Avaya Solution & Interoperability Test Lab

Application Notes for Oak Telecom aiOffice with Avaya Communication Manager - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for Oak Telecom aiOffice to successfully collect call detail records (CDR) from Avaya Communication Manager over an IP network connection.

aiOffice is a call management and reporting software package designed to report on the phone activity of a business. aiOffice collects, stores and processes these CDR records to provide usage analysis, call costing and billing capabilities. During compliance testing, aiOffice was shown to successfully collect and process CDR records for all call scenarios tested, including outbound trunk calls, inbound trunk calls and intra-switch calls.

Information in these Application Notes has been obtained through interoperability compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the configuration steps required for the aiOffice 1.3.13, to successfully collect call detail records (CDR) from Avaya Communication Manager over TCP/IP.

aiOffice is a call management and reporting software package designed to report on the phone activity of a business. aiOffice collects, stores and processes these CDR records to provide usage analysis, call costing and billing capabilities. During compliance testing, aiOffice was shown to successfully collect and process CDR records for all call scenarios tested, including outbound trunk calls, inbound trunk calls and intra-switch calls.

Avaya Communication Manager can generate call detail records for intra-switch calls, inbound trunk calls and outbound trunk calls. In addition, split records can be generated for transferred calls and conference calls. aiOffice can support any CDR format provided by Avaya Communication Manager. aiOffice creates a custom PBX configuration file to accurately parse the CDR data. For the compliance testing, a customized format was used.

aiOffice is comprised of AIOSetup, AIOffice, AIOCommsServer, AIOConvert, OakWeb and ActiveReports. **AIOSetup** is used to configure the connection to the switch along with extensions, trunks, accounts and all other telephone system related configuration. **AIOCommsServer** is responsible for collecting CDR. This information is processed by **AIOConvert** for later retrieval. Historical reports can be run from the Win32 client application **AIOffice,** which is also responsible for report scheduling. **ActiveReports** presents live information enabling live trend analysis. OakWeb combines the features of AIOSetup and AIOffice into a web environment which clients can access through browsers.

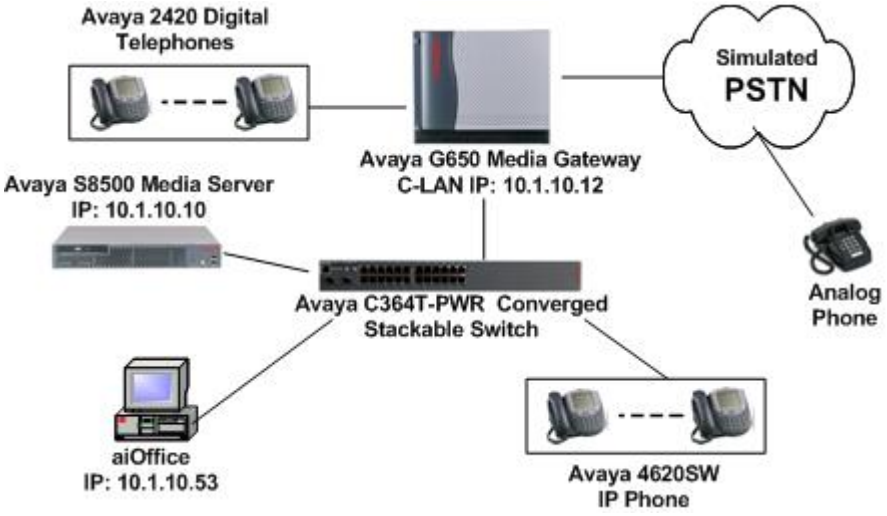


Figure 1: Avaya Communication Manager and aiOffice Compliance Test Configuration

2. Equipment and Software Validated

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

Equipment	Software
Avaya Communication Manager	3.0.1 (346.0)
Avaya 4620SW IP Telephones	2.2.3
Avaya C364T-PWR Converged Stackable Switch	4.3.12
Avaya 2420 Digital Telephones	-
Oak Telecom aiOffice	1.3.13

3. Configure the Avaya Communication Manager

This section describes the steps for configuring Call Detail Recording (CDR) links, CDR system parameters, and intra-switch CDR extensions on Avaya Communication Manager. The steps are performed through the System Access Terminal (SAT) interface.

Step	Description
1.	Enter the **change node-names ip** command. Create a new node name and IP address for the aiOffice application used to collect the call detail records from Avaya Communication Manager. The node name configured below will be used in the ip-services form to specify the remote node of the CDR links.

```
change node-names ip                                          Page   1 of   1
                                  IP NODE NAMES
    Name                 IP Address          Name               IP Address
aiOffice               10 .1  .10  .53                           .   .   .
G350                   10 .1  .30  .10                           .   .   .
clan                   10 .1  .10  .12                           .   .   .
default                0  .0   .0   .0                           .   .   .
medpro                 10 .1  .10  .13                           .   .   .
procr                  10 .1  .10  .10                           .   .   .
                          .   .   .                              .   .   .
 ( 8  of 8   administered node-names were displayed )
Use 'list node-names' command to see all the administered node-names
Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name
```

Step	Description
2.	Enter the **change ip-services** command. On Page 1 of the IP SERVICES form, define a primary CDR link by setting the **Service Type** to "CDR1". A secondary link can be defined by setting Service Type to CDR2. Set **Local Node** to "clan" and **Remote Node** to "aiOffice" as configured in step 1 above. The **Local Port** is fixed at "**0**" and the **Remote Port** may be set to a value between 5000 and 64500, inclusive, but must match the port configured on the aiOffice application in Section 4.1, step 7.

```
change ip-services                                          Page   1 of   3


                                  IP SERVICES
 Service     Enabled     Local        Local       Remote      Remote
  Type                   Node         Port        Node        Port
CDR1                  clan              0       aiOffice        9000
```

On Page 3 of the **ip-services** form, disable the Reliable Session Protocol (RSP) for the CDR link by setting **Reliable Protocol** to "**n**".

```
change ip-services                                          Page   3 of   3


                            SESSION LAYER TIMERS
  Service     Reliable  Packet Resp   Session Connect  SPDU  Connectivity
   Type       Protocol     Timer       Message Cntr    Cntr     Timer


 CDR1            n         30               3          3         60
```

Step	Description
3.	Enter the **change system-parameters cdr** command and set the following: • **CDR Date Format**: set to either **month/day** or **day/month**. The date format will be used for the date stamp that begins each new day of call records or in the "int-direct" and "customized" CDR output formats (see below). • **Primary Output Format**: set to a format specified or "**customized**". For compliance testing the "customized" format was used. • **Primary Output Endpoint**: set to "CDR1". • **Record Outgoing Calls Only**: set to "n" so that incoming calls are tracked in CDR records. • **Suppress CDR for Ineffective Call Attempts**: set to "y" so that calls that are blocked do not generate CDR records. • **Intra-switch CDR**: set to "y" so that CDR records will be generated for calls to/from extensions that are assigned intra-switch CDR (see Step 5 below). • **Outg Trk Call Splitting / Inc Trk Call Splitting**: set to "y" if a separate CDR record is desired for any portion of an outgoing/incoming call that is transferred or conferenced. 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: Use ISDN Layouts? n Use Enhanced Formats? n Condition Code 'T' For Redirected Calls? y Modified Circuit ID Display? n Remove # From Called Number? n **Record Outgoing Calls Only? n Intra-switch CDR? y** **Suppress CDR for Ineffective Call Attempts? n Outg Trk Call Splitting? y** Disconnect Information in Place of FRL? n Outg Attd Call Record? y 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 **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: 15

Step	Description
4.	If **Primary Output Format** is set to "**customized**", then on Page 2 of the **system-parameters cdr** form, enter the data items in the order that the information should appear in the customized call records sent over the CDR link. For each field in the CDR record, specify the data item and length as shown below.

```
change system-parameters cdr                                  Page   2 of   2
                            CDR SYSTEM PARAMETERS


     Data Item - Length          Data Item - Length          Data Item - Length
 1: date              - 6   17: in-trk-code      - 4   33: line-feed       - 1
 2: space             - 1   18: space            - 1   34:                   -
 3: time              - 4   19: in-crt-id        - 3   35:                   -
 4: space             - 1   20: space            - 1   36:                   -
 5: sec-dur           - 5   21: out-crt-id       - 3   37:                   -
 6: space             - 1   22: space            - 1   38:                   -
 7: cond-code         - 1   23: ppm              - 5   39:                   -
 8: space             - 1   24: space            - 1   40:                   -
 9: code-used         - 4   25: isdn-cc          - 11  41:                   -
10: space             - 1   26: space            - 1   42:                   -
11: code-dial         - 4   27: attd-console     -  2  43:                   -
12: space             - 1   28: space            - 1   44:                   -
13: dialed-num        - 18  29: vdn              - 5   45:                   -
14: space             - 1   30: space            - 1   46:                   -
15: clg-num/in-tac    - 10  31: acct-code        - 15  47:                   -
16: space             - 1   32: return           - 1   48:                   -


                               Record length = 117
```

Step	Description
5.	If Intra-switch CDR is enabled (Step 3), enter the command **change intra-switch-cdr** and enter the extensions for which intra-switch calls will generate CDR data.

```
change intra-switch-cdr                                        Page   1 of   2
                          INTRA-SWITCH CDR

Assigned Members:   3    of 5000   administered
  1: 10000    19:          37:          55:          73:          91:
  2: 10001    20:          38:          56:          74:          92:
  3: 10010    21:          39:          57:          75:          93:
  4:          22:          40:          58:          76:          94:
  5:          23:          41:          59:          77:          95:
  6:          24:          42:          60:          78:          96:
  7:          25:          43:          61:          79:          97:
  8:          26:          44:          62:          80:          98:
  9:          27:          45:          63:          81:          99:
 10:          28:          46:          64:          82:         100:
 11:          29:          47:          65:          83:         101:
 12:          30:          48:          66:          84:         102:
 13:          31:          49:          67:          85:         103:
 14:          32:          50:          68:          86:         104:
 15:          33:          51:          69:          87:         105:
 16:          34:          52:          70:          88:         106:
 17:          35:          53:          71:          89:         107:
 18:          36:          54:          72:          90:         108:
```

Note: For ease of implementation, special application **(SA8202) Intra-Switch CDR by COS** is an optional feature that allows customers to enable intra-switch CDR for extensions that are assigned a COS with intra-switch CDR activated. The customer does not have to manually add individual extensions in the **intra-switch-cdr** form. The SA8202 feature also removes the 5000 extension limit for the S8500, allowing CDR records to be generated for as many extensions as are administered on the switch.

Step	Description
6.	For each trunk group for which CDR records are desired, enter the command **change trunk-group n**, where n is the trunk group number, and set **CDR Reports** to "r". CDR Reports, field valid entries are y, n, and r. Default is y. "y" All outgoing calls on this trunk group will generate call detail records. "n" Calls over this trunk group will not generate call detail records. "r" (ring-intvl) CDR records will be generated for both incoming and outgoing calls. In addition, the following ringing interval CDR records are generated: ▪ Abandoned calls: The system creates a record with a condition code of "H," indicating the time until the call was abandoned. ▪ Answered calls: The system creates a record with a condition code of "G," indicating the interval from start of ring to answer. ▪ Calls to busy stations: The system creates a record with a condition code of "I," indicating a recorded interval of 0. The example below depicts the trunk group connected to the PSTN in the sample configuration.

```
change trunk-group 3                                          Page   1 of  20
                                TRUNK GROUP

Group Number: 3                    Group Type: co            CDR Reports: r
  Group Name: PSTN                          COR: 1        TN: 1        TAC: 103
   Direction: two-way        Outgoing Display? n
 Dial Access? y                Busy Threshold: 255       Night Service:
Queue Length: 0           Country: 1              Incoming Destination: 50001
   Comm Type: voice                 Auth Code? n   Digit Absorption List:
    Prefix-1? y                   Trunk Flash? n         Toll Restricted? n

TRUNK PARAMETERS
            Trunk Type: loop-start
    Outgoing Dial Type: automatic
     Trunk Termination: 600ohm                Disconnect Timing(msec): 500

            Auto Guard? n    Call Still Held? n     Sig Bit Inversion: none
     Analog Loss Group: 6                           Digital Loss Group: 11
                                  Trunk Gain: high

 Disconnect Supervision - In? y  Out? n                 Cyclical Hunt? n
 Answer Supervision Timeout: 10            Receive Answer Supervision? n
```

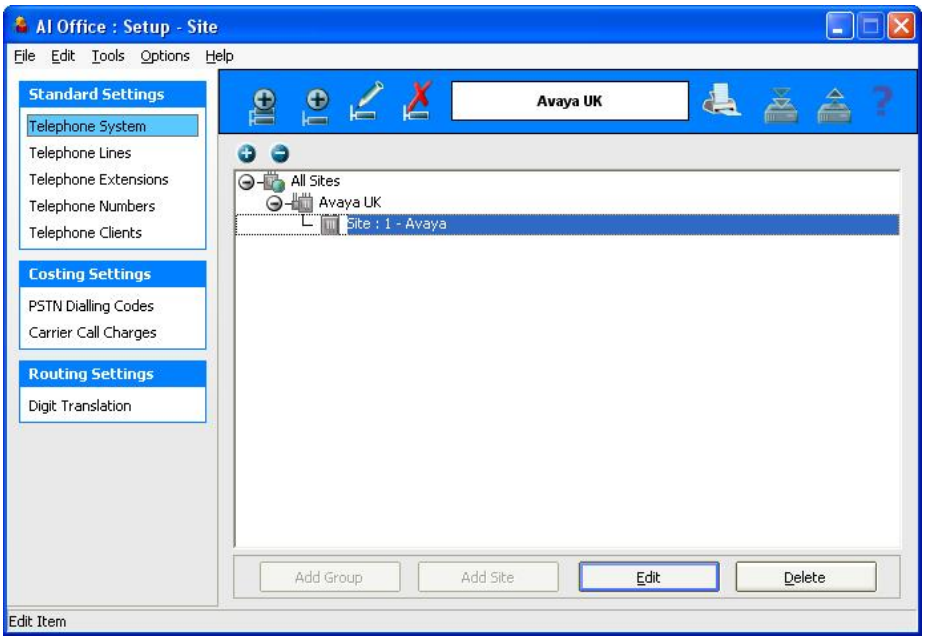
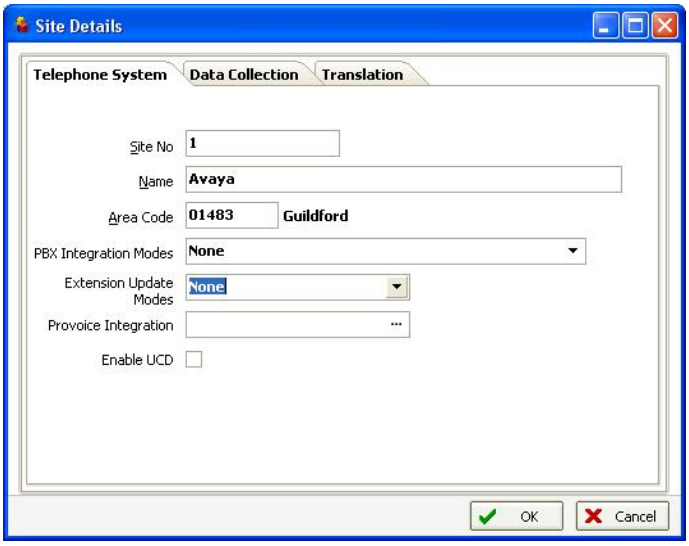
4. Configure aiOffice

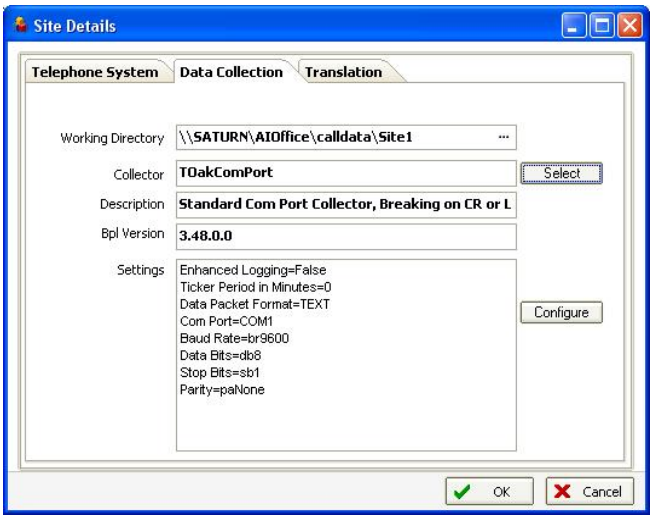
The configuration information provided in this section describes the steps required to set up aiOffice to collect CDR records generated over a TCP/IP link to the Avaya Communication Manager.

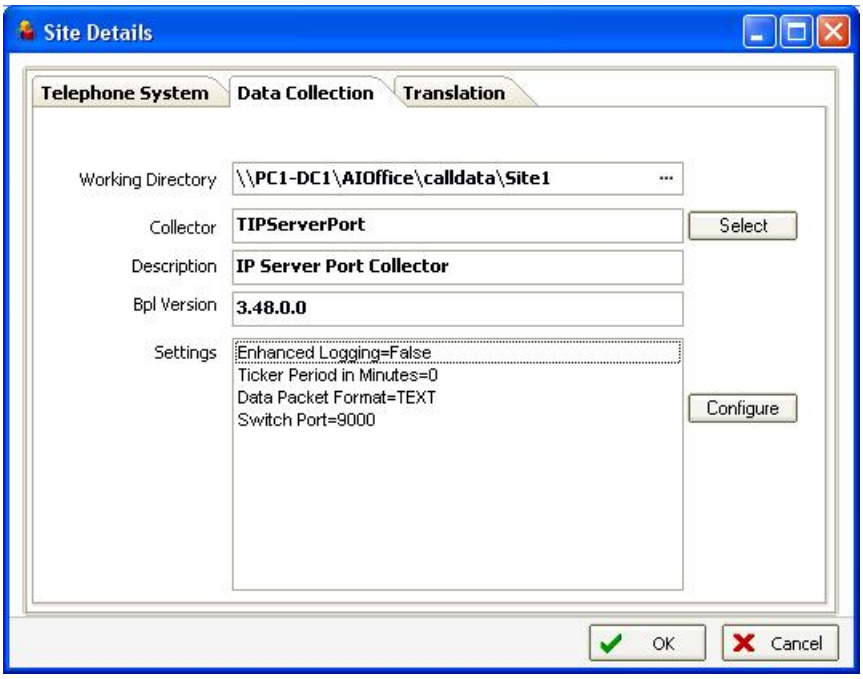
For all other provisioning information, such as aiOffice software installation, refer to Oak Telecom aiOffice product documentation in Section 9.

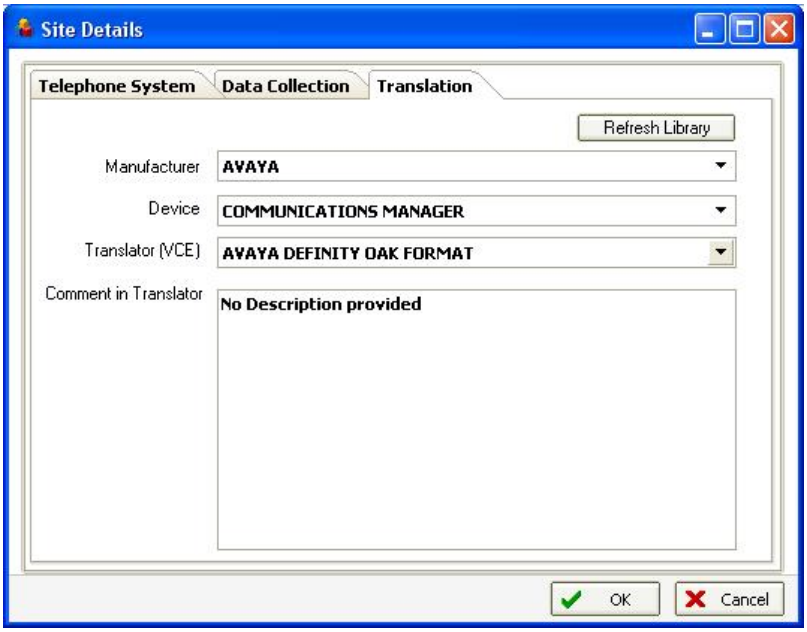
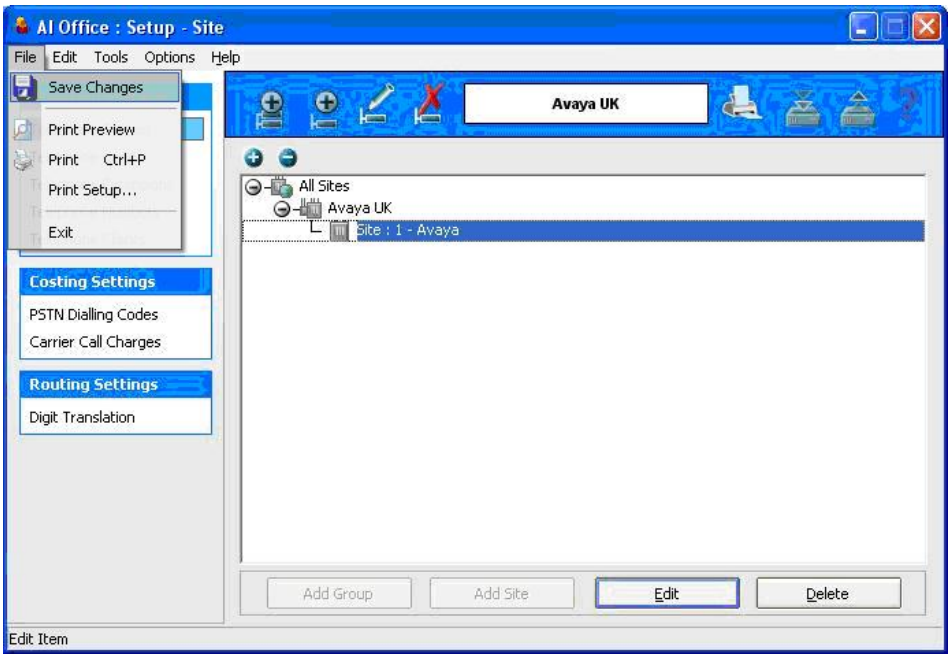
4.1. aiOffice Configuration

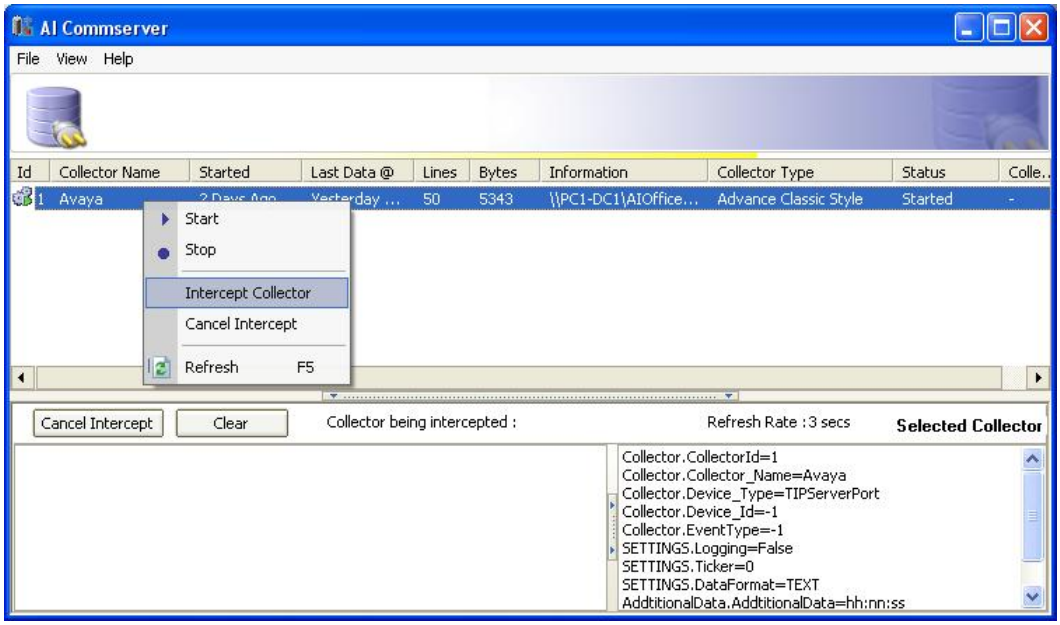
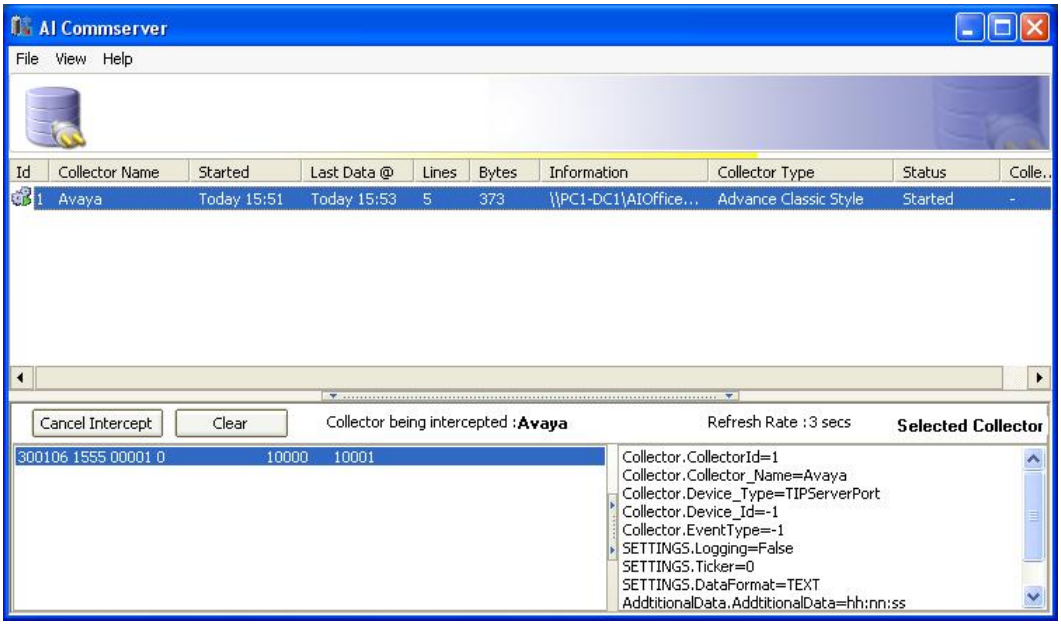
Step	Description
1.	On the aiOffice PC navigate to Start → Programs → Oak Telecom → AI Office → AI Office Setup. Select "Supervisor" for the **User Name** and enter the appropriate password. Click **OK**. 

2.	From the Standard Settings section in the left pane, select **Telephone System** to bring up the sites configured. All default installations will be provided with a default site for configuration. If a site name was added during installation, it will be viewable in the right pane. In this case, "Avaya" was entered as the site name. Select the site and click the **Edit** button. 
3.	The **Telephone System** tab is pre-populated with information of the site details entered during the aiOffice installation. 

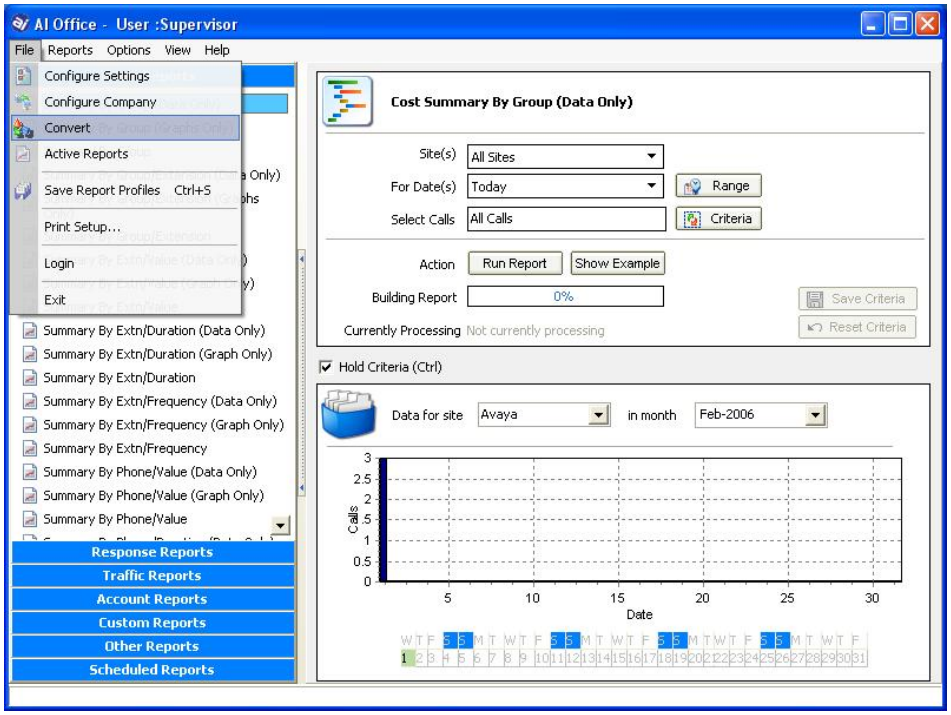
4.	Select the **Data Collection** tab. The Working Directory will be the folder to which all collected and processed CDR information will be stored. Pressing the three dots at the end of the entry box will present a folder selection dialog box where this location can be set. In a Client/Server environment a Uniform Naming Convention (UNC) path should be used so that data is visible to other network clients. To set the **Collector** field, click the **Select** button. 
5.	Pressing the **Select** button launches a selection dialog displaying the available Collector types. Double click on the collector named **IP Server.** 

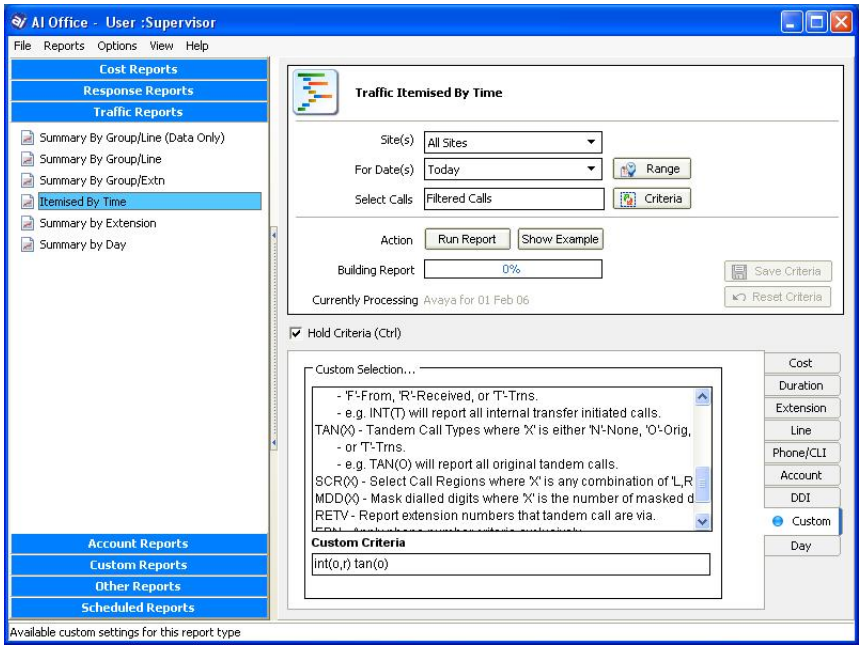
6.	To set the **Settings,** click on the **Configure** button. 
7.	In the **IP Server Setup** dialog box, in the **Switch Port** field, enter the matching the **Remote port** configured on the Avaya Communication manager in Section 3, Step 2. 

8.	Select the **Translation** tab. Select "AVAYA" from the **Manufacturer** drop-down followed by "COMMUNICATIONS MANAGER" from the **Device** drop-down followed by "AVAYA DEFINITY OAK FORMAT" from the **Translator (VCE)** drop-down. Click **OK** to return to the main window in AI Office Setup. 
9.	From the main AI Office Setup window, select the **File** menu from the task bar and select the **Save Changes** option as shown below. 

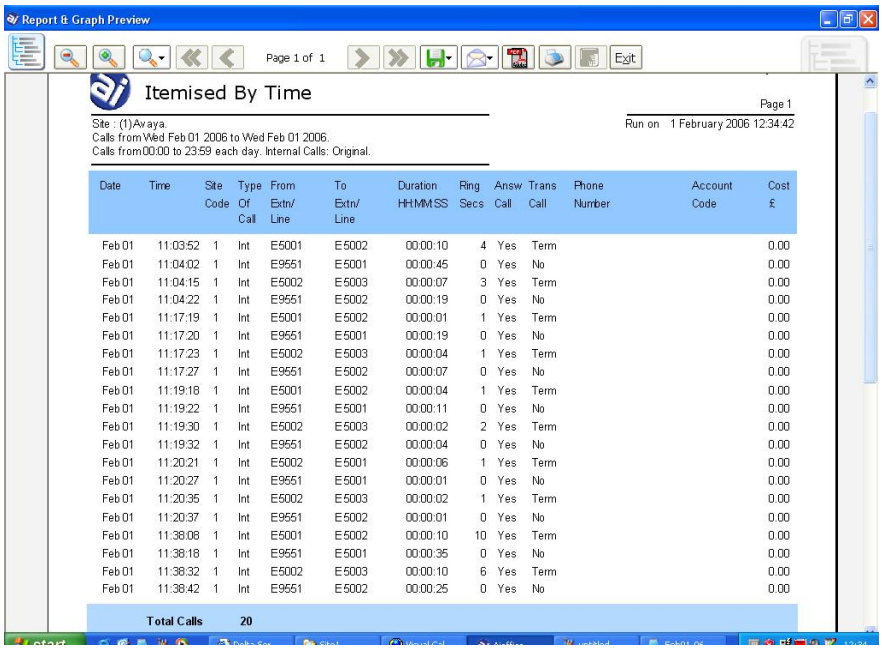
10.	To launch the AI Commserver to start collecting the CDR records select Start → Programs → Oak Telecom → AI Office → AI Office Commserver. To verify data collection is taking place, right click on the collector and select Intercept Collector. Any CDR being collected will be shown in the bottom left pane. 
11.	A green 'play' icon and a **Status** change to *Started* will be shown as below to indicate that the application is connected and collection has started. 

4.2. Generating aiOffice Reports

Step	Description
1.	Navigate to Start → Programs → Oak Telecom → AI Office → AI Office Reports. From the taskbar, select the **File** menu → **Convert**. 
2.	A dialog box appears. Select continue to process the new CDR records collected. 

3.	Select the **Traffic Reports** section from the left pane, then click the **Itemised By Time** report within that section. This report shows details of each call. The report does not include tandem and internal calls as standard. To include tandem and internal calls, click the **Criteria** button then select the **Custom** tab in the **Custom selection** section. Enter "int(o,r)" to include internal calls and "tan(o)" to include tandem calls in the **Custom Criteria** field. Click **Save Criteria**. Now click the **Run Report** button. 

4.	An example of a Traffic Itemised By Time report is shown below.



5. Interoperability Compliance Testing

The interoperability compliance testing included feature, serviceability and performance testing. The feature testing evaluated the ability of aiOffice to collect and process CDR records for various types of calls. The source and destination of each call was verified on the aiOffice application. The serviceability testing introduced failure scenarios to see if aiOffice could resume CDR collection after failure recovery. The performance testing produced bulk call volumes to generate around 20,000 CDR records.

5.1. General Test Approach

The general test approach was to manually place intra-switch calls, inbound trunk, outbound trunk calls, conference calls, transferred calls, and forwarded calls to and from telephones controlled by Avaya Communication Manager and verify that aiOffice collects the CDR records and properly classifies and reports the attributes of the call. For serviceability testing, logical links were disabled/re-enabled. For performance testing, a call generator was used to place calls over an extended period of time.

5.2. Test Results

All feature and performance tests passed. The aiOffice application successfully captured and processed call records from Avaya Communication Manager. aiOffice also successfully processed the CDR data, performed call costing, and produced call accounting reports.

All executed test cases passed. aiOffice successfully collected the CDR records from Avaya Communication Manager for all types of calls generated including intra-switch calls, inbound/outbound PSTN trunk calls, inbound/outbound private IP trunk calls, transferred calls, and conference calls. Performance tests verified that aiOffice could collect call records during a sustained, high volume of calls. For serviceability testing, aiOffice was able to resume collecting CDR records after failure, but not for CDR records for calls that were placed during the outages between the Avaya Communication Manager and aiOffice as only the standard CDR link was used as the Avaya Communication Manager Reliable Session Protocol is not supported.

The aiOffice application can link call records for transferred incoming calls but not for outgoing and internal transfers.

Note: As shown in section 3, step 2, the Avaya Communication Manager Reliable Session Protocol (RSP) was disabled for compatibility with aiOffice. With RSP disabled, the communication protocol is not as robust and there is a higher chance of loss of CDR records if there is a network failure.

6. Verification Steps

The following steps may be used to verify the configuration:

- Use the **ping** command to verify IP communication between the aiOffice PC and the Avaya Communications Manager C-LAN IP address.
- On the SAT, enter the **status cdr-link** command to verify that the CDR link state is up.
- Place a call and verify that aiOffice received the CDR record for the call. Compare the values of data fields in the CDR record with the expected values and verify that the values match.
- Verify aiOffice Commserver connection to Avaya Communication Manager (Section 4.1, step 10 - 11)
- Place internal, inbound trunk, and outbound trunk calls to and from various telephones, generate an appropriate report in aiOffice Reports , and verify the report's accuracy. (Section 4.2).

7. Support

Technical support for aiOffice can be obtained by contacting OAK Telecom. at:

- Phone: 0870 2000 247
- E-mail: support@oak.co.uk
- Web: www.oak.co.uk

8. Conclusion

These Application Notes describe the required configuration steps for the aiOffice application to collect call detail records from Avaya Communication Manager. aiOffice 1.3.13 was successfully compliance tested with Avaya Communication Manager 3.0.

9. Additional References

This section references the Avaya and Oak Telecom product documentation that are relevant to these Application Notes.

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

- Feature Description and Implementation For Avaya Communication Manager, Release 3.0, Issue 3.0, June 2005, Document Number 555-245-205
- Administrator Guide for Avaya Communication Manager, Release 3.0, Issue 1.0, June 2005, Document Number 03-300509

The following Oak documentation can be found on the aiOffice installation CD and at http://www.oak.co.uk

- aiOffice Installation, Configuration and Running Reports Issue 1.5 in document AIOHelp.chm

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 Developer*Connection* Program at devconnect@avaya.com.