



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Imperium Software from Protocol Systems with Avaya IP Office R8.1 using Avaya IP Office TAPI Service Provider -Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Protocol Systems Imperium Software to successfully interoperate with Avaya IP Office via Avaya TAPI Service Provider.

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 compliance tested configuration used to validate Imperium software R1.2 from Protocol Systems with Avaya IP Office R8.1 using Avaya IP Office TAPI3 Service Provider (TAPI) to allow screen pops on a client PC.

The Imperium software has a Computer Telephony Integration (CTI) module that provides screen pops to end users via the TAPI3 Service Provider installed on the Imperium server. Imperium utilizes a client/server model with the server component of the software connecting to the Avaya IP Office via TAPI.

2. General Test Approach and Test Results

The overall objective of this interoperability compliance testing is to verify that the Imperium server can provide a client with a screen pop based on the Call in-line ID (CLID) information received into the Imperium server from the Avaya IP Office. This screen pop contains information such as the name and address based on the CLID received by the Imperium Server through the TAPI connection with the Avaya IP Office. The Imperium server can establish a connection to the Avaya IP Office through a TAPI Driver installed on the Imperium Server to allow Screen Pops. An extension and user must be added on the Imperium Server for each telephone extension that will be monitored for CTI.

Note: Testing was performed with IP Office 500 R8.1, but it also applies to IP Office Server Edition R8.1. Note that IP Office Server Edition requires an Expansion IP Office 500 v2 R8.1 to support analog or digital endpoints or trunks.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Compliance testing

The interoperability compliance testing included feature and serviceability testing. The feature testing evaluated the screen pops received by the client containing information on the CLID from the Avaya IP Office.

- Screen pops following internal calls
- Screen pops following external calls over PRI trunks

2.2. Test Results

All tests passed successfully.

2.3. Support

For technical support on the Imperium product please contact the Protocol Systems support team at:

Web address: www.protocolsystems-me.com
Email address: support@protocolsystems-me.com
Phone Number: +9716 5578383

3. Reference Configuration

Figure 1 shows the network topology for compliance testing. The Imperium server is placed on the Avaya LAN and the TAPI3 Service Provider is installed on the Imperium Server to provide CTI connection to the IP Office. Avaya 9408 Digital Deskphones and 9608 H.323 IP Deskphones are used in making and receiving calls.

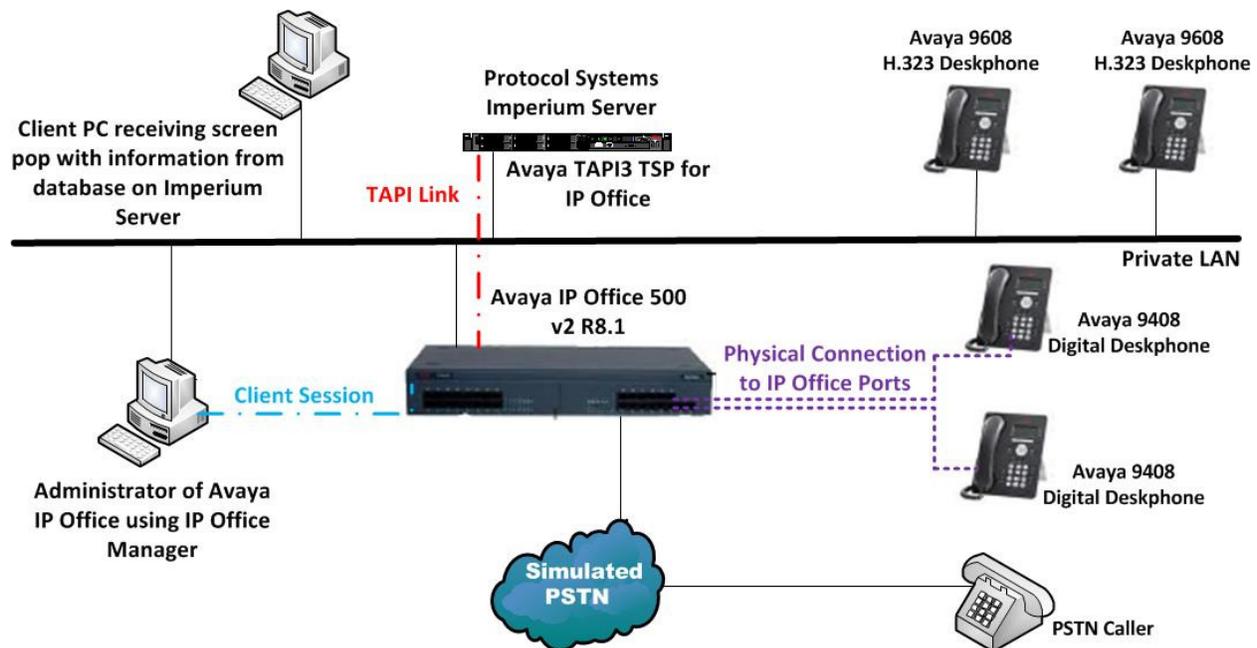


Figure 1: Connection of Protocol Systems Imperium Server with Avaya IP Office R8.1

4. Equipment and Software Validated

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

<i>Equipment/Software</i>	<i>Release/Version</i>
Avaya IP Office 500	R8.1
Avaya IP Office TAPI3 Driver	R8.1
Avaya 9608 IP Deskphone	H323 6.2.009
Avaya 9408 Digital Telephone	N/A
Windows 2008 Server O/S and Protocol Systems Imperium Server	R1.2
Client Workstation with Windows XP	Internet Explorer. R8.0

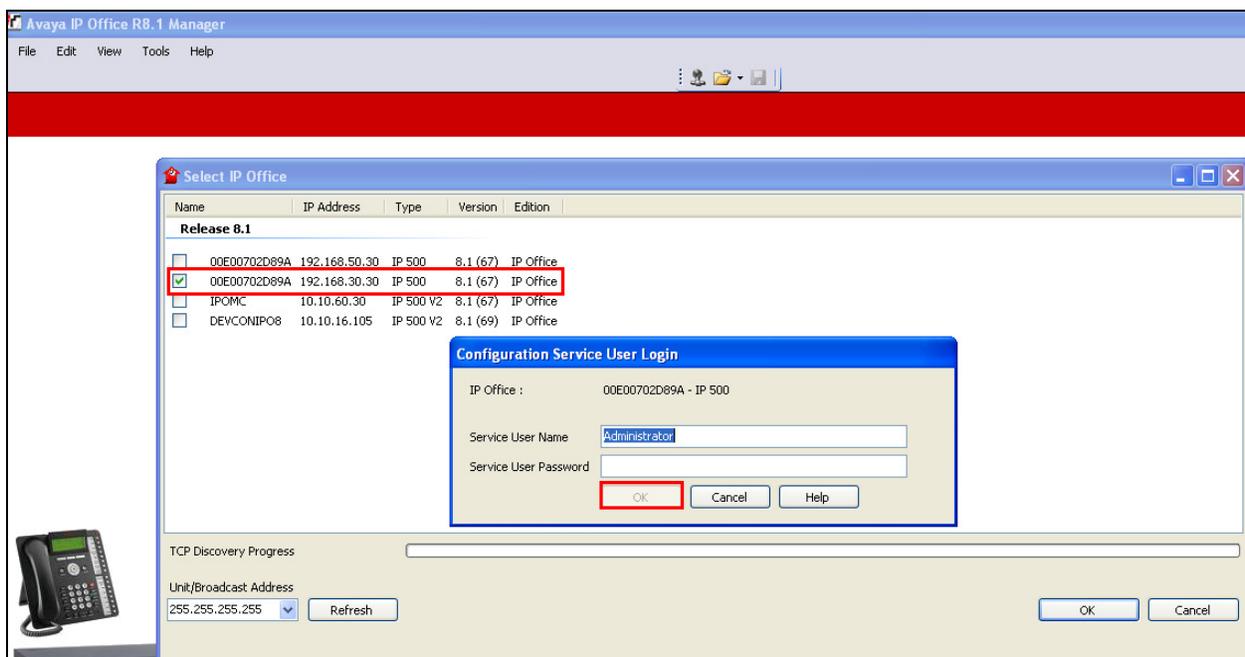
5. Configuration of Avaya IP Office

Configuration and verification operations on the Avaya IP Office illustrated in this section were all performed using Avaya IP Office Manager. The information provided in this section describes the configuration of the Avaya IP Office for this solution. It is implied a working system is already in place. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 10**. The configuration operations described in this section can be summarized as follows:

- Launch Avaya IP Office Manager
- Display LAN Configuration
- SMDR Configuration
- Configuration of an IP Office User
- Save Configuration

5.1. Launch Avaya IP Office Manager

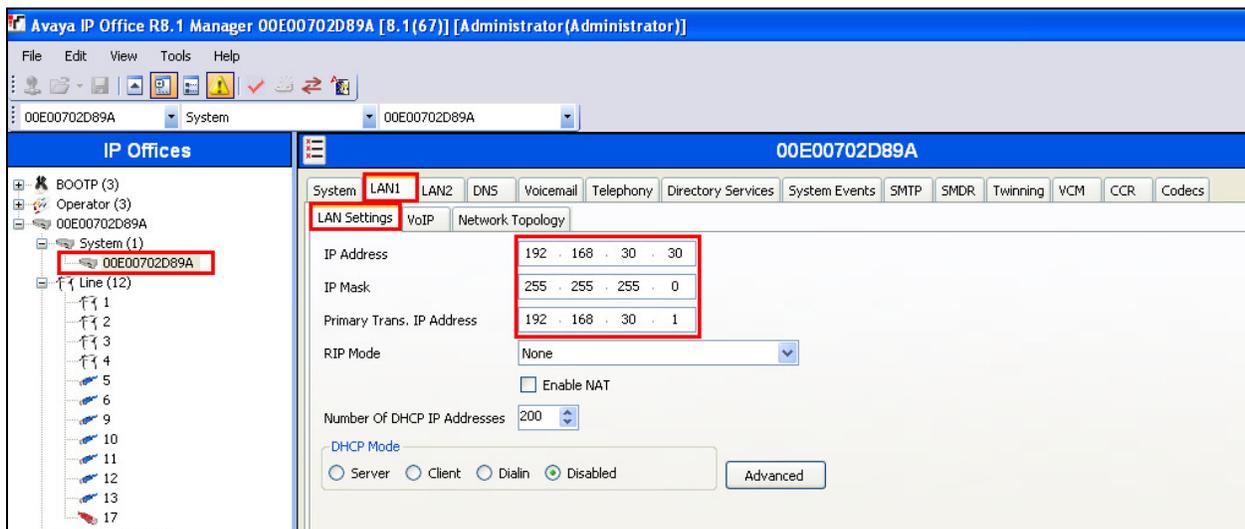
From the Avaya IP Office Manager PC, go to **Start**→**Programs**→**IP Office**→**Manager** to launch the Manager application (not shown). Log in to Avaya IP Office using the appropriate credentials to receive its configuration.



5.2. Display LAN Configuration

In the IP Office Manager window expand the configuration tree in the left pane and double-click **System**. During compliance testing the System was called **00E00702D89A**. Select the **LAN1** tab and note the following information:

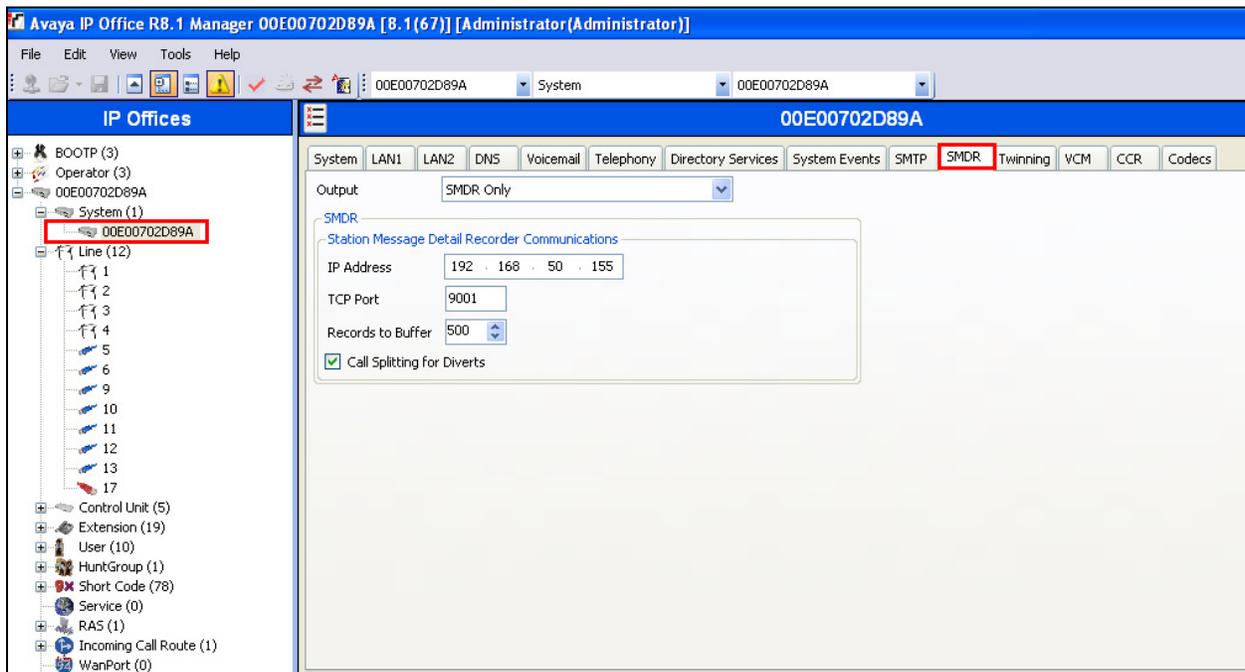
- **IP Address** IP Address of the IP Office that will be required in **Section 6** for the configuration of the TAPI Driver and again in **Section 7.1** during the configuration of the Imperium Server
- **IP Mask** Subnet mask for the IP Office
- **Primary Trans IP** Gateway IP Address



5.3. SMDR Configuration

In the IP Offices window expand the configuration tree in the left pane and double-click **System**. During compliance testing the System was called **00E00702D89A**. Select the **SMDR** tab and enter the following information:

- **Output** Select **SMDR** from the drop box
- **IP Address** Enter the IP Address of the Imperium Server
- **TCP Port** Enter **9001**
- **Records to buffer** Enter **500**
- Check the **Call Splitting for Diverts** check box



5.4. Configure an IP Office User

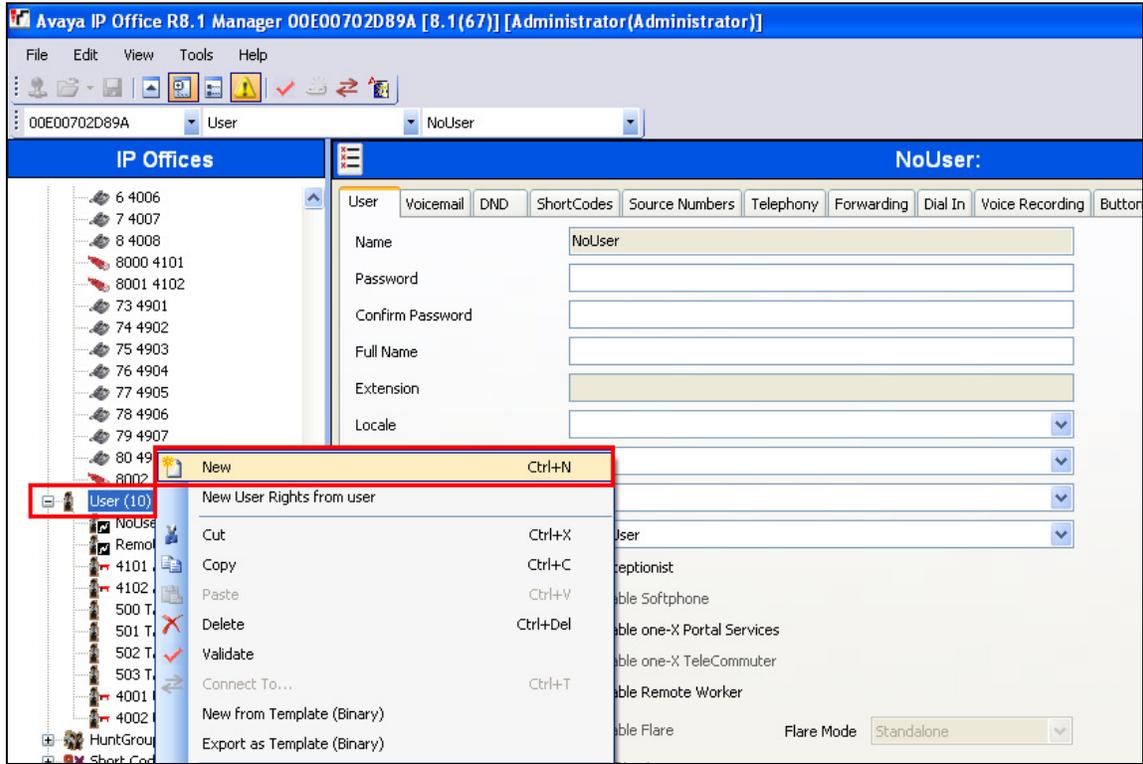
This section shows how to add a new user in order to login to a digital extension. Once a digital extension is plugged in it can be configured as follows. Enter the extension number into the **Base Extension** highlighted below. Note that this number will be automatically filled in by the IP Office and can be changed by accessing the extension in the left window.

The screenshot displays the Avaya IP Office R8.1 Manager interface. The title bar reads "Avaya IP Office R8.1 Manager 00E00702D89A [8.1 (67)] [Administrator/Administrator]". The menu bar includes File, Edit, View, Tools, and Help. Below the menu bar, there are navigation icons and a status bar showing "00E00702D89A" and "Extension 1 4001".

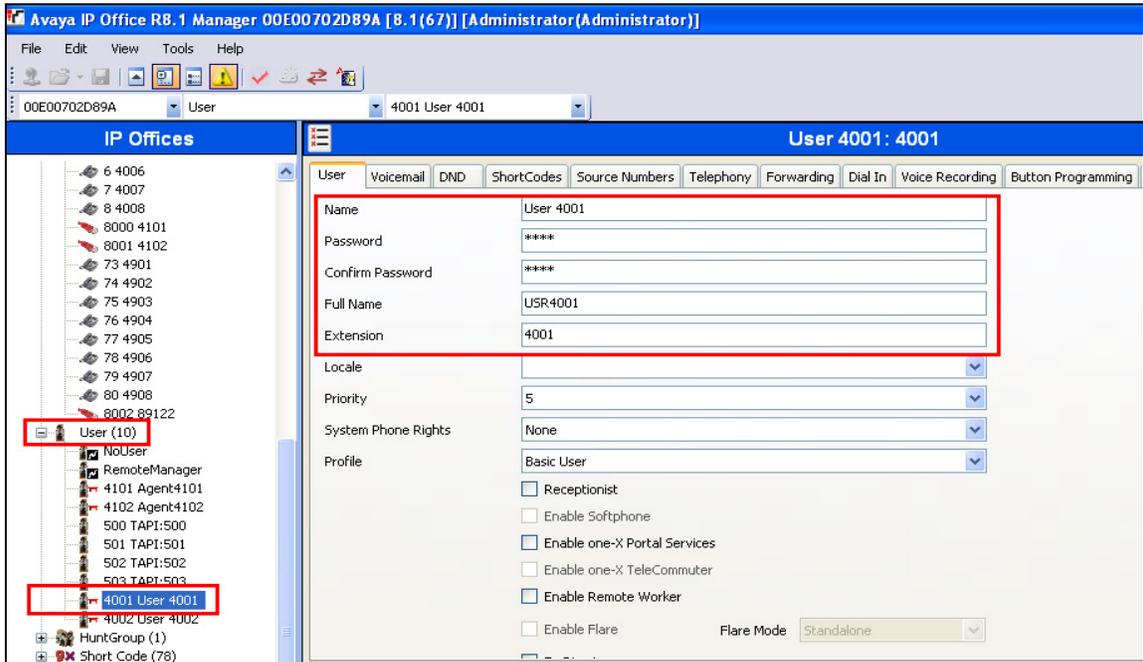
The interface is divided into two main sections:

- IP Offices:** A tree view on the left showing a list of extensions. The "Extension (19)" folder is expanded, and the extension "1 4001" is selected and highlighted with a red box.
- Digital Extension: 1 4001:** A configuration panel on the right. The "Base Extension" field is highlighted with a red box and contains the value "4001". Other fields include:
 - Extension Id: 1
 - Caller Display Type: On
 - Reset Volume After Calls:
 - Device Type: Avaya 9408
 - Module: BD1
 - Port: 1
 - Disable Speakerphone:

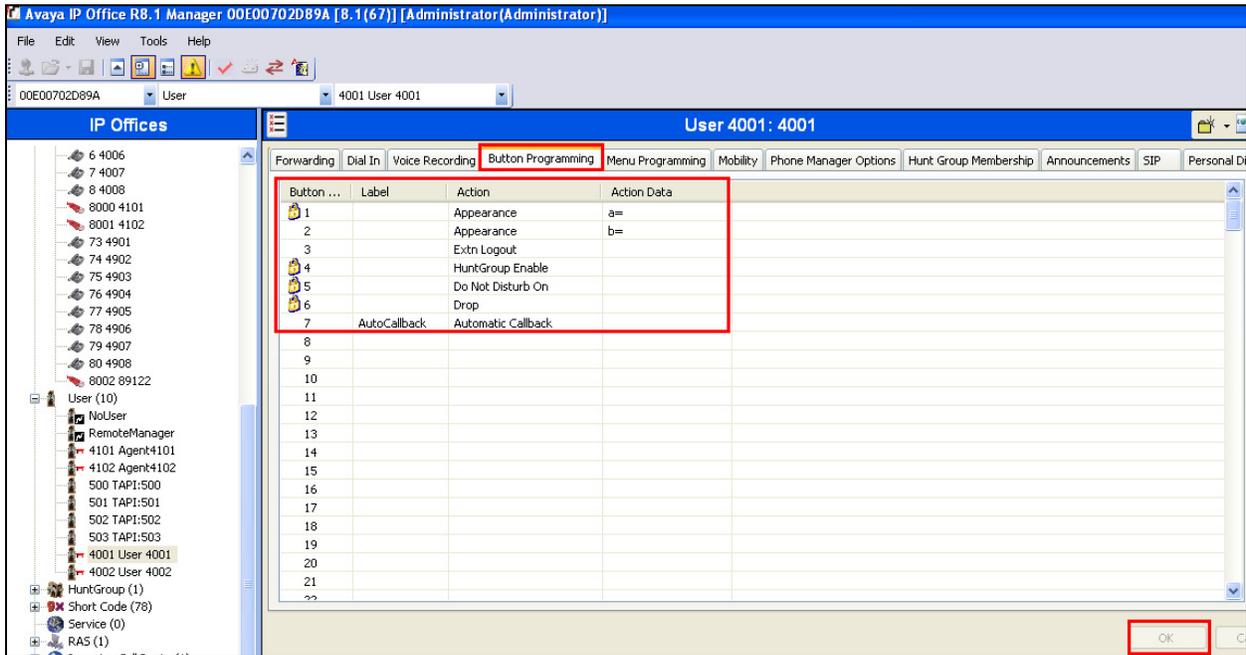
In order to add a new user right click **Users** in the left window and a new window will appear where **New** can be selected as highlighted below.



Information such as the **Name**, **Password** and **Extension** are filled in.



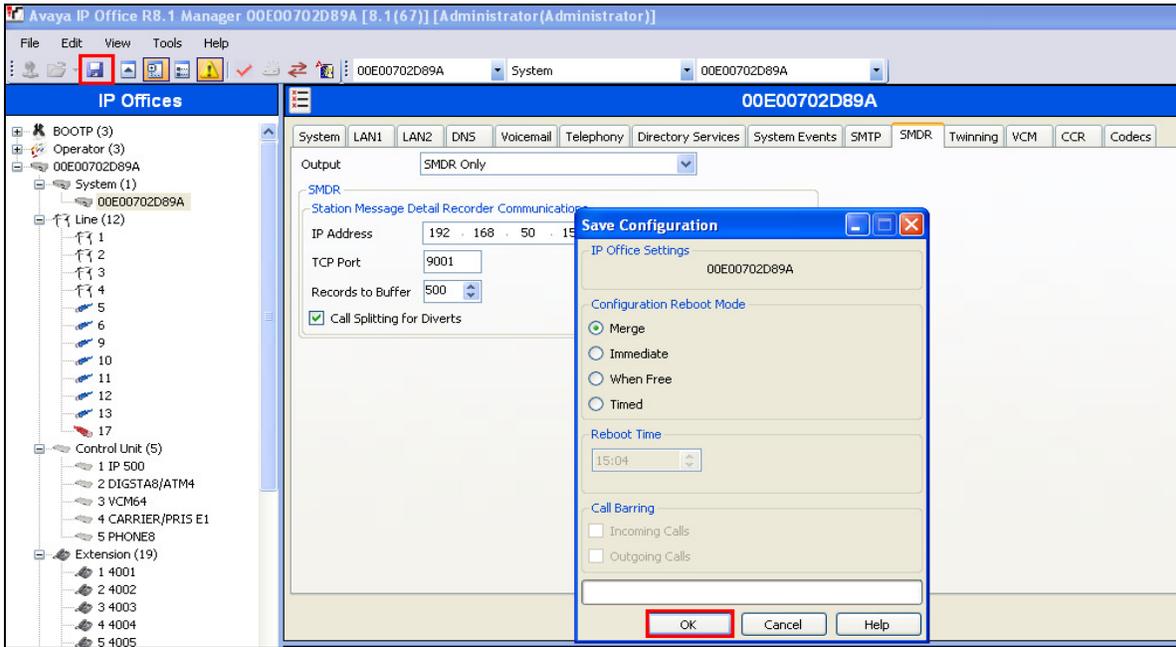
Click on the **Button Programming** tab; ensure that there are at least two **Appearance** buttons configured as shown in the example below.



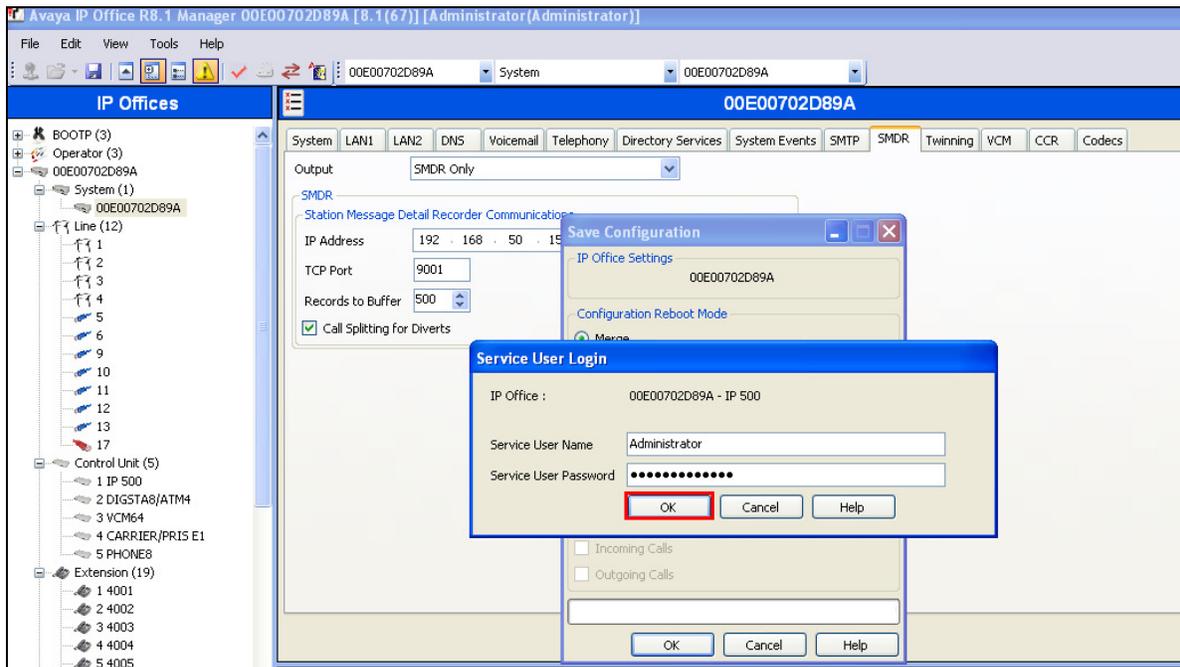
Click on **OK** to complete the new user.

5.5. Save Configuration

Once the configuration has been made it must be sent to the IP Office. Click on the **Save** Icon as shown below. Once the **Save Configuration** window opens, click on the **Merge** radio button followed by the **OK** button.

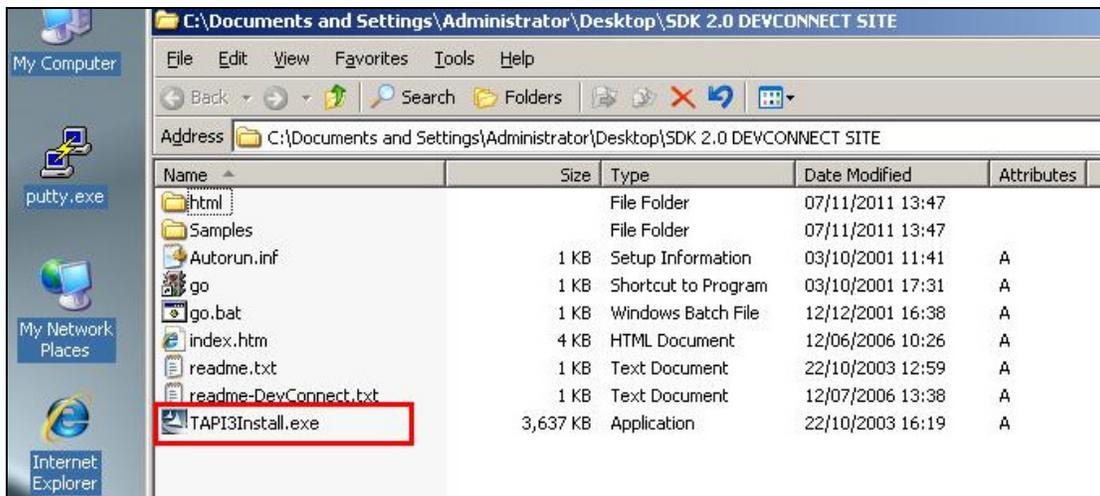


Enter the **Administrator** password and click on **OK** to complete the configuration save.

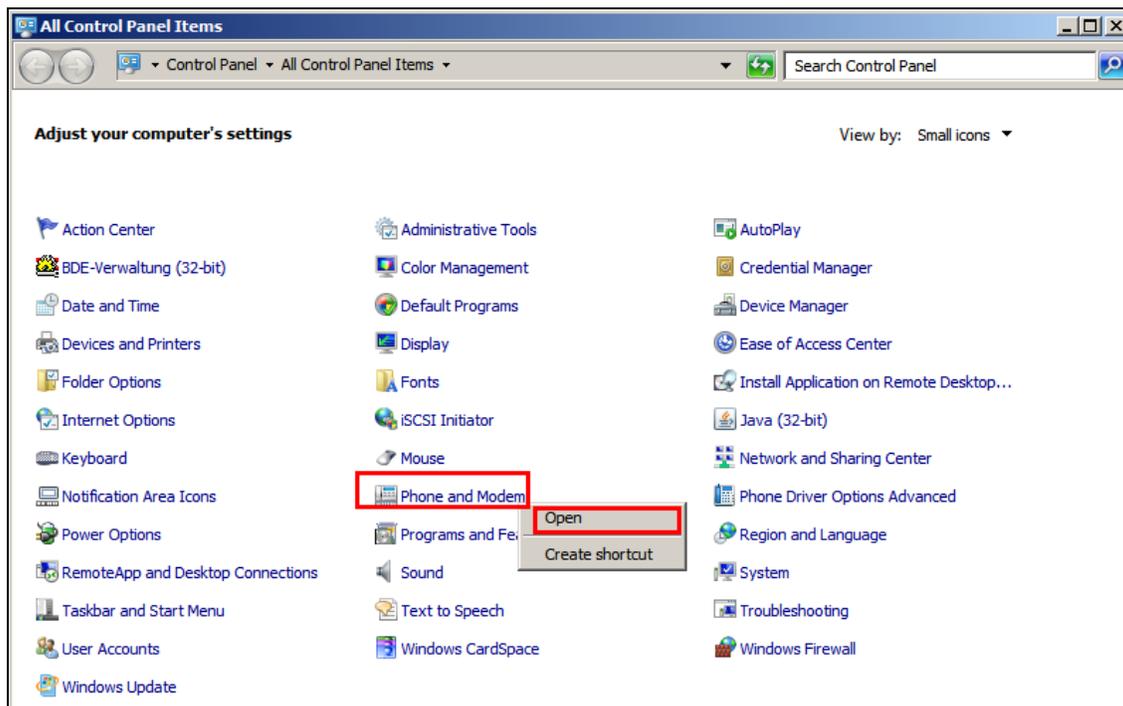


6. Installation and Configuration of Avaya IP Office TAPI3 Service Provider

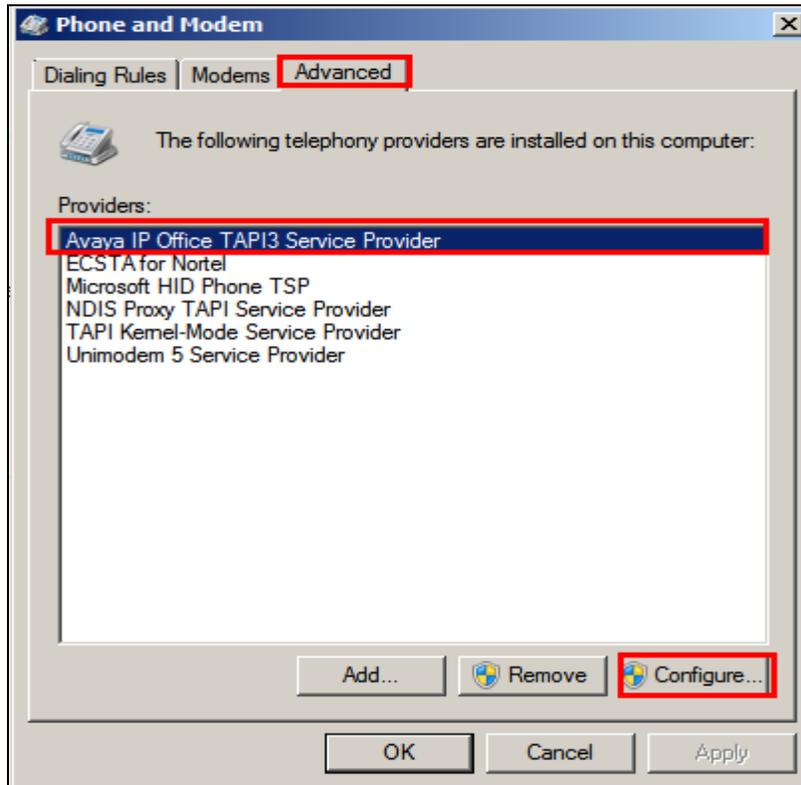
TAPI3 Service Provider is included in the IP Office CTI Link Software Development Kit (SDK) located on the DevConnect website (<http://www.avaya.com/gcm/master-usa/en-us/corporate/alliances/devconnect/index.htm>) under the product name IP Office. Once downloaded the install is initiated by running **TAPI3Install.exe** as shown below.



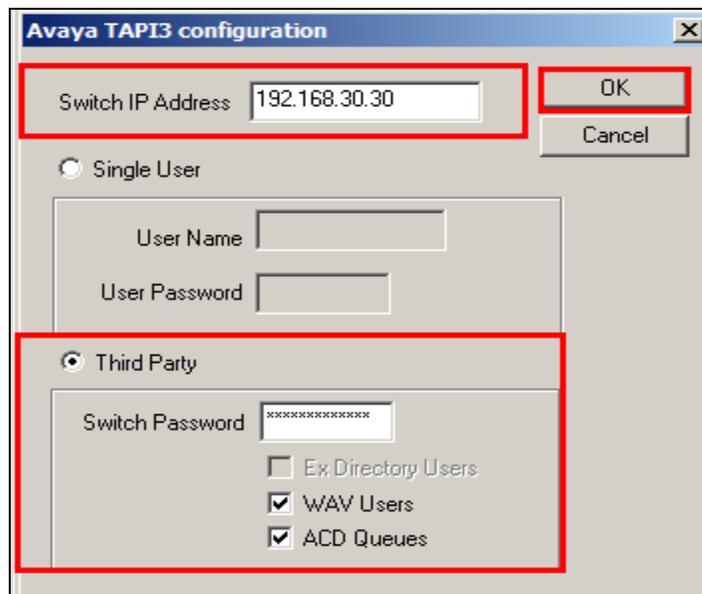
To configure the TAPI Service Provider, navigate to **Control Panel** and right click on **Phone and Modem Options** and **Open** as highlighted below.



Click on the **Advanced** tab and highlight **Avaya IP Office TAPI3 Service Provider** and click **Configure**.



Enter the IP Office IP address into the **Switch IP Address** box. Select **Third Party** and enter the IP Office Administrators password into the **Switch Password** box. Ensure **WAV Users** and **ACD Queues** are ticked as shown below.

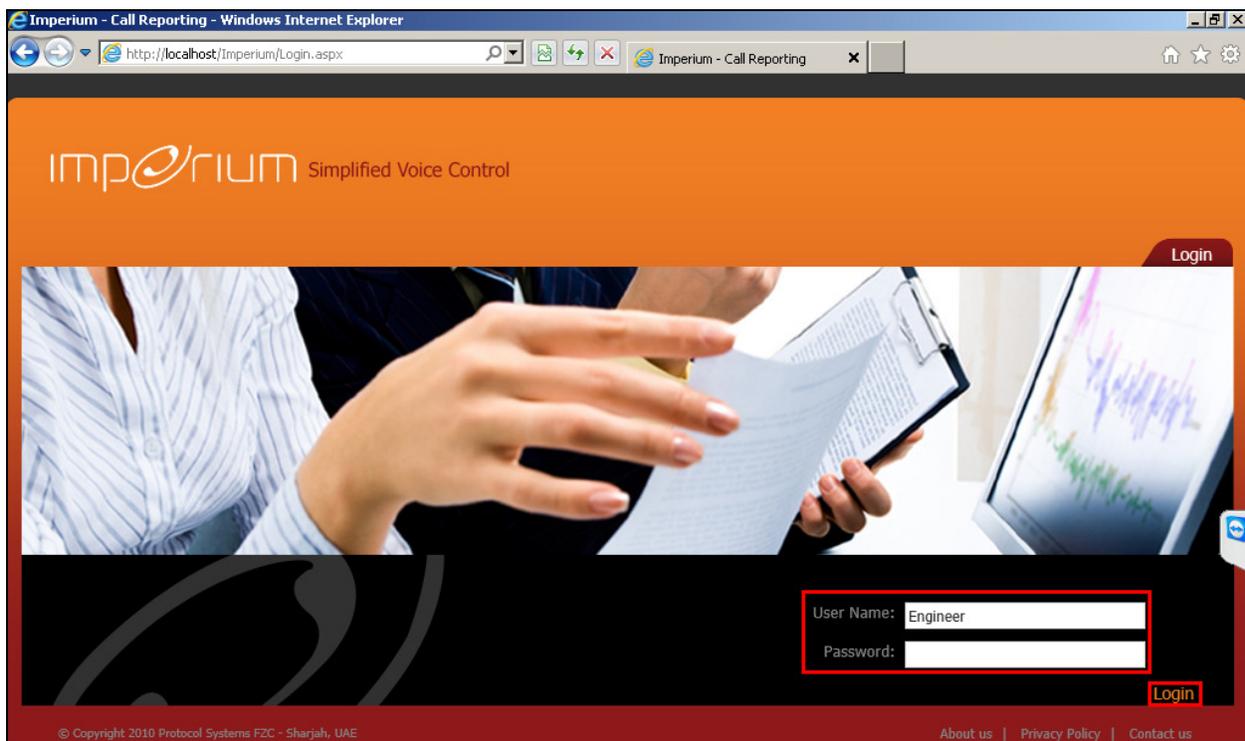


7. Configuration of Protocol Systems Imperium Server

This section outlines the steps necessary to configure the Imperium Server to enable screen pops through a connection to the IP Office over TAPI. All configuration changes on the Imperium Server are made using a web browser connecting to the Imperium Servers IP Address.

7.1. Imperium PBX connection configuration

Open a web browser and navigate to **http://<ImperiumServerIPAddress>/Imperium/Login.aspx**. Once the **Login** page appears enter the **User Name Engineer** with the suitable **Password**. Click on the **Login** button highlighted below.

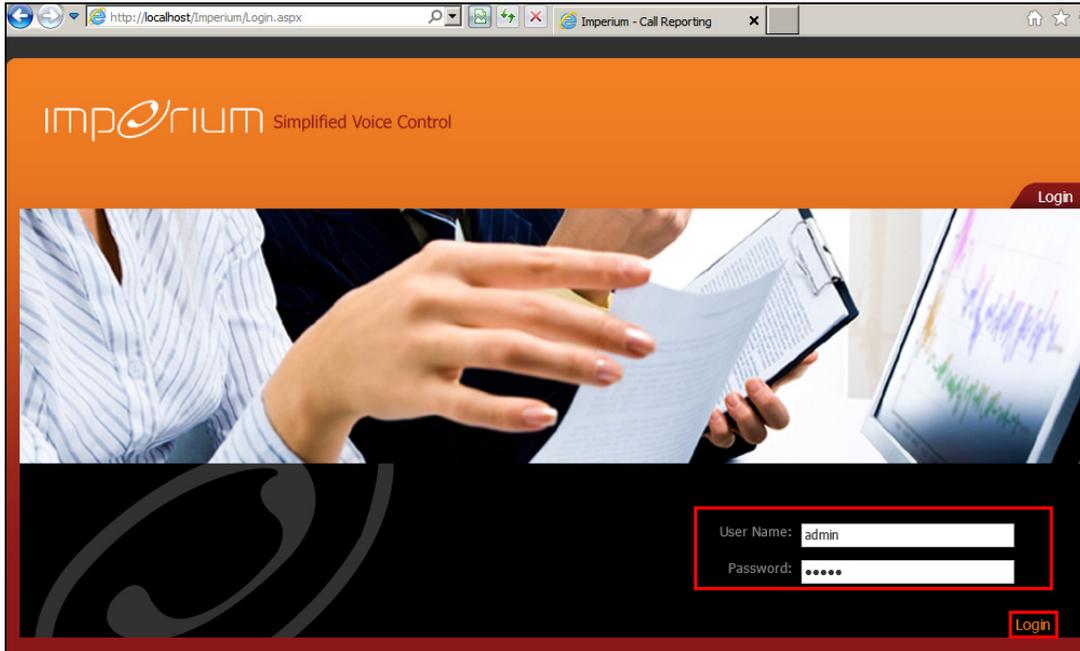


Once logged in click on the **Utility** tab. Once there click on the **Master** tab and the Site Info page is shown where the **Site Name**, **Location**, and contact details are added. Click on **Add New** once all the details are added correctly.

Click on the **Configuration** tab highlighted and the **PBXCount Info** page is shown. Here the **Site Name** that was created above is selected along with the **PBX Name**. The IP address for the PBX is entered & all other information is not necessary for the CTI connection.

7.2. Imperium User Configuration

Open a web browser and navigate to the Imperium login page <http://<ImperiumServerIPAddress>/Imperium/Login.aspx>. Once the **Login** page appears enter the **User Name Admin** with the suitable **Password**. Click on the **Login** button highlighted below.



Click on the Settings tab at the top of the screen and select the **Extension** tab highlighted.

Extension	User	Mobile No	Auth Code	Branch	Department	Email Id	Edit	All	Delete
	E							<input type="checkbox"/>	
204	Extn204			Ireland	ADMIN			<input type="checkbox"/>	
205	Extn205			Ireland	ADMIN			<input type="checkbox"/>	
206	Extn206			Ireland	ADMIN			<input type="checkbox"/>	
207	Extn207			Ireland	ADMIN			<input type="checkbox"/>	
208	Extn208			Ireland	ADMIN			<input type="checkbox"/>	

Scroll down to the **Add Extension** section at the bottom of the screen and enter the extension number on the IP Office that requires CTI capability. Click on the **Add** button highlighted.

The screenshot shows the 'Extension' management interface. At the top, there are tabs for 'Branch', 'Department', and 'Extension'. Below the tabs is a search bar labeled 'Search By Extension : --Select--'. The main area contains a table with the following columns: Extension, User, Mobile No, Auth Code, Branch, Department, Email Id, Edit, All, and Delete. The table lists several existing extensions, including 4101, 500, 501, 502, 503, 5901, 5998, and 7001. At the bottom of the interface, there is an 'Add Extension' section with a text input field for 'Extension Number' containing the value '4003' and an 'Add' button. A 'CreateUser' button is also visible at the bottom right.

Extension	User	Mobile No	Auth Code	Branch	Department	Email Id	Edit	All	Delete
4101	E4101							<input type="checkbox"/>	
500	TAPI:500			Ireland	ADMIN			<input type="checkbox"/>	
501	TAPI:501			Ireland	ADMIN			<input type="checkbox"/>	
502	TAPI:502			Ireland	ADMIN			<input type="checkbox"/>	
503	TAPI:503			Ireland	ADMIN			<input type="checkbox"/>	
5901	Anologe			Ireland	ADMIN			<input type="checkbox"/>	
5998	Extn5998			Ireland	ADMIN			<input type="checkbox"/>	
7001	VoiceMail SIP			Ireland	IT			<input type="checkbox"/>	

A new user must be created for the new extension, ensure the tick box is selected opposite the new extension, as shown below. Then click on **CreateUser** at the bottom of the screen.

This screenshot shows the 'Extension' management interface after the new extension 4003 has been added. The table now includes the new entry at the top. The 'All' checkbox for the new extension 4003 is checked, indicating that a user must be created for it. The 'Add' button from the previous screenshot is no longer visible, and the 'CreateUser' button is highlighted at the bottom right.

Extension	User	Mobile No	Auth Code	Branch	Department	Email Id	Edit	All	Delete
4003								<input checked="" type="checkbox"/>	
4101	E4101							<input type="checkbox"/>	
500	TAPI:500			Ireland	ADMIN			<input type="checkbox"/>	
501	TAPI:501			Ireland	ADMIN			<input type="checkbox"/>	
502	TAPI:502			Ireland	ADMIN			<input type="checkbox"/>	
503	TAPI:503			Ireland	ADMIN			<input type="checkbox"/>	
5901	Anologe			Ireland	ADMIN			<input type="checkbox"/>	
5998	Extn5998			Ireland	ADMIN			<input type="checkbox"/>	

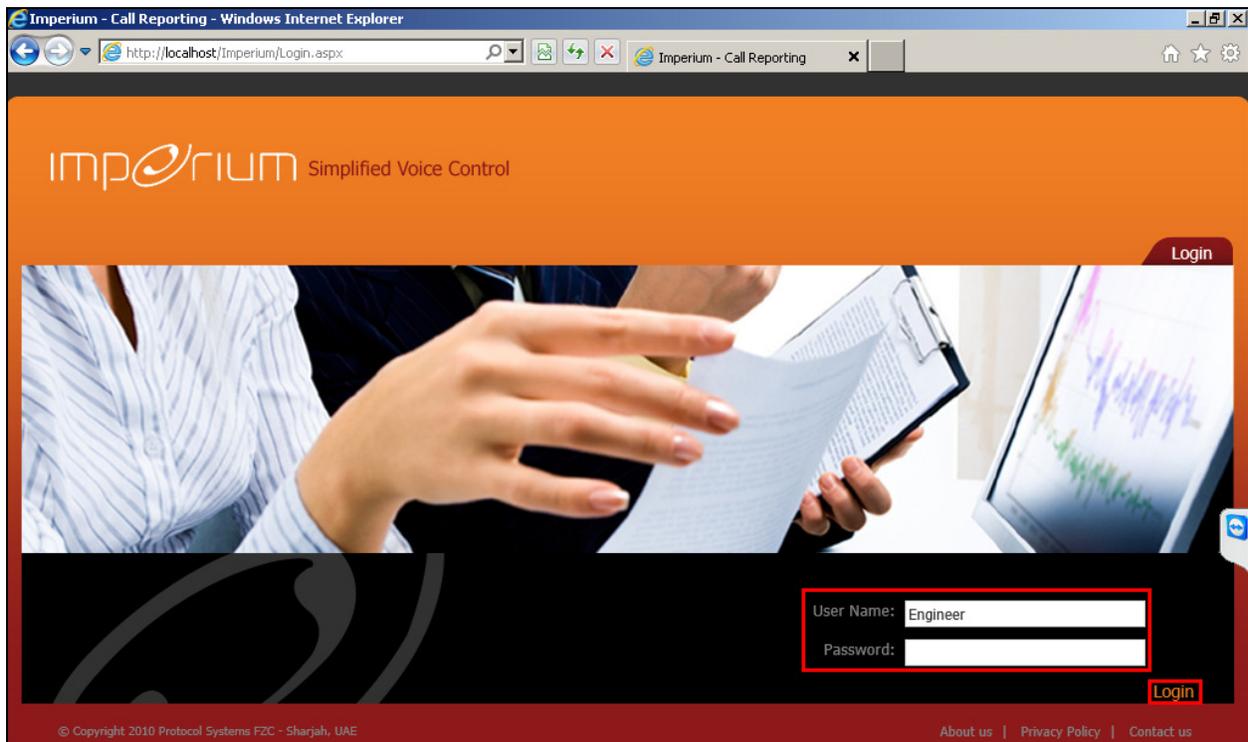
Once added the screen should show the **Created Successfully** message as highlighted below.

The screenshot shows the Imporium web application interface. At the top, the logo 'imporium Simplified Voice Control' is visible on the left, and the user status '!! Welcome admin / Login Time : 11:43' is on the right. A navigation bar contains buttons for 'Home', 'Admin', 'Settings', 'Reports', 'Help', and 'Logout'. Below this is a decorative banner image of a hand using a calculator. The main content area is titled 'Extension' and features a search bar with a dropdown menu set to '-Select-'. A red box highlights the message 'Created Successfully !!!' in the top left corner of the main content area. Below the search bar is a table with columns for Extension, User, Mobile No, Auth Code, Branch, Department, Email Id, Edit, All, and Delete. The table contains four rows of data:

Extension	User	Mobile No	Auth Code	Branch	Department	Email Id	Edit	All	Delete
	E							<input type="checkbox"/>	
204	Extn204			Ireland	ADMIN			<input type="checkbox"/>	
205	Extn205			Ireland	ADMIN			<input type="checkbox"/>	
206	Extn206			Ireland	ADMIN			<input type="checkbox"/>	

7.3. Imperium PBX connection configuration (Optional - If Installing along with Imperium Call Billing Suite)

Open a web browser and navigate to **http://<ImperiumServerIPAddress>/Imperium/Login.aspx**. Once the **Login** page appears enter the **User Name, Engineer** with the suitable **Password**. Click on the **Login** button highlighted below.



Once logged in click on the **Utility** tab. Once there click on the **Master** tab and the Site Info page is shown where the **Site Name**, **Location**, and contact details are added. Click on **Add New** once all the details are added correctly.

The screenshot displays a web application interface with a navigation menu at the top containing 'Home', 'Utility', 'Admin', 'Settings', 'Reports', 'Help', and 'Logout'. The 'Utility' tab is active. Below the navigation is a 'Master Information' section with a table listing site details. The 'Master' sub-tab is selected. Underneath, the 'Site Info' section is active, showing a form with the following data:

Select	Site Name	Location	Contact Name	Contact No
<input checked="" type="checkbox"/>	Avaya-Devconnect	Ireland	Paul	454545

Site Info				
SiteInfo	PBXInfo	Service Provider	AlertInfo	TrunkInfo
Site Name	Avaya-Devconnect			
Location	Ireland			
Contact Name	Paul			
Contact No	454545			

At the bottom of the form are three buttons: 'Add New', 'Update', and 'Cancel'.

Click on the **PBXInfo** tab and enter the following details for the IP Office connection.

- **PBX Name** This can be any suitable name
- **Connection Type** Must be set to **1**
- **Data split** Must be set to **1**
- **Separator** ,
- **Fields** **CALL_DATE, DURATION, RING_DURATION, CALLER_NO, DIRECTION, CALLED_NO, DIALED_NO, ACC, FLAG1, CALL_ID, FLAG2, FLAG3, FLAG4, FLAG5, TRUNK_ID, FLAG7, FLAG8, FLAG9, AUTH_CODE, FLAG10, FLAG11, FLAG12, FLAG13, FLAG14, FLAG15, FLAG16, FLAG17, FLAG18, FLAG19, FLAG20**

Master Information Configuration **Master**

Select	PBX Name	ConnectionType	Data Split	Separator
<input checked="" type="checkbox"/>	Avaya Communication Manager	0	0	6,1,6,1,6,1,5,1,1,1,4,1,4,1,23,1,15,1,4,1,7,1,3,1,3,1,1,1,1,5,1,7,1,4,1,20,1,1,1,1
<input checked="" type="checkbox"/>	IP Office	1	1	,
<input checked="" type="checkbox"/>	IP Office Server Edition	0	1	,

PBX Info SiteInfo **PBXInfo** Service Provider AlertInfo TrunkInfo

PBX Name: IP Office

Connection Type: 1

Data split: 1

Separator: ,

Fields: CALL_DATE, DURATION, RING_DURATION, CALLER_NO, DIRECTION, CALLED_NO, DIALED_NO, ACC, FLAG1, CALL_ID, FLAG2, FLAG3, FLAG4, FLAG5, TRUNK_ID, FLAG7, FLAG8, FLAG9, AUTH_CODE, FLAG10, FLAG11, FLAG12, FLAG13, FLAG14, FLAG15, FLAG16, FLAG17, FLAG18, FLAG19, FLAG20

Add New Update Cancel

Click on the **Configuration** tab highlighted and the **PBXCount Info** page is shown. Here the **Site Name** that was created above is selected along with the **PBX Name**. The IP address for the PBX is entered along with the port number for the SMDR output.

Select	SITE_NAME	PBX_NAME	PBX_NO	PBX_IP	PORT_NO
<input checked="" type="checkbox"/>	Avaya-Devconnect	IP Office	1	192.168.30.30	9001
<input checked="" type="checkbox"/>	Avaya-Devconnect	IP Office Server Edition	1	192.168.10.250	6005

PBXCount Info

PBXCount | **ApplnInfo**

Site Name	Avaya-Devconnect	Prefix Status	Disable
PBX Name	IP Office	Extension Max Len	5
PBX No	1	Mis Name	MIS1
PBX_IP	192.168.30.30	Alert Name	Failure Alert
Port No	9001	Countrycode	00971
Socket Timeout	20	Areacode	06
Socket Sleep	10800	Mobilecode	05
Prefix Value	9	Service Code	1
Trunk Name	ETISALAT	Status	1

Click on the **AppInInfo** tab highlighted. Three Applications must be added here.

- PBXCALLCOSTCALCULATOR
- PBXDATALOGGER
- PBXFILEWATCHER

Add the **PBXCALLCOSTCALAULATOR** application with the necessary **License Key** available from Protocol Systems. Click **Add New** once added correctly.

Select	APPLN_NAME	PBX Name	LICENSE_KEY
<input checked="" type="checkbox"/>	PBXCALLCOSTCALCULATOR	IP Office	pcH+BSapklSZllLWW3gCjZl0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXDATALOGGER	IP Office	pcH+BSapklSZllLWW3gCjZl0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXFILEWATCHER	IP Office	pcH+BSapklSZllLWW3gCjZl0RsYSbarz9q8bvQRadc=

Application Info

PBXCount | **ApplnInfo**

Application Name	PBXCALLCOSTCALCULATOR
PBX Name	IP Office
License Key	pcH+BSapklSZllLWW3gCjZl0RsYSbarz9q8bvQRadc=

Add New **Update** **Cancel**

Add the **PBXDATALOGGER** application with the necessary **License Key** available from Protocol Systems. Click **Add New** once added correctly.

The screenshot shows the Configuration interface with a table of applications and an Application Info form. The table lists three applications: PBXCALLCOSTCALCULATOR, PBXDATALOGGER, and PBXFILEWATCHER. The Application Info form for PBXDATALOGGER is highlighted with a red box, showing the following fields:

Select	APPLN_NAME	PBX Name	LICENSE_KEY
<input checked="" type="checkbox"/>	PBXCALLCOSTCALCULATOR	IP Office	pcH+BSapklSZIILLWW3gCjZi0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXDATALOGGER	IP Office	pcH+BSapklSZIILLWW3gCjZi0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXFILEWATCHER	IP Office	pcH+BSapklSZIILLWW3gCjZi0RsYSbarz9q8bvQRadc=

Application Info

PBXCount: **ApplnInfo**

Application Name: PBXDATALOGGER

PBX Name: IP Office

License Key: pcH+BSapklSZIILLWW3gCjZi0RsYSbarz9q8bvQRadc=

Buttons: Add New, Update, Cancel

Add the **PBXFILEWATCHER** application with the necessary **License Key** available from Protocol Systems. Click **Add New** once added correctly.

The screenshot shows the Configuration interface with a table of applications and an Application Info form. The table lists three applications: PBXCALLCOSTCALCULATOR, PBXDATALOGGER, and PBXFILEWATCHER. The Application Info form for PBXFILEWATCHER is highlighted with a red box, showing the following fields:

Select	APPLN_NAME	PBX Name	LICENSE_KEY
<input checked="" type="checkbox"/>	PBXCALLCOSTCALCULATOR	IP Office	pcH+BSapklSZIILLWW3gCjZi0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXDATALOGGER	IP Office	pcH+BSapklSZIILLWW3gCjZi0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXFILEWATCHER	IP Office	pcH+BSapklSZIILLWW3gCjZi0RsYSbarz9q8bvQRadc=

Application Info

PBXCount: **ApplnInfo**

Application Name: PBXFILEWATCHER

PBX Name: IP Office

License Key: pcH+BSapklSZIILLWW3gCjZi0RsYSbarz9q8bvQRadc=

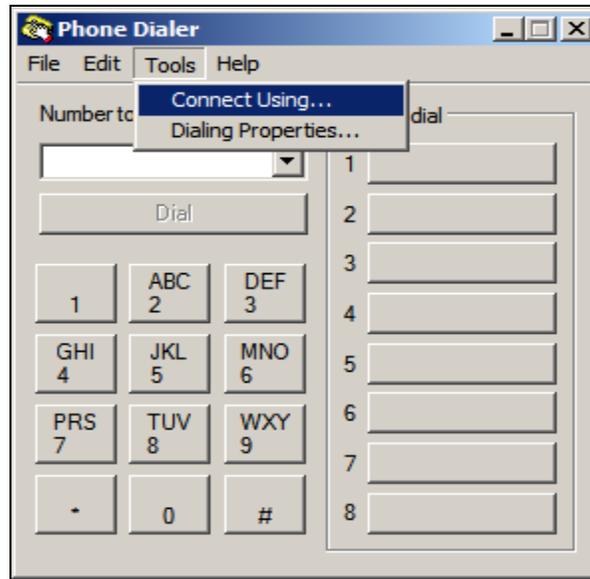
Buttons: Add New, Update, Cancel

8. Verification Steps

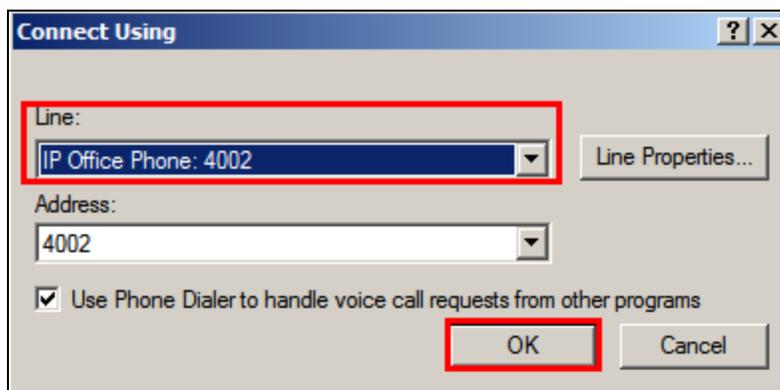
This section illustrates the steps necessary to verify that the Imperium Server is connected to the IP Office correctly in order to receive screen pop information.

8.1. Verify that Avaya IP Office TAPI Service Provider is running correctly

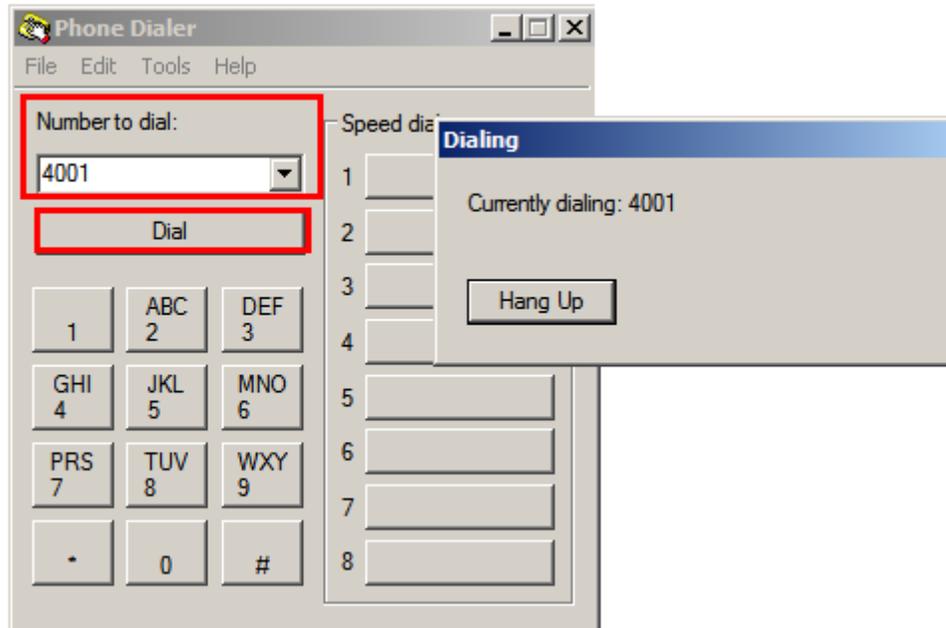
Open **Phone Dialer** (Windows program installed on all Windows platforms) on the Imperium Server where TAPI is installed. Click on the Tools menu and select **Connect Using**.



Another box opens as shown below. Open the **Line** dropdown box and all the IP Office users should appear as an available line to use.



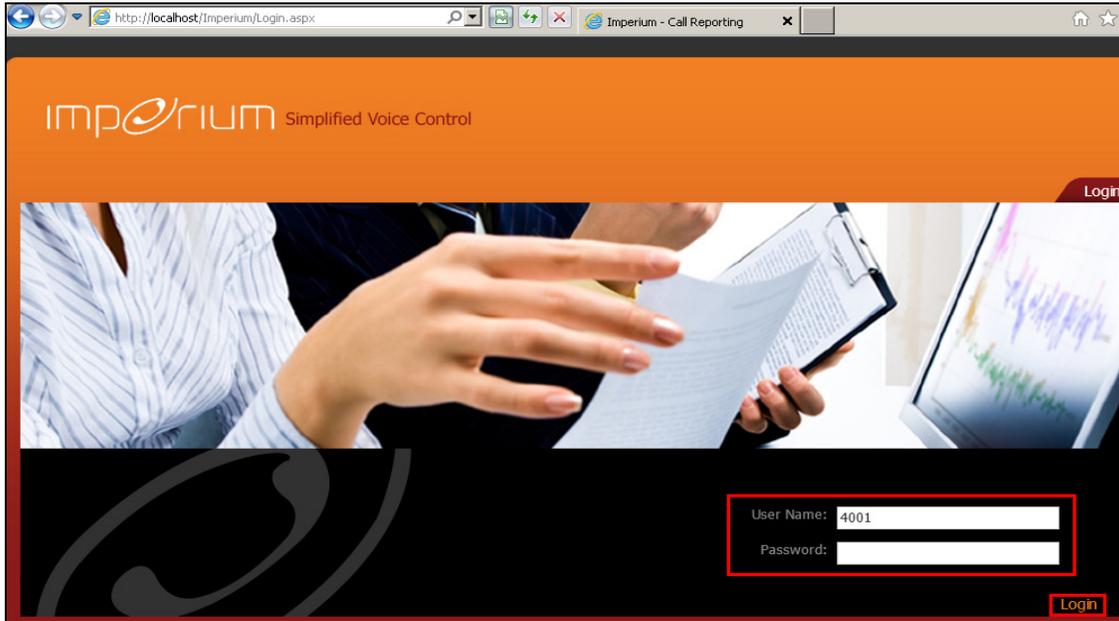
In the box **Number to dial** enter a valid IP Office extension number as shown below and click **Dial**. The **Phone Dialer** should successfully call the chosen extension number.



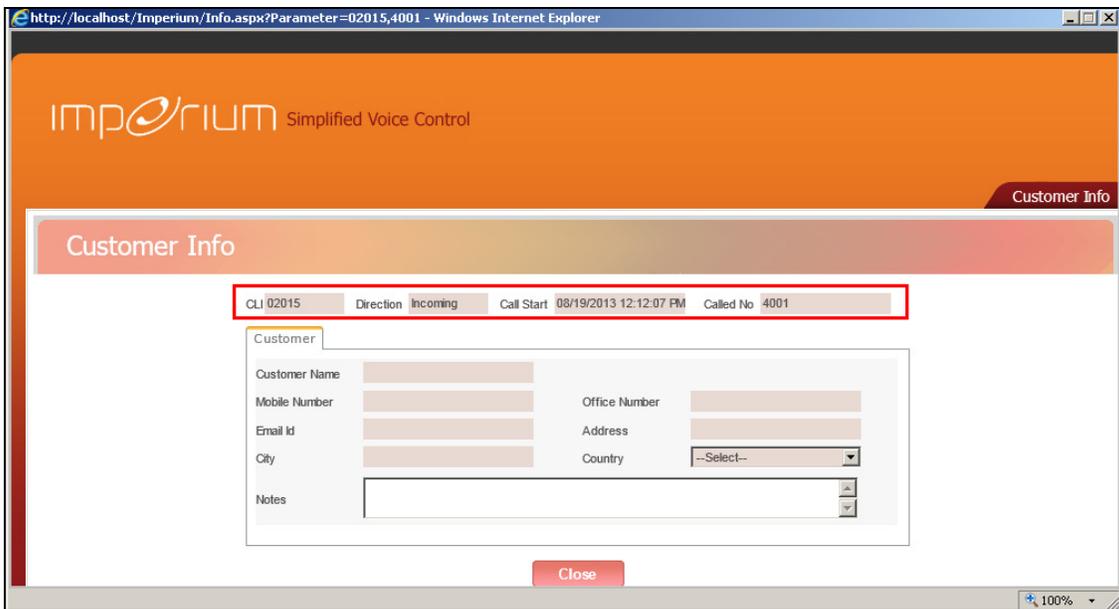
8.2. Verify that Imperium Client can receive screen pops

Open a web browser and navigate to the Imperium login page

http://<ImperiumServerIPAddress>/Imperium/Login.aspx. Once the **Login** page appears enter the **User Name** of an agent created in **Section 7.2** with the suitable **Password**. Click on the **Login** button highlighted below.



Make a call to the extension of the user logged in above in the example below extension **2015** has called extension **4001**. This information is reflected on the screen pop shown below.



9. Conclusion

As illustrated in these Application Notes the procedures for configuring Protocol Systems Imperium Server to interoperate with Avaya IP Office R8.1 connecting to the IP Office via the TAPI Driver loaded on the Imperium Server. In the configuration described in these Application Notes, various types of calls including intra-switch and PSTN calls were tested and a screen pop was produced for each call. During compliance testing, all test cases were completed successfully as outlined in **Section 2.2**.

10. Additional References

This section references documentation relevant to these Application Notes. The Avaya product documentation is available at <http://support.avaya.com>.

- [1] *Avaya IP Office R8.1 Manager 10.1*, August 3rd 2012, Issue 29o, Document Number 15-601011
- [2] *IP Office R8.1 Doc library*

The following Imperium product documentation can be found at www.protocolsystems-me.com

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