Avaya Solution & Interoperability Test Lab

Application Notes for the Metropolis Technologies ProfitWatch Hotel Call Accounting System with Avaya Communication Manager – Issue 1.0

Abstract

These Application Notes describe the procedures for configuring the Metropolis Technologies ProfitWatch Hotel Call Accounting System to collect call detail records from Avaya Media Servers running Avaya Communication Manager. ProfitWatch processes and stores the call detail records for usage analysis, billing, and reporting purposes. The Avaya Media Servers and ProfitWatch communicate over the TCP/IP network, using the Avaya Reliable Session Protocol (RSP) to ensure reliable delivery of the call records. During compliance testing, ProfitWatch was able to collect and process CDR data for inbound and outbound trunk calls, as well as intra-switch calls. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe a Call Detail Recording (CDR) solution comprised of Avaya Media Servers running Avaya Communication Manager and the Metropolis Technologies ProfitWatch Hotel Call Accounting System. Avaya Communication Manager generates call detail records for intra-switch, inbound trunk, and outbound trunk calls, and transmit the records to ProfitWatch. ProfitWatch processes and stores the call detail records, and provides reports for telephone and trunk usage analysis and billing purposes.

Avaya Communication Manager and a ProfitWatch system establish a session over the TCP/IP network using the Avaya Reliable Session Protocol (RSP). RSP provides a transport mechanism for reliable delivery of CDR records. If connectivity between Avaya Communication Manager and ProfitWatch is lost, Avaya Communication Manager buffers the CDR records until connectivity is restored. For proper parsing and processing of CDR records, the positions and lengths of certain data fields (time, duration, calling number, dialed number, etc.) in the CDR record must be specified in ProfitWatch. The data field positions and lengths depend on the CDR record format configured in Avaya Communication Manager. Avaya Communication Manager supports standard CDR record formats, such as the "int-direct" and "unformatted" formats used during compliance testing, and also allows customized formats.

Figure 1 illustrates a sample configuration consisting of an Avaya S8500 Media Server, an Avaya S8300 Media Server residing in an Avaya G350 Media Gateway, an Avaya G650 Media Gateway, Avaya 4600 Series IP Telephones, and a Metropolis Technologies ProfitWatch Call Accounting System. Avaya Communication Manager runs on the S8500 and S8300 Media Servers, though the solution described herein is also extensible to other Avaya Media Servers. ProfitWatch collects CDR records from both the S8500 and S8300 Media Servers in the test configuration, but collects CDR records from a single switch in typical configurations. The Avaya C363T-PWR supports the verification of the Avaya/Metropolis solution, but is not the focus of these Application Notes and so its configuration is not described here.

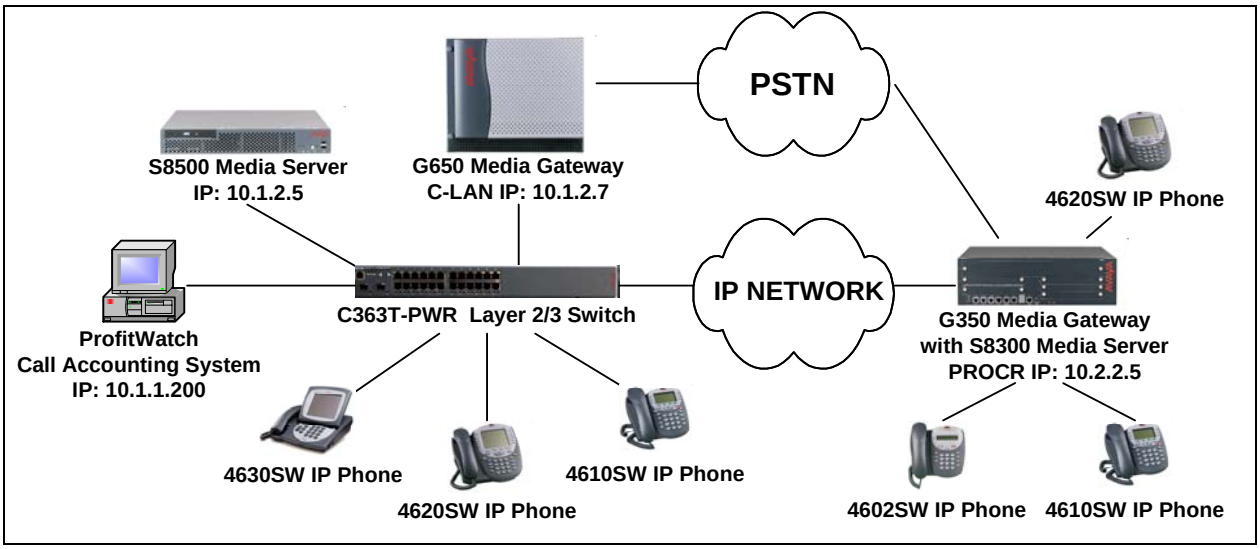


Figure 1: Sample configuration.

2. Equipment and Software Validated

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

Equipment	Software/Firmware
Avaya S8500 Media Server	2.1.1 (R012x.01.1.414.1)
Avaya G650 Media Gateway	-
TN799DP C-LAN	11
TN2312BP IPSI	9
TN2302AP MEDPRO	92
Avaya S8300 Media Server	2.1.1 (R012x.01.1.414.1)
Avaya G350 Media Gateway	22.16.0 (Media Gateway Processor)
Avaya 4600 Series IP Telephones	1.8.2 (4602SW) 2.1.1 (4610SW) 2.1.2 (4620SW) 2.0.1 (4630SW)
Avaya C363T-PWR Converged Stackable Switch	4.3.12
Metropolis Technologies ProfitWatch Hotel Call Accounting System on Windows 2000 Server SP4	8.4 2004.11.17

3. Configure Avaya Communication Manager

This section describes the steps for configuring CDR links, CDR system parameters, and intra-switch CDR extensions on Avaya Communication Manager. The steps are performed through the System Access Terminal (SAT) interface. The steps are applicable to both Avaya Media Servers in the sample configuration of **Figure 1**; some minor differences are noted where helpful.

Step	Description

1.	Enter the **change node-names ip** command.
	
	For the S8500, specify node names for the C-LAN board and ProfitWatch and enter their respective IP addresses.
	
	`change node-names ip` `Page 1 of 1`
	`IP NODE NAMES`
	`Name IP Address Name IP Address`
	`CLAN-1A02 10 .1 .2 .7`
	`G350-MGP 10 .2 .2 .10`
	`MEDPRO-1A03 10 .1 .2 .8`
	`ProfitWatch 10 .1 .1 .200`
	`RDTT 10 .1 .1 .201`
	`S8300-G350-ICC 10 .2 .2 .5`
	`default 0 .0 .0 .0`
	`procr . . .`
	`. . .`
	`( 8 of 8 administered node-names were displayed )`
	`Use 'list node-names' command to see all the administered node-names`
	`Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name`
	
	For the S8300, specify a node name for ProfitWatch and enter its IP address. The node name and IP address for **procr** (the S8300 Media Server Processor Ethernet) are automatically set when the S8300 is configured with an IP address.
	
	`change node-names ip` `Page 1 of 1`
	`IP NODE NAMES`
	`Name IP Address Name IP Address`
	`G650-CLAN1A02 10 .1 .2 .7`
	`ProfitWatch 10 .1 .1 .200`
	`RDTT 10 .1 .1 .201`
	`default 0 .0 .0 .0`
	`procr 10 .2 .2 .5`
	`. . .`
	`( 5 of 5 administered node-names were displayed )`
	`Use 'list node-names' command to see all the administered node-names`
	`Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name`
	
	The node names configured above will be used in the ip-services form to specify the local and remote nodes of the CDR links.

Step	Description

2.	Enter the **change ip-services** command. On page 1 of the **ip-services** form, configure a "**CDR1**" **Service Type** and specify the node names configured in Step 1 above for the C-LAN board (or Processor Ethernet for the S8300) and ProfitWatch as the **Local Node** and **Remote Node**, respectively. The **Local Port** is fixed at "**0**" and the **Remote Port** may be set to a value between 5000 and 64500, inclusive, but must match the port configured on ProfitWatch (see Step 3 of Section 4).
	
	S8500:
	
	`change ip-services` `Page 1 of 3`
	
	`IP SERVICES`
	`Service Type` `Enabled` `Local Node` `Local Port` `Remote Node` `Remote Port`
	`CDR1 CLAN-1A02 0 ProfitWatch 9000`
	
	S8300:
	
	`change ip-services` `Page 1 of 3`
	
	`IP SERVICES`
	`Service Type` `Enabled` `Local Node` `Local Port` `Remote Node` `Remote Port`
	`CDR1 procr 0 ProfitWatch 9000`
	
	On page 3 of the **ip-services** form, enable the Reliable Session Protocol (RSP) for the CDR link by setting **Reliable Protocol** to "**y**".
	
	`change ip-services` `Page 3 of 3`
	
	`SESSION LAYER TIMERS`
	`Service Type` `Reliable Protocol` `Packet Resp Timer` `Session Connect Message Cntr` `SPDU Cntr` `Connectivity Timer`
	`CDR1` **`y`** `30 3 3 60`

Step	Description

3.	Enter the **change system-parameters cdr** command and set the following:
	
	• **CDR Date Format**: set to either **month/day** or **day/month**. The date format will be used for the date stamp that begins each new day of call records or in the "int-direct" and "customized" CDR output formats (see below).
	• **Primary Output Format**: set to a format specified in [1] or "**customized**". The example below uses the "**int-direct**" format.
	• **Primary Output Endpoint**: set to "**CDR1**".
	• **Record Outgoing Calls Only**: set to "**n**" so that incoming calls are tracked in CDR records.
	• **Suppress CDR for Ineffective Call Attempts**: set to "**y**" so that calls that are blocked do not generate CDR records.
	• **Intra-switch CDR**: set to "**y**" so that CDR records will be generated for calls to/from extensions that are assigned intra-switch CDR (see Step 5 below).
	• **Outg Trk Call Splitting / Inc Trk Call Splitting**: set to "**y**" if a separate CDR record is desired for any portion of an outgoing/incoming call that is transferred or conferenced.
	
	`change system-parameters cdr` `Page 1 of 2`
	`CDR SYSTEM PARAMETERS`
	
	`Node Number (Local PBX ID):` **`CDR Date Format: month/day`**
	`Primary Output Format: int-direct Primary Output Endpoint: CDR1`
	`Secondary Output Format:`
	`Use ISDN Layouts? n`
	`Use Enhanced Formats? n Condition Code 'T' For Redirected Calls? n`
	`Modified Circuit ID Display? n Remove # From Called Number? n`
	`Record Outgoing Calls Only? n Intra-switch CDR? y`
	`Suppress CDR for Ineffective Call Attempts? y Outg Trk Call Splitting? y`
	`Disconnect Information in Place of FRL? n Outg Attd Call Record? 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? 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: 15`

Step	Description
4.	If **Primary Output Format** is set to "**customized**", then on page 2 of the **system-parameters cdr** form, enter the data items in the order that they should appear in the customized call records sent over the CDR link. For each field in the CDR record, specify the data item and length.

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


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

                               Record length = 69
```

Step	Description
5.	If Intra-switch CDR is enabled (Step 3), enter the command **change intra-switch-cdr** and enter the extensions for which intra-switch calls will generate CDR data.

```
change intra-switch-cdr                                        Page   1 of   2
                          INTRA-SWITCH CDR

Assigned Members:   3    of 5000   administered
  1: 50000    19:          37:          55:          73:          91:
  2: 50001    20:          38:          56:          74:          92:
  3: 50002    21:          39:          57:          75:          93:
  4:          22:          40:          58:          76:          94:
  5:          23:          41:          59:          77:          95:
  6:          24:          42:          60:          78:          96:
  7:          25:          43:          61:          79:          97:
  8:          26:          44:          62:          80:          98:
  9:          27:          45:          63:          81:          99:
 10:          28:          46:          64:          82:         100:
 11:          29:          47:          65:          83:         101:
 12:          30:          48:          66:          84:         102:
 13:          31:          49:          67:          85:         103:
 14:          32:          50:          68:          86:         104:
 15:          33:          51:          69:          87:         105:
 16:          34:          52:          70:          88:         106:
 17:          35:          53:          71:          89:         107:
 18:          36:          54:          72:          90:         108:
```

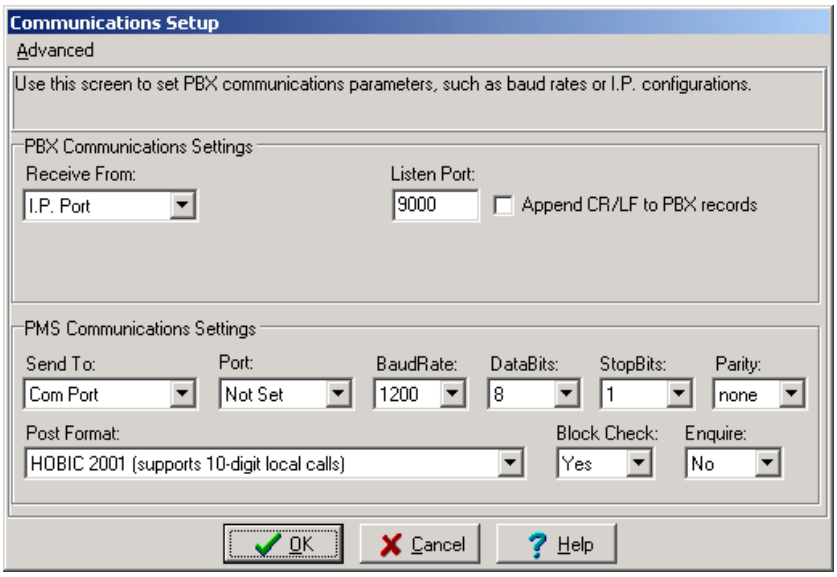
Note: For ease of implementation, special application **(SA8202) Intra-Switch CDR by COS** is an optional feature that allows customers to enable intra-switch CDR for extensions that are assigned a COS with intra-switch CDR activated. The customer does not have to manually add individual extensions in the **intra-switch-cdr** form. The SA8202 feature also removes the 1000 and 5000 extension limit for the S8300 and S8500, respectively, allowing CDR records to be generated for as many extensions as are administered on the switch.

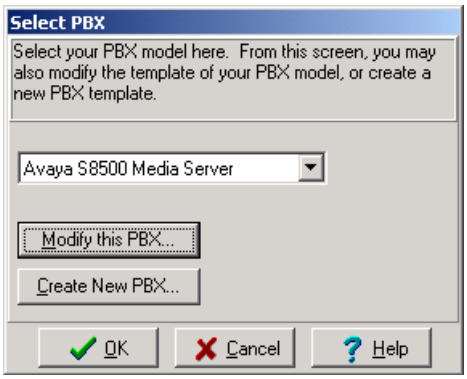
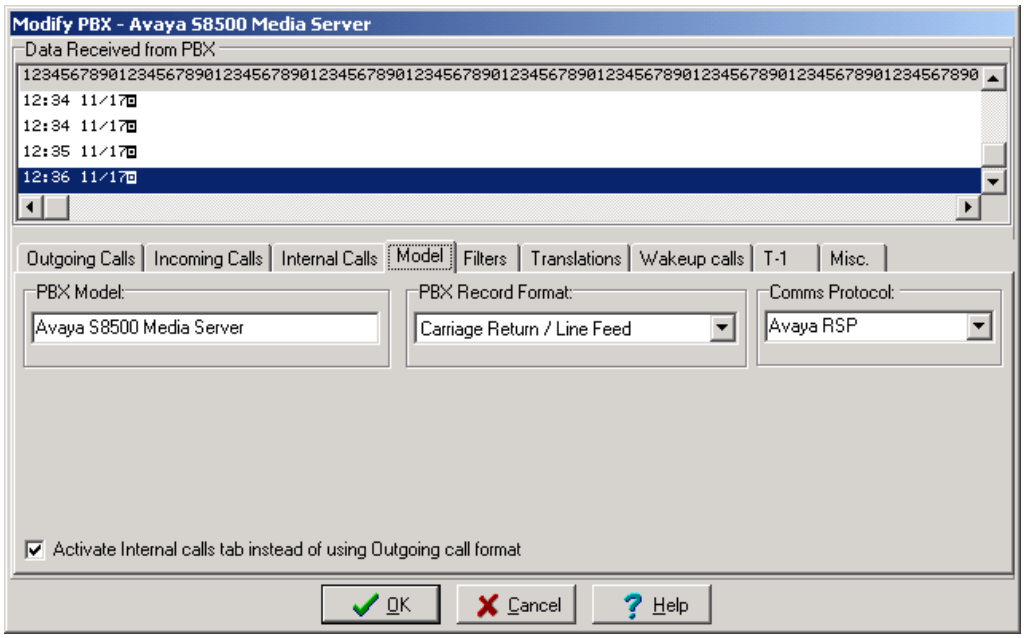
Step	Description
6.	For each trunk group for which CDR records are desired, enter the command **change trunk-group n**, where n is the trunk group number, and set **CDR Reports** to "**y**". The example below depicts the trunk group containing trunks connected to the PSTN in the sample configuration.

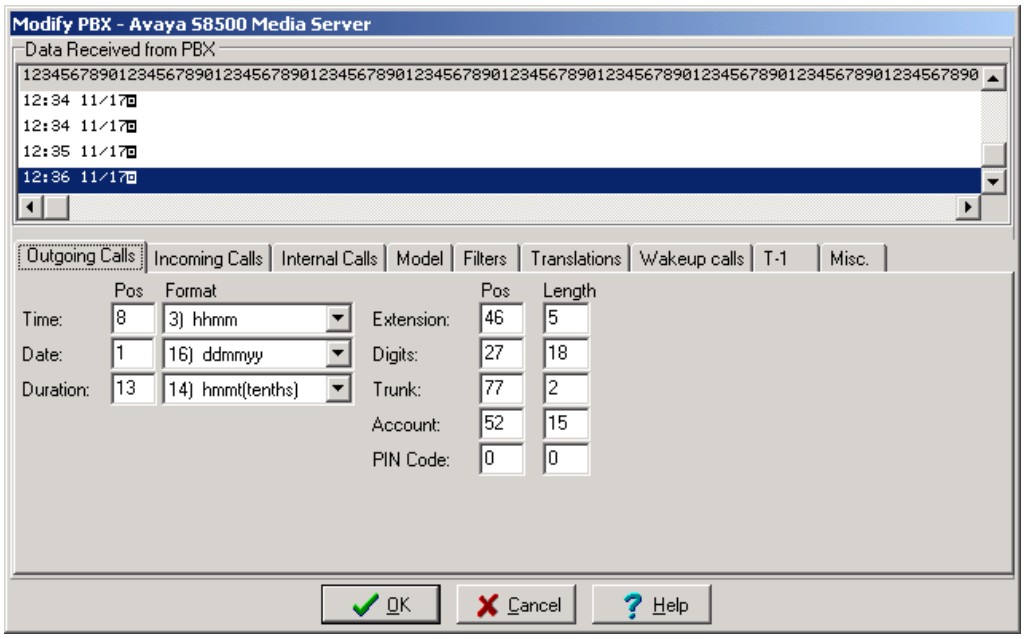
```
change trunk-group 3                                          Page   1 of  20
                                TRUNK GROUP

Group Number: 3                     Group Type: co            CDR Reports: y
  Group Name: PSTN                        COR: 1        TN: 1        TAC: 103
   Direction: two-way        Outgoing Display? n
 Dial Access? y                Busy Threshold: 255       Night Service:
Queue Length: 0           Country: 1              Incoming Destination: 50001
   Comm Type: voice                 Auth Code? n   Digit Absorption List:
    Prefix-1? y                   Trunk Flash? n         Toll Restricted? n

TRUNK PARAMETERS
            Trunk Type: loop-start
    Outgoing Dial Type: automatic
     Trunk Termination: 600ohm                Disconnect Timing(msec): 500

            Auto Guard? n    Call Still Held? n     Sig Bit Inversion: none
     Analog Loss Group: 6                           Digital Loss Group: 11
                                   Trunk Gain: high

 Disconnect Supervision - In? y  Out? n                Cyclical Hunt? n
 Answer Supervision Timeout: 10            Receive Answer Supervision? n
```

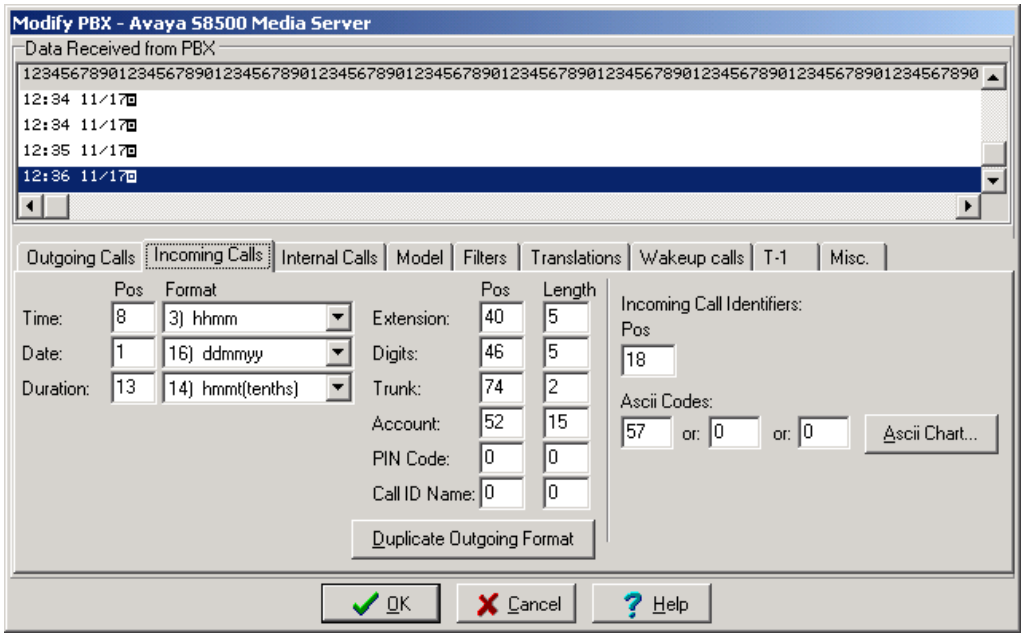
4. Configure the Metropolis ProfitWatch

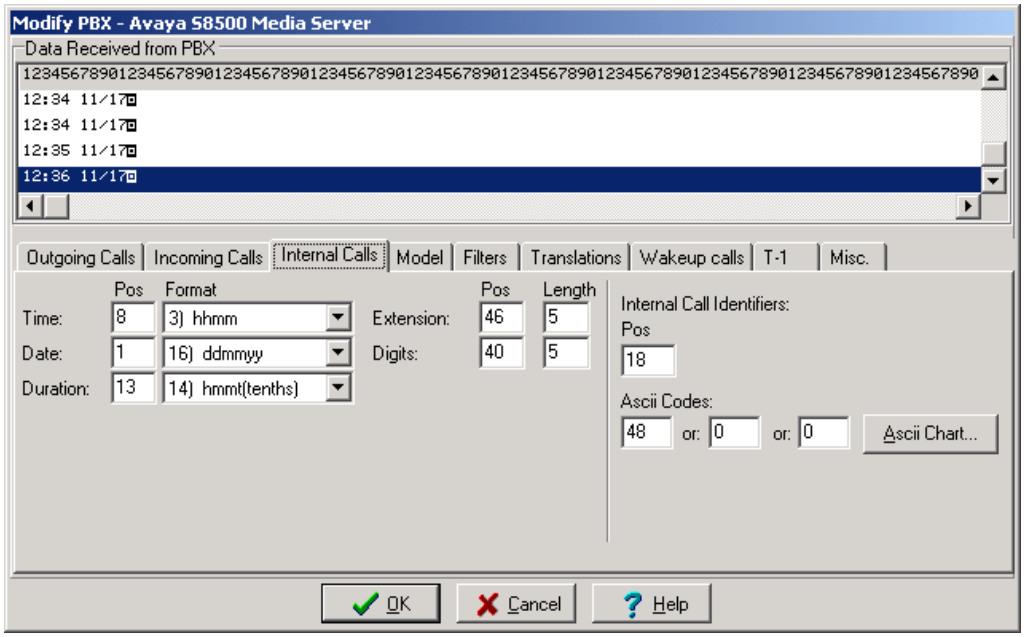
The steps in this section describe the configuration of the ProfitWatch system.

Step	Description
1.	Start the ProfitWatch Call Accounting application.
2.	Select "**Communications**" from the **Setup** menu.
3.	In the **PBX Communications Settings** box, set **Receive From** to "**I.P. Port**" and **Listen Port** to a value between 5000 and 64500. Note that the **Listen Port** must match the CDR link port configured for Avaya Communication Manager (see Step 2 of Section 3). Click on "**OK**". 
4.	Select "**Select PBX…**" from the **Setup** menu.

Step	Description
5.	Select "**Avaya S8300 Media Server**" or "**Avaya S8500 Media Server**" from the drop-down menu box and click on "**Modify this PBX…**". The choice between the two templates is immaterial because in the steps that follow, the selected template will be modified according to the CDR record format configured on the Media Server. Alternatively, click on "**Create New PBX…**" to define and use a new template. 
6.	Select the **Model** tab, set **PBX Record Format** to **"Carriage Return / Line Feed**" and **Comms Protocol** to "**Avaya RSP**", and check the **Activate Internal calls tab instead of using Outgoing call format** checkbox. Modify the name of the template in the **PBX Model** textbox if so desired. 

Step	Description
7.	Select the **Outgoing Calls** tab, and specify the positions, formats, and lengths of the fields shown below in accordance with the CDR record format configured on Avaya Communication Manager (see Step 3 of Section 3). Note the following equivalent Avaya CDR data format terminology for outgoing calls: • **Extension** is the "Calling number" • **Digits** is the "Dialed number" • **Trunk** is the "Outgoing circuit ID" • **Account** is the "Account code" See [1] for Avaya Communication Manager CDR record formats and data field descriptions. 

Step	Description
8.	Select the **Incoming Calls** tab, and specify the positions, formats, and lengths of the fields shown below in accordance with the CDR record format configured on Avaya Communication Manager (see Step 3 of Section 3). Note the following equivalent Avaya CDR data format terminology for incoming calls: • **Extension** is the "Dialed number" • **Digits** is the "Calling number" • **Trunk** is the "Incoming circuit ID" • **Account** is the "Account code" • **Incoming Call Identifiers** is the "Condition code" See [1] for Avaya Communication Manager CDR record formats and data field descriptions. For **Ascii Codes**, enter "**73**" for 59-character CDR record formats or "**57**" for other formats. "73" and "57" are the ASCII values for characters "I" and "9", respectively, which are the condition codes for incoming calls. 

Step	Description
9.	Select the **Internal Calls** tab, and specify the positions, formats, and lengths of the fields shown below in accordance with the CDR record format configured on Avaya Communication Manager (see Step 3 of Section 3). Note the following equivalent Avaya CDR data format terminology for internal (intra-switch) calls: • **Extension** is the "Calling number" • **Digits** is the "Dialed number" • **Internal Call Identifiers** is the "Condition code" See [1] for Avaya Communication Manager CDR record formats and data field descriptions. For **Ascii Codes**, enter "**48**". "48" is the ASCII value for the character "0", which is the condition code for intra-switch calls. Click on "**OK**". 

5. Interoperability Compliance Testing

The interoperability compliance testing included feature, serviceability, and performance testing. The feature testing evaluated the ability of ProfitWatch to collect and process CDR records for various types of calls. The serviceability testing introduced failure scenarios to see if ProfitWatch can resume CDR record collection after failure recovery. The performance testing produced bulk call volumes to generate a substantial amount of CDR records.

5.1. General Test Approach

The general test approach was to place internal (intra-switch), inbound trunk, and outbound trunk calls to and from telephones controlled by the Avaya Media Servers, and verify that ProfitWatch collects the CDR records for those calls. For serviceability testing, physical and logical links were to be disabled and re-enabled, and the Avaya Media Servers and ProfitWatch were to be reset. For performance testing, a call generator was to continuously place calls to the Avaya Media Servers over an extended period of time.

5.2. Test Results

ProfitWatch successfully collected CDR records from the Avaya Media Servers for internal calls as well as inbound/outbound trunk calls from/to the PSTN and trunk calls between the two Avaya Media Servers over the IP network. For serviceability testing, ProfitWatch was able to resume collecting CDR records after failure recovery, including buffered CDR records, i.e. CDR records for calls placed during the outages. For performance testing, ProfitWatch successfully collected CDR records for a moderate call volume lasting for over 12 hours.

6. Verification Steps

The following steps may be used to verify the configuration:

- From the ProfitWatch computer, ping the Avaya G650 Media Gateway C-LAN and Media Processor boards and verify connectivity.
- On the SAT of each Avaya Media Server, enter the **status cdr-link** command and verify that the CDR link state is up.
- Place a call and verify that ProfitWatch received the raw CDR record for the call using the “Data Spy” or “Display PBX Data” features in ProfitWatch. Compare the positions and lengths of the data fields in the raw CDR record with the positions and lengths specified in ProfitWatch, and verify that they match.
- Examine the processed CDR record and verify its accuracy.
- Place internal, inbound trunk, and outbound trunk calls to and from various telephones, generate an appropriate report in ProfitWatch, and verify the report’s accuracy.

7. Support

Contact the following for technical support on Metropolis Technologies products:

- Phone: 1-858-488-4600
- E-mail: support2004@metropolis.com

8. Conclusion

These Application Notes illustrate the procedures for configuring the Metropolis Technologies ProfitWatch Hotel Call Accounting System to collect call detail records from Avaya Media Servers running Avaya Communication Manager. During compliance testing, ProfitWatch was able to collect and process CDR data for inbound and outbound trunk calls, as well as intra-switch calls placed to and from telephones controlled by the Avaya Media Servers.

9. Additional References

[1] Administrator's Guide for Avaya Communication Manager, Volumes 1, 2, and 3, Issue 7, November 2003, Document Number 555-233-506.

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

Product information for the Metropolis Technologies ProfitWatch Hotel Call Accounting System may be found at http://www.metropolis.com/hotelcallaccounting.html.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya Developer*Connection* Program at devconnect@avaya.com.