



Avaya Solution & Interoperability Test Lab

Application Notes for RedSky Technologies E-911 Manager with Avaya Communication Manager 3.0 and Avaya Directory Enabled Management 3.0 - Issue 1.0

Abstract

These Application Notes describe a compliance-tested configuration comprised of Avaya Communication Manager 3.0, Avaya Directory Enabled Management 3.0, and the RedSky Technologies E-911 Manager. The RedSky E-911 Manager retrieves station numbering and location information from a PBX, and validates, reformats, and uploads the information to public Automatic Location Identification (ALI) databases. During compliance testing, the RedSky E-911 Manager successfully used Avaya Directory Enablement Management to obtain station numbering and location information as Avaya Communication Manager stations were added, deleted, and changed. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the *DeveloperConnection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe a compliance-tested configuration comprised of Avaya Communication Manager 3.0, Avaya Directory Enabled Management 3.0, and the RedSky Technologies E-911 Manager. Using Avaya Directory Enabled Management, the RedSky E-911 Manager retrieves station numbering and location information from Avaya Communication Manager, and 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 Calling Party Number (CPN).

Figure 1 illustrates a sample configuration consisting of:

- a pair of redundant Avaya S8710 Media Servers
- an Avaya G650 Media Gateway
- Avaya IP and Digital Telephones
- analog telephones
- a RedSky Technologies E-911 Manager with Avaya Directory Enabled Management installed and running on the same server.

Avaya Communication Manager runs on the S8710 Media Server, though the solution described herein is also extensible to other Avaya Media Servers and Media Gateways. The RedSky E-911 Manager uses Avaya Directory Enabled Management to obtain station numbering and location information.

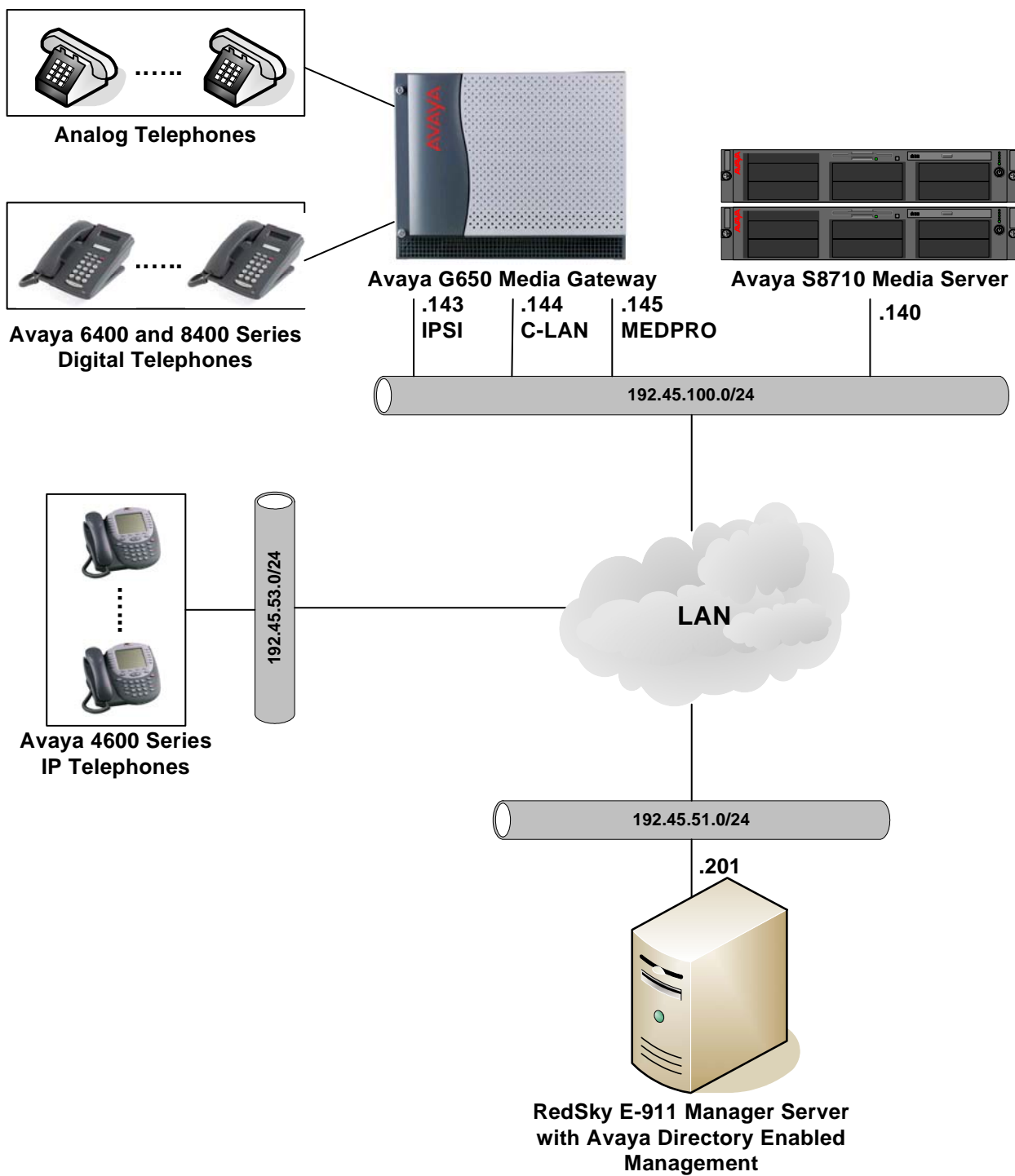


Figure 1: Sample configuration.

2. Equipment and Software Validated

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

Equipment		Software/Firmware
Avaya S8710 Media Server		3.0 (R013x.00.0.340.3)
Avaya G650 Media Gateway		-
	TN2312BP IP Server Interface	15
	TN799DP C-LAN Interface	21
	TN2302AP IP Media Processor	104
Avaya Directory Enabled Management		3.0 (3.00.003.00)
Avaya 4600 Series IP Telephones		2.2.3 (4610SW) 2.2.3 (4620SW) 2.5 (4525SW)
Avaya 6400 and 8400 Series Digital Telephones		-
Analog Telephones		-
RedSky Technologies E-911 Manager Server		
	E-911 Manager	5.0.1.17827
	PhoneDataExtract.dll	1.0.2110.30299

3. Configure Avaya Communication Manager

This section describes the steps for configuring station name and location information (room, floor, building) and public/unknown numbering formats.

3.1. Define Site Data

From the Avaya Communication Manager System Access Terminal (SAT), enter the **change site-data** command. On Pages 1 and 2 of the **site-data** form, define the values that may be used for the **Building** field in the **station** form. In the example below, buildings “**307**” and “**456**” are defined.

change site-data	SITE DATA USER DEFINITION VALID BUILDING FIELDS	Page 1 of 4
307		
456		

Similarly, on Page 3 of the **site-data** form, define the values that may be used for the **Floor** field in the **station** form. In the example below, floors 1 through 5 are defined.

change site-data	SITE DATA USER DEFINITION VALID FLOOR FIELDS	Page 3 of 4
1		
2		
3		
4		
5		

3.2. Configure Station Location Information

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

change station 50001		Page 1 of 4
STATION		
Extension: 50001	Lock Messages? n	BCC: 0
Type: 4610	Security Code: *	TN: 1
Port: S00003	Coverage Path 1:	COR: 1
Name: John Smith	Coverage Path 2:	COS: 1
	Hunt-to Station:	
STATION OPTIONS		
Loss Group: 19	Personalized Ringing Pattern: 1	
	Message Lamp Ext: 50001	
Speakerphone: 2-way	Mute Button Enabled? y	
Display Language: english		
Survivable GK Node Name:		
Survivable COR: internal	Media Complex Ext:	
Survivable Trunk Dest? y	IP SoftPhone? n	

On Page 2 of the **station** form, if external callers can directly reach the station extension, for example, the station extension is a DID number, then set **Emergency Location Ext** to the station extension (default). If not, set **Emergency Location Ext** to a DID extension as in the example below (where station **50001** has an **Emergency Location Ext** of **53001**). The **Emergency Location Ext** is used, along with any numbering modification defined in the public-unknown-numbering form (see Section 3.3), to form the Calling Party Number in outbound 911 calls and provides the PSAP with a direct call back number. In addition, if **Always Use** is set to “n”, and the station is an IP phone, then the **Emergency Location Ext** may be overridden by an Emergency Location Extension defined in the ip-network-map form. Refer to [1] for further details on administering Emergency Location Extensions in the ip-network-map form. Otherwise, the **Emergency Location Ext** is always used. In the record uploaded to the ALI database, the RedSky E-911 Manager replaces the station extension with an Emergency Location Extension defined in the ip-network-map form when applicable or with the **Emergency Location Ext** defined in the station form. The RedSky E-911 Manager does not currently consider the **Always Use** parameter.

Note: The ip-network-map form was not configured with Emergency Location Extensions during compliance testing.

change station 50001	Page 2 of 4
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	Conf/Trans on Primary Appearance? n
H.320 Conversion? n	Per Station CPN - Send Calling Number?
Service Link Mode: as-needed	
Multimedia Mode: enhanced	
MWI Served User Type:	Display Client Redirection? n
AUDIX Name:	Select Last Used Appearance? n
	Coverage After Forwarding? s
	Direct IP-IP Audio Connections? y
Emergency Location Ext: 53001	Always Use? n IP Audio Hairpinning? y

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 3.1.

change station 50001	Page 3 of 4
STATION	
SITE DATA	
Room: 999	Headset? n
Jack:	Speaker? n
Cable:	Mounting: d
Floor: 5	Cord Length: 0
Building: 456	Set Color:
ABBREVIATED DIALING	
List1:	List2: List3:
BUTTON ASSIGNMENTS	
1: call-appr	5:
2: call-appr	6:
3: call-appr	7:
4:	8:

3.3. Configure Numbering

From the SAT, enter the **change public-unknown-numbering** command to invoke the **Numbering – Public/Unknown Format** table. This table specifies the digit(s) to pre-pend to the calling party numbers of outbound calls routed to ISDN trunk groups. The entry in the example below states that all **5**-digit calling party numbers that begin with “**50**” will be pre-pended with “**73285**” to form **10**-digit calling party numbers. If **Trk Grp(s)** is blank, then the entry applies to all calls originated by “5xxxx” extensions and routed to any ISDN trunk group. If one or more consecutive trunk groups are specified for **Trk Grp(s)**, then the entry applies to calls originated by “50xxx” extensions and routed to those specific trunk groups. Additional entries may be similarly configured for other extension lengths and prefixes - for example, for “72xxx” extensions. The RedSky E-911 Manager also retrieves the information in this table from Avaya Communication Manager and uses the information to form full 10-digit numbers for Avaya Communication Manager stations before uploading to the ALI databases.

change public-unknown-numbering 0									Page 1 of 2
NUMBERING - PUBLIC/UNKNOWN FORMAT									
Total									Total
Ext	Ext	Trk	CPN	CPN	Ext	Ext	Trk	CPN	CPN
Len	Code	Grp(s)	Prefix	Len	Len	Code	Grp(s)	Prefix	Len
5	50		73285	10					

3.4. Create Login for Avaya Directory Enabled Management

From the SAT, enter the **add login <login-id>** command, where <login-id> is a 2 – 8 alphanumeric character login ID. In the **login** form, set **Login Type** to “**customer**” and **Service Level** to “**super-user**”, and assign a **Password**.

add login redsky	Page 1 of 1
LOGIN ADMINISTRATION	
LOGIN BEING ADMINISTERED	
Login's Name: redsky	
Login Type: customer	
Service Level: super-user	
Days To Disable After Inactivity:	
LOGIN'S PASSWORD INFORMATION	
Login's Password:	
Reenter Login's Password:	
Password Aging Cycle Length (Days):	
LOGOFF NOTIFICATION	
Facility Test Call Notification? y	Acknowledgement Required? y
Remote Access Notification? y	Acknowledgement Required? y

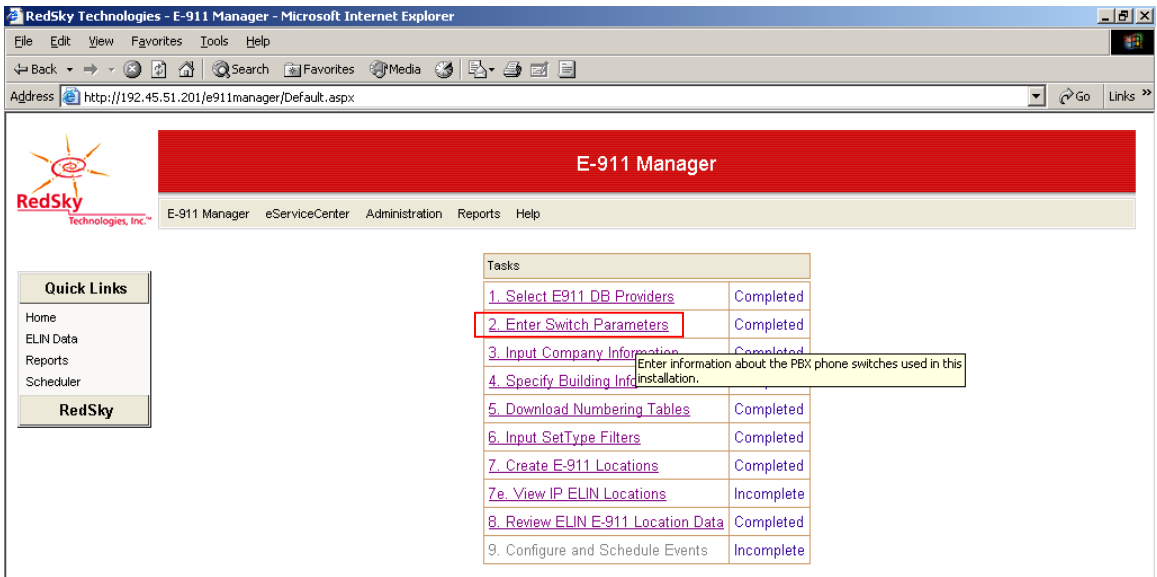
4. Avaya Directory Enabled Management

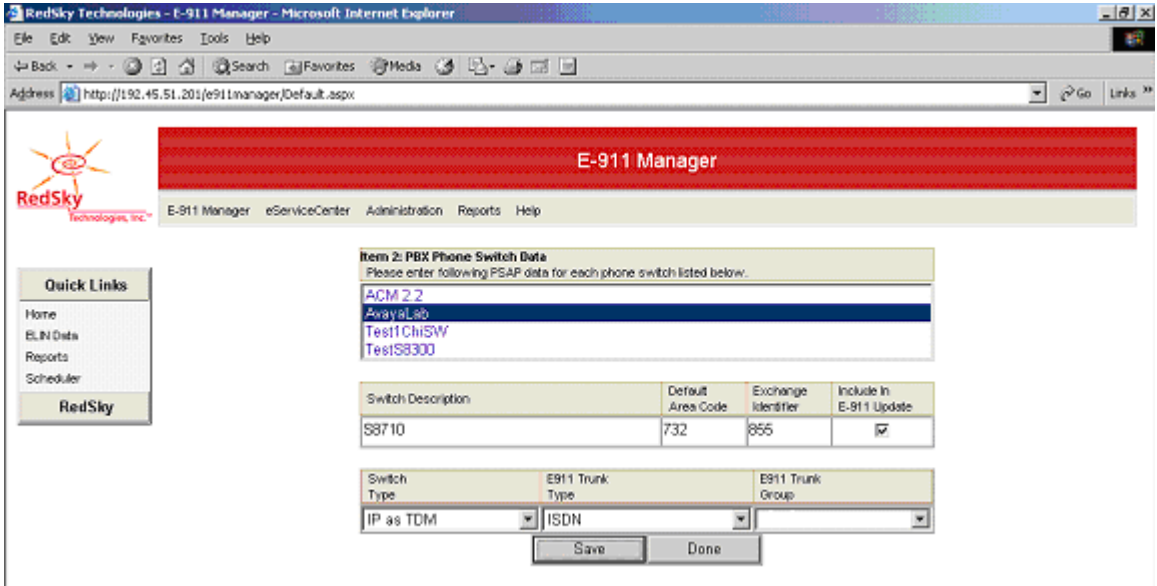
Configure Avaya Directory Enabled Management to use the login created in Section 3.4. RedSky Technologies performs the initial configuration required for Avaya Directory Enabled Management to log into Avaya Communication Manager, download station numbering and location information from Avaya Communication Manager, and automatically receive updates from Avaya Communication Manager when station adds, deletes, and changes occur. For details on Avaya Directory Enabled Management installation and administration, review [2] and [3].

5. Configure RedSky E-911 Manager

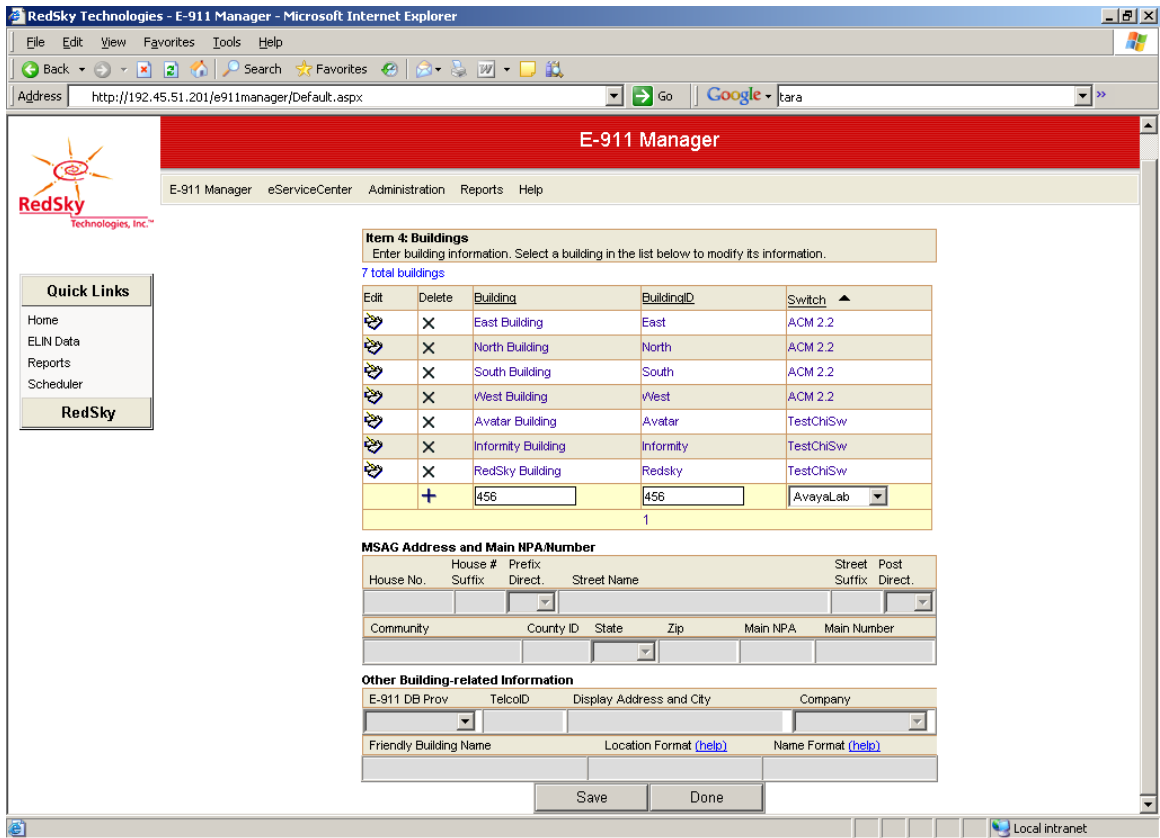
This section provides the relevant steps for configuring the RedSky E-911 Manager to retrieve station numbering and location information from Avaya Communication Manager.

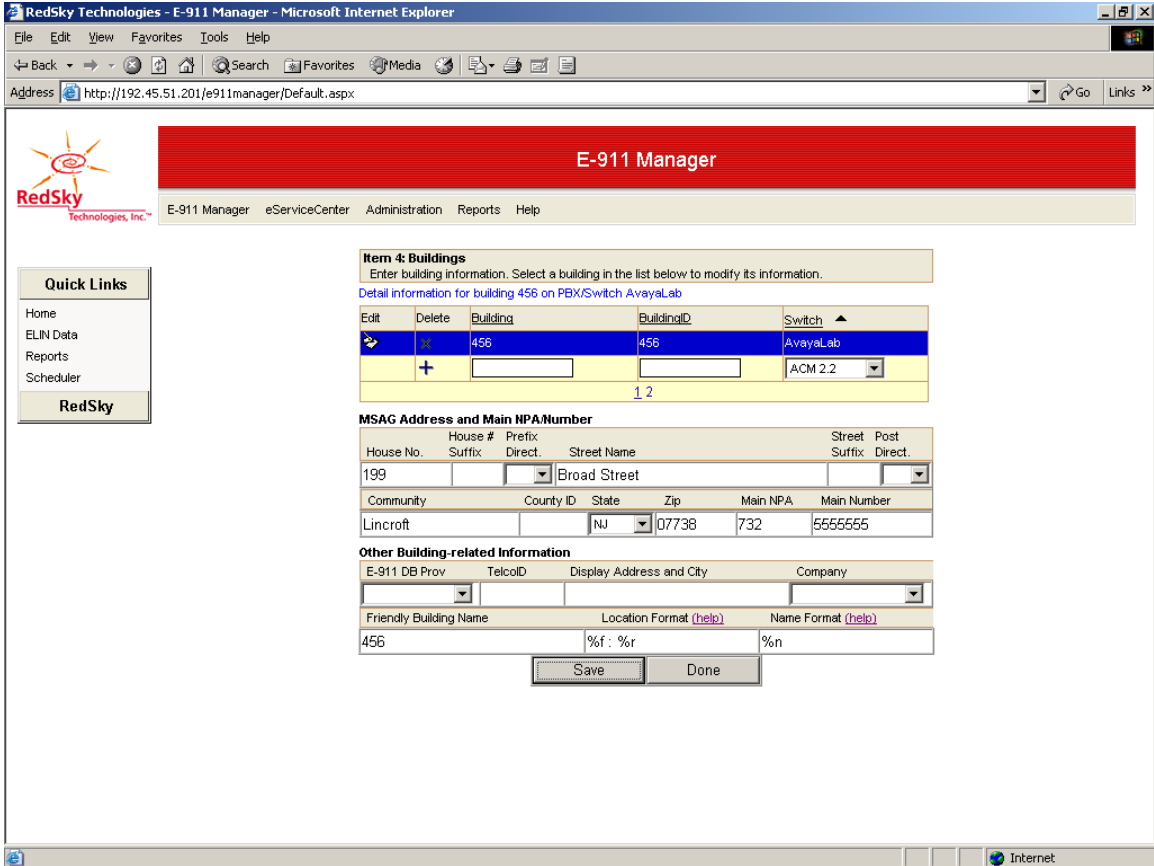
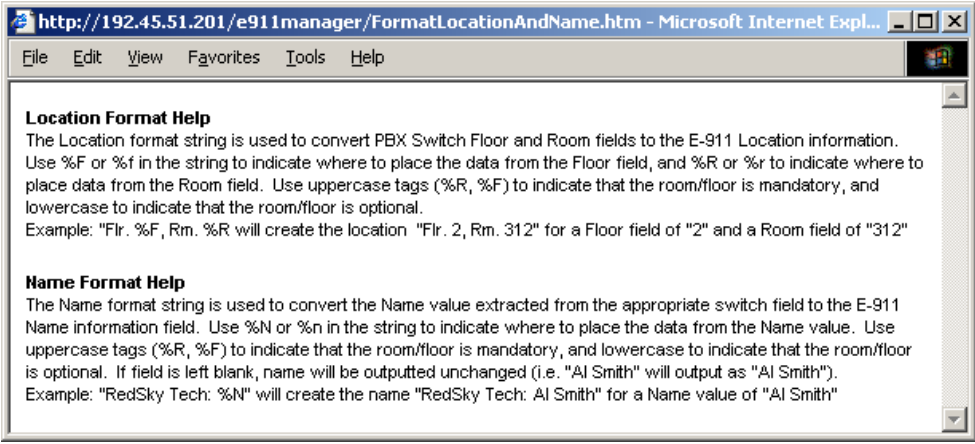
In the steps below, the term “Avaya phone switch” refers to a RedSky E-911 Manager entity that represents the Avaya Communication Manager 3.0 system of the sample configuration. RedSky Technologies technicians create this entity during the installation and initial configuration of RedSky E-911 Manager.

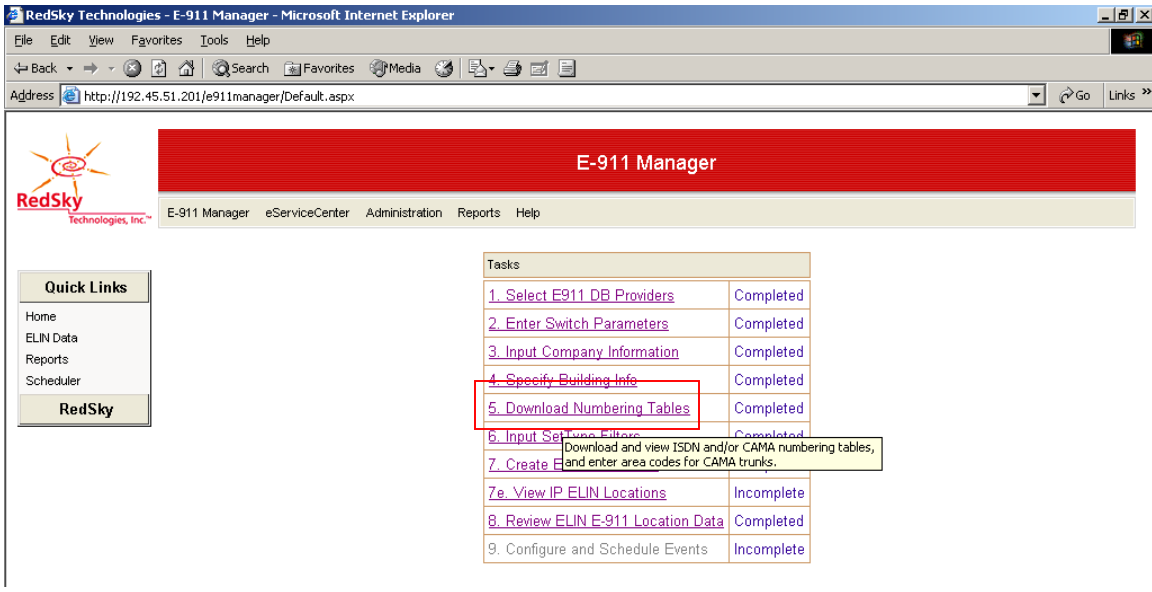
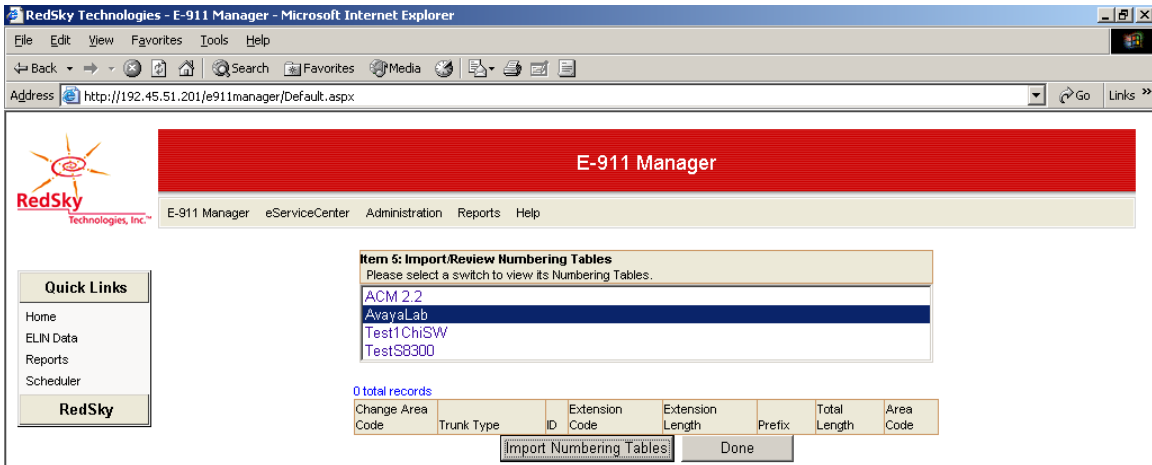
Step	Description
1.	Launch a web browser, enter <a href="http://<IP address of E-911 Manager server>/e911manager">http://<IP address of E-911 Manager server>/e911manager in the URL, and log in with the appropriate credentials.
2.	Click on “ Home ” under the Quick Links menu on the left. Select “ Enter Switch Parameters ” from the Tasks list. <div></div>

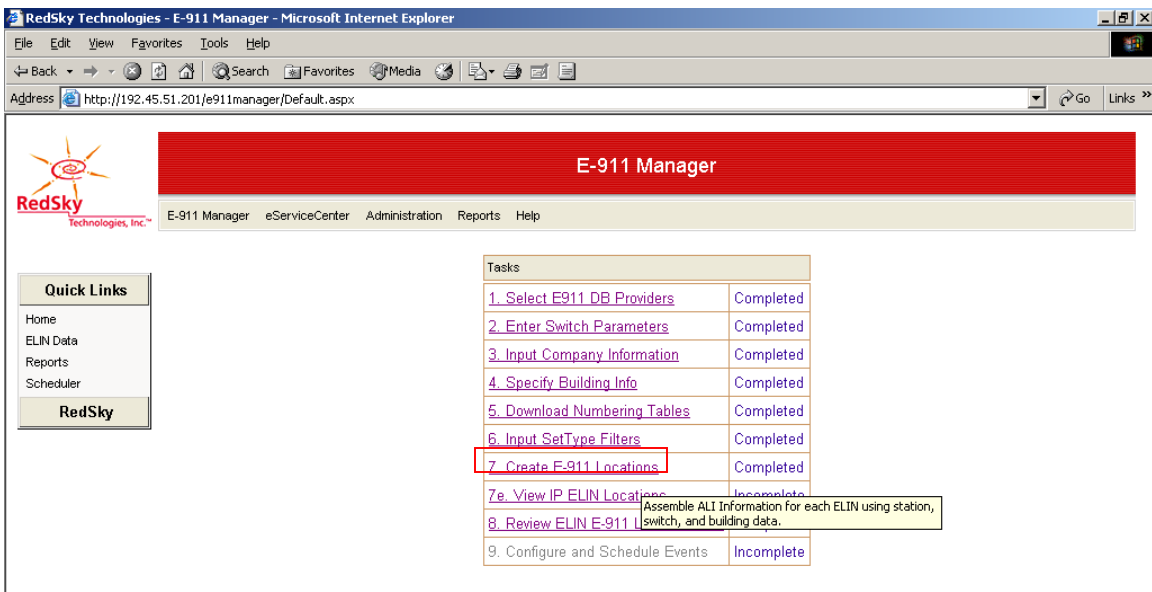
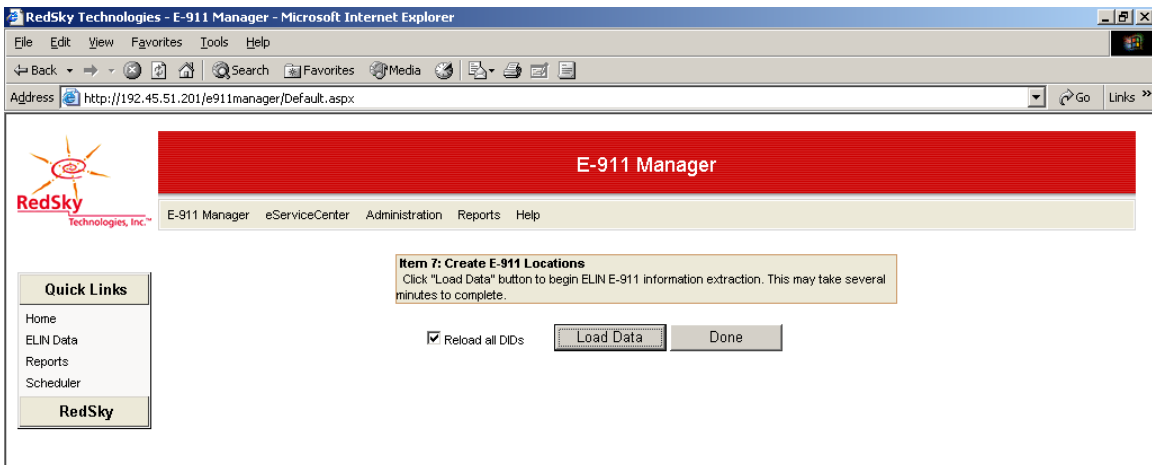
Step	Description
3.	<p>Select the Avaya phone switch (“AvayaLab” in the example below). Enter information for Switch Description, Default Area Code, and Exchange Identifier. Check the Include in E-911 Update checkbox and configure the following parameters:</p> <ul style="list-style-type: none"> • Switch Type – select “IP as TDM” from the drop-down menu box. • E911 Trunk Type – select “ISDN” from the drop-down menu box. • E911 Trunk Group – Leave blank if a trunk group is not specified in the public-unknown-numbering form (see Section 3.3). 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 in Avaya Communication Manager. <p>Click on “Save” and then “Done”.</p> 

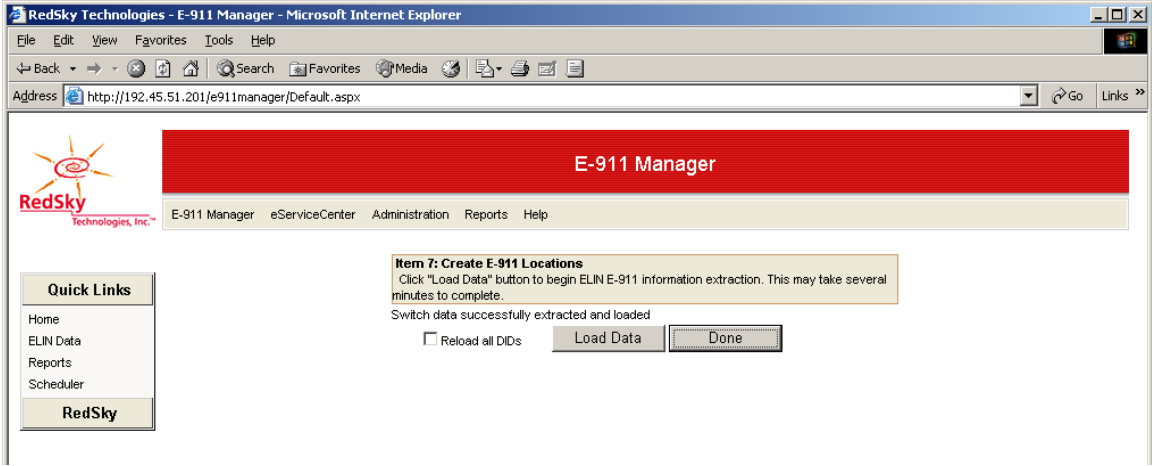
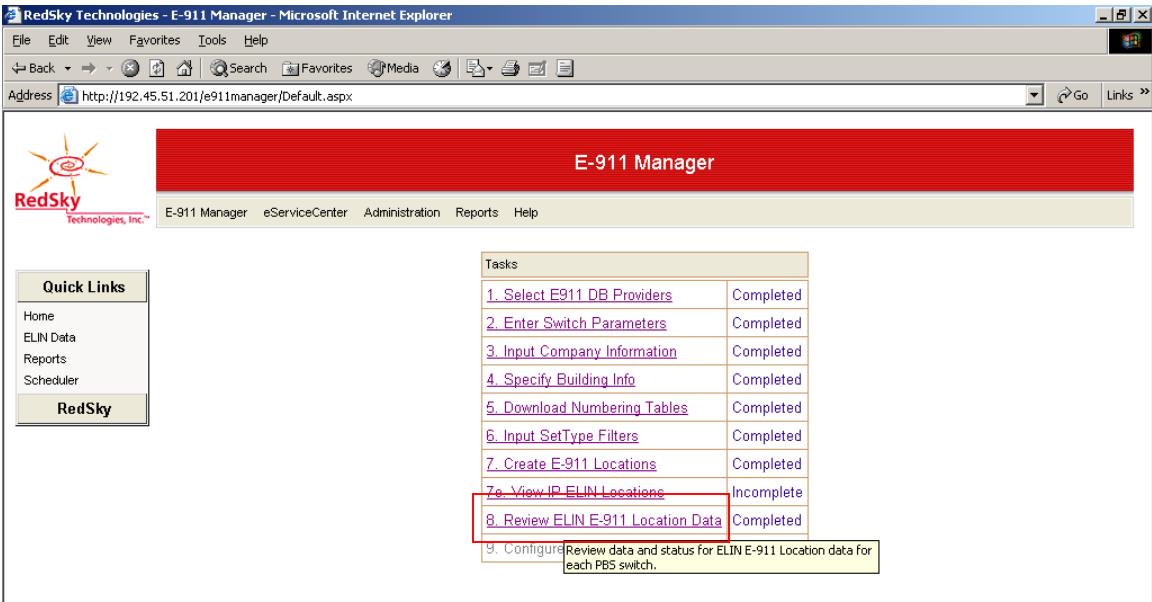
Step	Description																						
4.	<p>Select “Specify Building Info” from the Tasks list.</p> <table border="1"> <thead> <tr> <th colspan="2">Tasks</th></tr> </thead> <tbody> <tr> <td>1. Select E911 DB Providers</td><td>Completed</td></tr> <tr> <td>2. Enter Switch Parameters</td><td>Completed</td></tr> <tr> <td>3. Input Company Information</td><td>Completed</td></tr> <tr> <td>4. Specify Building Info</td><td>Completed</td></tr> <tr> <td>5. Download Nura</td><td>Completed</td></tr> <tr> <td>6. Input SetType</td><td>Completed</td></tr> <tr> <td>7. Create E-911 Locations</td><td>Completed</td></tr> <tr> <td>7e. View IP ELIN Locations</td><td>Incomplete</td></tr> <tr> <td>8. Review ELIN E-911 Location Data</td><td>Completed</td></tr> <tr> <td>9. Configure and Schedule Events</td><td>Incomplete</td></tr> </tbody> </table>	Tasks		1. Select E911 DB Providers	Completed	2. Enter Switch Parameters	Completed	3. Input Company Information	Completed	4. Specify Building Info	Completed	5. Download Nura	Completed	6. Input SetType	Completed	7. Create E-911 Locations	Completed	7e. View IP ELIN Locations	Incomplete	8. Review ELIN E-911 Location Data	Completed	9. Configure and Schedule Events	Incomplete
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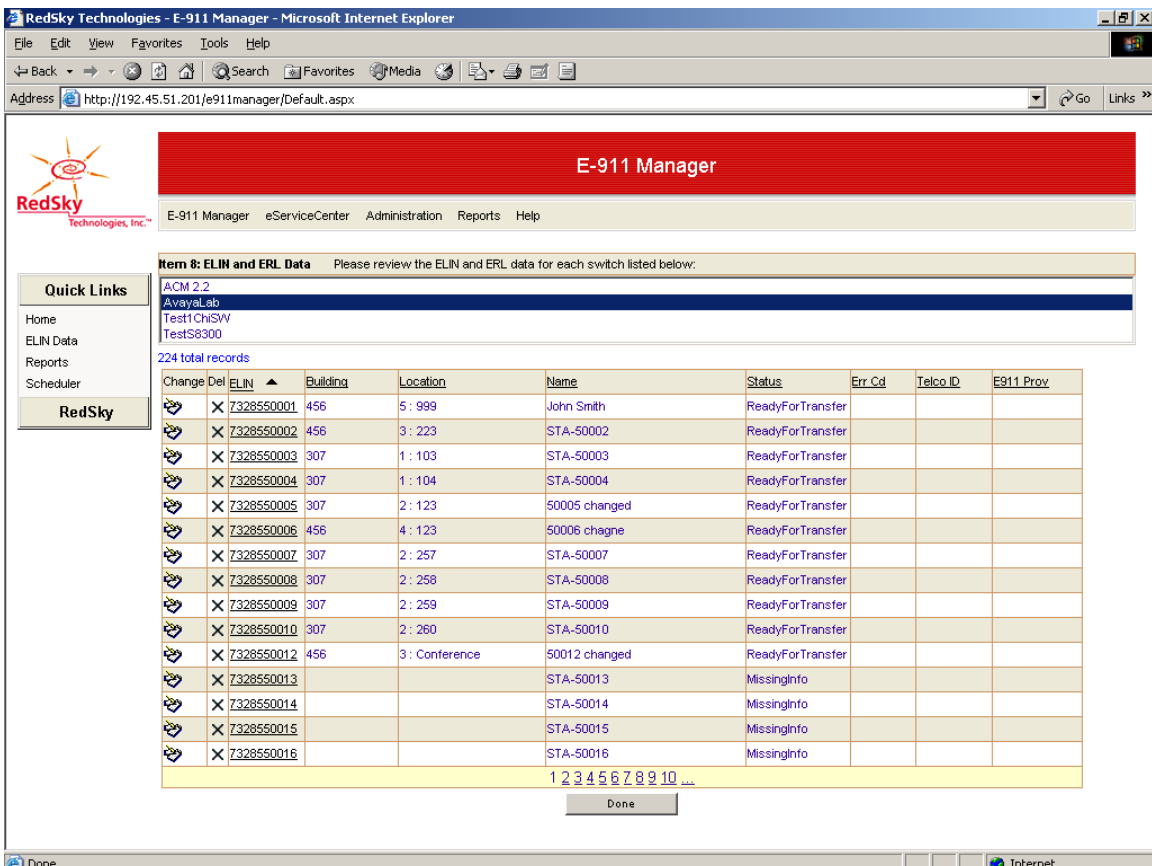
Step	Description
5.	<p>For each building defined in Avaya Communication Manager in Section 3.1, enter the BuildingID and a descriptive Building name. The BuildingID value must match the value configured in Avaya Communication Manager. For Switch, select the Avaya phone switch (“AvayaLab” in the example below) from the drop-down menu box. Click on the “+” icon under the Delete column.</p> 

Step	Description
6.	<p>Click on the Edit icon corresponding to a building defined in Step 5, and enter address and main telephone number information for the building in the MSAG Address and Main NPA/Number section.</p>  <p>Specify the Location Format and Name Format according to the instructions below. Click on Save.</p> 

Step	Description
7.	Repeat Steps 5 - 6 for each building defined in Avaya Communication Manager and click on “Done”.
8.	<p>Select “Download Numbering Tables” from the Tasks list.</p> 
9.	<p>Select the Avaya phone switch (“AvayaLab” in the example below) and click on “Import Numbering Tables”. Click on “Done” after the import is completed.</p> 

Step	Description																						
10.	<p>Select “Create E-911 Locations” from the Tasks list.</p>  <p>The screenshot shows the RedSky E-911 Manager interface in Microsoft Internet Explorer. The browser address bar shows http://192.45.51.201/e911manager/Default.aspx. The page has a red header with the RedSky logo and navigation links: E-911 Manager, eServiceCenter, Administration, Reports, and Help. On the left is a 'Quick Links' sidebar with Home, ELIN Data, Reports, Scheduler, and a RedSky button. The main content area features a 'Tasks' table:</p> <table border="1"> <thead> <tr> <th>Tasks</th> <th>Status</th> </tr> </thead> <tbody> <tr><td>1. Select E911 DB Providers</td><td>Completed</td></tr> <tr><td>2. Enter Switch Parameters</td><td>Completed</td></tr> <tr><td>3. Input Company Information</td><td>Completed</td></tr> <tr><td>4. Specify Building Info</td><td>Completed</td></tr> <tr><td>5. Download Numbering Tables</td><td>Completed</td></tr> <tr><td>6. Input SetType Filters</td><td>Completed</td></tr> <tr><td>7. Create E-911 Locations</td><td>Completed</td></tr> <tr><td>7e. View IP ELIN Locations</td><td>Incomplete</td></tr> <tr><td>8. Review ELIN E-911</td><td>Incomplete</td></tr> <tr><td>9. Configure and Schedule Events</td><td>Incomplete</td></tr> </tbody> </table> <p>A tooltip for item 8 is visible, stating: 'Assemble ALL Information for each ELIN using station, switch, and building data.'</p>	Tasks	Status	1. Select E911 DB Providers	Completed	2. Enter Switch Parameters	Completed	3. Input Company Information	Completed	4. Specify Building Info	Completed	5. Download Numbering Tables	Completed	6. Input SetType Filters	Completed	7. Create E-911 Locations	Completed	7e. View IP ELIN Locations	Incomplete	8. Review ELIN E-911	Incomplete	9. Configure and Schedule Events	Incomplete
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11.	<p>Check the “Reload all DIDs” checkbox and click on “Load Data”.</p>  <p>The screenshot shows the 'Item 7: Create E-911 Locations' screen. It includes a message box: 'Click "Load Data" button to begin ELIN E-911 information extraction. This may take several minutes to complete.' Below this is a checkbox labeled 'Reload all DIDs' which is checked, and two buttons: 'Load Data' and 'Done'.</p>																						

Step	Description																				
12.	<p>After loading is completed, click on “Done”.</p> 																				
13.	<p>Select “Review ELIN E-911 Location Data” from the Tasks list.</p>  <table border="1" data-bbox="802 1121 1127 1415"> <thead> <tr> <th data-bbox="802 1121 1045 1142">Tasks</th> <th data-bbox="1045 1121 1127 1142"></th> </tr> </thead> <tbody> <tr> <td data-bbox="802 1142 1045 1163">1. Select E911 DB Providers</td> <td data-bbox="1045 1142 1127 1163">Completed</td> </tr> <tr> <td data-bbox="802 1163 1045 1184">2. Enter Switch Parameters</td> <td data-bbox="1045 1163 1127 1184">Completed</td> </tr> <tr> <td data-bbox="802 1184 1045 1205">3. Input Company Information</td> <td data-bbox="1045 1184 1127 1205">Completed</td> </tr> <tr> <td data-bbox="802 1205 1045 1226">4. Specify Building Info</td> <td data-bbox="1045 1205 1127 1226">Completed</td> </tr> <tr> <td data-bbox="802 1226 1045 1247">5. Download Numbering Tables</td> <td data-bbox="1045 1226 1127 1247">Completed</td> </tr> <tr> <td data-bbox="802 1247 1045 1268">6. Input SetType Filters</td> <td data-bbox="1045 1247 1127 1268">Completed</td> </tr> <tr> <td data-bbox="802 1268 1045 1289">7. Create E-911 Locations</td> <td data-bbox="1045 1268 1127 1289">Completed</td> </tr> <tr> <td data-bbox="802 1289 1045 1310">8. Review ELIN E-911 Location Data</td> <td data-bbox="1045 1289 1127 1310">Completed</td> </tr> <tr> <td data-bbox="802 1310 1045 1331">9. Configure Review data and status for ELIN E-911 Location data for each PBS switch.</td> <td data-bbox="1045 1310 1127 1331">Incomplete</td> </tr> </tbody> </table>	Tasks		1. Select E911 DB Providers	Completed	2. Enter Switch Parameters	Completed	3. Input Company Information	Completed	4. Specify Building Info	Completed	5. Download Numbering Tables	Completed	6. Input SetType Filters	Completed	7. Create E-911 Locations	Completed	8. Review ELIN E-911 Location Data	Completed	9. Configure Review data and status for ELIN E-911 Location data for each PBS switch.	Incomplete
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Step	Description
14.	<p>Select the Avaya phone switch (“AvayaLab” in the example below) to view the numbering and location information for stations retrieved from Avaya Communication Manager. Click on a station record to view the specific information to be delivered to the ALI databases.</p> 

6. Interoperability Compliance Testing

The interoperability compliance testing included functionality and serviceability testing. The functionality testing evaluated the ability of the RedSky E-911 Manager to accurately obtain station numbering and location information from Avaya Communication Manager. The serviceability testing introduced failure scenarios to see if the RedSky E-911 Manager can resume operation after failure recovery.

6.1. General Test Approach

The main objective was to verify that the RedSky E-911 Manager accurately obtains station numbering and location information from Avaya Communication Manager as stations are added, deleted, and changed. For serviceability testing, connection and cable disconnects and reconnects, and device resets were applied.

6.2. Test Results

The main objective of Section 6.1 was verified. For serviceability testing, the RedSky E-911 Manager was able to retrieve station numbering and location information from Avaya Communication Manager after the connection to the active Avaya S8710 Media Server was disconnected and reconnected, as well as after resets of Avaya Communication Manager and the RedSky E-911 Manager server.

7. Verification Steps

The following steps may be used to verify the configuration:

- Compare the station numbering and location information reported in the RedSky E-911 Manager and Avaya Communication Manager, and verify consistency.
- Add, delete, and change Avaya Communication Manager station information and verify that the RedSky E-911 Manager receives and processes the updates accurately.

8. Support

For technical support on RedSky Technologies products, contact RedSky Technologies at:

- Phone: 1-866-RST-CIELO
- E-mail: support@redskytech.com

9. Conclusion

These Application Notes described a compliance-tested configuration comprised of Avaya Communication Manager 3.0, Avaya Directory Enabled Management 3.0, and the RedSky Technologies E-911 Manager. The RedSky E-911 Manager retrieves station numbering and location information from a PBX, and validates, reformats, and uploads the information to public

Automatic Location Identification (ALI) databases. During compliance testing, the RedSky E-911 Manager successfully used Avaya Directory Enablement Management to obtain station numbering and location information as Avaya Communication Manager stations were added, deleted, and changed.

10. Additional References

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

Product information for RedSky Technologies products may be found at http://www.redskytech.com/src/03_sec/software/index.htm.

[1] *Avaya Communication Manager Application Notes: Emergency Calling*

[2] *Avaya Directory Enabled Management Release 3.0 Installation and Implementation*, Issue 9, April 2005, Document Number 555-038-101.

[3] *Avaya Directory Enabled Management Release 3.0 Administration*, Issue 9, April 2005, Document Number 555-038-501.

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