



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Avaya Aura® Communication Manager 6.3 with Soft-ex Optimiser/RingMaster 5.5 to collect Call Detail Records - Issue 1.0

Abstract

These Application Notes describe the configuration steps necessary for provisioning Soft-ex's product Optimiser/RingMaster to successfully interoperate with Avaya Aura® Communication Manager.

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.

1. Introduction

Optimiser/RingMaster from Soft-ex is a telephone call accounting system that collects Call Detail Records (CDR) information from the Avaya Aura® Communication Manager and produces management reports. RingMaster was the original product supplied by Soft-ex to process CDR and Optimiser is an additional product/service built onto RingMaster which is an alerting system for calls that meet specific requirements, for instance that may indicate telephone fraud.

2. General Test Approach and Test Results

The compatibility testing is concerned with verifying that the addition of Soft-ex's Optimiser/RingMaster does not interfere with the operation of the Communication Manager. CDR information is transferred via TCP/IP, so RingMaster is listening on a port awaiting CDR output. RingMaster also operates in multisite environments, where CDR data from more than one site is collected and forwarded to a central site. In these cases the data is collected by buffering devices supplied by Soft-ex and transferred by a variety of methods such as TCP/IP, FTP or email. Essentially however for each PBX the interface has the same characteristics: one way data flow from the PBX. During compliance The CDR was output to a Scannex IP Buffer where it was collected by RingMaster. See **Figure 1** for a network diagram. The interoperability compliance test included feature functionality and defence tests.

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.

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.

Note: In some Soft-ex literature the Optimiser/RingMaster product is referred to as Call Management Software or just Optimiser to avoid confusion the product name in this document will be referred to as Optimiser/RingMaster.

2.1. Interoperability Compliance Testing

The principle objective of Interoperability Compliance testing is to provide assurance to the potential customers that the tested products operate as specified and can interoperate in an environment similar to the one that will be encountered at a customer's premises. The interoperability compliance testing includes the following:

- Verification of connectivity between Optimiser/RingMaster /IP buffer and Communication Manager using a TCP connection.
- Verification that CDR data was collected as output by the Communication Manager.
- Link Failure\Recovery was also tested to ensure successful reconnection after link failure.
- CDR data collected included:
 - Local internal call handling
 - Handling of Incoming Network calls over PRI and SIP trunks
 - Handling of External Calls
 - Call Forwarding on busy or No Answer
 - Transfers – Blind and Supervised
 - Conference Calls
 - Call Park and Call Pick Up
 - Account Codes
- Handling of calls to and from Avaya Deskphones.
- Handling of calls to/from the PSTN.

2.2. Test Results

Tests were performed to insure full interoperability of Communication Manager 6.3 with Soft-ex Optimiser/RingMaster 5.5. Performance and load testing is outside the scope of the compliance testing. All the test cases passed successfully.

2.3. Support

Information on Soft-ex and product support can be obtained through the following:

Phone: +353 1 241 6600
Fax: +353 1 295 6290
E-mail: sales@soft-ex.net
Web: <http://www.soft-ex.net>

3. Reference Configuration

Figure 1 illustrates the network topology used during compliance testing. The Avaya solution consists of a Communication Manager, System Manager, Session Manager and a G430 Gateway. The Communication Manager is configured to output CDR over a TCP/IP port. A Node is configured on the Communication Manager to point to the Scannex IP buffer. CDR are sent in customized format, stored in the buffer and retrieved by RingMaster. A variety of Avaya Deskphones were used to generate intra-switch calls (calls between phones on the same system), and outbound/inbound calls to/from the PSTN. The Session and System Manager are shown in the diagram as they are required for the SIP telephones.

Note: RingMaster can also connect directly to Communication Manager using a direct TCP/IP connection.

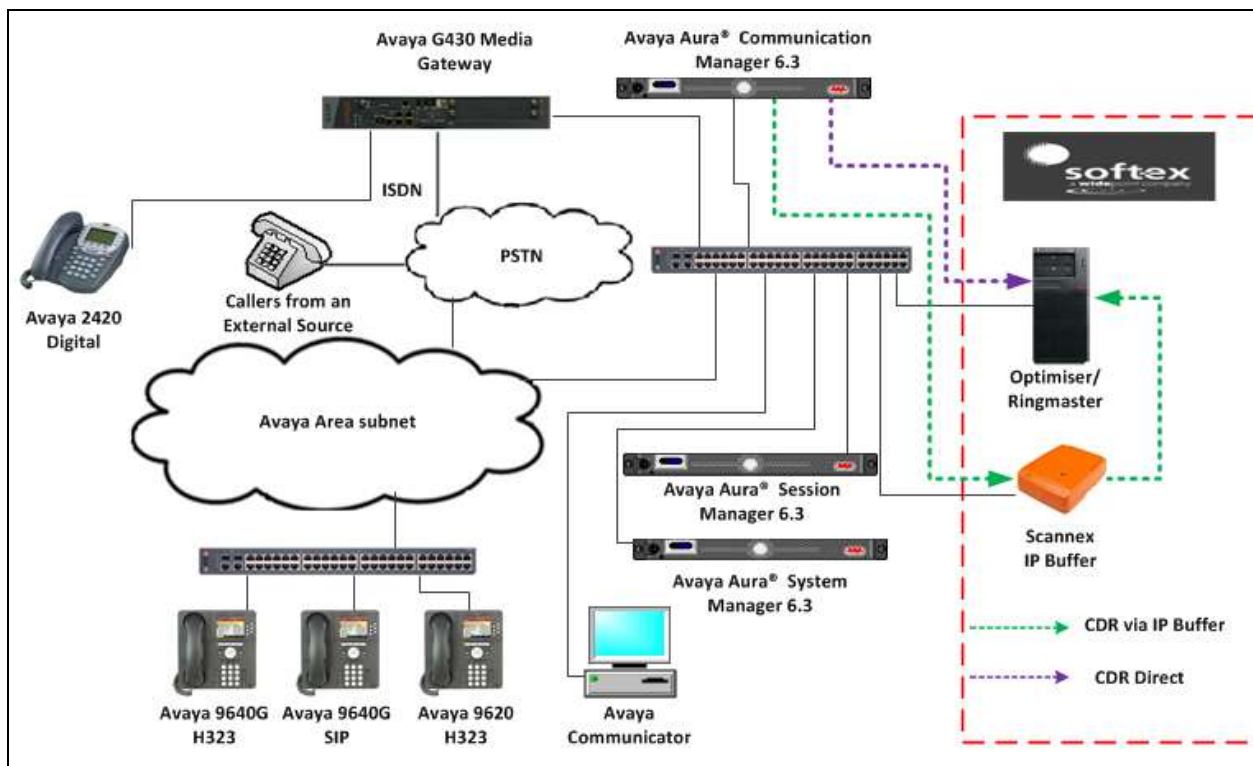


Figure 1: Avaya Aura® Communication Manager and Soft-ex Reference Configuration

4. Equipment and Software Validated

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

Avaya Equipment/Software	Release/Version
Avaya Aura® Communication Manager running on VMware	R6.3.9 Build R016x.03.0.124.0 S/W Update 03.0.124.0-21971
Avaya Aura® System Manager running on VMware	R6.3.11 Build No. 6.3.0.8.5682-6.3.8.4711 S/W update 6.3.11.8.2871
Avaya Aura® Session Manager running on VMware	R6.3.11.0.631103 S/W Update 6.3.11.0.631103
Avaya G430 Media Gateway Module MM710 (DSP MP20) Media Gateway DSP module	Version 36.7.0/1 Version HW04 FW021 MP20 FW 132
Avaya one-X® Deskphone Edition for 9600 Series IP Telephones <ul style="list-style-type: none">- H323 9620D- H323 9640G- SIP 9640D	3.101S 3.105S 2.6.10.1
Avaya Communicator	2.0.3.30
Avaya Digital 2420	F/W 6
Avaya Analog 98309	N/A
Soft-ex Equipment/Software	Release/Version
Optimiser/RingMaster running on a PC with Windows 7	Version 5.5
Scannex IP Buffer	Release 2.91

5. Configure Avaya Aura® Communication Manager

Configuration and verification operations on the Communication Manager illustrated in this section were all performed using Avaya Site Administrator Emulation Mode. The information provided describes the configuration of the Communication Manager for this solution. It is implied that 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 10**.

The configuration operations described in this section can be summarized as follows:

- Create Node Name for IP buffer
- Define the CDR Link
- Change system-parameters cdr
- Set Intra-Switch Extensions
- Configure Trunks for CDR Reporting

5.1. Create Node Name for IP buffer

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

Page 1.

- **Name** Enter an informative name i.e. **Ringmaster**
- **IP address** Enter the IP address of the **IP buffer** (if connecting direct to the RingMaster directly enter the IP address of the RingMaster PC/Server)

change node-names ip		Page	1 of	2
IP NODE NAMES				
Name	IP Address			
Ringmaster	10.10.16.36			

5.2. Define the CDR Link

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

- **Service Type** Enter **CDR1**
- **Local Node** Enter **procr**
- **Remote Node** Enter **Ringmaster**
- **Remote Port** Enter **9000**

change ip-services					Page	1 of	3
IP SERVICES							
Service	Enabled	Local	Local	Remote	Remote		
Type		Node	Port	Node	Port		
CDR1		Procr	0	Ringmaster	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 with RSP.

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

change ip-services				Page	3 of 3
SESSION LAYER TIMERS					
Service	Reliable	Packet Resp	Session Connect	SPDU	Connectivity
Type	Protocol	Timer	Message Cntr	Cntr	Timer
CDR1	n	30	3	3	60

5.3. Change CDR System Parameters

Certain parameter changes are required for Communication Manager to interoperate with RingMaster. The screen shots below show the settings used during compliance testing. Use the **change system-parameters cdr** command to configure the inputs below.

change system-parameters cdr		Page 1 of 2
CDR SYSTEM PARAMETERS		
Node Number (Local PBX ID):		CDR Date Format: month/day
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? n		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: 15

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

- Enter **Data Item** and **Length** as shown in the screen 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: in-trk-code - 4	33: return - 1	
2: space - 1	18: space - 1	34: line-feed 1	
3: time - 4	19: auth-code - 7	35: -	
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: in-crt-id - 3	39: -	
8: space - 1	24: space - 1	40: -	
9: code-dial - 4	25: isdn-cc - 11	41: -	
10: space - 1	26: space - 1	42: -	
11: code-used - 4	27: ppm - 5	43: -	
12: space - 1	28: space - 1	44: -	
13: dialed-num - 18	29: acct-code - 15	45: -	
14: space - 1	30: space - 1	46: -	
15: clg-num/in-tac - 10	31: attd-console - 2	47: -	
16: space - 1	32: space - 1	48: -	

Record length = 120

5.4. Set Intra-Switch Extensions

If the Intra-switch CDR field is set to **y** in the CDR SYSTEM PARAMETERS form in **Section 5.3**, use the **change intra-switch-cdr** command to define the extensions that will be subject to CDR. On **Page 1** of the **INTRA-SWITCH CDR** form, enter a specific extension whose usage will be tracked with a CDR. Add an entry for each additional **Extension**.

change intra-switch-cdr		Page 1 of 3	
INTRA-SWITCH CDR			
Extension	Extension	Assigned Members: 0 of 5000 administered	Extension
1000			
1001			
1002			
1004			
1008			
1009			
...1015			
1016			
1026			

5.5. Configure Trunks for CDR Reporting

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

change trunk-group 10		Page 1 of 21	
TRUNK GROUP			
Group Number: 10	Group Type: isdn	CDR Reports: y	
Group Name: OUTSIDE CALL	COR: 1	TN: 1	TAC: 710
Direction: two-way	Outgoing Display? y	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			

6. Configuration of Scannex IP buffer

This section provides the procedures to configure the Scannex IP buffer. It is implied that the Scannex IP buffer is already in place and configured with an IP address on the same subnet as the Communication Manager. For all other provisioning information, such as initial installation and configuration, please refer to the product documentation in **Section 10**.

Note: The procedures described below are normally carried out by a Soft-ex or partner engineer during installation and subsequent re-configuration.

6.1. Setup Scannex IP Buffer

After logging in, the **Status** page is displayed. Select **SETUP** followed by **Channel 1** (Not shown).



Once the **Channel 1** page is opened, select **TCP** from the **Source** dropdown box, and then select **show**.



Once the next page opens, enter the following:

- **Connect** Select **Device to ipbuffer (passive/server)** from the drop down box
- **TCP Port** Enter **9000**. The port number used should match the **Remote Port** configured on the Communication Manager in **Section 5.2**
- **Protocol** Enter **ASCII Lines** from the drop down box

Use the scroll bar on the right side of the page and scroll down to **Destination** (not shown).

Channel 1: "Channel1"

Name: Channel1

Source: TCP

TCP/IP

Connect: Device to ipbuffer (passive/server)

Address: multihome

Allow:

TLS/SSL: No encryption

TCP Port: 9000

Protocol

Protocol: ASCII Lines

Time Stamp:

Match & Send

From the **Destination** dropdown box, select **TCP Server** and enter **5001** in the TCP port field. Click on the **Save** button on the bottom of the page (not shown), when the configuration is complete.

Channel 1: "Channel1"

Name: Channel1

Source: TCP

Destination: TCP server (passive)

TCP server (passive)

TCP Port: 5001

Allow:

TLS/SSL: No encryption

Prompt:

Password:

Success:

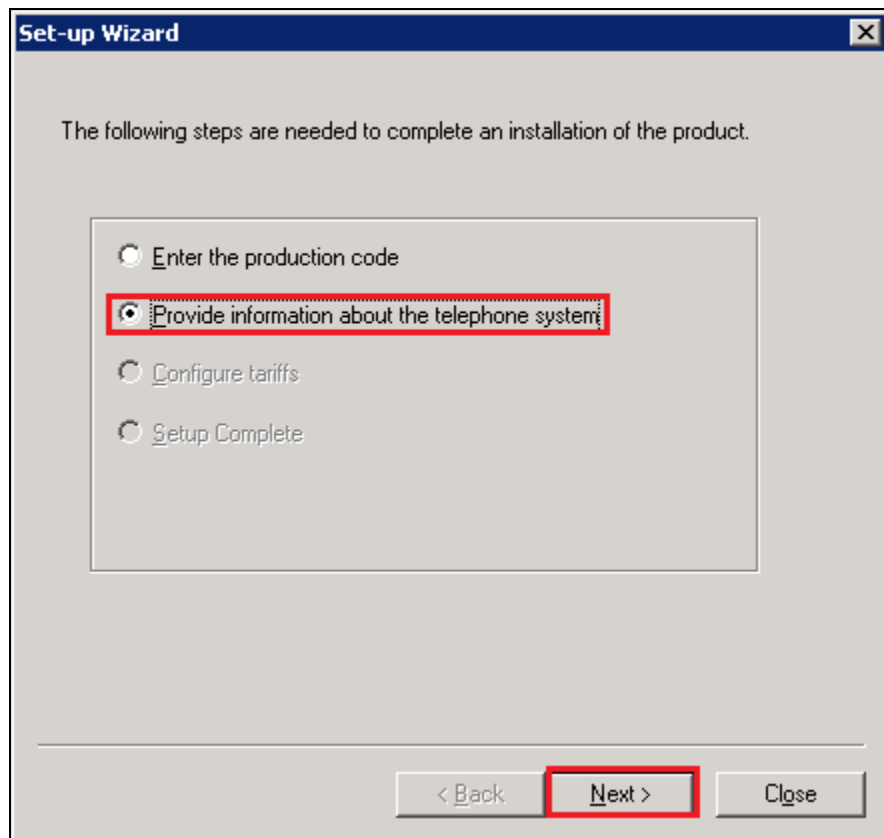
On Complete: Stay connected (real-time)

Warning! Old

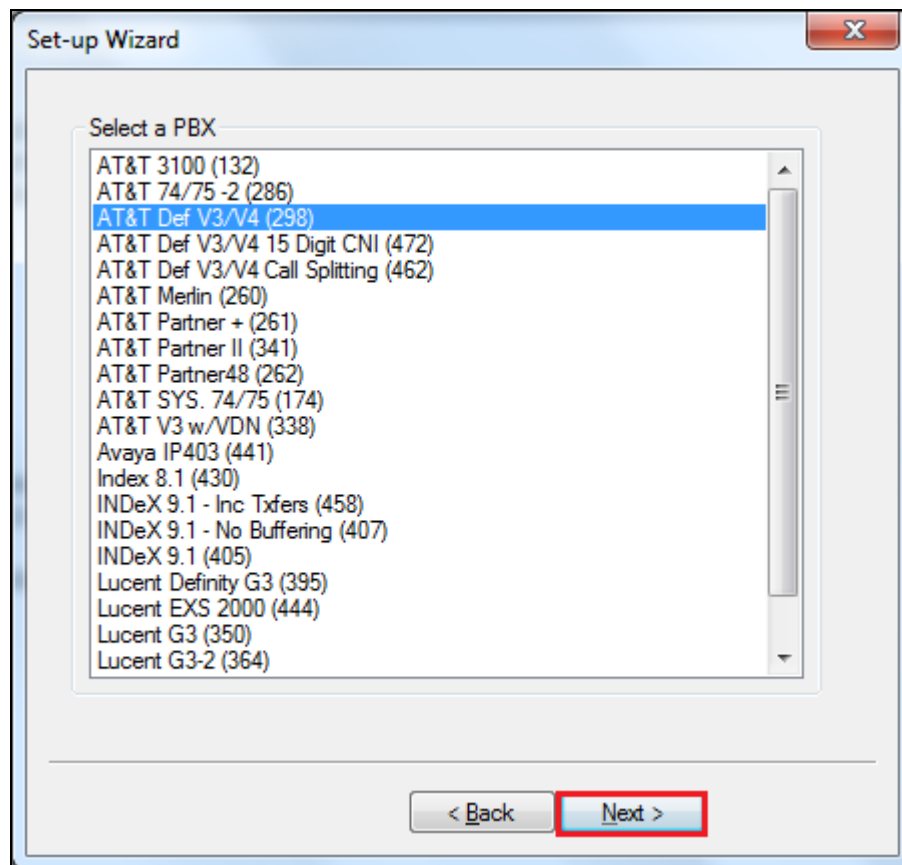
7. Configuration of Soft-ex Optimiser/RingMaster

This section outlines the steps to configure the RingMaster/Optimiser from Soft-ex in order to correctly collect CDR data. RingMaster/Optimiser is installed on a server or PC from a program on CD/DVD. Installation instructions are outside the scope of this document but information on installation of Optimiser/ RingMaster can be found in **Section 10** of this document.

Once the software is correctly installed a wizard is opened which automatically prompts for some configuration details to complete the installation. This includes information on the PBX that it is connecting to. When the Wizard opens, click on the **Provide information about the telephone system** radio button. Click the **Next** button to continue.



Select the PBX that is being connected to from the **PBX Group** as shown below. For a connection to Communication Manager choose **Nortel** from the list for PBX's (not shown below, scroll down to Nortel). Click the **Next** button followed by the **Finish** button (not shown).



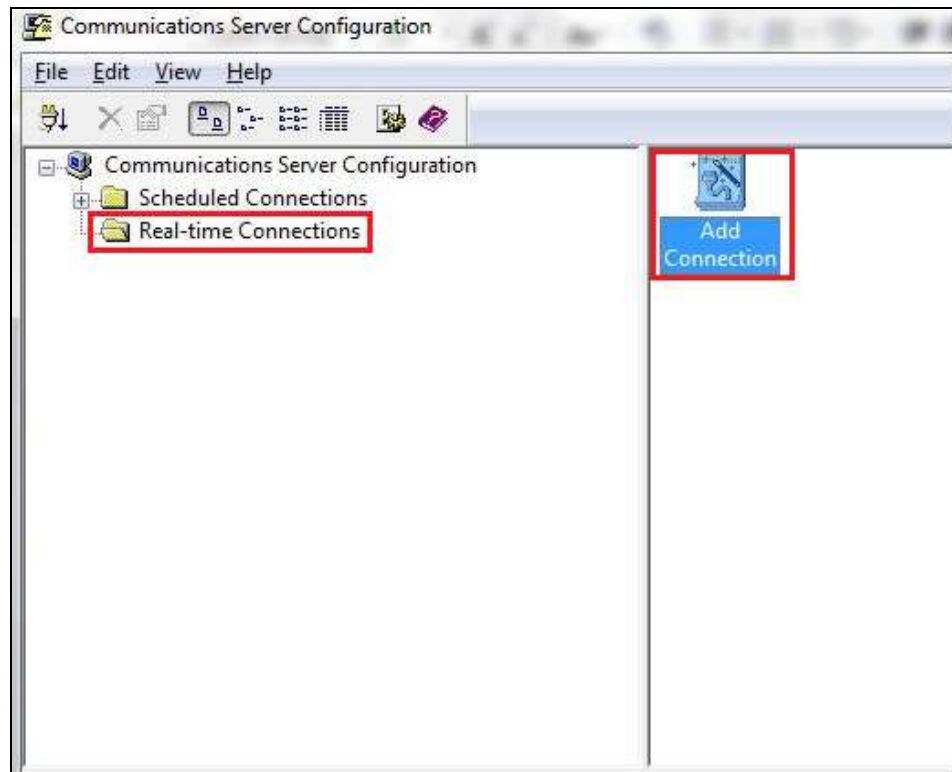
7.1. Configuration of Soft-ex Optimiser/RingMaster connection to Avaya Aura® Communication Manager

Once the application is successfully installed a connection must be setup to collect CDR data. This section shows the setup of a Real-time TCP/IP connection to Communication Manager. This uses a port to listen for CDR data being sent from Communication Manager.

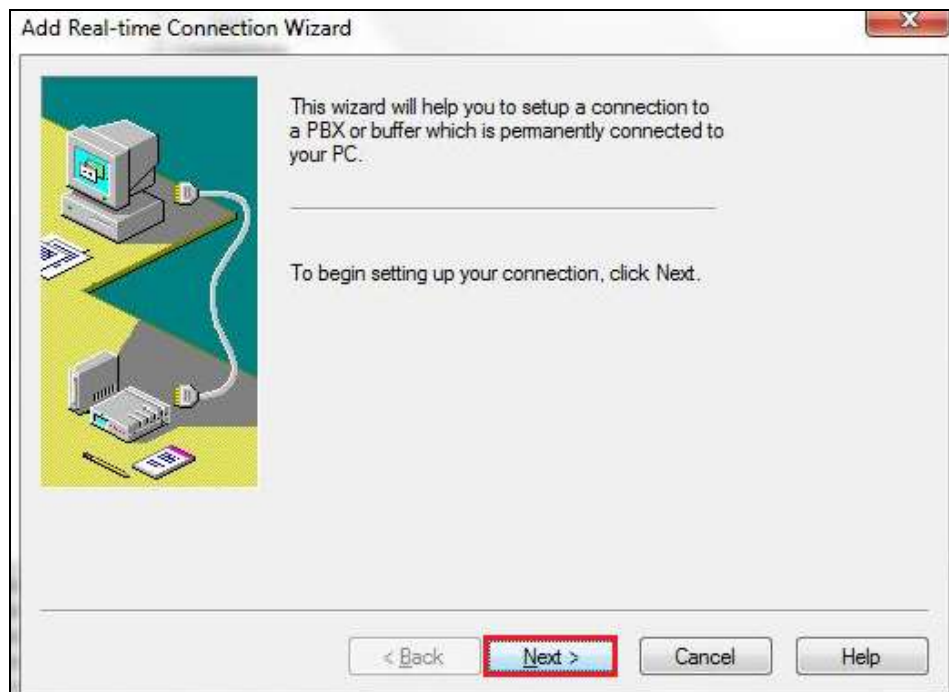
Open the Communication Server configuration in order to configure the new Real-time connection by clicking on **Communications Server** as shown below.



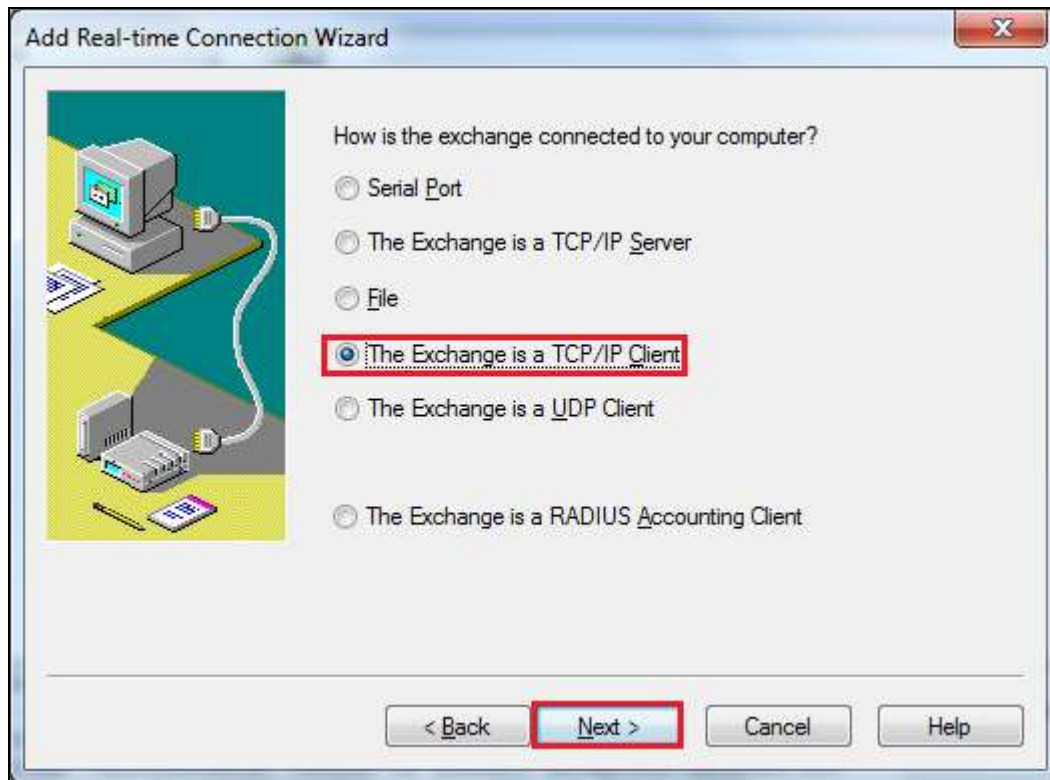
Select the **Real-time Connections** folder in the left hand pane and double click on **Add Connection** as highlighted below.



When the **Add Real-time Connection Wizard** opens, click the **Next** button to continue.



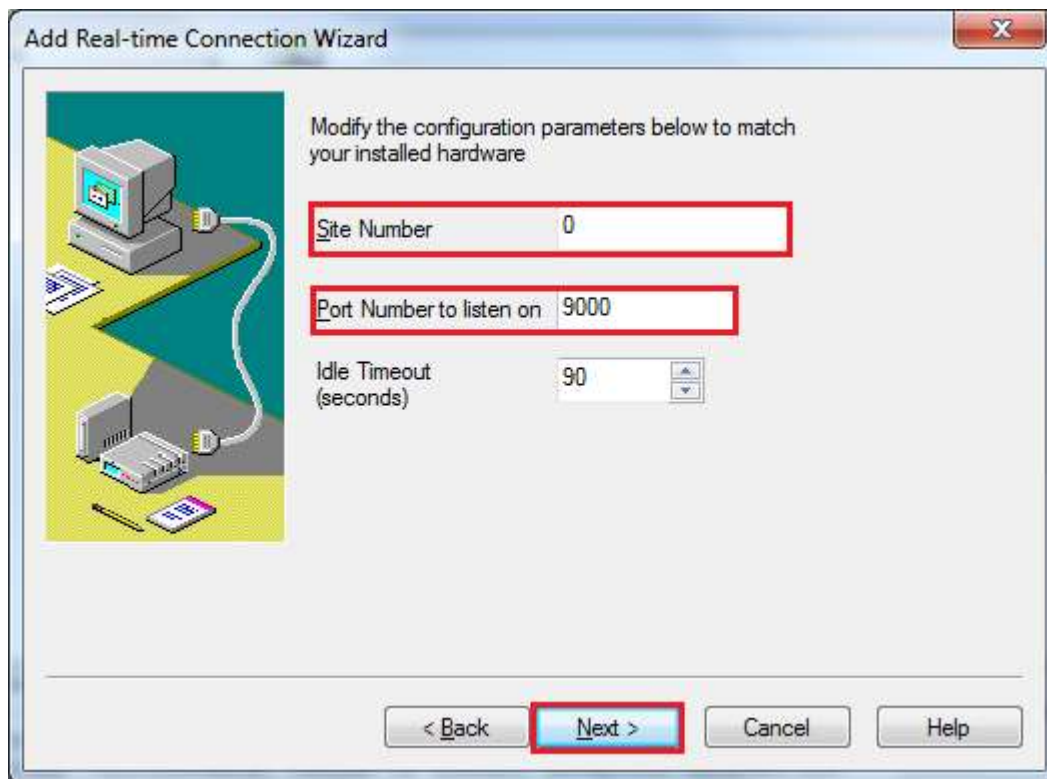
On the subsequent screen select **The Exchange is a TCP/IP Client** radio button, followed by the **Next** button.



On the subsequent screen enter the following:

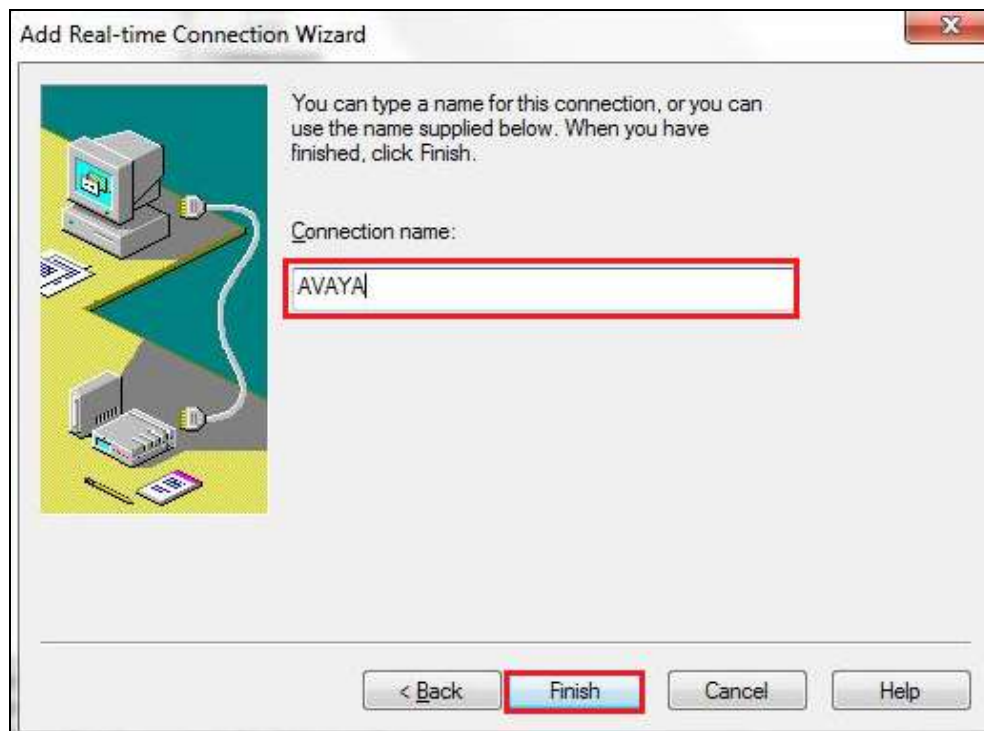
- **Site Number** Select the site number (When there is only one site the site number will always be **0**)
- **Port Number** Enter the port number to listen on (this is the port number as configured in **Section 5.2**)

Click the **Next** button to continue.



The image shows a Windows-style dialog box titled "Add Real-time Connection Wizard". On the left is an illustration of a computer system connected to a network switch. On the right, the text "Modify the configuration parameters below to match your installed hardware" is displayed. Below this text are three input fields: "Site Number" with the value "0", "Port Number to listen on" with the value "9000", and "Idle Timeout (seconds)" with the value "90" and up/down arrow controls. At the bottom of the dialog are four buttons: "< Back", "Next >", "Cancel", and "Help". The "Next >" button is highlighted with a red rectangular border.

On the subsequent screen choose a **Connection name** for the new connection and click on the **Finish** button.

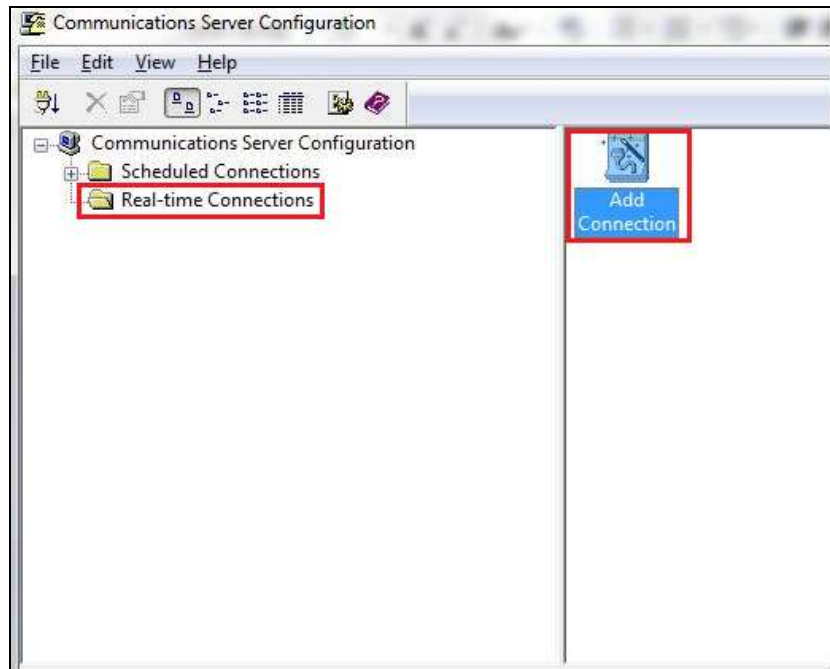


This new connection is shown under **Real-time Connections**.

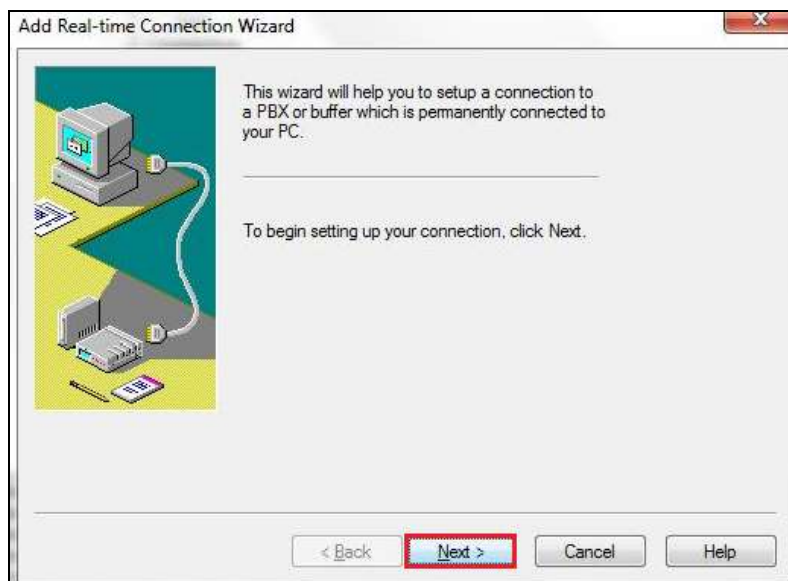


7.2. Configuration of Soft-ex Optimiser/RingMaster connection to the IP Buffer

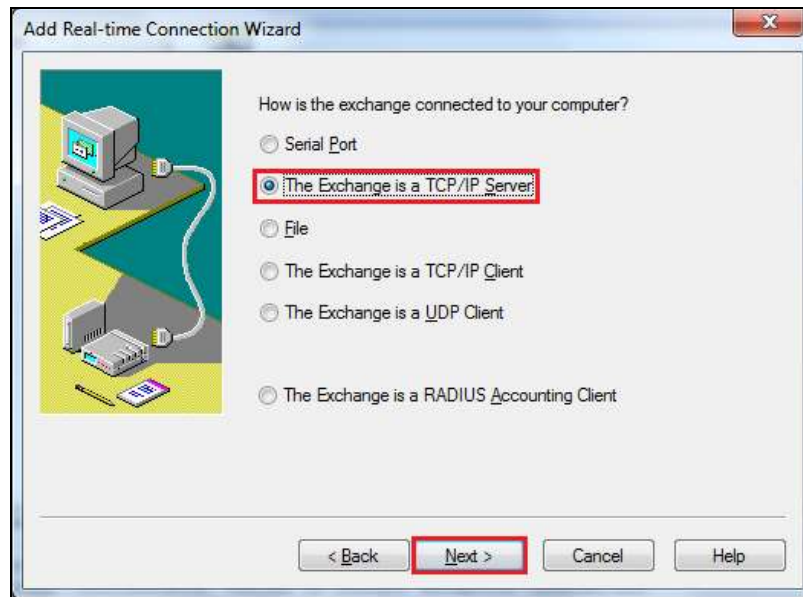
Open the Communications Server Configuration as shown in **Section 7.1** and select the **Real-time Connections** folder in the left hand pane and double click on **Add Connection** as highlighted below.



On the subsequent screen choose the **Add Real-time Connection Wizard** and, click the **Next** button to continue.



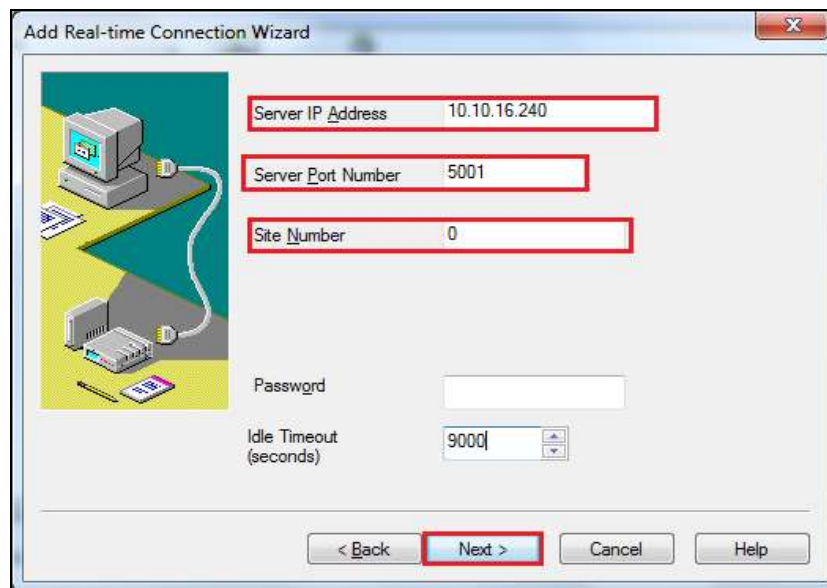
On the subsequent screen select **The Exchange is a TCP/IP Server** radio button, followed by the **Next** button.



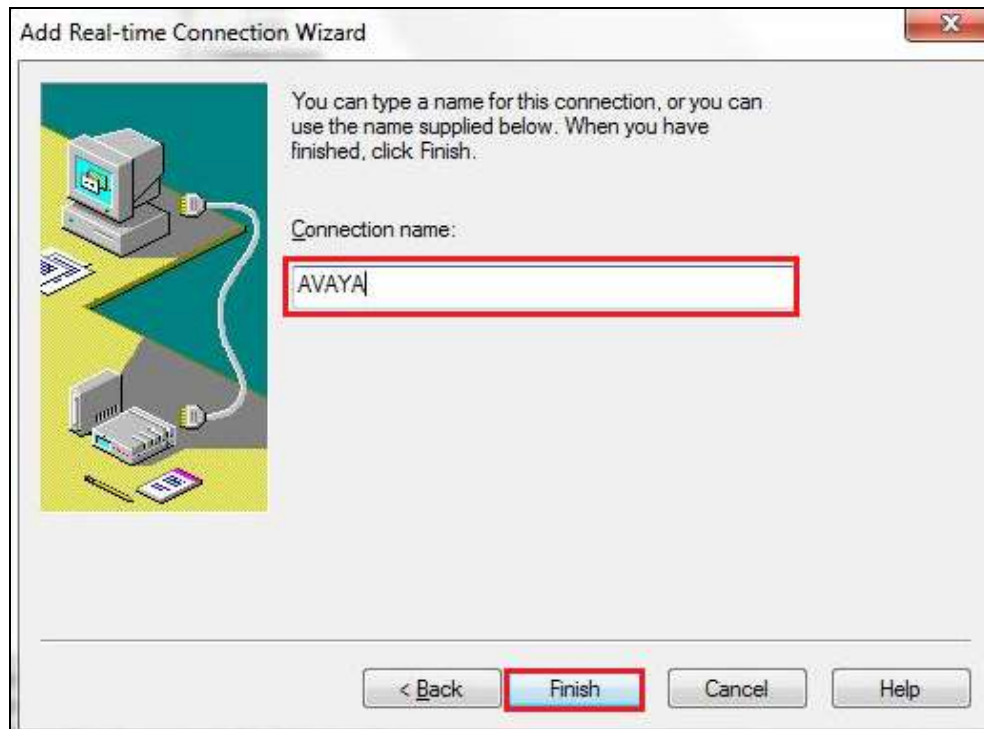
On the subsequent screen enter the following:

- **Server IP Address** Enter the IP address of the IP Buffer
- **Port Number** Enter the port number to listen on (this is the Destination TCT port number as configured in **Section 6.1**)
- **Site Number** Select the site number (When there is only one site the site number will always be **0**)

Click the **Next** button to continue.



On the subsequent screen choose a **Connection name** for the new connection and click on the **Finish** button.



8. Verification Steps

This section provides tests that can be performed to verify correct configuration of the Avaya and Soft-ex solution.

8.1. Verify the Avaya Aura® Communication Manager CDR Link

Use the **status cdr-link** command to verify that the link between Communication Manager and the IP buffer is in service. **Link State: up** and **Reason Code: OK** confirms successful connection.

status cdr-link		
CDR LINK STATUS		
	Primary	Secondary
Link State:	up	CDR administered
Number of Retries:	999	
Date & Time:	2015/01/28 18:01:12	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	

8.2. Verify the connection between Scannex IP buffer and Avaya Aura® Communication Manager

On the IP Buffer select **Status**, the completed **Status** screen is displayed. The **TCP Source** displays in green indicating that the IP Buffer has successfully connected to the Avaya solution.



8.3. Verify CDR data is being sent from Avaya Aura® Communication Manager

Setup a port listening tool on a PC and set it to listen on port 9000 (as per **Section 5.2**). Once connected make an incoming and outgoing call and on completion of the calls CDR data should be visible on the port listening tool. An example is shown below.

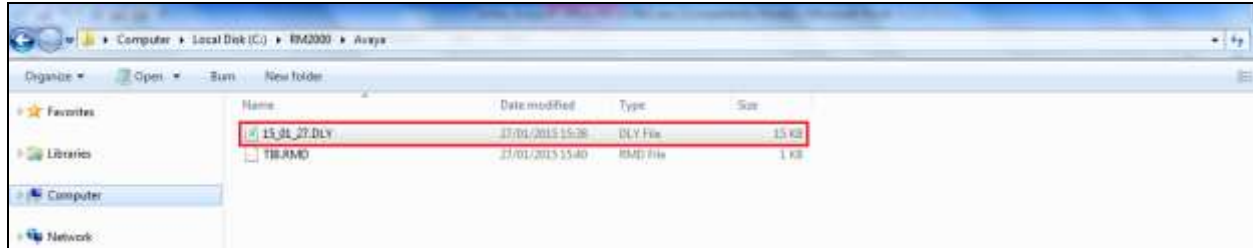
270115	1614	00007	0	701	1003	1003	710	015	007	0	0	8888
270115	1614	00007	C		1003	3005	710	001		0	0	8888
270115	1623	00004	9		710	1003	701	001	009	0	0	8888
270115	1623	00004	7	9	710	3005	1003	010		0	0	8888
270115	1623	00002	7	9	710	3005	1016			0	0	8888
270115	1632	00004	C			1003	1016					
270115	1632	00004	0	701		1003	1003		008	0	0	8888
270115	1633	00004	C			1003	1016					
270115	1633	00004	0	701		1003	1003		009	0	0	8888
270115	1633	00004	C			1003	1016					
270115	1633	00004	0	701		1003	1003		010	0	0	8888
270115	1635	00006	C			1003	1016					
270115	1635	00006	0	701		1003	1003		011	0	0	8888
270115	1637	00004	9			710	1003	701	001	0	0	8888
270115	1637	00004	7	9	710	3005	1003	001	011	0	0	8888
270115	1638	00003	9			1015	1003	701	001	0	0	8888
270115	1638	00003	C			1003	1016					

8.4. Verify CDR data is being received by the Optimiser/RingMaster

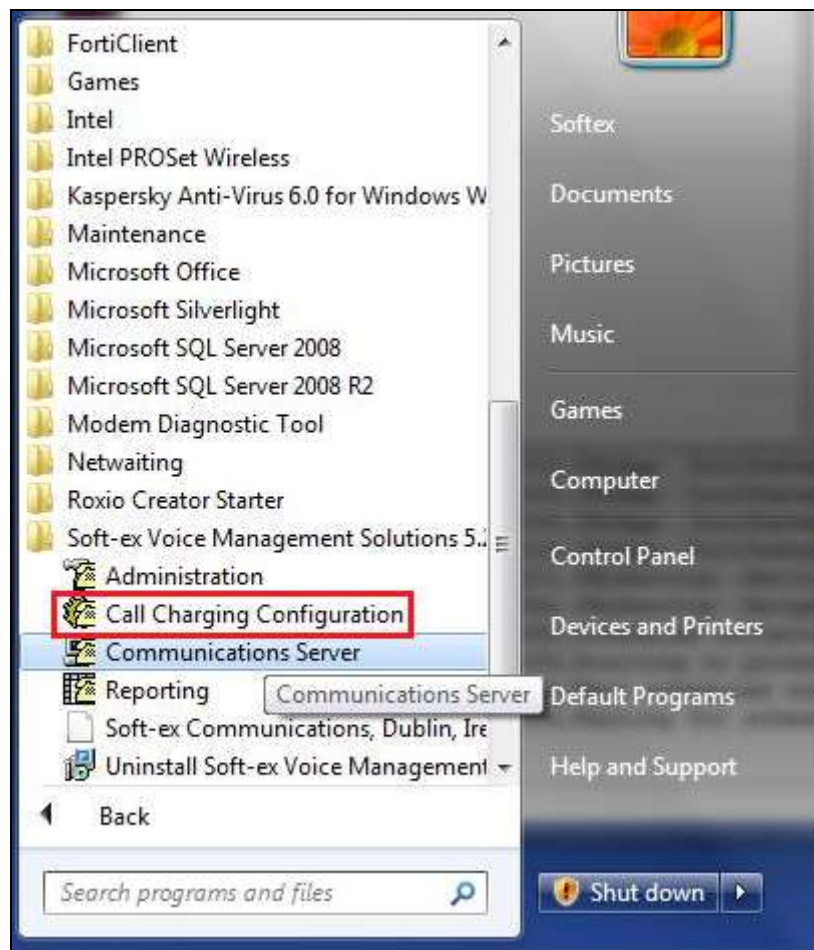
Check that the Soft-ex Communications Server service is running as shown below.

Services			
Soft-ex Communication Server			
Stop the service Restart the service Description: Collects data for Soft-ex Communication Server Application			
Name	Description	Status	
Secondary Logon	Enables starting processes under alternate crede...		
Secure Socket Tunneling Proto...	Provides support for the Secure Socket Tunnelin...		
Security Accounts Manager	The startup of this service signals other services ...	Started	
Security Center	The WSCSVC (Windows Security Center) service ...	Started	
Server	Supports file, print, and named-pipe sharing ov...	Started	
Shell Hardware Detection	Provides notifications for AutoPlay hardware ev...	Started	
Skype Updater	Enables the detection, download and installatio...		
Smart Card	Manages access to smart cards read by this com...	Started	
Smart Card Removal Policy	Allows the system to be configured to lock the ...		
SNMP Trap	Receives trap messages generated by local or re...		
Soft-ex BrokerHandler	Hosts and handles distributed management tas...	Started	
Soft-ex Call Processing	Records and applies cost to CDR for Soft-ex Call ...		
Soft-ex CM Agent	Collects records from Cisco CallManager		
Soft-ex Communication Server	Collects data for Soft-ex Communication Server ...	Started	
Software Protection	Enables the download, installation and enforce...		
SPP Notification Service	Provides Software Licensing activation and notif...		

Check to see that a CDR file is created in the location **C:\RM2000\<Sitename>** as shown below.



Check using the Soft-ex Call Charging Configuration tool, that CDR data is being processed correctly. This will show the CDR data as it was sent from the Communication Manager.



An example is shown below.

Soft-ex RingMaster - Call Charging Configuraton									
File Options Maintenance Help									
Int. Extn:1016 Extn:1015 (Recorded)									
1015, A, 08:49, 00:00:05, Internal, 00:00, , , €0.0000, 1016, , , Standard, 28/01/2015, Wednesday									
280115 0923 00005 0 1004 1015									
Int. Extn:1004 Extn:1015 (Recorded)									
1015, A, 09:22, 00:00:05, Internal, 00:00, , , €0.0000, 1004, , , Standard, 28/01/2015, Wednesday									
280115 0924 00003 0 1004 1015									
Int. Extn:1004 Extn:1015 (Recorded)									
1015, A, 09:23, 00:00:03, Internal, 00:00, , , €0.0000, 1004, , , Standard, 28/01/2015, Wednesday									
280115 0925 00003 0 1004 1015									

9. Conclusion

A full and comprehensive set of feature functional test cases were preformed during Compliance testing. Soft-ex Optimiser/Ringmaster 5.5 is considered compliant with Avaya Aura® Communication Manager 6.3.

10. Additional References

These documents form part of the Avaya official technical reference documentation suite. Further information may be had from <http://support.avaya.com> or from your Avaya representative.

- [1] *Administering Avaya Aura® Communication Manager, Release 6.3, October 2013, Document Number 03-300509, Issue 9.0.*
- [2] *Avaya Aura® Communication Manager Feature Description and Implementation, Release 6.3, May 2013, Document Number 555-245-205, Issue 10.0.*
- [3] *Administering Avaya Aura® Session Manager, Release 6.3, Issue 3 October 2013*
- [4] *Administering Avaya Aura® System Manager, Release 6.3, Issue 3, October, 2013*
- [5] *Administration for the Avaya G430, 03-603228, Issue 1, May, 2009*

Information on the installation and configuration of Optimiser/RingMaster can be found at <http://www.soft-ex.net> website. Information on the install and configuration of the IP Buffer from Scannex can be found at <http://www.scannex.co.uk>.

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