Avaya Solution & Interoperability Test Lab

Application Notes for Metropolis ProfitWatch SL Call Accounting System with Avaya Aura® Communication Manager – Issue 1.0

Abstract

These Application Notes describe the steps required to integrate the Metropolis ProfitWatch Call Accounting System with Avaya Aura® Communication Manager. Metropolis ProfitWatch SL Call Accounting System captures call records from Avaya Aura® Communication Manager using a Call Detail Record (CDR) link with Avaya Reliable Session Protocol (RSP) enabled for reliable transmission of call records. In turn, ProfitWatch SL processes the call records and generates detailed reports.

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 steps required to integrate the Metropolis ProfitWatch SL Call Accounting System with Avaya Aura® Communication Manager. Metropolis ProfitWatch SL Call Accounting System captures call records from Avaya Aura® Communication Manager using a Call Detail Record (CDR) link with Avaya Reliable Session Protocol (RSP) enabled for reliable transmission of call records. In turn, ProfitWatch SL processes the call records and generates detailed reports.

Note: For security purposes public IP addresses and phone numbers have been altered in this document.

2. General Test Approach and Test Results

This section describes the compliance testing used to verify interoperability of Metropolis ProfitWatch SL Call Accounting System with Communication Manager. This section covers the general test approach and the test results. The testing covered feature and serviceability test cases. The feature testing covered the ability of ProfitWatch SL to capture and process call records.

The call records captured and displayed by ProfitWatch SL were compared for accuracy to the call records received by an Avaya Definity Reliable Data Transport Tool, a CDR test tool. Call records for various call types were generated, including internal calls, inbound and outbound trunk calls, including PSTN calls, transferred calls, and conference calls. Calls were established using H.323 and SIP telephones.

The serviceability testing focused on the ability of ProfitWatch SL to recover from adverse conditions such as loss of network connectivity. With the use Avaya RSP, call records that were generated while ProfitWatch SL was disconnected from the network were not lost.

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 feature and serviceability testing. The feature testing focused on verifying the proper parsing and displaying of unformatted CDR data received from Communication Manager by ProfitWatch SL.

The following is a list of Interoperability tests that were performed:
- Internal calls
- Inbound Inter-Switch calls
- Outbound Inter-Switch calls
- Inbound PSTN calls
- Outbound PSTN calls
- Tandem calls to PSTN
- Hold and Resume
- Blind and Consultative Transfer
- Blind and Consultative Conference
- Hunt Groups
- Bridged Appearance
- Account codes
- Authorization codes
- Split CDR Records
- Serviceability

The serviceability testing focused on the ability of ProfitWatch SL to recover from adverse conditions such as loss of network connectivity, disabling and re-enabling the CDR Link and power cycling. With the use of Avaya RSP, call records that were generated while ProfitWatch SL was disconnected from the network were not lost.

2.2. Test Results

All applicable test cases were executed and passed with the following observation:

There are some differences in Communication Manager in the call records generated by SIP endpoints compared to Analog, Digital, and H.323 endpoints. As a result in certain scenarios involving SIP endpoints (e.g., two-party call, transfer, or conference), a CDR application may see more or less records, or records with condition codes/calling party other than expected. Avaya is investigating the differences and code changes may be made available in a future release pending the outcome of that investigation.

2.3. Support

For technical support on Metropolis ProfitWatch SL Call Accounting System, contact Metropolis Customer Service by phone, through their website, or email.

Phone: (954) 414-2900 x32
Web: http://www.metropolis.com/support.html
Email: support2017@metropolis.com

3. Reference Configuration

Figure 1 illustrates the configuration used for the compliance test. In the sample configuration two sites, Sites A and B, are connected via a SIP trunk through Session Manager. ProfitWatch SL only monitors the calls at Site A. Site B is used to generate inter-site traffic across the SIP trunk.

Site A has a VMWare virtual machine hosting Communication Manager, Session Manager, System Manager and Media Server. The Communication Manager is connected to an Avaya G450 Media Gateway. Site A also includes Avaya 9600 Series H.323 and SIP telephones. In addition, Site A has connectivity to the PSTN. The configuration at Site B is similar to Site A and also uses the Session Manager at Site A. ProfitWatch SL connects via the LAN and establishes a CDR link to Communication Manager at Site A. The ProfitWatch SL is also installed and configured on the VMWare virtual machine.
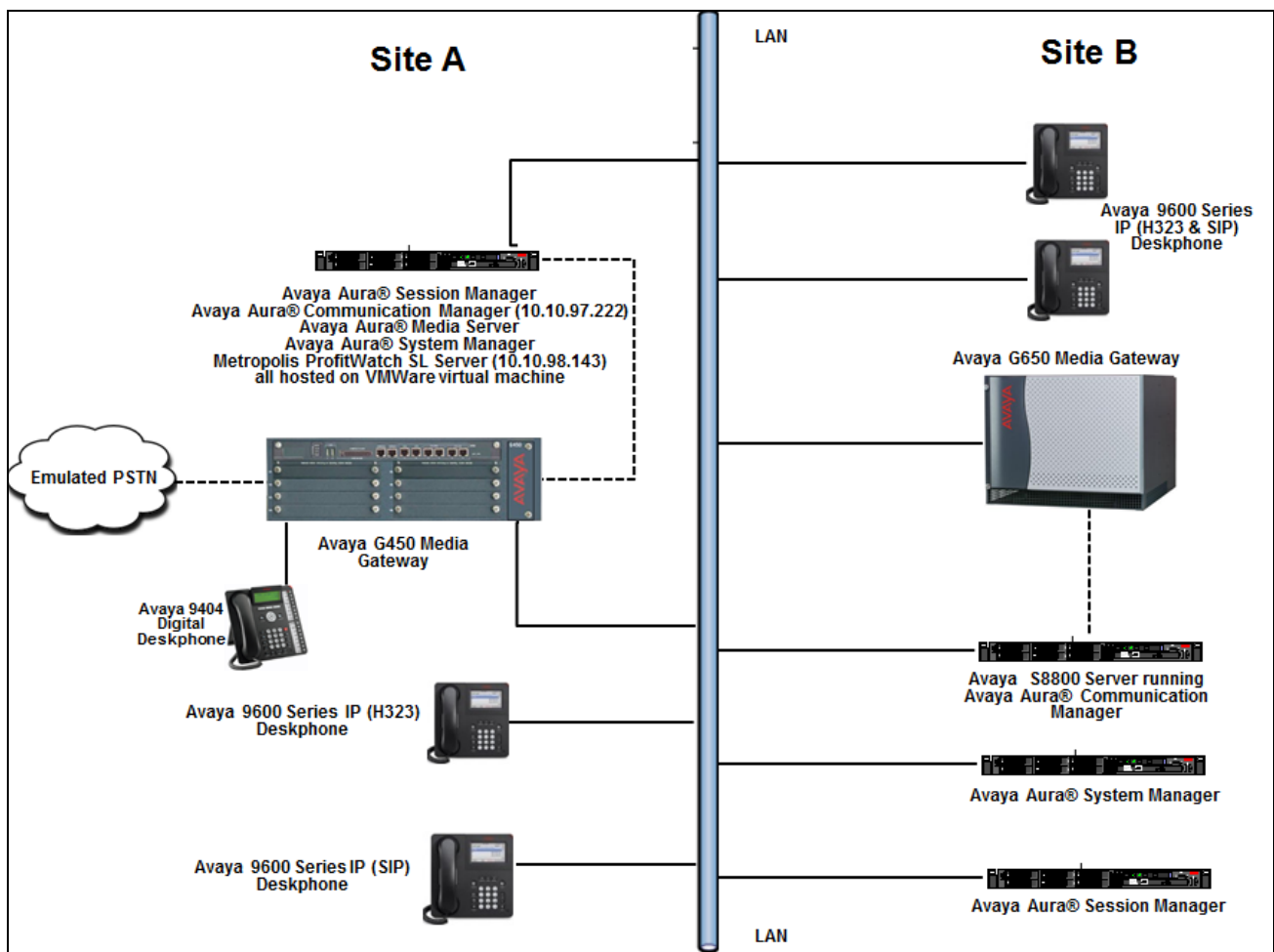
**Figure 1: Metropolis ProfitWatch SL Call Accounting System with Avaya Aura®
Communication Manager**

4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya Aura® Communication Manager running on a virtual server	7.0.1.1.0-FP1SP1
Avaya Aura® Session Manager running on a virtual server	7.0.1.1.701114
Avaya Aura® System Manager running on a virtual server	7.0.1.2 SP2
Avaya Aura® Media Server running on a virtual server	7.7.0.359
Avaya G450 Media Gateway	FW 37.19.0/1
Avaya IP Deskphones: 9641 (H.323) 9608 (H.323) 9621 (SIP) 9641 (SIP)	 6.6229 6.6229 7.0.1.1.5 7.0.1.1.5
Avaya 9404 Digital Deskphone	R 0.15 V21
Metropolis ProfitWatch SL running on Windows Server 2012 R2 Standard running on VMware (5.5)	2016.10.25a

5. Configure Avaya Aura® Communication Manager

This section describes the procedure for configuring call detail recording (CDR) on Communication Manager. These steps are performed through the System Access Terminal (SAT). Communication Manager is configured to generate CDR records and send them to the IP address of the server running ProfitWatch SL using TCP/IP. The procedure covers the following areas:

- Administer IP Node Names
- Configure CDR Link
- Enable CDR for Intra-Switch Calls
- Enable CDR for Trunks Calls
- Configure Off-PBX-Telephone Configuration-Set

5.1. Administer IP Node Names

Use the **change node-names ip** command to create a new node name for the server running ProfitWatch SL. This node name is associated with the IP Address of the server. In the sample configuration **CDR-Collector** was used for the name and **10.10.98.143** was used for the IP address. Also, take note of the node name **procr**. It will be used in the next step. The procr entry on this form was previously administered. The **AVAYA-RDTT** was used to setup the collection of CDR on the Secondary link.

```
change node-names ip                                           Page   1 of   2
                                 IP NODE NAMES
    Name              IP Address
AVAYA-RDTT          10.10.98.71
CDR-Collector       10.10.98.143
DevvmAES            10.10.97.224
DevvmAMS            10.10.97.232
GW-G450             10.10.4.25
Loopback            10.10.97.222
SM-VM               10.10.97.228
TFTP-Server         10.10.98.72
default             0.0.0.0
procr               10.10.97.222
```

5.2. Configure CDR Link

Use the **change ip-services** command to define the CDR link between Communication Manager and ProfitWatch SL. To define a primary CDR link, provide the following information:

- **Service Type**: **CDR1** [If needed, a secondary link can be defined by setting Service Type to CDR2.]
- **Local Node**: **procr** [For the Communication Manager used during compliance testing, set the Local Node to the node name of the processor board.]
- **Local Port**: **0** [The Local Port is fixed to 0 because Communication Manager initiates the CDR link.]
- **Remote Node**: **CDR-Collector** [The Remote Node is set to the node name previously defined in **Section 5.1**.]
- **Remote Port**: **9000** [The Remote Port may be set to a value between 5000 and 64500 inclusive, and must match the port configured in ProfitWatch SL.]

```
change ip-services                                         Page   1 of   4

                               IP SERVICES
 Service      Enabled     Local      Local      Remote      Remote
  Type                    Node       Port       Node        Port
AESVCS         y       procr         8765
CDR1                   procr         0       CDR-Collector   9000
CDR2                   procr         0       AVAYA-RDTT      9001
```

For this solution the Reliable Session Protocol (RSP) is used. On **Page 3** of the ip-services form, set the **Reliable Protocol** field to **y**.

```
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            y         30             3             3        60
 CDR2            y         30             3             3        60
```

Enter the **change system-parameters cdr** command to set the parameters for the type of calls to track, and for the format of the CDR data. The example below shows the settings used during the compliance test. Provide the following information:

- **CDR Date Format: month/day**
- **Primary Output Format: unformatted**
- **Primary Output Endpoint: CDR1**

The remaining parameters define the type of calls that will be recorded and what data will be included in the record. See **Reference 8** in **Section 9** for a full explanation of each field. The test configuration used some of the more common fields described below.

- **Use Legacy CDR Formats?**: **y** [Allows CDR formats to use 4.x CDR formats for "n". If the field is set to "y", then CDR formats utilize the 3.x CDR formats.]
- **Intra-switch CDR**: **y** [Allows call records for internal calls involving specific stations. Those stations must be specified in the INTRA-SWITCH CDR form.]
- **Record Outgoing Calls Only?**: **n** [Allows incoming trunk calls to appear in the CDR records along with the outgoing trunk calls.]
- **Outg Trk Call Splitting?**: **y** [Allows a separate call record for any portion of an outgoing call that is transferred or conferenced.]
- **Inc Trk Call Splitting?**: **y** [Allows a separate call record for any portion of an incoming call that is transferred or conferenced.]
- **CDR Account Code Length:** 4 [The length may be set to a value between 1 and 15. However, during the compliance test, "4" was used.]

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

 Node Number (Local PBX ID):                      CDR Date Format: month/day
     Primary Output Format: unformatted    Primary Output Endpoint: CDR1
   Secondary Output Format: unformatted Secondary Output Endpoint: CDR2
           Use ISDN Layouts? n                  Enable CDR Storage on Disk? n
       Use Enhanced Formats? n     Condition Code 'T' For Redirected Calls? n
     Use Legacy CDR Formats? y              Remove # From Called Number? n
Modified Circuit ID Display? n                         Intra-switch CDR? y
             Record Outgoing Calls Only? n      Outg Trk Call Splitting? y
 Suppress CDR for Ineffective Call Attempts? y        Outg Attd Call Record? y
      Disconnect Information in Place of FRL? n       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? n
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? n        Call Record Handling Option: warning
     Record Call-Assoc TSC? n   Digits to Record for Outgoing Calls: dialed
  Privacy - Digits to Hide: 0             CDR Account Code Length: 4
Remove '+' from SIP Numbers? Y
```

5.3. Enable CDR for Intra-Switch Calls

If the **Intra-switch CDR** field is set to **y** on **Page 1** of the **system-parameters cdr** form, then use the **change intra-switch-cdr** command to define the extensions that will be subject to call detail records. In the **Extension** field, enter the specific extensions whose usage will be tracked.

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 form under the system-parameters section. To utilize this feature, contact an authorized Avaya account representative to obtain the license.

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

                                Assigned Members:   8    of 1000   administered
     Extension          Extension           Extension          Extension
     56101
     56102
     56103
     56201
     56202
     56203
     56204
     56205
```

5.4. Enable CDR for Trunk Calls

For each trunk group for which CDR records are desired, verify that CDR reporting is enabled. To do this, use the **change trunk-group** *n* command, where *n* is the trunk group number, and verify that the **CDR Reports** field is set to *y*. This applies to all trunk group types.

The example below shows the ISDN-PRI trunk to the PSTN.

```
change trunk-group 4                                        Page   1 of  21
                              TRUNK GROUP

Group Number: 4                     Group Type: isdn        CDR Reports: y
  Group Name: To-IPO 36_44                COR: 1      TN: 1       TAC: #004
   Direction: two-way        Outgoing Display? n      Carrier Medium: PRI/BRI
 Dial Access? n              Busy Threshold: 255  Night Service:
Queue Length: 0
Service Type: tie                     Auth Code? n        TestCall ITC: rest
                        Far End Test Line No:
TestCall BCC: 4
```

The example below shows the SIP trunk between Sites A and B. This SIP trunk actually terminates to Session Manager, which then routes calls to Site B over another SIP trunk.

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

Group Number: 1                     Group Type: sip         CDR Reports: y
  Group Name: Trunk to SM on VM           COR: 1      TN: 1       TAC: #001
   Direction: two-way        Outgoing Display? y
 Dial Access? n                                   Night Service:
Queue Length: 0
Service Type: tie                  Auth Code? n
                                     Member Assignment Method: auto
                                            Signaling Group: 1
                                          Number of Members: 24
```

5.5. Configure Off-PBX-Telephone Configuration-Set

SIP endpoints and off-pbx-telephone stations will be automatically created in Communication Manager when users (SIP endpoints) are created in Session Manager.

However, the off-pbx-telephone configuration-set form needs to be modified. Enter **change off-pbx-telephone configuration-set** and disable the **CDR for Calls to EC500 Destination?** field by setting it to *n*.

```
change off-pbx-telephone configuration-set 1                 Page   1 of   1

                               CONFIGURATION SET: 1

                    Configuration Set Description:
                             Calling Number Style: network
                              CDR for Origination: phone-number
                CDR for Calls to EC500 Destination? n
                        Fast Connect on Origination? n
                        Post Connect Dialing Options: dtmf
                       Cellular Voice Mail Detection: timed  (seconds): 4
                                    Barge-in Tone? n
                        Calling Number Verification? y
            Call Appearance Selection for Origination: primary-first
                                  Confirmed Answer? n

 Use Shared Voice Connections for Second Call Answered? n
Use Shared Voice Connections for Second Call Initiated? n
            Provide Forced Local Ringback for EC500? n
                      Apply Ringback upon Receipt of: Call-Proceeding
```

6. Configure Metropolis ProfitWatch SL Call Accounting System

This section provides the procedures for configuring Metropolis ProfitWatch SL Call Accounting System. The procedures include the following areas:

- Administer PBX
- Administer Customization
- Administer Grace Periods

6.1. Administer PBX

From the Metropolis ProfitWatch SL Call Accounting System server, launch **ProfitWatch** to display the **ProfitWatch SL Pro Telemanagement 2016 – AVAYA DEVCONNECT PSL DEMO** screen as shown below. Select **PBX → Select PBX…** from the top menu.

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The **Select PBX** screen is displayed next. In the **Select primary PBX** drop-down box select **Avaya CM S Series** and then click **OK**.
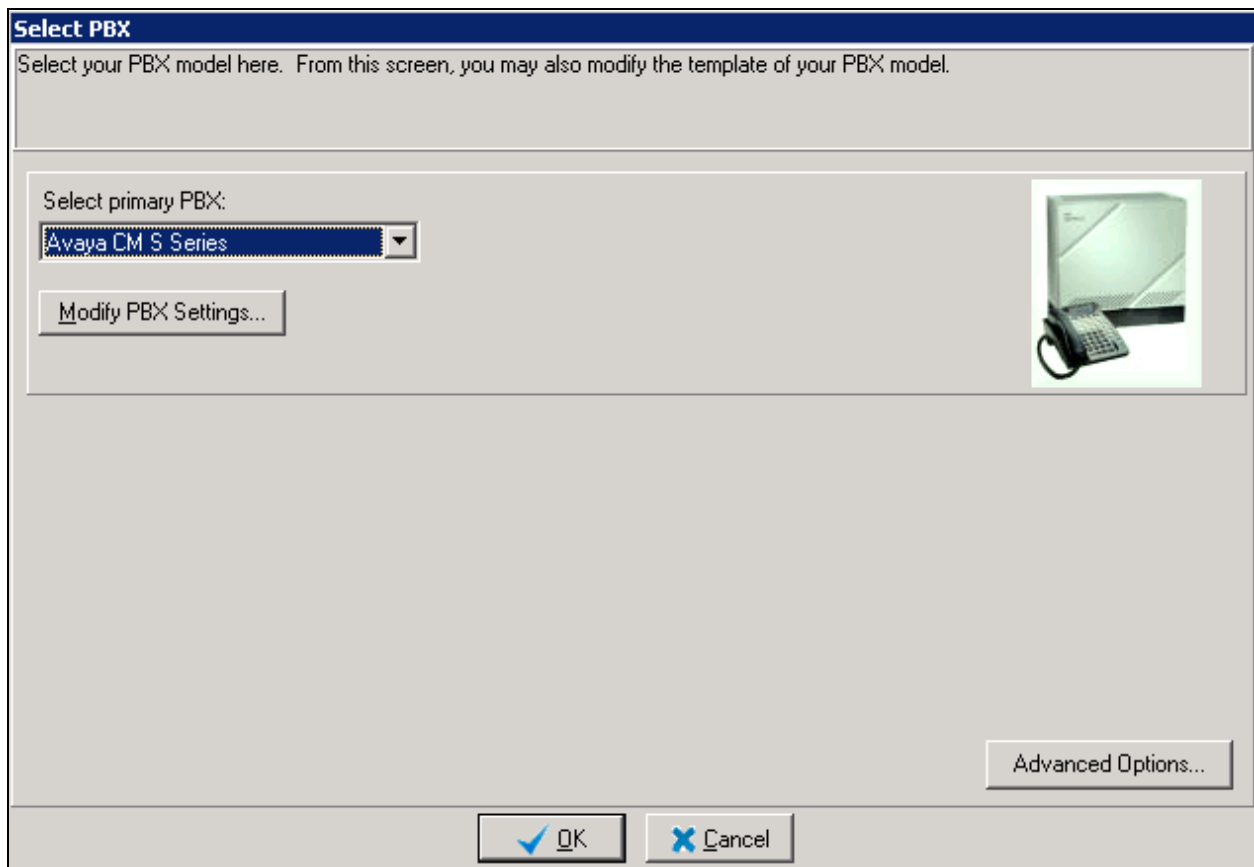
Select **PBX → PBX Communications…** from the top menu of the **ProfitWatch SL Pro Telemanagement 2016 – AVAYA DEVCONNECT PSL DEMO** screen (not shown). Enter the following values for the specified fields.

- **Receive data using:** *I.P. Port (PBX sends data to IP port)*
- **Listen Port:** The remote port number from **Section 5.2**
- **Optional protocol:** *Avaya RSP*

Click **OK** when finished.
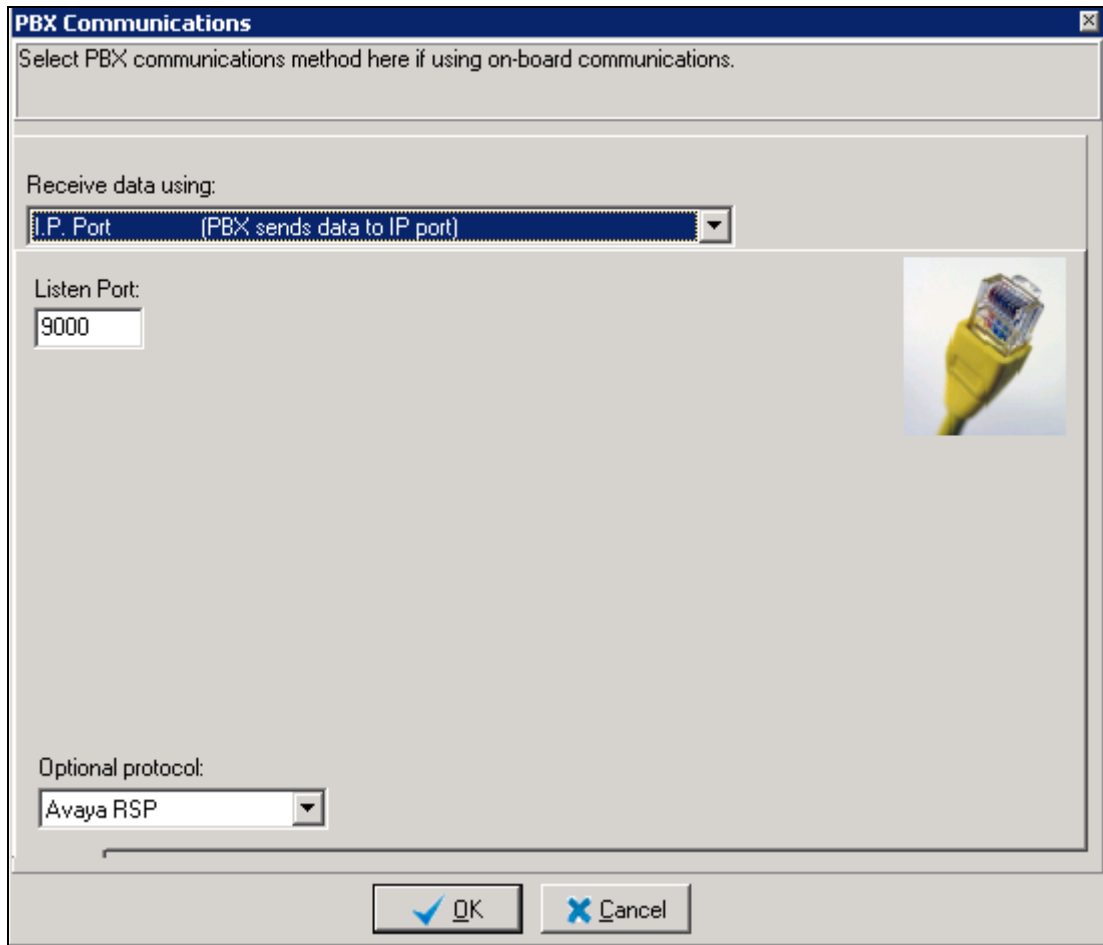
On the **ProfitWatch SL Pro Telemanagement 2016 – AVAYA DEVCONNECT PSL DEMO** screen, select **PBX → Select PBX…** from the top menu (not shown). Click the **Modify PBX Settings**… button (not shown).

The **Modify PBX – Avaya CM S Series** screen is displayed. Note that in a live customer environment, CDR data may start appearing in the top portion of the screen. Select the **Outgoing** tab.

For **Extension Length**, enter the maximum number of digits used for internal extensions on Communication Manager. As the calling number field in the CDR record is right-justified and ends at position 42, adjust the **Extension Pos** value accordingly. In the compliance testing, calling numbers with 5-digit extensions appear in position 38-42 in the CDR records.

For **Digits**, enter "18" for **Pos** and "16" for **Length** as shown below. This will match to any number in the dialed number field in position 18-33 of the CDR record.

Retain the default values in the remaining fields.

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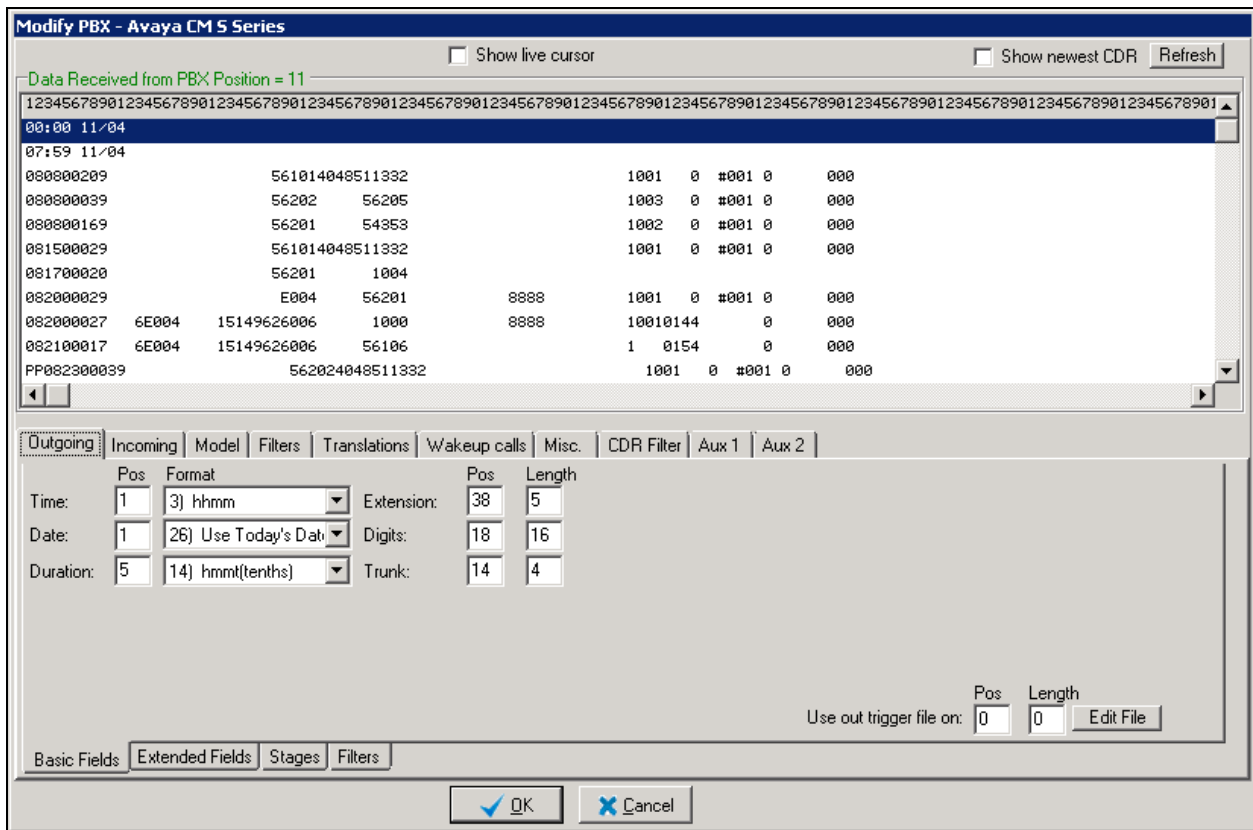
Select the **Incoming** tab. For **Extension Length**, enter the maximum number of digits used for the internal extensions on Communication Manager. The dialed number field in the CDR record is right-justified and ends at position 32, adjust the **Extension Pos** value accordingly. In the compliance testing, dialed numbers with 5-digit extensions appear in position 28-32 in the CDR records.

For **Digits**, enter "33" for **Pos** and "11" for **Length** as shown below. This will match to any number in the calling number field in position 33-43 of the CDR record.

Retain the default values in the remaining fields.
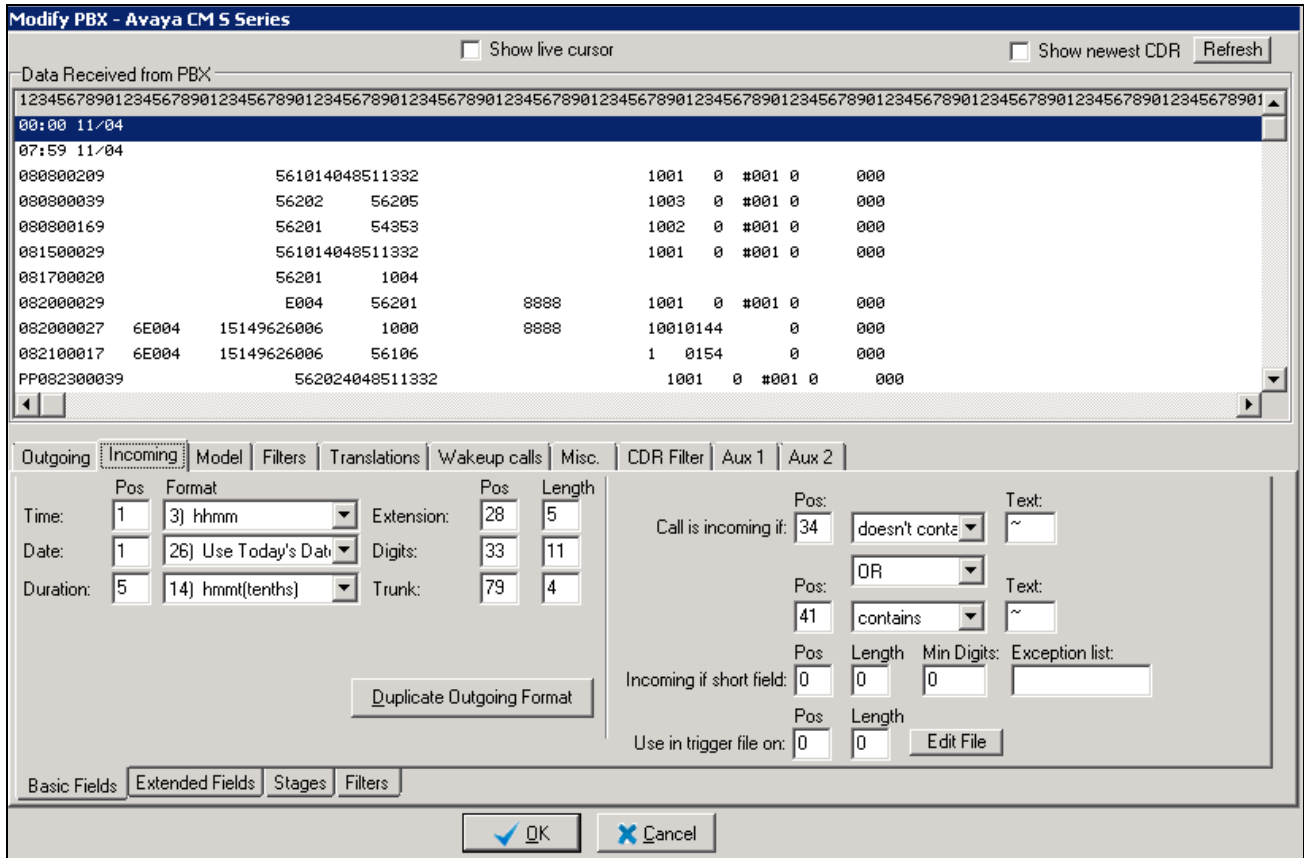
6.2. Administer Customization

From the **ProfitWatch SL Pro Telemanagement 2016 – AVAYA DEVCONNECT PSL DEMO** screen shown in **Section 6.1**, select **Setup → Call Processing Options…** from the top menu to display the **Call Processing Options** screen.

Under **Processing** tab, check **Process Incoming calls** and **Process extension-to-extension (internal) calls**, if desired. Set the appropriate value for **Maximum Internal Extension Length**, and retain the default values in the remaining fields. The screenshot below shows the settings used for the compliance testing.

6.3. Administer Grace Periods

From the **ProfitWatch SL Pro Telemanagement 2016 – AVAYA DEVCONNECT PSL DEMO** screen shown in **Section 6.1**, select **Setup → Grace Periods…** from the top menu to display the **Grace Periods** screen. Modify the grace period value for each type of call if desired. Note that calls with duration shorter than the grace period will not be logged. The screenshot below shows the settings used for the compliance testing. The value of "0" was used during compliance testing.

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7. Verification Steps

This section provides the tests that can be performed to verify the configuration of Communication Manager and Metropolis ProfitWatch SL Call Accounting System.

7.1. Verify Avaya Aura® Communication Manager

From the SAT of Communication Manager, use the **status cdr-link** command to verify that the **Link State** to ProfitWatch SL is "up".

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

          Link State: up                       up

         Date & Time: 2016/11/04 10:09:29      2016/11/01 11:14:14
    Forward Seq. No: 13                        134
   Backward Seq. No: 0                         0
  CDR Buffer % Full:   0.00                      0.00
        Reason Code: OK                        OK
```

7.2. Verify Metropolis ProfitWatch SL Call Accounting System

Make and complete a few phone calls, including internal, inbound from the PSTN, and outbound to the PSTN.

From the **ProfitWatch SL Telemanagement 2016 – AVAYA DEVCONNECT TEST DEMO** screen verify that an entry is displayed for each completed call.

Follow the navigation in **Section 6.1** to display the **Modify PBX…** screen. In the top portion of the screen, verify that an entry is displayed for each completed call with proper values.

From the **ProfitWatch SL Pro Telemanagement 2016 – AVAYA DEVCONNECT PSL DEMO** screen (not shown below), select **Reports** → **Report Generator…** from the top menu. The **Reports Generator** screen is displayed. Select **Extension** → **Extension Details Report** from the top menu, and click **Report**, retaining the default values.

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The **Extension Details Report** automatically pops up in a browser window.

Extension Details Report

AVAYA DEVCONNECT PSL DEMO - BELLEVILLE, ON
Report Date: 04-Nov-16 10:19:03
User ID Range: 0 to 99999999999
Date Range: 04-Nov-16 to 04-Nov-16

Department: Default
User ID: 1000 / (Unknown)

Date	Time	Number Dialed	Dur.	Location	Class	Account	Misc	Charge	Total
11/04/16	08:20:00	15149626006	00:00:12	PQ-Montreal	LD	8888		0.20	0.20
	Calls: 1		00:00:12	Avg Dur: 00:12				0.-20	0.-20

Department: Default
User ID: 1004 / (Unknown)

Date	Time	Number Dialed	Dur.	Location	Class	Account	Misc	Charge	Total
11/04/16	08:17:00	56201	00:00:12	Internal_Ext-Out	EXT			0.00	0.00
11/04/16	08:38:00	54353	00:00:18	Internal_Ext-Out	EXT			0.00	0.00
11/04/16	08:40:00	54353	00:00:36	Internal_Ext-Out	EXT			0.00	0.00
	Calls: 3		00:01:06	Avg Dur: 00:22				0.00	0.00

Department: Default
User ID: 54353 / (Unknown)

Date	Time	Number Dialed	Dur.	Location	Class	Account	Misc	Charge	Total
11/04/16	08:08:00	56201	00:01:36	Internal_Ext-Out	EXT			0.00	0.00
11/04/16	08:37:00	56010	00:00:12	Internal_Ext-Out	EXT			0.00	0.00
	Calls: 2		00:01:48	Avg Dur: 00:54				0.00	0.00

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8. Conclusion

These Application Notes describe the steps required to configure Metropolis ProfitWatch SL Call Accounting System to interoperate with Avaya Aura® Communication Manager, including establishing a CDR link with Avaya Reliable Session Protocol (RSP) enabled and capturing/processing call records. All tests passed as noted in **Section 2.2**.

9. Additional References

This section references the product documentation relevant to these Application Notes.

Product documentation for Avaya products may be found at http://support.avaya.com.

1. *Implementing Avaya Aura® Session Manager* Document ID 03-603473.
2. *Administering Avaya Aura® Session Manager*, Doc ID 03-603324.
3. *Deploying Avaya Aura® System Manager*, Release 7.0.
4. *Administering Avaya Aura® System Manager for Release 7.0*, Release 7.0.
5. *Quick Start Guide to Using the Avaya Aura® Media Server with Avaya Aura® Communication Manager.*
6. *Deploying and Updating Avaya Aura® Media Server Appliance*, Release 7.7.
7. *Administering Avaya Aura® Communication Manager*, Release 7.0, 03-300509.
8. *Avaya Aura® Communication Manager Feature Description and Implementation*, Release 7.0, 555-245-205.

Product documentation for Metropolis products may be found at http://www.metropolis.com.
9. *Metropolis ProfitWatch SL Call Accounting User Guide*.

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