

ShoreWare CSTA Server Installation Guide

Version 1.0

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Table of Contents

Deployment Considerations.....	5
Requirements.....	5
System Overview.....	6
Installation and Configuration.....	7
Advanced Configurations.....	9
<i>Translating Numbers Received from uaCSTA Clients.....</i>	<i>10</i>
<i>Translating Numbers to be Delivered to uaCSTA Clients.....</i>	<i>11</i>
<i>Configuring Dialplan for On-Net Dialing.....</i>	<i>12</i>
Update Existing Installations.....	15
Troubleshooting.....	16
Appendix 1: Configuration File Details.....	17
Appendix 2: Installer Parameters.....	19





ShoreWare CSTA Server Installation Guide

1. Deployment Considerations

The ShoreWare CSTA Server package, v1.0 is designed to be deployed in conjunction with a single ShoreTel System installation (i.e. a single switching domain). The concept of sub sites is currently not supported. This means CSTA Server treats all numbers presented in canonical, or international, format as either PSTN numbers or as extensions in a single ShoreTel System. Calls to PSTN numbers placed through a given CSTA Server will be placed using configured trunk access codes. Users may place external calls with arbitrary dialing prefixes by explicitly entering the desired prefix followed by the appropriate dialable number.

If a deployment requires that different groups of users or applications have different default trunk access codes this can be accomplished by installing ShoreWare CSTA Server on multiple servers, configuring each with a different trunk access code, and assigning users and/or applications to work with the appropriate server.

2. Requirements

A server for the ShoreWare CSTA Server package must satisfy the following requirements:

- Windows 2003 Server
- At least 1024 MBytes of RAM
- At least 200 MBytes of free disk space
- A network adapter card for the TCP/IP connection
- A Java Runtime (at least JRE v1.4 or higher)
- The ShoreTel TAPI Service Provider for application server mode

For additional hardware requirements for the ShoreWare Remote Application Server, refer to the *ShoreTel Planning and Installation Guide*.

An appropriate ShoreWare CSTA Server license file is needed in order to complete the installation.

If the ShoreWare CSTA Server is to be used with Microsoft LCS or OCS there must be at least one Microsoft Live Communications Server 2005 or Microsoft Office Communications Server 2007 accessible to the ShoreWare CSTA Server.

Before beginning the installation process be sure to review all the information in this document, determine how many ShoreWare Remote Application Servers your deployment will require, and complete the *Shoreware CSTA Server and OCS Remote Application Server Planning Worksheet* for each.



3. System Overview

Figure 1, below, illustrates a typical deployment diagram for a ShoreWare CSTA Server deployment.

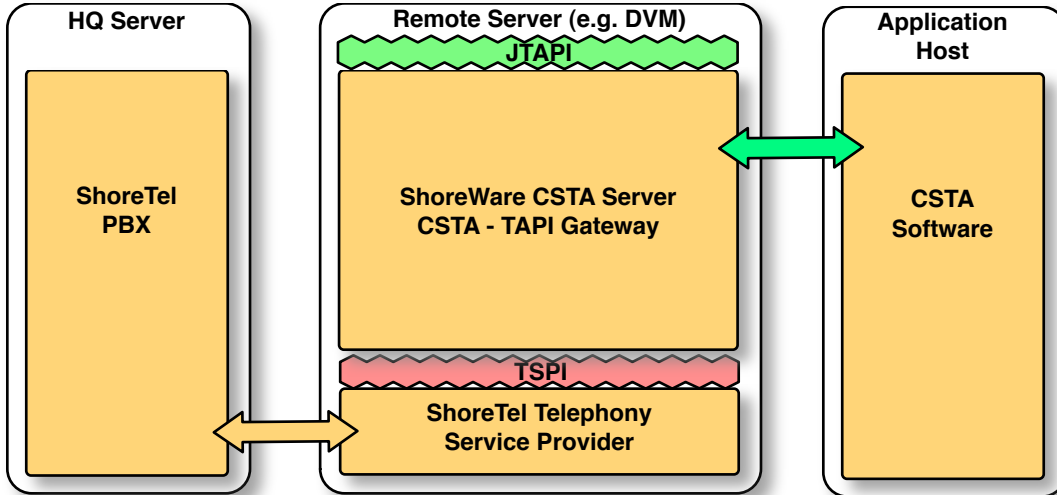


Figure 1—Typical deployment of ShoreWare CSTA Server

The ShoreWare CSTA Server package is to be installed on a ShoreTel Remote Server also known as a Distributed Voice Mail (DVM) Server. The ShoreTel Telephony Service Provider (RpcTspX.tsp) must be installed on this server.

Firewall rules on the DVM server and network settings must allow clients to connect to the ShoreWare CSTA Server service on the DVM Server. The default TCP/IP port number for this access is 26535 (an alternative port number can be set during the installation process).

Figure 2, below, illustrates a typical deployment for a Microsoft Office Communications environment.

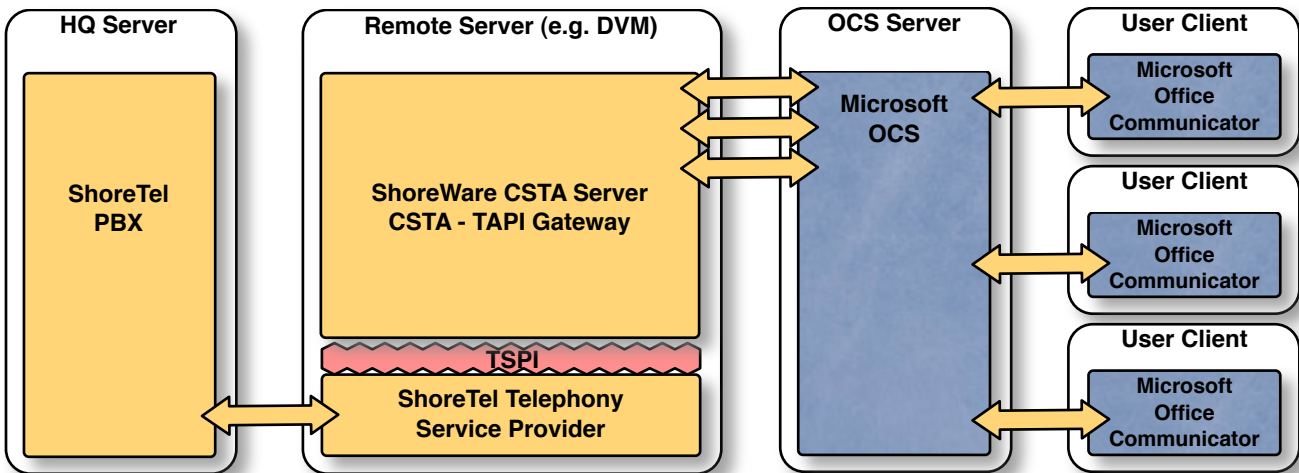


Figure 2—Deployment of ShoreWare CSTA Server in an OCS environment



4. Installation and Configuration

Copy the *ShoreWare CSTA Server.msi* installer file to the DVM server where CSTA Server is to be installed. Double click on the file and follow the instructions presented.

During the installation you are asked for your license file. If you do not have this license file you may abort the installation process and start again after obtaining it. If you proceed without it the ShoreWare CSTA Server package is set to demo mode—which means that your CSTA Server will be limited to monitoring exactly one device.

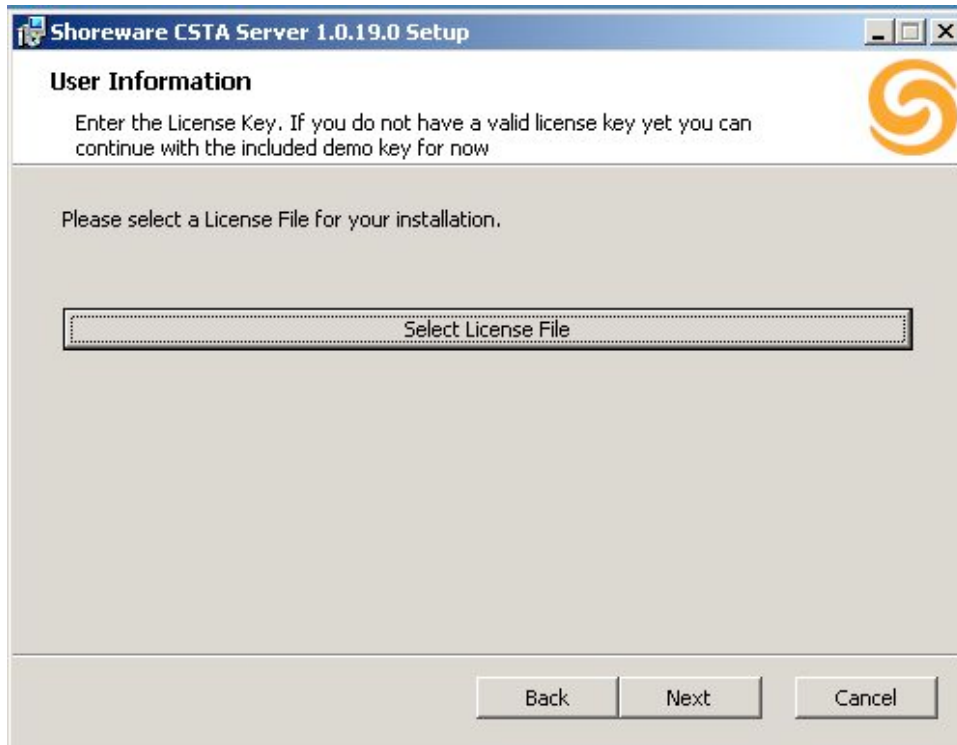


Figure 3—Installer Select License File step

During the installation process you will be asked to enter a Trunk Access Code and a DID Prefix.

Trunk Access Code: A trunk access code is the digit or digit sequence that is used to direct an outbound call to a desired trunk or trunk group. The CSTA Server will use the trunk access code specified during installation as the default value to prefix calls placed to external numbers. Typical examples:

Geographical Area	Typical Trunk Access Code
North America	9
Europe	0

If your ShoreTel System has multiple trunk access codes, enter the one that should be used by default for calls placed by users who will be configured for the Gateway you are installing. See the section *Advanced Configuration*, below, for information on manually configuring additional trunk access codes.



DID Prefix: The DID Prefix specifies the DID range in the PSTN that has been assigned to the ShoreTel System. If the ShoreTel System has multiple DID ranges, enter the DID prefix for the primary DID range and refer to the section below on multiple DIDs.

Note: Do not include spaces in the DID prefix

The DID Prefix consists of the unique digits, including the country code and the first digit of the extension range, that define a DID range in the PSTN. For example, if the DID range is +1(408)555-7000 through +1(408)555-7999 it means that the carrier has allocated all PSTN numbers starting with the digit sequence 14085557 to the ShoreTel System in question. In a typical configuration the ShoreTel System would assign these DID numbers to extensions 7000 through 7999 respectively. Some additional examples:

DID Range	DID Prefix
+1(408)555-0000 through +1(408)555-9999	+1408555
+1(408)555-1000 through +1(408)555-1999	+14085551
+1(408)555-1100 through +1(408)555-1199	+140828511
+1(408)555-1110 through +1(408)555-1119	+1408285111

Note: The installer only asks for a single DID Prefix so the one entered should be the primary DID prefix associated with the ShoreTel System. Additional DID range mappings must be added to the *DialPlan.conf* file manually (see below). The installer assumes that the ShoreTel System conforms to the convention that all extensions corresponding to the DID range start with the last digit of the ID Prefix. If this is not the case, the *DialPlan.conf* file must be manually corrected after the installation process is completed.

Shoreware CSTA Server 1.0.19.0 Setup

User Information

Enter the following information to configure the CSTA functionality

Trunk Access Code:

DID Prefix:

The DID Prefix consists of all digits, including country code, that are shared by all numbers in your DID range.

Examples:

For a range from +14085550500 to +14085550599, the DID Prefix is 140855505

For a range from +14085553000 to +14085553999, the DID Prefix is 14085553

For a range from +14085550000 to +14085559999, the DID Prefix is 1408555

To add support for additional DID ranges, please edit the dialplan.conf configuration file after installation is complete. Please refer to the documentation for additional information.

Back Next Cancel

Figure 4—Installer window



5. Advanced Configurations

The ShoreWare CSTA Server provides a telephone number mapping function for clients using the uaCSTA protocol such as Microsoft OCS software. The installer supports completely configuring this functionality for a new CSTA Server with a basic configuration. This consists of a ShoreTel System with a single DID range where every PSTN number in the range corresponds to an extension such that the extension number appears as the final digits of the PSTN number. For example if the DID range is +1(408)555-9400 through +1(408)555-9499 then the extension corresponding to the DID number +1(408)555-9432 is 432.

If one of these circumstances applies to your ShoreTel System, it is considered an advanced configuration:

- configured to use the On-Net Dialing feature
- multiple DID ranges
- extension numbers in the same DID range that start with different leading digits
- extension numbers that don't match the final digits of the corresponding DID numbers
- multiple trunk access codes that are to be used depending on the number dialed
- external numbers delivered by a trunk must be mapped before delivery to uaCSTA clients such as computers running Microsoft Office Communicator

All advanced configurations require that the *DialPlan.conf* configuration file be manually edited in order for the number mapping function for uaCSTA clients to operate correctly.

If On-Net Dialing is being used, the *Default.conf* configuration file must also be edited.

Both these configuration files are found in the configuration directory. By default, the installer creates the configuration directory at:

C:\Program Files\Shoreline Communications\ShoreWare Server\CSTA\Config

Be sure to plan such configurations using the *Shoreware CSTA Server and OCS Remote Application Server Planning Worksheet* before modifying any files. After modifying these configuration files the ShoreWare CSTA Server components must be restarted.

The Default.conf Configuration File

The *Default.conf* configuration file is a text file containing a list of key-value pairs. It can be edited using a text editor. The two keys that are used in configuring the software for mapping, or translation, of telephone numbers are `onNetPrefixList` and `maxExtensionLength`.

Key	Default	Comment
<code>onNetPrefixList</code>		List of prefixes used if ShoreTel On-Net Dialing feature is activated. All prefixes are listed on a single line separated by semicolons (";")
<code>maxExtensionLength</code>	5	Maximum number of digits in an extension number. Should be set to 3, 4, or 5.

Unless the On -Net Dialing feature is active, leave the value for `onNetPrefixList` blank. To configure support for On-Net Dialing, enter the list of all On-Net Dialing prefixes separated by semi colons. For example if you are using the On-Net Dialing prefixes 241, 242, and 243 then the value for the `onNetPrefixList` key is **241 ; 242 ; 243**.

Note: If you enable On-Net Dialing you must also make appropriate entries for each On-Net Dialing prefix in the *DialPlan.conf* file (see below).

For more information about the contents of the *Default.conf* configuration file and other ShoreWare CSTA Server Configuration files see Appendix 1.



The DialPlan.conf Configuration File

The configuration file *DialPlan.conf* contains two tables each consisting of two columns of values. The first columns of both tables start in the first character position and the second columns start after a run of tabs and/or spaces.

The first table is known as the “Extension Translation Table” and it starts after a line that reads:

```
--Extension Translation Table
```

The entries in this table tell the gateway how to map references to internal extensions between DID numbers and extension numbers that can be dialed by the ShoreTel System. The first column contains characters to match with an external number (including country code). The second column contains digits to substitute in order to form the corresponding extension number.

The second table is known as the “External Translation Table” and it starts after a line that reads:

```
--External Translation Table
```

The entries in this table tell the gateway how to map references to external numbers between DID numbers and digit sequences that can be dialed by the ShoreTel System. The first column contains characters to match with an external number (including country code). The second column contains digits to substitute in order to form the corresponding dialable sequence.

Note: All entries are evaluated in the order they appear in the *DialPlan.conf* file. For translation to occur correctly, make sure that every entry is in the correct order: from most specific to least specific.

Translating Numbers Received from uaCSTA Clients

Telephone numbers received from a uaCSTA client are first examined to determine if they are already dialable extension numbers (based on their length) or On-Net Dialing extensions (based on their prefix). If so, no translation is required.

Otherwise, these numbers are processed by matching the leading characters of the telephone number provided with an entry in the first column of the Extension Translation Table. If a match is found, the matching portion of the provided telephone number is replaced with the digits found in the corresponding entry in the second column.

The examples below illustrate the substitution process for mapping to extension numbers:

First Column	Second Column	Number Provided	Resulting Extension
+14085551	11	+14085551234	11234
+14085551	589	+14085551234	589234
+140828512	7	+14085551234	734
+14085551234	456	+14085551234	456



If no match is found in the Extension Translation Table, then the matching process is repeated using the External Translation Table. The leading characters of the provided telephone number are matched with an entry in the first column of the External Translation Table. If a match is found the matching portion of the provided telephone number is replaced with the digits found in the corresponding entry in the second column.

These examples illustrate the substitution process for mapping to a dialing sequence for an external number:

First Column	Second Column	Number Provided	Resulting External Dialing Sequence
+	9+	+14085551234	9+14085551234
+1	91	+14085551234	914085551234
+1408	9	+14085551234	95551234
+1212	81212	+12125551234	812125551234

Translating Numbers to be Delivered to uaCSTA Clients

Telephone numbers received from the ShoreTel System are first examined to determine if they are extension numbers (based on their length) or On-Net Dialing extensions (based on their prefix). If so, numbers are converted from extension numbers to numbers in “international format” by matching the leading digits of the extension number with an entry in the second column of the Extension Translation Table. If a match is found the matching portion of the extension number is replaced with the digits found in the corresponding entry in the first column. If no match is found no translation is performed. If all the digits in the second column match the number in question, then all the digits are replaced with the entry found in the corresponding first column.

These examples illustrate the substitution process:

First Column	Second Column	Extension Number	Resulting Number
+14085551	11	11987	+14085551987
+14085551	589	589123	+14085551123
+140828512	7	789	+14082851289
+14085551234	456	456	+14085551234

Telephone numbers received from the ShoreTel System that correspond to external numbers are converted to DID numbers by matching the leading digits of the external number with an entry in the second column of the External Translation Table. If a match is found the matching portion of the number is replaced with the digits found in the corresponding entry in the first column. If no match is found then no translation is performed. If all the digits in the second column match the external number, then all the digits are replaced with the entry found in the corresponding first column.

These examples illustrate the substitution process:

First Column	Second Column	External Number	Resulting Number
+1	1	14085551987	+14085551987
+1		4085551987	+14085551987



Configuring On-Net Dialing

If the On-Net Dialing feature is enabled additional entries in the Extension Translation Table. As described above, the CSTA Server determines if a number is an extension number or an external number based on its length. Telephone numbers too long to be extension numbers are considered external numbers unless they start with one of the On-Net Dialing prefixes configured in the *Default.conf* configuration file (see above).

If On-Net Dialing is configured then the extension numbers used in the mapping process will consist of the On-Net Dialing prefix followed by an extension number of the standard length and the Extension Translation Table must contain appropriate entries.

For example, a ShoreTel System is configured to use 3 digit extensions and an On-Net Dialing prefix of 589. All extensions associated with that prefix are associated with the DID range (408)555-1xxx. In this case the On-Net Dialing prefix 589 would be added to the list of On-Net Dialing prefixes configured in the *Default.conf* file:

```
onNetPrefixList = 589
```

and there would be an entry in the Extension Translation Table of the *Dialplan.conf* file with +14085551 in the first column and 589 in the second column:

```
--Extension Translation Table
+14085551          589
```

Configuring for Multiple DID Ranges

If the ShoreTel System has multiple DID ranges use the *Shoreware CSTA Server and OCS Remote Application Server Planning Worksheet* to document each DID range and the corresponding extension ranges. Next determine what the appropriate entries should be in the first and second columns based on the mapping substitution rules described above.

For example, a ShoreTel System is configured to use 3 DID ranges with corresponding extensions as follows:

DID Range Start	DID Range End	Extension Range Start	Extension Range End
+14085551101	+14085551199	101	199
+14085559900	+14085559909	200	209
+14085551234	+14085551234	0	0

The resulting entries in the Extension Translation Table of the *Dialplan.conf* file are:

```
--Extension Translation Table
+140855511        1
+1408555990      20
+14085551234     0
```



Configuring for Extensions in one DID Range with Different Leading Digits

If the ShoreTel System has extension numbers in the same DID range that start with different leading digits, use the *Shoreware CSTA Server and OCS Remote Application Server Planning Worksheet* to document each range of consecutive extension numbers and the corresponding DID ranges. Next determine what the appropriate entries should be in the first and second columns based on the mapping substitution rules described above.

For example, a ShoreTel System is configured to use 3 groups of extensions in one DID range as follows:

DID Range Start	DID Range End	Extension Range Start	Extension Range End
+14085552220	+14085552249	4120	4149
+14085552250	+14085552259	4450	4459
+14085552260	+14085552269	4560	4569

The resulting entries in the Extension Translation Table of the *Dialplan.conf* file are:

```
--Extension Translation Table
+140855522      41
+140855522      44
+140855522      45
```

Configuring for Extensions with Arbitrary DID Numbers

If the ShoreTel System has extension numbers that don't match the final digits of the corresponding DID numbers, use the *Shoreware CSTA Server and OCS Remote Application Server Planning Worksheet* to list each individual DID number and its corresponding extension number. You'll enter the DID numbers in the first column and the extensions in the second.

For example, a ShoreTel System is configured with 3 DIDs that have arbitrary corresponding extensions as follows:

DID Range Start	DID Range End	Extension Range Start	Extension Range End
+14085551834	+14085551834	612	612
+14085551348	+14085551348	613	613
+14085551483	+14085551483	614	614

The resulting entries in the Extension Translation Table of the *Dialplan.conf* file are:

```
--Extension Translation Table
+14085551834    612
+14085551348    613
+14085551483    614
```



Configuring for Multiple Trunk Access Codes

If the ShoreTel System has multiple trunk access codes that are to be used for different ranges of PSTN numbers, use the *Shoreware CSTA Server and OCS Remote Application Server Planning Worksheet* to document each range of PSTN numbers and their associated trunk access codes. Next determine what the appropriate entries should be in the first and second columns based on the mapping substitution rules described above.

For example, a ShoreTel System is configured to use 3 special trunk access codes that correspond to trunk lines for placing local, 7 digit dialed, calls in 3 corresponding areas codes as follows:

PSTN Range Start	PSTN Range End	Trunk Access Code	Country Code	Area Code
+14080000000	+14089999999	6	1	408
+12120000000	+12129999999	7	1	212
+16130000000	+16139999999	8	1	613

The resulting entries in the External Translation Table of the *Dialplan.conf* file are:

```
--External Translation Table
+1408      6
+1212      7
+1613      8
```

Configuring for Mapping ANI Digits

If the ShoreTel System is configured with a trunk such that ANI data must be mapped before delivery to uaCSTA clients, use the *Shoreware CSTA Server and OCS Remote Application Server Planning Worksheet* to list the range of PSTN numbers that will not be correctly reported if not mapped and the corresponding leading digits that will be used to identify them. Next determine what the appropriate entries should be in the first and second columns based on the mapping substitution rules described above.

For example, a ShoreTel System is configured with trunks that only deliver 7 digit ANI which is prefixed by special leading digits that indicates which trunk is delivering the call:

PSTN Range Start	PSTN Range End	Leading Digits
+14080000000	+14089999999	06
+12120000000	+12129999999	07
+16130000000	+16139999999	08

The resulting entries at the end of the Extension Translation Table of the *Dialplan.conf* file are:

```
+1408      06
+1212      07
+1613      08
```



6. Update Existing Installations

The installation package supports updates of existing installations.

Using an update installation the administrator does not need to remove the existing installation. A new configuration is also not necessary because the existing configuration files will not be replaced by the update.

In order to do an update installation use the the following command:

```
msiexec /i "ShoreWare CSTA Server.msi" REINSTALLMODE=vomus REINSTALL=all
```

Please note that existing configuration and log files will not be replaced by the update.



7. Troubleshooting

The following section covers common problem situation and gives solution approaches for these situations.

Problem: Only a single device can be controlled from client software.

Solution: Obtain and install a valid license for the CSTA Server by copying and pasting it into the CSTA Server *Default.conf* file (see Appendix 1) or by using the **License Tool** application.

Problem: An external number can not be dialed in international format

Solution: Check if the value `uaCSTATrunkAccessCode` is configured correctly (typically `uaCSTATrunkAccessCode` is set to 9 in North America) in the *Default.conf* file of the CSTA Server.

Problem: The configuration is correct but telephony is still not available.

Solution: Check the firewall configuration of your system. Make sure that the CSTA Server TCP/IP port is not blocked by a firewall or used by another software process.

Refer to the *Advanced Troubleshooting Guide for ShoreWare CSTA Server* for additional troubleshooting information.



Appendix 1: Configuration File Details

By default, the configuration files for the CSTA Server components are stored in the directory *C:\Program Files\Shoreline Communications\ShoreWare Server\CSTA\Config*

Note: You do not usually need to modify these files as these are already properly configured by the CSTA Server Installer.

Note: As a best practice, you should always create a backup copy of a configuration file before modifying it.

ShoreTel-CSTAsvr Settings

The configuration file for the ShoreTel-CSTAsvr is named *Default.conf*. It contains the following keys.

Key	Default	Comment
loginPort	26535	Listener Port. This port is to be used in the OCS routing settings
license		Default is empty: demo mode with 1 monitor, Otherwise: a hexdump on a single line with encrypted licensing data
logFileMaxSize	100	Maximum size of a log file In KByte units. Actual size is limited only be file system constraints. The recommended range is 10 to 2000.
logFileMaxBackups	2	Number of log files to keep during log rotation. Actual number is limited only be file system constraints. The recommended range is 0 to 30.
debugLevel	0	0 = debug logging switched off 9 = for logging during debug sessions
cstaLogEnabled	0	Write csta.log (0 or 1)
interfaceLogEnabled	0	Write Interface.log (0 or 1)
cstaLinkAddress	127.0.0.1	The ip address for the host where ShoreTel-CSTAcnr service is running. By default this is the loopback address because it is on the same host as the ShoreTel-CSTAsvr service.
cstaLinkPort	26001	The listener port of the ShoreTel-CSTAcnr. Note: this port is explicitly set to 26001 during the installation
onNetPrefixList		List of prefixes used if ShoreTel On-Net Dialing feature is activated. All prefixes are listed on a single line separated by semicolons (“;”) By default this is empty. Note: Configuring the CSTA server for On-Net Dialing also requires making corresponding entries in the <i>Dialplan.conf</i> file.
maxExtensionLength	5	Maximum number of digits in an extension number. Should be set to 3, 4, or 5.



rfc2806PrivateContext		"Private Context" string used to construct RFC2806 telURIs for extension numbers that have no corresponding DID number. The DID Prefix entered during installation is unique to the ShoreTel System and is used for this purpose.
setsignalhandler	1	For debugging only in the case a crash occurs: 0 : don't create a coredump 1 : create a coredump

ShoreTel-CSTAcnr Settings

The configuration file for the ShoreTel-CSTAcnr is named *ca_config.properties*. It contains the following keys.

Key	Default	Comment
server_port	26001	The listener port.
nettspi_hostname	127.0.0.1	The ip address for the host where the ShoreTel-CSTAlnk service is running. By default this is the loopback address because it is on the same host as the ShoreTel-CSTAcnr service.
nettspi_port	20000	The port of the ShoreTel-CSTAlnk service.

ShoreTel-CSTAlnk Settings

The configuration file for the ShoreTel-CSTAlnk is named *LINKTSP.INI*. It contains the following keys.

Key	Default	Comment
loginPort	20000	The listener port.
Driver	RpcTspX.tsp	The TAPI TSP driver DLL

ShoreTel-CSTAcnr and ShoreTel-CSTAlnk Logging Settings

The ShoreTel-CSTAcnr and ShoreTel-CSTAlnk share a common configuration file that controls logging behavior named *log4j-config.xml*. This is an XML file that contains additional key value pairs using XML tags. The key "level value" appears once for each component. To change the level of detail in the log files produced, change the value for these keys.

Key	Default	Comment
level value	ERROR	Logging level. The default, "ERROR", will log only errors. To capture all debugging information, change this value to "DEBUG". To stop all logging change the value to "OFF".



Appendix 2: Installer Parameters

During installation of the CSTA Server the installer requests two parameters: a **Trunk Access Code** and a **DID Prefix**. These parameters are used by the installer when it generates an initial *DialPlan.conf* file and create default entries in both the Extension Translation Table and the External Translation Table.

The DID Prefix consists of the unique digits, including the country code and the first digit of the extension range, that define a DID range in the PSTN. For example, if the DID range is +1(408)555-7000 through +1(408)555-7999 it means that the carrier has allocated all PSTN numbers starting with the digit sequence 14085557 to the ShoreTel System in question.

The DID prefix that is requested is also mapped internally to the following configurations key and stored into the *Default.conf* file.

Parameter Label	Internal Parameter Name	Comment
DID Prefix	rfc2806PrivateContext	MOC 2007 requires that extensions that cannot be mapped to any number in the PSTN must be specially encoded when placed in the uaCSTA protocol. This encoding is specified in RFC2806 which requires a "Private Context" string which uniquely identifies the ShoreTel System. The DID prefix for the ShoreTel System satisfies this requirement and is used for this purpose by default.

In a typical configuration the ShoreTel System with the DID prefix 14085557 would have these DID numbers assigned to extensions 7000 through 7999 respectively. The installer supports this basic configuration by creating a single entry in the *DialPlan.conf* file that maps PSTN number +1(408)555-7xxx to extension 7xxx. The entry in the Extension Translation Table in *DialPlan.conf* for this example is:

```
+14085557      7
```

This entry tells the CSTA Server to map to internal extension numbers by replacing the leading digits "+14085557" with just the digit "7" and to convert from internal extension numbers by replacing the leading digit "7" with the digits "+14085557".

Note: The installer only asks for a single DID Prefix so the one entered should be the primary DID prefix associated with the ShoreTel System. Additional DID range mappings must be added to the *DialPlan.conf* file manually. The installer assumes that the ShoreTel System conforms to the convention that all extensions corresponding to the DID range start with the last digit of the ID Prefix. If this is not the case, the *DialPlan.conf* file **must** be manually corrected after the installation process is completed. ShoreTel Professional Services may be engaged to assist with this process.

The installer uses the trunk access code parameter to create a default entry in the External Translation Table for converting canonical numbers to a digit sequence that can be dialed. It does this by creating an entry that prefixes canonical numbers with the trunk access code.



For example, if the trunk access code entered was “9” then the entry created in the External Translation Table in *DialPlan.conf* would be as follows:

```
+          9+
```

Note: The installer does not create default entries in the External Translation Table for mapping external numbers. In the basic configuration external numbers are delivered to the uaCSTA client as they are received from the ShoreTel System. If mapping of these numbers is required, appropriate entries must be created in the *DialPlan.conf* External Translation Table.

The example below illustrates the importance of entering the correct DID Prefix. In this case a user has extension 1100 and their OCS telURI setting is +14085551100.

DID Prefix	Resulting extension	comment
+14085551	1100	ok
+1408555	51100	wrong
+140828511	100	wrong
+4930828526	+14085551100	wrong