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Avaya Solution & Interoperability Test Lab

Application Notes for Data Track Eclipse Call Management System and Avaya Aura® Communication Manager 6.2 – Issue 1.0

Abstract

These application notes describe the configuration steps required for Data Track Eclipse Call Management System to successfully interoperate with Avaya Aura® Communication Manager. Eclipse Call Management System collects Call Detail Records from the Avaya Aura® Communication Manager and processes them to allow users to analyse and report on incoming, outgoing, internal and Automatic Call Distribution traffic. Real-time Transport Control Protocol data is also collected and processed by Eclipse Call Management System to provide voice quality reports including a calculated Mean Opinion Score for Voice over IP environments.

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.

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1. Introduction

These Application Notes describe the compliance tested configuration used to validate Data Track Eclipse Call Management System (Eclipse CMS) with Avaya Aura® Communication Manager (Communication Manager). Eclipse CMS receives Call Detail Recording (CDR) and Real-Time Transport Control Protocol (RTCP) data and processes this data to provide a complete overview of a voice network's operation and performance. A comprehensive reporting suite allows the user to produce a range of reports including:

- Quality of Service Reports
- Cost Allocation Reports
- Response Reporting
- Traffic Analysis Reports
- Fraud Analysis Reports

During compliance testing a customized CDR format was supplied by Data Track for use with Eclipse CMS.

2. General Test Approach and Test Results

The general test approach was to configure the Eclipse CMS to communicate with the Communication Manager as implemented on a customer's premises. See **Figure 1** for a network diagram. The interoperability compliance testing included feature and serviceability testing. The feature testing verified the ability of Eclipse CMS to collect and process CDR records for various types of calls including intra-switch, PSTN, outgoing and incoming calls. The source, destination and duration of each call were verified on the Eclipse CMS. For call quality reporting, a number of calls were made using Voice over IP (VoIP) handsets and the receipt of the RTCP data and subsequent Mean Opinion Score (MOS) calculations were done. The serviceability testing introduced failure scenarios to see if Eclipse CMS can resume CDR and RTCP data collection after a failure.

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 Eclipse CMS and Communication Manager.
- 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
Handling of External Calls
Handling of call to voice Mail
Call Forwarding on busy or No Answer
Transfers – Blind and Supervised
Conference Calls
Call Park and Call Pick Up
Bridged Appearances
Automatic Call Distribution (ACD) Calls
- Handling of calls to and from Avaya H323and SIP phones.
- Receiving RTCP data.

2.2. Test Results

Tests were performed to ensure full interoperability between Eclipse CMS and Communication Manager. The tests were all functional in nature and performance testing was not included. All the test cases passed successfully.

2.3. Support

For technical support on Data Track products please contact Data Track support team at:
Web: www.dtrack.com
Email: support@dtrack.com
Phone: +44 (0) 1425282020

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 G250 Gateway. The Communication Manager is configured to output CDR and RTCP data over TCP/IP ports to the Eclipse CMS server. A variety of Avaya 96XX H323 and SIP phones were used to generate intra-switch calls (calls between phones on the same system), and outbound/inbound calls to/from the PSTN. Communication Manager Messaging was also configured on the Communication Manager so as to test Voice Mail interoperability. To test calls to VDN's and agents the Communication Manager Elite feature was used.
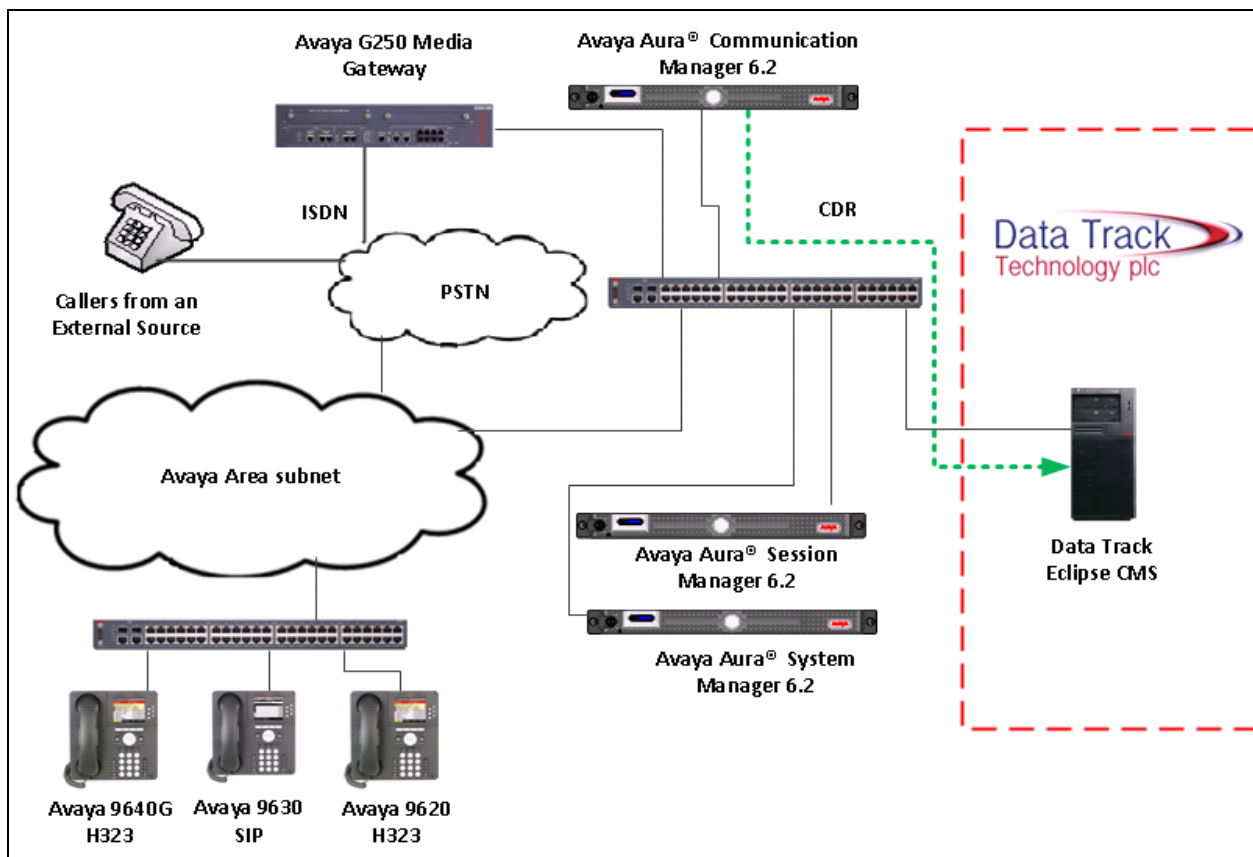
Figure 1: Avaya Aura® Communication Manager and Data Track Eclipse Call Management System Reference Configuration

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4. Equipment and Software Validated

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

Avaya Equipment	Software / Firmware Version
Avaya S8800 Server running Avaya Aura® Communication Manager	Avaya Aura® Communication Manager R6.2 Build R016x.02.0.832.0
Avaya S8800 Server running Avaya Aura® System Manager	Avaya Aura® System Manager R6.2 Build 6.2.2.0.622005
Avaya S8800 Server running Avaya Aura® Session Manager	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 - SIP 9630	 S3.186a S3.105s 2.6.2
Communication Manager Messaging	6.2
Data Track Soft Equipment	**Software / Firmware Version**
Windows Server 2008 R2 Enterprise SP1	Eclipse Call Management System Software 1.34.1.2

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 in this section describes the configuration of the Communication Manager for this solution. It is implied a working system is already in place, including Skill Hunt Groups, Agents, Vectors and voice mail boxes. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 9**. The configuration operations described in this section can be summarized as follows:

- Create Node Name for Eclipse CMS Server
- Define the CDR Link
- Change system-parameters cdr
- Define Intra-Switch Extensions
- Configure Trunks for CDR Reporting
- Configure RTCP Monitor Server
- Configure IP Network Region

5.1. Create Node Name for Eclipse CMS Server

A Node Name needs to be created to associate Eclipse CMS with the Communication Manager
Use the **change node-names ip** command to configure the following:
Page **1**

- **Name**   Enter an informative name i.e. **Eclipse**
- **IP address**   Enter the IP address of the Eclipse CMS

```
change node-names ip                                         Page   1 of
2
                             IP NODE NAMES
   Name            IP Address
Eclipse           10.10.60.70
Procr             10.10.16.23
```

5.2. Define the CDR Link

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

- **Service Type**   Enter **CDR1**
- **Local Node**   Enter **procr**
- **Remote Node**   Enter **Eclipse**
- **Remote Port**   Enter **5101**

```
change ip-services                                    Page   1 of   3
                             IP SERVICES
 Service     Enabled     Local       Local       Remote      Remote
  Type                   Node        Port        Node        Port
CDR1                     Procr       0           Eclipse     5101
```

Navigate to **Page 3** and set the **Reliable Protocol** field to **n**. This will enable Reliable Session
Protocol (RSP) for CDR transmission. In this case, the CDR link will use TCP with RSP.

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

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

```
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
```

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5.3. Change system parameters cdr

Certain parameter changes are required for Communication Manager to interoperate with Eclipse CMS. 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:** Set it to **month/day.** The date format will be used for the date stamp that begins each new day of call records.
- **Primary Out Format:** Set this to **customized** format.
- **Primary Output Endpoint:** Set to **CDR1** to correspond with CDR link set in **Section 5.2**.
- **Intra-switch CDR:** Set this to **y** to allow call records for internal calls involving specific stations. Those stations must be specified in the **inter-switch-cdr** form as set in **Section 5.4**.
- **Record Outgoing Calls Only**: Set this to **n** to allow incoming trunk calls to appear in the CDR records along with the outgoing trunk calls.
- **Suppress CDR for Ineffective Call Attempts?** Set this to **n** so that calls that are blocked do not generate CDR.
- **Outg Trk Call Splitting:** Set this to **y** to allow a separate call record for any portion of an outgoing call that is transferred or conferenced.
- **Inc Trk Call Splitting**: Set this to **y** to allow 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):                        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? n                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

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: in-trk-code   - 4   33: feat-flag      - 1
 2: space         - 1   18: space         - 1   34: frl            - 1
 3: time          - 4   19: auth-code     - 7   35: node-num       - 2
 4: space         - 1   20: space         - 1   36: vdn            - 5
 5: sec-dur       - 5   21: in-crt-id     - 3   37: country-from   - 3
 6: space         - 1   22: space         - 1   38: country-to     - 3
 7: cond-code     - 1   23: out-crt-id    - 3   39: location-from  - 3
 8: space         - 1   24: space         - 1   40: location-to    - 3
 9: code-dial     - 4   25: isdn-cc       - 11  41: return         - 1
10: space         - 1   26: space         - 1   42: line-feed      - 1
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: calling-num   - 15  31: attd-console  - 4   47:                -
16: space         - 1   32: bandwidth     - 2   48:                -

                         Record length = 149
```

5.4. Define 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** enter the specific extensions whose usage will be tracked with a CDR. Add an entry for each **Extension**

```
change intra-switch-cdr                                   Page   1 of   3
                         INTRA-SWITCH CDR

                            Assigned Members:   4   of 5000   administered
  Extension         Extension         Extension         Extension
  2000
  2001
  2011
  2014
```

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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 **r**. This applies to all types of trunk groups.

```
change trunk-group 9                                           Page   1 of  21
                              TRUNK GROUP

Group Number: 9                      Group Type: isdn          CDR Reports: r
  Group Name: OUTSIDE CALL                   COR: 1       TN: 1       TAC: 109
    Direction: two-way      Outgoing Display? y        Carrier Medium: PRI/BRI
 Dial Access? y             Busy Threshold: 255  Night Service:
Queue Length: 0
Service Type: public-ntwrk          Auth Code? n             TestCall ITC: rest
                        Far End Test Line No:
TestCall BCC: 4
```

5.6. Configure RTCP Monitor Server

Eclipse CMS uses RTCP packets to calculate and report the quality of the call stream, Eclipse CMS needs to be defined as an RTCP Monitor Server in Communication Manager. Use the **change system-parameters ip-options** command to configure the following:

- The **Server IPV4 Address** field should be set to the IP address of the Eclipse CMS as configured in **Section 5.1**.

- The **IPV4 Server Port** should be set to **5005**. This port number must match what is configured on Eclipse CMS as the RTCP Listening Port **(Section .6.5)**

- **RTCP Report Period(secs)** should be set to a **5.** This defines how frequently the Communication Manager forwards RTCP packets to the RTCP Monitor Server, which is the Eclipse CMS server.

```
change system-parameters ip-options                           Page   1 of   3
                        IP-OPTIONS SYSTEM PARAMETERS

 IP MEDIA PACKET PERFORMANCE THRESHOLDS
    Roundtrip Propagation Delay (ms)    High: 800      Low: 400
                    Packet Loss (%)     High: 40       Low: 15
                    Ping Test Interval (sec): 20
    Number of Pings Per Measurement Interval: 10
              Enable Voice/Network Stats? n
 RTCP MONITOR SERVER
    Server IPV4 Address: 10.10.60.70       RTCP Report Period(secs): 5
            IPV4 Server Port: 5005
    Server IPV6 Address:
            IPV6 Server Port: 5005


AUTOMATIC TRACE ROUTE ON
          Link Failure? y
                                    H.323 IP ENDPOINT
 H.248 MEDIA GATEWAY                    Link Loss Delay Timer (min): 5
  Link Loss Delay Timer (min): 5        Primary Search Time (sec): 75
                        Periodic Registration Timer (min): 20
                        Short/Prefixed Registration Allowed? n
```

5.7. Configure IP Network Region

RTCP reporting is enabled on a per IP network region basis. Enter the **change ip-network-region n** command, where **n** is IP network region number to be monitored. Navigate to **Page 2** and enter the following information.

- Set **RTCP Reporting Enabled** to **y.**
- Set the **Use Default Server Parameters** field to **y** so that the IP network region will use the default server parameters defined in **Section 5.6**.

Note: Only one RTCP monitor server can be configured per IP network region.

```
change ip-network-region 1                                    Page   2 of  20
                              IP NETWORK REGION

 RTCP Reporting Enabled? y

 RTCP MONITOR SERVER PARAMETERS
   Use Default Server Parameters? y
```

6. Configure Eclipse Call Management System

The following sections describe the steps required to configure the base configuration required to enable Eclipse CMS to collect CDR records and report on the RTCP generated by Communication Manager. 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 operations described in this section can be summarized as follows:

- Configure Site
- Configure Digit Translation
- Configure Default Trunk
- Configure CDR Data Collection
- Configure RTCP Data Collection

6.1. Configure Site
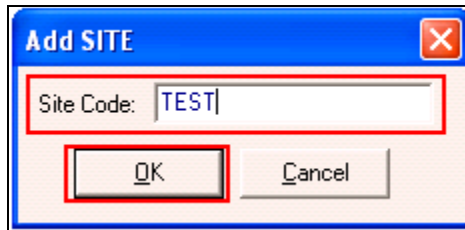
To configure a site launch the Eclipse System Configuration tool by navigating to **Start → All Programs → Eclipse III CMS → Eclipse Configuration (not shown)** and log in with appropriate credentials. From the Eclipse System Configuration window select **System → Sites**.
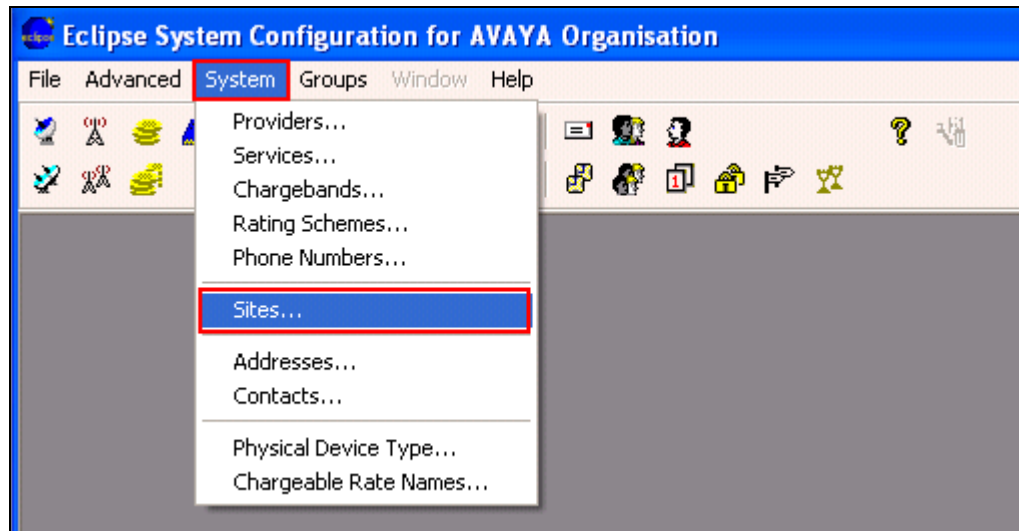
Once the **Sites** window opens click on the **Add** button.

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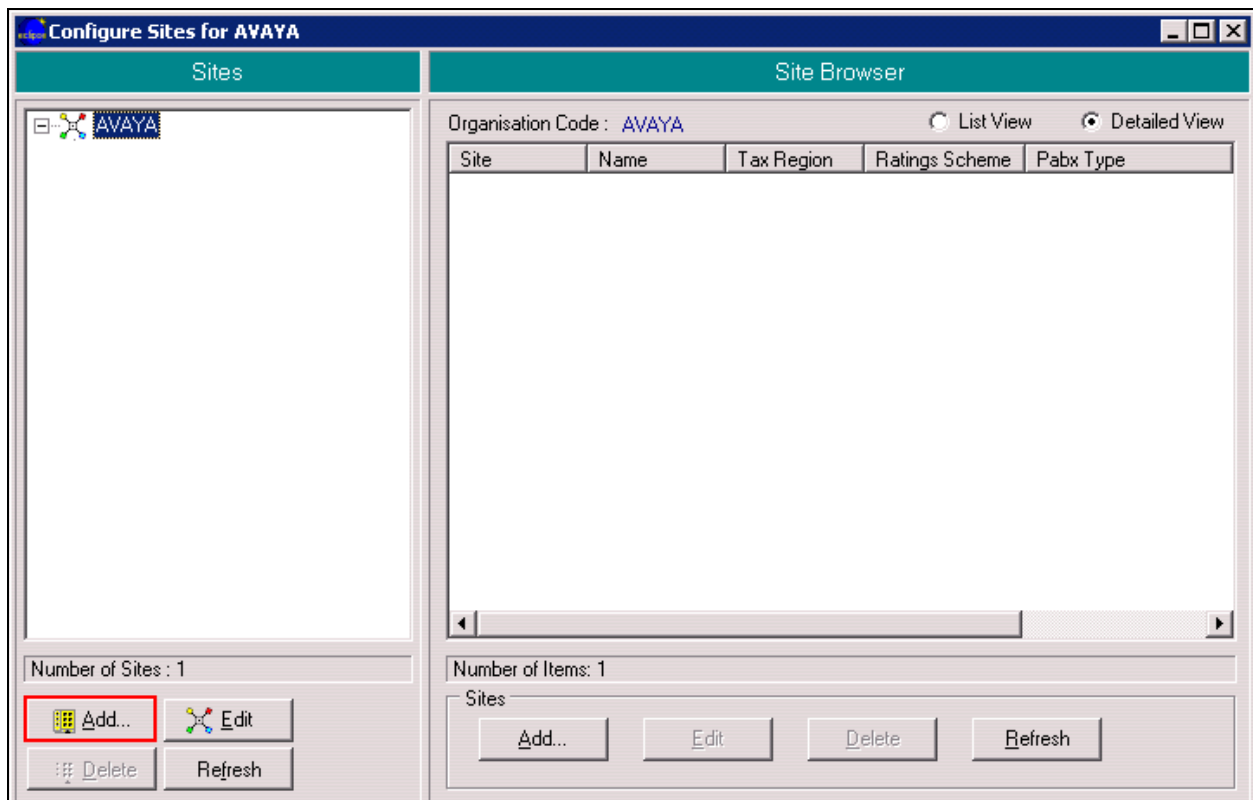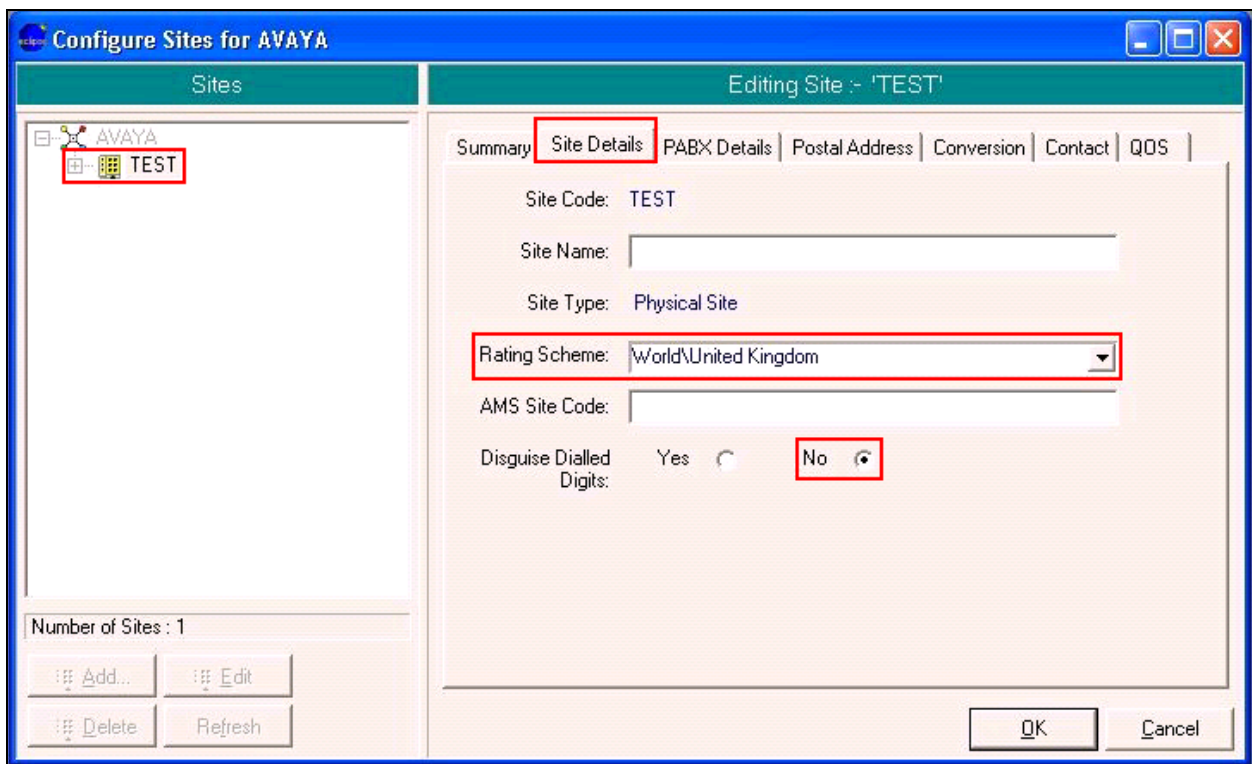
Once the **Add Site** window opens, enter a name for the logical site that the CDR records and RTCP data will be associated with. During compliance testing **Site Code** of **TEST** was used. Click on the **OK** button to save.

In the resulting window select **TEST**. In the **Editing Site** window select the **Site Details** tab and enter the following:

- From the **Rating Scheme** drop down box select an appropriate Rating Scheme. A Rating Scheme allows calls to be costed based on their origin and destination. During compliance testing **World\United Kingdom** was selected.
- Click on the **No** Radio button for **Disguise Dialled Digits**

Click on the **PBX Details** tab followed by the **Select PABX** Type button

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In the resulting menu expand the menu tree to **Avaya → Communication Manager→ R4.0 customised** and click the **Select** button.

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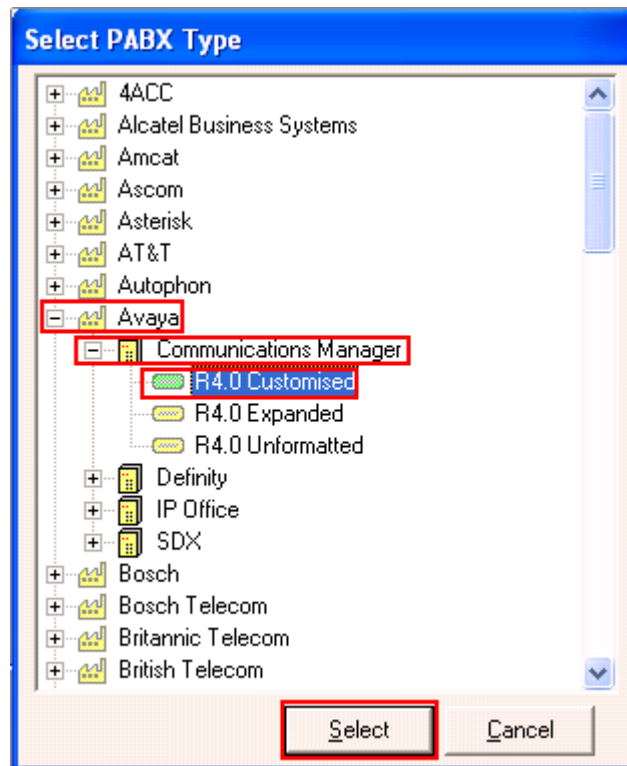
Click on the **Conversion** tab and select and select the following:

- Click on the **Yes** radio button for **Log Data** to log information about the conversion.
- Click the **Live** radio button for **Data Conversion** to ensure that any received data is processed in real time
- Enter **2** in the **Options** field. Eclipse CMS provides a number of options that can alter the behaviour of the system, however during compliance testing the **Options** field was set to **2**. By default Eclipse CMS uses a UK date format. Option **2** allows the use of an American date format as this was used for the CDR Date Format in **Section 5.3**. The remaining fields can be left with their default values.

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Click on the **QOS** tab and select the Codec from the drop down box that will be used to calculate the MOS score for calls made involving the site being configured. During compliance testing **G711** was used. Click on the **OK** button to save.

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6.2. Configure Digit Translation

Digit translations are used to identify routing digits and prevent costing errors. For example a call made to a number with the initial digits 1-9 are costed as local rate calls, however in the compliance test, users dialed 9 for an outside line so a digit translation must be entered to make the Eclipse CMS aware that 9 is a routing digit and should be ignored for costing purposes. From the **Configure Sites** window, expand **TEST** and highlight **Digit Translation** in the menu tree and click the **Add** button.

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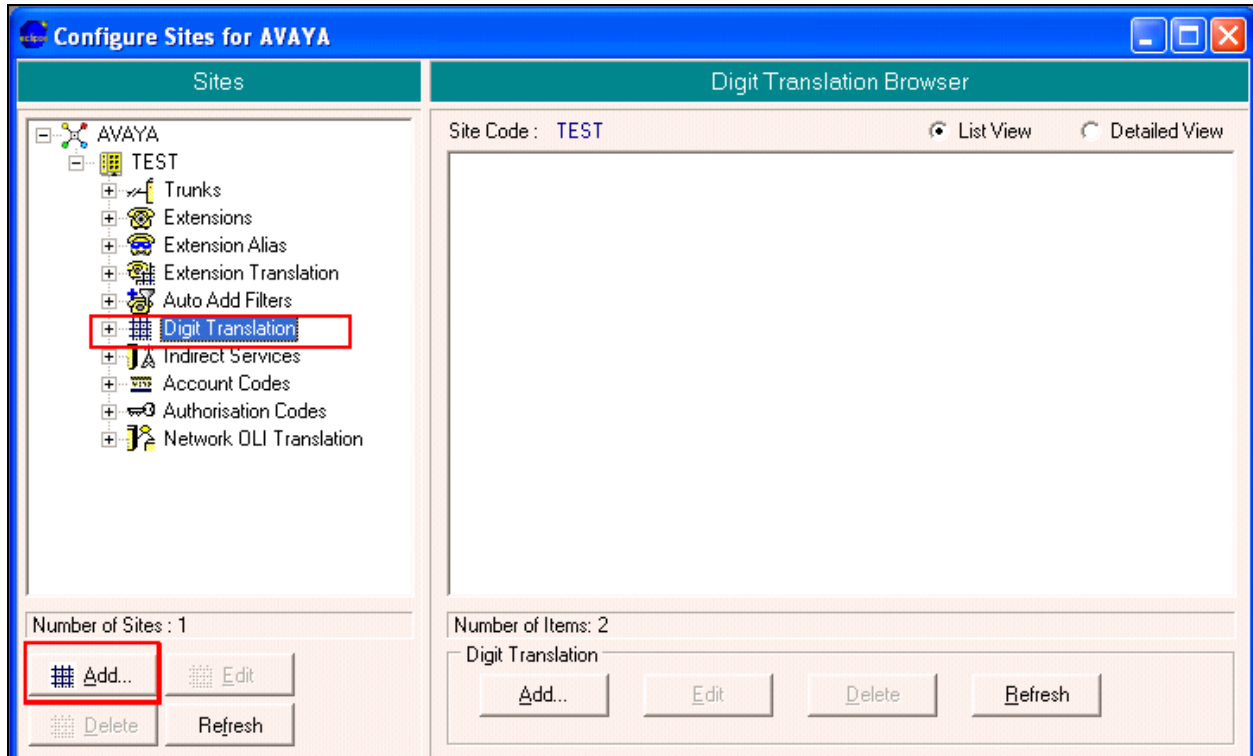
In the resulting window, enter the following:
- Enter a descriptive name in the **Description** field. (example **Default 9**)
- Enter the access code (in the case **9**) in the **Access Digits** field
- Enter a plus (+) in the **Destination Digits** field. A plus symbol indicates an acceptance of any combination and length of digits. All other fields can be left with their default values.

Click the **OK** button to save..

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6.3. Configure Default Trunk

Trunks can be individually defined within Eclipse CMS to provide individual costing per trunk. A default trunk is used to provide costing for any calls that are carried by unconfigured trunks. It is recommended that a default trunk is configured for each site to ensure that all trunk calls are accounted for. From the **Configure Sites** window, expand **TEST** and highlight **Trunks** in the menu tree and click the **Add** button.

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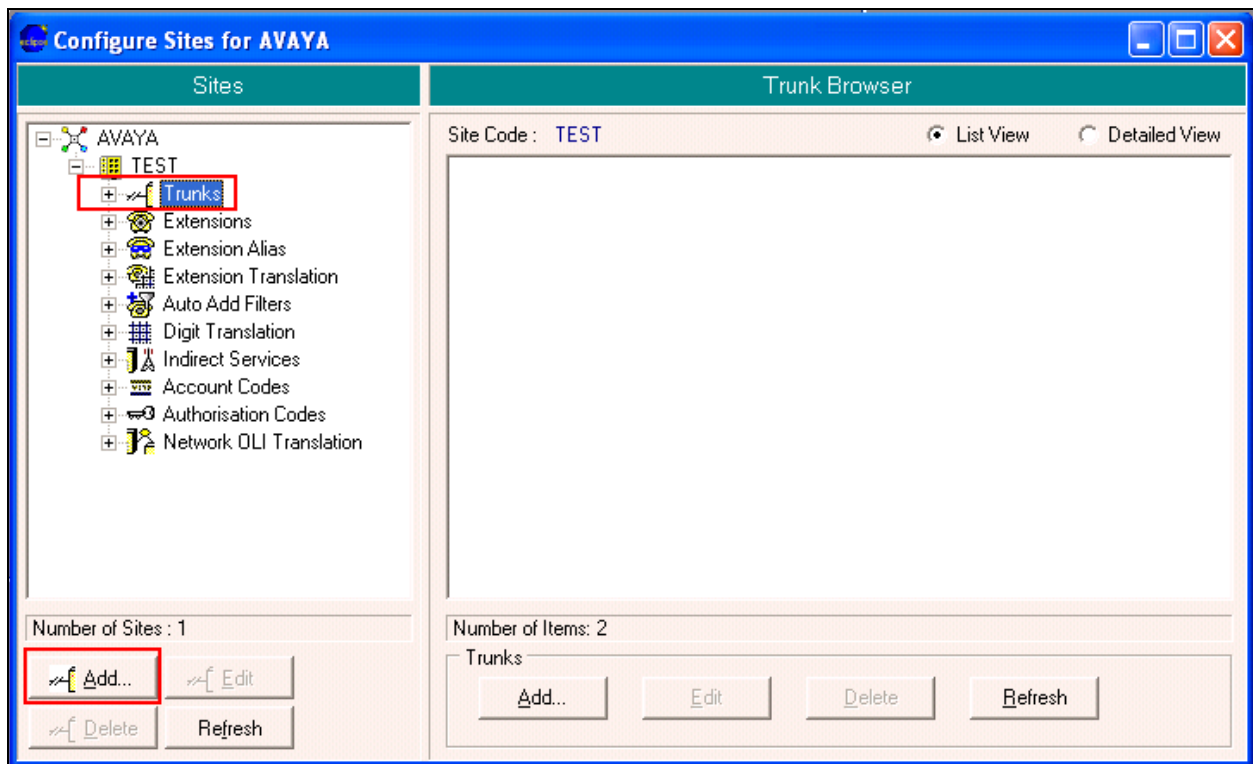
In the **Add Trunk** window enter **DEFAULT** as the trunk identifier and click the **Next** button.

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Click on the **Outgoing/Tandem Costing** tab and enter the following:

- Select the **Cost calls** radio button **Yes** so that Eclipse CMS will apply costings to the calls associate with the default trunk.
- From the **Default Service** drop down box select a service that will be used to cost the calls. During compliance testing **British Telecom – Business Rate** was selected.
- Check the **Actual Call Duration** check box.
- Check the **Answer Indication** check box.

All other fields can be left with their default values. Click **OK** to complete the default trunk configuration.

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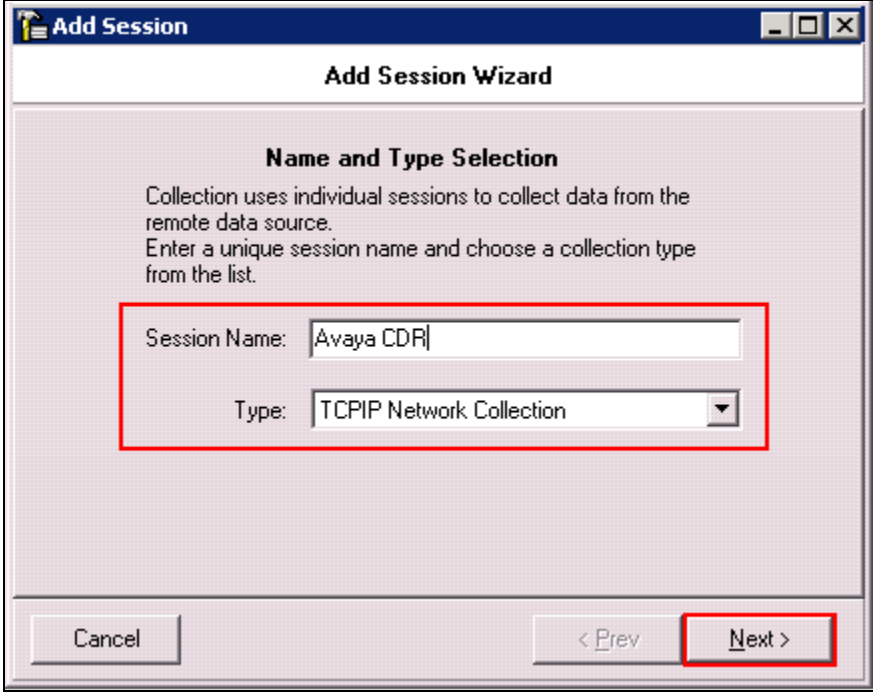
6.4. Configure CDR Data Collection

This section describes the steps required to configure a collection session on the Eclipse CMS. This session will be used to collect Call Detail Record data from Communication Manager, and will specify a location for the raw data to be stored. To add a new CDR collection session **Start → All Programs → Eclipse III CMS → Eclipse Collection Manager (not shown)** and log in with appropriate credentials. Once the **Collection Manager** window opens select **Session** followed by **New Session.**

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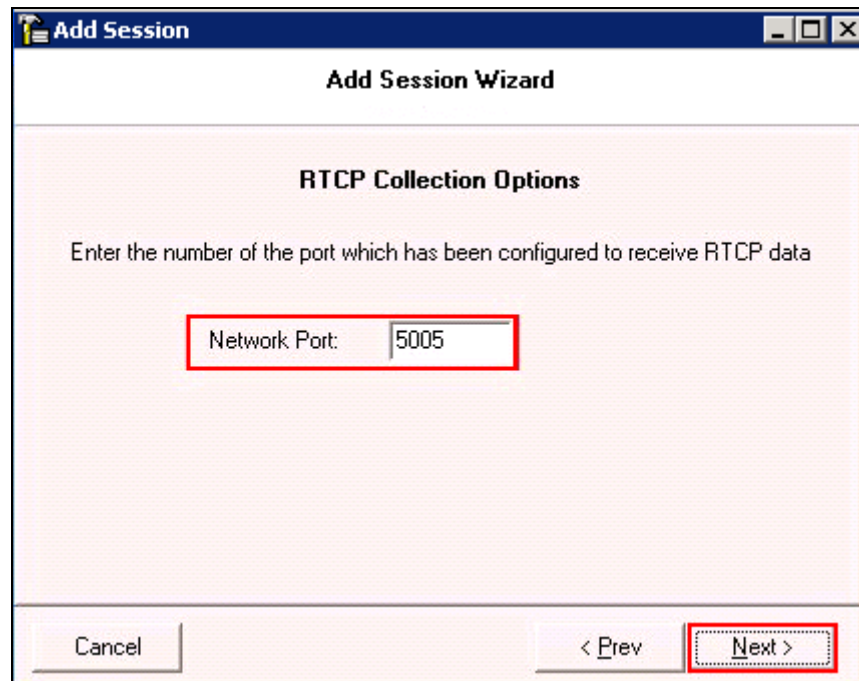
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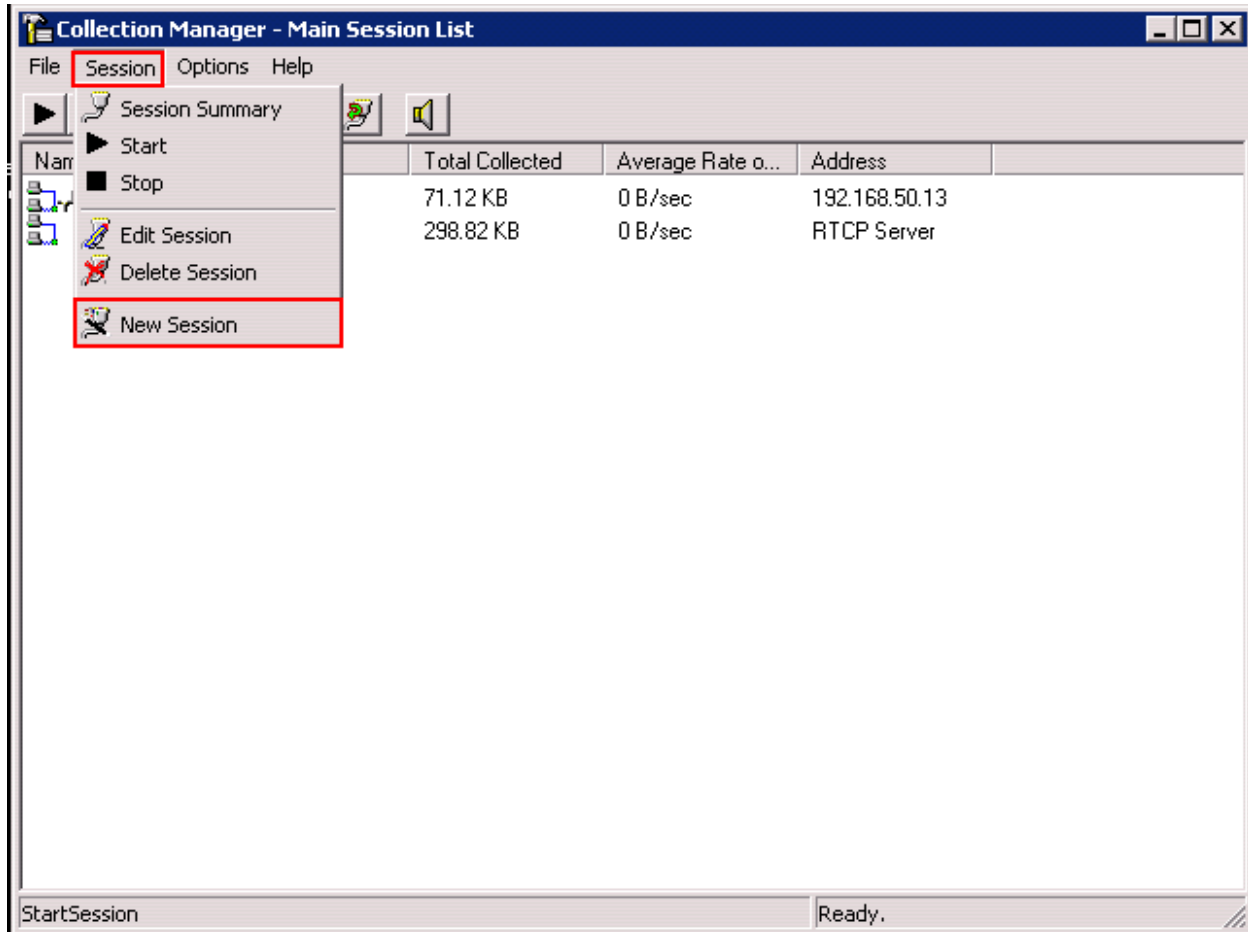
In the **Name and Type Selection** window enter any name in the **Session Name** field and select **TCP/IP Network Collection** form the **Type** drop down box. Click **Next** to continue.

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In the **Site Entry** window, enter the **Site Code** as configured in **Section 6.1**. Click **<u>Next</u>** to continue.

Note: The **Site Code** is not case sensitive. The case used in **Section 6.1** may differ from what is used here as long the characters match.

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In the **TCPIP Network Collection Options** window, enter IP address of the PROCR (IP address of the Communication Manager) that will provide the CDR connection in the **Network Address** field. In the **Network Port** field enter the remote port as used in **Section 5.2**. Select the **Server Mode** check box and click **Next** to continue.

In the **Raw File Options** screen specify a path where the raw CDR files will be stored and processed by the Eclipse CMS. The path that should be used is dependent on the installation, if in doubt which path to use, please contact Data Track using the details in **Section 2.3.** Click **Next** to continue.

In the **Collection Session Startup Options** window select the **Enabled** radio button so that the collection session automatically starts when Eclipse CMS starts. Click **Finish** to complete the configuration of the CDR collection session.

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6.5. Configure RTCP Data Collection

This section describes the steps required to configure a second collection session on the Eclipse CMS. This session will be used to collect RTCP data from Communication Manager, and will specify a location for the raw data to be stored. To add a new CDR collection session **Start** ➔ **All Programs** ➔ **Eclipse III CMS** ➔ **Eclipse Collection Manager (not shown)** and log in with appropriate credentials. Once the **Collection Manager** window opens select **Session** followed by **New Session.**

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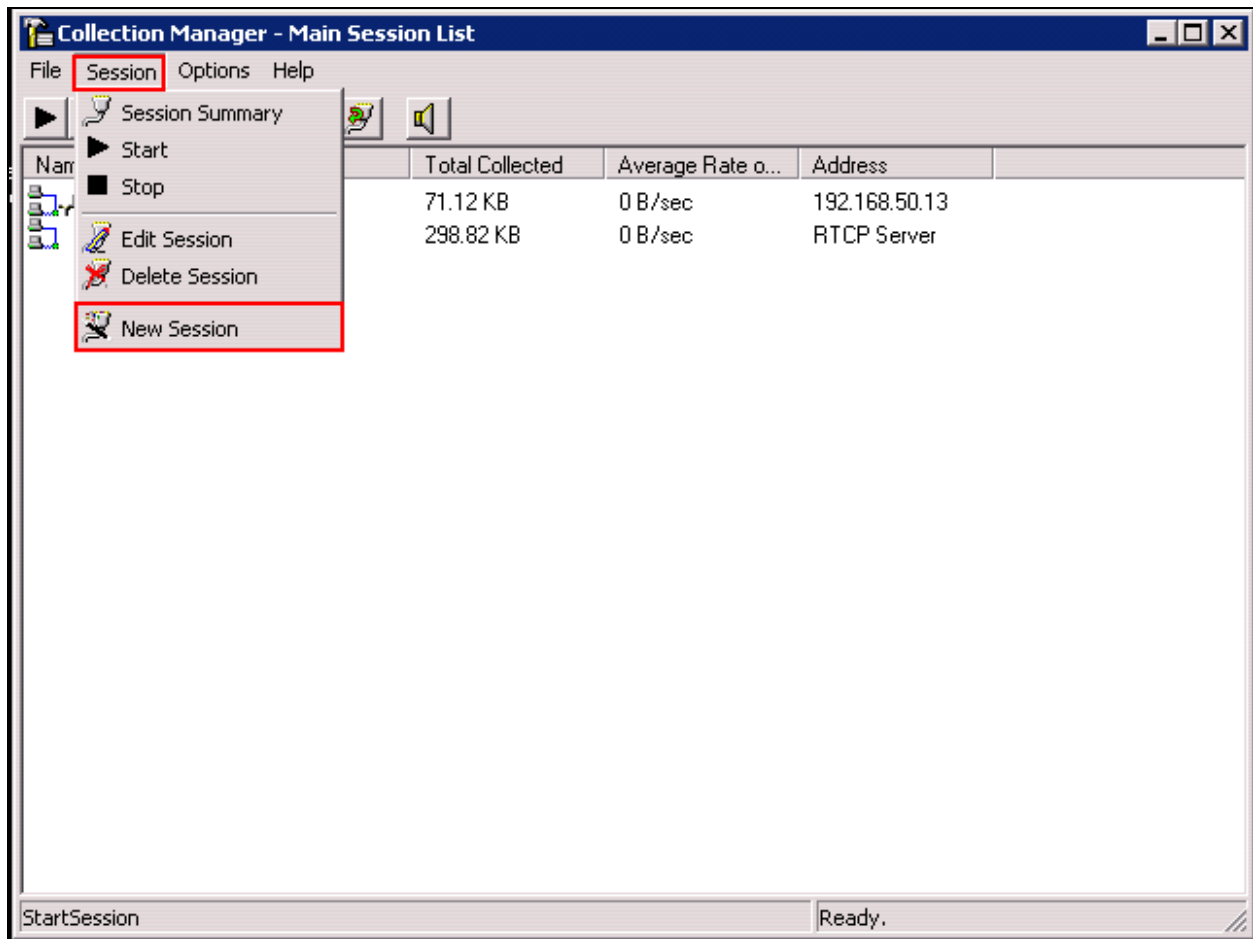
In the **Name and Type Selection** window enter any name in the **Session Name** field and select **RTCP Collection** from the **Type** drop down box. Click **Next** to continue.

In the **Site Entry** window confirm the correct **Site Code**, the site code will be defined by Data Track as part of the system installation. Please use the details in **Section 3.**2 to contact Data Track for further information. Click **Next** to continue.
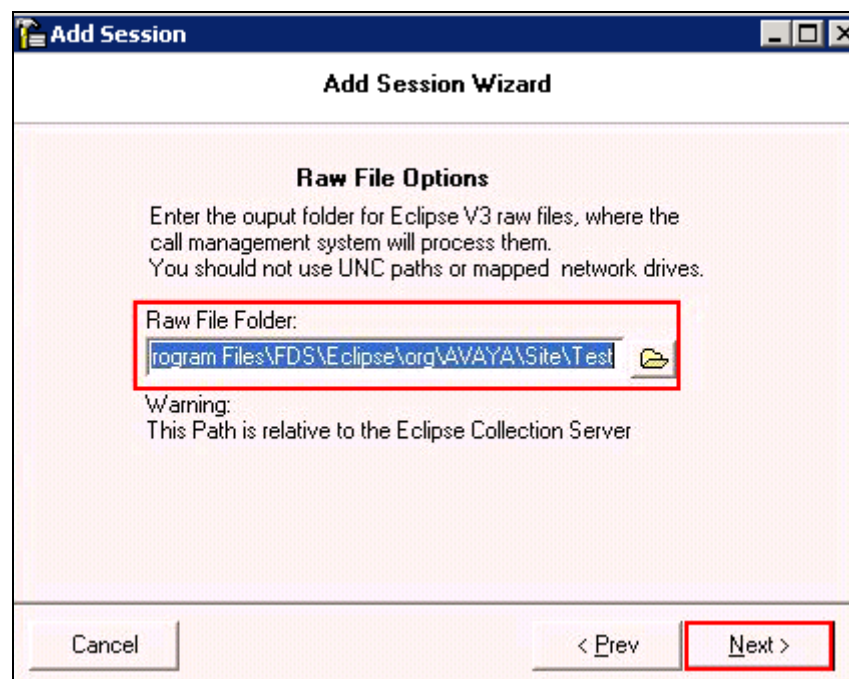
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In the **RTCP Collection Options** window, enter the default server port as used in **Section 5.6** in the **Network Port** field and click **Next** to continue.

In the **Raw File Options** screen specify a path where the raw RTCP files will be stored and processed by the Eclipse CMS. The path that should be used is dependent on the installation, if in doubt which path to use, please contact Data Track using the details in **Section 2.3**. Click **Next** to continue.

In the **Collection Session Startup Options** window select the **Enabled** radio button so that the collection session automatically starts when Eclipse CMS starts. Click **Finish** to complete the configuration of the RTCP collection session.
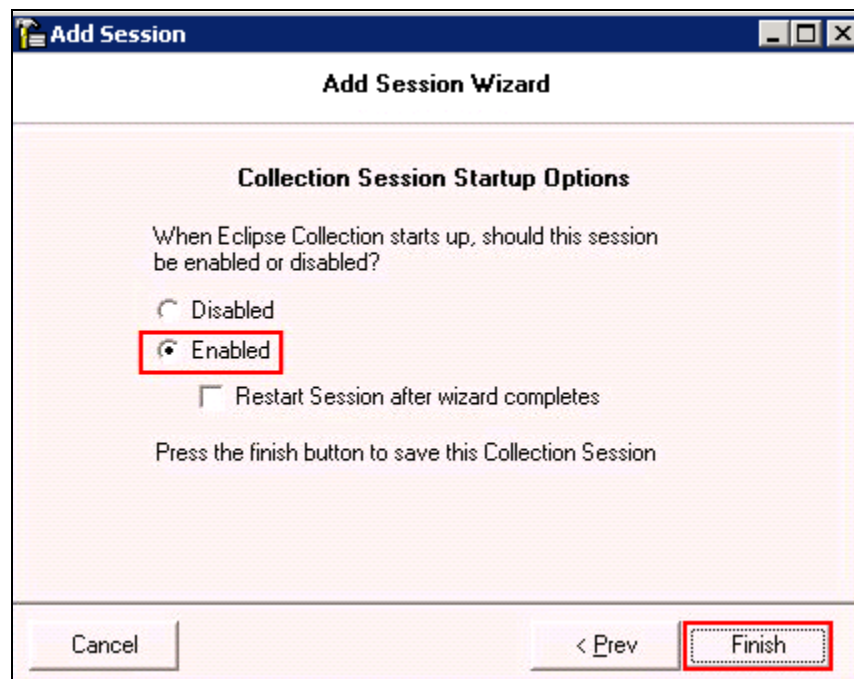
7. Verification Steps

This section provides tests that can be performed to verify correct configuration of the Avaya and Data Track Eclipse CMS solution.

7.1. Verify the Avaya Aura® Communication Manager CDR Link

Use the **status cdr-link** command to verify that the link between the Communication Manager and the Eclipse CMS 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: 2013/01/10 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
```

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7.2. Verify Collection processes are running

To check if Eclipse Collection is running on the Eclipse CMS navigate to **Settings →Control Panel →Administrative Tools →Services (not shown)**. Check that the status of a service called **Eclipse Collection** is started.

7.3. Verify Data is being received

To check CDR and RTCP data is being received browse to the installation directory specified for the **Raw File Options** screens in **Section 6.4** and **Section 6.5**. Locate the RAW and VSRAW files and confirm that they are increasing in size when calls are made. The RAW file relates to the CDR data being received and the VSRAW file relates to the RTCP data being received.
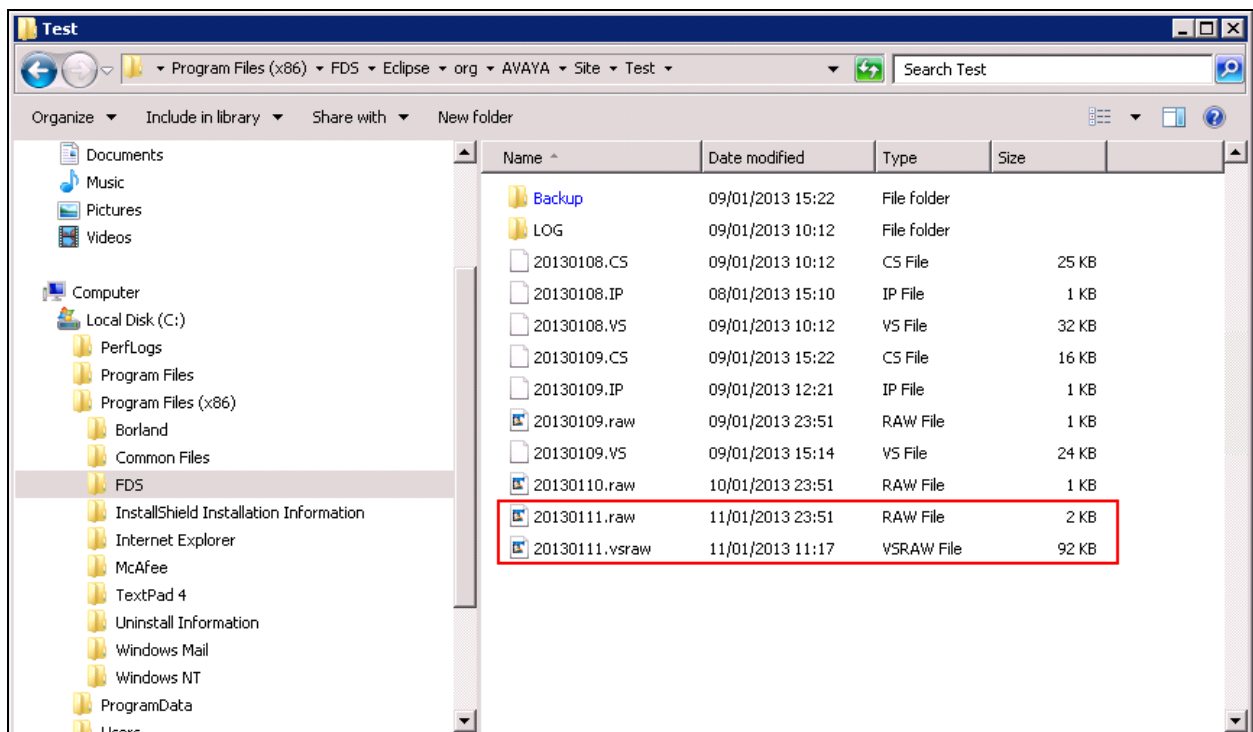
8. Conclusion

A full and comprehensive set of feature and functional test cases were preformed during Compliance testing. Data Track Eclipse Call Management System 1.34.1.2 is considered compliant with Avaya Aura® Communication Manager 6.2. All test cases have passed and achieved the objectives outlined in **Section 2.2**.

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9. 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] *Avaya Aura® Communication Manager Feature Description and Implementation, Release 6.2, Issue 9.0, February 2012, Document Number 555-245-205.*

[2] *[2] Administering Avaya Aura® Communication Manager, Release 6.2, Issue 7.0, February 2012, Document Number 03-300509.*

Data Track documentation can be found on the Eclipse Call Management system installation disk or requested from Data Track by using the contact details listed in **Section 2.3**.

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