



Avaya Solution & Interoperability Test Lab

Application Notes for Tri-Line's TIM Plus with Avaya Aura® Communication Manager - Issue 1.1

Abstract

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

TIM Plus is call logging software that interoperates with Avaya Aura® Communication Manager over TCP/IP for the collection of Call Details Records (CDRs). TIM Plus 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 Plus 3.0.0.108 call logging software can interoperate with Avaya Aura® Communication Manager 7.0.1.2. TIM Plus 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 Aura® 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 Plus 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 Plus 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 Plus server was able to resume collecting CDR records automatically after failure recovery, including buffered CDR records for calls that were placed during the outages.

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 evaluated the ability of Tri-Line's TIM Plus 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 Plus can resume CDR collection after failure recovery.

2.2. Test Results

All tests carried out passed successfully with the following observations.

- The Reliable Session Protocol (RSP) for CDR collection is currently not supported by Tri-Line. CDR test cases were run with RSP disabled, since RSP is not currently supported by Tri-Line. In the event that the Tri-Line application loses network connectivity, there will be loss of call record data until the application can regain the connectivity with Communication Manager. When Communication Manager detects the loss of connectivity it will start buffering the call records, but this could take several minutes. For possible workarounds, reach out to the Tri-Line support team. Due to the above reason Avaya recommends using RSP over TCP/IP.
- There are some differences 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. At the time of testing TIM Plus processed the records correctly taking into account the extra or modified records using a configurable option.

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 Plus and Avaya Communication Manager. TIM Plus was installed on Windows and it was connected to Communication Manager for collecting CDR records.

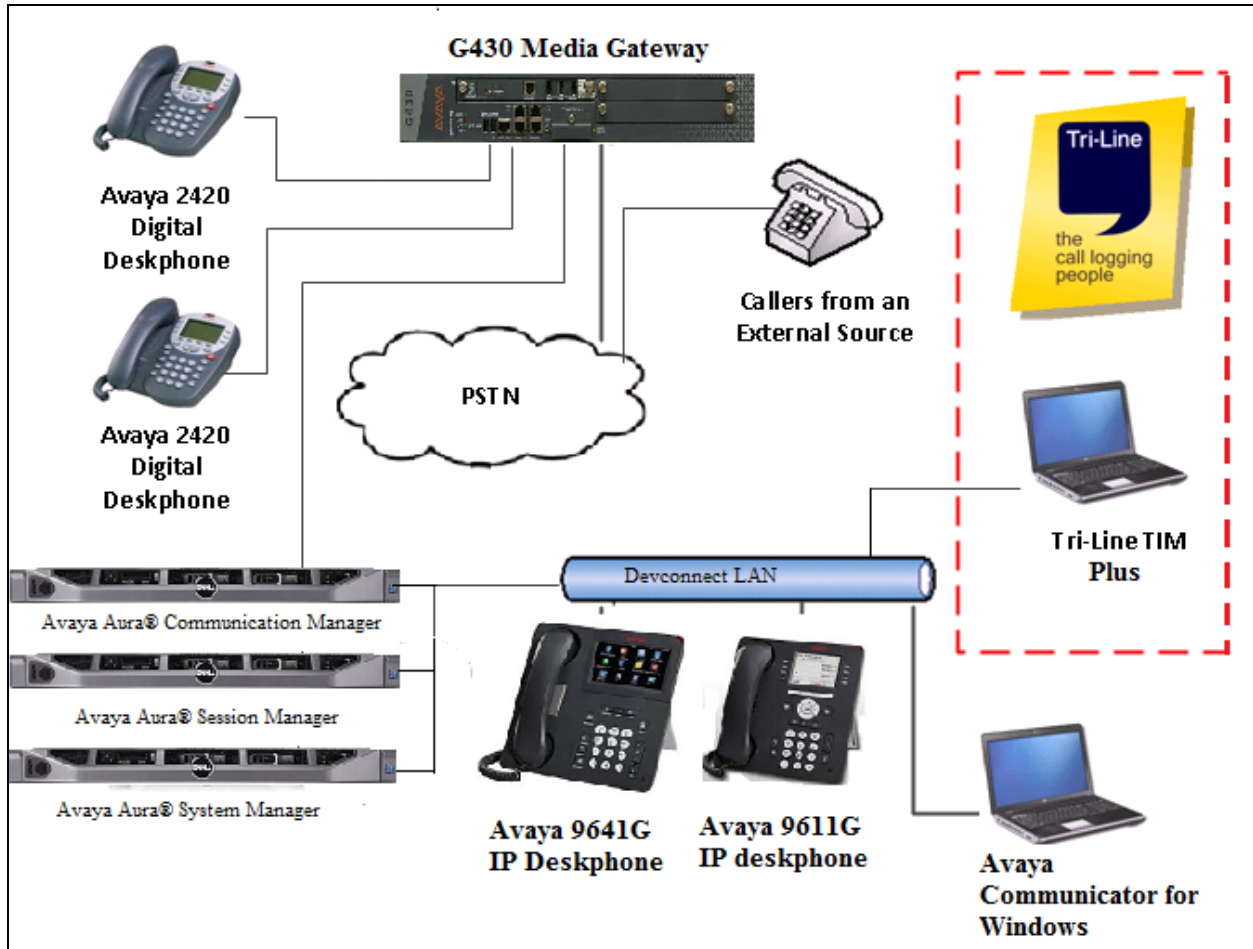


Figure 1: Tri-Line TIM Plus with Avaya Communication Manager

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 Aura® Session Manager running in a VMware environment	7.0.1.2.701230
Avaya Aura® System Manager running in a VMware environment	7.0.1.2 Build No: 7.0.0.0.16266 Software Update Revision No: 7.0.1.2.086007 Service Pack 2
Avaya 96x1 Series IP Telephones - 9611g - 9641g	6.6229 (H.323) 7.0.11(SIP)
Avaya 2400 Series Digital Telephone	NA
Avaya Communicator for Windows	2.1.3.0
Tri-Line TIM Plus • Windows 2012 Server • Internet Explorer	3.0.0.108

5. Configure the Avaya Aura® 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 Plus 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 Plus 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 Plus 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		
TIMPlus	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: TIMPlus** [The Remote Node is set to the node name that was created in the previous step for the TIM Plus 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 Plus 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
```

Service Type	Enabled	IP SERVICES			
		Local Node	Local Port	Remote Node	Remote Port
CDR1		procr	0	TIMPlus	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
Service Type	Reliable Protocol	SESSION LAYER TIMERS				
		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	Data Item	Length
1: date	- 6	17: dialed-num	- 18	33: auth-code	- 13
2: space	- 1	18: space	- 1	34: return	- 1
3: time	- 4	19: in-trk-code	- 4	35: line-feed	- 1
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: attd-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

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	Extension	Assigned Members:	of 5000 administered
8270001		4	
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.

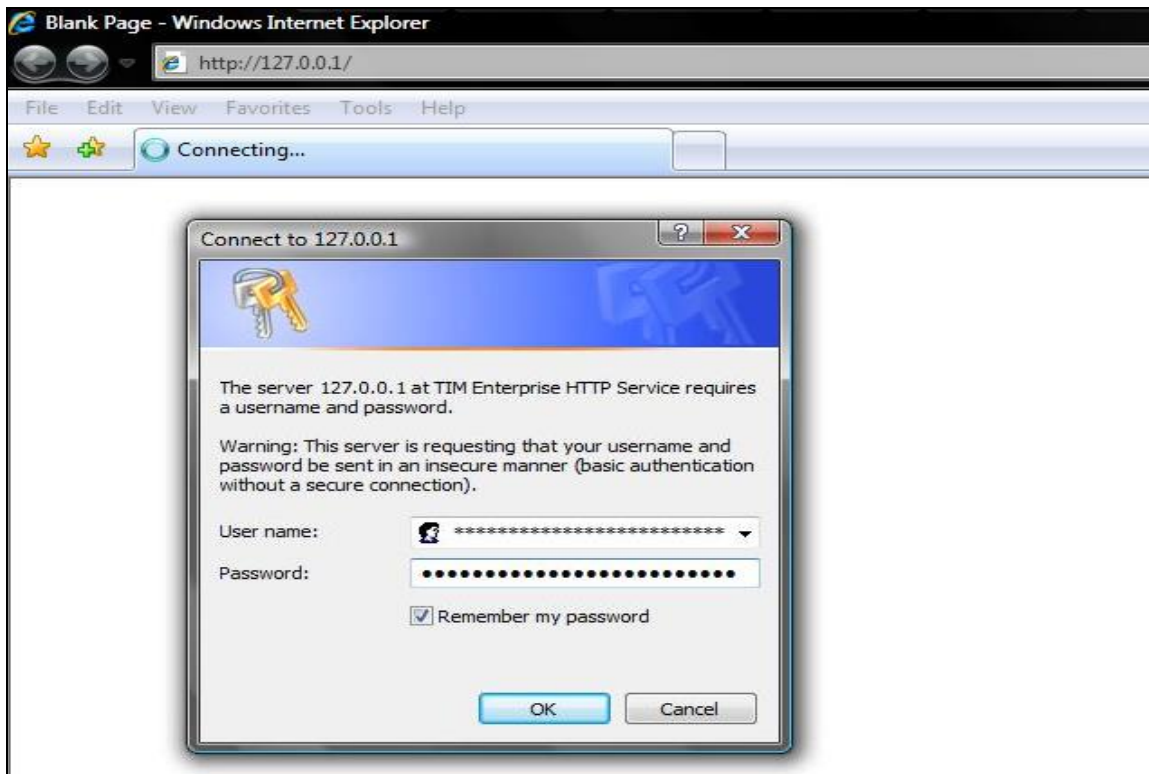
```
change trunk-group 3                                     Page 1 of 21
                                                         TRUNK GROUP
Group Number:3                                         Group Type: isdn      CDR Reports: r
  Group Name: ToSimulatedPSTN                          COR: 1                TN: 1          TAC: 113
  Direction: two-way                                   Outgoing Display? y   Carrier Medium: PRI/BRI
  Dial Access? y                                       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
```

6. Configure the TIM Plus server

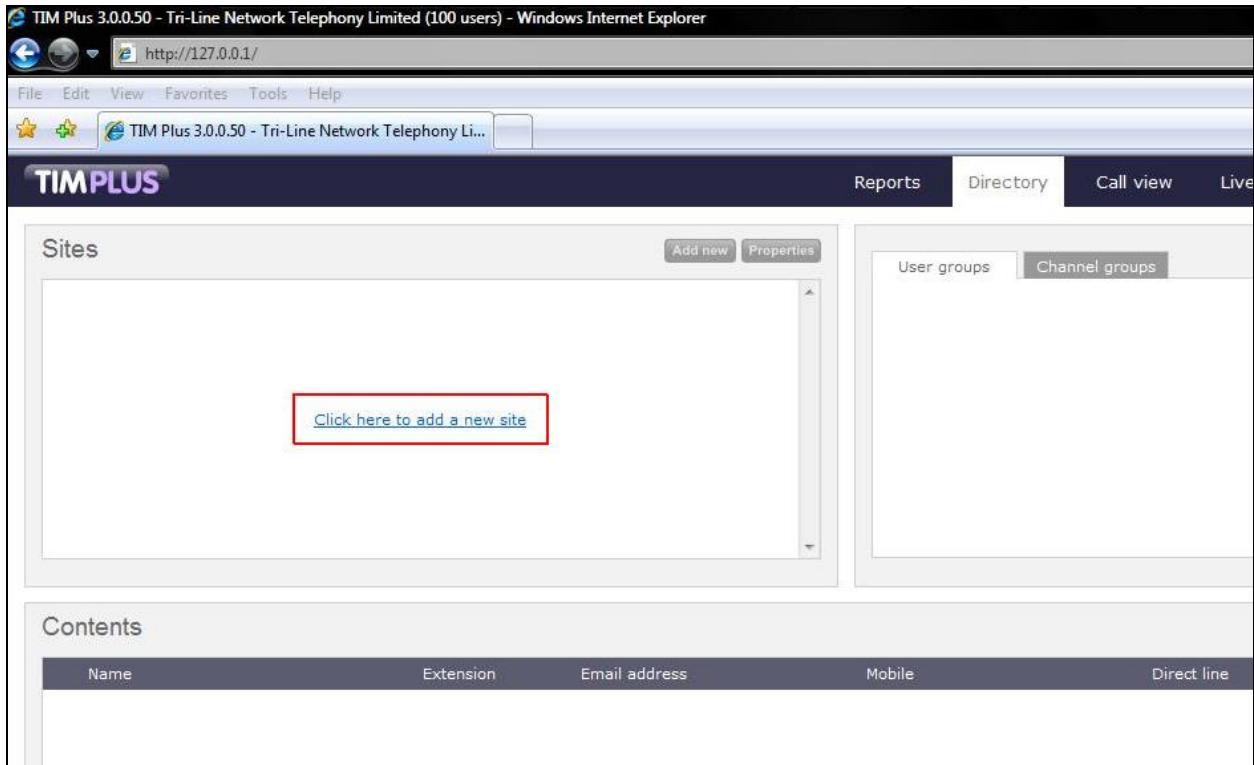
This section provides the procedures for configuring the TIM Plus server to receive Call Data Records (CDRs) for various call types output by the Avaya Communication Manager.

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

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



After successful login, click on the **Directory** tab in the TIM Plus toolbar and Directory content will be displayed as shown below. On the default Directory screen, click on the link **Click here to add a new site** and a new window will open.



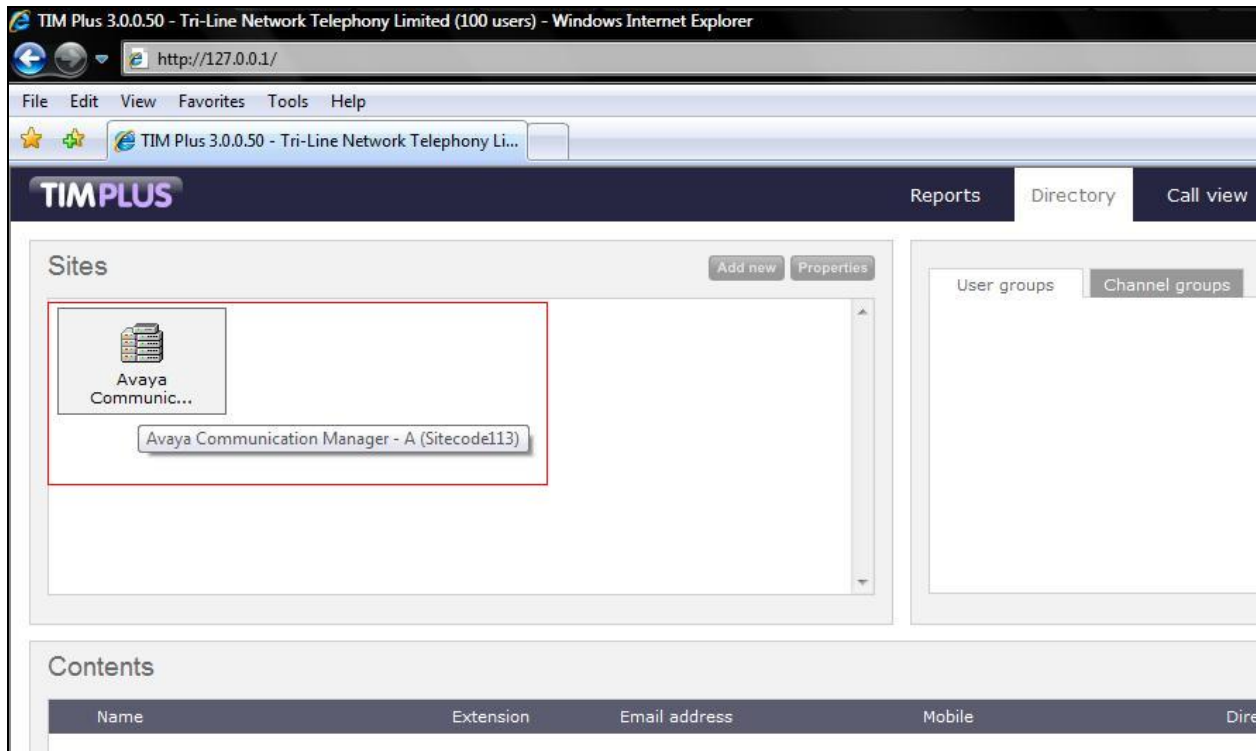
On the new **Site properties** window that appears, the default **PBX** tab is displayed. Enter the **Name** of the site; in this case **Avaya Communication Manager - A** was specified. From the drop down list select **AvayaCommunicationsManager** as the **PBX model** and for the **Connection method** select **Listen for connection from PBX**. Enter the **Port** number as configured on the CDR link in **Section 5**, in this case value **9000** was specified, and click **Options** tab.

The screenshot shows the 'Site properties' dialog box with the 'Options' tab selected. The 'Name' field contains 'Avaya Communication Manager - A'. The 'PBX model' dropdown is set to 'AvayaCommunicationsManager'. The 'Connection method' dropdown is set to 'Listen for connection from PBX'. The 'Port' field contains '9000'. The 'Cancel' and 'Add' buttons are visible at the bottom right.

On the Options tab, check the **Timestamp received data** checkbox, and then click on the **Add** button as shown below.

The screenshot shows the 'Site properties' dialog box with the 'Options' tab selected. The 'Timestamp received data' checkbox is checked. The 'Cancel' and 'Add' buttons are visible at the bottom right.

A configured **Avaya Communication Manager** – A site object will appear on the Directory screen as shown below.



Repeat the above steps to add a new directory site object 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 Plus 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 Plus receives the raw CDR record for the call. Compare the values of data fields in the raw CDR record with TIM Plus's Call View by selecting the **Call View** tab on the TIM Plus toolbar.

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 Plus 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 Plus to collect call detail records from Avaya Communication Manager. TIM Plus 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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