



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Libatel SharpDial with Avaya Aura® Communication Manager R7.0 - Issue 1.0

Abstract

These Application Notes describe the configuration steps for provisioning Libatel's SharpDial Call Detail Recording Solution to successfully interoperate with Avaya Aura® Communication Manager R7.0. The Libatel's SharpDial solution consists of a Call Detail Recording server based on the logging of outgoing, incoming and internal calls data reported by Avaya Aura® Communication Manager, to manage captured data and generate reports. The monitoring of Call Detail Recording using Libatel's SharpDial, a web-SQL based call accounting solution, gives a detailed account of all calls made and received by the Avaya Aura® Communication Manager R7.0.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

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

Libatel SharpDial (SharpDial) is a web-SQL based call accounting solution used to log outgoing, incoming and internal call data sent by Avaya Aura® Communication Manager (Communication Manager), to manage captured data and generate reports. SharpDial connects to Communication Manager that sends Call Detail Record (CDR) on a Transmission Control Protocol (TCP) port (client or server). When connected to Communication Manager, no parser is needed. SharpDial Components are:

1. **Monitor Service:** SharpDial Monitor Service is responsible for starting and stopping all SharpDial services, also responsible for sending heartbeat and notification emails at configurable intervals to configured email addresses.
2. **Process0 Service:** Responsible for establishing connection with multi-site PBX and logging data in the Process0 databases table.
3. **Engine Service:** Engine Service is responsible for pricing all incoming, outgoing and internal calls.
4. **Parser (optional):** Acting as a bridge, responsible for converting CDR data into standard format, recognized by the SharpDial engine.
5. **License Service:** Manage solution license.
6. **Administration and reporting interface:** Web based interface used for updating the software's database and generating reports.

2. General Test Approach and Test Results

The test environment comprises of a Communication Manager connected to a simulated PSTN in order to generate CDR information for incoming, outgoing and internal calls. The information captured consists of call information originating and terminating on Avaya 96x1Series IP Deskphones with H.323 firmware. The information on calls made and received is presented in a reporting structure by a web interface on the SharpDial server.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

This section contains a summary of test cases carried out to validate the various capabilities of the solution and to show the interoperability of the SharpDial and the Communication Manager.

2.1.1. Avaya feature Interaction Verification

This consists of verification of the response of the SharpDial solution to Communication Manager.

- **Connection between SharpDial Process0 Service and Communication Manager:** The Communication Manager should connect to the SharpDial Process0 Service (TCP Server) via TCP/IP Socket. Process0 log files should be checked.
- **CDR Captured by the SharpDial Process0 Service:** Captured CDR could be saved to backup files. Process0 log files and backup files should be checked.
- **Captured CDR logged to Process0 table in the database:** Captured CDR should be stored in Process0 table before being parsed and billed.
- **Incoming and outgoing calls over H.323 and ISDN trunks. Internal calls between Extensions present in the Intra Switch CDR:** Associated CDR should be captured in the backup files.

2.1.2. SharpDial Application functionality Verification

This consists of verification of features of the SharpDial Solution to ensure they function in an Avaya solution.

- **Parsing Validation:** Parsing should be validated. Engine log files should be checked.
- **Billing Validation:** Billing should be validated with the applied billing schema. Engine log files should be checked.
- **Report Testing:** Testing Outgoing Extension, Incoming Extension, and Internal reports.

2.1.3. Serviceability Tests

This consists of verification of the response of the SharpDial solution to various failures.

- SharpDial Process0 Service Stopped.
- SharpDial Server restarted.
- Communication Manager rebooted.

2.2. Test Results

All tests passed successfully.

2.3. Support

Support from Avaya is available at <http://support.avaya.com>. Technical support for Libatel SharpDial can be obtained as shown below:

Libatel
93, Debahy Centre,
Charles de Gaulle Avenue,
Sin el Fil,
Beirut, Lebanon
Tel.: +961 1 485160
Fax: +961 1 485172
Email: sales@libatel.com
Website: <http://www.libatel.com>

3. Reference Configuration

Figure 1 shows the network topology during compliance testing. The SharpDial server was placed on the LAN. The SharpDial server collected CDR records from Communication Manager and presented the information obtained to users on the LAN via an http web session.

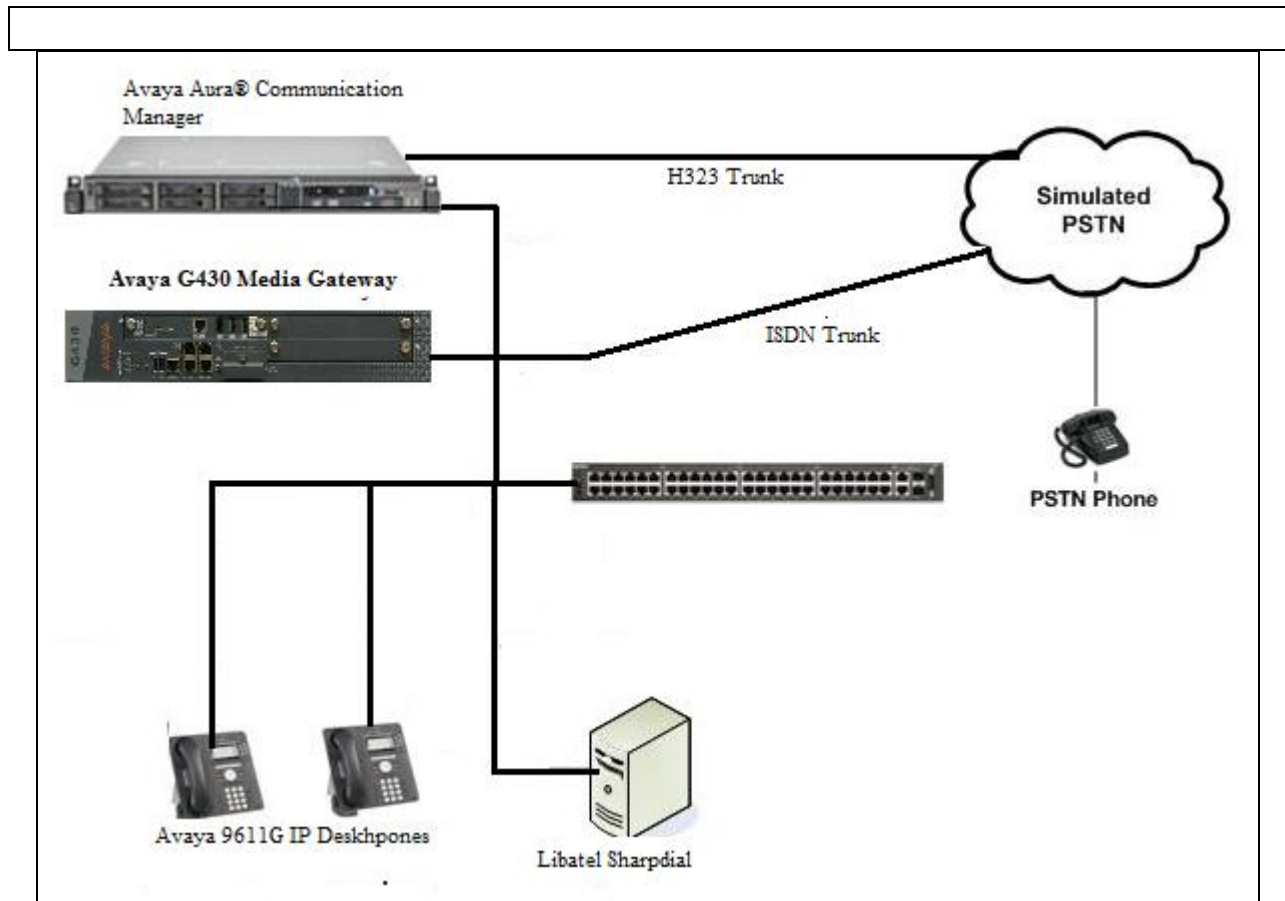


Figure 1: Configuration Diagram

4. Equipment and Software Validated

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

Equipment Description	Software Release
Avaya Communication Manager running in a VMware Environment	R7.0.1 (Build CM 7.0.1.1.0.441.23169)
Avaya G430 Media Gateway	37.19.0
Avaya 9611G H323 IP Telephones	6.2029
Libatel SharpDial installed on Windows Server 2012 R2	SharpDial Package 5.0

5. Configuration of Avaya Aura® Communication Manager

Configuration of the Communication Manager is performed through Avaya Site Administration supporting System Administration Terminal (SAT). An SSH session to the IP address of the Communication Manager initiates the console connection.

Note: The configuration of Communication Manager for call routing is outside the scope of this document. It is assumed that a full working system is already installed. Included below are the changes necessary in order to ensure CDR records are being produced correctly by the Communication Manager.

5.1. Add CDR Server to Node Names IP

Add the IP address of the CDR server into the **IP NODE NAMES** form. Use **change node-names ip** to access the node names and add the server **Name** and **IP Address** as shown below.

change node-names ip		Page 1 of 2	
		IP NODE NAMES	
Name	IP Address		
RDTT	10.10.16.126		
SharpDial	10.10.16.95		
VAL2a11	10.10.16.26		

5.2. Add CDR Service as an IP Service

Add the CDR service into IP Services by typing **change ip-services**. Note the following as this information may be needed when setting up the SharpDial Server.

- **Service Type** is **CDR1**
- **Local Node** is **procr**
- **Remote Node** is that of the **SharpDial** entered as it was configured above
- **Remote Port** number in this example shown as **9000** but can be any free port number

change ip-services			Page 1 of 4		
			IP SERVICES		
Service Type	Enabled	Local Node	Local Port	Remote Node	Remote Port
AESVCS	y	procr	8765		
CDR1		procr	0	SharpDial	9000

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

5.3. Configure CDR parameters

Type **change system-parameters cdr**. Ensure all the fields are as shown below on **Page 1** of **system-parameters cdr** form. Note the **Primary Output Endpoint** is that of the service type added in **Section 5.2**.

change system-parameters cdr		Page 1 of 2
CDR SYSTEM PARAMETERS		
Node Number (Local PBX ID):		CDR Date Format: month/day
Primary Output Format: customized		Primary Output Endpoint: CDR1
Secondary Output Format: customized		Secondary Output Endpoint: CDR2
Use ISDN Layouts? y		Enable CDR Storage on Disk? y
Use Enhanced Formats? n		Condition Code 'T' For Redirected Calls? n
Use Legacy CDR Formats? y		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? y		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		
Calls to Hunt Group - Record: member-ext		
Record Called Vector Directory Number Instead of Group or Member? n		
Record Agent ID on Incoming? n		Record Agent ID on Outgoing? y
Inc Trk Call Splitting? 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: 4
Remove '+' from SIP Numbers? y		

Ensure that all **Data Item - Length** entries are the same as outlined below on **Page 2** of **system-parameters cdr**.

change system-parameters cdr		Page 2 of 2
CDR SYSTEM PARAMETERS		
Data Item - Length	Data Item - Length	Data Item - Length
1: date - 6	17: calling-num - 15	33: -
2: space - 1	18: space - 1	34: -
3: time - 4	19: auth-code - 7	35: -
4: space - 1	20: space - 1	36: -
5: duration - 4	21: vdn - 6	37: -
6: space - 1	22: return - 1	38: -
7: cond-code - 1	23: line-feed - 1	39: -
8: space - 1	24: -	40: -
9: code-dial - 4	25: -	41: -
10: space - 1	26: -	42: -
11: code-used - 4	27: -	43: -
12: space - 1	28: -	44: -
13: in-trk-code - 4	29: -	45: -
14: space - 1	30: -	46: -
15: dialed-num - 23	31: -	47: -
16: space - 1	32: -	48: -
Record length = 90		

5.4. Enable Missed and Internal Calls

To allow calls to appear on the CDR reports, set **CDR Reports** to **r** in the trunk group used for outgoing/incoming calls. Type **change trunk-group x** where **x** is the number of the incoming/outgoing trunk group.

change trunk-group 3		Page 1 of 21	
TRUNK GROUP			
Group Number: 3	Group Type: isdn	CDR Reports: r	
Group Name: H.323 to IP Office	COR: 1	TN: 1	TAC: 703
Direction: two-way	Outgoing Display? n	Carrier Medium: H.323	
Dial Access? n	Busy Threshold: 255	Night Service:	
Queue Length: 0			
Service Type: tie	Auth Code? n		
		Member Assignment Method: auto	
		Signaling Group: 3	
		Number of Members: 20	

To enable intra-switch calls be recorded type **change intra-switch-cdr** and add the **Extension** numbers of the sets that are to be recorded for internal calls.

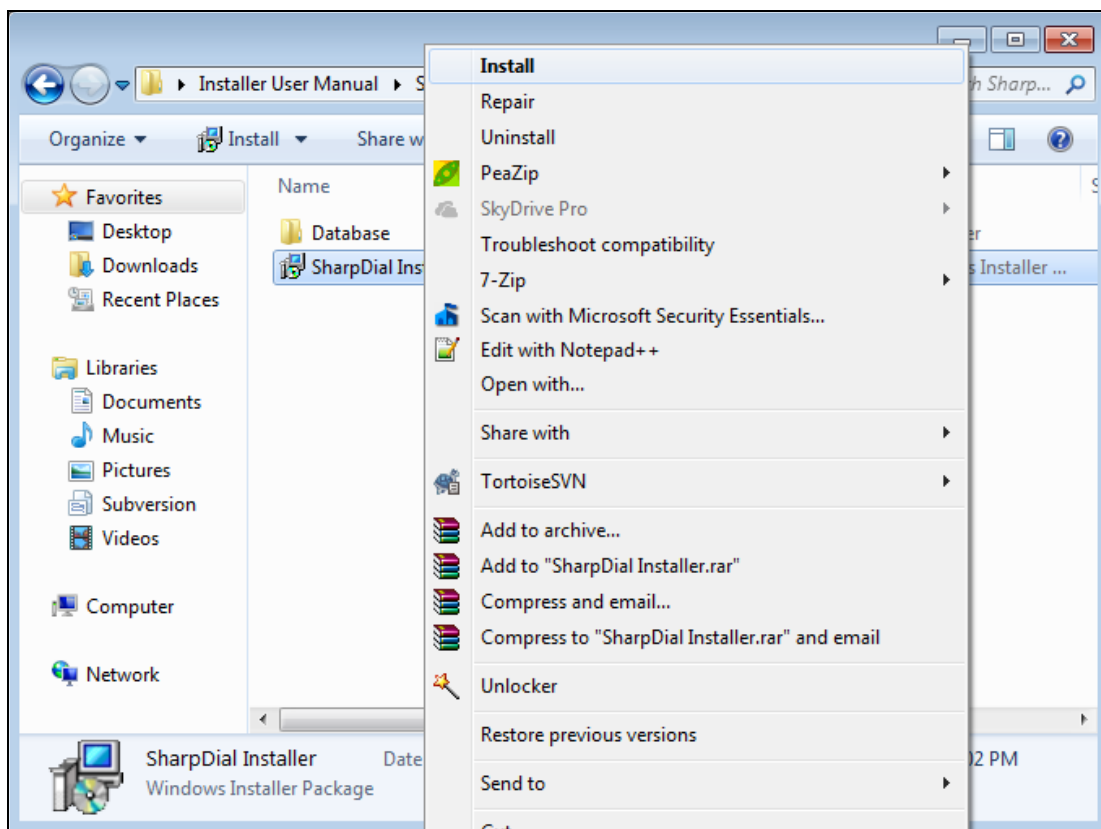
change intra-switch-cdr		Page 1 of 3	
INTRA-SWITCH CDR			
		Assigned Members: 7 of 5000 administered	
Extension	Extension	Extension	Extension
8270001			
8270002			
8270003			
8270004			
8270005			

6. Configuration of the Libatel SharpDial

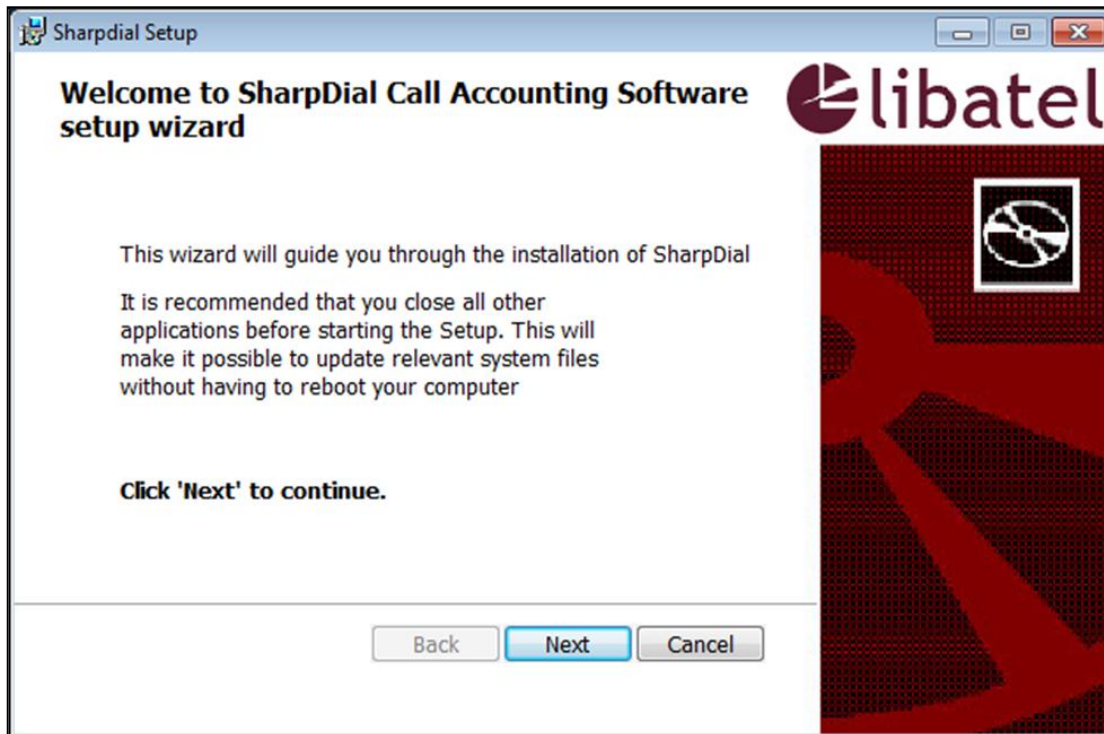
The configuration of Windows Server 2012 R2 and the installation of any prerequisite software of the SharpDial server are outside the scope of these Application Notes. It is assumed that the server is prepared for installation. Refer to the product documentation in **Section 10** for further details.

6.1. Libatel SharpDial Components Installation

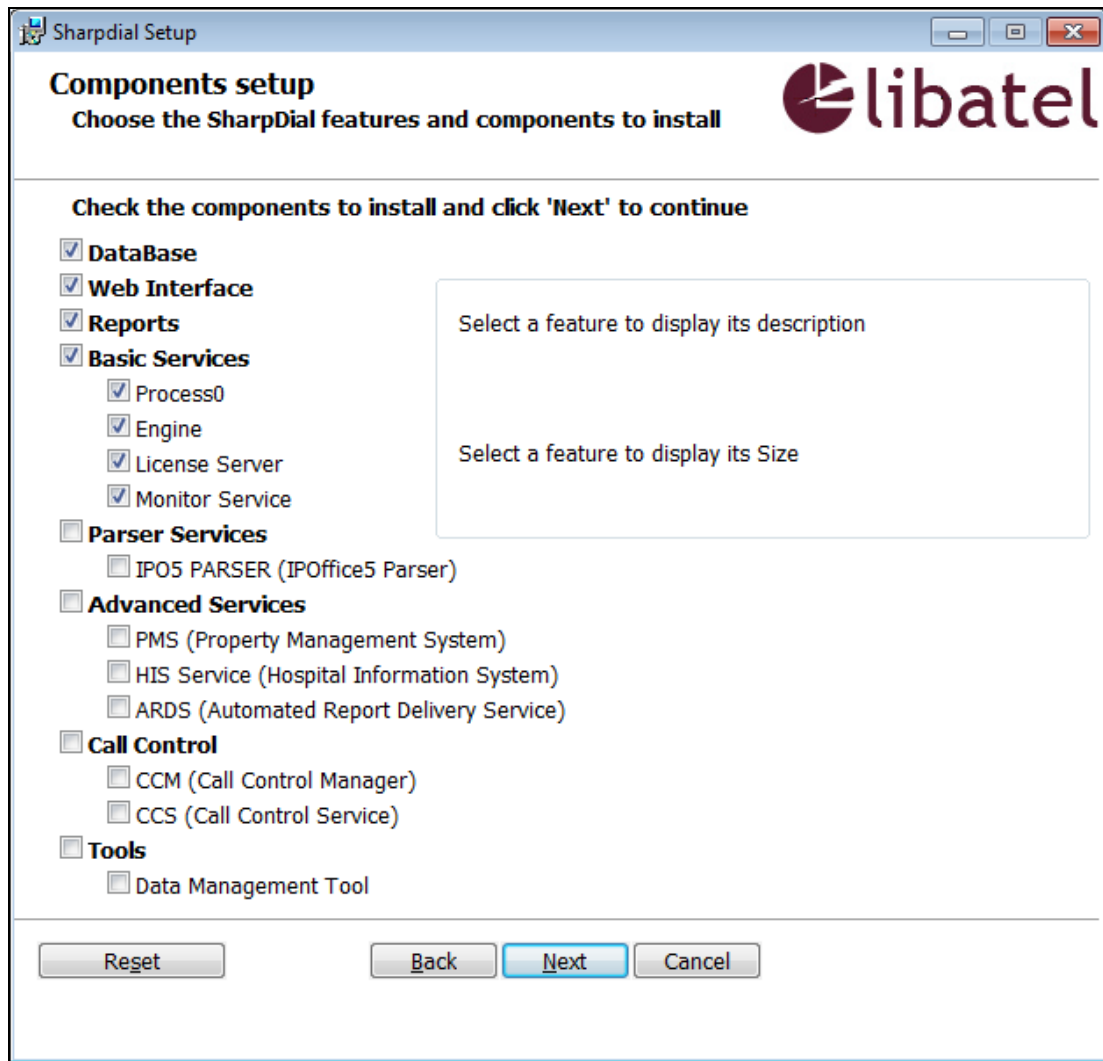
The installation of SharpDial includes connection requirements specific to the Communication Manager and will be outlined in this section. To manually install the SharpDial call accounting software, run the **SharpDial Installer.msi** file. Right click on SharpDial Installer.msi setup icon and click **Install** as shown below.



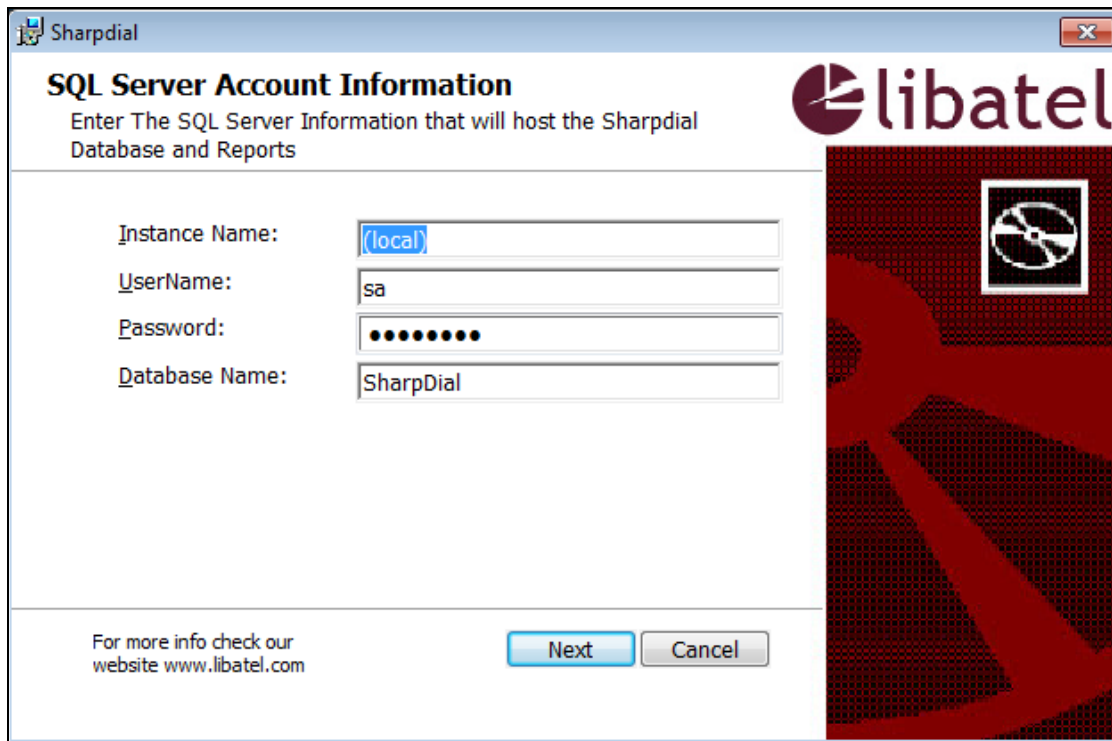
The system displays a welcome screen. Press **Next** to continue.



The system displays the components selection screen. Keep the default selection and click **Next** to continue.

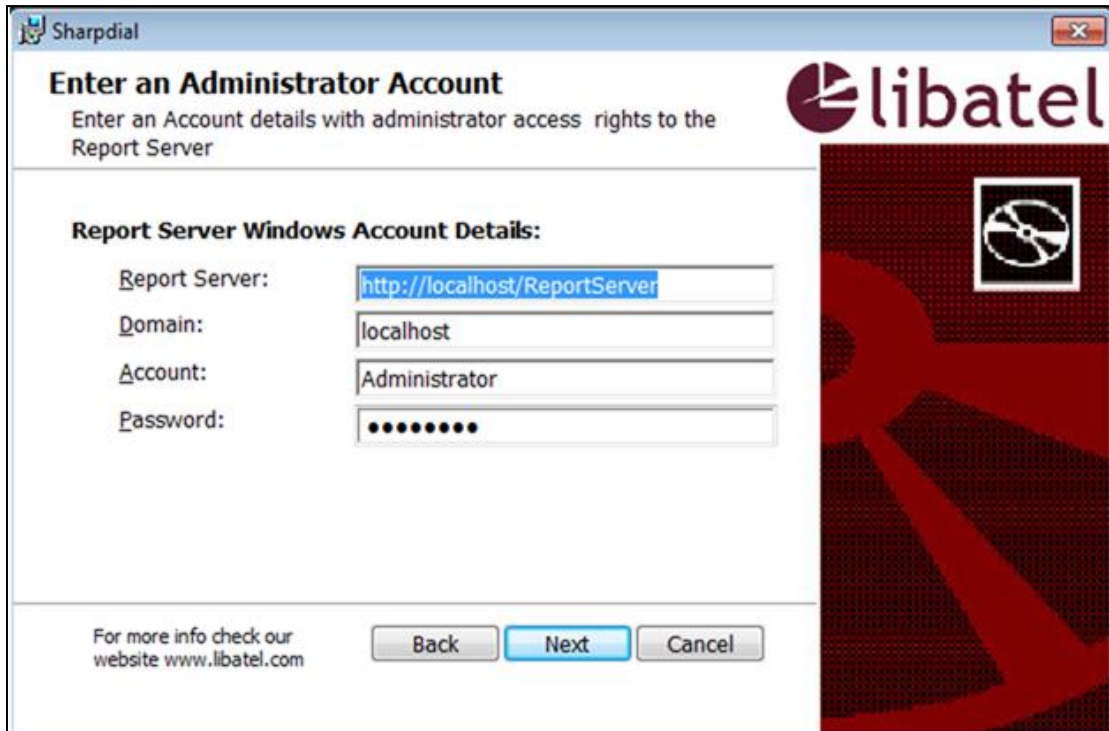


The SQL Server Account Information Screen appears. Enter the proper information as for the administrator **Username** “sa” of the SQL Server account, the **Password** and the **Database Name** that the installer will create.



The screenshot shows a Windows-style window titled "Sharpdial". The main heading is "SQL Server Account Information". Below this, a subtitle reads "Enter The SQL Server Information that will host the Sharpdial Database and Reports". The window contains four input fields: "Instance Name:" with the value "(local)", "UserName:" with the value "sa", "Password:" with masked characters (dots), and "Database Name:" with the value "SharpDial". At the bottom left, there is a note: "For more info check our website www.libatel.com". At the bottom right, there are two buttons: "Next" and "Cancel". On the right side of the window, there is a vertical banner with the "libatel" logo at the top and a large red graphic below it, which includes a white circle with a diagonal line through it.

Configure the **Report server** login/domain credentials. If no domain configuration is required, keep the default **localhost** value.



The image shows a Windows-style dialog box titled "Sharpdial". The main heading is "Enter an Administrator Account", followed by the instruction "Enter an Account details with administrator access rights to the Report Server". On the right side of the dialog is the libatel logo and a red graphic with a white circle containing a dial icon. The section "Report Server Windows Account Details:" contains four input fields: "Report Server:" with the value "http://localhost/ReportServer", "Domain:" with "localhost", "Account:" with "Administrator", and "Password:" with masked characters (dots). At the bottom left, there is a link to "www.libatel.com". At the bottom right, there are three buttons: "Back", "Next" (highlighted in blue), and "Cancel".

Enter an Administrator Account
Enter an Account details with administrator access rights to the Report Server

Report Server Windows Account Details:

Report Server:

Domain:

Account:

Password:

For more info check our website www.libatel.com

Configure the PBX site information as described below:

- i. **Site name:** Description of the PBX site's name. Choose the PBX branch name, or keep the default value "Main site". This can be changed later on from the SharpDial Administration interface.
- ii. **Time Pattern:** Displays the different call pricing protocols according to different countries and states
- iii. **Connection type:** TCP/IP
- iv. **Frame Type:** CM Customized for Communication Manager
- v. **Connection IP:** IP address of Communication Manager
- vi. **Connection port:** Socket port number matching the configured CDR port on Communication Manager (see **Section 5.2**).

Sharpdial

Enter the Connection Info

Enter the Information Needed to connect to the PBX.

libatel

Site Name:

Time Pattern:

Connection Type:

Frame Type:

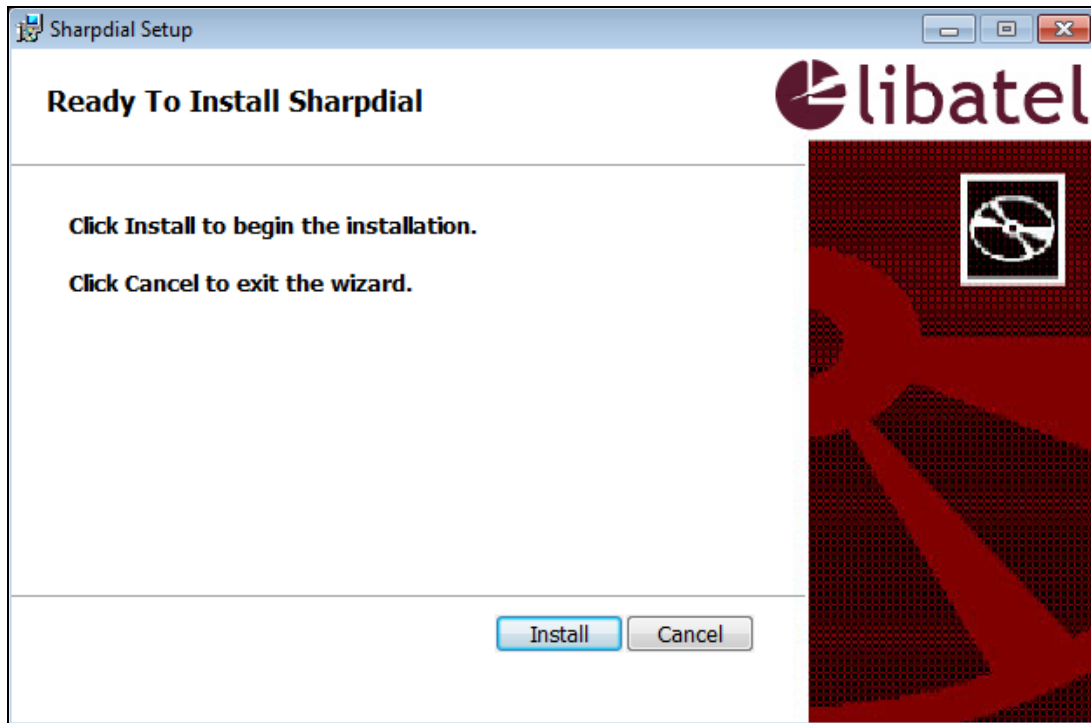
* Refer to documentation for customized format

Connection IP: . . .

Connection Port:

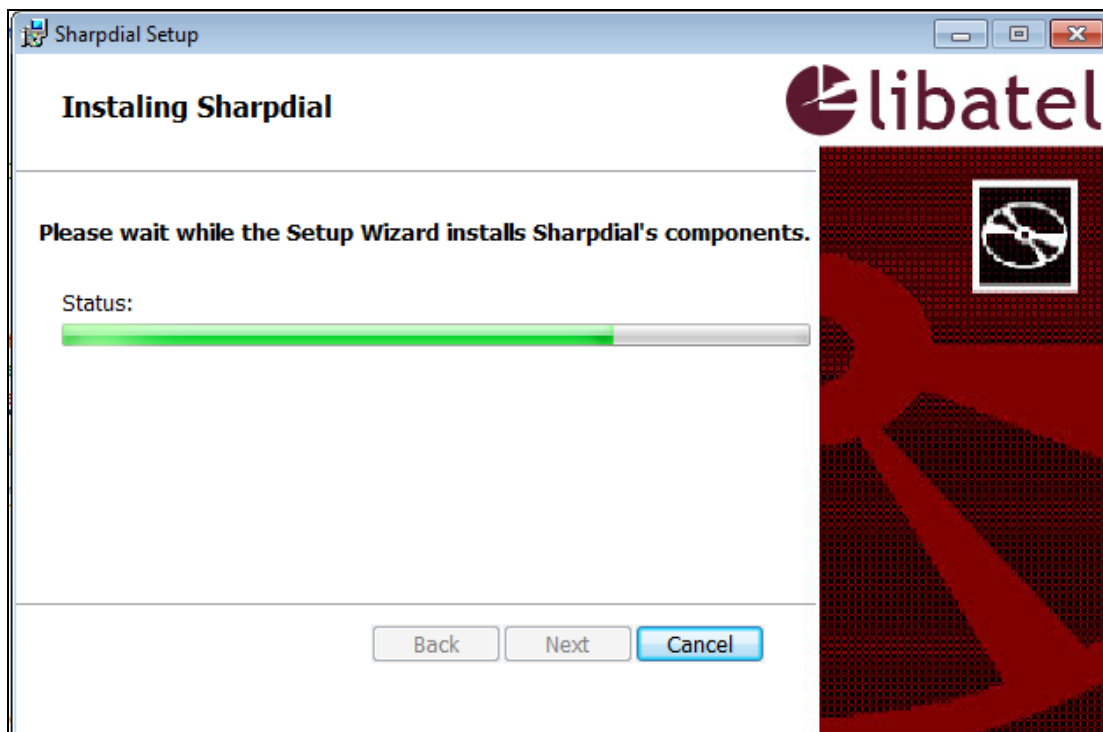
For more info check our website www.libatel.com

Click **Next** and the **Ready To Install SharpDial** screen will appear.



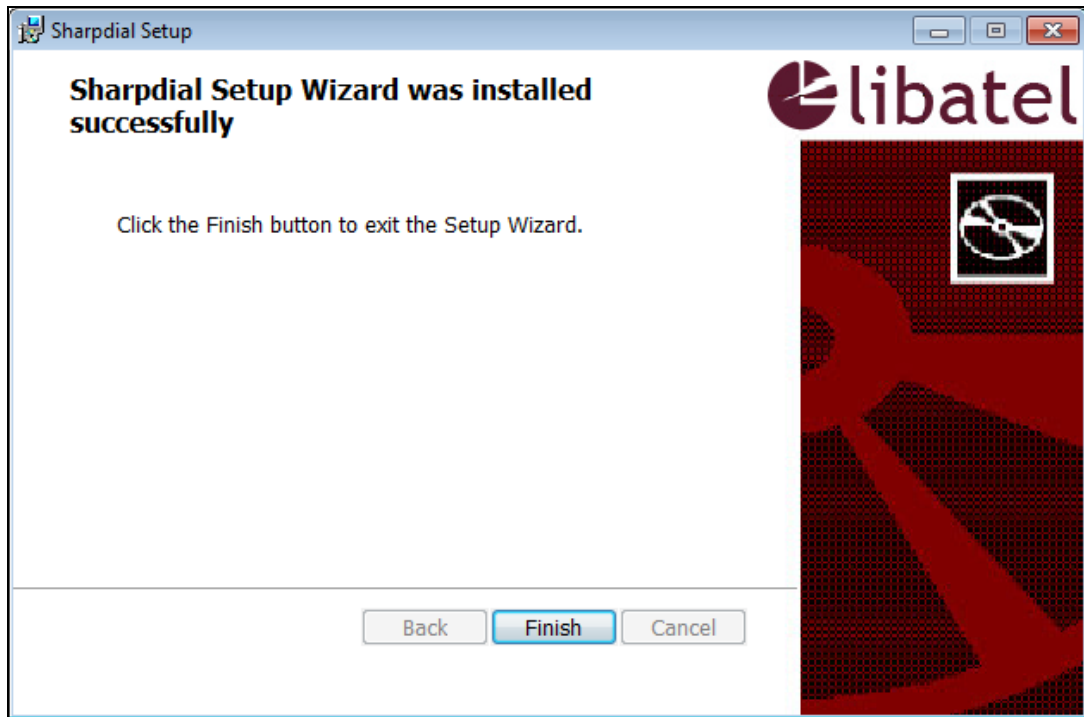
Click on **Install**. SharpDial installs by default in the following directories:

```
<c:\> client hard drive
Program Files
  SharpDial
    Engine
      Sharpdial_X.X.exe
      SharpDial_X_X.config
    Email Service
      SharpDial_ES_X.X.exe
      SharpDial_ES_X_X.config
    Parser Service
      SharpDial_Parser_PBXTYPE_X.X.exe
      SharpDial_Parser_PBXTYPE_X_X.config
    Process 0 Service
      SharpDial_P0_X.X.exe
      SharpDial_P0_X_X.config
    Monitor Service
      SharpDial_MS_X.X.exe
      SharpDial_MS_X_X.config
```



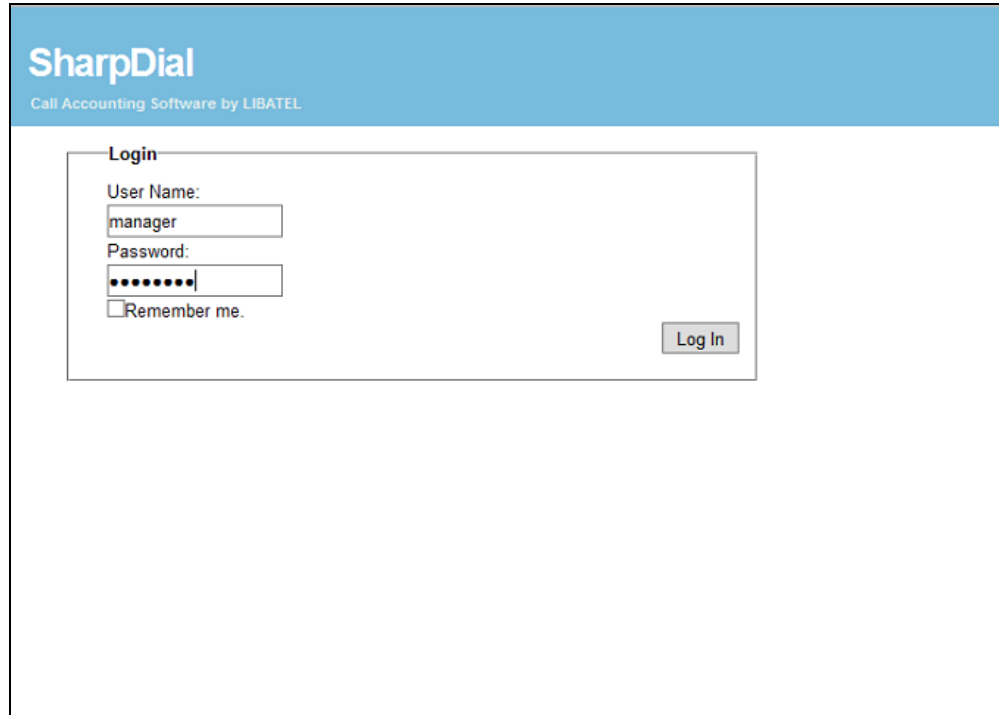
This stage might take several minutes since it installs Sharpdial website and deploys its reports on the report server.

The installation is done. Click **Finish** to complete.



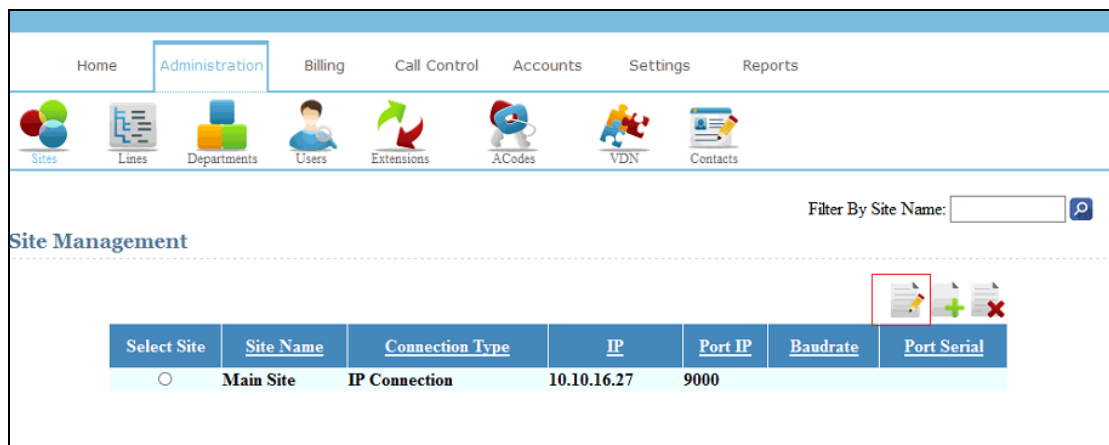
7. Configuring Libatel SharpDial through Web Interface

Open <http://<SharpDial Server IP Address>/sharpdial/reportinguser/login.aspx>. Log into the SharpDial web interface with credentials that have the security manager role.



The image shows the SharpDial login page. At the top, there is a blue header with the text "SharpDial" and "Call Accounting Software by LIBATEL". Below the header is a white box containing the login form. The form has a "Login" title, a "User Name:" label with a text input field containing "manager", a "Password:" label with a password input field containing "*****", and a "Remember me." checkbox. A "Log In" button is located at the bottom right of the form.

Under **Administration** section in the menu, click on **Sites**, this displays all connection information of the current site. Any changes that need to be made on the connection to this site can be made from here by clicking **Edit** icon. The information highlighted below is automatically populated as was configured in **Section 6.1**.



The image shows the SharpDial Site Management page. At the top, there is a navigation bar with tabs: Home, Administration (selected), Billing, Call Control, Accounts, Settings, and Reports. Below the navigation bar is a row of icons for Sites, Lines, Departments, Users, Extensions, ACodes, VDN, and Contacts. Below the icons is a "Filter By Site Name:" search bar. The main content area is titled "Site Management" and contains a table with the following data:

Select Site	Site Name	Connection Type	IP	Port IP	Baudrate	Port Serial
<input type="radio"/>	Main Site	IP Connection	10.10.16.27	9000		

There are three icons (edit, add, delete) to the right of the table, with the edit icon highlighted by a red box.

8. Verification Steps

The following steps can be taken to ensure that the Communication Manager is sending CDR data and to show that the SharpDial server is receiving this data and processing it properly.

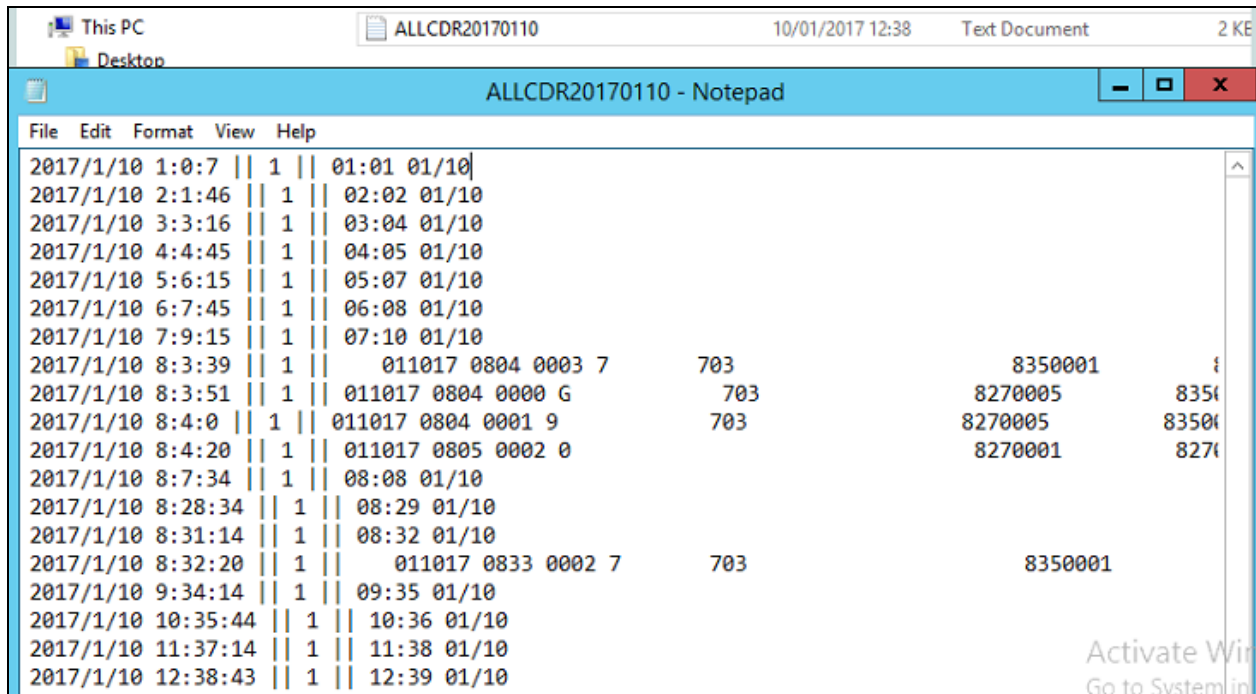
8.1. Verify that CDR data is being sent by the Avaya Aura® Communication Manager

Type **status cdr-link** this brings up a page showing the **Link State** as either up or down. Observe as shown below, the **Link State** should be **up** for the **Primary**.

status cdr-link	
CDR LINK STATUS	
Primary	Secondary
Link State: up	CDR not administered
Date & Time: 2017/01/09 13:19:33	0000/00/00 00:00:00
Forward Seq. No: 0	0
Backward Seq. No: 0	0
CDR Buffer % Full: 0.00	0.00
Reason Code: OK	

8.2. Verify that CDR data is being received by Libatel SharpDial

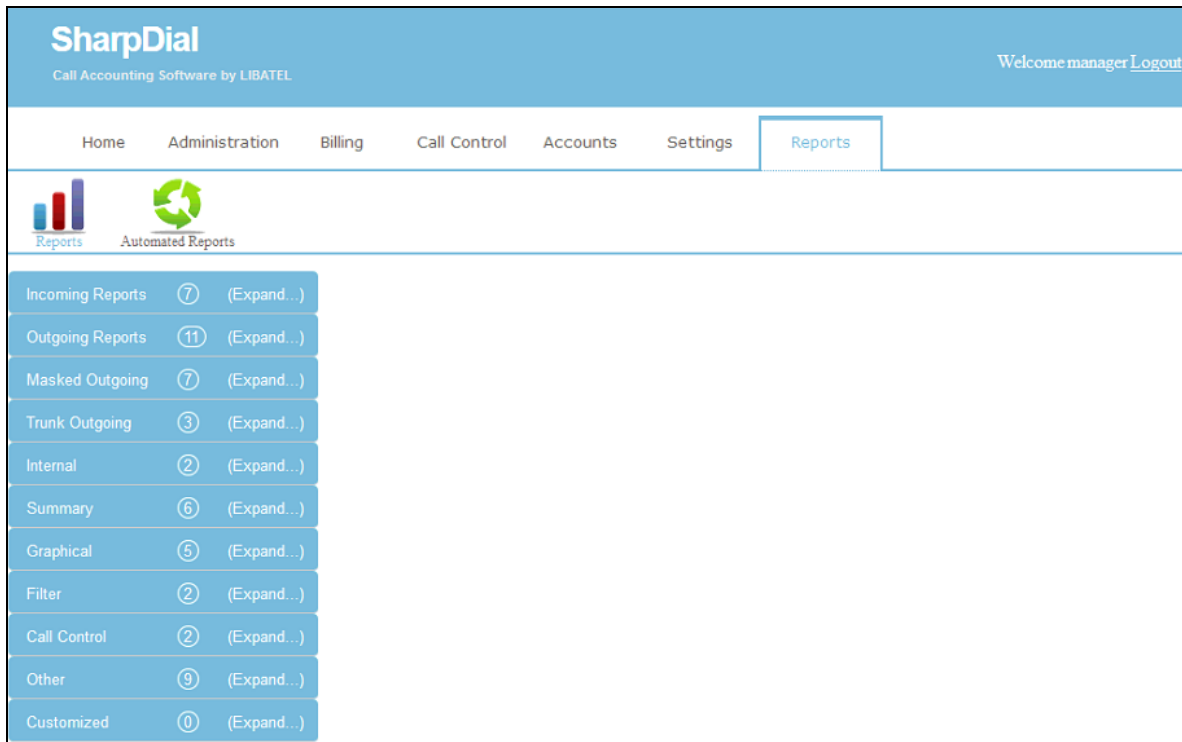
Log onto the SharpDial server and check that raw CDR data is being received into the CDR backup files. Open the CDR backup file located in **C:/ProgramFiles(x86)/SharpDial/Process0/CDRBackup**. The information related to recent calls should be visible as shown below.



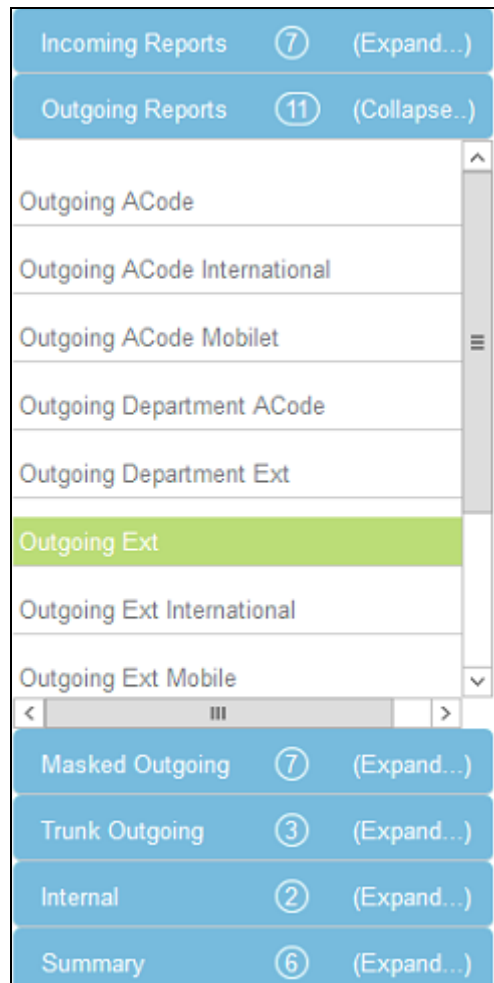
```
ALLCDR20170110 - Notepad
File Edit Format View Help
2017/1/10 1:0:7 || 1 || 01:01 01/10|
2017/1/10 2:1:46 || 1 || 02:02 01/10
2017/1/10 3:3:16 || 1 || 03:04 01/10
2017/1/10 4:4:45 || 1 || 04:05 01/10
2017/1/10 5:6:15 || 1 || 05:07 01/10
2017/1/10 6:7:45 || 1 || 06:08 01/10
2017/1/10 7:9:15 || 1 || 07:10 01/10
2017/1/10 8:3:39 || 1 || 011017 0804 0003 7 703 8350001
2017/1/10 8:3:51 || 1 || 011017 0804 0000 G 703 8270005 8350
2017/1/10 8:4:0 || 1 || 011017 0804 0001 9 703 8270005 8350
2017/1/10 8:4:20 || 1 || 011017 0805 0002 0 8270001 8270
2017/1/10 8:7:34 || 1 || 08:08 01/10
2017/1/10 8:28:34 || 1 || 08:29 01/10
2017/1/10 8:31:14 || 1 || 08:32 01/10
2017/1/10 8:32:20 || 1 || 011017 0833 0002 7 703 8350001
2017/1/10 9:34:14 || 1 || 09:35 01/10
2017/1/10 10:35:44 || 1 || 10:36 01/10
2017/1/10 11:37:14 || 1 || 11:38 01/10
2017/1/10 12:38:43 || 1 || 12:39 01/10
```

8.3. Verify that Libatel SharpDial is producing reports on CDR information correctly

Use the reporting tool on the Web Interface to create a CDR report by logging onto <http://<sharpdial Server IP>/sharpdial/reportinguser/login.aspx>. click on the **Reports** tab to view the report types.



There are a number of reports that can be run. In the example below, **Outgoing Ext** is picked from the **Outgoing Reports** section.



Select the start date and end date that this report is to be run from and the extension for the report. In this example there is only one site called **Main Site** and the extension used is 8270001. Click **Preview**.

Outgoing Ext

Enter Start Date and End Date

Start Date

10/01/2017

Start Time

00

00

End Date

10/01/2017

End Time

23

59

Filter per Extensions

Site

Main Site

Extension

8270001

Filter per Personal/Business (Expand...)

Apply Discount (Expand...)

Filter per Call Duration (Expand...)

Preview

Save to PDF

Save to Excel

Below is an example of an **Outgoing Ext** report.

SharpDial									
Call Accounting Software by LIBATEL									
Welcome manager Logout									
Home Administration Billing Call Control Accounts Settings Reports									
<div> <div>Reports</div> <div>Automated Reports</div> </div>									
<div> <div>1</div> <div>of 1</div> <div></div> <div></div> <div></div> <div>Find</div> <div>Next</div> </div>									
Outgoing Extension									
Detailed outgoing calls made by the extension									
From : 1/1/2017		Extension : 8270005				Site Name : Main Site			
To : 1/10/2017		User Name : Unknown				Department : Unknown			
Date :	Time	Duration :	Code	Code User Name	Contact Number	Contact Name	Contact Type	Region	Price L.L :
1/10/2017	08:33	0:00:12		Unknown	08350001	Unknown	Personal	Bekaa	0.00
1/10/2017	08:04	0:00:18		Unknown	08350001	Unknown	Personal	Bekaa	50.00
1/9/2017	15:41	0:00:06		Unknown	08350001	Unknown	Personal	Bekaa	0.00
Totals for extension 8270005									
Duration		0:00:36					Total Price	50.00	
Number of calls		3					Discount Price	0.00	
							Net To Pay	50.00	

9. Conclusion

These Application Notes describe the configuration to successfully interoperate Libatel's SharpDial Call Detail Recording Solution with Avaya Aura® Communication Manager R7.0. All test cases were completed successfully.

10. Additional References

This section references documentation relevant to these Application Notes.

The Avaya product documentation is available at <http://support.avaya.com> where the following documents can be obtained.

- [1] *Administering Avaya Aura® Communication Manager*, Document ID 03-300509.
- [2] *Avaya Aura® Communication Manager Feature Description and Implementation*, Document ID 555-245-205.

All information on the product installation and configuration of SharpDial can be requested from Libatel.

- [3] *SharpDial – Prerequisites Installation guide*, Version 5.1, 2015
- [4] *SharpDial Installation Checklist*, Version 2.0
- [5] *SharpDial Step By Step Installation guide*, Version 5.1

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