

Product Information



07 | 2021

More effective communication with Voice over IP - regardless of company size

Unified Communications (UC) via Voice over IP (VoIP) probably offers the greatest potential to make corporate communication in the information age faster, focused, clearly structured and, therefore, also more cost-effective.

One for All

Landline or mobile phone calls, voicemail or instant messaging, e-mail, faxes, conference calls or process applications - everything is handled via the same user interface. On one side, this makes it possible to consistently manage all data relating to a particular matter, and on the other side, to use the same database for all applications.

With UC, the company will work faster and cost-efficiently while being more customer-friendly at the same time. The employees have the opportunity to use the respective effective mobile or fixed device for any type of information exchange.

Fast and "soft" Migration with the XC-API

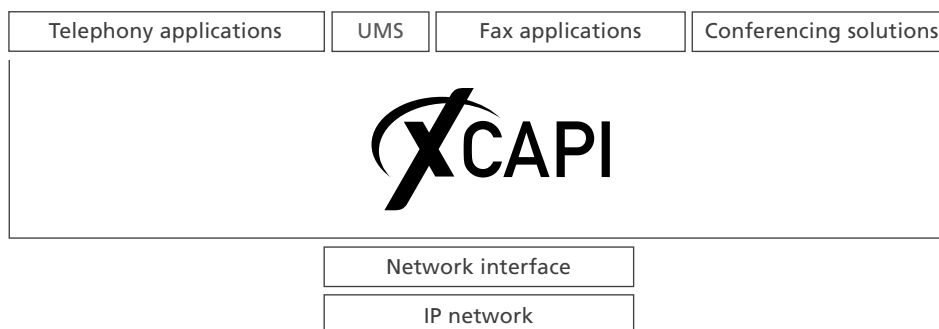
Changing to IP technology normally requires extensive, and therefore cost-intensive, modification

of existing applications. Not with XC-API! Our software offers the ability to change your previous system in a smooth process known as „soft migration“.

In order to capitalize on all the functions of conventional ISDN adapters, many applications use CAPI 2.0, which represents a standard for the interfacing between applications and hardware. However, CAPI 2.0 has been limited to ISDN so far.

XC-API also makes a CAPI interface available without requiring ISDN hardware. Instead, it implements a VoIP protocol stack compatible with H.323 and SIP.

Thereby, XC-API enables a fast and simple, as well as "soft", migration from ISDN to VoIP, ensuring excellent quality without requiring any modification to the existing application base.



The XC-API allows you to use your existing CAPI 2.0-compatible application for [Unified Messaging \(UMS\)](#), [Automatic Call Distribution \(ACD\)](#) or [Interactive Voice Response \(IVR\)](#) via Voice over IP. This will enable you to use your telephone and fax functions without conventional hardware such as modems or ISDN cards.

XC-API Overview

Pure Software Solution

XC-API is a pure software solution for CAPI 2.0 applications, offering all the performance features of a classic ISDN card without the hardware.

Virtualization

Virtualization in the context of VoIP is only possible with a software solution such as XC-API. Cluster scenarios can be planned and implemented more easily. Operation and maintenance costs less. Cloud-based solutions such as Azure or AWS are supported.

Performance Features

XC-API is the complete solution for your interface to the VoIP world. It supports numerous IP infrastructure features. Some absent features can be simulated by XC-API making them available to the application as well.

Compatible with H.323 and SIP

The solution supports the most widely used standards on the market. This means that XC-API is compatible with H.323 and SIP-compatible terminals and gateways of all manufacturers. In addition, XC-API uses proprietary features used by most common solutions.

Scalability

XC-API is the ideal partner for all areas of application. Between 2 and 500 channels can be used simultaneously. Different codecs or features can be licensed as options.

Fax fallback from T.38 to G.711 (fax pass through)

Different infrastructures need different configurations. XC-API provides a multitude of configuration options, including for faxing. If a gateway does not support the T.38 protocol, the fax fallback feature switches automatically to G.711 (fax pass through).

V.34 High Speed Fax

With the use of the V.34 standard, the time of fax transmission can be reduced by almost half.

Reliability

Outstanding reliability, stability and availability are the most important qualities that companies require from their communications. XC-API provides numerous references to meet precisely these demands day in, day out.

Security

With XC-API, you won't run any risk regarding the security of your data transfer. For voice and fax communication XC-API supports TLS and SRTP, thwarting any attempts of eavesdropping or manipulation.

Open Interfaces

CAPI 2.0 is an open interface and freely available to everyone. The ETSI (European Telecommunications Standards Institute) adopted CAPI 2.0 as standard ETC 300 325 (Profile B).

TE-SYSTEMS offers an SDK which provides a simple and fast integration of XC-API into your own application, including several source code samples.

XC-API Performance Features

The listed functions give an idea of the outstanding performance range of XC-API - take a look for yourself:

General

SIP	■
H.323	■
QSIG via IP	■
Conferencing	■
Integration of audio ports	optional
Multi controller capability	■
High availability	■
Quality of service	■
DTMF inband / out-of-band	■
V.23 modem	■
Licensing via MAC address	■
WMI / SNMP	■
IPv4, IPv6	■
Channel density	2 - 500
Use in virtual environments	■

Fax (optional)

G.711 (fax pass through)	■
T.38	■
Fax fallback from T.38 to G.711	■
V.34 High Speed Fax	■
Compression to T.4 and T.6	■
Error Correction Mode (ECM)	■
Fax on demand	■
Definition of own headlines	■

Supplementary Services

Hold	■
Message Waiting	■
Call Forwarding	■
Connect	■
Call Divert	■
Caller ID Name	■
Calling Number Identification	■
Calling Line Identification Restriction	■

Codecs

G.711 (A-Law, μ -Law)	■
G.722	optional
G.729	■
GSM 6.10	■
PCM 16 bit	■
Transparent	■
MPEG2 (audio only)	optional

Security

SRTP	optional
TLS	optional
X.509	optional

The listed features are not supported by all telephone systems. You can find detailed information on individual telephone systems in the [Interoperability List](#), which is updated monthly and available for downloading in our [Community](#) at www.te-systems.de.

Flexible Fax Support

With XCAPI, fax applications can be used in almost every VoIP environment, irrespective of the capabilities of the infrastructure. Scalability and interoperability form the perfect combination to integrate your fax server seamlessly into the world of IP communication.

Fax fallback from T.38 to G.711 (fax pass through)

XCAPI supports fax transmission via T.38 both in H.323 and in SIP. If your VoIP infrastructure does not support T.38, the fax fallback will switch

automatically to G.711 (fax pass through). As a result, you can send faxes even in situations where it is not possible to use T.38.

The following graph shows the fax fallback within the SIP communication. Here you can see the example of a gateway that does not support T.38:



Transmission Speeds

Of course, XCAPI supports the regular transmission speeds of 2,400 bps to 14,400 bps. And each of these combinations work with T.38 and G.711 (fax pass through).

With V.34 Standard in T.38 Protocol, you will get a major gain of speed in fax transmission. The transmission time can be more than halved and consequently your connection costs will be reduced.

High-resolution facsimile transmission

In addition to the common resolutions, XCAPI now supports the transmission of faxes with a resolution up to 1200 x 1200 dpi (ultra-high resolution).

Compression and Error Correction

The current methods of data compression by T.4 and T.6 are also supported by XCAPI. This shortens the transmission time and in consequence your connection costs are reduced.

Parts of the fax data that are not received in full can be requested again through the Error Correction Mode (ECM), ensuring reliable transmission of all data.

User Specific Settings

In addition to conventional fax transmission and reception, XCAPI also supports fax on demand. Here the fax recipient can choose the documents they want faxed to them.

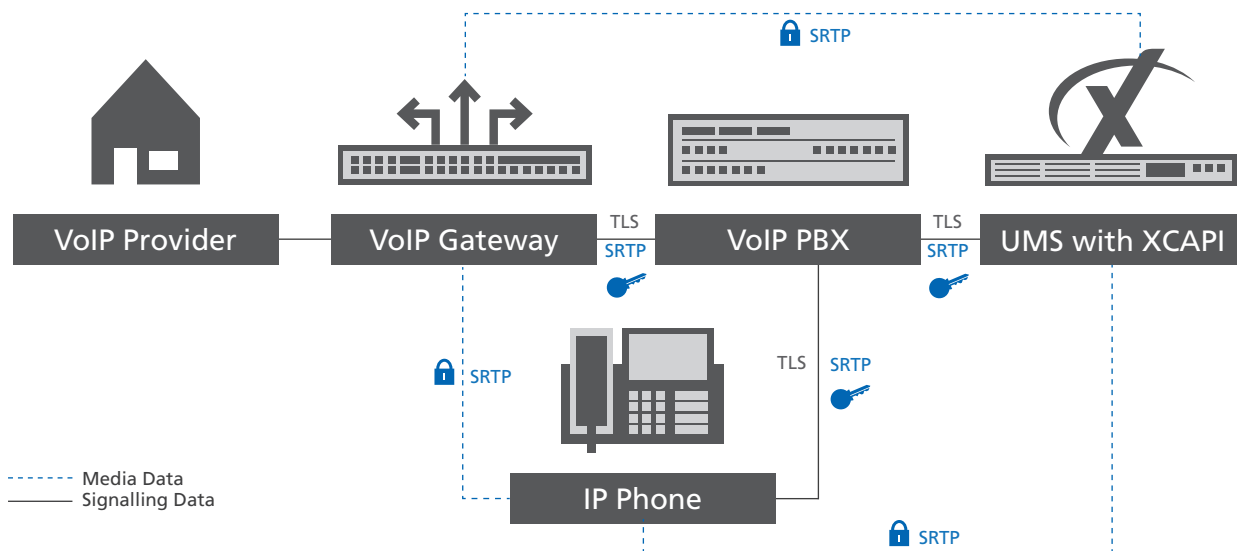
XCAPI - A Secure Solution

For voice and fax communication, XCAPI supports TLS and SRTP and thus protect against any attempts to "hack" the transmission.

Securing VoIP communications in WLANs, corporate networks or in public hotspots is a frequently increasing topic of discussion.

And with reason, because security is the top priority, especially when protecting your sensitive data!

Signalling and Media Flows



TLS - Signalling Encryption

Establishing, controlling and terminating internet calls according to the SIP specification can be encrypted, and therefore secured, via TLS. TLS stands for „Transport Layer Security“ and is a protocol which is in turn based on SSL (Secure Socket Layer) version 3.0. It implements a secure - in other words authentic and confidential-channel on the transport layer.

The signalling data is transmitted together with an SRTP key for the encrypted voice data.

- TLS (Transport Layer Security)
Signalling encryption to specification RFC2246, RFC4346 and RFC5246
- SRTP (Secure RTP Protocol)
Encryption and authentication of RTP data in the SIP to specification RFC3711

SRTP - Media Encryption

The SRTP protocol, designed for real-time communication, stands for security of voice data transmissions. By encrypting the data with symmetrical encryption to AES (Advanced Encryption Standard), eavesdropping is effectively prevented.

High Availability

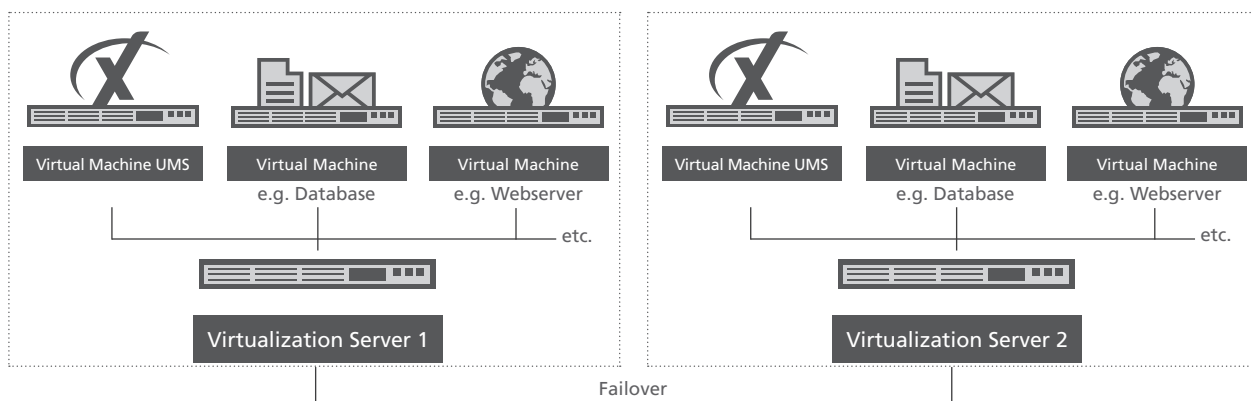
A high degree of availability is essential for communication. Particularly in the area of VoIP, virtualization offers more flexibility, redundancy and increased security while reducing costs at the same time.

Advantages

It takes a software solution such as XC-API to realise virtualization in the area of VoIP. And the advantages over hardware solutions based on an ISDN card become particularly evident when you are trying to save on both, resources and costs, in your operation:

- Only one actual server hardware to run several virtual machines
- Straightforward and fast restoration of the working environment after hardware failures by simply reverting to the latest backup of the virtual machines
- Since XC-API is a pure software solution, hardware defects and the associated replacement costs and waiting times are avoided
- The hardware environment can be configured quickly and flexibly: when changing to different virtualization hardware, the virtual machine can simply be migrated
- XC-API offers absolute flexibility regarding the number of channels since the licenses can be upgraded as required in increments of two
- Fast adjustment of the number of channels with XC-API through online requests for the license file, which is then simply imported

XC-API in Virtual Cluster Solution



High Availability Cluster (HA cluster)

If you need to guarantee high availability (e.g. 24/7 operation) and wish to ensure this via a HA cluster, the XC-API cost model offers a significant savings potential compared to traditional hardware ISDN solutions, in particular where larger numbers of channels are involved.

Supported Virtualization Solutions

- VMware ESX
- Citrix XenServer
- Microsoft Hyper-V

Supported Cloud Virtualization Solutions

- Microsoft Azure
- Amazon Web Services (AWS)

Supported Cluster Technologies

- Microsoft Cluster Server
- EMC AutoStart

Configuration Examples

XC-API Basic Packages

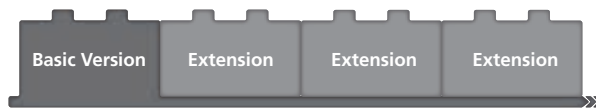
The XC-API basic version includes 2 channels for voice communication and can be expanded as required with the add-on modules:



In this combination of the XC-API basic version and one XC-API extension, there is a total of 4 voice channels available.



In this configuration example, a total of 8 voice channels is available.



One XC-API basic version can be expanded to a maximum of 500 channels.

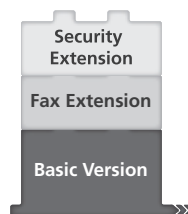
XC-API Add-on Modules

The add-on modules expand the channels by the respective functions.

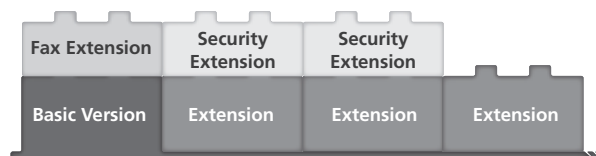
Each of the 2 channels in this example can be used either for voice or fax, as required.



Each of the 2 channels in this example can be used either for voice or fax, as required. The Security extension allows existing channels to also use TLS and SRTP.



In this configuration example, 6 of the 8 channels will be used for voice communication. Any 4 of these voice channels can use the Security extension to also use TLS and SRTP. With the fax extension, 2 of the 8 channels can be used for either voice or fax.

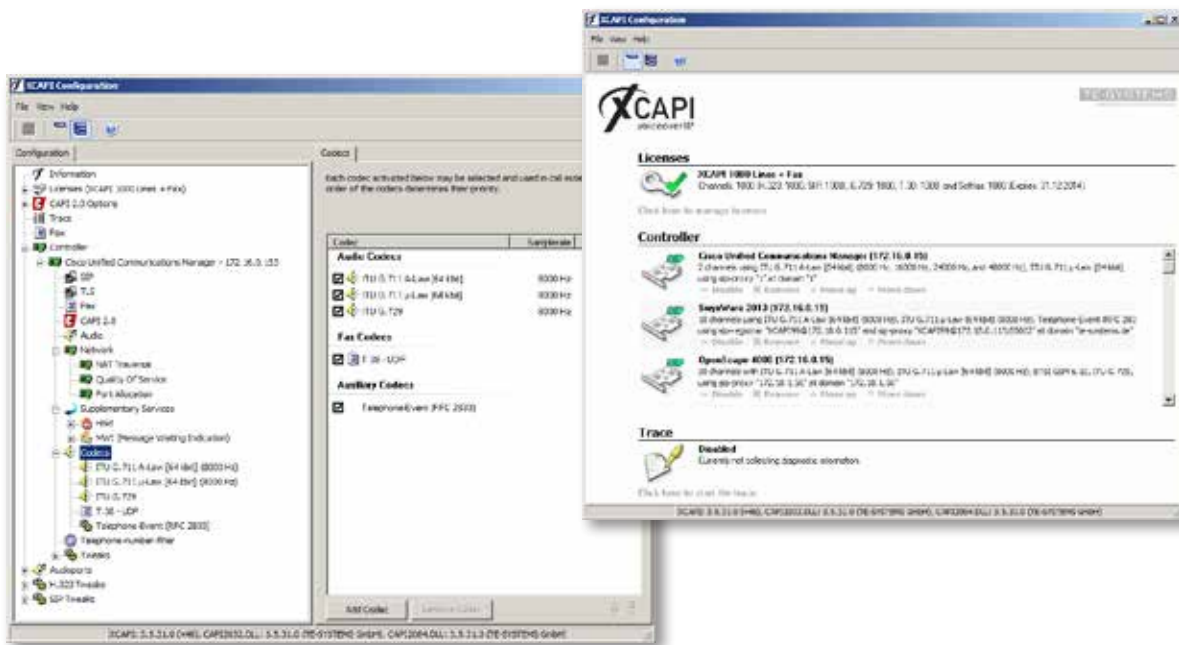


XCAPI Tools

Configuration

The XCAPI configuration tool offers an overview of the configured controllers, of the used licenses and of the current trace status. Wizards

simplify the installation of licenses and the configuration of controllers to link in with your infrastructure.



The XCAPI configuration tool contains a large number of predefined settings for most of the telecommunication systems on the market. This saves installation and configuration time. Details can subsequently be changed at any time in the expert view.

Controller-specific settings for all fax-related topics, including the support of V.34, have been implemented in the XCAPI configuration.

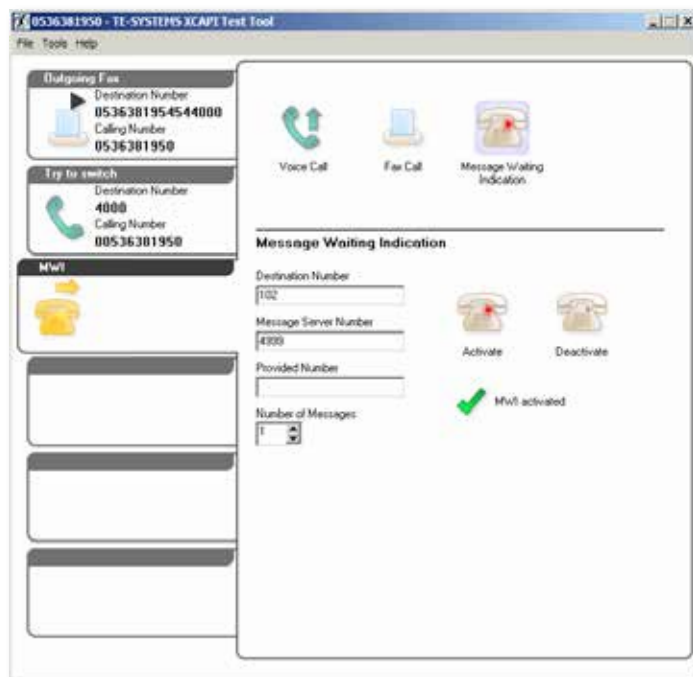
The setting of the desired fax protocol is clearly summarized on one side in the expert view and you need to make settings for them only at this point.

It is possible to select whether XCAPI fax messages are transmitted via T.38 signaling or via G.711. Details can be changed anytime.

XCAPI Tools

Controller Wizard

The XCAPI controller wizard is used when setting up new controllers. A user friendly interface guides you through the complete menu step by step. The choice is between different templates for a large number of tested SIP providers, as well as H.323 and SIP gateways. You only have to input the information which you have received from your provider or system administrator. By using the wizard, it is ensured that you use the optimal XCAPI settings for your individual VoIP environment.



Test Tool

The XCAPI Test Tool is provided automatically on every XCAPI installation. This allows you to check the compatibility of your provider or your telephone system without having to install a full application.

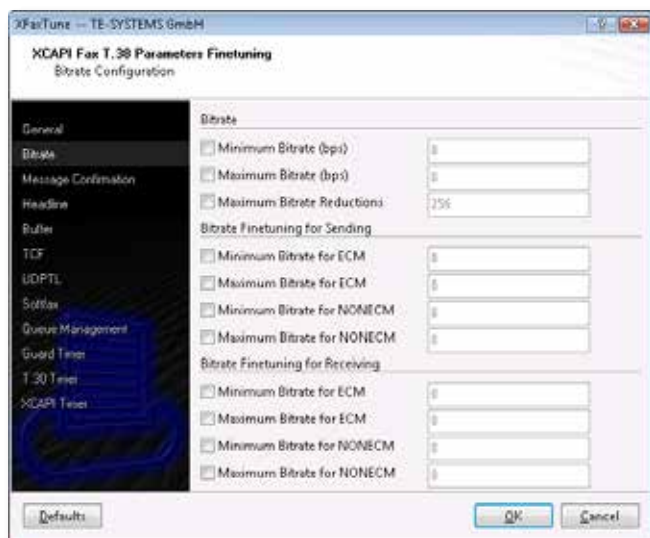
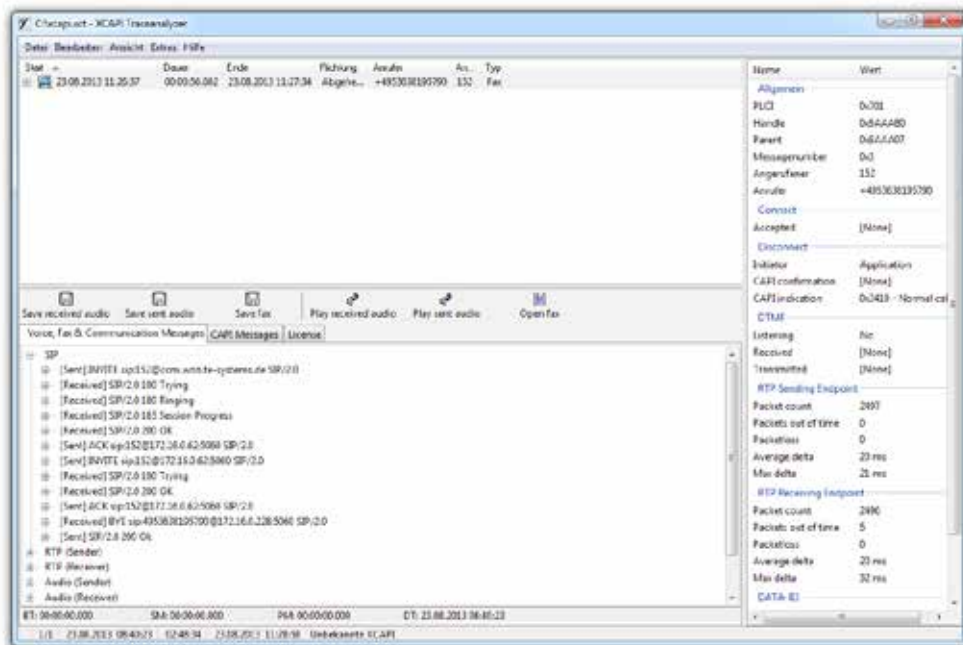
For example, you can send faxes with speeds up to 33,600 bps, and you are thus able to test the efficiency of your VoIP environment. The setting „(automatic)“ always uses the highest transmission rate.

XCAPI Tools

Trace Analyzer

If necessary, the trace analyzer can be used. The trace analyzer records calls chronologically and reports the time and direction of the call as well as the telephone or fax numbers involved. Moreover, an overview is provided which will be

available to your organisation for subsequent problem analysis. In addition, individual data like fax or voice messages can be extracted with the trace analyzer.



XFaxTune

XFaxTune is a tool for fine tuning your fax settings. With a user friendly interface you can set optimizations with the assistance of our support Team. The „Defaults“-button offers the option to reset all actions in case that something has been changed accidentally.

XC-API Tools

Line Monitor

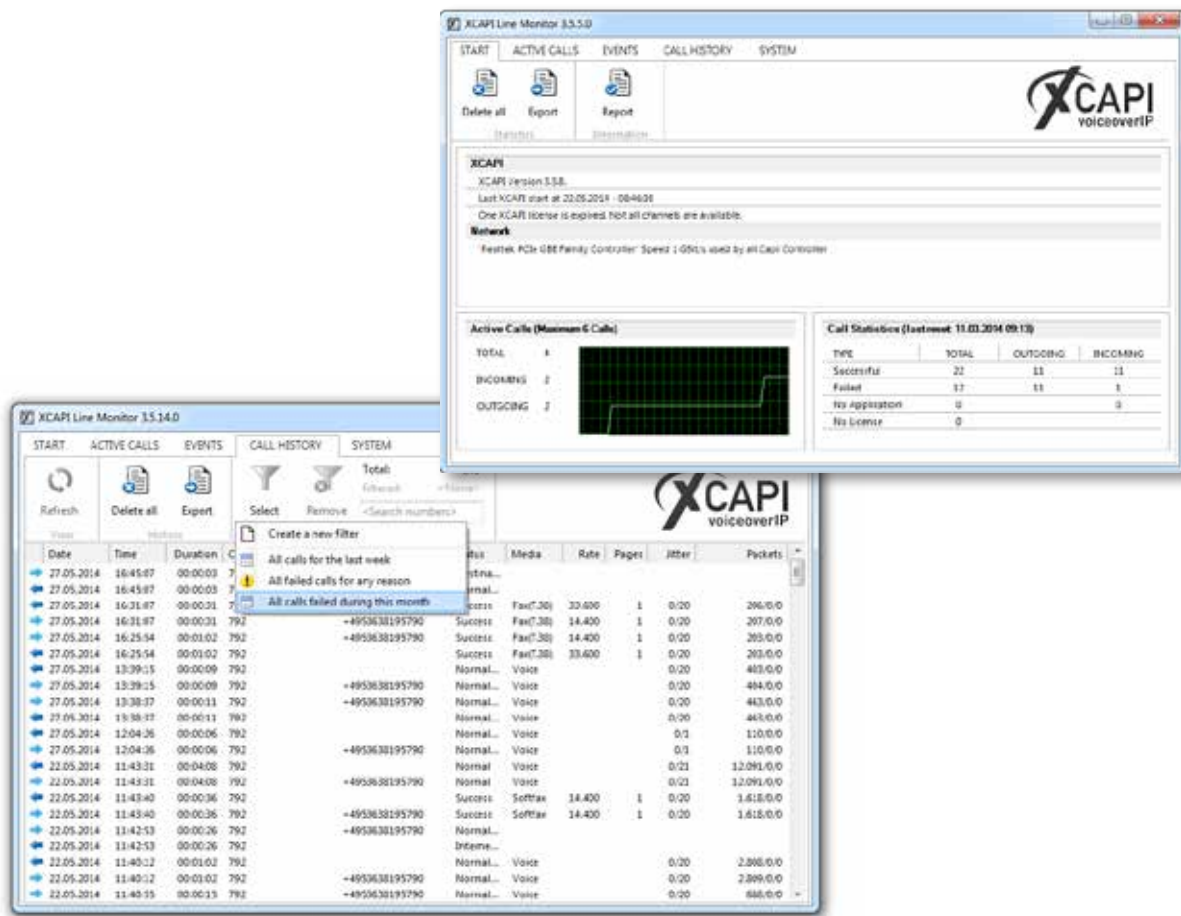
The XC-API Line Monitor gives you a quick overview of the installation and configuration, as well as a detailed history of all calls.

The function CALL HISTORY is equipped with a new filter function and individual selection options. This allows you to filter and export your data in any order.

Out of the report you get all important information at a glance, for example installation

data, drivers or services of XC-API, system- and network-data with the firewall-status, recent entries of the event-log as well as the actual status of your license. If needed the report can be stored as a PDF file.

Under ACTIVE CALLS you are able to monitor all incoming and outgoing calls and faxes. Among other things you can watch the phone-/fax-number, duration, jitter and status of every active connection.



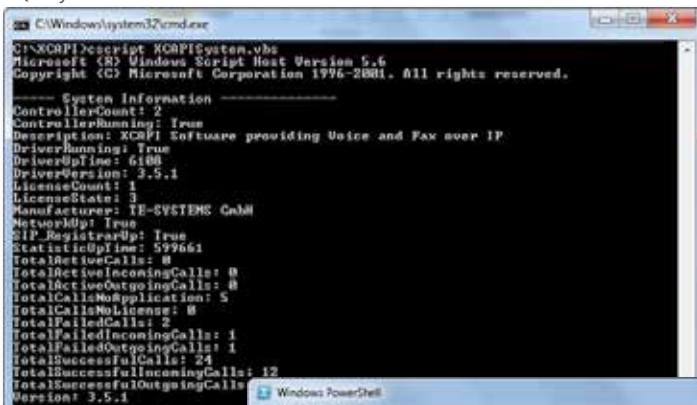
WMI-Interface

WMI provides more security by using crypted passwords and the integrating with Microsoft System Center World.

XCAPI supports, in addition to the Simple Network Management Protocol (SNMP), the Windows Management Instrumentation (WMI). WMI is used to read and write information and to trigger events. Thus the administrators have the ability to use monitoring tools for monitoring XCAPI.

The use of graphical representation in such monitoring tools is great for monitoring CPU utilization. Also, in case of a critical error or system problem, an alert via e-mail or text may be sent out immediately to an administrators' group.

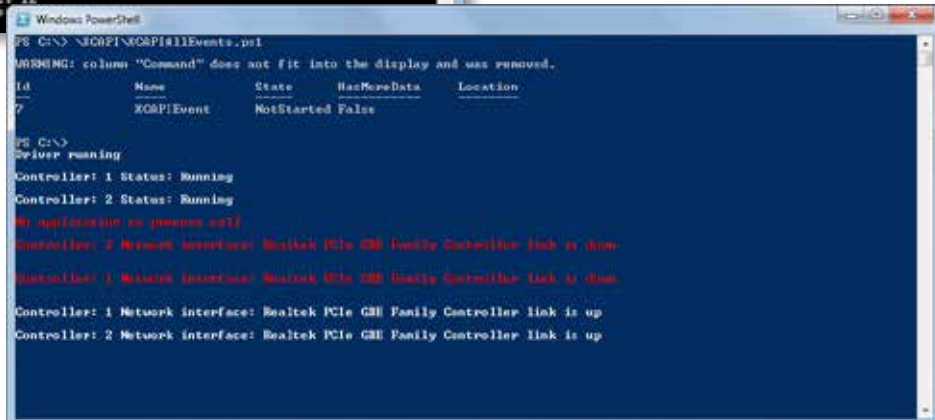
Query Information



```
C:\Windows\system32\cmd.exe
C:\XCAPI>XCAPIDescript XCAPISystem.vbs
Microsoft (R) Windows Script Host Version 5.6
Copyright (C) Microsoft Corporation 1996-2001. All rights reserved.

----- System Information -----
ControllerCount: 2
ControllerRunning: True
Description: XCAPI Software providing Voice and Fax over IP
DriverRunning: True
DriverUpTime: 6180
DriverVersion: 3.5.1
LicenseCount: 1
LicenseState: 3
Manufacturer: TE-SYSTEMS GmbH
NetworkUp: True
SIP.RegistrarUp: True
StatisticUpTime: 599661
TotalRetireCalls: 0
TotalActiveIncomingCalls: 0
TotalActiveOutgoingCalls: 0
TotalCallsNoApplication: 5
TotalCallsNoLicense: 0
TotalFailedCalls: 2
TotalFailedIncomingCalls: 1
TotalFailedOutgoingCalls: 1
TotalSuccessfulCalls: 24
TotalSuccessfulIncomingCalls: 12
TotalSuccessfulOutgoingCalls: 12
Version: 3.5.1
```

PowerShell All Events



```
PS C:\> .\XCAPISystem.vbs
WARNING: column "Command" does not fit into the display and was removed.
Id      Name      State      HasMoreData  Location
----
7       XCAPIEvent  NotStarted False

PS C:\>
Driver running
Controller: 1 Status: Running
Controller: 2 Status: Running
No application to process call
Controller: 2 Network interface: Realtek PCIe GBE Family Controller link is down
Controller: 1 Network interface: Realtek PCIe GBE Family Controller link is down
Controller: 1 Network interface: Realtek PCIe GBE Family Controller link is up
Controller: 2 Network interface: Realtek PCIe GBE Family Controller link is up
```

This data can be easily read and analyzed, with VB scripts and also with Microsoft PowerShell. And of course, examples of this are provided.

System Requirements

XCAPI is a „plug and play“ solution - simple, fast installation with instant availability for VoIP use at the highest quality level.

Your IT equipment will be as individual as your company. XCAPI will adapt to anything! The facts to keep in mind are:

- the application you are using,
- the number of channels to be used simultaneously and
- the codecs to be used.

Very special configurations and the particularities involved are dealt with in our [TechNotes](#), which are constantly being updated and adapted. You will find these in our Community at www.te-systems.de. If you do not find information covering your specific problem, please feel free to contact us: Individual customer solutions are part of our service!

System Requirements - at a glance

Telephone system

- SIP
- H.323
- SIP-Provider

Operating system (32-/64-Bit, respectively)

- Windows Server 2019
- Windows Server 2016
- Windows Server 2012
Windows Server 2012 R2
- Windows 10
- Windows 8 / 8.1
- Windows Server 2008 R2
- Windows 7

Server

- at least 1 GHz clock frequency
- at least 512 MB RAM

Software

- CAPI 2.0-compatible application
- SDK

Supported virtualization solutions

- VMware ESX
- Citrix XenServer
- Microsoft Hyper-V

Supported cloud virtualization solutions

- Microsoft Azure
- Amazon Web Services (AWS)



TE-SYSTEMS GmbH

We have made it our mission to support partners in the area of Unified Communications with XCAPI so they can operate in the market more effectively over the long term.

Technology Partners

To ensure that the interplay between XCAPI and the involved products is, and remains of, the highest quality, we maintain technology partnerships and undergo regular certification.

This is the only way to ensure that our complete solutions provide optimum functionality to our joint customers.



About Us

TE-SYSTEMS - based in Wolfsburg, Germany - was founded in 1990. The company currently has a workforce of more than 20 employees, most of whom work in development.

Unified Communications solutions using XCAPI have been successfully implemented worldwide since 2001.

Innovation is future - therefore we have extended our product portfolio with the session border controller (SBC) **anynode**. This pure software solution acts as an interface of incom-

patible SIP-endpoints and translates port- and address-information. It supports security, makes routing-decisions and performs manipulation of call numbers.

Since the beginning of 2013, TE-SYSTEMS is a "Microsoft Gold Certified Partner". This gives more access to Microsoft technologies at an early stage in order to respond quickly to new technological developments on the Windows platform and other Microsoft products. So, TE-SYSTEMS can guarantee maximum quality of our products.

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