



Avaya Solution & Interoperability Test Lab

Application Notes for Resource Software International Shadow Call Management Software with Avaya IP Office – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Resource Software International Shadow Call Management Software (CMS) to work with Avaya IP Office. Shadow CMS is a flexible, feature rich application that captures Simple Message Detail Records (SMDR) / Call Detail Records (CDR) from the Avaya IP Office. Call activity can be reported by extension, trunk, account code, and authorization code.

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

These Application Notes describe the configuration steps required for Revolution Software International (RSI) Shadow Communication Management Software (CMS) to work with Avaya IP Office. Shadow CMS is a comprehensive call accounting solution providing flexible and accurate call pricing. This call accounting product is distributed under the brand name Shadow CMS within the United States and TeleCOST outside of the United States. This software can price calls using most commercially available carrier rate plans subscribed to by customers. The easy to use Report Generator provides users with access to both detail and summary reports. This comprehensive product is multi-site ready. It can support up to 10,000 unique locations each with up to 10,000 extensions. The software can price calls using up to five different carriers or rate plans. A built-in Job Scheduler permits automatic, unattended generation of reports at scheduled intervals (i.e., daily, weekly, monthly, etc.). Most environments can install this application on an existing non-dedicated computer.

Shadow CMS is a flexible, feature rich application that listens for CDR/SMDR records from the Avaya IP Office. The Shadow CMS winlink data collection module is used to listen for CDR/SMDR information from Avaya IP Office. This module is normally installed on the same computer as the Shadow CMS Administration/Reporting module. It can, however, be deployed on a different computer. Call activity can be reported by extension, trunk, account code, and authorization code.

The configuration in **Figure 1** shows a network consisting of an Avaya IP412 Office, Avaya IP406 Office V2, Avaya IP Office Manager/Voicemail Pro Personal Computer (PC), Shadow CMS, and Avaya 4600 series IP Telephones connected to an Avaya C364T-PWR Converged Stackable Switch. The Avaya IP412 Office has PRI and Analog trunks to the central office. The Avaya IP406 Office V2 can also access the central office facilities over the Small Community Network (SCN) network, but first must pass through the Avaya IP412 Office system. Consequently, a CDR record of this transaction is created and processed.

The Avaya IP412 Office has T1, PRI and Analog trunks to the central office. The Avaya IP412 Office is configured to generate CDR data for all inbound, outbound, and internal calls, and for calls made to and from other Avaya IP Office systems over SCN. The Avaya IP412 Office is configured to send the CDR records to a user configured IP address and port. The Shadow CMS winlink module is configured to listen on the port configured on the Avaya IP412 Office for CDR data. Once winlink receives the raw CDR data from the IP Office, Shadow CMS translates the CDR record then stores it into its database for later record retrieval and/or reporting by the end user.

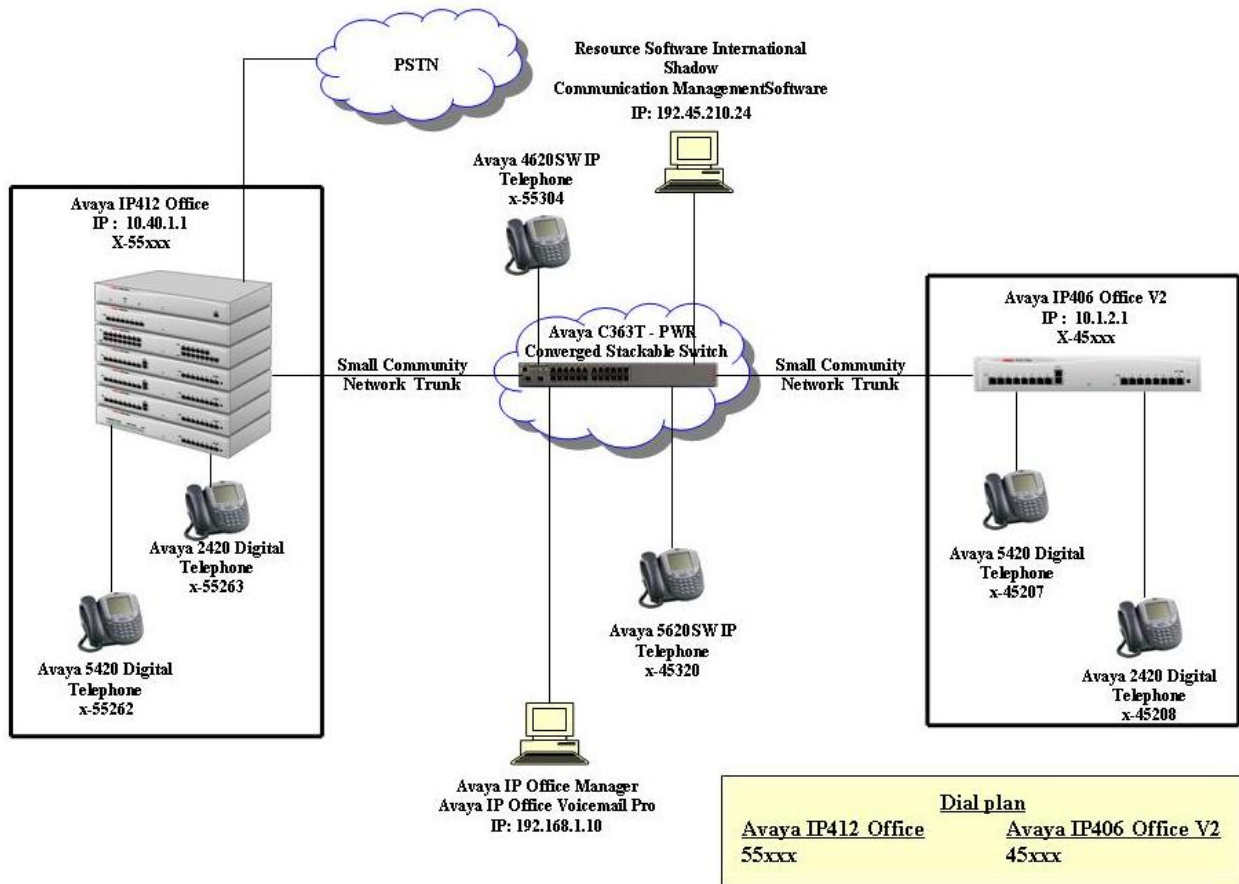


Figure 1 – Network Configuration Diagram

2. Equipment and Software Validated

The following products and software were used for the configuration in **Figure 1**:

Product	Software/Version
Avaya IP412 Office	4.0.10
Avaya IP406 Office V2	4.0.10
Avaya IP400 Digital Station Module	6.0.10
Avaya IP Office Manager	6.0.10
Avaya Voicemail Pro	4.0.23
Avaya 4620SW IP Telephones	2.3
Avaya 5620SW IP Telephones	2.3
Avaya 2420 Digital Telephones	5.0
Avaya 5420 Digital Telephones	5.0
Avaya C363T-PWR Converged Stackable Switch	4.3.12
Revolution Software International Shadow Call Management System	4.1.0.366
PCs for Avaya IP Office Manager, Avaya Voicemail Pro and RSI Shadow CMS	Windows XP Professional Service Pack 2

Table 1 – Product and Software Version

3. Configure Avaya IP412 Office

The configuration information provided in this section describes the steps required to set up Avaya IP412 Office to generate CDR data to a user-defined destination IP address and port.

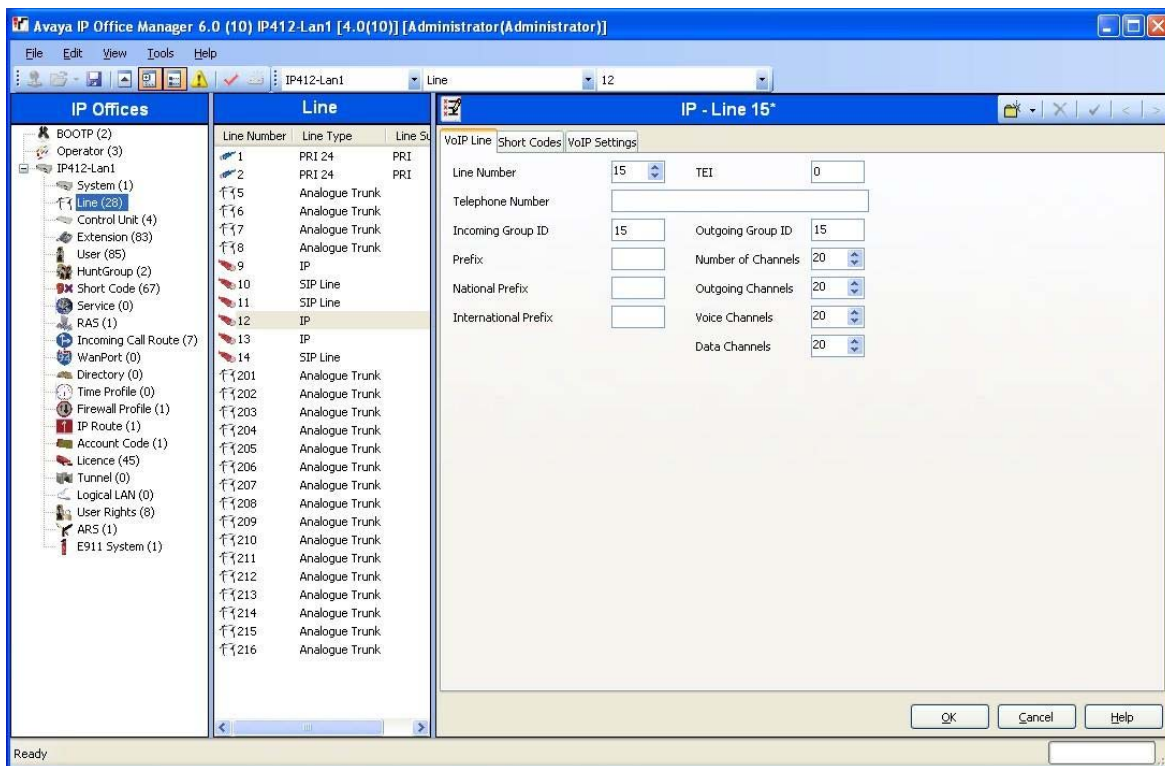
Note: **Steps 4, 5 and 7** are also performed on the Avaya IP406 Office V2.

For all other provisioning information, such as Avaya IP Office installation and configuration, etc., please refer to the Avaya IP Office product documentation in reference [1].

1. From the Avaya IP Office Manager PC, go to **Start** → **Programs** → **IP Office** → **Manager** to launch the Manager Application and log into the Manager application using the appropriate credentials.
2. On the Manager window that is displayed, select **File** → **Open** to search for the IP Office system in the network.
3. Log into the appropriate IP Office system using the appropriate login credentials to receive its configuration.

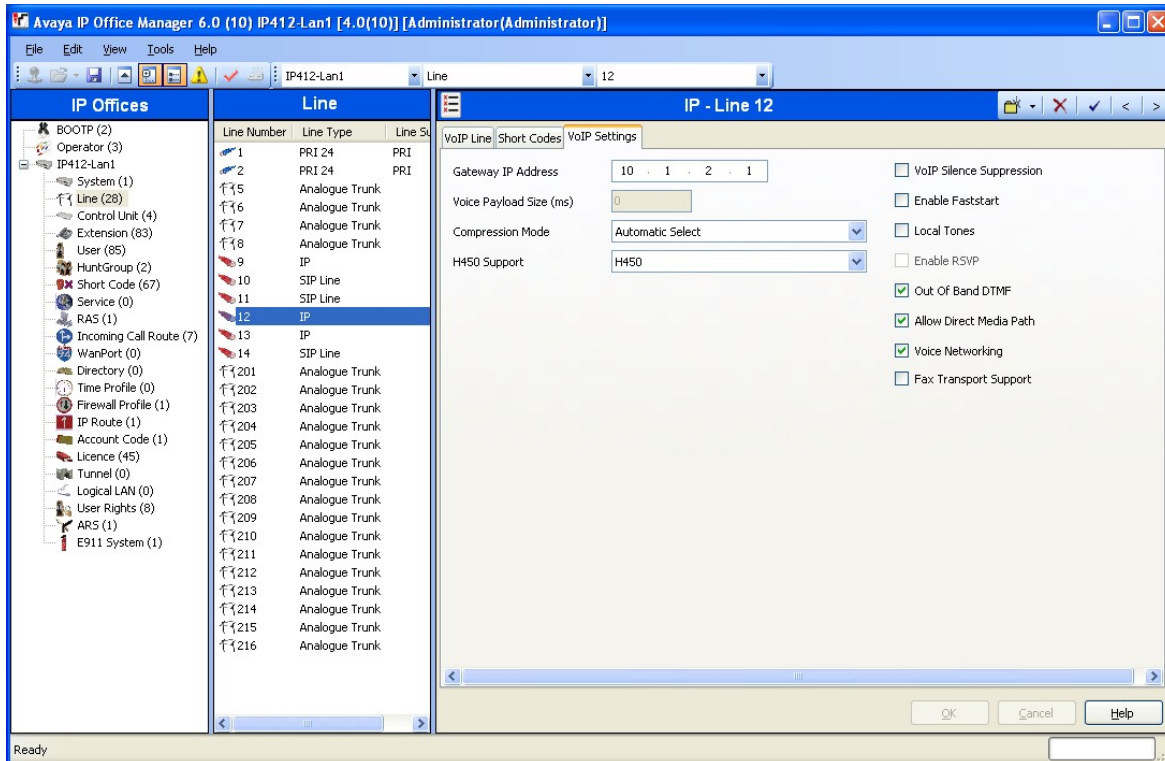
4. In the **Avaya IP Office Manager** window, go to the configuration tree in the left-hand panel and right-click **Line** and select **New → IP Line** (not shown). The screen below should display.

In this case, the system automatically assigns **15** as the **Line Number** (and will vary). Place the value **15** in the **Incoming Group ID** and **Outgoing Group ID**. Click the **VoIP Settings** tab.

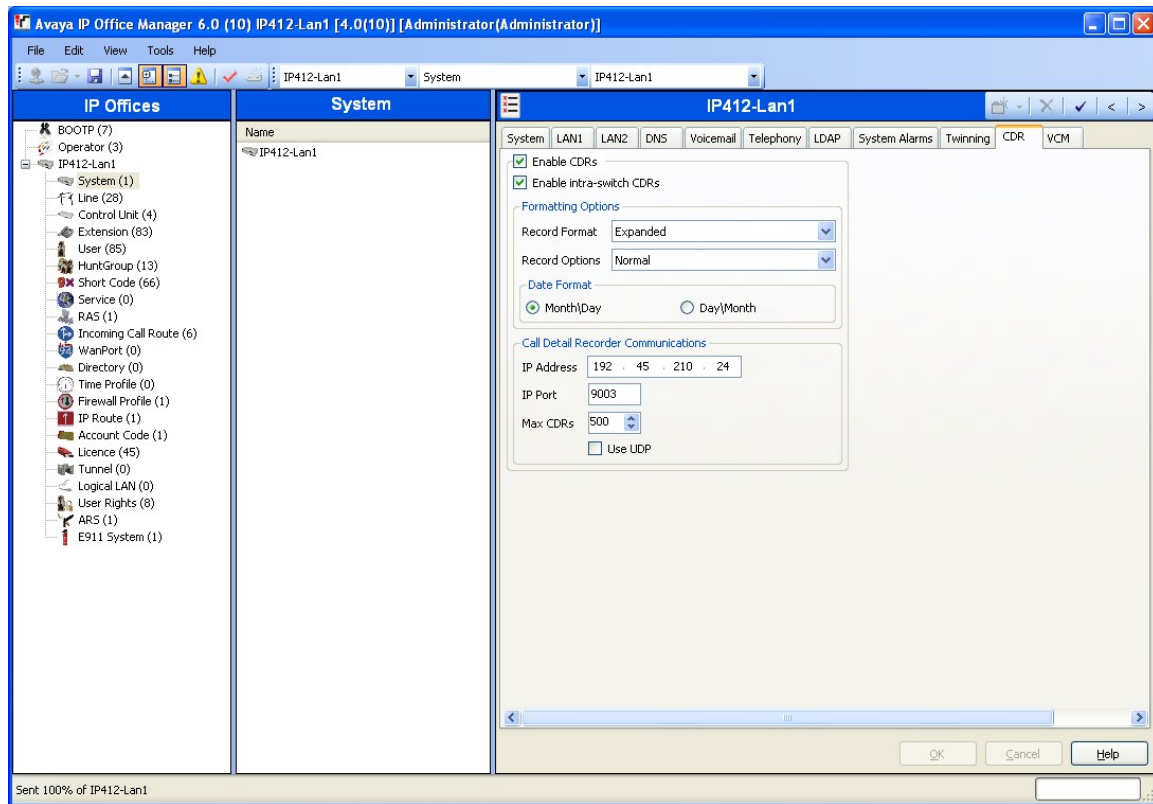


5. Set the **Gateway IP Address** to the IP address of the other Avaya IP Office System. See **Figure 1**. Check **Voice Networking**. The **Voice Networking** parameter turns on SCN capabilities. Click **OK**.

Note: The IP address will be different when administering the other Avaya IP Office system.



6. On the **Avaya IP Office Manager** window, double-click on **System** from the right panel configuration tree. On the right panel, select the **CDR** tab. In the **CDR** window set the following; **Enable CDRs** is checked, **Enable intra-switch CDRs** is checked, **Record Format** select **Expanded**, **Record Options** select **Normal**, **Date Format** select **Month\Day**, **IP Address** to **192.45.210.24** the IP address of the Shadow CMS PC, and **IP Port** to **9003** the port that Shadow CMS will listen on. Click **OK**.



7. In the **Avaya IP Office Manager**, select **File** → **Save** to push the configuration to the IP Office system and wait for the system to update. This completes configuration of Avaya IP Office CDR
8. Log into the Avaya IP406 Office V2 system and perform **Steps 4, 5** and **7**. Note the IP address is different.
9. This completes configuration of Avaya IP Office CDR.

4. Configure Revolution Software International Shadow Communication Management System

For all other provisioning information, such as software installation, installation of optional components, configuration of Shadow CMS for call accounting, report generation, etc., please refer to the RSI Shadow CMS product documentation in references [2] and [3].

4.1. Create the Shadow Communication Management System Configuration

The configuration information provided in this section describes the steps required to configure Shadow CMS to listen for CDR records from Avaya IP Office.

The information provided in this section assumes the Shadow CMS has already been successfully installed and licensed on the PC.


1. Log into the Shadow CMS PC with the appropriate administrative credentials and navigate to **Start** → **Programs** → **RSI** → **CMS** → **Configuration Wizard**.
2. On the **RSI Call Accounting Configuration Creator** window that is displayed, click **Next >** to step through the configuration screens.



3. On the **Configuration Creator - Customer Information** window, fill in the required information then click **Next >**.

Configuration Creator - Customer Information

The Configuration Creator Program requires the following Customer Information to set up your configuration files.



*Company Name

*Address

*City or Town *State/Prov

Zip/Postal Code

EMail

URL:

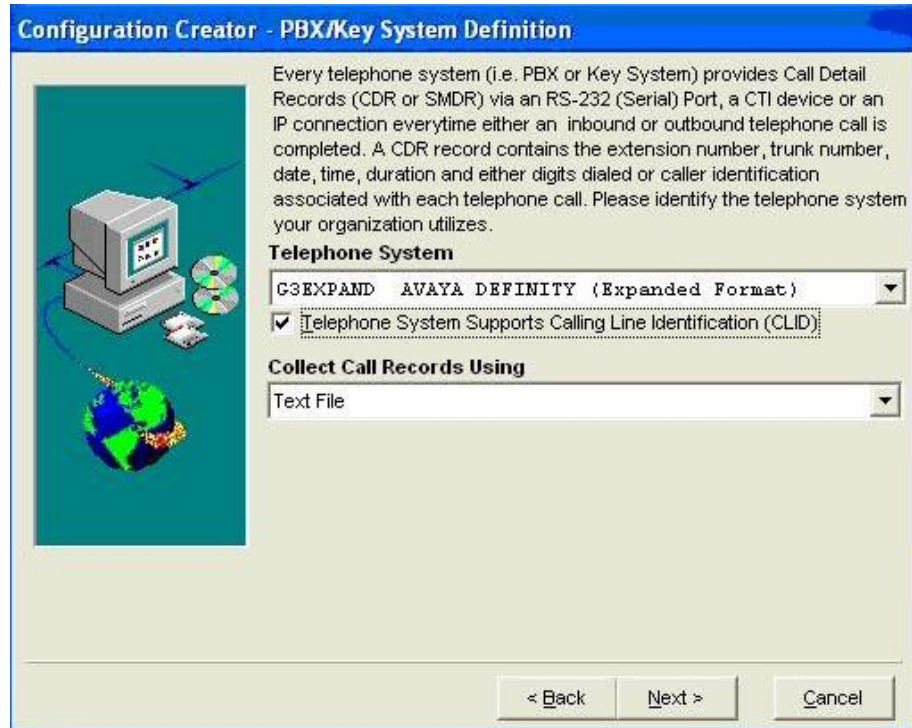
*Phone Number () -

Fax Number () -

Please Note, fields marked with an asterik (*) are mandatory.

< Back Next > Cancel

4. On the **Configuration Creator - PBX/Key System Definition** window, from the pull-down menu, select and set **Telephone System** to **G3EXPAND AVAYA DEFINITY (Expanded Format)**, check **Telephone System Supports Calling Line Identification (CLID)**, and select and set **Collect Call Records Using** to **Text File**. Click **Next >**.



Configuration Creator - PBX/Key System Definition

Every telephone system (i.e. PBX or Key System) provides Call Detail Records (CDR or SMDR) via an RS-232 (Serial) Port, a CTI device or an IP connection everytime either an inbound or outbound telephone call is completed. A CDR record contains the extension number, trunk number, date, time, duration and either digits dialed or caller identification associated with each telephone call. Please identify the telephone system your organization utilizes.

Telephone System

G3EXPAND AVAYA DEFINITY (Expanded Format)

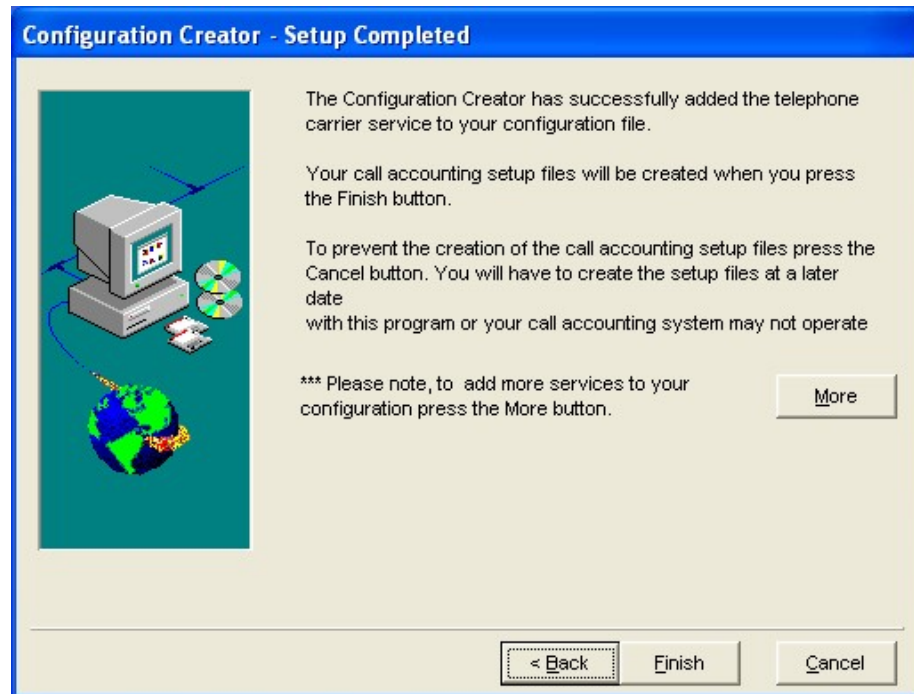
☒ Telephone System Supports Calling Line Identification (CLID)

Collect Call Records Using

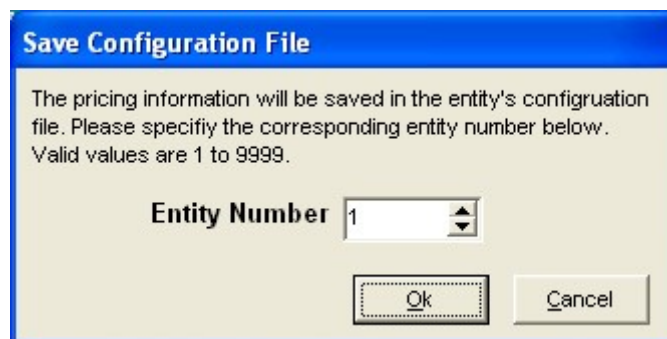
Text File

< Back Next > Cancel

5. The next several screens (not shown) deal with Directory Assistance, Cost Allocation, Taxes, Carrier Information, Comparisons, and Discounts. Continue to click on the **Next >** button and modify the defaults as needed for a local configuration until the **Configuration Creator - Setup Completed** window is displayed. Click **Finish**.



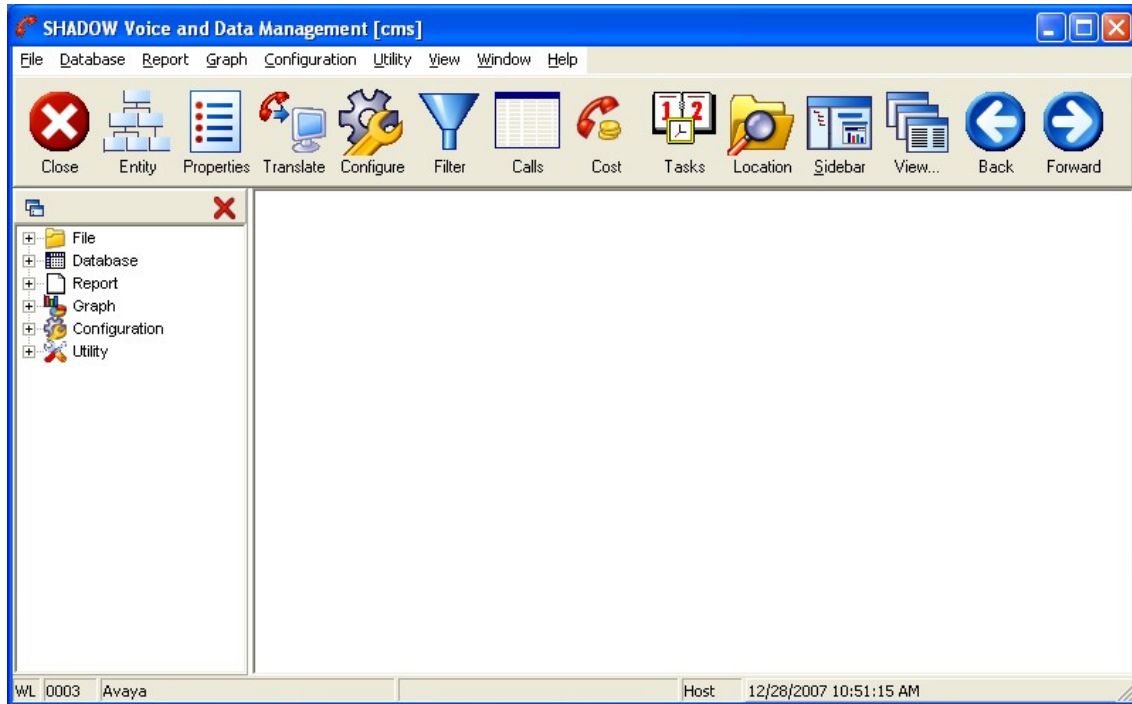
6. On the **Save Configuration File** popup that is displayed, select an **Entity Number** and click the **Ok** button. The **Entity Number** selected is required in **Section 4.2, Step 2**.



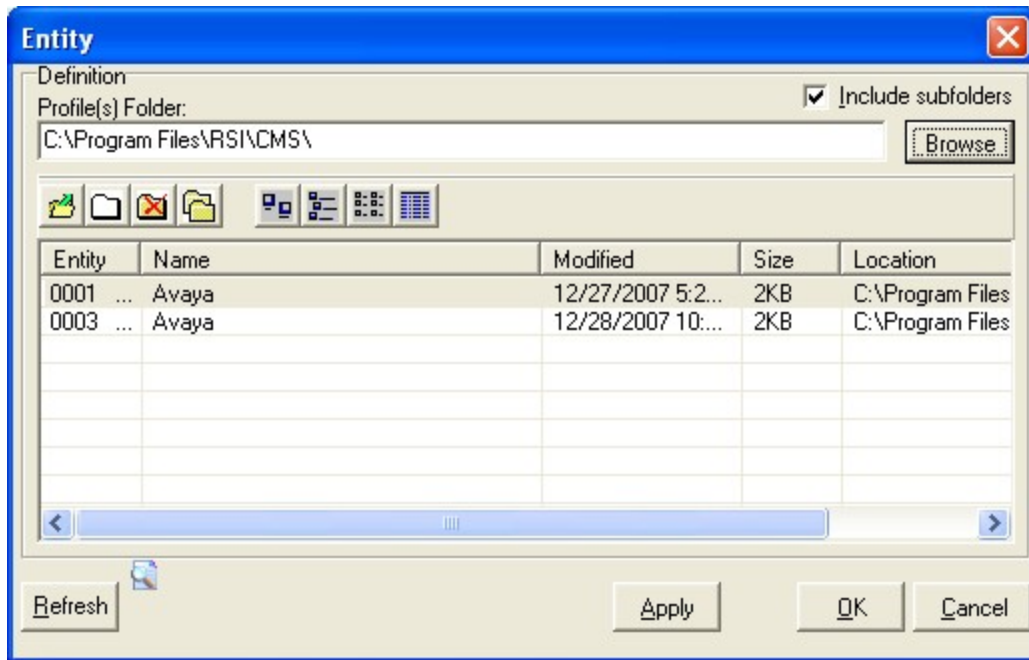
7. The Configuration Wizard will close after the **Ok** button is pressed.
8. This completes the configuration of Shadow CMS.

4.2. Configure CMS Application

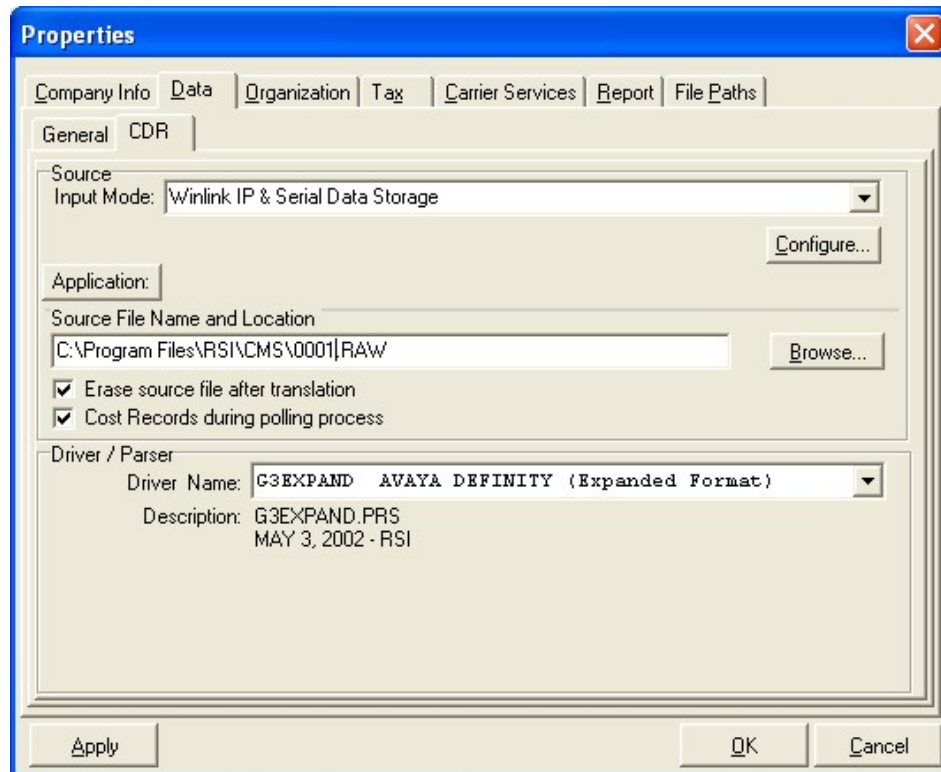
1. Launch Shadow CMS by clicking **Start** → **All Programs** → **RSI** → **CMS** → **CMS** and click the **Entity** icon



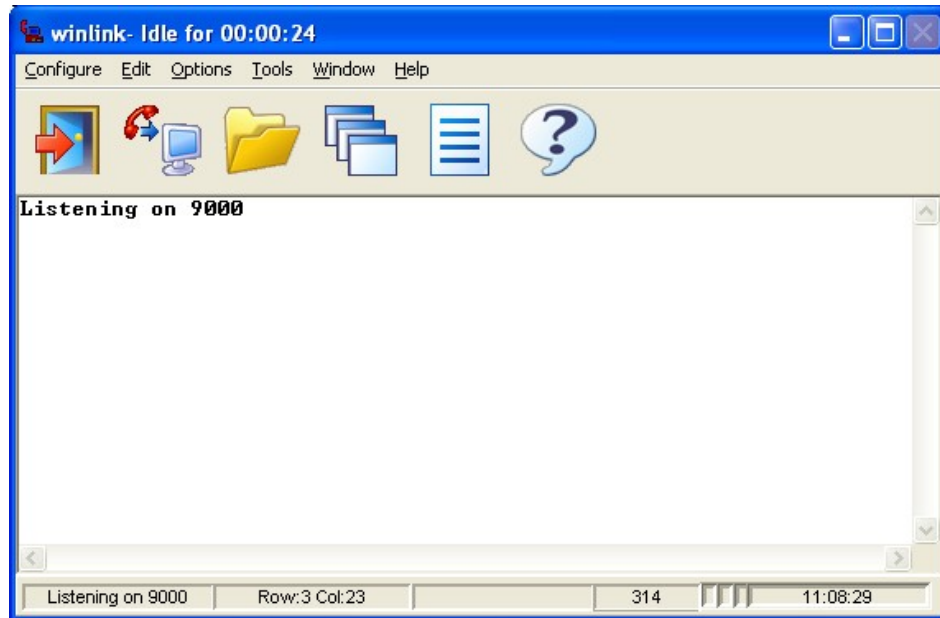
2. Select the **Entity** number created in Section 4.1, Step 6. Click **OK**.



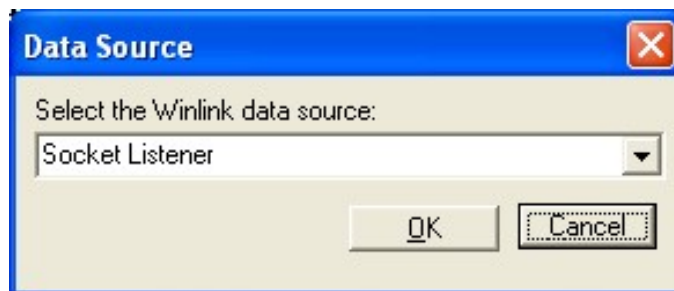
3. On the **SHADOW Voice and Data Management [cms]** window, click the **Properties** icon. Select the **Data** tab then select the **CDR** tab. Select and set **Source Input Mode:** to **Winlink IP & Serial Data Storage**, select and set **Driver Name** to **G3EXPAND AVAYA DEFINITY (Expanded Format)**. Click **Configure**.



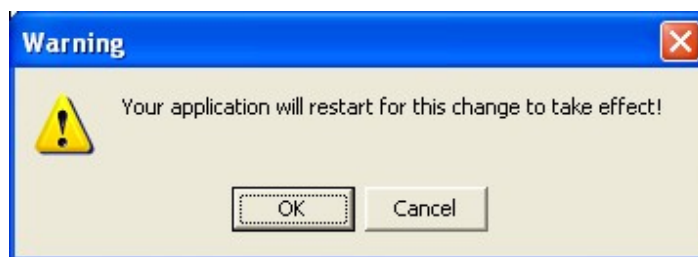
4. When the **Configure** button is pressed from the previous properties screen, the *winlink* window should be displayed as below. Select **Configure** → **Data Source**.



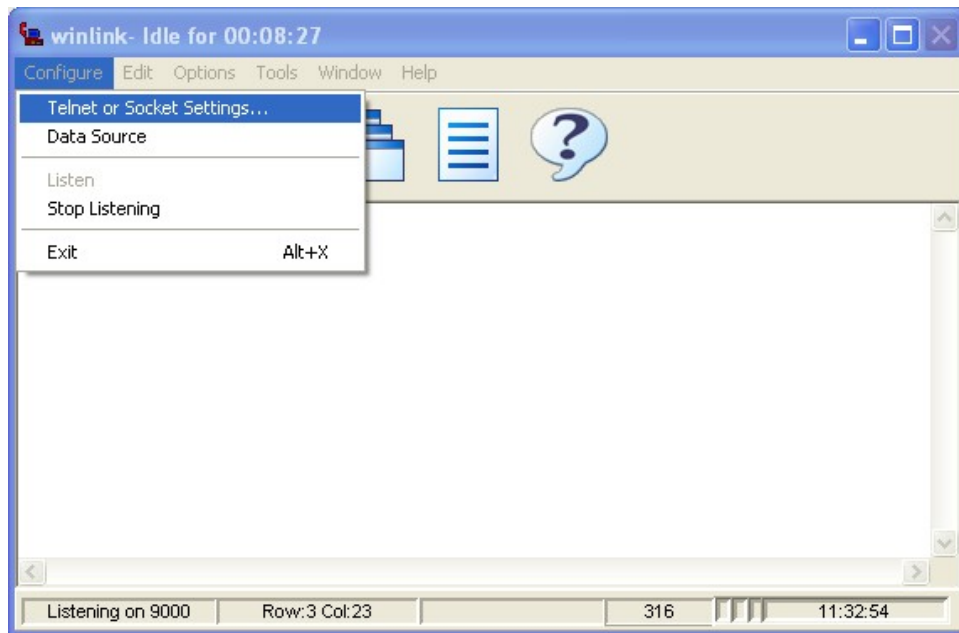
5. On the **Data Source** popup that is displayed, set **Select the Winlink data source:** to **Socket Listener**. Click **OK**.



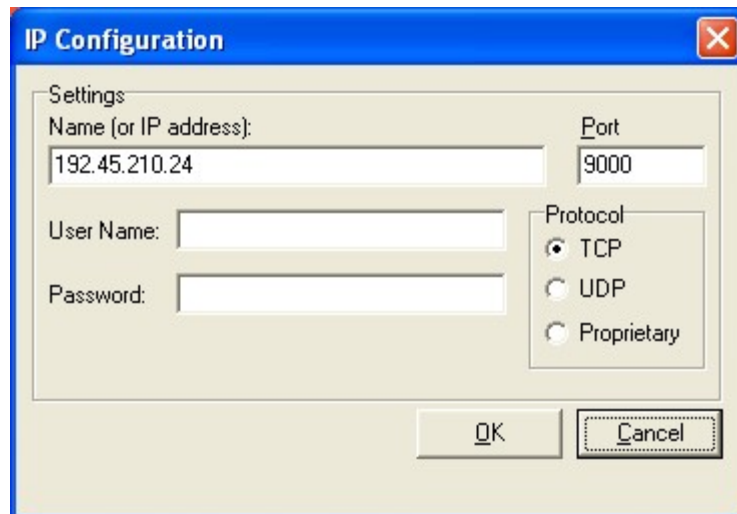
6. On the **Warning** popup that is displayed, click **OK**.



- After the application restarts, the **Properties** window in **Step 3** should be displayed. Click **Configure** again to return to the **winlink** window as in **Step 4**. On the **winlink** window, select **Configure** → **Telnet or Socket Settings...** from the pull-down menu.



- On the **IP Configuration** window that is displayed, set **Name (or IP address)** to the IP address of the Shadow CMS PC, and **Port** to the port number configured on the Avaya IP412 Office CDR configuration in **Section 3, Step 6**. Set **Protocol** to **TCP**. Click **OK**.



- On the **winlink** window, select **Configure** → **Listen** from the pull-down menu to put winlink into listen mode (see **Step 7**). This completes configuration of Shadow CMS

5. Interoperability Compliance Testing

Interoperability compliance testing evaluated the ability of Shadow CMS to collect and process CDR records for various types of calls (inbound, outbound, internal, transfer, conference, etc.).

5.1. General Test Approach

The general test approach was to enable Shadow CMS to collect CDR records by or and:

- Manually place calls:
 1. Between Avaya IP Office extensions.
 2. Inbound and outbound trunk over PRI and Analog trunks.
 3. To and from telephones attached to a remote Avaya IP Office over SCN trunks.
- Verify that Shadow CMS properly classified the CDR records.
- Verify that Shadow CMS properly displayed the CDR records in a formatted report.

Ensure Verify that Shadow CMS properly resumed operation after serviceability testing was performed by resetting the Avaya IP412 Office, removing the network connection on Avaya IP412 Office, removing the network connection on Shadow CMS PC, and power down/up the Shadow CMS PC.

5.2. Test Results

All feature and performance test cases that were executed passed. Shadow CMS successfully captured and processed call records from Avaya IP Office. For serviceability testing, Shadow CMS was able to resume CDR record collection for outages where Avaya IP Office was reset or lost its network link without requiring manual intervention. In cases where the Shadow CMS computer lost power or its network link, Shadow CMS was able to successfully resume collecting CDR records once it was back online but not for CDR records for calls that were placed during the outage. Since the current IP Office CDR implementation does not support Reliable Session Protocol, there is a chance of CDR record loss if there is a network failure.

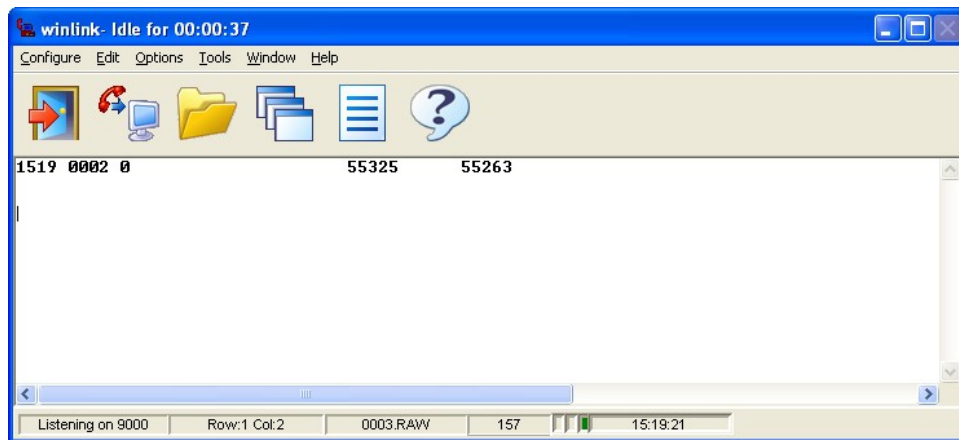
The following observations were made during testing:

- CDR records for blind verses supervised transfers are not handled the same by IP Office. IP Office blind transfer call splitting behaves correctly. Hold time for a supervised transfer is not factored on the CDR record.
- In a conference scenario where an external call is made to extension 65263 and this extension conferences extension 45207 across a SCN trunk, the extension identification data is not correct on the CDR record.
- IP Office CDR does not provide DNIS information in CDR records generated.

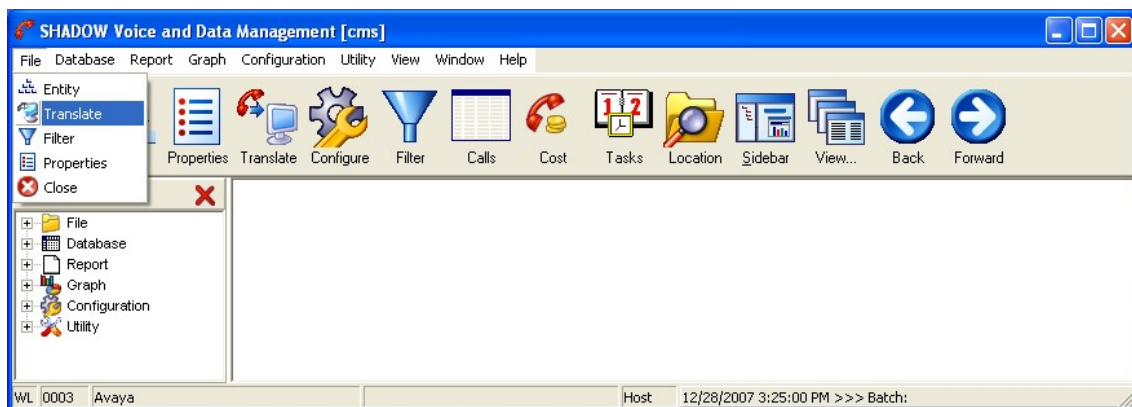
6. Verification Steps

The following steps may be used to verify the configuration:

1. Place a telephone call to the Avaya IP Office, answer the call, and drop the call after a few seconds.
2. The raw CDR data such as the one displayed below will appear in the **winlink** window after the call is dropped.



3. In the **SHADOW Voice and Data Management [cms]** window, click **File** → **Translate** in the pull-down menu to manually translate the CDR record.



4. In the **Translate Data** window that is displayed, click **OK**. Note: Shadow CMS can be configured to automatically translate CDR data at user-defined time intervals. Please refer to the Shadow CMS documentation for information on how this is accomplished.

- On the left hand **SHADOW Voice and Data Management [cms]** navigation panel, click **Database** → **Calls Database** to view the incoming call parsed by Shadow CMS. The itemized data records are formatted in label-headed columns with various aspects of the CDR data within the **Calls Database**. For example, records 5, 6, and 7 below represent an incoming PSTN call from 732-852-3043 (only 7 digits visible) to extension 55325. This call remains connected for 42 seconds after which a transfer from extension 55325 to extension 45207 occurs over trunk number 12. At this point, extension 45207 and 732-852-3043 remain connected for an addition 30 seconds. There are many configurable fields that can be used. Refer to Reference [3]

Record No	DATE	TIME	DURATION	CALLTYPE	EXTENSION	TRUNK	DIGITS	RINGTIME	ACCOUNT
1									
2	20071228	1028		0 ET	0055263	0000012	45207	0	
3	20071228	1029	6	EO	0055263	8523043		0	
4	20071228	1029	6	EI	8523043	0055263		0	
5	20071228	1030	30	ET	0045207	0000012	7328523043	0	
6	20071228	1030	42	EO	0055325	8523043		0	
7	20071228	1030	42	EI	8523043	0055325		0	
8	20071228	1035	0	ET	0055263	0000012	45207	0	
9	20071228	1036	12	EO	0055263	0099999		0	
10	20071228	1036	12	EI	0099999	0055263		0	
11	20071228	1317	30	ET	0055263	0000012	45207	0	12345
12	20071228	1318	30	TE	0045207	0000002		0	12345
13	20071228	1355	66	TE	0055263	0000002		0	
14	20071228	1358	180	TE	0055325	0000002		0	
15	20071228	1404	60	ET	0055263	0000012	45207	0	12345
16	20071228	1405	66	TE	0045207	0000002		0	12345
17	20071228	1410	12	EO	0055263	0099999		0	
18	20071228	1410	12	EI	0099999	0055263		0	
19	20071228	1416	72	TE	0055263	0000002		0	
20	20071228	1416	72	EO	0055263	0055325		0	
21	20071228	1416	72	EI	0055325	0055263		0	
22	20071228	1437	6	ET	0065209	0000013	7328523043	0	
23	20071228	1437	12	EO	0055263	8523043		0	
24	20071228	1437	12	EI	8523043	0055263		0	

- On the left hand **SHADOW Voice and Data Management [cms]** navigation panel, click **Report → Chronological → Chronological Detail** to view a report for the incoming call. In this report, the Shadow CMS application takes the call information already stored and formats the data base on the chronological order of the call events. Call reporting intervals can be altered by the user. Call reporting can be viewed in many various formats and graphs.

SHADOW Voice and Data Management [cms] - [Chronological Detail]

File Database Report Graph Configuration Utility View Window Help

Close Entity Properties Translate Configure Filter Calls Cost Tasks Location Sidebar View... Back Forward

1 of 1 91% Total:28 100% 28 of 38

RSI

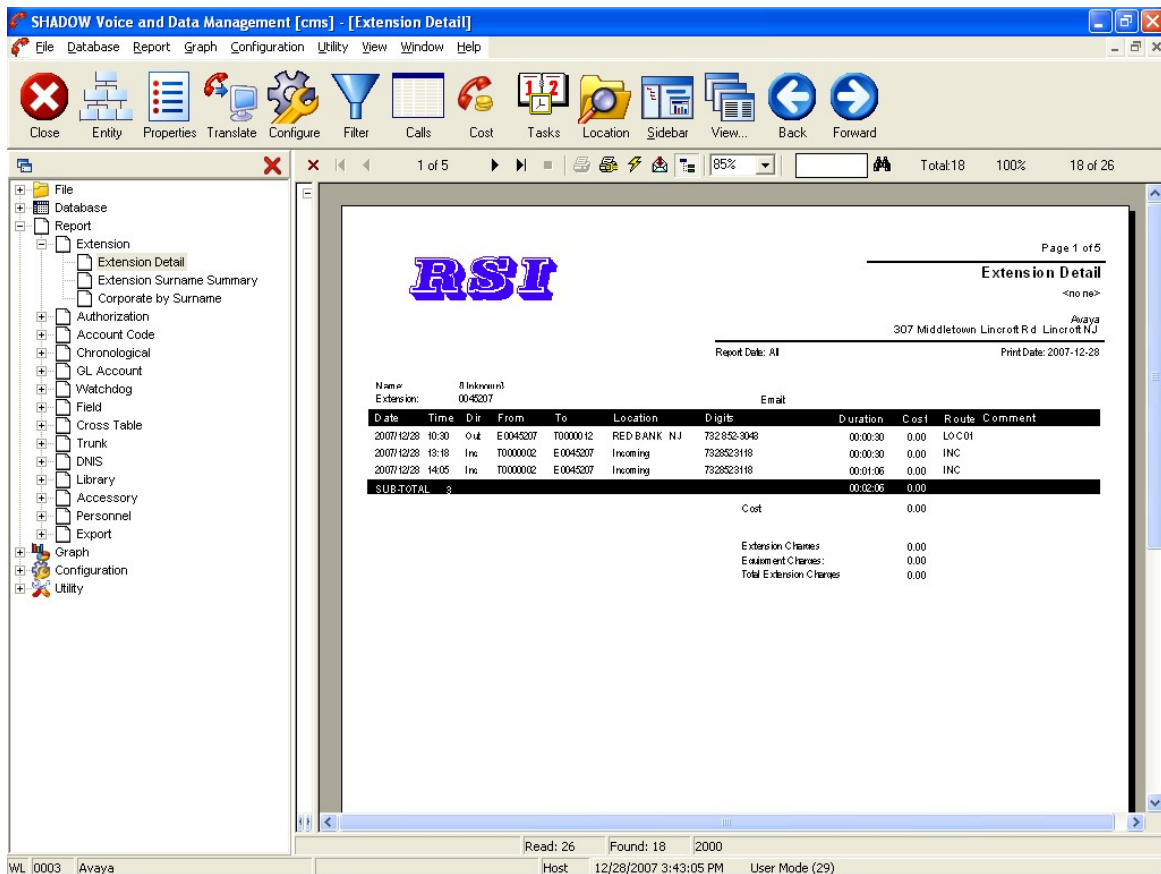
Page 1 of 1
Chronological Detail
Avaya
307 Middletown Lincroft Rd Lincroft NJ
Report Date: All Print Date: 2007-12-28

Date	Time	Dir	From	To	Location	Dist	Duration	Cost	Route	Comment
2007/12/28	16:40	Out	E08523043	T0000013	Outgoing	65206	00:00:06	0.00	INV	
2007/12/28	16:37	Out	E0055263	T0000012	Outgoing		00:00:00	0.00	INV	Other
2007/12/28	16:37	Inc	T0000002	E0045320	Incoming	7304523043	00:00:06	0.00	INC	
2007/12/28	16:35	Out	E0055262	T0000013	Outgoing	65209	00:00:12	0.00	INV	
2007/12/28	16:35	Int	E0055262	E0055325	Internal		00:00:18	0.00		Local-to-Local
2007/12/28	16:33	Out	E0055304	T0000012	Outgoing		00:00:00	0.00	INV	Other
2007/12/28	16:33	Out	E0055263	T0000012	Outgoing	4507	00:00:06	0.00	INV	
2007/12/28	16:29	Out	E0055263	T0000012	Outgoing	45207	00:00:06	0.00	INV	
2007/12/28	16:24	Int	E0055304	E0055325	Internal		00:00:12	0.00		Local-to-Local
2007/12/28	16:24	Int	E0055304	E0055262	Internal		00:00:12	0.00		Local-to-Local
2007/12/28	15:19	Int	E0055263	E0055325	Internal		00:00:12	0.00		Local-to-Local
2007/12/28	14:37	Out	E0085209	T0000013	RED BANK NJ	7304523043	00:00:06	0.00	LOC01	
2007/12/28	14:37	Int	E0055263	E08523043	Internal		00:00:12	0.00		Local-to-Local
2007/12/28	14:16	Inc	T0000002	E0055263	Incoming	7304523043	00:01:12	0.00	INC	
2007/12/28	14:16	Int	E0055263	E0055325	Internal		00:01:12	0.00		Local-to-Local
2007/12/28	14:10	Int	E0055263	E0099999	Internal		00:00:12	0.00		Local-to-Local
2007/12/28	14:05	Inc	T0000002	E0045207	Incoming	7328523118	00:01:06	0.00	INC	
2007/12/28	14:04	Out	E0055263	T0000012	Outgoing	4507	00:01:00	0.00	INV	
2007/12/28	13:58	Inc	T0000002	E0055325	Incoming	7328523043	00:03:00	0.00	INC	
2007/12/28	13:55	Inc	T0000002	E0055263	Incoming	7304523043	00:01:06	0.00	INC	
2007/12/28	13:18	Inc	T0000002	E0045207	Incoming	7304523118	00:00:30	0.00	INC	
2007/12/28	13:17	Out	E0055263	T0000012	Outgoing	45207	00:00:30	0.00	INV	
2007/12/28	10:36	Int	E0055263	E0099999	Internal		00:00:12	0.00		Local-to-Local
2007/12/28	10:35	Out	E0055263	T0000012	Outgoing	45207	00:00:00	0.00	INV	

Read: 38 Found: 28

0003 Avaya Fire Host 12/28/2007 6:52:52 PM User Mode (1)

7. In this report, the Shadow CMS application takes the information already stored and formats the data base on an extension number. In this case, extension 45207 was used.



7. Support

Technical support for Shadow CMS can be obtained by contacting Resource Software International Systems, Ltd. at:

- Phone: 800-891-6014 / 905-576-4575
- E-mail: support@telecost.com
- Web: www.telecost.com

8. Conclusion

These Application Notes describe the steps for configuring the Revolution Software International Shadow Communication Management System to retrieve SMDR/CDR data from the Avaya IP Office. All test cases completed successfully.

9. References

The following Avaya product documentation can be found at <http://support.avaya.com>

[1] Avaya IP Office 4.0 Installation Manual, Issue 15e (31st January 2007), 15-601042.

The following Resource Software International product documentation is installed during the CMS installation process:

[2] CMS Startup Guide.

[3] CMS User Guide.

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