

Alcatel-Lucent OmniPCX Enterprise R12



November 13, 2017

Introduction

This document is intended to support you with the integration of XC-API into an existing environment of the Alcatel-Lucent OmniPCX Enterprise. In the following sections we describe the essential configuration steps for SIP trunking to allow optimal interworking of both, the XC-API and the Alcatel-Lucent OmniPCX Enterprise. Though being based on the Alcatel-Lucent OmniPCX Enterprise R12 series, this document is applicable with other versions given a few adjustments.

At this point we suppose that the Alcatel-Lucent OmniPCX Enterprise 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 XC-API and the CAPI 2.0 voice or fax application is properly installed. Independent of the deployed application, the SIP trunk configuration can be tested with the XC-API's included test application (xtest.exe) that is available within the XC-API's installation folder (by default `\\Program Files (x86)\TE-SYSTEMS\XC-API\`). This test tool allows to check with inbound and outbound calls, fax and testing several supplementary services.

However, we recommend to visit our [YouTube channel](#) frequently for XC-API related tutorials about licensing, the test tool, line monitor, tracing, analyzing and others. Registered [community](#) users can check about latest XC-API documents, TechNotes and versions.

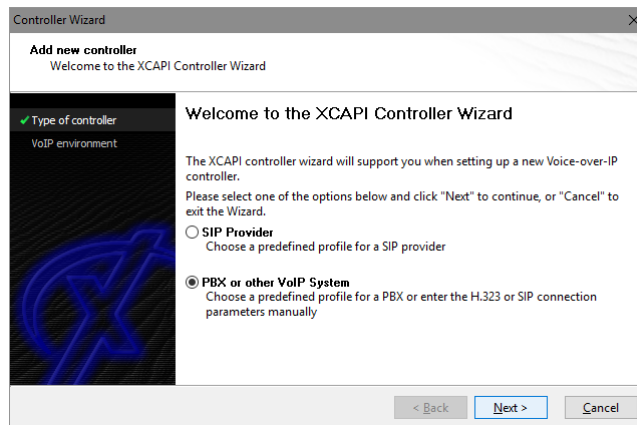


For Alcatel-Lucent OmniPCX Enterprise troubleshooting, please check with the documents **TG0069 Session Initiation Protocol (SIP)** and **TG0022 FAX OVER IP ISSUES** for in-depth analyzing. Also review the document **Alcatel-Lucent OmniPCX Enterprise Communication Server IP-PCX Networks (Release 12 - April 2017 8AL91007USAG Ed. 01)** for several SIP related information and hints.

XCAPI Configuration

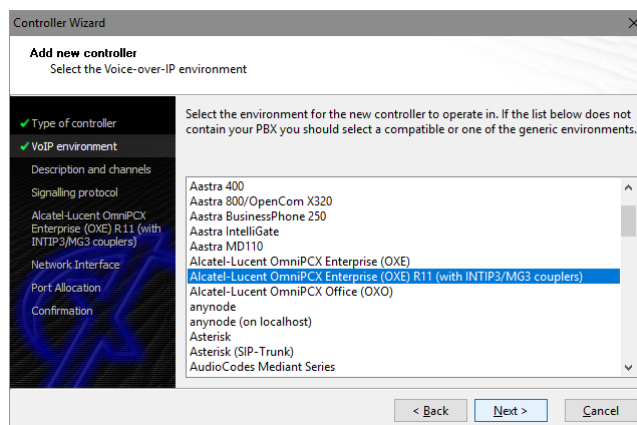
Please start up the XCAPI configuration to create a new controller assigned to the Alcatel-Lucent OmniPCX Enterprise. If you've just installed the XCAPI and start the configuration tool for the first time or no controller is available at all, the XCAPI controller wizard will pop up automatically.

To start up the XCAPI controller wizard manually, the hyperlink labeled **Click here to add a controller** on the main page has to be clicked. However, select **PBX or other VoIP System** in the initial **Type of controller** dialog and proceed with the **Next** button.



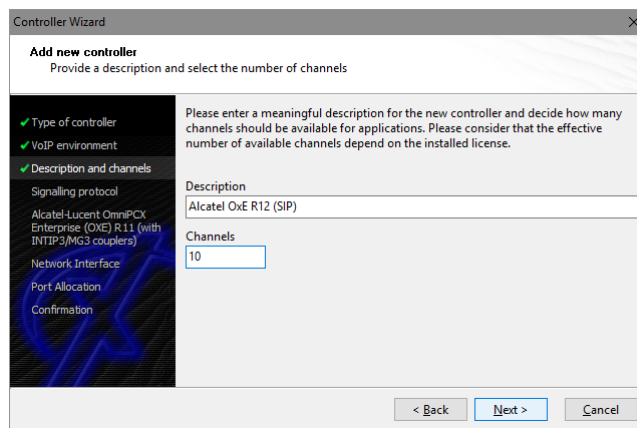
2.1 Voice-over-IP Environment

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



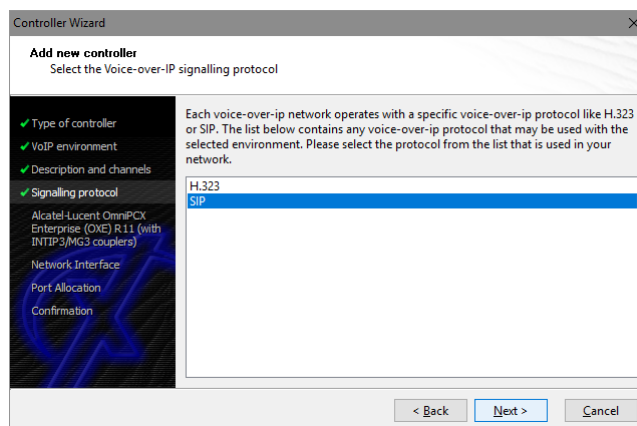
2.2 Description and Channels

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



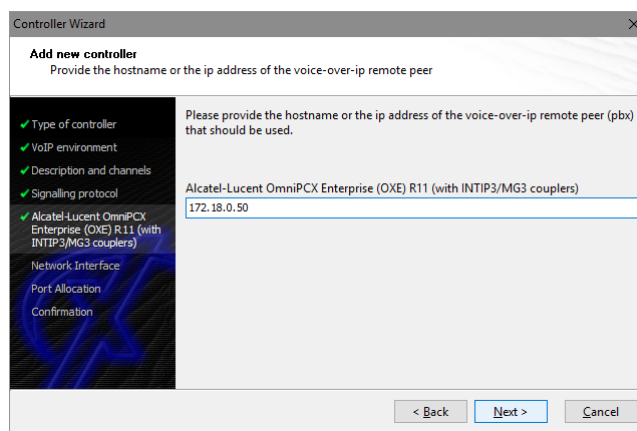
2.3 Signaling Protocol

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



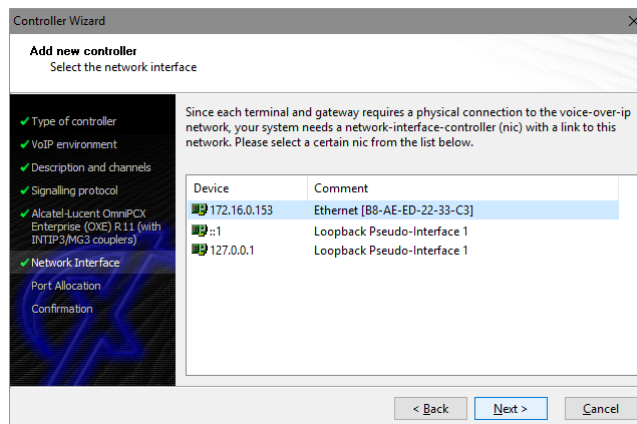
2.4 IP Address of the Alcatel OmniPCX Enterprise Gateway

Next, you have to provide the IP address, in this example 172.18.0.50, or host name of the Alcatel-Lucent OmniPCX Enterprise call server with its SIP gateway.



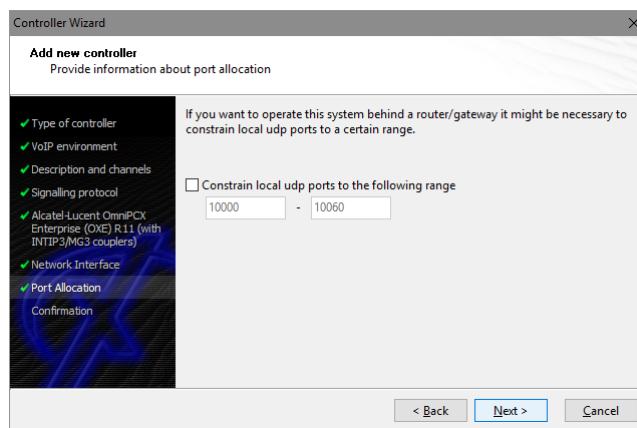
2.5 Network Interface

Afterwards, select the network interface that will be used for the inbound and outbound communications for this controller. Note that this is the XCAPI controller used Ethernet interface which is related to the according **SIP External Gateway** of the Alcatel-Lucent OmniPCX Enterprise, as described from [page 10](#).



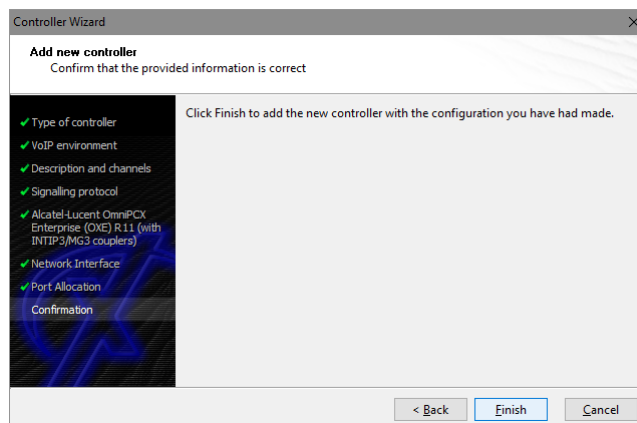
2.6 Port Allocation

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 using a random port range between 1024 and 65535.

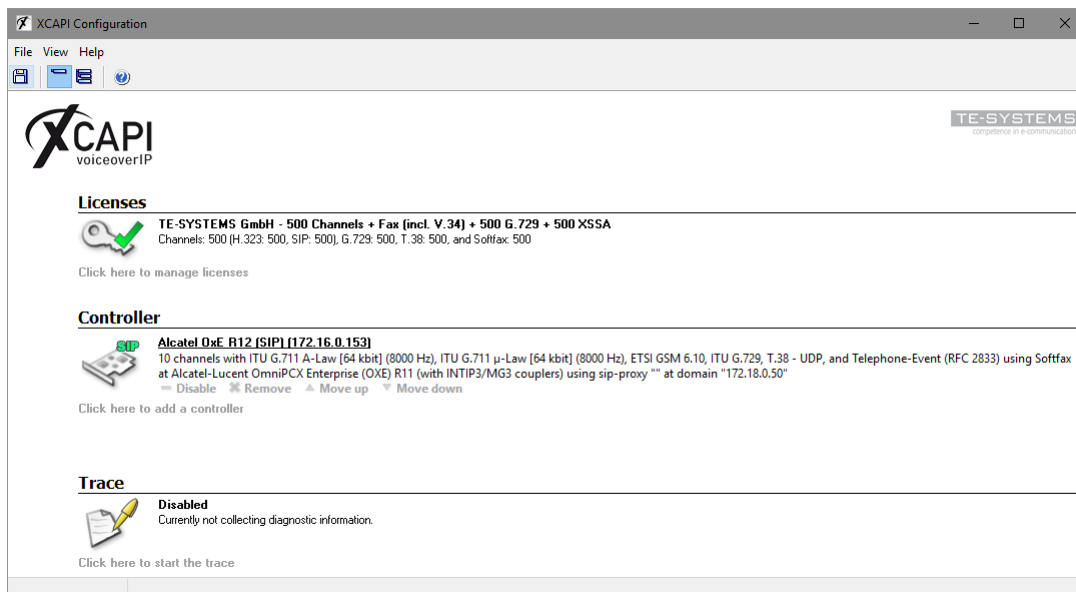


2.7 Confirmation

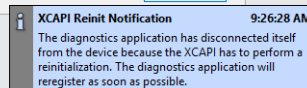
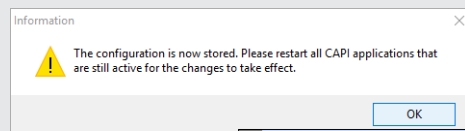
The final wizard dialog performs some checks on the configuration parameters you've made. If errors will be detected, use the **Back** button to the respective erroneous dialogs and correct them. Use the **Finish** button in order to finally create the new controller if everything is correct.



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



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



Alcatel-Lucent OmniPCX Enterprise Configurations

This examples configurations are predominantly reviewed via the **OXEWBM** frontend. Additionally, some of this examples used PBX configurations will be also shown via CLI commands in the referring Appendix chapters starting on [page 20](#). The chapters are not shown in their order of configurations steps.

3.1 SIP Gateway

The Alcatel-Lucent OmniPCX Enterprise SIP gateway is here related to IP address 172.18.0.50 which enables the speech and data services to your VoIP and PSTN network. This is the IP address or host name that the XCAPI controller has to be aware about.

The **SIP Subnetwork** and **SIP Trunk Group** relations must be set up on local requirements. The timer defaults usually works well. If any changes are required, ensure that the XCAPI controller will be accordingly adjusted. The **Session Timer Method** can be set to **UPDATE** or **RE_INVITE**.

Please note that the new default for the **Dynamic Payload for DTMF** within the SIP Gateway as well as for the SIP External Gateway configuration is **101** from release 12.0.

The screenshot shows the OXEWBM Configuration interface for a SIP Gateway. The left sidebar contains a tree view of configuration categories, with 'SIP Gateway' selected under the 'SIP' category. The main configuration area displays the following parameters for the gateway at IP address 172.18.0.50:

- SIP Subnetwork: 0
- SIP Trunk Group: 61
- IP Address: 172.18.0.50
- Machine name - Host: node000000
- SIP Proxy Port Number: 5060
- SIP Subscribe Min Duration: 300
- SIP Subscribe Max Duration: 86400
- Session Timer: 1800
- Min Session Timer: 900
- Session Timer Method: RE_INVITE
- DNS local domain name: (empty)
- DNS type: DNS A
- SIP DNS1 IP Address: 172.18.0.2
- SIP DNS2 IP Address: (empty)
- SDP in 18x:
- Cac SIP-SIP:
- INFO method for remote extension:
- Dynamic Payload type for DTMF: 101
- Overflow Licenses Threshold: 80

3.2 SIP Proxy

The Alcatel-Lucent OmniPCX Enterprise **SIP Proxy** is used to locate, route and authenticate SIP users. As this is basically not relevant for the XCAPI SIP trunk, it is used with its defaults and just shown for completeness.

The screenshot displays the configuration page for the SIP Proxy in the Alcatel-Lucent OmniPCX Enterprise R12. The interface is divided into a left navigation pane and a main configuration area.

Navigation Pane (Left):

- OXEWBM
- Configuration
- SIP > SIP Proxy
- Shelf
- Media Gateway
- PWT/DECT System
- System
- Translator
- Classes of Service
- Attendant
- Users
- Users by profile
- Set Profile
- Groups
- Speed Dialing
- Phone Book
- Entities
- Trunk Groups
- External Services
- Inter-Node Links
- X25
- DATA
- Applications
- Specific Telephone Services
- ATM
- Events Routing Discriminator
- Security and Access Control
- IP
- SIP
 - SIP Gateway
 - SIP Proxy

Configuration Area (Right):

- SIP initial time-out: 500
- SIP timer T2: 4000
- Dns Timer overflow: 5000
- Timer TLS: 30
- Recursive search
- Minimal authentication method: SIP None
- Authentication realm: [Empty]
- Only authenticated incoming calls
- Framework Period: 3
- Framework Nb Message By Period: 255
- Framework Quarantine Period: 300
- TCP when long messages
- Retransmission number for INVITE: 4
- Degraded mode Time To Live: 1800
- User Agent Identifier: %

3.3 SIP External Gateway

The XCAPI has to be assigned as **SIP External Gateway** (in this example with ID 0) and is here used with the default **SIP Port Number 5060** and the **UDP Transport type**. Set the IP address of XCAPIs listening Ethernet interface as **SIP Remote domain**. The **Trunk Group** is here assigned to number **4** as described in the chapter **Trunk Groups** starting on [page 13](#).

Ensure that those settings are equivalent to the ones of the XCAPI SIP controller. The **Dynamic Payload type for DTMF** is here used with value **97**, as this was the formerly Alcatel and XCAPI (this might be changed for future XCAPI versions) default. However, in the case of multiple SIP Ext. Gateways, the payload has to be set conform for all instances. So, you may prefer using the new Alcatel default value **101** and change the XCAPI controller codec **RFC2833** value as well.

Further it is recommended to disable the **Support Re-invite without SDP** parameter for interworking. The most important settings are marked on the next screenshot.

The screenshot displays the configuration page for a SIP External Gateway (ID 0) in the XCAPI interface. The main configuration area includes the following settings:

- SIP External Gateway ID:** 0
- Gateway Name:** XCAPI
- SIP Remote domain:** 172.16.0.153
- PCS IP Address:** (empty)
- SIP Port Number:** 5060
- Transport type:** UDP
- Belonging Domain:** (empty)
- Registration ID:** (empty)
- Registration ID P_Asserted:** (unchecked)
- Registration timer:** 0
- SIP Outbound Proxy:** (empty)
- Supervision timer:** 0
- Trunk group number:** 4
- Pool Number:** -1
- Outgoing realm:** (empty)
- Outgoing username:** (empty)
- Outgoing Password:** (empty)
- Incoming username:** (empty)
- Incoming Password:** (empty)
- RFC 3225 supported by the distant:** (unchecked)
- DNS type:** DNS A
- SIP DNS1 IP Address:** 172.18.0.2
- SIP DNS2 IP Address:** (empty)
- SDP in 18x:** (unchecked)
- Minimal authentication method:** SIP None
- INFO method for remote extension:** (unchecked)
- To EMS:** (unchecked)
- SRTP:** RTP only
- Ignore inactive/black hole:** (unchecked)
- Contact with IP address:** (checked)
- Dynamic Payload type for DTMF:** 97

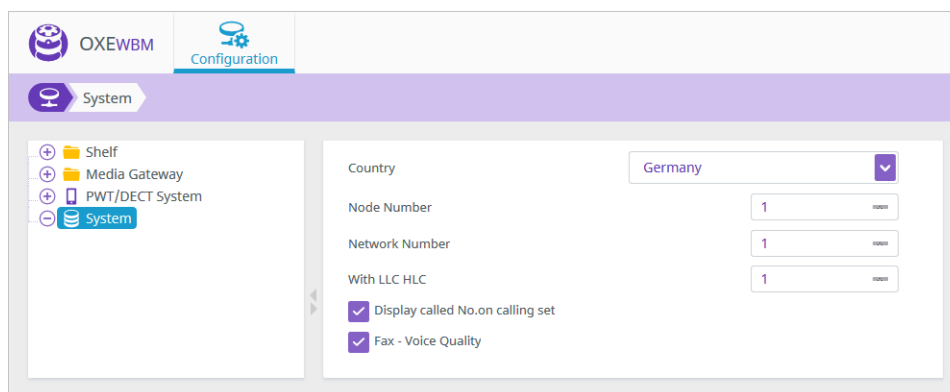
The right-hand panel contains various advanced settings, many of which are set to 'Not Supported' or 'Not Requested':

- Outbound Calls 100 REL:** Not Supported
- Incoming Calls 100 REL:** Not Requested
- Gateway type:** Standard type
- Re-Trans No. for REGISTER/OPTIONS:** 2
- P-Asserted-ID in Calling Number:** (unchecked)
- Trusted P-Asserted-ID header:** (unchecked)
- Trusted From header:** (unchecked)
- Diversion Info to provide via:** History Info
- Support Re-invite without SDP:** (unchecked)
- Proxy Identification on IP address:** (unchecked)
- Outbound calls only:** (unchecked)
- SDP relay on Ext. Call Fwd:** 180 only
- SDP Transparency Override:** (unchecked)
- RFC 5009 supported / Outbound call:** Not Supported
- Nonce caching activation:** NO
- FAX Procedure Type:** G711 only
- Type of codec negotiation:** Single codec G711
- DNS SRV/Call retry on busy server:** 0
- Unattended Transfer for RSI:** NO
- Redirection functionality:** NO
- Attended Transfer:** NO
- Send BYE on REFER:** YES
- Redirection response support:** NO
- OPTIONS required:** NO
- Support UTF8 characters set:** NO
- CSTA User-to-User supported:** NO
- DDI destination number:** ReqURI
- Video Support Profile:** Not Supported
- UPDATE in Allow header/INVITE:** Optional
- RFC 4904 supported:** NO
- Bulk registration (RFC 6140):** NO

3.4 System Parameters

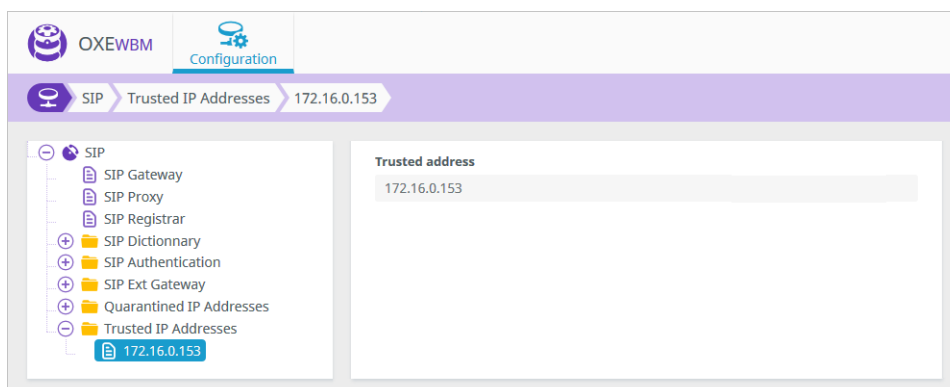
There are a lot of global system parameters affecting the interworking of the Alcatel system. Here we just review a few of them which might have an impact to the XCAPI related SIP trunk about numbering and fax topics.

If using ISDN connections through the Alcatel for public calls, some global system parameters might have to be adjusted for interworking. The **Fax - Voice Quality** parameter should be enabled for ensuring compatibility with some fax devices. Also the **With LLC HLC** parameter may give some interoperability improvements between the Alcatel gateway and the ISDN provider. Additional information about fax is given in the according Appendix chapters starting on [page 20](#). In a use case of enabling display information, the parameter **Display called No.on calling set** have to be set.



3.5 Trusted IP Addresses

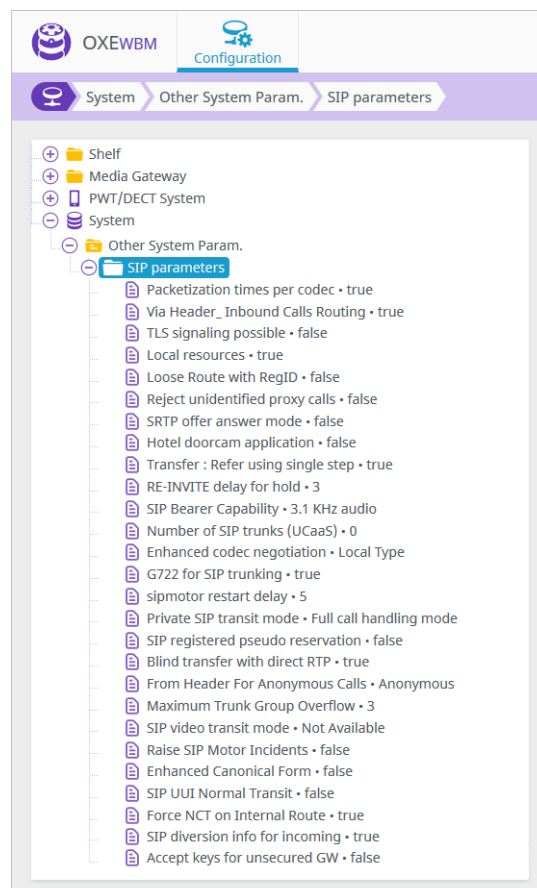
Set the trusted IP address, here 172.16.0.153, of the External SIP Gateway which is related to the XCAPI SIP controller. If set, this address cannot be set to quarantine for whatever reasons, even if the amount of incoming messages of this origin is higher than the threshold values configured within the Alcatel SIP-Proxy configuration. However, ensure that the CLI command `dhs3_init -R SIPMOTOR` will be invoked afterwards for allowing the new **Trusted IP Address**.



3.6 SIP Parameters

Also the SIP parameters are predominantly used with their defaults. Please check with the following parameters and given hints. Additional adjustments for SIP trunk interworking might be required, especially in the case of an additional Alcatel SIP trunk towards a SIP provider for public communications.

- the **Via Header_Inbound Calls Routing** must be set to **true**, for allowing to determine the origin of incoming calls when other headers do not match with the Remote Domain of an External Gateway.
- In case of fax issues which are related to an analog 3.1 KHz bearer capability towards ISDN, this parameter must be set to **3.1 KHz audio**.
- If the Alcatel gateway is bothering with **488 Not Acceptable Here** or **403 Forbidden** responses, the parameters **Loose Route with RegID** or **Reject unidentified proxy calls** may have to be adjusted.
- The parameter **Private SIP transit mode** has to be changed in the case of unexpected **301 Moved Permanently** responses that are not related to any call diversion or call forwarding scenarios.



3.7 Trunk Groups

The XCAPI Trunk Group is here created with ID 4

For SIP trunking the T2 Specification MINI SIP or SIP has to be used.

For interworking, the Q931 Signal variant as to be used with the ABC-F protocol.

The Public Network COS is here related to COS number 31. For details check with the chapter Class of Service starting on [page 17](#).

The Remote Network, in meaning of the Network Routing Table which details will be shown from [page 17](#), is here related to network number 10.

The screenshot displays the configuration page for Trunk Group 4 in the XCAPI system. The left sidebar shows a navigation tree with 'Trunk Groups' selected. The main content area is divided into two columns. The left column contains configuration fields for the trunk group, including ID (4), Type (T2), Name (XCAPI), Node number (1), and various signal variants (Q931: ABC-F, SS7: No variant). The right column contains advanced settings such as Auto.DTMF dialing (YES), T2 Specification (SIP), Public Network COS (31), and Preempter (NO). A 'Shared Trunk Group' checkbox is also present.



Note, the Q931 Signal Variant must be set to ABC-F for enabling Message Waiting Indication, Call Transfer and Redirecting Number services.

3.8 Trunk Group

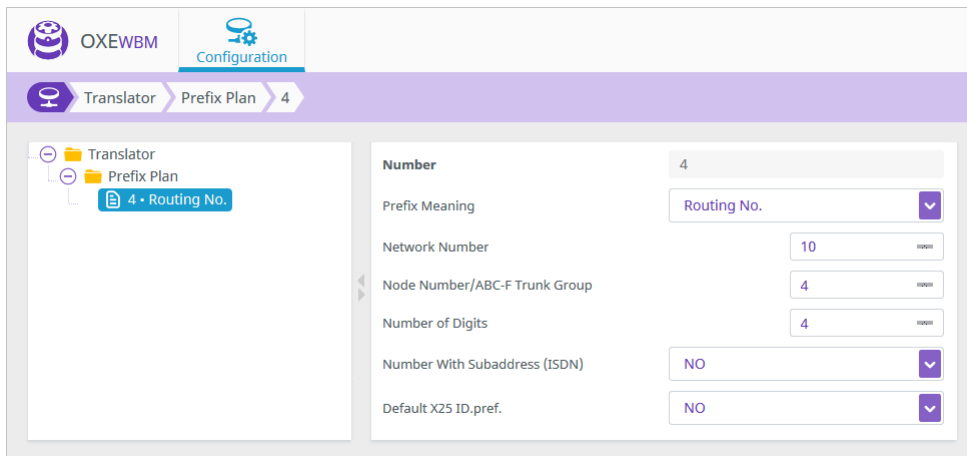
The parameters **End-to-end dialing** and **DTMF end-to-end signal.** are not set by default. If internal stations requires automatically switching over to the DTMF mode after picking up the call, both parameters must be set to **YES**. Ensure that the related class of service ID got the required rights.

The screenshot displays the configuration page for a Trunk Group in the XCAPI interface. The left sidebar shows a navigation tree with 'Trunk Groups' expanded to '4 • T2 • XCAPI • 1'. The main content area is divided into two columns of settings. The left column contains parameters such as 'Trunk Group Type' (T2), 'T2 Specification' (SIP), 'Public Network Ref.', 'End-to-end dialing' (NO), 'DTMF end-to-end signal.' (NO), 'Trunk group used in DISA' (NO), 'DISA Secret Code', 'VG for non-existent No.' (NO), 'Routing To Manager' (NO), 'Trunk COS' (31), 'Sending of Progress message' (YES), 'No. of digits unused (ISDN)' (0), 'B Channel Choice' (YES), 'Channels: Attendant Control (Rsvd)' (0), 'Redirection For ACD (Dissuasion)' (NO), 'DTO joining' (NO), 'Consultation Call On B Channel' (NO), 'Automated Attendant' (NO), 'Calling party Rights COS' (0), 'Entity Number' (0), 'TS Overflow' (YES), 'Number To Be Added', and 'Supervised by Routing' (NO). The right column contains parameters like 'VPN Cost Limit for Incom.Calls' (0), 'Immediate Trk Listening if VPNCall' (YES), 'VPN TS %' (50), 'CSTA-Monitored' (NO), 'Max.% of trunks out CCD' (0), 'Charge Calling And ADN Creation' (NO), 'Ratio analog.to ISDN cost', 'Logical Channel' (1_30), 'TS Distribution on Accesses' (YES), 'Use Split Access' (NO), 'Heterogeneous Remote Network' (NO), 'COS Restrictions - Barring mode' (Not Restricted / Not barred), 'ARS Class of service' (31), 'Quality profile for voice over IP' (Always VoIP), 'Use of volume in system' (YES), 'External Access Server' (NO), 'CSTA Tracking MCDU Trk', 'IE External Forward' (None), 'Announcement for dial tone' (NO), 'Announcement for Ring tone' (NO), 'Reroute Anonymous Calls to Entity' (NO), and 'Max ABCF-IP and SIP connections' (0). 'Called Number Storage' is set to 'NO'.

3.9 Prefix Plan

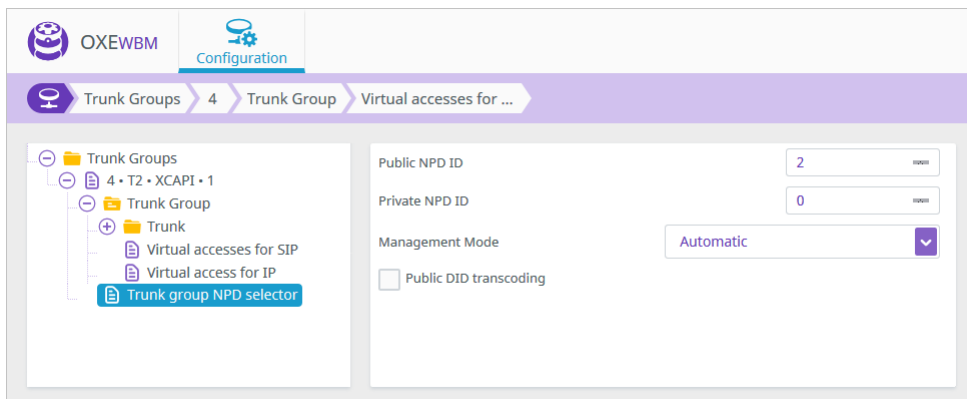
The prefix number **4** is here used with the **Prefix Meaning Routing No.**, which only allows using up to 8 digits at maximum. Using other prefix meanings (for example **ARS Professional Trunk group seizure**) is also possible, but not described here.

The **Network Number**, in meaning of the **Network Routing Table** which is described in the same named chapter starting on [page 17](#), is here related to number 10. The trunk related configurations will be shown in the chapters **Trunk Groups** and **Trunk Group** from [page 13](#).



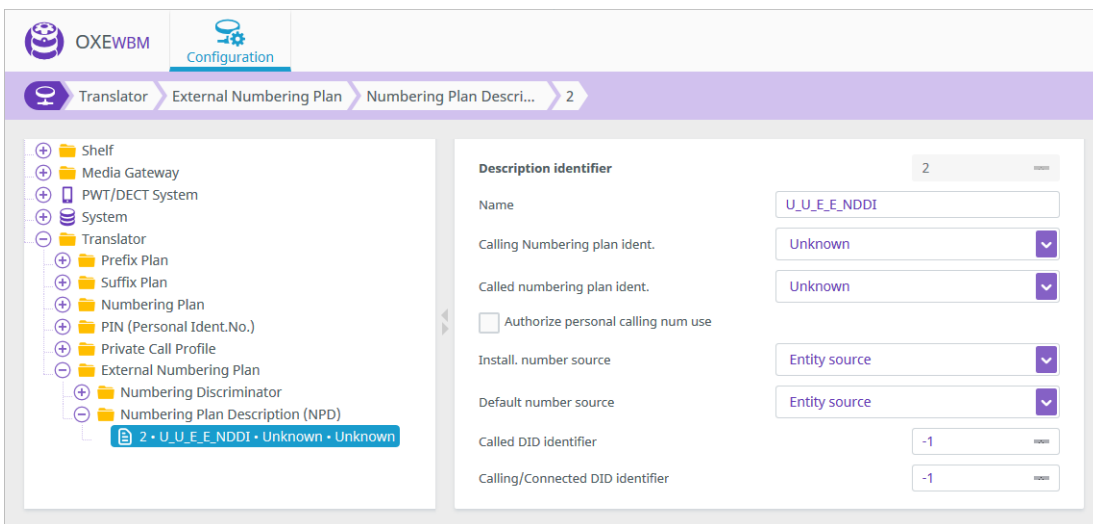
3.10 Trunk Group NPD Selector

The numbering behavior depends on local circumstances, so appropriate configurations must be ensured. See also chapter **External Numbering Plan** starting on [page 16](#).

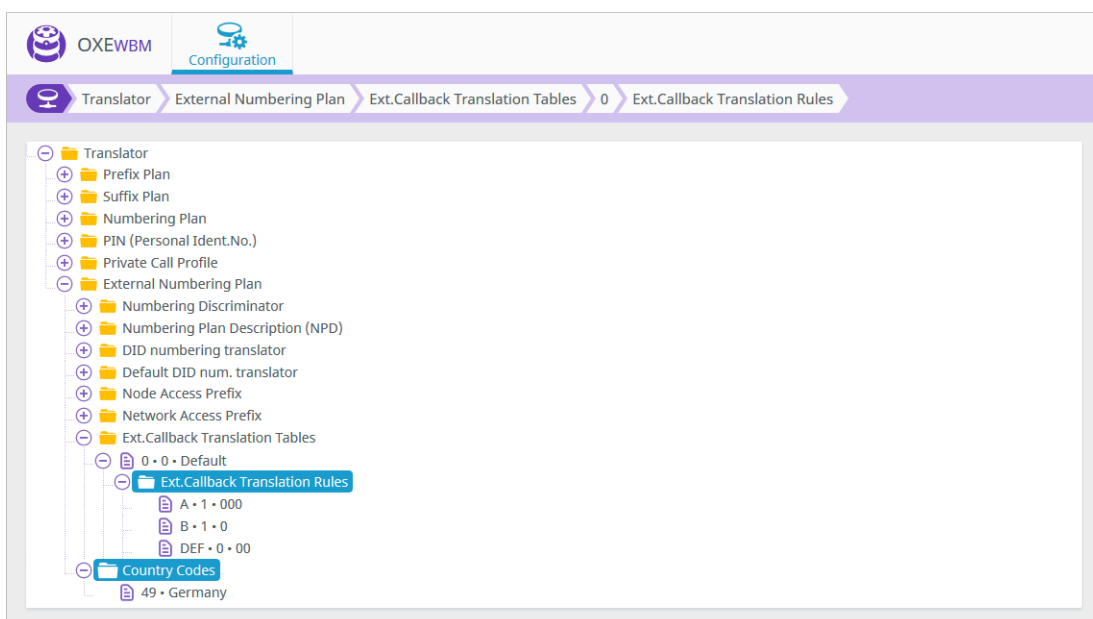


3.11 External Numbering Plan

The **External Numbering Plan** must be configured up to local and country related requirements and here used as shown below. If required additional DID or ARS configurations has to be made. The **Numbering Plan Description** is here used as shown next.

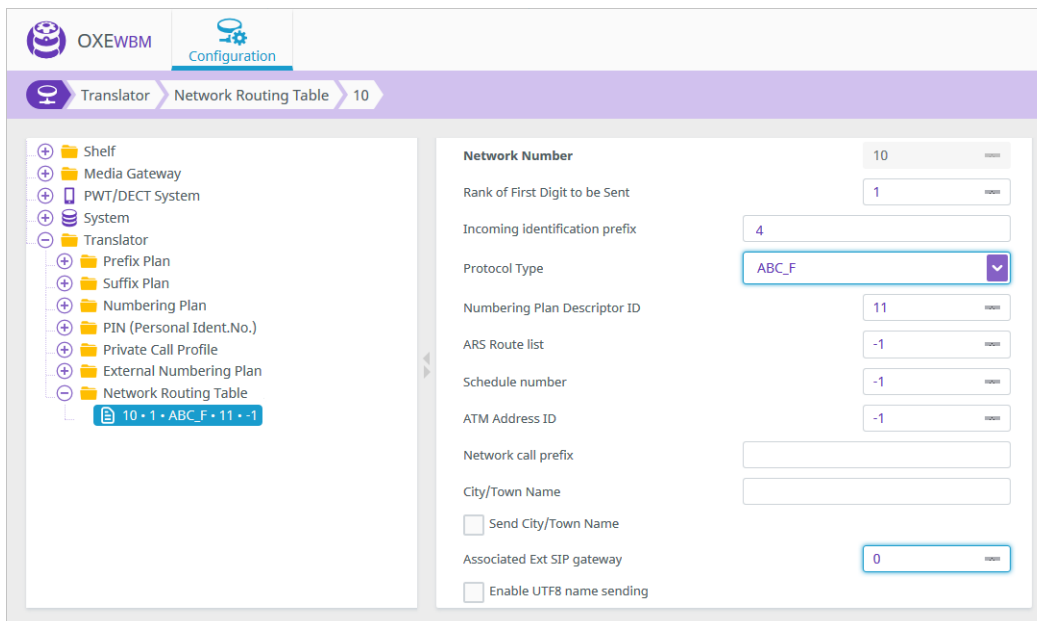


The **Ext. Callback Translator Rules** and **Country Codes** for this environment are used as follows.



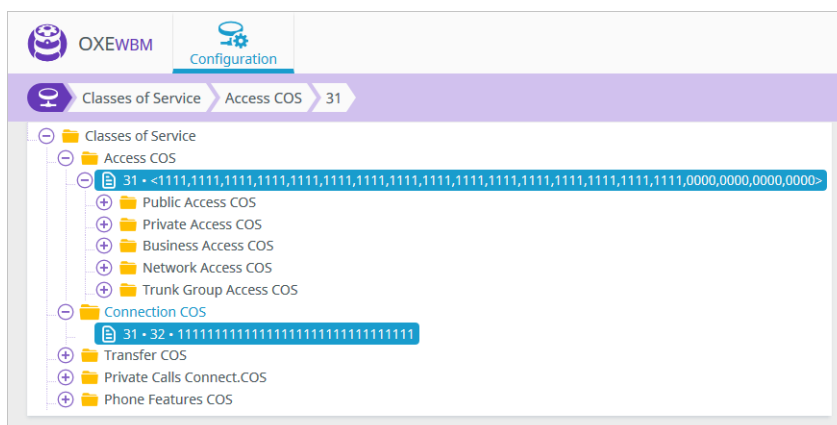
3.12 Network Routing Table

The XCAPI related **Network Routing Table** is here used with ID 10. Its details are shown next.



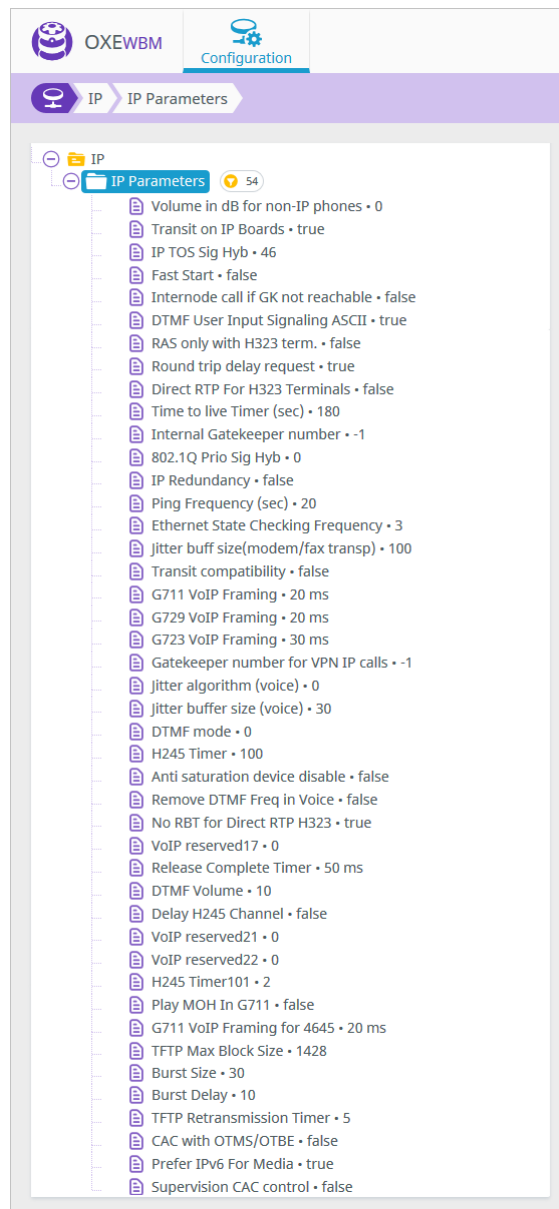
3.13 Classes of Service

The **Classes of Service** consist of **Public Network COS**, **Connection COS**, **Transfer COS**, **Private Calls COS** and **Phone Features COS** which has to be configured up to the local requirements of the Alcatel-Lucent OmniPCX Enterprise environment. For this example the **Access / Public Network** and **Trunk** class of services are related to number 31. This example doesn't use any restrictions but nevertheless, **Connection COS** number 5 may be set for allowing trunk to trunk connections.



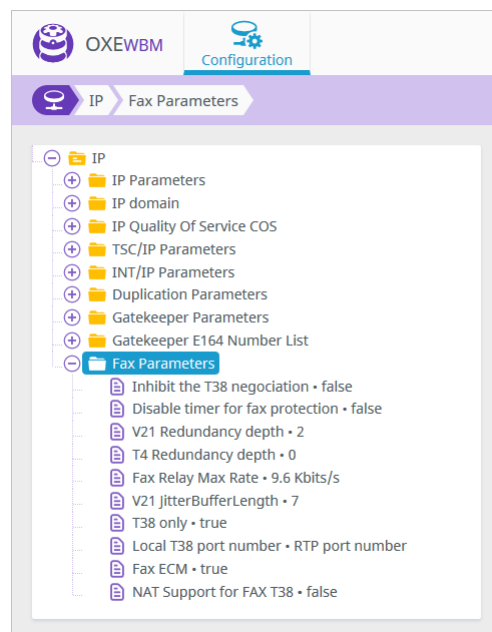
3.14 IP Parameters

In common the given system defaults works well for SIP trunking. The codec and fax related settings affects the whole telephony environment and should only be adjusted after consultation. They must, however, correspond with the ones of XCAPI's related SIP trunk and the XCAPI controller configurations. The **IP Parameters** for this test environment are used as shown next.



3.15 IP Fax Parameters

Beside of **Fax ECM** (available for GD3/INTP3), all other Parameters are used with their defaults and should only be adjusted after consultation. Enabling the error correction mode is only relevant in case of the T.38 fax method. Do NOT change the **Fax Relay Max Rate 9.6 Kbits/s** default. Additional information about fax interworking and configurations will be given in the according **Appendix** chapters starting on [page 20](#).



Please note, after fax parameter modifications you have to reset the GD, GA and INT-IPA boards. It is strongly recommended using conform and supported codec configurations for all participating Alcatel SIP entities (gateways, providers).

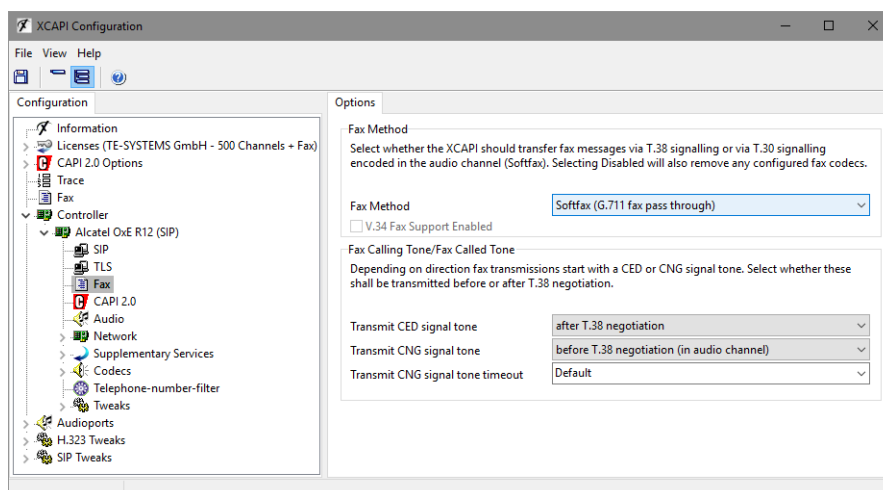
Appendix

The appendix gives several information and configuration hints as well as some considerations. If using the XCAPI controller wizard with its Alcatel-Lucent OmniPCX Enterprise template most of the shown settings are used by default. Nevertheless, the next topics and the shown configurations must be reviewed, checked and tested, especially with the participating extensions, VoIP or ISDN boards and SIP or ISDN provider.

4.0.1 Softfax (G.711 fax pass through)

With the Softfax mode, the XCAPI simulates an analogue Fax device by transmitting modulated Fax-signals modem-like through the established G.711 audio channels. Facsimile via Softfax (G.711 fax pass through) is only supported from OmniPCX release 11 that uses INTIP3/MG3 couplers only.

For enabling **Softfax (G.711 fax pass through)** it must be set as **Fax Method** as shown next. Ensure that **G711 Only** is selected as **FAX Procedure Type**, as shown in the screenshot of the XCAPI related **SIP External Gateway** on [page 10](#).

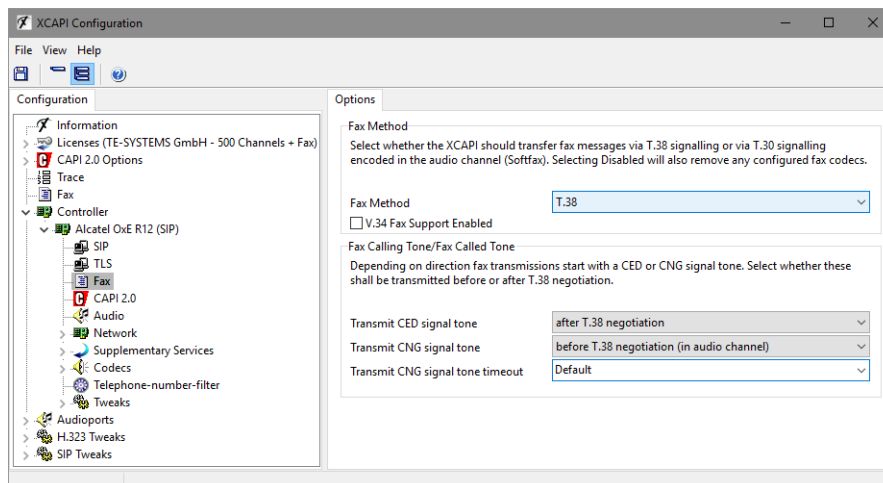


Please note, facsimile via G.711 (Softfax) is supported from OmniPCX release 11 using INTIP3/MG3 couplers. Don't use the **Softfax (G.711 fax pass through)** method, if the PBX is connected to a SIP provider or another SIP gateway that only support T.38.

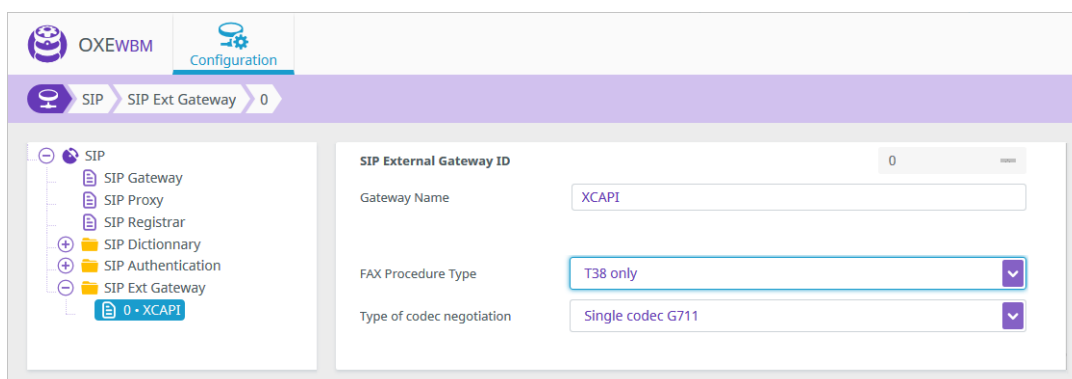
4.1 T.38 Fax

In the case of T.38 usage, this protocol has also to be supported by the Alcatel-Lucent OmniPCX Enterprise related PSTN trunk (SIP gateway, SIP provider). It is recommended to avoid unnecessary transcoding (G.711 to T.38 or vice versa) and using conform fax methods for all participating instances.

Pre Alcatel-Lucent OmniPCX Enterprise 11 releases and non GD3/INTP3 usage allows facsimile via T.38 without any support of the error correction mode only. This changed from Release 12 with the according gateways. So in the case for release 11 with using INTIP3/MG3 couplers, facsimile via G.711 should be preferred as XCAPI allows the advantage of using of the error correction mode. However, for T.38 support please ensure that **T.38** is selected as **Fax Method** within the controllers **Fax** dialog. It is mandatory that the **T.38 - UDP** Codec is available within the XCAPI controller configuration, what it is by default.

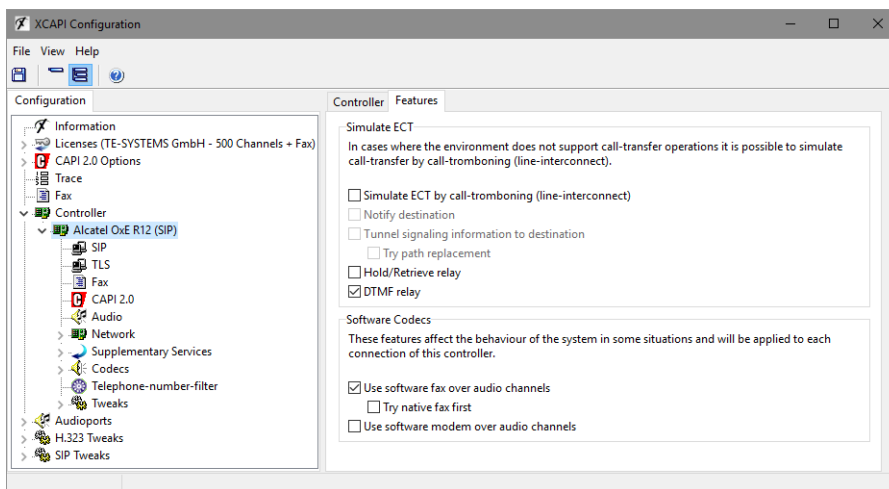


T.38 only has to set as **FAX Procedure Type** in the XCAPI related **External SIP Gateway** of the Alcatel-Lucent OmniPCX Enterprise.



4.2 Call Transfer

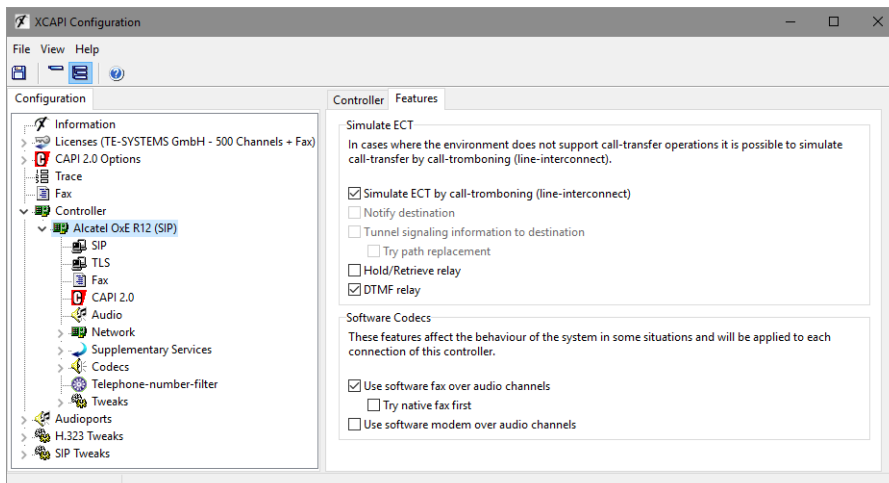
Call transfer via SIP refer is supported by the XCAPI and the Alcatel-Lucent OmniPCX Enterprise SIP gateway. For allowing SIP refer on the part of XCAPI, the **Simulate ECT by call tromboning (line interconnect)** parameter has to be disabled.



4.3 Simulated Call Transfer

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

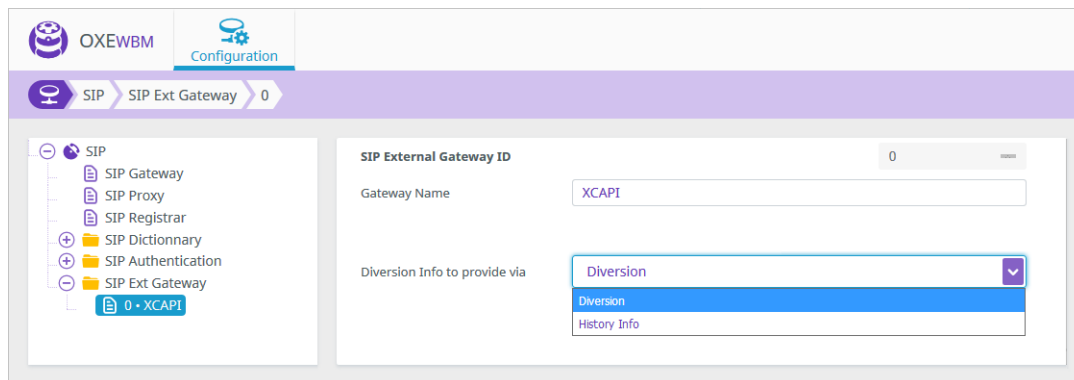
So, check the **Features** tab of the respective XCAPI controller and ensure that the **Simulate ECT by call-tromboning (line-interconnect)** parameter is enabled.



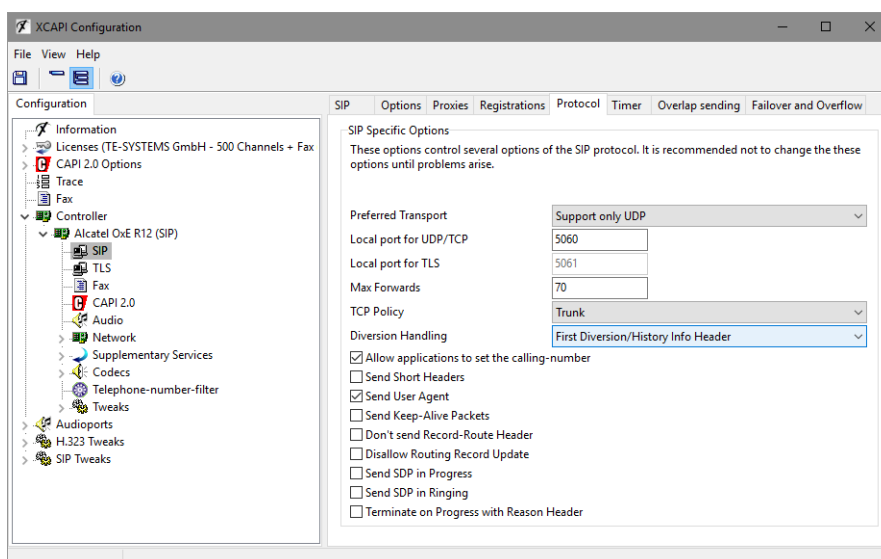
4.4 Redirecting Number and Diversion Handling

The XCAPI SIP controller handles PBX delivered redirection numbers via **Diversion** or **History Info**. The according method can be specified by the **"Diversion Info to provide via"** parameter in the XCAPI related **SIP External Gateway** of the Alcatel-Lucent OmniPCX Enterprise.

However, the Alcatel-Lucent OmniPCX Enterprise recently just provides the information of the last forwarded set and its index parameter is always set to 1. Due to this, the diversion header should be preferred, especially if the bound CAPI 2.0 application has to be aware of the redirecting reasons.



However, for some scenarios the application might have to know about the first or last given redirection information. This can be handled via the **Diversion Info to provide via** parameter and changed within the XCAPI's controller protocol tab.

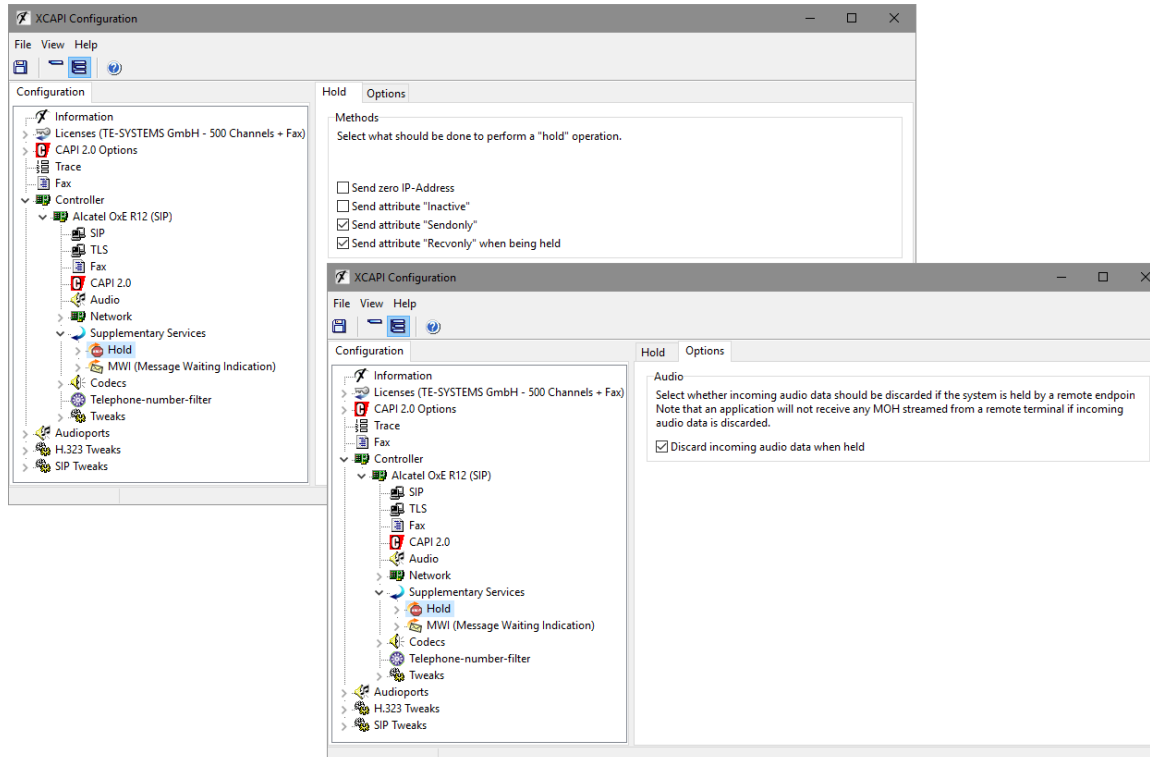


4.5 Hold

If the supplementary service **Hold** is enabled, the system temporarily removes a participant from a connection and executes a remote hold. The participants placed on hold will then usually hear **Music on Hold** while they wait and the participant who pressed the hold button can place a second call. This is activated by default with the attributes **Sendonly** and **Recvonly** if creating the Alcatel-Lucent OmniPCX Enterprise controller via the XCAPI controller wizard.

Select whether incoming audio data should be discarded if the system is held by a remote endpoint. Note that an application will not receive any Music on Hold streamed from a remote terminal if incoming audio data is discarded, normally, the caller would like to listen to Music on Hold while being held.

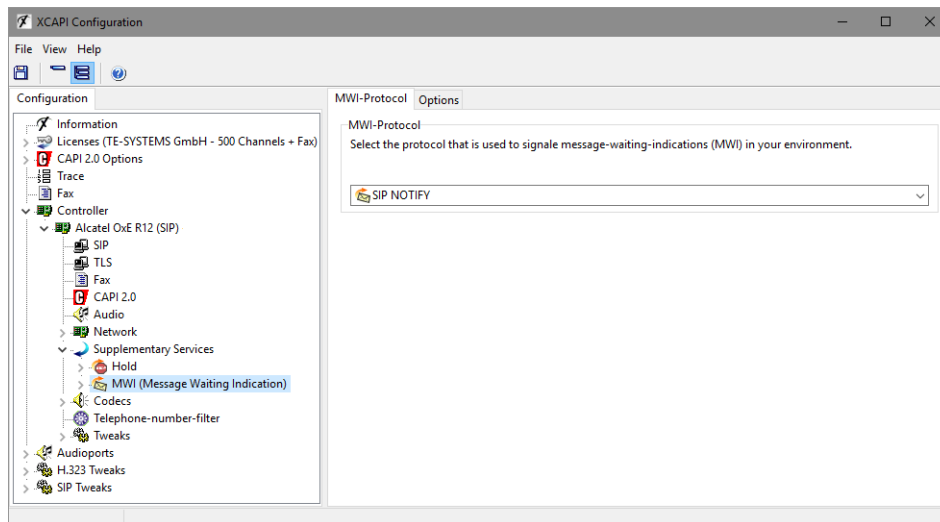
Deactivate the option **Discard incoming audio data when held** to receive Music on Hold from a remote endpoint. However, if you use the XCAPI to interconnect several endpoints in a conference, this behavior might be undesirable. Assumed that one participant of a conference places the conference line on hold to make another telephone call, all other participants will hear the **Music on Hold**. Activate this option to prevent incoming Music on Hold from disturbing the conference.



4.6 Message Waiting Indications

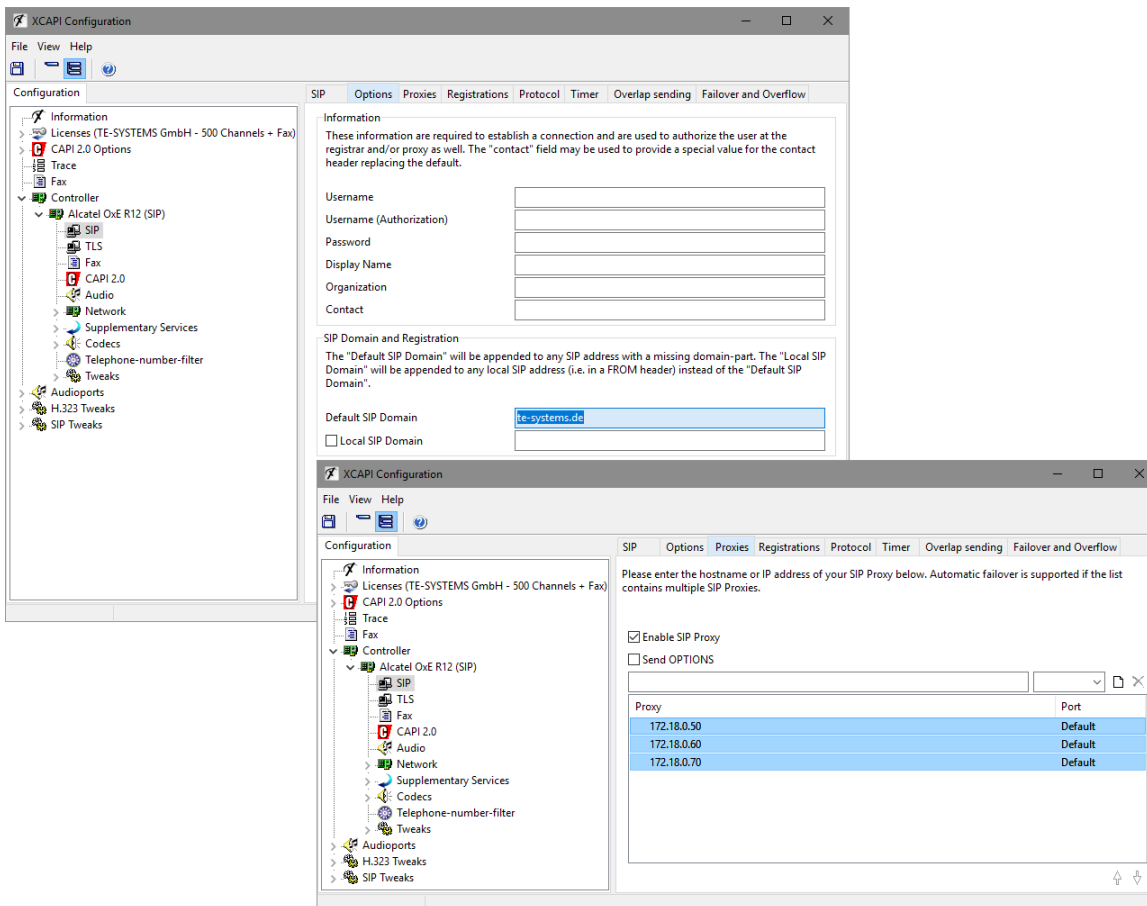
Message waiting indication is enabled by default for the XCAPI controller and will be indicated with a **SIP Notify** towards the gateway. Ensure that the application provides the required message server number for allowing the user callback. Alternatively a fixed number could be set within the XCAPI controllers MWI settings in the **Options** tab.

MWI support requires the **Q931 Signal variant ABC-F** for the PBX related XCAPI SIP trunk. Depending on the Alcatel-Lucent OmniPCX Enterprise release and environment a valid directory number is required for interworking, what was not required while testing with the Alcatel-Lucent OmniPCX Enterprise R12.0 m1.403.15.h firmware. However, this can be achieved by creating a fictive user as **MULTIMEDIA PC 2** set type. For appropriate callback to the voice mail server, an additional call-back prefix (**Incoming identification prefix**) can be added in the according **Networking Routing Table** of the XCAPI related SIP trunk. So, If a user get a notification about a voice mail via SIP Notify, the according number (Incoming identification prefix + the fictive MWI directory number) will be indicated.



4.7 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 Alcatel-Lucent OmniPCX Enterprise gateways 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.



4.8 CompVisu SYS

For completeness, the **compvisu sys** output used for this example.

```
(101)alcatel-oxe> compvisu sys

=====
|                               C O M P V I S U                               |
=====
| Inter-node protocol H323..... yes |
| RTP Direct..... yes |
| RTP Direct for H323 terminals.. no |
| Fast Start..... no |
| VAD (Voice Activity Detection): |
|   - G723/G729..... no |
|   - G711..... no |
| ECE (Echo Cancellor)..... yes |
|   - INTIP/GA/GD..... 128 ms |
| Volume for IP Phone ..... 0dB |
| Volume for other device. .... 0dB |
| Law (Except Media Gateway).... A law |
| Global compression type ..... G723 |
| Multi-algorithm (for H323/SIP) ... yes |
| Compression for INTIP/GD ..... without |
| Compression for IPP ..... without |
| Transit on IP Boards .....yes |
| ticket Stat IP..... yes |
| IP version..... IPv4 |
| Transit compatibility..... no |
| Voip Framing G711 ..... 20 ms |
| Voip Framing G723 ..... 30 ms |
| Voip Framing G729 ..... 20 ms |
| No RBT For Direct RTP H323.... yes |
| T38 FAX..... yes |
| Enhanced Codec Nego..... LOCAL |
| G722 for SIP Trunking..... yes |
| Network Media Protocol..... IPV4 |
| Prefer IPv6 For Media..... yes |
=====
```

4.9 CompVisu IP

For completeness, the **compvisu ip** output of the XCAPI related SIP trunk group.

```
(101)alcatel-oxe> compvisu ip

=====
|                               C O M P V I S U                               |
=====
| Nber of used Ip calls => 0 | Nber of allowed Ip calls => 10 |
=====
| TG | Name | IP address | Pos, IP Parameters |
|-----|-----|-----|-----|
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
| 4 | XCAPI | use 'sip' | 19-0 , G711 |
=====
```

4.10 SipExtGw

For completeness, this example used configurations for the XCAPI related SIP External Gateway shown via `sipextgw`.

```
(101)alcatel-oxe> sipextgw -g 0

=====
| SIP EXTERNAL GATEWAY Nb 0 |
=====
Gateway Name           : XCAPI
Gateway Type           : Standard type
State                   : IN SERVICE
Belong to pool number  : -1
Use trunk group number : 4 (ABC-F)
Remote domain           : 172.16.0.153
Port number             : 5060
Transport               : UDP
SRTP                    : RTP only
Prack                   : NO
Clir                    : NO
SIP info enable        : NO
Authentication method  : NONE
SDP in 180 messages    : NO
Payload                 : 101
Local domain name      :
Local user name        :
Realm name              :
Outbound proxy         :
Supervision timer      : 0
Registration timer     : 0
DNS type                : DNS A
Primary DNS IP address  : 172.018.000.002
Secondary DNS IP address : 000.000.000.000
PCS IP address         : 000.000.000.000
Retransmission number  : 2
of REGISTER/OPTIONS   : 2
DDI Destination Number : TO
Nonce caching activation : YES
  -> Used              : NO
Service route index    : -1
P-Asserted-ID         : FALSE
TrustedPAssIDHeader    : FALSE
TrustedFromHeader      : TRUE
Outbound calls only    : FALSE
ReInviteWoSDP          : FALSE
Diversion Info to
provide through        : History Info
Proxy ident. on IP address : FALSE
Regist. on proxy
discovery               : FALSE
SDP relay on Ext.      :
Call Fwd                : 180 Only
RFC 5009 supported
/ Outbound call        : Not Supported
FAX Procedure Type     : G711 only
unAttenTransfer RSI    : FALSE
attendedTransfer       : FALSE
Redirection Functionality : FALSE
Support of UTF8        : FALSE
Redirection Resp. Support : FALSE
Send BYE on REFER      : TRUE
CSTA User-User supported : FALSE
OPTIONS required       : FALSE
Type Of Codec Negotiation : SingleCodecG711
DNS SRV/Call retry
on busy server         : 0
RFC4904 Supported     : FALSE
BulkRegistration       : FALSE
Video Support Profile  : Not Supported
```

4.11 InfoCs

As running nonsynchronous systems may lead to exceeding fax abortions, all involved Alcatel nodes must be checked about their clock synchronization and prioritization. For details, please check with the Alcatel **TG0022 FAX OVER IP ISSUES** document. An example of a single domain and a synchronized PRA T2 interface is shown next.

```
(101)alcatel-oxe> infocs
```

N_CR	N_CPL	TYPE	N_ACCES	PRI0	SYNC_CLOCK	TG/LK
Synchronization on global domain						
Synchronization on domain no 1						
N_CR	N_CPL	TYPE	N_ACCES	PRI0	SYNC_CLOCK	TG/LK
1	6	PRA T2	0	210	SYNCHRO	TG:0

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

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

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

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