

# estos ECSTA for Avaya ACM

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1	Introduction.....	4
2	Software requirements.....	5
3	Driver administration.....	6
4	Installation.....	7
5	Avaya Communication Manager.....	8
6	AE Service Configuration.....	9
7	General Settings.....	11
8	Location Settings.....	12
9	Line Settings.....	13
10	Advanced Settings.....	14
11	Phone Number Format.....	15
11.1	Licenses.....	17
12	Software requirements.....	18
13	Supported TAPI operations.....	19
14	Info about estos ECSTA for Avaya ACM.....	22

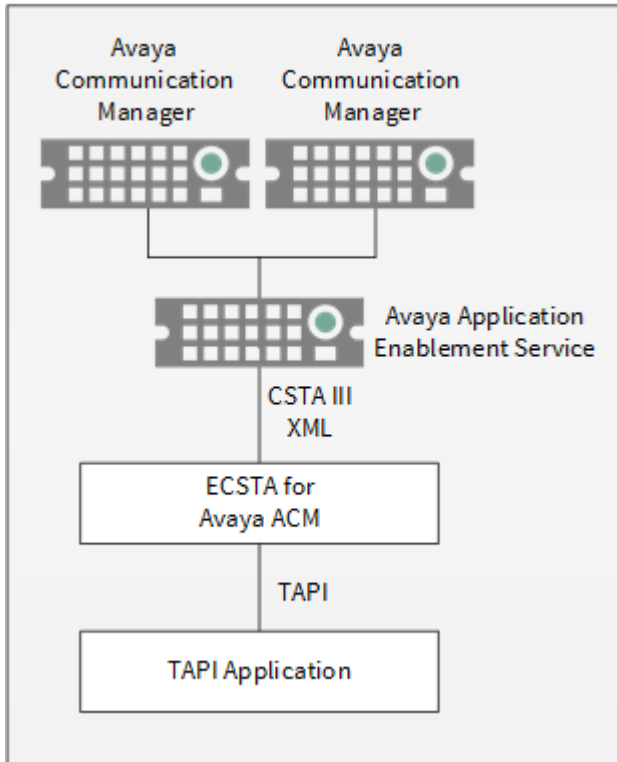


# 1 Introduction

estos ECSTA for Avaya ACM offers a Telephony Service Provider (TSP) for Microsoft® TAPI 2.1 (also 2.2 and 3.0). This TAPI driver implements a central communication between a PC and the PBX system. estos ECSTA for Avaya ACM uses the Avaya Application Enablement Service (AE Service) for connecting to the PBX system.

For installation of the driver see Driver Installation.

For administration of the driver see Driver Administration.



## 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:

1. 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.
2. 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 Software requirements

The estos ECSTA for Avaya ACM 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® 7 Service Pack 1
- Windows® 8.1
- Windows® 10
- Windows Server® 2008 R2
- Windows Server® 2012
- Windows Server® 2012 R2
- Windows Server® 2016

## 3 Driver administration

### Installation

Using the Windows® Installer (msi) packet, the driver will be installed on the system.

### Driver instance

The driver can be used to connect one or more PBX systems. For each Avaya Communication Manager you want to connect you must configure one instance of the driver.

### Register at Tapi System

During the installation, an instance in the already selected driver is registered at the Tapi System. For this purpose you indicate 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 via *Telephone and Modem options* in the Control Panel or via the provided program *Advanced Telephone Driver options*, that can be found in the Control Panel or Start menu.

### Updates

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

If an instance of the driver is configured, it will be removed during the update process. It will be automatically re-added afterwards.

### Deinstallation

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

## 4 Installation

For installation and administration of the driver see Driver management.

When setting up the driver, follow these steps:

1. Configure Application Enablement Service  
The driver requires an Avaya Application Enablement Service (AE Service). Please check the AE Service Configuration.
2. Run driver setup  
Launch the `ecstaAvayaACM.msi` (32 Bit Systems) or `ecstaAvayaACM_x64.msi` (64 Bit Systems).
3. Establish the connection to the AE Service  
Configure the connection to the AE Service and the name of the Communication Manager. Each instance of the driver supports the connection to one Communication Manager (switch connection).
4. Line configuration  
Add the phone devices, the Tapi driver should use as lines. You may read out existing lines from the PBX system.

## 5 Avaya Communication Manager

estos ECSTA for Avaya ACM can be used to control and monitor telephone devices attached to a Avaya Communication Manager. The driver can be installed in multiple instances. Each driver instance supports the connection to one AE Service and one Communication Manager (switch connection).

The driver requires the Avaya Application Enablement Service (AE Service). Please check the AE Service Configuration.

The connection to the AE Service is established using the Device, Media and Call Control Interface (DMCC). The protocol is CSTA Phase III XML(ed3).

TSAPI licenses are required in the AE Service.

For Installation of the driver see Driver Installation.

For administration and configuration of the driver see Driver Administration.



## 6 AE Service Configuration

A detailed instruction for configuring the Avaya ACM can be found in the document 'ecstaacm\_application\_notes\_aes.pdf'.

The following instruction is a short form and requires an appropriate configuration of the ACM and an installed AE Service:

The operation of the driver requires a correct configuration of the Avaya Application Enablement Service.

The connection to the AE Service is established using the Device, Media and Call Control Interface (DMCC). The protocol is CSTA Phase III XML(ed3).

### Requirements

The Application Enablement Service (AE Service) must be configured for DMCC use and connected to a Communication Manager.

Validating the configuration:

- Open the 'AE Service Operations Administration and Maintenance (OAM)' configuration.
- Open the 'CTI OAM Administration' and navigate to 'Administration', 'Network Configuration', 'Ports'.
- Verify the 'DMCC Server Ports' and activate the desired port with 'Enabled'.
- Navigate to 'Administration', 'Switch Connections' and verify the configuration of the Communication Manager connection.
- Navigate to 'Administration', 'Security Database'. It is recommended to activate the option 'Enable SDB for DMCC Service'.

### User configuration

It is required to have a user for accessing the AE Service. The user must be configured as 'CT User'.

Adding a user:

- Open the 'AE Service Operations Administration and Maintenance (OAM)' configuration.
- Open 'User Management' and add a user with the name 'ecsta'.
- For 'User Id', 'Common Name' and 'Surname' use the name 'ecsta'.
- Enter a password.
- Activate the option 'CT User'.
- Save the changes.

### Configure User rights

The user requires appropriate rights to monitor and control the phone devices using DMCC.

Configure CTI user rights:

- Open the 'AE Service Operations Administration and Maintenance (OAM)' configuration.
- Open 'CTI OAM Administration' and navigate to 'Administration', 'Security Database', 'CTI Users'.
- Open the list of users by clicking 'List All Users'. Mark the newly added user 'ecsta' and option the settings with 'Edit'.
- Activate the option 'Unrestricted Access', by clicking the button 'Enable'.
- Optional: If you want to restrict the access to certain devices, deactivate 'Unrestricted Access' and configure the phone devices under 'Devices'. Group the devices in a 'Worktop' and give the user the appropriate rights for this Worktop.
- Save the changes using 'Apply Changes'.

### Configure an encrypted connection with TLS

To connect estos ECSTA for Avaya ACM to the AE Service with an encrypted TLS connection you need appropriate certificates.

- Your DNS Server must contain an appropriate entry for the host name of the server.
- The AE Service server requires a certificate that is issued to the host name (DNS name) of the server (e.g. aeserver.mydomain.com).
- The certificate must have been issued by a Certificate Authority (root CA). This may also be a company internal Certificate Authority.
- The root CA must be installed on the Computer where estos ECSTA for Avaya ACM is installed. The root CA must be installed as Trusted Root Certification Authority in the Windows® Certificate Store in Local Machine.

## 7 General Settings

### AE Service Connection

The connection to the AE Service is established using TCP or TLS. Enter the host name or IP address of the Application Enablement Service. The default port für TCP is 4721, for TLS 4722.

### Login

Enter the user name and password. The user must be configured in the AE Service user management and must be enabled for 'Unlimited Access' in the CTI Administration. See also AE Service Configuration.

### Communication Manager Name

Enter the name of the Communication Manager that you want to control and monitor with this instance of the driver. The name must match a 'Switch Connection' in the AE Service Configuration.

## 8 Location Settings

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

### 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 more than one telephone system. 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'.

### Range of extensions

Enter the first and the last extension number. The range between the extension numbers is used to read out existing devices in the PBX system.

### Phone Number Format

You may change the phone number format, that the driver reports to the applications. You may also change the phone numbers that are sent from the PC to the PBX. See Phone number formatting.

## 9 Line Settings

Enter the lines that the driver should make available through Tapi. The phone numbers are the internal callnumbers of your devices, the names are used for display only.

### Phone Number Format

The lines may be either entered as internal phone numbers e.g. *123* or in a canonic phone number format e.g. *+49(30)12345-123*.

You should use canonic phone numbers in case you are using multiple driver instances. A canonic phone number consists of the following parts:

*+CountryCode(CityCode)CompanyAccessCode-Extension*

The dialog Location can be used to configure Country Code, Area Code and Company Access Code.

### Manually adding a line

Enter the internal extension number of the phone. Optionally you may enter a name.

### Extras - Query available lines

The available lines are automatically read from the PBX system. This is done by querying all phone numbers in the range of extensions. The range of extensions can be configured in the dialog Location.

### Extras - Import Text

You can import a list of lines from a text file. The file must begin every line with the phone number.

Optionally, the name can also be split with a comma.

### Extras - 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.

## 10 Advanced Settings

### Features:

- **Enable Do Not Disturb**  
If this option is enabled, the feature Do Not Disturb is available on all line devices. To use the feature with the telephones, the ACM configuration must have the feature 'Send All Calls' enabled for every phone.
- **Report incoming calls on busy extension**  
If an extension is busy any incoming call is notified.

### Phone Number Format:

- **National Prefix**  
The national prefix will be inserted at the beginning of all phone numbers that are reported by the PBX system with 'type of number: national'. In case the driver should report full canonic phone numbers, the national prefix consists of a '+' and the country code. When using '+1' for the United States the national number '5551234567' will be converted to '+15551234567'.
- **International Prefix**  
The international prefix will be inserted at the beginning of all phone numbers that are reported by the PBX system with 'type of number: international'. In case the driver should report full canonic phone numbers, the international prefix is a '+'. The international phone number '15551234567' will be converted to '+15551234567'.
- **Phone number format**  
You may change the phone number format, that the driver reports to the applications. You may also change the phone numbers that are sent from the PC to the PBX. See Phone number formatting.

### Advanced Parameters:

- **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.

## 11 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 sent 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 Dialing  
This section is for phone numbers that are dialed on the PC and sent to the PBX system

Search for:

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

Hint: The Caret Sign (^) is located on the german keyboard on top left.

Here is a short description of the available expressions:

character	description
^	The beginning of the search string (phone number). The expression "^0" matches '0' 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 "[^0-8]" indicates that the target character should not be 0
\$	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 (.) will match any character.

*	The asterix (*) indicates that the character to the left of the asterix 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.
[]	Brackets ([ and ]) enclosing a set of characters indicates that any of the enclosed characters may match the target character.

Replace with:

Enter the expression how the output of the phone number should look like.

\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:

Effect	search pattern	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 phone numbers that are internal (not more than 3 digits).	^[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][0-9].+)	0\1
Add an area code and prefix (03012345) to all internal numbers (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][0-9].*)	08151\1



## 11.1 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.

## 12 Software requirements

The estos ECSTA for Avaya ACM 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.

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- Windows® 8.1
- Windows® 10
- Windows Server® 2008 R2
- Windows Server® 2012
- Windows Server® 2012 R2
- Windows Server® 2016

## 13 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
DTMF dialing	TSPI_lineGenerateDigits
Dial in dial tone mode <sup>1</sup>	TSPI_lineDial
Forwarding	TSPI_lineForward TSPI_lineGetAddressStatus <ul style="list-style-type: none"> <li>• LINEFORWARDMODE_UNCOND</li> </ul>
Do not disturb	TSPI_lineForward TSPI_lineGetAddressStatus
Message waiting	TSPI_lineSetLineDevStatus TSPI_lineGetLineDevStatus

<sup>1</sup>Only with H323 phones

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

Other exported functions:

TSPI\_lineSendUserUser Info

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

## 14 Info about estos ECSTA for Avaya ACM

estos ECSTA for Avaya ACM 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 diagnostic purposes the driver can create log files. These are stored in the specified path.

You may enter comma separated phone numbers in the 'Log Filter' field. In case you have entered phone numbers here, the log files will only contain relevant information for these extensions.

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