



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for configuring Avaya IP Office IP500 R7.0 with 2Ring TAS v3.2.4 - Issue 1.0**

### **Abstract**

These Application Notes describe the configuration steps required for 2Ring TAS to successfully interoperate with Avaya IP Office IP500. The 2Ring TAS product provides users with an interface to manage the Station Message Detail Recording (SMDR) record output from Avaya IP Office for call billing and analysis.

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

2Ring TAS is a telephone call accounting system that processes Station Message Detail Recording (SMDR) information from the Avaya IP Office PBX and provides statistics, phone call summaries, and other detailed call information. 2Ring TAS enables users to analyse these reports for call billing purposes with spend analysis, most frequently called numbers, gateway load and 30 other built-in reports. 2Ring TAS also enables custom creation of reports and can serve as a managerial tool. It can split charges among branches or departments, or it can offer prepared data to other information systems for processing. It is possible to import electronic bills from telco providers or to use intranet application to process CDR (Call Detail Record) from customers.

## 2. General Test Approach and Test Results

The interoperability compliance test included both feature functionality and serviceability testing. The feature functionality testing focused on basic call handing, as well as calls to and from the PSTN, and included the use of bridged appearance, hold, transfer and conferencing features. The serviceability testing focused on verifying the ability of the TAS server to recover from disconnection and reconnection to the Avaya solution.

### 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. Performance and load testing is outside the scope of the compliance testing.

### 2.2. Test Results

All tests were completed successfully. The following observations were made:

- When a call is placed to an extension which is on call forward, the extension called is shown in the Aux No. column of the report. The number to which the call was forwarded appears in the Called No. column of the report.
- Where a call is answered by a bridged appearance of an extension, the extension called is shown in the Aux No. column of the report. The extension where the bridge appearance was used appears in the Called No. column of the report.
- Where a call is made from a bridged appearance, the extension of the bridged appearance does not appear in the report. The extension on which the bridged appearance is configured is show in the Calling No. column.
- Where a call is transferred, no evident record is shown from the report.
- Where a blind transfer is performed, 2 call records are created.
- Where a consultative transfer is performed, 3 call records are created.
- Where an outbound call is made to a busy PSTN user, TAS identifies this as Internal Unrealised.
- Where an internal call is made to a busy extension, TAS identifies this as U:100.
- Where a call covers to voicemail, TAS identifies this as VM\_<extn>, e.g., VM\_203.

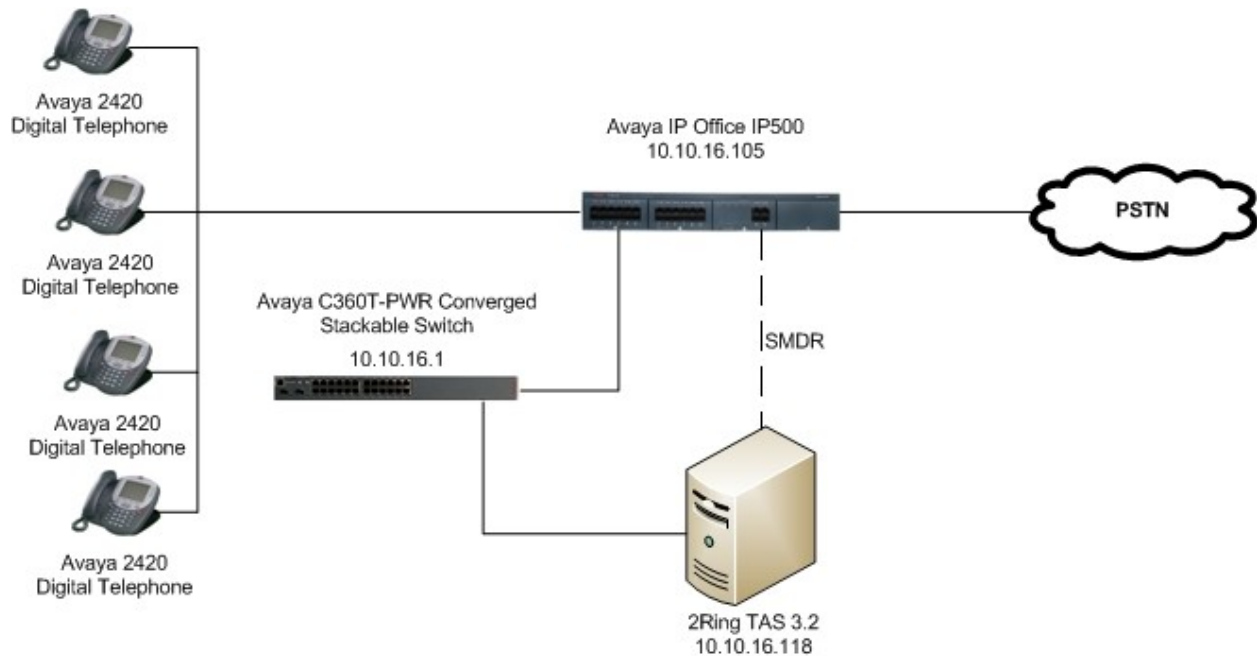
## 2.3. Support

Technical Support can be obtained for the 2Ring TAS product as follows:

- Email: support@2ring.com
- Phone: +421 2 58224097

## 3. Reference Configuration

**Figure 1** illustrates the network topology used during the compliance testing. The Avaya solution consists of an IP Office IP500 running Release 7.0 (23) firmware. The TAS application was hosted on a server running Microsoft Windows Server 2008 in a VMWare environment. PSTN Connectivity was provided over PRI to the IP Office.



**Figure 1: Avaya IP Office 500 with 2Ring TAS configuration**

## 4. Equipment and Software Validated

The following equipment and software were used for the sample configuration used in the compliance testing:

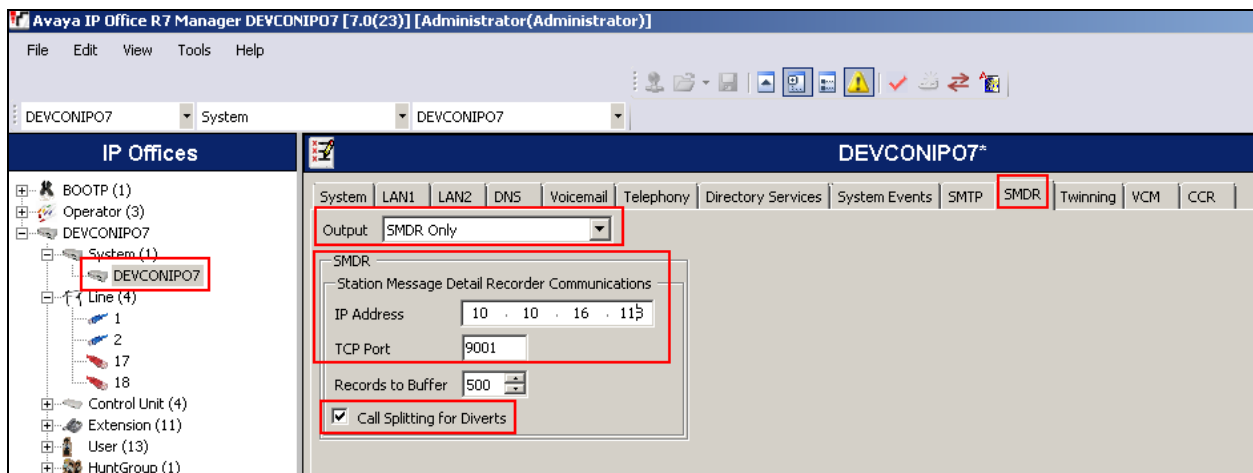
| Equipment Description | Software Release  |
|-----------------------|---|
| Avaya IP Office IP500 | Avaya IP Office 7.0 (23)  |
| Windows XP Desktop PC | Avaya IP Office Manager 9.0 (12)  |
| Generic VMWare Server | VMWare ESXi 4.1<br>Microsoft Windows 2008 Server R2 Enterprise SP1<br>2Ring TAS 3.2.4:<br>Main:3_2_4<br>Billing: 3_2_4<br>Mailer: 3_2_4<br>Scheduler 3_2_4<br>cdr_AvIPO: 3_2_4<br>Microsoft SQL Server 2005 |

## 5. Configuration of Avaya IP Office IP500

The configuration and verification operations illustrated in this section were all performed using the IP Office Manager application. For all other provisioning information such as initial installation and configuration, please refer to the product documentation as referenced in **Section 9**. The Application Notes assumes the IP500 has been installed and configured properly and a PRI circuit to the PSTN configured. User familiarity with navigation of the Manager application and saving of IP Office configuration is also assumed.

### 5.1. Configure SMDR Parameters

In order to output the SMDR records to TAS, the feature must be enabled on the IP Office, a port specified, and an IP address configured for destination of SMDR records. Using the Manager application, click **System** and click on the **SMDR** tab. Select **SMDR Only** as the **Output**. In the SMDR section, enter the **IP Address** of the TAS server, and set the **TCP Port** to **9001**. Place a tick on the box for **Call Splitting for Diverts**, and click on **OK** (not shown). Save the config to the IP Office when complete.



## 6. Configure 2Ring TAS

As part of the compliance test, TAS was supplied by 2Ring preconfigured in accordance with the TAS – Pre-installation Questionnaire. Details specific to the test scenario configuration can be summarized as follows:

- Configure Listener Port
- Add New CDR Source
- Configure Exchange
- Rate Map and Rates
- Evaluation Batch Schedule

### 6.1. Configure Listener Port

2Ring TAS installs a Windows service named socketListener. The configuration file for this service must be configured in order to listen on a configured port for data. It is usual during the TAS setup, that only the file name, location and port are amended. On the 2Ring TAS server, edit the file **C:\2ring\TAS\bin\socketListener.cfg**. Amendments to the file name and location (**logFile** parameter) and port (**listenPort**) are highlighted as follows. Note that **listenPort = 9001** relates directly to the port configured on the IP Office in **Section 5.1**.

```
#logFile = "string"
logFile = "/var/log/socketlistener.log"

#pidFile = "string"
pidFile = "/var/run/socketlistener.pid"

#logType = "file"|"syslog"
logType = "file"

#fileNameTemplate = "string"
fileNameTemplate = "/var/log/socketlistener/${IP}/%Y/%m/${IP}_%Y%m%d.dat"

#dataTarget = "file"|"shmmem"
dataTarget = "file"

#runOnce = "No"|"0"|"Yes"|"1"
runOnce = "No"

#debugLevel = integer
debugLevel = 0

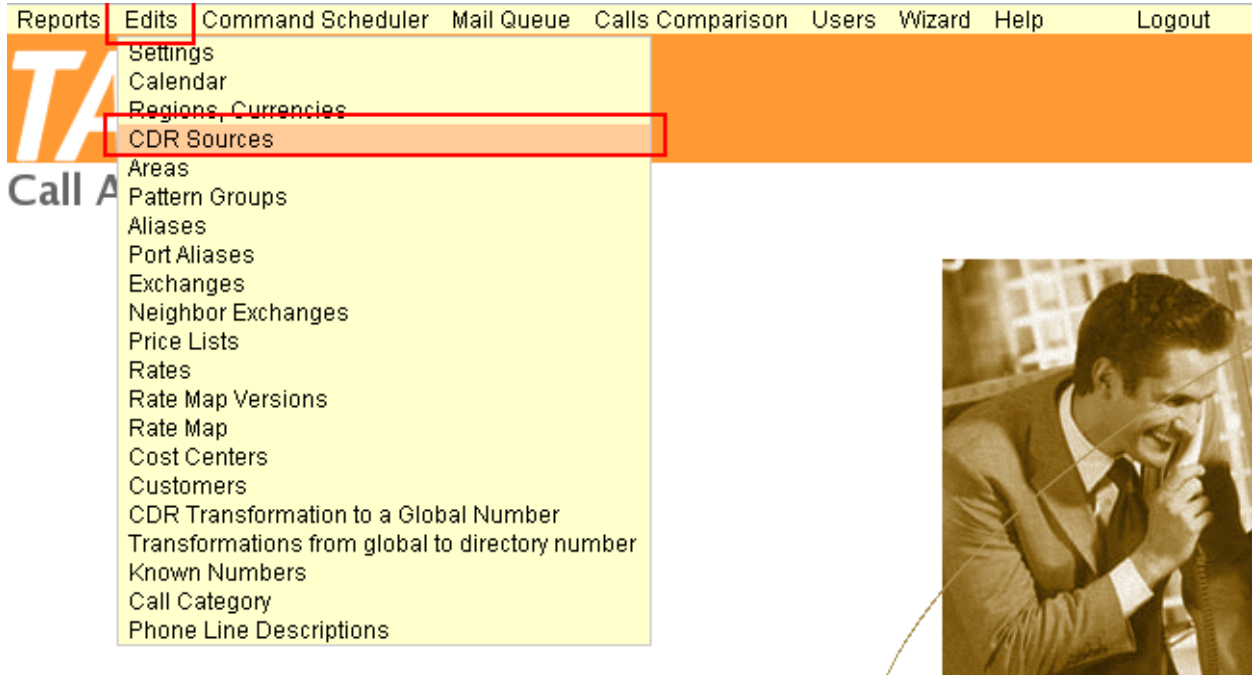
#doFork = "No"|"0"|"Yes"|"1"
doFork = "Yes"

#logAppend = "No"|"0"|"Yes"|"1"
logAppend = "Yes"

#listenPort = integer
listenPort = 9001
```

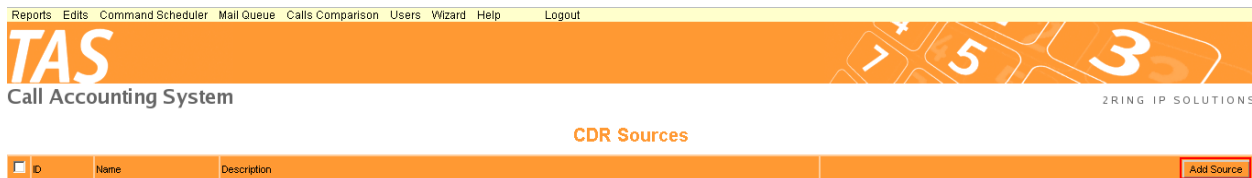
## 6.2. Add New CDR Source

A new CDR source is configured on the TAS server defining the **Name** and providing a **Description** of the CDR Source. On the TAS web interface, navigate to **Edits** → **CDR Source**.



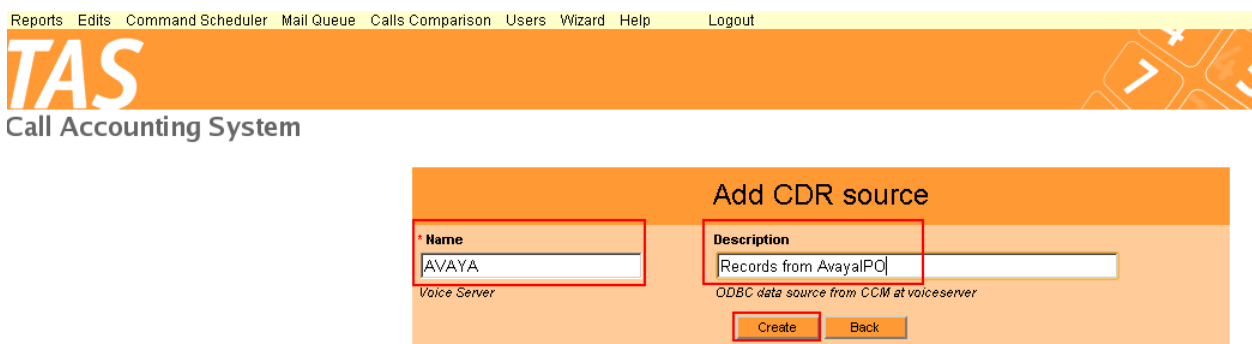
The screenshot shows the TAS web interface. The top navigation bar includes 'Reports', 'Edits', 'Command Scheduler', 'Mail Queue', 'Calls Comparison', 'Users', 'Wizard', 'Help', and 'Logout'. The 'Edits' menu is expanded, showing a list of options: 'Settings', 'Calendar', 'Regions, Currencies', 'CDR Sources', 'Areas', 'Pattern Groups', 'Aliases', 'Port Aliases', 'Exchanges', 'Neighbor Exchanges', 'Price Lists', 'Rates', 'Rate Map Versions', 'Rate Map', 'Cost Centers', 'Customers', 'CDR Transformation to a Global Number', 'Transformations from global to directory number', 'Known Numbers', 'Call Category', and 'Phone Line Descriptions'. The 'CDR Sources' option is highlighted with a red box. On the right side of the page, there is a photograph of a man in a suit talking on a mobile phone.

Click the **Add Source** button under **CDR Sources**.



The screenshot shows the TAS web interface. The top navigation bar includes 'Reports', 'Edits', 'Command Scheduler', 'Mail Queue', 'Calls Comparison', 'Users', 'Wizard', 'Help', and 'Logout'. The 'TAS Call Accounting System' header is visible. The 'CDR Sources' page is displayed, showing a table with columns for 'ID', 'Name', and 'Description'. The 'Add Source' button is highlighted with a red box.

Enter the **Name** and **Description** of the data source, in this case, the IP Office and click **Create**.



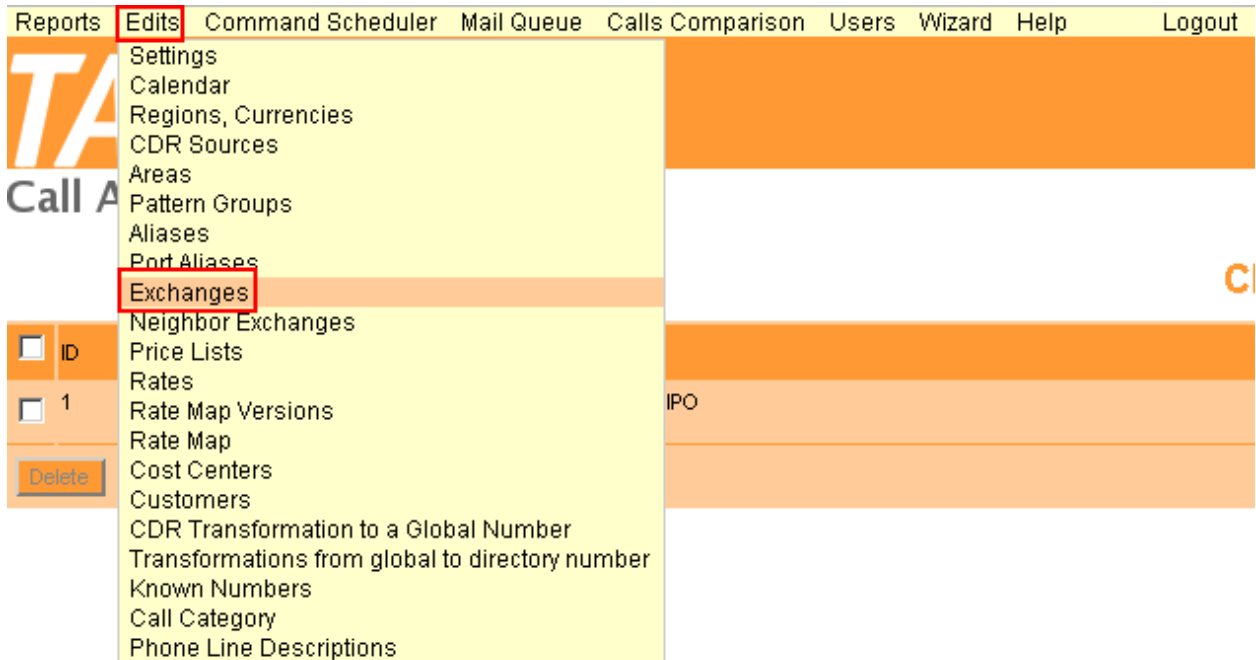
The screenshot shows the TAS web interface. The top navigation bar includes 'Reports', 'Edits', 'Command Scheduler', 'Mail Queue', 'Calls Comparison', 'Users', 'Wizard', 'Help', and 'Logout'. The 'TAS Call Accounting System' header is visible. The 'Add CDR source' form is displayed, showing two input fields: 'Name' (containing 'AVAYA') and 'Description' (containing 'Records from AvayaIPO'). The 'Create' button is highlighted with a red box.

The following screen will now appear displaying the new CDR source.

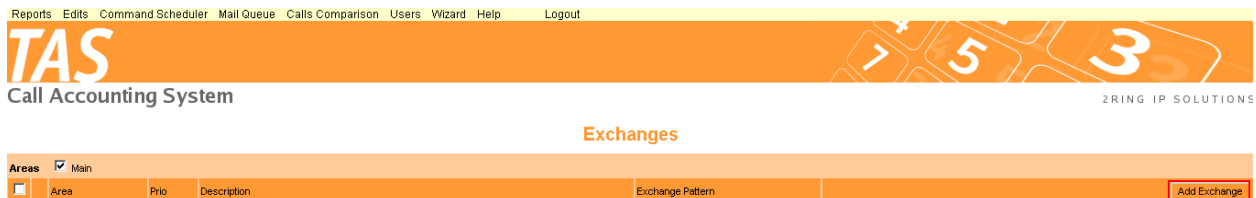


### 6.3. Configure Exchange

The IP Office must be added as an exchange (PBX) to TAS and its ports defined. Ports are used to categorize the call type using a defined pattern. On the TAS web interface, navigate to **Edits** → **Exchanges**.

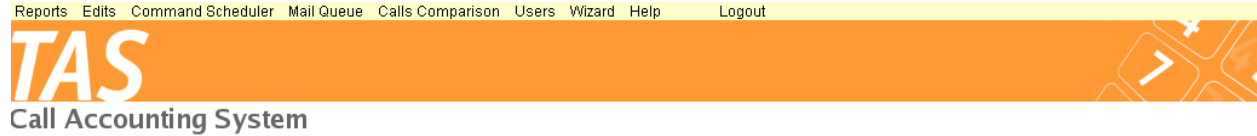


Click the **Add Exchange** button under **Exchanges**.



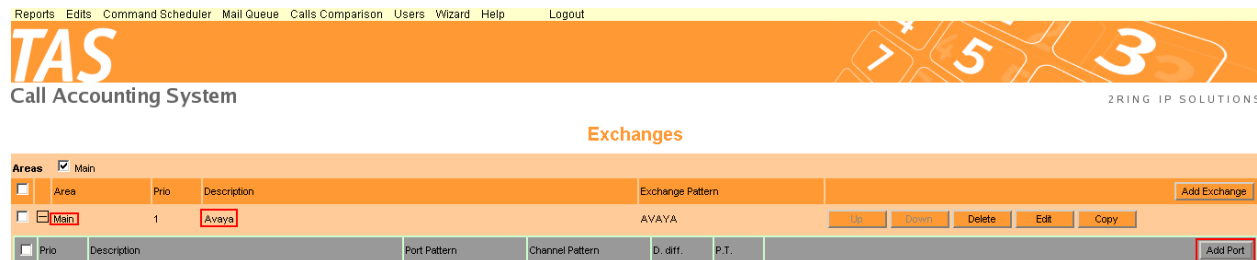


Enter a **Description** and **Exchange Pattern** and click **Create**.



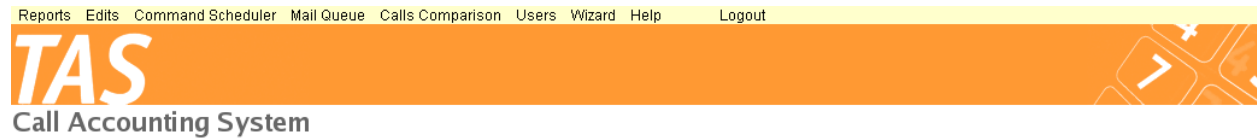
The screenshot shows the "Add Exchange" form. The form has a title "Add Exchange" and a sub-title "Avaya". It contains the following fields: "Area" (Main), "Description" (Avaya), and "Exchange Pattern" (AVAYA). Below the "Description" field is the text "Accounting Office, 1st floor". Below the "Exchange Pattern" field is the text "192.168.200.1". There are "Create" and "Back" buttons at the bottom of the form.

The following screen will now appear displaying the newly added Exchange. Click on **Add Port**.



Create an Exchange Port for each of the following and click **Create** after each port is added:

- IP Telephones – these are internal extensions and not strictly IP Phones



The screenshot shows the "Add Exchange Port" form. The form has a title "Add Exchange Port" and a sub-title "Avaya". It contains the following fields: "Description" (IP Telephones), "Port Pattern" (LINE-\*), "Channel Pattern" (.\*), "Duration Difference" (0), and "Port Type" (1 - Internal (Local) Lines/Ports of Exchange). Below the "Description" field is the text "Accounting Office, 1st floor". Below the "Port Pattern" field is the text "IPA|EXCH\_PRAHA". Below the "Channel Pattern" field is the text ".\*|SEP123456789012". Below the "Duration Difference" field is the text "0". Below the "Port Type" field is the text "E". There are "Create" and "Back" buttons at the bottom of the form.

- Outgoing ports – these are calls using a trunk port.

Reports Edits Command Scheduler Mail Queue Calls Comparison Users Wizard Help Logout

# TAS

## Call Accounting System

### Add Exchange Port

Avaya

**\* Description**  
 Outgoing Ports  
*Accounting Office, 1st floor*

**\* Port Pattern**  
 TRUNK-.\*  
*IPA|EXCH\_PRAHA*

**\* Channel Pattern**  
 CHANNEL-.\*  
*.\*|SEP123456789012*

**\* Duration Difference**  
 0  
*0*

**Port Type**  
 E - External Trunks/Ports of Exchange  
*E*

Create Back

- Voicemail – this is for calls covering to voicemail.

Reports Edits Command Scheduler Mail Queue Calls Comparison Users Wizard Help Logout

# TAS

## Call Accounting System

### Add Exchange Port

Avaya

**\* Description**  
 Voice Mail  
*Accounting Office, 1st floor*

**\* Port Pattern**  
 DEVICE\_VM  
*IPA|EXCH\_PRAHA*

**\* Channel Pattern**  
 CHANNEL-.\*  
*.\*|SEP123456789012*

**\* Duration Difference**  
 0  
*0*

**Port Type**  
 I - Internal (Local) Lines/Ports of Exchange  
*E*

Create Back

- Conference port – used where calls are in conference.

Reports Edits Command Scheduler Mail Queue Calls Comparison Users Wizard Help Logout

# TAS

## Call Accounting System

### Add Exchange Port

Avaya

**\* Description**  
  
*Accounting Office, 1st floor*

**\* Port Pattern**  
  
*IP|EXCH\_PRAHA*

**\* Channel Pattern**  
  
*.\*|SEP123456789012*

**\* Duration Difference**  
  
*0*

**Port Type**

Once all ports have been added, the screen below will be displayed displaying the new exchange and added ports.

Reports Edits Command Scheduler Mail Queue Calls Comparison Users Wizard Help Logout

# TAS

## Call Accounting System

2RING IP SOLUTIONS

### Exchanges

Areas  Main

| <input type="checkbox"/> | Area | Prio | Description | Exchange Pattern |                                   |                                     |                                       |                                     |                                     |
|--------------------------|------|------|-------------|------------------|-----------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> | Main | 1    | Avaya       | AVAYA            | <input type="button" value="Up"/> | <input type="button" value="Down"/> | <input type="button" value="Delete"/> | <input type="button" value="Edit"/> | <input type="button" value="Copy"/> |

| <input type="checkbox"/> | Prio | Description    | Port Pattern | Channel Pattern | D. diff. | P.T. |                                   |                                     |                                       |                                     |                                     |
|--------------------------|------|----------------|--------------|-----------------|----------|------|-----------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> | 1    | IP Telephones  | LINE-*       | *               | 0        | I    | <input type="button" value="Up"/> | <input type="button" value="Down"/> | <input type="button" value="Delete"/> | <input type="button" value="Edit"/> | <input type="button" value="Copy"/> |
| <input type="checkbox"/> | 2    | Outgoing Ports | TRUNK-*      | CHANNEL-*       | 0        | E    | <input type="button" value="Up"/> | <input type="button" value="Down"/> | <input type="button" value="Delete"/> | <input type="button" value="Edit"/> | <input type="button" value="Copy"/> |
| <input type="checkbox"/> | 3    | Voice Mail     | DEVICE_VM    | CHANNEL-*       | 0        | I    | <input type="button" value="Up"/> | <input type="button" value="Down"/> | <input type="button" value="Delete"/> | <input type="button" value="Edit"/> | <input type="button" value="Copy"/> |
| <input type="checkbox"/> | 4    | Conference     | DEVICE_CO_*  | CHANNEL-*       | 0        | I    | <input type="button" value="Up"/> | <input type="button" value="Down"/> | <input type="button" value="Delete"/> | <input type="button" value="Edit"/> | <input type="button" value="Copy"/> |

## **6.4. Rate Map and Rates**

The call rates are specified as part of the TAS – Pre-installation Questionnaire. 2Ring provides TAS with the Rates and Rate Map preconfigured according to the call types and rates specified in the questionnaire. The compliance test is not concerned with the call rates.

## **6.5. Evaluation Batch Schedule**

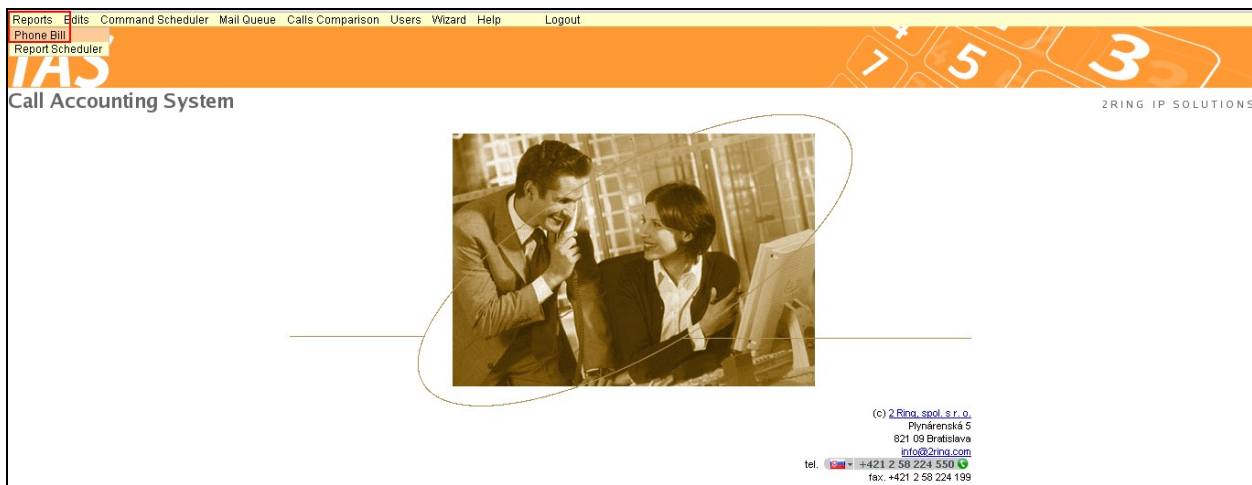
The evaluation process takes the raw data captured from IP Office and processes it for analysis and reporting. Evaluation is automatically scheduled and referred to as an Evaluation Batch. 2Ring provides TAS with a predefined Evaluation Batch schedule.

## 7. Verification Steps

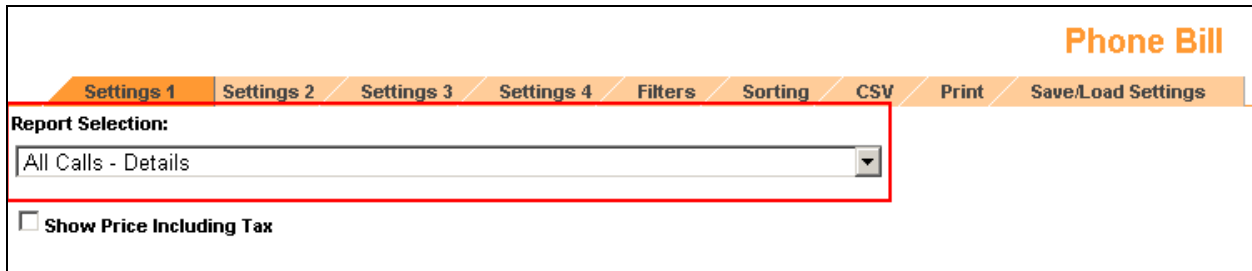
Verification that SMDR data is being produced and sent to TAS, and is available for analysis is done by checking that SMDR information is being received by the TAS server as well as by running a report using the TAS web client.

### 7.1. Verify TAS Receives SMDR

From the TAS server, open the file `c:\var\log\socketlistener.log` and confirm the file contains data pertaining to recent calls. Access the web client using the URL <http://10.10.16.118/billing> enter the appropriate login details and the following screen will be displayed. Click on **Reports** → **Phone Bill** in the top left.



Select **All Calls – Details** from the **Report Selection** drop down list.



Click the **Defined by User** radio button beneath **Interval Selection** and enter a relevant date range where calls were made, and click **Evaluate**.

## Phone Bill

Save/Load Settings

**Interval Selection:**

Today  
 Yesterday  
 This Week  
 Last Week  
 This Month  
 Last Month  
 This Quarter  
 Last Quarter  
 This Year  
 Last Year  
 **Defined by User**  
 All

Start:

End:

Save as CSV **Evaluate** Evaluate for Print Save as PDF

Confirm the details in the report produced reflect real events:

| All Calls - Details |        |            |                  |          |               |                          |           |         |                    |                           | Evaluated at: 02:17:44 22.10.2011                              |               |          |
|---------------------|--------|------------|------------------|----------|---------------|--------------------------|-----------|---------|--------------------|---------------------------|--|---------------|----------|
|                     |        |            |                  |          |               |                          |           |         |                    |                           | Start Date: 17:30:00 29.09.2011, End Date: 19:00:00 29.09.2011 |               |          |
| Src                 | R.Type | Calling P. | Calling No.      | Exchange | Aux No.       | Called No.               | Called P. | Owner   | Time               | Rate                      | Ringtime/Duration (h:m:s)(h:m:s)                               | Price         |          |
| 1                   | C      | LINE-201   | 201 - Extn201    | AVAYA    | 202           | 203 - Extn203            | LINE-203  |         | 17:30:25, 29.09.11 | Internal - Internal calls | 0:00:13:00:11  | 0,00 V        |          |
| 1                   | C      | LINE-201   | 201 - Extn201    | AVAYA    | 202           | 202 - Extn202            | LINE-202  |         | 17:30:39, 29.09.11 | Internal - Internal calls | 0:00:02:00:21  | 0,00 V        |          |
| 1                   | C      | LINE-201   | 201 - Extn201    | AVAYA    | 202           | 203 - Extn203            | LINE-203  |         | 17:31:12, 29.09.11 | Internal - Internal calls | 0:00:12:00:17  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.7  | AVAYA    | 202           | 202 - Extn202            | LINE-202  |         | 17:35:32, 29.09.11 | Internal - Incoming Calls | 0:00:06:00:26  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.7  | AVAYA    | 202           | 203 - Extn203            | LINE-203  |         | 17:36:10, 29.09.11 | Internal - Incoming Calls | 0:00:12:00:27  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.9  | AVAYA    | 202           | 202 - Extn202            | LINE-202  |         | 17:38:11, 29.09.11 | Internal - Incoming Calls | 0:00:09:00:10  | 0,00 V        |          |
| 1                   | C      | LINE-202   | 202 - Extn202    | AVAYA    |               | 203 - Extn203            | LINE-203  |         | 17:38:36, 29.09.11 | Internal - Internal calls | 0:00:12:00:31  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.9  | AVAYA    | 202           | 203 - Extn203            | LINE-203  |         | 17:39:11, 29.09.11 | Internal - Incoming Calls | 0:00:00:00:29  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.11 | AVAYA    |               | 202 - Extn202            | LINE-202  |         | 17:47:46, 29.09.11 | Internal - Incoming Calls | 0:00:06:00:48  | 0,00 V        |          |
| 1                   | C      | LINE-202   | 202 - Extn202    | AVAYA    |               | 203 - Extn203            | LINE-203  |         | 17:48:08, 29.09.11 | Internal - Internal calls | 0:00:08:00:22  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.11 | AVAYA    | 202           | 203 - Extn203            | LINE-203  |         | 17:48:34, 29.09.11 | Internal - Incoming Calls | 0:00:00:00:53  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.12 | AVAYA    |               | 202 - Extn202            | LINE-202  |         | 17:51:01, 29.09.11 | Internal - Incoming Calls | 0:00:04:00:24  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.12 | AVAYA    | 202           | 203 - Extn203            | LINE-203  |         | 17:51:32, 29.09.11 | Internal - Incoming Calls | 0:00:07:00:16  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.13 | AVAYA    |               | 202 - Extn202            | LINE-202  |         | 17:53:04, 29.09.11 | Internal - Incoming Calls | 0:00:05:00:23  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.13 | AVAYA    | 202           | 203 - Extn203            | LINE-203  |         | 17:53:37, 29.09.11 | Internal - Incoming Calls | 0:00:10:00:22  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.14 | AVAYA    |               | 202 - Extn202            | LINE-202  |         | 17:54:54, 29.09.11 | Internal - Incoming Calls | 0:00:06:00:21  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.14 | AVAYA    | 202           | 203 - Extn203            | LINE-203  |         | 17:55:24, 29.09.11 | Internal - Incoming Calls | 0:00:09:00:18  | 0,00 V        |          |
| 1                   | C      | LINE-201   | 201 - Extn201    | AVAYA    |               | 202 - Extn202            | LINE-202  |         | 17:58:10, 29.09.11 | Internal - Internal calls | 0:00:03:00:25  | 0,00 V        |          |
| 1                   | C      | LINE-202   | 202 - Extn202    | AVAYA    |               | EXCHANGE-AVAYA - Extn203 | LINE-203  |         | 17:58:45, 29.09.11 | Internal - Internal calls | 0:00:10:00:18  | 0,00 V        |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.15 | AVAYA    |               | 202 - Extn202            | LINE-202  |         | 18:28:15, 29.09.11 | Internal - Incoming Calls | 0:00:06:00:42  | 0,00 V        |          |
| 1                   | C      | LINE-202   | 202 - Extn202    | AVAYA    |               | 94002 - Line 17.1        | TRUNK-17  |         | 18:28:37, 29.09.11 | Outgoing - Outgoing Calls | 0:00:08:00:13  | 0,22 EUR      |          |
| 1                   | C      | TRUNK-1    | 4001 - Line 1.15 | AVAYA    | 202 - Extn202 | 94002 - Line 17.1        | TRUNK-17  | Extn202 | 18:28:50, 29.09.11 | Outgoing - Outgoing Calls | 0:00:00:00:18  | 0,30 EUR      |          |
| <b>Total:</b>       |        |            |                  |          |               |                          |           |         |                    |                           | 20   | 0:02:20       | 0,00 V   |
|                     |        |            |                  |          |               |                          |           |         |                    |                           | 2  | 0:00:08:00:14 | 0,52 EUR |
|                     |        |            |                  |          |               |                          |           |         |                    |                           |  | 0:00:31       |          |
|                     |        |            |                  |          |               |                          |           |         |                    |                           | 22   | 0:02:28:00:45 |          |

## 8. Conclusion

These Application Notes describe the configuration steps required for the 2Ring TAS to successfully interoperate with Avaya IP Office IP500. All functionality and serviceability test cases were completed successfully.

## 9. Additional References

Product documentation for Avaya products may be found at <http://support.avaya.com>

[1] IP Office KnowledgeBase 7.0 Documentation CD (English Only)

Product documentation for 2Ring TAS can be found at <http://www.2ring.sk>.

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