



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring the CELLX Cellular Gateway with Avaya Aura® Telephony Infrastructure using T1 ISDN-PRI – Issue 1.0

Abstract

These Application Notes describe a compliance-tested configuration comprised of Avaya Aura® Communication Manager and the CELLX cellular gateway. The CELLX cellular gateway is a gateway that can augment landline connectivity with wireless connectivity to the cellular network. In case of landline connectivity failure, the CELLX provides a backup solution to maintain voice communications. During compliance testing, outbound calls from Avaya Aura® Communication Manager were successfully routed over a T1 ISDN-PRI to the CELLX and in turn to the cellular network. Similarly, inbound calls from the cellular network to the CELLX were successfully forwarded to Aura® Communication Manager over the T1 ISDN-PRI.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe a solution that integrates the CELLX cellular gateway, with Avaya Aura® Communication Manager. The CELLX cellular gateway can provide a backup solution to maintain voice communications in the event of a landline failure and provide a mechanism to place cellular to cellular calls from the Avaya Deskphone. The integration included a T1 ISDN-PRI connecting Avaya Aura® Communication Manager and the CELLX cellular gateway.

2. General Test Approach and Test Results

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

The interoperability compliance testing focused on verifying the routing of outbound/inbound calls from/to the CELLX cellular gateway.

The high-level objectives of the solution described in these Application Notes are as follows:

- When the landline is out of service, Communication Manager will route all outbound calls to the CELLX cellular gateway.
- When the landline is out of service, inbound calls from the cellular network route through the CELLX cellular gateway and are routed to the Communication Manager.
- If the landline is operational, Communication Manager will re-route calls rejected by the CELLX cellular gateway to the landline.

The enterprise callers can enter a “CELLX gateway dial prefix” to use the CELLX cellular gateway to make calls. For example, enterprise callers place outbound calls via the CELLX cellular gateway to reach cellular endpoints and save on cellular minutes and costs.

2.2. Test Results

The test objectives listed in **Section 2.1** were verified. For serviceability testing, outbound and inbound calls routed through the CELLX completed successfully after recovering from failures such as Ethernet cable disconnects, and resets of Communication Manager and the CELLX gateway. Calls routed through the CELLX gateway via the T1 ISDN-PRI between the Avaya G450 Media Gateway and CELLX gateway during failover testing completed successfully.

During the compliance testing it was observed that media shuffling must be disabled for successful communication when forwarding calls from CELLX gateway to an H.323 IP telephone.

TELES CELLX cellular gateway successfully passed compliance testing.

2.3. Support

For technical support on the TELES CELLX Cellular Gateway, consult the support pages at <http://cellx.teles.com> or contact TELES customer support at:

- Phone: 1-646-225-6598
- E-mail: cellx@teles.com
- Website: <http://cellx.teles.com> – Support
- Website: <http://www.teles.com/cellx> – Product Information

3. Reference Configuration

In case of landline connectivity failure, the CELLX cellular gateway provides a backup solution to maintain voice communications. When the landline is operational, outbound calls to the public network may be routed to either the landline or the CELLX cellular gateway, but when the landline is unavailable, outbound calls to the public network are routed to the CELLX cellular gateway only. The CELLX cellular gateway routes the outbound calls to the cellular network, but may also reject outbound calls under certain configurable conditions. The caller, however, may bypass such restrictions by dialing a pre-configured “CELLX gateway dial prefix” before dialing the external phone number.

Figure 1 illustrates the configuration used for the compliance testing. The network consisted of Avaya Aura® Communication Manager running on an S8300D card that was installed in the G450 Media gateway, Avaya Aura® Session Manager, Avaya 9600 Series IP Telephones, along with a CELLX cellular gateway. Avaya Aura® Communication Manager was connected to Avaya Aura® Session Manager using a SIP Trunk and the CELLX cellular gateway with a T1 ISDN-PRI. The CELLX in turn was connected to the cellular network via Subscriber Identity Module (SIM) cards that reside on boards inserted in the CELLX

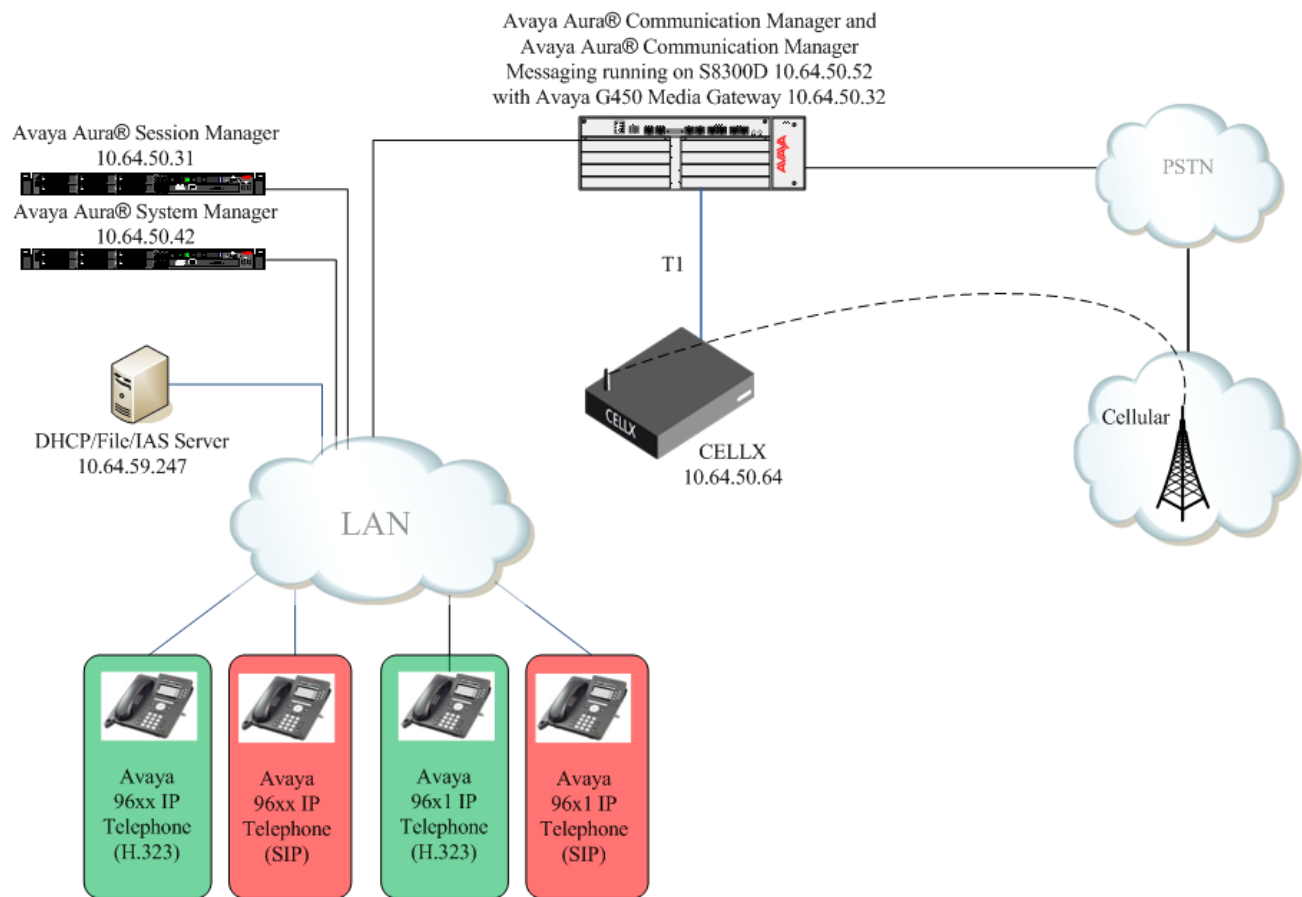


Figure 1: Network Configuration.

4. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software/Firmware
<i>Avaya PBX Products</i>	
Avaya S8300D Server running Avaya Aura® Communication Manager	Avaya Aura® Communication Manager 6.0.1 with SP5.0.1(Patch 19303)
Avaya G450 Media gateway Mainboard MM710 T1 Module MM712 DCP Media Module MP80 VoIP-DSP	HW 2 FW 31.22.0(A) HW 5 FW 22 HW 7 FW 14 HW 6 FW 67
<i>Avaya Aura® Session Manager</i>	
Avaya Aura® Session Manager HP Proliant DL360 G7	6.1 with SP5
Avaya Aura® System Manager HP Proliant DL360 G7	6.1 with SP5
<i>Avaya Messaging (Voice Mail) Products</i>	
Avaya Aura® Communication Manager Messaging (CMM)	6.0
<i>Avaya Telephony Sets</i>	
Avaya 96xx Series IP Telephones	(SIP 3.1SP2), (SIP 2.6.6.0)
Avaya 96x1 Series IP Telephones	(SIP S6.010f), (SIP 6.0.3)
<i>TELES Products</i>	
TELES CELLX cellular gateway	Software Version 17.0

5. Configure Avaya Aura® Communication Manager

This section describes the steps required for Communication Manager to support the configuration in **Figure 1**. The following pages provide step-by-step instructions on how to administer parameters specific to the CELLX cellular gateway solution only. The assumption is that the appropriate license and authentication files have been installed on the servers, valid login credentials are available, and the reader has a basic understanding of how to administer Communication Manager. It is assumed that all other connections, e.g., to PSTN, to LAN, are configured and will not be covered in this document. The reader will need access to the System Administration Terminal screen (SAT). For detailed information on the installation, maintenance, and configuration of Communication Manager, please refer to **Section 9** ([1]).

5.1. Configuring T1 ISDN-PRI

This section describes the steps for configuring the T1 ISDN-PRI line on Communication Manager to the CELLX cellular gateway in the sample configuration of **Figure 1**.

1.	Issue the command display media-gateway 1 to display the Media Gateway information. On page 2 verify there is a DS1 card available, if not, install the card and refer to Section 9 for documentation links.
	<pre>display media-gateway 1 Page 2 of 2 MEDIA GATEWAY 1 Type: g450 Slot Module Type Name DSP Type FW/HW version V1: S8300 ICC MM MP80 69 6 V2: MM710 DS1 MM V3: MM712 DCP MM V4: V5: MM710 DS1 MM V6: MM710 DS1 MM V7: V8: V9: Max Survivable IP Ext: 8</pre>

5.2. DS1 Circuit Pack Configuration

1.	<p>Enter the add ds1 xxxxx command, where xxxxx is the board number of the DS1 connected to the CELLX. For this configuration board number 001v5 was used. On Page 1 of the ds1 form, configure the following:</p> <ul style="list-style-type: none">• Name – enter a meaningful description.• Bit Rate – set to 1.544• Line Coding – set to b8zs• Framing Mode – set to esf• Signaling Mode – set to isdn-pri• Connect – set to pbx• Interface – set to network• Protocol Version – set to b <div><div>add ds1 1v5</div><div>DS1 CIRCUIT PACK</div><div>Page 1 of 2</div><div>Location: 001V5 Bit Rate: 1.544 Line Compensation: 1 Signaling Mode: isdn-pri Connect: pbx TN-C7 Long Timers? n Interworking Message: PROgress Interface Companding: mulaw Idle Code: 11111111</div><div>Name: CELLX T1 Line Coding: b8zs Framing Mode: esf Interface: network Country Protocol: 1 Protocol Version: b CRC? n DCP/Analog Bearer Capability: 3.1kHz T303 Timer(sec): 4</div><div>Slip Detection? n Echo Cancellation? n</div><div>Near-end CSU Type: other</div></div>
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5.3. T1 ISDN-PRI Trunks and Signaling Groups

1.	<p>Enter the add trunk-group i command, where i is an available trunk group number. On Page 1 of the trunk-group form, configure the following:</p> <ul style="list-style-type: none">• Group Type – set to isdn• Group Name – enter a meaningful name/description• TAC – enter a Trunk Access Code that is valid under the provisioned dial plan• Carrier Medium – set to PRI/BRI• Service Type – set to tie
	<div><div>add trunk-group 5</div><div>Page 1 of 21</div><div>TRUNK GROUP</div><div><div>Group Number: 5</div><div>Group Type: isdn</div><div>CDR Reports: y</div><div>Group Name: CELLX T1</div><div>COR: 1</div><div>TN: 1</div><div>TAC: *005</div><div>Direction: two-way</div><div>Outgoing Display? n</div><div>Carrier Medium: PRI/BRI</div><div>Dial Access? n</div><div>Busy Threshold: 255</div><div>Night Service:</div><div>Queue Length: 0</div><div>Service Type: tie</div><div>Auth Code? n</div><div>TestCall ITC: rest</div><div>Far End Test Line No:</div><div>TestCall BCC: 4</div></div></div>

<p>2.</p>	<p>Enter add signaling group j command, where j is an available signaling group number. On Page 1 of the signaling-group form, configure the following:</p> <ul style="list-style-type: none"> • Group Type – set to isdn-pri • Associated Signaling – set to y • Primary D-Channel – enter xxxxx24, where xxxxx is the board number of the DS1 circuit pack configured in Section 5.2 and connected to the CELLX(24 is the D-Channel in a T1 ISDN-PRI) • Trunk Group for Channel Selection – enter the number of the trunk group configured in Step 1 <hr/> <div> <div>add signaling-group 5</div> <div>Page 1 of 5</div> </div> <div>SIGNALING GROUP</div> <div> <div>Group Number: 5</div> <div>Group Type: isdn-pri</div> <div>Associated Signaling? y</div> <div>Primary D-Channel: 1v524</div> <div>Trunk Group for Channel Selection: 5</div> <div>TSC Supplementary Service Protocol: a</div> </div> <div> <div>Max number of NCA TSC: 0</div> <div>Max number of CA TSC: 0</div> <div>Trunk Group for NCA TSC:</div> <div>X-Mobility/Wireless Type: NONE</div> <div>Network Call Transfer? n</div> </div>																																																																																																																
<p>3.</p>	<p>Enter the change trunk-group i command, where i is the number of the trunk group configured in Step 1. On Page 5 of the trunk-group form, add one or more trunk members by entering:</p> <ul style="list-style-type: none"> • xxxxxxzz for Port, where xxxxxx is the board number of the DS1 circuit pack configured in Section 5.2 and connected to the CELLX, zz is a channel in the T1 ISDN-PRI, and the number of the signaling group configured in Step 2. Note: Enter <i>Esc-n</i> to add the remaining T1 channels. <hr/> <div> <div>change trunk-group 5</div> <div>Page 5 of 21</div> </div> <div>TRUNK GROUP</div> <div> <div>Administered Members (min/max): 1/23</div> <div>Total Administered Members: 23</div> </div> <div>GROUP MEMBER ASSIGNMENTS</div> <table border="1"> <thead> <tr> <th>Port</th> <th>Code</th> <th>Sfx</th> <th>Name</th> <th>Night</th> <th>Sig</th> <th>Grp</th> </tr> </thead> <tbody> <tr><td>1: 001V501</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>2: 001V502</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>3: 001V503</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>4: 001V504</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>5: 001V505</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>6: 001V506</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>7: 001V507</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>8: 001V508</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>9: 001V509</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>10: 001V510</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>11: 001V511</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>12: 001V512</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>13: 001V513</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>14: 001V514</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> <tr><td>15: 001V515</td><td>MM</td><td>7</td><td>10</td><td></td><td>5</td><td></td></tr> </tbody> </table>	Port	Code	Sfx	Name	Night	Sig	Grp	1: 001V501	MM	7	10		5		2: 001V502	MM	7	10		5		3: 001V503	MM	7	10		5		4: 001V504	MM	7	10		5		5: 001V505	MM	7	10		5		6: 001V506	MM	7	10		5		7: 001V507	MM	7	10		5		8: 001V508	MM	7	10		5		9: 001V509	MM	7	10		5		10: 001V510	MM	7	10		5		11: 001V511	MM	7	10		5		12: 001V512	MM	7	10		5		13: 001V513	MM	7	10		5		14: 001V514	MM	7	10		5		15: 001V515	MM	7	10		5	
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5.4. ARS Table, Route Patterns & Failover Configuration

Note: For compliance testing, the Communication Manager's connection to the PSTN used the ARS Feature Access Code digit "9" and route pattern 2.

5.4.1. ARS Table configuration

1.

Enter the **change ars analysis p** command, where “p” is any digit. Configure **Dialed String** entries according to customer requirements. In the example below, the entries match dialed numbers as follows:

- The “**908**” **Dialed String** matches 10-digit dialed numbers that begin with **908**, and routes calls to **Route Pattern 56**. For example, a dialed number of **908-555-1212** would be matched by this entry.
- The “**190**” **Dialed String** matches 11-digit dialed numbers that begin with 190, and routes calls to **Route Pattern 56**. For example, a dialed number of 1-908-555-1212 would be matched by this entry.
- The first “**23**” **Dialed String** matches 12-digit dialed numbers that begin with 23, and routes calls to **Route Pattern 68**. This entry is intended to match dialed numbers that begin with the CELLX Dial Prefix (23 was used in the compliance-tested configuration). For example, a dialed number of 23-908-555-1212 would be matched by this entry.
- The second “**23**” **Dialed String** matches 13-digit dialed numbers that begin with 23, and routes calls to **Route Pattern 68**. This entry is also intended to match dialed numbers that begin with the CELLX Dial Prefix (23 was used in the compliance-tested configuration). For example, a dialed number of 23-1-908-555-1212 would be matched by this entry.

change ars analysis XX

ARS DIGIT ANALYSIS TABLE

Location: all

Percent Full: 3

Dialed String	Total		Route	Call	Node	ANI
	Min	Max	Pattern	Type	Num	Reqd
23	12	12	68	hnpa		n
23	13	13	68	hnpa		n
908	10	10	56	hnpa		n
190	12	12	56	hnpa		n

5.4.2. Route Pattern Configuration

1.	<p>Enter the change route-pattern r command, where “r” is the route-pattern used for the CELLX Gateway. Route-pattern 5 was used for compliance testing.</p> <p>Add a routing preference entry as follows:</p> <ul style="list-style-type: none"> • Grp No – enter the trunk group configured in Section 5.3, Step 1. • Pfx Mrk – set to 1 • FRL - assign a Facility Restriction Level to this routing preference.
	<pre> change route-pattern 5 Pattern Number: 5 Pattern Name: CELLX T1 SCCAN? n Secure SIP? n Grp FRL NPA Pfx Hop Toll No. Inserted DCS/ IXC No Mrk Lmt List Del Digits QSIG Dgts Intw 1: 5 0 1 n user 2: n user 3: n user 4: n user 5: n user 6: n user BCC VALUE TSC CA-TSC ITC BCIE Service/Feature PARM No. Numbering LAR 0 1 2 M 4 W Request Subaddress 1: y y y y y n n rest none 2: y y y y y n n rest none 3: y y y y y n n rest none 4: y y y y y n n rest none 5: y y y y y n n rest none 6: y y y y y n n rest none </pre>

5.4.3. Failover Configuration

1.	<p>For compliance testing, the Primary route pattern out to the PSTN was 2. Enter the change route-pattern r command, where “r” is the route pattern out to the PSTN. Add the routing information for the route pattern used to the CELLX gateway. Configure the following:</p> <ul style="list-style-type: none"> • Grp No – enter the trunk group that contains trunk members from only the T1 ISDN-PRI line connected to the CELLX (Section 5.3. Step 1). • FRL - assign a Facility Restriction Level to this routing preference.
	<pre> change route-pattern 2 Page 1 of 3 Pattern Number: 2 Pattern Name: To PSTN SCCAN? n Secure SIP? n Grp FRL NPA Pfx Hop Toll No. Inserted DCS/ IXC No Mrk Lmt List Del Digits QSIG Dgts Intw 1: 1 0 0 9 n user 2: 5 0 0 n user 3: 0 n user 4: 0 n user 5: 0 n user 6: 0 n user BCC VALUE TSC CA-TSC ITC BCIE Service/Feature PARM No. Numbering LAR 0 1 2 M 4 W Request Dgts Format Subaddress 1: y y y y y n n rest none 2: y y y y y n n rest none 3: y y y y y n n rest none 4: y y y y y n n rest none 5: y y y y y n n rest none 6: y y y y y n n rest none </pre>

5.5. Called Party Number Adjustments for Incoming Calls Through the CELLX Gateway

Outside callers may use the CELLX to reach Communication Manager extensions by first calling a SIM card number on the CELLX. The CELLX may be configured to directly route incoming calls from the SIM card to a specific extension on Communication Manager. If the extension is a Vector Directory Number (VDN), the vector associated with the VDN may then prompt and collect digits from the caller.

During compliance testing, the CELLX was configured to send all calls to an internal Avaya extension configured on Communication Manager.

6. Configure CELLX Cellular Gateway

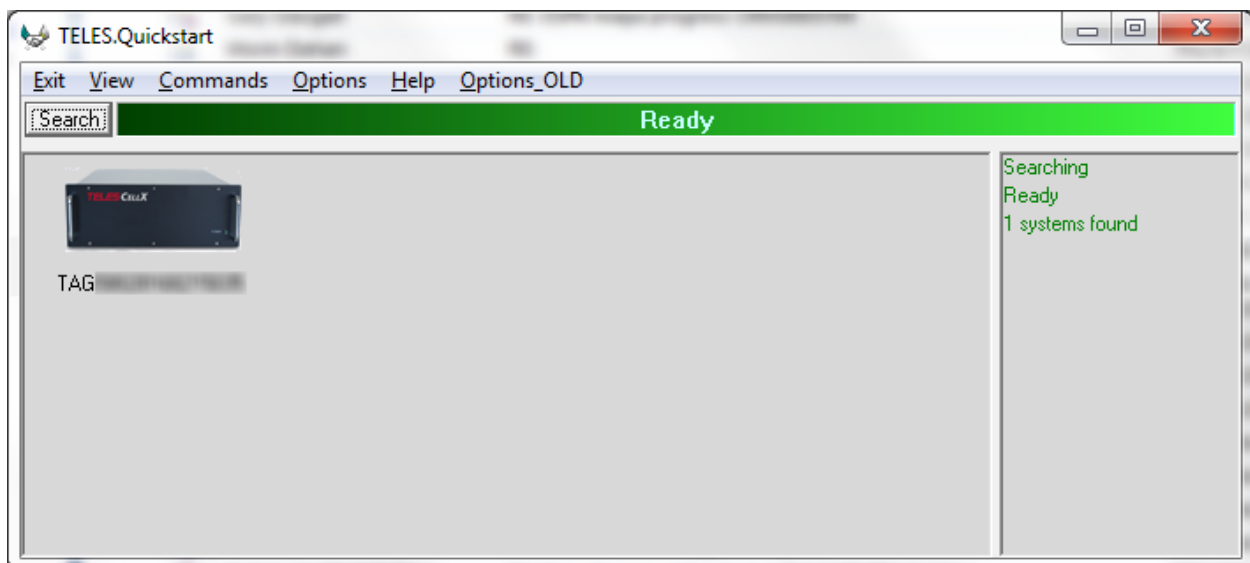
This section describes the steps for configuring the cellular boards, SIM cards, VoIP, and outbound/inbound routing policies on the CELLX cellular gateway. The steps are provided for illustration only; users should consult with CELLX cellular gateway documentation for specific instructions.

6.1. System Configuration

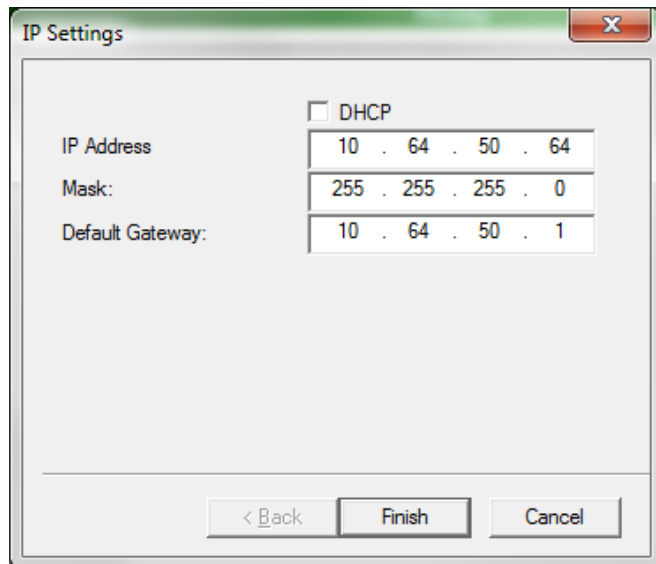
The configuration of the CELLX cellular gateway is a two-step process. Each step requires the use of its own tool, both of which are included on the CD that shipped with the gateway. Install both the “TELES Quickstart” application and the “TELES GATE Manager”.

6.1.1. Configure CELLX IP Address

Launch the “TELES Quickstart” application. Two prompts appear regarding the network setup of the PC. Depending on the network setup, follow the prompts and proceed to allow the tool to scan the network. Once, completed, double click on the gateway **icon** to continue.



The IP-Setting box will appear. Assign the appropriate network settings, as shown below and click **Finish**.



The image shows a Windows-style dialog box titled "IP Settings". It has a standard title bar with a close button (X). Inside the dialog, there is a checkbox labeled "DHCP" which is currently unchecked. Below this, there are three input fields for network configuration. The first field is labeled "IP Address" and contains the text "10 . 64 . 50 . 64". The second field is labeled "Mask:" and contains the text "255 . 255 . 255 . 0". The third field is labeled "Default Gateway:" and contains the text "10 . 64 . 50 . 1". At the bottom of the dialog, there are three buttons: "< Back", "Finish", and "Cancel".

IP Address	10 . 64 . 50 . 64
Mask:	255 . 255 . 255 . 0
Default Gateway:	10 . 64 . 50 . 1

Wait while the TELES Quickstart application updates and reboots the CELLX, then close the Quickstart application.

Note: The gateway can take up to 5 minutes to reboot and apply settings.

6.1.2. CELLX Cellular Gateway First Connection

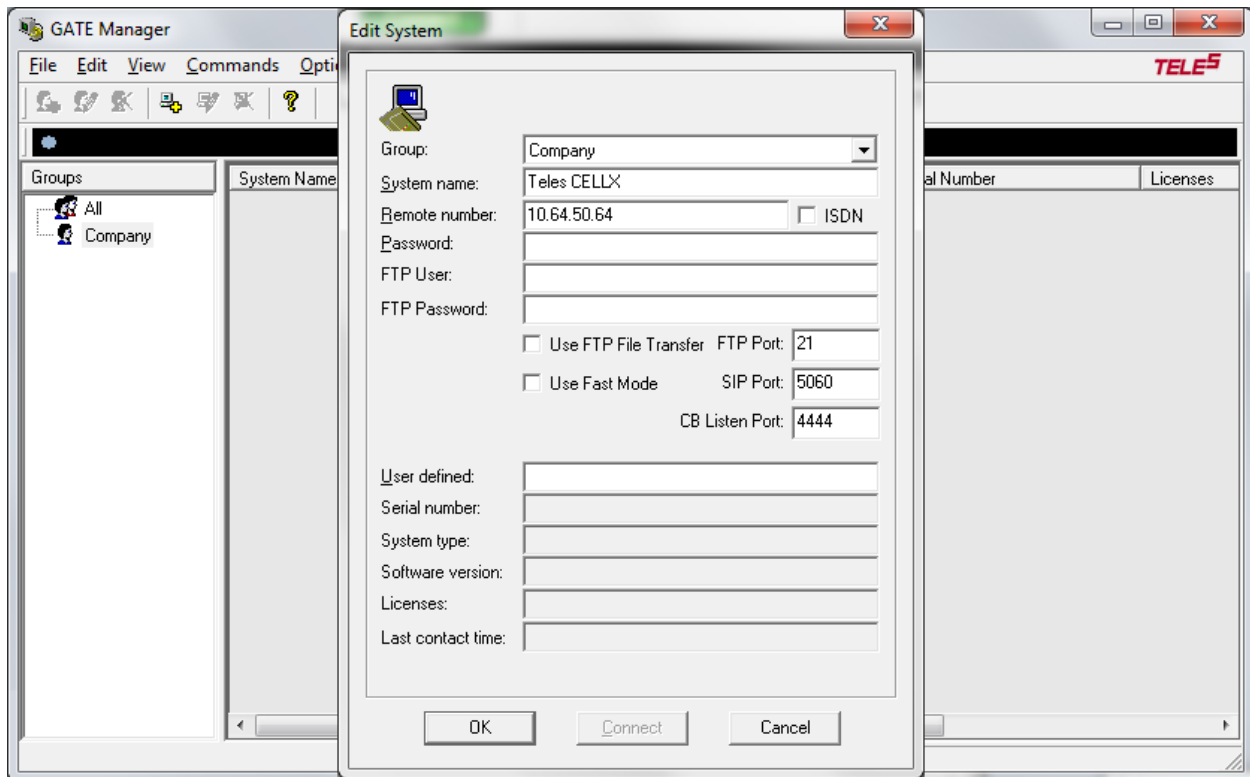
Launch the TELES GATE Manager application.

The first time the GATE Manager is used, a Group must be added. Under **Groups**, right click on the left pane of the GATE Manager and choose **New Group**. Assign a name and click **OK** (not shown) to continue.

In the right pane, right-click on the new group that was just created, choose **New System**, the **Edit System** box appears. Assign the following values:

Note: the values used are based on this sample configuration.

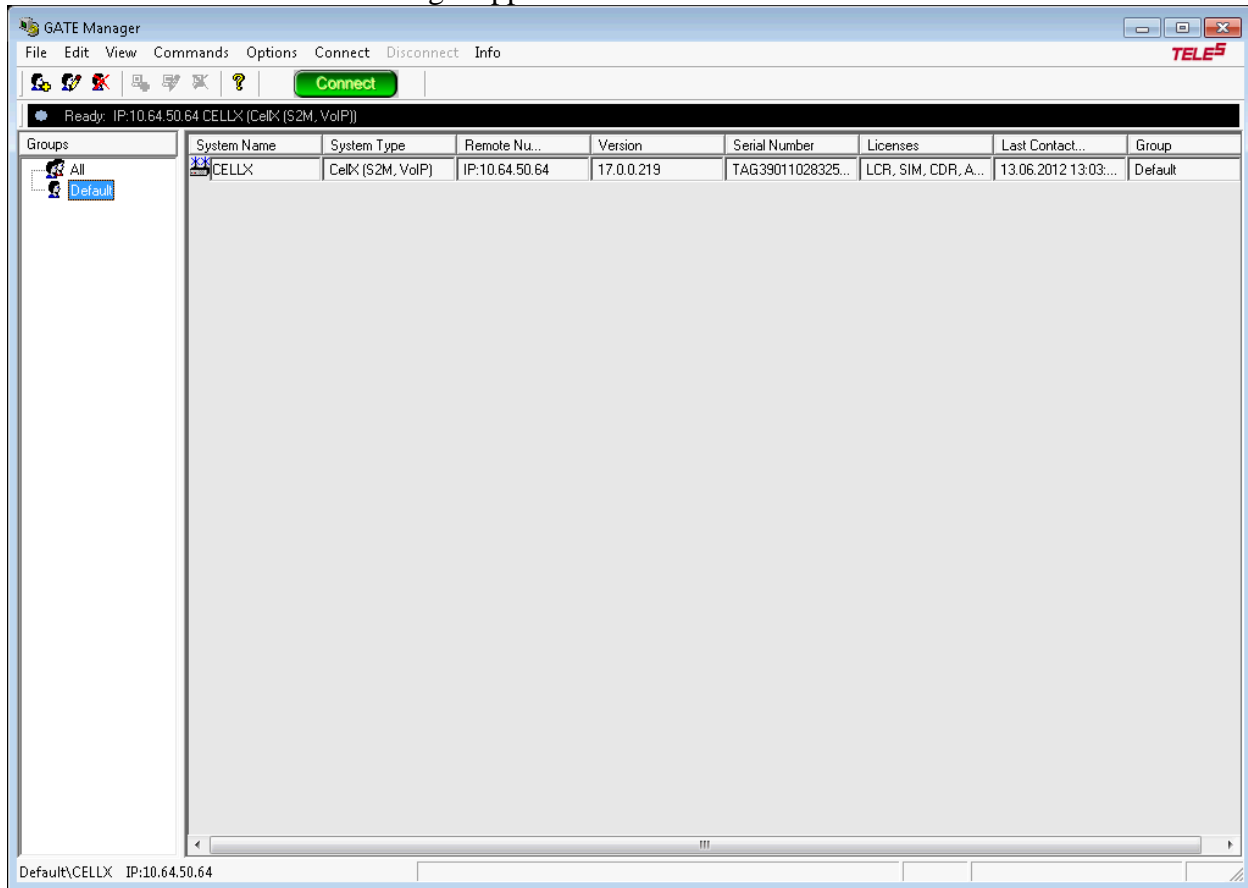
- System Name: TELES CELLX (*May be configured to match custom naming conventions*)
- Remote Number: 10.64.50.64



Once completed, click the **OK** button.

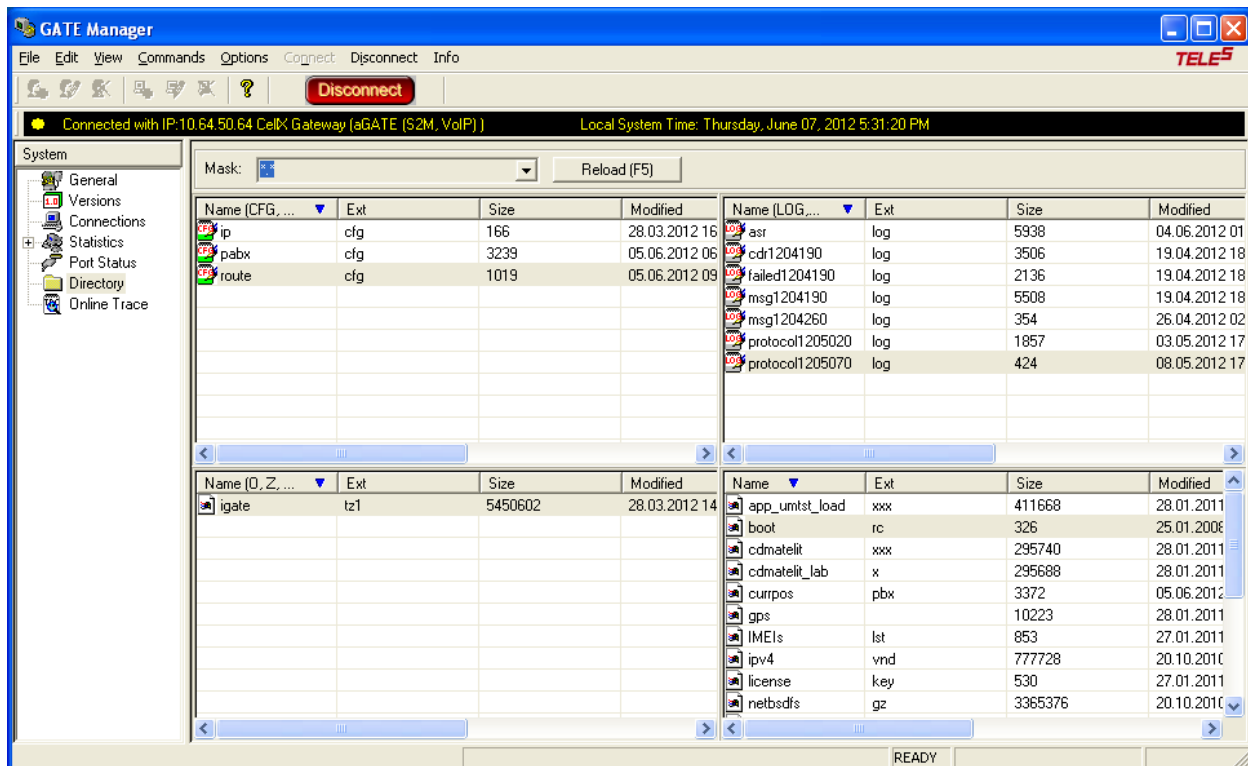
6.1.3. Configuring the CELLX

Launch the TELES GATE Manager application.



Select the system name of the CELLX cellular gateway to be configured and click the **Connect** button at the top of the screen. When prompted for a password, enter the current password, and click **OK**. The default password is blank.

Once connected, select **Directory** from **System** tree on the left side. The following screen will appear if done correctly.



From the GATE Manager window (not shown), right click on **route cfg** and choose **Copy**. In the **Rename/Copy** dialog that is presented, rename **route.cfg** to **route_orig.cfg** and click **OK**. Confirm any prompts received to overwrite the current **route_orig.cfg** file.

From the GATE Manager window (not shown), right click on **T1_route cfg** and choose **Copy**. In the **Rename/Copy** dialog that is presented, rename **T1_route.cfg** to **route.cfg** and click **OK**. Confirm any prompts received to overwrite the current **route.cfg** file.

Right click on **route cfg** and choose **Receive**. This will download the file to the PC to be edited. These files are standard Windows text files, normally ending in .txt. Open the file in a text editor like Wordpad. **Do NOT** use Word.

Below is a copy of the configuration present when the CELLX ships from the factory. The contents of this configuration file determine how the CELLX processes calls between the cellular network and the Communication Manager via a T1 PRI circuit.

```
; #####
; Default configuration for T1 and E1 connections
; #####

[System]
;-----

; write incoming USSD and SMS in msglog file
restrict20=@FILE 06
restrict20=@FILE 05

; outbound calls
Restrict9=out ; Labels all calls from PRI as "out"
MapAllout911=20911 ; Forward "out" calls to 911 immediately, no waiting
MapAllout01=|201<<13 ; "out" calls matching 01+13 digits, send to GSM
MapAllout0=|201<<13 ; "out" calls matching 0+13 digits, send to GSM
MapAllout1=|201<<13 ; "out" calls matching 1+13 digits, send to GSM

DTMFWaitDial=3 ; timeout for digit collection

; inbound calls
Restrict20=in 01
MapAllin=91234 ; 1234 represents an Avaya registered Extension -
; forward inbound calls to extension 1234 via PRI

; *END CONFIG*
```

In this context, "inbound" means calls coming into the network from the CELLULAR network and routed by the CELLX to Communication Manager via the T1. "Outbound" refers to calls going out of Communication Manager via the T1 to the CELLX and progressing out to the CELLULAR network.

The "Restrict" commands associate the relevant class of CELLX call handling hardware with an identifier, in this case "out" for outbound calls and "in" for inbound calls (as defined above). These identifiers are inserted in the B party number as a prefix to the actual received dialed digits. Full syntax and semantics for the Restrict command can be found on the documentation CD in the "*CellX User Manual*", version 16.2; see **Section 5.3.1.2** "The Restrict Command".

The "MapAll" commands evaluate the B party number, and "MapAllin" and "MapAllout" refer respectively to the "in" or "out" labels that have been inserted with the "Restrict" command. For outbound calls, depending on the format of the B party number that is sent by the PBX (i.e., the type of number, with or without a leading "1"), one of the following lines for outbound calls will match:

```
MapAllout01=|201<<13
MapAllout0=|201<<13
MapAllout1=|201<<13
```

This sequence indicates that the CELLX should wait until the number is complete (13 digits, 11 dialed digits plus 2 more for the "20" prefix identifier specifying the Cellx's CELLULAR ports) and then send the calls to the CELLULAR network.

Inbound calls (calls coming from the CELLULAR network) will be forwarded by the CELLX to an extension on the Avaya PBX as specified by the following line

```
MapAllin=91234
```

Here "9" indicates the address on the CELLX of the T1 interface connected to the PBX, while "1234" is an example of an extension on the PBX that should be changed as appropriate for the implementation. Change the "1234" extension to match where the calls FROM the CELLULAR will be sent on the PBX system, e.g., an operator, voicemail, or auto-attendant. For example, if the inbound calls are forwarded to an operator that has the extension "00", then change the line to:

```
MapAllin=900
```

Full syntax and semantics for the MapAll command can be found on the documentation CD in the "*CELLX User Manual*", version 16.2; see **Section 5.3.1.1**, "The MapAll Command".

Right click on the GATE Manager window and choose **Send** from the context menu. Select the new (edited) version of **route.cfg** and send it. This will upload the new changes to the CellX.

Right click on **pabx.cfg** and choose **Copy**. In the **Rename/Copy** dialog that is presented (not shown), rename **pabx.cfg** to **pabx_orig.cfg** and click **OK**. Confirm any prompts received to overwrite the current **pabx_orig.cfg** file.

Right click on **T1_pabx.cfg** and choose **Copy**. In the **Rename/Copy** dialog that is presented, rename **T1_pabx.cfg** to **pabx.cfg** and click **OK**. Confirm any prompts received to overwrite the current **pabx.cfg** file.

The default T1_pabx.cfg file will work unmodified for nearly every application, so it is not covered in this document.

Please view the detailed manual for the CELLX or contact support with additional questions. It is advised to contact support before changing the preconfigured pabx.cfg files included with the gateway.

Go to the **Commands** menu and select **Restart System**

7. Verification Steps

The following steps may be used to verify the configuration:

- From the SAT, enter the command **status signaling-group s**, where s is the number of a signaling group configured in **Section 5.3**, and verify that the Group State is “in service”.
- From the SAT, enter the command **status trunk-group t**, where t is the number of a trunk group configured in **Section 5.3**, and verify that the Service States of all trunks are “in-service/idle” or “in-service/active”.
- While the landline is operational, place several outbound calls, and verify successful routing to the landline and CELLX and successful call completion.
- While the landline is out of service, place several outbound calls, and verify successful routing to the CELLX and successful call completion.
- Place inbound calls to the CELLX and verify successful forwarding to an extension registered to Communication Manager.
- Place outbound calls using the CELLX Dial Prefix, and verify successful routing to the CELLX and successful call completion.

8. Conclusion

These Application Notes describe a compliance-tested configuration comprised of Avaya Aura® Communication Manager and the CELLX cellular gateway. The CELLX is a cellular gateway that can augment landline connectivity with wireless connectivity to the cellular network. In case of landline connectivity failure, CELLX provides a backup solution to maintain voice communications. During compliance testing, outbound calls from Avaya Aura® Communication Manager were successfully routed over a T1 ISDN-PRI to the CELLX and in turn to the cellular network. Similarly, inbound calls from the cellular network to the CELLX were successfully forwarded to Avaya Aura® Communication Manager over the T1 ISDN-PRI. The TELES CELLX cellular gateway successfully completed the compliance testing. Refer to **Section 2.2** for more details and listed observations.

9. Additional References

The documents referenced below were used for additional support and configuration information.

The following Avaya product documentation can be found at <http://support.avaya.com>.

- [1] *Administering Avaya Aura® Communication Manager*, June 2010, Release 6.0, Issue 6.0, Document Number 03-300509, available at <http://support.avaya.com>.
- [2] *Administering Avaya Aura® Session Manager*, October 2010, Issue 1.1, Release 6.1, Document Number 03-603324, available at <http://support.avaya.com>.
- [3] *Avaya one-X Deskphone Edition for 9600 Series IP Telephones Administrator Guide Release 3.1*, November 2009, Document Number 16-300698.
- [4] *Implementing Avaya Aura® Communication Manager Messaging*, May 2011, Document Number 18-603644.

Product information for the CELLX cellular gateway may be found at <http://www.teles.com/cellx>.

[5] *TELES CELLX User Manual, Revision 16.2, September 2011.*

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