Avaya Solution & Interoperability Test Lab

Application Notes for INVISION Billing System Version 8.0 with Avaya Aura® Communication Manager R6.3 - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for INVISION Billing System Version 8.0 to interoperate with Avaya Aura® Communication Manager R6.3.

INVISION Billing System is an enterprise software solution that provides customers with detailed analysis of PABX communication usage. INVISION Billing System interoperates with Avaya Aura® Communication Manager over TCP/IP for the collection of call detail records.

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.

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1. Introduction

The objective of this interoperability compliance testing is to verify that INVISION Billing System Version 8.0 can interoperate with Avaya Aura® Communication Manager R6.3. INVISION Billing System interoperates with Avaya Aura® Communication Manager over TCP/IP for the collection of Call Detail Records (CDR). During the compliance testing, CDR collection was verified for two Avaya Aura® Communication Manager Systems:

- A duplex pair of Avaya S8800 Servers
- Avaya S8300D Server

2. General Test Approach and Test Results

The general test approach was to manually place intra-switch calls, inter-switch H323 IP Trunk calls, inbound and outbound PSTN trunk calls to and from telephones on Avaya Aura® Communication Manager (Communication Manager) Systems, and verify that INVISION Billing System collects the CDR records and reports the correct attributes of the call.

There are some differences in Communication Manager in the call records generated by SIP endpoints compared to Analog, Digital, and H.323 endpoints. As a result in certain scenarios involving SIP endpoints (e.g., two-party call, transfer, or conference), a CDR application may see more or less records, or records with condition codes/calling party other than expected. Avaya is investigating the differences and code changes may be made available in a future release pending the outcome of that investigation.

2.1. Interoperability Compliance Testing

The interoperability compliance testing included feature and serviceability testing. CDR links without reliable protocol were tested.

For feature testing, the ability of INVISION Billing System to collect and process CDR records for intra-switch calls, inter-switch calls, inbound and outbound PSTN trunk calls to and from telephones on both Communication Manager systems was evaluated.

For serviceability testing, the following were performed:

- Busied out and released the CDR links on Communication Manager.
- Disconnected and reconnected network connection to the INVISION Billing System server.
- Rebooted the INVISION Billing System, Avaya S8300D Server.

2.2. Test Results

All test cases described in **Section 2.1** passed successfully.

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2.3. Support

Technical support for INVISION Billing System can be obtained through the following:

- Phone: +62-81-1101109
- Email: support@invision-ap.com

3. Reference Configuration

Figure 1 illustrates the network configuration used to verify the INVISION Billing System solution. Site A is comprised of a pair of duplex Avaya S8800 Servers running Communication Manager and Avaya G650 Media Gateway, and has connections to the following: Avaya 96x1 and 1600 Series H323 IP Telephones, Avaya 1400 Series Digital Telephones, and an ISDN-BRI trunk to the PSTN. INVISION Billing System is installed on a server running Microsoft Windows Server 2003 with Service Pack 2. Site B is comprised of an Avaya S8300D Server running Communication Manager with Avaya G450 Media Gateway, and has connections to Avaya 9600 Series IP Telephone and 1400 Series Digital Telephone. The Avaya 5520-48T-PWR Ethernet Routing Switch provides Ethernet connectivity to the servers and H323 IP telephones and Layer 3 IP routing between the two sites. An H.323 IP trunk is configured between Site A and B for the users to call between the two sites.

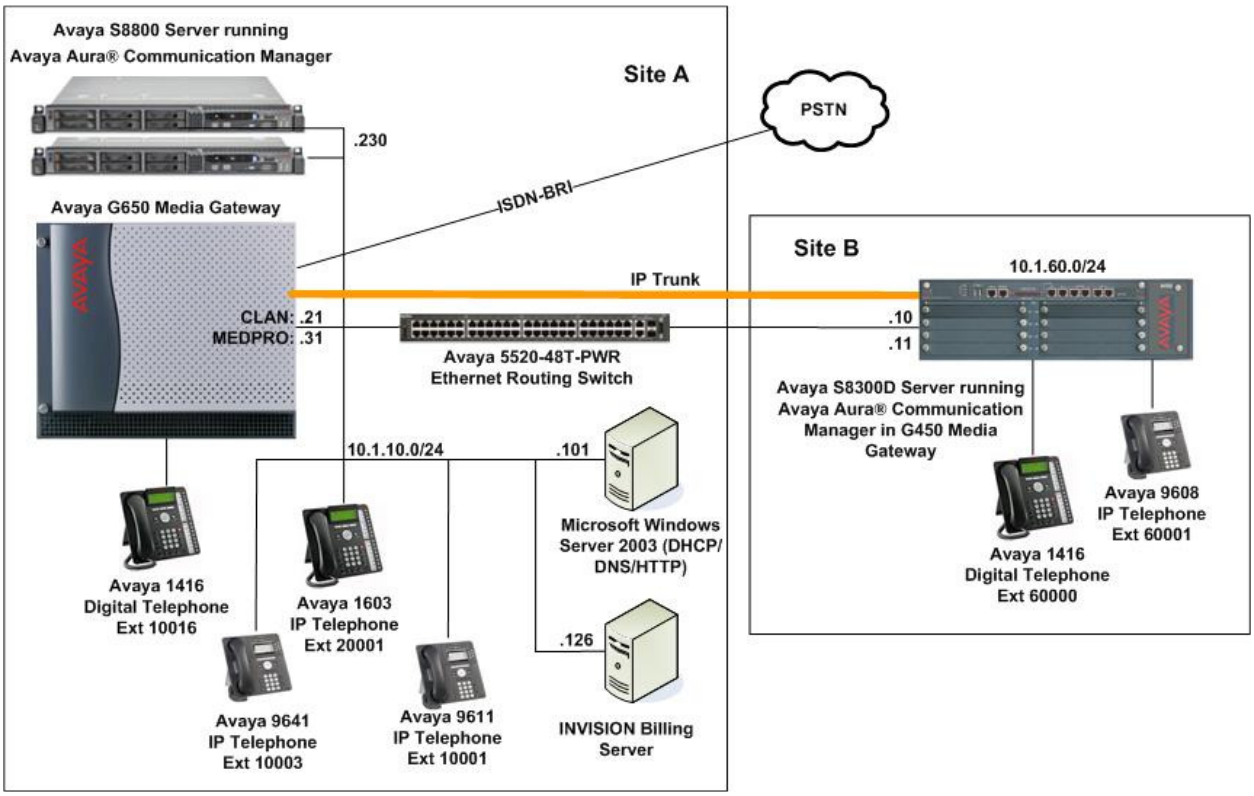

Figure 1: Test configuration for INVISION Billing System solution

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4. Equipment and Software Validated

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

Equipment	Software
Avaya S8800 Server Duplex Server	Avaya Aura® Communication Manager R6.3 Build R016x.03.0.124.0-21503
Avaya G650 Media Gateway • TN2312BP IP Server Interface • TN799DP C-LAN Interface • TN2302AP IP Media Processor • TN2602AP IP Media Processor • TN2214CP Digital Line	- HW07, FW057 HW01, FW040 HW20, FW121 HW02, FW063 HW08, FW015
Avaya S8300D Server	Avaya Aura® Communication Manager R6.3 Build R016x.03.0.124.0-21503
Avaya G450 Media Gateway	34.5.1
Avaya 9600 Series IP Telephones • 9641 • 9611 • 9608	 6.3 (H.323) 6.3 (H.323) 6.3 (H.323)
Avaya 1600 Series IP Telephones - 1603	 1.34 (H.323)
Avaya 1416 Digital Telephone	R4 SP2
Avaya 5520-48T-PWR Ethernet Routing Switch	V6.2.4.010
INVISION Billing System Microsoft SQL 2008 32 bit Server installed on same server	8.0

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5. Configure Avaya Aura® Communication Manager

This section provides the procedures for configuring Call Detail Recording (CDR) in Communication Manager. All configuration changes in Communication Manager are performed through the System Access Terminal (SAT). These steps describe the procedure used for Communication Manager Site A. All steps are the same for Communication Manager Site B. Communication Manager is configured to generate and send the CDR records to the IP address of the INVISION Billing System server over TCP/IP. For this configuration, the CDR links are configured to originate from the IP addresses of the Communication Manager Site A and Site B (i.e. with node-name – "procr") and terminates at the IP address of the INVISION Billing System server. The highlights in the following screens indicate the parameter values used during the compliance test.

Step	Description
1.	Use the **change node-names ip** command to add a new node name for the INVISION Billing System server.

	`change node-names ip` `Page 1 of 1`
	`IP NODE NAMES`
	`Name IP Address`
	`default 0.0.0.0`
	`procr 10.1.10.230`
	`Invision 10.1.10.126`

2.	Use the **change ip-services** command to define the CDR link. To define a primary CDR link, the following information should be provided: • **Service Type: CDR1** [If needed, a secondary link can be defined by setting Service Type to CDR2.] • **Local Node: procr** • **Local Port: 0** [The Local Port is fixed to 0 because Communication Manager initiates the CDR link.] • **Remote Node: Invision** [The Remote Node is set to the node name previously defined in **Step 1**.] • **Remote Port: 5001** [The Remote Port may be set to a value between 5000 and 64500 inclusive, and must match the port configured in INVISION Billing System server in **Section 6.4**. Note that the same port can be used for each Communication Manager system regardless if they are survivable or separate systems as the records distinguish the different ip addresses]

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Step	Description
	change ip-services Page 1 of 4 IP SERVICES Service Type / Enabled / Local Node / Local Port / Remote Node / Remote Port **CDR1 procr 0 Invision 5001**
	On Page 3 of the IP SERVICES form, enable or disable the Reliable Session Protocol (RSP) for the CDR link by setting the **Reliable Protocol** field to **n** as it is not supported. In this compliance testing, CDR is tested without reliable protocol.
	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 to set the parameters for the type of calls to track and the format of the CDR data. The following settings were used during the compliance test. • **CDR Date Format**: **day/month** • **Primary Output Format**: **customized** • **Primary Output Endpoint**: **CDR1** The remaining parameters define the type of calls that will be recorded and what data will be included in the record. See Reference [2] for a full explanation of each field. The test configuration used some of the more common fields described below. • **Use Legacy CDR Formats? n** [Specify the use of the new Communication Manager 4.0.1 and later formats in the CDR records produced by the system.] • **Remove # From Called Number? y** [The system will remove the pound sign (#) from the Dialed Number field of the call detail record.] • **Intra-switch CDR: y** [Allows call records for internal calls involving specific stations. Those stations must be specified in the INTRA-SWITCH-CDR form.] • **Record Outgoing Calls Only? n** [Allows incoming trunk calls to appear in the CDR records along with the outgoing trunk calls.] • **Outg Trk Call Splitting? y** [Allows a separate call record for any portion of an outgoing call that is transferred or conferenced.] • **Inc Trk Call Splitting? y** [Allows a separate call record for any portion of an incoming call that is transferred or conferenced.]

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Step	Description
	change system-parameters cdr Page 1 of 2 CDR SYSTEM PARAMETERS Node Number (Local PBX ID): 1 **CDR Date Format: day/month** **Primary Output Format: customized** **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? y** 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: group-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? 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: outpulsed Privacy - Digits to Hide: 0 CDR Account Code Length: 7 Remove '+' from SIP Numbers? y
	On Page 2 of the CDR SYSTEM PARAMETERS form, define the customized CDR format as shown.
	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: **in-crt-id - 3** 37: - 6: **space - 1** 22: **space - 1** 38: - 7: **sec-dur - 5** 23: **out-crt-id - 3** 39: - 8: **space - 1** 24: **space - 1** 40: - 9: **cond-code - 1** 25: **acct-code - 7** 41: - 10: **space - 1** 26: **space - 1** 42: - 11: **code-used - 4** 27: **in-trk-code - 4** 43: - 12: **space - 1** 28: **space - 1** 44: - 13: **code-dial - 4** 29: **frl - 1** 45: - 14: **space - 1** 30: **space - 1** 46: - 15: **dialed-num - 23** 31: **return - 1** 47: - 16: **space - 1** 32: **line-feed - 1** 48: - Record length = 108
4.	If the **Intra-switch CDR** field is set to **y** on Page 1 of the CDR SYSTEM PARAMETERS form, then use the **change intra-switch-cdr** command to define the extensions that will be subjected to call detail records. In the **Extension** column, enter the specific extensions whose usage will be tracked with the CDR records.

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Step	Description
	change intra-switch-cdr Page 1 of 3 INTRA-SWITCH CDR Assigned Members: 4 of 5000 administered Extension Extension Extension Extension 10001 10003 10016 20001
5.	For each trunk group for which CDR records are desired, verify that CDR reporting is enabled. Use the **change trunk-group n** command, where **n** is the trunk group number, to verify that the **CDR Reports** field is set to **y**. This applies to all types of trunk groups.
	change trunk-group 1 Page 1 of 21 TRUNK GROUP Group Number: 1 Group Type: isdn **CDR Reports: y** Group Name: PSTN - BRI COR: 95 TN: 1 TAC: #01 Direction: two-way Outgoing Display? n Carrier Medium: PRI/BRI Dial Access? y Busy Threshold: 255 Night Service: Queue Length: 0 Service Type: public-ntwrk Auth Code? n TestCall ITC: rest Far End Test Line No: TestCall BCC: 4

6. Configure INVISION Billing System

This section describes the configuration of INVISION Billing System. This involves the following:

1. Install Billing Server
2. Install Billing Client
3. Restore Database
4. Setup Billing Server
5. Setup Billing Client

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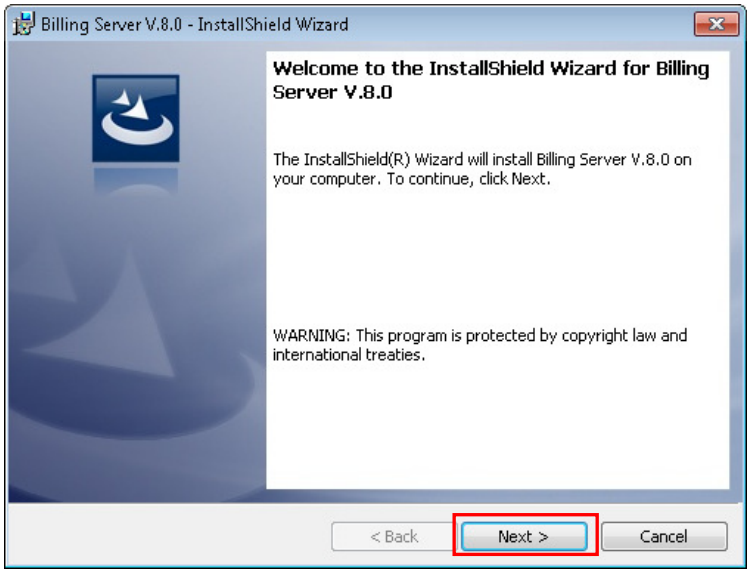
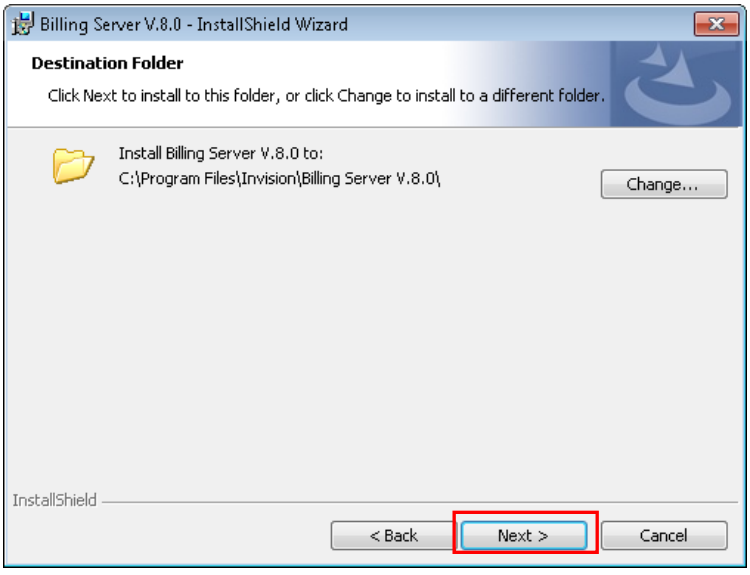
6.1. Install Billing Server

Step	Description
1.	Install the Billing server software from the setup program provided. Click **Next** to continue. 
2.	Click **Next** to continue (or change the default installation directory). 

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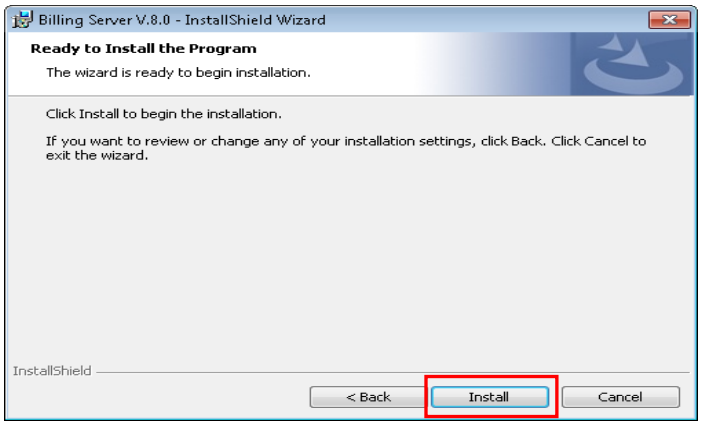
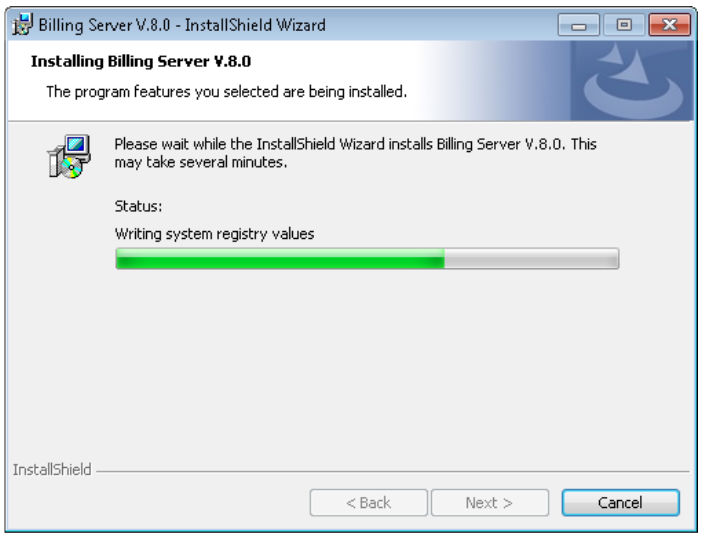
Step	Description
3.	Click **Install** to continue. 
4.	Installation will proceed as in screenshot below: 

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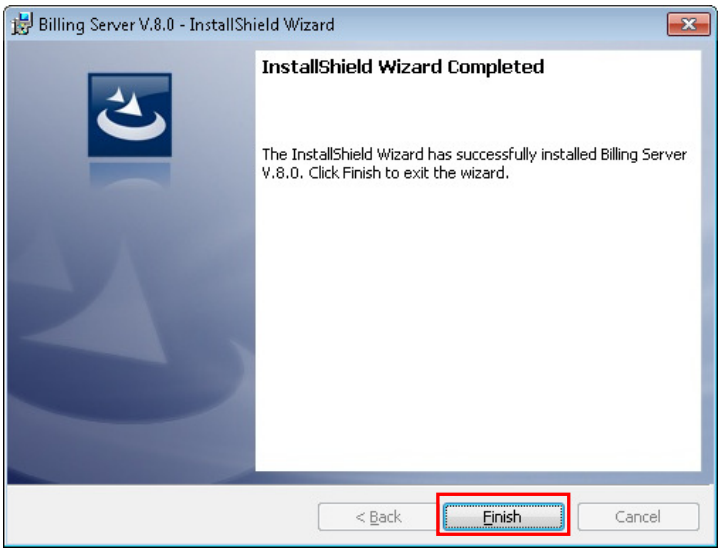
Step	Description
5.	Click **Finish** to complete installation. 

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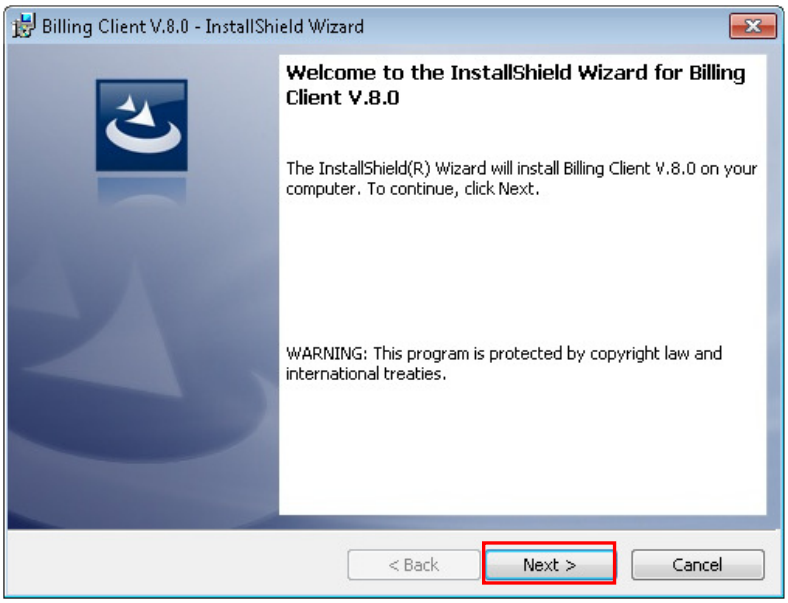
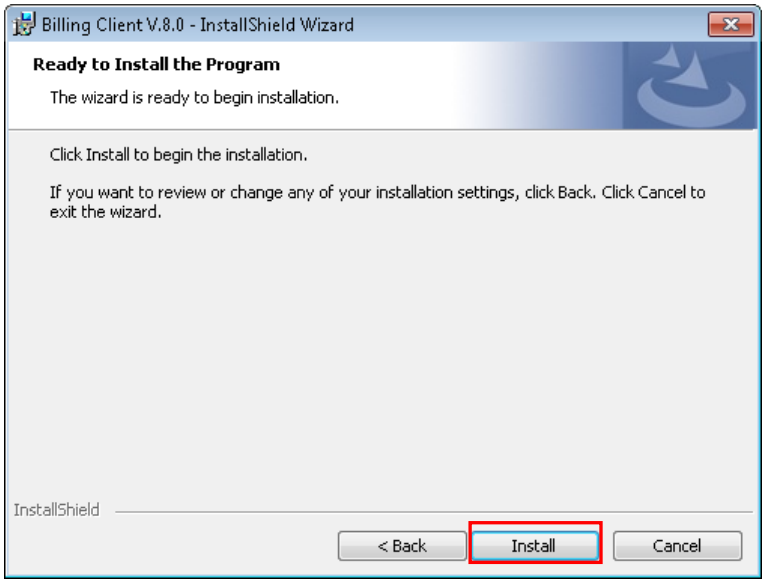
6.2. Install Billing Client

Step	Description
1.	The Billing Client can be installed on any PC. In this Compliance Test, the Billing Client is installed on the Billing Server. Install the Billing Client software from the setup program provided. Click **Next** to continue. 
2.	Click **Install** to continue. 

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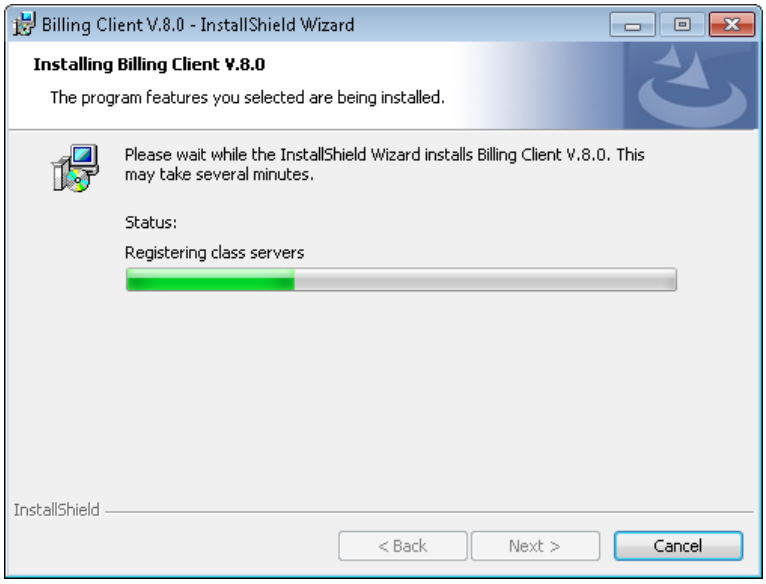
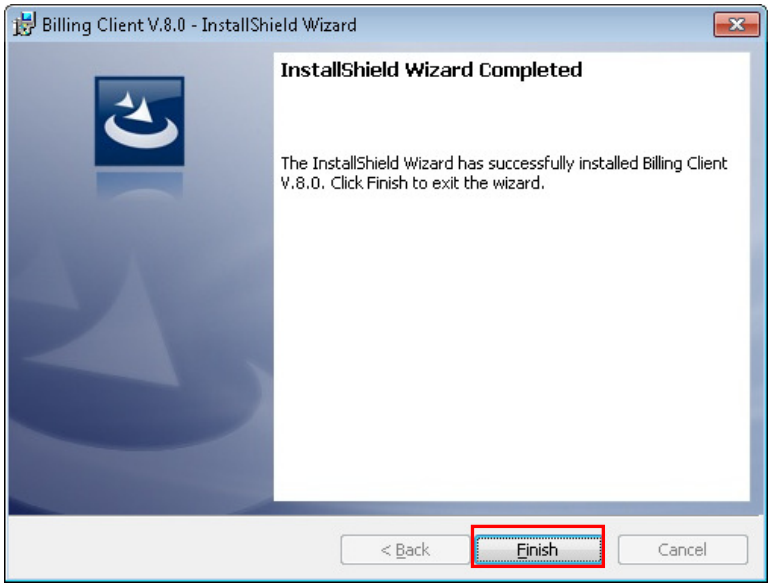
Step	Description
3.	Install progress as screenshot below. 
4.	Click **Finish** to complete. 

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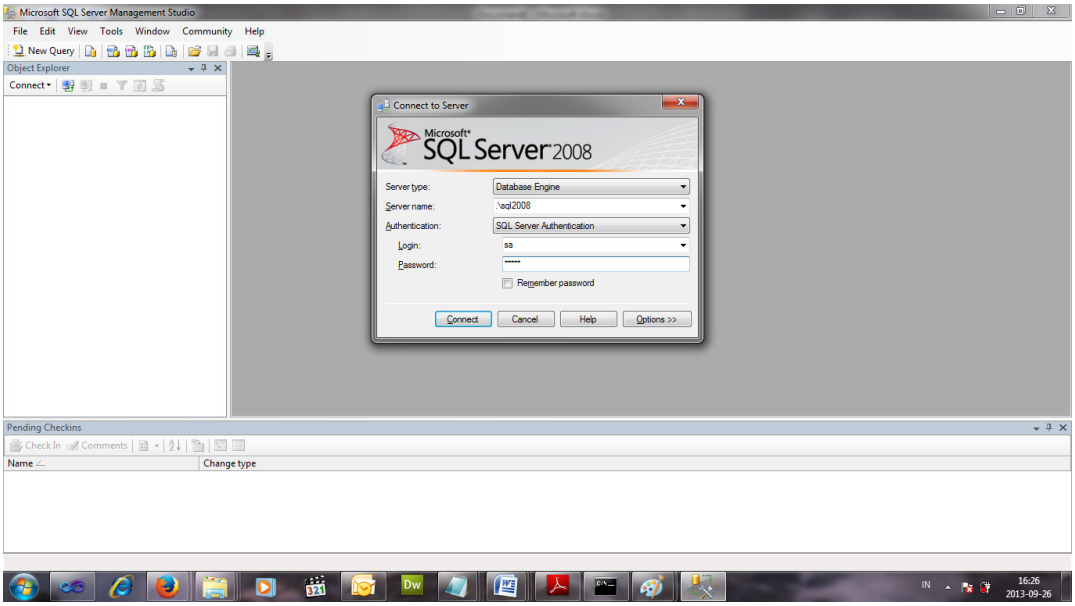
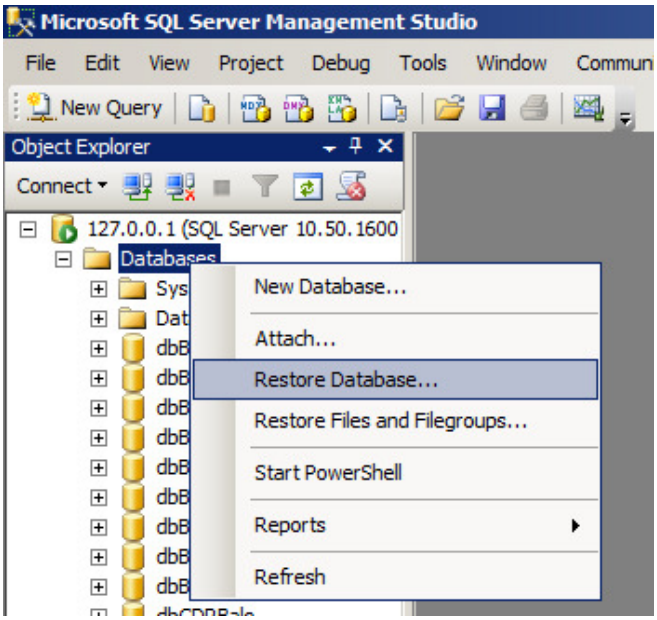
6.3. Restore Database

Step	Description
1.	Setup of the database server will not be covered in this application note. Below highlights the steps used to restore the database. Open *SQL Server Management* (not shown) and log in with the appropriate login and password. Click **Connect** to continue. 
2.	Restore the database by selecting **127.0.0.1 (SQL …) → Databases → Restore Database**. 

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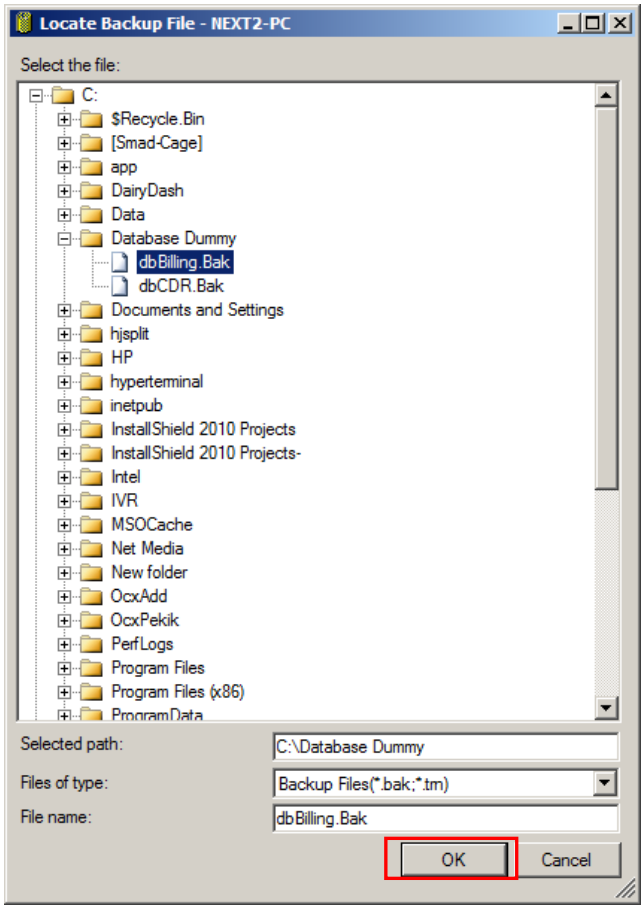
Step	Description
3.	Select the backup sets to restore from its location. In the following, **dbBilling.bak** is restored. Click **OK** to continue. 

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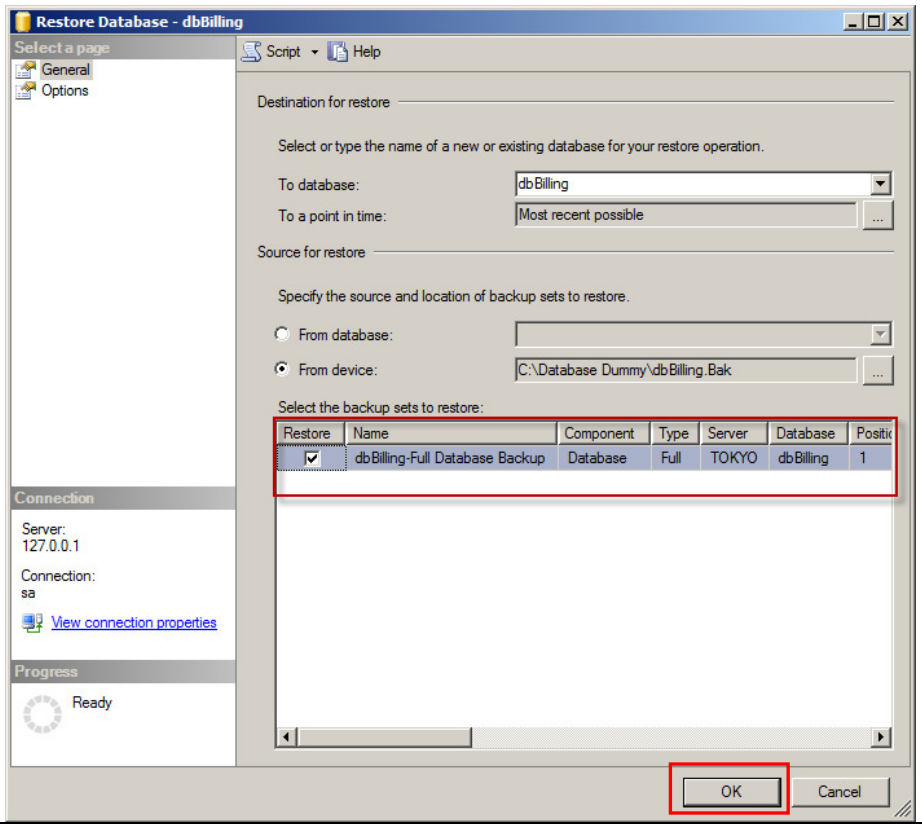
Step	Description
4.	Click **OK** to finish restore. 
5.	Repeat Step 3 to 4 for database **dbCDR.bak**.

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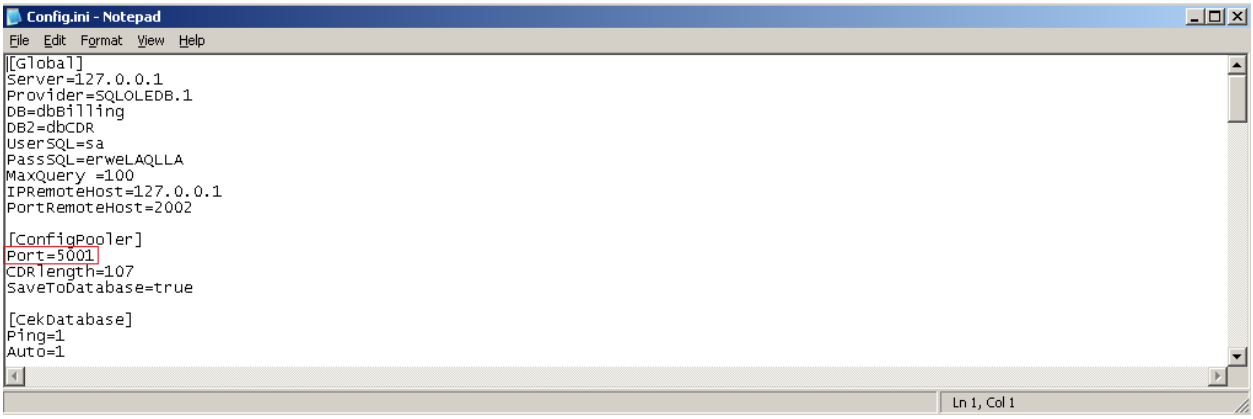
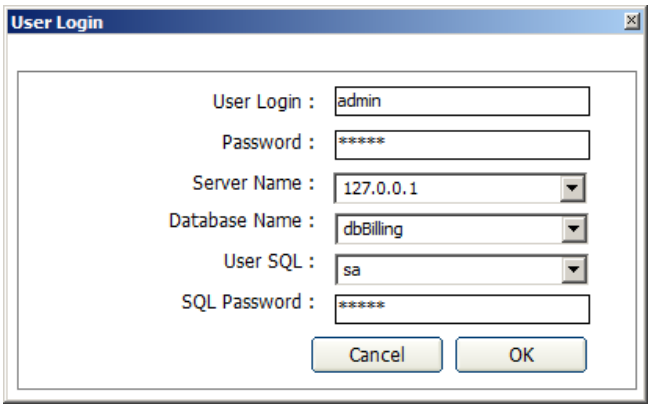
6.4. Setup Billing Server

Step	Description
1.	Open the file *config.ini* in the Billing Server folder. Ensure that the port set tallies with the port setting on Communication Manager **Section 5 Step 2**. 

6.5. Setup Billing Client

Step	Description
1.	Login to the Billing Client with the appropriate login and password. 

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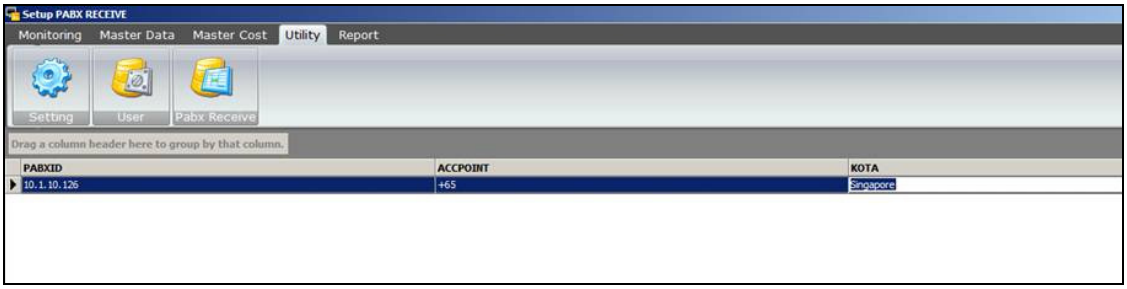
Step	Description
2.	In the Menu **Utility**, select the **Pabx Received** menu and input the PABXID, AccPoint (Code Area) and City. PABXID is the ip address of the Communication Manager. 

6.6. Verification Steps

The following steps may be used to verify the configuration:

- Confirm that the INVISION Billing System server and Communication Manager Site A or Site B can ping each other.
- On the SAT of each Communication Manager Site A and Site B, enter the **status cdr-link** command and verify that the **Link State** shows **up**.

```
status cdr-link
                                CDR LINK STATUS
                    Primary                         Secondary

       Link State: up                               CDR not administered

      Date & Time: 2013/11/12 14:42:02              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
```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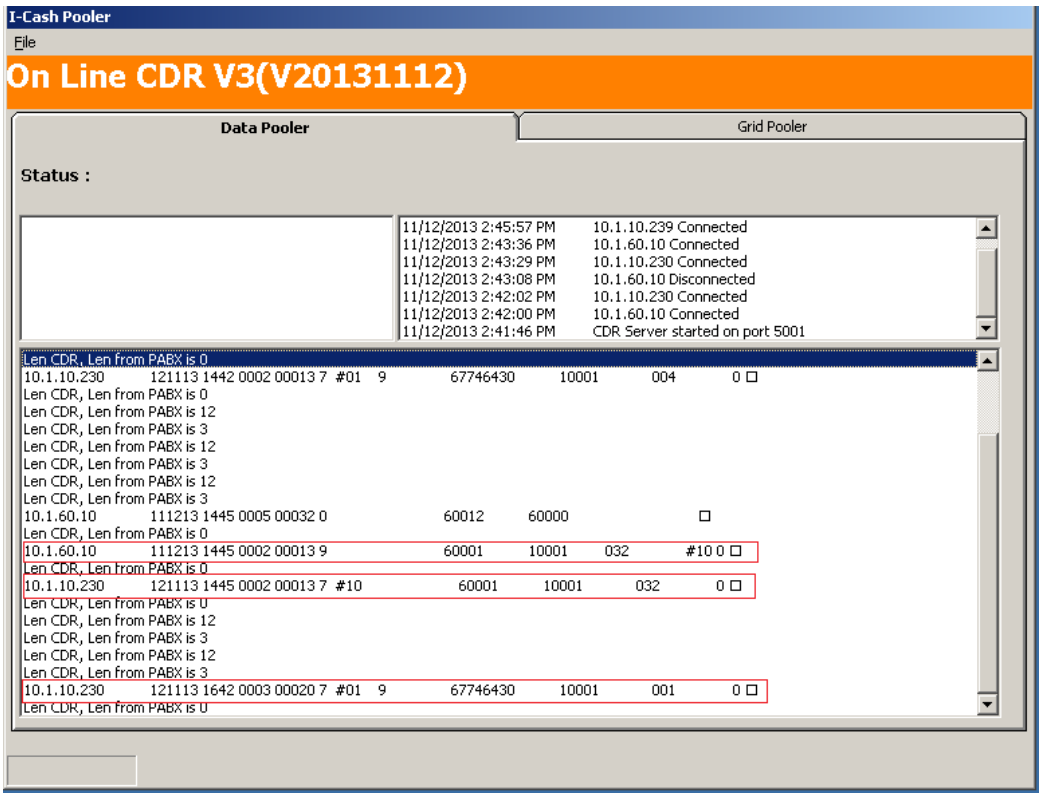
- Place an outgoing PSTN trunk call on the Communication Manager Site A and a Trunk call from Communication Manager Site A to Site B. Verify that INVISION Billing System receives the CDR record for the calls. Login to INVISION Billing System and compare the values of data fields in the CDR record with the expected values and verify that they match.



- Place internal, inbound trunk, and outbound trunk calls to and from various telephones, generate an appropriate report in INVISION Billing System and verify the report's accuracy.

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7. Conclusion

These Application Notes describe the procedures for configuring INVISION Billing System to collect call detail records from Avaya Aura® Communication Manager. INVISION Billing System successfully passed the compliance testing.

8. Additional References

This section references the Avaya documentation that is relevant to these Application Notes.

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

[1] Administering Avaya Aura® Communication Manager, Release 6.3, October 2013, Document Number 03-300509, Issue 9.0.

[2] Avaya Aura® Communication Manager Feature Description and Implementation, Release 6.3, May 2013, Document Number 555-245-205, Issue 10.0.

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