Avaya Solution & Interoperability Test Lab

Application Notes for the CTI Data Solutions Proteus Office 5.0 with Avaya Communication Manager - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the CTI Data Solutions Proteus Office 5.0 to successfully interoperate with Avaya Communication Manager. Features and functionality were validated and performance testing was conducted in order to verify operation under load.

The Proteus Office is a telephone call management and reporting application. The Proteus Office provides information about call detail records through a range of reports that can be printed, or saved to a number of popular file formats for further analysis.

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.

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1. Introduction

These Application Notes describe a compliance-tested configuration utilizing Avaya Communication Manager 3.0 and CTI Data Solutions Proteus Office 5.0.

Proteus Office is a telephone call management and reporting application. Proteus Office comprises three principal parts:

- The Switch Interface is used to collect Avaya Communication Manager specific call information and translate the information into the standard Proteus call record format.
- The Costing Engine receives data from the Switch Interface and writes the data to the calls database.
- The Proteus Office Main User Interface displays a user-selectable real-time call summary. The Main User Interface is also used to set up information about the telephone system, company organisation and reports.

The Proteus switch interface program connects to Avaya Communication Manager over the local or wide area network using TCP/IP and runs in a passive server mode. Avaya Communication Manager is set up to output Call Detail Records (CDRs) to the Proteus server on a specified port.

The Costing Engine processes the call records received in the 'call queue' database and writes the records to the Proteus calls database. Call processing involves applying the correct tariff rates and costing the calls (where appropriate, for example outgoing calls).

Proteus Office provides information about telephone usage through a range of reports that can be printed, or saved to a number of popular file formats for further analysis.

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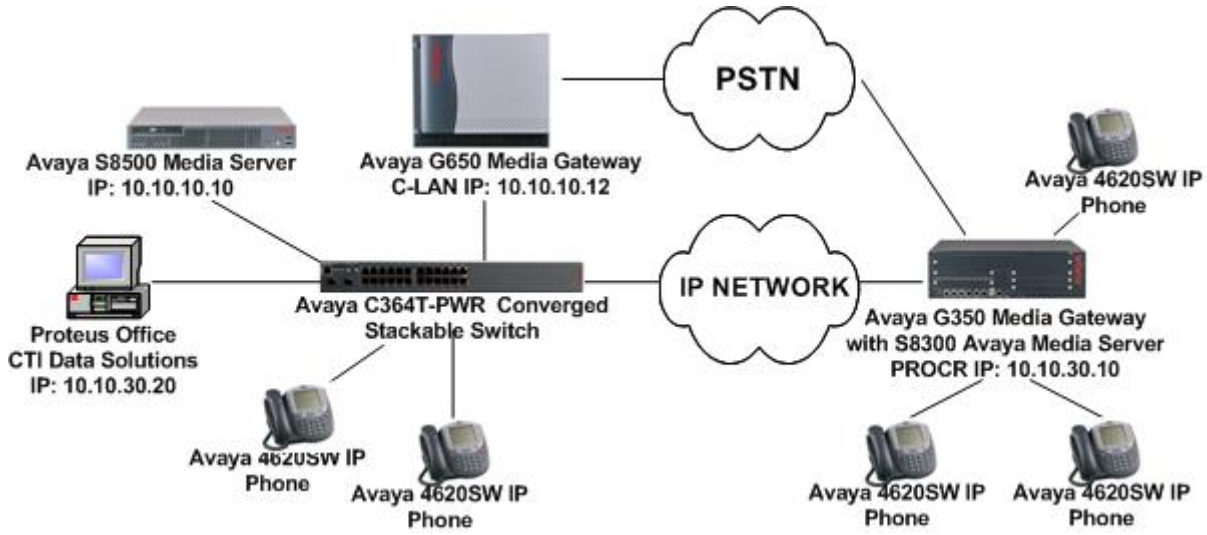

Figure 1: Avaya Communication Manager and CTI Data Solutions Proteus Office Compliance Test Configuration

2. Equipment and Software Validated

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

Equipment	Software
Avaya Communication Manager	340.3
Avaya 4620 IP Telephones	1.9.1
Avaya C364T-PWR Converged Stackable Switch	4.3.12
CTI Data Solutions Proteus Office	5.0

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3. Configure the Avaya Communication Manager

This section describes the steps for configuring 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. The steps are applicable to both Avaya Media Servers in the sample configuration of **Figure 1**; some minor differences are noted where helpful.

Step	Description

1.	Enter the **change node-names ip** command.
	
	For the S8500, specify node names and IP addresses for the C-LAN board and Proteus Office (CDR Server).
	
	`change node-names ip` `Page 1 of 1`
	`IP NODE NAMES`
	`Name IP Address Name IP Address`
	`CDR_Server 10 .10 .30 .20`
	`G350 10 .10 .30 .10`
	`VAL 10 .10 .10 .14`
	`clan 10 .10 .10 .12`
	`default 0 .0 .0 .0`
	`medpro 10 .10 .10 .13`
	`procr 10 .10 .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`
	
	For the S8300, specify a node name and IP address for the Proteus Office. The node name and IP address for **procr** (the S8300 Media Server Processor Ethernet) are automatically set when the S8300 is configured with an IP address.
	
	`change node-names ip` `Page 1 of 1`
	`IP NODE NAMES`
	`Name IP Address Name IP Address`
	`CDR_Server 10 .10 .30 .20`
	`clan 10 .10 .10 .12`
	`default 0 .0 .0 .0`
	`procr 10 .10 .30 .10`
	`( 5 of 5 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`
	
	The node names configured above will be used in the ip-services form to specify the local and remote nodes of the CDR links.

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Step	Description

2.	Enter the **change ip-services** command. On Page 1 of the **ip-services** form, configure a "**CDR1**" **Service Type** and specify the node names configured in Step 1 above for the C-LAN board (or Processor Ethernet for the S8300) and CDR_Server as the **Local Node** and **Remote Node**, respectively. 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 Proteus Office (see Section 5.7).
	
	S8500:
	
	`change ip-services` `Page 1 of 3`
	
	`IP SERVICES`
	`Service Type` `Enabled` `Local Node` `Local Port` `Remote Node` `Remote Port`
	`CDR1 clan 0 CDR_Server 9000`
	
	S8300:
	
	`change ip-services` `Page 1 of 3`
	
	`IP SERVICES`
	`Service Type` `Enabled` `Local Node` `Local Port` `Remote Node` `Remote Port`
	`CDR1 procr 0 CDR_Server 9000`
	
	The Proteus Office CDR server is able to receive CDR outputs from more than one switch as it can listen on the same port configured on separate Avaya Communication Manager systems. 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 Type` `Reliable Protocol` `Packet Resp Timer` `Session Connect Message Cntr` `SPDU Cntr` `Connectivity Timer`
	`CDR1` **`n`** `30 3 3 60`

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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 in [1] or "**customized**". The example below uses the "**customized**" format. • **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
```


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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 they 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.

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


                                Record length = 130
```


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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: 3000     19:          37:          55:          73:          91:
  2: 3001     20:          38:          56:          74:          92:
  3: 3003     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 1000 and 5000 extension limit for the S8300 and S8500, respectively, allowing CDR records to be generated for as many extensions as are administered on the switch.

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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 "**y**". The example below depicts the trunk group containing trunks 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: y
  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 the Avaya C364T Converged Stackable Switch

No special configuration of this device is necessary in this configuration.

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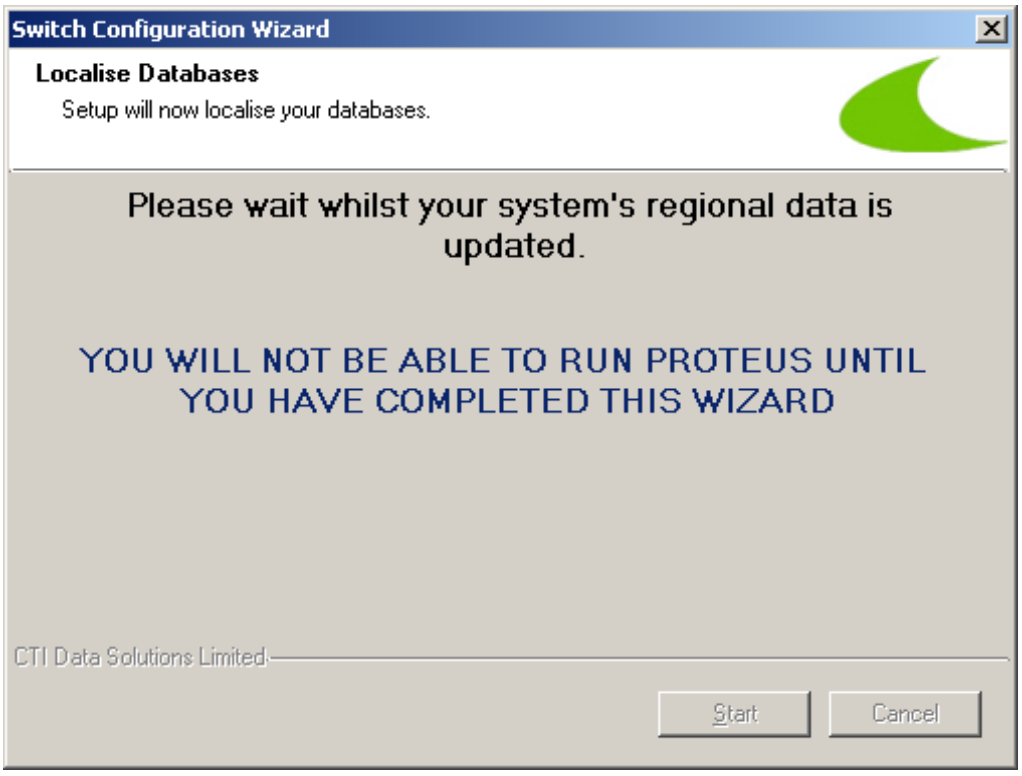
5. Configure the Proteus Office Application

The following describes the configuration of the Proteus Office switch interface program. This configuration is performed during the second phase of the Proteus application installation.

Please refer to the Proteus Office Installation documentation for details of Phase 1 of the Proteus Office application. The documentation can be found on http://www.proteusoffice.com

On reboot of the PC, the following screens appear in the order shown:

5.1. Switch Configuration Wizard



Click **Start** to begin.

5.2. Create/Edit Switch

Enter a site or switch name for Avaya Communication Manager, then click the **Create** button then the **Next** button.

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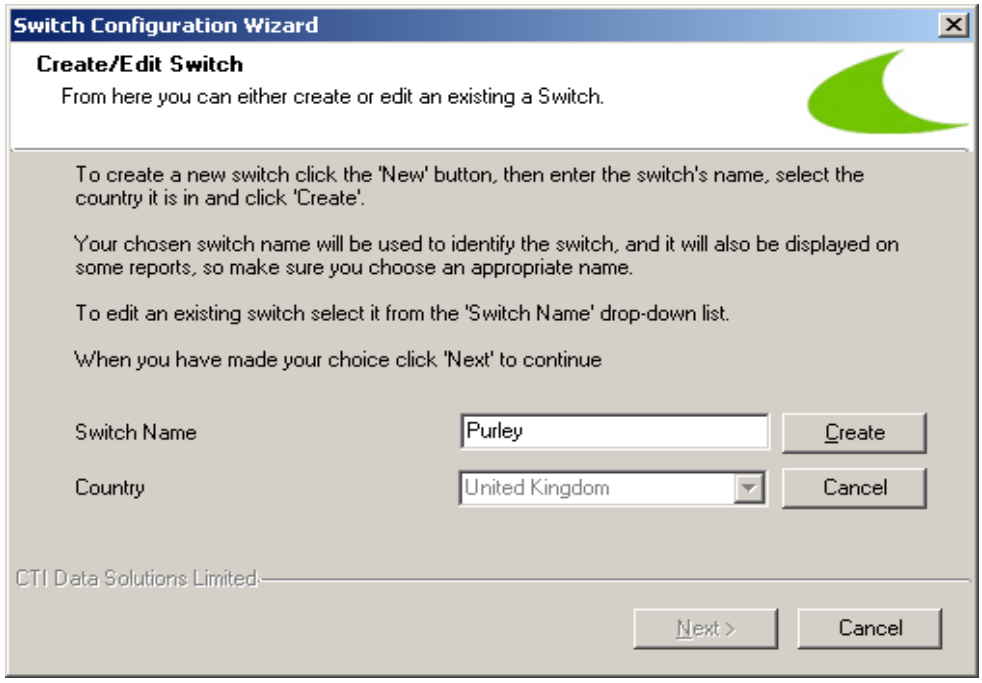
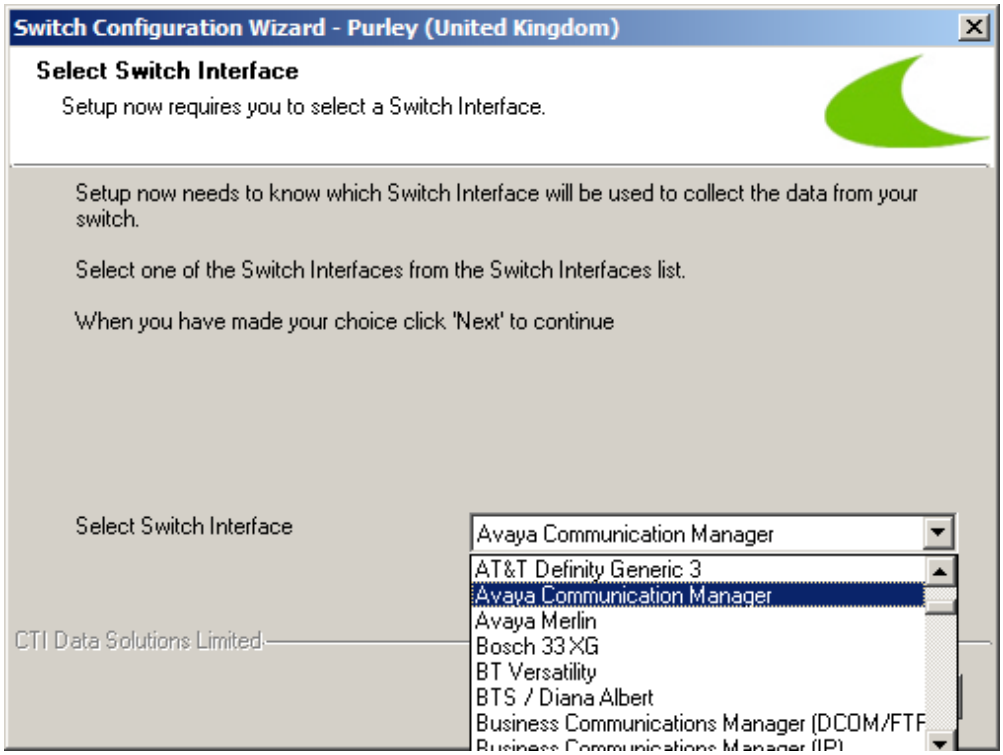


5.3. Select Switch Interface

Select 'Avaya Communication Manager' from the list of switch interfaces, and then click the **Next** button.



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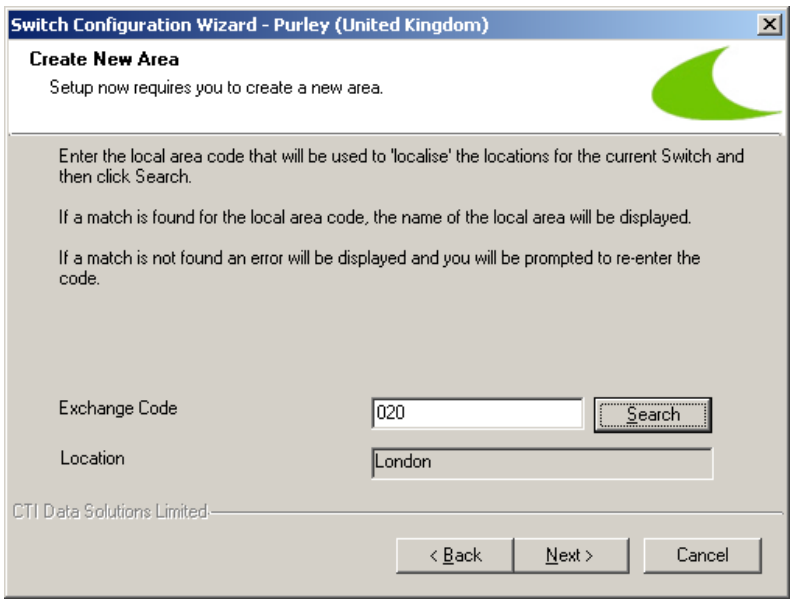
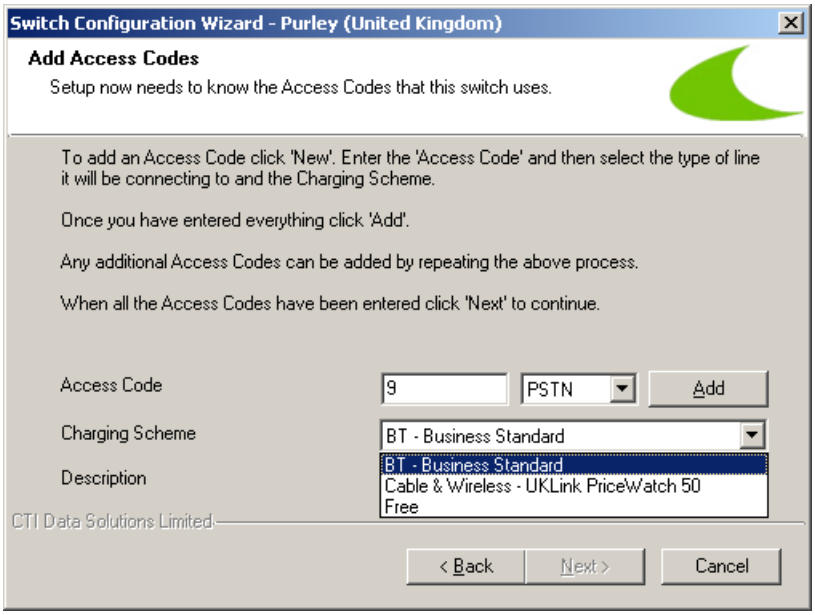
5.4. Create New Area

Enter an area dialing code, for example 020 for London and then click the **Search** button to search the database. If found, the Location will be displayed and the **Next** button will be enabled. Click the **Next** button.



5.5. Add Access Codes

Create an access code that will be used to link the selected charging scheme for costing. Note that an access code needs to be created even if the switch does not output an access code. This feature allows multiple charging schemes to be installed for systems using multiple carriers for outgoing calls.



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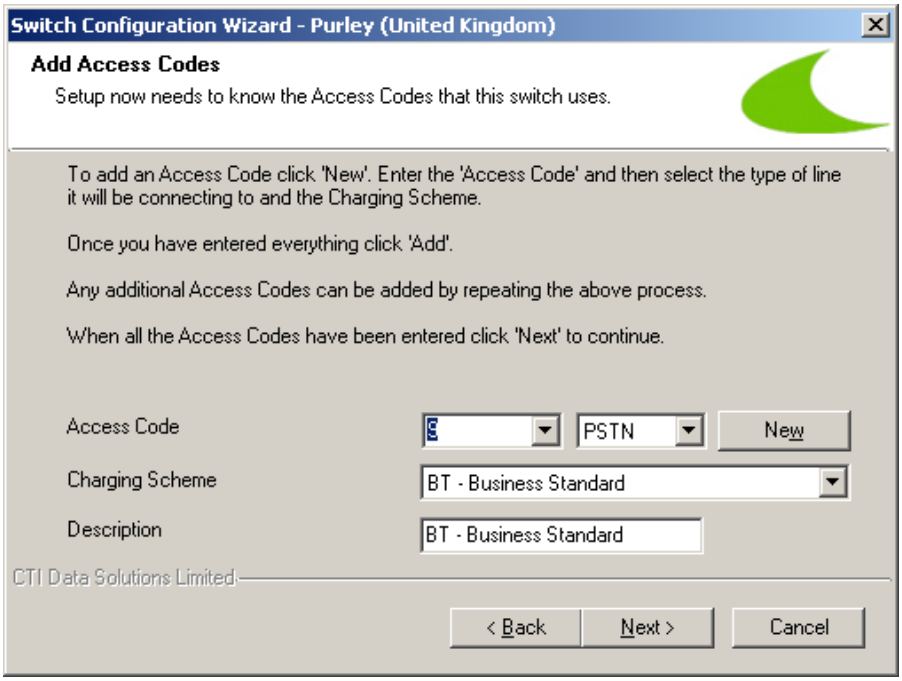
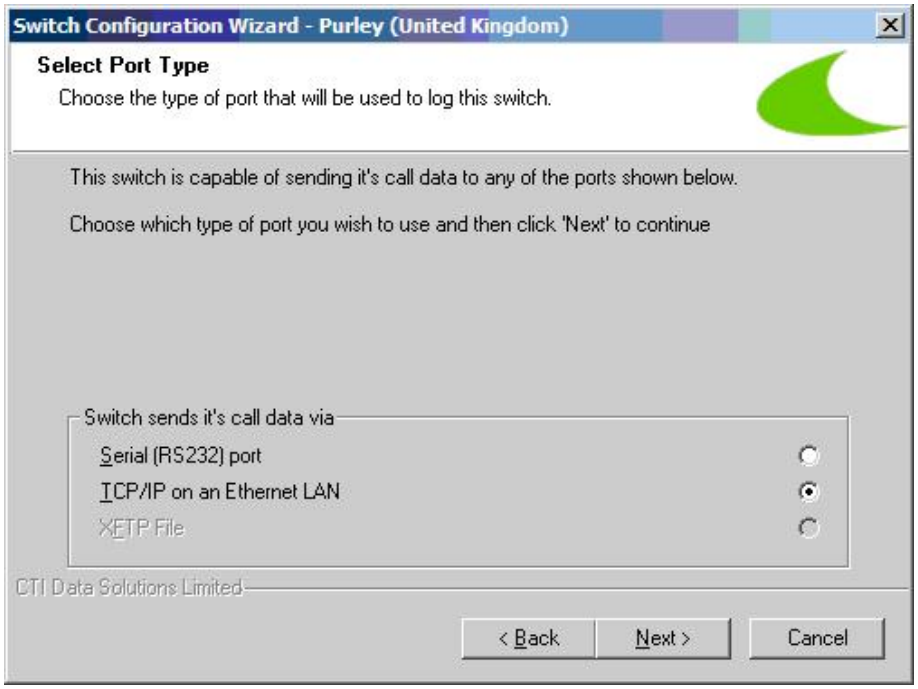
Click the **Add** button to enable the **Next** button.



Click **Next** to continue configuring the TCP/IP settings.

5.6. Select Type of Port to Log Data



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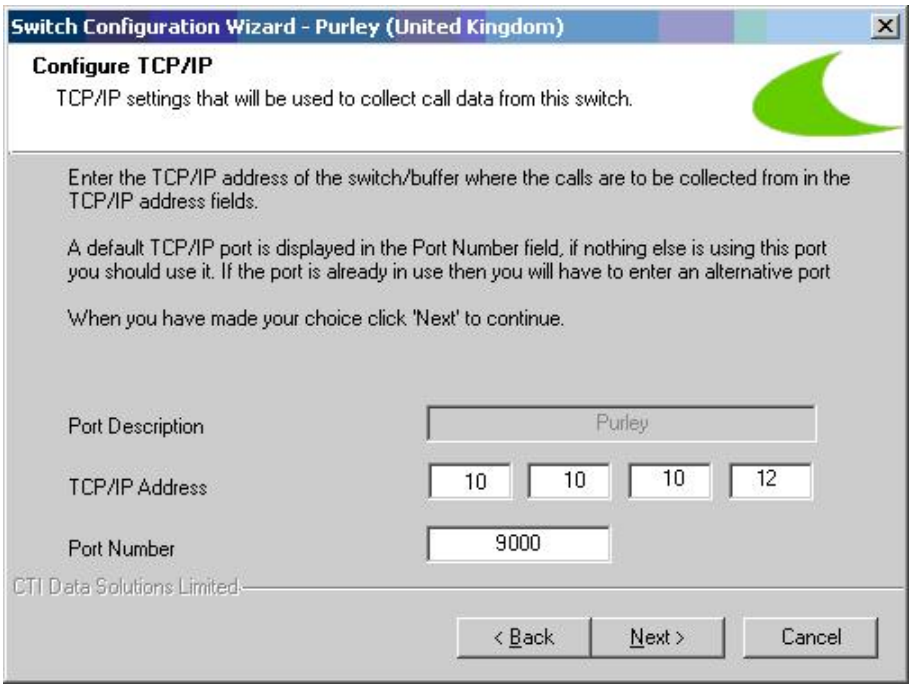
Select the type of port to which Avaya Communication Manager sends its call data. For this configuration, TCP/IP on an Ethernet LAN was selected.

5.7. Configure TCP/IP

Enter the IP address of the C-LAN (S8500) or Processor Ethernet (S8300) and the port that data will be output on.



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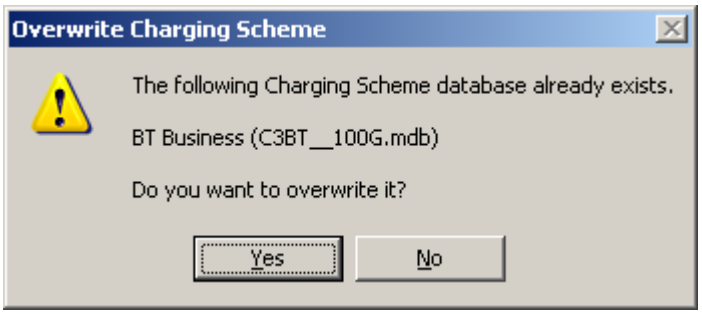
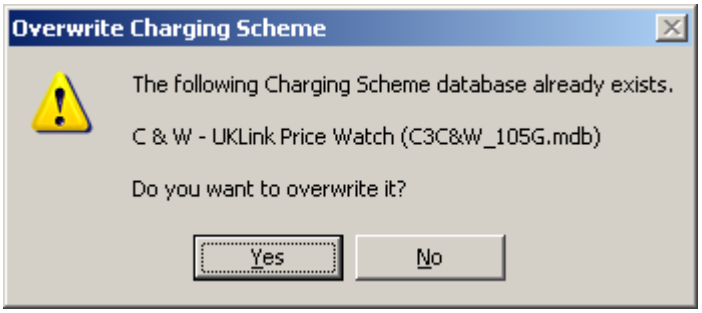
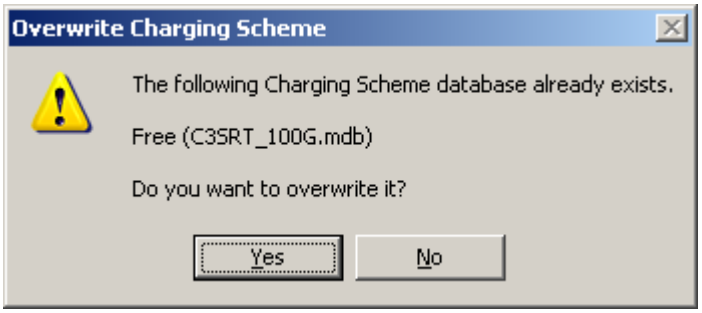
5.8. Update Switch Configuration

Click **Yes** when prompted to overwrite the charging scheme(s).







Click **Start Logging** to start the Proteus Office programs including the switch interface program

IMPORTANT NOTE!
The current version of the Avaya Communication Manager CDR interface must be installed (see Section 2). This is available from the CTI Data Solutions support website (http://support.ctidata.co.uk).

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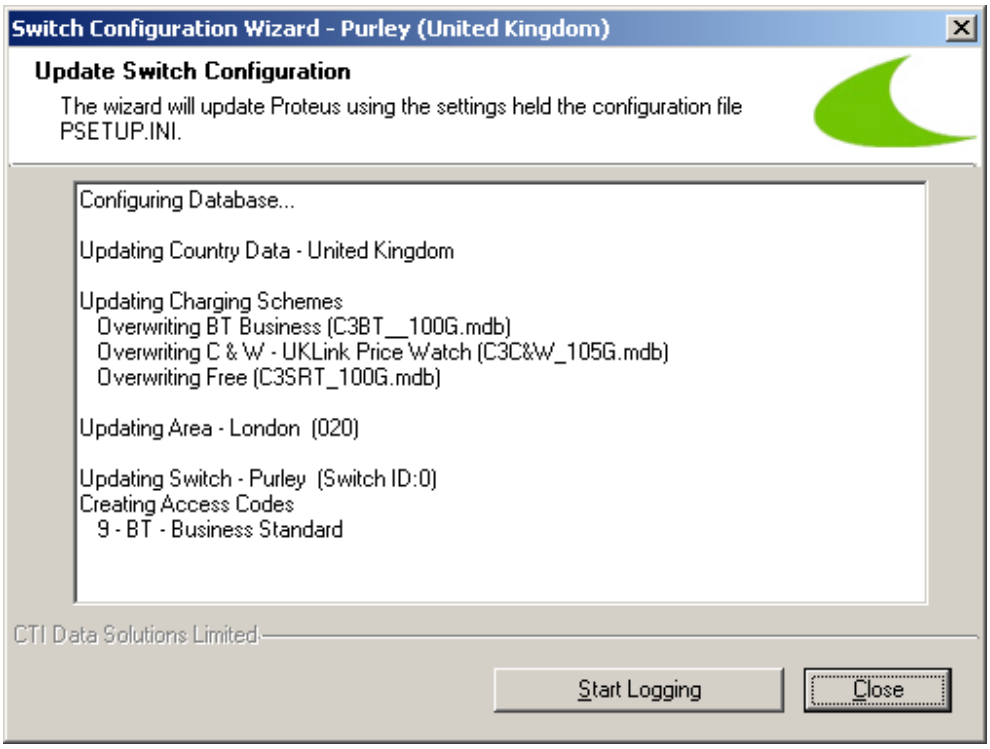
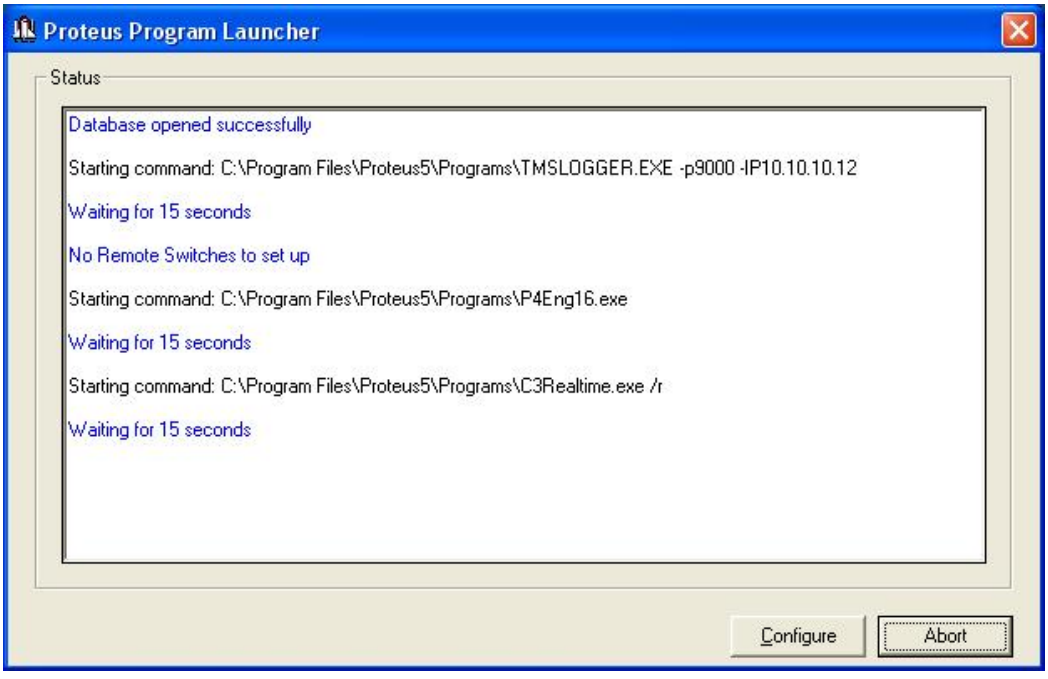


The Proteus Office Programs Launcher will be started.



Wait a few moments for the programs to start. The Switch Interface, Proteus Costing Engine and Proteus Report Scheduler will be launched.

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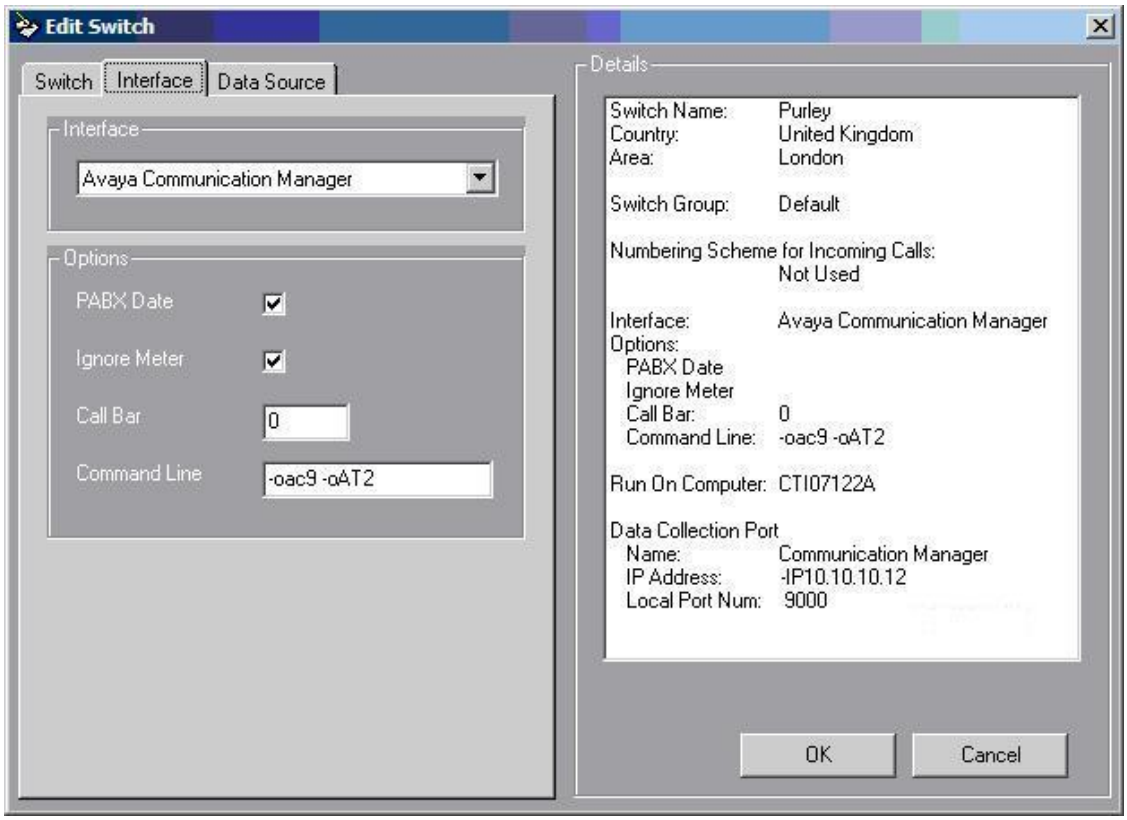
5.9. Proteus Edit Switch screen

Once started, click the **Proteus Office** icon on the desktop to start using Proteus Office.



The command line option –oAT<num> is used to specify the CDR format to log.

-oAT2 configures the switch interface to log the custom format specified (see below) for the verification test.

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6. Interoperability Compliance Testing

A generic call account and billing test plan was used and customized to include the specific features of the CTI Data Solutions Proteus Office application.

The interoperability compliance test included feature, functionality and performance load testing. The testing examined the Proteus Office 5.0 interoperability with Avaya Communication Manager 3.0. The majority of the testing focused on the ability of the Proteus Office application to collect and process the CDR data produced by Avaya Communication Manager server correctly. The source and destination of each call was verified on the Proteus Office application to see if it was the same as what the Avaya Communication Manager outputted.

Important Note: The Proteus application 5.0 uses the standard CDR link, instead of using the Reliable Session Protocol (RSP) link to communicate with Avaya Communication Manager. For example, this could mean that ten minutes worth of calls could be potentially lost before Avaya Communication Manager starts buffering the calls if the network cable is unplugged from the Proteus server. A secondary CDR link on Avaya Communication Manager may be configured to output CDR records to another CTI Data Solutions server to collect CDR records if the primary CDR link goes down.

6.1. General Test Approach

All feature functionality test cases were performed manually. The general test approach entailed verifying CDR collection for different call types, such as trunk calls, intra-switch calls, conference calls, transferred calls, and forwarded calls. Compliance testing also verified the compatible CDR record formats supported by Proteus Office. Performance tests verified CDR collection under a bulk call load.

6.2. Test Results

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

Important Note: The Proteus application 5.0 uses the standard CDR link, instead of using the Reliable Session Protocol (RSP) link to communicate with Avaya Communication Manager. For example, this could mean that ten minutes worth of calls could be potentially lost before Avaya Communication Manager starts buffering the calls if the network cable is unplugged from the Proteus server. A secondary CDR link on Avaya Communication Manager may be configured to output CDR records to another CTI Data Solutions server to collect CDR records if the primary CDR link goes down.

7. Verification Steps

Check that Avaya Communication Manager is outputting CDRs and that the Proteus switch interface has been configured correctly as follows:

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1. **Communication Manager CDR Output:**
    - Click the icon on the bottom right hand corner of the Proteus switch interface screen.
    - Click the **View** button.
    - Make a test call.
    - Check that the CDR is displayed in the window.

      Notes:
      1. This is raw data from Avaya Communication Manager being accessed over the IP connection. Data in this window confirms Avaya Communication Manager is outputting data over the specified IP port.

      2. NetStat and/or Hyperterminal (Windows utility programs) can be used to monitor open ports and check for output from Avaya Communication Manager.

2. **Switch Interface logging:**
    - If CDRs are displayed in the View window, check that the Calls Logged counter is being incremented to confirm that the switch interface is logging correctly.

8. Support

Customers requiring technical support for the Proteus Office can contact CTI Data Solutions Ltd by calling Tel: +44 (0) 84 5123 2761 or e-mailing support@ctidata.co.uk. Customers may also visit the support website at http://support.ctidata.co.uk.

9. Conclusion

These Application Notes describe the required configuration steps for the Proteus Office 5.0 to successfully interoperate with Avaya Communication Manager. Features, functionality, and performance were successfully validated. The configuration described in these Application Notes has been successfully compliance tested.

10. Additional References

This section references the Avaya and CTI Data Solutions product documentation that are relevant to these Application Notes.

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

10.1. Documentation

The following documentation is available on request from CTI Data Solutions Ltd;

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Proteus Enterprise:

- Proteus Enterprise v5 Installation Guide.doc

Proteus Office:

- Proteus Office 5 Installation Guide
- Getting Started with Proteus Office 5

More information is available for Proteus Office at http://www.proteusoffice.com

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