

estos ECSTA for Cisco CallManager Express

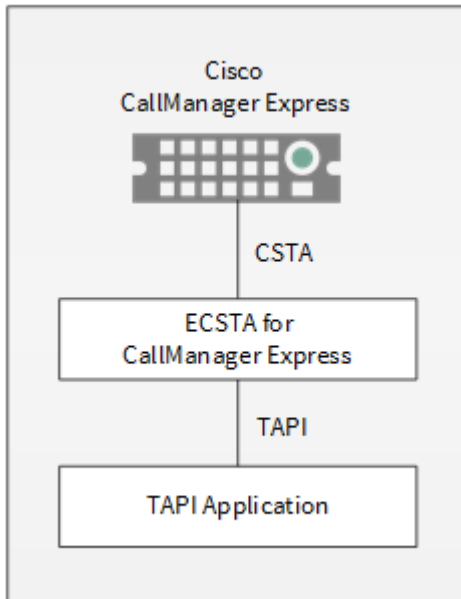
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1 Introduction

estos ECSTA for Cisco CallManager Express makes available a Telephony Service Provider for Microsoft® TAPI 2.1 (also 2.2 and 3.0). This TAPI driver establishes a central communication between a server and the telephone system. On this server all devices on the telephone system are available as TAPI lines. All estos ECSTA for Cisco CallManager Express drivers use the efficient interface CSTA in order to communicate with the telephone system.

For the installation and management of the driver see driver Management.



Supported telephone systems

PBX	Driver
Cisco CallManager Express from Version 8.0	ECSTA for CallManager Express

Supported Telephones

Only SCCP Phones are supported. It is not possible to use SIP phones.

Using in the network

After installing the driver, you may use all configured line devices on the server as TAPI-lines. If you are using a server based CTI Software, you may install it now. To have the TAPI-devices available on all workstations, the TAPI-driver must be distributed in the network. There are the following options:

- estos UCServer**
 The estos UCServer is a CTI/UCC server software which distributes the telephony informations across the network using a graphical client or a multiline TAPI driver. Workgroups, domains, Active Directory® and Terminal Server are supported.
- estos CallControlGateway**
 The estos CallControlGateway for Lync/OCS is a gateway that connects the TAPI-lines with the Lync/OCS server. This enables the Lync/OCS client to use traditional telephone devices via Remote Call Control (RCC).

3. **Windows® Telephony Server**

The Windows® Telephony Server is a component of Windows® server operating systems since Windows® NT. You will need a domain. The service is limited to domain users.

2 CallManager Express

When setting up the driver, follow these steps:

1. **Check network connection**
Check connectivity of the callmanager (ping host name / IP address).
2. **Version of the CallManager Express**
At least Version 8.0 is required.
The feature Overlay (Floating number) is not supported.
3. **Understand the operation mode of the Tapi driver.**
See also Tapi driver operation mode.
4. **Configuration of the CallManager Express**
Configuration of the AXL connection. See CallManager AXL configuration.
Configure CSTA in the CallManager. See also CallManager CSTA configuration.
5. **Driver installation**
See also Settings

2.1 General Settings

Connection

The connection to the CallManager Express is established using SIP/TCP and HTTP/HTTPS for AXL. Enter the IP address of the CallManager.

Locate

The IP address of the CallManager can be determined from the DHCP option 'TFTP server'.

AXL Connection

The line configuration is loaded from the CallManager using the AXL/SOAP connection. Choose if HTTP or HTTPS should be used. Enter the user name and password for the AXL connection.

The AXL/SOAP connection must be configured in the CallManager Express. See CallManager AXL configuration.

SIP Parameters

For the SIP communication the Tapi driver must be able to accept inbound SIP traffic. Choose the IP interface and the SIP port. An exception in the windows firewall is required. This exception will be added automatically during installation.

Session Server ID

For the communication with the CallManager Express it is required to configure a Session Server ID in the CME. The Session Server ID can be configured here (Default: ss_ecsta).

2.2 Advanced Settings

Readout line names

If this option is active, the names for the phone numbers are loaded from the CallManager during readout of the lines.

Readout line buttons

If this option is active, the additional line buttons are loaded from the CallManager during readout of the lines. These line buttons are added as Tapi addresses.
See also Tapi driver operation mode.

Snapshot for active calls

The driver can validate existing calls. This prevents that calls are displayed on the PC that do no more exist in the PBX system.

The higher this value the longer it takes for the driver to detect a hanging call. The lower this value the higher is the load on the PBX.

Enter a time interval in seconds.

Retry MonitorStart

In case the driver cannot start the monitoring of an extension for example because the extension is not connected to the PBX, the driver will retry the monitoring at regular intervals.

Enter a time interval in seconds.

Update available lines

The AXL connection is used to query the registered phones from the CallManager. This will be used to detect extension mobility logins and temporarily unregistered phones. The given interval is the maximum time span the driver takes to detect phone register actions.

Enter a time interval in seconds.

2.3 TAPI Lines

Enter the lines that the Tapi driver should provide as Tapi lines. The number is the internal phone number, the device-ID is the MAC address of the phone, the name will be used just for display. Optionally, each line may use additional line buttons from the phone as Tapi addresses. Enter the line buttons as semicolon separated list of phone numbers (e.g. 9011;9012;9013).

Supported Telephones

Only SCCP Phones are supported. It is not possible to use SIP phones.

Phone Number Format

The lines can be optionally as an internal phone number, for example 123 or canonical +49(30)12345-123

You should use canonical phone numbers if you use several instances of Tapi driver and thus switch on several telephone systems at the same time. A canonical phone number consists as follows:

+Country code (prefix) Local prefix-extension

In the dialogue Location You can configure the country code, area code and local dialing prefix.

Menu Extras

This menu contains the following additional actions.

Load Lines from PBX

The available lines are loaded automatically from the CallManager. This action requires the AXL configuration in the CallManager.

CallManager CSTA configuration

This dialog assists you with the CSTA configuration of the CallManager. The AXL user must have write access (level 15).

Manual addition of a line

Enter the internal phone number of the phone. The device-ID is the MAC address of the phone where the number is configured as line button. In case of a extension mobility user the device-ID must be empty.

Optionally, you can enter a name. Optionally, you may add the phone numbers of additional line buttons on the phone.

Import text

You may import a list of lines from a text file. Each line must contain the phone number;name;device-ID;line buttons.

Export text

You may export the actual line configuration to a text file.

Attention

After the installation of the driver it may be necessary to restart the computer.

2.4 Tapi driver operation mode

Phone devices and phone numbers

In the CallManager Express configuration there are phone numbers assigned to line buttons on the phones. Each phone device may have one or more phone numbers. A phone number may be assigned to one or more phone devices (shared lines). There can be user accounts that have a list of phone numbers. These users can log in on especially configured phone devices (extension mobility).

Unambiguous phone numbers

The Tapi driver is designed for systems where each person has a unique extension phone number. This phone number of the person is configured as first line button on all of his phone devices. In case of an extension mobility user this is the first phone number in his user profile.

Static lines

Each phone device that has a static configuration (no extension mobility) appears as Tapi line. The primary view on this phone device is the view on the first line button on the phone. These lines all have a phone number (phone number of the first line button) and a device-ID (MAC address of the phone device where this phone numbers is configured as the first line button). Optionally, additional line buttons from the phone device may be represented as Tapi addresses on the Tapi line.

Extension mobility lines

Each extension mobility user is represented by a Tapi line. The primary view on this user is the view on the first line button in the user profile. These lines all have a phone number (phone number of the first line button) and no device-ID. Optionally, additional line buttons from the user may be represented as Tapi addresses on the Tapi line.

View of the phone device, additional line buttons

Each Tapi line may represent the first line button and the additional line buttons. If the option 'Readout line buttons' from the advanced settings is active, the additional line buttons on each phone device will be loaded from the CallManager. All phone calls appearing on the phone device (no matter on which line button) are signalled on this Tapi line. The additional line buttons are represented as Tapi addresses.

Status of the phone devices

Each Tapi line may be monitored, independent of the phone device registration status. The status of the line is 'Out Of Service' if there is no phone device registered. The status changes to 'In Service' as soon as the phone device registers with the CallManager.

2.5 CallManager AXL configuration

CallManager Express Version

Cisco Unified CME 8.0 or higher is required

AXL/SOAP AXL API access configuration

The AXL interface is used to read the line configuration from the CallManager Express. The AXL connection is required for the Tapi driver operation.

XML transport parameters, XML application parameters, XML authentication

```
enable
configure terminal

ip http server
```



```

ixi transport http
no shutdown
response size 64
request outstanding 3
exit

ixi application cme
no shutdown
exit

telephony-service
xml user ecstausername password ecstauserpas 15
no shutdown
exit

```

Detailed instructions for can be found in the Cisco CallManager Express Administration guide.

- Configuring CTI CSTA Protocol Suite
- Configuring the XML API

2.6 CallManager CSTA configuration

CallManager Express Version

Cisco Unified CME 8.0 or higher is required

Configure CSTA protocol

The configuration of the CallManager for using CSTA can be done manually or assisted by the estos ECSTA for Cisco CallManager Express. On the page 'Line Settings' you will find the 'CallManager Configuration' in 'Extras'.

SIP configuration:

CTI will be enabled, the SIP Registrar will be enabled and a Session Server (here number 2) will be configured for use by the ECSTA.

```

enable
configure terminal

voice service voip
allow-connections sip to sip
no cti shutdown
gcid
no cti csta mode basic
sip
registrar server expires max 1800 min 60
exit
exit

voice register global
mode cme
exit

voice register session-server 2
cti-aware
register-id ss_ecsta
keepalive 600
exit

```

Configure ephone-dn '1':

CTI Watch allows control and monitoring of the telephones. CTI Notify additionally allows to monitor the availability of a phone device.

```
ephone-dn 1
cti watch
cti notify
exit
```

Configure Security (optional):

You may optionally configure authentication for the Session Server registration. In case this authentication is enabled, all SIP registrations require a username and password. In case this authentication is enabled, the ECSTA uses the AXL credentials. Before enabling authentication please check if any other applications and devices connected to the CME also support this.

```
voice register global
authenticate register
exit
```

Attention: In older versions it was possible to operate the CSTA communication without Session Server. In case you just updated the ECSTA, you have to check the CME configuration.

Detailed instructions for the configuration of the phones and CSTA can be found in the Cisco CallManager Express Administration guide.

- Configuring CTI CSTA Protocol Suite
- Configuring the XML API

2.7 Settings

- General Settings
- Location Settings
- TAPI Lines
- Advanced Settings
- License Settings
- Phone Number Format
- CallManager AXL configuration
- CallManager CSTA configuration

2.8 Licenses

The driver can be tested without license for 45 days with 25 lines. After the trial period, the lines can no longer be controlled and monitored. You can purchase license keys that unlock the driver permanently. To purchase licenses, contact your dealer.

The driver can be configured any number of lines. Opening a line consumes a license. If the existing licenses are used up, opening further lines will fail.

If you have configured multiple driver instances, all instances share the licenses entered. You can consume licenses anywhere on different instances.

3 Location Settings

The phone numbers of the telephone system are defined in the Location Settings

Phone Number Range

Enter here which internal phone numbers exist in the PBX system. This information is used to detect internal calls. The internal phone numbers of the telephone system and the phone number information of a call are used to determine whether it is an internal or an external call. In addition, when lines are generated automatically, estos UCServer checks whether the number of the line to be generated automatically lies within the range of internal numbers. Only then is the line generated by estos ECSTA for Cisco CallManager Express and the TAPI notified.

Location

Indicate here which international phone numbers precede the internal extension numbers.

The input of this location information should only be carried out if you use several driver instances and have connected several telephone systems. This location information can only be configured when the option Use Location is switched on. If you enter a location here, all extension phone numbers are entered fully international.

Example: With location information '49(89)1234' the extension '100' is formatted as '49(89)1234-100'.

Phone Number Format

The phone number registered from the driver at the application can be changed with rules. Moreover, you can also change phone numbers sent by the PC to the telephone system. See Phone number formatting.

4 Phone Number Format

You may enter rules for formatting the phone numbers.

The phone numbers that are reported from the PBX system to the PC and the numbers that are send from the PC to the PBX system may be modified with a Search and Replace function.

The phone numbers that are sent from the Tapi Application to the PBX (make call) may be modified as well.

Each line in the list contains an option if direct text compare or a regular expression is used.

The Search and Replace function uses regular expressions. If a search pattern matches, the result from replace with will be used as output. If the search pattern does not match, the original number will be reported unchanged. The entries in the list are processed one after each other. If one match is found the remaining entries will be ignored.

There are three categories:

- **Incoming**
This section is for phone number from incoming calls that are reported from the PBX system to the PC.
- **Outgoing**
This section is for phone number from outgoing calls that are reported from the PBX system to the PC.
- **PC Dialling**
This section is for phone numbers that are dialed on the PC and send to the PBX system

Search for:

Enter the regular expression that will be used to find a phone number.

Hint: The caret (^) can be found on the upper left key of a keyboard with German layout.

An overview of allowed expressions:

Character	Description
^	The beginning of the search string (phone number). The expression "^o" matches "o" only at the beginning of the search string.
^	The caret (^) immediately following the left-bracket ([) has a different meaning. It is used to exclude the remaining characters within brackets from matching the target string. The expression "[^o-8]" indicates that the target character should not be o
\$	The dollar sign (\$) will match the end of the string. The expression "152\$" will match the substring "152" only if it is at the end of the string.
	The alternation character () allows either expression on its side to match the target string. The expression "1 2" will match "1" as well as "2".
.	The dot (.) allows any character (or any number).
*	The asterisk (*) indicates that the character to the left of the asterisk in the expression should

	match 0 or more times.
+	The plus (+) is similar to asterix but there should be at least one match of the character to the left of the + sign in the expression.
?	The question mark (?) matches the character to its left 0 or 1 times.
()	The parenthesis affects the order of pattern evaluation and also serves as a tagged expression that can be used when replacing the matched sub-string with another expression.
[]	The corner brackets ([and]) indicates the amount of signs that are permitted at this point.

Replace with:

Enter the expression that defines how the number is to be formatted.

\1 represents the first matched expression enclosed by parentheses '(')' from the *search pattern* field.

\2 the second ...

Check:

You may check your expressions right here by entering a phone number in the indicate field. The resulting output will be displayed. If the expression from the search pattern is not found, the phone number will be send to the output without modification.

Examples:

Result	Search for	Replace with
Remove a leading 0 from the phone number	^0(.*)	\1
Replace a leading 80 at the beginning of the phone number by a 0	^80(.*)	0\1
Remove a private pin number that may be identified by a 50 followed by a 3 digit pin.	^50[0-9][0-9][0-9](.*)	\1
Suppress all internal numbers having a 3-digit extension.	^[0-9][0-9][0-9]\$	
Add an access code (leading 0) to all numbers with more than 3 digits (e.g. all external numbers).	^([0-9][0-9][0-9].+)	0\1
Add the PBX system root number (03012345) to all internal numbers (with 1 to 3 digits)	^([0-9][0-9]?[0-9]?)\$	03012345\1
Adding an area code to all numbers not beginning with 0 and containing at least 4 digits (thus not internal).	^([\^0][0-9][0-9][0-9].*)	08151\1

5 Driver Management

Installation

The driver is installed on the system with the Windows® Installer (msi) package. If the set-up package contains several drivers, you can select which drivers should be installed during the set-up.

Driver instance

The driver can be used to connect one or several phone systems. For this purpose one or several driver instances are registered in Windows® Tapi System.

Register at Tapi System

During the installation, an instance from the selected driver is already registered at the Tapi system. Thereby, you select the necessary data in a Wizard in order to connect the driver with the telephone system.

Configuration of Driver instance

The configuration of the driver instances takes place either over *Telephone and Modem option* in the Control Panel or over the standard program *Advanced Telephone Driver option* that can be found in the Control Panel or in the Start Menu.

Add further driver instances

If you want to connect the computer with a further telephone system, you must add a further instance of the driver to the Tapi system. This takes place with Help in the standard program *Advanced Telephone Driver options* that can be found in the Control Panel or in the Start Menu.

Updates

To install an Update start the Windows® Installer Package (msi).

If a driver instance is configured, this is deleted during the Update and is automatically added again after the Update is completed. If several driver instances are configured, the computer must be restarted after the Update.

Deinstallation

The Deinstallation takes place via the Windows® Software Administration. In the Deinstallation, all instances of the driver are removed from the Tapi system and the software uninstalled.

6 Software requirements

The estos ECSTA for Cisco CallManager Express can be installed on all Windows® systems that support Microsoft® TAPI 2.0 or higher. The following systems are supported in 32- as well as in 64-bit versions.

- Windows® 10
- Windows Server® 2008 R2
- Windows Server® 2012
- Windows Server® 2012 R2
- Windows Server® 2016
- Windows Server® 2019

7 Supported TAPI operations

The driver offers the following TAPI call control operations.

Action:	Corresponding TAPI function:
Dial	TSPI_lineMakecall
Hang up	TSPI_lineDrop
Answer call	TSPI_lineAnswer
Hold call	TSPI_lineHold
Retrieve call	TSPI_lineUnhold
Redirect call	TSPI_lineRedirect
Blind transfer	TSPI_lineBlindTransfer
Setup transfer	TSPI_lineSetupTransfer
Swap hold	TSPI_lineSwapHold
Complete transfer	TSPI_lineCompleteTransfer (LINETRANSFERMODE_TRANSFER)
Create conference	TSPI_lineCompleteTransfer (LINETRANSFERMODE_CONFERENCE)
Add to conference	TSPI_lineAddToConference
Remove from conference	TSPI_lineRemoveFromConference
Dial in dial tone mode	TSPI_lineDial
Forwarding	TSPI_lineForward TSPI_lineGetAddressStatus <ul style="list-style-type: none"> LINEFORWARDMODE_UNCOND
Do not disturb	TSPI_lineForward TSPI_lineGetAddressStatus

The following TAPI functions are implemented due to requirements of the TAPI subsystem.

Other exported functions:

TSPI_lineSendUserUserInfo

TSPI_lineClose

TSPI_lineCloseCall

TSPI_lineConditionalMediaDetection

TSPI_lineDevSpecific

TSPI_lineDevSpecificFeature

TSPI_lineGetDevConfig

TSPI_lineSetDevConfig

TSPI_lineGetAddressCaps

TSPI_lineGetAddressStatus

TSPI_lineGetAddressID

TSPI_lineGetCallAddressID

TSPI_lineGetCallInfo

TSPI_lineGetCallStatus

TSPI_lineGetDevCaps

TSPI_lineGetExtensionID

TSPI_lineGetIcon

TSPI_lineGetID

TSPI_lineGetNumAddressIDs

TSPI_lineNegotiateExtVersion

TSPI_lineNegotiateTSPIVersion

TSPI_lineOpen

TSPI_lineSelectExtVersion

TSPI_lineSetDefaultMediaDetection

TSPI_lineSetStatusMessages

TSPI_lineSetAppSpecific

TSPI_lineSetCallData

TSPI_providerCreateLineDevice

TSPI_providerEnumDevices

TSPI_providerFreeDialogInstance

TSPI_providerGenericDialogData

TSPI_providerInit

TSPI_providerShutdown

TSPI_providerUIIdentify

TSPI_lineGetCallIDs

TUISPI_lineConfigDialog

TUISPI_lineConfigDialogEdit

TUISPI_providerConfig

TUISPI_providerInstall

TUISPI_providerRemove

TUISPI_providerGenericDialog

TUISPI_providerGenericDialogData

8 Info about estos ECSTA for Cisco CallManager Express

estos ECSTA for Cisco CallManager Express is a product of estos GmbH.

Product updates can be found under <http://www.estos.de>.

Frequently asked questions and answers, as well as support, can be found under <https://www.estos.de/service>.

Logging

For error analysis it is possible to create log files. These are stored in the specified path.

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