



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Imperium Software from Protocol Systems with Avaya IP Office R8.1 Using an SMDR Connection to Receive CDR Data -Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Protocol Systems Imperium Software to successfully interoperate with Avaya IP Office to collect CDR data.

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 the Imperium software R1.2 with Avaya IP Office R8.1 using Station Message Detail Reporting (SMDR) for collecting Call Detail Record (CDR).

Imperium call control system can report on call data from the Avaya IP Office and process billing data provided by telecom service providers, including mobile phone billing data.

2. General Test Approach and Test Results

The overall objective of this interoperability compliance testing is to verify that the Imperium call accounting software can interoperate with the Avaya IP Office 8.1. The Imperium server connects to the Avaya IP Office SMDR port in order to receive delivery of CDR information. Call records will then be generated for various types of calls and collected by Imperium. Serviceability testing will also be conducted to assess the reliability of the solution.

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 processing of SMDR data obtained from the Avaya IP Office via a TCP-IP link. The serviceability testing introduced failure scenarios to see if the Imperium server could resume after a link failure with the Avaya IP Office.

The testing included:

- Local internal call handling
- Handling of incoming network calls
- Handling of external calls to network
- Call Forwarding
- Transfers – Blind and Supervised
- Conference calls
- Call Pick Up
- Bridged Appearances
- Calls to hunt groups
- Handling of calls to and from Avaya Digital, H323 and SIP phones

2.2. Test Results

All tests passed successfully. The following observations were noted during testing but these are all expected results according to Protocol Systems.

- When performing a call to a busy IP Office extension the CDR shows “Busy” for internal calls only, there is no information when call originates from PSTN.
- When performing a call to a busy PSTN extension there is no information to show the line was busy.
- When performing a call from one extension forwarded to another, there is no data on the CDR to indicate the call was forwarded. Note this is only when forwarded to an internal number, this is not the case when forwarded to the PSTN, and this is the same for all call forward types.
- There is no information of a call pickup if the call is an internal call.
- A call that is parked shows Park time but does not show on what extension it was parked.

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 connects to the IP Office using the SMDR port to receive CDR information. Avaya 9408 Digital Deskphones and 9608 H.323 IP Deskphones are used in making and receiving calls.

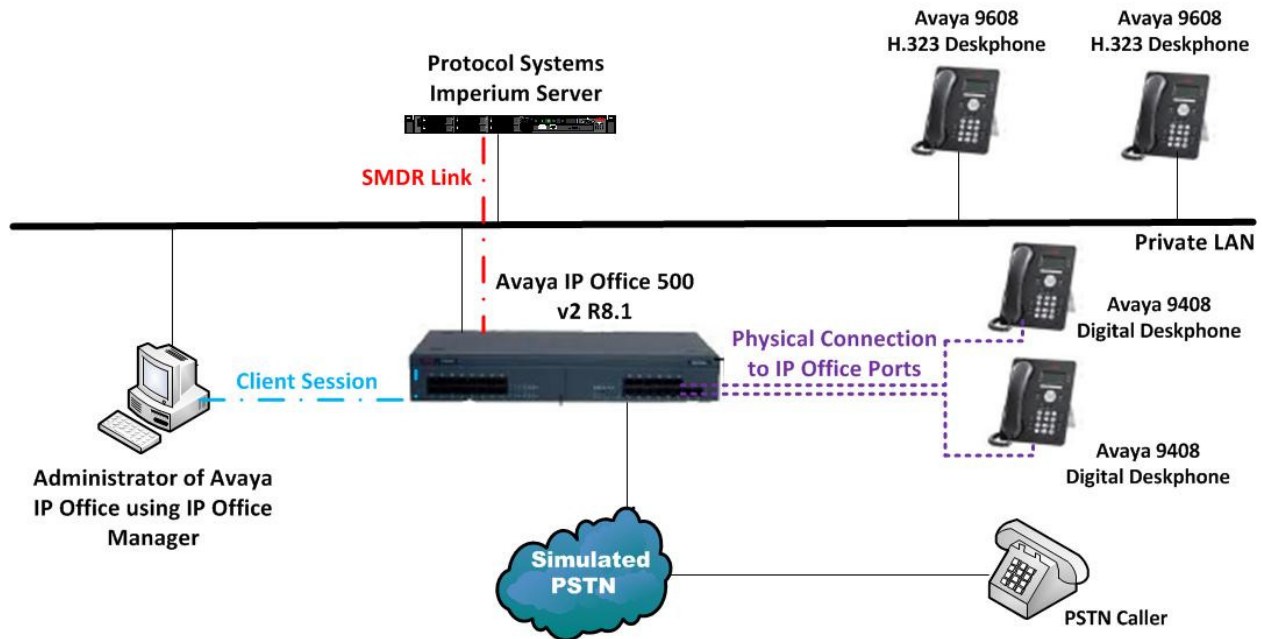


Figure 1: Connection of Protocol Systems Imperium Server with Avaya IP Office R8.1

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 9608 IP Deskphone	H323 6.2.009
Avaya 9408 Digital Deskphone	N/A
Windows 2008 Server O/S and Protocol Systems Imperium Server	R1.2
Client Workstation with Windows XP	Internet Explorer R8.0

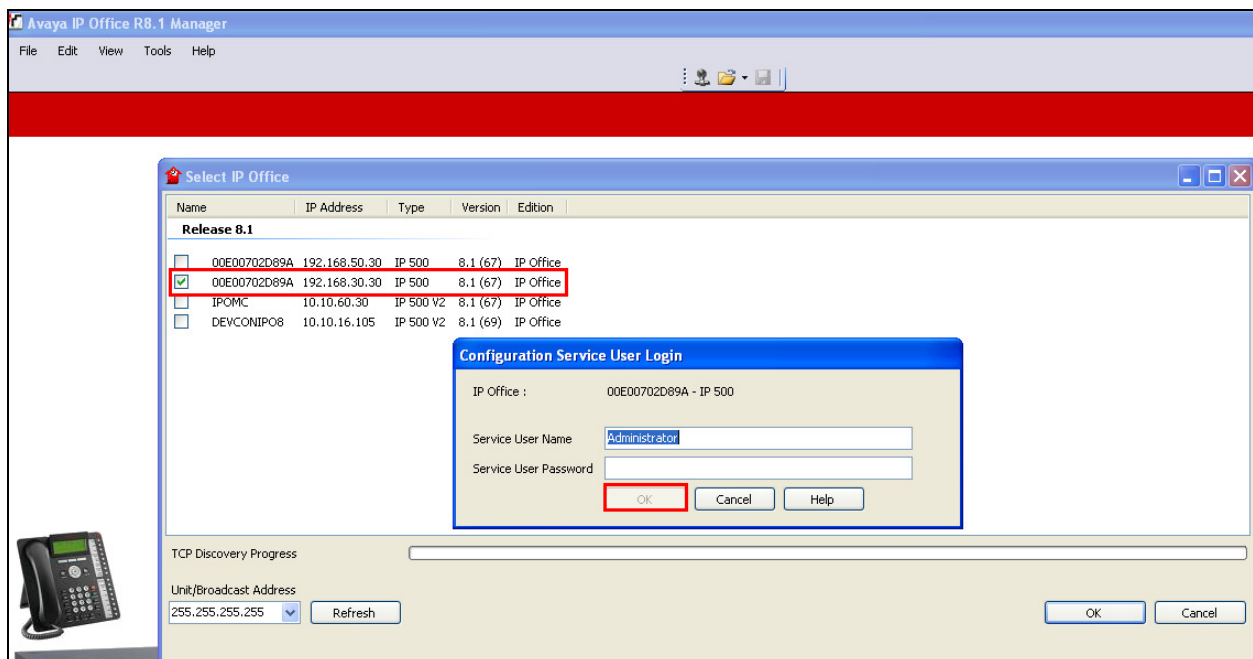
5. Configuration of Avaya IP Office

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 9**. The configuration operations described in this section can be summarized as follows:

- Launch Avaya IP Office Manager
- Display LAN Configuration
- SMDR Configuration
- Save Configuration

5.1. Launch Avaya IP Office Manager

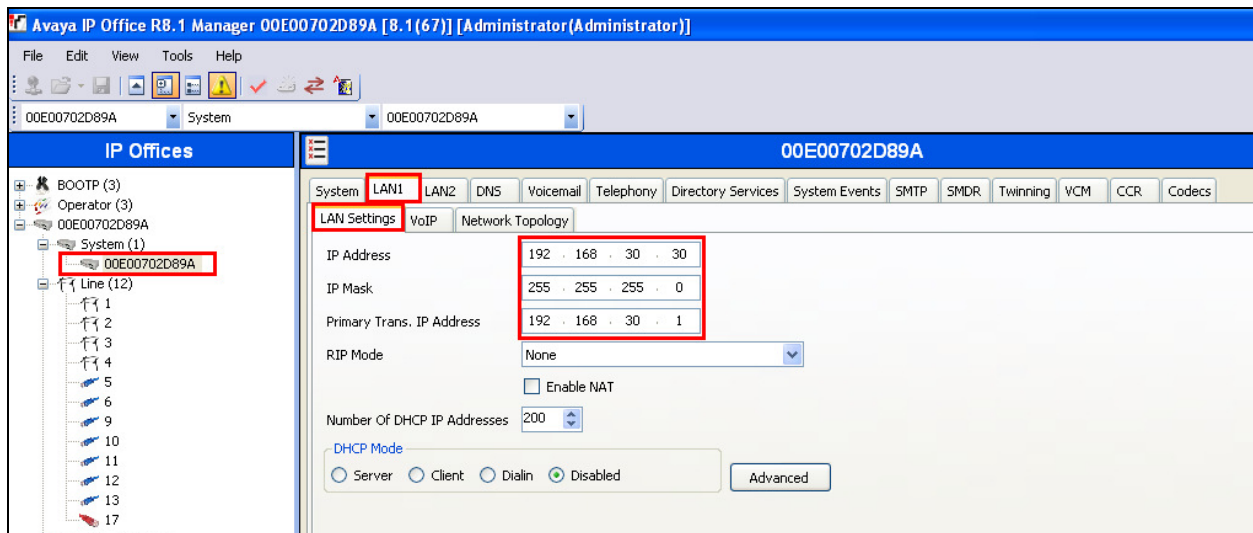
From the Avaya IP Office Manager PC, go to **Start→Programs→IP Office→Manager** to launch the Manager application (not shown). Log in to Avaya IP Office using the appropriate credentials to receive its configuration.



5.2. Display LAN Configuration

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

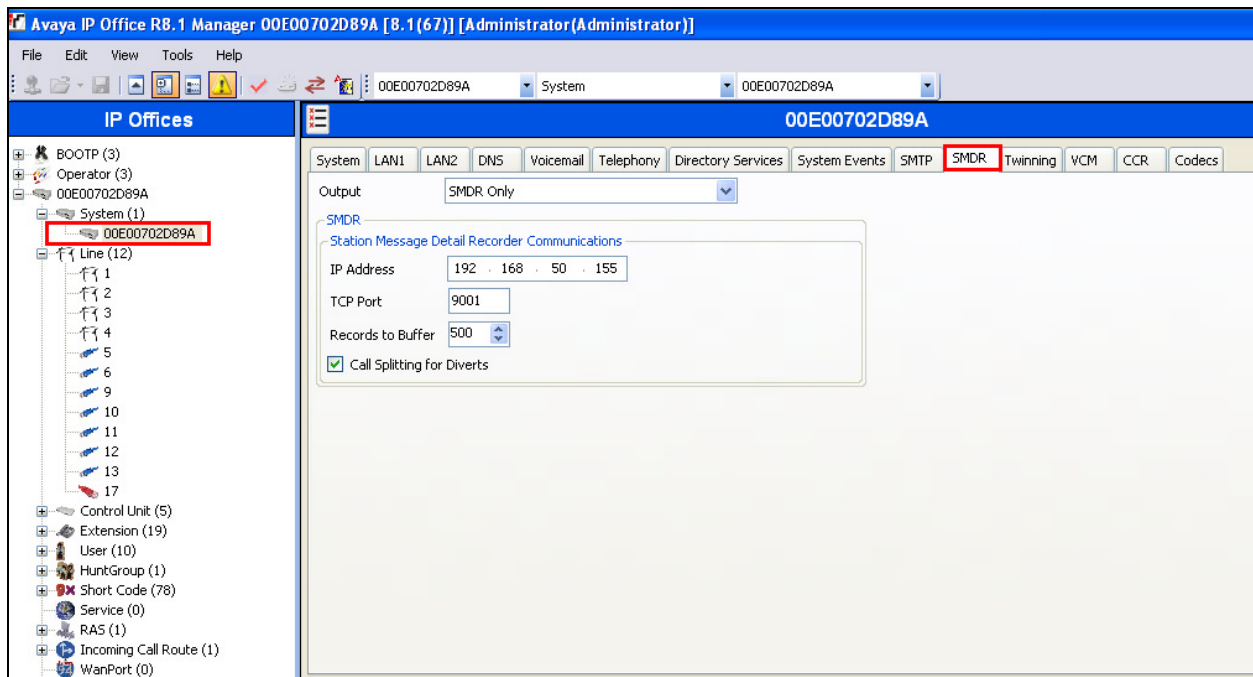
- **IP Address** IP Address of the IP Office that will be required in **Section 6.1** during the configuration of the Imperium Server
- **IP Mask** Subnet mask for the IP Office
- **Primary Trans IP** Gateway IP Address



5.3. SMDR Configuration

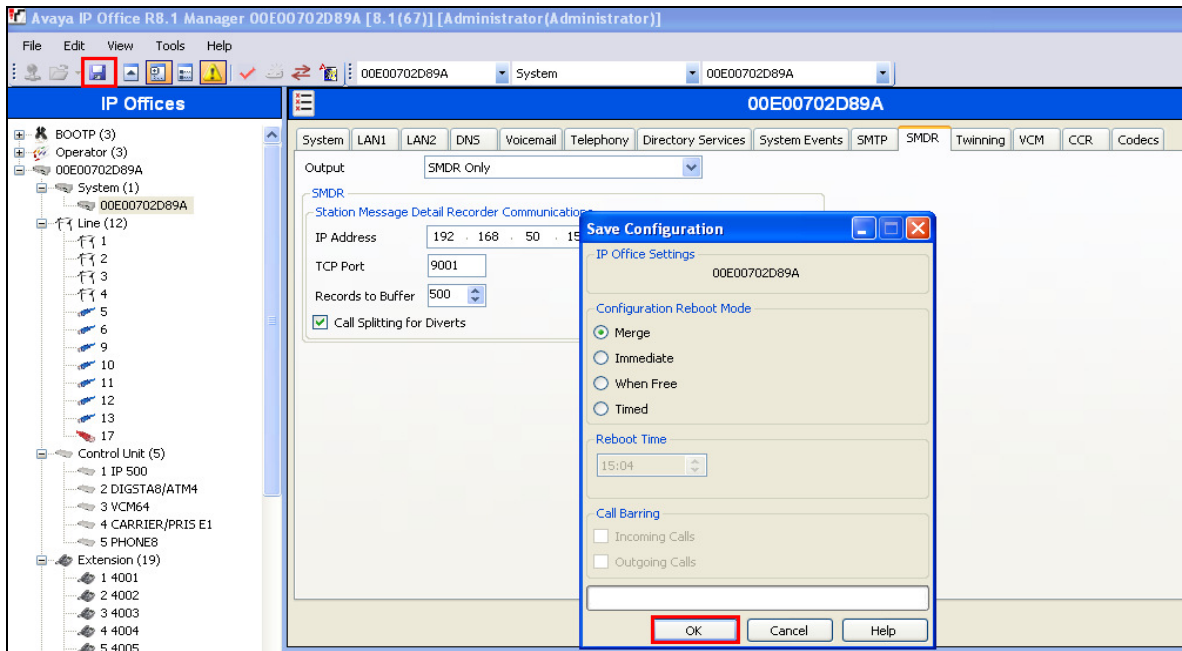
In the IP Offices window expand the configuration tree in the left pane and double-click **System**. During compliance testing the System was called **00E00702D89A**. Select the **SMDR** tab and enter the following information:

- **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

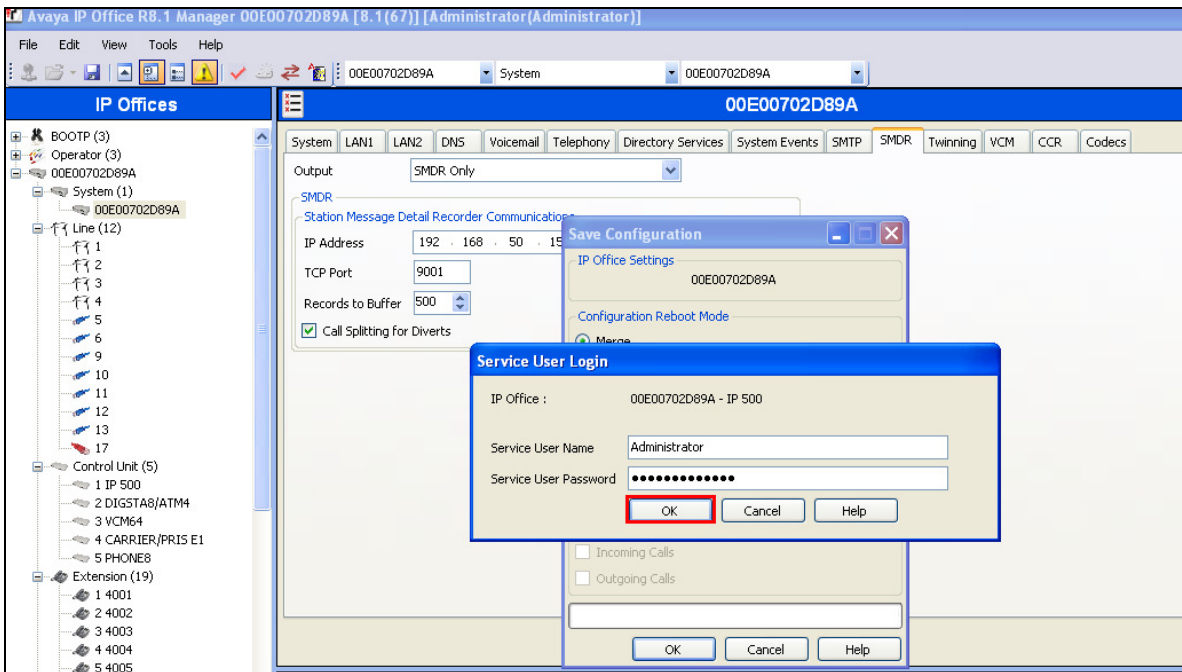


5.4. Save Configuration

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.

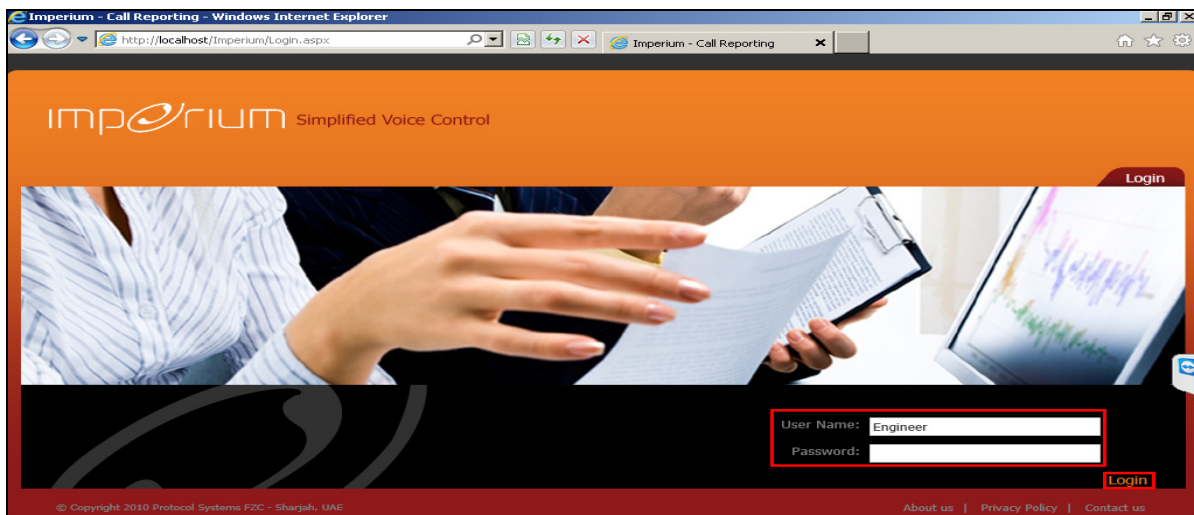


6. Configuration of Protocol Systems Imperium Server

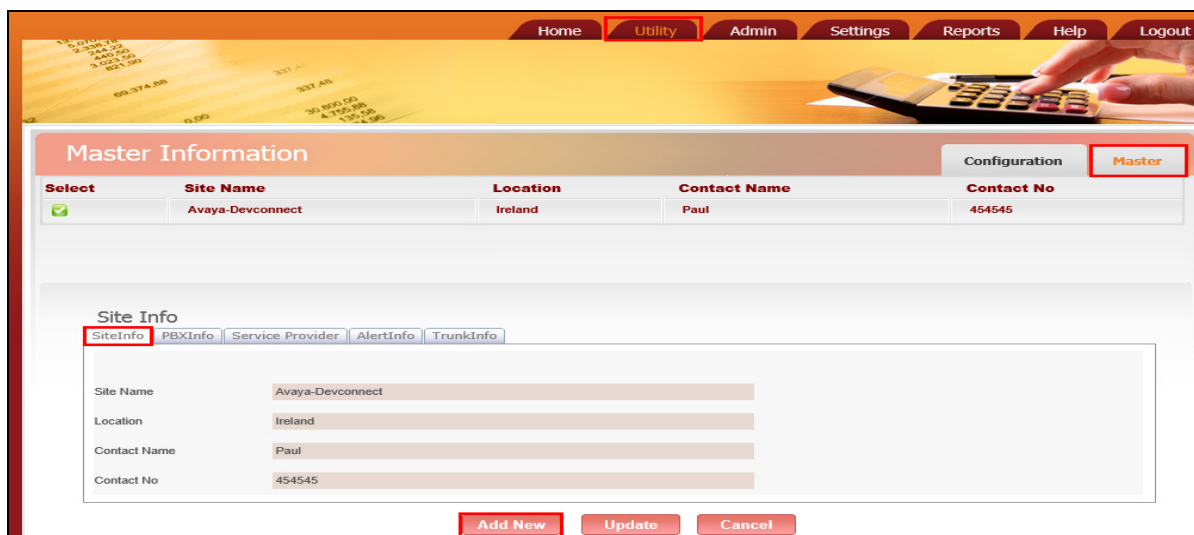
This section outlines the steps necessary to configure the Imperium Server to enable the collection of CDR records via the SMDR connection on IP Office.

6.1. 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.

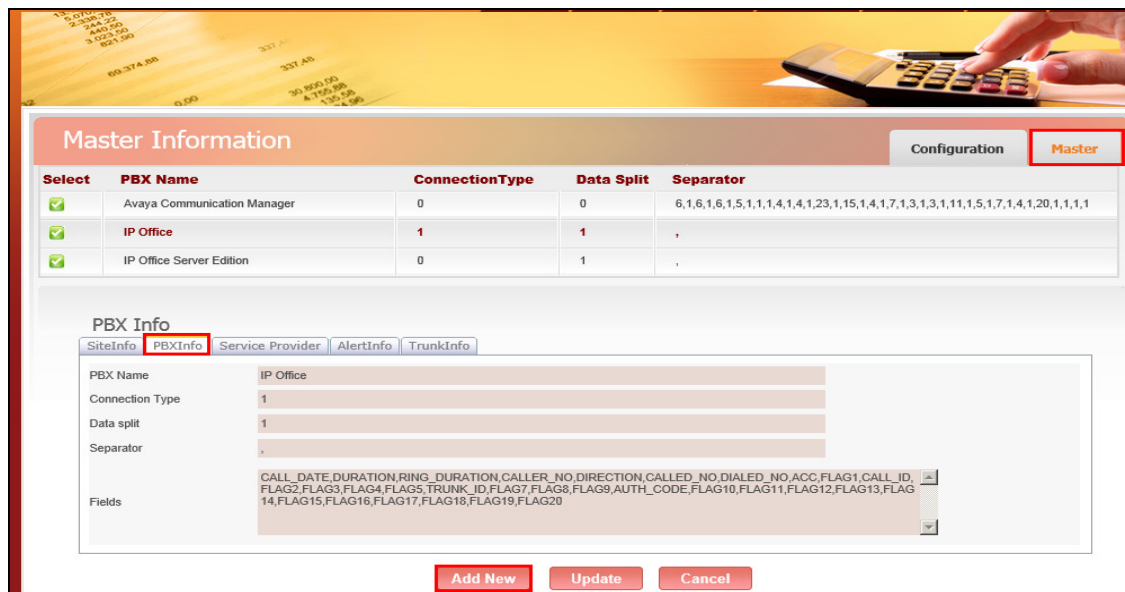


Once logged in click on the **Utility** tab. Once there click on **Master** tab and the Site Info page is shown where the **Site Name**, **Location**, and contact details are added. Click on the **Add New** button once all the details are added correctly.



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**



The screenshot shows a software interface for configuring PBX information. At the top, there's a 'Master Information' header with 'Configuration' and 'Master' tabs. Below this is a table listing PBX entries:

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
<input checked="" type="checkbox"/>	IP Office	1	1	,
<input checked="" type="checkbox"/>	IP Office Server Edition	0	1	,

Below the table, the 'PBX Info' section is active, showing fields for the selected 'IP Office' entry:

- 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

At the bottom, there are 'Add New', 'Update', and 'Cancel' buttons.

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 **ApplnInfo** tab highlighted. Three Applications must be added here.

- PBXCALLCOSTCALCULATOR
- PBXDATA LOGGER
- 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"/>	PBXDATA LOGGER	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' page with a table of applications and an 'Application Info' form below it. The 'Configuration' tab is selected. The table lists three applications: PBXCALLCOSTCALCULATOR, PBXDATALOGGER, and PBXFILEWATCHER. The 'Application Info' form is open for 'PBXDATALOGGER'.

Select	APPLN_NAME	PBX Name	LICENSE_KEY
<input checked="" type="checkbox"/>	PBXCALLCOSTCALCULATOR	IP Office	pcH+BSapkiSZIILWW3gCjZi0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXDATALOGGER	IP Office	pcH+BSapkiSZIILWW3gCjZi0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXFILEWATCHER	IP Office	pcH+BSapkiSZIILWW3gCjZi0RsYSbarz9q8bvQRadc=

Application Info

PBXCount **ApplnInfo**

Application Name: PBXDATALOGGER

PBX Name: IP Office

License Key: pcH+BSapkiSZIILWW3gCjZi0RsYSbarz9q8bvQRadc=

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' page with a table of applications and an 'Application Info' form below it. The 'Configuration' tab is selected. The table lists three applications: PBXCALLCOSTCALCULATOR, PBXDATALOGGER, and PBXFILEWATCHER. The 'Application Info' form is open for 'PBXFILEWATCHER'.

Select	APPLN_NAME	PBX Name	LICENSE_KEY
<input checked="" type="checkbox"/>	PBXCALLCOSTCALCULATOR	IP Office	pcH+BSapkiSZIILWW3gCjZi0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXDATALOGGER	IP Office	pcH+BSapkiSZIILWW3gCjZi0RsYSbarz9q8bvQRadc=
<input checked="" type="checkbox"/>	PBXFILEWATCHER	IP Office	pcH+BSapkiSZIILWW3gCjZi0RsYSbarz9q8bvQRadc=

Application Info

PBXCount **ApplnInfo**

Application Name: PBXFILEWATCHER

PBX Name: IP Office

License Key: pcH+BSapkiSZIILWW3gCjZi0RsYSbarz9q8bvQRadc=

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

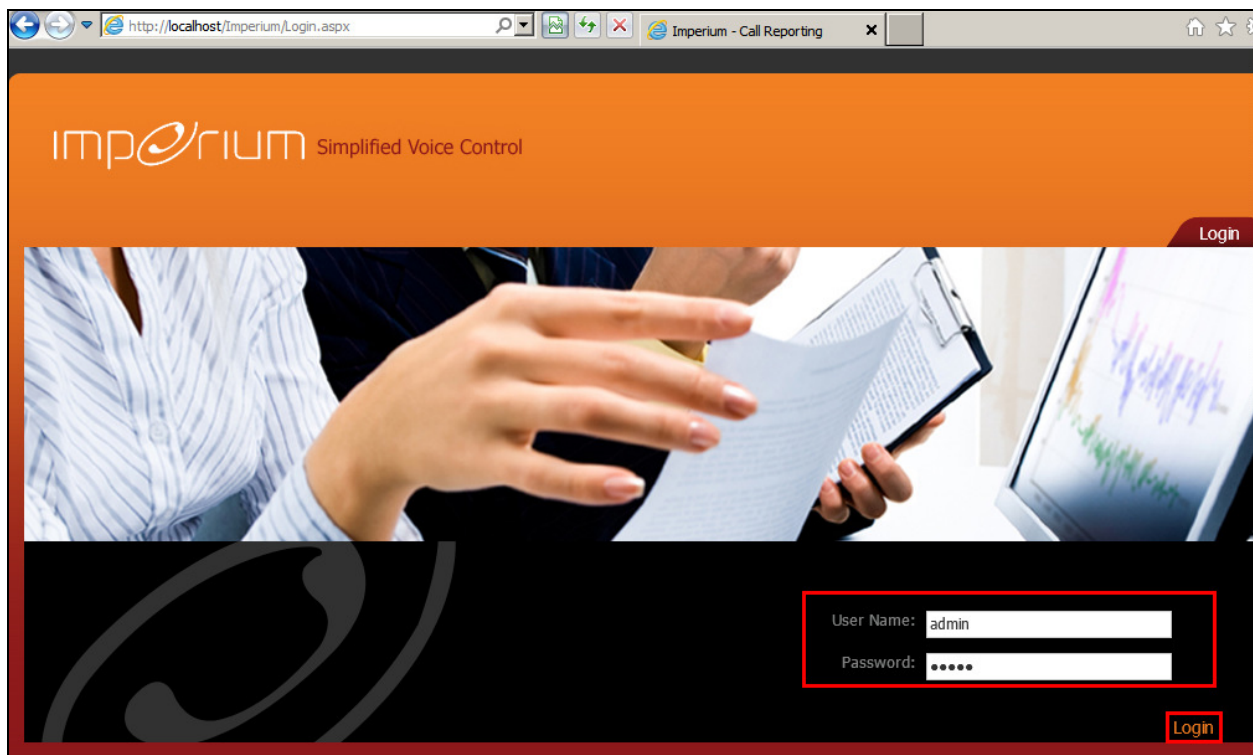
7. Verification Steps

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

7.1. Verify that Imperium call logger is retrieving the SMDR data

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 Reports tab at the top of the page and click on the Reports tab in the Reports main window. Select the data range and the extension numbers and call types for the report and once finished click on Generate to continue.

Home Admin Settings **Reports** Help Logout

Reports Data Log **Reports**

Date Option: Today
From Dt: 8/19/2013 12:00 AM
To Dt: 8/19/2013 01:12 PM
Branch: All Branches
Department: All Departments
Extension: All Extensions
Call Type: All Calls
Trunk: All Trunks
AuthCode: All AuthCodes

Direction: Outgoing
Cost: Disable
Highest Duration / Cost: ☐ Top
Search By Number: ☐
Group By: Date
Order By: Date
Report Type: ☒ Detail ☐ Summary

Save Template as: Save Templates: Select

Generate

The following screenshot of a report shows calls for Extensions **4001** and **4002**.

http://localhost/ - Report - Windows Internet Explorer

1 / 2 Main Report 100% Business Objects

DevconnectI Call Report

Date From : 5/20/2013 12:00:00 AM Date To : 5/20/2013 11:59:59 PM Direction : B

Call_start	Duration	Direction	Caller	Caller Name	Called No	Called Name	Call Detail	Amount	Answer	Comments
05/20/2013										
05/20/2013 12:09:07PM	00:00:08	Outgoing	4101	E4101	92013			0.00	Yes	
05/20/2013 12:10:58PM	00:00:03	Outgoing	4101	E4101	2013			0.00	Yes	
05/20/2013 2:00:48PM	00:00:00	Outgoing	4101	E4101	4101	E4101		0.00	No	
05/20/2013 2:01:07PM	00:00:00	Incoming	02013		4001	E4001		0.00	No	
05/20/2013 2:02:33PM	00:00:03	Outgoing	4002	E4002	4101	E4101		0.00	Yes	
05/20/2013 2:05:09PM	00:00:00	Outgoing	4002	E4002	4101	E4101		0.00	No	
05/20/2013 2:05:14PM	00:00:00	Outgoing	4001	E4001	4101	E4101		0.00	No	
05/20/2013 2:05:23PM	00:00:02	Outgoing	4001	E4001	4101	E4101		0.00	Yes	
05/20/2013 2:08:38PM	00:00:00	Outgoing	4001	E4001	94109			0.00	No	
05/20/2013 2:49:15PM	00:00:00	Outgoing	4101	E4101	4001	E4001		0.00	No	Unobtainable or Busy call
05/20/2013 2:49:24PM	00:00:00	Incoming	02013		4001	E4001		0.00	No	
05/20/2013 2:49:29PM	00:00:00	Outgoing	4002	E4002	92999			0.00	No	
05/20/2013 2:49:36PM	00:00:00	Outgoing	4001	E4001	2999#			0.00	No	
05/20/2013 2:57:15PM	00:00:05	Outgoing	4101	E4101	4001	E4001		0.00	Yes	Answered By -4002
05/20/2013 2:57:33PM	00:00:05	Incoming	02013		4002	E4002		0.00	Yes	
05/20/2013 3:02:30PM	00:00:08	Outgoing	4101	E4101	92013			0.00	Yes	Forward unconditional
05/20/2013 3:02:43PM	00:00:00	Incoming	02015		4001	E4001		0.00	No	
05/20/2013 3:02:43PM	00:00:04	Outgoing	02015		2013			0.00	Yes	Forward unconditional
05/20/2013 3:20:30PM	00:00:02	Outgoing	4101	E4101	4001	E4001		0.00	Yes	

8. 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 SMDR port in order to receive CDR information. In the configuration described in these Application Notes, various types of calls including intra-switch, PSTN, outgoing and incoming calls were tested. During compliance testing, all test cases were completed successfully as outlined in **Section 2.2**.

9. 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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