

# estos ECSTA for Panasonic

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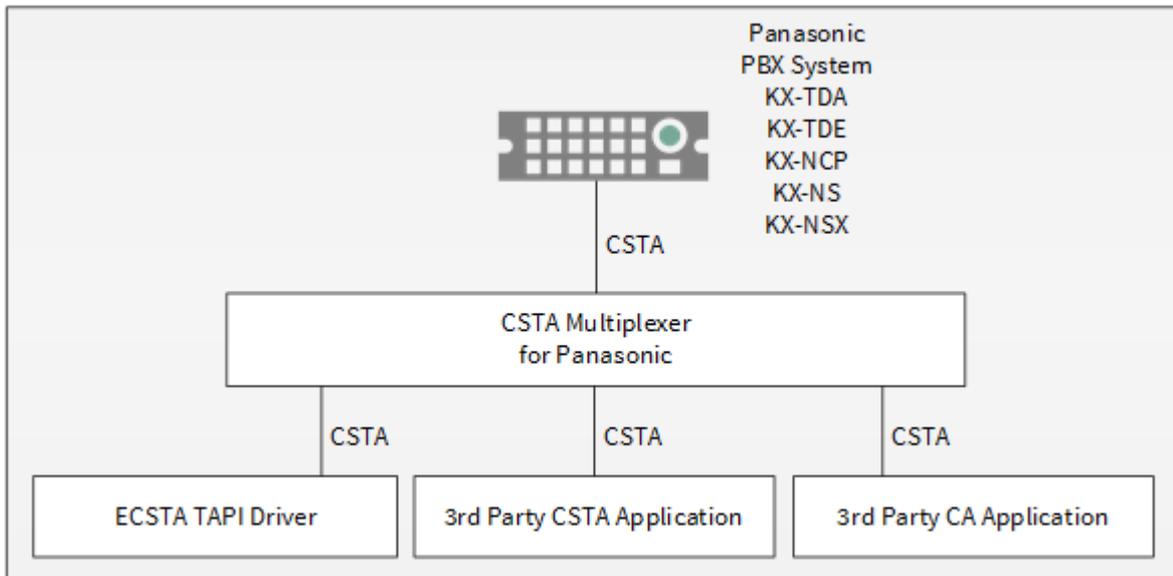


# 1 Introduction

## CSTA Multiplexer

estos CSTA Multiplexer for Panasonic is a CSTA Server that allows multiple CSTA Applications to access the Panasonic PBX system. The CSTA Interface of the Panasonic PBX system may only be used by one CSTA Application at the same time. Using the estos CSTA Multiplexer for Panasonic, the interface is accessible by multiple applications at the same time.

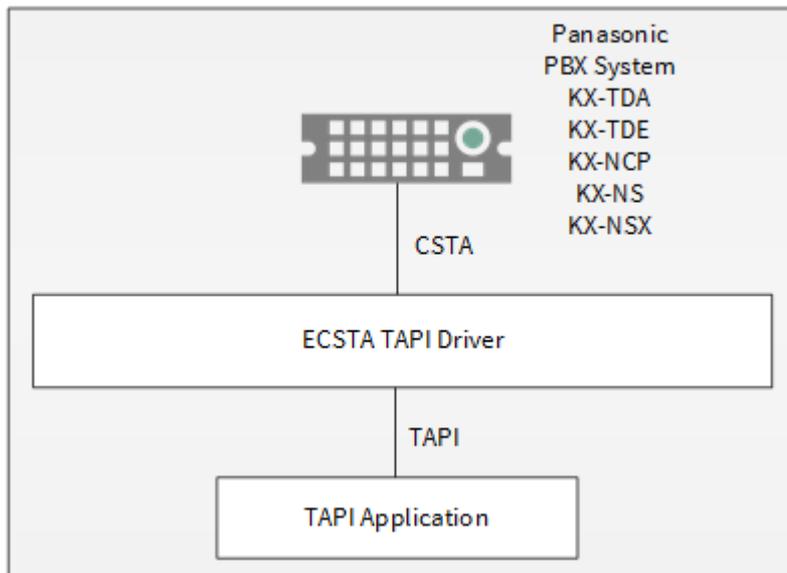
See also CSTA Multiplexer.



## Tapi Driver

estos ECSTA for Panasonic 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 Panasonic uses the CSTA protocol for connecting to the PBX system.

See also TAPI Driver.



For installation of the driver see Driver Installation.

For administration of the driver see Driver Administration.

### Using the driver 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 information across the network using a graphical client or a multi-line 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 ECSTA Tapi for Panasonic

estos ECSTA for Panasonic can be used to control and monitor telephone devices attached to a Panasonic PBX system. The driver can be installed in multiple instances. Each driver instance supports the connection to one PBX system.

The connection to the PBX system is established using CSTA Phase III.

The connection may be established using LAN (TCP/IP) only.

### Super-Twin Features

The driver supports the Super-Twin feature. A DECT system phone is paired to a desk phone. The driver automatically detects this situation. When making an outbound call using the DECT phone, it cannot automatically dial handsfree. It is required to press the hookswitch on the DECT phone.

The driver can automatically load all currently available devices from the PBX system.

For Installation of the driver see Driver Installation.

For administration and configuration of the driver see Driver Administration.

### 2.1 Requirements

A Panasonic PBX system is required. The following series are supported:

- KX-TDA30
- KX-TDA50
- KX-TDA100/200
- KX-TDA600
- KX-TDE100/200
- KX-TDE600
- KX-NCP500/1000
- KX-NS Series
- KX-NSX Series

The connection may be established using LAN (TCP/IP) only.

The connection to the PBX system is established using CSTA Phase III.

Licenses in the PBX system:

For the PBX series KX-NS a 3rd Party CTI Link license (Activation Key: KX-NSF101 or KX-NSA020) is required.

For the PBX series KX-NSX a 3rd Party CTI Link license (Activation Key: KX-NSXF004) is required.

For the PBX series KX-NCP/TDE/TDA no 3rd Party CTI Link license is required.

To use this drivers in combination with a KX-NSX series PBXs, estos ProCall release version 5.0.70 or later is required.

The estos ECSTA for Panasonic 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
- Windows® 8
- Windows® 8.1
- Windows® 10
- Windows Server® 2008
- Windows Server® 2008 R2
- Windows Server® 2012

- Windows Server® 2012 R2

## 2.2 Installation

For installation and administration of the driver see Driver management.

When setting up the driver, follow these steps:

1. Configure telephone system  
Check the PBX Configuration.
2. Run driver setup  
Launch the *ecstaPanasonic.msi* (32 Bit Systems) or *ecstaPanasonic\_x64.msi* (64 Bit Systems).
3. Establish the connection to the PBX System  
Configure the connection to the PBX system. Each instance of the driver supports the connection to one PBX system.
4. Line configuration  
The driver to automatically load all currently available devices from the PBX system.

## 2.3 Driver Management

### 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 PBX system 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.

## 2.4 Configure telephone system

The PBX system configuration can be accessed using the Panasonic PBX Unified Maintenance Console.

### CTI Port Number

The default setting for the CTI Port Number is 33333.

### Required licenses in the PBX system

PBX system	Required activation keys
KX-NS Serie	3rd Party CTI Link (KX-NSF101 or KX-NSA020)
KX-NSX Series	3rd Party CTI Link (KX-NSXF004)
KX-NCP/TDE/TDA series	No

## 2.5 General Settings

### Connection directly to the PBX system

The connection to the PBX system is established using TCP. Enter the Host Name or IP Address of the PBX system. The default port for TCP is 33333.

### Connection to the estos CSTA Multiplexer for Panasonic

The connection to the PBX system is established using the CSTA Multiplexer. Enter the host name or IP Address of the CSTA Multiplexer. The default Port for TCP is 33333.

### TLS

The connection to the CSTA Multiplexer may be encrypted using TLS. The CSTA Multiplexer must be configured for TLS using a valid certificate. In this case the host name from the certificate must be used. The default port for TLS is 33334.

### Login

For the connection to the CSTA Multiplexer a user name and password is required. Enter the CSTA user and password as configured in the CSTA Multiplexer. The default setting is admin / admin.

## 2.6 Line Settings

Here you see all lines, the driver offers as Tapi Lines. The phone numbers are the internal callnumbers of your devices, the names are used for display only.

### Phone Number Format

The lines can optionally be indicated 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.

### Manual addition of a line

Give the internal phone number of the phone. Optionally, a name can also be given.

### Extras - Query available lines

The currently available lines are automatically read from the PBX system.

### 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.

## 3 Location Settings

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

### Extension Range

Indicate here which internal phone numbers exist in the phone system. This information is used to determine the available lines from the phone system.

### 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.

### 3.1 Advanced Settings

Phone Number Format:

- 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.

Read names of the lines

If this option is active the driver will read the phones names from the PBX.

Advanced Parameters:

- 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. 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.

### 3.2 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 Dialing  
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 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 sub-string "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 "8 9" will match '8' as well as '9'.
.	The dot (.) will match any character.
*	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 asterisk 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 characters that are permitted at this point.
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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\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).	^([0-9][0-9][0-9][0-9].*)	08151\1

See also Location.

### 3.3 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.

### 3.4 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
Pickup	TSPI_linePickup
DTMF dialing	TSPI_lineGenerateDigits
Dial in dial tone mode	TSPI_lineDial
Call completion	TSPI_lineCompleteCall (LINECALLFEATURE2_COMPLCALLBACK)
Intrusion on existing call	TSPI_lineCompleteCall (LINECALLFEATURE2_COMPLINTRUDE)

Forwarding	<p>TSPI_lineForward TSPI_lineGetAddressStatus</p> <ul style="list-style-type: none"> <li>• LINEFORWARDMODE_UNCOND</li> <li>• LINEFORWARDMODE_UNCONDETERNAL</li> <li>• LINEFORWARDMODE_UNCONDINTERNAL</li> <li>• LINEFORWARDMODE_BUSY</li> <li>• LINEFORWARDMODE_BUSYEXTERNAL</li> <li>• LINEFORWARDMODE_BUSYINTERNAL</li> <li>• LINEFORWARDMODE_NOANSW</li> <li>• LINEFORWARDMODE_NOANSWEXTERNAL</li> <li>• LINEFORWARDMODE_NOANSWINTERNAL</li> </ul>
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The following TAPI functions are implemented due to requirements of the TAPI subsystem.

Other functions exported by the driver:

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

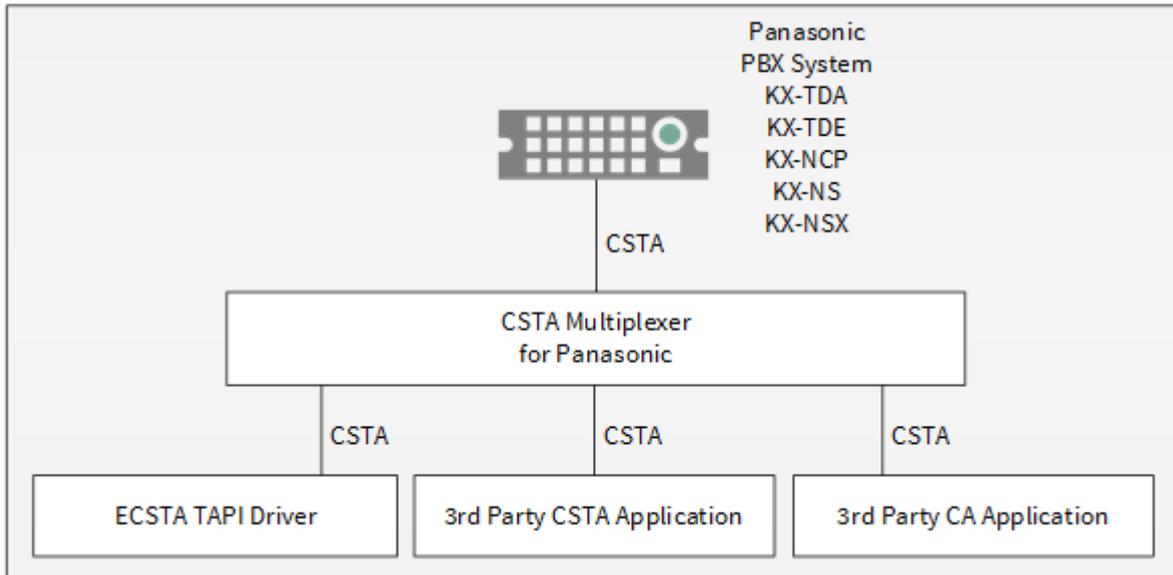
TUISPI\_providerGenericDialogData

#### Super-Twin Feature

The driver offers two addresses for each line. The second address contains the label 'Mobile'. The second address will only be used with line devices that have a Super-Twin DECT slave device.

## 4 estos CSTA Multiplexer for Panasonic

The Panasonic PBX systems allow only one concurrent CSTA connection. To allow multiple CSTA Applications at the same time, a CSTA Multiplexer is required.



The CSTA Multiplexer connects to the PBX system. The CSTA Applications connect to the CSTA Multiplexer.

Supported Connections:

Type	Count
CTI Application	1000
CDR Application	1
Hotel Application	1
Panasonic CA Server	0 - The Panasonic CA server uses beside a CSTA connection undocumented and undisclosed other connections to the PBX.

### 4.1 Requirements

A Panasonic PBX system is required. The following series are supported:

- KX-TDA30
- KX-TDA50
- KX-TDA100/200
- KX-TDA600
- KX-TDE100/200
- KX-TDE600
- KX-NCP500/1000

- KX-NS1000

The connection may be established using LAN (TCP/IP) only.  
The connection to the PBX system is established using CSTA Phase III.

Licenses in the PBX system:

For the PBX series KX-NS1000 a 3rd Party CTI Link license (Activation Key: KX-NSF101) is required.  
For the PBX series KX-NCP/TDE/TDA no 3rd Party CTI Link license is required.

The estos ECSTA for Panasonic requires a Windows® Operating System. The following versions are supported in 32- and 64-bit:

- Windows® 7
- Windows® 8
- Windows® 8.1
- Windows® 10
- Windows Server® 2008
- Windows Server® 2008 R2
- Windows Server® 2012
- Windows Server® 2012 R2

## 4.2 Configure telephone system

The PBX system configuration can be accessed using the Panasonic PBX Unified Maintenance Console.

CTI Port Number

The default setting for the CTI Port Number is 33333.

Required licenses in the PBX system

PBX system	Required activation keys
KX-NS1000	3rd Party CTI Link (KX-NSF101)
KX-NCP/TDE/TDA series	No

## 4.3 Installation

During the server setup, proceed as follows:

1. Configure telephone system  
Check the PBX Configuration.
2. Run Server Setup  
Run the ecstaPanasonicMultiplexer.msi (32 Bit Systems) or ecstaPanasonicMultiplexer\_x64.msi (64 Bit Systems).
3. Establish the connection to the PBX System  
Configure the connection to the PBX System.
4. Configure the CSTA Server  
Enter on which port the server is listening and optionally configure TLS communication.

## 4.4 Connection to the PBX system

### Connection to the PBX system

The connection to the PBX system is established using TCP. Enter the Host Name or IP Address of the PBX system. The default port for TCP is 33333.

### Connection Status

Here you can see if the CSTA Multiplexer has established a connection to the PBX System. As long as there is an active connection you will see additional information.

## 4.5 CSTA Server

This dialog is used to configure the CSTA server.

### TCP port and IP interface

On this IP Port (Default 33333) the CSTA Server listens for incoming TCP connections (no encryption). In case you are only using a local CSTA application that is installed on the same computer, you may choose the local IP interface '127.0.0.1' here.

### TLS port and IP interface

On this IP Port (Default 33334) the CSTA Server listens for incoming TLS connections (encrypted). This requires a TLS/SSL certificate.

### Certificate for the TLS/SSL communication

For the encrypted communication over TLS (Transport Layer Security), a server certificate is required. A server certificate is used to uniquely identify a server. The certificate must be issued to the FQDN (fully qualified domain name) of the server. The server certificate must be issued by a trusted certification authority.

Certificates are configured in the Certificate Snap-In of the Management console (MMC).

The certificate must be saved in the 'Local Computer' certificate store. They must contain a private key. The 'Local Computer' certificate store can be opened using the MMC console.

- From the Windows® start menu choose Run... and enter mmc.exe
- Choose File | Add/remove SnapIn...
- Choose Add. From the list of available Snap-Ins choose Certificates. Choose Computer account, Local computer and press Finish
- In the list navigate to Certificates (Local computer) / Personal Certificates

A certificate can be issued either in the own company using a 'Windows® Certificate Authority' or from several companies like <http://www.startssl.com>.

### CSTA Login

Enter a user name and password. This login is required by the estos ECSTA for Panasonic driver to connect to this server. The default user is 'admin', the default password is 'admin'. For unencrypted TCP connections the login is not required. This allows third party applications that normally connect directly to the PBX system to use this Multiplexer. For SSL/TLS connections the login is required.

## 4.6 Server Service

On this dialog you see the status of the server service and you may start and stop the server service.

### Server Service

The CSTA Multiplexer runs a Windows® System Service. The Service is registered during installation and started after configuration.

In case one of the following errors occurs during the server startup, the server will fail to start:

- TCP IP port cannot be opened (another application is using it)
- TLS IP port cannot be opened (another application is using it)
- TLS server certificate is not valid

## 4.7 Supported CSTA Functions

### General

The supported CSTA interface is compatible to the Panasonic PBX - CTI Version 6.000 and is related to the Panasonic CSTA Documentation Revision 4.03.

### ACSE Login

The ACSE Login is compatible with the login to the Panasonic CSTA interface. Additionally the CSTA Application may submit a user name and password. This is required when using the SSL/TLS encrypted connection.

The login is transmitted using ACSE-calling\_authentication\_value-external-encoding-single\_ASN1\_type-sender\_authentication. The user is transmitted as authentication\_name, the password as authentication\_password. The string encoding is UTF-8.

### General CSTA Functions

All CSTA Commands that an application sends to the Multiplexer will be forwarded to the PBX system. Please note the following exceptions:

Function	Comment
MonitorStart	The monitoring for each device is started only once in the PBX system and distributed to all interested applications.
MonitorStop	The monitoring for each device will be stopped in the PBX system after the last application has called MonitorStop for the device.

### CSTA Events

The following events will be distributed by the Multiplexer to all applications:

Function	Comment
EventReport	The CSTA event will be sent to all applications that called MonitorStart for the device.
SwitchingFunctionDevicesChanged	The CSTA Event will be sent to all applications.

### Panasonic Private Extensions

All Panasonic Private Extensions (KMESpecificPrivateData) will be transmitted.

### Call Detail Record (CDR) Services

The commands 'StartCallDetailRecordsTransmission', 'StopCallDetailRecordsTransmission' and the associated event 'CallDetailRecordsReport' can be used only by one CSTA application that is connected to the Multiplexer. Only one registration with 'StartCallDetailRecordsTransmission' is allowed. In case an

application is already registered, subsequent invocations will be answered with an error (operations error - generic). All 'CallDetailRecordsReport' events are always forwarded to the application that registered with 'StartCallDetailRecordsTransmission'. The Multiplexer makes sure that all CDR Reports will be delivered to the application. In case a CDR report cannot be forwarded to the application or the application does not respond to the report, the Multiplexer sends a negative response to the PBX system and stops CDR transmission with 'StopCallDetailRecordsTransmission'. The CSTA connection to the application will be disconnected.

#### Data Collection Services

The command 'StartDataCollection', 'StopDataCollection' and the associated event 'DataCollected' can be used only by one CSTA application that is connected to the Multiplexer. In case an application has called 'StartDataCollection', subsequent invocations by other applications will be answered with an error (operations error - generic).

## 5 Info about estos ECSTA for Panasonic

estos ECSTA for Panasonic is a product of estos GmbH.

Product updates may be found on <http://www.estos.de>.

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

### Diagnostic

For diagnostic purposes the driver can create log files. These are stored in the specified path.

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