estos ECSTA for Avaya CS1000

5.0.17.794

1   Introduction

estos ECSTA for Avaya CS1000 offers multiple Telephony Service Providers for Microsoft® Tapi 2.1 (also 2.2 and 3.0). These Tapi drivers implement a central communication between a Server and the Telephony system (PBX). On this server all devices from the PBX are shown as TAPI lines.
All estos ECSTA for Avaya CS1000 drivers use the powerful CSTA Interface to communicate with the PBX.
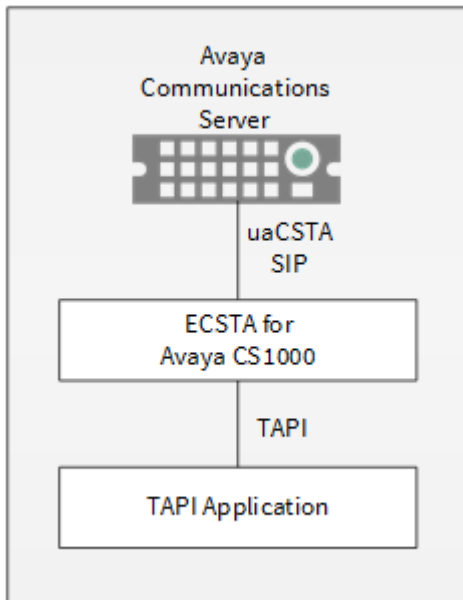
Supported PBX systems
All systems of the Avaya Communications Server 1000 / Meridian / Succession family.

PBX	Driver
CS 1000	ECSTA for Avaya
CS 2000	ECSTA for Avaya
CS 2100	ECSTA for Avaya

Installation
The driver is installed using a Microsoft® Installer setup.

1.   Setup for Communications Server

Multiple PBX systems
If you want to connect multiple CS1000 nodes or different service domains, you can install the driver several times.
This is done using the 'Advanced Phone and Modem Options. This program was installed with the driver and is located in the Control Panel.

Supported Operating systems
These are described in Software requirements.

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 CS1000 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

3   Communications Server

In the arrangement of the driver with a CS1000, proceed as follows:

1. **Check network connection**
   Test availability of the CS1000 node or the NRS (ping hostname / IP Addresse).
2. **Configuration of the CS1000 node**
   Configure the SIP Cti service in the CS1000 node over the Element Manager. See CS1000 node configuration.
3. **Configuration of the Network Routing Service (Optional)**
   Configure Gateway Endpoints in the NRS. See Configure Network Routing Service.
4. **Additional instruction regarding the configuration of the CS1000 participants and the overall system (Version 7.x)**
   Various settings in CS1000 must be set properly in addition to the connection configuration itself. See Configuration Details.
5. **Driver installation**
   See also Settings

3.1   General Settings

The connection to the PBX system is established using SIP / TCP.
The connection is established either directly to a CS1000 node or to a Network Routing Service (NRS).

Connect to Communications Server
This is a direct connection to the CS1000 node. Input the IP address of the CS1000 server nodes here. The standard TCP Port for the SIP connection is 5060.
See also configuring CS1000 Node.

Connect to Network Routing Service
Input the IP address of the primary and optionally the secondary NRS here. The standard TCP Port for the SIP connection is 5060.
Connection over the NRS requires the configuration of the CS1000 node sip URI and the ECSTA gateways sip URI.

- ECSTA Gateway sip URI
  Input the sip URI of the gateway Endpoint, that is configured in the NRS for this instance of the ECSTA.
  Example: sip:ecsta@service_domain
  See also configuring Network Routing Service.

CS1000 Node sip URI
Input the sip URI of the CS1000 node, for the devices that are supposed to be used over this instance of the ECSTA. The sip URI Endpoint consists of the sip Gateway Endpoint Name from the CS1000 node configuration and the service domain.
See also configuring CS1000 Node.

The CS1000 node must be registered in the NRS configuration under gateway Endpoints.
Example: sip:SS_SIP@service_domain
See also configuring Network Routing Service.

Link to interface IP / TCP port
For SIP communication an IP port is required. This is automatically registered in the Windows® Firewall.
You can link the SIP communication to a specific IP interface. Please note that the IP interface used must be located on the same network segment as the CS1000 node or the NRS.

3.2 TAPI Lines

Please add all Lines, that should be available as TAPI lines on the PC.

Manual Add/Remove Lines:
Please enter the internal dialing numbers and the name of the telephony device.

Load Lines from PBX:
All known device numbers are queried from the PBX system. All devices are queried that are in the range set in Advanced Settings.

Import text:
You may import simple text files with the line numbers and names. The content of the text file should be one extension (line) in each line of text. The separator is automatically detected. Example of text file content:
100,Extension 100
101,Office
102,Secretary

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.

Location
You can enter the number of the line in supercanonical format e.g. *+49(30)12345-123*. You should use the supercanonical number format if you are using several instances of Tapi drivers and connecting to several PBX sytems at the same time. **In this case you should configure the data in the location dialog.**
Please note that the entry is in accordance with the following example. The internal extension has to be separated from the remainder with the minus sign '-'. If the connected PBX systems have no consistent numbering plan, you would get duplicate internal extensions as tapi lines. In the location dialog you may enter the following data.

- Country Code
  The country code for Germany is 49, for the USA 1, for Switzerland 41. You can find more country codes in the telephone directory.
- Area code
  The area code is only necessary in countries where it exists.
- PBX phone number
  The PBX number is the remaining part between the area code and the direct access number.

The components and assemblies of an area code are: +country code(area code)PBX phone number-internal extension.

3.3 Location Settings

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

Phone Number 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.

phone-context of the telephone URI
Enter the phone-context, that is used for addressing the phone devices. This is either the domain or

'dialstring'.

Each phone device is represented by a tel URI. This is for example: tel:12345;phone-context=dialstring.

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.

3.3.1 Phone number formatting

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 enties will be ignored.

A differentiation is made between categories:

- **Incoming**
  Phone numbers for incoming calls which are reported to the PC by the phone system are formatted with these rules.
- **Outgoing**
  Numbers for outgoing calls which are reported to the PC by the phone system are formatted with these rules.
- **PC dialling**
  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 find a phone number.

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

A brief overview of the permitted 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 "1|2" will match '1' as well as '2'.
.	The dot (.) allows any character (or any number).
*	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 an 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 outpout without modification.

Examples:

Effect	Search for	Replace with
Removal of a leading 0	^0(.*)	\1
Replacing a 80 at the beginning of a number (e.g. targeted external dialling code) with 0	^80(.*)	0\1
Removal of a private PIN which is added to the beginning of a phone number as 50xxx	^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 external dialling code code (leading 0) for all numbers with more then 3 digits	^([0-9][0-9][0-9].+)	0\1
Add the phone system base number (03012345) to all internal numbers (1 to 3 digits in length)	^([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

3.4   Advanced Settings

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.
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.

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 montoring at regular intervals.
Enter a time interval in seconds.

3.5   Licences

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.

4   Configure Network Routing Service

The connection to the telephone system can be made through the Network Routing Service (NRS). This requires the CS1000 node and the ECSTA driver to be configured as Gateway Endpoints in the corresponding Service Domain.

4.1   Configuration details for Avaya CS1000 Version 6.5 and earlier versions

1. **Open the Network Routing Service Manager.**
   Navigate to the Network Routing Service in CS1000 Element Manager and open the Network Routing Service Manager. Enter user name and password.

2. **Switch to Standby DB view**
   In order to add a Gateway Endpoint or to change settings, this must be done in the mode standby DB view.

3. **Navigate to Configuration - Gateway Endpoints**
   Select the Service Domain to be used. Press 'Show'.

4. **Check the Gateway Endpoint for the ECSTA Drivers**
   You need a Gateway Endpoint to add ECSTA drivers.

Endpoint Name	ecsta (ECSTA Gateway sip URI user part)
Endpoint authentication enabled	Not configured
Static endpoint address type	IP version 4
H.323 Support	H.323 not supported
SIP support	Dynamic SIP endpoint
SIP transport	TCP
SIP port	5260 (ECSTA TCP Listen Port)

5.
6. **Save the changes**
   Under Tools - Database Actions, run 'Cut over and Commit.'

4.2   Configuration details for Avaya CS1000 Version 7.0 and later versions

1. **Open the Networks Routing Service Manager**
   Navigate in the CS1000 Element Manager to Network Routing Service and open the Network Routing Service Manager. Log on.

2. **Open the End Points view under Numbering Plans.**
   To add a gateway endpoint or to change settings, the Managing mode must be set to the Standby Database Mode. Add a new endpoint under the Gateway Endpoints item.

3. **Configure the new gateway endpoint as follows:**

Endpoint Name	ecsta (ECSTA Gateway sip URI user part)
Endpoint authentication enabled	Authentication off
Static endpoint address type	IP version 4
H.323 Support	H.323 not supported
SIP support	Dynamic SIP endpoint
SIP mode	Proxy mode
SIP TCP transport enabled	activate
SIP TCP port	5260 (ECSTA TCP Listen Port)

4.
5. **Save the changes**
   Save the settings for the gateway endpoint Execute the Cut Over and then the Commit menu options under System Database.

5   Configure CS1000 node

The connection with the PBX system can be established via the Network Routing service (NRS) or directly to a CS1000 node. In any case, the SIP Cti service must be configured in the CS1000 node.

5.1   Configuration details for Avaya CS1000 Version 6.5 and earlier versions

1. **Open the Element Manager**
   Open the

2. **Navigating to the CS1000 node.**
   Navigate under System - IP Network - Nodes: Servers, Media Cards CS1000 to the node you want to configure. Click 'Edit ...' on the corresponding node

3. **Activating the SIP CTI Service**
   In SIP, CTI services, please check the following settings:

Service Enabled	aktivieren
Support TLS Endpoints Only	deaktivieren

4.
5. **Save the changes**

5.2   Configuration details for Avaya CS1000 Version 7.0 and later versions

1. **Open the Element Manager**
   Open the

2. **Navigating to the CS1000 node.**
   Navigate to the CS1000 node that you want to configure under System - IP Network - Nodes: Servers, Media Cards. Open the corresponding node.

3. **Open Gateway (SIPGw & H323Gw) under Applications.**
   You will find the SIP URI's domain component for the CS1000 node and for the ECSTA node (for the configuration in ECSTA) under the SIP Domain item.
   You will find the SIP URI's user component for the CS1000 node under the Gateway Endpoint Name item (for configuration in ECSTA).

4. **Activating the SIP CTI Service**
   Check the following settings under the SIP CTI service:

Enable CTI service	activate
TLS Endpoints only	deactivate
Calling device URI format	Check that the URI notation configured here agrees with the URI notation in ECSTA configured under the Location Phone context.

5.
6. **Save the changes**

6 CS detail configuration

1. **An Elan 32 must have been programmed (it absolutely must be Elan 32).**

```
2.
3. ld 22
4.
5. REQ prt
6. TYPE adan elan
7. ADAN ELAN 32
8.   CTYP ELAN
9.   DES Application
10.  N1 512
```

11. **A VAS ID 32 must have been programmed.**

```
12.
13.  REQ prt
14.  TYPE vas
15.  VAS
16.    VSID 032
17.    ELAN 032
18.    SECU YES
19.    INTL 0001
20.    MCNT 9999
```

21. **SIP CTI licenses must be present.**

```
22.
23. ld 22
24.
25.  REQ slt
26.  System type is - Communication Server 1000E/CP PMCP PM - Pentium M
   1.4 GHz
27.  IPMGs Registered: 24IPMGs Unregistered: 0IPMGs
   Configured/unregistered: 0
28.
29.  TRADITIONAL TELEPHONES 68 LEFT 59 USED 9
30.  DECT USERS 0 LEFT 0 USED 0
31.  IP USERS 1305 LEFT 0 USED 1305
32.  BASIC IP USERS 0 LEFT 0 USED 0
33.  TEMPORARY IP USERS 0 LEFT 0 USED 0
34.  DECT VISITOR USER 0 LEFT 0 USED 0
35.  ACD AGENTS 940 LEFT 57 USED 883
36.  MOBILE EXTENSIONS 5 LEFT 5 USED 0
37.  TELEPHONY SERVICES 25 LEFT 25 USED 0
38.  CONVERGED MOBILE USERS 0 LEFT 0 USED 0
39.  AVAYA SIP LINES 0 LEFT 0 USED 0
40.  THIRD PARTY SIP LINES 0 LEFT 0 USED 0
41.
42.  PCA 40 LEFT 40 USED 0
43.  ITG ISDN TRUNKS 0 LEFT 0 USED 0
44.  H.323 ACCESS PORTS 20 LEFT 8 USED 12
45.  AST 1605 LEFT 358 USED 1247
46.  SIP CONVERGED DESKTOPS 0 LEFT 0 USED 0
47.  SIP CTI TR87 1225 LEFT 1224 USED 1
48.  SIP ACCESS PORTS 1475 LEFT 909 USED 566
49.  RAN CON 124 LEFT 124 USED 0
50.  MUS CON 300 LEFT 272 USED 28
51.
52.  IP RAN CON 0 LEFT 0 USED 0
53.  IP MUS CON 0 LEFT 0 USED 0
54.  IP MEDIA SESSIONS 0 LEFT 0 USED 0
55.  TNS 65535 LEFT 59490 USED 6045
56.  ACDN 24000 LEFT 23387 USED 613
57.  AML 16 LEFT 14 USED 2
```

```
58.  IDLE_SET_DISPLAY HRG
59.  LTID 65535 LEFT 65535 USED 0
60.  RAN RTE 512 LEFT 511 USED 1
61.  ATTENDANT CONSOLES 65535 LEFT 65535 USED 0
62.  IP ATTENDANT CONSOLES 0 LEFT 0 USED 0
63.  BRI DSL 10000 LEFT 10000 USED 0
64.  DATA PORTS 65535 LEFT 65535 USED 0
65.  PHANTOM PORTS 65535 LEFT 65508 USED 27
66.  TRADITIONAL TRUNKS 65535 LEFT 65145 USED 390
67.  ELC ACCESS PORTS 0 LEFT 0 USED 0
68.  DCH 254 LEFT 239 USED 15
```

69. **The telephones to be controlled must have the T87A prompt in the Class of Service (T87D is the default).**

Likewise, IAPG must have been set to 1 and AST must show the key to be monitored. In this example, the key is 0 and AST is also 0 for that reason.

```
70.
71.  LD 20
72.  REQ:PRT
73.  TYPE:1140
74.  DES 1140
75.  TN 188 0 08 01 VIRTUAL
76.  TYPE 1140
77.  CDEN 8D
78.  CTYP XDLC
79.  CUST 0
80.  NUID
81.  NHTN
82.  CFG_ZONE 00177
83.  CUR_ZONE 00177
84.  MRT
85.  ERL 0
86.  ECL 0
87.  FDN
88.  TGAR 0
89.  LDN NO
90.  NCOS 7
91.  SGRP 0
92.  RNPG 177
93.  SCI 0
94.  SSU 0177
95.  LNRS 20
96.  XLST 2
97.  SCPW 1234
98.  SFLT NO
99.  CAC_MFC 0
100. CLS TLD FBD WTA LPR PUA MTD FND HTD TDD HFA CRPA
101.     MWA LMPN RMMD AAD IMD XHD IRD NID OLD VCE DRG1
102.     POD SLKD CCSD SWD LNA CNDA
103.     CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBD
104.     ICDD CMD MCTD CLBD AUTU
105.     GPUD DPUD DNDD CFXA ARHD FITD CLTD ASCD
106.     ABDD CFHD FICD NAID BUZZ AGRD MOAD
107.     UDI RCC HBTD AHA IPND DDGA NAMA MIND PRSD NRWD NRCD NROD
108.     DRDD EXR0
109.     USRD ULAD RTDD RBDD RBHD PGND OCBD FLXD FTTC DNDY DNO3 MCBN
110.     FDSD NOVD VOLA VOUA CDMR PRED RECD MCDD T87A SBMD
111.     KEM3 MSNV FRA PKCH MUTA MWTD DVLD CROD ELCD
112. CPND_LANG ROM
113. RCO 0
114. HUNT
115. PLEV 02
116. PUID
```

```
117. UPWD
118. DANI NO
119. AST 0                                                          17
120. IAPG 1
121. AACS NO
122. ITNA NO
123. DGRP
124. MLWU_LANG 0
125. MLNG FRE
126. DNDR 0
127. KEY 00 SCR 330032 3832 MARP
128.  CPND
129.  CPND_LANG ROMAN
130.  NAME COMS, Room
131.  XPLN 23
132.  DISPLAY_FMT FIRST,LAST
133.  01 ADL 20
134.  02 ADL 20
135.  03 ADL 20
136.  04 ADL 20
137.  05 ADL 20
138.  06 ADL 20
139.  07 ADL 20
140.  08 ADL 20
141.  09 ADL 20
142.  10 ADL 20
143.  11 ADL 20
144.  12
145.  13
146.  14
147.  15
148.  16 MWK 330345
149.  17 TRN
150.  18 AO6
151.  19 CFW 20
152.  20 RGA
153.  21
154.  22 RNP
155.  23 SSU 0177
156.  24
157.  25
158.  26
159.  27
160.  28
161.  29
162.  30
163.  31
164. DATE 10 DEC 2011
```

7   Supported TAPI functions

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)
DTMF dialing	TSPI_lineGenerateDigits
Add to conference	TSPI_lineAddToConference
Dial in dial tone mode	TSPI_lineDial
Forwarding	TSPI_lineForward TSPI_lineGetAddressStatus • LINEFORWARDMODE_UNCOND

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 Avaya CS1000

estos ECSTA for Avaya CS1000 is a product of estos GmbH.

Product updates can be found under https://www.estos.de/.

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

Diagnosis
Log files can be created for troubleshooting. These are stored in the specified path.

Active Directory®, Microsoft®, Windows Server®, Windows® are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

All brands and product names used in this document are for identification purposes only and may be trademarks or registered trademarks of their respective owners.