Avaya Solution & Interoperability Test Lab

Application Notes for RedSky Technologies E911 Manager, E911 Anywhere, Emergency On-Site Notification and MyE911 with Avaya Aura® Session Manager, Avaya Aura® Communication Manager and Avaya Aura® Application Enablement Services – Issue 1.0

Abstract

These Application Notes describe a compliance-tested configuration consisting of Avaya Aura® Session Manager, Avaya Aura® Communication Manager, Avaya Aura® Application Enablement Services, and RedSky E911 Manager, E911 Anywhere, Emergency On-Site Notification and MyE911 Client.

Readers should pay attention to **Section 2**, in particular, the scope of testing as outlined in **Section 2.1** as well as any observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

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

1. Introduction

These Application Notes describe a compliance-tested configuration consisting of Avaya Aura® Session Manager (Session Manager), Avaya Aura® Communication Manager (Communication Manager), Avaya Aura® Application Enablement Services (AES), and RedSky E911 Manager, E911 Anywhere and Emergency On-Site Notification.

The purpose of RedSky E911 Manager (ELIN server) is to provide or update emergency numbering and location information for endpoints on Communication Manager and Session Manager. When a Public Safety Answering Point (PSAP) receives a 911 call, the PSAP searches an Automatic Location Identifier (ALI) database to obtain the specific address/location associated with the Automatic Number Identification (ANI) or the Emergency Location Identification Number (ELIN). ELINs are used to more precisely define the location of a device based on where the device is actually being used, rather than a static location that is generally associated with an ANI of an endpoint or trunk.

RedSky E911 Anywhere is a cloud-based service that routes emergency calls to the appropriate PSAP anywhere in the United States as well as provides a proxy for E911 Manager to make updates to the ALI database. During the compliance test, calls to RedSky E911 Anywhere from Session Manager were routed via Avaya Session Border Controller for Enterprise (Avaya SBCE).

The Emergency On-Site Notification (EON) Client is responsible for alerting the user when an Emergency call has been made and all information E911 has about the call. This alert comes in the form of an audible siren as well as an on-screen focus. MyE911 client updates Softphone Users to provision their location to ensure accurate location updates when an emergency call is dialled. If the location is not updated, the Softphone user will not be able to logon.

For SIP endpoints registered to Session Manager, RedSky receives registration information from Session Manager when a SIP Entity Link is established, and when endpoints register with Session Manager. For SIP Endpoints, the registration information Session Manager provides contains the network address of the endpoint via a SIP PUBLISH message. RedSky in return provides an ELIN associated with the current location of the endpoint via a SIP PUBLISH message. Session Manager uses the ELIN information obtained from RedSky to populate the AP-Loc header in a SIP INVITE when an emergency call is made from a SIP Endpoint. For non-SIP Endpoints, RedSky via AES' System Management Service (SMS) interface, retrieves a list of Extensions from Communication Manager and updates the Emergency Location Ext field with an actual ELIN. For calls routed via a SIP Trunk, ELIN is sent in AP-Loc header of a SIP INVITE. For calls routed via a PRI Trunk, ELIN is delivered in Calling Party Number. For non-SIP endpoints, RedSky uses the SMS interface via AES to receive the endpoints information for Communication Manager.

Session Managers' support for emergency calling is broader than the emergency services used in North America. Specifics and availability of products and capabilities beyond those used in North America are not covered in these Application Notes. More details can be obtained by

consulting with RedSky, or the providers of emergency location solution offered in other locations.

2. General Test Approach and Test Results

The compliance test focused on the interoperability between RedSky E911 Manager, E911 Anywhere, Emergency On-Site Notification and MyE911 Client, with Session Manager, Communication Manager and AES.

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.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in these DevConnect Application Notes included the enablement of supported encryption capabilities in the Avaya products. Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these Application Notes, the interfaces between Avaya systems and RedSky did not include use of any specific encryption features.

2.1. Interoperability Compliance Testing

Interoperability Compliance Testing tested functional tests mentioned below:

- Call setup using SIP (TCP).
- Codec and DTMF verification using G.711 and Inband, respectively.
- Calls from Analog, Digital, Avaya SIP and H.323 endpoints.
- Verification of alerts generated by EON Client when dialing emergency number from all types of endpoints.
- Verification of MyE911 Client to update locations for Softphone users.
- Correct ELIN delivery for emergency calls.
- Call backs for extension configured on Communication Manager.

In addition to the sunny day scenarios described above, testing included disconnecting network and restarting Entity Links, as well as restarting RedSky servers to verify recoverability of the solution.

Due to the nature of emergency calls, all test calls were routed to the RedSky E911 Anywhere Test System.

2.2. Test Results

All planned test cases were verified and passed.

2.3. Support

Technical support for RedSky products can be obtained at:

- Phone: (866) 778-2435
- Email: support@redskytech.com
- http://www.redskye911.com

3. Reference Configuration

Figure 1 illustrates the compliance test configuration consisting of:

- Avaya Aura® Session Manager
- Avaya Aura® System Manager
- Avaya Aura® Communication Manager
- Avaya Aura® Application Enablement Services
- Avaya Aura® Media Server
- Avaya G450 Media Gateway
- Avaya Endpoints
- RedSky E911 Manager server
- RedSky E911 Anywhere
- RedSky Emergency On-Site Notification Client
- RedSky MyE911 Client

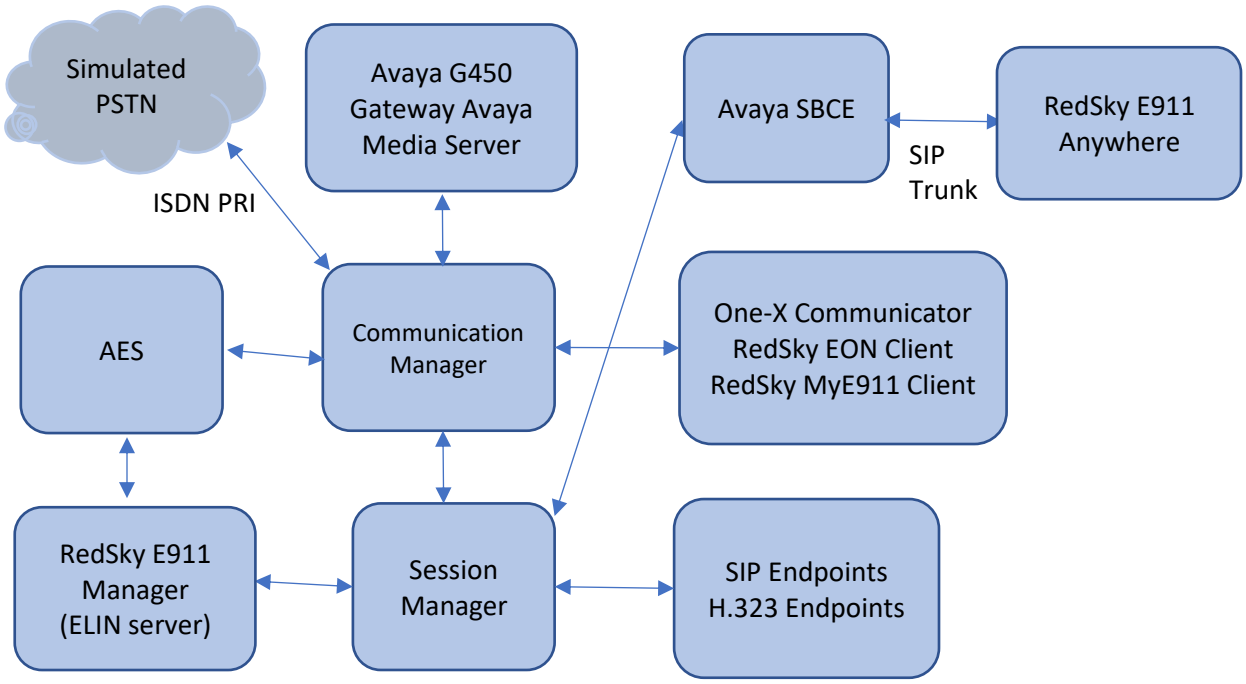


Figure 1 – Reference Configuration

This reference configuration diagram displays the connectivity between Avaya Environment and RedSky products. RedSky MyE911 client and RedSky Emergency On-Site Notification client were installed on a PC, which ran Avaya one-X® Communicator.

4. Equipment and Software Validated

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

Equipment	Version
Avaya Aura® System Manager	8.0.1.1 SP1
Avaya Aura® Session Manager	8.0.1.1.801103
Avaya Aura® Communication Manager	8.0.1.1.0-FP1SP1
Avaya Aura® Media Server	8.0.0.183
Avaya G450 Media Gateway	40.20.0
Avaya 9600 Series Deskphones	Various
Avaya Aura® Application Enablement Services	8.0.1.0.2.5-0
RedSky Technologies - E911 Manager (ELIN server) - E911 Anywhere - Emergency On-Site Notification Client - MyE911 Client	 6.9.4 rev 1812201527 6.9.4 rev 1812201527 3.7 3.9

5. Configure Avaya Aura® Communication Manager

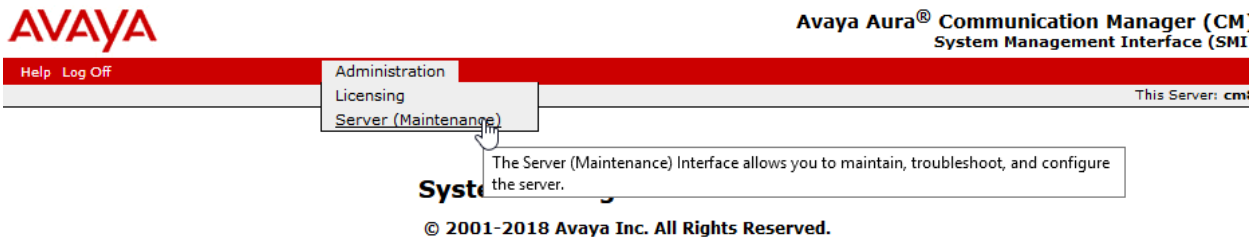
All configurations for Communication Manager are performed via a SAT terminal, unless otherwise noted.

5.1. Add SMS User

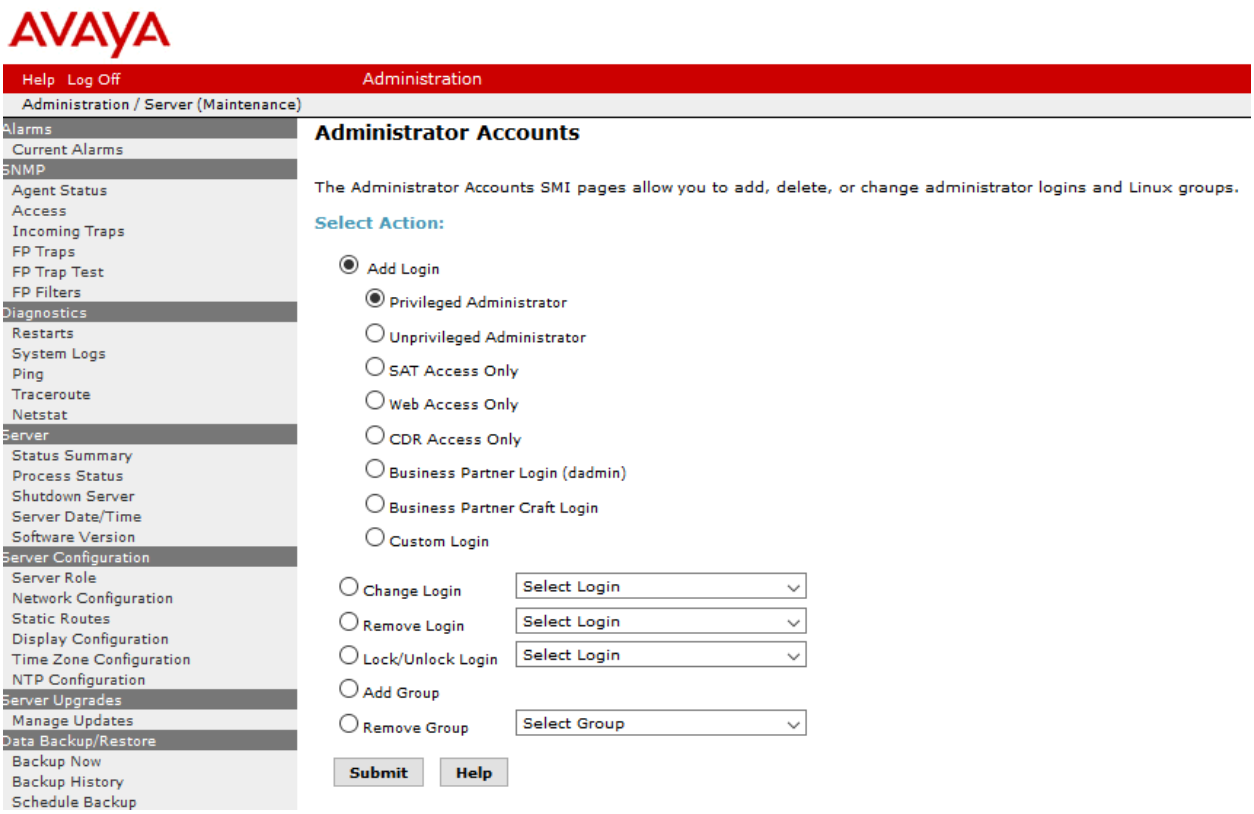
During the compliance test a super-user profile was used when an SMS user was created for RedSky. A list of available profiles can be viewed on Communication Manager using the **list user-profile** command. A user-profile 21 was created for RedSky SMS user.

```
add user-profile 21                                          Page   1 of  41
                                USER PROFILE 21

User Profile Name: Alert

       This Profile is Disabled? n                 Shell Access? y
Facility Test Call Notification? y   Acknowledgement Required? y
     Grant Un-owned Permissions? n              Extended Profile? y

             Name            Cat Enbl            Name                 Cat Enbl
                    Adjuncts A   y            Routing and Dial Plan J   y
                Call Center B   y                         Security K   y
                   Features C   y                          Servers L   y
                   Hardware D   y                         Stations M   y
                Hospitality E   y                System Parameters N   y
                         IP F   y                     Translations O   y
                Maintenance G   y                         Trunking P   y
Measurements and Performance H   y                            Usage Q   y
              Remote Access I   y                      User Access R   y
```

Create an SMS user account on the Communication Manager **System Management Interface** web page, https://<communication-manager-ip-address>. Navigating to **Administration → Server (Maintenance)**

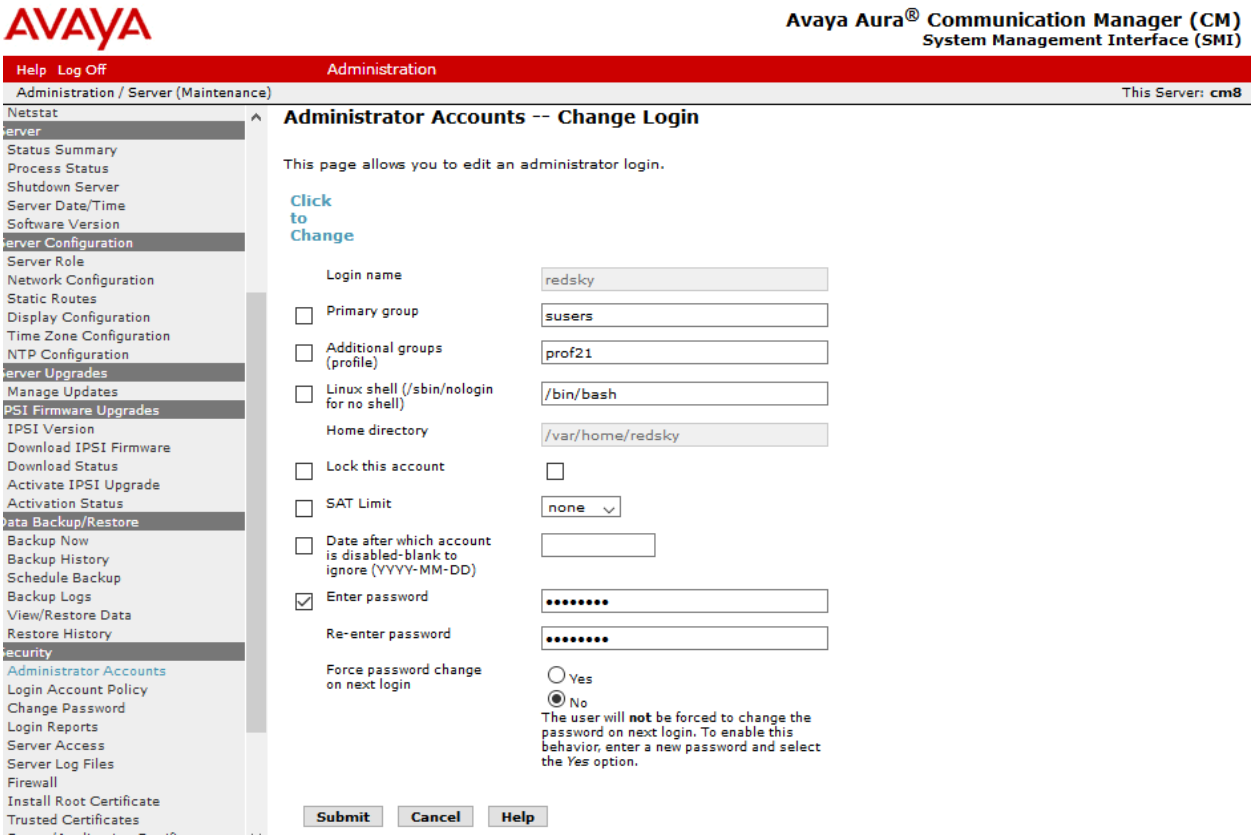


On the left side menu, select **Administrator Accounts** under **Security**, select **Add Login → Privileged Administrator** and **Submit**:



On the **Administrator Account – Add Login: Privileged Administrator** page:

- Type in a **Login Name**
- Type in a password in **Enter password or key** and **Re-enter password or key**



5.2. Configure ARS Routing

Configure ars analysis for emergency calls. Use **change ars analysis 911** to configure routing for 911 calls. Add an entry as follows:

- Type in **911** for **Dialed String**
- Set **Total Min** and **Max** to **3**
- Set **Route Pattern** to the route pattern used for the SIP trunk to Session Manager
- Set **Call Type** to **alrt**

If emergency calls are routed via an ISDN Trunk, type in the appropriate value for **Route Pattern.**

```
change ars analysis 911                                      Page   1 of   2
                            ARS DIGIT ANALYSIS TABLE
                                  Location: all            Percent Full: 0

          Dialed           Total     Route    Call   Node  ANI
          String          Min  Max  Pattern   Type   Num   Reqd
    911                   3    3     1        alrt         y
```

Note: Any number that is used to route emergency calls must be added in the ARS table as Call Type of **alrt** type. Setting a dial string to **alrt** has two purposes:

- When an emergency call is made, a crisis alert is sent to the station that is being monitored by RedSky
- In a scenario, where emergency calls are route to PSAP via an ISDN trunk, setting the dial string to **alrt** ensures that the ELIN in AP-Loc header gets converted to Calling Party Number.

5.3. Configure Public Unknown Numbering

RedSky E911 Manager uses the Public Unknown Number Table to determine the digits that should be written to the Emergency Location Extension (ELE) field, such that the proper ELIN can be out pulsed. Use **change public-unknown-numbering 0** to configure routing for 911 calls.

The requirements are as follows:

- Extension length must equal to the length of the ELE that E911 Manager will write back.
- Extension code must specify the leading digit(s) of the ELE that the E911 Manager will write back.
- The appropriate emergency trunk group must be specified.

During Compliance Test, extensions starting with 5 that were 5 digits in length were used. Also note that 10 digits ELIN were used by RedSky. ELIN starting with digits 3 and 7 that were 10 digits long were used during the compliance test.

```
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
 10 3                                        10    Maximum Entries: 9999
 10 7                                        10
 5  5                                        5 Note: If an entry applies to
                                               a SIP connection to Avaya
                                               Aura(R) Session Manager,
                                               the resulting number must
                                               be a complete E.164 number.

                                               Communication Manager
                                               automatically inserts
                                               a '+' digit in this case.
```

5.4. Configure Crisis Alert

RedSky E911 Manager registers to DMCC service using stations that are administered with IP Softphone enabled in Communication Manager to receive Crisis Alerts.

Add a station that will be used by RedSky E911 Manager to receive Crisis Alerts when emergency calls are placed. Use **add station *n*** command to add a station, where ***n*** is an available extension.

On Page 1:

- Set **Type** to **9641**
- Type in a desired name in **Name**
- Type in a **Security Code**
- Set **IP SoftPhone** to **y**

```
add station 53001                                          Page   1 of   5
                                    STATION

Extension: 53001                        Lock Messages? n               BCC: 0
     Type: 9641                         Security Code: *                TN: 1
     Port: S00068                     Coverage Path 1:                 COR: 1
     Name: RedSky Crisis Alert Station Coverage Path 2:                COS: 1
Unicode Name? n                     Hunt-to Station:                 Tests? y
STATION OPTIONS
                                          Time of Day Lock Table:
             Loss Group: 19         Personalized Ringing Pattern: 1
                                           Message Lamp Ext: 53001
           Speakerphone: 2-way              Mute Button Enabled? y
        Display Language: english                Button Modules: 0
 Survivable GK Node Name:
          Survivable COR: internal             Media Complex Ext:
   Survivable Trunk Dest? y                         IP SoftPhone? y

                                        IP Video Softphone? n
                              Short/Prefixed Registration Allowed: default

                                        Customizable Labels? y
```

One Page 4, under **BUTTON ASSIGNMENTS**, add an entry for **crss-alert** and **release**.

```
change station 53001                                          Page   4 of
5
                                    STATION
 SITE DATA
       Room:                                          Headset? n
       Jack:                                          Speaker? n
      Cable:                                         Mounting: d
      Floor:                                     Cord Length: 0
   Building:                                       Set Color:

ABBREVIATED DIALING
     List1:                   List2:                    List3:




BUTTON ASSIGNMENTS
 1: call-appr                          5: crss-alert
 2: call-appr                          6: release
 3: call-appr                          7:
 4:                                    8:
```

Similarly, add another extension that will be used for call back forwarding to the user that placed the emergency call. In our case extension 720-977-2872 was added.

Next, use **change system-parameters crisis-alert** and set **Every User Responds** to **n**. This ensures that not all physical telephones configured with **crss-alert** buttons continue to be alerted audibility and visually after the RedSky EON server acknowledges the Crisis Alert.

```
change system-parameters crisis-alert                         Page   1 of   1
                         CRISIS ALERT SYSTEM PARAMETERS

ALERT STATION
    Every User Responds? n

ALERT PAGER
            Alert Pager? n
```

5.5. Digital/Analog Phones

For Analog or Digital phones, the **SITE DATA** page must be utilized to determine their location. E911 Manager reads the **Building**, **Room**, and **Floor** fields to map the location. In order to properly identify the location of a Digital or Analog phone, the **Building** field should match the **Building ID** that is configured in E911 Manager. Additionally, supplemental information may be placed in the **Room** or **Floor** fields. Use **change station *n*** where ***n*** is an analog or digital extension; navigate to **Page 4** to configure **SITE DATA**.

```
change station 52001                                          Page   4 of   6
                                    STATION
 SITE DATA
       Room: 300                                        Headset? n
       Jack:                                            Speaker? n
      Cable:                                           Mounting: d
      Floor: 16th_FL                                 Cord Length: 0
   Building: RedSky                                    Set Color:


ABBREVIATED DIALING
     List1:                    List2:                    List3:

HOT LINE DESTINATION
         Abbreviated Dialing List Number (From above 1, 2 or 3):
                                                       Dial Code:

     Line Appearance: call-appr
```

5.6. IP Phone Registration

In order for E911 Manager to determine when an IP phone registers or unregisters, the logging level for **Log IP Registrations and events** must be set to **Y**. Use **change logging-levels** and navigate to page 2 to verify the logging level.

```
change logging-levels                                         Page   2 of   2

                                LOGGING LEVELS

      Log All Submission Failures: y
          Log PMS/AD Transactions: n
  Log IP Registrations and events: y
     Log CTA/PSA/TTI Transactions: y
```

5.7. Emergency Route Pattern

Configure ars route pattern for emergency calls. Use **change route-pattern n** where **n** is the route pattern configured for the emergency number in the ars analysis table as mentioned in **Section 5.2**.

- Provide a descriptive name in **Pattern Name**
- Set **Grp No** to the trunk group associated with Session Manager

If emergency calls are to be routed via an ISDN Trunk, provide an appropriate value for **Grp No**.

```
change route-pattern 1                                          Page   1 of   3
                   Pattern Number: 1   Pattern Name: SM_62_18
                                SCCAN? n     Secure SIP? n
    Grp FRL NPA Pfx Hop Toll No.  Inserted                          DCS/ IXC
    No          Mrk Lmt List Del  Digits                            QSIG
                                Dgts                                Intw
 1: 1    0                                                           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: v v v v v n  n            rest                                     none
```

5.8. Emergency Call Trunk Group

Configure the trunk group; use **change trunk-group 1.** There is no specific trunk group configuration, however, there does need to be a trunk group defined. This trunk-group number is the trunk group used when configuring the AES in E911 Manager. Please note that this trunk group is used for routing calls to and from Session Manager and was pre-configured.

```
display trunk-group 1                                           Page   1 of  22
                                TRUNK GROUP

Group Number: 1                     Group Type: sip           CDR Reports: y
  Group Name: asm                          COR: 1        TN: 1        TAC: 101
   Direction: two-way        Outgoing Display? n
 Dial Access? n                                    Night Service:
Queue Length: 0
Service Type: public-ntwrk          Auth Code? n
                                              Member Assignment Method: auto
                                                        Signaling Group: 1
                                                      Number of Members: 10
```

5.9. Configure Call back forwarding

When an emergency call is unexpectedly disconnected, PSAP may decide to call the emergency caller back. The call back will be placed to the **Emergency Location Ext** configured in the section above. For extensions configured on Communication Manager, call backs can temporarily forward calls made to **Emergency Location Ext** to the extension that placed the emergency call. The duration for temporary forwarding can be configured in system-parameters features form.

```
change system-parameters features                                Page   5 of  19
                        FEATURE-RELATED SYSTEM PARAMETERS

SYSTEM PRINTER PARAMETERS
  Endpoint:               Lines Per Page: 60

SYSTEM-WIDE PARAMETERS
                                     Switch Name:
            Emergency Extension Forwarding (min): 10
          Enable Inter-Gateway Alternate Routing? n
Enable Dial Plan Transparency in Survivable Mode? n
                              COR to Use for DPT: station
                EC500 Routing in Survivable Mode: dpt-then-ec500
```

5.10. Configure AES connection

Use **change node-names ip** command to add an entry for AES. Type in a **Name** for AES and the AES IP address in **IP Address.**

```
change node-names ip                                          Page   1 of   2
                                IP NODE NAMES
    Name              IP Address
aes8                 10.64.110.132
ams8                 10.64.110.136
cms18                10.64.110.20
default              0.0.0.0
procr                10.64.110.131
procr6               ::
sm8                  10.64.110.135
```

Use **change ip-services** command to add an entry for AES. On Page 1,

- In the **Service Type** field, type **AESVCS**.
- In the **Enabled** field, type **y**.
- In the **Local Node** field, type the Node name **procr** for the Processor Ethernet Interface.
- In the **Local Port** field, use the default of **8765**.

```
change ip-services                                            Page   1 of   3
                                IP SERVICES
 Service     Enabled     Local        Local       Remote      Remote
  Type                   Node         Port        Node        Port
AESVCS        y      procr            8765
```

On Page 3 of the IP Services form, enter the following values:

- In the **AE Services Server** field, type the name added for AES in node-names above.
- In the **Password** field, type a password to be administered on AES.
- In the **Enabled** field, type **y**.

```
change ip-services                                            Page   3 of   3
                           AE Services Administration

   Server ID    AE Services       Password          Enabled    Status
                   Server
      1:      aes8              *                     y        in use
      2:
      3:
      4:
      5:
      6:
      7:
      8:
      9:
     10:
```

Use **add cti-link *n*** command, where ***n*** is an available CTI link number.

- In the **Extension** field, type **<station extension>**, where **<station extension>** is a valid station extension.
- In the **Type** field, type **ADJ-IP**.
- In the **Name** field, type a descriptive name.

```
add cti-link 1                                              Page   1 of   3
                                    CTI LINK
 CTI Link: 1
Extension: 59999
     Type: ADJ-IP
                                                                      COR: 1
     Name: AES CTI Link 1
Unicode Name? n
```

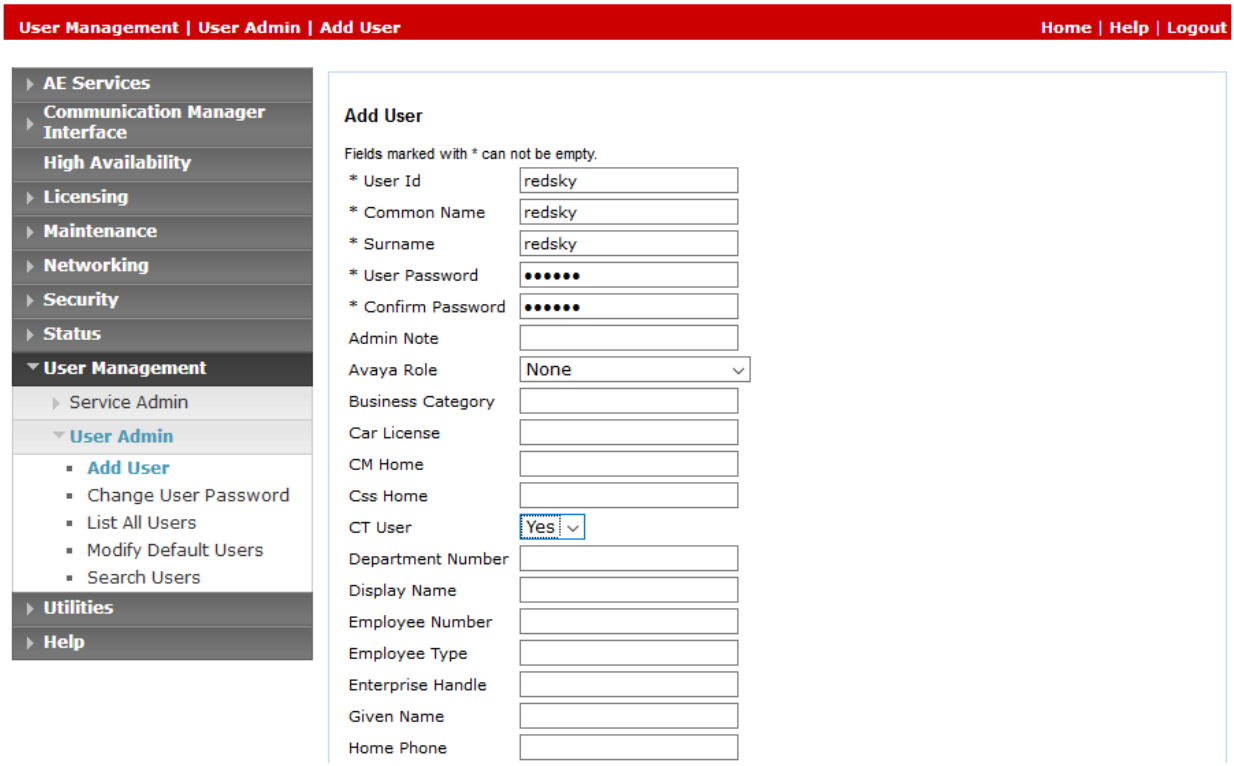
6. Configure Avaya Aura® Application Enablement Services

Configuration of Avaya Aura® Application Enablement Services requires a user account to be configured for RedSky E911 Manager.

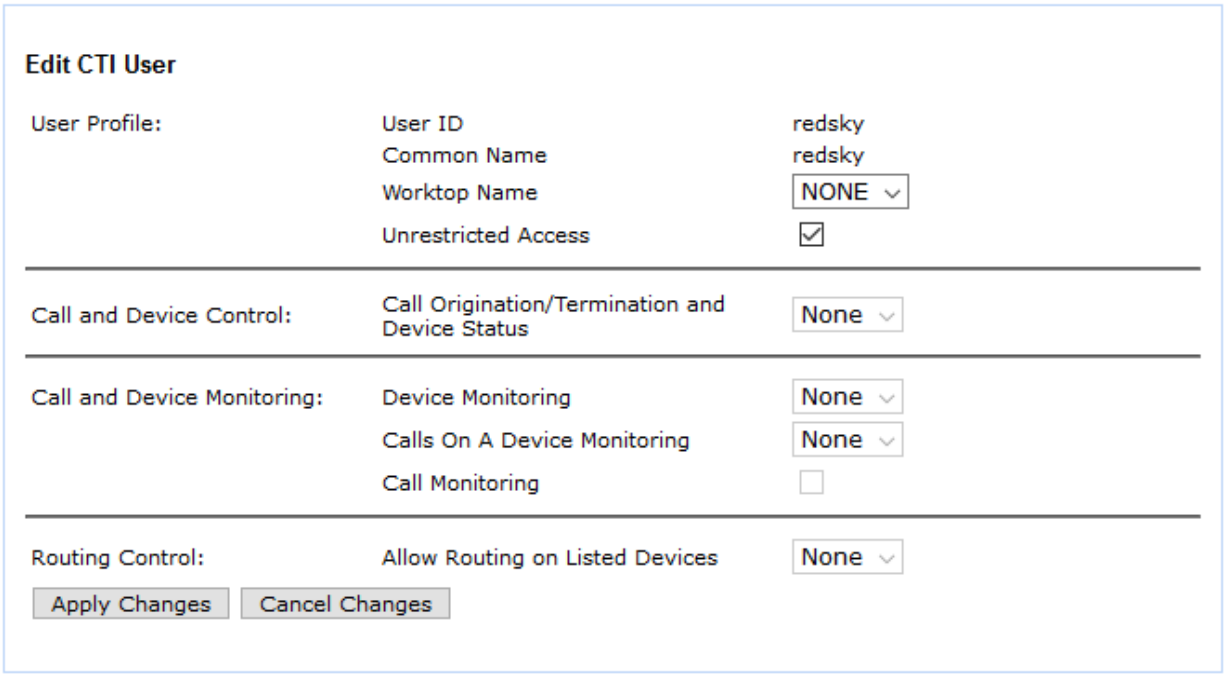
6.1. Configure Application Enablement Services Details

All administration is performed by web browser, https://<aes-ip-address>/

A user needs to be created for RedSky E911 Manager to communicate with AES. Navigate to **User Management → User Admin → Add User**. Fill in **User Id, Common Name, Surname, User Password** and **Confirm Password**. Set the **CT User** to **Yes,** and **Apply**.



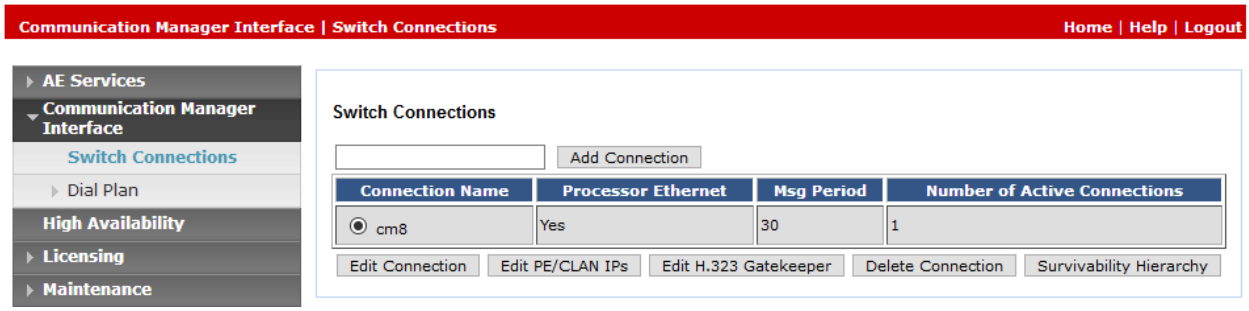
On the left side menu, navigate to **Security → Security Database → CTI Users → List All Users**. Select the recently added user and click **Edit** (not shown). Check the box for **Unrestricted Access** and click **Apply Changes**.



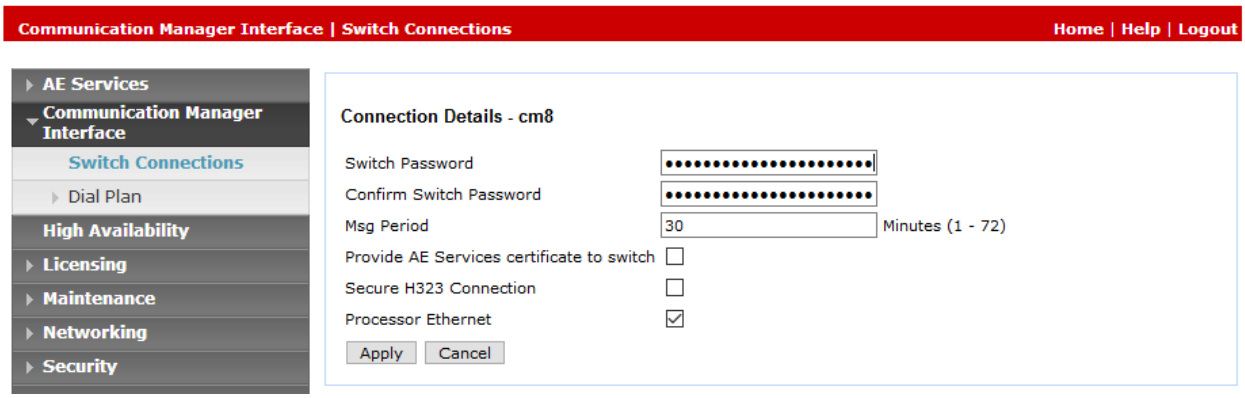
6.2. Configure Avaya Aura® Communication Manager Switch Connections

To add links to the Communication Manager, navigate to the **Communication Manager Interface → Switch Connections** page and enter a name for the new switch connection. Click the **Add Connection** button.

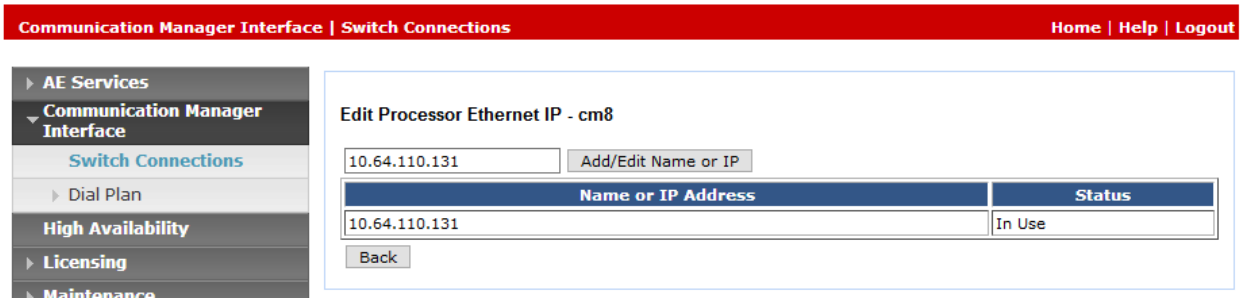
This was previously configured as **cm8** for this test environment:



Use the **Edit Connection** button shown above to configure the connection. Enter the **Switch Password** and check the **Processor Ethernet** box if using the **procr** interface, as shown below. This must match the password configured when adding AESVCS connection in Communication Manager.



Use the **Edit PE/CLAN IPs** button (shown in this section's first screen shot above) to configure the **procr** of Communication Manager.

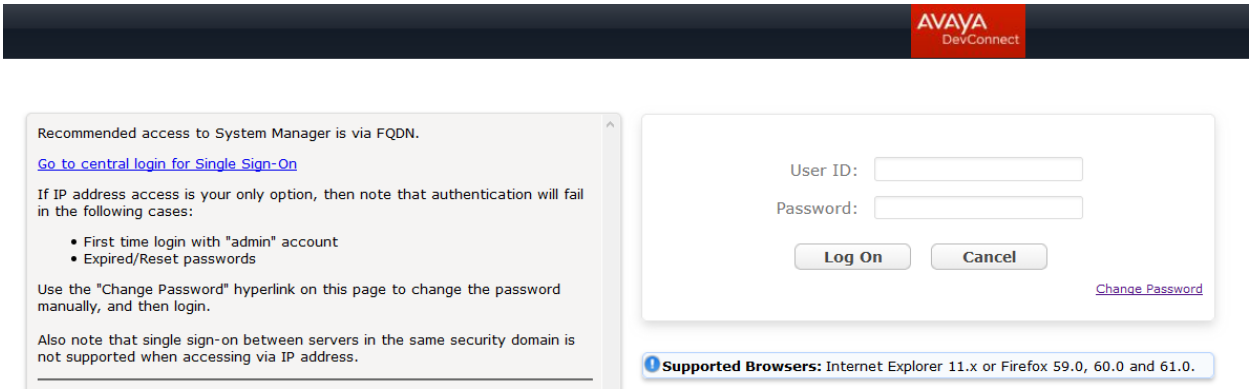


Use the **Edit H.323 Gatekeeper** button (shown in this section's first screen capture above) to configure the IP Address of Communication Manager.

7. Configure Avaya Aura® Session Manager

This section provides the steps for configuring Session Manager to communicate with the RedSky E911 Manager.

Session Manager is configured using System Manager. Enter the URL of System Manager such as https://<system-manager-ip-address>/SMGR. Log in using appropriate credentials.



7.1. Add Adaptation

When an emergency call is placed by a SIP user to the dial pattern configured in System Manager, the call routes directly to the RedSky E911 Anywhere SIP Entity (bypassing Communication Manager). A notification (SIP PUBLISH) is sent to RedSky regarding this call to generate an Emergency Alert. A problem arises when a H.323 or Analog/Digital station places an emergency call. For H.323 and Analog/Digital stations, RedSky uses AES for Emergency alerts. When a call from H.323 or Analog/Digital station arrives to Session Manager, add additional alert is generated by RedSky. To avoid additional alerts, a digit is added when the call arrives to Session Manager and removed when the call leaves Session Manager. During compliance test 9 was added and removed via the use of adaptations.

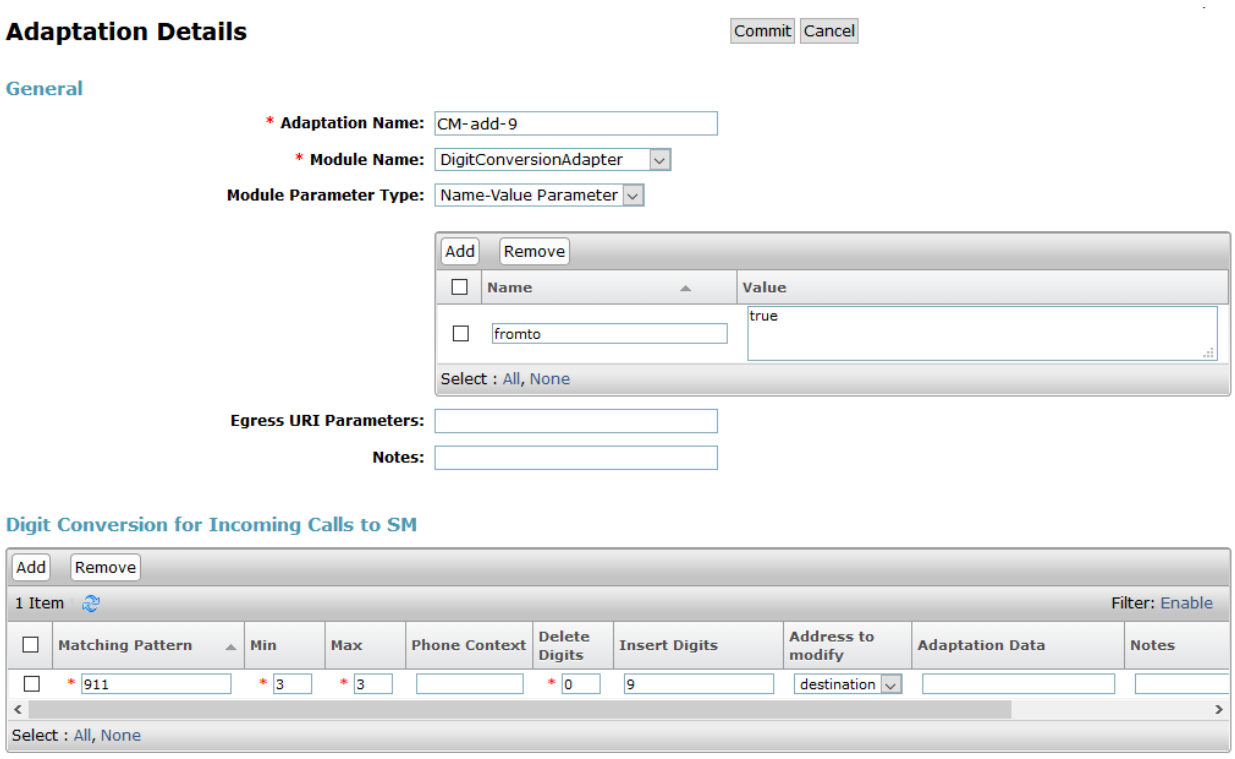
Navigate to **Elements → Routing → Adaptation**. Click **New** to add a new Adaptation. This Adaptation inserts a 9 in front of the emergency pattern configured in **Section 5.2.**

- Type in a name in **Adaptation Name.**
- Select **DigitConversionAdapter** for **Module Name**.
- Select **Name-Value Parameter** for **Module Parameter Type.**
- Add a Parameter of **fromto** with value of **true.**

In the **Digit Conversion for Incoming Calls to SM** subsection:

- Set the Matching Pattern to the emergency pattern configured in **Section 5.2.**
- Set **Min** and **Max** to the digit length of the pattern.
- Type in **9** for **Inserted Digits**.
- Set **Address to modify** to **destination.**

Click **Commit** to save changes.



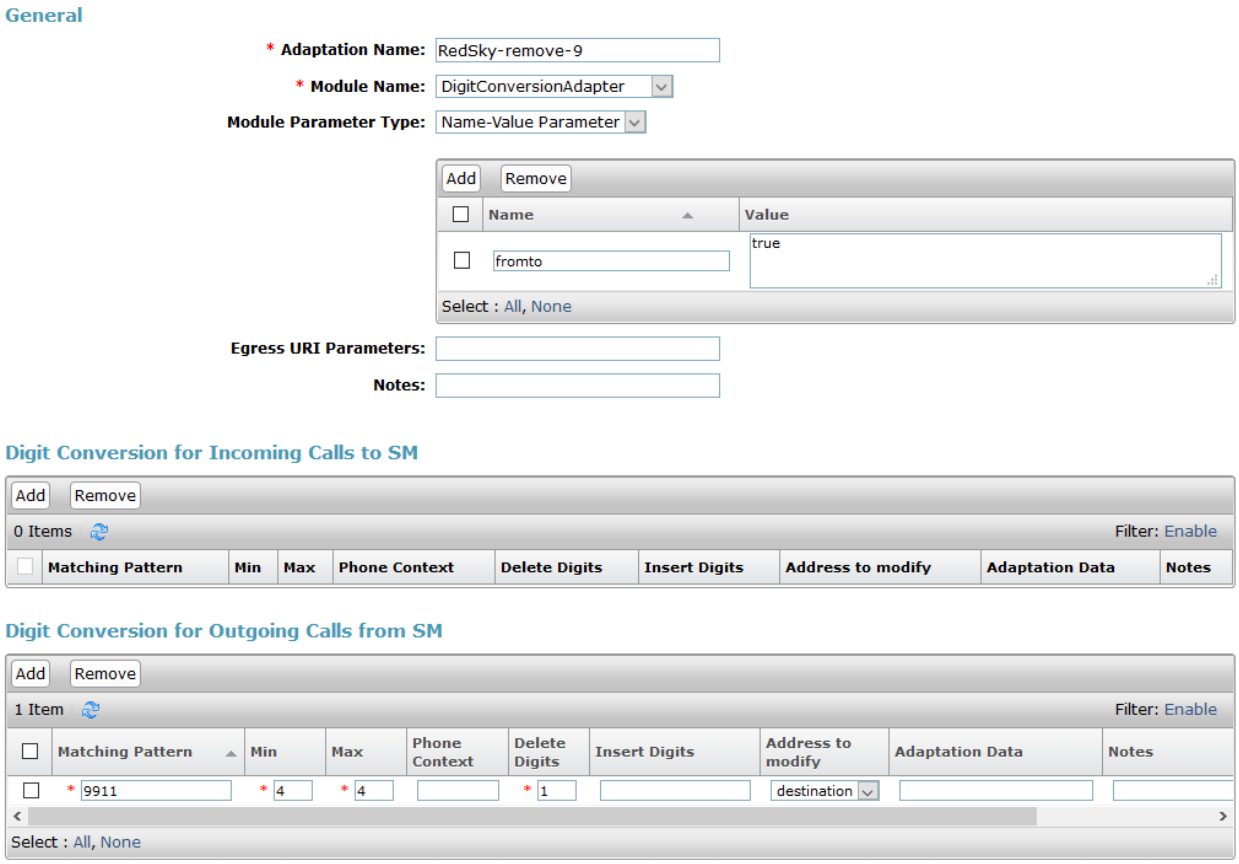
Continuing from above, click **New** to add a new Adaptation. This Adaptation deletes a 9 that was inserted in step above.

- Type in a name in **Adaptation Name.**
- Select **DigitConversionAdapter** for **Module Name**.
- Select **Name-Value Parameter** for **Module Parameter Type.**
- Add a Parameter of **fromto** with value of **true.**

In the **Digit Conversion for Outgoing Calls from SM** subsection:

- Set the Matching Pattern to the 9 + emergency pattern configured above.
- Set **Min** and **Max** to **4**.
- Type in **1** for **Delete Digits**.
- Set **Address to modify** to **destination.**

Click **Commit** to save changes.



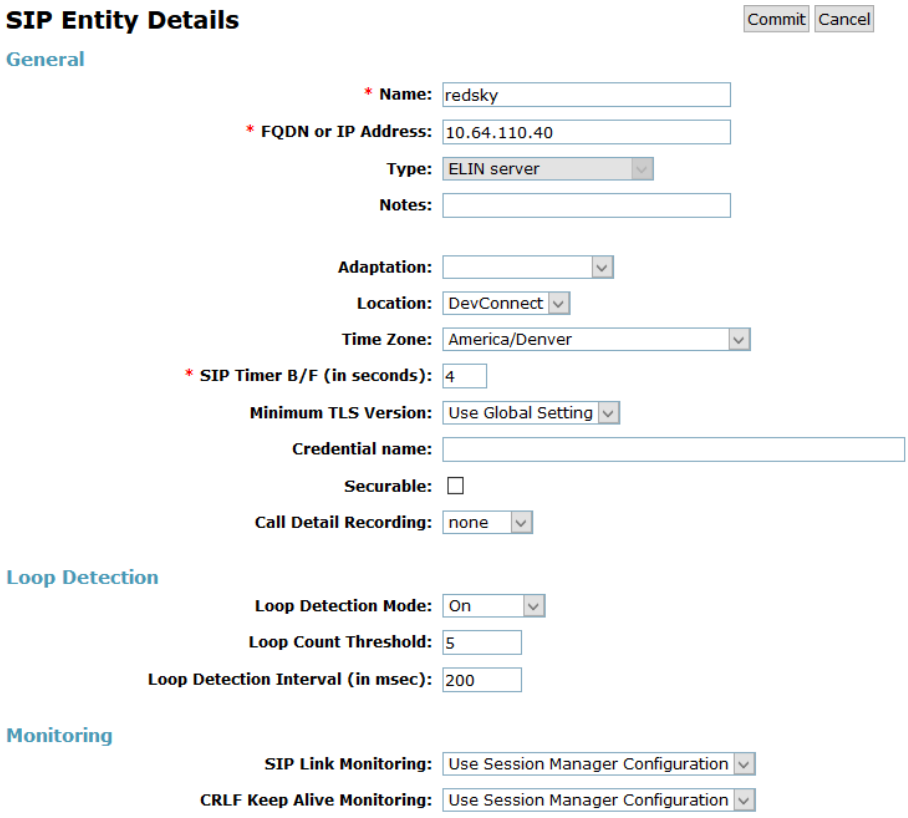
7.2. Add a SIP Entity

Continuing from above, select **Routing → SIP Entities.** Click **New** to add a new SIP entity for RedSky ELIN Server.

- Enter a **Name.**
- Type in IP address of RedSky ELIN Server in **FQDN or IP Address.**
- Set **Type** to **ELIN server.**
- Set **Location** to a configured Location.

Click **Commit** to save changes.

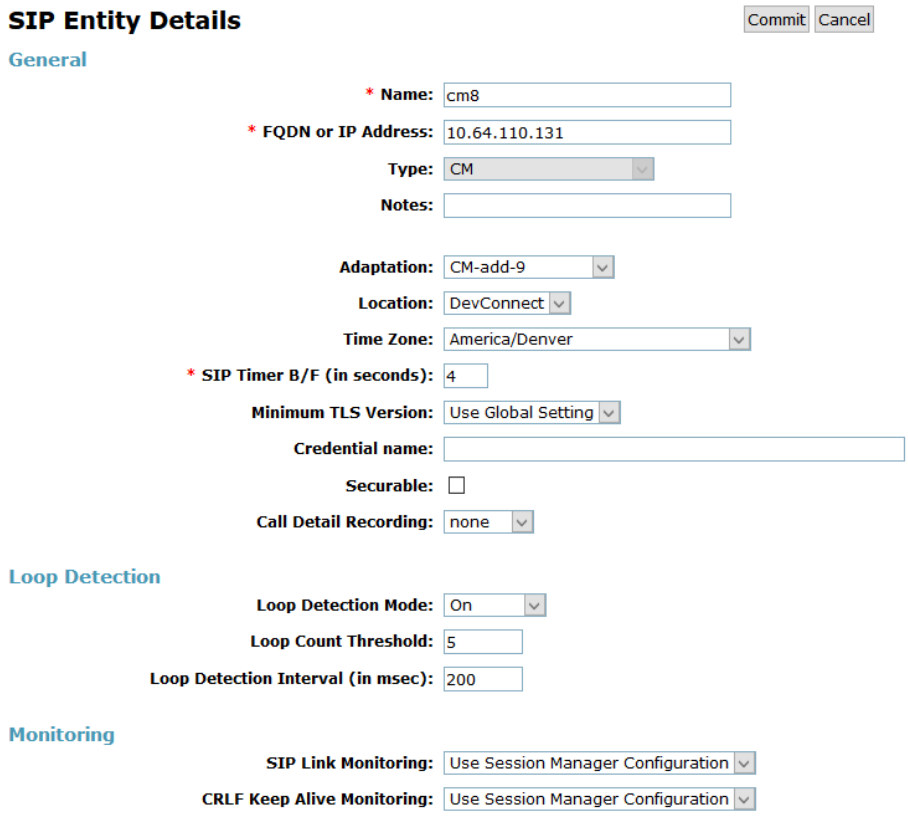
Note: If more than one E911 Manager is used, entries for FQDN will needed to be added in Local Host Name Resolution page of Session Manager.



Add another SIP Entity for Communication Manager.

- Enter a **Name.**
- Type in IP address of RedSky in **FQDN or IP Address.**
- Set **Type** to **CM.**
- Set **Adaptation** to that was added to insert a digit in **Section 7.1.**
- Set **Location** to a configured Location.

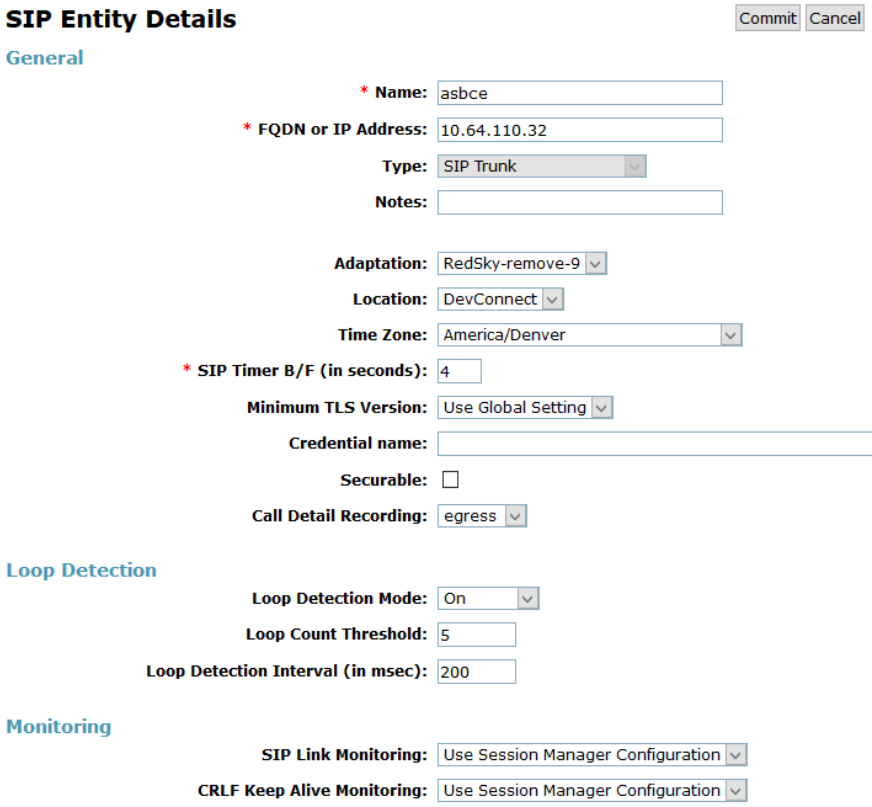
Click **Commit** to save changes.



Add another SIP Entity for emergency call routing to RedSky E911 Anywhere. If emergency calls are to be routed via an ISDN Trunk, skip this configuration. In this case, calls to RedSky E911 Anywhere were routed via Avaya SBCE. Thus, a SIP Entity to Avaya SBCE was added.

- Enter a **Name.**
- Type in IP address of RedSky in **FQDN or IP Address.**
- Set **Type** to **SIP Trunk.**
- Set **Adaptation** to that was added to remove the inserted digit in **Section 7.1.**
- Set **Location** to a configured Location.

Click **Commit** to save changes.



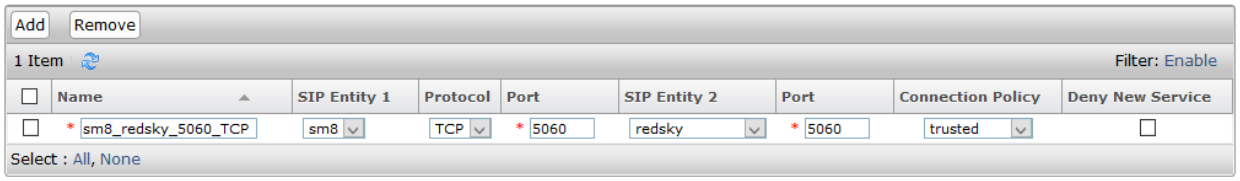
7.3. Add an Entity Link

Once the SIP Entity is added, edit it. At the bottom of the page click **Add** under **Entity Links**.

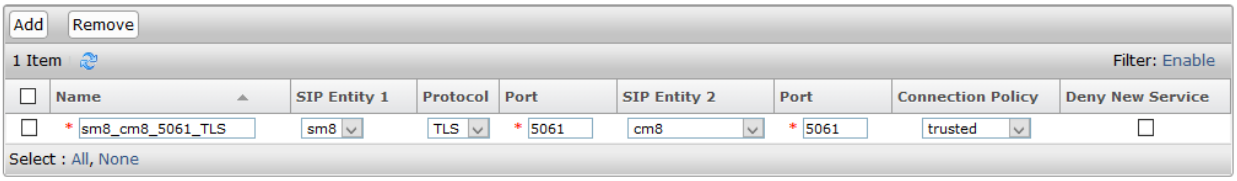
- Set **SIP Entity 1** to Session Manager's SIP Entity
- Set **Protocol** to **TCP**
- Set **Port** to **5060**
- Set **SIP Entity 2** to the SIP Entity added in the previous step
- Set **Port** to **5060**

Click **Commit** to save the changes.

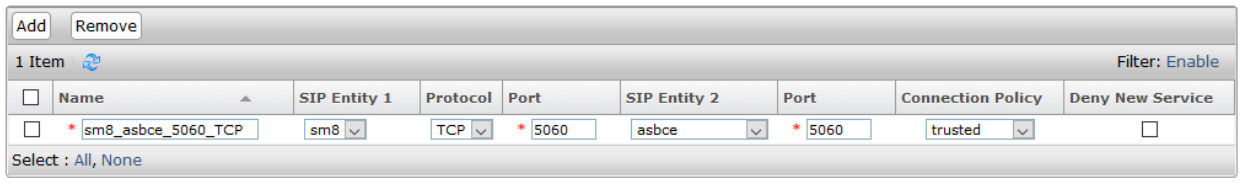
Following screen captures shows Entity Link added for RedSky ELIN Server.



Following screen capture shows Entity Link added for Communication Manager.



Following screen capture shows Entity Link added for emergency call routing to RedSky E911 Anywhere (Avaya SBCE). If emergency calls are to be routed via an ISDN Trunk, skip this configuration.

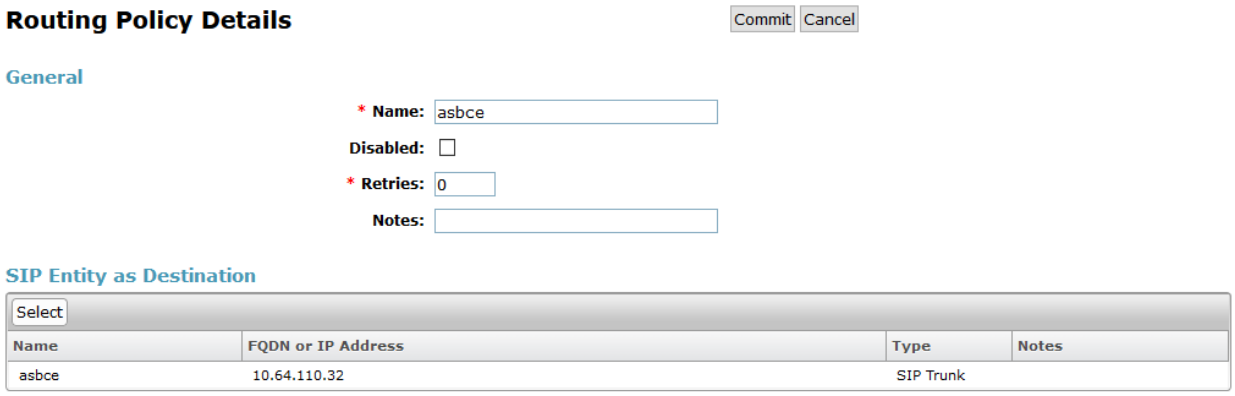


7.4. Add a Routing Policy

If emergency calls are to be routed via an ISDN Trunk, skip this configuration. Continuing from above, select **Routing → Routing Policies.** Click **New** to add a new Routing Policy for RedSky E911 Anywhere (Avaya SBCE).

- Type in the **Name** for Routing Policy.
- Under **SIP Entity as Destination**, click **Select**. From the **SIP Entity List** select the SIP Entity configured for Avaya SBCE in **Section 7.2** (asbce) and click **Select** (not shown).

Click **Commit** to save changes.



7.5. Add a Dial Pattern

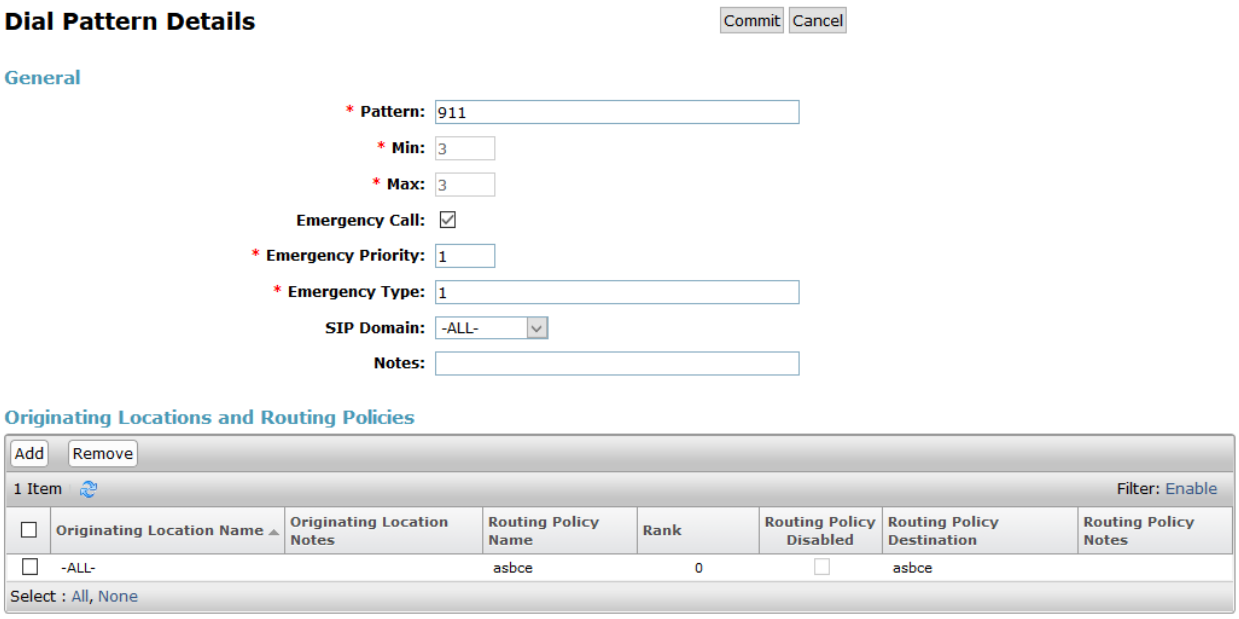
Continuing from above, select **Routing → Dial Patterns.** Click **New** to add a new Dial Pattern for RedSky E911 Anywhere (Avaya SBCE). On the **Dial Patterns** page, click on **New:**

- Set **Pattern** to **911**
- Set **Min** and **Max to** 3
- Check box for **Emergency Call**
- Enter an **Emergency Priority**
- Enter an **Emergency Type**
- Under **Originating Locations and Routing Policies**, click **Add** (New screen not shown)
    - Select a location configured
    - Select the Routing Policy configured in for RedSky E911 Anywhere (Avaya SBCE).

Click **Commit** to save changes.

If emergency calls are to be routed via an ISDN Trunk, select the Communication Manager Routing Policy.

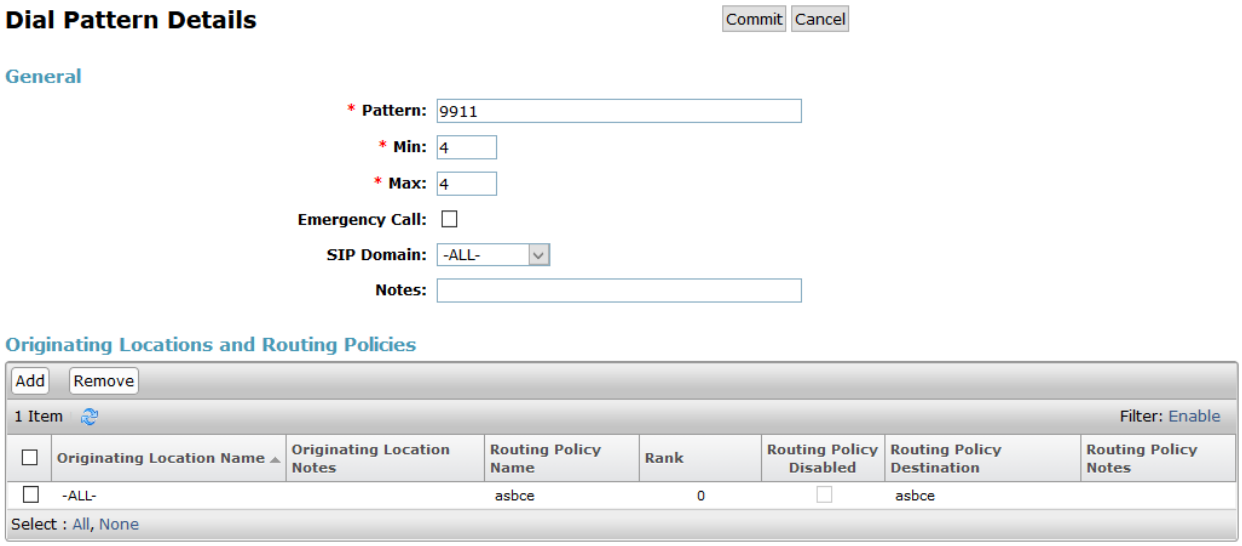
For emergency calls Session Manager skips any application sequencing and it goes straight to the final destination as per the Dial Pattern. Session Manager emergency calls are those, where the Dial Pattern has the **Emergency Call** box checked. Note that checking the **Emergency Call** box will result in Session Manager sending emergency call notification to RedSky ELIN server.



Continuing from above, add another dial pattern. This dial pattern will be used for the resultant digits after the adaptation is applied to insert 9. This adaptation is created to ensure that emergency calls from H.323 and Analog/Digital do not generate an emergency alert for RedSky ELIN server. Click **New** to add a new Dial Pattern for RedSky E911 Anywhere (Avaya SBCE). On **Dial Patterns** page, click on **New:**

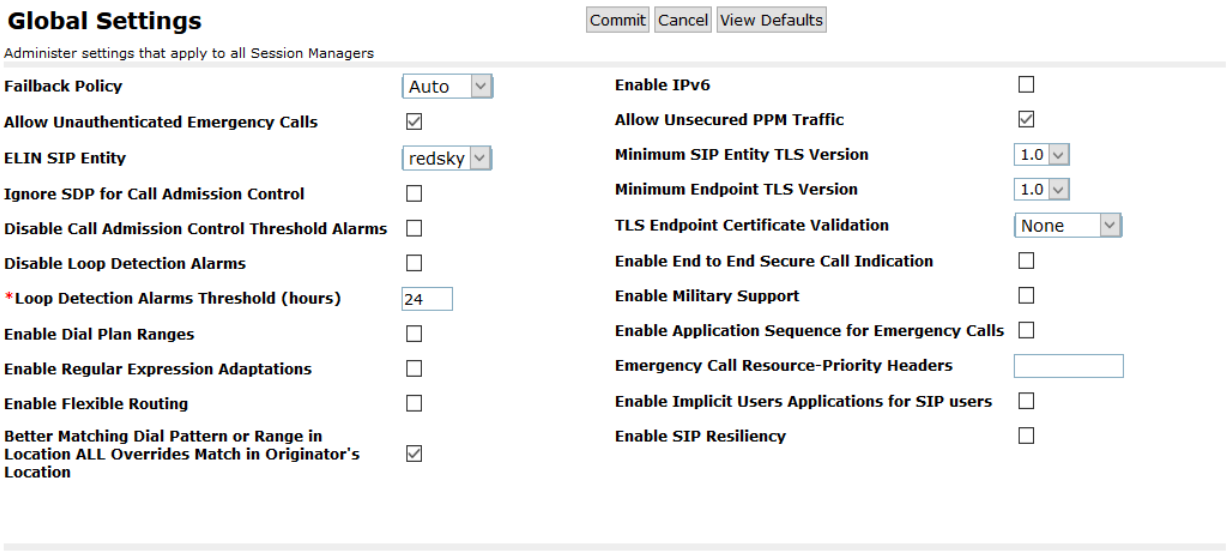
- Set **Pattern** to **9911**
- Set **Min** and **Max to** 4
- Ensure that **Emergency Call** box is NOT checked.
- Under **Originating Locations and Routing Policies**, click **Add** (New screen not shown)
    - Select a location configured

Select the Routing Policy configured in for RedSky E911 Anywhere (Avaya SBCE).



7.6. Configure ELIN SIP Entity

Navigate to **Elements → Session Manager → Global Settings.** From the **ELIN SIP Entity** drop down menu, select the SIP Entity added for RedSky ELIN Server. Click **Commit** to save the change.

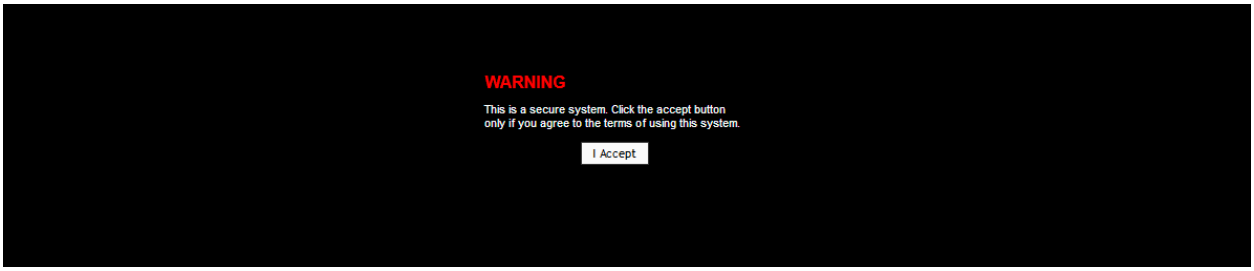


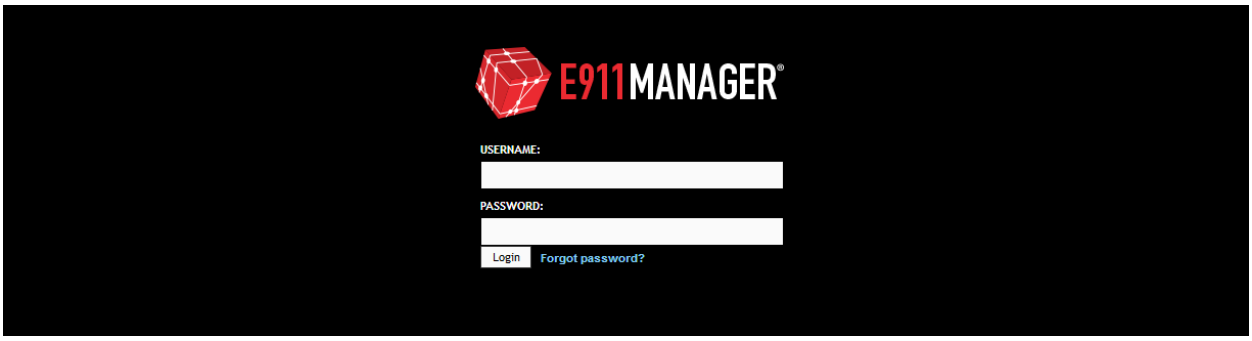
8. Configure RedSky E911 Manager

This section provides the steps for configuring the RedSky E911 Manager to provide ELIN information to Session Manager. All configuration for compliance testing was performed by a RedSky Engineer.

8.1. RedSky E911 Manager Configuration Details

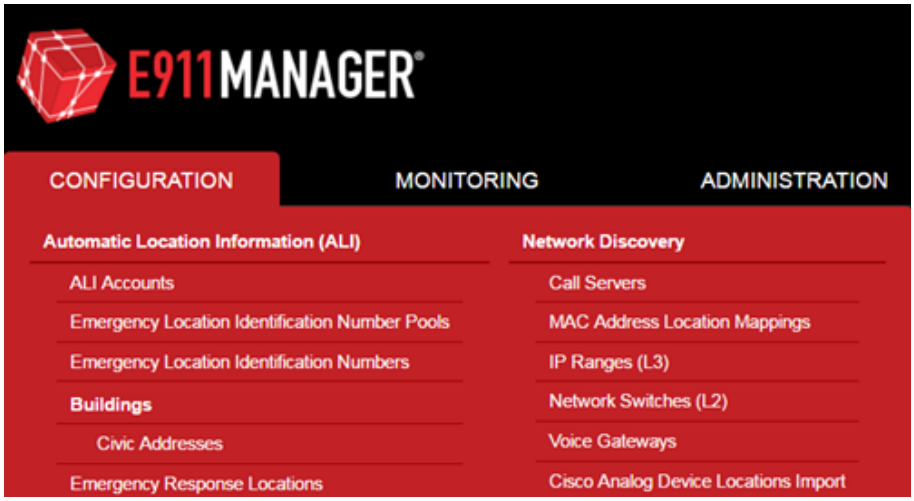
RedSky E911 Manager is configured using a web browser. Enter the URL of the RedSky E911 server such as https://<hostname> where <hostname> is the ip address or fully qualified domain name of the RedSky server. Click **I ACCEPT** on the warning page. Login using appropriate credentials.





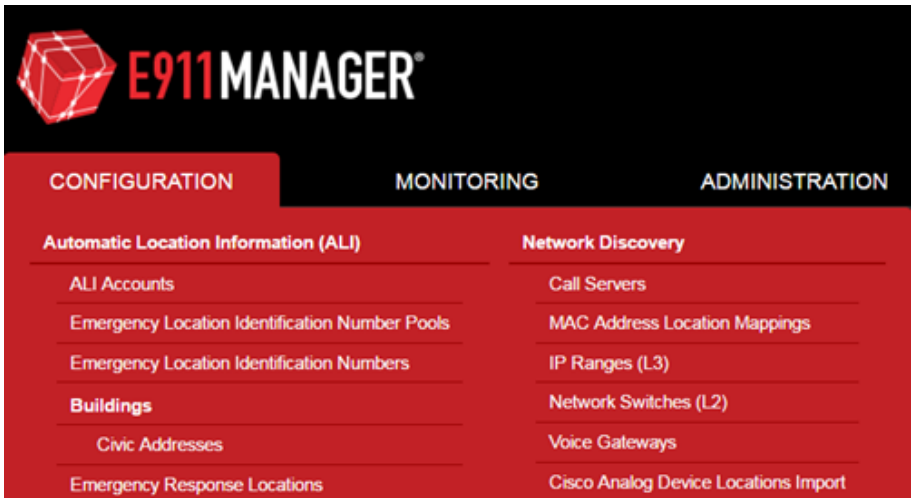
In general, the steps are as follows:

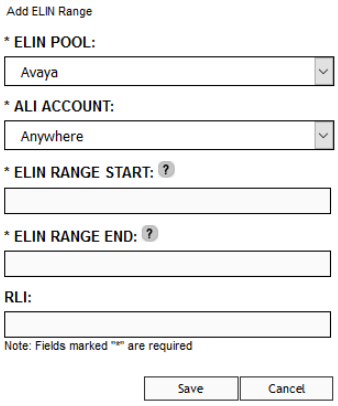
- Define an ELIN Pool
- Define an ELIN Range
- Define a Call Server
- Define a building
- Create locations and tie the location to an ELIN
- Administer the IP Address Ranges

Step	Description
1.	**Define an ELIN Pool** Select **Emergency Location Identification Number Pools** from the **CONFIGURATION** menu and click the **Add ELIN Pool** button. Give the new ELIN Pool a name and click **Add**. In the compliance test, a single ELIN Pool was used; however, it is possible to administer more than one ELIN Pool by repeating the process.  

2. **Define an ELIN Range**

Select **Emergency Location Identification Numbers** from the **CONFIGURATION** menu and click the **Add ELIN Range** button. Select an ELIN Pool from the dropdown and pick an **ALI Account**. Finally define the starting 10-digit number and ending 10 digit number.



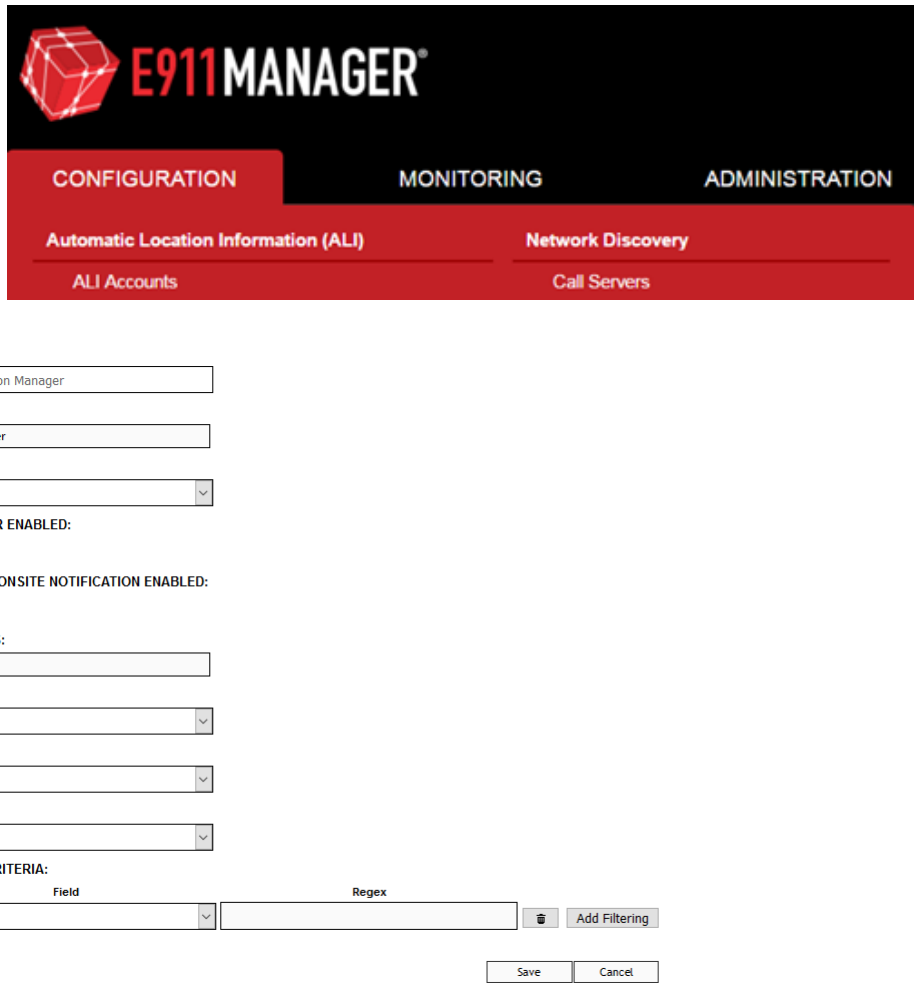


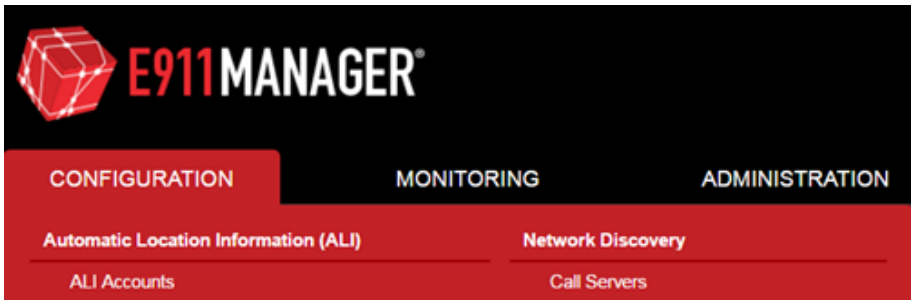
Step	Description
	The following was added during the compliance test.

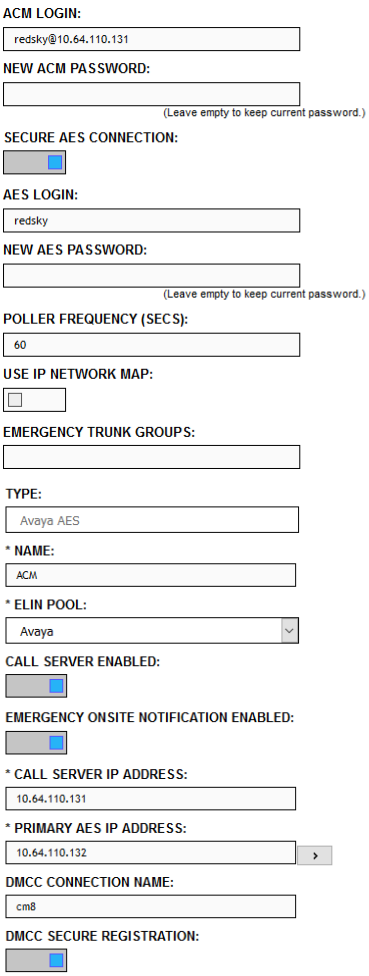
Search: Show 100 entries

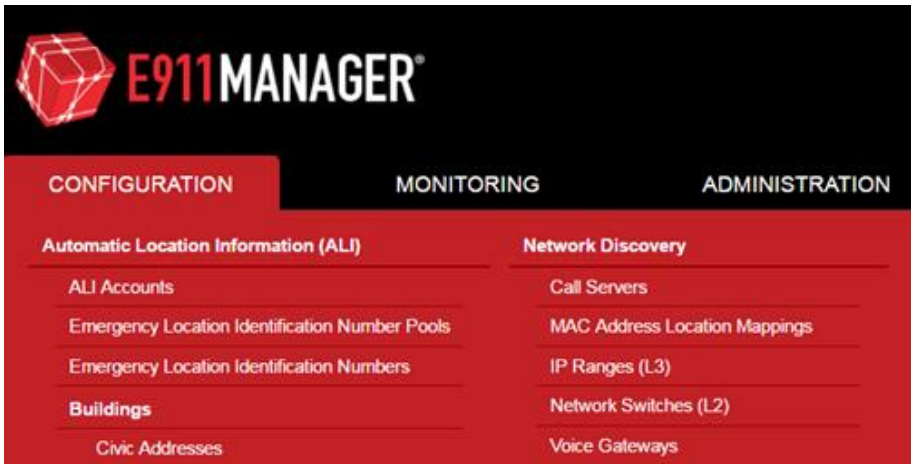
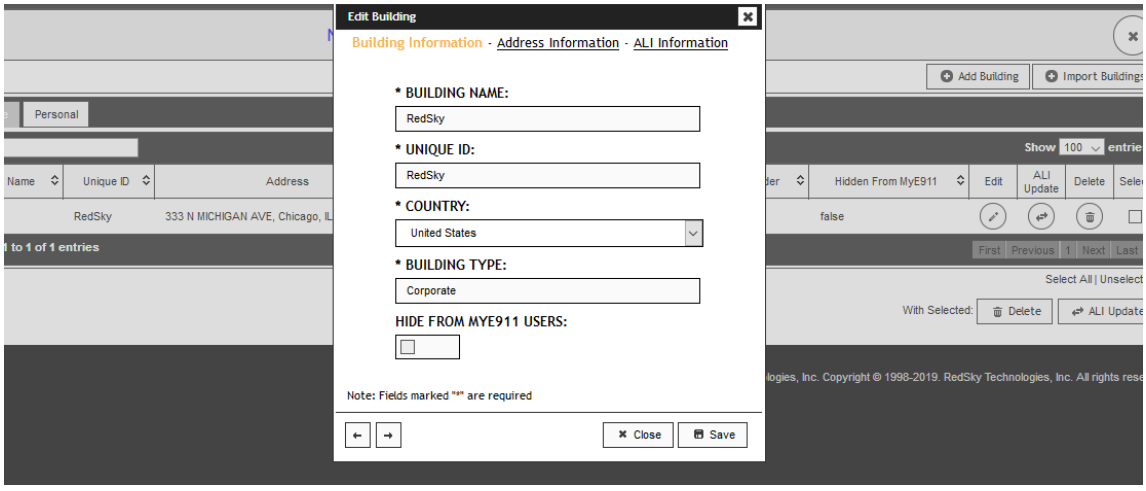
ELIN Pool	Phone Number	Username	Building Name	Location Name	ALI Provider Site	Validation Status	Message	RLI	Edit	Delete	Select
Avaya	3035358000				Anywhere	New					
Avaya	7209772872		RedSky	RedSky	Anywhere	Valid	Update successful, location valid.				
Avaya	3035358003		RedSky	AES-RedSky-300:16th_FL	Anywhere	Valid	Update successful, location valid.				
Avaya	3035358001	MyE911	RedSky	RedSky	Anywhere	Valid	Update successful, location valid.				

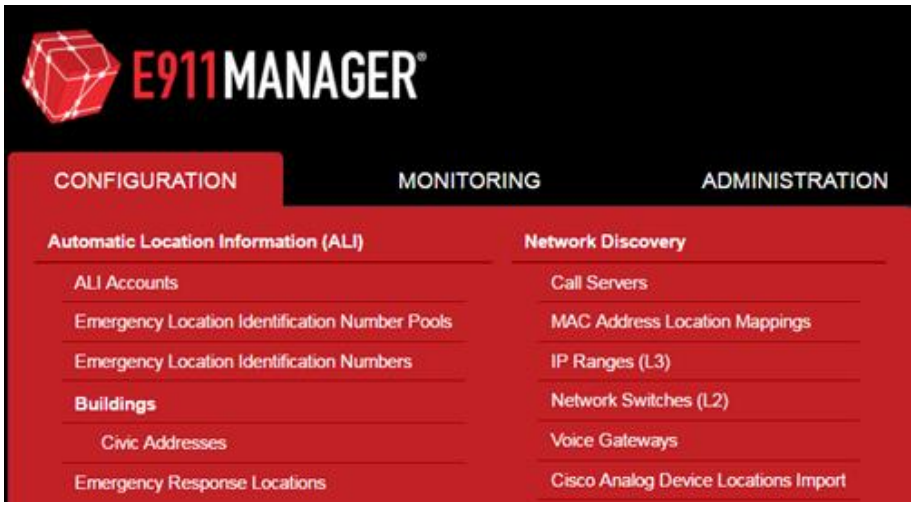
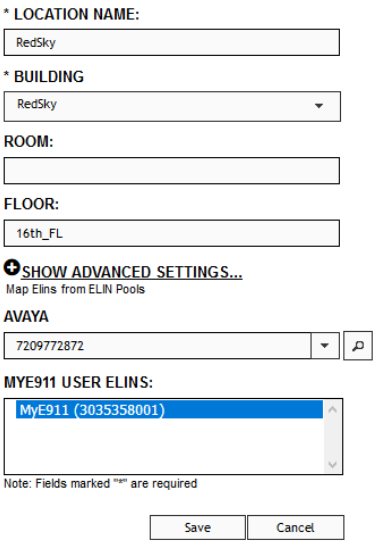
Showing 1 to 4 of 4 entries First Previous 1 Next Last

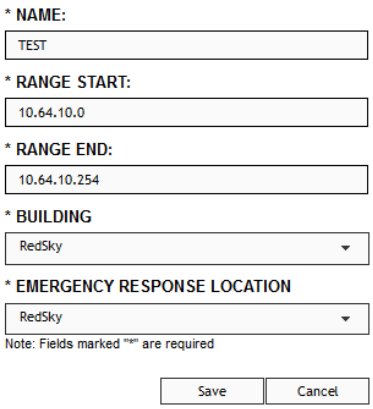
Step	Description
3.	**Administer the Session Manager link (Optional)** Select **Call Servers** from the **CONFIGURATION** menu and click the **Add Call Server** button to administer the Session Manager(s). In the compliance test, a single Session Manager was used; however, it is possible to administer more than one Session Manager by repeating the process. When Session Manager is administered correctly, a connection will automatically be established between servers. Enter the SIP Entity **IP address** of Session Manager**,** give the call server a **Name**, select the **"Avaya Session Manager" Type,** and check **"Call Server Enabled"**. Enter the **Transport** protocol to match the entry in **Section 7.3** for RedSky ELIN Server. 

4.	**Administer the Avaya AES link (Optional)** Select **Call Servers** from the **CONFIGURATION** menu and click the **Add Call Server** button to administer the Avaya AES(s). In the compliance test, a single Avaya AES was used; however, it is possible to administer more than one Avaya AES by repeating the process. When Avaya AES is administered correctly, a connection will automatically be established between servers.  Give the call server a **Name** and change the **Type** to **Avaya AES** if not set already. Check "**Call Server Enabled**", enter the "**DMCC Connection Name**," and fill in the rest of the required fields. Finally, enter the **ACM Login** and **ACM Password** from **Section 5.1**. Enter the **AES Login**, and fill in the **AES password** from **Section 6.1**.

Step	Description
	

Step	Description
5.	**Define the Company Locations (Buildings)** Location administration involves defining one or more Buildings, one or more Locations within each building, one or more network IP Ranges associated with each Location, and assigning ELINs to each IP Range. It is also possible to define devices such as phones. However, this is not necessary as this would be redundant with administration in Communication Manager and Session Manager. Device definitions are overridden with IP Address based location information if it differs from the statically defined device location information. Click the **Civic Addresses** from the **CONFIGURATION → Buildings** menu to administer general location information. Multiple Buildings may be administered by repeating the process. For the compliance test, one building was defined. Click **Next** then **Save** to complete the entry.  

Step	Description
6.	**Define the Company Locations (Emergency Response Locations)** Click the **Emergency Response Locations** from the **CONFIGURATION** menu to administer general location information. Click on the **Add ERL** button. Multiple locations may be administered by repeating the process.  

Step	Description
7.	**Administer the IP Address Ranges** Click **Add Range button** from the **CONFIGURATION → IP Ranges (L3)** menu to administer the IP Address Ranges that will be associated with each location. For the Compliance Test, one address range entry was created for each Location.  

9. Verification Steps

For SIP Endpoints, the following command was executed on the command line of the Session Manager in order to validate that the ELIN information provided by RedSky E911 Manager was updated on Session Manager. Note the **elin** value below was updated by RedSky E911 Manager.

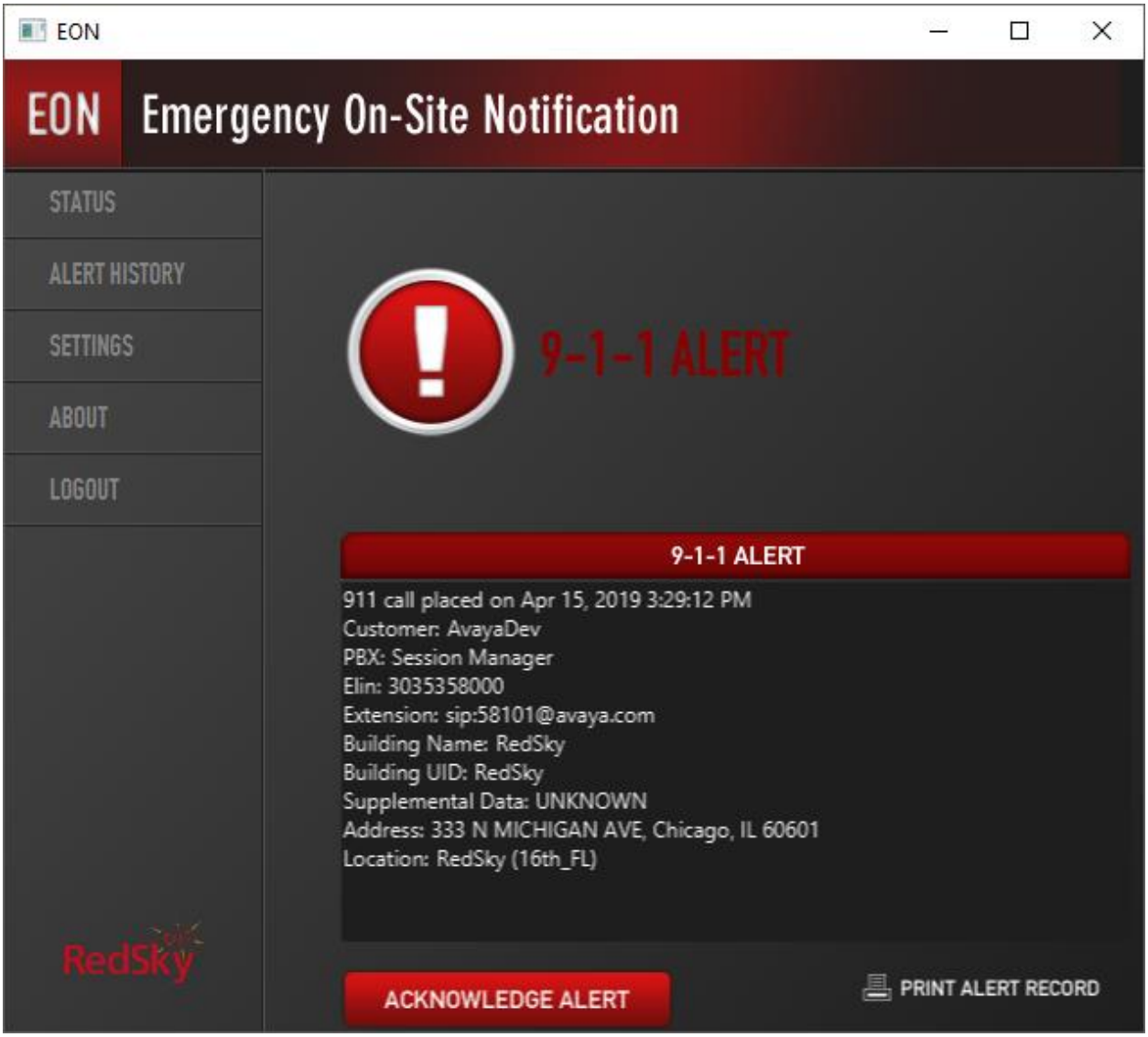
```
[cust@sm8 ~]$ sm cons get AllRSLocal
[Registrations]
RegistrationKey[commProfileSetId:200,
contactHashKey:sip:58101@10.64.10.202:20583;transport=tls;avaya-sc-
enabled]=RegistrationData[expirationTime=Mon Apr 15 17:23:09 MDT 2019,
callId=1_5cb4d181-1a5973f783a3w9436y103ua3y1t6c_R58101,
lastRegistrationInterruption=Never, cSeq=14, elin=3035358000, elinTStamp=Mon Apr 15
16:23:09 MDT 2019, sendNoSubNotify=false, endpointAdapter=null, avayaEndpoint=true]
RegistrationKey[commProfileSetId:150,
contactHashKey:sips:50091@10.64.10.171:5061;transport=tls]=RegistrationData[expiration
Time=Mon Apr 15 16:33:23 MDT 2019, callId=168658532711201001220@10.64.10.171,
lastRegistrationInterruption=Never, cSeq=20323, elin=3035358000, elinTStamp=Mon Apr 15
16:30:23 MDT 2019, sendNoSubNotify=false, endpointAdapter=null, avayaEndpoint=true]
RegistrationKey[commProfileSetId:151,
contactHashKey:sips:50092@10.64.10.171:5061;transport=tls]=RegistrationData[expiration
Time=Mon Apr 15 16:32:46 MDT 2019, callId=9539038861120100122@10.64.10.171,
lastRegistrationInterruption=Never, cSeq=20324, elin=3035358000, elinTStamp=Mon Apr 15
16:29:46 MDT 2019, sendNoSubNotify=false, endpointAdapter=null, avayaEndpoint=true]
```

Alternatively, using the traceSM tool on Session Manager, verify ELIN is sent by RedSky E911 Manager in a SIP PUBLISH when a SIP Endpoint registers to Session Manager.

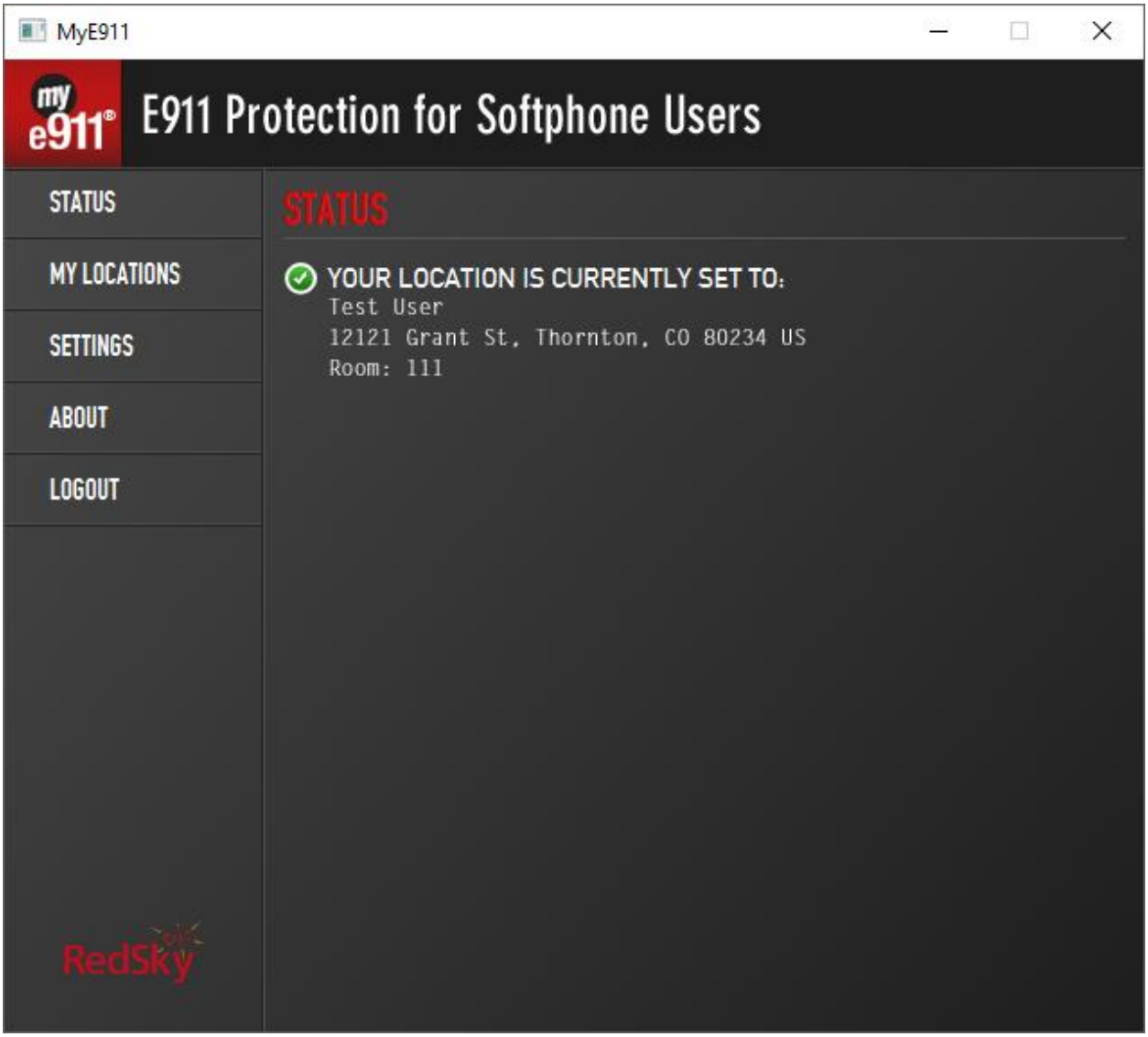
```
PUBLISH sip:10.64.110.135:5060;transport=tcp SIP/2.0
Call-ID: 383c89417e066e205584fd2e766c1168@0.0.0.0
CSeq: 1 PUBLISH
From: <sip:10.64.110.40:5060>;tag=11037307_efb54f65_af0854de_d1eac386
To: <sip:10.64.110.135:5060>
Max-Forwards: 70
User-Agent: Mobicents Sip Servlets 4.0.21
Via: SIP/2.0/TCP 10.64.110.40:5060;branch=z9hG4bKd1eac386_af0854de_da5ce6cb-38f1-4e79-
a42b-a44b16497d32
Content-Type: application/reginfo+xml
Event: reg
Expires: 0
Content-Length: 1499

<?xml version="1.0" encoding="UTF-8"?>
<reginfo state="partial" version="0" xmlns="urn:ietf:params:xml:ns:reginfo"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <registration aor="sip:58101@avaya.com" id="a150" state="active">
    <contact id="c150-1753665258-1678529939-1" state="active" event="registered"
duration-registered="0" q="1.0" xmlns="">
      <uri>sip:58101@10.64.10.202:8469;transport=tls;avaya-sc-enabled</uri>
      <unknown-param name="+sip.instance"> "&lt;urn:uuid:00000000-0000-1000-8000-
a009ede7f7a3&gt;" </unknown-param>
      <unknown-param name="reg-id"> "1" </unknown-param>
      <unknown-param name="+avaya.model"> "9641" </unknown-param>
      <unknown-param name="+avaya.js-ver"> "1.0" </unknown-param>
      <unknown-param name="+av.sdp.anat"> "" </unknown-param>
      <unknown-param name="+av.sip.media"> "4" </unknown-param>
      <unknown-param name="+avaya.gmtoffset"> "0:00" </unknown-param>
      <unknown-param name="+av.sip.iptolerance"> "" </unknown-param>
```

```
      <unknown-param name="+av.sip.sig"> "4" </unknown-param>
      <unknown-param name="+avaya.firmware"> "S96x1_SALBR7_1_4_0r11_V4r83.tar"
</unknown-param>
      <unknown-param name="+avaya.sn"> "17N511507223" </unknown-param>
      <unknown-param name="+av.ip.mode"> "4" </unknown-param>
      <unknown-param name="avaya-actions"> "presence.initiate-
pubsub,presence.redirect" </unknown-param>
      <elin>3035358000</elin>
    </contact>
  </registration>
</reginfo>
```

To validate Emergency Alerts are generated successfully, place a test emergency call and verify the EON client receives the alert. Test emergency call may need to be scheduled with appropriate PSAP. Place calls from both SIP and non-SIP Endpoints. The following screen capture displays an Emergency Alert that was received for an emergency call dialed from a SIP Endpoint.



For Softphone users, validate that the location is set correctly on myE911 client.



From the System Manager web interface, navigate to **Home → Session Manager → System Status → SIP Entity Monitoring**. Under **All Monitored SIP Entities**, click on the SIP Entity for RedSky ELIN Server. Verify the **Conn. Status** and **Link Status** are **Up**. This displays the SIP Connectivity status between RedSky ELIN Server and Session Manager.

	Session Manager Name	IP Address Family	SIP Entity Resolved IP	Port	Proto.	Deny	Conn. Status	Reason Code	Link Status
○	sm8	IPv4	10.64.110.40	5060	TCP	FALSE	UP	200 OK	UP

Select : None

10. Conclusion

The RedSky E911 Manager successfully demonstrated the ability to send ELIN to Avaya Aura® Communication Manager and Avaya Aura® Session Manager. The general location information a company may have on file with the Automatic Location Identifier (ALI) database providers can be matched to an ANI from the Calling Party Number sent over public networks. This information may not be precise and could in fact be incorrect given the roaming nature of IP endpoints, as well as the distributed nature of modern communications systems. The precision afforded to enterprises using a RedSky ELIN server solution can make a significant difference in response times in the event of an emergency. RedSky E911 Manager also successfully demonstrated the ability to ensure softphone users update their locations and send emergency alerts when an emergency call is placed from an Avaya Aura® environment. RedSky E911 Anywhere successfully demonstrated the ability to route emergency calls.

11. Additional References

Product documentation for Avaya products may be found at http://support.avaya.com.

[1] Administering Avaya Aura® Communication Manager, Release 8.0.1

[2] Administering Avaya Aura® Session Manager, Release 8.0.1

Product information for RedSky Technologies E911 Manager may be found at http://www.redskye911com.

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.