



## **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**.

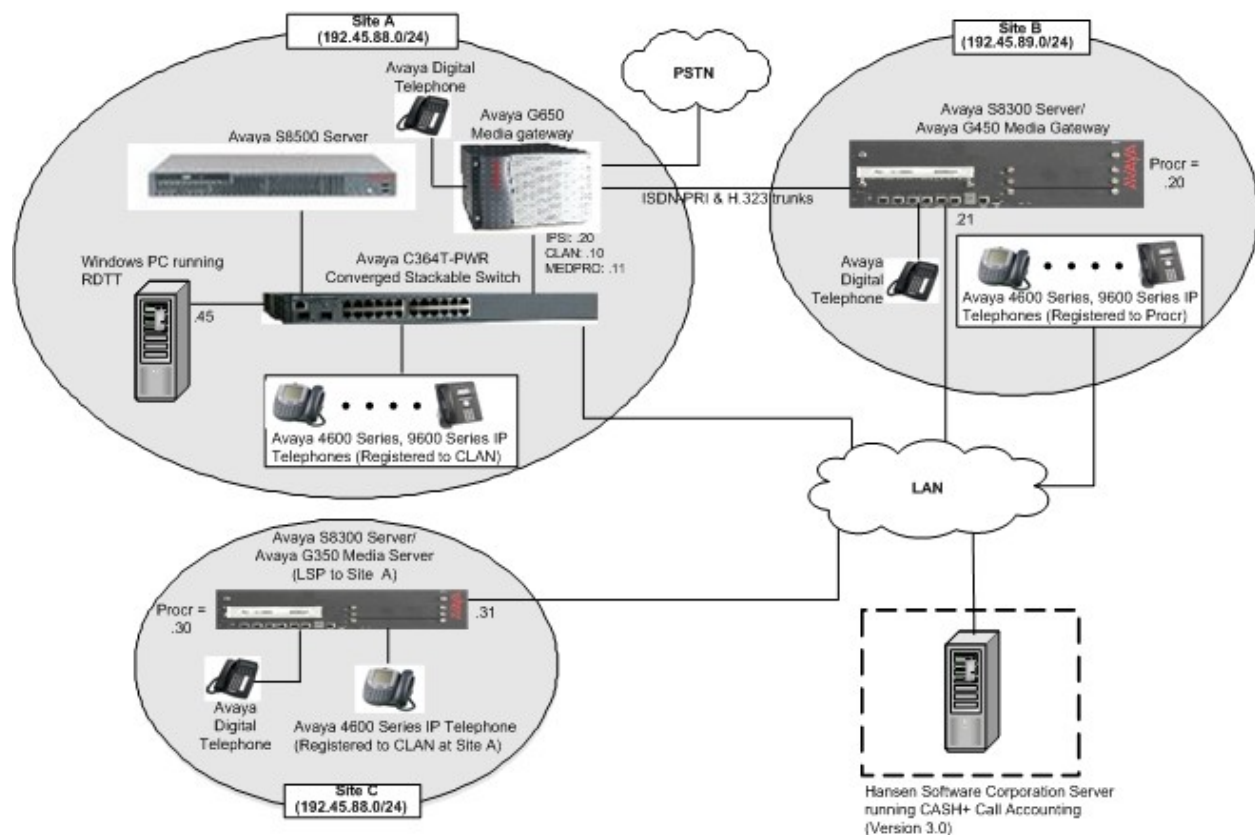
## 1.2. Support

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

- Phone: 1-877-795-2274
- E-mail: [info@hansensoftware.com](mailto: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		
<b>CLAN</b>	<b>192.45.88.10</b>		
CLAN2	192.45.88.13		
CLAN3	192.45.88.14		
CLAN4	192.45.88.15		
<b>Hansen-CDR</b>	<b>192.168.199.69</b>		
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		
<b>CDR1</b>		<b>CLAN</b>	<b>0</b>	<b>Hansen-CDR</b>	<b>9000</b>

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

change ip-services					Page	3 of	4
SESSION LAYER TIMERS							
Service Type	Reliable Protocol	Packet Resp Timer	Session Connect Message Cntr	SPDU Cntr	Connectivity Timer		
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):				<b>CDR Date Format: month/day</b>			
<b>Primary Output Format: expanded</b>				<b>Primary Output Endpoint: CDR1</b>			
Secondary Output Format:							
Use ISDN Layouts? n				Enable CDR Storage on Disk? y			
Use Enhanced Formats? n				Condition Code 'T' For Redirected Calls? n			
<b>Use Legacy CDR Formats? n</b>				Remove # From Called Number? n			
Modified Circuit ID Display? n				<b>Intra-switch CDR? y</b>			
Record Outgoing Calls Only? n				<b>Outg Trk Call Splitting? y</b>			
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			
<b>Inc Trk Call Splitting? y</b>				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.

Setup

Phone System: Avaya (ACM) Ver 4.0 Expanded

Name: Hansen Software

Address: #300-1855 Kirschner Road  
Kelowna BC V1Y 4N7

Fax:

E-Mail:

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: ☐

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: ☐

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

Use MultiSite: ☐

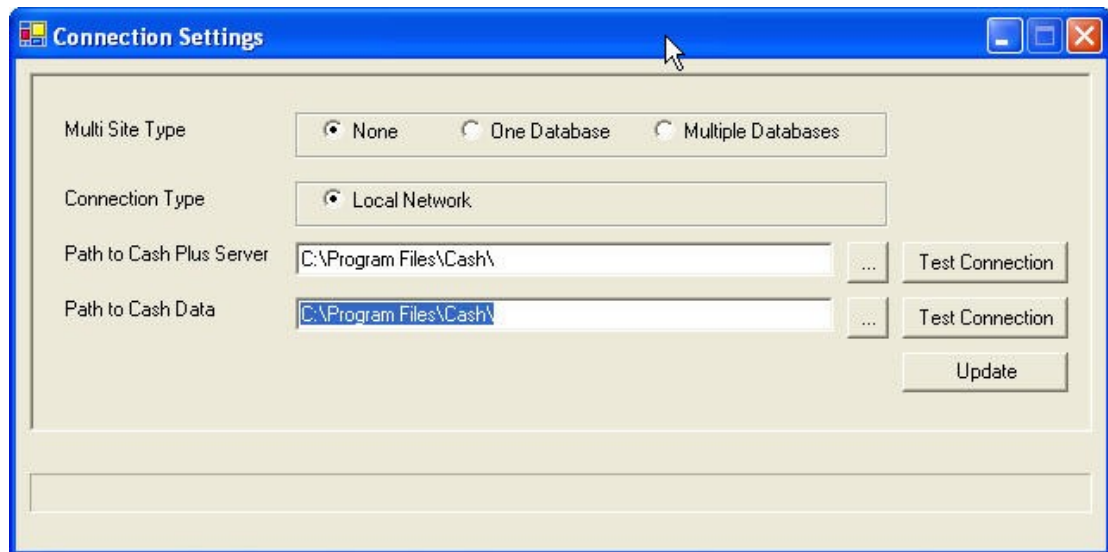
Cancel OK

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

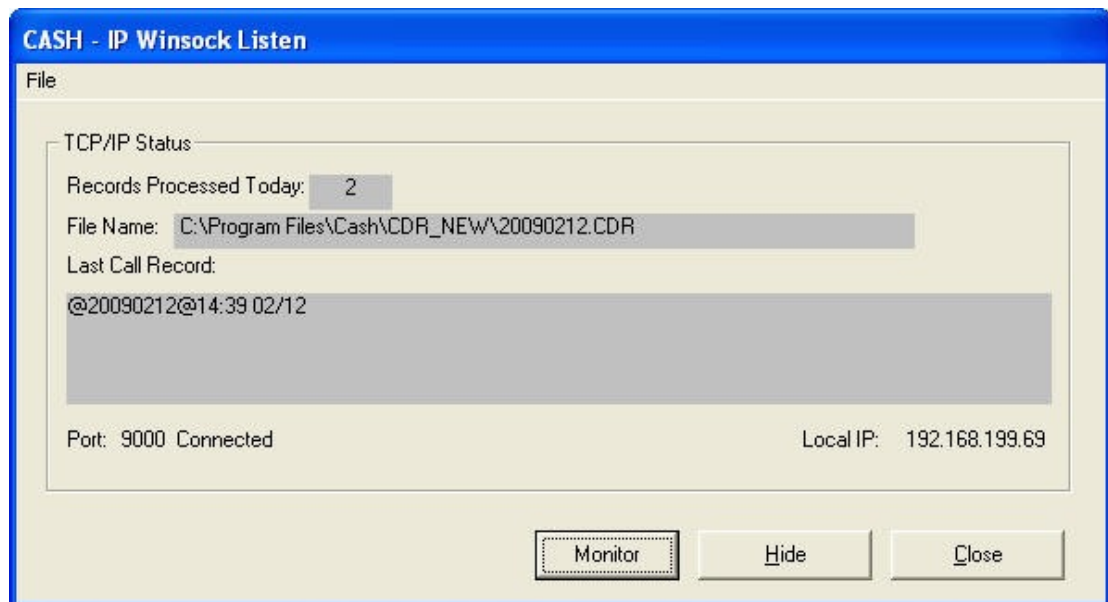
2. Navigate to **Start** → **All Programs** → **CASH Call Accounting** → **Cash Plus Admin**. The **Cash+ Administration** screen is displayed as illustrated below. The **Admin Setup** displays the same screen shown in **Step 1**. **Connection Settings** is illustrated in **Step 3** below. The other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



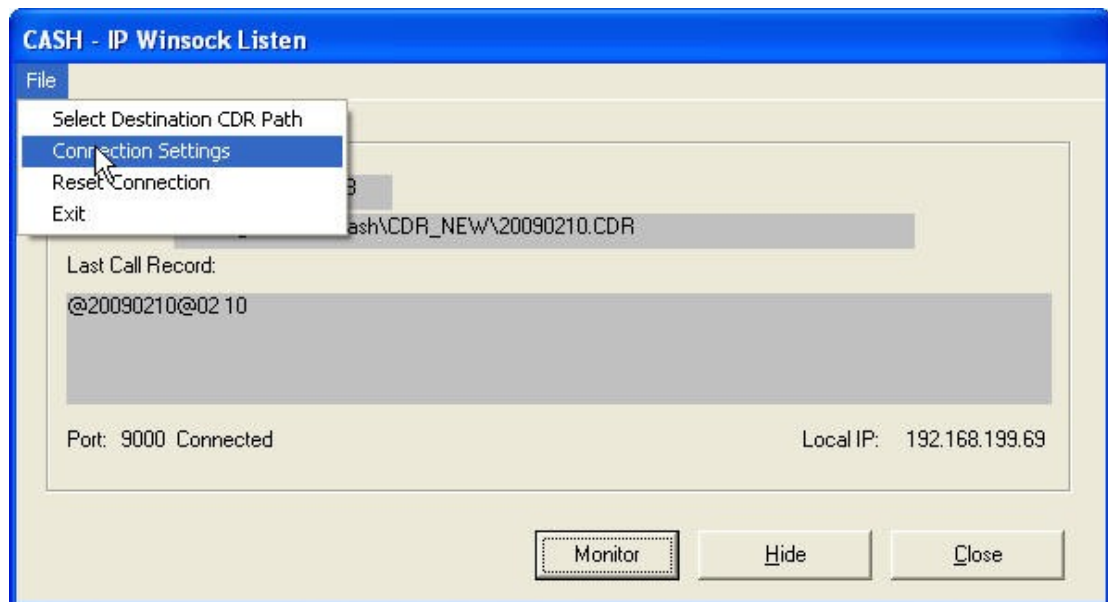
3. Click **Connection Settings**. The **Connection Settings** screen illustrated below turns on and tests the server and database functionality. For the compliance testing, only one database was used and both the **Path to Cash Plus Server** and **Path to Cash Data** were located on the Hansen Software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



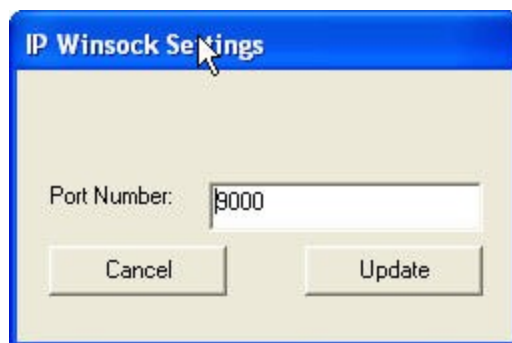
4. Navigate to **Start** → **All Programs** → **CASH Call Accounting** → **Cash Log**. The **CASH – IP Winsock Listen** screen is displayed as illustrated below. The **Local IP** address should be the IP address of the CASH+ server.



- 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**.

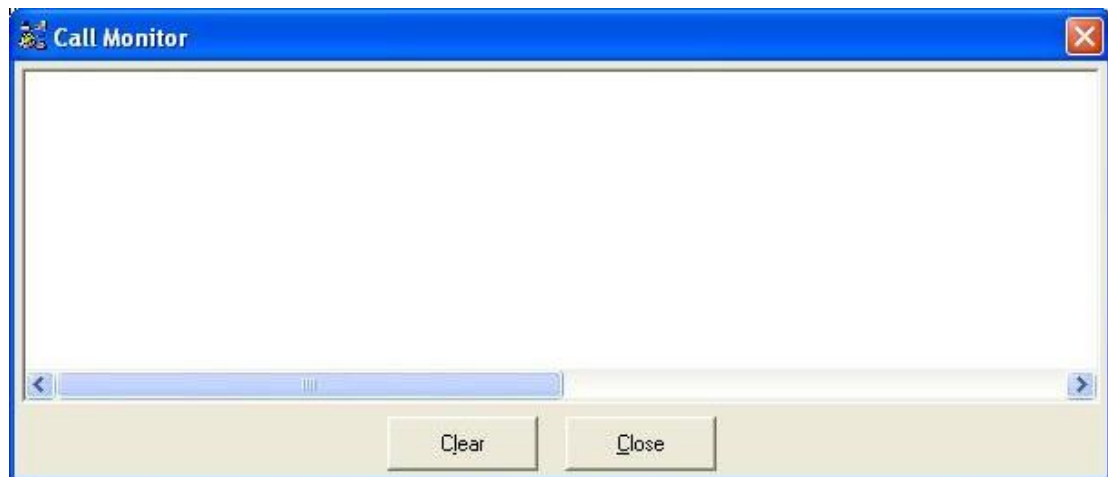


- Enter the **Port Number** and click **Update**. The **Port Number** on the **IP Winsock Settings** screen below must match the **Remote Port** number entered on the **change ip-services** screen during **Step 2** of the Avaya Communication Manager configuration.

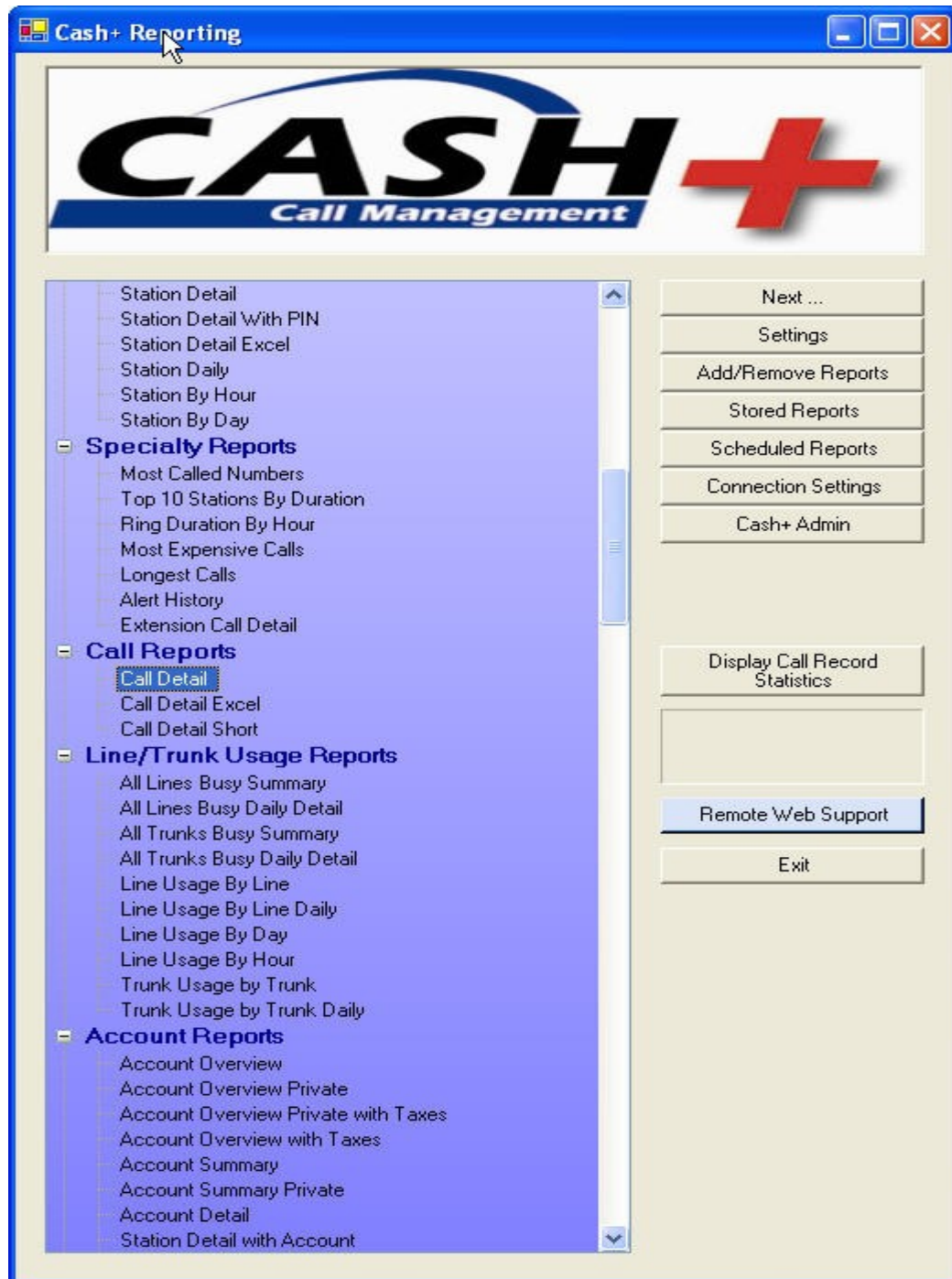


This completes the steps required to establish a CDR connection between Avaya Communication Manager and the CASH+ server.

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

**Select Field**

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

**Departments**

- 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
```

	Primary	CDR LINK STATUS	Secondary
<b>Link State:</b>	<b>up</b>		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.

Call Monitor									
1613	0002	C		55263	55304				
1613	0001	C		55325	55304				
1612	0001	A	45207010.1.2.1	55263	12345	11	1		
1612	0011	0		55325	55263				
1612	0004	A	45207010.1.2.1	55325	12345	11	1		
1611	0001	A	45207010.1.2.1	55325		11	1		
1611	0001	9		55263	45320010.1	11		11	
1611	0001	G		55263	45320010.1	11		11	
1609	0000	H		55325	45320	12		12	
1608	0002	A	45207010.1.2.1	55263		11	1		
1608	0001	9		55325	7328523043	5		5	
1608	0000	G		55325	7328523043	5		5	
1607	0001	A	*97328523043	55304		2	0		0
1417	0009	0	?Extn	55325	55325				

4. 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)	Stn	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													
000:05:12													
Average Duration: 00:00:20													

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*

---

**©2009 Avaya Inc. All Rights Reserved.**

Avaya and the Avaya Logo are trademarks of Avaya Inc. All trademarks identified by ® and ™ are registered trademarks or trademarks, respectively, of Avaya Inc. All other trademarks are the property of their respective owners. The information provided in these Application Notes is subject to change without notice. The configurations, technical data, and recommendations provided in these Application Notes are believed to be accurate and dependable, but are presented without express or implied warranty. Users are responsible for their application of any products specified in these Application Notes.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya DevConnect Program at [devconnect@avaya.com](mailto:devconnect@avaya.com).