



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Avaya Aura® Communication Manager R6.2 with Tri-Line TIM Plus 3.0.0.86 using TCP - Issue 1.0

Abstract

These Application Notes describe the configuration steps for provisioning Avaya Aura® Communication Manager R6.2 with Tri-Line TIM Plus 3.0.0.86. Tri-Line TIM Plus will collect Call Detailed Records by listening to a TCP port configured on Avaya Aura® Communication Manager

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

Tri-Line TIM Plus is a call logger which runs as a Windows Service and all of its functions, configuration, and call reports are accessible through any standard web browser. Tri-Line TIM Plus collects Call Detailed Record (CDR) data from Avaya Aura® Communication Manager by listening for connections on a specific TCP port and it uses a native SQL database for storing and processing data. Tri-Line TIM Plus provides a web interface which can be used for configuration with Avaya Aura® Communication Manager. The web interface also allows the system to be updated for additional Avaya Aura® Communication Managers and for general maintenance. Users can use this web interface for reporting purposes and access can be restricted by username and password and directory position.

2. General Test Approach and Test Results

The interoperability compliance test included both feature and functionality testing. The feature and functionality testing focused on verifying that Call Detailed Records are collected by TIM Plus and received in the format as generated by Communication Manager. The TIM Plus Call Logger collects CDR data by listening on a TCP port configured on Communication Manager.

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 testing included:

- Verification of connectivity between TIM Plus and Communication Manager using a TCP connection.
- Verification that Call Detailed Records (CDR) was collected as output by Communication Manager.
- Link Failure\Recovery was also tested to ensure successful reconnection on link failure.

2.2. Test Results

Tests were performed to insure full interoperability between TIM Plus and Communication Manager. The tests were all functional in nature and performance testing was not included. All test cases passed successfully.

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

Technical support can be obtained for TRI-Line products as follows:

- Web Portal <http://www.tri-line.com/en/support/>
- E-mail: support@tri-line.com
- Telephone +44 (0)20 7265 2626

3. Reference Configuration

Figure 1 illustrates the network diagram of the configuration used during compliance testing. Communication Manager is configured to output CDR data using a **non- Reliable Session Protocol (RSP)** CDR link. CDR data is sent via IP to the Tri-Line TIM Plus server on a designated TCP port. The CDR format is **customized**. The Tri-Line TIM Plus Call Logger is connected on the same LAN as Communication Manager and will collect CDR records.

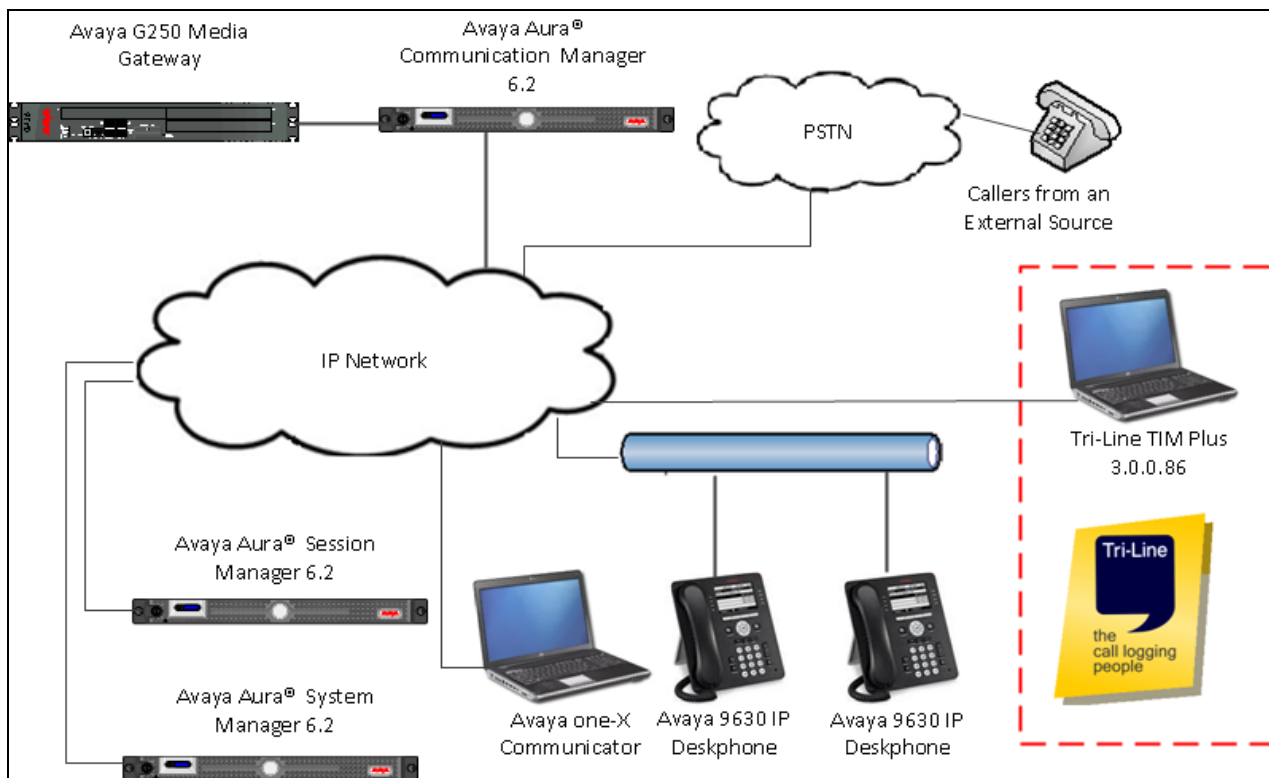


Figure 1: Avaya Aura® Communication Manager R6.2 with Tri-Line TIM Plus Reference Configuration

4. Equipment and Software Validated

The hardware and associated software used in the compliance testing is listed below.

Avaya Equipment	Software / Firmware Version
Avaya S8800 Server	Avaya Aura® Communication Manager R6.2 Build R016x.02.0.832.0-20558
Avaya S8800 Server	Avaya Aura® System Manager R6.2 Build 6.2.2.0.622005
Avaya S8800 Server	Avaya Aura® Session Manager R6.2 Build 6.2.0.0.15669-2.12.9
Avaya G250 Media Gateway	30.18.1
Avaya 96xx Deskphones - H323 9620 - H323 9640G - SIP9611G - SIP9621G Avaya One-X communicator	S3.186a S3.105s 2.6.2 2.7.2 6.1.5.07
Tri-Line Equipment	Software Version
TIM Plus running on a Dell Latitude E5400 with Windows 7 Professional SP1	Version 3.0.0.86

5. Avaya Aura® Communication Manager Configuration

Configuration and verification operations on Communication Manager illustrated in this section were all performed using Avaya Site Administrator Emulation Mode. The information provided in this section describes the configuration of Communication Manager for this solution. It is implied a working system is already in place. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 9**. The configuration described in this section can be summarized as follows:

- Create Node Name for TIM Plus Call Logger
- Define the CDR link
- Change system-parameters cdr
- Change Trunk Group
- Change Intra- Switch-CDR

Note: Any settings not in **Bold** in the following screen shots may be left as Default.

5.1. Create Node Name for Tri-Line TIM Plus Call Logger

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

- **Name** Enter an informative name i.e. **TIMPro**
- **IP address** Enter the IP address of the **TIM Plus Call Logger**

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

change node-names ip		Page 1 of 2
IP NODE NAMES		
Name	IP Address	
TIMPro	192.168.30.175	
CLAN	192.168.30.80	
procr	192.168.30.92	

5.2. Define the CDR link

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

- **Service Type** Enter **CDR1**
- **Local Node** Enter **CLAN**
- **Remote Node** Enter **TIMPro**
- **Remote Port** Enter **9000**

change ip-services					Page 1 of 3
IP SERVICES					
Service Type	Enabled	Local Node	Local Port	Remote Node	Remote Port
CDR1		CLAN	0	TIMPro	9000

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.

- **Reliable Protocol** Enter **n**

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

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

5.3. Change system-parameters cdr

Certain parameter changes are required for Communication Manager to interoperate with TIM Plus. 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 **day/month**
- **Primary Output Format** Enter **customized**
- **Primary Output Endpoint** Enter **CDR1**
- **Record Outgoing Calls Only** Enter **n**
- **Intra-Switch CDR** Enter **y**
- **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):                                     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? 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
```

Navigate to **Page 2** and enter the following information.

- Enter **Data Item** and **Length** as shown in the screen below

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: 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-numbe	- 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					

5.4. Change Trunk Group

To collect call data on Trunks, CDR Reports need to be set. Trunk Group **9** was used for the compliance test. Use the **change trunk-group 9** command to configure the following:

- **CDR Reports** Enter **r**

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

change trunk-group 9			Page 1 of 21	
TRUNK GROUP				
Group Number: 7		Group Type: isdn		CDR Reports: r
Group Name: ISDN to CS1K		COR: 1	TN: 1	TAC: *19
Direction: two-way		Outgoing Display? n		Carrier Medium: PRI/BRI
Dial Access? n		Busy Threshold: 255		Night Service:
Queue Length: 0		Auth Code? n		TestCall ITC: rest
Service Type: tie		Far End Test Line No:		
TestCall BCC: 4				

5.5. 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** form, the extensions that will be subject to CDR need to be defined. During compliance testing, extensions **2010**, **2011**, **2012** and **2022** 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 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: 4 of 5000 administered						
Extension	Extension	Extension	Extension	Extension		
2010						
2011						
2012						
2022						

6. Configuring Tri-Line TIM Plus

A number of steps are required to configure TIM Plus to interoperate with Communication Manager. The TIM Plus Call Logger uses a TCP port to collect CDR data from Communication Manager. The TIM Plus application requires a template file which matches the PBX type during configuration. Both TIM Plus application and template file can be downloaded from the Tri-Line Web Site once the end customer has a registered account.

The configuration of the TIM Plus Call Logger is achieved during the initial installation. An installation wizard is used whereby certain steps require specific information relating to the TIM Plus configuration. The configuration described in this section can be summarized as follows:

- Downloading the Communication Manager template.
- Configure Site information
- Create an administrator account
- Logging into TIM Plus Call logger
- Access to TIM Plus

6.1. Downloading Avaya Aura® Communication Manager Template

As part of configuration an Avaya Communication Manager template is required. This template is provided as standard with the installation package. During compliance testing the template used was called **Avaya Communication Manager.tdt**.

6.2. Configure Site information

Start the installation wizard after the TIM Plus application has been downloaded. Follow the wizard steps until step 5. The **PBX model** used is a template which was downloaded as described in **Section 6.1**. The following information is required for the initial site setup:

- **Site name** Enter an informative name, i.e. **Test Site**
- **PBX model** Choose **Avaya Communication Manager** from the dropdown box.
- **Method** Choose **Listen for connection from PBX** from the dropdown box.
- **Port** Enter **9000**
Note this is the Remote Port as configured in **Section 5.2**

Click on the **Next** button to continue

Site Progress 1 2 3 4 5 6 7 8

In order to collect call data from your telephone system, an initial site needs to be setup.

First, give the site a name:

Site name: Test Site

Choose the make and model of the telephone system from the drop-down list below.
If the list is empty, you'll need to obtain the correct **interface file** from your vendor, copy this file to the C:\Program Files\Tri-Line\TIM Plus\config\ folder, then refresh this page.

PBX model: Avaya Communications Manager

Specify the type of connection that the telephone system requires, as well as any further information, such as login details and connection script:

Method: Listen for connection from PBX

Host:

Port: 9000

Some telephone systems require further options in order to successfully capture call information. You may need to check with your vendor if these options apply to your installation:

☐ Enable timestamp on received data

☐ The data is in binary format

If no data is received from your telephone system for a user-definable time period, an inactivity alarm can be sent by email to one or more people.
To use this feature, tick the box below:

☐ Enable inactivity timer

Back Next

6.3. Create an administrator account

Once the wizard has progressed to step 8, an administrator account must be created. This account allows web users to log into the TIM Plus Call Logger. The following information is required to create the administrator account:

- **Display name** Enter an informative name, i.e. **Tri-Line Support**
- **UserName** Enter a User name, i.e. **admin**
- **Password** Enter a password.

Click on the **Finish** button to continue.

The screenshot shows a web-based wizard titled "Create an administrator account". At the top right, a progress bar shows steps 1 through 8, with step 8 being the current step. The main content area contains instructions: "To administer TIM Plus further, as well as to perform the additional site-specific tasks required to complete the installation, you need to create an administrator's web user account." and "As with all web users, a display name is important because it is used as a signature when you create reports, in addition to other duties you may perform as a user of the system." Below this, it says "Enter a display name for the administrator user now." and shows a text input field with "Tri-Line Support" entered. Then, it says "Specify a username and password to associate with this administrator account." and shows two input fields: "Username" with "admin" entered and "Password" with masked characters "••••••". At the bottom, a red text box states: "Henceforth, these login details should be used to log in to TIM Plus as the system administrator **including right now, after clicking the Finish button below to complete this wizard.**" At the bottom right, there are two buttons: "Back" and "Finish". The "Finish" button is highlighted with a red border.

Create an administrator account Progress 1 2 3 4 5 6 7 8

To administer TIM Plus further, as well as to perform the additional site-specific tasks required to complete the installation, you need to create an administrator's web user account.

As with all web users, a display name is important because it is used as a signature when you create reports, in addition to other duties you may perform as a user of the system.

Enter a display name for the administrator user now.

Display name Tri-Line Support

Specify a username and password to associate with this administrator account.

Username admin

Password ••••••

Henceforth, these login details should be used to log in to TIM Plus as the system administrator **including right now, after clicking the Finish button below to complete this wizard.**

Back Finish

6.4. Logging into the Tri-Line TIM Plus Call Logger

Once the administrator account is created, the user is prompted to log in. Log into the TIM Plus Call logger by entering the **User name** and **Password** as created in **Section 6.3**.

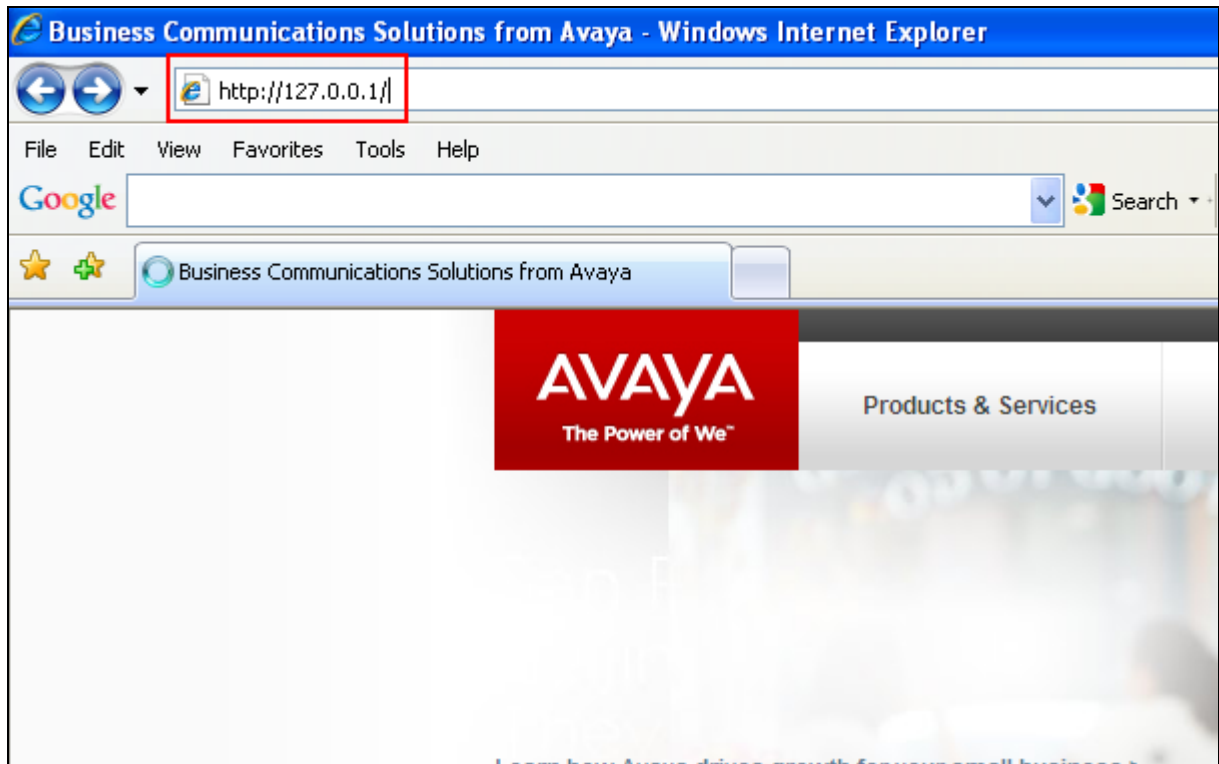
Click the **OK** button to log in.

The screenshot shows a web-based wizard titled "Create an administrator account". At the top right, a progress bar indicates steps 1 through 8, with step 1 being the current step. The main content area contains instructions: "To administer TIM Plus further, as well as to perform the additional site-specific tasks required to complete the installation, you need to create an administrator's web user account." and "As with all web users, a display name is important because it is used as a signature when you create reports, in addition to other duties you may perform as a user of the system." Below this, it says "Enter a display name for the administrator user now." and "Specify a user name and password for the administrator user now." There are input fields for "Display Name", "User Name", and "Password". An "Authentication Required" dialog box is overlaid on the form. The dialog box has a blue header with a question mark icon and the text "Authentication Required". The main text in the dialog says "A username and password are being requested by http://localhost. The site says: 'TIM Plus HTTP Service'". Below this text are two input fields: "User Name:" and "Password:". At the bottom of the dialog are "OK" and "Cancel" buttons. The "OK" button is highlighted with a red rectangle. Below the dialog box, the text "Henceforth, you will be prompted to log in to the TIM Plus Call Logger. To log in, click the OK button on the right now, after clicking the Finish button below to complete this wizard." is displayed. At the bottom right of the wizard are "Back" and "Finish" buttons.

6.5. Access to Tri-Line TIM Plus

A web browser is required to view the call record. During compliance testing, the web browser and TIM Plus service were installed on the same PC. The loopback address **http://127.0.0.1** was used.

Note: The **User name** and **Password** as created in **Section 6.3** is required for log in.



7. Verification Steps

This section provides a set of tests that can be performed to verify correct configuration of Communication Manager and TIM Plus.

7.1. Verify the Avaya Aura® Communication Manager CDR Link

Use the **status cdr-link** command to verify that the **Link State** is **up** and the **Reason Code** is **OK**.

status cdr-link		
CDR LINK STATUS		
	Primary	Secondary
Link State:	up	CDR administered
Number of Retries:	999	
Date & Time:	2011/12/15 17:32:12	0000/00/00 00:00:00
Forward Seq. No:	0	0
Backward Seq. No:	0	0
CDR Buffer % Full:	0.03	0.00
Reason Code:	OK	

7.2. Verify that Tri-Line TIM Plus Call Logger retrieves CDR data

To ensure that TIM Plus Call Logger is retrieving CDR data, make some calls on Communication Manager. Verify that something similar to the following is presented.

timenterprise								
Call View								
Date	Time	Source	Route	Destination	Response	Duration	Cost	
21 March 2013	14:06:28	Local Call	89112	2017	0	00:00:00	0.00	
21 March 2013	14:06:28	Local Call	89112	2017	0	00:00:00	0.00	
21 March 2013	14:06:28	Local Call	89112	2017	0	00:00:00	0.00	
21 March 2013	14:06:28	Local Call	89112	2017	0	00:00:00	0.00	
21 March 2013	14:06:28	Local Call	89112	2017	0	00:00:00	0.00	
21 March 2013	14:06:27	109	89112	Local Call	0	00:00:01	0.03	
21 March 2013	14:06:26	109	89112	Local Call	0	00:00:02	0.03	
21 March 2013	14:06:26	2017	89111	Local Call	0	00:00:02	0.03	
21 March 2013	14:06:25	2017	89112	Local Call	0	00:00:03	0.03	
21 March 2013	14:06:24	Local Call	89112	3015	0	00:00:04	0.00	
21 March 2013	14:06:24	Local Call	89112	3017	2	00:00:02	0.00	
21 March 2013	14:06:24	Local Call	89112	3017	2	00:00:02	0.00	
21 March 2013	14:06:23	2017	89123	Local Call	0	00:00:05	0.03	

8. Conclusion

These Application Notes describe the configuration steps required for Avaya Aura® Communication Manager R6.2 to successfully interoperate with Tri-Line TIM Plus 3.0.0.86 using a TCP connection. Tri-Line TIM Plus 3.0.0.86 is considered compliant with Avaya Aura® Communication Manager R6.2. All test cases have passed and met the objectives outlined in **Section 2.2**.

9. Additional References

This section references Avaya and Tri-Line documentation that is relevant to these Application Notes.

Product documentation for Avaya products is available at <http://support.avaya.com>

- [1] *Installing and Configuring Avaya Aura® System Platform Release 6.2*, June 2012.
- [2] *Administering Avaya Aura® System Platform Release 6.2*, June 2012.
- [3] *Administering Avaya Aura® Communication Manager*, Release 6.2, April 2013
- [4] *Avaya Aura® Communication Manager Feature Description and Implementation*, April 2013.
- [5] *Implementing Avaya Aura® System Manager Release 6.2*, July 2012.
- [6] *Implementing Avaya Aura® Session Manager*, March 2013.

Product Documentation for Tri-Line can be obtained at <http://gateway.tri-line.com/>. Login required.

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