

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 Developer*Connection* 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.

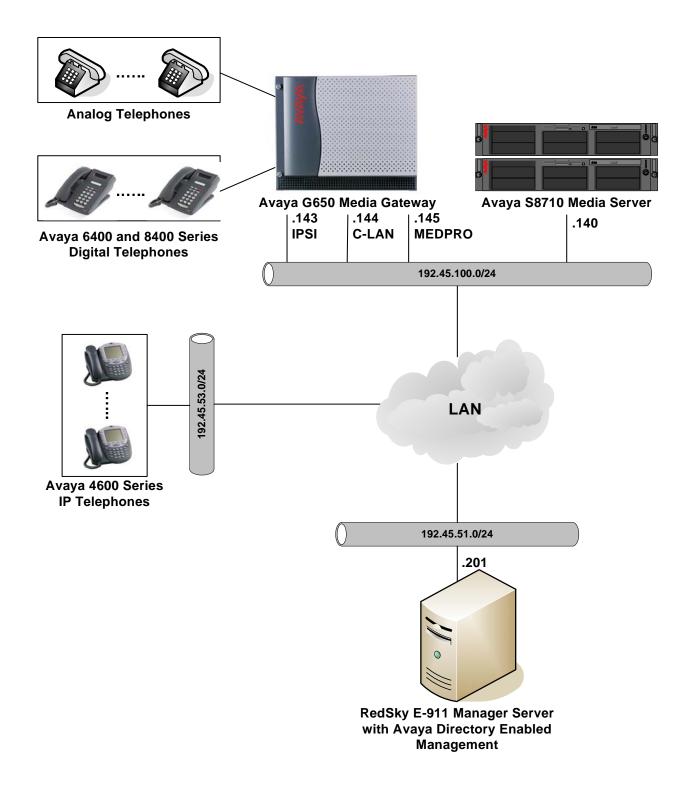


Figure 1: Sample configuration.

# 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	Page	1 of	4
SITE DATA USER DEFINITION			
VALID BUILDING FIELDS			
207			
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		Page	3 of	4
	SITE DATA USER DEFINITION			
	VALID FLOOR FIELDS			
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 Type: 4610 Port: S00003 Name: John Smith		Lock Messages? n Security Code: * Coverage Path 1: Coverage Path 2: Hunt-to Station:		BCC: TN: COR: COS:	1 1
STATION OPTIONS					
Loss Group:	19	Personalized Ringing Message			01
Speakerphone: Display Language: Survivable GK Node Name:	-	Mute Buttor	n Enable	ed? y	
Survivable COR: Survivable Trunk Dest?		Media Com IP S	nplex Ex SoftPhor		

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 **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 **Ext** 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: 5	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 "5xxx" 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 Specific up of a specific uploading to the ALI databases.

change public-unkno	wn-numbering	0		Page	1 of 2	2
	NUMBERING	- PUBLIC/UNKNOWN	FORMAT			
		Total			Tota	1
Ext Ext Trk	CPN	CPN Ext Ext	Trk	CPN	CPN	
Len Code Grp(s)	Prefix	<b>Len</b> 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].

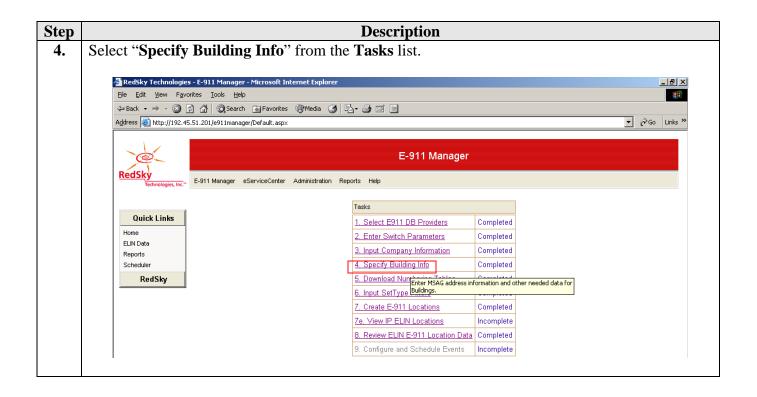
## 5. Configure RedSky E-911 Manager

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 http:// <ip address="" e-911="" manager="" of="" server="">/e911manager in the</ip>						
	URL, and log in with the appropriate cr						
2.	Click on "Home" under the Quick Lin	ks menu on the left	Select "Enter Switch Parameters"				
4.	from the <b>Tasks</b> list.		Select Enter Switch I arameters				
	from the Tasks list.						
	The left of the second se						
	RedSky Technologies - E-911 Manager - Microsoft Internet Explorer     File Edit View Favorites Tools Help						
	→ Back      → →	B- <i>3</i> : ₫ E					
	Address 🕘 http://192.45.51.201/e911manager/Default.aspx		▼ 🖗 Go Links »				
		E-911 Manager					
	RedSký Technologies, Inc." E-911 Manager eServiceCenter Administration I	Reports Help					
		Tasks					
	Quick Links	1. Select E911 DB Providers	Completed				
	Home ELIN Data	2. Enter Switch Parameters	Completed				
	Reports 3. Input Company Information Compared by Apple of the Information about the PSK phone switches used in this						
	4. Opecity Balance interview						
	RedSky	5. Download Numbering Tables	Completed				
		6. Input SetType Filters 7. Create E-911 Locations	Completed Completed				
		7e. View IP ELIN Locations	Incomplete				
		8. Review ELIN E-911 Location Data	· · · · · · · · · · · · · · · · · · ·				
		9. Configure and Schedule Events	Incomplete				

Step		Description							
3.	Select the Avaya phone switch ("Ava	aLab" in the example below). Enter inf	formation for						
	Switch Description, Default Area Code, and Exchange Identifier. Check the Include in E-								
	911 Update checkbox and configure the following parameters:								
	<ul> <li>Switch Type – select "IP as TDM" from the drop-down menu box.</li> </ul>								
	• •	1							
		lect "ISDN" from the drop-down menu b							
	unknown-numbering for are routed to a specific	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							
		ring form, then select the number of that	t trunk group in						
	Avaya Communication	Manager.							
	Click on "Save" and then "Done".								
	RedSky Technologies - E-911 Manager - Microsoft Internet Explor		X						
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		E-911 Manager							
		C-ST Manager							
	RedSký Technologia, inc.* E-911 Manager eServiceCenter Administration	Reports Help							
	tem 2: PBX P	ine Switch Data							
	Ouick Links	lowing PSAP data for each phone switch listed below.							
	ACM 2.2 Hone AvayaLab								
	ELINOste Test1ChiSV Reports Test58300								
	Scheduler	naputa							
	RedSky	RedSky Switch Description Description Description Exchange Include In Area Code Identifier E-911 Update							
	S8710 732 855 💌								
	Switch E911 Trunk B911 Trunk Type Type Group								
	IP as TDM Y ISDN Y								
		Save Done							



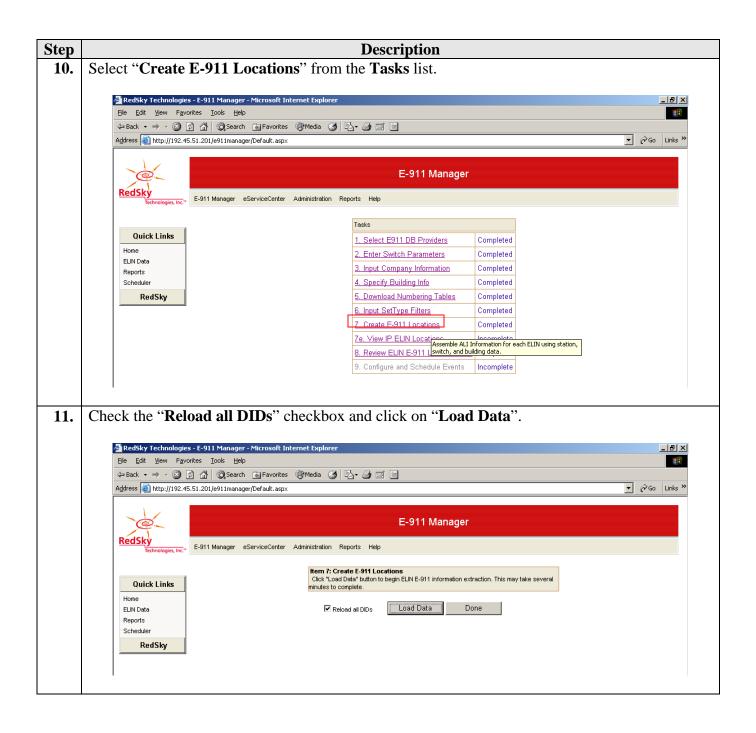
Step				Description	on			
5.	For each building defined in Avaya Communication Manager in Section 3.1, enter the							
<b>BuildingID</b> and a descriptive <b>Building</b> name. The <b>BuildingID</b> value must match the value configured in Avaya Communication Manager. For <b>Switch</b> , select the Avaya phone switch								
	("AvayaLab" in the example"	below	) fr	om the drop-	down mei	nu box. Click on the	"+" icon	
	under the <b>Delete</b> column.		<i>.</i>	1				
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		P.1						
				E-911	Manager			
	e.							
	E-911 Manager eServiceCente	r Administra	ation	Reports Help				
	Technologies, Inc."	Item 4: B	uildie -					
		Enter bui	Iding int	≈ ormation. Select a building in the	list below to modify it	s information.		
	Quick Links	7 total build	_					
		N	Delete	Building	BuildingID	Switch		
	Home ELIN Data		X	East Building	East	ACM 2.2		
	Reports	N	×	North Building	North	ACM 2.2 ACM 2.2		
	Scheduler		× ×	South Building	Vest	ACM 2.2		
	RedSky		x	Avatar Building	Avatar	TestChiSw		
			x	Informity Building	Informity	TestChiSw		
			x	RedSky Building	Redsky	TestChiSw		
		-	+	456	456	AvayaLab 💌		
					1			
		MSAG Ad		and Main NPA/Number				
		House No		ouse # Prefix uffix Direct. Street Nam		Street Post Suffix Direct.		
				<b>V</b>				
		Communit	y	County ID State	Zip M	ain NPA Main Number		
				elated Information				
		E-911 DB			dress and City	Company		
		Friendly E		▼ Name Local	ion Format (help)	Name Format (help)		
		Thomaly E	anonig	Loca	(interest of the second s			
		1		Save	Done			
	(a)						.ocal intranet	
	é						locarinicianec	

Step		Description	
6.	Click on the <b>Edit</b> icon corres	ponding to a building defined in Step	p 5, and enter address and main
	telephone number informatio	n for the building in the MSAG Add	dress and Main NPA/Number
	section.		
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	Address 🛃 http://192.45.51.201/e911manager/Default.	aspx	▼ 🖓 Go Links »
		E-911 Manager	
	RedSky Technologies, Inc." E-911 Manager eServiceCer	enter Administration Reports Help	
		Item 4: Buildings	
	Quick Links	Enter building information. Select a building in the list below to modify its inform Detail information for building 456 on PBX/Switch AvayaLab	ation.
	Home		witch
	ELIN Data Reports		wayaLab
	Scheduler	+ I2	ACM 2.2
	RedSky	MSAG Address and Main NPA.Number House # Prefix	Street Post
		House No. Suffix Direct. Street Name	Suffix Direct.
		199 Street Community County ID State Zip Main NPA	Main Number
		Lincroft NJ 07738 732	555555
		Other Building-related Information E-911 DB Prov TelcolD Display Address and City	Company
		Friendly Building Name Location Format (help) Name 456 % f : % r % n	ne Format (help)
		Save Done	
	e e		👔 👔 Internet
	Specify the Location Forma	t and Name Format according to th	e instructions below. Click on
	"Save".		
	👰 http://192.45.51.201/	e911manager/FormatLocationAndName.htm - Micro	psoft Internet Expl 💶 🗙
	<u>File E</u> dit <u>V</u> iew F <u>a</u> voril	tes <u>T</u> ools <u>H</u> elp	<b>1</b>
			A
	Location Format Help The Location format string is	s used to convert PBX Switch Floor and Room fields to the E-	-911 Location information.
	Use %F or %f in the string t	to indicate where to place the data from the Floor field, and $\%$	6R or %r to indicate where to
	lowercase to indicate that the	eld. Use uppercase tags (%R, %F) to indicate that the room/ he room/floor is optional.	floor is mandatory, and
		will create the location "Flr. 2, Rm. 312" for a Floor field of "2	" and a Room field of "312"
	Name Format Help		
	The Name format string is us	sed to convert the Name value extracted from the appropriat	
		%N or %n in the string to indicate where to place the data fi o indicate that the room/floor is mandatory, and lowercase to	
	is optional. If field is left bla	nk, name will be outputted unchanged (i.e. "Al Smith" will out	put as "AISmith").
	Example: "RedSky Tech: %N	N" will create the name "RedSky Tech: Al Smith" for a Name v	/alue of "AI Smith"
	<u> </u>		

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Step	Description
7.	Repeat Steps 5 - 6 for each building defined in Avaya Communication Manager and click on " <b>Done</b> ".
8.	Select "Download Numbering Tables" from the Tasks list.
	ELIN Data Reports Scheduler       2. Enter Switch Parameters       Completed         3. Input Company Information       Completed         4. Specify Building Infe       Completed         5. Download Numbering Tables       Completed         6. Input SetTune Elitors       Completed         7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA numbering tables, 7. Create Eland enter area codes for CAMA trunks.
9.	Select the Avaya phone switch ("AvayaLab" in the example below) and click on "Import Numbering Tables". Click on "Done" after the import is completed.
	E-911 Manager E-91 E-91 Manager E-91 Mana



Step		Description										
12.	After loading is completed, click on "	Done".										
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	E-911 Manager											
	RedSky         E-911 Manager eServiceCenter Administration Reports Help											
	Item 7: Create E-911 Locations           Click "Load Data" button to begin ELIN E-911 information extraction. This may take several minutes to complete.											
		ata successfully extracted and loaded										
	ELIN Data											
	Reports Scheduler											
	RedSky											
	I		1									
10												
13.	Select "Review ELIN E-911 Location Data" from the Tasks list.											
	<sup>2</sup> RedSky Technologies - E-911 Manager - Microsoft Internet Explorer <sup>2</sup> Ø ×             Eile Edit View Favorites Iools Help <sup>2</sup> Back → → ✓ ③ P M ③ Search ③ Favorites ④ Media ③ P → ④ □ ■											
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	Quick Links	Tasks										
	Home	1. Select E911 DB Providers	Completed									
	ELIN Data	2. Enter Switch Parameters	Completed									
	Reports	3. Input Company Information	Completed									
	Scheduler	4. Specify Building Info 5. Download Numbering Tables	Completed Completed									
	RedSky	6. Input SetType Filters	Completed									
		7. Create E-911 Locations	Completed									
		7e. View IP ELIN Locations	Incomplete									
		8. Review ELIN E-911 Location Data	Completed									
		9. Configure Review data and status for El										
		each PBS switch.										

tep		Description											
14.	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.												
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		ltere f	E FLINA	nd FRI Da	ta Please rei	view the ELIN and ERL	data for each switch listed below	N°.					
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	ELIN Data	TestS											
	Reports		al recor										
	Scheduler		ge Del <u>El</u>		<u>Building</u>	Location	Name	Status	Err Cd	<u>Telco ID</u>	E911 Prov		
	RedSky	<b>8</b>		328550001		5:999	John Smith	ReadyForTransfer					
		*		328550002		3:223	STA-50002	ReadyForTransfer	-				
		<b>2</b>		328550003		1:103	STA-50003	ReadyForTransfer					
		S S S		328550004		1:104 2:123	STA-50004	ReadyForTransfer	-				
		2		328550005 328550006		4:123	50005 changed 50006 chagne	ReadyForTransfer					
		~	_	328550007		2:257	STA-50007	ReadyForTransfer					
		è		328550008		2:258	STA-50008	ReadyForTransfer					
		ě,		328550009		2:259	STA-50009	ReadyForTransfer	-				
		è		328550010		2:260	STA-50010	ReadyForTransfer					
		2	× 73	328550012	456	3 : Conference	50012 changed	ReadyForTransfer	r				
		3	× 73	328550013			STA-50013	MissingInfo					
		<b>&gt;</b>	× 73	328550014			STA-50014	MissingInfo					
		Ì	× 7.	328550015			STA-50015	MissingInfo					
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## 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: <a href="mailto:support@redskytech.com">support@redskytech.com</a>

## 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

RL; Reviewed: SPOC 11/21/2005 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 <u>http://www.redskytech.com/src/03\_sec/software/index.htm</u>.

 Avaya Communication Manager Application Notes: Emergency Calling
 Avaya Directory Enabled Management Release 3.0 Installation and Implementation, Issue 9, April 2005, Document Number 555-038-101.
 Avaya Directory Enabled Management Release 3.0 Administration, Issue 9, April 2005, Document Number 555-038-501.

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