



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Tri-Line TIM Enterprise with Avaya IP Office Delta Server - Issue 1.0

Abstract

These Application Notes describe the procedures for configuring Avaya IP Office Delta Server to work with Tri-Line's TIM Enterprise. TIM Enterprise is a Windows-based call analysis software program that collects and reports on the Station Message Detail Reporting (SMDR) information generated by Avaya IP Office Delta Server.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

The objective of this compliance test is to verify that Tri-Line's TIM Enterprise 3.0.0.52 call accounting software can interoperate with Avaya IP Office Delta Server 5.2.30. TIM Enterprise connects to the Avaya IP Office Delta Server using a Transmission Control Protocol (TCP) socket connection for the collection of Station Message Detail Reporting (SMDR) information. TIM Enterprise processes the collected SMDR data and accurately bills them. It provides querying and reporting functionality on the billed data. The data can also be exported to various formats for processing. During this compliance test, the SMDR collection was verified for two Avaya IP Office Delta Servers, which were parsing records from the Avaya IP500 Office and Avaya IP412 Office respectively.

1.1. Interoperability Compliance Testing

The interoperability compliance test included feature and serviceability testing. The feature testing evaluated the ability of the Tri-Line's TIM Enterprise to collect and process SMDR 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 the TIM Enterprise can resume SMDR collection after failure recovery.

1.2. Support

Technical support from the 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

2. Reference Configuration

Figure 1 illustrates the network configuration used to verify the Tri-Line's TIM Enterprise solution. Site A was comprised of an Avaya IP500 Office, Avaya 1616 and 1603SW IP Telephones, Avaya 2420 Digital Telephone, a server running Avaya IP Office Manager, Avaya Voicemail Pro and Avaya Delta Server, a server running Tri-Line TIM Enterprise, a H.323 IP trunk to Site B and a simulated PSTN trunk over an E1 ISDN-PRI. Site B was comprised of an Avaya IP412 Office with Avaya IP400 Digital Station, and it had connections to the following: Avaya 1616 and 1608 IP Telephones, Avaya 2420 Digital Telephone, and a H.323 IP trunk to Site A. The network configuration at branch Site B was used to generate IP trunk call records. Avaya IP Office Manager, Voicemail Pro and Delta Server were installed on a server running Microsoft Windows XP with Service Pack 3. Tri-Line TIM Enterprise was installed on a server running Microsoft Windows Vista Business. The Extreme Network Summit X250e-24p Switch provided ethernet connectivity to the servers and IP telephones and Layer 3 IP routing between the two sites.

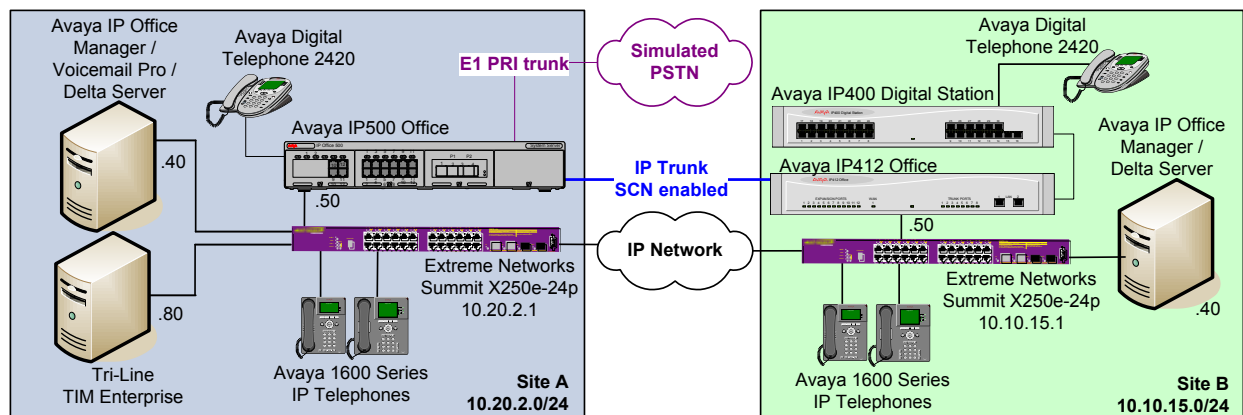


Figure 1: Tri-Line TIM Enterprise with Avaya IP Office Delta Server

Avaya IP Office Delta Server may only be used to report SMDR data from a single Avaya IP Office at a time, therefore, for each site there was an Avaya IP Office Delta Server installed. Each Avaya IP Office Delta Server was configured to connect to respective Avaya IP Office, in order to receive the SMDR data from the Avaya IP Office and to send them to a third-party call accounting application. The Avaya IP Office Delta Server can be configured to send the SMDR data to a third-party call accounting application using different methods: SMDR log file, IP polling, sending to a specified IP address and port or sending to a serial (COM) port. The required method depends on the method of data transfer that is supported by the third-party call accounting application being used. For this solution, the Avaya IP Office Delta Server was configured for IP polling, meaning that IP port number was specified on which Avaya IP Office Delta Server PC was listening. TIM Enterprise was polling that IP port, and requesting the most recent SMDR records. In Site A, Delta Server was configured to listen on IP port 9000 and the Site B Delta Server was listening on IP Port 9001. TIM Enterprise opens a connection to each Avaya IP Office Delta Server and keeps this connection open for collecting SMDR records. Upon SMDR record retrieval, the TIM Enterprise parses and processes the SMDR data and then

stores the parsed SMDR data into a database for later record retrieval and/or reporting by the end user.

3. Equipment and Software Validated

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

Equipment	Software
Avaya IP500 Office	5.0
Avaya IP412 Office	5.0
Avaya IP400 Digital Station	7.0 (8)
Avaya IP Office Manager on Windows PC	7.0 (8)
Avaya IP Office Delta Server on Windows PC	5.2.30
Avaya IP Office Voicemail Pro on Windows PC	5.0 (21)
Avaya 1616, 1603SW, 1608 IP Telephones	1.2 (H.323)
Avaya 2420 Digital Telephones	-
Extreme Network Summit X250e-24p Switch	12.0.3.16
TIM Enterprise running on Windows Vista Business	3.0.0.52
AvayaIPOffice.tdt file (Tri-Line' Avaya IP Office Interface)	1.11

4. Configure Avaya IP Office

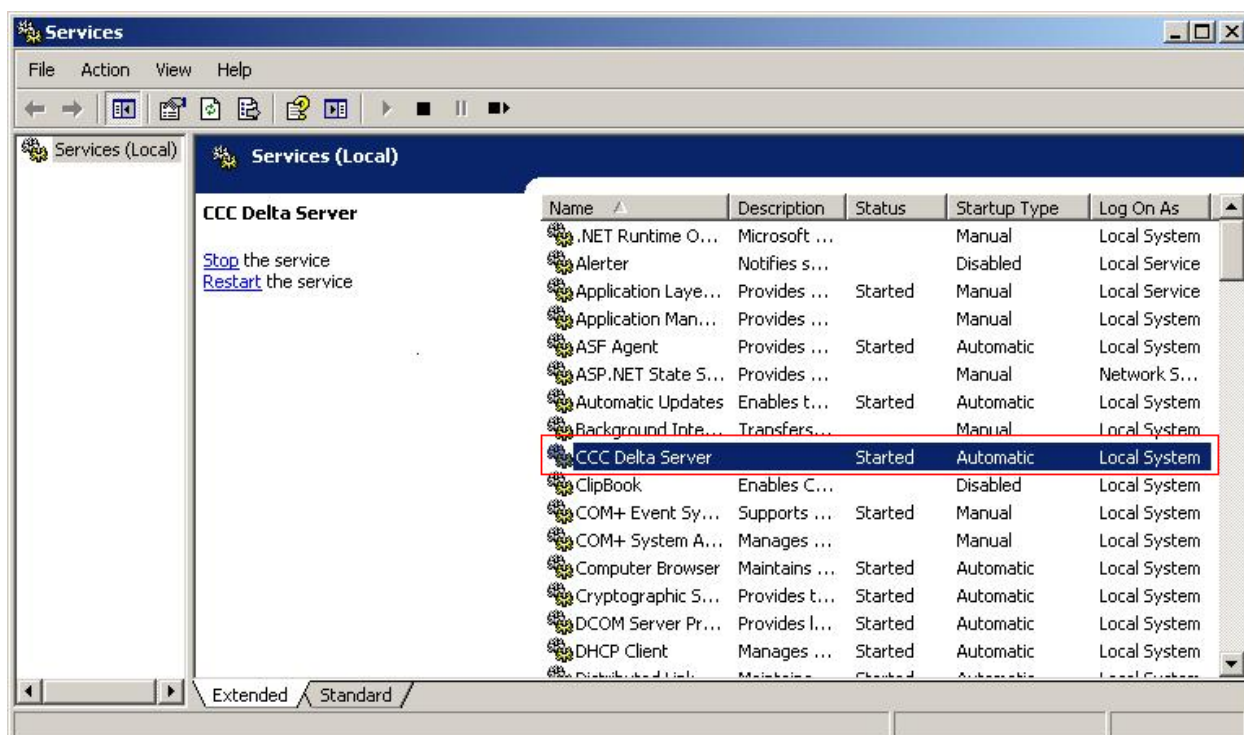
No specific configuration is required on IP Office for the Tri-Line's TIM Enterprise Solution. For all other provisioning information such as Avaya IP Office installation and configuration, please refer to Avaya IP Office product documentation in reference [1].

5. Configure Avaya IP Office Delta Server

The configuration information provided in this section describes the steps used to configure Avaya IP Office Delta Server for this solution. For all other provisioning information, such as Avaya IP Office Delta Server installation, please refer to the product documentation in reference [2].

5.1. Start Avaya IP Office Delta Server service

Log into the Avaya IP Office Delta Server PC in Site A with the appropriate administrative credentials and navigate to **Start → Control Panel**. In the Control Panel window that appears, double-click **Administrative Tools**. In the Administrative Tools window that appears, double-click **Services** (not shown). In the **Services** window that appears, verify **CCC Delta Server** is already started as shown below. If it is not started, start it manually.

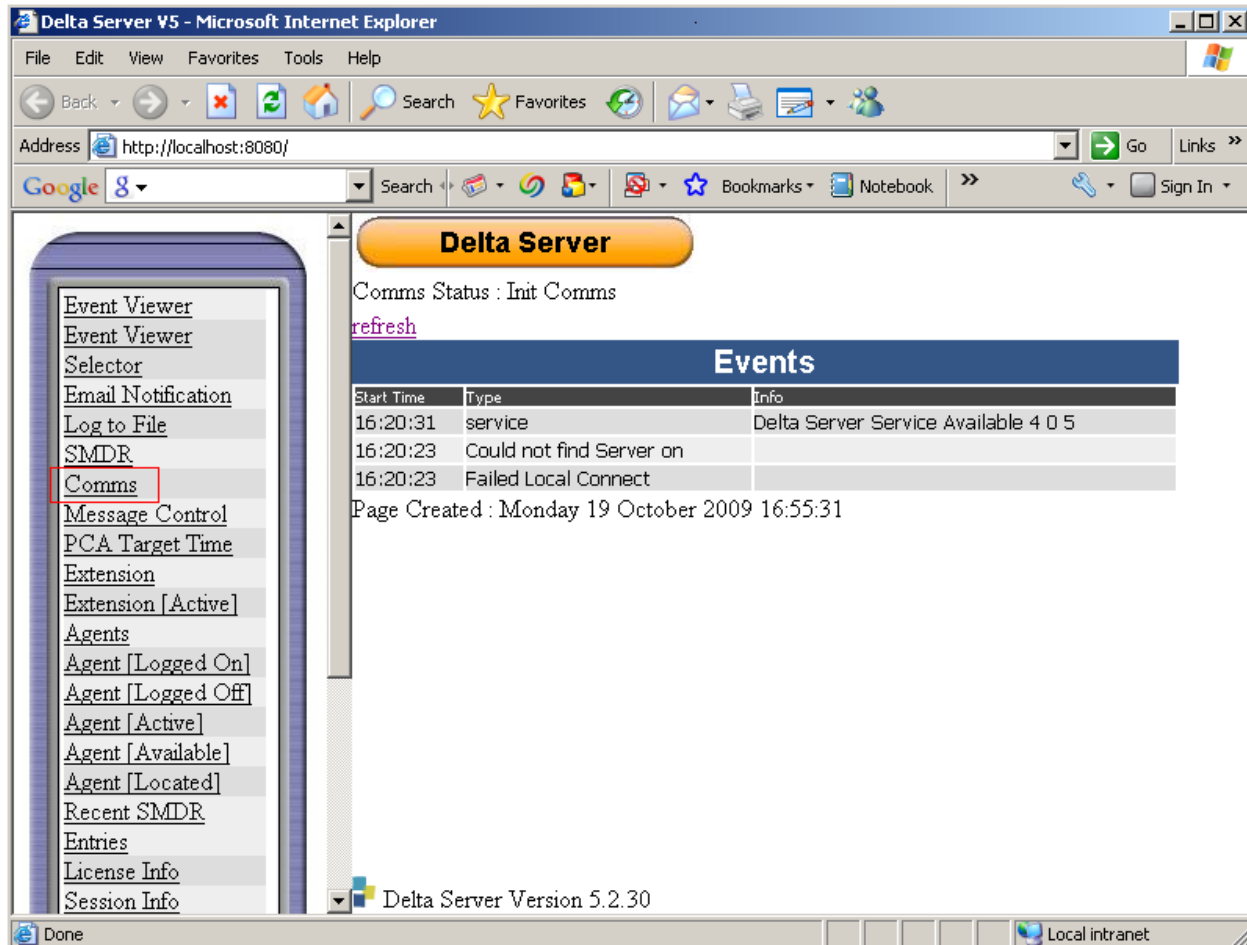


NOTE: Following initial installation, the CCC Delta Server service is not started until either the PC is restarted or the service is started manually.

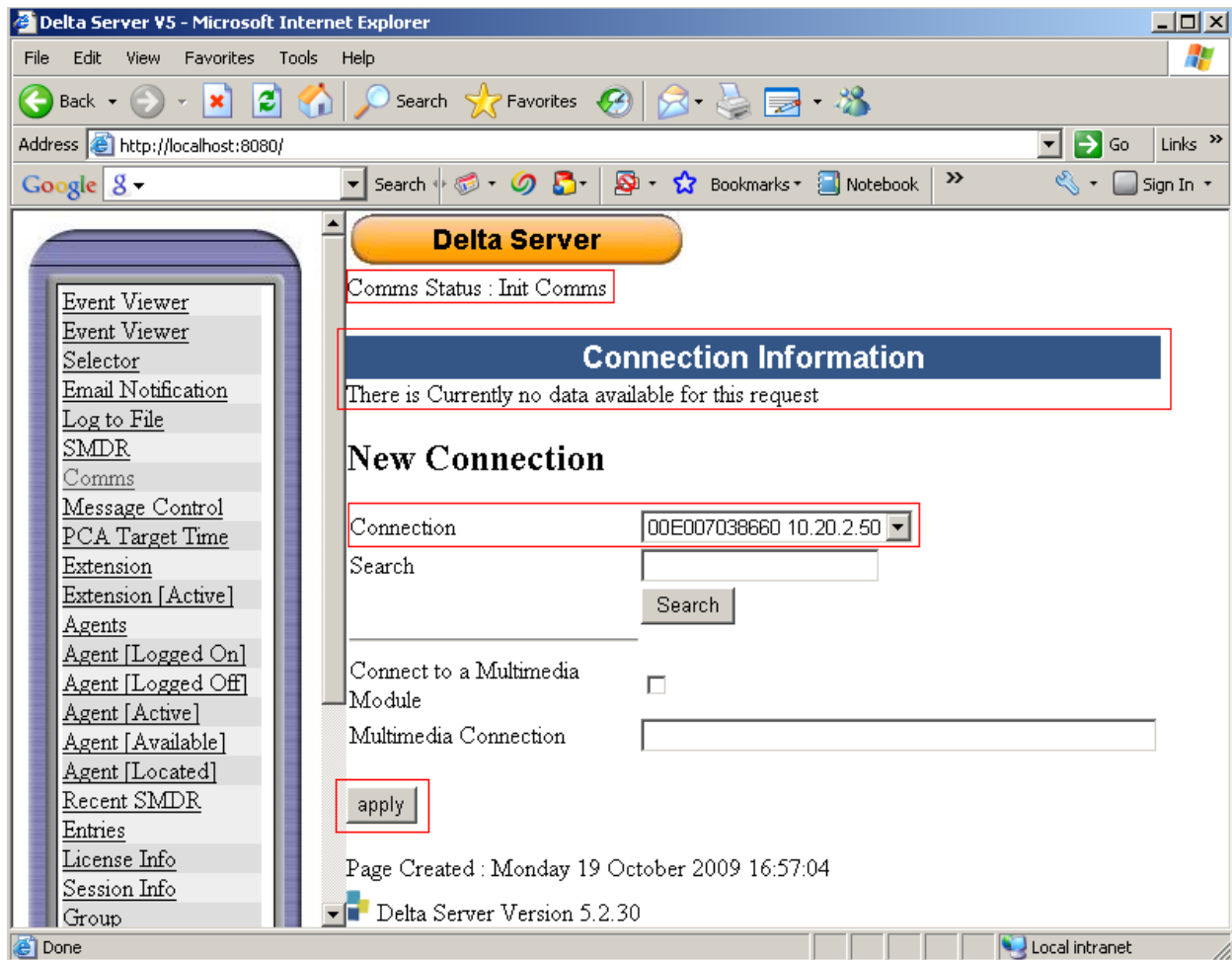
Repeat the above step on Avaya IP Office Delta Server in Site B.

5.2. Configure connection between Avaya IP Office and Delta Server

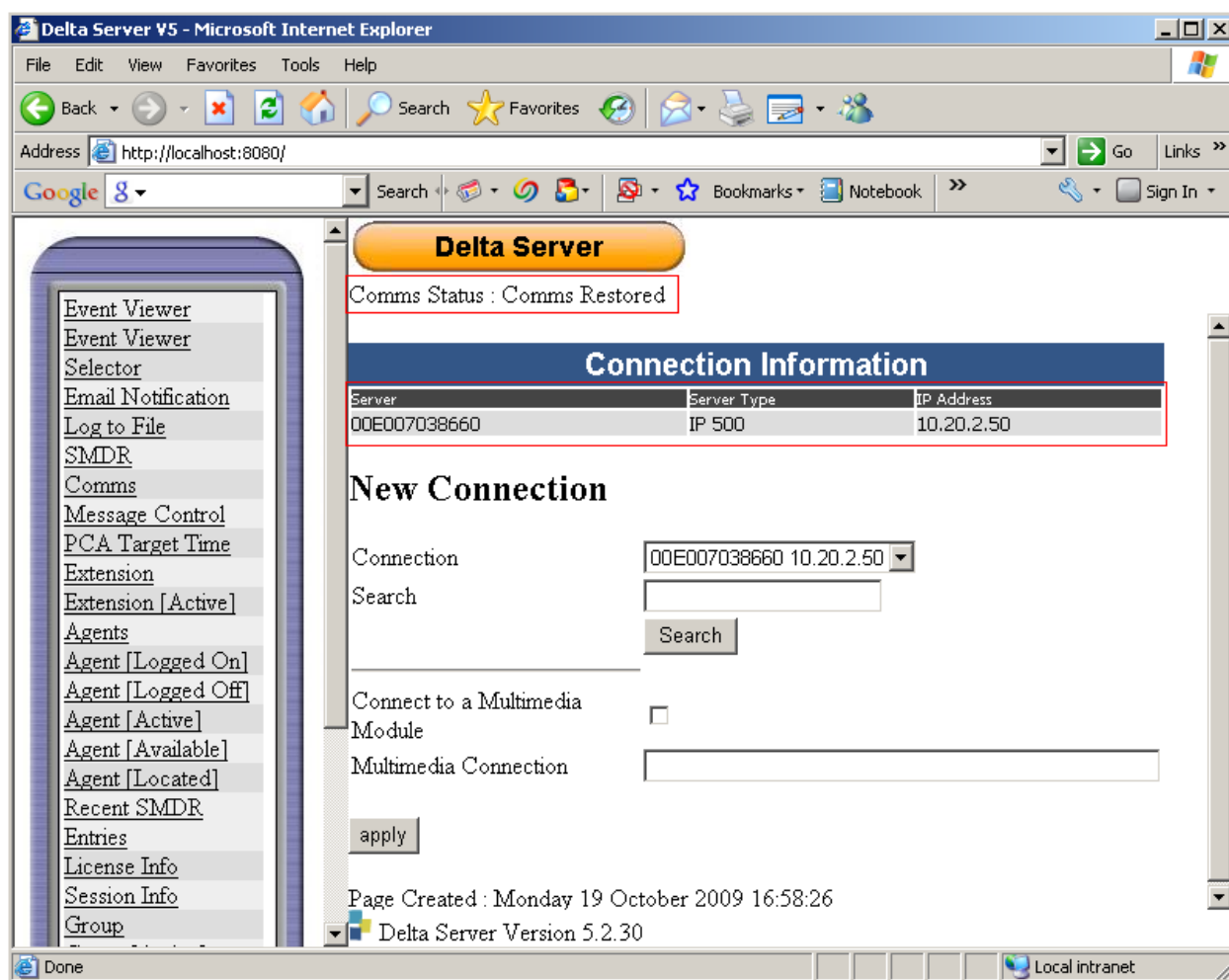
To launch the Avaya IP Office Delta Server, navigate to **Start → All Programs → CCC → Delta Server**. In the Avaya IP Office Delta Server window that appears, click **Comms** in the left pane.



In the **Connection Information** page that appears, the following message is displayed: **There is currently no data available for this request.** At this stage the **Comms Status** displays **Init Comms**. Select the required IP Office system from the **Connection** drop-down list. If the required IP Office system is not listed, enter its IP address in the **Search** field, and click the Search button (not shown). Once the IP Office is listed, click **apply** button.



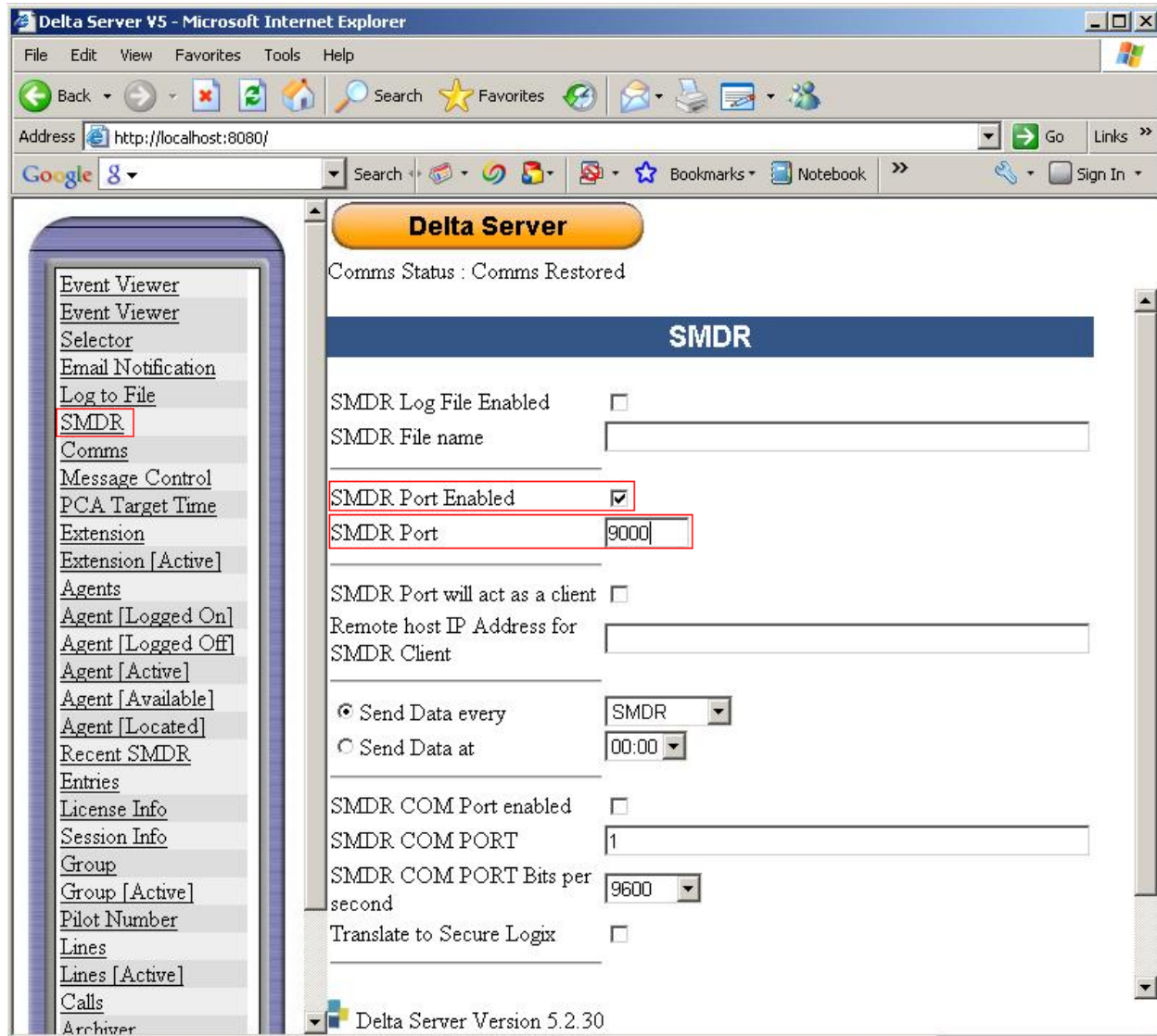
After the apply button was clicked, the **Connection Information** should be updated with details of the selected Avaya IP Office. Also the **Comms Status** should have changed from **Init Comms** to **Comms Restored**. This may take a few minutes.



This completes configuration of the connection between the Avaya IP Office Delta Server and Avaya IP500 Office in Site A. This connection will enable Avaya IP Office Delta Server to receive the SMDR data from the Avaya IP Office. Repeat the above steps to establish connection between the Avaya IP Office Delta Server and Avaya IP412 Office in Site B.

5.3. Configure Delta Server's SMDR Port for IP Polling

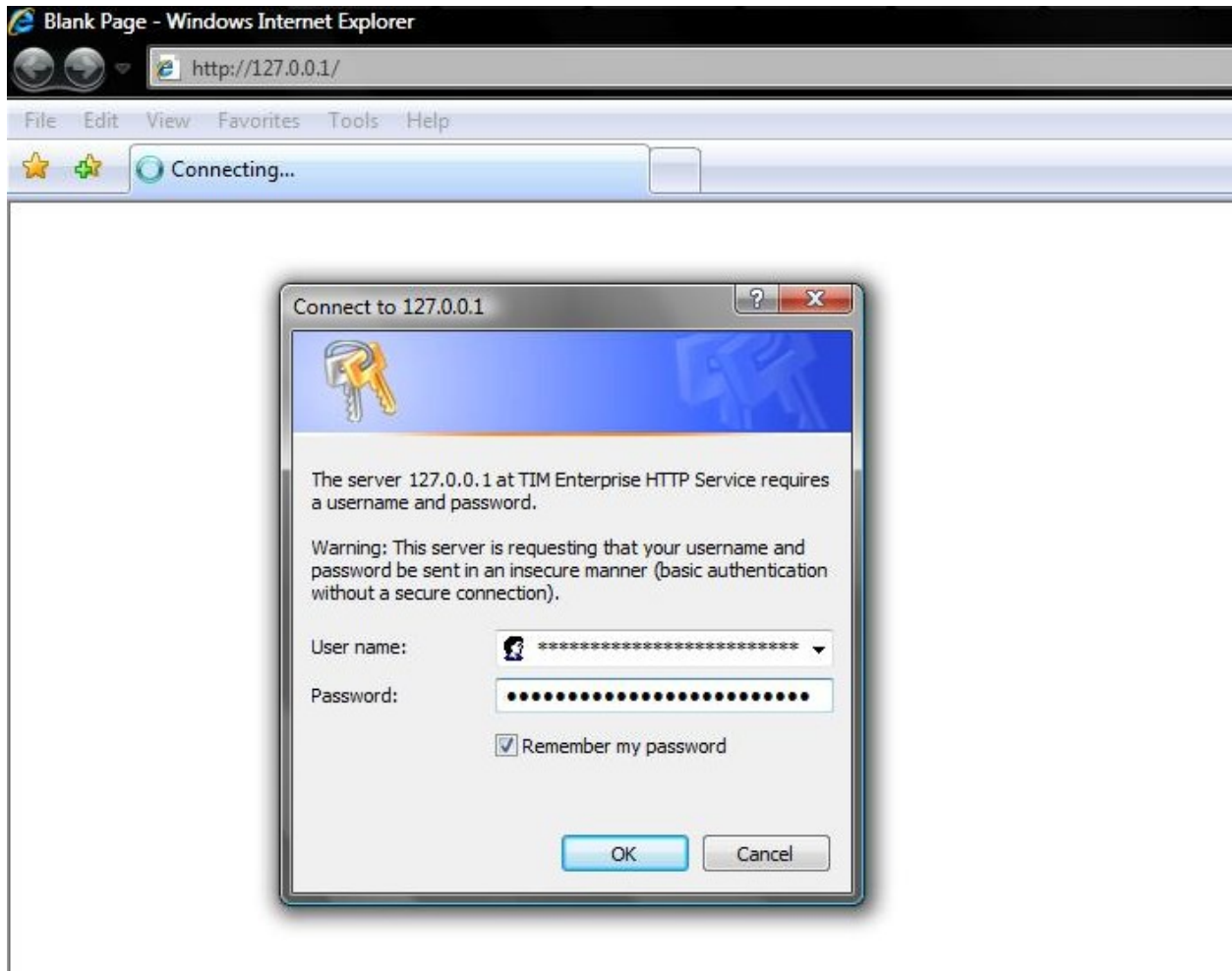
Click **SMDR** in the left-hand panel. In the SMDR page that appears, check **SMDR Port Enabled**, and set **SMDR Port** to **9000**. Click **apply** (Not Shown).



Repeat the above step in Site B and configure the **SMDR Port** as **9001**. This completes configuration of the Avaya IP Office Delta Server.

6. Configure the TIM Enterprise

This section provides the procedures for configuring the TIM Enterprise to receive SMDR for various call types output by the Avaya IP Office Delta Server application. To access TIM Enterprise, open a web browser and enter the IP address of the TIM enterprise server e.g. <http://x.x.x.x/> where x.x.x.x is the IP address of the machine running the TIM Enterprise. Enter proper username and a password in the authentication window and select **OK**.



After successful login, default **Engineering** screen is displayed as shown below. To configure the **Database Settings**, select the **Database Provider** from the drop-down list that will be used to store the call data on the TIM Enterprise server. In this case **MySQL Server** was specified. Type in the **Host** and **Port** number of the SQL server and enter the **Username** and **Password** for the SQL server connection. Type the name of the **Database** to be connected to, in this case **timenterprise** database name was specified. Click on the **Test settings** button.

The screenshot shows the 'timenterprise' System settings page. The 'Database' tab is selected, and the 'Test settings...' button is highlighted. The form contains the following fields:

Enter connection information of database storage engine	
Database provider	Native Database Microsoft SQL Server MySQL Server
Host : Port	127.0.0.1 3306
Username	tim
Password	*****
Database	timenterprise

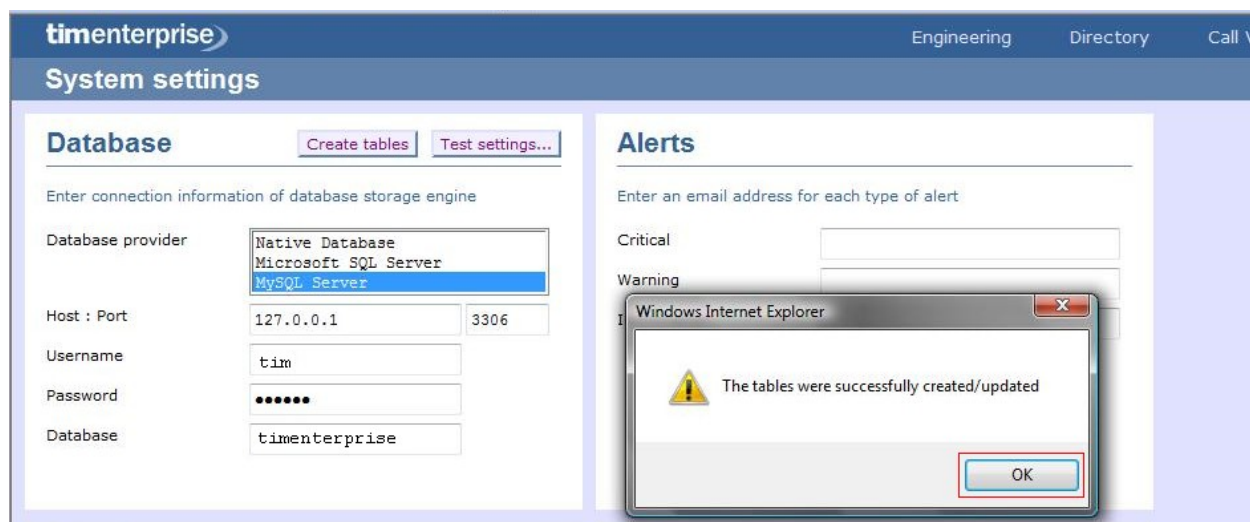
The 'Alerts' section on the right has three input fields for 'Critical', 'Warning', and 'Information' alerts.

When the **Test settings** button comes back green, click **Create tables** button.

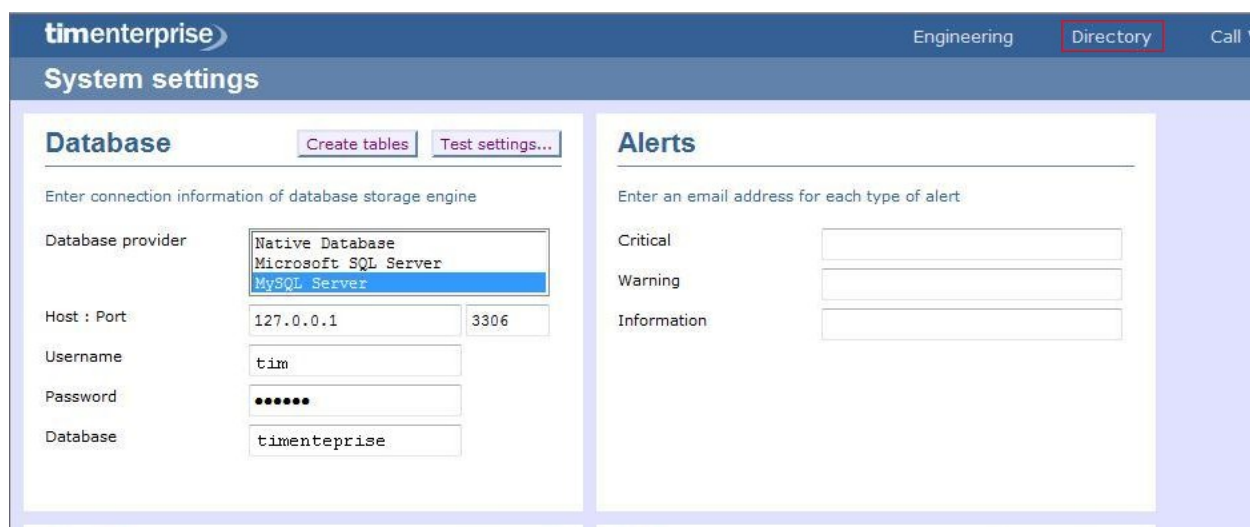
The screenshot shows the 'timenterprise' System settings page with the 'Test settings...' button turned green. The 'Create tables' button is highlighted. The form fields are:

Enter connection information of database storage engine	
Database provider	Native Database Microsoft SQL Server MySQL Server
Host : Port	127.0.0.1 3306
Username	root
Password	*****
Database	timenterprise

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



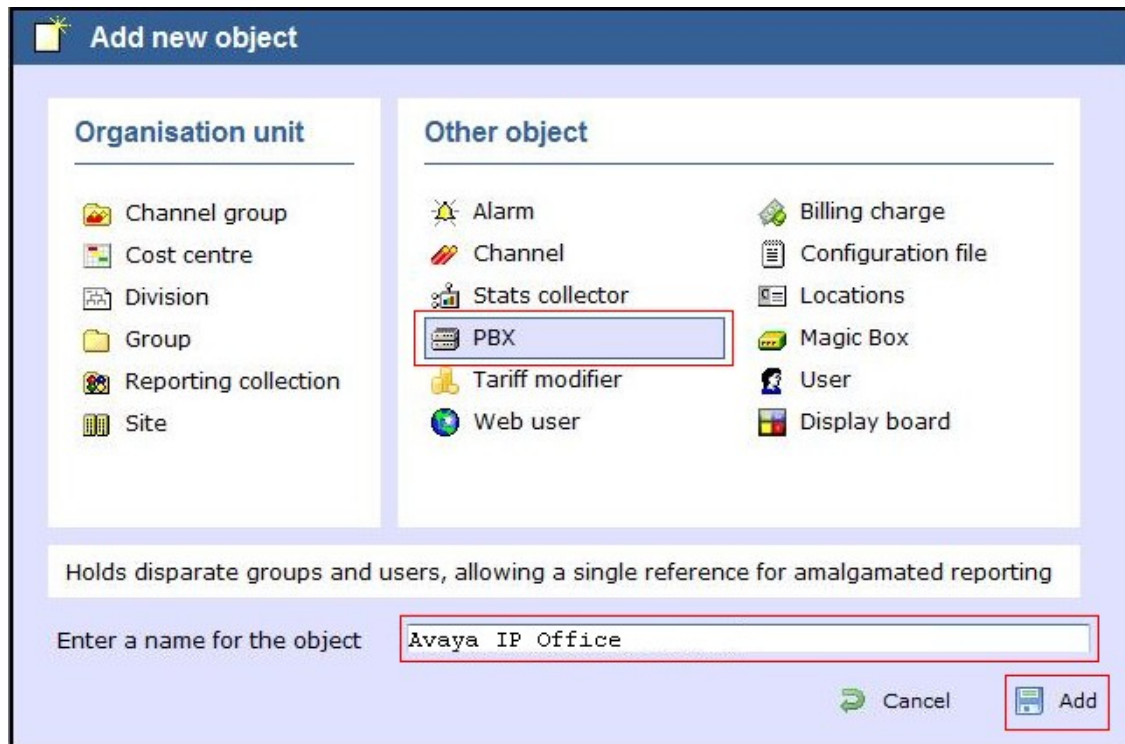
This completes the configuration of the Database settings on TIM Enterprise. To configure the Directory Settings, click on the **Directory** tab in the TIM Enterprise menu.



On the default Directory screen click on **New Object**.



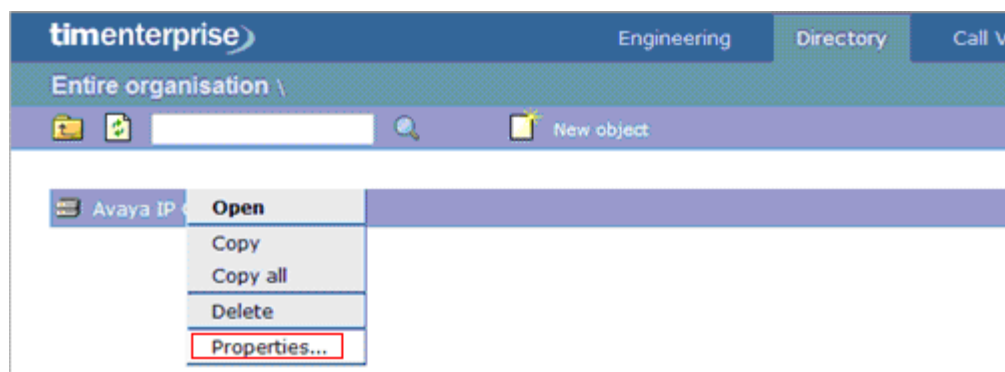
On the **Add new object** window that appears, select **PBX**, enter the name of the object as **Avaya IP Office** and click the **Add** button as shown below.



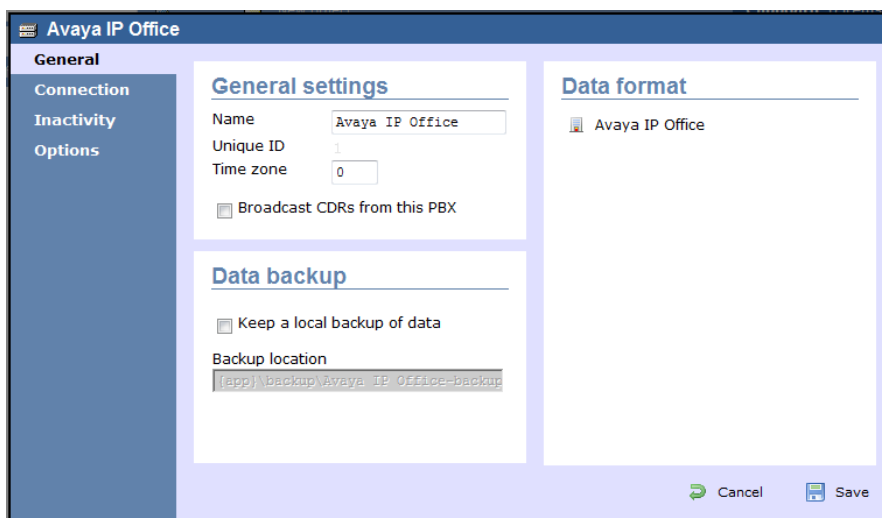
The **Avaya IP Office** will appear in the Directory as shown below.



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

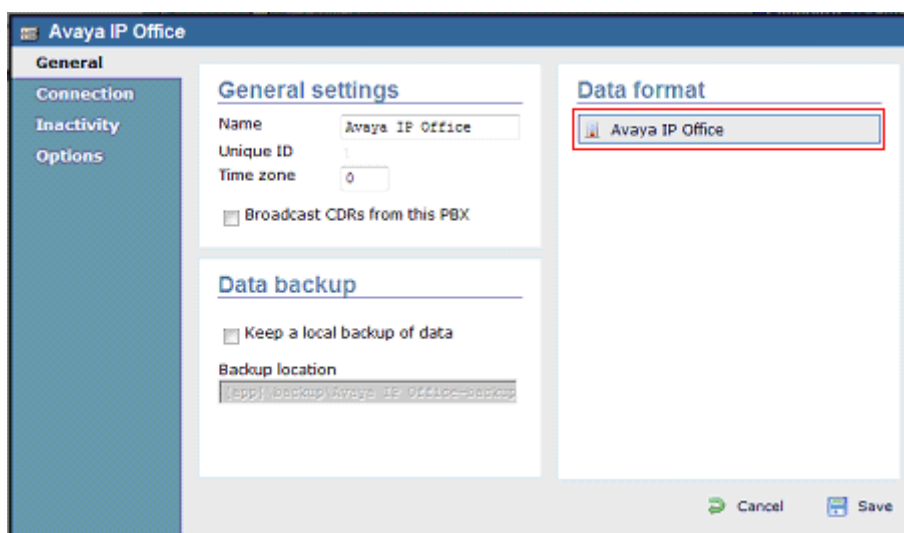


The new **Avaya IP Office** window will appear with default **General** tab displayed.



The screenshot shows the 'Avaya IP Office' configuration window. On the left is a sidebar with 'General' selected, and sub-options 'Connection', 'Inactivity', and 'Options'. The main area is divided into two panels. The left panel contains 'General settings' with fields for 'Name' (Avaya IP Office), 'Unique ID' (1), and 'Time zone' (0), along with a checkbox for 'Broadcast CDRs from this PBX'. Below this is a 'Data backup' section with a checkbox for 'Keep a local backup of data' and a text field for 'Backup location' containing '[app]\backup\Avaya IP Office-backup'. The right panel is titled 'Data format' and contains a single entry 'Avaya IP Office' with a small icon to its left. At the bottom right are 'Cancel' and 'Save' buttons.

Under the **Data format** section of the General tab, select **Avaya IP Office**.



This screenshot is identical to the one above, but with a red rectangular box highlighting the 'Avaya IP Office' entry in the 'Data format' section of the right-hand panel.

Click on the **Connection** tab on the left hand side. In the screen that appears select **Establish TCP connection to PBX**. Configure **Host** parameter with the IP address of the Avaya IP Office Delta Server in Site A; in this case that was **10.20.2.40**. Configure **Port** parameter with the SMDR port that is configured in **Section 5.3**; in this case that was **9000**. Select **ipoffice** from the **IP script** drop-down list, and click **Save**.

The screenshot displays the 'Avaya IP Office' configuration window. On the left, a sidebar contains tabs: 'General', 'Connection' (selected), 'Inactivity', and 'Options'. The main area is divided into three sections. The 'Connection method' section on the left lists five options: 'Receive FTP transfers from PBX', 'Establish TCP connection to PBX' (highlighted with a red box), 'Listen for connections from PBX', 'System DSN connection', and 'No connection required'. The 'Connection details' section on the right contains fields for 'Host' (10.20.2.40), 'Port' (9000), 'Username', 'Password', and 'IP script' (ipoffice, selected from a dropdown menu). The 'Connection options' section at the bottom right has checkboxes for 'Binary data', 'Timestamp data', and 'Delay processing by' (with a text input field and 'ms' unit). At the bottom right of the window are 'Cancel' and 'Save' buttons, with the 'Save' button highlighted by a red box.

Repeat the above steps to add a new Directory for the Avaya IP Office in Site B. In this case **Host** was configured as **10.10.15.40** and **Port** as **9001**.

7. 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 IP Office to verify that TIM Enterprise collects the SMDR records from the Avaya IP Office Delta Server and properly classifies and reports the attributes of the call. For serviceability testing, logical links were disabled/re-enabled, and Delta Server and TIM Enterprise servers were rebooted. The TIM Enterprise successfully collected and processed the SMDR records from Avaya IP Office Delta Server for all types of calls generated including intra-switch calls, inbound/outbound PSTN trunk calls, inbound/outbound inter-switch IP trunk calls, transferred calls, and conference calls. For serviceability testing, the TIM Enterprise was able to resume collecting SMDR records after failure recovery including buffered SMDR records for calls that were placed during the outages. The following discrepancies were observed with the Delta Server output and are being investigated by the Avaya IP Office team:

- An incoming call which is abandoned after a transfer appears as an outbound call.
- An incoming call which is abandoned at a Hunt Group appears as abandoned at the User's Extension.

8. Verification Steps

The following steps may be used to verify the configuration:

- Use the **ping** utility on the Tri-Line's TIM Enterprise server to verify the IP connectivity to the Avaya IP Office Delta Server.
- Verify that the Avaya IP Office Delta Server properly generates SMDR records by placing internal, inbound and outbound calls on the Avaya IP Office. Then click **Recent SMDR Entries** and confirm the call activity is properly reflected.

Time Of Call Arrival	Call Duration	Ring Time	CLI	Dir.	DDI	DDI	Account Code	Internal	Call ID	More	P1 ID	P1 Name	P2 ID	P2 Name	Hold Time	Park Time	AuthValid
2009/10/20 11:16:49	00:00:03	1	1001	O	1002	1002	1	834	0	E1001	Extn1001	E1002	Extn1002	0	0		

- Verify that TIM Enterprise receives the raw SMDR record for the call. Compare the values of data fields in the SMDR record with the expected values and verify that they match.
- Place internal, inbound trunk, outbound trunk and abandoned calls to and from various telephones. Select **Call view** tab on the TIM Enterprise menu and verify accuracy of the call details in the Call view. The screens shots below represent examples of the internal, inbound trunk, outbound trunk and abandoned calls respectively.

The following is an example of the Internal call.

timenterprise

ReportsDirectoryCall ViewTariff Editor

Call View

Clear all

Head

Date	Time	Source	Route	Destination	Response	Duration	Datasource
29 September 2009	16:32:15	Extn1001	1002	1002	5	00:00:04	Avaya IP Office

The following is an example of the Inbound Call.

timenterprise

ReportsDirectoryCall ViewTariff Editor

Call View

Clear all

Date ▼	Time	Source	Route	Destination	Response	Duration	Datasource
29 September 2009	16:29:36	Line 1.1	2071002	Local Call	2	00:00:09	Avaya IP Office
29 September 2009	16:29:36	Line 1.13	UNAVAILABLE	1002	2	00:00:09	Avaya IP Office

The following is an example of the Outbound Call.

timenterprise

Reports

Directory

Call View

Tariff Editor

Call View

Clear all

Date	Time	Source	Route	Destination	Response	Duration	Datasource
29 September 2009	16:26:56	1002	6563303	Local Call	7	00:00:03	Avaya IP Office

The following is an example of the Abandoned Call.

timenterprise

ReportsDirectoryCall ViewTariff Editor

Call View

Clear all

Date ▼	Time	Source	Route	Destination	Response	Duration	Datasource
29 September 2009	16:34:25	Line 1.15	UNAVAILABLE	1002	0	00:00:09	Avaya IP Office

9. Conclusion

These Application Notes describe the procedures for configuring the Tri-Line's TIM Enterprise to collect SMDR records from Avaya IP Office Delta Server. The TIM Enterprise successfully passed all compliance testing.

10. Additional References

Product documentation for Avaya products may be found at <http://support.avaya.com> and on <http://marketingtools.avaya.com/knowledgebase/ipoffice/>

[1] *Avaya IP Office 5.0 Manager 7.0*, Issue 23h - 16 July 2009

[2] *Avaya IP Office Delta Server SMDR*, Issue 08c - 03 October 2008

The Tri-Line TIM Enterprise documentation can be provided by Tri-Line on request.

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