



Avaya Solution & Interoperability Test Lab

Application Notes for Hansen Software CASH+ Call Accounting with Avaya Communication Manager - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Hansen Software Corporation CASH+ Call Accounting to successfully interoperate with Avaya Communication Manager. CASH+ is a call accounting solution designed to meet the needs of a wide range of businesses. Call Detail Recording (CDR) records from Avaya Communication Manager are sent over a TCP/IP connection to the CASH+ server where the records are captured and saved. Over 100 reports are available using numerous search functions to easily track down specific call details.

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 Hansen Software Corporation CASH+ Call Accounting (Version 3.0) to successfully interoperate with Avaya Communication Manager (Version 5.1.2). CASH+ provides a comprehensive call accounting solution that may be customized in many ways for a wide range of business needs.

Avaya Communication Manager is configured to generate CDR data for all inbound, outbound, and internal calls. The CDR data is sent over a TCP/IP connection to an IP address and port specified in the Avaya Communication Manager configuration. CASH+ is configured to listen for CDR data on that same port specified in the Avaya Communication Manager configuration. CASH+ collects and stores all Call Detail Recording (CDR) records generated from Avaya Communication Manager. The raw CDR data is stored in the CASH+ database for later retrieval and report generation.

CASH+ typically processes CDR records that include date, time, call duration, calling/destination parties, call authorization, account code and line/trunk information. Integrating the CDR records with the local customization and the numerous search functions makes the formatted reports very informative to businesses.

1.1. Interoperability Compliance Testing

The CASH+ software may be run as either a Windows application or as a Windows Service. For compliance testing, only the Windows application was tested.

CASH+ provides two Avaya Communication Manager CDR data filters, **Avaya (ACM) Ver 3.0 Expanded** and **Avaya (ACM) Version 4.0 Expanded**. The **Avaya (ACM) Ver 3.0 Expanded** filter supports the Avaya Communication Manager Legacy Expanded CDR format. The Legacy Expanded format was used exclusively in Avaya Communication Manager up through Release 3.x. The **Avaya (ACM) Version 4.0 Expanded** filter supports the latest Avaya Communication Manager Expanded CDR format (first introduced in Release 4.x). Both CASH+ filters for Avaya Communication Manager were fully tested; however, these Application Notes will only show screen shots for the **Avaya (ACM) Version 4.0 Expanded** filter configuration.

Interoperability compliance testing consisted of placing internal calls on Avaya Communication Manager, as well as inbound and outbound calls over various types of trunks. Several call scenarios were tested including call conferences, call transfers, holds/reconnects, call forwarding, bridging, etc. Verification steps were taken after each call scenario to ensure CASH+ properly classified the CDR records and it accurately displayed the CDR records in a formatted report. Serviceability testing was also completed to ensure CASH+ properly resumed operation after network outages, Avaya Communication Manager outages, and outages on the server hosting CASH+. For complete test results, refer to **Section 6**.

1.2. Support

Technical support for CASH+ can be obtained by contacting Hansen Software Corporation at:

- Phone: 1-877-795-2274
- E-mail: info@hansensoftware.com
- Web: <http://www.hansensoftware.com/>

2. Reference Configuration

The test configuration in **Figure 1** (below) was used to compliance test the interoperability of the Hansen Software Corporation CASH+ Call Accounting and Avaya Communication Manager. The figure shows three separate communication systems each running Avaya Communication Manager on separate media servers. The first system (Site A) is comprised of an Avaya S8500 Server with an Avaya G650 Media Gateway. The second system (Site B) is comprised of an Avaya S8300 Server with an Avaya G450 Media Gateway. Sites A and B are connected via an IP (H.323) trunk and an ISDN-PRI trunk. The third system (Site C) is comprised of an Avaya S8300 Server with an Avaya G350 Media Gateway. Site C is configured as an LSP to Site A. Initially, the 4600 Series Avaya IP Telephones at Site C register to a CLAN in the Avaya G650 Media Gateway at Site A. When the CLAN is not available, the 4600 Series Avaya IP Telephones will register to the S8300 at Site C. The CASH+ Call Accounting system will be connected to and will collect CDR records from Site A. The telephones were used to generate intra-switch calls, inter-switch calls (via the H.323 and ISDN-PRI trunks), and calls to and from the PSTN. In addition, a PC hosting the Avaya Reliable Data Test Tool (RD TT) was be connected to Site A to compare the records received by RD TT with the CDR data received and stored on the CASH+ Call Accounting system.

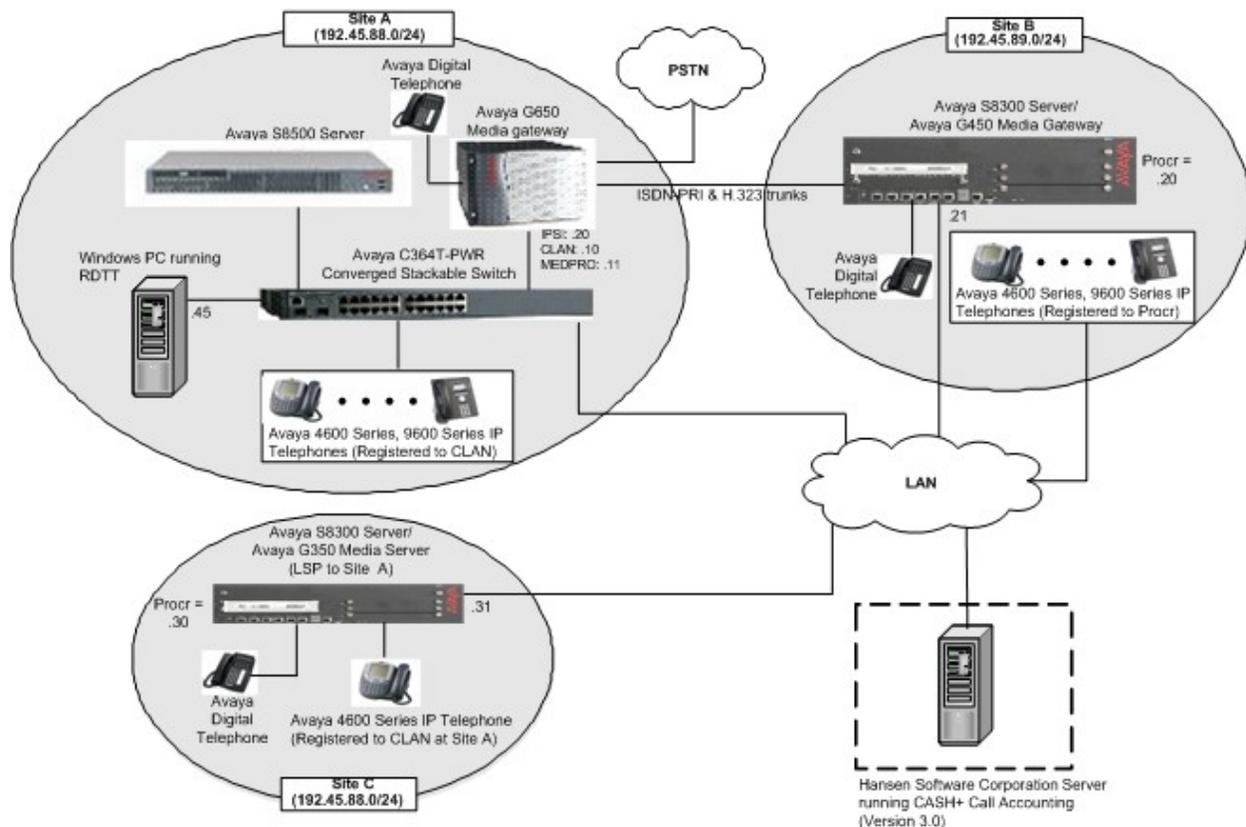


Figure 1: Compliance Test Configuration

3. Equipment and Software Validated

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

Equipment	Software
Avaya™ S8500 Media Server	Avaya™ Communication Manager 5.1.2 (R015x.01.2.416.4)
Avaya™ S8300 Media Server	Avaya™ Communication Manager 5.1.2 (R015x.01.2.416.4)
Avaya™ G650 Media Gateway : TN799DP (C-LAN) TN2602AP (MEDPRO) TN232BP	HW01, FW026 HW02, FW007 HW15, FW030
Avaya™ G450 Media Gateway : MM710BP (DS1) MM712AP (DCP)	HW11, FW044 HW07, FW009
Avaya™ G350 Media Gateway : MM710AP (DS1) MM712AP (DCP)	HW02, FW019 HW05, FW009
Avaya™ 1600 Series IP Phones : 1608SW (H.323) 1616SW (H.323)	1.0.3 1.0.3
Avaya™ 4600 Series IP Phones : 4610SW (H.323) 4620SW (H.323) 4621SW (H.323)	2.9 2.9 2.9
Avaya™ 6400 Series Digital Phones	-
Avaya™ 9600 Series IP Phones : 9620 (H.323)	2.0.0
Avaya™ C364T-PWR Converged Stackable Switch	4.5.14
Hansen Software Corporation CASH+ Call Accounting Server	3.0

4. Configure Avaya Communication Manager

This section provides the procedures for configuring Avaya Communication Manager. Please note that it is expected that the installer is familiar with configuring stations, agents, vectors, VDNs, etc., as necessary on Avaya Communication Manager. The focus of these Application Notes is on the configuration of the CDR interface only. For all other provisioning information, such as software installation, installation of optional components, basic configuration of Avaya Communication Manager, etc., refer to the Avaya Communication Manager product documentation in **References [1] and [2]**.

The System Administration Terminal (SAT) interface was used for all Avaya Communication Manager configuration in the following steps.

1. Enter the **change node-names ip** command. Create a node name for the CASH+ server and enter the IP address of that server. Note the node-name of the C-LAN board that will be used for the CDR connection.

```
change node-names ip                                     Page 1 of 2
```

		IP NODE NAMES
Name	IP Address	
8300	192.45.89.20	
CLAN	192.45.88.10	
CLAN2	192.45.88.13	
CLAN3	192.45.88.14	
CLAN4	192.45.88.15	
Hansen-CDR	192.168.199.69	
LSP-8300	192.45.88.30	
RDTT-CDR	192.45.88.45	

2. Enter the **change ip-services** command. On **Page 1**, define a CDR link by setting the **Service Type** to "CDR1". Set **Local Node** to the node-name of the C-LAN board to be used for the CDR connection (as noted in **Step 1**). **Local Port** is fixed at "0". Set **Remote Node** to the node-name of the CASH+ server (as configured in **Step 1**). Set **Remote Port** to the port that the CASH+ server will use to listen for the CDR connection.

```
change ip-services                                     Page 1 of 4
```

			IP SERVICES		
Service Type	Enabled	Local Node	Local Port	Remote Node	Remote Port
AESVCS	y	CLAN2	8765		
AESVCS	y	CLAN3	8765		
AESVCS	y	CLAN4	8765		
CDR1		CLAN	0	Hansen-CDR	9000

On Page 3, set **Reliable Protocol** to “n”.

```
change ip-services
```

Page 3 of 4

Service Type	Reliable Protocol	SESSION LAYER TIMERS				Connectivity Timer
		Packet Resp Timer	Session Message Cntr	Connect Cntr	SPDU Cntr	
CDR1	n	30	3	3	60	

3. Enter the **change system-parameters cdr** command. Configure the fields on **Page 1** as follows:

- **CDR Date Format:** “month/day”
- **Primary Output Format:** “expanded”
- **Primary Output Endpoint:** “CDR1”
- **Use Legacy CDR Formats?** “n” *
- **Intra-switch CDR?** “y”
- **Outg Trk Call Splitting?** “y”
- **Inc Trk Call Splitting?** “y”

** Note: To use the Avaya Communication Manager Legacy format, set **Use Legacy CDR Formats?** to “y”.*

```
change system-parameters cdr
```

Page 1 of 1

CDR SYSTEM PARAMETERS

Node Number (Local PBX ID):	CDR Date Format: month/day
Primary Output Format: expanded	Primary Output Endpoint: CDR1
Secondary Output Format:	
Use ISDN Layouts? n	Enable CDR Storage on Disk? y
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	
Record Called Vector Directory Number Instead of Group or Member? n	Calls to Hunt Group - Record: group-ext
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: 6

4. Enter the **change intra-switch-cdr** command. Enter all extensions for which intra-switch CDR is to be enabled.

```

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

Assigned Members: 43 of 5000 administered
Extension          Extension          Extension          Extension
30001              31006              32011
30002              31007              32012
30003              31008              32013
30004              31009              32014
30005              31010              32015
30006              32001              32016
30020              32002              32017
30021              32003              32018
30031              32004              32019
31000              32005              32020
31001              32006              32021
31002              32007              32022
31003              32008              32023
31004              32009
31005              32010

```

5. Configure Hansen Software Corporation CASH+ Server

The configuration information provided in this section describes the steps required to configure CASH+ to listen for CDR records from Avaya Communication Manager.

For all other provisioning information, such as software installation, configuration of CASH+ for call accounting, report generation, etc., please refer to the CASH+ product documentation in **References [3] and [4]**.

The information provided in this section assumes the Hansen Software Corporation CASH+ Call Accounting application has already been successfully installed and licensed on the host server. However, **Step 1** below is an exception because it is part of the installation process.

1. As part of the installation process, the Setup screen below is displayed. Select **Avaya (ACM) Ver 4.0 Expanded** for the **Phone System***. Add **Name** and **Address** information as appropriate, and place an appropriate telephone number in the **Area Code**, **Exchange**, and **Number** fields. Select **Record Incoming Calls**, **Record Local Calls**, **Record Long Distance Calls**, **Record Extension Calls**, and **Enable 10 Digit North American Calls**, as appropriate. Click **OK** and complete the installation process.

The screenshot shows the 'Setup' window with the following configuration:

- Phone System:** Avaya (ACM) Ver 4.0 Expanded
- Name:** Hansen Software
- Address:** #300-1855 Kirschner Road, Kelowna BC V1Y 4N7
- Area Code:** 250, **Exchange:** 861, **Number:** 9166
- Number of trailing account code digits:** 0
- Auto Purge Calls After:** 0 days (Use 0 to disable)
- Enable Security:**
- Use Hotel Features:**
- Use MultiSite:**
- Call Recording Options:**
 - Record Incoming Calls:
 - Record Local Calls:
 - Record Long Distance Calls:
 - Record Extension Calls:
 - Account Code is Pin Number:
 - Enable 10 Digit North American Calls:
 - Cost 10 Digit North American Calls:
 - Enable overriding Int. Rate Band:
 - Enable overriding Int. Mobile Rate Band:
 - Enable overriding N. American Rate Band:
- Tax Table:**

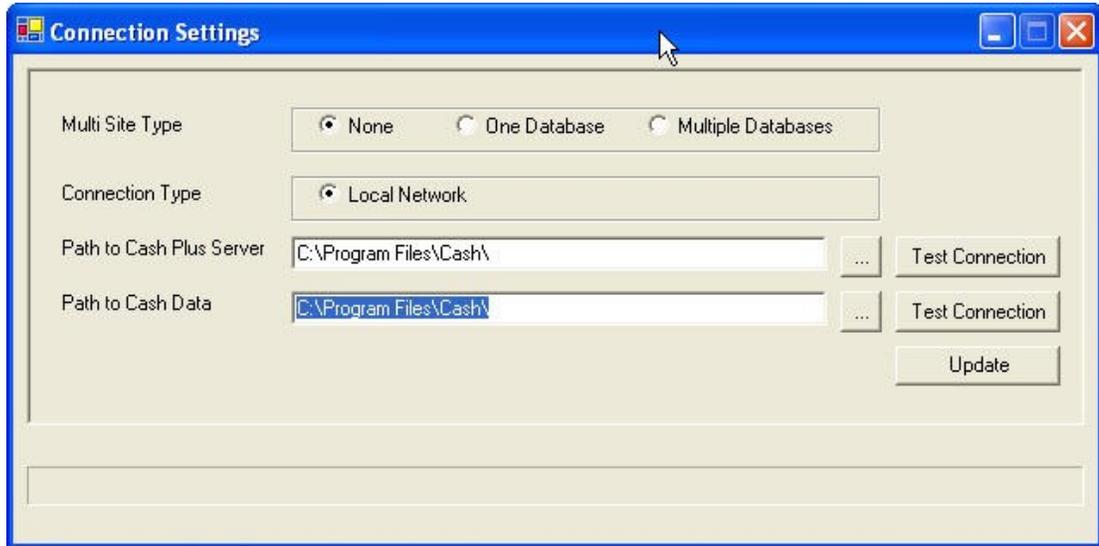
Description	Rate
Tax 1: GST	5.000%
Tax 2: Tax 2	0.000%
Tax 3: Tax 3	0.000%

** Note: To use the Avaya Communication Manager Legacy format, select **Avaya (ACM) Ver 3.0 Expanded** for the **Phone System**.*

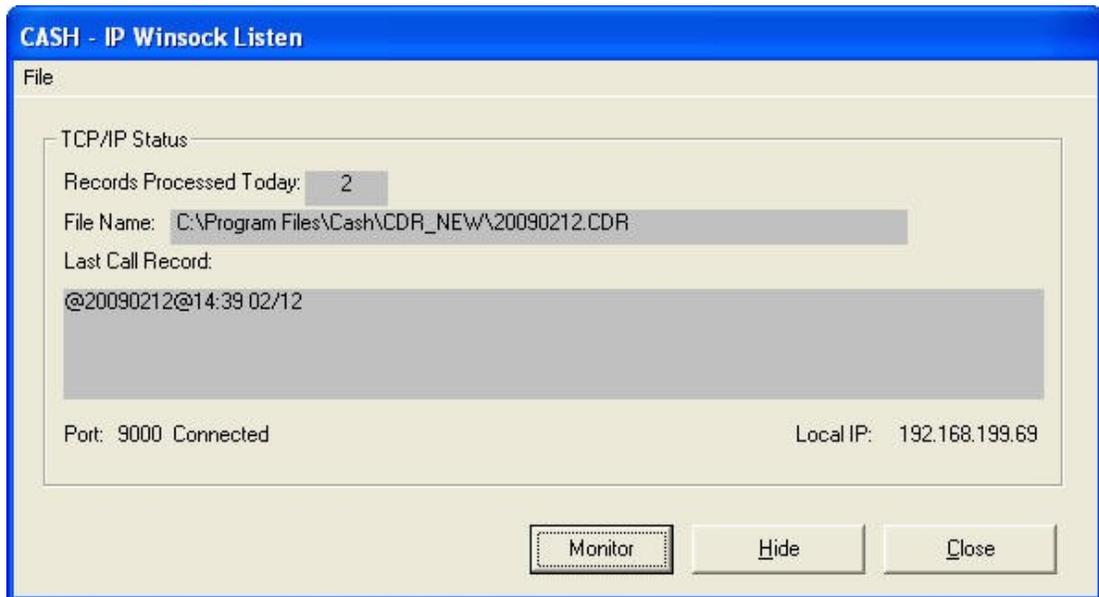
2. Navigate to **Start** → **All Programs** → **CASH Call Accounting** → **Cash Plus Admin**. The **Cash+ Administration** screen is displayed as illustrated below. The **Admin Setup** displays the same screen shown in **Step 1**. **Connection Settings** is illustrated in **Step 3** below. The other buttons, **Email List** and **Email Groups**, deal with customization for business office needs. See **Reference [4]** for more information.



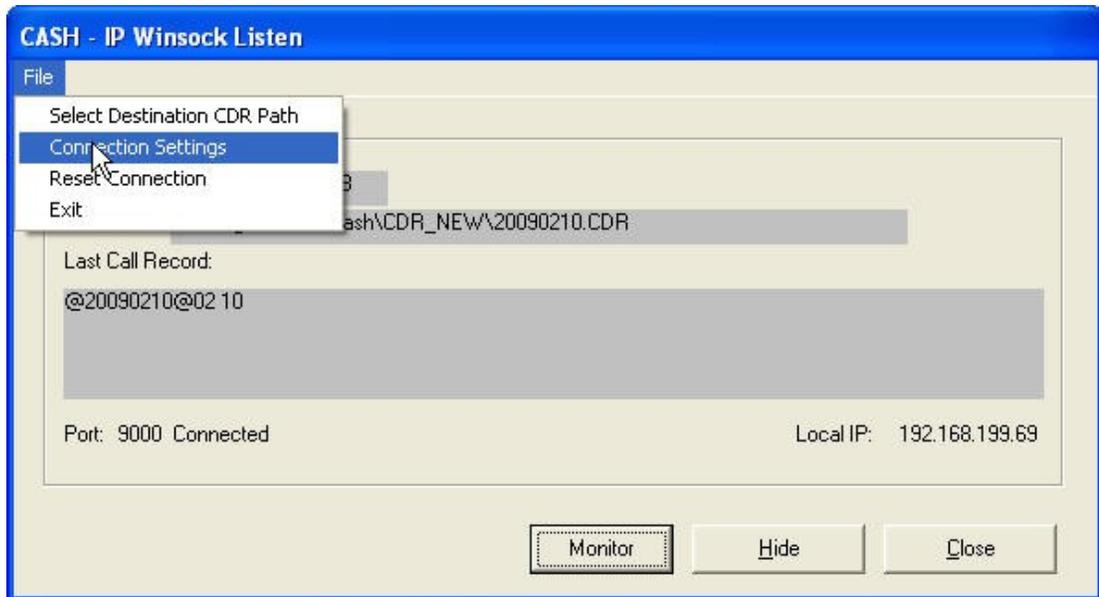
3. Click **Connection Settings**. The **Connection Settings** screen illustrated below turns on and tests the server and database functionality. For the compliance testing, only one database was used and both the **Path to Cash Plus Server** and **Path to Cash Data** were located on the Hansen Software Corporation CASH+ server. Click **Update**.



4. Navigate to **Start** → **All Programs** → **CASH Call Accounting** → **Cash Log**. The **CASH – IP Winsock Listen** screen is displayed as illustrated below. The **Local IP** address should be the IP address of the CASH+ server.



- From within the **CASH – IP Winsock Listen** screen (**Step 4**), select the **File** menu and then select **Connection Settings**. The **IP Winsock Settings** screen is displayed as illustrated in **Step 6**.



- Enter the **Port Number** and click **Update**. The **Port Number** on the **IP Winsock Settings** screen below must match the **Remote Port** number entered on the **change ip-services** screen during **Step 2** of the Avaya Communication Manager configuration.

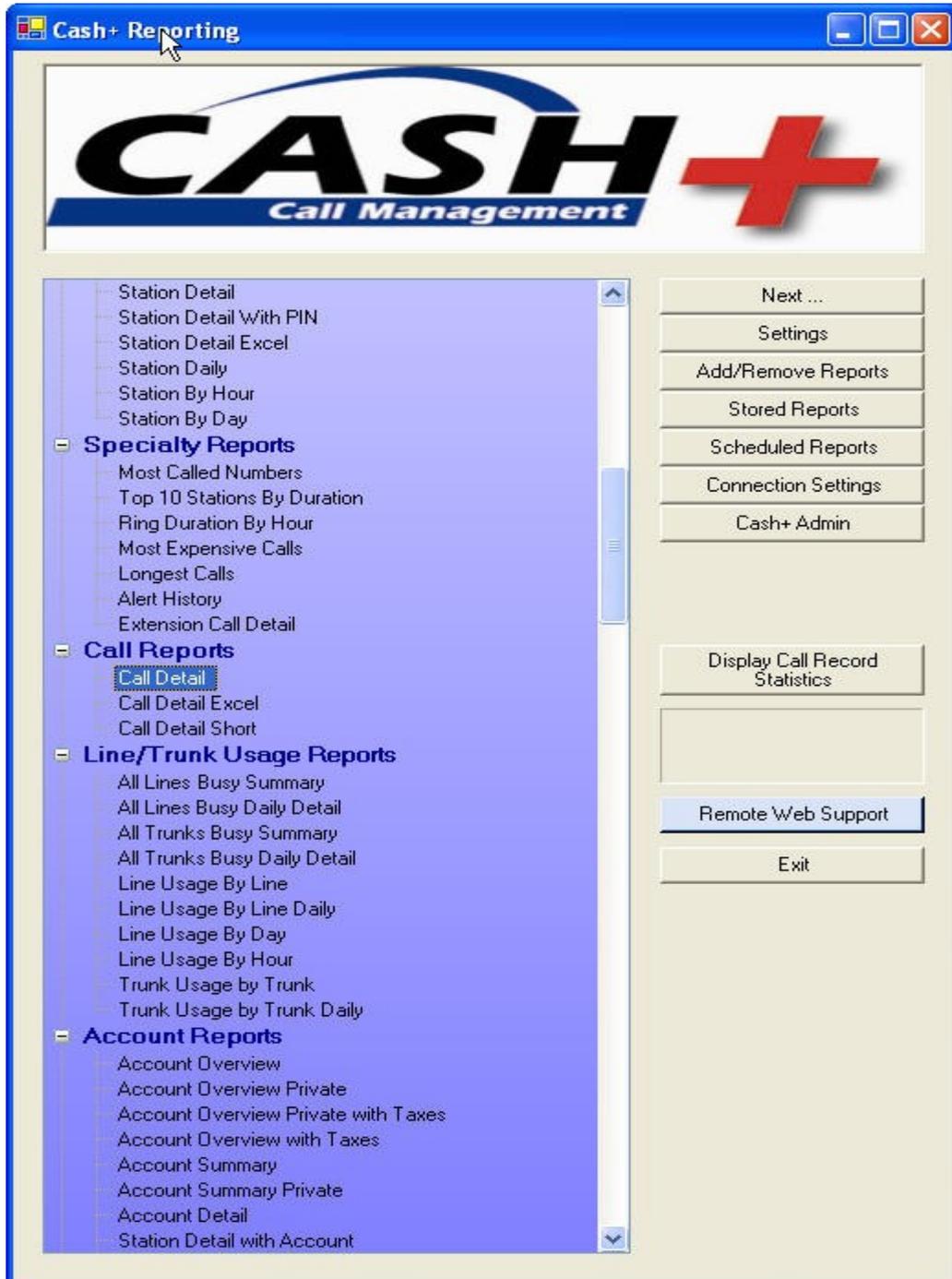


This completes the steps required to establish a CDR connection between Avaya Communication Manager and the CASH+ server.

7. To view CDR data, from the **CASH – IP Winsock Listen** screen shown in **Step 4**, click **Monitor**. The **Call Monitor** screen is displayed as illustrated below. Raw CDR records are displayed in near real-time as they occur. Initially, since no CDR records have been processed, the **Call Monitor** screen should be clear of CDR records as shown below. Click **Close** on the **Call Monitor** screen, and then click **Hide** on the **CASH – IP Winsock Listen** screen (**Step 4**).



8. To create and view customized Reports, navigate to **Start** → **All Programs** → **CASH Call Accounting** → **Cash Plus Reports**. The **Cash+ Reporting** screen is displayed as illustrated below. The **Cash+ Reporting** screen is shown with all the report modules enabled, however modification within the **Add/Remove Reports** button can streamline the report details to fit business needs. For compliance testing, the **Call Reports** → **Call Detail** was selected. Click **Next**.



9. The **Call Detail – Select Report Criteria** screen should display as illustrated below. Select the criteria from the **Select Field** column and click the **Add Rule** button. Click the **Add Rule** button for each criterion selected. Once the business criterion has been selected, click **Preview Report** to view the immediate report results on screen.

Call Detail - Select Report Criteria

Record Selection | Sort Orders

And Or Is

Departments

Select Field

- Account
- Account List
- Area Code
- City
- Country
- Date Advanced Options
- Date Range
- Date/Time Range
- Department Number
- Departments List
- Duration (in seconds)

Administration
Administration
Customer Service
Programming
Rooms
Sales

Add Rule Delete Rule

Date = @@Today
AND Departments List = Administration

Print Report Preview Report
Email Report ... Save Definition
Save Scheduled Save As...
Close

This completes configuration of CASH+.

6. General Test Approach and Test Results

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

6.1. General Test Approach

The general test approach was to enable CASH+ to collect CDR records from Avaya Communication Manager. Calls were placed internally as well as inbound and outbound over

various types of trunks. Several call scenarios were tested including call conferences, call transfers, hold/reconnects, call forwarding, bridging, etc. The following was verified:

- CASH+ properly classified the CDR records.
- CASH+ properly displayed the CDR records in a formatted report.
- CASH+ properly resumed operation after network outages, Avaya Communication Manager outages, and outages on the server hosting CASH+.

6.2. Test Results

All feature test cases were executed and passed. CASH+ successfully captured and processed call records from Avaya Communication Manager, with the following observations:

All serviceability test cases were executed and passed. CASH+ was able to resume CDR record collection after Avaya Communication Manager was reset or lost its network link, without requiring manual intervention. In cases where the CASH+ server lost power or its network link, CASH+ was able to successfully resume collecting CDR records once the server was back online. The following serviceability observations were made:

1. CASH+ does not currently support CDR using Reliable Data Transport. The connection status displayed by CASH+ is not always accurate since CDR link outages are not recognized by CASH+ in a timely manner. The **status cdr-link** command on Avaya Communication Manager should be used to properly determine the CDR link connection status.
2. CASH+ does not currently support Avaya's survivable CDR procedures. Although CASH+ is capable of properly processing the CDR data files at remote sites served by an LSP or ESS, CASH+ does not automatically poll each Avaya Communication Manager periodically at the main and remote sites to collect the data files.

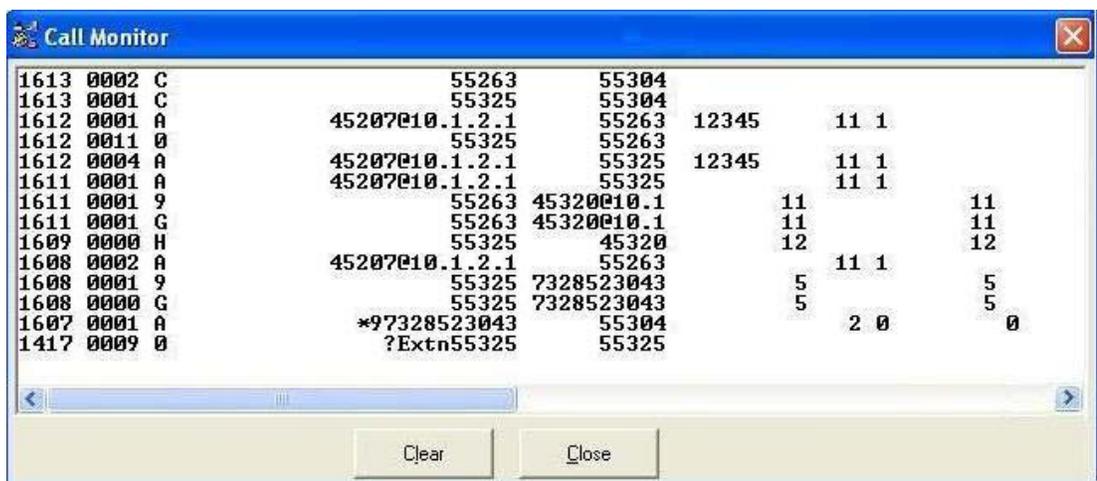
7. Verification Steps

The following steps may be used to verify the configuration:

1. On the SAT for Avaya Communication Manager, enter the **status cdr-link** command to verify that the **Link State** is “up”.

```
status cdr-link
                                CDR LINK STATUS
                                Primary                Secondary
Link State: up                                CDR not administered
Date & Time: 2009/2 /12 15:30:59                0 /0 /0 0 :0 :0
Forward Seq. No: 12                              0
Backward Seq. No: 0                              0
CDR Buffer % Full: 0.00                          0.00
Reason Code: OK
```

2. Place telephone calls between local extensions, as well as inbound and outbound calls over various types of trunks. In all cases, allow calls to remain active for at least six seconds.
3. On the CASH+ **Call Monitor** screen, view the raw CDR records as the calls are completed. The **Call Monitor** screen below illustrates how CDR records are displayed as they are being completed along with their call attributes. Verify the data is correct.



- On the **CASH+ Reporting** interface, create a **Call Detail** formatted report. In this case, the raw CDR records from **Step 2** have been formatted into a simple Call Detail Report.

Call Detail Report

Rod's Grand Hotel

All Records Selected

Date	Time	Duration	T-A(s)	Str	I/O	Phone Number	Location	Line	Trunk	Dept	Pin	Account	Cost
03/10/2008	9:52:42 AM	00:00:18	0	55325	I	(732)-852-3118	RED BANK, NJ	2	2	0001		12345	\$0.00
03/10/2008	9:55:42 AM	00:00:18	0	55325	O	(732)-852-3043	RED BANK, NJ	2		0001		12345	\$0.00
03/10/2008	10:02:48 AM	00:00:12	0	55304	E	55325				0001			\$0.00
03/10/2008	10:14:54 AM	00:00:08	0	55325	I	(732)-852-3043	RED BANK, NJ	5	5	0001			\$0.00
03/10/2008	11:23:08 AM	00:00:54	0	55325	O	(?Ex)-tn5-5325				0001			\$0.00
03/10/2008	2:16:08 PM	00:00:54	0	55325	O	(?Ex)-tn5-5325				0001			\$0.00
03/10/2008	4:06:54 PM	00:00:08	0	55304	O	(732)-852-3043	RED BANK, NJ	2		0001			\$0.00
03/10/2008	4:07:48 PM	00:00:12	0	55283	E	45207		11		0001			\$0.00
03/10/2008	4:07:54 PM	00:00:08	0	55325	I	(732)-852-3043	RED BANK, NJ	5	5	0001			\$0.00
03/10/2008	4:10:54 PM	00:00:08	0	55283	I			11	11	0001			\$0.00
						45320@10.1							
03/10/2008	4:10:54 PM	00:00:08	0	55325	E	45207		11		0001			\$0.00
03/10/2008	4:10:54 PM	00:01:08	0	55283	E	55325				0001			\$0.00
03/10/2008	4:11:36 PM	00:00:24	0	55325	E	45207		11		0001		12345	\$0.00
03/10/2008	4:11:54 PM	00:00:08	0	55283	E	45207		11		0001		12345	\$0.00
03/10/2008	4:12:48 PM	00:00:12	0	55283	E	55304				0001			\$0.00
03/10/2008	4:12:54 PM	00:00:08	0	55325	E	55304				0001			\$0.00
Number of calls: 16												Average Duration: 00:00:20	Cost: \$0.00
												Total	\$0.00

8. Conclusion

These Application Notes describe the steps for configuring Hansen Software Corporation CASH+ Call Accounting application to retrieve CDR data from Avaya Communication Manager. All test cases were completed successfully.

9. Additional References

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

[1] *Feature Description and Implementation for Avaya Communication Manager*, Doc ID: 555-245-205, Issue 6, January 2008

[2] *Administrator Guide for Avaya Communication Manager*, Doc ID: 03-300509, Issue 4.0, Release 5.0, January 2008

The following Hansen Software product documentation can be found at <http://www.hansensoftware.com/dl/documentation.htm>:

[3] *CASH+ Install Guide*

[4] *CASH+ User Guide*

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