Avaya Solution & Interoperability Test Lab

Application Notes for Configuring 911 Enable Emergency Routing Service with Avaya IP Office using ISDN-PRI - Issue 1.0

Abstract

These Application Notes describe the procedures for configuring the 911 Enable Emergency Routing Service with Avaya IP Office.

The 911 Enable Emergency Routing Service offers an E911 call routing and location provisioning solution for enterprises using both legacy and IP phone deployments. In these Application Notes, Avaya IP Office connects to the Emergency Routing Service via an ISDN-PRI trunk. The compliance testing focused on placing 911 calls from various endpoint types to verify that their location and call back number could be properly determined.

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

1. Introduction

These Application Notes describe the procedures for configuring the 911 Enable Emergency Routing Service with Avaya IP Office.

The 911 Enable Emergency Routing Service (ERS) offers an E911 call routing and location provisioning solution for enterprises using both legacy and IP phone deployments. In these Application Notes, Avaya IP Office connects to the Emergency Routing Service via an ISDN-PRI trunk. The compliance testing focused on placing 911 calls from various endpoint types to verify that their location and call back number could be properly determined.

All 911 emergency calls from the enterprise are routed to the ERS. The calling party number is used to determine the caller's location and call back number. The call back number (CBN) is used by the 911 operator to reach the caller if the emergency call is dropped. The call back number for each extension would be its Direct Inward Dial (DID) number if it has one assigned. However, all internal extensions may not have a DID assigned. In this case, a central number for that location (e.g., attendant or security desk) is used for the call back number.

Calls that reach the ERS without proper location and/or call back information are routed to the 911 Enable Emergency Call Response Center (ECRC) where a trained 911 operator collects the correct information before transferring the call to the Public Safety Answering Point (PSAP) Dispatcher.

1.1. Interoperability Compliance Testing

The interoperability compliance test exercised the following features and functionality. See **Section 7** for complete test results and observations.

- Emergency calls from all endpoint types were routed successfully to the ERS.
- Proper location information provided for all known locations.
- Calls from unknown locations were routed to the ECRC.
- Calls placed using the provided call back number were routed to the proper extension.

1.2. Support

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

2. Reference Configuration

Figure 1 illustrates the test configuration. The test configuration shows an enterprise site connected to the Emergency Routing Service.

Located at the enterprise site is an Avaya IP Office 500. Endpoints include Avaya 4600 Series IP Telephones (with H.323 firmware), Avaya 5600 Series IP Telephones (with H.323 firmware), an Avaya IP Office Phone Manager, an Avaya 5420 Digital Telephone, and an Avaya 6211 Analog Telephone. An ISDN-PRI trunk connects the Avaya IP Office to the PSTN.

For security purposes, any public IP addresses or PSTN routable phone numbers used in the compliance test are not shown in these Application Notes. Instead, public IP addresses have been replaced with private addresses and all phone numbers have been replaced with numbers that can not be routed by the PSTN.

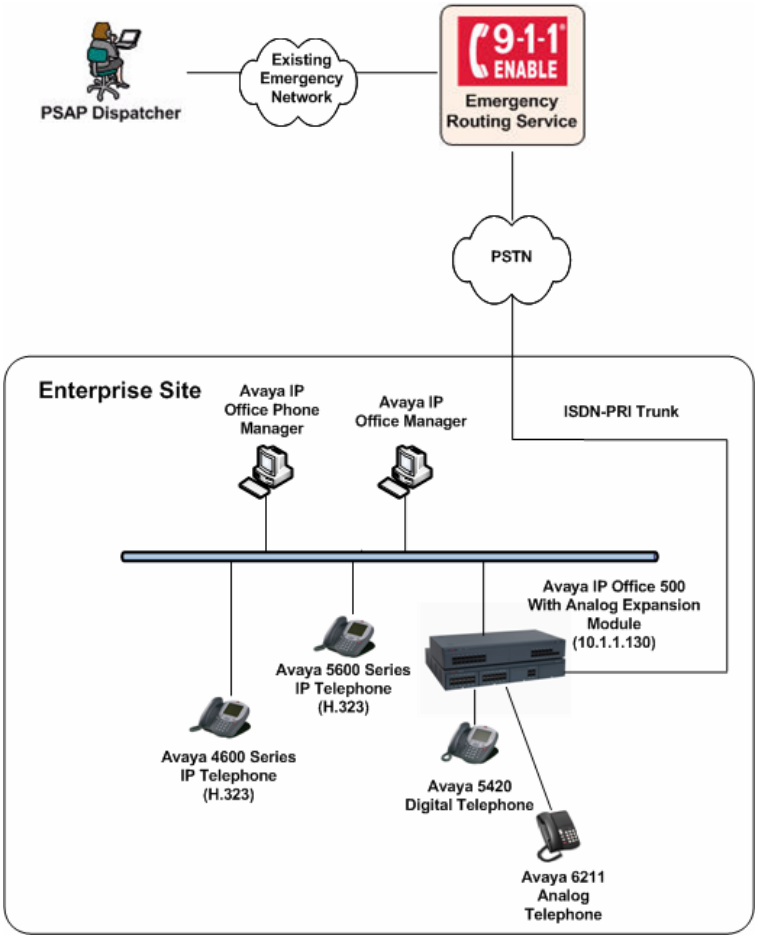


Figure 1: Test Configuration

3. Equipment and Software Validated

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

Avaya Telephony Components	
Equipment	**Release**
Avaya IP Office 500 with Analog Expansion Module	5.0 (8)
Avaya IP Office Manager	7.0 (8)
Avaya 4610SW IP Telephone (H.323)	2.9.1
Avaya 5620 IP Telephone (H.323)	2.9.1
Avaya IP Office Phone Manager	4.2.25
Avaya 5420 Digital Telephone	N/A
Avaya 6211 Analog Telephone	N/A
Analog Telephone	N/A
911 Enable Components	
Equipment	**Release**
911 Enable Emergency Routing Service	N/A

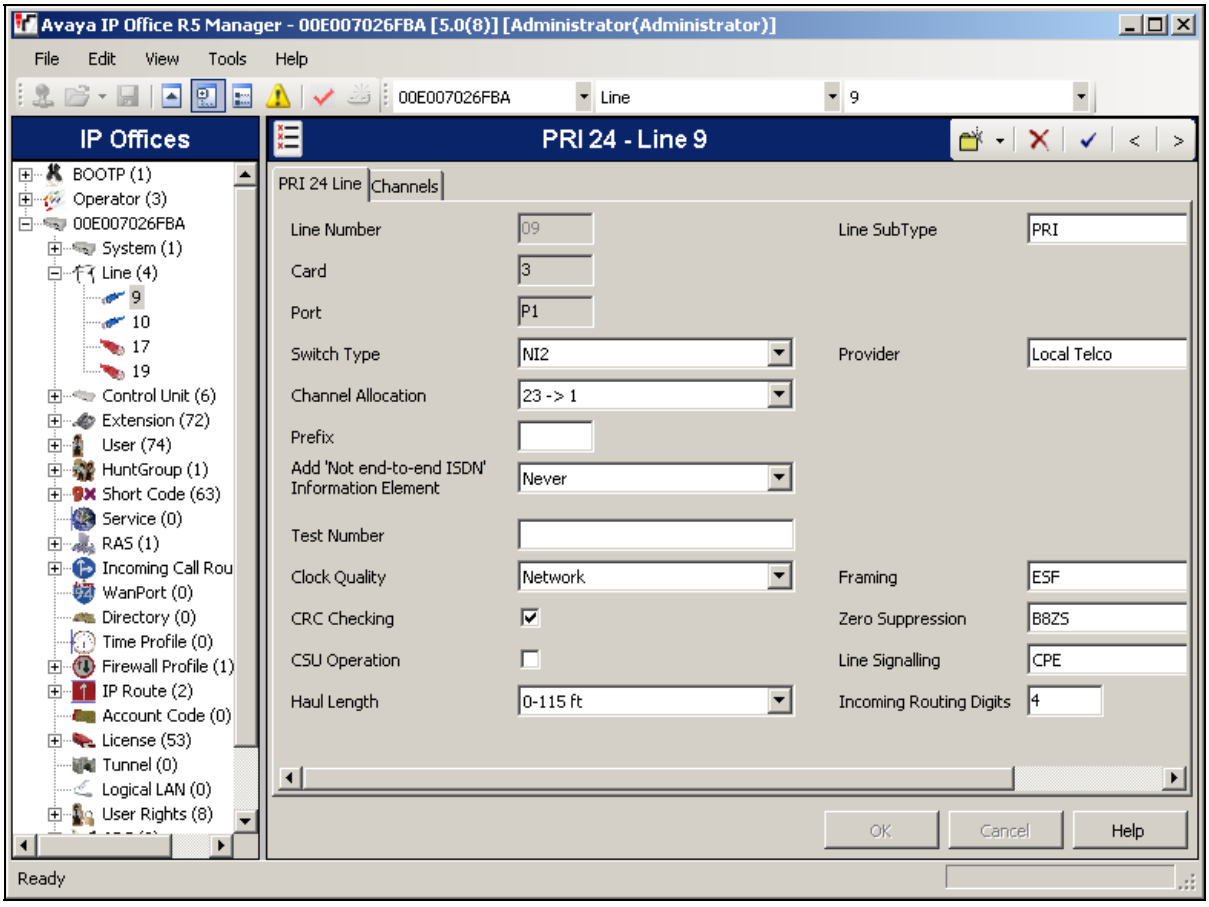
4. Configure Avaya IP Office

This section describes the Avaya IP Office configuration to support connectivity to the ERS. Avaya IP Office is configured through the Avaya IP Office Manager PC application. From a PC running the Avaya IP Office Manager application, select **Start → Programs → IP Office → Manager** to launch the Manager application. Navigate to **File → Open Configuration**, select the proper Avaya IP Office system from the pop-up window, and log in with the appropriate credentials. A management window will appear similar to the one in the next section, showing all the Avaya IP Office configurable components in a configuration tree in the left pane.

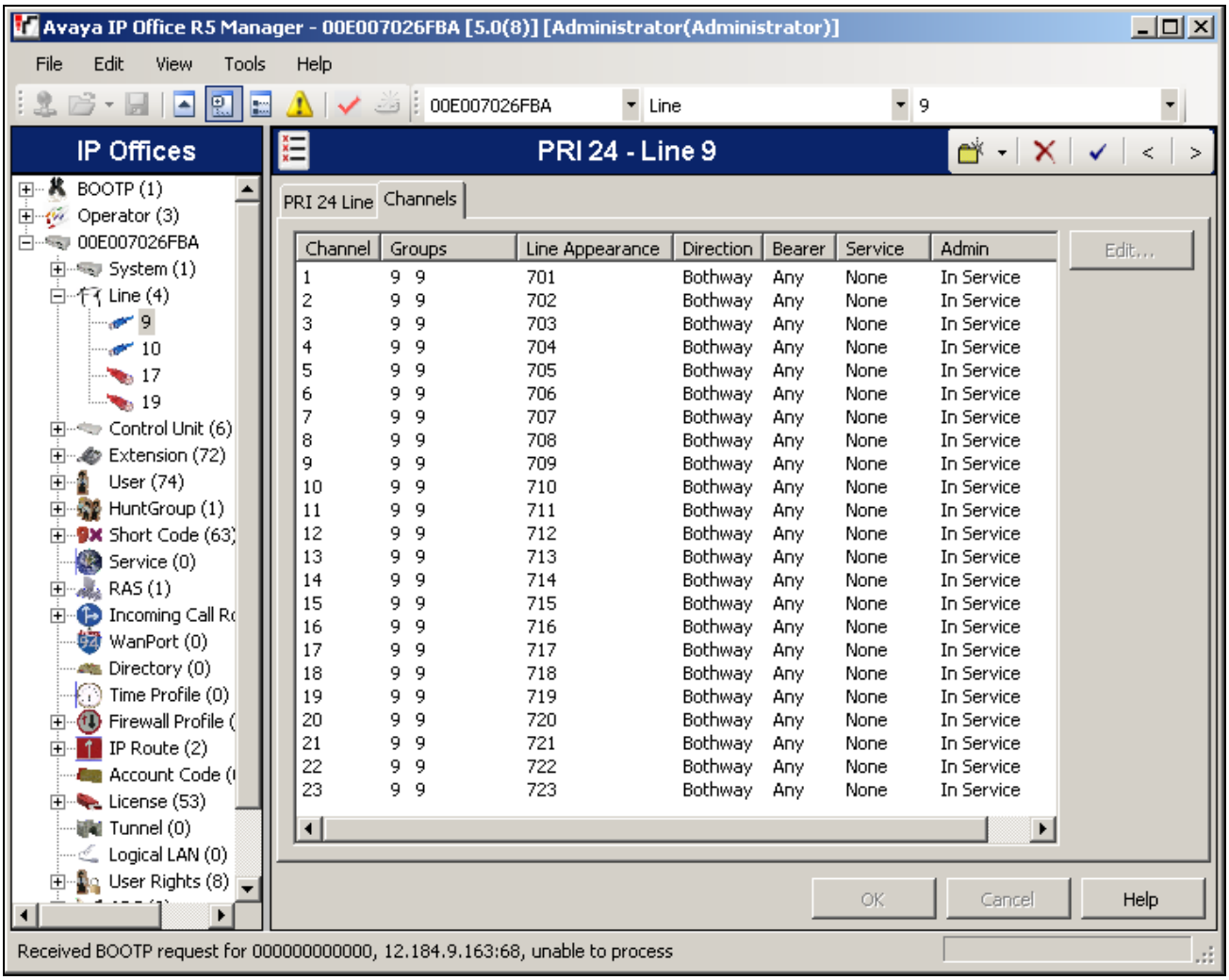
4.1. Administer ISDN-PRI Line

From the configuration tree in the left pane, select **Line** to display the available lines. Lines 9 and 10 are ISDN-PRI lines. Line 9 was used for the connection to the PSTN. Select line 9 to display the **PRI24-Line9** screen in the right pane. On the **PRI 24 Line** tab, configure the line as follows:

- Set the **Switch Type** to ***NI2***.
- Set **Framing** to ***ESF***.
- Set **Zero Suppression** to ***B8ZS***.
- Set **Line Signaling** to ***CPE***.



On the **Channels** tab, highlight all the channels to be placed into service. Right mouse-click and select ***in-service***. For the compliance test, all channels were placed into service. As a result, the **Admin** column of each channel displays ***In Service*** as shown below.



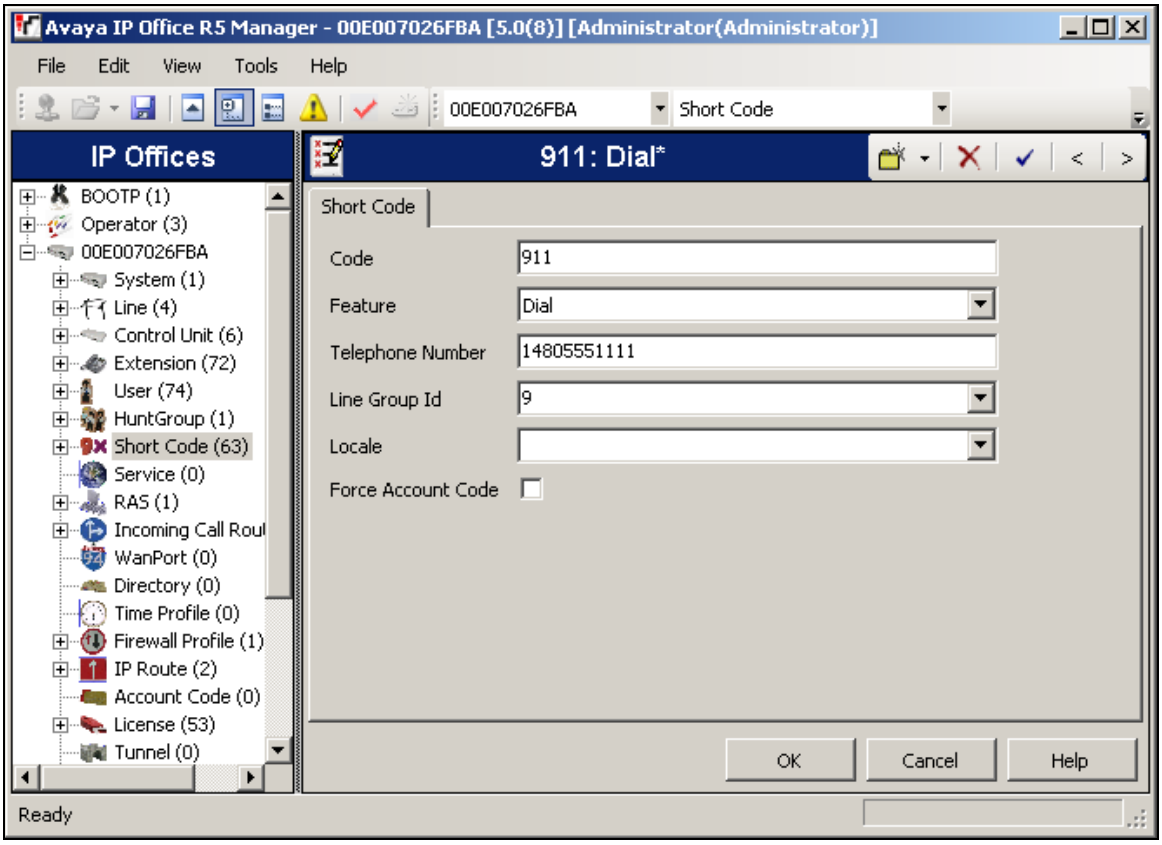
Channel	Groups	Line Appearance	Direction	Bearer	Service	Admin
1	9 9	701	Bothway	Any	None	In Service
2	9 9	702	Bothway	Any	None	In Service
3	9 9	703	Bothway	Any	None	In Service
4	9 9	704	Bothway	Any	None	In Service
5	9 9	705	Bothway	Any	None	In Service
6	9 9	706	Bothway	Any	None	In Service
7	9 9	707	Bothway	Any	None	In Service
8	9 9	708	Bothway	Any	None	In Service
9	9 9	709	Bothway	Any	None	In Service
10	9 9	710	Bothway	Any	None	In Service
11	9 9	711	Bothway	Any	None	In Service
12	9 9	712	Bothway	Any	None	In Service
13	9 9	713	Bothway	Any	None	In Service
14	9 9	714	Bothway	Any	None	In Service
15	9 9	715	Bothway	Any	None	In Service
16	9 9	716	Bothway	Any	None	In Service
17	9 9	717	Bothway	Any	None	In Service
18	9 9	718	Bothway	Any	None	In Service
19	9 9	719	Bothway	Any	None	In Service
20	9 9	720	Bothway	Any	None	In Service
21	9 9	721	Bothway	Any	None	In Service
22	9 9	722	Bothway	Any	None	In Service
23	9 9	723	Bothway	Any	None	In Service

4.2. Administer System Short Code For 911

In times of emergency, users will expect to dial a well known number to contact emergency services. In the United States, 911 is used for this purpose. Other countries may use a different number. For the purposes of the compliance test, 911 was used. Thus, a short code was created on Avaya IP Office to map 911 to the actual 11-digit PSTN number needed to reach the ERS.

From the configuration tree in the left pane, right-click on **Short Code** and select **New** to add a new short code. In the right pane that appears, configure the following:

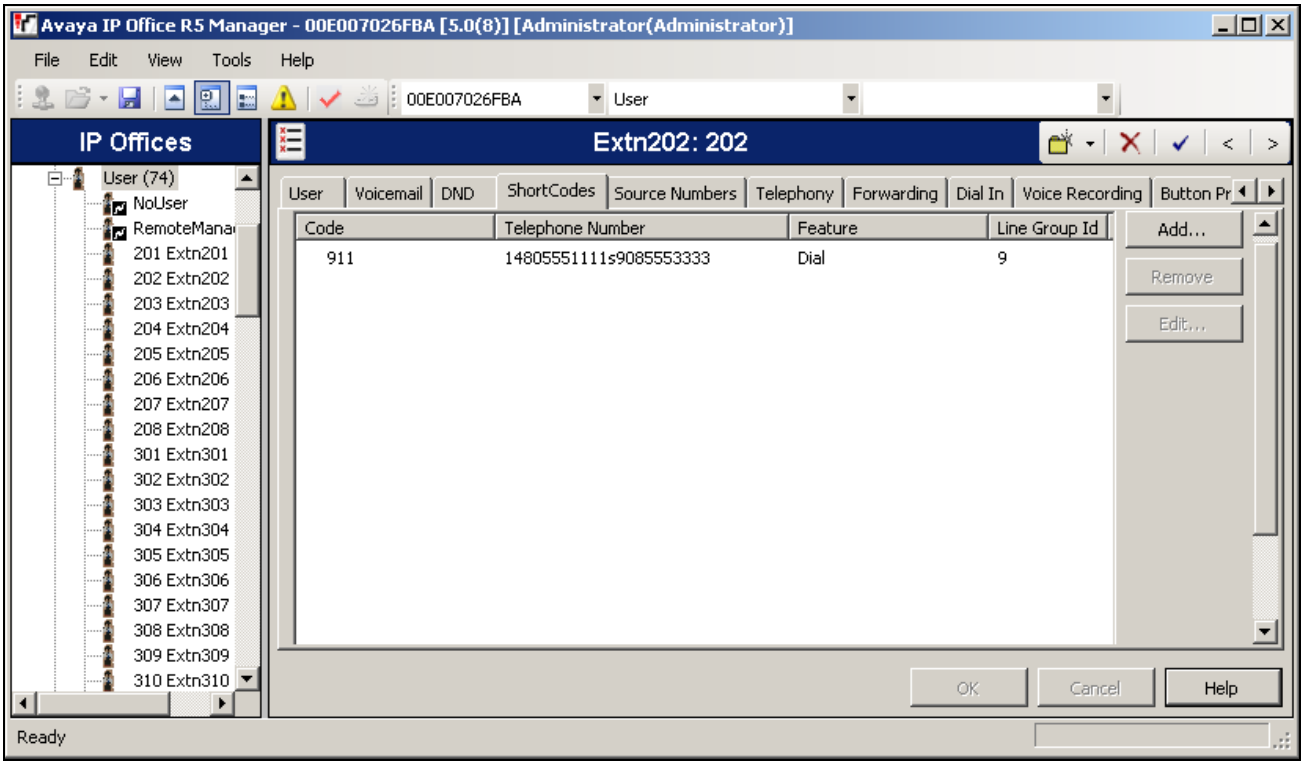
- In the **Code** field, enter the dial string which will trigger this short code. In this case, ***911***.
- Set the **Feature** field to ***Dial*** since the purpose of this short code is to dial a number.
- In the **Telephone Number** field, enter the number the system should dial when the user dials 911. This is the 11-digit number provided by 911 Enable to contact the Emergency Routing Service. By default, the caller ID information sent by this short code to the far-end is the Direct Inward Dialing (DID) number assigned to the extension dialing the short code (see **Section 4.5**). This caller ID number is used by the ERS to identify the calling location and is used as the call back number. If an extension does not have a DID number assigned to it, then it would use a user-specific short code (see **Section 4.3**).
- Set the **Line Group Id** to the line connected to the PSTN configured in **Section 4.1**.



4.3. Administer User Short Code For 911

If an extension does not have a DID number assigned to it which can be used by the ERS as a call back number, then that extension can not use the system short code for 911. Instead, an extension-specific short code is defined for each extension without a DID number. This short code will send a fixed pre-defined number (e.g., attendant or security desk) as the calling party number.

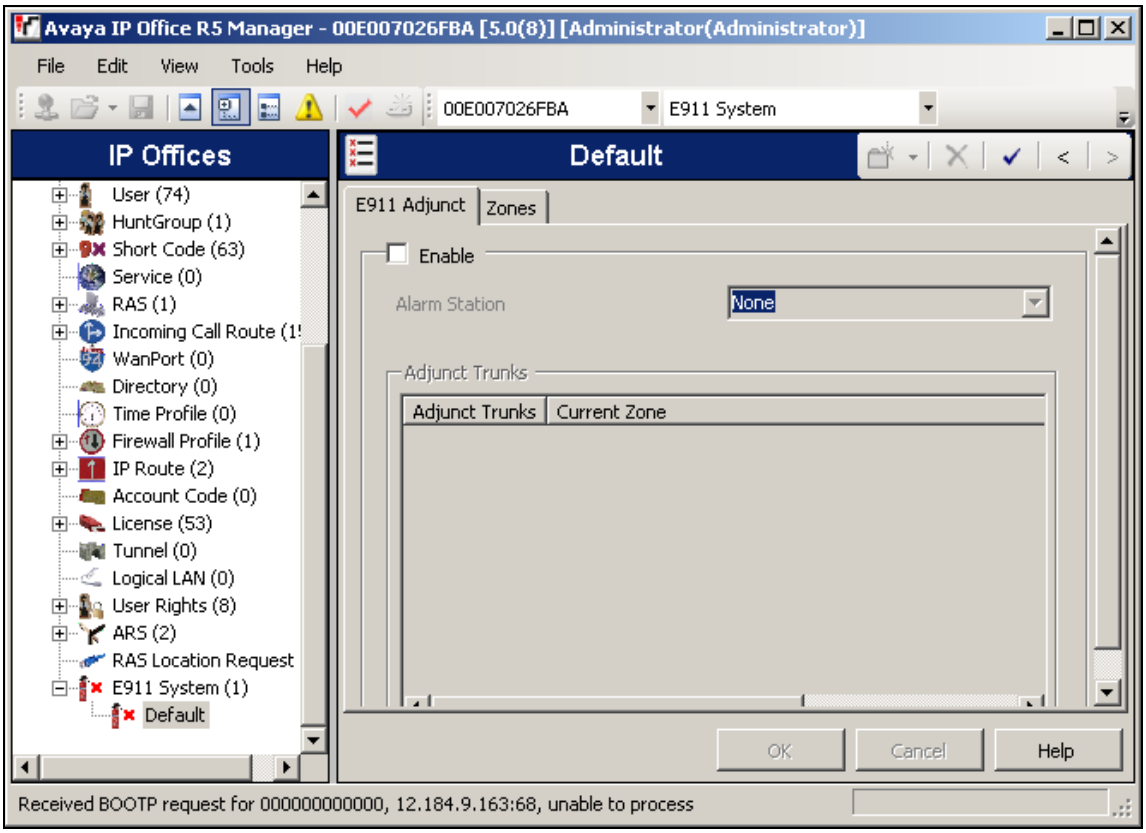
To configure a user short code, select **User** from the configuration tree in the left pane. A list of users will appear. Highlight the specific user and in the right pane select the **Short Code** tab. Configure the short code fields in the right pane in the same manner as was done in **Section 4.2** with the exception of the **Telephone Number**. The **Telephone Number** for this short code will also contain the calling party number by using the **s** parameter. Thus, the format of the **Telephone Number** becomes the number for the ERS service, followed by an **s**, followed by the calling party information (e.g., 4085551111s9085553333). Avaya IP Office will use the number following the **s** parameter as the calling party number.



4.4. Disable E911 System Adjunct

The ERS does not make use of an E911 adjunct. Thus, this capability must be disabled on Avaya IP Office.

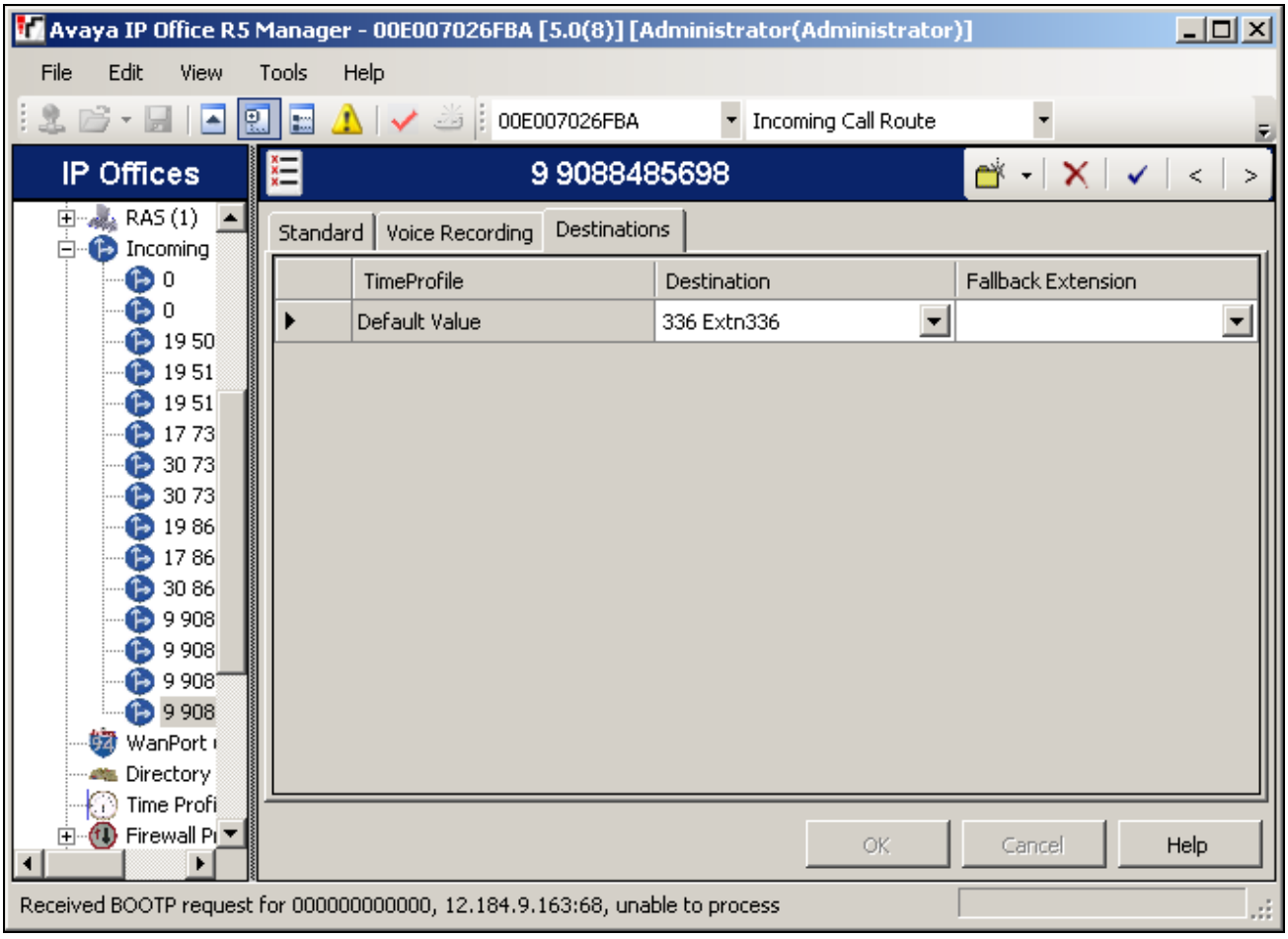
From the configuration tree in the left pane, click on **E911 System**. In the right pane on the **E911 Adjunct** tab, verify the **Enable** box is unchecked.



4.5. View Incoming Call Routes

An incoming call route maps an inbound DID number on a specific line to an internal extension. These DID numbers are sent as the calling party number by the short code defined in **Section 4.2**. These numbers are provided by the local PSTN service provider and would have been provisioned on Avaya IP Office at the time of installation.

To view the incoming call routes, select **Incoming Call Routes** in the configuration tree in the left pane. The list of incoming call routes with DID numbers are displayed. To view the extension mapping, highlight a call route and select the **Destinations** tab in the right pane. The extension is shown in the **Destination** field.



4.6. Save Configuration

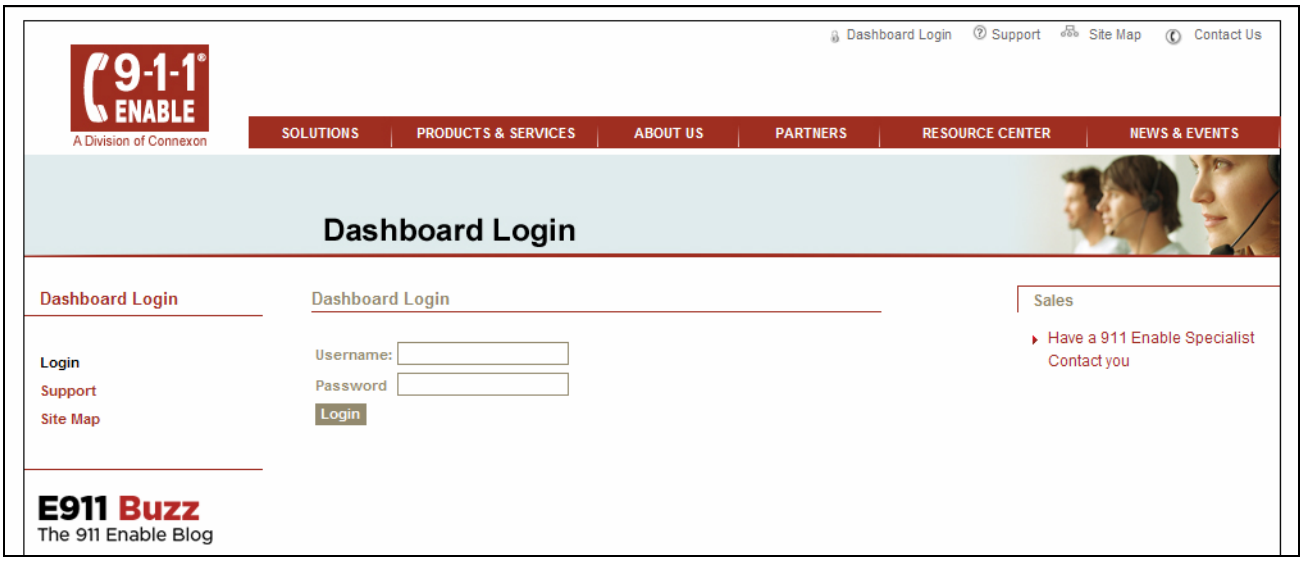
Navigate to **File → Save Configuration** in the menu bar at the top of the screen to save the configuration performed in the preceding sections.

5. Configure Emergency Routing Service (ERS)

This section describes the configuration of the ERS via the 911 Enable Dashboard web interface.

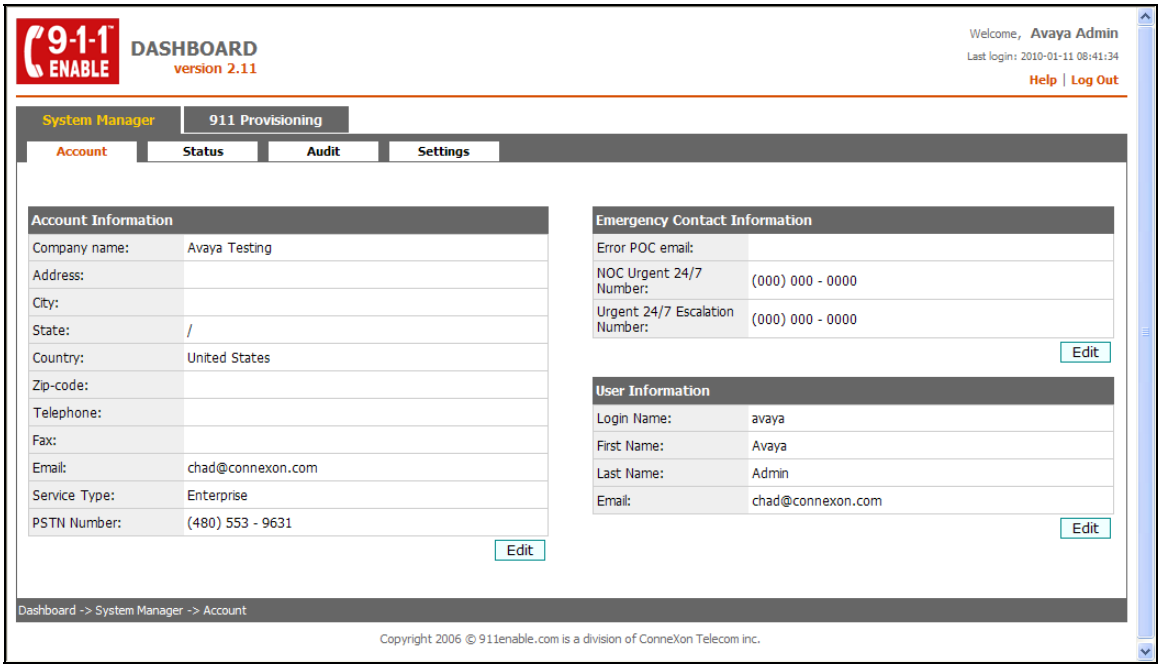
5.1. Login

Use a web browser to access www.911enable.com. Click the **Dashboard Login** link at the top of the page. The **Dashboard Login** page will appear as shown below. Log in with the proper credentials.



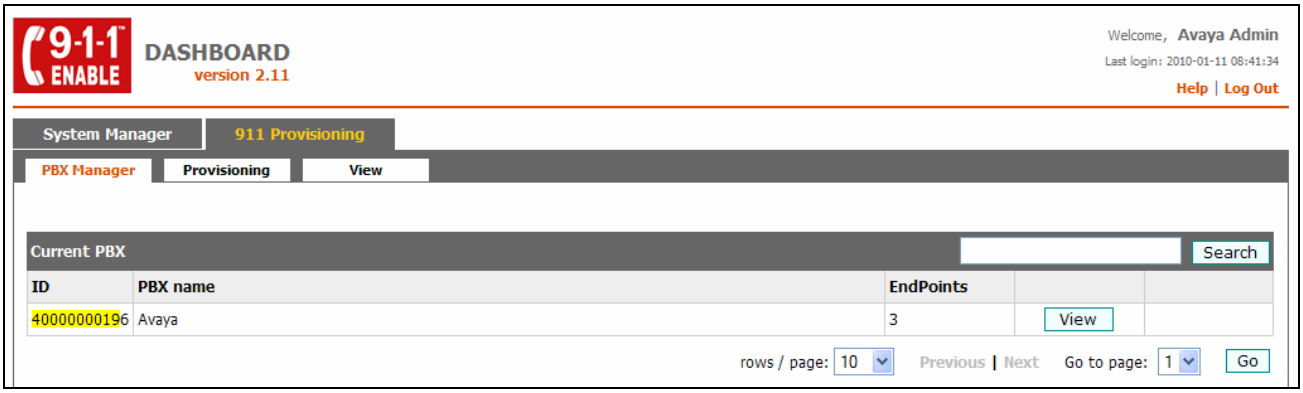
5.2. Account

The dashboard displays the account for this user. The account is set-up by 911 Enable as part of the service set-up. To begin provisioning, select the **911 Provisioning** tab.



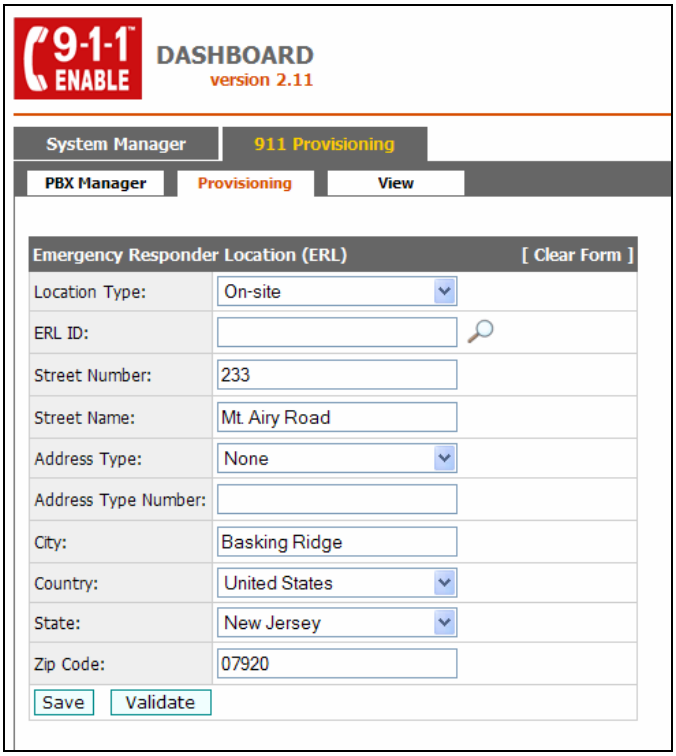
5.3. Provision PBX

The **PBX Manager** tab displays all the PBXs associated with this account. For the compliance test, a single PBX was created. The example below shows the PBX related to this account which was created by 911 Enable.

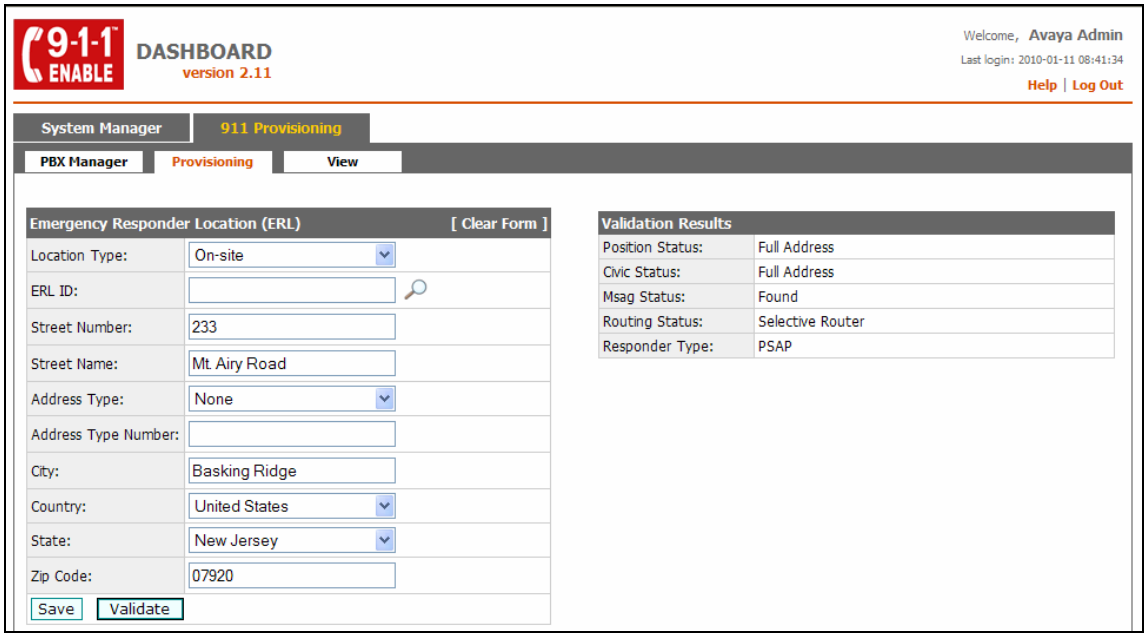


5.4. Provision ERLs and Endpoints

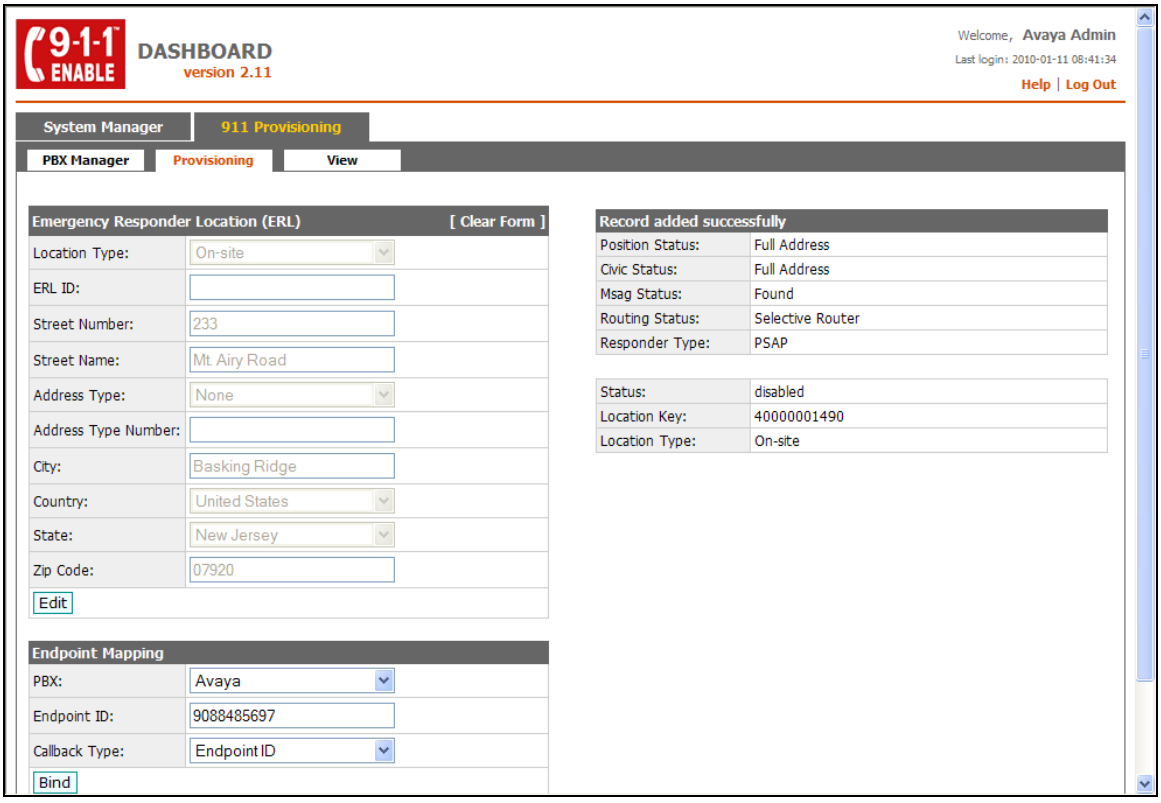
The PBX defined above may have users in multiple locations. These locations are referred to by the dashboard as Emergency Response Locations (ERLs). Create an ERL for each location served by the PBX. Begin by clicking the **Provisioning** tab. Enter the requested information about the location as shown below then click **Validate**.



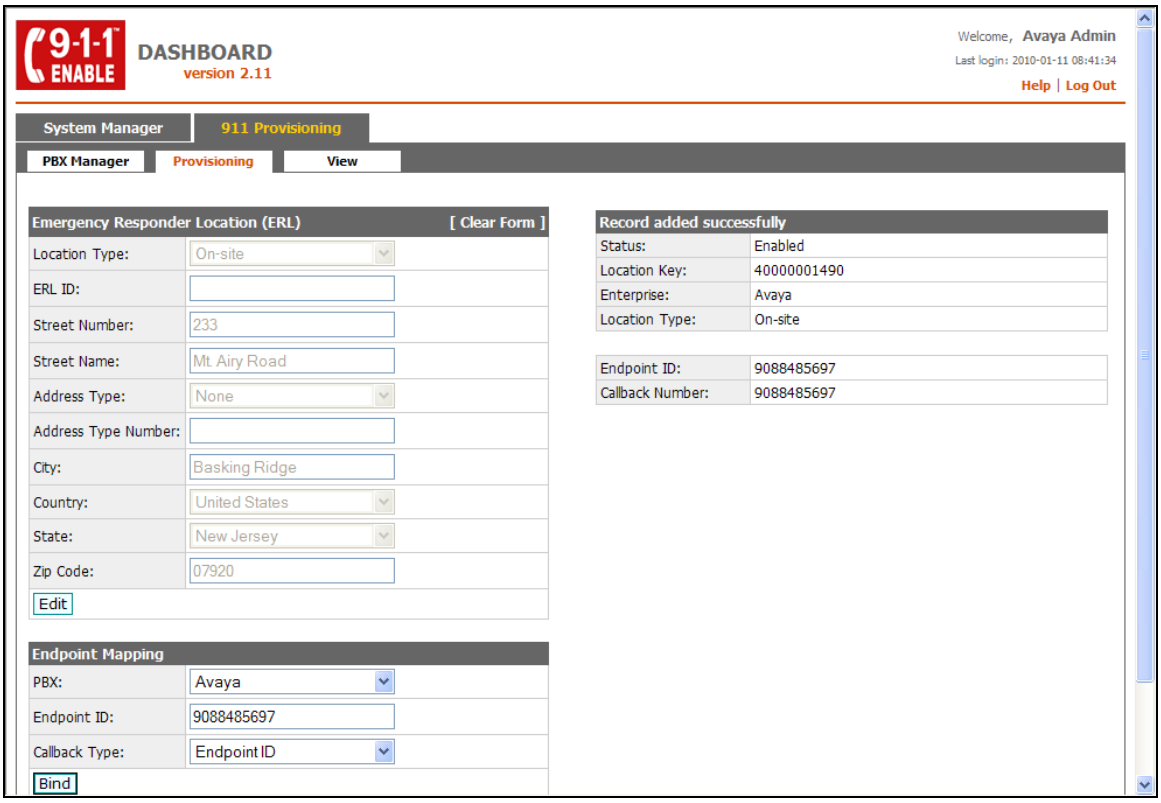
Validation results appear at the right. Click **Save** to save the entered data.



The **Endpoint Mapping** section appears at the bottom of the screen. Use this section to map endpoints to this ERL. Enter the PBX name from **Section 5.3** in the **PBX** field. Enter the endpoint DID number as the **Endpoint ID** and enter ***Endpoint ID*** as the **Callback Type**. Click **Bind**.

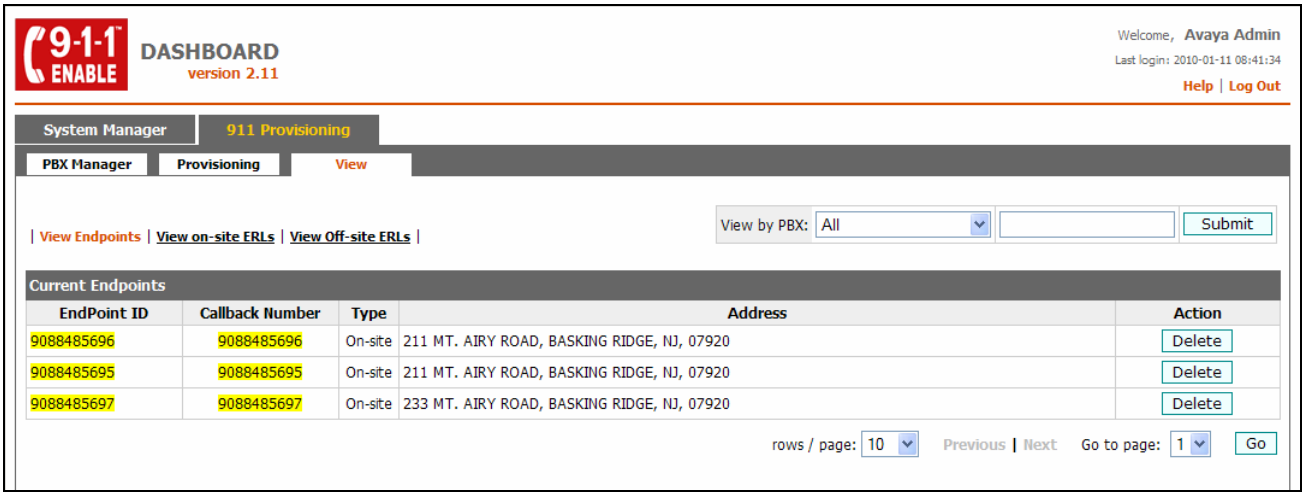


The **Endpoint ID** and **Callback Number** are added to the status on the right. To enter additional endpoints to this ERL, enter the endpoint data in the **Endpoint Mapping** section and click **Bind**. To enter a new ERL, click the provisioning tab again and repeat the steps from the beginning of this section.

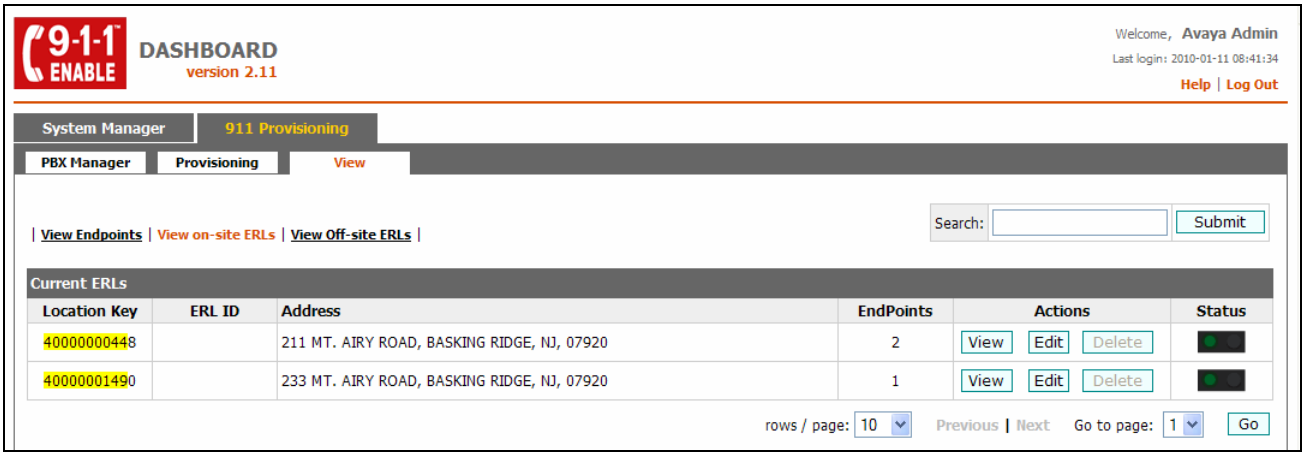


5.5. Summary

To view a summary of the ERL and endpoint provisioning, click the **View** tab. This screen shows all the endpoints.



Click the **View on-site ERLs** link to see the ERL summary.



6. General Test Approach and Test Results

This section describes the compliance testing used to verify the interoperability of the ERS with Avaya IP Office. The general test approach was to make emergency calls from different endpoints types and verify the location and call back information provided to the ERS.

6.1. Test Results

The ERS passed compliance testing. All test cases were successful.

7. Verification Steps

The following steps may be used to verify the configuration:

- From the Avaya Communication Manager SAT, use the **status signaling-group** command to verify that the PRI signaling group is in-service.
- From the Avaya Communication Manager SAT, use the **status trunk-group** command to verify that the PRI trunk group is in-service.
- On the ERS, verify the ERL and endpoint information is correct as shown in **Section 5.5**.

8. Conclusion

911 Enable Emergency Routing Service passed compliance testing. These Application Notes describe the procedures required to configure the connectivity between Avaya IP Office and the 911 Enable Emergency Routing Service as shown in **Figure 1**.

9. Additional References

[1] *IP Office 5.0 Documentation CD,* August 2009.
[2] *VSP Dashboard Manual*, v2.10 Rev B, October 1, 2009.

Product documentation for Avaya products may be found at http://support.avaya.com.
Product documentation for the Emergency Routing Service is available from 911 Enable.

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.