AVAYA

Avaya Solution & Interoperability Test Lab

Application Notes for RedSky Technologies E911 Manager and Emergency On-site Notification (EON) with Avaya Communication Manager – Issue 1.0

Abstract

These Application Notes describe a compliance-tested configuration consisting of Avaya Communication Manager and the RedSky Technologies E911 Manager with Emergency On-site Notification (EON). The RedSky E911 Manager retrieves emergency numbering and location information for a station from a PBX. The RedSky E911 Manager validates, reformats, and uploads the information to public Automatic Location Identification (ALI) databases. EON is an add-on module to the RedSky E911 Manager that detects emergency calls originated by PBX stations and notifies EON clients when such calls are detected. During compliance testing, the RedSky E911 Manager successfully retrieved station emergency numbering and location information after Avaya Communication Manager stations were added, deleted, and changed. In addition, the RedSky EON server successfully detected emergency calls placed by Avaya Communication Manager stations and notified EON clients of such calls.

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.

SH; Reviewed:
SPOC 10/28/2008

Solution & Interoperability Test Lab Application Notes
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rse911-acm5

1. Introduction

These Application Notes describe a compliance-tested configuration consisting of Avaya Communication Manager and the RedSky Technologies E911 Manager with Emergency On-site Notification (EON). The RedSky E911 Manager retrieves emergency numbering and location information for a station from a PBX. The RedSky E911 Manager validates, reformats, and uploads the information to public Automatic Location Identification (ALI) databases. When a Public Safety Answering Point (PSAP) receives an Enhanced 911 (E911) call, the PSAP searches the ALI databases to obtain the specific address/location associated with the Auto Number Identification (ANI) or Emergency Location Identification Number (ELIN). EON is an add-on module to the RedSky E911 Manager that detects emergency calls originated by PBX stations and notifies EON clients and other notification subscribers when such calls are detected.

Figure 1 illustrates a sample configuration consisting of:
- Avaya S8720, S8500, S8300 Servers
- Avaya G650 and G350 Media Gateways
- Avaya IP, digital, and analog telephones
- RedSky E911 Manager primary and backup servers

The compliance testing focused on verifying the generation of the ALI records and not on the transfer of ALI records to ALI databases.

The RedSky E911 Manager retrieves station numbering and location information from Avaya Communication Manager at user defined intervals. When an Avaya Communication Manager telephone originates an E911 call, an entry is created in the Emergency log. The RedSky EON server service running on the RedSky server monitors the Emergency log to detect the E911 calls and notifies all EON clients of the call.
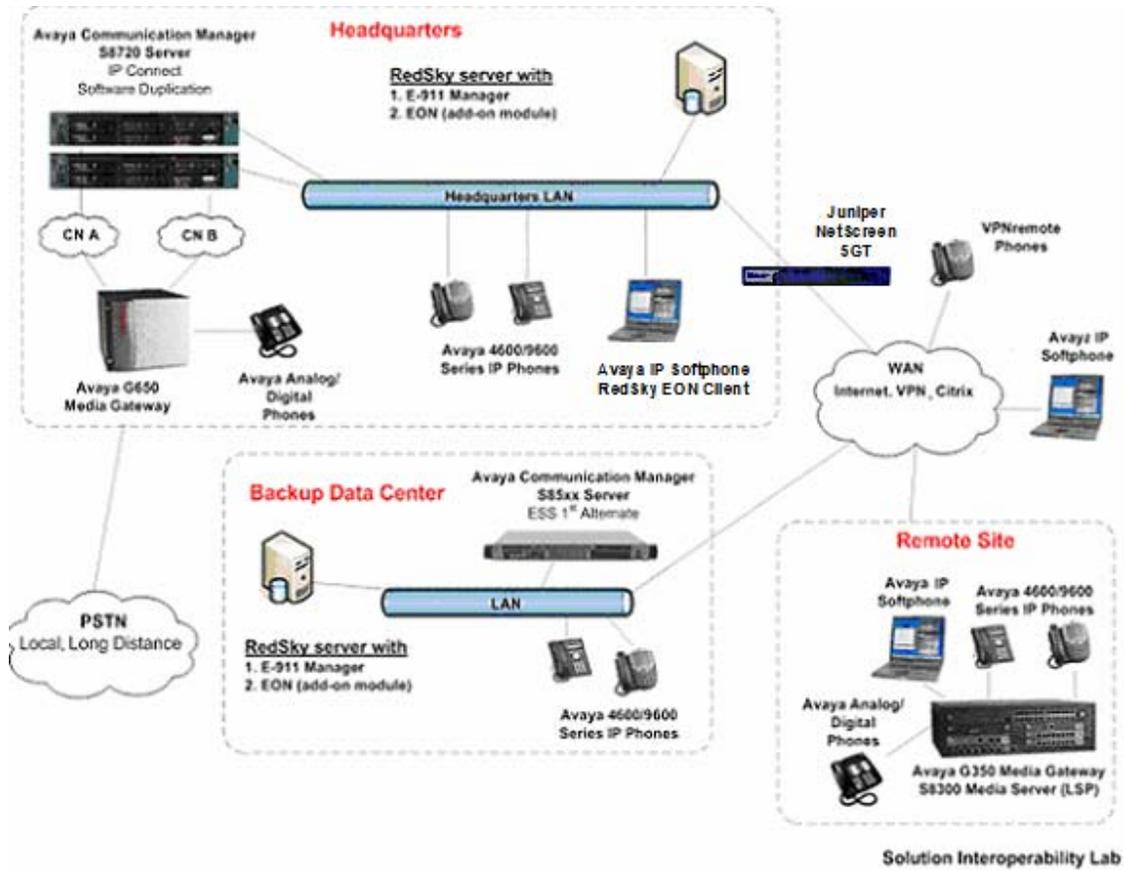
Figure 1 – Sample Configuration

2. Equipment and Software Validated

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

Equipment	Version
Avaya Communication Manager - Avaya S8720 Servers - Avaya S8500 Server - Avaya S8300 Server	5.0 (R015x.00.0.825.4) Headquarter ESS LSP
Avaya G650 Media Gateway - IPSI (TN2312BP) - C-LAN (TN799DP) - MedPro (TN2602AP)	 HW15 FW039 HW01 FW156 HW02 FW033
Avaya 4600 Series H.323 Phones	2.8
Avaya G350 Media Gateway	27.26.0
Avaya 9600 Series H.323 Phones	1.5
Avaya IP Softphone	6.0.0.25
Avaya 6211 Analog Phone	---
Avaya 2420 Digital Phone	---
Juniper NetScreen 5GT	5.3.0r2.0
RedSky Technologies - E911 Manager - EON Server	Windows 2003 Server Standard Edition with SP2 5.4.2 5.4.2
RedSky Technologies - EON Client	Windows XP Professional with SP2 5.4.2

3. Configure Avaya Communication Manager

This section describes the steps for configuring IP registration logging, the public/unknown numbering formats and stations with location information (e.g., room, floor, building), System Access Terminal (SAT) access for the RedSky servers, and the ARS dial plan for alerts. The commands shown were issued from the SAT.

3.1. Enable Logging for IP Registrations

Use the **change logging-levels** command to set the *Log IP Registrations and events* field to **y** on Page 2 of the **Logging Levels** form.

```
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


```

3.2. Configure Numbering

Use the **change public-unknown-numbering** command to specify the digits which will be prefixed to the calling party number of outbound calls routed to ISDN trunk groups. In the example shown below, 5-digit calling party numbers that begin with a **"2"** will be prefixed with **"73285"** to form a 10-digit calling party number. If the *Trk Grp(s)* field is blank, then the entry applies to all calls originated by **"2xxxx"** extensions and routed to any ISDN trunk group. The RedSky E911 Manager retrieves the information in this table from Avaya Communication Manager to form 10-digit numbers for stations before uploading to the ALI databases.

```
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: 4
 5   2                     73285          10                Maximum Entries: 9999
 5   4                                     5
 5   5                                     5
 5   49                    73224          10
```

3.3. Define Site Data

Use the **change site-data** command to define the values that may be used for the *Building* field on the **station** form.

```
change site-data                                         Page   1 of   4
                    SITE DATA USER DEFINITION
                     VALID BUILDING FIELDS


  BLD-ESS
  BLD-LSP
  BLD-MAIN
  RMT-HOME
```

On Page 3, define the values that may be used for the *Floor* field on the s**tation** form.

```
change site-data                                         Page   3 of   4
                    SITE DATA USER DEFINITION
                     VALID FLOOR FIELDS


  69-WOOD-CT
  FLR-EC500
  FLR-ESS
  FLR-LSP
  FLR-MAIN
```

3.4. Configure Station Location Information

Use the **change station n** command, where **n** is an existing station. On Page 1 of the **station** form, enter a *Name* if one has not been entered yet.

```
change station 23000                                          Page   1 of   5
                                      STATION

Extension: 23000                    Lock Messages? n                   BCC: 0
      Type: 4625                   Security Code: 1234                   TN: 1
      Port: S00142               Coverage Path 1:                      COR: 1
      Name: HQ 9630               Coverage Path 2:                      COS: 1
                                   Hunt-to Station:
STATION OPTIONS
                                       Time of Day Lock Table:
                  Loss Group: 19   Personalized Ringing Pattern: 1
                                           Message Lamp Ext: 23000
             Speakerphone: 2-way         Mute Button Enabled? y
           Display Language: english       Expansion Module? n
   Survivable GK Node Name:
             Survivable COR: internal      Media Complex Ext:
       Survivable Trunk Dest? y                  IP SoftPhone? y

                                       IP Video Softphone? n


                                        Customizable Labels? y


```

On Page 2 of the **station** form, if external callers can reach the station extension directly, set the *Emergency Location Ext* field to the station extension (default). If not, set the *Emergency Location Ext* field to the extension of a DID station. The *Emergency Location Ext* is used, along with any modifications defined in the **public-unknown-numbering** form (see Section 3.2), to form the Calling Party Number for an outbound 911 call and provides the PSAP with a direct call back number. The *Always Use* field should be set to **y**, so that the *Emergency Location Ext* is always used to form the Calling Party Number. The RedSky E911 Manager does not currently consider the *Always Use* parameter.

```
change station 23000                                      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? y
         H.320 Conversion? n    Per Station CPN - Send Calling Number?
       Service Link Mode: as-needed
         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: 23000      Always Use? y  IP Audio Hairpinning? n
```

On Page 3 of the **station** form, enter location information for *Room*, *Floor*, and *Building*. The valid *Floor* and *Building* values that may be entered were defined in Section 3.3.

```
change station 23000                                      Page   4 of   5
                              STATION
 SITE DATA
       Room: ROOM 123                              Headset? n
       Jack:                                       Speaker? n
       Cable:                                     Mounting: d
       Floor: FLR-MAIN                          Cord Length: 0
    Building: BLD-MAIN                            Set Color:

ABBREVIATED DIALING
     List1:                 List2:                     List3:




BUTTON ASSIGNMENTS
 1: call-appr                   5: ec500      Timer? n
 2: call-appr                   6:
 3: call-appr                   7:
 4:                             8:
```

3.5. Configure IP Node Names

Use the **change node-names ip** command to create node names (e.g., **RedSky1** and **RedSky2**) and enter the IP addresses (e.g., **9.1.1.55** and **9.1.1.56**) for the RedSky E911 servers. Note the node-name and IP address of the C-LAN board which will be used by E911 Manager to connect and retrieve station and location information from Avaya Communication Manager.

```
change node-names ip                                        Page   1 of   2
                                   IP NODE NAMES
     Name                 IP Address
AES1                 9.1.1.50
CLAN-01A02           9.1.1.8
CLAN-01B02           9.1.1.9
CLAN-RETAIL          30.1.1.4
FCSWinsuite          9.1.1.203
GVT-S8300-LSP        9.1.4.2
MedPro-01A03         9.1.1.5
MedPro-01B07         9.1.1.6
RedSky1              9.1.1.55
RedSky2              9.1.1.56
S8500-ESS            9.1.1.13
SES1                 9.1.1.34
VAL-01A12            9.1.1.12
clan-trade           5.1.1.4
default              0.0.0.0
govmas1              9.1.1.31
```

3.6. Configure IP Services

Use the **change ip-services** command to configure entries for the RedSky E911 servers as follows:

- *Service Type* – Set to **SAT**.
- *Enabled* – Set to **y**.
- *Local Node* – Set to the node name (e.g., **CLAN-01A02**) of the C-LAN in Section 3.5.
- *Local Port* – Set to **5023**.
- *Remote Node* – Set to the node names (e.g., **RedSky1** and **RedSky2**) of the RedSky E911 servers in Section 3.5.
- *Remote Port* – Set to the default value.

```
change ip-services                                          Page   1 of   4

                                   IP SERVICES
   Service      Enabled      Local        Local       Remote       Remote
    Type                     Node         Port        Node         Port
PMS                       CLAN-01A02     0          FCSWinsuite   5103
CDR1                      CLAN-01A02     0          FCSWinsuite   5050
SAT           y           CLAN-01A02     5023       RedSky1       0
SAT           y           CLAN-01A02     5023       RedSky2       0
AESVCS        y           CLAN-01A02     8765
AESVCS        y           CLAN-01B02     8765
```

3.7. Configure ARS Dial Plan for Alerts

Use the **change ars analysis 911** command to alert for E911 calls. Add an entry to set the *Call Type* to **alrt** for **"911"** calls. If the digit **"9"** is used as the ARS Feature Access Code in Avaya Communication Manager, then add an entry for the Dialed String of "**9911**" with *Call Type* set to **alrt**. These two entries allow the caller to dial either "**911**" or "**9911**" when placing a 911 call.

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

            Dialed          Total     Route     Call   Node  ANI
            String         Min  Max  Pattern    Type   Num   Reqd
      911                   3    3      1        alrt         n
      976                   7    7     deny      hnpa         n
      9911                  4    4      1        alrt         n
                                                             n
                                                             n
                                                             n
                                                             n
                                                             n
                                                             n
                                                             n
                                                             n
                                                             n
                                                             n
                                                             n
```

3.8. Create Login for RedSky E911 Manager

Launch the Maintenance web interface for Avaya Communication Manager. Click the **Administrator Accounts** option under *Security* on the left half of the screen. On the screen that appears (not shown), select the **Add Login** action and the *Privileged Administrator* radio button. Click **Submit**. On the Administrator Accounts – Add Login screen, enter a *Login name* and *password* that will be used by the Redsky E911 Manager to log into Avaya Communication Manager. The login and password will be used in Step 3 of Section 4. Click **Submit**.

4. Configure RedSky E911 Manager

This section provides the steps for configuring the RedSky E911 Manager to retrieve station numbering and location information from Avaya Communication Manager.

1. Launch a web browser and enter http://<IP address of E911 Manager server>/home.aspx as the URL and log in with the appropriate credentials. The following *Tasks* list is shown. The tasks listed will change depending on the *Switch Type* selected in Step 7 for the "Define Phone Switch Parameters" task.

Tasks			
1	ALI Database Providers	Incomplete	🔴
2	Define Phone Switch Connectivity	Incomplete	🔴
3	Company Information	Incomplete	🔴
4	Building Information	Incomplete	🔴
5	Import Data From Phone Switch	Incomplete	🔴
6	Define Phone Switch Parameters	Incomplete	🔴
7	Create DIDs	Incomplete	🔴
8	Create ALI Records	Incomplete	🔴
9	Review ELIN E-911 location data	Incomplete	🔴
10	Review Downloaded Stations	Incomplete	🔴

2. From the *Tasks* list, click on **ALI Database Providers** and then click **Add Provider**. Configure the following parameters:
   - *Providers* – Select AT&T Web from the drop-down list.
   - *Provider Name* – Enter **ATT**.
   - *RAS Connections* – Select **test** from the drop-down list.
   - *Next Cycle Counter* – Enter **1**.
   - *E911 Account* – Enter **test**.
   - *E911 Password* – Enter **test**.
   - *Customer Code* – Enter **AVAYA**.
   - *Company Name* – Enter **AVAYA**.
   - *State* – Select **NJ** from the drop-down list.

   Click **Save**, then **Done**.

3. From the **Tasks** list, click on **Define Phone Switch Connectivity**. Click on **Add Phone Switch**. Configure the following parameters:
    - *Switch Name* – Enter a name for the switch.
    - *Switch Type* – Select **Avaya** from the drop-down list.
    - *Login* – Enter the login created in Section 3.8.
    - *Password* – Enter the password created in Section 3.8.
    - *Software Version* – Select **V15** from the drop-down list.
    - *Connection Method* – Select **Network**.
    - *PBX IP* – Enter the IP address of the C-LAN board on which the SAT service is enabled (see Section 3.5).
    - *PBX Port* – Enter **5023**.
    - *EON Settings* – Check to enable EON.

    Click **Save,** then **Done**.
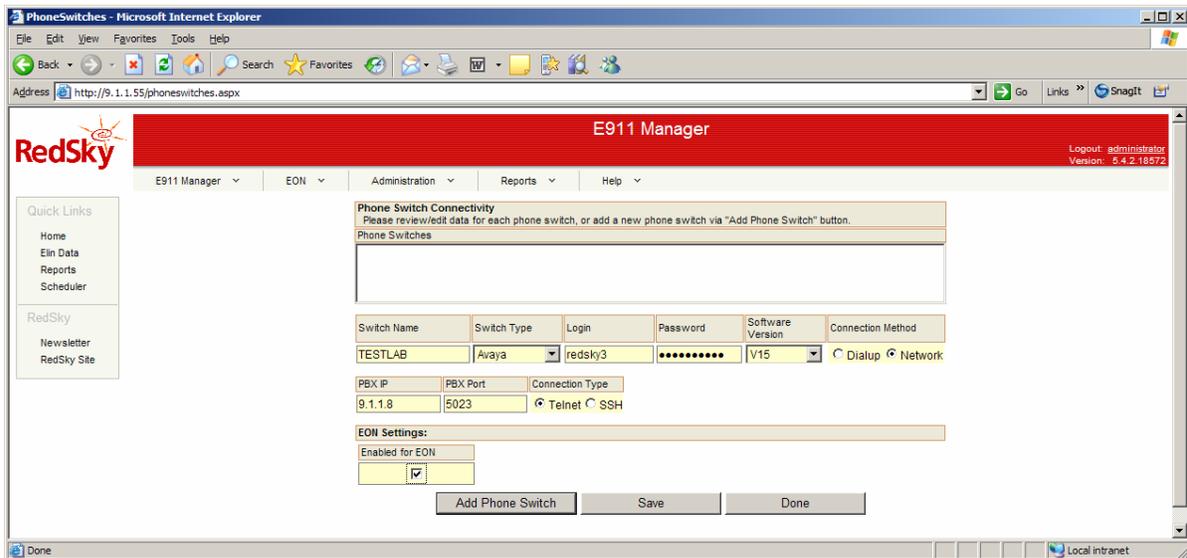
4. From the **Tasks** list, click on **Company Information**. Enter a *Company Name* and an associated *Company Acronym*. Click on **Add**, then **Done**.
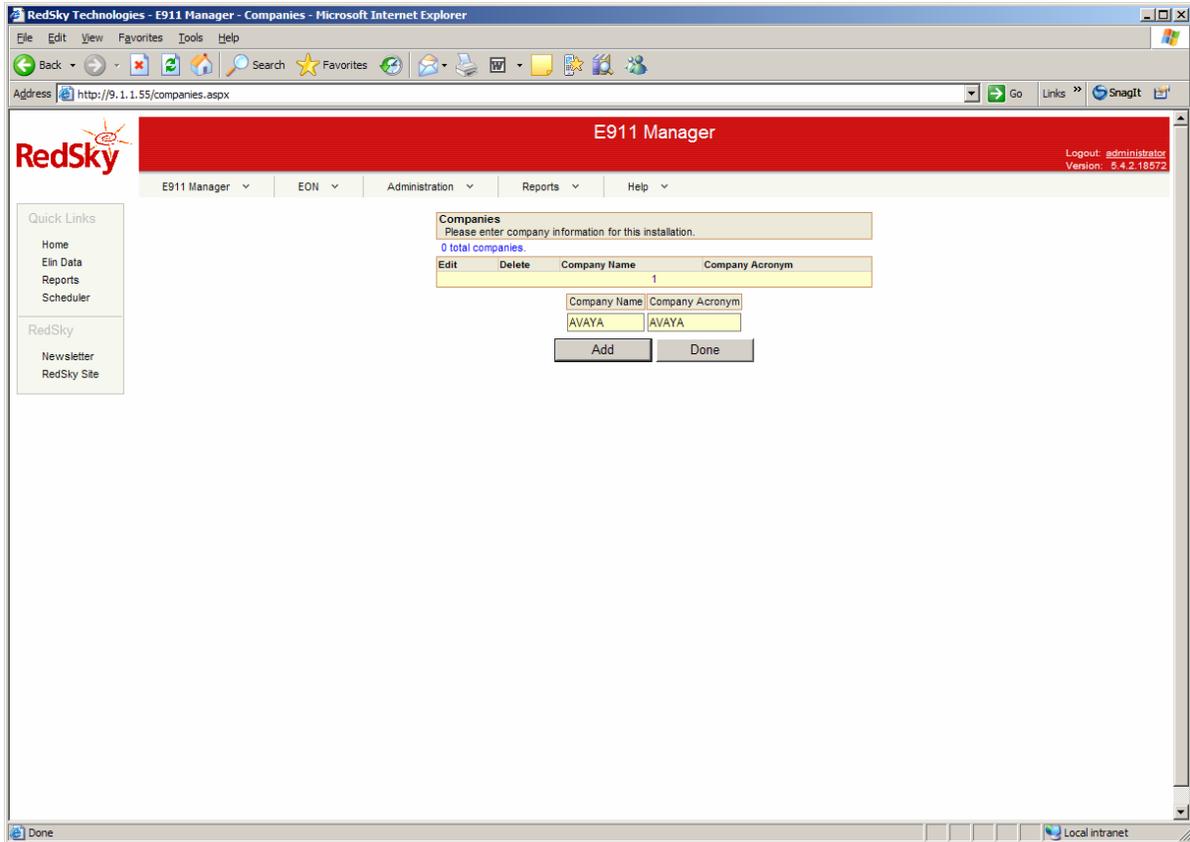
5. From the **Tasks** list, click on **Building Information**. Click on **Add Building**. For each building defined in Avaya Communication Manager in Section 3.3, enter the *BuildingID* and a *Friendly Building Name*. The *BuildingID* value must match the value configured in Avaya Communication Manager. For Switch, select the phone switch configured in Step 3 from the drop-down list. Enter address and main telephone number information for the building in the *MSAG Address and Main NPA Number* section. Accept the defaults for the other fields. Click on **Save**, then **Done**.
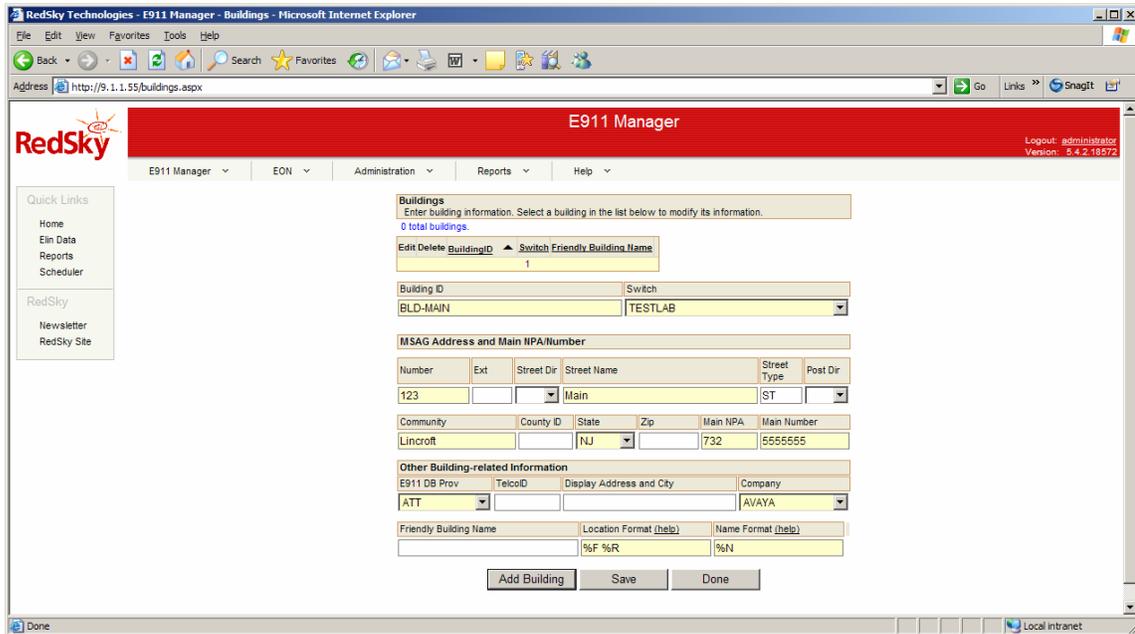
6. From the **Tasks** list, click on **Import Data from Phone Switch**. Click on **Start Download**. Click on **Done** after the download completes.
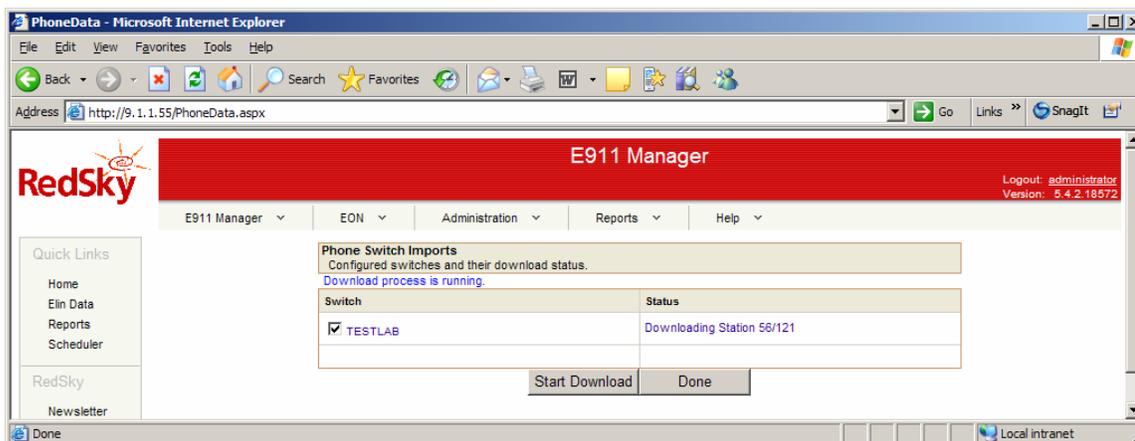
7. From the **Tasks** list, click on **Define Phone Switch Parameters**. Select the switch configured in Step 3, and enter the following information:
   - *Switch Description* – Enter a description for the switch.
   - *NPA* – Enter the area code.
   - *NXX* – Enter the region code.
   - *Include in E911 Update* – Check this checkbox.
   - *Switch Type* – Select **IP as TDM** from the drop-down menu box.
   - *E911 Trunk Types* – Select **ISDN** from the drop-down menu list.
   - *E911 Trunk Group*- Leave blank if a trunk group is not specified in the public-unknown-numbering form (see Section 3.2) in Avaya Communication Manager. Alternatively, if outbound 911 calls are routed to a specific trunk group, and that trunk group is specified in the public-unknown-numbering form, then select the number of that trunk group.

   Click on **Save,** then **Done**.
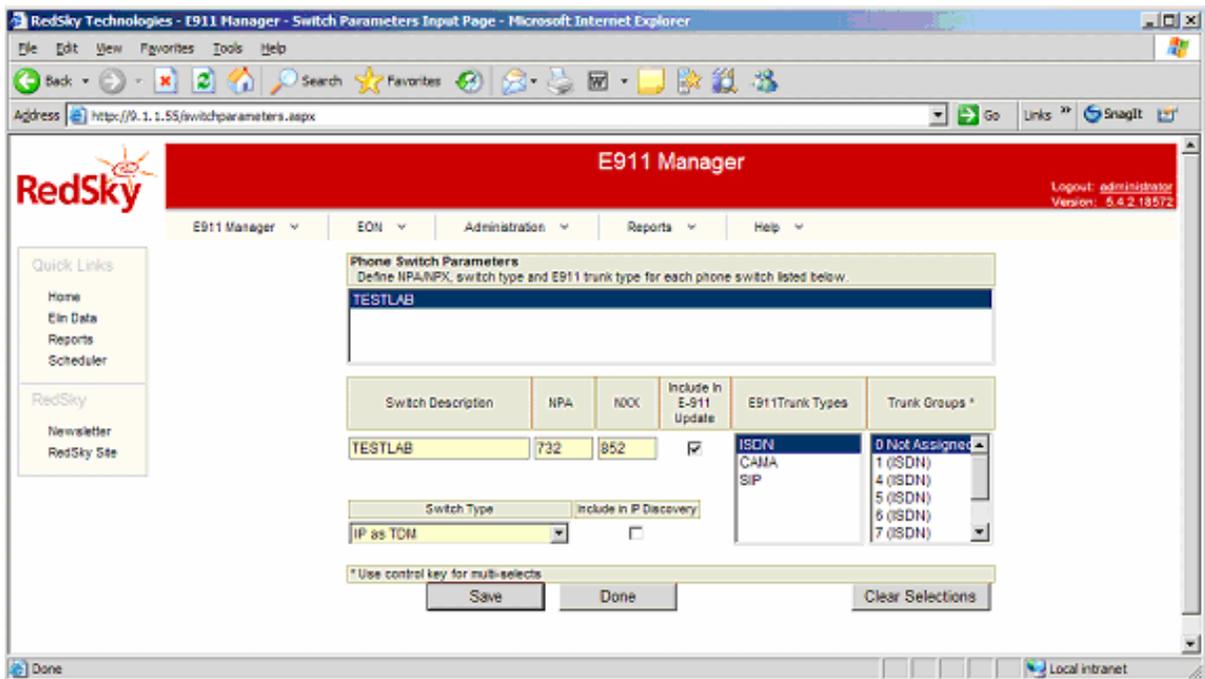
8. From the **Tasks** list, click on **Import/Review Numbering Tables**. Select the switch to import and view its numbering tables. Click on **Import Numbering Tables**. After the import completes, review the table entries and verify consistency with the public unknown-numbering form entries in Avaya Communication Manager. Only entries with a prefix are imported. Click on **Done**.
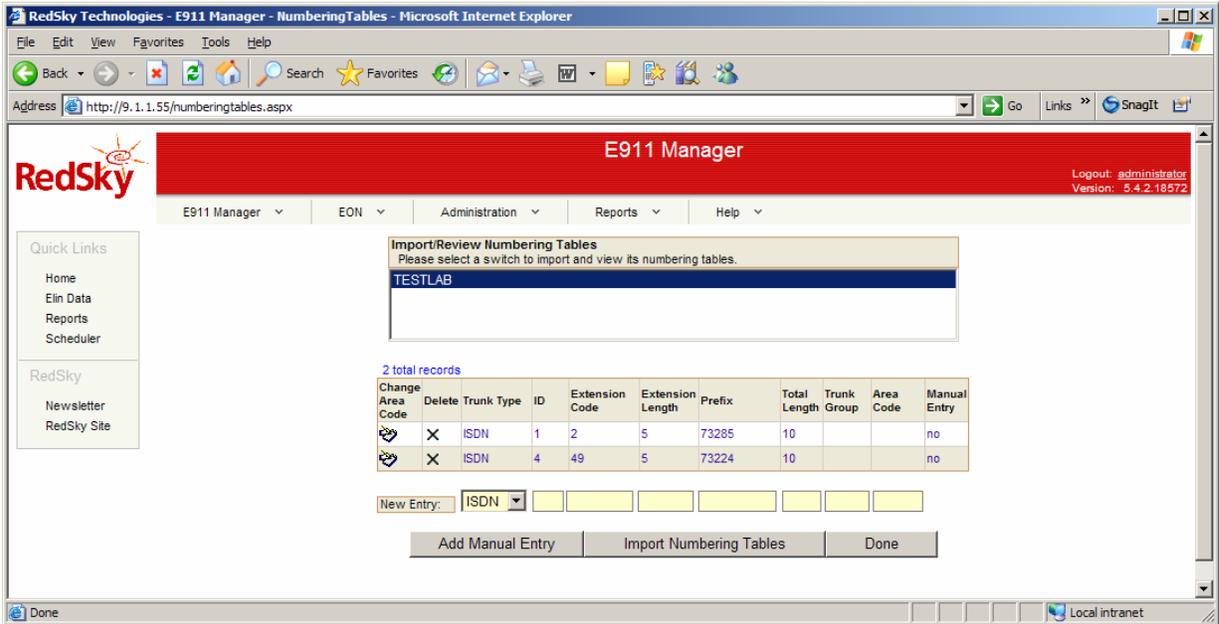
9. From the **Tasks** list, click on **Select Station Filters**. Select the switch to review and Click **Import Filter List**. Check the checkboxes of the phone types for which ALI records are NOT to be generated. Click on **Save,** then **Done**.
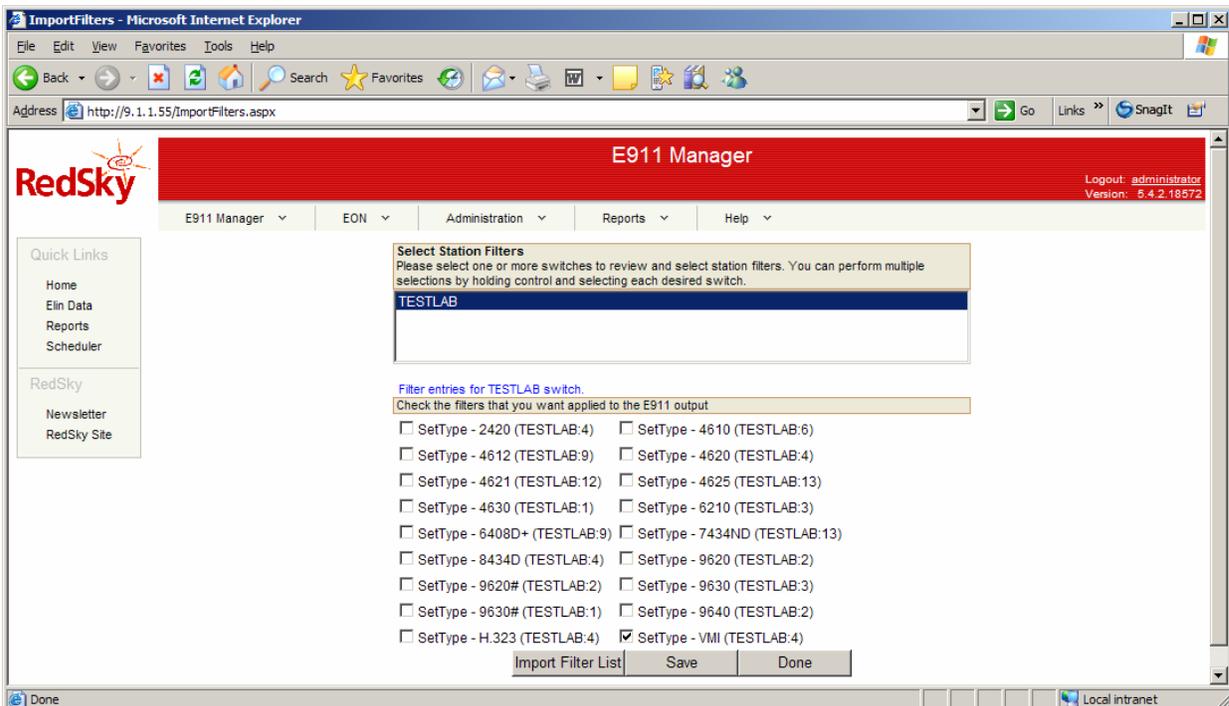
10. From the **Tasks** list, click on **Create DIDs**. Click on **Load Data**. Click on **Done** after the load data completes.
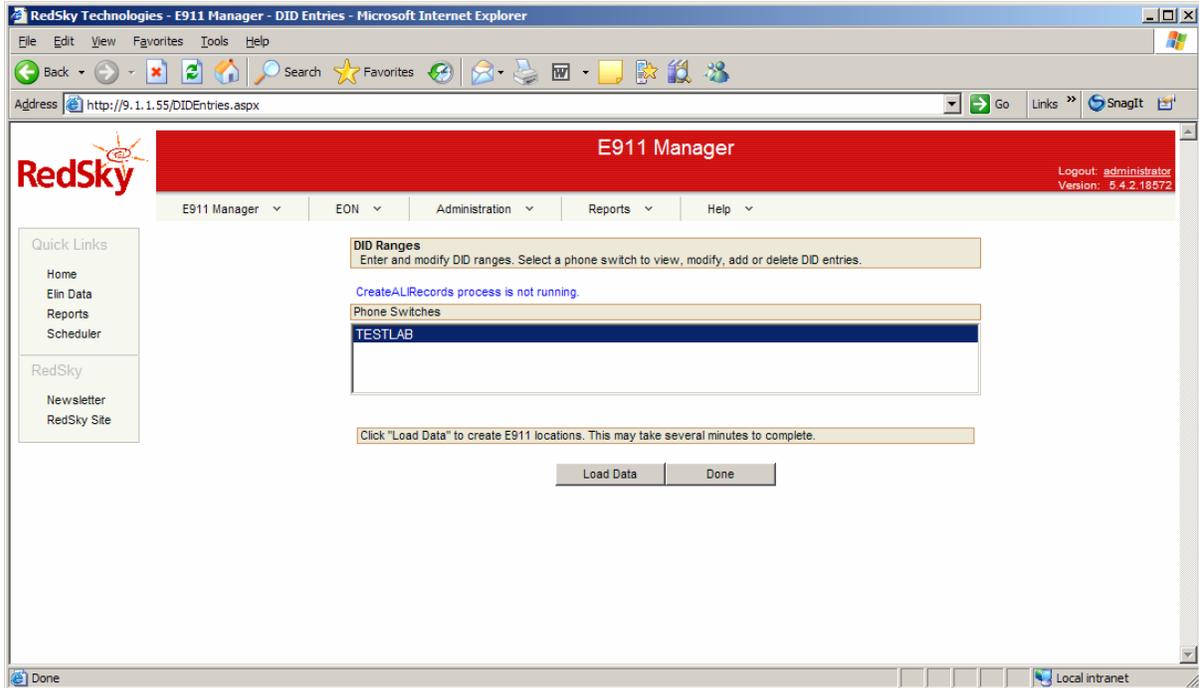
11. From the **Tasks** list, click on **Create ALI Records**. Click on **Load Data**. Click on **Done** after the load data completes.
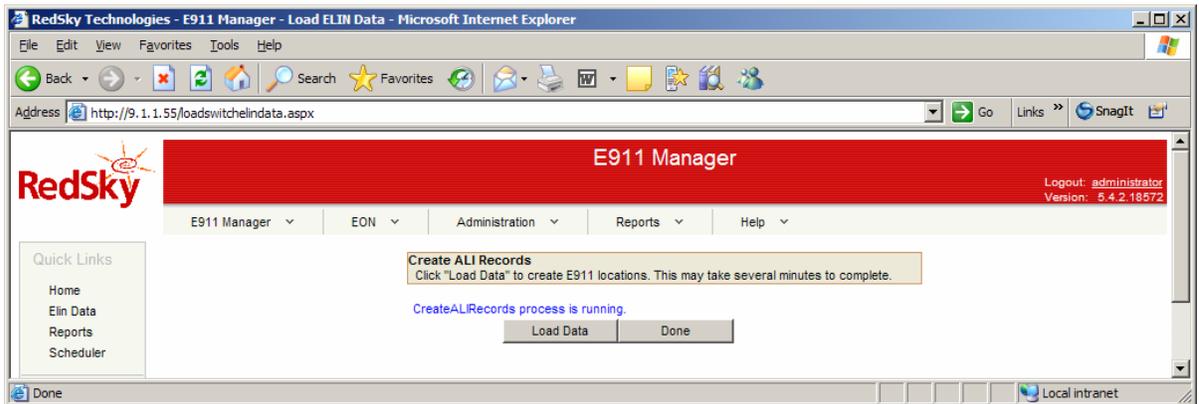
12. From the **Tasks** list, click on **Review ELIN E-911 location data**. Click on **Filter**. The subsequent screen shows the ALI records that were generated based on the information retrieved from Avaya Communication Manager. Only those records with **"Ready For Transfer"** status will be uploaded to the E911 database service provider. The records with **"Missing Information"** status are displayed because the Building (e.g., **BLD-LSP**) associated with the stations on the PBX has not been defined on E911 Manager. Repeat Steps 5 and 6 to define the building in E911 Manager and import the data from the phone switch again. Repeat Step 11 to create the ALI records. Click on **Done** to return to the Task list.

13. From the **Tasks** list, click on **Review Downloaded Stations**. Select **AVAYA** in the *Company* drop-down list and **TESTLAB** for the *Switch* drop-down list. Click on **Load Data.**
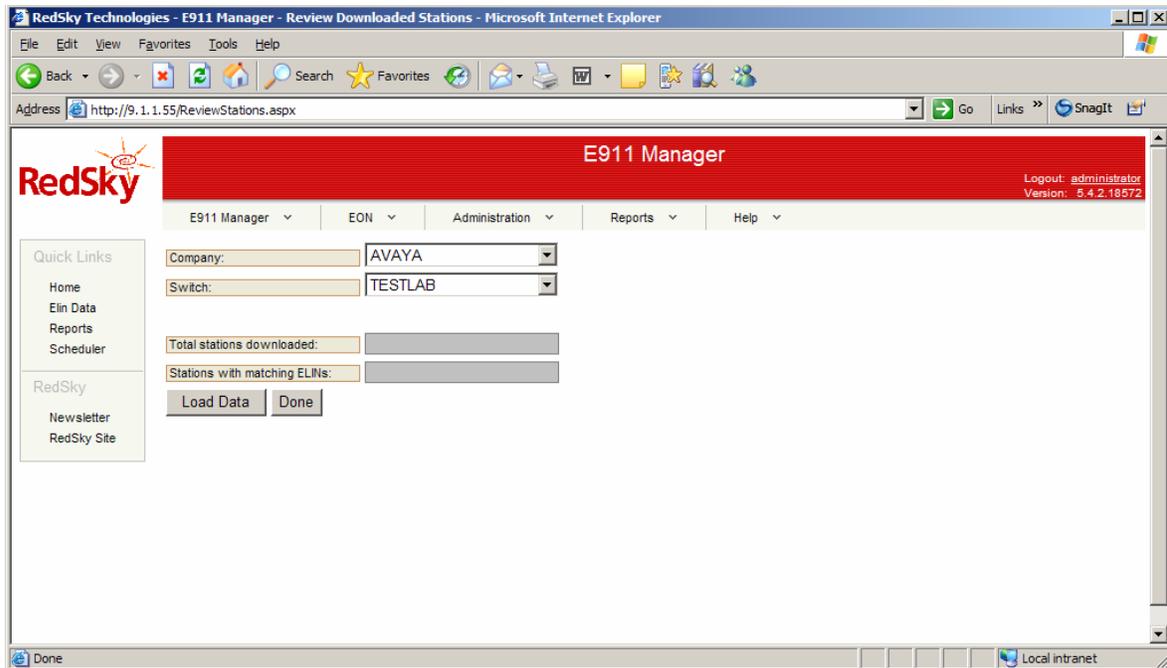
The *Extensions* that have matching *ELINs* are prefixed with a green circle. The *ELEs* for those extensions that don't have matching *ELINs* are also displayed.
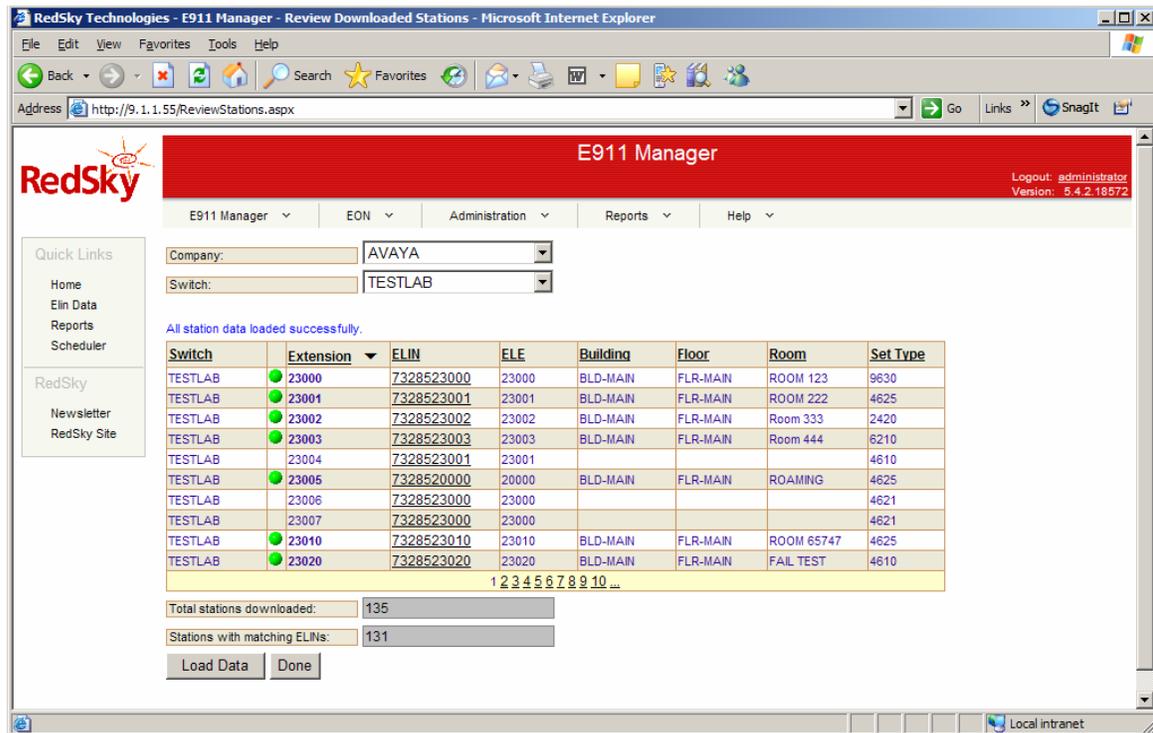
14. Notice that all of the items on the *Tasks* list are now marked "Complete".

Tasks			
1	ALI Database Providers	Completed	🟢
2	Define Phone Switch Connectivity	Completed	🟢
3	Company Information	Completed	🟢
4	Building Information	Completed	🟢
5	Import Data From Phone Switch	Completed	🟢
6	Define Phone Switch Parameters	Completed	🟢
7	Import/Review Numbering Tables	Completed	🟢
8	Select Station Filters	Completed	🟢
9	Create DIDs	Completed	🟢
10	Create ALI Records	Completed	🟢
11	Review ELIN E-911 location data	Completed	🟢
12	Review Downloaded Stations	Completed	🟢

15. Click on **Scheduler** under the *Quick Links* section. Click on **Add New Task**. Enter the following information:
    - *Task Template* – Select **Download Phone Data – Complete** from the drop-down list.
    - *Switchs* – Select **TESTLAB** from the drop-down list.
    - *Task Name* – Enter a name for the task.
    - *Start Time* – Select a start time.
    - *Select an Interval* – Select the frequency and time-frame for the task.

    Click **Save** to schedule the task to retrieve data from Avaya Communication Manager and upload ALI records to the E-911 database service provider.
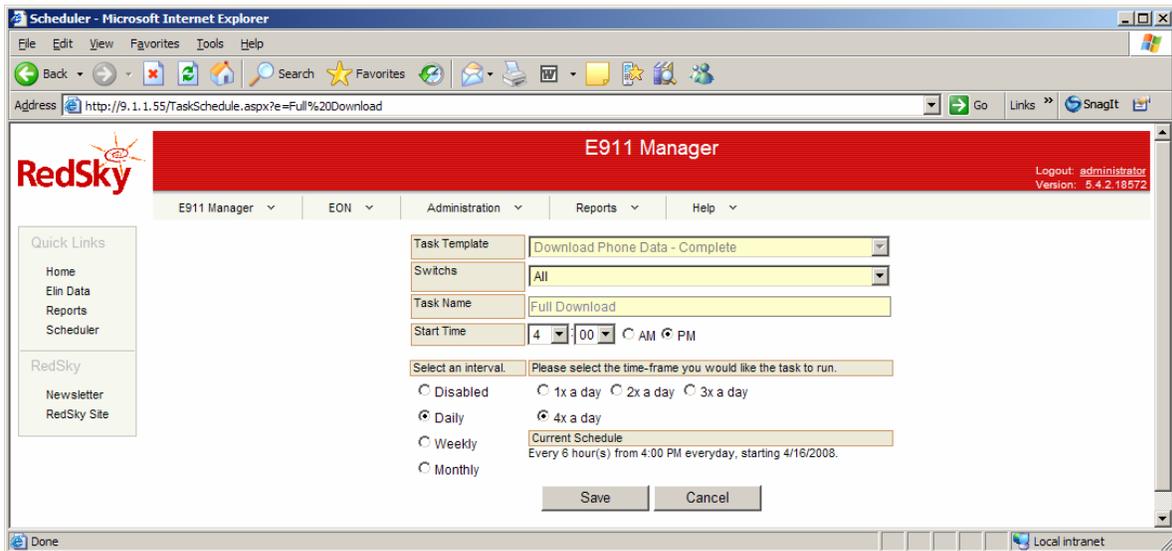
5. Configure EON Client

This section provides the steps for configuring the RedSky client to connect to the RedSky EON server to detect emergency calls.

1. Configure the following parameters in the "EONClient.exe.config" file on the EON client located in the "C:\Programs Files\RedSky Technologies, Inc\EON Client" directory:
   - serverIPAddress – Set to the IP address of the EON server.
   - serverListeningPort – Set to **12800**.

2. Start the EON client by navigating to Start → Programs → Red Sky Technologies, Inc → EON Client → Launch EON Client.

3. Click **Connect** to connect to the EON server.

6. Interoperability Compliance Testing

The interoperability compliance testing included functionality and serviceability testing. The functionality testing evaluated the ability of the RedSky E911 Manager to accurately retrieve station emergency numbering and location information from Avaya Communication Manager, and the RedSky Emergency On-site Notification (EON) server to correctly detect 911 calls originated by Avaya Communication Manager stations. The serviceability testing introduced failure scenarios to see if the RedSky E911 Manager can resume operation after failure recovery.

6.1. General Test Approach

The main objective was to verify that:
- The RedSky E911 Manager accurately obtains station emergency numbering and location information from Avaya Communication Manager after stations were added, deleted, or changed.
- The RedSky EON server correctly detects E911 calls placed by Avaya IP, digital, and analog telephones.
- The RedSky EON server notifies RedSky EON clients of the E911 calls in a timely manner and with the correct caller numbering and location information.

For serviceability testing, Ethernet cable disconnects and reconnects as well as device resets were applied.

6.2. Test Results

The main objectives of Section 6.1 were verified. For serviceability testing, the RedSky E911 Manager was able to retrieve station emergency numbering and location information from Avaya Communication Manager after connection to the active Avaya S8720 Server was disconnected and reconnected, as well as after resets of Avaya Communication Manager and the RedSky E911 Manager server. The RedSky EON server was able to detect E911 calls and notify the RedSky EON clients after resets of Avaya Communication Manager and the RedSky E911 Manager server.

7. Verification Steps

The following steps may be used to verify the configuration:
- Compare the station emergency numbering and location information reported in the RedSky E911 Manager and Avaya Communication Manager, and verify consistency.
- Add, delete, and change Avaya Communication Manager station information and verify that the RedSky E911 Manager retrieves and processes the updates accurately at the scheduled time.
- Place E911 calls from Avaya Communication Manager stations and verify that all EON clients are notified of the calls along with the correct caller numbering and location information.

8. Support

For technical support on RedSky Technologies products, contact RedSky Technologies at:
- Phone: 1-866-778-2435
- E-mail: support@redskytech.com

9. Conclusion

These Application Notes describe a compliance-tested configuration comprised of Avaya Communication Manager and the RedSky Technologies E911 Manager with Emergency On-site Notification (EON). The RedSky E911 Manager retrieves station emergency numbering and location information from a PBX, validates, reformats, and uploads the information to public Automatic Location Identification (ALI) databases. EON is an add-on module to the RedSky E911 Manager that detects emergency calls originated by PBX stations and notifies the EON clients when such calls are detected. During compliance testing, the RedSky E911 Manager successfully obtained station emergency numbering and location information after Avaya Communication stations were added, deleted and changed. In addition, the RedSky EON server successfully detected emergency calls placed by Avaya Communication Manger stations and notified EON clients of such calls.

10. Additional References

Product documentation for Avaya products may be found at http://support.avaya.com.
[1] *Administrator Guide for Avaya Communication Manager*, Document ID 03-300509.
[2] *Feature Description and Implementation for Avaya Communication Manager*, Document ID 555-245-205.

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

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