Application Notes for Configuring 911 Enable Emergency Gateway and Emergency Routing Service with Avaya Aura® Communication Manager R6.2, Avaya one-X® Desk Phones and Avaya one-X® Communicator– Issue 1.2

Abstract

These Application Notes describe the procedures for configuring the 911 Enable Emergency Gateway and Emergency Routing Service with Avaya Aura® Communication Manager R6.2 and Avaya one-X® Desk Phones.

The 911 Enable Emergency Gateway and Emergency Routing Service offer E911 call routing and location provisioning solution for enterprises using both legacy and IP phone deployments. Avaya Aura® Communication Manager connects to the Emergency Gateway via an H.323 trunk and the Emergency Gateway connects to the public Internet to access the Emergency Routing Service. The compliance testing focused on placing 911 calls from Avaya one-X® Desk Phones connected to different network equipment to verify that their location and callback number could be properly determined.

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 the procedures for configuring the 911 Enable Emergency Gateway (EGW) and Emergency Routing Service (ERS) with Avaya Aura® Communication Manager and Avaya one-X® Desk Phones.

The 911 Enable Emergency Gateway and Emergency Routing Service offers an E911 call routing and location provisioning solution for enterprises using both legacy and IP phone deployments. Avaya Aura® Communication Manager connects to the Emergency Gateway via an H.323 trunk and the Emergency Gateway connects to the public Internet to access the Emergency Routing Service. The compliance testing focused on placing 911 calls from various endpoint types connected to different network equipment to verify that their location and callback number could be properly determined.

2. General Test Approach and Test Results

This section describes the compliance testing used to verify the interoperability of the EGW and ERS with Communication Manager. This section covers the general test approach and the 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 following features and functionality of the EGW were tested.

- Layer 2 discovery from supported layer 2 switches.
- Layer 3 discovery of Avaya one-X® Desk Phones that support the PUSH API.
- Layer 3 discovery of Avaya one-X® Communicator when used with 911 Enable E911 Softphone Locator (ESL) Software.
- Emergency calls from all endpoint types were routed to the ERS via the EGW.
- Proper location information provided for all "known" locations.
- Calls from "unknown" locations were routed to the 911 Enable Emergency Call Response Center (ECRC).
- Callback numbers were assigned using the EGW Extension-Bind feature.
- Calls placed using the provided callback number were routed to the proper extension.
- Failover to the secondary EGW, if the primary EGW was not available.
- If neither EGW was available, Communication Manager routed emergency calls to the ECRC via the PSTN.
- If the ERS was not available, the EGW routed emergency calls to the ECRC via Communication Manager.
  Note: *Please note that EGW supports only G711MU audio codec and does not support IP-IP media shuffling.*

2.2. Test Results

The features described in **Section 2.1** were tested. All test cases passed successfully

2.3. Support

For technical support on the EGW, contact 911 Enable at www.911enable.com.

3. Reference Configuration

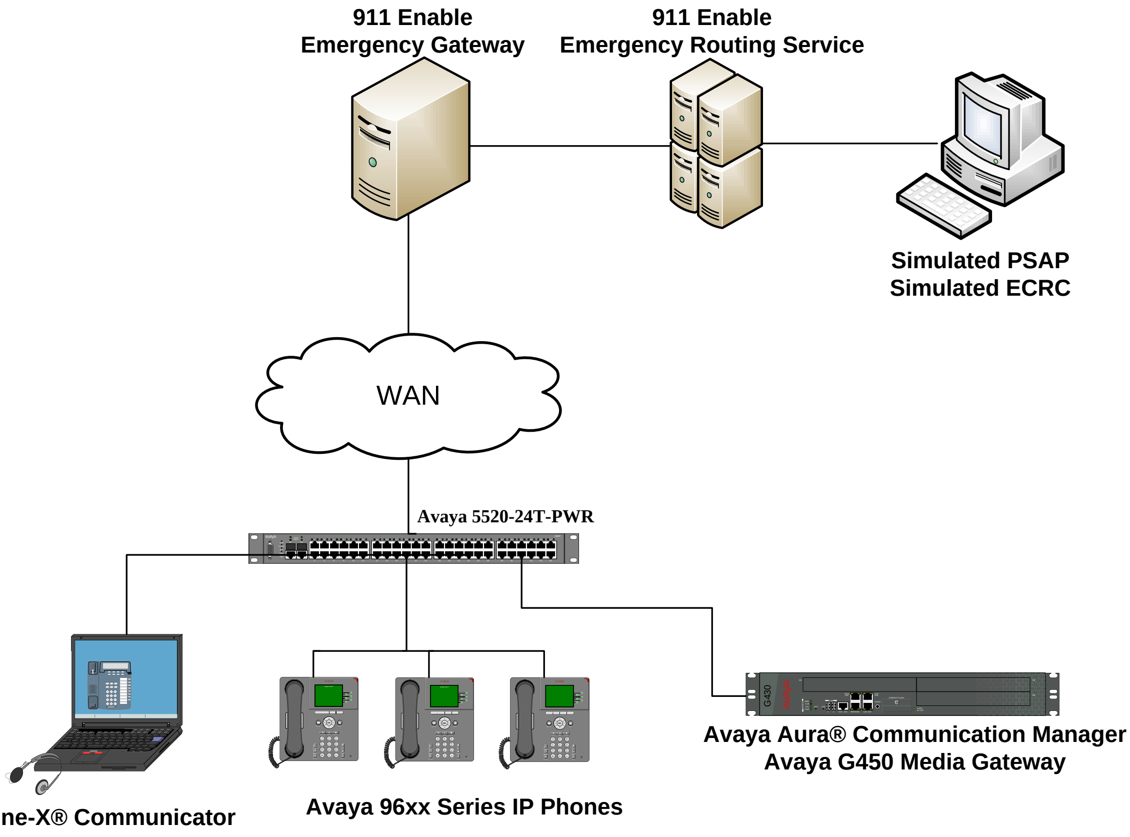

911 Enable
Emergency Gateway
911 Enable
Emergency Routing Service
Simulated PSAP
Simulated ECRC
WAN
Avaya 5520-24T-PWR
Avaya Aura® Communication Manager
Avaya G450 Media Gateway
Avaya one-X® Communicator
Avaya 96xx Series IP Phones

Figure 1: Reference Configuration

Figure 1 illustrates the test configuration. The test configuration shows an enterprise site connected to the 911 Enable Emergency Routing Service (ERS) via the 911 Enable Emergency Gateway (EGW). The ERS can send calls to the Public Service Answering Point (PSAP) or to the ECRC.

3.1. Auto-Discovery of Endpoints

The EGW attempts to auto discover the presence and location of Avaya one-X® Desk Phones by correlating data obtained through two mechanisms.

1. The first mechanism is known as layer 2 discovery. To support layer 2 discovery, each layer 2 switch where the above telephone types are connected must support certain MIB objects required by the EGW. In the test configuration, Avaya 5520-24T-PWR was used. The data obtained from layer 2 discovery includes the MAC address of the device connected to each port of the switch.

2. The second mechanism required for auto-discovery is known as layer 3 discovery. To support layer 3 discovery, each listed telephone type uses an application downloaded to it during initialization to report information to the EGW. Thus, the Avaya one-X® Desk Phone must support the PUSH API. The information collected includes the MAC address, IP address and extension of the phone. Correlating the information from layer 2 and 3, the EGW learns what extensions are physically connected to which layer 2 switch.

The location of Avaya one-X® Communicator is gathered in a similar manner. Layer 2 discovery is dependent upon which layer 2 switch the Windows PC running Avaya one-X® Communicator is connected. Layer 3 discovery is done by installing the 911 Enable ESL software on the same PC, to report the necessary information for these endpoints.

All digital and analog endpoints also must be manually provisioned.

3.2. Callback Numbers

A callback number (CBN) is assigned to each extension for use by the 911 operator to reach the caller if the emergency call is dropped. The callback number for each extension would be its Direct Inward Dial (DID) number if it has one assigned. However, all internal extensions may not have a DID assigned. In this case, where an extension does not have a DID assigned, the EGW will temporarily map a DID number to that extension for the duration of the emergency call. This is known as the EGW Extension-Bind feature. The pool of DIDs used by the EGW is assigned to the EGW from the DIDs owned by the enterprise. In the case of the compliance test, none of the extensions were assigned an individual DID number, instead all extensions were assigned a temporary DID from the EGW during an emergency call. In addition, a single DID number was allocated to the EGW for this purpose.

3.3. Emergency Call Flows

Emergency calls are routed differently depending on whether all components are operational and what information is available about the caller.

1. **Typical "Sunny Day" Scenario**: If all components and user information are available then the call flow is as follows: User Extension → Communication Manager → EGW → ERS → PSAP. If a callback call is needed and a temporary DID number is used from the EGW Extension-Bind pool, then the callback call flow is PSAP → PSTN → Communication Manager → EGW → Communication Manager → User Extension. If the user extension has its own DID number, then the callback call would not need to be routed through the EGW but would flow from PSAP → PSTN → Communication Manager → User Extension.
2. **Missing User Information**: If all components are operational, but the emergency call does not have the proper location or callback information, then the call is routed to the ECRC where a trained 911 operator collects the correct information before forwarding the call to the PSAP. This call can reach the ECRC in two different ways based on the provisioning of the EGW. The EGW can be provisioned to reject the call if all necessary information is not present, so that Communication Manager reroutes the call out the PSTN. This was done for the compliance test. The call flows from User Extension → Communication Manager → EGW (rejects the call), then the call is rerouted as Communication Manager → PSTN → ECRC → PSAP. Alternatively, the EGW can be provisioned to accept the call and send it to the ERS. The ERS will determine that all information is not present and send the call to the

ECRC. The call flow would be User Extension → Communication Manager → EGW → ERS → ECRC → PSAP. Either the ECRC or the PSAP can initiate a callback if necessary. If the callback is made from the PSAP, the callback call flow would be the same as described in scenario 1 above. If the ECRC places the callback, the call flow is the same as described in scenario 1 with the exception that the ECRC replaces the PSAP in the call flow.

3. **ERS Unavailable**: If the EGW is operational but the ERS is unavailable, then when the EGW receives an emergency call, it will originate a new call leg to the ECRC (using the 10 digit ECRC number) through Communication Manager and bridge the emergency call. The call flows from User Extension → Communication Manager → EGW, then EGW → Communication Manager → PSTN → ECRC → PSAP. The callback call flows would be the same as the callback call flows described in scenario 2 above.
4. **EGW Failover**: If the primary EGW fails, Communication Manager will reroute the call to the secondary EGW. The call flow would be the same as scenario 1 above.
5. **Both EGWs Fail**: If both EGWs are unreachable, Communication Manager will timeout on its call requests to EGWs and reroute the call to the ECRC. The call flow is User Extension → Communication Manager → EGW (no response), then the call is rerouted as Communication Manager → PSTN → ECRC → PSAP. The callback call flows would be the same as the callback call flows described in scenario 2 above.

4. Equipment and Software Validated

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

Equipment	Software/Firmware
Avaya Aura® Communication Manager	6.2 SP3
Avaya G450 Media Gateway	31.20.1
Avaya Aura® Session Manager	6.2 SP3
Avaya 9630 IP Phone Avaya 9608 IP Phone Avaya 9641 IP Phone	SIP 2.6.7 H.323 3.1.5
Avaya one-X® Communicator	6.1
Avaya 6408D Digital Telephone	-
Avaya 6210 Analog Telephone	-
911 Enable Emergency Gateway	4.1
911 Enable E911 Softphone Locator Software	1.5
911 Enable Emergency Routing Service	2.12

5. Configure Avaya Aura® Communication Manager

This section describes the Communication Manager configuration to support connectivity to the EGWs and related functionality. It assumes all other components of **Figure 1** have already been configured. For more detailed information on any other Communication Manager configuration shown in **Figure 1**, see [1].

The configuration of Communication Manager was performed using the System Access Terminal (SAT). After the completion of the configuration, perform a **save translation** command to make the changes permanent.

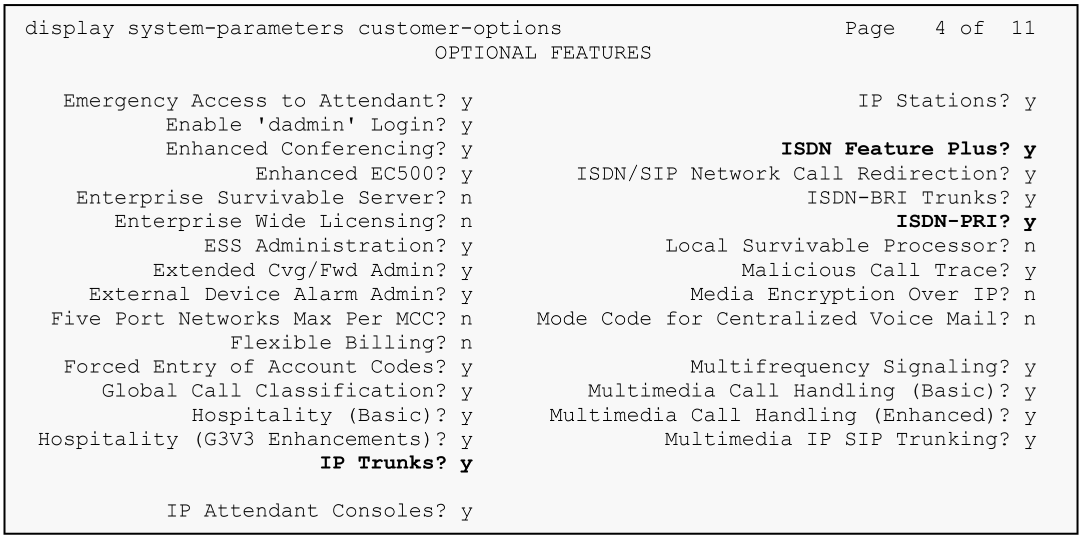
5.1. H.323 Trunk Related Configuration

This section summarizes the configuration of the H.323 trunks that connects the Communication Manager to each EGW.

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>1.</td><td>

System Parameters – Customer Options

Use the **display system-parameters customer-options** command to verify that the options highlighted below are enabled. The **IP Trunks** and **ISDN-PRI** options are required to support H.323 trunks in general. In addition, the **ISDN Feature Plus** option is required for EGW interoperability.



```
display system-parameters customer-options                    Page   4 of  11
                                OPTIONAL FEATURES

   Emergency Access to Attendant? y                              IP Stations? y
           Enable 'dadmin' Login? y
           Enhanced Conferencing? y                        ISDN Feature Plus? y
                  Enhanced EC500? y       ISDN/SIP Network Call Redirection? y
    Enterprise Survivable Server? n                          ISDN-BRI Trunks? y
       Enterprise Wide Licensing? n                                 ISDN-PRI? y
              ESS Administration? y               Local Survivable Processor? n
          Extended Cvg/Fwd Admin? y                     Malicious Call Trace? y
     External Device Alarm Admin? y                 Media Encryption Over IP? n
  Five Port Networks Max Per MCC? n     Mode Code for Centralized Voice Mail? n
                Flexible Billing? n
   Forced Entry of Account Codes? y                 Multifrequency Signaling? y
      Global Call Classification? y         Multimedia Call Handling (Basic)? y
             Hospitality (Basic)? y      Multimedia Call Handling (Enhanced)? y
  Hospitality (G3V3 Enhancements)? y               Multimedia IP SIP Trunking? y
                       IP Trunks? y

           IP Attendant Consoles? y
```

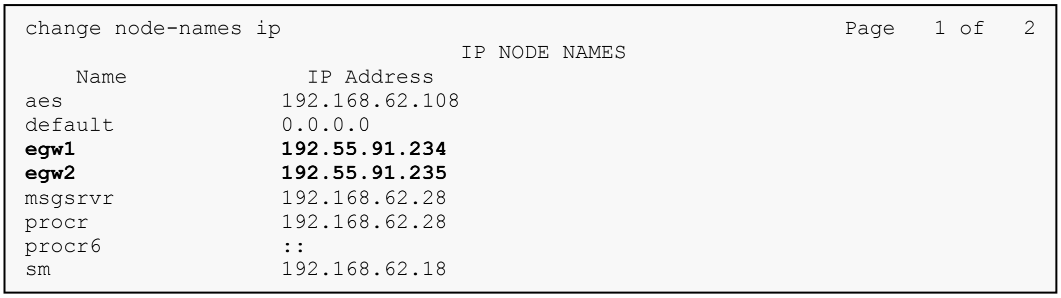
</td></tr>
</table>

Step	Description

2.

Node Names

Use the **change node-names ip** command to create node names for each EGW and associate the node name with the IP address of the corresponding EGW.   The example below shows the node names and IP addresses used for the compliance test. These node names will be used in the administration of other forms on Communication Manager.



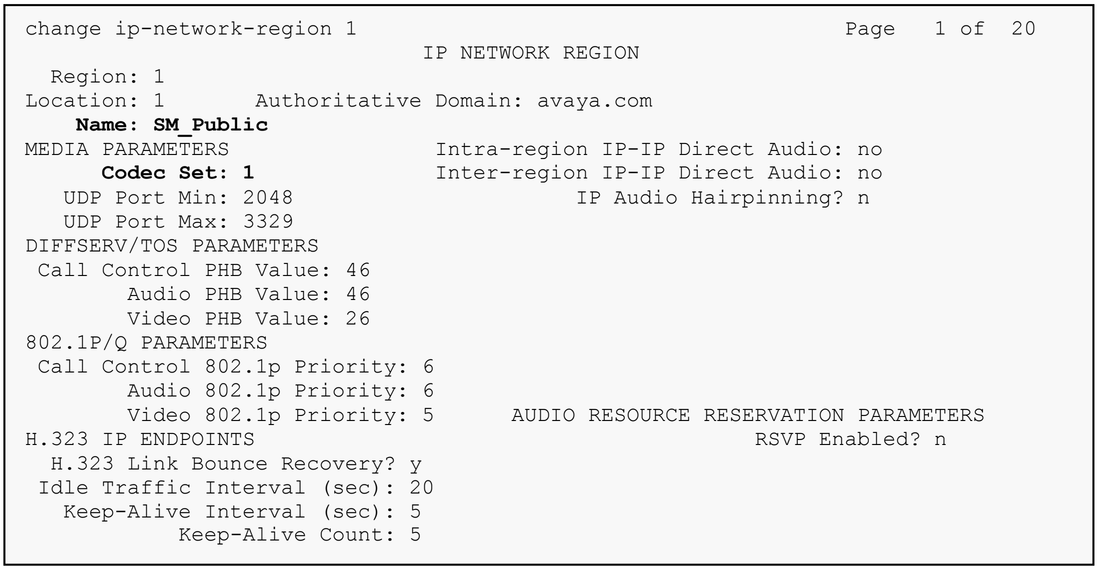
```
change node-names ip                                            Page   1 of   2
                                  IP NODE NAMES
    Name              IP Address
aes                 192.168.62.108
default             0.0.0.0
egw1                192.55.91.234
egw2                192.55.91.235
msgsrvr             192.168.62.28
procr               192.168.62.28
procr6              ::
sm                  192.168.62.18
```

3.

IP network region

Avaya endpoints were located in a single IP network region (IP network region 1) using the parameters described below. Use the **display ip-network-region** command to view these settings. By default, both EGWs will also be in IP network region 1 unless specifically placed in a separate region using the **ip-network-map** command. The example below shows the values used for the compliance test.

- A descriptive name was entered for the **Name** field.
- The **Codec Set** field was set to the IP codec set to be used for calls within this IP network region. In this case, IP codec set 1 was selected. This is the codec set that will be used for calls between the EGW and Communication Manager since all components are in IP network region 1.
- The default values were used for all other fields.



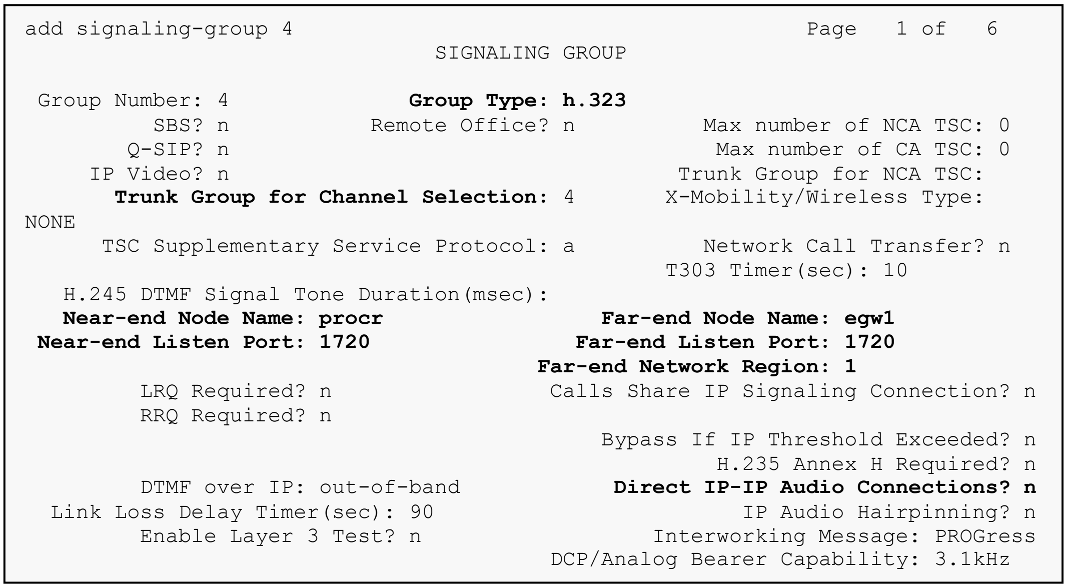
```
change ip-network-region 1                                      Page   1 of  20
                               IP NETWORK REGION
  Region: 1
Location: 1       Authoritative Domain: avaya.com
    Name: SM_Public
MEDIA PARAMETERS                Intra-region IP-IP Direct Audio: no
      Codec Set: 1              Inter-region IP-IP Direct Audio: no
   UDP Port Min: 2048                      IP Audio Hairpinning? n
   UDP Port Max: 3329
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
```

Step	Description
4.	**Codecs** Use the **change ip-codec-set 1** command to define the codecs used by IP codec set 1. The EGW only supports the G.711MU codec. Thus for the compliance test, only G.711MU was set in the codec list.

Step	Description
5.	**Signaling Group**

Use the **add signaling-group *n*** command, where ***n*** is an unused signaling group, to create a new signaling group for each H.323 trunk to each of the EGWs. For the compliance test, signaling group 4 was created for the trunk to the primary EGW and signaling group 5 was created for the trunk to the secondary EGW. Signaling group 4 was configured using the parameters highlighted below. Signaling group 5 was configured in the same way except where noted below. Default values were used for all other fields.

- Set the **Group Type** to ***h.323***.
- Set the **Trunk Group for Channel Selection** field to the trunk group created in the next step. This cannot be done until the trunk group is created. Thus, initially this field is left blank and later changed to the correct value after the trunk group is created. A separate trunk group will be created for each signaling-group.
- Set the **Near-end Node Name** to ***procr***. This node name maps to the IP address of the Avaya Server. Node names are defined using the **change node-names ip** command (**Step 2**).
- Set the **Far-end Node Name** to ***egw1***. This node name maps to the IP address of the primary EGW as defined using the **change node-names ip** command (**Step 2**). For signaling-group 32, set this field to ***egw2***.
- Set the **Near-end Listen Port** and **Far-end Listen Port** to ***1720***.
- Set the **Far-end Network Region** to ***1***. This is the IP network region which contains the EGW.
- Set the **Direct IP-IP Audio Connections** field to ***n***. The EGW does not support media shuffling so this field must be set to ***n***.
- The default values were used for all other fields.



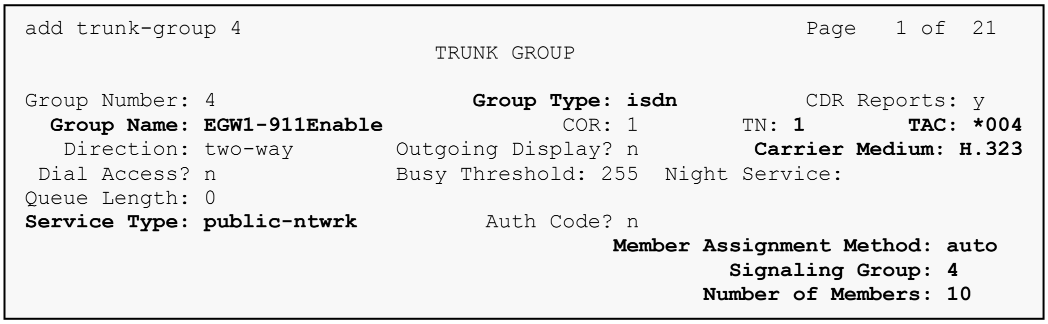
```
add signaling-group 4                                        Page   1 of   6
                                SIGNALING GROUP

 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: egw1
 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
                                             Bypass If IP Threshold Exceeded? n
                                                      H.235 Annex H Required? n
         DTMF over IP: out-of-band            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
```

Step	Description
6.	**Trunk Group**

Use the **add trunk-group *n*** command, where ***n*** is an unused trunk group, to create a new trunk group for each H.323 trunk to each of the EGWs. For the compliance test, trunk group 4 was created for the trunk to the primary EGW and trunk group 5 was created for the trunk to the secondary EGW. Trunk group 4 was configured using the parameters highlighted below. Trunk group 5 was configured in the same way except where noted below. Default values were used for all other fields.

On **Page 1**:

- Set the **Group Type** to ***isdn***.
- Enter a descriptive name for the **Group Name**.
- Enter an available trunk access code (TAC) that is consistent with the existing dial plan in the **TAC** field.
- Set the **Carrier Medium** to ***H.323***.
- Set the **Service Type** to ***public-ntwrk***.
- Set the **Member Assignment Method** to ***auto***.
- Set the **Signaling Group** to the signaling group shown in the previous step.
- Set the **Number of Members** field to the number of channels available in this trunk. For an H.323 trunk, the number of members also represents the number of simultaneous calls that can be supported by the trunk. For the compliance test, the number of members was chosen to be ***10***.
- The default values were used for all other fields.



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

Group Number: 4                    Group Type: isdn          CDR Reports: y
  Group Name: EGW1-911Enable              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: public-ntwrk          Auth Code? n
                                              Member Assignment Method: auto
                                                       Signaling Group: 4
                                                     Number of Members: 10
```

Step | **Description**

7. **Trunk Group – continued**

On **Page 3**:

- It is required that the **Send Name** field is set to ***y*** and the **Send Calling Number** field is set to ***y***.
- Set the **Format** field to ***pub-unk***. This field specifies the format of the calling party number sent to the far-end.
- The default values were used for all other fields.

```
add trunk-group 4                                              Page   3 of  21
TRUNK FEATURES
          ACA Assignment? n            Measured: none
                                                           Maintenance Tests? y
                               Data Restriction? n     NCA-TSC Trunk Member:
                                      Send Name: y      Send Calling Number: y
            Used for DCS? n                             Send EMU Visitor CPN? n
   Suppress # Outpulsing? n    Format: pub-unk
                                             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     Modify Tandem Calling Number: no
               Send UCID? n
 Send Codeset 6/7 LAI IE? y
```

8. **Public Unknown Numbering**

Public unknown numbering defines the calling party number to be sent to the far-end. An entry was created that will be used by the trunk groups defined in **Step 6**. In the example shown below, all calls originating from a 5-digit extension beginning with 5 and routed across trunk group 4 or 5 will be sent as a 5-digit calling number.

```
change public-unknown-numbering 0                               Page   1 of   2
                      NUMBERING - PUBLIC/UNKNOWN FORMAT
                                           Total
Ext Ext           Trk       CPN             CPN
Len Code          Grp(s)    Prefix          Len
                                                  Total Administered: 2
 5  4                                       5        Maximum Entries: 240
 5  7                                       5
 5  5             4                         5     Note: If an entry applies to
 5  5             5                         5     a SIP connection to Avaya
```

Step	Description

9. **Automatic Route Selection (ARS)**

For the compliance test, ARS was used to route emergency calls to the EGW. The dialed string of 9 was configured as the feature access code (FAC) for ARS. Use the **change ars analysis** command to create an entry in the ARS table. Two entries can be created in the ARS table so that calls dialed with or without the ARS feature access code were routed to the EGW (e.g., 9911 or 911). Accessing ARS without first dialing the FAC, is only possible if the **ARS/AAR Dialing without FAC** field is enabled. Use the **display system-parameters customer-options** command to view its current state. In either case, the preceding 9 is removed by ARS before searching the table for a matching entry. The two resulting entries (for 11 and 911) are highlighted below.

For the current compliance test, only the user dialed string of both 911 and 9911 was tested. Both cases result in the same call to destination 911 being sent to the EGW. Thus, the difference in these approaches is more related to ARS than interoperability with the EGW.

A third entry is highlighted below which is used to route emergency calls to the ECRC. This is used if the ERS is unavailable and the EGW initiates a call to the ECRC number 1438xxxxxxx. The ECRC number begins with the dialed string of ***1438***. This dialed string is mapped to route pattern ***2*** which routes calls to trunk 2 connected to the PSTN.

```
change ars analysis 11                                          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
    11                     2    2     4        emer         n
    911                    3    3     4        emer         n
    1438                   11   11    2        natl         n
```

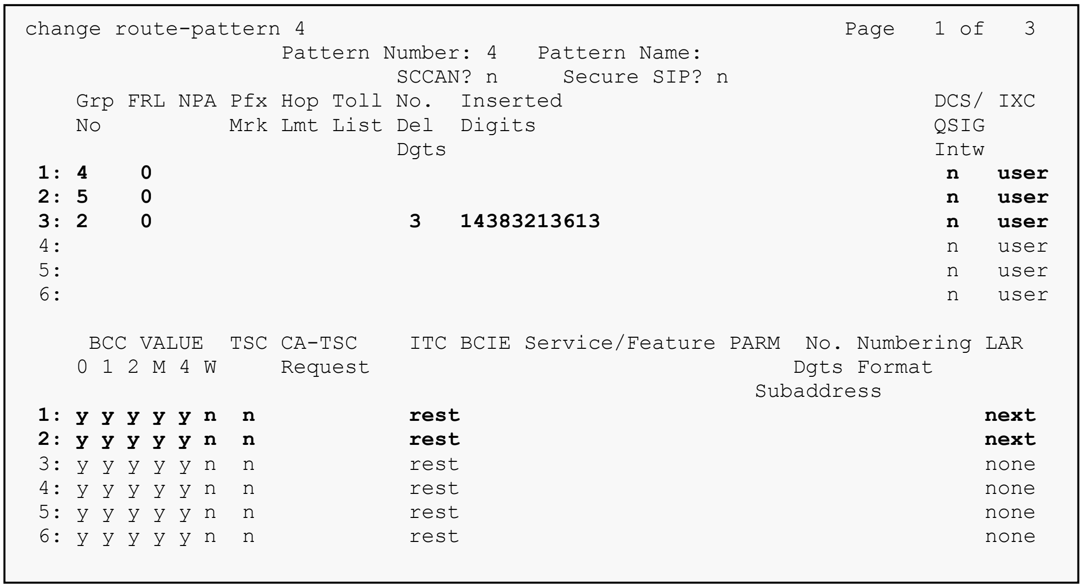
Step	Description
10.	**Route Patterns**

Use the **change route pattern *n*** command, where ***n*** is an unused route pattern, to create a separate route pattern for each of the dialed strings used for emergency calls in the ARS table. Set the **Pattern Name** field to a descriptive name. Create an entry in the table for each trunk that will be used in an attempt to complete the emergency call.

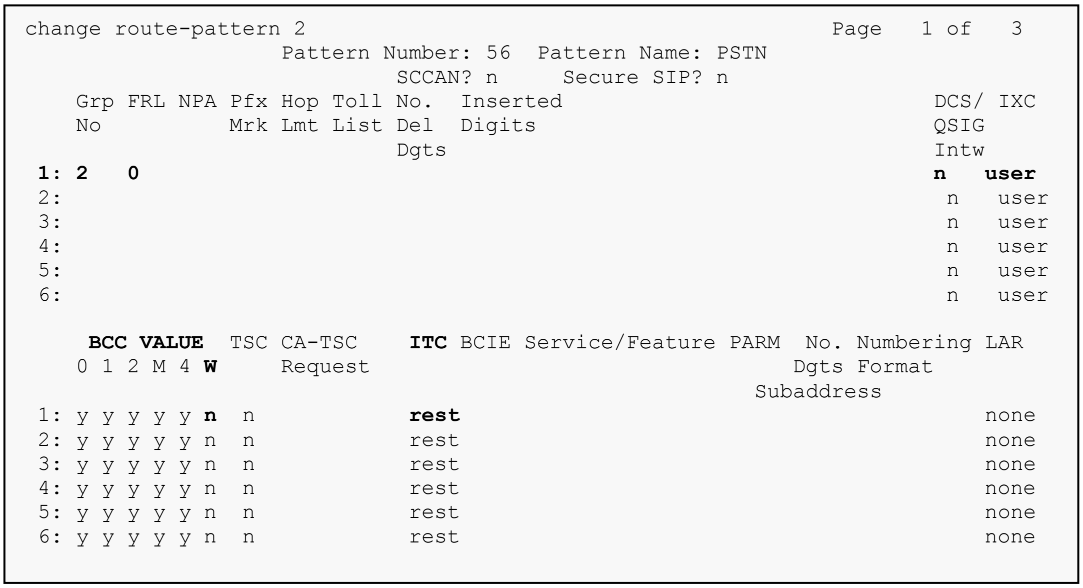
The example below shows route pattern 4 used in the compliance test. Route pattern 4 was accessed when ARS matches on a dialed string of 911. For the first entry, set the **Grp No.** field to the trunk group of the primary EGW1 (trunk group 4). Set the Facility Restriction Level (**FRL**) of the trunk to an appropriate level to allow authorized users to access the trunk. The level of ***0*** is the least restrictive. Set the Lookahead Routing (**LAR**) field to ***next***. This allows the next trunk in the table to be selected if the current one is unavailable.

For the second entry, set the **Grp No.** field to the trunk group of the secondary EGW1 (trunk group 5). Set all other fields the same as the previous entry.

For the third entry, set the **Grp No.** field to the trunk group of the PSTN trunk. In the case of the compliance test, this was trunk group 2. If both EGWs are unavailable, the call will be routed to the PSTN using the number of the ECRC where a trained operator will answer the call, collect location and callback information. Set the **FRL** to the same value as the previous entry. Set the **No. Del Dgts** field to ***3*** and set the **Inserted Digits** field to the PSTN number of the ECRC including the preceding 1. This setting deletes the post-processed ARS digits of 911 and replaces them with the PSTN number of the ECRC. The **LAR** field is left as ***none*** since this is the last entry.



```
change route-pattern 4                                         Page   1 of   3
                    Pattern Number: 4   Pattern Name:
                             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                                                             n   user
 2: 5    0                                                             n   user
 3: 2    0                    3   14383213613                          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                                          next
 2: y y y y y n  n            rest                                          next
 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
```

Step	Description
11.	**Route Pattern – PSTN Trunk** In cases where the EGW is operational but it cannot reach the ERS due to a WAN failure, the EGW will place a call across the H.323 trunk to Communication Manager destined to the PSTN number of the ECRC. Communication Manager will then route the call out the PSTN trunk. In testing with earlier versions of the EGW, the H.323 call originated from the EGW contained bearer capabilities that were not compatible with the typical settings for a PSTN trunk used for voice traffic. Thus, the route pattern to the PSTN trunk required that the **BCC Value W** be set to ***y*** and the **ITC** field was set to ***both***. These settings were not necessary with the version of EGW and Communication Manager used for this current compliance test. Thus, the default values were used for these parameters. The **BCC Value W** was set to ***n*** and the **ITC** field was set to ***rest*** (restricted) as shown below. 

```
change route-pattern 2                                          Page   1 of   3
                    Pattern Number: 56  Pattern Name: 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                                                                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
```

Step	Description

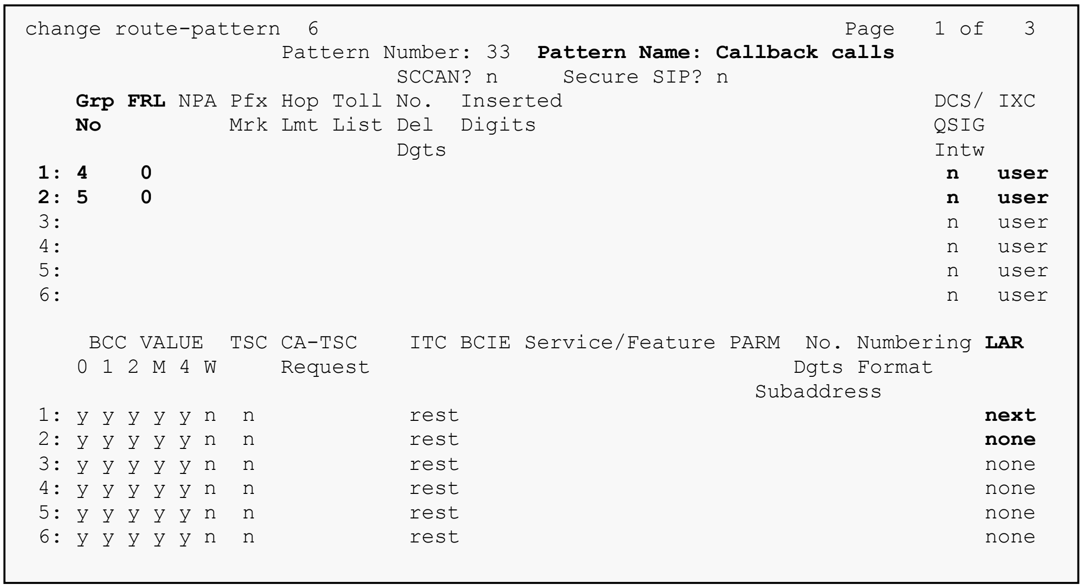
12. **Inbound Call Routing – Temporary Callback Numbers**
When the PSAP uses the callback number, it must be routed to the correct destination. If the callback number is a DID number temporarily assigned by the EGW as a callback number, then the call must get routed to the EGW to determine the associated internal extension. Use the **change inc-call-handling-trmt trunk-group *n*** command, where ***n*** is the trunk group to the PSTN, to insert a 9 in front of all the DID numbers used by the EGW as temporary DIDs. The preceding 9 (which is the ARS feature access code) will instruct Communication Manager to process the digits using ARS to determine the route. The **xxxx** in the example below is simply to mask the DID number for security reasons.

```
change inc-call-handling-trmt trunk-group 2                    Page   1 of   3
                       INCOMING CALL HANDLING TREATMENT
 Service/      Number   Number      Del Insert            Per Call Night
 Feature        Len      Digits                           CPN/BN   Serv
 tie             10  3035368xxxx         9
```

13. **Routing Callback Calls to the EGW**
Use the **change ars analysis** command to add an entry in the ARS table for each DID used by the EGW. Each entry will match on the inbound DID number and map it to a route pattern that will route the call to the EGW. The example below was used for the compliance test. The dialed string is the actual DID number (the **xxxx** in the example below is simply to mask the DID number for security reasons). This dialed string is mapped to route pattern ***6*** defined in the next step.

```
change ars analysis 11                                          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
    11                    2    2     4       emer          n
    1514                  11   11    2       natl          n
    303538xxxx            10   10    6       natl          n
    911                   3    3     5       emer          n
```

Step	Description
14.	**Callback Route Pattern** Use the **change route pattern** command to create a route for the callback calls using the EGW assigned DID numbers. These calls must be directed to the EGW. Thus, the route pattern is created the same as the route pattern 4 in **Step 10** with the following exceptions: • Use a unique name for the **Pattern Name**. • Remove the third trunk choice shown in route pattern 4. If the callback call fails to reach the EGW, it should not be routed out the PSTN trunk ***2*** as was done in **Step 10**. • By removing the third trunk from the route pattern, the **LAR** value for the second trunk should be set to none.



```
change route-pattern  6                                         Page   1 of   3
                    Pattern Number: 33  Pattern Name: Callback calls
                             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                                                              n   user
 2: 5    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                                          next
 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
```

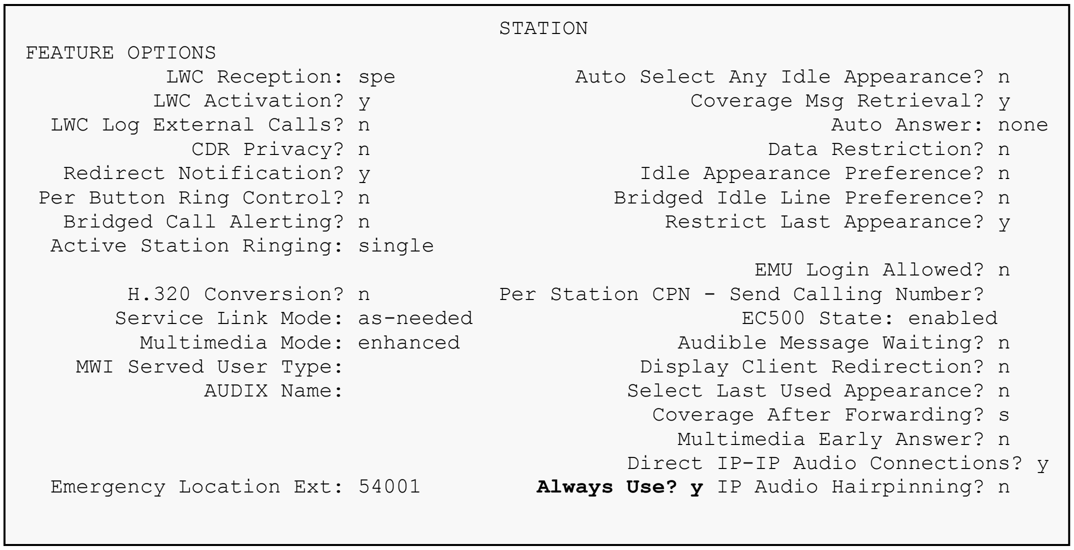
5.2. Station Configuration

This section will describe the settings required of each of the different station types to support the EGW functionality. Each station is required to have an Emergency Location Extension configured.

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>1.</td><td>

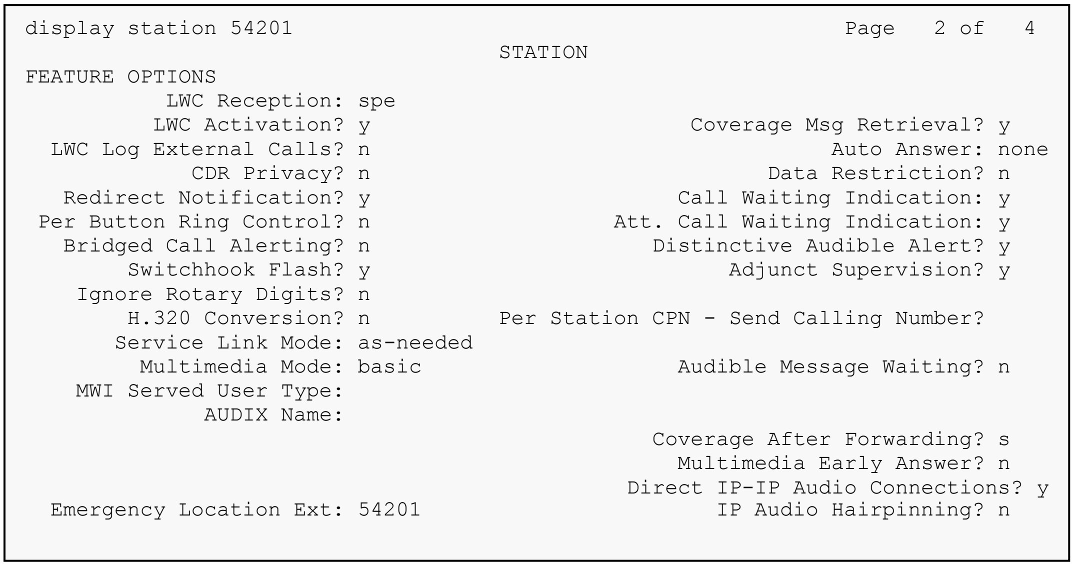
H.323 and SIP Telephones

The example below shows the Emergency Location Extension configuration for an Avaya 9630 IP Telephone (H.323). Use the **display station *n*** command, where ***n*** is the station extension, to view the settings. By default, the Emergency Location Extension is the same as the station extension and the **Always Use** field is set to ***y***. If the **Always Use** field is set to ***n***, then the Emergency Location Extension will be taken from the IP network map form if an extension is configured there. All H.323 and SIP telephones are configured in a similar way.



```
                                     STATION
FEATURE OPTIONS
           LWC Reception: spe              Auto Select Any Idle Appearance? n
          LWC Activation? y                         Coverage Msg Retrieval? y
  LWC Log External Calls? n                                    Auto Answer: none
            CDR Privacy? n                                Data Restriction? n
   Redirect Notification? y                     Idle Appearance Preference? n
 Per Button Ring Control? n                   Bridged Idle Line Preference? n
   Bridged Call Alerting? n                       Restrict Last Appearance? y
  Active Station Ringing: single
                                                         EMU Login Allowed? n
      H.320 Conversion? n          Per Station CPN - Send Calling Number?
     Service Link Mode: as-needed                     EC500 State: enabled
       Multimedia Mode: enhanced                   Audible Message Waiting? n
    MWI Served User Type:                       Display Client Redirection? n
             AUDIX Name:                       Select Last Used Appearance? n
                                                 Coverage After Forwarding? s
                                                   Multimedia Early Answer? n
                                               Direct IP-IP Audio Connections? y
  Emergency Location Ext: 54001         Always Use? y IP Audio Hairpinning? n
```

</td></tr>
</table>

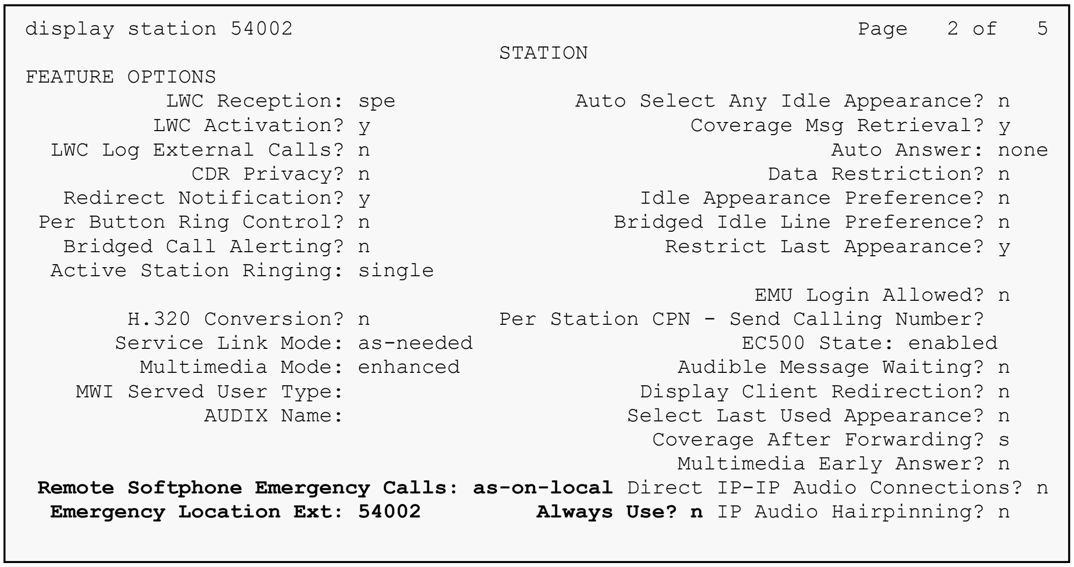
Step	Description
2.	**Digital and Analog Telephones** The example below shows the Emergency Location Extension configuration for a digital telephone. Use the **display station *n*** command, where ***n*** is the station extension, to view the settings. By default, the Emergency Location Extension is the same as the station extension. There is no **Always Use** field as there was for the H.323/SIP telephones. All digital and analog telephones are configured in a similar way. 

```
display station 54201                                           Page   2 of   4
                                     STATION
FEATURE OPTIONS
           LWC Reception: spe
          LWC Activation? y                         Coverage Msg Retrieval? y
  LWC Log External Calls? n                                    Auto Answer: none
             CDR Privacy? n                               Data Restriction? n
   Redirect Notification? y                         Call Waiting Indication: y
 Per Button Ring Control? n                    Att. Call Waiting Indication: y
   Bridged Call Alerting? n                       Distinctive Audible Alert? y
        Switchhook Flash? y                             Adjunct Supervision? y
    Ignore Rotary Digits? n
        H.320 Conversion? n          Per Station CPN - Send Calling Number?
       Service Link Mode: as-needed
         Multimedia Mode: basic                     Audible Message Waiting? n
    MWI Served User Type:
              AUDIX Name:
                                                 Coverage After Forwarding? s
                                                   Multimedia Early Answer? n
                                               Direct IP-IP Audio Connections? y
  Emergency Location Ext: 54201                        IP Audio Hairpinning? n
```

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>3.</td><td>

Avaya one-X® Communicators (H.323)

The example shows the settings for an Avaya one-X® Communicator (H.323). Use the **display station *n*** command, where ***n*** is the station extension, to view the settings. It contains an additional field named **Remote Softphone Emergency Calls**. In the case of the compliance test, the Avaya one-X® Communicator was treated the same as any other H.323 telephone on the enterprise, so the **Remote Softphone Emergency Calls** field was left with the default value of ***as-on-local***. This setting instructs the Communication Manager to use the value in the **Emergency Location Ext.** field as the Emergency Location Extension. This value can still be overwritten by the value on the IP network map form if permitted by the setting of the **Always Use** field.



```
display station 54002                                            Page   2 of   5
                                     STATION
FEATURE OPTIONS
           LWC Reception: spe              Auto Select Any Idle Appearance? n
          LWC Activation? y                         Coverage Msg Retrieval? y
  LWC Log External Calls? n                                    Auto Answer: none
             CDR Privacy? n                               Data Restriction? n
   Redirect Notification? y                     Idle Appearance Preference? n
 Per Button Ring Control? n                   Bridged Idle Line Preference? n
   Bridged Call Alerting? n                       Restrict Last Appearance? y
  Active Station Ringing: single
                                                         EMU Login Allowed? n
        H.320 Conversion? n          Per Station CPN - Send Calling Number?
       Service Link Mode: as-needed                     EC500 State: enabled
         Multimedia Mode: enhanced               Audible Message Waiting? n
    MWI Served User Type:                       Display Client Redirection? n
              AUDIX Name:                      Select Last Used Appearance? n
                                                 Coverage After Forwarding? s
                                                   Multimedia Early Answer? n
 Remote Softphone Emergency Calls: as-on-local Direct IP-IP Audio Connections? n
  Emergency Location Ext: 54002         Always Use? n IP Audio Hairpinning? n
```

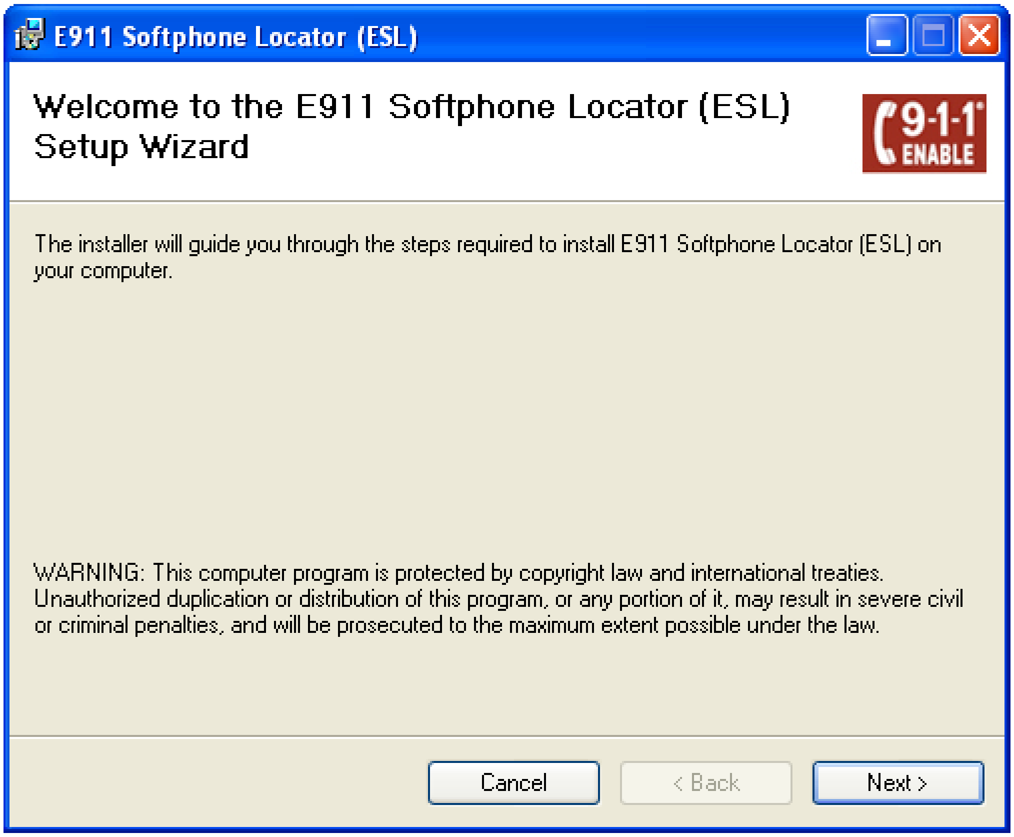
</td></tr>
</table>

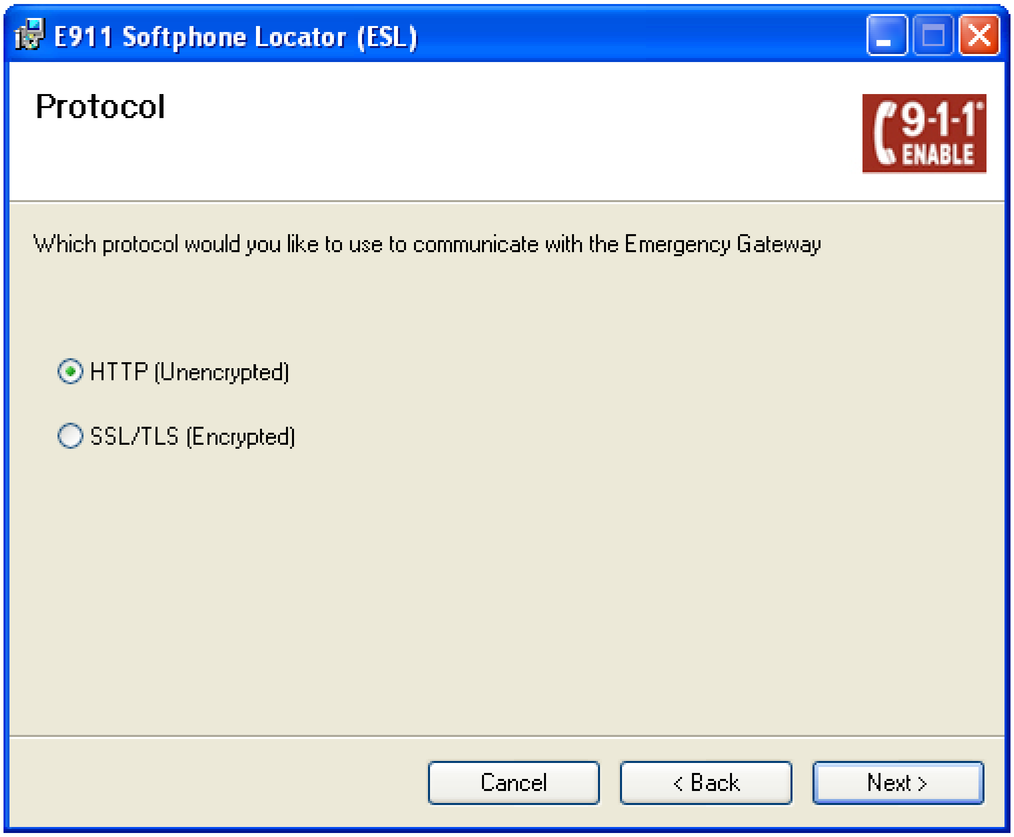
6. Configure Avaya Endpoints

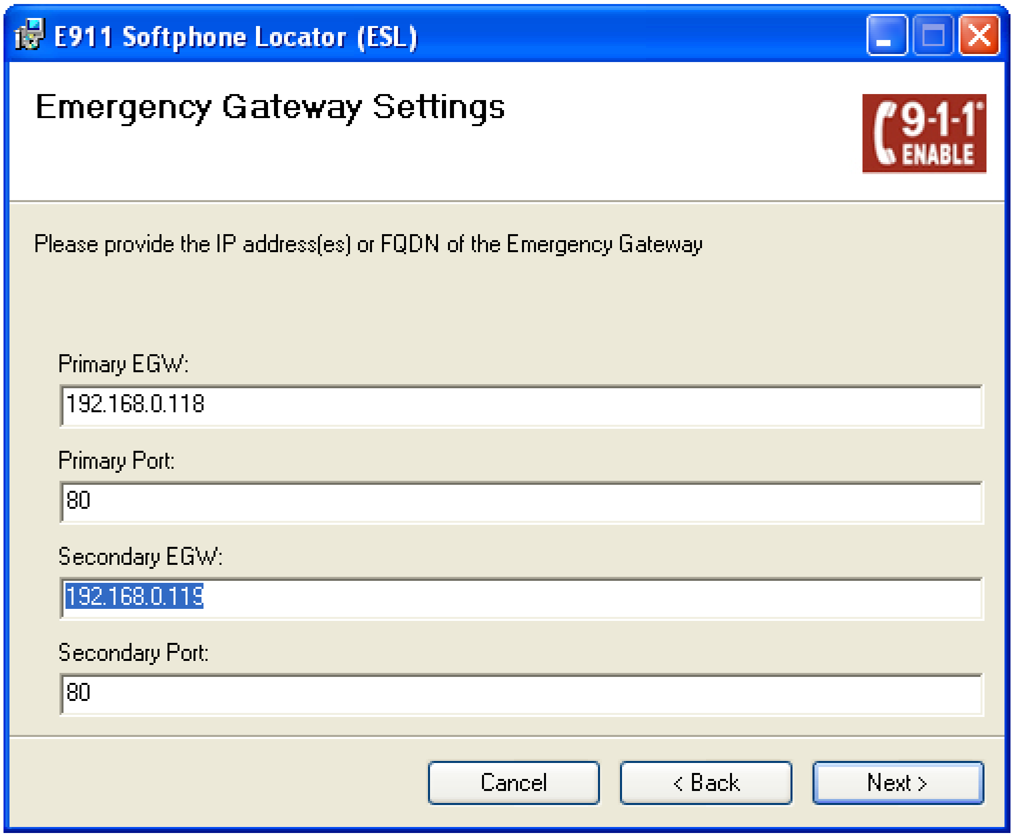
This section describes the configuration required of Avaya endpoints to support the EGW functionality. Avaya H.323 and SIP telephones require additions to the 46xxsettings.txt file to support layer 3 discovery. The Avaya one-X® Communicator requires installation of the ESL software on the same PC running the Avaya one-X® Communicator. No special configuration is required of analog or digital telephones.

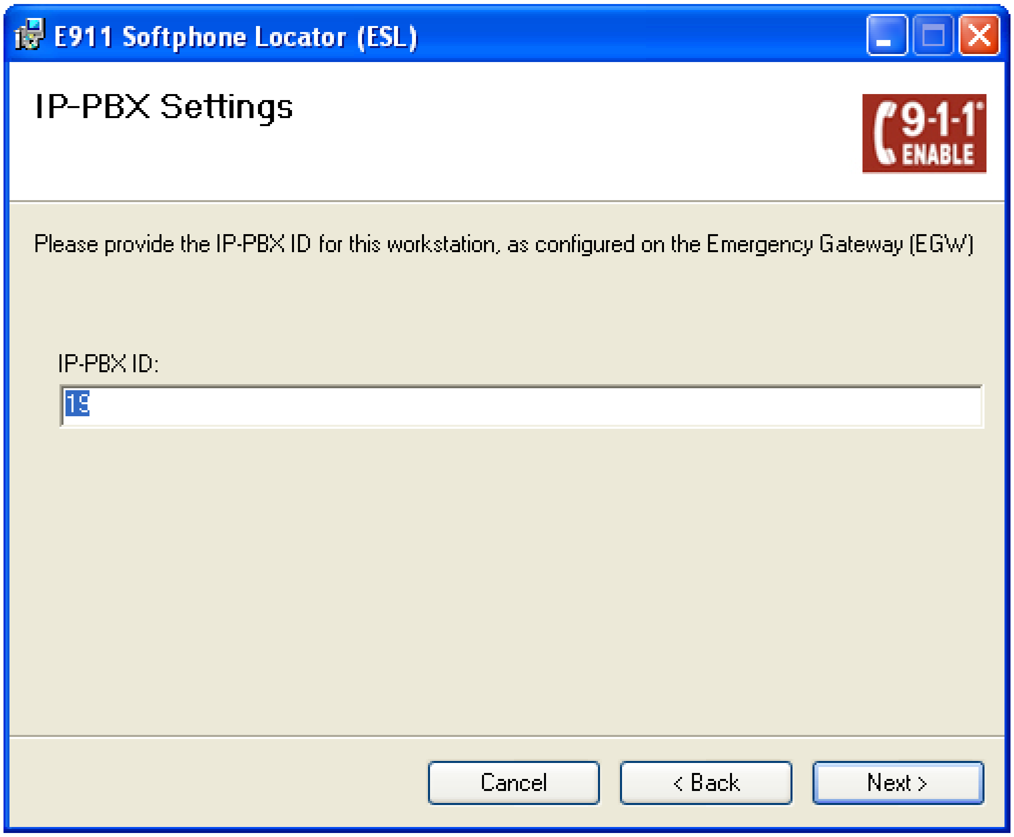
Step	Description

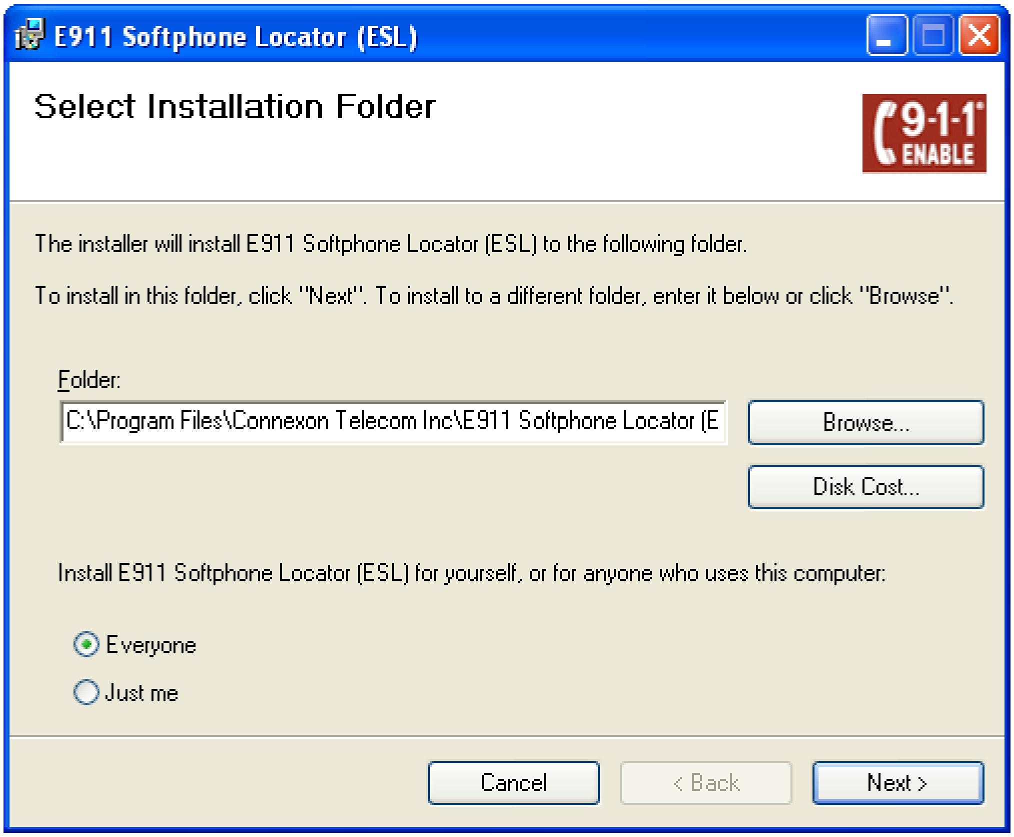
1.	**Avaya H.323 and SIP Telephone Configuration File**
	In order to support layer 3 discovery, the following lines need to be added to the 46xxsettings.txt configuration file for Avaya H.323 and SIP telephones. The two highlighted parameters in the **SUBSCRIBELIST** and **WMLHOME** URLs must be modified for a specific installation. The first parameter (***192.168.0.118***) represents the IP address of the private side of the primary EGW. The second parameter (***19***) is the **IP-PBX ID** number that is created while configuring EGW.
	`## 911 Enable Settings`
	`SET TPSLIST /`
	`SET SUBSCRIBELIST http://192.168.0.118/19/r`
	`SET PUSHPORT 80`
	`SET PUSHCAP 2`
	`SET WMLHOME http://192.168.0.118/wml/19/service.html`

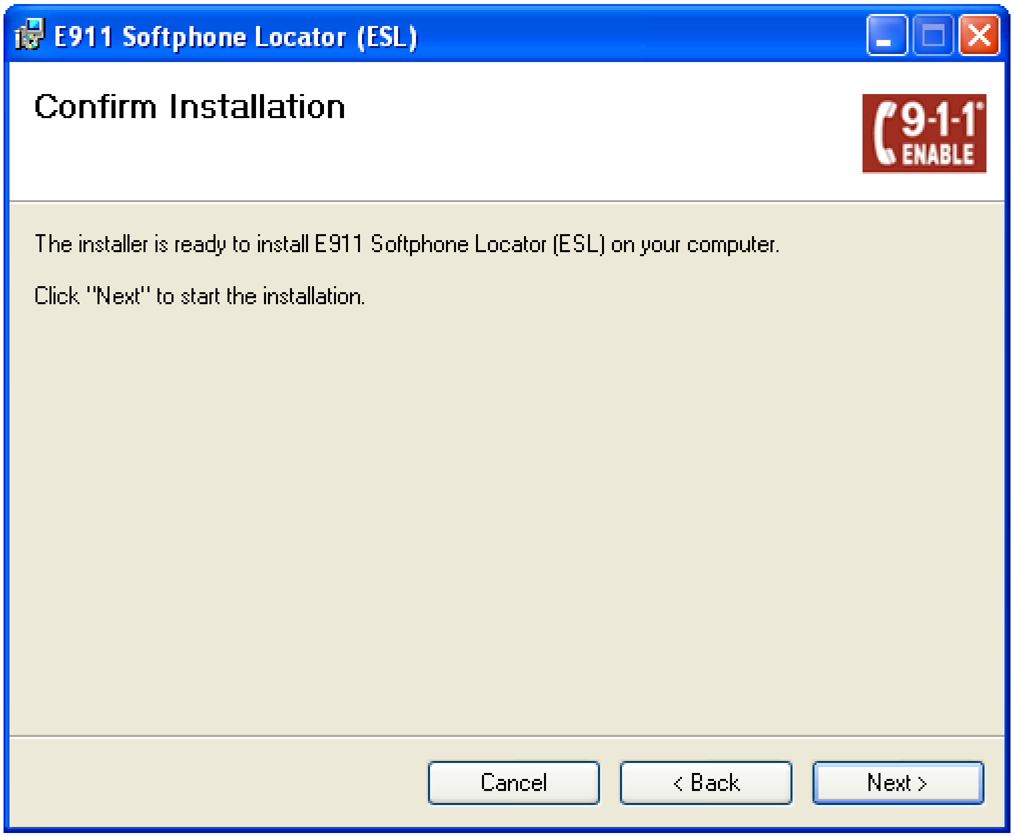
Step	Description
2.	**Avaya one-X® Communicator (H.323) – ESL software installation** On the PC running the Avaya one-X® Communicator, launch the ESL setup application. A welcome screen will appear. Click **Next** to proceed.  E911 Softphone Locator (ESL) Welcome to the E911 Softphone Locator (ESL) Setup Wizard The installer will guide you through the steps required to install E911 Softphone Locator (ESL) on your computer. WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.

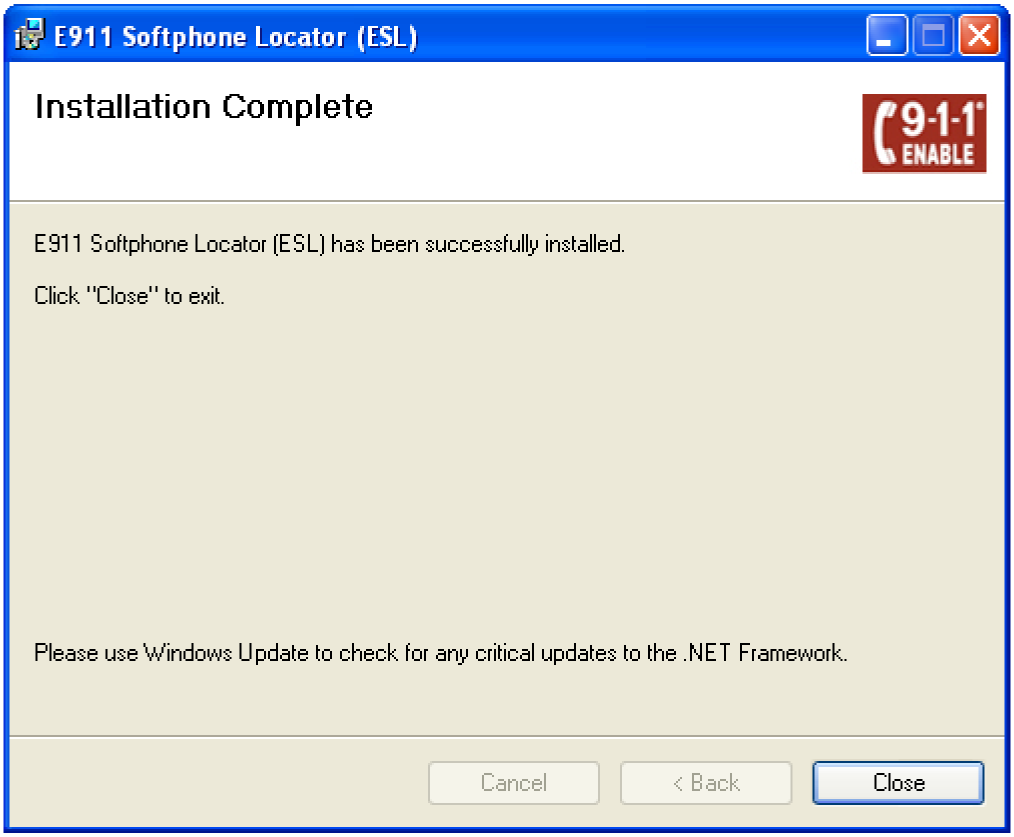
Step	Description
3.	**ESL Installation – Select Protocol** Select the desired protocol. HTTP was used for the compliance test. Click **Next**.  E911 Softphone Locator (ESL) Protocol Which protocol would you like to use to communicate with the Emergency Gateway ● HTTP (Unencrypted) ○ SSL/TLS (Encrypted)

Step	Description
4.	**ESL Installation – EGW Settings** Enter the IP addresses for both EGWs. Use the default port ***80*** for HTTP. Click **Next**.  E911 Softphone Locator (ESL) 9-1-1 ENABLE Cancel < Back Next > Emergency Gateway Settings Please provide the IP address(es) or FQDN of the Emergency Gateway Primary EGW: 192.168.0.118 Primary Port: 80 Secondary EGW: 192.168.0.119 Secondary Port: 80

Step	Description
5.	**ESL Installation – IP-PBX Settings** Enter an **IP-PBX ID**. Click **Next**.  E911 Softphone Locator (ESL) IP-PBX Settings Please provide the IP-PBX ID for this workstation, as configured on the Emergency Gateway (EGW) IP-PBX ID: 19

Step	Description
6.	**ESL Installation – Installation Folder** Enter the installation folder and who should have access to the software. Click **Next**.  E911 Softphone Locator (ESL) Select Installation Folder The installer will install E911 Softphone Locator (ESL) to the following folder. To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse". Folder: C:\Program Files\Connexon Telecom Inc\E911 Softphone Locator (E Install E911 Softphone Locator (ESL) for yourself, or for anyone who uses this computer: ● Everyone ○ Just me 9-1-1 ENABLE Browse... Disk Cost... Cancel < Back Next >

Step	Description
7.	**ESL Installation – Confirm** Confirm the installation by clicking **Next**.  E911 Softphone Locator (ESL) Confirm Installation The installer is ready to install E911 Softphone Locator (ESL) on your computer. Click "Next" to start the installation.

Step	Description
8.	**ESL Installation – Complete** The following screen appears when installation is complete. Click **Close** to exit the set-up application.  E911 Softphone Locator (ESL) 9-1-1 ENABLE Cancel < Back Close Installation Complete E911 Softphone Locator (ESL) has been successfully installed. Click "Close" to exit. Please use Windows Update to check for any critical updates to the .NET Framework.

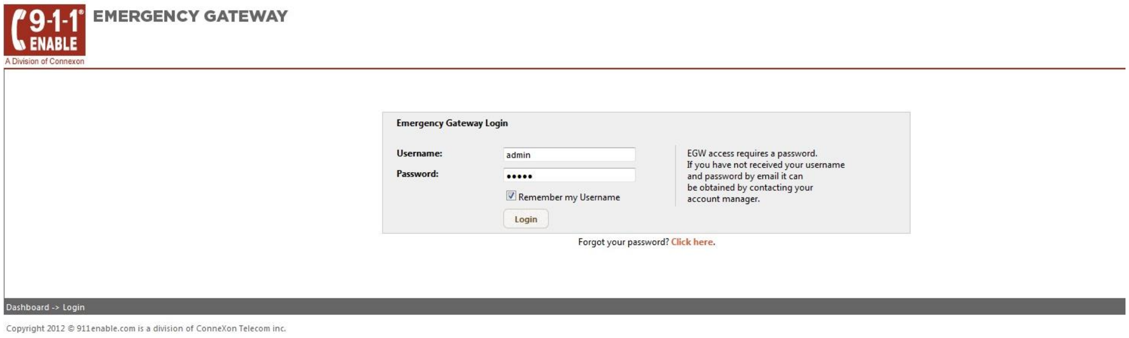
7. Configure 911 Enable Emergency Gateway (EGW)

The configuration of the EGW is performed by 911 Enable for the customer when the customer subscribes to 911 Enable's Emergency Routing Service. The information in this section is included simply as a reference.

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>1.</td><td>

Login

The EGW is configured via a web browser. To access the web interface, enter http://<*ip-addr*> in the address field of the web browser, where <*ip-addr*> is the IP address of the primary EGW. Log in with the appropriate credentials. Click **Login**.



Emergency Gateway Login

Username: admin

Password: •••••

☑ Remember my Username

EGW access requires a password. If you have not received your username and password by email it can be obtained by contacting your account manager.

Forgot your password? Click here.

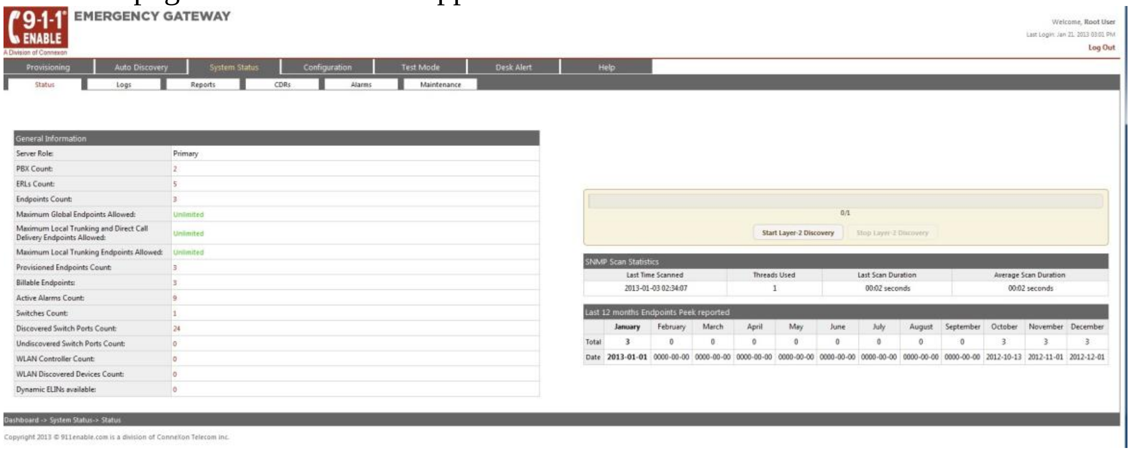
Dashboard -> Login

Copyright 2012 © 911enable.com is a division of ConneXon Telecom inc.

</td></tr>
<tr><td>2.</td><td>

Main Page

The main page of the EGW will appear.



Welcome, Root User

Last Login: Jan 21, 2013 03:01 PM

<table>
<tr><th colspan="2">General Information</th></tr>
<tr><td>Server Role:</td><td>Primary</td></tr>
<tr><td>PBX Count:</td><td>2</td></tr>
<tr><td>ERLs Count:</td><td>5</td></tr>
<tr><td>Endpoints Count:</td><td>3</td></tr>
<tr><td>Maximum Global Endpoints Allowed:</td><td>Unlimited</td></tr>
<tr><td>Maximum Local Trunking and Direct Call Delivery Endpoints Allowed:</td><td>Unlimited</td></tr>
<tr><td>Maximum Local Trunking Endpoints Allowed:</td><td>Unlimited</td></tr>
<tr><td>Provisioned Endpoints Count:</td><td>3</td></tr>
<tr><td>Billable Endpoints:</td><td>3</td></tr>
<tr><td>Active Alarms Count:</td><td>9</td></tr>
<tr><td>Switches Count:</td><td>1</td></tr>
<tr><td>Discovered Switch Ports Count:</td><td>24</td></tr>
<tr><td>Undiscovered Switch Ports Count:</td><td>0</td></tr>
<tr><td>WLAN Controller Count:</td><td>0</td></tr>
<tr><td>WLAN Discovered Devices Count:</td><td>0</td></tr>
<tr><td>Dynamic ELINs available:</td><td>0</td></tr>
</table>

0/1

<table>
<tr><th colspan="4">SNMP Scan Statistics</th></tr>
<tr><th>Last Time Scanned</th><th>Threads Used</th><th>Last Scan Duration</th><th>Average Scan Duration</th></tr>
<tr><td>2013-01-03 02:34:07</td><td>1</td><td>00:02 seconds</td><td>00:02 seconds</td></tr>
</table>

<table>
<tr><th colspan="13">Last 12 months Endpoints Peek reported</th></tr>
<tr><th></th><th>January</th><th>February</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>August</th><th>September</th><th>October</th><th>November</th><th>December</th></tr>
<tr><td>Total</td><td>3</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>3</td><td>3</td><td>3</td></tr>
<tr><td>Date</td><td>2013-01-01</td><td>0000-00-00</td><td>0000-00-00</td><td>0000-00-00</td><td>0000-00-00</td><td>0000-00-00</td><td>0000-00-00</td><td>0000-00-00</td><td>0000-00-00</td><td>2012-10-13</td><td>2012-11-01</td><td>2012-12-01</td></tr>
</table>

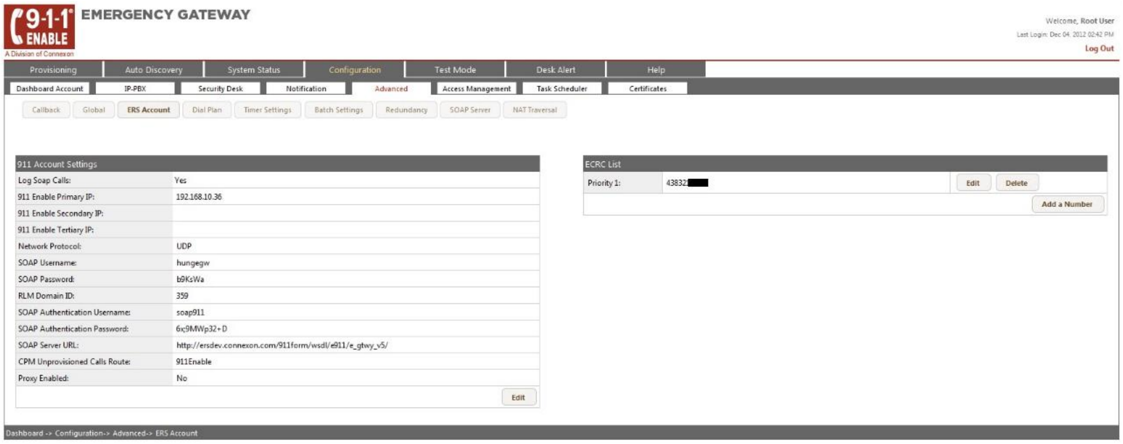
Dashboard -> System Status-> Status

Copyright 2013 © 911enable.com is a division of ConneXon Telecom inc.

</td></tr>
</table>

Step	Description
3.	**ERS Account**

The ERS account defines the parameters used to connect to the Emergency Routing Service. Navigate to the **Configuration → Advanced → ERS Account** tab to configure these settings. The example below shows the settings used for the compliance test. The necessary values for each field shown for the **911 Account Settings** and the **ECRC List** are provided by 911 Enable for connection to the ERS. For security reasons, the public IP addresses of the ERS are not shown but some digits are replaced by an x. The ECRC list shows the phone number of the ECRC. This number is dialed through Communication Manager so it contains the preceding 9 (ARS feature access code) followed by the 11-digit number. For security reasons, the full PSTN number is not shown..



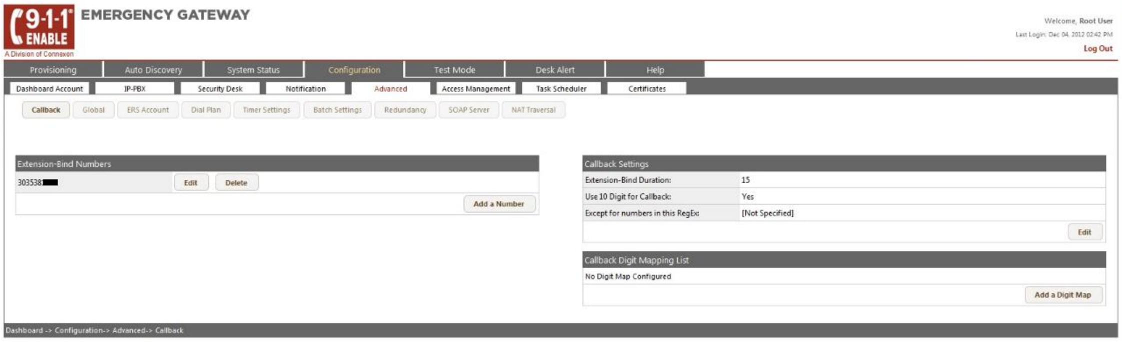
911 Account Settings	
Log Soap Calls:	Yes
911 Enable Primary IP:	192.168.10.36
911 Enable Secondary IP:	
911 Enable Tertiary IP:	
Network Protocol:	UDP
SOAP Username:	hungegw
SOAP Password:	b9KsWa
RLM Domain ID:	359
SOAP Authentication Username:	soap911
SOAP Authentication Password:	6x;9MWp32+D
SOAP Server URL:	http://ersdev.connexon.com/911form/wsdl/e911/e_gtwy_v5/
CPM Unprovisioned Calls Route:	911Enable
Proxy Enabled:	No

ECRC List	
Priority 1:	43832[redacted]

Dashboard -> Configuration-> Advanced-> ERS Account

Step	Description
4.	**Extension-Bind Numbers**

The Extension-Bind numbers are the pool of DID numbers owned by the enterprise that the EGW can use as callback numbers for active 911 calls. Navigate to the **Configuration → Advanced → Callback** tab to configure these Extension-Bind numbers. For the compliance test, a single number was used in the Extension-Bind Numbers list. To add a number to the list, click the **Add a number** button. Enter the number in the subsequent window (not shown). Each number is represented by 10-digits. For security reasons, the full PSTN number is not shown.



Extension-Bind Numbers
303538[redacted]

Callback Settings	
Extension-Bind Duration:	15
Use 10 Digit for Callback:	Yes
Except for numbers in this RegEx:	[Not Specified]

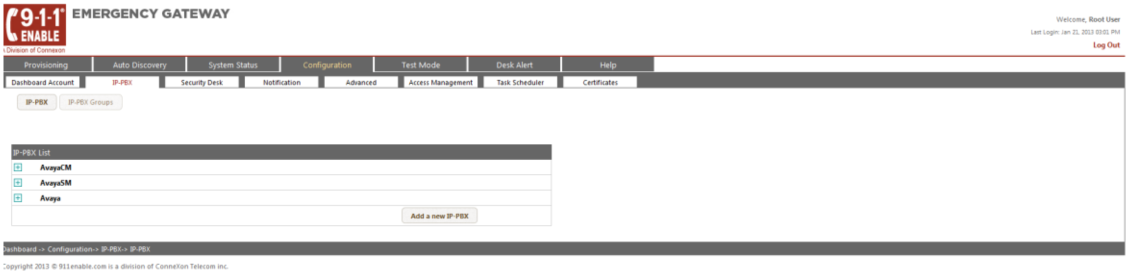
Callback Digit Mapping List
No Digit Map Configured

Dashboard -> Configuration-> Advanced-> Callback

Step | **Description**

5. **IP-PBX**

Steps 5 – 7 define the parameters needed to connect to Communication Manager via an H.323 trunk on the private side of the EGW. Navigate to **Configuration → IP-PBX** to configure these settings. First, an IP-PBX is defined by clicking the **Add a new IP-PBX** button. The example below shows the IP-PBX created for the compliance test. Click the IP-PBX name to view the details.



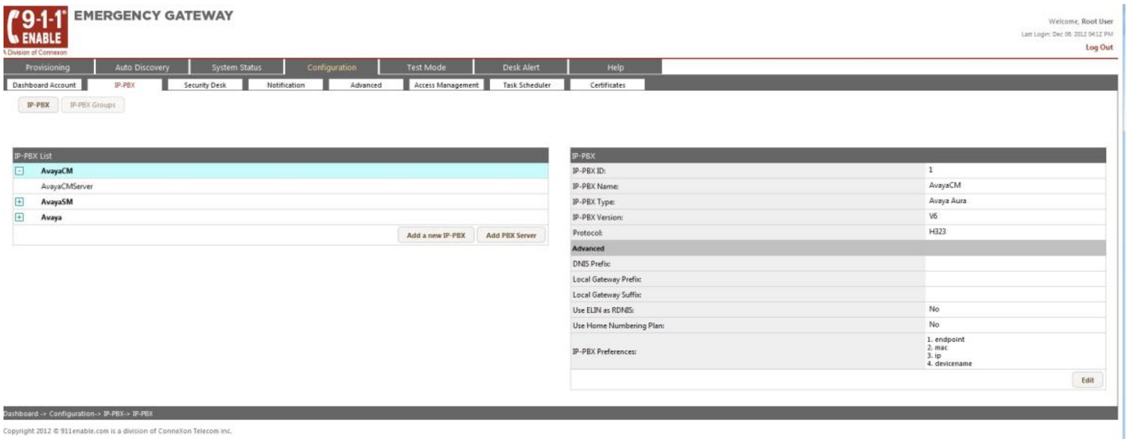
IP-PBX List
AvayaCM
AvayaSM
Avaya

6. **IP-PBX – Continued**

The IP-PBX was created with the following parameters. Use default values for all other fields.

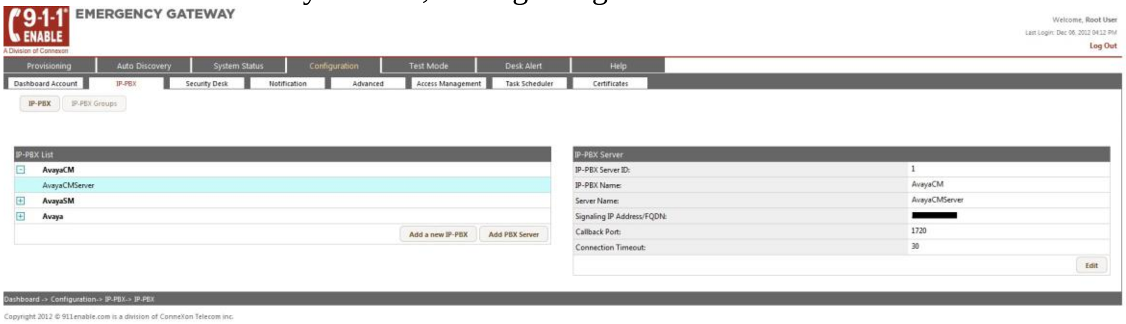
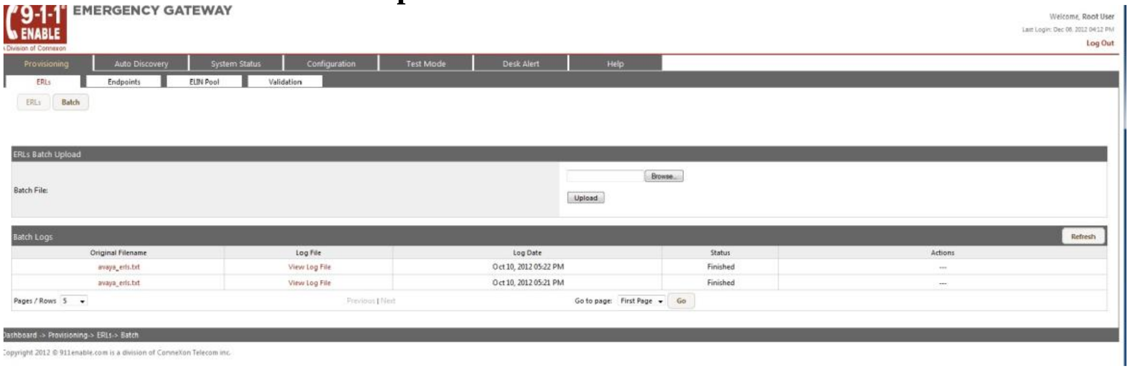
- Set the **IP-PBX Name** to a descriptive name.
- Set the **PBX-Type** to ***Avaya***.
- Set the **Protocol** to ***H323***.

The EGW automatically assigned the IP-PBX ID number shown below. This value is needed for the configuration of the Avaya H.323 and SIP Telephone 46xxsettings file and the ESL installation.



IP-PBX List
AvayaCM
AvayaCMServer
AvayaSM
Avaya

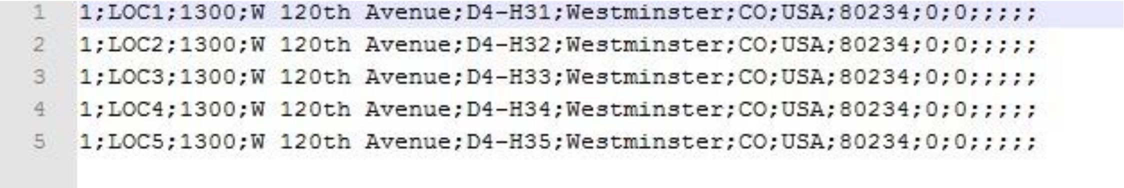
IP-PBX	
IP-PBX ID:	1
IP-PBX Name:	AvayaCM
IP-PBX Type:	Avaya Aura
IP-PBX Version:	V6
Protocol:	H323
Advanced	
DNIS Prefix:	
Local Gateway Prefix:	
Local Gateway Suffix:	
Use ELIN as RDNIS:	No
Use Home Numbering Plan:	No
IP-PBX Preferences:	1. endpoint 2. mac 3. ip 4. devicename

Step	Description
7.	**IP-PBX – Continued** The IP-PBX created in the previous step can be comprised of multiple servers. To view the list of servers, click the **+** icon next to the IP-PBX name. The example below shows the server list for the IP-PBX named ***Avaya*** created for the compliance test. The list contains a single server named ***Server1***. Click the server name to see the details. A server can be added by clicking the **Add a server** button. Enter a descriptive name for the **Server Name**. Set the **Signaling IP Address/FQDN** to the IP address of the Avaya Server terminating the H.323 trunk at the far-end. Use default values for all other fields. For security reasons, the Signaling IP Address is masked.  EMERGENCY GATEWAY Welcome, Root User Last Login: Dec 06, 2012 04:12 PM Log Out Provisioning | Auto Discovery | System Status | Configuration | Test Mode | Desk Alert | Help Dashboard Account | IP-PBX | Security Desk | Notification | Advanced | Access Management | Task Scheduler | Certificates IP-PBX | IP-PBX Groups IP-PBX List ⊟ AvayaCM AvayaCMServer ⊞ AvayaSM ⊞ Avaya Add a new IP-PBX | Add PBX Server IP-PBX Server IP-PBX Server ID: 1 IP-PBX Name: AvayaCM Server Name: AvayaCMServer Signaling IP Address/FQDN: [redacted] Callback Port: 1720 Connection Timeout: 30 Edit Dashboard -> Configuration-> IP-PBX-> IP-PBX Copyright 2012 © 911enable.com is a division of ConneXon Telecom inc.
8.	**Emergency Response Locations (ERLs)** The ERL is a location identifier that is associated with a physical address. This association is contained in a batch file uploaded to the EGW. To perform this upload, navigate to the **Provisioning → ERLs** tab. Enter the file name in the **Batch File** field and click the **Upload** button. At the bottom of the screen, **Status** and **Actions columns** will appear associated with the batch file. The following actions are necessary to complete the upload but are not all shown in the screen below. Next, click **Validate** under **Actions**. Once the file is validated, click **Batch Process** which will appear under **Actions**. Once this completes, the **Status** will change to **Finished**. An example of an ERL batch file is shown in **Step 9**.  EMERGENCY GATEWAY Welcome, Root User Last Login: Dec 06, 2012 04:12 PM Log Out Provisioning | Auto Discovery | System Status | Configuration | Test Mode | Desk Alert | Help ERLs | Endpoints | ELIN Pool | Validation ERLs | Batch ERLs Batch Upload Batch File: Browse... Upload Batch Logs Refresh Original Filename | Log File | Log Date | Status | Actions avaya_erls.txt | View Log File | Oct 10, 2012 05:22 PM | Finished | --- avaya_erls.txt | View Log File | Oct 10, 2012 05:21 PM | Finished | --- Pages / Rows 5 Previous | Next Go to page: First Page Go Dashboard -> Provisioning-> ERLs-> Batch Copyright 2012 © 911enable.com is a division of ConneXon Telecom inc.

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>9.</td><td>

Locations Batch File

The following is an example of the ERL batch file used for the compliance test. It shows that ERL LOC1 is associated with address 1300 W 120th Avenue, D4-H31, Westminster, CO 80234. Similarly, ERL LOC2, LOC3, LOC4 and LOC5 are also associated with the same address.

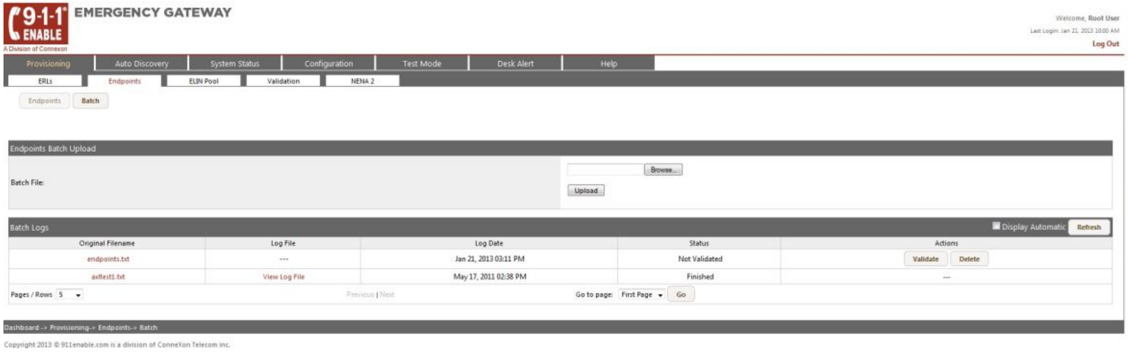


```
1;LOC1;1300;W 120th Avenue;D4-H31;Westminster;CO;USA;80234;0;0;;;;;
1;LOC2;1300;W 120th Avenue;D4-H32;Westminster;CO;USA;80234;0;0;;;;;
1;LOC3;1300;W 120th Avenue;D4-H33;Westminster;CO;USA;80234;0;0;;;;;
1;LOC4;1300;W 120th Avenue;D4-H34;Westminster;CO;USA;80234;0;0;;;;;
1;LOC5;1300;W 120th Avenue;D4-H35;Westminster;CO;USA;80234;0;0;;;;;
```

</td></tr>
<tr><td>10.</td><td>

Provisioned Endpoints

All endpoints that cannot be auto-discovered, should be manually provisioned so that each extension that is not auto-discovered is associated with an ERL. This association is contained in a batch file uploaded to the EGW. To perform this upload, navigate to the **Provisioning → Endpoints** tab. Enter the file name in the **Batch File** field and click the **Upload** button. At the bottom of the screen, **Status** and **Actions columns** will appear associated with the batch file. The following actions are necessary to complete the upload but are not all shown in the screen below. Next, click **Validate** under **Actions**. Once the file is validated, click **Batch Process** which will appear under **Actions**. Once this completes, the **Status** will change to **Finished**. An example of a provisioned endpoints batch file is shown in **Step 11**.



Batch File:

Batch Logs

Original Filename	Log File	Log Date	Status	Actions
endpoints.txt	---	Jan 21, 2013 03:11 PM	Not Validated	Validate Delete
axltest1.txt	View Log File	May 17, 2011 02:38 PM	Finished	---

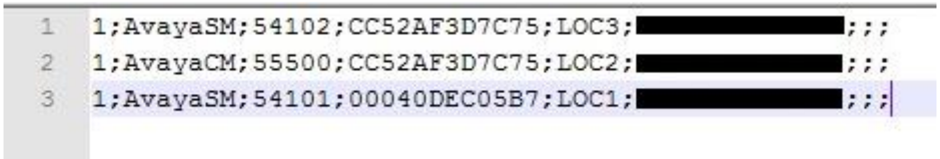
Pages / Rows 5 Previous \| Next Go to page: First Page

</td></tr>
</table>

<table>
<tr><th>Step</th><th>Description</th></tr>
<tr><td>11.</td><td>

Provisioned Endpoints Batch File

The following is an example of the provisioned endpoints batch file used for the compliance test. It contains the extensions associated with the digital and analog endpoints since these endpoints cannotcannot be auto-discovered. In the case of the compliance test, the Avaya IP Telephone with extension 50023 also could not be auto-discovered due to the type of layer 2 switch to which it was connected. Thus, this extension should also be manually provisioned. However, for the purposes of the compliance test, this extension was not provisioned in order to test the EGW operation when the location of an extension is unknown. In this case, emergency calls from extension 50023 would get routed to an ECRC operator to collect location and callback information. The batch file shows that all the provisioned endpoints (extensions 52000, and 52003) are associated with the same ERL – LOC3. For Security reasons, IP addresses are masked.

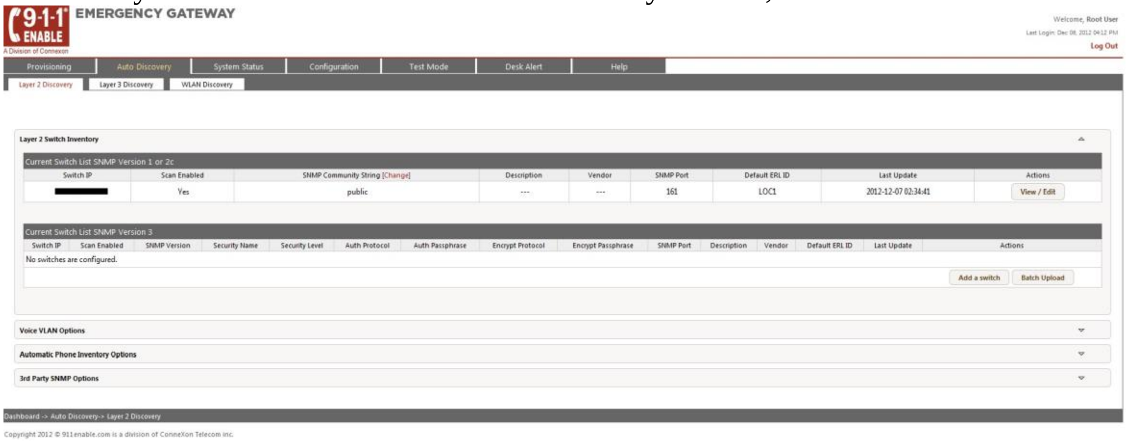


```
1;AvayaSM;54102;CC52AF3D7C75;LOC3;[redacted];;;
1;AvayaCM;55500;CC52AF3D7C75;LOC2;[redacted];;;
1;AvayaSM;54101;00040DEC05B7;LOC1;[redacted];;;
```

</td></tr>
<tr><td>12.</td><td>

Layer 2 Discovery

Each enterprise layer 2 switch that has Avaya H.323 or SIP telephones connected to it must be configured on the EGW so that it can be queried as part of layer 2 discovery. Navigate to the **Auto Discovery → Layer 2 Discovery** tab to display the list of layer 2 switches. The example below shows the list used for the compliance test. The IP address of switch shown in **Figure 1** was entered. Click the **Add a switch** button to enter the switch parameters. Enter the management IP address of the switch in the **Switch IP** field and enter the appropriate string in the **SNMP Community String** field. Enter the ERL where the switch resides in the **Default ERL ID** field. Default values may be used for all other fields. For security reasons, IP address is masked.



Layer 2 Switch Inventory

Current Switch List SNMP Version 1 or 2c

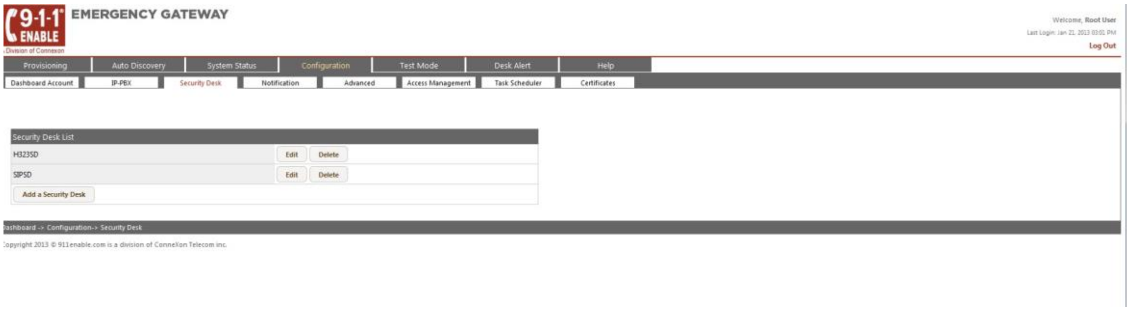
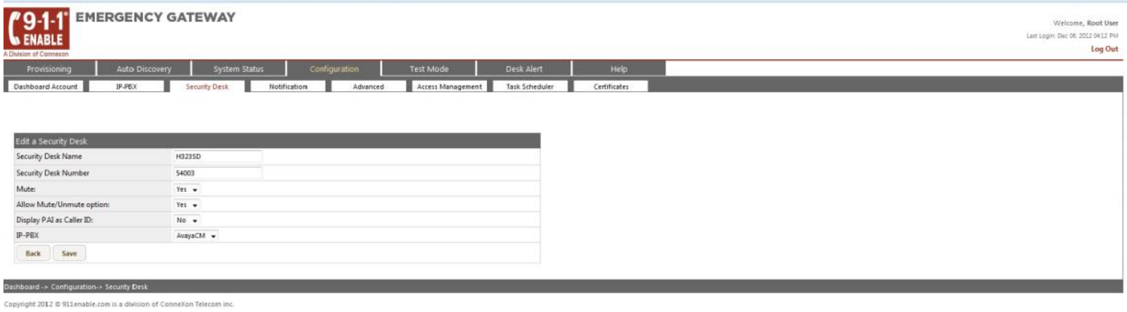
<table>
<tr><th>Switch IP</th><th>Scan Enabled</th><th>SNMP Community String [Change]</th><th>Description</th><th>Vendor</th><th>SNMP Port</th><th>Default ERL ID</th><th>Last Update</th><th>Actions</th></tr>
<tr><td>[redacted]</td><td>Yes</td><td>public</td><td>---</td><td>---</td><td>161</td><td>LOC1</td><td>2012-12-07 02:34:41</td><td>View / Edit</td></tr>
</table>

Current Switch List SNMP Version 3

<table>
<tr><th>Switch IP</th><th>Scan Enabled</th><th>SNMP Version</th><th>Security Name</th><th>Security Level</th><th>Auth Protocol</th><th>Auth Passphrase</th><th>Encrypt Protocol</th><th>Encrypt Passphrase</th><th>SNMP Port</th><th>Description</th><th>Vendor</th><th>Default ERL ID</th><th>Last Update</th><th>Actions</th></tr>
<tr><td colspan="15">No switches are configured.</td></tr>
</table>

Add a switch
Batch Upload
Voice VLAN Options
Automatic Phone Inventory Options
3rd Party SNMP Options
Dashboard -> Auto Discovery-> Layer 2 Discovery
Copyright 2012 © 911enable.com is a division of ConneXon Telecom inc.

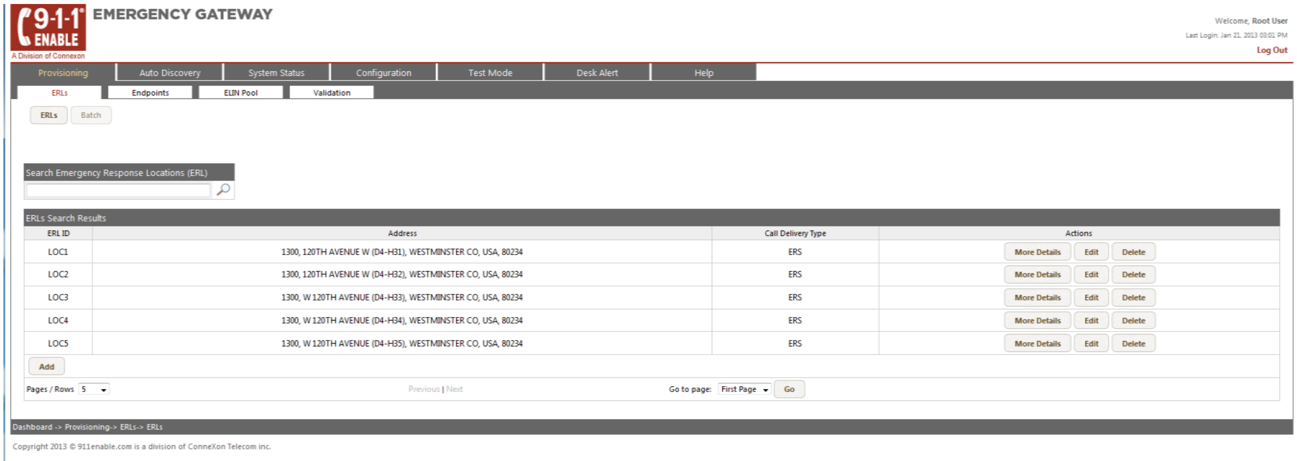
</td></tr>
</table>

Step	Description
13.	**Security Desk** Emergency calls may be routed to a Security Desk extension as well as being sent to the Emergency Routing Service. Navigate to the **Configuration → Security Desk** tab to create the Security Desk List. To create a security desk, click **Add a Security Desk**. The example below shows the Security Desk created for the compliance test. Click the **Edit** button to view the details.  9-1-1 ENABLE A Division of Connexon EMERGENCY GATEWAY Welcome, Root User Last Login: Jan 21, 2013 03:01 PM Log Out Provisioning Auto Discovery System Status Configuration Test Mode Desk Alert Help Dashboard Account IP-PBX Security Desk Notification Advanced Access Management Task Scheduler Certificates Edit Delete Add a Security Desk Dashboard -> Configuration-> Security Desk Copyright 2013 © 911enable.com is a division of ConneXon Telecom inc. Security Desk List H323SD SIPSD
14.	**Security Desk – Continued** The Security Desk was created with the following parameters. Use default values for all other fields. ▪ Enter a descriptive name for the **Security Desk Name**. ▪ Set the **Security Desk Number** to the extension to call when any user dials an emergency call. This is in addition to the call that will be placed to the Emergency Routing Service. ▪ Set the **IP-PBX** field to the IP-PBX created earlier in this section.  9-1-1 ENABLE A Division of Connexon EMERGENCY GATEWAY Welcome, Root User Last Login: Dec 06, 2012 04:12 PM Log Out Provisioning Auto Discovery System Status Configuration Test Mode Desk Alert Help Dashboard Account IP-PBX Security Desk Notification Advanced Access Management Task Scheduler Certificates Back Save Dashboard -> Configuration-> Security Desk Copyright 2012 © 911enable.com is a division of ConneXon Telecom inc. Edit a Security Desk Security Desk Name: H323SD Security Desk Number: 54003 Mute: Yes Allow Mute/Unmute option: Yes Display P.AI as Caller ID: No IP-PBX: AvayaCM

8. Verification Steps

The following steps may be used to verify the configuration:

- From the Communication Manager SAT, use the **status signaling-group** command to verify that the H.323 signaling group is in-service.
- From the Communication Manager SAT, use the **status trunk-group** command to verify that the H.323 trunk group is in-service.
- On the EGW, verify the ERL information. Navigate to the **Search → ERLs** tab, verify that the locations provided in the batch file in **Section 7, Step 9** are displayed.

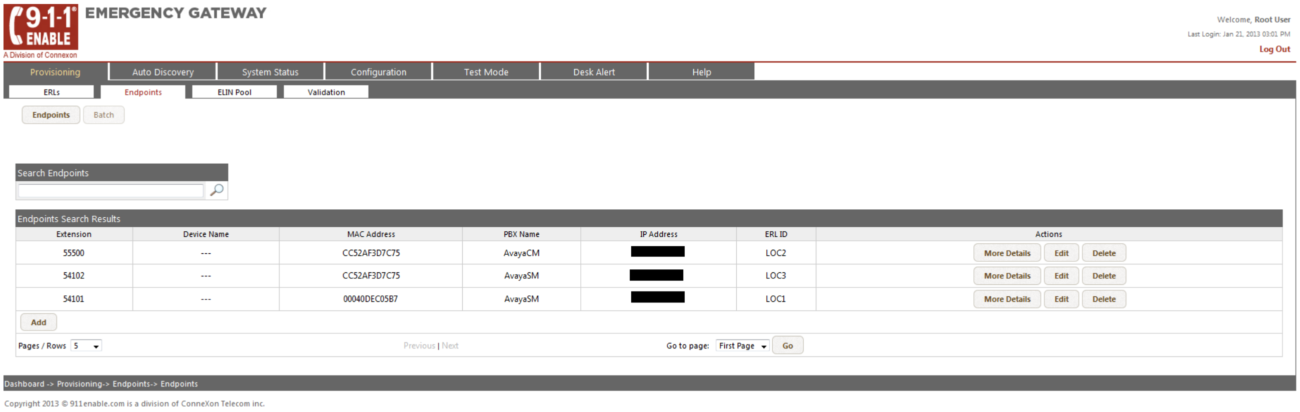


ERLs Search Results

ERL ID	Address	Call Delivery Type	Actions
LOC1	1300, 120TH AVENUE W (D4-H31), WESTMINSTER CO, USA, 80234	ERS	More Details Edit Delete
LOC2	1300, 120TH AVENUE W (D4-H32), WESTMINSTER CO, USA, 80234	ERS	More Details Edit Delete
LOC3	1300, W 120TH AVENUE (D4-H33), WESTMINSTER CO, USA, 80234	ERS	More Details Edit Delete
LOC4	1300, W 120TH AVENUE (D4-H34), WESTMINSTER CO, USA, 80234	ERS	More Details Edit Delete
LOC5	1300, W 120TH AVENUE (D4-H35), WESTMINSTER CO, USA, 80234	ERS	More Details Edit Delete

Copyright 2013 © 911enable.com is a division of ConneXon Telecom inc.

- On the EGW, verify the endpoints. Navigate to the **Search → Endpoints** tab, verify that all endpoints are displayed.

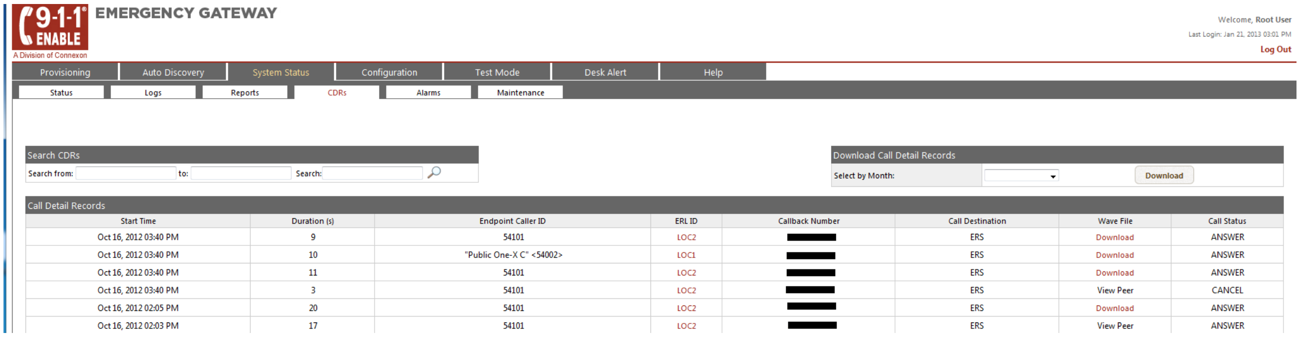


Endpoints Search Results

Extension	Device Name	MAC Address	PBX Name	IP Address	ERL ID	Actions
55500	---	CC52AF3D7C75	AvayaCM	[redacted]	LOC2	More Details Edit Delete
54102	---	CC52AF3D7C75	AvayaSM	[redacted]	LOC3	More Details Edit Delete
54101	---	00040DEC05B7	AvayaSM	[redacted]	LOC1	More Details Edit Delete

Add
Pages / Rows 5
Previous | Next
Go to page: First Page
Go
Dashboard -> Provisioning-> Endpoints-> Endpoints
Copyright 2013 © 911enable.com is a division of ConneXon Telecom inc.

- Verify that 911 calls can be placed from different endpoints types from different locations. Verify from the EGW Call Detail Records (CDR), that the correct location and callback number is being passed to 911 Enable. Navigate to the **System Status → CDRs** tab to display this information. The example below shows two emergency 911 calls as represented by the value ***ERS*** in the **Call Destination** field. The example also shows three callback calls which show the local extension being called back in the **Call Destination** field. Each of the 911 calls shows the correct location and callback information for that endpoint.



Call Detail Records

Start Time	Duration (s)	Endpoint Caller ID	ERL ID	Callback Number	Call Destination	Wave File	Call Status
Oct 16, 2012 03:40 PM	9	54101	LOC2	[redacted]	ERS	Download	ANSWER
Oct 16, 2012 03:40 PM	10	"Public One-X C" <54002>	LOC1	[redacted]	ERS	Download	ANSWER
Oct 16, 2012 03:40 PM	11	54101	LOC2	[redacted]	ERS	Download	ANSWER
Oct 16, 2012 03:40 PM	3	54101	LOC2	[redacted]	ERS	View Peer	CANCEL
Oct 16, 2012 02:05 PM	20	54101	LOC2	[redacted]	ERS	Download	ANSWER
Oct 16, 2012 02:03 PM	17	54101	LOC2	[redacted]	ERS	View Peer	ANSWER

9. Conclusion

911 Enable Emergency Gateway and Emergency Routing Service passed compliance testing. These Application Notes describe the procedures required to configure the connectivity between Avaya Aura® Communication Manager and the 911 Enable equipment and service as shown in **Figure 1**.

10. Additional References

This section references the documentation relevant to these Application Notes. Avaya product documentation is available at http://support.avaya.com. Product documentation for the EGW can be obtained from 911 Enable.

[1] Administering Avaya Aura® Communication Manager, Release 6.2, Document 03-3005089, Issue 7.0, December 2012

[2] 911Enable Emergency Gateway System Guide 2.6.
[3] ESL Configuration Guide Rev. A, February 15, 2010.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at devconnect@avaya.com.