



Avaya Solution & Interoperability Test Lab

Application Notes for Tri-Line's TIM Enterprise with Avaya Aura® Communication Manager - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Tri-Line's TIM Enterprise to interoperate with Avaya Aura® Communication Manager.

TIM Enterprise is an enterprise-class call logging software that interoperates with Avaya Aura® Communication Manager over TCP/IP for the collection of Call Details Records (CDRs). TIM Enterprise listens, collects, and processes the call records generated for various types of calls.

Readers should pay particular attention to the scope of testing as outlined in **Section 2.1**, as well as 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.

1. Introduction

The objective of this compliance test is to verify that Tri-Line's TIM Enterprise 3.0.0.108 enterprise-class call logging software can interoperate with Avaya Aura® Communication Manager 7.0.1.2. TIM Enterprise interoperates with Avaya Aura® Communication Manager over TCP/IP for the collection of Call Detail Records (CDR). During compliance testing, the CDR collection was verified Avaya Communication Manager running in a VMware Environment.

2. General Test Approach and Test Results

The general test approach was to manually place intra-switch calls, inter-switch calls, inbound and outbound PSTN trunk calls to and from telephones attached to the Avaya Media Servers, and verify that TIM Enterprise collects the CDR records and properly classifies and reports the attributes of the call. For serviceability testing, logical links were disabled/re-enabled, and media servers were rebooted.

All executed test cases were passed. TIM Enterprise successfully collected the CDR records from Avaya Communication Managers via CDR link for all types of calls generated including intra-switch calls, inbound/outbound PSTN trunk calls, inbound/outbound inter-switch IP trunk calls, transferred calls, and conference calls. For serviceability testing, the TIM Enterprise server was able to resume collecting CDR records automatically after failure recovery, including buffered CDR records for calls that were placed during the outages.

2.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. The feature testing evaluated the ability of Tri-Line's TIM Enterprise to collect and process CDR records for various types of calls: intra-switch calls (calls between phones on the same site), outbound/inbound calls to/from the PSTN and outbound/inbound calls to/from the phones between the two sites via the IP trunk. The serviceability testing introduced failure scenarios to see if TIM Enterprise can resume CDR collection after failure recovery.

2.2. Test Results

All tests carried out passed successfully.

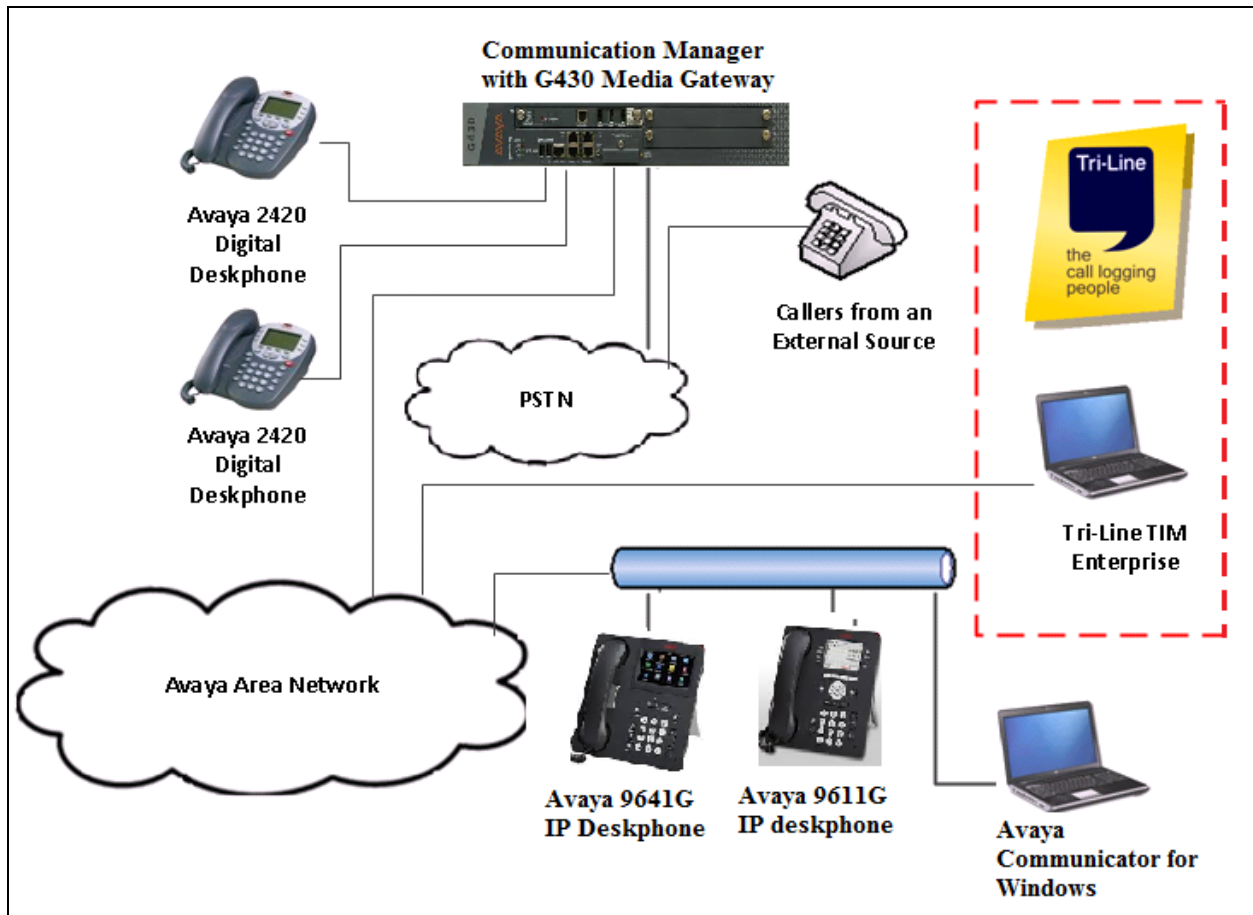
2.3. Support

Technical support from Tri-Line can be obtained through the following:

Phone: +44 20 7265 2626
E-mail: support@tri-line.com.
Web: <http://www.tri-line.com/>
Address: 9-10 Telfords Yard
The Highway
LONDON
E1W 2BS
England

3. Reference Configuration

Figure 1 illustrates a sample configuration that was used to compliance test the interoperability of Tri-Line's TIM Enterprise and Avaya Communication Manager. TIM Enterprise was installed on Windows and it was connected to Communication Manager for collecting CDR records.



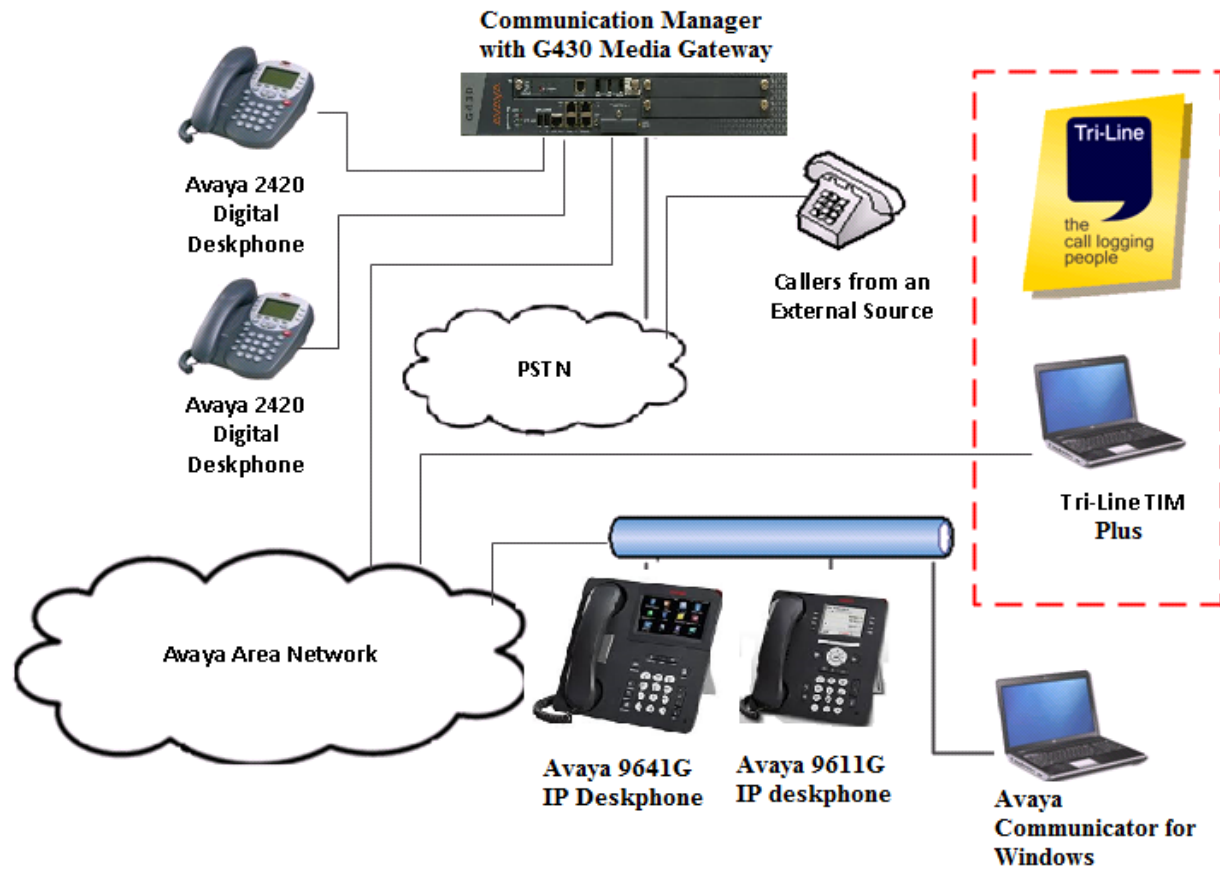


Figure 1: Tri-Line TIM Enterprise with Avaya Communication Manager

4. Equipment and Software Validated

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

Equipment	Software
Avaya Communication manager running in a VMware environment	R7.0.1.2 Build 7.0.0.0.16266 SW Update Revision No. 7.0.1.2.086007 Service Pack 2
Avaya G430 Media Gateway	37.41.0
Avaya 96x1 Series IP Telephones - 9611g - 9641g -	6.6229 (H.323) 7.0.11(SIP)
Avaya 2400 Series Digital Telephone	-
Avaya Communicator for Windows	2.1.3.0
Tri-Line TIM Enterprise <ul style="list-style-type: none">Windows 2012 ServerInternet Explorer	3.0.0.108

5. Configure the Avaya Communication Manager

This section provides the procedures for configuring Call Data Record (CDR) features in Avaya Communication Manager. All the configuration changes in Avaya Communication Manager are performed through the System Access Terminal (SAT). Avaya Communication Manager was configured to generate CDR records to the IP address of the TIM Enterprise server over TCP/IP. The CDR link originates at the IP address of the **procr** interface that connects to the same network where the TIM Enterprise server is located. The highlights in the following screens indicate the value used during the compliance test.

Use the **change node-names ip** command to add a new node name for the TIM Enterprise server by specifying the **Name** and the **IP Address** of the server.

change node-names ip		Page 1 of 1	
		IP NODE NAMES	
Name	IP Address	Name	IP Address
TIMEnterprise	10. 10 .16 .95	.	.
default	0 .0 .0 .0	.	.
procr	10. 10 .2 .201	.	.

Use the **change ip-services** command to define the CDR link over TCP/IP. To define a primary CDR link, the following information should be provided:

- **Service Type: CDR1** [If needed, a secondary link can be defined by setting Service Type to CDR2.]
- **Local Node: procr**
- **Local Port: 0** [The Local Port is fixed to 0.]
- **Remote Node: TIMEnterprise** [The Remote Node is set to the node name that was created in the previous step for the TIM Enterprise server.]
- **Remote Port: 9001** [The Remote Port may be set to a value between 5000 and 64500 inclusive and must match the port configured in the TIM Enterprise server. During the compliance test, the remote port 9001 was used.]

Note: A different port number must be specified for each Communication Manager Server.

change ip-services		Page 1 of 3	
		IP SERVICES	
Service Type	Enabled	Local Node	Remote Node
CDR1		procr	TIMEnterprise
		0	9001

On **Page 3** of the ip-services form, disable the Reliable Session Protocol (RSP) for the CDR link by setting the **Reliable Protocol** field to **n**.

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	n	30	3	3	60	

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

- **CDR Data Format: day/month**
- **Primary Out Format: customized**
- **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 [2] 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 5.x CDR formats. 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 **inter-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.]

change system-parameters cdr						Page	1	of	2
CDR SYSTEM PARAMETERS									
Node Number (Local PBX ID): 1				CDR Date Format: day/month					
Primary Output Format: customized				Primary Output Endpoint: CDR1					
Secondary Output Format:									
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? y				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: group-ext					
Record Called Vector Directory Number Instead of Group or Member? n									
Inc Trk Call Splitting? y				Inc Attd Call Record? y					
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: 6					

On the **Page 2** of the CDR SYSTEM PARAMETERS form, define the customized CDR format as shown below.

change system-parameters cdr			Page 2 of 2		
CDR SYSTEM PARAMETERS					
Data Item	Length		Data Item	Length	
1: date	- 6		17: dialed-num	- 18	33: auth-code
2: space	- 1		18: space	- 1	34: return
3: time	- 4		19: in-trk-code	- 4	35: line-feed
4: space	- 1		20: space	- 1	36:
5: sec-dur	- 5		21: in-crt-id	- 3	37:
6: space	- 1		22: space	- 1	38:
7: cond-code	- 1		23: calling-num	- 15	39:
8: space	- 1		24: space	- 1	40:
9: atttd-console	- 2		25: vdn	- 5	41:
10: space	- 1		26: space	- 1	42:
11: code-used	- 4		27: bcc	- 1	43:
12: space	- 1		28: space	- 1	44:
13: out-crt-id	- 3		29: ppm	- 5	45:
14: space	- 1		30: space	- 1	46:
15: code-dial	- 4		31: acct-code	- 15	47:
16: space	- 1		32: space	- 1	48:

Record length = 126

If the Intra-switch CDR field is set to **y** in the CDR SYSTEM PARAMETERS form, use the **change intra-switch-cdr** command to define the extensions that will be subject to call detail records. In the **intra-switch-cdr** form, enter a specific extensions tracked with a CDR record. Add an entry for each additional **Extension** of interest.

change intra-switch-cdr		Page 1 of 3	
INTRA-SWITCH CDR			
Extension	Assigned Members:	4	of 5000 administered
Extension	Extension	Extension	Extension
8270001			
8270002			
8270004			
8270005			
8275000			
8275400			

For each trunk group for which CDR records are desired, verify that CDR reporting is configured to generate the ring interval CDR records. Use the **change trunk-group n** command, where **n** is the trunk group number, to verify that the **CDR Reports** field is set to **r**. This applies to all types of trunk groups.

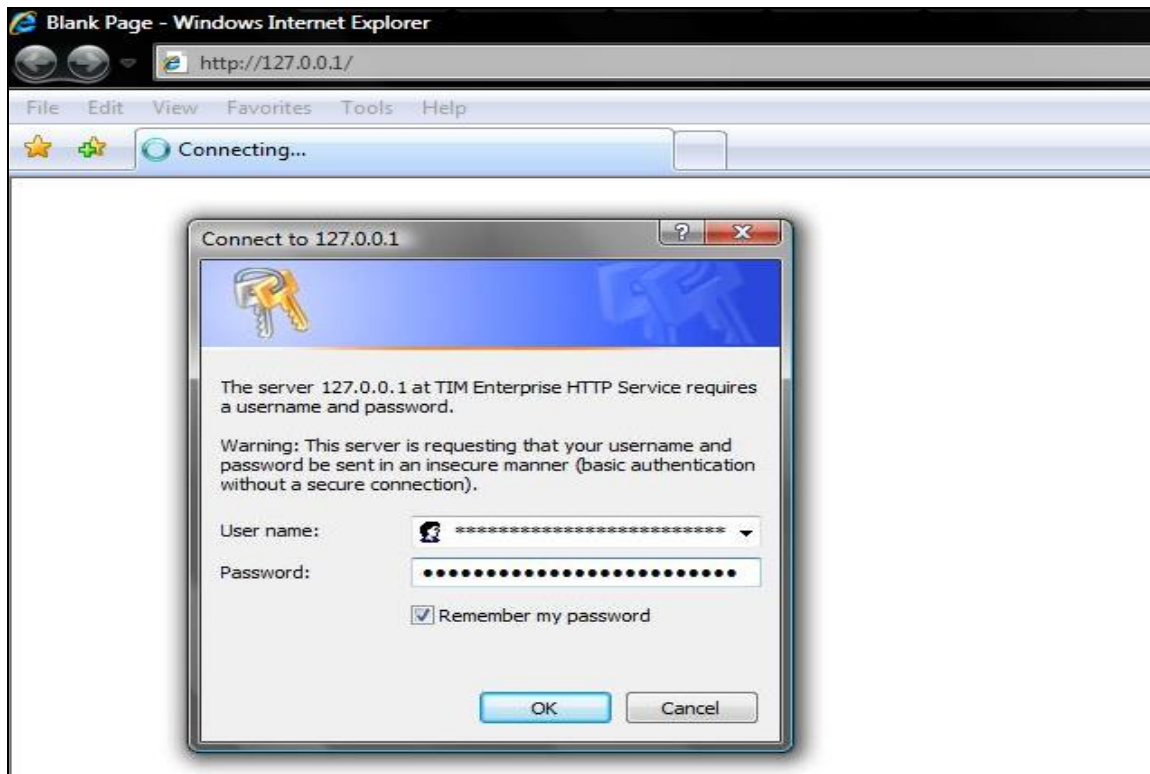
change trunk-group 3		Page 1 of 21	
TRUNK GROUP			
Group Number:3		Group Type: isdn	
Group Name: ToSimulatedPSTN		COR: 1	
Direction: two-way		Outgoing Display? y	
Dial Access? y		Busy Threshold: 255	
Queue Length: 0			
Service Type: tie		Auth Code? n	
		TestCall ITC: rest	
		Far End Test Line No:	
TestCall BCC: 4			

6. Configure the TIM Enterprise server

This section provides the procedures for configuring the TIM Enterprise server to receive Call Data Records (CDRs) for various call types output by the Avaya Communication Manager.

To access TIM Enterprise, open a web browser and enter the IP address of the TIM Enterprise server e.g. <http://x.x.x.x/> where x.x.x.x is the IP address of the machine running TIM Enterprise.

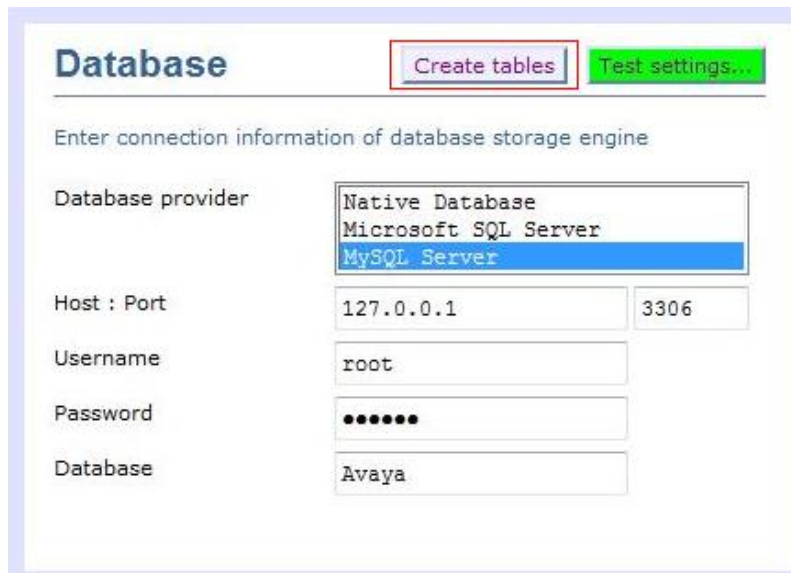
Enter a valid username and password in the web browser's authentication window that appears, and select **OK**.



After successful login, the default **System settings** screen is displayed. This is the main screen that will be used to configure the TIM Enterprise system.

To configure the Database settings, select the **Database provider** that will be used to store the call data on the TIM Enterprise server. In this case **MySQL Server** was specified. Type in the **Host** and **Port** number of the SQL server and enter the **Username** and **Password** for the SQL server connection. Type the name of the **Database** to connect to and click on the **Test settings** button to verify that the database details entered are valid.

If the **Test settings** button comes back green the settings were correct. Prepare the database tables and indices by clicking the **Create tables** button.



Database Create tables Test settings...

Enter connection information of database storage engine

Database provider: Native Database, Microsoft SQL Server, **MySQL Server**

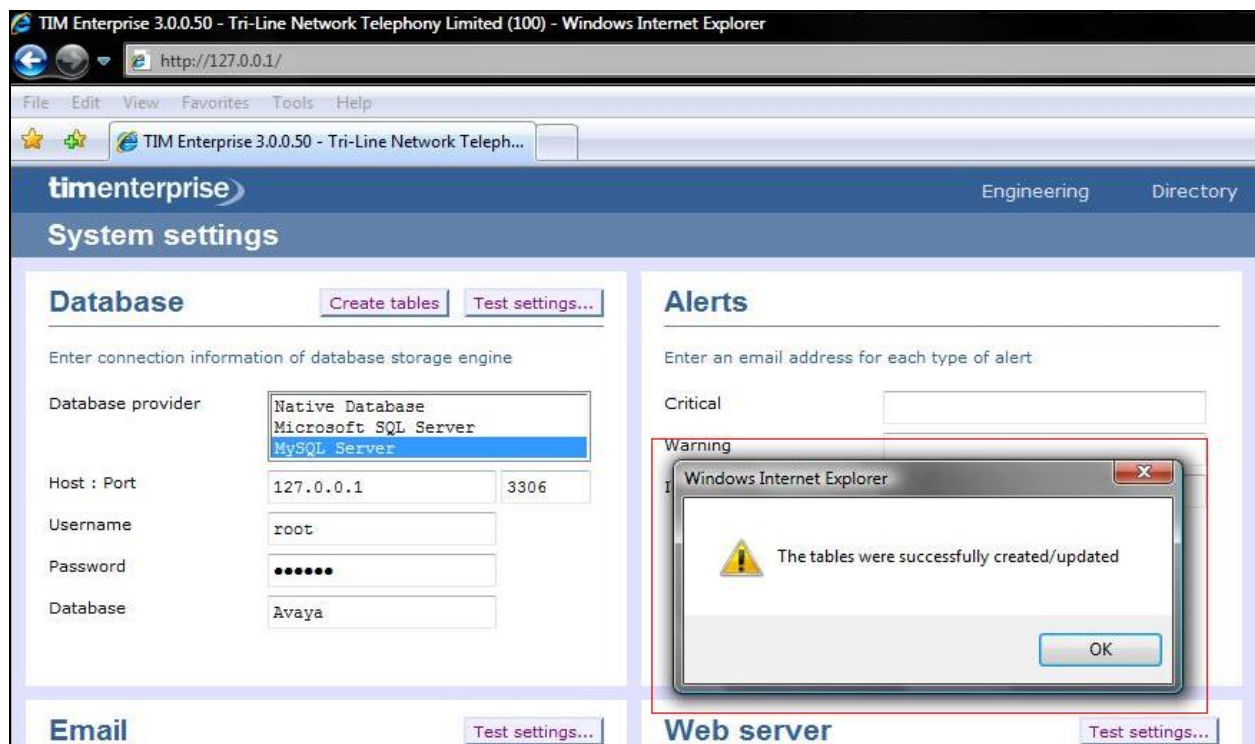
Host : Port: 127.0.0.1 3306

Username: root

Password:

Database: Avaya

When the tables are created successfully, the alert will be displayed as shown below. Click **OK**.



TIM Enterprise 3.0.0.50 - Tri-Line Network Telephony Limited (100) - Windows Internet Explorer

http://127.0.0.1/

File Edit View Favorites Tools Help

TIM Enterprise 3.0.0.50 - Tri-Line Network Teleph...

timenterprise Engineering Directory

System settings

Database Create tables Test settings...

Enter connection information of database storage engine

Database provider: Native Database, Microsoft SQL Server, **MySQL Server**

Host : Port: 127.0.0.1 3306

Username: root

Password:

Database: Avaya

Alerts

Enter an email address for each type of alert

Critical

Warning

Windows Internet Explorer

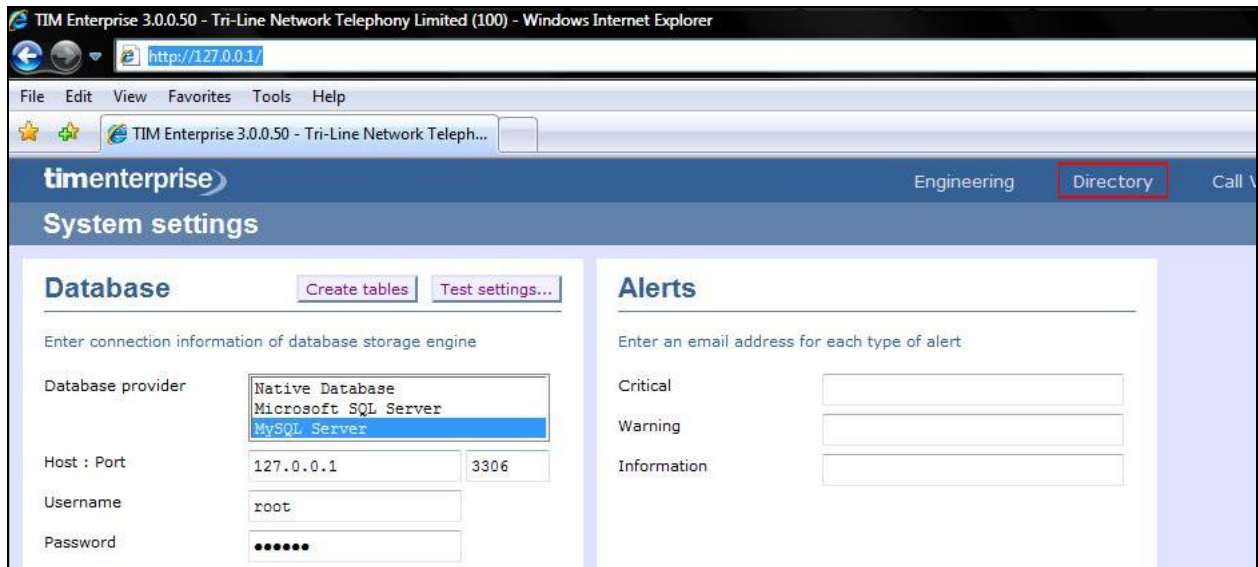
The tables were successfully created/updated

OK

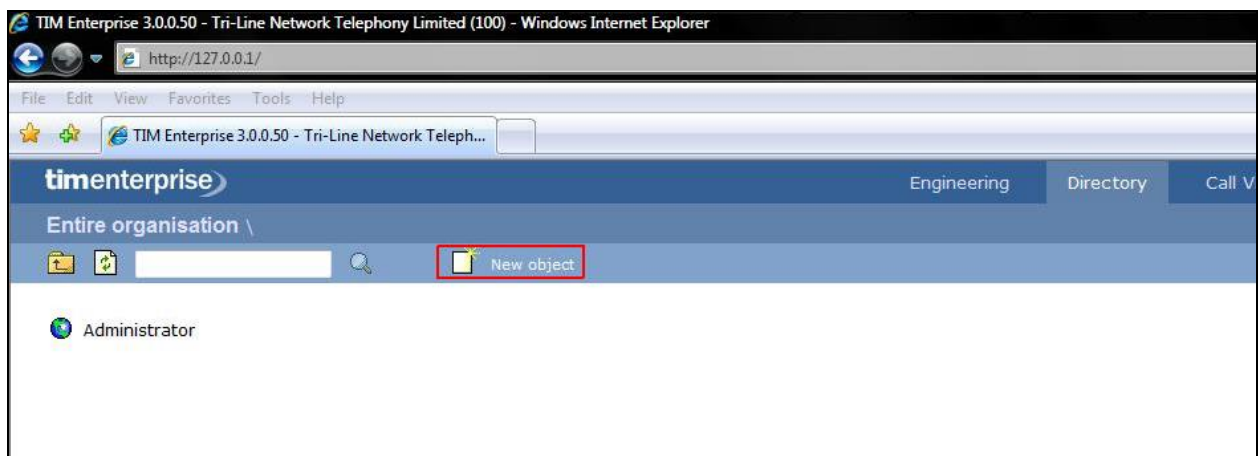
Email Test settings... **Web server** Test settings...

This completes the configuration of the Database settings on TIM Enterprise. The next task is to configure the Directory settings.

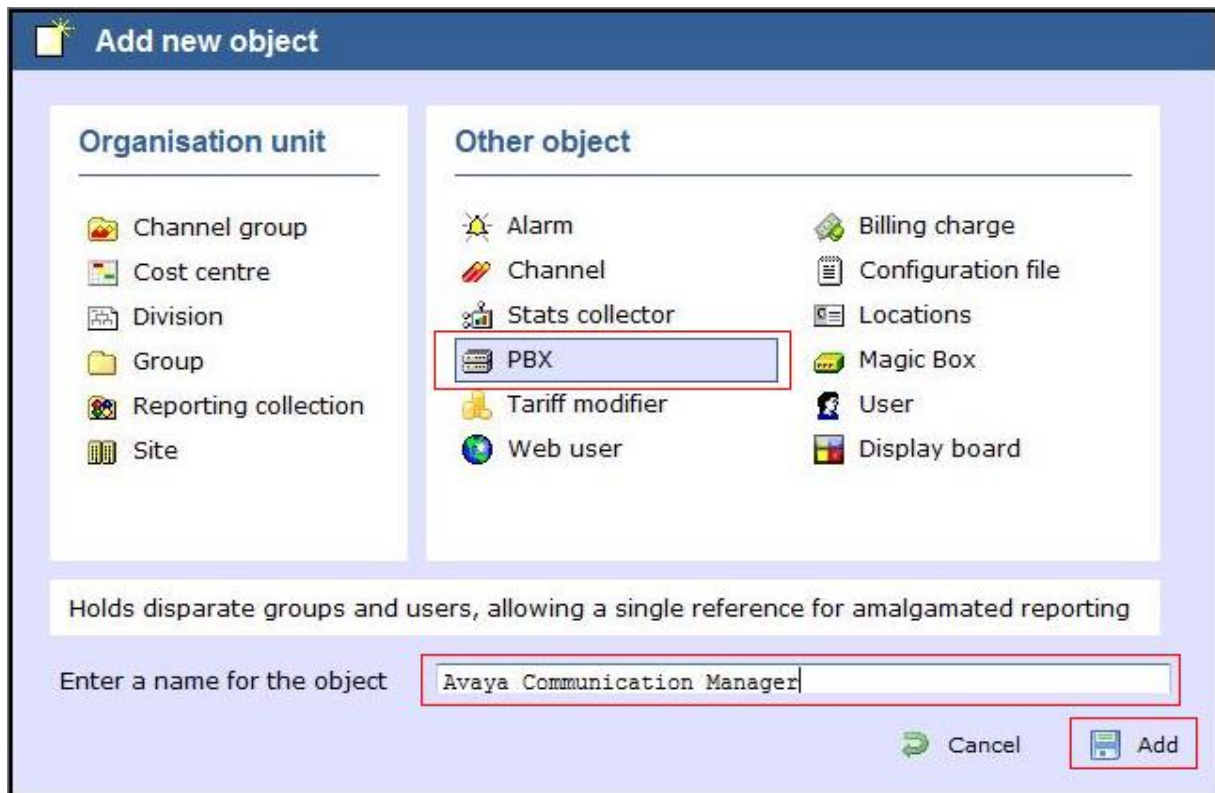
To configure the Directory settings, click on the **Directory** tab in the TIM Enterprise toolbar.



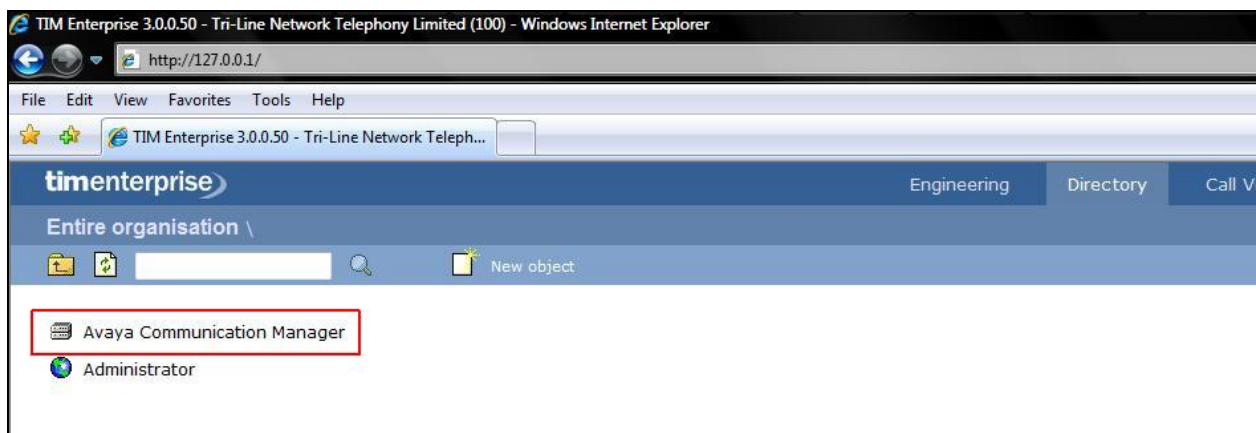
On the Directory screen that is displayed, click on **New Object**.



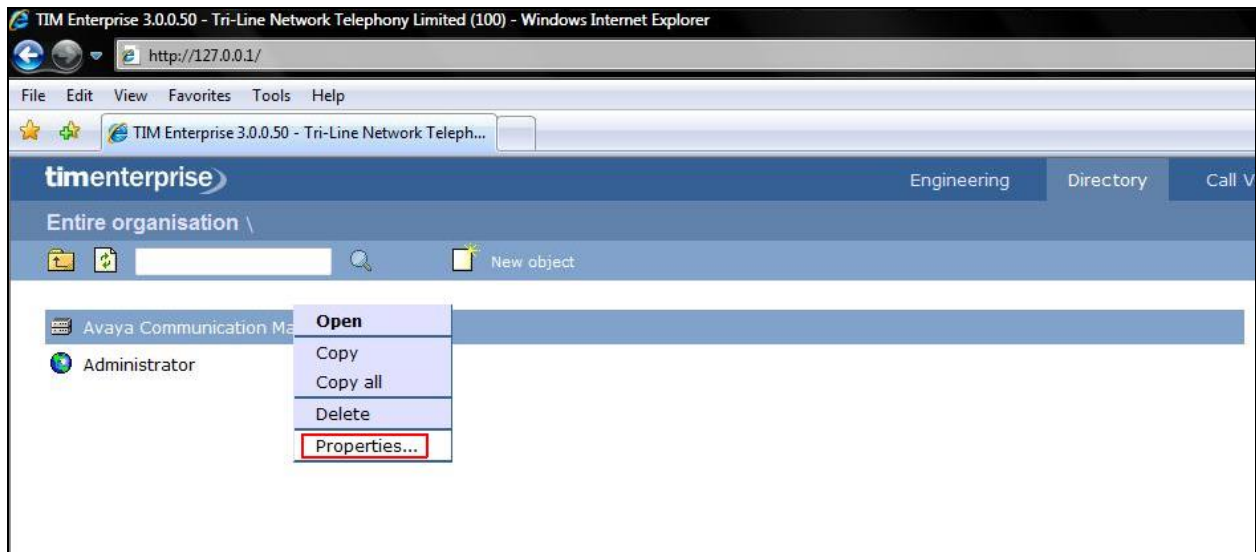
On the **Add new object** window that appears, select **PBX**. In the field, **Enter a name for the object**, enter **Avaya Communications Manager** and click the **Add** button as shown below.



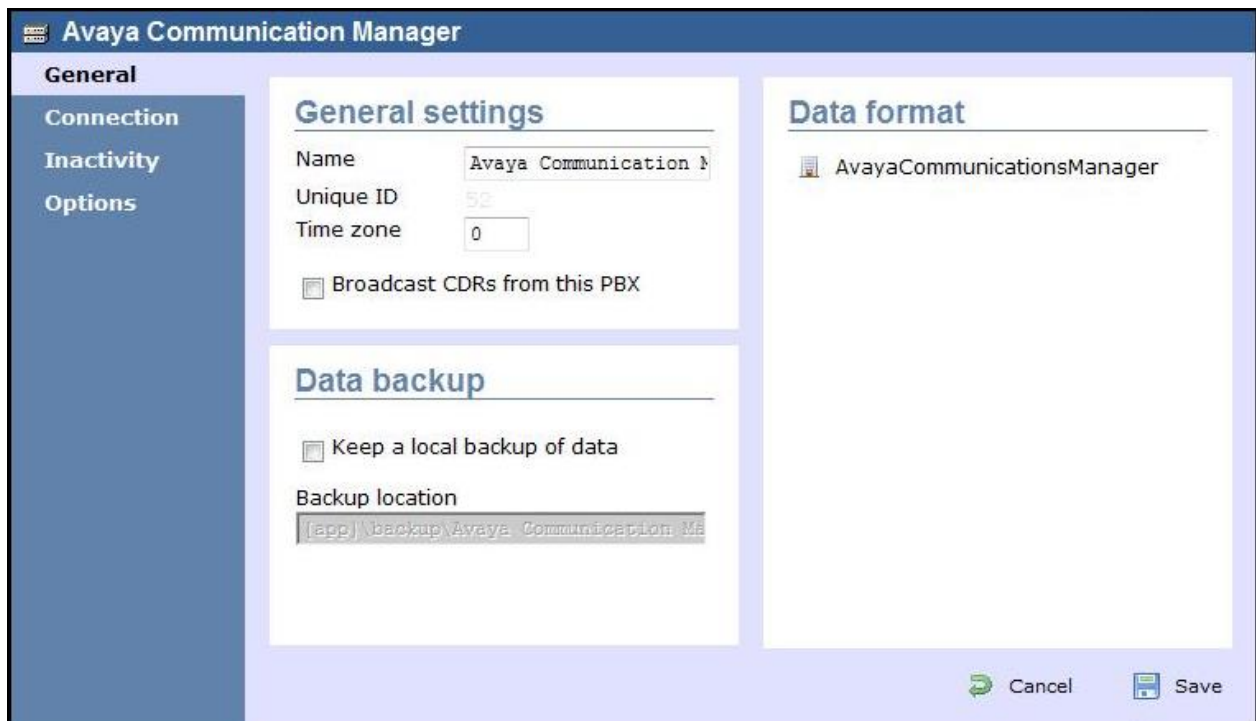
The **Avaya Communication Manager** will appear in the Directory as shown below.



To configure TIM Enterprise to receive information from Avaya Communication Manager, click on the **Avaya Communication Manager** object and select **Properties** as shown below.



A new **Avaya Communication Manager** window will appear with default **General** tab displayed.



Under the **Data format** section of the **General** tab, select **AvayaCommunicationsManager**.

The screenshot shows the 'Avaya Communication Manager' window with the 'General' tab selected. On the left sidebar, 'General' is highlighted. The main area is divided into two sections: 'General settings' and 'Data format'. In the 'Data format' section, 'AvayaCommunicationsManager' is selected from a dropdown menu and highlighted with a red box. Below it, a text field also contains 'AvayaCommunicationsManager'. At the bottom right, there are 'Cancel' and 'Save' buttons.

Click on the **Connection** tab on the left hand side. In the screen that appears select **Listen for connections from PBX** and enter the **Port** number as configured for the CDR link in **Section 4**. Check the **Timestamp data** check-box and click **Save**.

The screenshot shows the 'Avaya Communication Manager' window with the 'Connection' tab selected. On the left sidebar, 'Connection' is highlighted. The main area is divided into two sections: 'Connection method' and 'Connection details'. In the 'Connection method' section, 'Listen for connections from PBX' is selected and highlighted with a red box. In the 'Connection details' section, the 'Port' field is set to '9000' and highlighted with a red box. In the 'Connection options' section, the 'Timestamp data' checkbox is checked and highlighted with a red box. At the bottom right, there are 'Cancel' and 'Save' buttons, with the 'Save' button highlighted by a red box.

Repeat the above steps to add a new directory for the second Avaya Communication Manager.

7. Verification Steps

The following steps may be used to verify the configuration:

- Use the **ping** utility on the TIM Enterprise server to verify the IP connectivity to the Avaya Communication Manager Servers.
- Using the **status cdr-link** command verify that the Primary CDR **Link State** shows **up**.

status cdr-link	
CDR LINK STATUS	
Primary	Secondary
Link State: up	down
Date & Time: 2017/1 /29 11: 40: 34	2009/4 /14 11: 40: 34
Forward Seq. No: 134	130
Backward Seq. No: 325	321
CDR Buffer % Full: 0.00	0.00
Reason Code: OK	

- Place a call and verify that TIM Enterprise receives the raw CDR record for the call. Compare the values of data fields in the raw CDR record with TIM Enterprise's Call View by selecting the **Call View** tab on the TIM Enterprise toolbar (not shown).

12:37	8270005	Cross-site	30s	
30 January	8270005	01418230001	0.00	
12:37	8270005	8270001	48s	
30 January	8270005	8270001	0	
12:36	711 011	8270003	6s	
30 January		8270003	3	

- Place internal, inbound trunk and outbound trunk calls to and from various telephones, generate an appropriate report in TIM Enterprise and verify the report's accuracy.

My custom report							2009-04-15 11:10:26
Entire organisation \							About this report
Outbound							
Date & Time	Source	CLI	Route	Destination	Duration	Cost	
15/04/2009 10:01:51	302	-	2501#	Local Call	00:00:14	0.030	
15/04/2009 10:02:31	301	-	201#	Local Call	00:00:13	0.030	
2 calls					00:00:27	0.060	
Answered							
Date & Time	Source	CLI	Route	Destination	Duration	Cost	
15/04/2009 10:01:10	113 004	-		302	00:00:15	-	
15/04/2009 10:02:30	110 001	-		201	00:00:14	-	
2 calls					00:00:29	-	
Missed							
Date & Time	Source	CLI	Route	Destination	Duration	Cost	
15/04/2009 10:05:41	113 005	-		301	00:00:13	-	
1 call					00:00:13	-	
Internal							
Date & Time	Source	CLI	Route	Destination	Duration	Cost	
15/04/2009 09:59:54	301	-	302	302	00:00:14	-	
1 call					00:00:14	-	
6 calls					TOTALS	00:01:23	0.060

8. Conclusion

These Application Notes describe the procedures for configuring Tri-Line's TIM Enterprise to collect call detail records from Avaya Communication Manager. TIM Enterprise successfully passed all compliance testing.

9. Additional References

The following Avaya product documentation can be found at <http://support.avaya.com>.

- [1] *Feature Description and Implementation For Avaya Communication Manager*, Release 7.0.
- [2] *Administrator Guide for Avaya Communication Manager*, Release 7.0.

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