# AVAYA

**Avaya Solution & Interoperability Test Lab**

# Application Notes for Configuring the CELLX Cellular Gateway with Avaya Aura® Telephony Infrastructure using an H.323 IP Trunk – 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 H.323 IP Trunk 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 H.323 Trunk.

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.

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Solution & Interoperability Test Lab Application Notes
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CELLX_AA_H323

# 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 an H.323.IP trunk 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 H.323 trunk 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 via a H.323 Trunk. The CELLX in turn was connected to the cellular network via Subscriber Identity Module (SIM) cards that reside on boards inserted in the CELLX
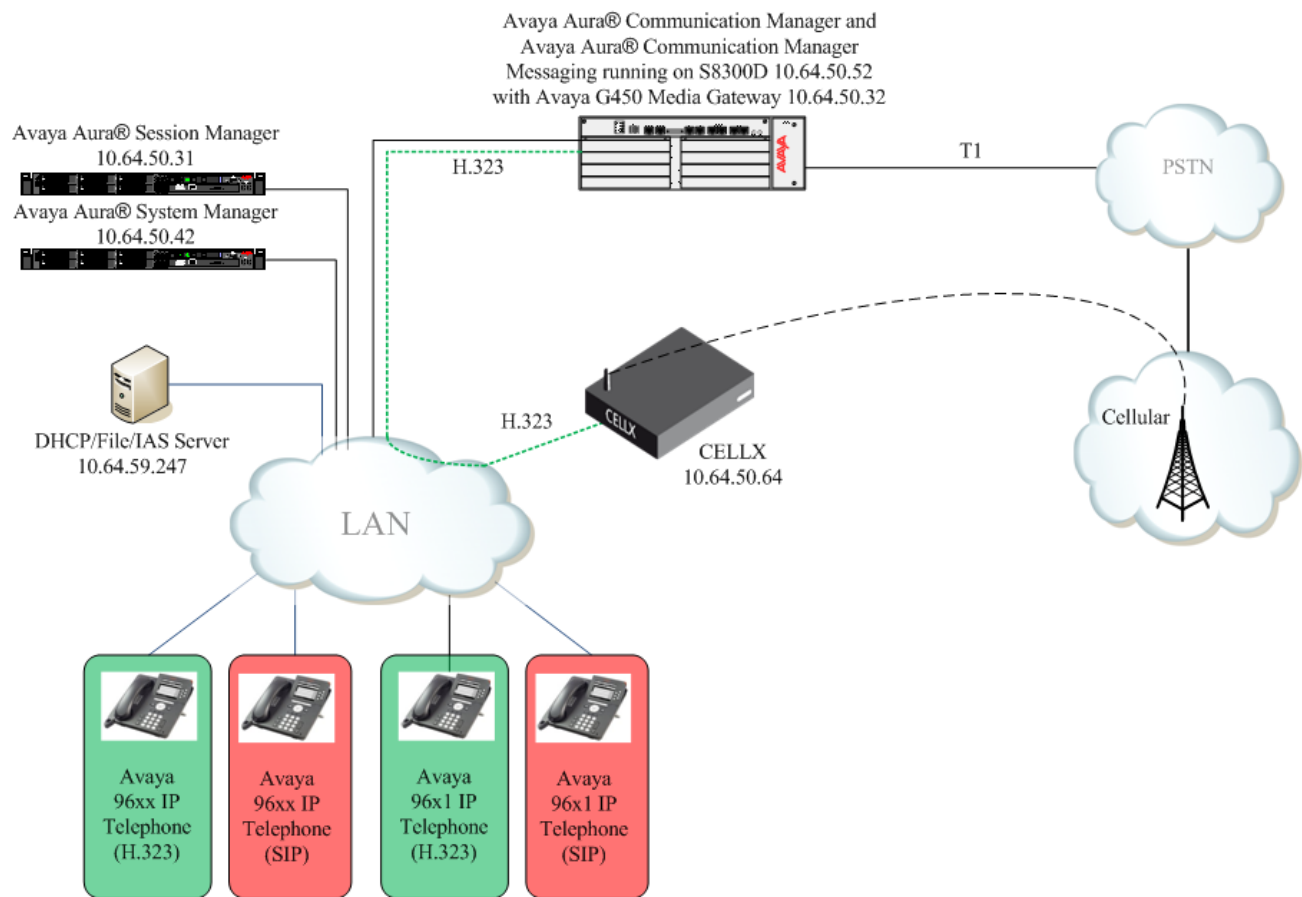


**Figure 1: Network Configuration.**

# 4. Equipment and Software Validated

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

| Equipment | Software/Firmware |
|---|---|
| *Avaya PBX Products* | |
| 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<br>    Mainboard<br>    MM710 T1 Module<br>    MM712 DCP Media Module<br>    MP80 VoIP-DSP | <br>HW 2 FW 31.22.0(A)<br>HW 5 FW 22<br>HW 7 FW 14<br>HW 6 FW 67 |
| *Avaya Aura® Session Manager* | |
| Avaya Aura® Session Manager HP Proliant DL360 G7 | 6.1 with SP5 |
| Avaya Aura® System Manager HP Proliant DL360 G7 | 6.1 with SP5 |
| *Avaya Messaging (Voice Mail) Products* | |
| Avaya Aura® Communication Manager Messaging (CMM) | 6.0 |
| *Avaya Telephony Sets* | |
| 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) |
| *TELES Products* | |
| 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 and password credentials are available, and the reader has a basic understanding of the administration of 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. Configure the H.323 IP Trunk to CELLX

This section describes the steps for configuring the H.323 trunk on Communication Manager to the TELES CELLX CELLULAR Gateway in the sample configuration of **Figure 1**.

| 1. | Enter the **change node-names ip** command.  Specify node names and management IP address for the CELLX. |
|---|---|
|  | <pre>change node-names ip                                       Page   1 of   2
                          IP NODE NAMES
    Name              IP Address
default           0.0.0.0
iq1               10.64.50.15
msgserver         10.64.50.52
procr             10.64.50.52
procr6            ::
sm5031            10.64.50.31
cellx             10.64.50.64




( 6  of 6    administered node-names were displayed )
Use 'list node-names' command to see all the administered node-names
Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name</pre> |

## 5.2. IP Codec Set and IP Network Region

| | |
|---|---|
| **1.** | Enter the **change ip-codec-set g** command, where "g" is a number between 1 and 7, inclusive, and enter "**G.711MU**" for **Audio Codec**. Note that the **Audio Codec** and **Packet Size** must match the corresponding configuration on the CELLX (see **Section 6.1.3, Step 5**). This IP codec set will be selected later in the IP Network Region form to define which codecs may be used within an IP network region. |

```
change ip-codec-set 1                                          Page   1 of   2

                           IP Codec Set

    Codec Set: 1

    Audio         Silence      Frames   Packet
    Codec         Suppression  Per Pkt  Size(ms)
 1: G.711MU          n            2        20
 2:
 3:
```

| | |
|---|---|
| **2.** | Enter the **change ip-network-region h** command, where "h" is a number between 1 and 250, inclusive. On page 1 of the **ip-network-region** form, set **Codec Set** to the number of the IP codec set configured in **Step 1**. Set the **Call Control PHB Value** to **46** and the **Audio PHB Value** to **46**. **Call Control 802.1p Priority** and **Audio 802.1p Priority** are set to **6**. |

```
change ip-network-region 1                                     Page   1 of  20
                           IP NETWORK REGION
  Region: 1
Location: 1       Authoritative Domain: lan50.d4f27.com
    Name:
MEDIA PARAMETERS                    Intra-region IP-IP Direct Audio: yes
      Codec Set: 1                  Inter-region IP-IP Direct Audio: yes
   UDP Port Min: 2048                        IP Audio Hairpinning? n
   UDP Port Max: 65535
DIFFSERV/TOS PARAMETERS
 Call Control PHB Value: 46
        Audio PHB Value: 46
        Video PHB Value: 26
802.1P/Q PARAMETERS
 Call Control 802.1p Priority: 6
        Audio 802.1p Priority: 6
        Video 802.1p Priority: 5     AUDIO RESOURCE RESERVATION PARAMETERS
H.323 IP ENDPOINTS                                   RSVP Enabled? n
  H.323 Link Bounce Recovery? y
 Idle Traffic Interval (sec): 20
   Keep-Alive Interval (sec): 5
           Keep-Alive Count: 5
```

## 5.3. Configure Trunks and Signaling Groups

| 1. | 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:<br><br>• **Group Type** – set to "**isdn**".<br>• **Group Name** – enter a meaningful name/description.<br>• **TAC** – enter a Trunk Access Code that is valid under the provisioned dial plan.<br>• **Carrier Medium** – set to "**H.323**".<br>• **Service Type** – set to "**tie**". |
|---|---|

```
add trunk-group 4                                              Page   1 of  21
                                  TRUNK GROUP

Group Number: 4                        Group Type: isdn          CDR Reports: y
  Group Name: CELLX H.323                     COR: 1        TN: 1         TAC: *004
   Direction: two-way         Outgoing Display? n         Carrier Medium: H.323
 Dial Access? n              Busy Threshold: 255  Night Service:
Queue Length: 0
Service Type: tie                       Auth Code? n
                                              Member Assignment Method: manual
```

| 2. | Enter the **add signaling group j** command, where "j" is an available signaling group number. On Page 1 of the **signaling-group** form, configure the following: |
|---|---|
|  | • **Group Type** – set to "**h.323**". |
|  | • **Trunk Group for Channel Selection** – enter the number of the trunk group configured in **Section 5.3 Step1** |
|  | • **Near-end Node Name** – enter the node name of a local C-LAN board, or "**procr**" if the local node is an Avaya S8300 Media Server. |
|  | • **Near-end Listen Port** – specify the local listen port, typically 1720. |
|  | • **Far-end Node Name** – enter the node name of the CELLX configured in **Section 5.1, Step 1**. |
|  | • **Far-end Listen Port** – specify the listen port, typically 1720. |
|  | • **Far-end Network Region** – enter the IP network region configured in **Section 5.2, Step 2.** |
|  | • **DTMF over IP** – set to "**rtp-payload**". |
|  | • **Direct IP-IP Audio Connections** – set to "**n**". |

```
add signaling-group 4                                          Page   1 of   6
                                 SIGNALING GROUP

 Group Number: 4                   Group Type: h.323
            SBS? n            Remote Office? n          Max number of NCA TSC: 0
           Q-SIP? n                                      Max number of CA TSC: 0
        IP Video? n                                   Trunk Group for NCA TSC:
      Trunk Group for Channel Selection: 4        X-Mobility/Wireless Type: NONE
      TSC Supplementary Service Protocol: a           Network Call Transfer? n
                                                     T303 Timer(sec): 10
   H.245 DTMF Signal Tone Duration(msec):
    Near-end Node Name: procr                   Far-end Node Name: cellx
   Near-end Listen Port: 1720                  Far-end Listen Port: 1720
                                             Far-end Network Region: 1
             LRQ Required? n           Calls Share IP Signaling Connection? n
             RRQ Required? n
        Media Encryption? n                  Bypass If IP Threshold Exceeded? n
                                                   H.235 Annex H Required? n
            DTMF over IP: rtp-payload         Direct IP-IP Audio Connections? n
   Link Loss Delay Timer(sec): 90                       IP Audio Hairpinning? n
         Enable Layer 3 Test? n                  Interworking Message: PROGress
                                           DCP/Analog Bearer Capability: 3.1kHz
```

| 3. | Enter the **change trunk-group i** command, where **i** is the number of the trunk group configured in **Section 5.3**, **Step 1**.  Set **Member Assignment Method** to **auto**, Signaling **Group** to what was configured in **Section 5.3**, **Step 2** and **Number of Members** to **24**. |
|---|---|

```
change trunk-group 4                                        Page   1 of  21
                               TRUNK GROUP

Group Number: 4                   Group Type: isdn          CDR Reports: y
  Group Name: CELLX H.323               COR: 1       TN: 1       TAC: *004
   Direction: two-way      Outgoing Display? n     Carrier Medium: H.323
 Dial Access? n            Busy Threshold: 255  Night Service:
Queue Length: 0
Service Type: tie                    Auth Code? n
                                        Member Assignment Method: auto
                                                  Signaling Group: 4
                                               Number of Members: 24
```

| 4. | On **Page 3** of the **trunk-group** form, set **Send Calling Number** to "**y**". |
|---|---|

```
change trunk-group 4                                        Page   3 of  21
TRUNK FEATURES
         ACA Assignment? n            Measured: none
                                   Internal Alert? n      Maintenance Tests? y
                                  Data Restriction? n    NCA-TSC Trunk Member:
                                        Send Name: n     Send Calling Number: y
            Used for DCS? n                              Send EMU Visitor CPN? n
   Suppress # Outpulsing? n

                                            UUI IE Treatment: service-provider

                                               Replace Restricted Numbers? n
                                              Replace Unavailable Numbers? n
                                                    Send Connected Number: n
Network Call Redirection: none                Hold/Unhold Notifications? n
          Send UUI IE? y
             Send UCID? n
  Send Codeset 6/7 LAI IE? y
```

## 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 33**.  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 33**.  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                                      Page   1 of   2
                          ARS DIGIT ANALYSIS TABLE
                            Location:  all        Percent Full:    3

          Dialed           Total      Route     Call   Node  ANI
          String          Min  Max   Pattern    Type   Num   Reqd
      23                   12   12      33       hnpa         n
      23                   13   13      33       hnpa         n
      908                  10   10      56       hnpa         n
      190                  12   12      56       hnpa         n
```

## 5.4.2. Route Pattern Configuration

| Step | Description |
|------|-------------|
| **1.** | 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.<br><br>Add a routing preference entry as follows:<br>• **Grp No** – enter the trunk group created in **Section 5.3**, **Step 1.**<br>• **Pfx Mrk – set to 1**<br>• **FRL** - assign a Facility Restriction Level to this routing preference. |

```
change route-pattern 5                                         Page   1 of   3
                      Pattern Number: 5   Pattern Name: CELLX H.323
                              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: 4   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                                 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
```

## 5.4.3. Failover Configuration

| Step | Description |
|---|---|
| **1.** | 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:<br>• **Grp No** – enter the trunk group created in **Section 5.3. Step 1.**<br>• **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: 2    0                        0   9                               n   user
  2: 4    0                                                            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                                 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
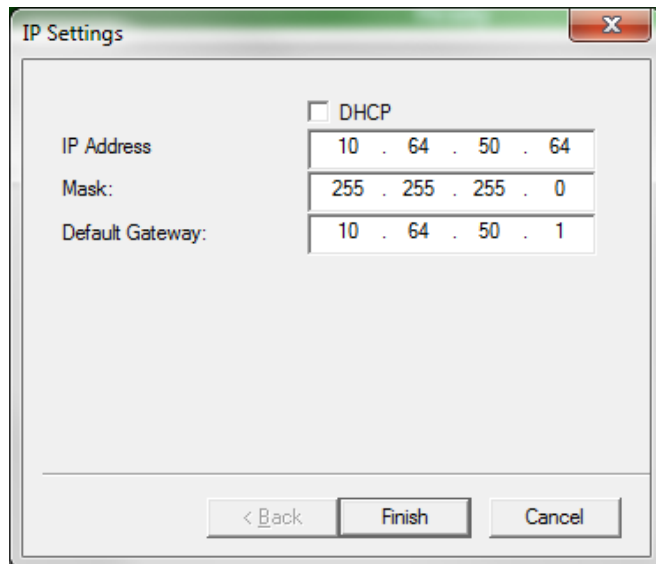
The configuration of the CELLX cellular gateway is a two-step process. Each step requires the use of its own tool, both of which are included on the CD that shipped with the gateway. Install both the "TELES Quickstart" application and the "TELES GATE Manager".

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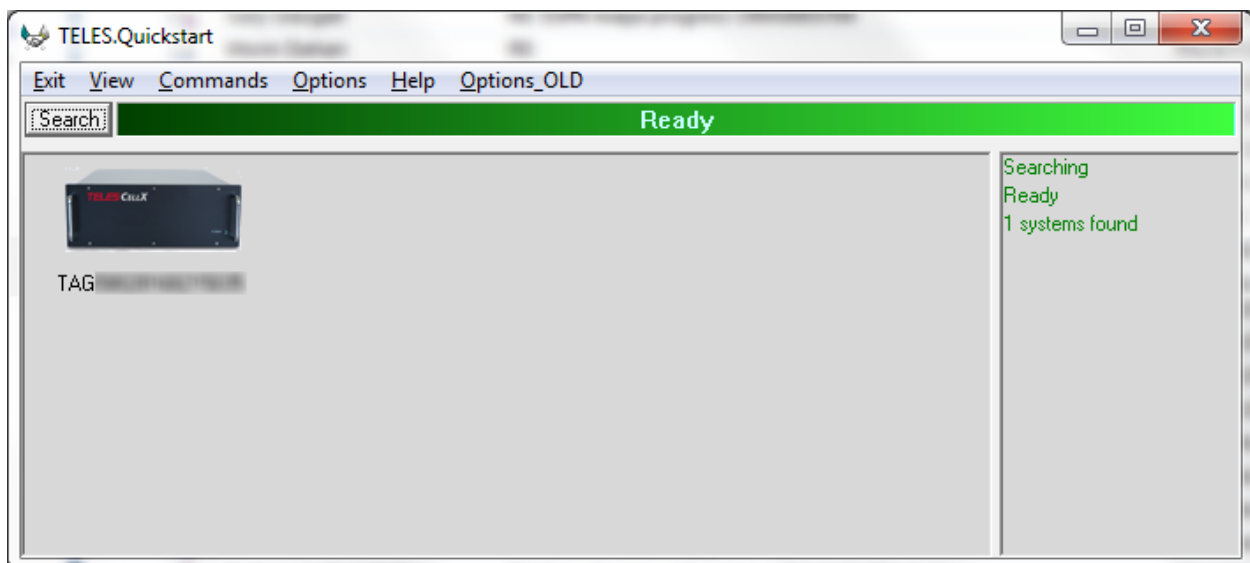
The IP-Setting box will appear. Assign the appropriate network settings, as shown below and click **Finish**.



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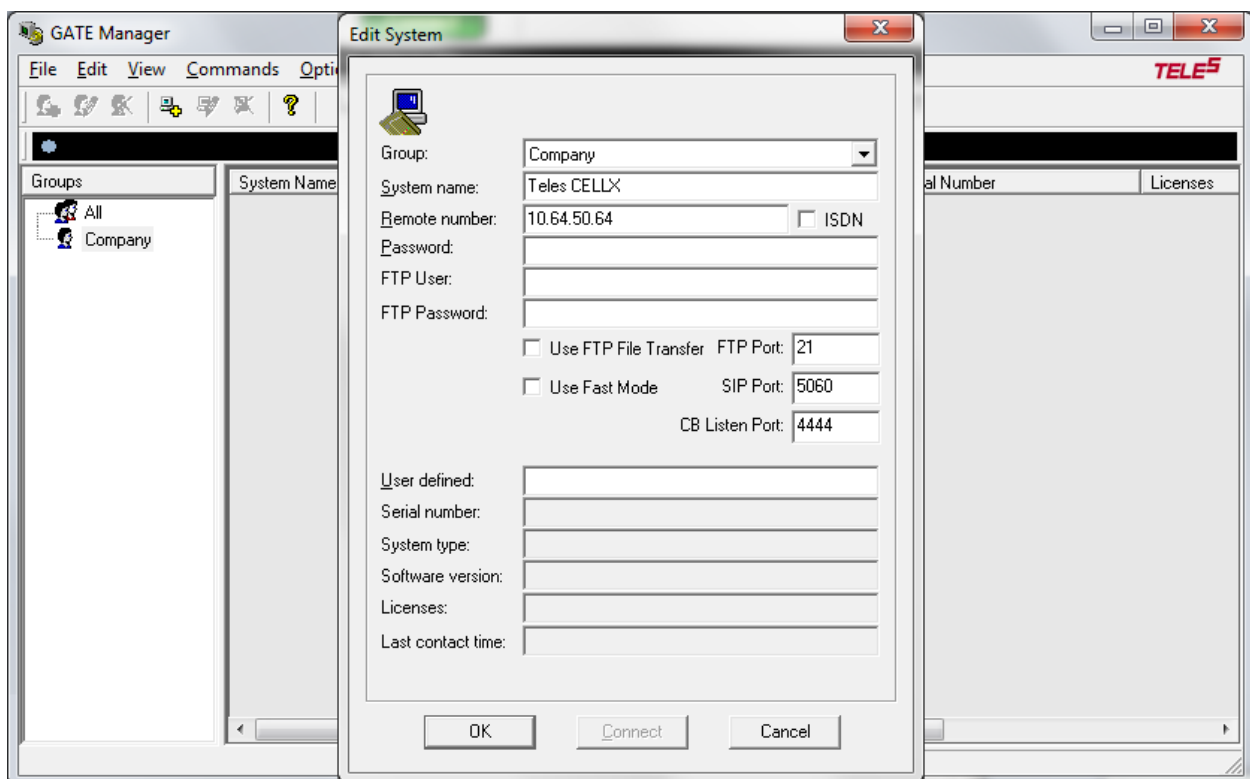
Launch the TELES GATE Manager application.
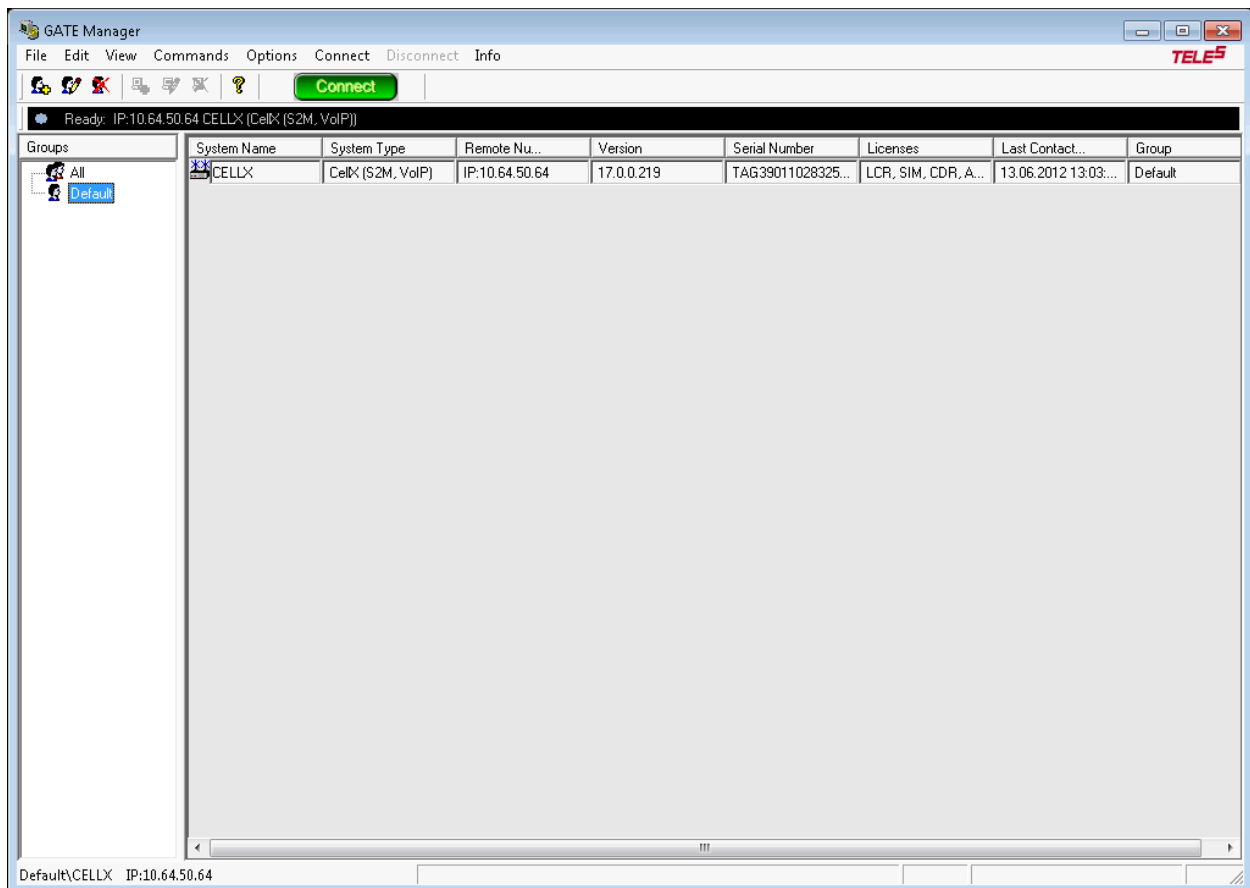
The first time the GATE Manager is used, a Group must be added. Under **Groups**, right click on the left pane of the GATE Manager and choose **New Group**. Assign a name and click **OK** (not shown) to continue.

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.
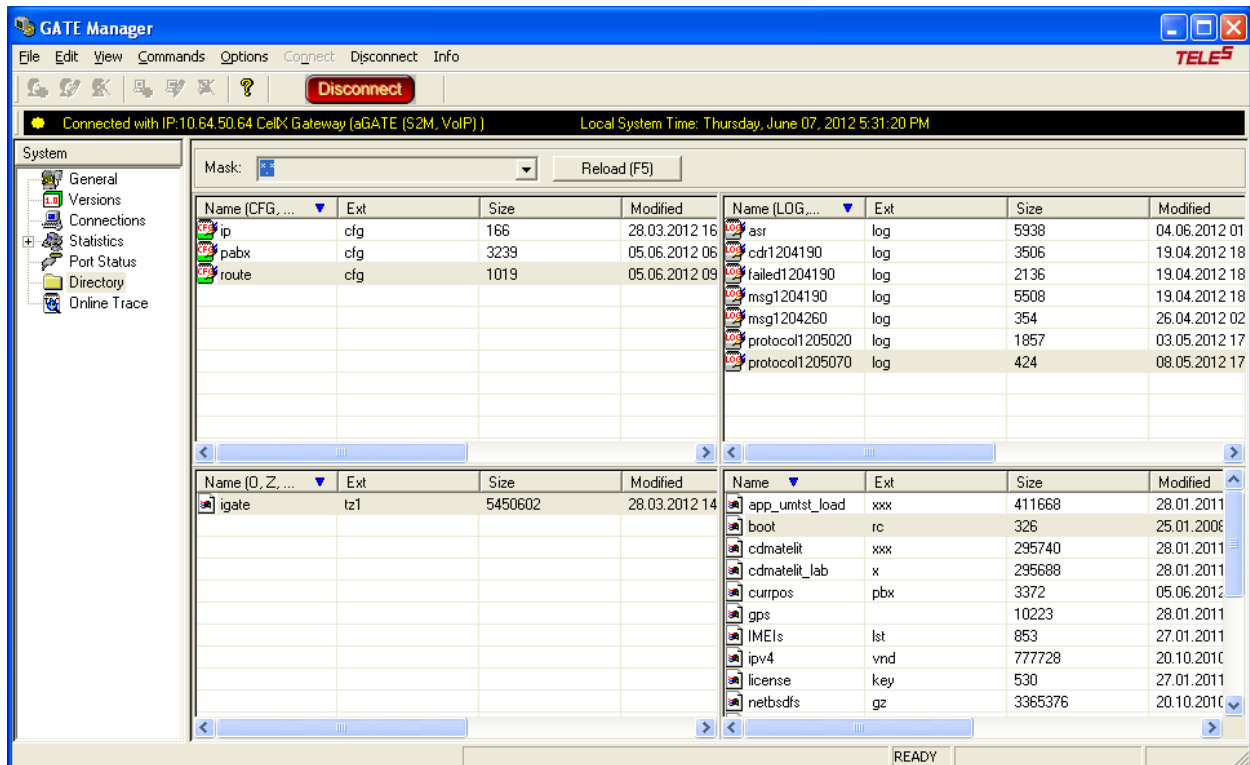


From the GATE Manager window (not shown), right click on **H323_route cfg** and choose **Copy**. In the **Rename/Copy** dialog that is presented, rename **H323_route.cfg** to **route.cfg** and click **OK**. Confirm any prompts received to overwrite the current **route.cfg** file.

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 **Microsoft 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 Avaya PBX by way of an H.323 trunk. In this context, "**inbound**" means calls coming into the Avaya PBX from the cellular network, routed via H.323. "**Outbound**" refers to calls going out of the PBX, via H.323, to the CELLX and progressing out to the cellular network.

```
; ###########################################################
: Default configuration for H.323 connections
; ###########################################################


[System]
;---------------

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

; outbound calls
Restrict40=out          ; calls from VoIP are labelled as "out"
MapAllout911=20911
MapAllout01=|201<<13   ; collect digits and forward calls to cellular
MapAllout0=|201<<13
MapAllout=20

DTMFWaitDial=3          ; timeout for digit collection

; inbound calls
Restrict20=in 01
MapAllin=40PBX:61234   ; forward inbound calls to extension 61234 via
VoIP

[Voip:PBX]
VoipDirection=IO
VoipPeerAddress=1.2.3.4     ; Replace with the IP address of your PBX
VoipIpMask=0xffffffff
VoipCompression=g711u
VoipSilenceSuppression=No
VoipSignalling=0
VoipMaxChan=64
VoipTxM=2
VoipDtmfTransport=2
VoipRFC2833PayloadType=101
VoipIgnoreDADType=Yes
VoipMediaWaitForConnect=No
VoipIPLogging=Yes
VoipRfc4028=0
```

The H.323 connection to the Avaya PBX is defined with the following lines in the route.cfg
configuration file, called a "profile":

```
[Voip:PBX]
VoipDirection=IO
VoipPeerAddress=1.2.3.4      ; Replace with the IP address of your PBX
VoipIpMask=0xffffffff
VoipCompression=g711u
VoipSilenceSuppression=No
VoipSignalling=0
VoipMaxChan=64
VoipTxM=2
VoipDtmfTransport=2
VoipRFC2833PayloadType=101
VoipIgnoreDADType=Yes
VoipMediaWaitForConnect=No
VoipIPLogging=Yes
VoipRfc4028=0
```

In most applications, these parameters will remain unchanged except the "VoipPeerAddress" parameter. Replace "**1.2.3.4**" with the Communication Manager IP address.

The "**Restrict**" commands, found near the top of the route.cfg file, 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 dialled 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 5.3.1.1** "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
MapAllout=20
```

These three lines will create three routing rules. Calls that start with "01" will be wait until enough digits have been collected (last 10 digits + the "1" + the "20" representing the cellular channels). Similarly, calls that start with "0", but don't have a "1". Then lastly, a catch-all rule that sends calls as received by the CELLX.

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=40PBX:61234
```

Here "40:PBX" indicates the address on the CELLX of the H.323 interface connected to the profile
"PBX", while "61234" is an example of an extension on the PBX that should be changed as appropriate for the implementation. Change the "61234" 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=40PBX:00
```

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 5.3.1.2, "The MapAll Command".

Save changes and exit the text editor. This will save the document locally on thePC.

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 H323_pabx cfg and choose Copy. In the Rename/Copy dialog that is presented, rename H323_pabx.cfg to pabx.cfg and click OK. Confirm any prompts received to overwrite the current pabx.cfg file.

The default H323_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. Please 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 H.323 IP trunk 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 H.323 trunk. 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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