Proay Registral PFC 3325 Diversion Info Diversion Calling Preferred identity Incoming From Passetter Durgoing Pheter Corrected Preferred identity Ourgoing To Passetter Atternative CLIP Contact Atternative CLIP Contact Proferred identity Preferred identity	Image: Second	Alton Media DNS Identity Perforced



For interoperability please ensure that gateway configurations and settings are supported and used conform to the ones of the XCAPI controller and other participating VoIP instances.



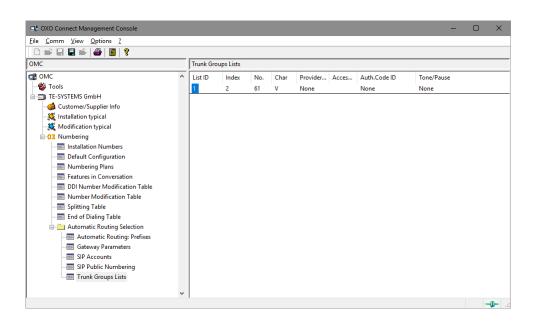
#### 3.4.3 SIP Public Numbering

The **SIP Public Numbering** specifies the handling of the numbering format of the incoming and outgoing calls for private or public SIP numbers. For this environment the numbering (based on T2 access type for pstn interworking) is used as shown next.

COND Connect Management Console				-		$\times$
File Comm View Options ?						
D 📽 🖬 🖀 🗳 🚺 🚺 🕈						
омс	SIP Pub	olic Numbering				
OMC     Tools     Tools     Tools     Customer/Supplier Info     Sumbering     Installation typical     Modification typical     Dol Numbering     Installation Numbers     Default Configuration     Numbering Plans     Features in Conversation     Dol Number Modification Table     Splitting Table     End of Dailing Table     End of Dailing Table     Automatic Routing Selection     Substratic Routing Selection     Substratic Routing Selection     Spl Accounts     Spl Accounts     Spl Accounts     Spl Pace	Index	Calling Format (Outgoing) Canonical	 Called Format (Outgoing) Undefined Called Format (Incoming) DDI	 Called Short Prefix (C		
~					-	<b>0-</b> .a

#### 3.4.4 Trunk Groups Lists

In the **Trunk Group Lists** configuration dialog you have to specify the trunk which has to be used with the ARS mechanism. This list is related to the Lists of Trunk Groups and Numbering Plans configuration.

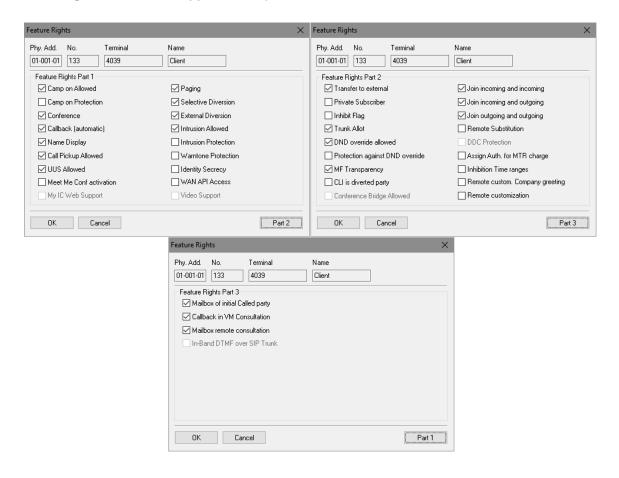




#### 3.5 Subscribers/Basestations List

It might be required to enable or disable phone features for specific services (for example allowing external call diversion). The screenshot below shows the settings of an Alcatel 4023 terminal used while testing the XCAPI interoperability.

Some additional information, for e.g. about redirecting numbers, can be found in the according sections of the **Appendix** chapter.





#### 3.6 System Miscellaneous

This chapter is about **System Miscellaneous** configurations. Beside of this example used **Features Design** settings some hints about the noteworthy addresses will be given. For details please refer to the according administration and technical OXO Connect documentations.

#### 3.6.1 Features Design

The **Features Design** configuration parts 1 and 2 are used as shown next. The omitted configuration tabs 3, 4 and 5 are not shown here in detail and used with their defaults.

Feature Design X	Feature Design ×
Part 1 Part 2 Part 3 Part 4 Part 5	Part 1 Part 2 Part 3 Part 4 Part 5
Go to Initiator if Transfer fails  Reservation for Conference  Cisconnect last Group Member allowed  Conference Initiation  CLI for external diversion  Transparent Access to PE Features in idle state	Transfer Ext/Ext Joining Analog:ISDN Call waiting/Automatic camp on CIL is diverted party if external caller CIL for VPS Busy group indication
Transparent Access to PE Features in connect state	Ringing tone for external calls
Busy attendant indication	Group called with signalling mode
Activate general bell for default attendant	Manual connection mode for attendant
Redial external numbers only	Transfer by on hook
Different icon for calls to attendant	Transfer Ext/Ext by on hook
Delayed call back for calls on hold	Cascaded External Diversion
Do not allow internal calls between multi-tenant entities	Automatic Answer for External Call
OK Cancel	OK Cancel

#### 3.6.2 Noteworthy Addresses

For appropriate SIP signaling please ensure that the **SimConnImm** ([System Miscellaneous] - [Memory Read/Write] - [Other Labels]) address is disable (set to 0). Some OmniPCX Office and OXO Connect releases might have this enabled by default what omits correct SIP signaling for busy lines.

Additional information and hints about **Noteworthy Addresses** can be found in the referring Alcatel-Lucent technical bulletin TC1398.

Other Labels, Detai	ls		×
Format: Hex V Baselabet Labet SimConnImm Address: 028DBDD3 Length (HEX): 1 Relevant	0ffset (HEX)	00	Modify Read Write
Return			



### Appendix

#### 4.1 SoftFax (G.711 fax pass through)

In the **SoftFax** mode, the XCAPI simulates an analog Fax device by transmitting modulated Fax-signals modem-like via audio-channels.

The **Fax** method within the gateway parameters **Media** settings are used by default with **G.711**. However, for appropriate facsimile interworking it has been ensured that those Codec, Framing, Bandwidth and DTMF settings (as shown in the chapter **Gateway Parameters** starting on **page 13**) are set conform to the ones of the XCAPI controller configuration and other participating SIP instances.

🖉 XCAPI Configuration		-	
File View Help			
Configuration Information Configuration Configuration Configuration Configuration Configuration Configuration Controller	the audio channel (Softfax). Selecting Fax Method V.34 Fax Support Enabled Fax Calling Tone/Fax Called Tone	sfer fax messages via T.38 signalling or via T.30 signallin Disabled will also remove any configured fax codecs. Softfax (G.711 fax pass through) ions start with a CED or CNG signal tone. Select whethe gotiation. after T.38 negotiation before T.38 negotiation (in audio channel) Default	~



#### 4.2 T.38

For enabling T.38 this Fax Method must be selected as shown below.

XCAPI Configuration       File     View       Help       Image: Second	_	-
Configuration Configuration Configuration Configuration Capital Capita	the audio channel (Softfax). Selecting Fax Method V.34 Fax Support Enabled Fax Calling Tone/Fax Called Tone	sfer fax messages via T.38 signalling or via T.30 signalling encoded in Disabled will also remove any configured fax codecs.           T.38            ions start with a CED or CNG signal tone. Select whether these shall gotiation.
	Transmit CED signal tone Transmit CNG signal tone Transmit CNG signal tone timeout	after T.38 negotiation     ~       before T.38 negotiation (in audio channel)     ~       Default     ~

The according OXO Connect parameters must also be properly set as described next. For our T.38 interoperability tests, the OXO settings were used as follows.

The XCAPI related **Media** configurations are set to **T.38** as **Fax** method. **T38** additional signaling was set to **No Signal** and **Called identification Tone (CED)** was disabled. The **Codec/Framing** is used with **G.711\_20**. As **DTMF** method **Out-Of-Band (RFC 4733)** is used. For allowing T.38 also check with the **Debug Label** parameter **VOIPNoT38** within the [System Miscellaneous] - [Memory Read/Write] settings, which must be set to value 00. Note that a system reboot is required to get this configuration change finally enabled.

ateway Parameters Details	×	
General Domain Proxy Re	gistration Media DNS Identity Protocol	
Fax	T38 ~	
T38 additional signaling	No Signal  Called Identification Tone (CED)	
Codec/Framing	G711_20 ~	
Gateway Bandwidth	>=1024 kBit/s (>20 calls) $\sim$	
DTMF	Out-Of-Band (RFC 4733) 🛛 🗸	
	Debug Labels, Details	
0K Cancel	Format: Offset (HEX) 00	Modify
	Hex ~ 000000 00	Read
	Baselabel:	Write
	Label:	
	V0IPNoT38	
	Address:	
	022F0A53	
	Length (HEX):	
	Relevant	



#### 4.3 Call Transfer

For enabling call transfer via SIP refer **Simulated ECT by call-tromboning (line-interconnect)** has to be disabled within the XCAPI controller **Features** tab.

File View Help  Configuration Configuration Controller In cases where the environment does not support call-transfer operations it is possible to simulate Call-transfer operations Controller CARD CONTROL Controller CARD CONTROL Controller CARD CONTROL Controller CARD CO	🖉 XCAPI Configuration			-	×
Information         > Information         > CAP12.0 Options         If Trace         If Trace </th <th></th> <th></th> <th></th> <th></th> <th></th>					
	Information         > Information         Informatin         Informatin	Simulate In cases call-trar Simu Notii Hold DTM Software These fe connect	e ECT where the ensite by call- late ECT by y destinatio el signaling iny path repl. /Retrieve rel F relay e Codecs eatures affection of this c software fax iny native fax	tromboning (line-interconnect). call-tromboning (line-interconnect) n information to destination iccement ay t t be behaviour of the system in some situations and will be applied to each ontroller. over audio channels first	

#### 4.4 Redirecting Number

If the CAPI application has to be aware of redirecting numbers additional configurations might be taken into account. Please check with the according OXO parameters like within the feature design settings, as shown in the **Features Design** chapter starting on **page 17**. Ensure that **CLI for external diversion** is enabled and **CLI is diverted party if external caller** is disabled.

In accordance with your CAPI application you have to enable/disable the client(s) feature rights parameter **CLI is diverted party**.



#### 4.5 Codecs

As a general rule for codecs we recommend using conform codec settings for all involved VoIP instances. So, beside of the XCAPI controller and the according OXO Connect settings (global and trunk related), it has to be ensured that other VoIP trunks or SIP trunks towards a provider are used conform. The required codecs must be available and be used with the same frame size (framing), any transcoding should be avoided and the RFC 2833 payload should be set to the same value for all SIP instances.

In case of a SIP provider instance it is compulsory using conform and supported fax methods (T.38 or G.711).

🛠 XCAPI Configuration		-		×
File View Help				
Configuration → ☆ Information → ☆ Licenses (TE-SYSTEMS GmbH - 500 Channels + Fax)	Codecs Each codec activated below may be selected and used in call establishment. The order of t determines their priority.	he cod	ecs	
→ (Q) CAPI 2.0 Options → III Trace → III Fax				_
Controller	Codec Sample	rate	Packettin	ne
Audioports     Markatel-Lucent OXO Connect      SIP     SIP     Fax     GAP12.0     CAP12.0     GAP12.0     G	Audio Codecs         8000           ☑ <pti>[1] L. L. aw [64 kbi]         8000           ☑ <pti>[1] L. S. T. I. μ-Law [64 kbi]         8000           ☑ <pti>[1] L. S. T. I. μ-Law [64 kbi]         8000           ☑ <pti>[1] T. S. S. M. S. 10         8000           ☑ <pti>[1] T. S. S. M. S. 10         8000           ☑ <pti>[1] T. S. S. UDP         Auditary Codecs           ☑         T. Bephone-Event (RFC 2833)</pti></pti></pti></pti></pti></pti>	) Hz ) Hz ) Hz	20 m 20 m 20 m 20 m	ns ns ns
	Add Codec Remove Codec		Ŷ	¢



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"OpenSSL", developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/), written by Eric Young (eay@cryptsoft.com) and written by Tim Hudson (tjh@cryptsoft.com).

"MD2, MD4 and MD5 Message Digest Algorithms" via source code derived from the RSA Data Security, Inc.

"RFC 4634 Secure Hash Algorithm", via source code derived from the RFC 4634.

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