

April 2, 2019





Introduction

This document is intended to support you with the integration of XCAPI into an existing environment of the Cisco Unified Communications Manager. In the following sections we describe the essential configuration steps for SIP trunking to allow optimal interworking of both, the XCAPI and the Cisco Unified Communications Manager.

Though being based on the Cisco Unified Communications Manager release 12 and 12.5, this document is applicable with other versions given a few adjustments.

At this point we suppose that the Cisco Unified Communications Manager 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. It is also supposed that the public network access via ISDN and/or SIP is given and properly working, also in context with the custom and country dependent numberings and call routings. The same goes for the networking (LAN, WAN, DMZ, NAT, Firewall) itself as such topics are beyond the scope of this document and thus not shown here at all. Please refer to the respective manufacturer documentations, manuals and examples in such cases.

However, independent of the deployed application, the SIP connection 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.

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 documents, TechNotes and releases for XCAPI.



XCAPI Configuration

Please start up the XCAPI configuration to create a new controller assigned to the Cisco Unified Communications Manager.

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.

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





Page 4

2.1 VoIP 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, sparing you manual configuration.

Add new controller Select the Voice-over-II	P environment
Type of controller VoIP environment	Select the environment for the new controller to operate in. If the list below does not contain your PBX you should select a compatible or one of the generic environments
Description and channels	
Signalling protocol Cisco CallManager/Cisco Unified Communications Manager	Avaya IP Office 8.0/9.0 Avaya SES (Session Enablement Services) AVM FRITZIBox WLAN 7270 AVM FRITZIBox WLAN 7370 beroNet bero'Nt VolP Gateways bintec elmeg be.IP Series brekets EP Server/brekete PBX Cisco Gateway Cisco Unified Communications Manager Express Claon (La Minanger/Cisco Unified Communications Manager Clarity Communication Center Dialogice "100 Media Gateway

2.2 Description and Channels

When the VoIP environment was selected, the next dialog allows to set a description 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 Cisco Unified Communications Manager and the bound CAPI 2.0 application.

Add new controller Provide a description	and select the number of channels
✓ Type of controller ✓ VoIP environment	Please enter a meaningful description for the new controller and decide how many channels should be available for applications. Please consider that the effective number of available channels depend on the installed license.
Description and channels	
Signalling protocol	Description
Cisco CallManager/Cisco Unified Communications Manager	Cisco Unified Communications Manager Channels 20
	< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel



Page 5

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.

Add new controller Select the Voice-ove	-IP signalling protocol
/ Type of controller / VoIP environment / Description and channels	Each voice-over-ip network operates with a specific voice-over-ip protocol like H.323 or SIP. The list below contains any voice-over-ip protocol that may be used with the selected environment. Please select the protocol from the list that is used in your network.
Signalling protocol	H.323 SIP
Cisco CallManager/Cisco Unified Communications Manager	
Network Interface	
Port Allocation	
Confirmation	

2.4 IP Address of the Cisco Unified Communications Manager

Next the IP address or host name of Cisco's environment must be provided. In this example the CUCM's Ethernet address is using 172.18.0.124.

Controller Wizard	×
Add new controller Provide the address of	the Cisco CallManager/Cisco Unified Communications Manager
 Type of controller VoIP environment Description and channels 	Provide the IP address of the Cisco device in the network. If there is more than one Cisco device present in the network be sure to provide the IP address of the Cisco device that you want to use.
 Signalling protocol Cisco CallManager/Cisco Unified Communications Manager 	CCM/CUCM address 172.18.0.124
Network Interface Port Allocation Confirmation	
	< <u>Back</u> <u>Next</u> <u>Cancel</u>



Page 6

2.5 Network Interface

Afterwards, select the network interface that will control the inbound and outbound communications. Note that this is the XCAPI controller used Ethernet interface which will be leveraged for the SIP communication with the Cisco Unified Communications Manager.

Add new controller Select the network inte	rface	
/ Type of controller / VoIP environment / Description and channels	Since each terminal network, your syster network. Please sele	and gateway requires a physical connection to the voice-over- n needs a network-interface-controller (nic) with a link to this ct a certain nic from the list below.
Signalling protocol	Device	Comment
Cisco CallManager/Cisco Unified Communications Manager	172.16.0.153	Ethernet [B8-AE-ED-22-33-C3] Loopback Pseudo-Interface 1 Loopback Pseudo-Interface 1
Network Interface Port Allocation Confirmation		

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 to use a random port range between 1024 and 65535.

Controller Wizard	×
Add new controller Provide information a	bout port allocation
Type of controller VoIP environment Secription and channels Signalling protocol Gisco CallManager/Cisco Unified Communications Manager Network Interface Port Allocation Confirmation	If you want to operate this system behind a router/gateway it might be necessary to constrain local udp ports to a certain range. Constrain local udp ports to the following range 10000 - 10120
	< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel



Page 7

2.7 Confirmation

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

Controller Wizard	×
Add new controller Confirm that the prov	ided information 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 	
 Cisco CallManager/Cisco Unified Communications Manager 	
✓ Network Interface	
Port Allocation	
Confirmation	
	< <u>Back</u> <u>Finish</u> <u>C</u> ancel

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

🛠 XCAPI Configuratio	•		-		×		
File View Help							
CAP	ļ		TE-S compete	YSTE ce in e-com	MS nuncations		
License	; TE-SYSTEMS GmbH - 500 Channels + Fax (incl. V. 34) + 500 Channels: 500 (H. 323: 500, SIP: 500), 6729: 500, T. 38: 500, and Sofitz	6.729 + 500 6.722 + 500 XSSA			_		
Click here	o manage licenses						
Click here	ET Clice Unified Communications Manager (172.16.0.153) 20 channels using (TU G.711 A-Law (54 kbit) (8000 Hz), (TU G.711 at Cisco CallManager/Cisco Unified Communications Manager — Disable & Remove A Move up T Move down add a controller	u-Law [64 kbit] (8000 Hz), ITU G.729, T.38 - UDP, and Te sing sip-proxy "172.18.0.124" at domain "172.18.0.124"	ephone-Eve	ent (RFC	2833)		
Trace	Disabled				_		
Click here	Click here to analyze the trace now o start the trace	Information				×	
		The configuration is now stored. Please are still active for the changes to take eff	estart all CA ect.	API appli	cations the	at	
		1 X Ti fri re	API Reinit e diagnosti om the devi- nitialization register as s	Notifica cs applic ce becau i. The dia pon as p	tion ation has use the XCA agnostics a ossible.	disconn API has t applicati	9:26: acted it o perfo on will



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





In order to establish the communication between the Cisco Unified Communications Manager and the created XCAPI controller, a SIP trunk must be created. This enables XCAPI to be recognized as device handler for the Cisco environment. After creating the SIP trunk, a **Route Pattern** must be created for proper call-legs and call routings.

The SIP trunk must be related to some SIP and SIP Security Profiles. Some examples will be described in the following sections.

3.1 SIP Trunk Security Profile

First of all it is necessary to specify a **SIP Trunk Security Profile** which has to be applied to the XCAPI SIP trunk. The **SIP Trunk Security Profile** can be created or changed through the **Security** submenu of the **[System ▼]** tab. This profile can be used with or without **Digest Authentication**. Both methods will be described in detail here.

Besides the profile defaults, you may have to set the parameters **Accept Out-of-Dialog REFER**, **Accept Unsolicited Notification** and **Accept Replaces Header** for allowing supplementary services such as call transfer via SIP refer or message waiting indications via SIP Notify. Such services and XCAPI related configurations will be described in the chapter **Call Transfer** and **Message Waiting Indications** from page 37.

Sys	stem 🔻	Call Routing 🔻	Media Resour	rces	▼ Advanced Features ▼ Device	•	Application •	User Management 🔻
	Service	e Parameters						
	Securi	ty	•		Certificate			
	Applica	ation Server			Phone Security Profile			
	Licensi	ing			SIP Trunk Security Profile			
	Geoloc	ation Configuration			CUMA Server Security Profile			
	Geoloc	ation Filter		Γ		_		
	E911 M	essages						



3.1.1 SIP Trunk Security Profile without Digest Authentication

For running a SIP trunk without any digest authentication the **Enable Digest Authentication** must be disabled.

SIP Trunk Security Profile Configuration							
SIP Trunk Security Profile Informati	on						
Name*	XCAPI Non Secure SIP Trunk Profile						
Description XCAPI Non Secure SIP Trunk Profile							
Device Security Mode	Non Secure V						
Incoming Transport Type*	TCP+UDP v						
Outgoing Transport Type	TCP v						
Enable Digest Authentication							
Nonce Validity Time (mins)*	600						
X.509 Subject Name							
Incoming Port*	Incoming Port* 5060						
Enable Application level authorization							
Accept presence subscription							
✓ Accept out-of-dialog refer**							
Accept unsolicited notification							
Accept replaces header							
Transmit security status							
Allow charging header							
SIP V.150 Outbound SDP Offer Filtering*	Use Default Filter 🗸 🗸						

3.1.2 SIP Trunk Security Profile with Digest Authentication

For this example the existing **Non Secure SIP Trunk Profile** will be copied, renamed to **XCAPI Non Secure SIP Trunk Profile with Digest Authentication** and adapted for using digest authentication. Of course a new SIP trunk could be created, it is just mandatory to set the **Enable Digest Authentication** parameter.

SIP Trunk Security Profile Infor	mation	
Name*	XCAPI Non Secure SIP Trunk Prof	ile with Digest Authentication
Description	XCAPI Non Secure SIP Trunk Prof	ile with Digest Authentication
Device Security Mode	Non Secure	~
Incoming Transport Type*	TCP+UDP	~
Outgoing Transport Type	TCP	×
Enable Digest Authentication		
Nonce Validity Time (mins)*	600	
X.509 Subject Name		
Incoming Port*	5060	
Enable Application level authoriz	ation	
Accept presence subscription		
✓ Accept out-of-dialog refer**		
Accept unsolicited notification		
Accept replaces header		
Transmit security status		
Allow charging header		



Page 10

3.2 SIP Trunking

A new SIP trunk can be created by selecting the **Trunk** entry through the Cisco Unified Communications Manager [**Device** \mathbf{v}] menu.

As described in the previous **SIP Trunk Security Profiles** chapters from **page 8**, the XCAPI related **SIP Trunk** can be used with or without digest authentication. The only difference has to be made by the selection of the corresponding **SIP Trunk Security Profile** which has the **Enable Digest Authentication** parameter set or not. If digest authentication is required additional configurations have to be made.

System 🔻	Call Routing 🔻	Media Resources 🔻	Advanced Features 🔻	Dev	vice 🔻	Application -	User Management 🔻
					CTI Route Point		
					Gatekeeper		
					Gatev	/ay	
				Phone			
				Trunk			
					Remot	e Destination	
					Device	e Settings	



3.2.1 SIP Trunking without Digest Authentication

voiceoverIP

According to the selected protocol and the XCAPI SIP controller, the **Trunk Type** must be assigned to **SIP**. The **Device Protocol** parameter will be automatically set to **SIP** and the **Trunk Service Type** is used with **None (Default)**.

System Call Routing	✓ Media Resources ▼	Advanced Features 👻	Device 🔻	Application -	User Management 👻	Bulk Administration 👻	Help 🔻
Trunk Configuration							
Next							
Status Status: Ready							
Trunk Information							
Trunk Type*	SIP Trunk		~				
Device Protocol*	SIP		~				
Trunk Service Type*	None(Default)		~				
Next							
i *- indicates req	uired item.						

The shown **Trunk Configuration** is basically used with the system given defaults. The **Device Name** identifier as well as the **Description** is set to xcapi.te-systems.de, the host name of the XCAPI controller's assigned Ethernet interface IP address.

Trunk Configuration	
Device Information	
Product:	SIP Trunk
Device Protocol:	SIP
Trunk Service Type	None(Default)
Device Name*	xcapi.te-systems.de
Description	xcapi.te-systems.de
Device Pool*	Default v
Common Device Configuration	< None > v
Call Classification*	Use System Default
Media Resource Group List	< None > V
Location*	Hub_None v
AAR Group	< None > V
Tunneled Protocol*	None
QSIG Variant*	No Changes V
ASN.1 ROSE OID Encoding*	No Changes V
Packet Capture Mode*	None
Packet Capture Duration	0
Media Termination Point Required	
Retry Video Call as Audio	
Path Replacement Support	
✓ Transmit UTF-8 for Calling Party Name	
Transmit UTF-8 Names in QSIG APDU	
Unattended Port	
SRTP Allowed - When this flag is checked, E Failure to do so will expose keys and other i	ncrypted TLS needs to be configured in the network to provide end to end security, nformation.
Consider Traffic on This Trunk Secure*	When using both sRTP and TLS V
Route Class Signaling Enabled*	Default
Use Trusted Relay Point*	Default V
PSTN Access	
Run On All Active Unified CM Nodes	



For the **Call Routing Information (Inbound and Outbound Call)** the parameter **Redirecting Diversion Header Delivery** has to be set. This enables the delivery of the origin and redirecting number through SIP. All other parameters are used with their defaults.

runk Configuration						
Intercompany Media E	Engine (IM	4E)				
E.164 Transformation Pro	ofile < Nor	ne >	~			
MLPP and Confidential	Access L	evel Information				
MLPP Domain	< None :	>	~			
Confidential Access Mode	e < None :	>	~			
Confidential Access Leve	< None :	>	~			
Call Routing Informati	0.0					
Remote-Party-Id						
Asserted-Type*	Default					
SIP Privacy*	Default					
, Trust Received Identity*	Trust All ((Default)	· · ·			
Tabaund Calls						
-Inbound Calls						
Significant Digits	*	All		~		
Connected Line 10 Pres	sentation *	Default				
Colling Search Search	mation	Derault		~		
AAR Calling Search Space	ace	< None >		¥		
Prefix DN	300	< None >		•		
Redirecting Diversio	on Header I	Delivery - Inbound				
If the administrator	sets the pr	efix to Default this indicat	es call processing will u	se prefix at	the next level setting (DevicePool/Service Parameter)
Otherwise, the value	e configure	d is used as the prefix uni	ess the field is empty in	which case	there is no prefix assig	jned.
				С	lear Prefix Settings	Default Prefix Settings
Number Tv		0.0				
	pe	Prefix	Strip Digits		Calling Search Space	Use Device Pool CSS
Incoming Number	pe	Default	Strip Digits		Calling Search Space	Use Device Pool CSS
Incoming Number	rty Settin sets the pr configure	gs refix to Default this indicat d is used as the prefix unl	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix setting az Prefix Settings	Use Device Pool CSS y v v DevicePool/Service Parameter) aned. Default Prefix Settings
Incoming Number	rty Settin sets the pr	Default gs refix to Default this indicat d is used as the prefix unl	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix assig ear Prefix Settings	Use Device Pool CSS U DevicePool/Service Parameter) ned. Default Prefix Settings
Incoming Number	rty Settin sets the pr e configure	Pretix Default	Strip Digits	se prefix at which case	Calling Search Space None >	Use Device Pool CSS
Incoming Number If the administrator Otherwise, the value Number Ty Incoming Number	rty Settin sets the pr configure	Default gs refix to Default this indicat d is used as the prefix unl Prefix Default Default	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix assig ear Prefix Settings Calling Search Space None >	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party Se	rty Settin sets the pr e configure pe	Pretix Default Default G G G G G G G G G G G G G G G G G G G	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix assig ear Prefix Settings Calling Search Space None >	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party Se	rty Settin sets the pr e configure pe ettings	Pretix Default gs efix to Default this indicat d is used as the prefix unl Prefix Default CSS = these =	Strip Digits	se prefix at which case	Calling Search Space None >	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty, Incoming Number Connected Party Ses Connected Party Tran It is provided to the	rty Settin sets the pr a configure pe ettings sformation	Pretix Default gs refix to Default this indicat d is used as the prefix unl Prefix Default CSS < None > http://www.sine.com/	Strip Digits	se prefix at which case	Calling Search Space None >	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party See Connected Party Tran I Use Device Pool C	rty Settin sets the pr e configure pe ettings	Prefix Default gs refix to Default this indicated is used as the prefix und Default CSS < None > arty Transformation CSS	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix sesig car Prefix Settings Calling Search Space None >	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party Se Connected Party Tran I Use Device Pool CO Outbound Calls	rty Settin sets the pr configure pe ettings	Prefix Default gs refix to Default this indicated is used as the prefix und Default Cefault Cost of the prefix Default	Strip Digits	se prefix at CI	Calling Search Space None > The next level setting (the next level setting (there is no prefix assig ear Prefix Settings Calling Search Space None >	Use Device Pool CSS v DevicePool/Service Parameter) Default Prefix Settings v V V V V V V V V V V V V
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party See Connected Party Tran I Use Device Pool C Outbound Calls Called Party Transform	rty Settin sets the pr a configure pe strings	Prenx Default gs effix to Default this indicated is used as the prefix und Prefix Default CSS < None > Party Transformation CSS < None >	Strip Digits	se prefix at cl	Calling Search Space None >	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Tyt Incoming Number Connected Party Sec Connected Party Tran Called Party Transform Called Party Transform U Use Device Pool Ca	rty Settin sets the pr a configure pe strings	Prenx Default gs refix to Default this indicat d is used as the prefix unl Prefix Default CSS < None > arty Transformation CSS (None >	Strip Digits	se prefix at which case C	Calling Search Space None > the next level setting (there is no prefix sasis ear Prefix Settings Calling Search Spac None >	Use Device Pool CSS Use Device Pool CSS DevicePool/Service Parameter) Default Prefix Settings Use Device Pool CSS V
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty, Incoming Number Connected Party Sec Connected Party Tran U Use Device Pool Ca Outbound Calls Called Party Transform U Use Device Pool Ca	rty Settin sets the pr e configure pe sformation connected R ation CSS liled Party 1 ation CSS	Prefix Default gs refix to Default this indicat d is used as the prefix unit Default CSS < None > arty Transformation CSS < None > < None > < None >	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix assig car Prefix Settings Calling Search Space None > V	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Yy Incoming Number Connected Party Se Connected Party Tran I Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Transform Use Device Pool Ca	rty Settin sets the pr a configure pe ettings ation CSS lled Party 1 nation CSS	Prefix Default gs refix to Default this indicat d is used as the prefix unl Prefix Default ICSS < None > Party Transformation CSS (None > Transformation CSS Transformation CSS	Strip Digits	se prefix at which case	Calling Search Space None > Calling Search Space the next level setting (there is no prefix sesig car Prefix Settings Calling Search Space None >	Use Device Pool CSS v DevicePool/Service Parameter) Default Prefix Settings v V V V V V V V V V V V V
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Connected Party See Connected Party Tran Outbound Calls Called Party Transform I Use Device Pool Ca Calling Party Transform I Use Device Pool Ca Calling Party Selection	rty Settin sets the pr a configure pe sformation connected F ation CSS liked Party 1 hation CSS	Prefix Default gs effix to Default this indicat d is used as the prefix unit Default Prefix Default CSS < None > Party Transformation CSS < None > Transformation CSS < None > Transformation CSS < None >	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix assig ear Prefix Setting Calling Search Space None > v v v v v	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party Se Connected Party Se Connected Party Tran I Use Device Pool Ca Called Party Transform Use Device Pool Ca Calling In Party Selection Calling In D Present	rty Settin sets the pr configure pe sformation connected F ation CSS liled Party 1 ation CSS liling Party 1 ation Party 1 stor *	Prenx Default gs effix to Default this indicat d is used as the prefix unl Prefix Default CSS < None > Party Transformation CSS < None > transformation CSS < None > Transformation CSS < Originator Default	Strip Digits as call processing will u ass the field is empty in Strip Digits	se prefix at which case C	Calling Search Space None > the next level setting (there is no prefix assigned ear Prefix Settings Calling Search Space None > v v v v v v	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Yu Incoming Number Connected Party Sec Connected Party Transform Use Device Pool Ca Calling Party Transform Galling Party Selection Calling Party Selection Calling Party Selection Calling Party Selection Calling Name Presenta Calling Name Presenta	rty Settin sets the pr a configure pe strings sformation connected R ation CSS lled Party 1 nation CSS lling Party 1 ation * tion *	Prefix Default gs refix to Default this indicat d is used as the prefix und Prefix Default CSS < None > Party Transformation CSS < None > Transformation CSS (None > Transformation CSS (Originator Default) Default	Strip Digits as call processing will u ass the field is empty in Strip Digits	se prefix at which case c	Calling Search Space None > the next level setting (there is no prefix sais ear Prefix Settings Calling Search Space None > v v v v v v v v v v	Use Device Pool CSS Use Device Pool CSS DevicePool/Service Parameter) Default Prefix Settings Use Device Pool CSS Use Device Pool
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party See Connected Party Tran I Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Selection? Calling Party Selection? Calling Inte ID Present Calling Name Presentat Calling Name Presentat Calling Ame Presentat Ca	rty Settin sets the pr a configure pe stornation connected P ation CSS Illed Party T ation CSS Illing Party T ation * Party Info	Pretix Default Default this indicat d is used as the prefix und Prefix Default CSS < None > Anne > Anne > Transformation CSS (None > Transformation CSS (Transformation CSS	Strip Digits	se prefix at	Calling Search Space None > the next level setting (there is no prefix assig car Prefix Settings Calling Search Space None >	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Yy Incoming Number Connected Party See Connected Party Tran Use Device Pool Ca Called Party Transform Use Device Pool Ca Calling Party Selection Calling Name Presenta Calling And Connected Redirecting Diversio	rty Settin sets the pr a configure pe sformation connected F ation CSS liked Party 1 ation CSS liked Party 1 ation CSS settings thation CSS Party Info on Header I	Prefix Default ge refix to Default this indicat d is used as the prefix unl Prefix Default ICSS < None > Party Transformation CSS < None > Transformation CSS < None > Transformation CSS Originator Default Default <trr< td=""><td>Strip Digits</td><td>se prefix at which case</td><td>Calling Search Space None > the next level setting (there is no prefix settings ear Prefix Settings Calling Search Space None > v v v v v v v v v v v</td><td>Use Device Pool CSS</td></trr<>	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix settings ear Prefix Settings Calling Search Space None > v v v v v v v v v v v	Use Device Pool CSS
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Connected Party See Connected Party See Connected Party Tran Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Selection Calling Party Selection Calling Name Presentat Calling and Connected Redirecting Diversic	rty Settin sets the pre pe sets the pre settings ation CSS lield Party 1 ation CSS lield Party 1 ation CSS Party Info ation * ation * ation *	Prenx Default gs effix to Default this indicat d is used as the prefix unl Prefix Default CSS < None > Party Transformation CSS < None > Transformation CSS < None > Transformation CSS Originator Default Default Default Default Default Default Default Default Default Operault Default Operault Operault <td< td=""><td>Strip Digits Strip Digits as call processing will u ass the field is empty in Strip Digits</td><td>se prefix at</td><td>Calling Search Space None > the next level setting (there is no prefix assig ear Prefix Settings Calling Search Space None > v v v v v v v v</td><td>Use Device Pool CSS Use Device Pool CSS DevicePool/Service Parameter) Default Prefix Settings v V V</td></td<>	Strip Digits Strip Digits as call processing will u ass the field is empty in Strip Digits	se prefix at	Calling Search Space None > the next level setting (there is no prefix assig ear Prefix Settings Calling Search Space None > v v v v v v v v	Use Device Pool CSS Use Device Pool CSS DevicePool/Service Parameter) Default Prefix Settings v V V
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Yu Incoming Number Connected Party Sec Connected Party Transform Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Selection Calling Party Selection Calling Party Transform Calling Party Party Calling Party Transform Calling Party Party Calling Party Party Calling Party Transform Calling Party Party Calling Calling Party Calling	rty Settin sets the pre pe ttings ation CSS ation CSS lilled Party 1 ation CSS ation * ation * Party Info formation of formation of ation *	Prefix Default gs effix to Default this indicat d is used as the prefix unl Prefix Default CSS < None > Party Transformation CSS (None > Transformation CSS (None > Transformation CSS Originator Default CSS < None > arty Transformation CSS	Strip Digits	se prefix at which case c	Calling Search Space None > the next level setting (there is no prefix said calling Search Space None > v v v v v v v v v v	Use Device Pool CSS Use Device Pool CSS DevicePool/Service Parameter) Default Prefix Settings V V V
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party See Connected Party Tran Use Device Pool Ca Outbound Calls Calling Party Transform Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Selection; Calling Inc In D Present Calling and Connected Redirecting Diversis Redirecting Diversis Redirecting Diversis Use Device Pool Ree Calle Information	rty Settin rty Settin sets the pro- set configure set configur	Prenx Default gs refix to Default this indicat d is used as the prefix unl Default Default ICSS < None > Prefix CSS < None > Construction CSS < None > Transformation CSS Originator Default Default Format* Deliver DN only Delivery - Outbound CSS < None > arty Transformation CSS	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix sais ear Prefix Settings Calling Search Space None > v v v v v v v v v v v v	Use Device Pool CSS Use Device Pool CSS DevicePool/Service Parameter) Default Prefix Settings Use Device Pool CSS Use Device Pool
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Connected Party Se Connected Party Tran Use Device Pool Ca Called Party Transform Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Selection Calling Name Presentat Calling Name Presentat Calling Name Presentat Calling Name Presentat Calling Information Caller Information Caller Information Caller ID DN	rty Settin sets the properties of configure sets the properties of the properties	Prefix Default gs effix to Default this indicat d is used as the prefix unl Prefix Default is cSS < None > Party Transformation CSS < None > Transformation CSS Originator Default CSS < None > arty Transformation CSS	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix satisfies calling Search Space None > v v v v v v v v v v v v v v v v v v	Use Device Pool CSS Use Divice Pool (SS DevicePool/Service Parameter) and. DevicePool SS Use Device Pool CSS Use Device Pool CS Use Device Pool
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party See Connected Party Tran I Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Selection Calling Party Selection Calling Name Presenta Calling Name Presenta Calling Att Presenta Calling Att Presenta Calling Inter ID Presenta Calling ID Party Transform Caller ID ID Caller ID Presenta Calling ID Pr	rty Settin sets the pro- pe sformation connected if formation connected if and the set ation CSS lelled Party 11 ation CSS ation ation CSS ation	Prefix Default ge effix to Default this indicat d is used as the prefix und Prefix Default ICSS < None > Party Transformation CSS < None > arty Transformation CSS < None > arty Transformation CSS	Strip Digits	se prefix at which case	Calling Search Space None > the next level setting (there is no prefix satisfies calling Search Space None > v v v v v v v v	Use Device Pool CSS Use Device Pool CSS DevicePool/Service Parameter) Default Prefix Settings Use Device Pool CSS V
Incoming Number Incoming Called Pa If the administrator Otherwise, the value Number Ty Incoming Number Connected Party Sec Connected Party Sec Connected Party Transform Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Selection Use Device Pool Ca Calling Party Transform Use Device Pool Ca Calling Party Selection Calling and Connected Calling and Connected Calling Ine ID Present Caller Information Caller ID DN Caller Name	Pe rty Settin sets the pr pe sets the pr pe sets the pr sets th	Prenx Default gs effix to Default this indicat d is used as the prefix unl Prefix Default CSS < None > Party Transformation CSS < None > arty Transformation CSS arty Transformation CSS	Strip Digits as call processing will u ass the field is empty in Strip Digits in connected party in connected party	se prefix at vhich case	Calling Search Space None > the next level setting (there is no prefix assig car Prefix Settings Calling Search Space None >	Use Device Pool CSS Use Device Pool CSS DevicePool/Service Parameter/ pred. Default Prefix Settings Use Device Pool CSS V



In this example the **Destination Address** is set to the host name xcapi.te-systems.de. The SIP Trunk Security Profile as mentioned in the chapter from page 8, is set to XCAPI Non Secure SIP Trunk Profile. The parameters Destination Address is an SRV, Destination Port, MTP Preferred Originating Codec and Presence Group of the SIP Information section are used with their defaults.

If required the Rerouting, Out-Of-Dialog Refer and SUBSCRIBE Calling Search Space parameters has to be set.

The DTMF Signaling Method is used with RFC 2833.

Note that it is not necessary to reset the newly created SIP trunk when the Route Pattern will be added afterwards.

Trunk Configuration								
SIP Information								
_ Destination								
Destination Address is an SRV								
Destination Address	Destination Ad	dress IPv6	Destination Port	Status	Status Reason	Duration		
1* xcapi.te-systems.de			5060	N/A	N/A	N/A		
MTP Preferred Originating Codec*	711ulaw		V					
BLF Presence Group*	Standard Presence gr	oup	~					
SIP Trunk Security Profile*	XCAPI Non Secure SI	P Trunk Profile	×					
Rerouting Calling Search Space	< None >		~					
Out-Of-Dialog Refer Calling Search Space	< None >		~					
SUBSCRIBE Calling Search Space	< None >		~					
SIP Profile*	Standard SIP Profile		~	View Details				
DTMF Signaling Method*	RFC 2833		~					
∼Normalization Script								
Normalization Script < None >		~						
Enable Trace		+						
Parameter Nan	ie .		Parameter Value					
1					± =			
Recording Information								
None								
O This trunk connects to a recording-e	nabled gateway							
O This trunk connects to other clusters with recording-enabled gateways								
-Geolocation Configuration								
Geolocation < None >		*						
Geolocation Filter < None >		*						
Send Geolocation Information								

Please note that the **Rerouting, Out-Of-Dialog Refer and SUBSCRIBE Calling Search Space** parameters must be assigned for appropriate SIP trunk rights. Wrong calling search space relations will cause call and/or call transfer failures. A good indicator for of incorrect routing would be **404 Not Found** notifications in reply of a SIP Invite or SIP Refer from the Cisco Unified Communications Manager.





VoiceoverIP

Creating SIP Trunks with Digest Authentication is similar to the ones without any authentication as previously described in the chapter SIP Trunks on page 10. Please note that the SIP Trunk Security profile for Digest Authentication must be handled in a separate profile. The SIP trunk profile, named Non Secure SIP Trunk with Digest Authentication, will be described in the chapter SIP Trunk Security Profiles starting on page 8.

SIP Information								
- Destination								
Destination Add	ress is an SRV							
Desti	nation Address	Destination A	ddress IPv6	Destination	Port	Status	Status Reason	Duration
1* xcapi.te-syst	ems.de			5060		N/A	N/A	N/A
MTP Preferred Origina	ating Codec*	711ulaw			~			
BLF Presence Group*	•	Standard Presence g	roup		~			
SIP Trunk Security Pr	rofile*	Non Secure SIP Trun	k with Digest Au	thentication	~			
Rerouting Calling Sea	arch Space	< None >			~			
Out-Of-Dialog Refer	Calling Search Space	< None >			~			
SUBSCRIBE Calling S	Search Space	< None >			~			
SIP Profile*		Standard SIP Profile			View De	etails		
DTMF Signaling Metho	od*	RFC 2833			~			
-Normalization Sci	ript							
Normalization Scrip	t < None >		~					
Enable Trace								
	Parameter Nam	e		Paramete	er Value			
1						±		
-Recording Inform	ation							
None								
O This trunk conn	ects to a recording-er	nabled gateway						
O This trunk conn	ects to other clusters	with recording-enable	d gateways					
Geolocation Config	uration—							
Geolocation <	None >		~					
Geolocation Filter	None >		*					
Send Geolocation	Information							



Page 15

3.2.2.1 User Management

An **Application User** must be created for allowing **Digest Authentication**. For this please select the **Application User's** configuration in the Cisco's **[User Management ▼]** tab.



For the **Application User Information** configuration, the required authentication information has to be defined. In this example, the **User ID** is set to **xcapi** and used with an arbitrary password. The parameters **Digest Credentials** and **Confirm Digest Credentials** are used for the **Digest Authentication** method. This is your SIP password that has to be set to the XCAPI controller as shown in the chapter **XCAPI with Digest Authentication** on page 16. The parameters **Accept Presence Subscription**, **Accept Out-of-Dialog REFER**, **Accept Unsolicited Notification** and **Accept Replaces Header** are enabled. The **Device Information** parameters aren't modified at all.

pplication User Configura	ation
Application User Informa	tion
User ID*	xcapi
Password	
Confirm Password	
Digest Credentials	
Confirm Digest Credentials	
BLF Presence Group*	Standard Presence group
User Rank*	1-Default User Rank
Accent Presence Subscrip	tion
Accept Out-of-dialog REF	ER
Accept Unsolicited Notific	ation
Accept Replaces Header	
Device Information	
Available Devices	Auto-registration Template
	Sample Device Template with TAG usage examples
	★★
Controlled Devices	<u>^</u>
	✓
Available Profiles	
	Y
	**
CTI Controlled Device Profile	13
	×
-CAPF Information	
Associated CAPF Profiles	
	View Details
Permissions Information	
Groups	
	Add to Access Control Group
	View Details Remove from Access Control Group
Roles	



3.2.2.2 XCAPI with Digest Authentication

voiceoverIP

In accordance with Cisco's defined application user information, the given credentials must also be set to the XCAPI SIP controller. That ensures that the correct username and password will be used for proper authentication.

For enabling the authentication ensure that the Allow Digest Authentication is set.

🛠 XCAPI Configuration								-		×
File View Help										
Configuration	SIP	Options	Proxies	Registrations	Protocol	Timer	Overlap sending	Failover and	Overflow	
Information Port CAPI 2.0 Options Trace Trace								orize the user a ecial value for f	t the the contai	ct
✓ III) Controller	Use	mame			хсарі					
Cisco Unified Communications Manager	Use	rname (Aut	horization	ר)						
TLS	Pas	word			•••••	••••				
Fax	Disp	olay Name								
	Org	anization								
> ## Network	Cor	tact								
	SIP Domain and Registration The "Default SIP Domain" will be appended to any SIP address with a missing domain-part. SIP Domain" will be appended to any local SIP address (i.e. in a FROM header) instead of the Domain".							domain-part. T instead of the	'he "Local "Default S	I SIP
> 🎭 H.323 Tweaks	Def	ault SIP Dor	main		172.18.0.1	24				
		ocal SIP Do	main							
	Auti	nentication								
	Please select the allowed authentication scheme. Since the username and password won't be en- in the basic authentication scheme, it is not recommended to use the basic authentication scheme.								encrypte cheme.	d
		Allow Basic	Authentio	ation						
		Allow Diges	t Authent	ication						
	Max	Authentic	ation Atte	mpts	8					
L]										

3.3 Route Pattern

Define XCAPI's SIP trunk required **Route Pattern** through the [Call Routing ▼] menu.





Page 17

In this example the route pattern **75.!** is used for XCAPI's SIP trunk **xcapi.te-systems.de**.

Route Pattern Configuration								
Pattern Definition								
Route Pattern*	75.!							
Route Partition	< None >	~	_					
Description	XCAPI route pattern							
Numbering Plan	Not Selected	~						
Route Filter	< None >	~						
MLPP Precedence*	Default	~						
Apply Call Blocking Percentage								
Resource Priority Namespace Network Doma	in < None >	~						
Route Class*	Default	~						
Gateway/Route List*	xcapi.te-systems.de		(Edit)					
Route Option	Route this pattern							
	Block this pattern No Error	~						
Call Classification*								
External Call Control Profile		7						
Allew Davies Override Previde Outsid		Urgent Brierity						
Require Forced Authorization Code								
Authorization Level*								
Calling Party Transformations								
Use Calling Party's External Phone Number	er Mask							
Calling Party Transform Mask								
Prefix Digits (Outgoing Calls)								
Calling Line ID Presentation* Default								
Calling Name Presentation* Default								
Calling Party Number Type* Cisco CallMa	nager							
Calling Party Numbering Plan* Cisco CallMa	nager v	1						
Connected Party Transformations								
Connected Line ID Presentation* Default		~						
Connected Name Presentation* Default		~						
Called Party Transformations								
Discard Digits <pre>< None ></pre>		×						
Called Party Transform Mask								
Prefix Digits (Outgoing Calls)								
Called Party Number Type*								
Called Party Numbering Plan* Cisco CallMa	lager v	<u></u>						
Cisco Calima	iayoi v							
ISDN Network-Specific Facilities Inform	ation Element							
Network Service Protocol Not Selected -	- v							
Carrier Identification Code								
Network Service	Service Parameter Name	Service Parameter Valu	e					
Not Selected	✓ < Not Exist >							

Please ensure that the appropriate **Route Partition** is assigned to the SIP trunk's Calling Search Space for proper basic call and call transfer behavior.



Page 18

3.4 SIP Profile

A SIP profile can be configured through Cisco's **[Device ▼] [Device Settings ▶]** menu. You can specify a set of SIP attributes (timings, ports etc.) to the appropriate SIP trunks and SIP endpoints.

System 👻	Call Routing 🔻	Media Resources 🔻	Advanced Features 👻	Dev	rice 🔻	Application •	User Manage	ment	▼ Bulk Administration ▼ Help ▼
					CTI Ro	oute Point			
					Gateke	eeper			
					Gatew	vay			
					Phone				
					Trunk				
					Remot	e Destination			
					Device	e Settings	,		Device Defaults
								1	Firmware Load Information
									Default Device Profile
									Device Profile
									Phone Button Template
									Softkey Template
									Phone Services
									SIP Profile

In this example the **Standard SIP Profile** is used and assigned to XCAPI's SIP trunk as shown in the SIP trunking chapter on page 10.

SIP Profile Configuration								
Status	-Status							
Status: Ready	(i) Status: Ready							
(i) All SIP devices using this profile must be restarted before any changes will take affect.								
-SIP Profile Information								
Name*	Standard SIP Profile]					
Description	Default SIP Profile]					
Default MTP Telephony Event Payload Type*	101							
Early Offer for G.Clear Calls*	Disabled	~						
User-Agent and Server header information*	Send Unified CM Version	Information as User-Agen' 🗸						
Version in User Agent and Server Header*	Major And Minor	~						
Dial String Interpretation*	Phone number consists of	f characters 0-9, *, #, anc ∨						
Confidential Access Level Headers*	Disabled	~						
Redirect by Application								
Disable Early Media on 180								
Outgoing T.38 INVITE include audio mline								
Offer valid IP and Send/Receive mode on	ly for T.38 Fax Relay							
Use Fully Qualified Domain Name in SIP F	Requests							
Assured Services SIP conformance								
Enable External QoS**								
SDP Information								
SDP Session-level Bandwidth Modifier for E	SDP Session-level Bandwidth Modifier for Early Offer and Re-invites* TIAS and AS 🗸 🗸							
SDP Transparency Profile	SDP Transparency Profile < None > v							
Accept Audio Codec Preferences in Received Offer* Default v								
Require SDP Inactive Exchange for Mid-	Call Media Change							
Allow RR/RS bandwidth modifier (RFC 3	556)							



Page 19

The following SIP profile parameters are used with their defaults.

SIP Profile Configuration			
Parameters used in Phone		Trunk Specific Configuration	
Timer Invite Expires (seconds)*	180	Reroute Incoming Request to new Trunk based on*	Never
Timer Register Delta (seconds)*	5	Resource Priority Namespace List	< None > v
Timer Register Expires (seconds)*	3600	SIP Rel1XX Options*	Disabled v
Timer T1 (msec)*	500	Video Call Traffic Class*	Mixed v
Timer T2 (msec)*	4000	Calling Line Identification Presentation*	Default v
Retry INVITE*	6	Session Refresh Method*	Invite v
Retry Non-INVITE*	10	Early Offer support for voice and video calls*	Disabled (Default value)
Media Port Ranges	Original Desta Desea for Audio and Midea	Enable ANAT	
	Common Port Range for Audio and Video	Deliver Conference Bridge Identifier	
Start Media Port*	16294	Allow Passthrough of Configured Line Device Ca	ller Information
Stop Media Port*	22766	Reject Anonymous Incoming Calls	
DSCR for Audio Calls	Jan Sustan Default	Reject Anonymous Outgoing Calls	
DSCR for Video Calls	Use System Default	Send ILS Learned Destination Route String	
DSCR for Audio Portion of Video Calls	Use System Default	Connect Inbound Call before Playing Queuing Ar	nnouncement
DSCP for TelePresence Calls	lise System Default	SIP OPTIONS Ping	
DSCP for Audio Portion of TelePresence Calls	Use System Default	Enable OPTIONS Ping to monitor destination st	atus for Trunks with Service Type "None (Default)"
Call Pickup URI*	x-cisco-serviceuri-pickup	Ping Interval for In-service and Partially In-service	e Trunks (seconds)* 60
Call Pickup Group Other URI*	x-cisco-serviceuri-pickup	Ping Interval for Out-of-service Trunks (seconds)*	120
Call Pickup Group URI*		Ping Retry Timer (milliseconds)*	500
Meet Me Service LIRI*	x-cisco-serviceuri-gpickup	Ping Retry Count*	6
licer Info*	x-cisco-serviceuri-meetme		
DTME DB Level*	None	SDP Information	
Call Hold Bing Back*	Off	Send send-receive SDP in mid-call INVITE	
Anonymous Call Block*	Off	Allow Presentation Sharing using BFCP	
Caller ID Blocking*	Off	Allow iX Application Media	
Do Not Disturb Control*	User	Allow multiple codecs in answer SDP	
Telnet Level for 7940 and 7960*	Disabled		
Resource Priority Namespace	< None >		
Timer Keep Alive Expires (seconds)*	120		
Timer Subscribe Expires (seconds)*	120		
Timer Subscribe Delta (seconds)*	5		
Maximum Redirections*	70		
Off Hook To First Digit Timer (milliseconds)*	15000		
Call Forward UR1*	v sisse sequiseusi sfudell		
Speed Dial (Abbreviated Dial) URI*	v siese serviceuri abbedial		
	x-usco-serviced Habbrular		
Conference Join Enabled			
Sami Attended Transfer			
Enable VAD			
Stutter Message Waiting			
MLPP User Authorization			
Normalization Contact			
Normalization Script		1	
None >	v		
Darameter Name	Parameter Value		
1			
Incoming Requests FROM URI Settings		1	



Transport Layer Security

The requirements and configuration procedure for TLS (Transport Layer Security) will be described in the following sections.

4.1 XCAPI SIP Security Additions

To enable **XCAPI SIP Security Additions (XSSA)**, it is necessary to run the **XSSA installer**, on the application/XCAPI server. The current version is **1.8.3**. Please note that a server reboot is required after the XSSA installation.

It is possible to use the **XCAPI SIP Security Additions (XSSA)** application (the xssa-ldr executable) for generating RSA keys, self-signed certificates and certificate signing requests. Please note that those **RSA** keys will be generated within the folder where the **xssa-ldr** executable is called.

4.1.1 RSA Keys & Self-Signed Certificates

The Cisco UCM can handle RSA keys with an encryption level up to **2048 bit**. For this example the XSSA-loader (xssa-ldr.exe) is used to generate a 2048 bit RSA key via the command line using the hostname of the XCAPI server. The private key is stored as **xcapi-private-key.pem** while the **xcapi-public-key.pem** filename is used for the public key. The corresponding command line for this is used as shown below:

```
C\>xssa-ldr crytool generate rsa --bits=2048
--private=xcapi-private-key.pem
--public=xcapi-public-key.pem
```

Next, this RSA key is used for generating a self-signed certificate. This **xcapi-certificate.pem** is valid for 365 days.

```
C:\>xssa-ldr crytool generate certificate --private=xcapi-private-key.pem
--cn=xcapi.te-systems.de
--idn=xcapi.te-systems.de
--certificate=xcapi-certificate.pem
--days=365
```

4.1.2 CA-Signed Certificate

You can use the private key can to generate a **CSR (Certificate Signing Request)** file for requesting a CA-signed certificate. The next example shows how to create the **xcapi-csr.pem** file which is used for requesting a CA-signed certificate.

```
C:>xssa-ldr crytool generate csr --private=xcapi-private-key.pem
--cn=xcapi.te-systems.de
--idn=xcapi.te-systems.de
--csr=xcapi-csr.pem
```



4.2 Certificate Management

The **Certificate Management** is handled through the **[Security ▼]** menu of the **Cisco Unified Operating System Administration**.



The CUCMs generated **CallManager.pem** certificate, which is used for this example, is shown in the certificates list.

Show ▼ Settings ▼ Security ▼ Software Upgrades ▼ Services ▼ Help ▼									
Certificate List	Certificate List								
🛐 Generate Self-signed 🗁 Upload Certificate/Certificate chain 📳 Generate CSR									
- Status-									
Certificate List (1 - 1 of 1)									
Find Certificate List where Certificate v is exactly	✓ CallManager Find C	Clear Filter 🔁 😑							
Certificate Common Name Type	Key Type Distribution	Issued By	Expiration	Description					
CallManager cucm12.testlab.te-systems.de 04/24/2023 Self-signed certificate generated by system									
Generate Self-signed Upload Certificate/Certificate chain Generate CSR									

The **CallManager.pem** will be locally stored and has to be imported as **Trusted Certificate** to the XCAPI controller, which is described in detail in the chapter **Configuring the XCAPI SIP Security Additions** on page 28.

Regenerate Generate CSR Download PEM File Download DER File -Certificate Settings - File Name CallManager, pem Certificate Purpose CallManager Certificate Type Certificate Type Certificate Group product-cm Description(friendly name) Self-signed certificate generated by system -Certificate File Data - (Version: V3 Serial Number: 410E9015FC67FBD6A2E8DBE64EFA97E2 A SignatureAlgorithm: SHA256withRSA (1.2.840.113549.1.1.11) Issuer Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS Gmbh, C=DE Validity From: Wed Apr 25 14:24:12 CEST 2018 A To: Mon Apr 24 14:24:11 CEST 2023 Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS Gmbh, C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS Gmbh, C=DE Key: Stored Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS Gmbh, C=DE Key: Stored Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS Gmbh, C=DE Key: Stored Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS Gmbh, C=DE Stored Subject Name: Subject Name: L=Wolfsburg, ST=Nieders	Certificate Details for cu	cm12.testlab.te-systems.de, CallManager	
Certificate Settings File Name CallManager.pem Certificate Purpose CallManager Certificate Purpose CallManager Certificate Type certs Certificate Group product-cm Description(friendly name) Self-signed certificate generated by system Certificate File Data Version: V3 Serial Number: 410E9015FC67FBD6A2E80BE64EFA97E2 SignatureAlgorithm: SHA256withRSA (1.2.840.113549.1.1.11) Issuer Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Validity From: Wed Apr 23 14:24:11 CEST 2018 To: Mon Apr 24 14:24:11 CEST 2018 To: Mon Apr 24 14:24:11 CEST 2013 Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH; C=DE Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.	Regenerate 😱 Gener	ate CSR 🔋 Download .PEM File 🔋 Download .DER File	
File Name CallManager.pem Certificate Purpose CallManager Certificate Type certs Certificate Group product-on Description(friendly name) Self-signed certificate generated by system Certificate File Data Image: Certificate File Data [Verificate File Data [Serial Number: 410E9015FC67FBD6A2E80BE64EFA97E2 SignatureAlgorithm: SHA256withRSA (1.2.840.113549.1.1.11) Issuer Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH, C=DE Validity From: Wed Apr 25 14:24:11 CEST 2018 To: Mon Apr 24 14:24:11 CEST 2023 Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH, C=DE Key: RSA (1.2.840.113549.1.11) Key: RSA (1.2.840.113549.1.11) Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH, C=DE Key: RSA (1.2.840.113549.1.11) Key: Value: S08201000282010100be3481295fe6544b7c498ce9e99e860f42f63974d45794951436e08282a6089e	-Certificate Settings		_
Certificate Type CallManager Certificate Type certs Certificate Trype certs Certificate Group product-cm Description(friendly name) Self-signed certificate generated by system Certificate File Data Image: CallManager Image: Certificate File Data Image	File Name	CallManager.pem	
Certificate Group product-cm Description(friendly name) Self-signed certificate generated by system -Certificate File Data	Certificate Purpose	CallManager	
Certificate Group product-cm Description(friendly name) Self-signed certificate generated by system Certificate File Data (Version: V3 Serial Number: 410E9015FC67FBD5A2E8DBE64EFA97E2 SignatureAdgorithm: STA256withRSA (1.2.840.113549.1.1.11) Issuer Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH, C=DE Validity From: Wed Apr 22 14:24:11 CEST 2018 To: Mon Apr 24 14:24:11 CEST 2018 Subject Name: L=Wolfsburg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, O=TE-SYSTEMS GmbH, C=DE Key: RSA (1.2.840.113549.1.11) Key value: S0820100282010100be3481295fe6544b7c498ce9e9e650f42f6G3974d45794951436e08282a6089e	Certificate Type	certs	
Description(friendly name) Self-signed certificate generated by system Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data Certificate File Data	Certificate Group	product-cm	
Certificate File Data Version: V3	Description(friendly name) Self-signed certificate generated by system	
	Version: V3 Serial Number: 410590 SignatureAlgorithm: SH. Issuer Name: L=Wolfabl O=TE-SYSTEM SombH, C Validity From: Wed Apr To: Mon Apr 24 Subject Name: L=Wolfal O=TE-SYSTEMS GmbH, C Key: RSA (1.2.484.0133 Key value: 3082010a028201010be3	SFC67FBD6A2E8DBE64EFA97E2 A256withRSA (1.2.840.113549.1.1.11) urg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, =DE 25 14:24:11 CEST 2018 14:24:11 CEST 2023 urg, ST=Niedersachsen, CN=cucm12.testlab.te-systems.de, OU=Testlab, =DE 49.1.1.1) 481295fe6544b7c498ce9e99e860f42f663974d45794951436e08282a6089e	



The generated XSSA certificate **xcapi-certificate.pem** has to be imported to the CallManager.

Show + Settings + Security + Software Upgrades + Services + Help +
Certificate List
🥘 Generate Self-signed 🖓 Upload Certificate/Certificate chain 🔃 Generate CSR
Certificate List
Find Certificate List where Certificate V begins with V Find Clear Filter
Generate Self-signed Upload Certificate/Certificate chain Generate CSR
Upload Certificate/Certificate chain Upload Certificate/Certificate chain Upload Certificate/Certificate will distribute it to all servers in this duster Upload Certificate/Certificate chain Certificate Purpose* Certificate Certificate chain Upload File Certificate Purpose* Citicapi-Certificate.pem Browse Upload Cise * indicates required item.

Afterwards, the XCAPI certificate will be shown in the certificate list.

cisco For Cisco	OUnified Operating	J System	Admin	istration	Navig admin	ation Cisco Unif Search Docum	ied OS Administration 💙 Go entation About Logout
Show - Settings -	Security - Software Upgrades	 Services 	Help 👻				
Certificate List							
Generate Self-sign	ed Dipload Certificate/Certif	icate chain 🔋	Generate C	SR			
Status							
1 records found							
Certificate List	(1 - 1 of 1)						Rows per Page 250 V
Find Certificate List w	here Common Name 🗸 begin	s with 🗸 xcap	pi.testlab.te	-system Find Clear Filter	ф –		
Certificate	Common Name	Туре	Кеу Туре	Distribution	Issued By	Expiration	Description
CallManager-trust	xcapi.te-systems.de	Self-signed	RSA	xcapi.te-systems.de	xcapi.te-systems.de	08/31/2019	Self-signed XCAPI certificate
Generate Self-sign	ed Upload Certificate/Certifi	cate chain (Generate CS	R			

Please ensure that the **Subject** line, in this example **Subject: CN=xcapi.te-systems.de**, displays the correct host name. This must be correct for the **SIP Trunk Security Profile**, as shown in the next chapter on page 23.

eruncate Details		
🕻 Delete 🔋 Downlo	ad .PEM File 🧕 Download .DER File	
Status		
i Status: Ready		
Certificate Settings—		
File Name	xcapi.te-systems.de.pem	
Certificate Purpose	CallManager-trust	
Certificate Type	trust-certs	
Certificate Group	product-cm	
Constitution (Existendity and	the second se	
Castificate Cile Dates	me) Self-signed XCAPI certificate	
Certificate File Data -	me) Self-signed XCAPI certificate	
Certificate File Data	me) Self-signed XCAPI certificate	
Certificate File Data - [Version: V3 Serial Number: 01 SignatureAlgorithm	me) Self-signed XCAPI certificate	
Certificate File Data - (Version: V3 Serial Number: 01 SignatureAlgorithm : 1 Issuer Name: Charco	me) Self-signed XCAPI certificate	
Certificate File Data - [Version: V3 Serial Number: 01 SignatureAlgorithm : Issuer Name: CN=xci Validity From: Fri Aug	Me) Self-signed XCAPI certificate SHA1withRSA (1.2.840.113549.1.1.5) pit.es-systems.de pit.es-systems.	
Certificate File Data - [Version: V3 Serial Number: 01 SignatureAlgorithm: 1 Issuer Name: CN=xci Validity From: Fri Aug To: Sat Aug 3	me) Self-signed XCAPI certificate SHA1withRSA (1,2,840,113549,1,1.5) api,tie-systems.de 31 13:47:14 CEST 2018 1 13:47:14 CEST 2018	
Certificate File Data - [Version: V3 Serial Number: 01 SignatureAlgorithm : 1 Issuer Name: CN=xc Validity From: Fri Au TO: Sat Aug 3 Subject Name: CN=xc	me) Self-signed XCAPI certificate SHA1withRSA (1.2.840.113549.1.1.5) apite-systema.de 1 13:47:14 CEST 2018 1 13:47:14 CEST 2019 apite-systema.de	
Certificate File Data - [Version: V3 Serial Number: 01 SignatureAlgorithm: : Issuer Name: CN=xci Validity From: Fri Aug To: Sat Aug 3 Subject Name: CN=xci Key xalue:	me) Self-signed XCAPI certificate SHA1withRSA (1.2.840.113549.1.1.5) api.te-systems.de 31 1347:14 CEST 2018 1 1347:14 CEST 2019 Capi.te-systems.de 3349.1.1.1)	
Certificate File Data - [Version: V3 Serial Number: 01 SignatureAlgorithm: : Isuer Name: CN=xc: Validity From: Fri Aug To: Sat Aug 3 Subject Name: CN=xc Key: RSA (12.840.1) Key value: 3082010.00282010100	me) Self-signed XCAPI certificate	
Certificate File Data [Version: V3 Serial Number: 01 SignatureAlgorithm:: Issuer Name: CN=xc Validity From: Fri Aug To: Sat Aug 3 Subject Name: CN=x Key: RSA (1.2.840.1: Key value: 3082010a502822010100	me) Self-signed XCAPI certificate SHA1withRSA (1.2.840.113549.1.1.5) ppi.te-systems.de 31 13:47:14 CEST 2018 11:347:14 CEST 2018 13:49:1.1.2 4049550e43565078bc58dd1b2cd164e15ab5bb3e1a5c731 b7d5f5161ab2z47f125b945b282cffad5dfaf14d458f5482f	
Certificate File Data - [Version: V3 Serial Number: 01 SignatureAlignithm:: Issuer Name: CN+xxx Validity: From: Fri Aug Validity: From: Fri Aug Subject Name: CN+xx Key: RSA (1.2.840.1: Key Jaluat: Sey Jaluat: Sey Jaluat: Cotabulos22464bede3dbiddididi	me) Self-signed XCAPI certificate	



4.3 SIP Trunk Security Profile for TLS

Enabling TLS requires a properly configured SIP Trunk Security Profile.



In this example the profile is used as follows:

- The Device Security Mode must be set to Encrypted.
- The Incoming and Outgoing Transport Type must be set to TLS.
- The X.509 Subject Name must be equivalent to the one of the XCAPI certificates, here xcapi.te-systems.de.
- The **Incoming Port** is set to **5061** which is also used as default TLS port by the XCAPI controller.
- The Accept out-of-dialog refer, Accept unsolicited notification and accept replaces header are used enabled.

System 👻	
SIP Trunk Security Profile Configura	tion
🔜 Save 🗙 Delete 🗋 Copy 蠀	Reset 🥒 Apply Config 🕂 Add New
SIP Trunk Security Profile Informatio	n
Name*	XCAPI Security Profile
Description	SIP Trunk Security Profile for TLS
Device Security Mode	Encrypted V
Incoming Transport Type*	TLS V
Outgoing Transport Type	TLS V
Enable Digest Authentication	
Nonce Validity Time (mins)*	600
X.509 Subject Name	xcapi.te-systems.de
	\sim
Incoming Port*	5061
Enable Application level authorization	
Accept presence subscription	
✓ Accept out-of-dialog refer**	
Accept unsolicited notification	
Accept replaces header	
Transmit security status	
Allow charging header	
SIP V.150 Outbound SDP Offer Filtering*	Use Default Filter



Page 24

4.4 SIP Trunking with TLS

The SIP trunk for TLS has to be created as a standard SIP trunk (see chapter **SIP Trunking** on page 10). Additionally the TLS secured SIP trunk must be used with an enabled **SRTP Allowed** parameter. In detail this trunk will be used as follows:

System • Call Routing • Media Resources • Advanced Features • Device	•	
Trunk Configuration		
🔚 Save 🗶 Delete 省 Reset 🖧 Add New		
Status		
(i) Status: Ready		
- SIP Trunk Status		
Service Status: Full Service Duration: Time In Full Service: 2 days 19 hours 47 minutes		
Device Information		
Product:	SIP Trunk	
Device Protocol:	SIP	
Trunk Service Type	None(Default)	
Device Name*	xcapi.te-systems.de	
Description	XCAPI SIP Trunk for TLS	
Device Pool*	Default V	
Common Device Configuration	< None >	
Call Classification*	Use System Default	
Media Resource Group List	< None >	
Location*	Hub_None V	
AAR Group	< None >	
Tunneled Protocol*	None 🗸	
QSIG Variant*	No Changes 🗸	
ASN.1 ROSE OID Encoding*	No Changes 🗸	
Packet Capture Mode*	None	
Packet Capture Duration	0	
Media Termination Point Required	,	
Retry Video Call as Audio		
Path Replacement Support		
Transmit UTF-8 for Calling Party Name		
Transmit UTF-8 Names in QSIG APDU		
Unattended Port		
SRTP Allowed - When this flag is checked, Encrypted TLS needs to be con	nfigured in the network to provide end to end security. Fa	ilure to do so will expose keys and other information.
Consider Traffic on This Trunk Secure*	When using both sRTP and TLS	
Route Class Signaling Enabled*	Default	
Use Trusted Relay Point*	Default	
PSTN Access		
Run On All Active Unified CM Nodes		



Please ensure that the parameters for standard SIP trunking, **Redirecting Diversion Header Delivery - Inbound** and **Redirecting Diversion Header Delivery - Outbound** are enabled for redirection numbering support.

ystem 👻 Call Routing 👻 Media R	tesources 👻 Advanced Featur	es 🕶 Device 🕶				
runk Configuration						
🚽 Save 🗙 Delete	t 🛟 Add New					
Intercompany Media Engine (I	ME)					
E.164 Transformation Profile < No	one >	~				
MLPP and Confidential Access	Level Information					
MLPP Domain < None	>	~				
Confidential Access Mode < None	>	~				
Confidential Access Level < None	>	~				
Call Routing Information						
Remote-Party-Id						
Asserted-Identity						
Asserted-Type* Default		~				
SIP Privacy" Default		V				
Trust Received Identity" Trust All	(Default)	~				
Inbound Calls						
Significant Digits*	All		~			
Connected Line ID Presentation*	Default		~			
Connected Name Presentation*	Default		~			
Calling Search Space	< None >		~			
AAR Calling Search Space	< None >		~			
Prefix DN						
Redirecting Diversion Header	Delivery - Inbound					
used as the prefix unless the	field is empty in which case t	there is no prefix assign Clear Pref	ned.	It Ductive Cattings		
Number Type	Prefix	Strip Digits	ix settings Dela	Calling Search Space		Use Device Pool CSS
Number Type Incoming Number	Prefix	Strip Digits	< None >	Calling Search Space	~	Use Device Pool CSS
Number Type Incoming Number De	Prefix	Strip Digits	< None >	Calling Search Space	~	Use Device Pool CSS
Number Type Incoming Number	Prefix	Strip Digits	<pre>None ></pre>	Calling Search Space	V	Use Device Pool CSS
Number Type Incoming Number Incoming Called Party Settin If the administrator sets the i	Prefix efault ngs	Strip Digits	<pre>< None ></pre>	Calling Search Space	e Parameter), O	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting Dr If the administrator sets the prefix unless the prefi	Prefix efault ngs prefix to Default this indicate: field is empty in which case t	Strip Digits	<pre>< None > </pre>	Calling Search Space	v e Parameter). Of	Use Device Pool CSS
Number Type Incoming Number De Incoming Called Party Settin If the administrator sets the used as the prefix unless the	Prefix fault 195 prefix to Default this indicate: field is empty in which case t	Strip Digits	< None > <pre> c None > </pre> <pre> c None > </pre> <pre> c Prefix at the next le ned. </pre> <pre> fix Settings Defail</pre>	Calling Search Space Calling Search Space vel setting (DevicePool/Servi It Prefix Settings	e Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Data Incoming Called Party Settli If the administrator sets the used as the prefix unless the Number Type Incoming Number	Prefix sfault 195 orefix to Default this indicate field is empty in which case t Prefix	Strip Digits s call processing will us clear Pref Strip Digits	<pre>< None > </pre>	Calling Search Space Calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	e Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the pused as the prefix unless	Prefix efault 195 orefix to Default this indicate field is empty in which case t Prefix efault	s call processing will us Clear Pref Strip Digits	< None >	calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	e Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the set used as the prefix unless the prefix unless the set	Prefix sfault use sfault sfault prefix to Default this indicates field is empty in which case t Prefix sfault	s call processing will us clear prefix assign Clear Pref Strip Digits	<pre>x Settings Defail < None > </pre>	calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	e Parameter), Ol	Use Device Pool CSS
Number Type Incoming Number Dx Incoming Called Party Setting If the administrator sets the pused as the prefix unless	Prefix efault Igs orefix to Default this indicate: field is empty in which case t Prefix efault 0.055 Unen c	Strip Digits s call processing will us there is no prefix assign Clear Pref Strip Digits 0	<pre>x Settings Defail </pre> <pre>x prefix at the next le ned. </pre> <pre>(x Settings Defail </pre> <pre></pre>	Calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the pused as the prefix unless the used as the prefix unless the Incoming Number Incoming Number Dr Connected Party Settings Connected Party Transformation	Prefix cifault Igs rorefix to Default this indicate field is empty in which case t Prefix field is empty in which case t field is empty in which case t Comparison for CSS < None > Comparison CSS = to Take Security CCC	Strip Digits s call processing will us there is no prefix assign Clear Pref Strip Digits 0	<pre>x Settings Defail << None > </pre>	Calling Search Space calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Settin If the administrator sets the jused as the prefix unless the Number Type Incoming Number Incoming Number Dr Connected Party Settings Connected Party Transformatio I Use Device Pool Connected Device Pool Connected	Prefix isfault ings prefix to Default this indicate field is empty in which case t Prefix fault n CSS < None > Party Transformation CSS	Strip Digits	<pre>c None > c None</pre>	Calling Search Space Calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Detection Incoming Called Party Setting If the administrator sets the jused as the prefix unless the Number Type Incoming Number Incoming Number Detection Connected Party Settings Connected Party Transformation ✓ Use Device Pool Connected Outbound Calls	Prefix stault st	Stip Digits Stip Digits s call processing will us there is no prefix assign Clear Pref Strip Digits 0	<pre>c None > c None</pre>	calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	e Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the jused as the prefix unless the Number Type Incoming Number Incoming Number Dr Connected Party Settings Connected Party Transformation ✓ Use Device Pool Connected Connected Party Transformation CSS	Prefix ifault ig5 ig5 prefix to Default this indicate field is empty in which case t Prefix fault n CSS < None > Party Transformation CSS	Stip Digits Stip Digits s call processing will us clear Pref Strip Digits 0	<pre>x seturgs Defail << None > </pre>	calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the pused as the prefix unless	Prefix ifault ifault ig5 prefix to Default this indicates prefix ifault n CSS < None > Party Transformation CSS Transformation CSS	Strip Digits	<pre>x Settings Defail </pre> <pre>x Settings Defail </pre> <pre>x eprefix at the next le ned. </pre> <pre>x Settings Defail </pre> <pre>x = x = x = x = x = x = x = x = x = x =</pre>	Calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting Dr If the administrator sets the pused as the prefix unless the Number Type Incoming Number Dr Incoming Number Dr Connected Party Settings Connected Party Transformatio Outbound Calls Called Party Transformation CSS Ø Use Device Pool Called Party Called Party Transformation CSS	Prefix ofault 105 orefix to Default this indicater field is empty in which case to Prefix ofault in CSS < None > Party Transformation CSS C None > Transformation CSS Set	Strip Digits s call processing will us there is no prefix assign Clear Pref Strip Digits 0	<pre>x Settings Defail </pre> <pre>x prefix at the next le ned. </pre> <pre>x Settings Defail </pre> <pre>x Onne > </pre>	Calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ce Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the iused as the prefix unless the Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Dr Connected Party Transformatio Dr Outbound Calls Called Party Transformation CSS I use Device Pool Called Party Calling Party Transformation CSS I use Device Pool Called Party Calling Party Transformation CSS	Prefix ifault Ig5 refix to Default this indicate field is empty in which case t Prefix fault n CSS < None > Party Transformation CSS < None > Transformation CSS Transformation CSS Transformation CSS	Stip Digits	<pre>x Settings Defail << None > </pre>	Calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ce Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the jused as the prefix unless the Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Connected Party Transformation Contected Party Transformation CSS Use Device Pool Connected Outbound Calls Called Party Transformation CSS Called Party Transformation CSS Use Device Pool Called Party Calling Party Transformation CSS Use Device Pool Calling Party Outbourd Y Transformation CSS Use Device Pool Calling Party	Prefix ifault ig5 rorefix to Default this indicate field is empty in which case t Prefix fault n CSS None > Party Transformation CSS Transformation CSS Transformation CSS Transformation CSS	Stip Digits	<pre>x seturgs Defail << None > </pre>	Calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	e Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the jused as the prefix unless the Number Type Incoming Number Incoming Number Dr Connected Party Settings Connected Party Transformation Connected Party Transformation CSS Iso Device Pool Connected Outbound Calls Called Party Transformation CSS Iso Device Pool Called Party Calling Party Transformation CSS Iso Device Pool Calling Party Calling Party Selection *	Prefix ifault ig5 ig5 ig6 ig7 ig7 ig7 ig7 ig7 ig7 ig7	Stip Digits	<pre>x Settings Defail << None > </pre>	Calling Search Space //el setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Ol	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the jused as the prefix unless the Intoming Number Dr Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Dr Connected Party Transformation Dr Outbound Calls Called Party Transformation CSS I Use Device Pool Called Party Calling Party Selection* Calling Arty To Presentation* Calling Name Presentation*	Prefix ifault ifault ifault ifault ifault Prefix Prefix Prefix	Strip Digits	<pre>x Settings Defail </pre>	Calling Search Space //el setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the pused as the prefix unless the Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Dr Connected Party Transformation Dr Outbound Calls Called Party Transformation CSS Outbound Calls Called Party Transformation CSS Outsourd Calls Drosonation CSS Outsourd Party Selection* Calling Party Selection* Calling Name Presentation* Calling and Connected Party Information	Prefix ifault Igs rorefix to Default this indicate field is empty in which case t Prefix field is empty in which case t Prefix for CSS < None > Transformation CSS < None > Transformation CSS Transformation CSS Transformation CSS Transformation CSS Default	Stip Digits	<pre>x Settings Defail </pre> <pre>x Settings Defail </pre> <pre>x Prefix at the next le next.le </pre> <pre>x Defail </pre> <pre>x Output </pre> <pre>x Output </pre>	Calling Search Space vel setting (DevicePool/Servi- It Prefix Settings Calling Search Space	:e Parameter). Ol	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Settin If the administrator sets the jused as the prefix unless the Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Connected Party Transformatio Contected Party Transformation Dr Called Party Transformation CSS Use Device Pool Called Party Called Party Transformation CSS Use Device Pool Called Party Calling Party Selection* Calling Party Selection* Calling Ine ID Presentation* Calling Name Presentation* Calling and Connected Party Infe Medirecting Diversion Header	Prefix ifault 195 orefix to Default this indicate: field is empty in which case t Prefix fault n CSS < None > Party Transformation CSS < None > Transformation CSS < None > Transformation CSS < None > Transformation CSS	Stip Digits	<pre>x Settings Defail < None > </pre>	Calling Search Space vel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the jused as the prefix unless the Number Type Incoming Number Incoming Number Dr Connected Party Settings Connected Party Transformation Connected Party Transformation CSS Use Device Pool Connected Outbound Calls Called Party Transformation CSS Called Party Transformation CSS Use Device Pool Calling Party Calling Party Transformation* Calling Name Presentation* Calling Name Presentation* Calling Name Presentation * Calling Name Presentation * Calling Party Transformation CSS	Prefix ifault ifault ig5 refix to Default this indicate field is empty in which case t Prefix field is empty in which case t Prefix ransformation CSS Coriginator Coriginator Default Default Default Default Default Default Default Default CSS	Stip Digits Stip Digits call processing will us clear Pref Strip Digits connected party	<pre>x Settings Defail << None > </pre>	Calling Search Space //el setting (DevicePool/Servi It Prefix Settings Calling Search Space	re Parameter). Ol	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the jused as the prefix unless the Intoming Number Dr Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Dr Connected Party Transformation Dr Outbound Calls Called Party Transformation CSS If Use Device Pool Called Party Calling Party Selection* Calling Varty Velection* Calling Name Presentation* Calling and Connected Party Info Redirecting Diversion Header If use Device Pool Caller Complexition Dr Is Redirecting Diversion Header Is Device Pool Redirecting Filter	Prefix ifault ifault	Stip Digits	<pre>x Settings Defail << None > </pre>	Calling Search Space //el setting (DevicePool/Servi It Prefix Settings Calling Search Space	ce Parameter). Ol	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Setting If the administrator sets the pused as the prefix unless the Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Dr Connected Party Transformation Dr Outbound Calls Called Party Transformation CSS Outbound Calls Calling Party Transformation CSS Outsound Called Party Calling Party Selection* Calling Name Presentation* Calling and Connected Party Info Is deriveting Diversion Header Redirecting Diversion Header Redirecting Diversion Header Calling Lawier Fool Redirecting For Sol Redirecting Party Transformation* Calling Name Presentation* Calling Diversion Header Calling Name Presentation* Calling Diversion Header Caller Device Pool Redirecting For Sol Redirecting Party Transformation Diversion Header	Prefix :fault 195 orefix to Default this indicater field is empty in which case to Prefix of ault of CSS < None > Party Transformation CSS C None > Transformation CSS C None > Transformation CSS C None > Transformation CSS Originator Default Default <	Stip Digits	<pre>x Settings Defail </pre> <pre>x Settings Defail </pre> <pre>x Prefix at the next le ned. </pre> <pre>x Defail </pre> <pre>x V </pre> <pre>x V </pre>	Calling Search Space //el setting (DevicePool/Servi It Prefix Settings Calling Search Space	v Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Settin If the administrator sets the iused as the prefix unless the Incoming Number Dr Incoming Number Dr Connected Party Settings Connected Party Transformation I Use Device Pool Connected Outbound Calls Called Party Transformation CSS I Use Device Pool Called Party Calling Party Transformation CSS I Use Device Pool Called Party Calling Party Selection* Calling Num Presentation* Calling name Presentation* Calling and Connected Party Information I Use Device Pool Redirecting F Caller Device Pool Redirecting F Calling Name Presentation* Calling Darty Transformation I Use Device Pool Redirecting F Caller Information Caller Information Caller Information Caller ID DN	Prefix :fault 195 orefix to Default this indicater field is empty in which case to Prefix of ault ifault of ault of ault efault of ault efault (< None > Transformation CSS (< None > Transformation CSS (< None > Default Default Default Default Default Default Default Default Deliver DN only in CSS < None > Yarty Transformation CSS	Strip Digits	<pre>x Settings Defail << None > </pre>	Calling Search Space //el setting (DevicePool/Servi It Prefix Settings Calling Search Space	e Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Settin If the administrator sets the jused as the prefix unless the Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Connected Party Transformatio Connected Party Transformation Dr Called Party Transformation CSS Use Device Pool Called Party Calling Party Transformation CSS Use Device Pool Called Party Calling Party Selection* Calling Party Selection* Calling Nume Presentation* Calling Name Presentation* Calling and Connected Party Infeder Redirecting Diversion Header Redirecting Diversion Header Calling Information Caller Information Caller Information Caller Information Caller ID DN Caller ID DN Caller ID N Caller ID N Caller ID N	Prefix ifault 195 orefix to Default this indicate: field is empty in which case t Prefix fault n CSS < None > Party Transformation CSS < None > Transformation CSS < None > Transformation CSS < None > Transformation CSS	Stip Digits	<pre>x Settings Defail << None > </pre>	Calling Search Space rel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS
Number Type Incoming Number Dr Incoming Called Party Settin If the administrator sets the iused as the prefix unless the Incoming Number Dr Incoming Number Dr Incoming Number Dr Connected Party Settings Connected Party Transformatio Contected Party Transformation Diversion Connected Outbound Calls Called Party Transformation CSS Outbound Calls Called Party Transformation CSS Outbound Calls Calling Party Selection* Calling Party Selection* Calling Party Selection* Calling Name Presentation* Calling Name Presentation* Calling and Connected Party Information Medirecting Diversion Header Redirecting Diversion Header Calling and Connected Party Information Caller Information Caller Information Caller Information Ca	Prefix ifault ig5 prefix to Default this indicate field is empty in which case t Prefix fault n CSS < None > Party Transformation CSS C None > Transformation CSS C None > Transformation CSS Transformation CSS Transformation CSS C None > Transformation CSS C None > Transformation CSS C None > Transformation CSS C None > Transformation CSS C None > Transformation CSS C None > Transformation CSS Originator Default Default Deliver DN only in Deliver V Transformation CSS Outbound CSS C None > Party Transformation CSS DN and Caller Name in Idential	Strip Digits	<pre>x Settings Defail << None > </pre>	Calling Search Space rel setting (DevicePool/Servi It Prefix Settings Calling Search Space	ve Parameter). Of	Use Device Pool CSS



Beside of the default values within the SIP Information dialog, the Destination Address is used with the host address xcapi.te-systems.de and the default port for TLS 5061. The SIP Trunk Security Profile is associated to the XCAPI-Server-TLS security profile.

System - Call Routing - Media Resources	◄ Advanced Features ▼	Device 🔻		
Trunk Configuration				
	_			_
Save 🗙 Delete 🎦 Reset 🕂	Add New			
SIP Information				
Destination				
Destination Address is an SRV				
Destination Address		Destination Address IPv6	Destination Port	Status
1* xcapi.te-systems.de			5061	up
MTP Preferred Originating Codec*	711ulaw	\checkmark		
BLF Presence Group*	Standard Presence group	~		
SIP Trunk Security Profile*	XCAPI Security Profile	✓		
Rerouting Calling Search Space	< None >	~		
Out-Of-Dialog Refer Calling Search Space	< None >	~		
SUBSCRIBE Calling Search Space	< None >	~		
SIP Profile*	XCAPI SIP Profile	~	View Details	
DTMF Signaling Method*	RFC 2833	~		
Normalization Script				
Normalization Script < None >		~		
Enable Trace				
Parameter Name		Parameter Value		
1			± =	
Recording Information				
None				
	ashlad astaway			
	nableu gateway			
U This trunk connects to other clusters	with recording-enabled ga	teways		
Geolocation Configuration				
Geolocation < None >		~		
Geolocation Filter < None >		~		
Send Geolocation Information				



4.5 Route Pattern

The Route Pattern for the TLS SIP trunk is used as shown:

System - Call Routing -	
Route Pattern Configuration	
Save 🗙 Delete 🗋 Copy 🕂 Add N	lew
_ Status	
i Status: Ready	
Pattern Definition	
Route Pattern *	.!
Route Partition	XCAPIpartition 🗸
Description	XCAPI route pattern
Numbering Plan	Not Selected 🗸
Route Filter	< None >
MLPP Precedence*	Default 🗸
Apply Call Blocking Percentage	
Resource Priority Namespace Network Domain	< None >
Route Class*	Default 🗸
Gateway/Route List*	xcapi.te-systems.de 🗸 (Edit)
Route Option	Route this pattern
	○ Block this pattern No Error ✓
Call Classification* OffNet	~
External Call Control Profile < None >	~
□ Allow Device Override Provide Outside D	ial Tone 🗌 Allow Overlap Sending 🗌 Urgent Priority
Require Forced Authorization Code	
Authorization Level* 0	
Require Client Matter Code	



4.6 Configuring the XCAPI SIP Security Additions

For running XSSA it is necessary to enable the Use XCAPI SIP Security Additions for this controller option.



The self-generated **xcapi-certificate.pem** file, as described in the chapter **Certificate Management** on page 21 and the associated RSA key **xcapi-private-key.pem** must be uploaded through the XCAPI controllers **TLS Certificate** dialog.

ile View Help				
	Certificate Trusted Certificates Oct			
Jorniguation Jorniguation Controller Face Fa	Certificate and Private Key During TLS connection establishm and the corresponding RSA private Certificate RSA Private Key	ons Int it is neccessary to authenticate with the remot key. <u>xcapi.te-systems.de</u> <u><rsa key="" present="" private=""></rsa></u>	e peer using a c	ertificat



Within the **Trusted Certificates** dialog you have to import the **CallManager.pem** certificate, as shown in the chapter **Certificate Management** on page 21.

Finally you have to save the XCAPI controller changes and need to restart the CAPI application services.

XCAPI Configuration	- 0
le View Help	Certificate Trusted Certificates Options Trusted Certificates During ITS connection establishment a remote peer is authenticated using the certificate presented by this
Image: Trace Image: Trace	peer. Information cucm12.te-systems.de



Fax Services

In this chapter, we are going to describe configuring the fax services leveraging T.38 (including V.34), Softfax (G.711) and T.38 to Softfax fallback.

For faxing to function correctly it must be ensured that the Codec, Framing, Bandwidth and DTMF settings are set conform to the ones of the XCAPI controller configuration and other participating SIP instances.

Note that the XCAPI controller Fax dialog as well as T.38 (including V.34 support) to G.711 fallback support is available from XCAPI version 3.5.0. We strongly recommend using latest XCAPI versions for best results and it might be even be mandatory with latest manufacturer releases and firmware versions.



The fax related configurations for the Cisco gateway will be described in the chapter **Troubleshooting**, **Hints and Configuration Examples** from page 33. Please note that XCAPI does not support the **T.38** fax protocol through XSSA and enabled TLS.

5.1 SoftFax (G.711 Fax Pass Through)

In the **SoftFax** mode, the XCAPI simulates an analog fax device by transmitting modulated fax signals like a modem through the established G.711 audio channels. The **SoftFax (G.711 fax pass through)** fax method has to be enabled as shown below.

File View Help I View Help Configuration C	🗲 XCAPI Configuration			- 0	×
Configuration Options 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 Softfax (G.711 fax pass through) Softfax (G.711 fax pass through) V 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. Softfax (ED signal tone) Defore T.38 negotiation for V.34 only	File View Help				
V Supplementary Services V Hold V MWI (Message Waiting Indication) V Off Codecs V Default V With Wessage Waiting Indication) V Off Codecs V With Wessage Waiting Indication) V With Wessage Waiting Indication V <t< th=""><th>Configuration Information Info</th><th>Options Fax Method Select whether the XCAPI should tran in the audio channel (Softfax). Selecti Fax Method V.34 Fax Support Enabled Fax Calling Tone/Fax Called Tone Depending on direction fax transmiss be transmitted before or after T.38 ne Transmit CED signal tone Transmit CNG signal tone Transmit CNG signal tone timeout</th><th>ster fax messages via T.38 signalling or via T.30 sig g Disabled will also remove any configured fax co Softfax (G.711 fax pass through) ions start with a CED or CNG signal tone. Select wi goliation. before T.38 negotiation for V.34 only before T.38 negotiation (in audio channel) Default</th><th>nalling enco</th><th>ded shall</th></t<>	Configuration Information Info	Options Fax Method Select whether the XCAPI should tran in the audio channel (Softfax). Selecti Fax Method V.34 Fax Support Enabled Fax Calling Tone/Fax Called Tone Depending on direction fax transmiss be transmitted before or after T.38 ne Transmit CED signal tone Transmit CNG signal tone Transmit CNG signal tone timeout	ster fax messages via T.38 signalling or via T.30 sig g Disabled will also remove any configured fax co Softfax (G.711 fax pass through) ions start with a CED or CNG signal tone. Select wi goliation. before T.38 negotiation for V.34 only before T.38 negotiation (in audio channel) Default	nalling enco	ded shall



Page 31

5.2 T.38

In the case of T.38, using this fax method must also be supported and enabled for all other participating instances in between (SIP gateways, SIP provider, SBCs etc.). It is strongly recommended to avoid any kind of unnecessary transcoding (for e.g. G.711 to T.38 or vice versa) and using standard fax methods for all participating instances.

For enabling T.38 this Fax Method must be set as shown on the next screenshot.

Ensure that the **T.38** - **UDP** is available and enabled within the **Codecs** tab of the XCAPI controller configuration. One speech codec (in common G.711law or G.711 μ -law) must be enabled for the initial call establishment.







iceoverIP

T.38 with V.34 is available from XCAPI version 3.5.0 and Cisco VoIP gateways from version 15.1. To enable T.38 with V.34, **T.38** as well as **V.34 Fax Support** must be enabled within the XCAPI controllers **Fax** tab. The appropriate Cisco configurations will be described within the **Troubleshooting** section starting on page 33.

XCAPI Configuration		– 🗆 X					
File View Help	Options						
Grant Construction Generation Generati	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 ✓ V.34 Fax Support Enabled 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 ne Transmit CED signal tone Transmit CNG signal tone Transmit CNG signal tone timeout	gotistion. before T.38 negotiation for V.34 only before T.38 negotiation (in audio channel) Default V					

5.4 T.38 with G.711 Fax Fallback

The fax fallback can be enabled, also with **V.34 Fax Support**, as shown on the screenshot below. The corresponding Cisco configurations will be described within the **Troubleshooting** section starting on page 33. It is strongly recommended to check if this mode is supported by all participating VoIP instances, especially in the case of session border controller's or connected SIP providers. Depending on the VoIP environment additional configurations might be required. Incorrect configurations (not only for the ones of the XCAPI controller) will result in bad or non-working fax transmissions.





Troubleshooting, Hints and Configuration Examples

For best practice and functionality please read through the hints and examples of this section. The XCAPI related configurations for the given fax dial-peer examples can be reviewed in the chapter **Fax Services** from page 30.

6.1 Common Hints

- There are several protocols like **H.323**, **SIP** or **MGCP** that can be used for building up the connectivity between the Cisco Unified Communications Manager and a Cisco gateway. If the Cisco gateway and Cisco Unified Communications Manager connectivity is interacting via the SIP or H.323 VoIP protocol, the same protocol has to be used for the XCAPI trunk. Using different protocols for the VoIP environment commonly causes more issues (like DTMF functionality) and other side effects which require in-depth analysis.
- The dial-peer command **destination-pattern** is used for setting up the routing for the Cisco Unified Communications Manager and its connected gateway and can be used as well for the XCAPI trunk.
- You should give consideration to configuring dial-peers for routing the calls from the Cisco Unified Communications Manager to its gateway, as you cannot setup all necessary parameters within the global **voice service voip** dialog.
- The **called-number** dial-peer command can be used for utilizing its parameters for outgoing (outbound) call legs.
- In practice a wide range of matching calling numbers has to be routed which can be invoked with the **incoming called-number T** command.
- Use the dial-peer command answer-address for matching a specific calling number.

6.2 Frequent Issues

- In a case of working incoming (inbound) faxes with the outgoing (outbound) transmission always failing, it is recommended you check with the dial-peer that is used for the outbound route. In most cases it is incorrectly configured.
- If the XCAPI controller is configured to use the Softfax (G.711 Fax Pass Through) method but no outbound (outgoing) dial-peer is assigned a corresponding G.711 codec, the gateway will use the globally defined **voice service voip** code settings, which will probably be T.38. You can correct this by using commands like **incoming called-number T** or **answer-address 123456** for proper dial-peer matchings.
- If connections are rejected immediately or terminated after the call establishment, the root cause is mostly due to wrong or not conformed codec configurations. The related Cisco Unified Communications Manager dial-peer should be configured with a G.711 μ -Law codec which has to be enabled in the XCAPI controller also. However, this is normally the default setting for both instances.



Page 34

6.3 Network Clock

Wrong or faulty network clock configurations can be the reason for aborted faxes due to clocking and frame errors on the PRI. So if utilized, please check the proper PRI configurations and clocking or TX\RX errors. Example for the network:

network-clock-select 1 E1 0/0/0

6.4 MGCP

If using the **SoftFax (G.711 fax pass through)** method through an MGCP configured gateway, the dial-peer commands should be handled as follows. Do not set any of these MGCP commands:

```
mgcp modem passthrough voip mode nse
mgcp modem passthrough voip codec g711alaw (or codec g711ulaw)
mgcp fax t38 inhibit
mgcp fax t38 gateway force
```

Ensure that this MGCP command is set:

mgcp fax rate disabled

6.5 Using SoftFax (G.711 Fax Pass Through)

When running the SoftFax (G.711 fax pass through) method, you should avoid to enable commands like **fax protocol pass-through** or **fax protocol t.38**. Use the **fax rate disabled** command for disabling any gateway-sided fax detection for the related dial-peer.

SIP dial-peer example for using SoftFax (G.711 fax pass through):

```
dial-peer voice 800 voip
destination-pattern 8...
codec g711ulaw
session protocol sipv2
session target ipv4:192.168.1.100
incoming called-number T
dtmf-relay rtp-nte
fax rate disable
```



6.6 Using SoftFax (G.711 Fax Pass Through) in Virtual Environments

The parameters **playout-delay nominal 250** and **playout-delay mode fixed** are used to specify a more graceful jitter buffer. So the handling of UDP/RTP packets might be handled in a more efficient way.

SIP dial-peer example, which is only used for outgoing facsimile transmissions when matching a specific prefix, for using SoftFax (G.711 fax pass through) in virtual environments:

```
translation-rule 2

Rule 1 8999990 0

dial-peer voice 8999990 voip

translate-outgoing called 2

incoming called-number 8999990

playout-delay nominal 250

playout-delay mode fixed

codec g711ulaw

fax rate disable

no vad
```

6.7 Using T.38

Using the T.38 fax protocol requires to set the **fax protocol t.38** command. It is recommended you enable **ECM** error correction mode. For this, you need to ensure that the **fax-relay ecm disable** command is NOT used.

SIP dial-peer example for using T.38:

```
dial-peer voice 800 voip
    destination-pattern 8...
    codec g711ulaw
    session protocol sipv2
    session target ipv4:192.168.1.100
    incoming called-number T
    dtmf-relay rtp-nte
    fax protocol t38 ls-redundancy 0 hs-redundancy
```



6.8 Using T.38 with V.34

Using the T.38 fax protocol requires you set up the **fax protocol t38 version 3** command. Make certain that the **fax-relay ecm disable** command has **NOT** been set because V.34 requires the error correction mode.

SIP dial-peer example for using T.38 with V.34:

```
dial-peer voice 800 voip
    destination-pattern 8...
    codec g711ulaw
    session protocol sipv2
    session target ipv4:192.168.1.100
    incoming called-number T
    dtmf-relay rtp-nte
    fax protocol t38 version 3 ls-redundancy 0 hs-redundancy 0 fallback none
```

6.9 Using T.38 with G.711 Fax Fallback

Using the T.38 fax protocol requires to set the **fax protocol t.38** command. We recommend enabling the **ECM** mode. For this, you need to be certain that the **fax-relay ecm disable** command is **NOT** used.

SIP dial-peer example for using T.38 with G.711 fallback:

```
dial-peer voice 800 voip
    destination-pattern 8...
    codec g711ulaw
    session protocol sipv2
    session target ipv4:192.168.1.100
    incoming called-number T
    dtmf-relay rtp-nte
    fax protocol t38 version 0 (or version 3 for V.34 support)
    ls-redundancy 0 hs-redundancy 0 fallback pass-through g711ulaw
```



Page 37

Call Transfer

For enabling call transfer via SIP refer, the **simulated ect by call-tromboning (line-interconnect)** parameter has to be disabled within the XCAPI controller **features** tab. Make certain the SIP Trunk Security Profile parameters **Accept Out-of-Dialog REFER** and **Accept Replaces Header** (see chapter **SIP Trunk Security Profiles** on page 8) and the **Application User Configurations** of the User Management dialog (see chapter **User Management** on page 15) are all enabled. You must also be certain that the corresponding Route Partition is assigned to the SIP trunk's calling search space for allowing proper basic calls and call transfers.

🛠 XCAPI Configuration	
File View Help	Controller Features
Information > Information > Uccenses (TE-SYSTEMS GmbH - 500 Channels + Fax) > G CAPI 20 Options - Information - Information<	Simulate ECT In cases where the environment does not support call-transfer operations it is possible to simulate call-transfer by call-tromboning (line-interconnect) Simulate ECT by call-tromboning (line-interconnect) Notify destination To path replacement Hold/Retriev relay Software Codes These fratures affect the behaviour of the system in some situations and will be applied to each connection of this controller. Software Codes These fratures affect the behaviour of the system in some situations and will be applied to each connection of this controller. Software Codes These fratures affect the behaviour of the system in some situations and will be applied to each connection of this controller.

Message Waiting Indications

For Message Waiting Indications via SIP Notify, the **Accept Unsolicited Notification** parameter must be enabled in the SIP Trunk Security Profile. Also check if the **SIP NOTIFY** method is enabled for XCAPI controller.

🖉 XCAPI Configuration		- 0	×
File View Help			
Configuration Configuration	MWI-Protocol	Options of otocol that is used to signale message-waiting-indications (MWI) in your environment. IFY	>
> 🎭 SIP Tweaks			



Page 38

XCAPI Outbound Failover

A XCAPI related outbound failover can be accomplished with setting up multiple gateway IP addresses within the controller **Proxies** tab. Each gateway has to be available and aware of the XCAPI SIP trunk. If required the valid **Default SIP Domain** of the Cisco environment has to be set within the XCAPI controller **Options** tab, otherwise the system may reject inbound calls from the application if XCAPI uses the wrong host part in SIP URIs. An example is given on the screenshot below.

🚿 XCAPI Configuration								-	· 🗆 🗙		
File View Help											
Configuration	SIP	Options	Proxies	Registrations	Protocol	Timer	Overlap send	ling Failover	and Overflow		
Information Sourcesses (TE-SYSTEMS GmbH - 500 Channels Graph 2.0 Options Trace Trace Former	Infor Thes regis head	mation e informa trar and/o ler replacir	tion are re r proxy as ng the def	quired to estab well. The "con ault.	lish a conn tact" field r	ection ar nay be u	nd are used to a sed to provide	authorize the u a special value	user at the for the contact		
	User Pass Disp Orga Com SIP C SIP C SIP C SIP C	name (Aut word lay Name anization tact 'Default SI Domain" w Domain". ult SIP Doi ocal SIP Do	thorization d Registrat P Domain ill be appe main pmain	n) tion " will be appen ended to any lo	ded to any cal SIP add	SIP addr ress (i.e. <u>is.de</u>	ress with a miss in a FROM hea	ing domain-p der) instead of	art. The "Local f the "Default		
	Auth	entication								1	
File View Help		SIP	Opt	ions Proxies	Registratio	ons Pro	tocol Timer	Overlap send	ding Failover and	d Overflow	
✓ ✓	00 Chan	Plei Iist	Proxy Proxy 772.18.0.12 172.18.0.12	he hostname o multiple SIP Proxy TIONS	r IP addres xxies.	s of your	SIP Proxy belo	w. Automatic	failover is support Port Defaul Defaul	ed if the	



Exclusion of Liability

Copyright © 2019 TE-SYSTEMS GmbH

All rights reserved

This document, in part or in its entirety, may not be reproduced in any form without the prior consent of TE-SYSTEMS GmbH.

The information contained in this document was correct at the time of writing. TE-SYSTEMS GmbH reserves the right to make any alterations without prior notice.

The utmost care was applied during the compilation of texts and images, as well as during the creation of the software. Nevertheless, no responsibility can be taken for the content being accurate, up to date or complete, nor for the efficient or error-free operation of the software for a particular purpose. Therefore, TE-SYSTEMS GmbH cannot be held liable for any damages resulting directly or indirectly from the use of this document.

Trademarks

All names of products or services used are trademarks or registered trademarks (also without specified indication) of the respective private or legal persons and are therefore subject to legal regulations.

Third Party Disclaimer and Limitations

"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.

Copyright-Notices

All files included in this sample are copyrighted by TE-SYSTEMS GmbH.

All samples and the SDK may only be used in combination with the XCAPI-product.

The SDK contains code from libtiff with the following copyright-notice:

Copyright (c) 1988-1997 Sam Leffler

Copyright (c) 1991-1997 Silicon Graphics, Inc.

Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that (i) the above copyright notices and this permission notice appear in all copies of the software and related documentation, and (ii) the names of Sam Leffler and Silicon Graphics may not be used in any advertising or publicity relating to the software without the specific, prior written permission of Sam Leffler and Silicon Graphics.

THE SOFTWARE IS PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EXPRESS, IMPLIED OR OTHERWISE, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL SAM LEFFLER OR SILICON GRAPHICS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER OR NOT ADVISED OF THE POSSIBILITY OF DAMAGE, AND ON ANY THEORY OF LIABILITY, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.