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Avaya Solution & Interoperability Test Lab

Application Notes for configuring Imperium Call Reporter from Protocol Systems FZC with Avaya Aura® Communication Manager R6.3 to receive Call Detail Records - Issue 1.0

Abstract

These Application Notes describe the configuration steps for Protocol Systems FZC Imperium Call Reporter with Avaya Aura® Communication Manager R6.3. Imperium Call Reporter integrates with Avaya Aura® Communication Manager and collects CDR data by listening for connections on a specific TCP port.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

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.

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1. Introduction

These Application Notes describe the configuration steps for Protocol Systems FZC Imperium Call Reporter with Avaya Aura® Communication Manager R6.3. Imperium Call Reporter integrates with Avaya Aura® Communication Manager and collects Call Detail Records (CDR) data by listening for connections on a specific TCP port.

Imperium Call Reporter provides traditional call collection, rating, and reporting for any size business. Imperium Call Reporter connects with Avaya Aura® Communication Manager to collect and interpret the detailed records of inbound, outbound, tandem, and internal telephone calls. Imperium Call Reporter then calculates the appropriate charge for local, long distance, international & special calls and allocates them to responsible parties.

2. General Test Approach and Test Results

This section describes the compliance testing used to verify interoperability of Imperium Call Reporter with Communication Manager and covers the general test approach and the test results. The testing covered feature and serviceability test cases. The feature testing covered the ability of Imperium Call Reporter to capture and process call records. The call records captured and displayed by Imperium Call Reporter were compared for accuracy to calls that were performed at that time for call type and call duration. This comparison was made simply by noting the call duration from the telephone display and the type of call that was made. The call types that were generated include internal calls, inbound and outbound trunk calls, PSTN calls, transferred calls, and conference calls. Calls were established using Digital, H.323 and SIP telephones.

SIP endpoints are registered with Avaya Aura® Session Manager. An assumption is made that Avaya Aura® Session Manager and Avaya Aura® System Manager are already installed and basic configuration have been performed.

The serviceability testing focused on the ability of Imperium Call Reporter to recover from adverse conditions such as loss of network connectivity.

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. Interoperability Compliance Testing

The interoperability compliance test included both feature functionality and serviceability testing. The feature functionality testing focused on placing and recording calls in different call scenarios with good quality audio recordings and accurate call records. The tests included:

- **Basic calls** – Test CDR was generated for basic incoming and outgoing calls on Communication Manager.
- **Call Hold/Transfer/Conference** – Test CDR was generated for all of Hold, Transfer and Conference calls.
- **Call forward -** Test CDR was generated for calls that were forwarded.
- **Missed/abandoned/unanswered calls** – Calls to busy users or calls that are not answered.
- **Failover/Service Testing** – Tests the behaviour of Imperium Call Reporter during certain failed conditions.

2.2. Test Results

All functionality and serviceability test cases were completed successfully. The following observations were noted.

1. During compliance testing the field on the Imperium Call Reporter reports called "comments" showed "Transferred calls" whether they are transferred or not. This field is customizable on a per customer basis.
2. During compliance testing it was noted that Imperium Call Reporter reports showed no call details on Call Pickup or Call Park, there are only details on Conference Calls. Protocol Systems FZC notes that this information is not provided by Communication Manager CDR.

2.3. Support

Technical support can be obtained for Imperium Call Reporter from the website
http://imperiumapp.com/contact.aspx

Protocol Systems FZC
Q3-133, SAIF Zone,
Sharjah, UAE.
Tel: +9716 5578383
Fax: +9716 5578384
Email: support@protocolsystems-me.com

3. Reference Configuration

The configuration in **Figure 1** is used to compliance test Imperium Call Reporter with Avaya Aura® Communication Manager R6.3 and Avaya Aura® Session Manager R6.3 to collect CDR records from the various Avaya endpoints as shown below.
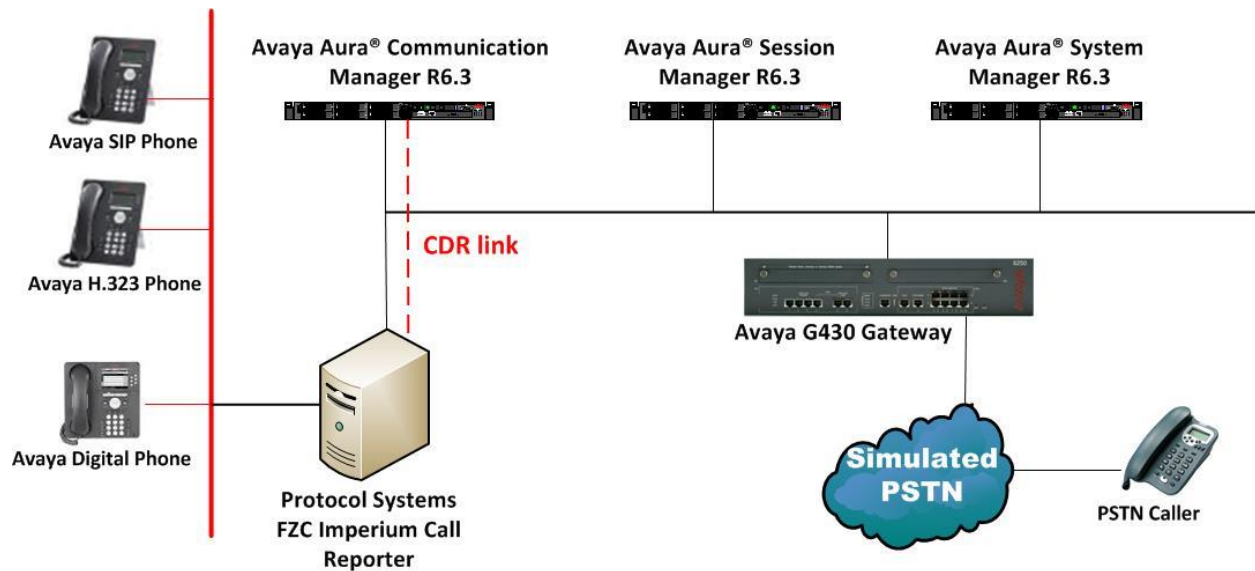
Figure 1: Connection of Imperium Call Reporter Server from Protocol Systems FZC with Avaya Aura® Communication Manager R6.3 and Avaya Aura® Session Manager R6.3.

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4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya Aura® System Manager running on Virtual Server	R6.3.9 [Build 6.3.0.8.5682-6.3.8.4414] [SW Update Rev 6.3.9.1.2482]
Avaya Aura® Session Manager running on Virtual Server	R6.3 (SP9) 6.3.9.0.639011
Avaya Aura® Communication Manager running on Virtual Server	R6.3 SP8 R016x.03.0.124.0
Avaya G430 Gateway	33.12.0 /1
Avaya 96xx/96x1H323 Deskphone	96xx H.323 Release 3.1 SP2
Avaya 9641 SIP Deskphone Avaya 9608 SIP Deskphone	96x1-IPT-SIP-R6_4_1-081114
Avaya 9408 Digital Deskphone	FW Version 2N/A
Windows 2008 Server running MS SQL 2008 on Virtual Server Imperium Call Reporter	Windows 2008 R2 SP2 MS SQL 2008 R2 R1.0

5. Configure Avaya Aura® Communication Manager

The information provided in this section describes the configuration of Communication Manager relevant to this solution. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 9**.

The configuration illustrated in this section was performed using Communication Manager System Administration Terminal (SAT).

5.1. Configure the Avaya Aura® Communication Manager for CDR output to Imperium Call Reporter

The following sections outline the steps necessary to configure Communication Manager to allow the correct CDR output for Imperium Call Reporter Server to display CDR records.

5.1.1. Verify System Features

Use the **change system-parameters special-applications** command to verify that Special Application 8202 **(SA8202) - Intra-switch CDR by COS?** is set to **y**. Navigate to **Page 3** to check this parameter as shown below.

```
change system-parameters special-applications              Page   3 of  10
                        SPECIAL APPLICATIONS


              (SA8141) - LDN Attendant Queue Priority? n
     (SA8143) - Omit Designated Extensions From Displays? n
          (SA8146) - Display Update for Redirected Calls? n
            (SA8156) - Attendant Priority Queuing by COR? n
             (SA8157) - Toll Free Vectoring until Answer? n
  (SA8201) - Start Time and 4-Digit Year CDR Custom Fields? y
                   (SA8202) - Intra-switch CDR by COS? y
               (SA8211) - Prime Appearance Preference? n
                (SA8240) - Station User Admin of FBI? n
                          (SA8312) - Meet-Me Paging? n
             (SA8323) - Idle Call Preference Display? n
                 (SA8339) - PHS X-Station Mobility? n
             (SA8348) - Map NCID to Universal Call ID? n
           (SA8428) - Station User Button Ring Control? n
           (SA8434) - Delay PSTN Connect on Agent Answer? n
                  (SA8439) - Forward Held-Call CPN? n
             (SA8440) - Unmodified QSIG Reroute Number? n


                            (SA8475) - SOSM? n
```

Navigate to **Page 5** and ensure that Special Application 8702 **(SA8702) - CDR Enhancements for Network?** is set to **y**.

```
change system-parameters special-applications          Page   5 of  10
                         SPECIAL APPLICATIONS



                              (SA8652) - No Hold Consult? n
     (SA8654) - Crisis Alert Call Monitoring and Recording? n
            (SA8661) - Increased Automatic Wakeup Calls? n
                 (SA8662) - Expanded PMS Name & Number? n
                         (SA8684) - PMS Wakeup Message? n
     (SA8693) - Connectivity Check for Direct IP Shuffling? n

            (SA8697) - 3rd Party H.323 Endpoint Support? n
 (SA8701) - Net Region Support H.323 Endpoints Behind ALG? n
            (SA8702) - CDR Enhancements for Network? y
         (SA8731) - Block Outgoing Bridged Call Display? n
                 (SA8734) - Enhanced Extension Display? n
         (SA8741) - CDR Identifier for IP Station Calls? n
            (SA8744) - Block Name for Room to Room Calls? n
        (SA8747) - Softphone Indication on DCP Terminals? n
```

5.1.2. Change System Parameters Features

In order to make changes to the system parameters features type in **change system-parameters features** and under the section **UNIVERSAL CALL ID** ensure that the following are set correctly.

- **Create Universal Call ID (UCID)?** is set to **Y**.
- **UCID Network Node ID:** is set to **1**.
- **Copy UCID for Station Conference/Transfer?** is set to **Y**.

```
change system-parameters features                         Page   5 of  20
                     FEATURE-RELATED SYSTEM PARAMETERS

SYSTEM PRINTER PARAMETERS
  Endpoint:              Lines Per Page: 60

SYSTEM-WIDE PARAMETERS
                              Switch Name:
          Emergency Extension Forwarding (min): 10
       Enable Inter-Gateway Alternate Routing? n
Enable Dial Plan Transparency in Survivable Mode? n
                        COR to Use for DPT: station
             EC500 Routing in Survivable Mode: dpt-then-ec500
MALICIOUS CALL TRACE PARAMETERS
              Apply MCT Warning Tone? n   MCT Voice Recorder Trunk Group:
     Delay Sending RELease (seconds): 0
SEND ALL CALLS OPTIONS
    Send All Calls Applies to: station    Auto Inspect on Send All Calls? n
            Preserve previous AUX Work button states after deactivation? n
UNIVERSAL CALL ID
    Create Universal Call ID (UCID)? y    UCID Network Node ID: 1
    Copy UCID for Station Conference/Transfer? y
```

5.1.3. Create Node Name for Imperium Call Reporter

A Node Name needs to be created to associate the Imperium Call Reporter with Communication Manager. Use the **change node-names ip** command to configure the following:

- Name: Enter an informative name i.e. **Imperium**.
- IP address: Enter the IP address of the Imperium Server in this case **10.10.40.130**.

Press **F3** button to save the new settings.

```
change node-names ip                                           Page   1 of   2
                                IP NODE NAMES
     Name              IP Address
AES63VMPG         10.10.40.30
G450              10.10.40.35
IPofficeR9        10.10.40.20
Imperium          10.10.40.130
PGDECT            10.10.40.50
SM62              192.168.50.16
SM62PG            192.168.50.16
SM63vmpg          10.10.40.34
Tiger             10.10.40.55
default           0.0.0.0
procr             10.10.40.31
procr6            ::
```

5.1.4. Define the CDR Link

A CDR link needs to be defined between the Communication Manager and Imperium Call Reporter. Use the **change ip-services** command to configure the following:

- **Service Type** Enter **CDR1**.
- **Local Node** Enter **procr**.
- **Remote Node** Enter **Imperium** (Node name entered in **Section 5.1.3**).
- **Remote Port** Enter **6008** (port that is used by Imperium Server).

```
change ip-services                                             Page   1 of   4

                                IP SERVICES
 Service      Enabled      Local        Local        Remote       Remote
  Type                     Node         Port         Node         Port
CDR1                       procr        0            Imperium     6008
```

Navigate to **Page 3** and set the **Reliable Protocol** field to **n**. This will disable Reliable Session Protocol (RSP) for CDR transmission. In this case, the CDR link will use TCP without RSP.

Press **F3** button to save the new settings.

```
change ip-services                                              Page   3 of   4

                            SESSION LAYER TIMERS
   Service     Reliable  Packet Resp  Session Connect  SPDU  Connectivity
    Type       Protocol     Timer      Message Cntr    Cntr     Timer

  CDR1            n         30              3           3        60
```

5.1.5. Change System-Parameters CDR

Certain parameters changes are required for Communication Manager to interoperate with Imperium Protocol. The screen shots below show the settings used during compliance testing. Use the **change system-parameters cdr** command to configure the following:

- **CDR Date Format** - Enter **month/day**.
- **Primary Output Format** - Enter **customized**.
- **Primary Output Endpoint** - Enter **CDR1**
- **Record Outgoing Calls Only** - Enter **n**.
- **Outg Trk Call Splitting** - Enter **y**.
- **Inc Trk Call Splitting** - Enter **y**.

```
change system-parameters cdr                                    Page   1 of   2
                        CDR SYSTEM PARAMETERS

 Node Number (Local PBX ID): 1                      CDR Date Format: month/day
     Primary Output Format: customized     Primary Output Endpoint: CDR1
    Secondary Output Format:
           Use ISDN Layouts? n                    Enable CDR Storage on Disk? y
      Use Enhanced Formats? n     Condition Code 'T' For Redirected Calls? y
     Use Legacy CDR Formats? n                   Remove # From Called Number? y
Modified Circuit ID Display? n
                 Record Outgoing Calls Only? n     Outg Trk Call Splitting? y
  Suppress CDR for Ineffective Call Attempts? n        Outg Attd Call Record? n
      Disconnect Information in Place of FRL? y      Interworking Feat-flag? n
 Force Entry of Acct Code for Calls Marked on Toll Analysis Form? n
                              Calls to Hunt Group - Record: member-ext
Record Called Vector Directory Number Instead of Group or Member? y
Record Agent ID on Incoming? n       Record Agent ID on Outgoing? y
     Inc Trk Call Splitting? y                   Inc Attd Call Record? n
  Record Non-Call-Assoc TSC? y        Call Record Handling Option: warning
     Record Call-Assoc TSC? y   Digits to Record for Outgoing Calls: dialed
   Privacy - Digits to Hide: 0             CDR Account Code Length: 5
Remove '+' from SIP Numbers? y
```

On **Page 2** ensure that **Data Item** and Length are configured as shown in the screen below. This setup is specific to Imperium Call Reporter.

Press **F3** button to save the new settings

```
change system-parameters cdr                                    Page   2 of   2
                          CDR SYSTEM PARAMETERS

    Data Item - Length          Data Item - Length          Data Item - Length
 1: date             - 6   17: clg-num/in-tac  - 15  33: attd-console    - 4
 2: space            - 1   18: space           - 1   34: space           - 1
 3: start-time       - 6   19: in-trk-code     - 4   35: space           - 20
 4: space            - 1   20: space           - 1   36: space           - 1
 5: end-time         - 6   21: auth-code       - 7   37: vdn             - 13
 6: space            - 1   22: space           - 1   38: space           - 1
 7: sec-dur          - 5   23: in-crt-id       - 3   39: frl             - 1
 8: space            - 1   24: space           - 1   40: return          - 1
 9: cond-code        - 1   25: out-crt-id      - 3   41: line-feed       - 1
10: space            - 1   26: space           - 1   42:                 -
11: code-dial        - 4   27: isdn-cc         - 11  43:                 -
12: space            - 1   28: space           - 1   44:                 -
13: code-used        - 4   29: ppm            - 5   45:                 -
14: space            - 1   30: space           - 1   46:                 -
15: dialed-num       - 23  31: acct-code       - 7   47:                 -
16: space            - 1   32: space           - 1   48:                 -

                          Record length = 169
```

5.1.6. Change Trunk Group

To collect call data on Trunks, CDR Reports need to set. During compliance Trunk Group **10** was used. Use the **change trunk-group 10** command to ensure that **CDR Reports** is set to **y**.

Press **F3** button to save the new settings.

```
change trunk-group 10                                           Page   1 of  21
                              TRUNK GROUP

Group Number: 10                 Group Type: isdn        CDR Reports: y
  Group Name: PSTN-ETSI-IPO             COR: 1      TN: 1        TAC: *10
   Direction: two-way      Outgoing Display? n        Carrier Medium: PRI/BRI
 Dial Access? y            Busy Threshold: 255  Night Service:
Queue Length: 0
Service Type: tie                   Auth Code? y          TestCall ITC: rest
                     Far End Test Line No:
TestCall BCC: 4
```

5.1.7. Change Intra-Switch CDR

Internal CDR is activated on a per set basis. When the **Intra-switch CDR** field is set to **y** in the CDR **System Parameters** then the extensions that will be subject to CDR need to be defined. During compliance testing extensions **1000**, **1001**, **2015**, **2016**, **2500** were used. Use the **change intra-switch-cdr** command to define the extensions that will be subject to call detail records. Configure the following:

- **Extension** - Enter the extensions that will be subject to CDR.

Press **F3** button to save the new settings.

Note: To simplify the process of adding multiple extensions in the Assigned Members field, the **Intra-switch CDR by COS (SA8202)** feature may be utilized in the SPECIAL APPLICATIONS as shown in **Section.5.1.1**.

```
change intra-switch-cdr                                        Page   1 of   3
                          INTRA-SWITCH CDR

                              Assigned Members:   11   of 5000   administered
   Extension          Extension          Extension           Extension
   1000
   1001
   2015
   2016
   2500
```

5.1.8. Change COS for Intra-Switch CDR

In order to allow CDR records for internal calls the Call of Service (COS) needs to be changed to allow Intra-switch CDR. Use the command **change cos-group x** where x is the COS group assigned to the extensions. Ensure that **Intra-switch CDR** is set to **y** as shown below.

```
change cos-group 1                                             Page   1 of   2
CLASS OF SERVICE       COS Group: 1    COS Name:

                           0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
 Auto Callback             n  y  y  n  y  n  y  n  y  n  y  n  y  n  y  n
 Call Fwd-All Calls        n  y  n  y  y  n  n  y  y  n  n  y  y  n  n  y
 Data Privacy              n  y  n  n  n  y  y  y  y  n  n  n  n  y  y  y
 Priority Calling          n  y  n  n  n  n  n  n  n  y  y  y  y  y  y  y
 Console Permissions       n  y  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Off-hook Alert            n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Client Room               n  n  y  n  n  n  n  n  n  n  n  n  n  n  n  n
 Restrict Call Fwd-Off Net n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Call Forwarding Busy/DA   y  y  y  y  y  y  y  n  n  n  n  n  n  n  n  n
 Personal Station Access (PSA) n n n n n  n  n  n  n  n  n  n  n  n  n  n
 Extended Forwarding All   y  y  y  y  y  y  y  y  y  y  y  y  y  y  y  y
 Extended Forwarding B/DA  y  y  y  y  y  y  y  y  y  y  y  y  y  y  y  y
 Trk-to-Trk Transfer Override n y n n n  n  n  n  n  n  n  n  n  n  n  n
 QSIG Call Offer Originations n n n n n  n  n  n  n  n  n  n  n  n  n  n
 Contact Closure Activation n n n n n  n  n  n  n  n  n  n  n  n  n  n


 Intra-switch CDR          y  y  y  y  y  y  y  y  y  y  y  y  y  y  y  y
```

6. Configuration of Protocol Systems FZC Imperium Call Reporter Server

This section outlines the steps necessary to configure the Imperium Call Reporter server to enable the collection of CDR records via the CDR connection on Communication Manager.

6.1. Imperium Call Reporter's 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.
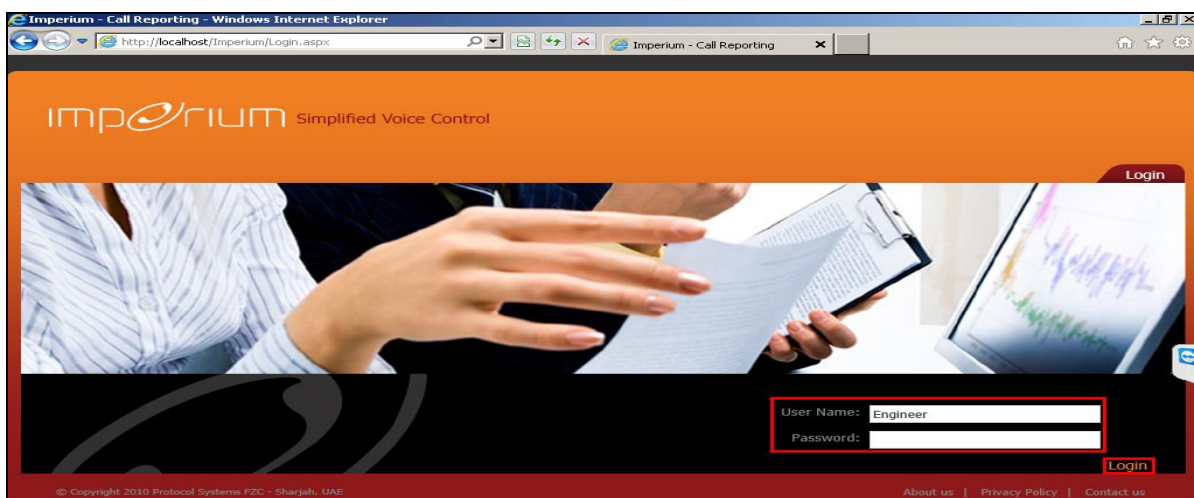
Once logged in click on the **Utility** tab. Once there click on **Master** and the Site Info page is shown where the **Site Name**, **Location**, and contact details are added. Click on the **PBXInfo** tab once all the details are added correctly.
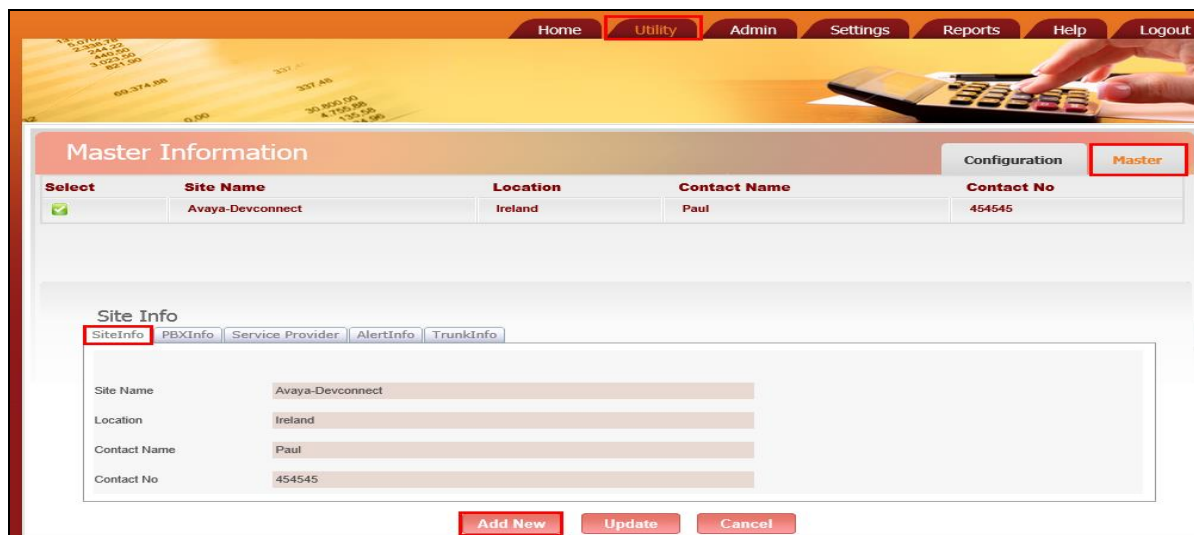
Click on the **PBXInfo** tab and enter the following details for the Communication Manager connection.

- **PBX Name**   This can be any suitable name
- **Connection Type**   Must be set to **0**
- **Data split**   Must be set to **0**
- **Separator**   **6, 1, 6, 1, 6, 1, 5, 1 ,1 ,1 ,4 ,1 ,4, 1, 2, 3, 1, 15, 1, 4, 1, 7, 1, 3, 1, 3, 1, 11, 1, 5, 1, 7, 1, 4, 1, 20, 1, 13, 1, 1, 1, 1**
- **Fields**   **CALL_DATE, SP1, CALL_TIME, SP2, CallEndTime, SP3, DURATION, SP4, DIRECTION, SP5, DIAL_CODE, SP6, TRUNK_ID, SP7, CALLED_NO, SP8, CALLER_NO, SP9, FLAG4, SP10, AUTH_CODE, SP11, FLAG5, SP12, FLAG6, SP13, FLAG7, SP14, FLAG8, SP15, FLAG9, SP16, FLAG10, SP17, CALL_ID, SP18, FLAG15, SP19, FLAG12, SP20, SP21**

Click on the **Add New** button at the bottom of the screen once the information is entered correctly.

Click on the **Configuration** tab highlighted and the **PBXCount Info** tab. 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 CDR output. All other entries can be left as default and click on **Add New** once the information is all entered correctly.

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

- PBXCALLCOSTCALCULATOR
- PBXDATALOGGER
- PBXFILEWATCHER

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

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

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

This concludes the setup of Imperium Call Reporter in order to connect to Communication Manager to listen for CDR on TCP.

7. Verification Steps

This section illustrates the steps necessary to verify that the Imperium Call Reporter Server is connected to Communication Manager correctly in order to receive CDR information.

7.1. Verify that Avaya Aura® Communication Manager CDR link is active

Log into Communication Manager as per **Section 5**, using something such as System Administration Terminal (SAT). From there type **status cdr link**. The result should show **Link State** as **up** as is highlighted below.

```
status cdr-link
                                CDR LINK STATUS
                 Primary                        Secondary

       Link State: up                           CDR not administered

       Date & Time: 2015/01/22 16:43:33         0000/00/00 00:00:00
  Forward Seq. No: 35                           0
 Backward Seq. No: 0                            0
CDR Buffer % Full:   0.00                         0.00
      Reason Code: OK
```

7.2. Verify that Imperium Call Reporter is receiving CDR 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.
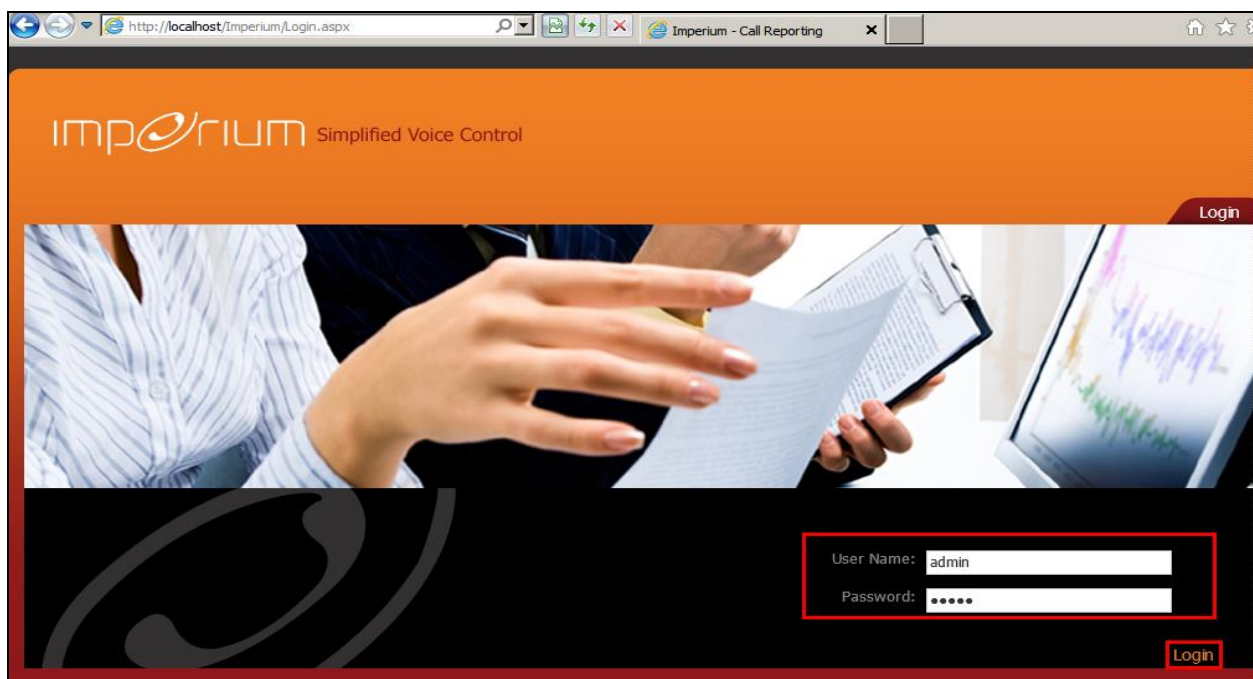
Click on the **Reports** tab at the top of the page and click on the **Reports** tab in the Reports main window. Select the correct data range from the **Data option** and set **Direction** to **Both** so as all calls are reported on, once finished click on **Generate** to continue.

The following screenshot of a report shows calls for various extensions such as **2015**, **2016, 1000** and **1001**.

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8. Conclusion

As illustrated in these Application Notes the procedures for configuring Protocol Systems FZC Imperium Call Reporter to interoperate with Avaya Aura® Communication Manager R6.3 by listening for connections on a specific TCP 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. Observations and results are outlined in **Section 2.2**.

9. Additional References

This section references the Avaya and Protocol Systems FZC product documentation that are relevant to these Application Notes.

Product documentation for Avaya products may be found at http://support.avaya.com
[1]   *Avaya Aura® Communication Manager Feature Description and Implementation,*
         Document ID 555-245-205

Technical documentation can be obtained for Imperium Call Reporter from the website
http://imperiumapp.com

Support for Imperium Call Reporter can be found at:
Protocol Systems FZC
Tel: +9716 5578383
Fax: +9716 5578384
Email: support@protocolsystems-me.com