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Introduction

This document is intended to support you with the integration of XCAPI into an existing environment of the Unify OpenScape Business. In the following sections we describe the configuration steps for SIP trunking to allow optimal integration of XCAPI and the Unify OpenScape Business. Even though this is based on the Unify OpenScape Business using firmware V3 and XCAPI version 4.0.12, this document is applicable to other versions given a few adjustments.

At this point we assume that the Unify OpenScape Business environment and the physical or virtual application server is available and accessible through the network. Application server is defined as a server with a recent installation Microsoft Windows operating system with all updates and patches included. It is important that XCAPI and the CAPI 2.0 voice or fax application is properly installed. It is also assumed that the public network access via ISDN and/or SIP is working properly, functioning correctly with any custom and country dependent numberings and call routes. The same goes for the networking (LAN, WAN, DMZ, NAT, Firewall...) itself, as such those are beyond the scope of this document and thus not shown here at all. Please refer to the respective manufacturer's documentation, manuals and examples. Without using the deployed CAPI 2.0 application, the SIP trunk configuration can initially be tested with the **xtest.exe** application which is located in the XCAPI installation folder (by default \\Program Files (x86)\TE-SYSTEMS\XCAPI\). This test tool allows you to check inbound and outbound calls, fax and testing several supplementary services.

We recommend a visit to 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 Unify OpenScape Business. On the first dialog of the XCAPI **Controller Wizard**, select **PBX or other VoIP System** 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 set up the XCAPI controller with a selection of near-optimal presets thus sparing you a lot of manual configuration.

Controller Wizard Add new controller		×
✓ Type of controller	Select the environment for the new controller to operate in. If the list below does r contain your PBX you should select a compatible or one of the generic environme	not ents.
✓ VoIP environment		
Description and channels		
Unify OpenScape Business	ShoreTel/ShoreGear	^
Network Interface	Sonus SBC 1000/2000	
Port Allocation	Studer CMS	
Confirmation	SwyxWare SwyxWare 2013/2015 tevitel.iPBX Unify HiPath 2000 Series Unify HiPath 3000 Series/HG 1500 Unify HiPath 4000 Series/HG 3500 Unify HiPath 8000 Series/OpenScape Voice	
	Unify OpenScape Business Unify OpenScape 4000	¥
	< <u>B</u> ack <u>N</u> ext > <u>C</u> ance	4

2.2 Description and Channels

When the VoIP environment was selected, the next dialog allows to setting a name for the controller. Also the number of channels that the new controller will be able to provide can be set. Here you enter how many simultaneous connections the XCAPI controller should handle when communicating with the VoIP gateway and the CAPI 2.0 application.





2.3 Gateway Address

Next, the host name or the IP address of the SIP listening Unify OpenScape Business Ethernet interface must be provided. In this example IP address **172.18.1.30** is used. Please note that both, the XCAPI controller and the Unify OpenScape Business, use by default the UDP port 5060 for SIP signaling.

Controller Wizard	×
Add new controller Provide the hostname of	or the ip address of the voice-over-ip remote peer
Type of controller VoIP environment	Please provide the hostname or the ip address of the voice-over-ip remote peer (pbx) that should be used.
 Description and channels Unify OpenScape Business 	Unify OpenScape Business
Network Interface Port Allocation	172. 18. 1. 30
Confirmation	
	< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel

2.4 Network Interface

Afterwards, select the network interface that will be used for the inbound and outbound VoIP communications for this SIP controller.





2.5 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 to use a random port range between 1024 and 65535.

Controller Wizard Add new controller	>
Provide information ab	out port allocation
✓ Type of controller	If you want to operate this system behind a router/gateway it might be necessary to constrain local udp ports to a certain range.
 VoIP environment 	
 Description and channels 	
Unify OpenScape Business	Constrain local udp ports to the following range
✓ Network Interface	50000 - 50120
✓ Port Allocation	
Confirmation	
	< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel

2.6 Confirmation

The final wizard dialog performs some checks on the configuration parameters you've made. If errors are detected, use the **Back** button to find the incorrect settings and correct them. Use the **Finish** button in order to create the new XCAPI controller.





Now, the newly created controller is listed on the main page of XCAPI configuration tool. Use the **Save** button and exit the tool.

XCAPI Cor	ion	<u> </u>
File View He		
8 29		
XČ	DI rIP	TE-SYSTEMS
Li	25	
C	TE-SYSTEMS GmbH - 100 Channels, 100 Fax Extension, 100 Security Extension, 100 G.722 Dec Channels: 100 [H.323 300, SIP: 300], T.38 100, and Softax: 100 [Expires: 10/16/2021]	oder, 100 G.722 Encoder
Cli	e to manage licenses	
C	ller	
4	Unify OpenScape Business (172.6.0.153) 20 channels with ITU G.711 A-Law (54 kbit) (8000 Hz), ITU G.711 µ-Law (54 kbit) (8000 Hz), ETSI GSM 6.10, at Unify OpenScape Business using sip-proxy "172.18.1.30" at domain "172.18.1.30" — Disable * Remove A Move up * Move down	TU G.729, T.38 - UDP, and Telephone-Event (RFC 2833) using Simulated ECT, and Softfax
Cli	e to add a controller	
I	-	
1	Disabled Currently not collecting diagnostic information.	
Cli	e to start the trace	
	XCAPI: 4.0.10.0 (¤119), CAPI2032.DLL: 4.0.10.0 (TE-SYSTEMS GmbH), CAPI2064.DLL: 4.0.10.0 (TE-SYSTEMS Gmb	H)



Please note that the bound CAPI 2.0 application with its services must be completely stopped and restarted for the XCAPI controller changes to take effect. Restarting any of the XCAPI services won't help at all. Alternatively the Server where XCAPI is running on can be restarted. If enabled, the XCAPI diagnostic monitor pops-up with a re-initialization notification on success:

ก	XCAPI Reinit Notification	2:16:34 PM
1	The diagnostics application has disconne from the device because the XCAPI has to reinitialization. The diagnostics applicatio reregister as soon as possible.	cted itself perform a n will

Alternatively check with the **Events** tab of the **XCAPI Line Monitor** about a configuration update notification (Event ID 20):

🕅 XCAPI	🖉 XCAPI Line Monitor 4.0.27.0 – 🗆 🗙			
START	ACTIVE CALLS	EVENTS	CALL HISTORY STATISTICS SYSTEM	
Q		J	CAPI	
Refresh View	Delete all Ever	Export nts	voiceoverIP	
Date	Time	Event ID	Description	
Today	11:55:43	20	XCAPI Configuration updated, previous configuration stored at "XCAPIConfig_ID_2_Ver_4_0_12_Date_2021_04_1511_55_43.txt"	
🚺 Today	11:55:31	121	Event log reset by user	



Unify OpenScape Business Configuration

In order to establish a connection between XCAPI and the Unify OpenScape Business gateway, the XCAPI SIP controller must be setup as **native SIP Server Trunk** with all appropriate configurations. Please note, native SIP Trunking requires a Unify OpenScape Business **Networking** license.

3.1 SIP Parameters

The global SIP parameters of the OpenScape Business gateway are commonly used with their default values. If some values have to be adjusted for local reasons or specific ITSP (SIP carrier) or SBC (Session Border Controller) bindings, then they should also be set conform with the XCAPI SIP controller to keep functionality through all participating SIP bindings of the Unify OpenScape Business environment. For e.g.: if disabling SIP via UDP for the gateway, the XCAPI SIP controller should also be changed to the **Prefer TCP over TCP** method. This can be done in the XCAPI expert configuration view (SIP controller -> SIP settings -> Protocol tab -> **Preferred Transport**). The same goes for the **Session Expires** and **Minimal SE** timer values.

If required, the timer values can be adjusted for the XCAPI SIP controller (SIP controller -> SIP settings -> Timer tab).

The **Timer** chapter on page 26 shows an example of the XCAPI SIP controller timer defaults.

Expert mode - Telephony Server			
Voice Gateway	SIP Parameters		
SIP Parameters	Edit SIP Parameters		
ITSP Loc-ID Settings			
Codec Parameters	SIP Transport Protocol		
Destination Codec Parameters	SIP via TCP:	Yes	
Internet Telephony Service Provider	SIP via UDP:		
Networking		¥	
SIPQ-Interconnection	SIP Via ILS.	tes	
Native SIP Server Trunk	SIP Registrar		
	Period of registration (sec):	120	
	RFC 3261 Timer Values		
	Transaction Timeout (msec):	32000	
	SIP Session Timer		
	RFC 4028 support:		
	Session Expires (sec):	1800	
	Minimal SE (sec):	90	
	DNS Records		
	Blocking time for unreachable destination(sec):	60	
	Provider Calls		
	Maximum possible Provider Calls:	10	
	Apply Undo Help		
	hopy may hop		





CAPI

The Unify OpenScape Business V3 XCAPI SIP trunk must be enabled as **Native SIP Trunk**. The **Remote Domain Name** and **IP Address / Host name** must be bound to the Ethernet interface of the XCAPI controller, here **172.6.0.153**. The **Transport protocol** and **Port** is used with the default **UDP** and **5060**. Ensure that **Native SIP trunk** is enabled and connected to the appropriate **Trunk Identifier in System**, in this example **ITSP/NS 10**. The **Extended SIP Data** are here set as shown on the next screenshot.

Expert mode - Telephony Server		
Voice Gateway	Native SIP Server Trunk	
SIP Parameters	Edit Native SIP Server Trunk Delete Native SIP Server Trunk Add Native SIP Server Trunk Liser	
ITSP Loc-ID Settings		
Codec Parameters	Trunk Name: Native SIP trunk	
Destination Codec Parameters		
Internet Telephony Service Provider		
Networking	Trunk Identifier in System:	
SIPQ-Interconnection	Remote Domain Name: 172.6.0.153	
▼Native SIP Server Trunk	Transport protocol: uth	
anynode SBC		
Circuit UTC (Cloud)		
▼ХСАРІ	IP Address / Host name: 1/2.6.0.153	
XCAPI-User	Port: 5060	
	SIP Registrar	
	Use Registrar:	
	IP Address / Host name:	
	Port: 5060	
	Beconistration Internal (con)	
	Reregistration interval (seC) [300	
	STUN Server	
	Use STUN:	
	IP Address / Host name:	
	D + 1000	
	Por: Pour	
	Show Extended SIP Data: 🗠	
	CLIP / CLIR	
	CLIP outgoing in From header - display part: call number ~	
	CLIP outgoing in From header - user part: call number →	
	Outgoing From Header - domain/host nart- domain/hama.vv	
	Diversion: From contains original CallingPartyNumber:	
	Diversion: PAI contains original CallingPartyNumber:	
	CLIP outgoing in P-Asserted-Id header - display part omit	
	CLIP outgoing in P-Asserted-Id header - user part: call number v	
	CLIP outgoing in P-Preferred-Id header - display part: omit	
	CLIP outgoing in P-Preferred-Id header - user part: omit	
	CLIP outgoing in Diversion header - display part: omit v	
	CLIP outgoing in Diversion header - user part: call number \checkmark	
	CLIR outgoing in From header - display part: omit	
	CLIR outgoing in From neader - user part: [fully anonymous]	
	CLIR outgoing Privacy header: id ~	
	COLP / TIP supported for outgoing calls: COLP supported	
	Call number formatting	
	Incoming call - Called party number request line	
	incoming can - caned party number: [request line V	
	Incoming call - Calling party number: From header user part	
	Contact URI contains: call number:	
	TCD port used in Contrast IDI:	
	ICP port used in Contact URI: ephem. src-port V	
	Appiy undo Refresh Reset Default Values Help	



The auto-created Native SIP Server Trunk User is used without any Authorization credentials.

ice Gateway	Native SIP Server Trunk User	
SIP Parameters	Edit Native SIP Server Trunk User	Delete Native SIP Server Truck Liser
TSP Loc-ID Settings		
Codec Parameters	Userid:	XCAPI-User
Destination Codec Parameters	A 10 - 5 - 10	
nternet Telephony Service Provider	Authorization name:	
Networking	Password:	
SIPQ-Interconnection	Confirm Password	
lative SIP Server Trunk		
anynodeSBC		
Circuit UTC (Cloud)		
Native SIP trunk		
XCAPI		
XCAPI-User		

3.3 Codec Parameters

It is recommended using conform codec settings for the VoIP environment. If the gateway defaults were changed for any ITSP and/or SBC bindings, the XCAPI SIP controller settings must be adjusted as well. An example of the XCAPI controller codec settings can be reviewed in the chapter **Codecs** from page 25.

Expert mode - Telephony Server				×	
Voice Gateway	Codec Parameters				
SIP Parameters	Edit Codec Parameters				
ITSP Loc-ID Settings					
Codec Parameters	Codec	Priority	Voice Activity Detection	Frame Size	
Destination Codec Parameters	G.711 A-law	Priority 1 🗸	VAD:		20 v msec
Internet Telephony Service Provider	G.711 µ-law	Priority 2 ~	VAD:		20 v msec
Networking	G 729A	not used v	VAD.		20 v msec
SIPQ-Interconnection	G 729AB	not used o	VAD: 2		20 0 mood
Native SIP Server Trunk	Enhanced DSP Channels	not used 🗸	VAD. 🗠		ZU V IIISec
	Emanced Dor Chamiers	Lise G 711 only			
	T 20 Few	Ode O./ IT only			
	1.50 Fax	T 20 E			
		1.30 Fax.	V		
		Use FillBitRemoval:			
	Max. UDP Dat	agram Size for T.38 Fax (bytes):	1472		
	Error Con	rrection Used for T.38 Fax (UDP)	t38UDPRedundancy v		
	T.30 Fax				
		Enable ECM:			
	Misc.				
		ClearChannel:		Frame Size: 20 🗸 msec	
	RFC2833				
	Transmission of Fax/Mod	em Tones according to RFC2833:			
	Transmission of DTI	MF Tones according to RFC2833:			
		Payload Type for RFC2833:	98		
	Redundant Transmission of RFC28	333 Tones according to RFC2198:			
	Apply Undo Help	5			

Important: for fax interoperability **Transmission of DTMF and Fax/Modem Tones according to RFC2833** must be enabled and **Redundant Transmission of RFC2833 Tones according to RFC2198** must be disabled. To avoid potential nonconformities due to media transcoding malfunction through the gateway with its bindings (ITSP's, SBC's), the **G.711** codecs should be used with a **Frame Size** of **20 msec**. The **Payload Type for RFC2833** is by default used with value **98**. If changed for the PBX, it must also be adjusted for the XCAPI SIP controller. For details check with the **RFC2833 Payload** chapter on **page 19**.



3.4 LCR

The test environment used in this example is based on the LCR (Automatic Least Cost Routing).

Expert mode - Telephony Server				
LCR	LCR			
Classes Of Service	Edit LCR Flags			
Dial Plan	LCR Flags			
Routing table	Activate LCR			
Dial rule	Reset LCR data			
Muttisite	Delete the configured LCR data			
	Apply Undo Help			

3.5 Route

For this test environment the XCAPI route is used as shown below. The local VoIP environment needs additional configurations and adjustments for a closed or open numbering scheme. The same goes for the **Routing Parameters**, **Special Parameters** and **Dial Plan** configurations.

Expert mode - Telephony Server					×
Trunks/Routing	Reute				
Trunks	Change Boute	Change Douting Darameters		Consist Darameter daapaa	
▶ LAN		Change Routing Parameters		apedai Paranieter Grange	
STL S2N		Route Name:	XCAPI	1	
▼Route				J	
ISDN		Seizure code:			
Trk Grp. 2		CO code (2nd trunk code):]	
Trk Grp. 3	Gateway Location			-	
Trk Grp. 4		Country code:	49		
Trk Grp. 5		Country code.	45		
Trk Grp. 6		Local area code:	5363		
XCAPI		PABX number:	816		
UC Suite	PABX number-incoming				
Trk Grp. 9	2	Country code:		1	
SIP INT 1		obanay obac.		_	
OSV		Local area code:			
SDCasII SP		PABX number:		1	
IT SD/NS 3		Leasting combine		-	
Trk Grp. 15		Location number:			
Networking	PABX number-outgoing				
QSIG-Feature		Country code:]	
MSN assign		Local area code:		1	
ISDN Parameters		DADY		7	
		PABX number:]	
		Suppress station number:			
	Overflow route				
		Overflow route :	None		
	Digit transmission				
	Digit transmission	and the second			
		Digit transmission:	en-bloc sending 🗸		
	Mobile Extension Number (MEX)				
		MEX Number]	
	Apply Undo	Help			



3.6 Routing Parameters

The **Routing** and **Special Parameters** of the XCAPI route are used as shown next. Again, we want to mention that all the numbering related configurations must be set according to local requirements.

				Σ	
Trunks/Routing	Route				
▼Trunks	Change Route	hange Routing Parameters	Special Parameter change		
LAN					
STL S2N	Routing flags				
▼Route		Digit repetition on: E	\leq		
ISDN	Analysis of second	dial tone / Trunk monitoring:			
Trk Grp. 2		Intercept per direction:			
Trk Grp. 3		Over service 3.1 kHz audio:	ব		
Trk Grp. 5					
Trk Grp. 6	μ	ad direction prefix incoming:			
XCAPI	· · · · · · · · · · · · · · · · · · ·	Add direction prefix outgoing:			
UC Suite	Call No. with i	nternational / national prefix:			
Trk Grp. 9		Ringback tone to CO:	7		
SIP INT 1		Name in CO:			
OSV		Name in CO.			
SBCasITSP		Segmentation:	yes 🗸		
anynode SBC		deactivate UUS per route:			
Trk Grp. 15		Always use DSP:			
Networking					
QSIG-Feature		Analas terrationals			
MSN assign		Analog trunk seizure.	no pause 🗸		
ISDN Parameters		Trunk call pause:	Pause 2 s v		
		Type of seizure:	linear 🗸		
		Route type:	CO ~		
		No. and type, outgoing:	Unknown ~		
		Call number type:	Internal / DID v		
	Rerouting		_		
		Change route allowed: L			
		Route optimize active:	No ~		
	Apply Undo Help				

The Special Parameters are used as shown below.

Frunks/Routing	Route			
Trunks	Chappe Route	Change Routing Parameters		Special Parameter change
LAN	entringe roote	Change Hooding Fordinetero		
STL S2N	Numbering plan			
Route		Called Party Number:	System check 🗸	
ISDN		All others:	System check	
Trk Grp. 2		Air othera.	Oystelli check	
Trk Grp. 3				_
Trk Grp. 4		Site:	System check v	·]
Trk Grp. 5		COLP:		
Trk Grp. 6		Makifa and		
XCAPI		Notity send:		
UC Suite		without CLIP:		
Trk Grp. 9		No SETUP ACK .:		
SIP INT 1		DIVUEO I-f-		
OSV		no DIV.LEG-INIO:		
SBCaSITSP anymode SBC		With sending complete:		
IT SDING 2		Internal call like external:		
Trk Grp. 15			-	
Networking		Without CCNR:		
QSIG-Feature				
MSN assign				
ISDN Parameters				



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3.7 Dial Plan

The XCAPI related dial plan entries are basically used for an internal numbering range, here with the dialed digit string **92CZ**. However there are also some variations shown for matching local, national, and international dial strings as well. All **Dial Plan** entries used the XCAPI native SIP trunk are associated to **Routing Table** number **24**. The **Routing Table** details will be shown on the next page.





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3.8 Routing Table

The **Routing Table** is set to the intended **Route** and **Dial Rule** for the XCAPI native SIP trunk. Some of the other settings might be enabled on demand.

Expert mode - Telephony Server													×
LCR	^	Routin	g Table										
LCR Flags			5		-	_	Change Rout	ing Table		_	_		
Classes Of Service													
Dial Plan							Rou	ting Table:	24		en-bloc	sending	
▼Routing table													
1 - Table		Index	Dedicated	Route			Dial Rule		min. COS	V	larning	Dedicated Gateway	GW Node ID
2 - Table			Route	VCADI 1	_	SID			15	Nono		No	
3 - Table				NCAFI	~	JIF			15 🗸	INDIRE	~	NU V	
4 - Table		2		None	\sim	None	~		15 🗸	None	~	No v	
5 - Table		3		None	\sim	None	\checkmark		15 🗸	None	~	No 🗸	
6 - Table		4		None	\sim	None	\sim		15 🗸	None	\sim	No 🗸	
7 - Table		5		None	~	None	~		15 🗸	None	~	No v	
9 - Table		6		None	~	None	~		15 🗸	None	~	No v	
10 - Table		7		None	~	None	~		15 🗸	None	~	No v	
11 - Table		8		None	~	None	~		15 🗸	None	~	No v	
12 - Table		9		None	$\overline{}$	None	~		15 🗸	None	~	No	
13 - Table		10		None		None			15	None		No	
14 - Table		11		None	_	None			15 0	None		No	
15 - Table				None	~	None	~		15 🗸	INDIRE	~	NU V	
16 - Table		12		None	\sim	None	~		15 🗸	None	~	No v	
17 - Table		13		None	\sim	None	\sim		15 🗸	None	\sim	No v	
18 - Table		14		None	\sim	None	\sim		15 🗸	None	~	No 🗸	
19 - Table		15		None	~	None	~		15 🗸	None	\sim	No v	
20 - Table		16		None	~	None	~		15 🗸	None	~	No v	
21 - Table													
23 - Table													
24 - Table													
			Apply	Undo	Help								
	v												

3.9 Dial Rule

The associated **Dial Rule**, here the second entry with the dial rule name **SIP**, is set to the **Dial rule format A** as shown below. When needed, use a rule and dial rule format that matches the local numbering requirements.

	Dial Rule				
R Flags			Change Dial Rule		
sses Of Service					
l Plan	Rule Na	me	Dial rule format	Network access	Туре
iting table	1 ISDN	A		Main network supplier v	Unknown ~
I rule	2 SIP	A		Main network supplier ~	Unknown ~
itisite	3 SIP lokal	HE2A		Main network supplier ~	Unknown ~
	4 MEB	E1A		Corporate Network ~	PABX number v
	5 IP-Network	A		Corporate Network ~	Unknown
	6 Multi-Location	BA		Corporate Network ~	Unknown 🗸
	7 Gateway call	E1A		Corporate Network ~	Unknown v
	8 COInternat	D0E4A		Main network supplier 🧹	Unknown ~
	9 Add_cc_to_Canoni	D49E2A		Main network supplier ~	Country code ~
	10 National_to_Cano	D49E3A		Main network supplier ~	Country code 🗸
	11 Internatto_Can	E3A		Main network supplier 🧹	Country code ~
	12 SIP local_Canoni	HE2A		Main network supplier ~	Country code ~
	13			Unknown ~	Unknown ~
	14			Unknown ~	Unknown ~
	15			Unknown	Unknown
	16	-		Unknown	Unknown
	Page 1 of 11		4 1 2 3	115161Z1819 🕨 🛤	Items per page <u>10 25 50 1</u>



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3.10 Trunk Lines

The required amount of trunk lines must be added and associated to the appropriate XCAPI route, in this example **Type ITSP/NS10**. Ensure that those trunk lines are properly licensed and available, otherwise their states won't become active (please check with the according **Status** column!).

Inks/Routing	Trunks						
īrunks		display all lines	_	add line		Change Direc	lion
-LAN							
▼Box: 1, Slot: 1	Trunk	Box-SI-Pt-Li	Code		Route	Status	Ту
Port 3 Networking	Line 5	LAN 1-0-16-7	7805	XCAPI		active	ITSP/NS 10
Port 4 SIPQ-Interconnection 1	Line 6	LAN 1-0-16-8	7806	XCAPI		active	ITSP/NS 10
Port 5 SIPQ-Interconnection 2	Line 7	LAN 1-0-16-9	7807	XCAPI		active	ITSP/NS 10
▼Port 7 IT SP/NS 1	Line 8	LAN 1-0-16-10	7808	XCAPI		active	ITSP/NS 10
7809 0-7-9	Line 28	LAN 1-0-16-1	7828	XCAPI		active	ITSP/NS 10
7810 0-7-10	Line 29	LAN 1-0-16-2	7829	XCAPI		active	ITSP/NS 10
◆7811 0-7-11	20020	0	1020			uctive	
•7812 0-7-12							
●7750 0-7-13							
♦7751 0-7-14							
♥//52 0-7-15							
▼//53 0-7-16							
Port 811 SP/NS 2							
Port 9 II SP/NS 3							
Port to IT SPINS 4							
Port 11 II SPINS 5							
Port 12 II SP/NS 6							
Port 13 II SP/NS 7							
Port 14 ITSP/NS 8							
Port 15 ITSP/NS 9	_						
Port 16 ITSP/NS 10							
◆7805 0-16-5							
7807 0 46 7							
▼100/ U-10-/							
7020 0 46 20							
7820 0.16.20							
STL S2N							
loute							
DSIG-Feature							
ASN assign							
SDN Parameters							



Important: a newly created Native SIP trunk may require a Unify OpenScape Business gateway reboot to become active.



3.11 System Parameter Flags

The Transit permission flags must be enabled, others upon local requirements.

Expert mode - Telephony Server		
Basic Settings	System Flags	
▼System	Edit System Flags	
System Flags		
Time Parameters	System flags	
DISPIAY	Through-connection for external FWD on:	
Intercept/Attendant/Hotline	Call forwarding to main station interface permitted:	
LDAP	Hunting to external call forwarding destination:	
Texts	nunung to external can forwarding destination.	
Flexible menu	Conterence tone:	
Speed Dials	Warning signal for call pickup groups:	
HFA Registration Password	Increase volume for optiPoint/OpenStage terminals:	
Gateway	Relocate allowed:	
DynDNS	More than 1 external conference member:	м
Quality of Service	Truck reconstion outematic:	
Date and Time	Turk reservation, automatic.	
Port Management	No. redial with a/c code:	
Call Charges	Simplified dialing:	
Phone Parameter Deployment	Use only default number for MSN :	
Power Management	Path optimization:	
	DTME automatic:	м
	Broadcast withti	_
	Droaucast with connection:	
	Tone from CO:	
	Ringback protection:	
	Euro-impedance:	
	Different phonemail messages Day/Night:	
	Display international / national code number:	
	Line change for direct call:	
	Automatic redial:	
	Voice mail Node call number:	
	Call Pickup after automatic recall:	
	Configurable CLIP:	
	Caller list at destination in case of Forward Line:	
	Call feguerding after deflect call / single step trapefer	
	Call forwarding after deliect call / single step transfer:	
	Follow call management in case of deflect call / single step transfer:	
	Warning tone during voice recording:	
	E.164 numbering scheme:	
	Extended Key Functionality:	
	Calling number in pick-up groups / ringing groups / CEN /RNA:	
	CODE evenents	
	SPE support:	
	SPE advisory tone:	
	Transparent dialing of * and # on trunk interfaces:	
	Add seizure code for MEX:	
	CMI MWI Ringer:	
	Automatic OpenStage / Desk Phone CP TDM Phone Software Lindate:	
	Destrict indirect trunk are a constant of the only of the contract of the cont	_
	Restrict indirect trunk group connections according to CON Matrix:	
	Open numbering scheme	
	active:	
	Node cellnumber:	
	Transit permission	
	Feature transit:	
	Tie traffic transit:	
	External traffic transit	
	Special switch	
	CALL PROC no send:	
	Automatic, cyclical line seizure:	
	Restriction for UC calls	
	Restriction for UC calls:	
	Apply Undo Help	



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Appendix

The **Appendix** chapter gives information and configuration hints as well as other considerations. If using the XCAPI controller wizard with its Unify OpenScape Business template, most of the shown configurations are set by default. The following topics and the shown configurations should still be reviewed, checked, and tested, especially with the participating stations in combination with the other trunk bindings of the Unify OpenScape Business environment. Some of the features, codecs and fax methods might not be supported in conjunction with specific Unify OpenScape Business trunk bindings.

4.1 Codecs

The codec defaults of the XCAPI SIP controller usually work fine and should only be changed if requested by our support team. When needed, please review with the codec related chapters **Codecs** on page 18, **RFC2833 Payload** on page 19, and **Fax Support** from page 20. The Unify OpenScape Business **Codec Parameters** chapter is described from page 11.

XCAPI Configuration File View Help Image: Second	-	
Configuration Information Solution Configuration Confi	Codecs Each codec activated below may be selected and used in call establishment. The order of the codecs determines their priorit	y.
 Controller Unify OpenScape Business SIP Fax CAPI 2.0 CAPI 2.0 Capital Control Conte	Codec Samplera Audio Codecs 8000 H I (E) ITU G.711 A-Law (64 kbit) 8000 H I (E) PCM 16-bit (L16) 8000 H I (E) FTS IGSM 6.10 8000 H I (E) ITU G.713 8000 H I (E) ITU G.723 8000 H I (E) ITU G.723 8000 H I (E) T.28 - UDP Auxiliary Codecs I Telephone-Event (RFC 2833) I	e Packettime z 20 ms z 20 ms z 20 ms z 20 ms z 20 ms
VCADI 4 0 10 0 (*110) CAD/2020 0	Add Codec Remove Codec	\$ ₹



Important: Incorrect configurations can result in codec negotiation errors and thus may lead into fax and voice malfunction of the SIP trunk.



4.2 RFC2833 Payload

As mentioned in the **Codec Parameters** chapter of the Unify OpenScape Business, those RFC2833 options must be enabled. The RFC2833 payload value must be set conform for the XCAPI SIP controller and the PBX. By default both should be set to value **98**. If required, the payload value can be changed as shown below.

🖉 XCAPI Configuration			×
File View Help			
Configuration	Options		
Information CAPI 2.0 Options Fax CAPI 2.0 Options Fax Controller CAPI 2.0 Options Fax CAPI 2.0 Fix 100 CAPI 2.0 CAPI 2.0 CAPI 2.0 Fix 100 CAPI 2.0 CAPI 2.0 Fix 100 CAPI 2.0 CAPI 2.0 Fix 100 CAPI 2.0	Payload Type Define the payload-type that should be used to receive telephone-events sent by remote terminals. Payload-Type (0-127)		
XCAPI: 4.0.10.0 (#119), CAPI2032.E	DLL: 4.0.10.0 (TE-SYSTEMS GmbH), CAPI2064.DLL: 4.0.10.0 (TE-SYSTEMS GmbH)		





4.3 Fax Support

This chapter refers to Fax related topics about leveraging T.38, Softfax (G.711) and T.38 to Softfax fallback.

It must be ensured that the fax method, codecs, framing, bandwidth and DTMF settings are properly set and conform to the ones of the XCAPI SIP controller and other participating instances (SBC's, ITSP's etc.) connected to the Unify OpenScape Business. We always recommend using the latest XCAPI version and manufacturer releases.



Always use the recommended and supported Fax method between the Unify OpenScape Business and the SIP carrier for the XCAPI controller. For most known SIP trunk scenarios G.711 Fax Pass Through should be the first choice!

4.3.1 G.711 Fax Pass Through (Softfax)

With the Softfax mode, the XCAPI simulates an analogue Fax device by transmitting modulated Fax-signals modem-like through the established G.711 audio channels. For enabling the **Softfax (G.711 Fax Pass Through)** method, it must be selected as shown in the next screenshot.

🖉 XCAPI Configuration			-		×
File View Help					
Configuration	Options				
Information See Licenses (TE-SYSTEMS GmbH - 100 Channels, GY CAPI 2.0 Options Trace Fax W Controller Jean Unify OpenScape Business	Fax Method Select whether the XCAPI should tran Selecting Disabled will also remove an Fax Method V.34 Fax Support Enabled	sfer fax messages via T.38 signalling or via T.30 signalling encoded in the audio o y configured fax codecs. Softfax (G.711 fax pass through)	:hannel (S	Softfax).	~
SIP	Negotiate T.38-Version=0 Upon Re Reject Attempts to Negotiate T 38	ceipt of CED (for Cisco)			
	Fax Calling Tone/Fax Called Tone Depending on direction fax transmiss T.38 negotiation. Transmit CED signal tone Transmit CNG signal tone	after T.38 negotiation	ed before	e or after	>
> 🎭 H.323 Tweaks	Transmit CNG signal tone timeout	Default			~
> 🇞 SIP Tweaks					
XCAPI: 4.0.10.0 (#119), CAPI2032.0	OLL: 4.0.10.0 (TE-SYSTEMS GmbH), CAPI206	4.DLL: 4.0.10.0 (TE-SYSTEMS GmbH)			



The Codec Parameters of the Unify OpenScape Business gateway should be set as shown below.

Expert mode - Telephony Server					×		
Voice Gateway	Codec Parameters	Codec Parameters					
SIP Parameters		Edit Codec Parameters					
ITSP Loc-ID Settings							
Codec Parameters	Codec	Priority	Voice Activity Detection	Frame Size			
Destination Codec Parameters	G.711 A-law	Priority 1 ~	VAD: 🗆		20 v msec		
Internet Telephony Service Provider	G.711 u-law	Priority 2 V	VAD:		20 v msec		
Networking	G 729A	not used w	VAD		20 v msec		
SIPQ-Interconnection	G 729AR	not used to			20 0 mooo		
Native SIP Server Trunk	Enhanced DSP Channels	liot useu 🗸	VAD. E		20 V Insec		
	Elinanced DSF Channels	Lice G 711 only					
	7.00 5	036 0.711 0119	L				
	1.38 Fax	700 5	8				
	1.38 Fax: ☑						
	Use FillBitRemoval: 🗹						
	Max. UDP Datagram Size for T.38 Fax (bytes): 1472						
	Error Co	rrection Used for T.38 Fax (UDP)	t38UDPRedundancy ~				
	T.30 Fax						
		Enable ECM:					
	Misc.						
		ClearChannel:		Frame Size: 20 🗸 msec			
	RFC2833						
	Transmission of Fax/Mod	em Tones according to RFC2833:					
	Transmission of DT	MF Tones according to RFC2833:	\square				
		Payload Type for RFC2833:	98				
	Redundant Transmission of RFC28	333 Tones according to RFC2198:					
	Apply Undo Help	•					



For G.711 Fax Pass Through (Softfax) integration, the gateways **T.38 Fax** flag can usually left enabled. Under certain conditions and in case of specific Fax interoperability issues between the Unify OpenScape Business gateway with its other ITSP and SBC bindings, the **T.38 Flag** might have to be disabled. In any case, the **Transmission of Fax/Modem Tones according to RFC2833** flag must be enabled and **Redundant Transmission of RFC2833 Tones according to RFC2198** must be disabled.



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4.3.2 T.38

In the case of T.38 usage, this protocol must also be the recommended and supported fax method between the Unify OpenScape Business and its carrier trunk binding. It is recommended to avoid transcoding (G.711 to T.38 or vice versa) and using matching fax methods for all participating VoIP instances. Please note that it is mandatory that the **T.38** - **UDP** and at least one voice codec (for the initial call establishment) is enabled for the XCAPI controller, what it is by default. An example of the default codec setup can be reviewed in the chapter from page 25. For XCAPI, T.38 has to be enabled as shown on the next screenshot. For the Unify OpenScape Business, the **T.38 Fax** attribute must be enabled in the **Codec Parameters** as shown in the same named chapter from page 11.

🜠 XCAPI Configuration		– 🗆 X					
File View Help							
8 7 8 0							
Configuration	Options						
Information P Licenses (TE-SYSTEMS GmbH - 100 Channels, O CAPI 2.0 Options Trace Trace Fax	Fax Method Select whether the XCAPI should trans Selecting Disabled will also remove an	fer fax messages via T.38 signalling or via T.30 signalling encoded in the audio channel (Softfax). y configured fax codecs.					
✓ III Controller	Fax Method	T.38 ~					
IIII Unify OpenScape Business III SIP III Fax	V.34 Fax Support Enabled	ceipt of CED (for Cisco)					
- UF CAPI 2.0 - QF Audio > ■ Network > - → Supplementary Services > - QF Codecs	Fax Calling Tone/Fax Called Tone Depending on direction fax transmissions start with a CED or CNG signal tone. Select whether these shall be transmitted before or aft T.38 negotiation.						
	Transmit CED signal tone	after T.38 negotiation 🗸 🗸					
> 🎭 Tweaks	Transmit CNG signal tone	before T.38 negotiation (in audio channel) $\qquad \qquad \checkmark$					
> S H.323 Tweaks	Transmit CNG signal tone timeout	Default					
> 🎭 H-323 Tweaks > 🎭 SIP Tweaks							
XCAPI: 4.0.10.0 (#119), CAPI2032.D	LL: 4.0.10.0 (TE-SYSTEMS GmbH), CAPI206	4.DLL: 4.0.10.0 (TE-SYSTEMS GmbH)					

Please also check with the Unify OpenScape Business documentation for T.38 related limitations and recommendations for fax support, especially in conjunction with other ITSP, SBC bindings.

Important: **Never** enable V.34 as this protocol is not supported by the Unify OpenScape Business gateway nor change any of the T.38 related codec settings (Rate Management, T.38 Version) in the XCAPI SIP controller. In any case, this will predominantly force fax handshake and transmission failures.





VoiceoverIP

The fax fallback can be enabled as shown on the screenshot below. It is important to check if this fax mode is supported by all participating VoIP instances, especially in case of cross-compatibility due to participating SBC's or connected ITSP's. Depending on the VoIP environment with its participating instances, additional configurations and adjustments might be required.

🜠 XCAPI Configuration	- 🗆 X
File View Help	
Configuration	Options
Information CAPI 20 Options Fax Controller Fax CAPI 2.0 Options Fax CAPI 2.0 options Fax CAPI 2.0 options Fax SIP Fax CAPI 2.0 Audio Fax Fax CAPI 2.0 Fax Fax Fax Supplementary Services Factor Telephone-number-filter Fay Tweaks Fay Tweaks SIP Tweaks SIP Tweaks SIP Tweaks SIP Tweaks SIP Tweaks	Fax Method Select whether the XCAPI should transfer fax messages via T.38 signalling or via T.30 signalling encoded in the audio channel (Softfax). Selecting Disabled will also remove any configured fax codecs. Fax Method T.38 (with fallback to Softfax) V.34 Fax Support Enabled Negotiate T.38-Version=0 Upon Receipt of CED (for Cisco) Fax Calling Tone/Fax Called Tone Depending on direction fax transmissions start with a CED or CNG signal tone. Select whether these shall be transmitted before or after T.38 negotiation. Transmit CED signal tone after T.38 negotiation Transmit CNG signal tone after T.38 negotiation Transmit CNG signal tone timeout
XCAPI: 4.0.10.0 (#119), CAPI2032.DLL: 4.0.	10.0 (1E-SYSTEMS GMDH), CAPI2004.DLL: 4.0.10.0 (1E-SYSTEMS GMDH)







voiceoverIP

Even though it is recommended to use the previously described call transfer via SIP refer, in some application specific cases the **Simulated Call Transfer** has to be used. Whenever the CAPI application initiates a call transfer between two active participants, the XCAPI starts triggering the call transfer simulation. During this simulation two b-channels are occupied, but from application side the calls are released such as in a real call transfer scenario.

When needed, check the **Features** tab of the XCAPI controller and ensure that the **Simulate ECT by call-tromboning (line-interconnect)** parameter is set.





4.5 Codecs

The screenshot below shows the default codec settings of the XCAPI SIP controller. As a general rule, there is no need to change anything here.

🖉 XCAPI Configuration		—	o x
File View Help			
Configuration	Codecs		
Information > ♥ Licences (TE-SYSTEMS GmbH - 100 Channels, > ♥ CAPI 2.0 Options +目 Tacce -1日 Tacce -1日 Tacce	Each codec activated below may be selected and used in call establishment. The order of the codecs determine	s their priority.	
V B Controller		Sampierate	Packettime
Audioports Audioports Audioports Telephone-Event (RFC 2833) Telephone-filter Soft Tables Soft Tab	Audio Codecs	8000 Hz 8000 Hz 8000 Hz 8000 Hz 8000 Hz	20 ms 20 ms 20 ms 20 ms
	Add Codec Remove Codec		- - ↓ ↓
XCAPI: 4.0.10.0 (#119), CAPI2032.I	DLL: 4.0.10.0 (TE-SYSTEMS GmbH), CAPI2064.DLL: 4.0.10.0 (TE-SYSTEMS GmbH)		.4





4.6 Timer

The XCAPI SIP controller timer values should only be adjusted if needed. The displayed timer value **0** always refers to a constant timer value based on standard RFC and protocol regulations. For example, with **MIN-SE** and **Session Expiration** default value 0, the XCAPI SIP controller uses **Min-SE**: **90** and **Session-Expires**: **300** as SIP timer defaults.

As previously mentioned in the **SIP Parameters** chapter on page 9, if the timer defaults of the Unify OpenScape Business were changed, value 0 should also be adjusted to the conform values in seconds.

XCAPI Configuration	– – ×
File View Help	
Configuration	Options Proxies Registrations Protocol Timer Overlap sending Failover and Overflow
	Timer These timeouts in seconds determine how long the system waits for certain events before a default behaviour is applied or an error is reported. The value "0" means that the default timeout should be used. Call retention 0
Juify OpenScape Business Juify SIP SIP Fay	Retransmit on no response 0 Provisional Response 0
CAPI 2.0 CA	Final response 0 Alert 0
	Ack 0 Keep-Aliye 0
	STUN Keep-Alive 0 REGISTER Expiration 0
	Session Expiration 0 Min-SE 0
	TCP Connect 0
	TCP Disconnect
	ICP Retention (Message) 0 TCP Retention (Trunk) 0
	TCP Retention (Call)
	NCS 0 OPTIONS Interval 0
XCAPI: 4.0.12.0 (#121), CAPI2032.DLL: 4.0.	12.0 (TE-SYSTEMS GmbH), CAPI2064.DLL: 4.0.12.0 (TE-SYSTEMS GmbH)





4.7 Diversion Handling

For some call scenarios, the CAPI 2.0 application might be aware of the first or last provided redirection number of the PBX. If you desire, this behavior can be changed via the **Diversion Handling** option in XCAPI's SIP controller protocol tab as shown on the screenshot below. This implements that the Unify OpenScape Business gateway delivers this information via the SIP **Diversion** header towards XCAPI.

For this, the **CLIP outgoing in Diversion header** must be enabled for XCAPI's native SIP trunk. This header has to be specified in the CLIP/CLIR section of the **Extended SIP Data** as shown in the screenshot of the **Native SIP Server Trunk** chapter from page 10.

🜠 XCAPI Configuration	- 0	×
File View Help		
Configuration	Options Proxies Registrations Protocol Timer Overlap sending Failover and Overflow	
 Information CAPI 2.0 Options Fax Fax Fax CAPI 2.0 Options Fax CAPI 2.0 Options SIP Fax CAPI 2.0 Audio Supplementary Services Codecs Telephone-number-filter Tweaks SIP Tweaks SIP Tweaks SIP Tweaks 	SIP Specific Options These options control several options of the SIP protocol. It is recommended not to change these options until problems arise. Preferred Transport Local port for UDP/TCP So60 Local port for TLS So61 Local port for TLS So61 Cocal port for TLS Sof1 C	
XCAPI: 4.0.10.0 (#119), CAPI2032.DLL: 4.0	10.0 (TE-SYSTEMS GmbH), CAPI2064.DLL: 4.0.10.0 (TE-SYSTEMS GmbH)	



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4.8 Numbering

Please note, apart from very few exceptions, XCAPI can't do any numbering manipulations. It must be ensured that the PBX or VoIP instance and the CAPI 2.0 application is based on a uniform dial plan. That means, that the CAPI application and the Unify OpenScape Business must provide proper calling and called numbers. If required, additional numbering manipulations have to be done within the PBX. AS the CAPI 2.0 ISDN layer is basically only aware of dialed digits (from 0 to 9) and some numbering attributes (NPI/TON), other dial strings formats (for e.g. +49536381950) are not passed through XCAPI by default. There are also some CAPI 2.0 applications which are not even able to generate other dial strings. If it's required that XCAPI pass dial strings like +49536381950, the controller has to be adjusted through the **Telephone-number-filter** settings. In the **Telephone numbers from application** tab, select the **H.323 ID** type and delete its **h323id**: related **Prefix** and move this entry to the top of the list as shown on the next screenshot.

🜠 XCAPI Configuration		_					×
File View Help							
Configuration	Telephone numbers from application	Telephone	e numbers from network	Options			
Information Informati	The here defined scheme determine generated for a certain type.	s how the ty	pe of dialed telephone nu	mbers is detected, respective	ely how a telephon	e numb	er is
·····································	ab)(H.323 ID 🗸 🗸					\sim	n X
V B Controller	Туре	Prefix	Options				
Ville Unify OpenScape Business	ab][H.323 ID						
	📬 IP V4 (delimiter)		*				
CAPI 2.0	📬 IP V4 (delimiter)						
- 🦗 Audio	C E-Mail	email:					
Sopplementary Services Sopplementary Services Soft Codecs Soft Codecs Soft Services Soft Services Soft Services Soft Services	🛞 Telephone Number (E.164)						
> 😵 Audioports > 🎭 H.323 Tweaks > 🎭 SIP Tweaks							
						Ŷ	*
XCAPI: 4.0.10.0 (#119), CAPI2032.DLL: 4.0.	10.0 (TE-SYSTEMS GmbH), CAPI2064.D	LL: 4.0.10.0 (TE-SYSTEMS GmbH)				

A

Important: There is no validation check of the provided dial string. XCAPI would even pass non-valid dial strings which may lead to malfunctions and call failures.



Unify Ready Technology Connectivity Certification

The official certificate and test report is available on the Unify Technology Partners Extranet.

O Unify

Atos Unify Ready Technology connectivity certification

The connectivity of



developed by TE-Systems GmbH has been certified at the SIP-Interface of Atos Unify OpenScape Business V3 in accordance with the respective test report, dated April 16th, 2021

The test was conducted conforming to DIN EN ISO 9001. This certificate is only valid in conjunction with the full test report and the notes contained therein. Please consider that the test report only covers the functionality of the interface. The certificate and test report are not good for a statement of end-to-end functionality.

Munich, April 19th, 2021

Andre Bergmann Director Technology Partner Program



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