Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Nu Technologies ORBi-TEL^7 with Avaya Communication Manager - Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the Nu Technologies ORBi-TEL^7 to successfully collect call detail records (CDR) from Avaya Communication Manager over TCP/IP.

ORBi-TEL^7 is a set of integrated tools to measure quality of service, usage trends, and performance to optimize the network. ORBi-TEL^7 consists of four modules. The Cost management module, also referred to as the Call logging and reporting module, was the only module that was tested. Call logging and reporting module collects, stores and processes call records to provide usage analysis, call costing and billing capabilities. The other modules that were not tested include Performance management, Traffic management, Operations management and Alarm management.

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

ORBi-TEL[7] is a set of integrated tools to measure quality of service, usage trends, and performance to optimize the network. ORBi-TEL[7] consists of four modules. The Cost management module, also referred to as the Call logging and reporting module, was the only module that was tested. The Call logging and reporting module collects, stores and processes call records to provide usage analysis, call costing and billing capabilities. The other modules that were not tested include Performance management, Traffic management, Operations management and Alarm management.

ORBi-TEL[7] retrieves call details records via a buffer called the NetBuffer from Avaya Communication Manager. The NetBuffer is configured using via a web interface to receive and buffer call detail records through TCP/IP. ORBi-TEL[7] polls the NetBuffer and converts the call records into a common internal format.

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. ORBi-TEL[7] can support any CDR format provided by Avaya Communication Manager. ORBi-TEL[7] creates a custom PBX configuration file to accurately parse the CDR data. For the compliance testing, a customized format was used.

The ORBi-TEL[7] server and multiple NetBuffers are 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. This configuration was not tested as part of the compliance test.

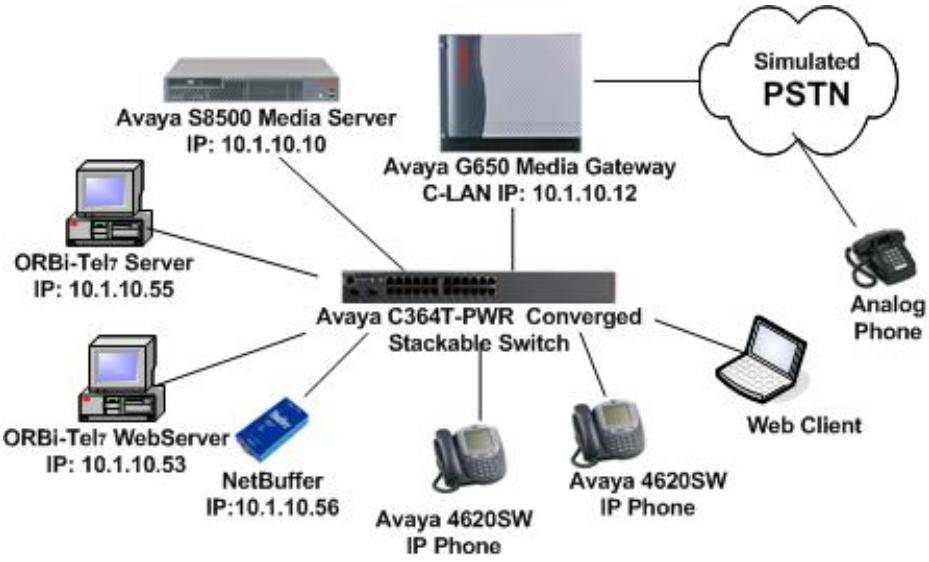


Figure 1: Avaya Communication Manager and ORBi-TEL[7] Test Configuration

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 4620 IP Telephones	2.2.3
Avaya C364T-PWR Converged Stackable Switch	4.3.12
Nu Technologies ORBi-TEL[7] Server	16.0.2 (Unix AIX 4.3)
NetBuffer GN03-0024	2.53
Nu Technologies ORBi-TEL[7] Web Server	Windows 2000 Server
WebClient PC	Windows 2000 Professional SP1

3. Configure 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 NetBuffer 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 link.

```
change node-names ip                                          Page   1 of   1
                                  IP NODE NAMES
    Name                 IP Address          Name               IP Address
NetBuffer              10 .1  .10  .56                            .   .   .
G350                   10 .1  .30  .10                            .   .   .
VAL                    10 .1  .10  .14                            .   .   .
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". Set **Local Node** to "clan" and **Remote Node** to "NetBuffer" 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 NetBuffer in Section 4.2, Step 5.

```
change ip-services                                          Page   1 of   3


                                    IP SERVICES
 Service      Enabled      Local        Local       Remote       Remote
  Type                     Node         Port        Node         Port
CDR1                    clan            0       NetBuffer       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 "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 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 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: auth-code        - 13  33: line-feed       - 1
 2: space            - 1   18: space            - 1   34:                   -
 3: time             - 4   19: in-crt-id        - 7   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: isdn-cc          - 3   39:                   -
 8: space            - 1   24: space            - 1   40:                   -
 9: code-dial        - 4   25: ppm              - 5   41:                   -
10: space            - 1   26: space            - 1   42:                   -
11: code-used        - 4   27: acct-code        - 15  43:                   -
12: space            - 1   28: space            - 1   44:                   -
13: dialed-num       - 23  29: in-trk-code      - 4   45:                   -
14: space            - 1   30: space            - 1   46:                   -
15: clg-num/in-tac   - 15  31: attd-console     - 2   47:                   -
16: space            - 1   32: return           - 1   48:                   -


                               Record length = 135
```

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:
```

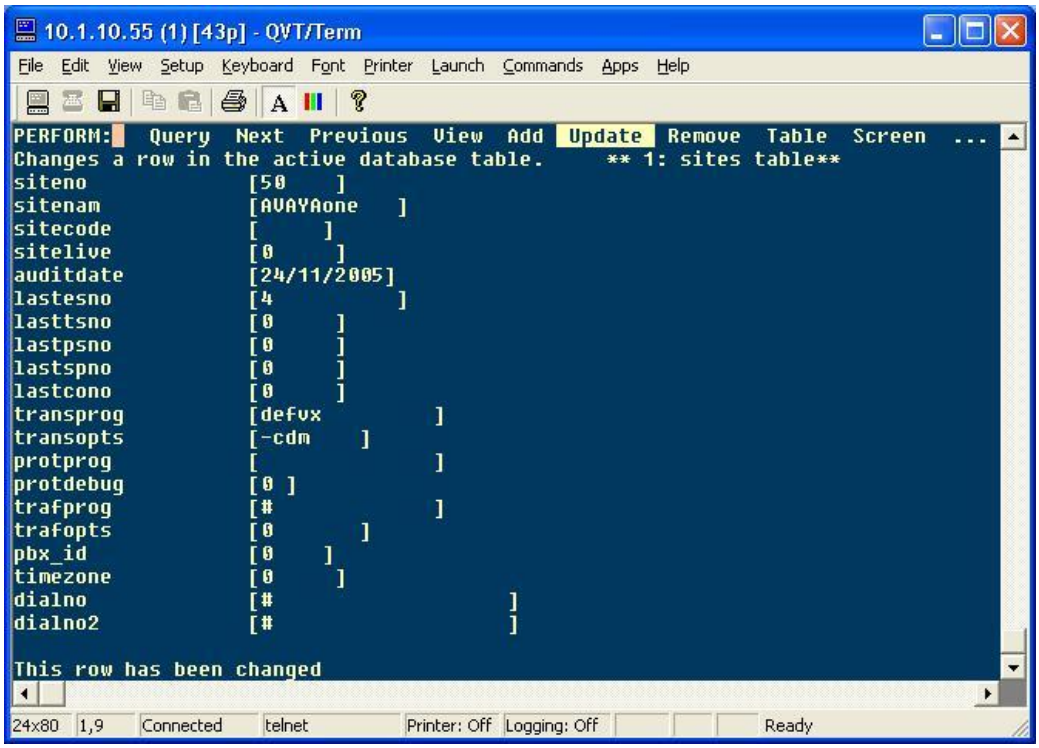
Note: For ease of implementation, special application **(SA8202) Intra-Switch CDR by COS** is an optional feature that allows customers to enable intra-switch CDR for extensions that are assigned a COS with intra-switch CDR activated. The customer does not have to manually add individual extensions in the **intra-switch-cdr** form. The SA8202 feature also removes the 1000 and 5000 extension limit for the S8500, respectively, allowing CDR records to be generated for as many extensions as are administered on the switch.

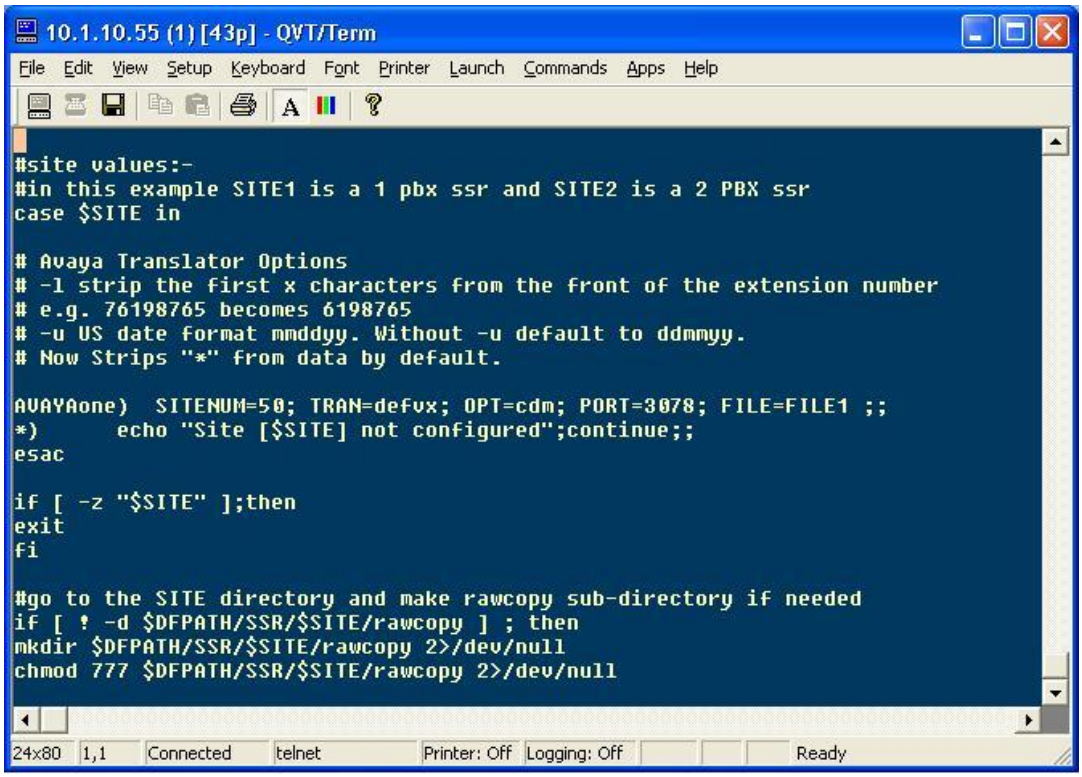
Step	Description
6.	For each trunk group for which CDR records are desired, enter the command **change trunk-group n**, where n is the trunk group number, and set **CDR Reports** to "y". The example below depicts the trunk group containing trunks connected to the PSTN in the sample configuration.

```
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
```

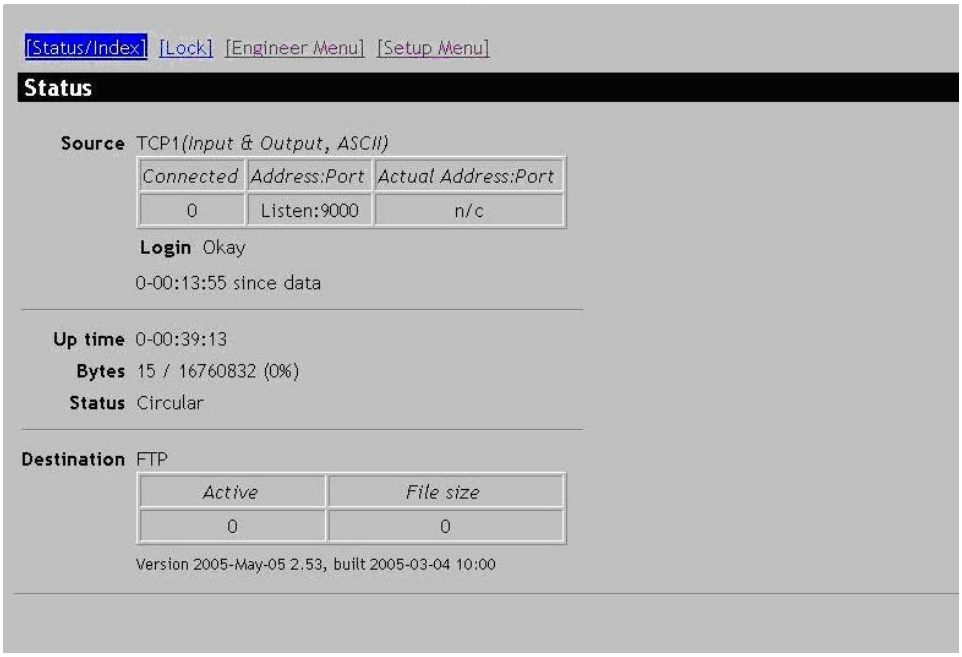
4. Configure the Nu Technologies ORBi-TEL[7]

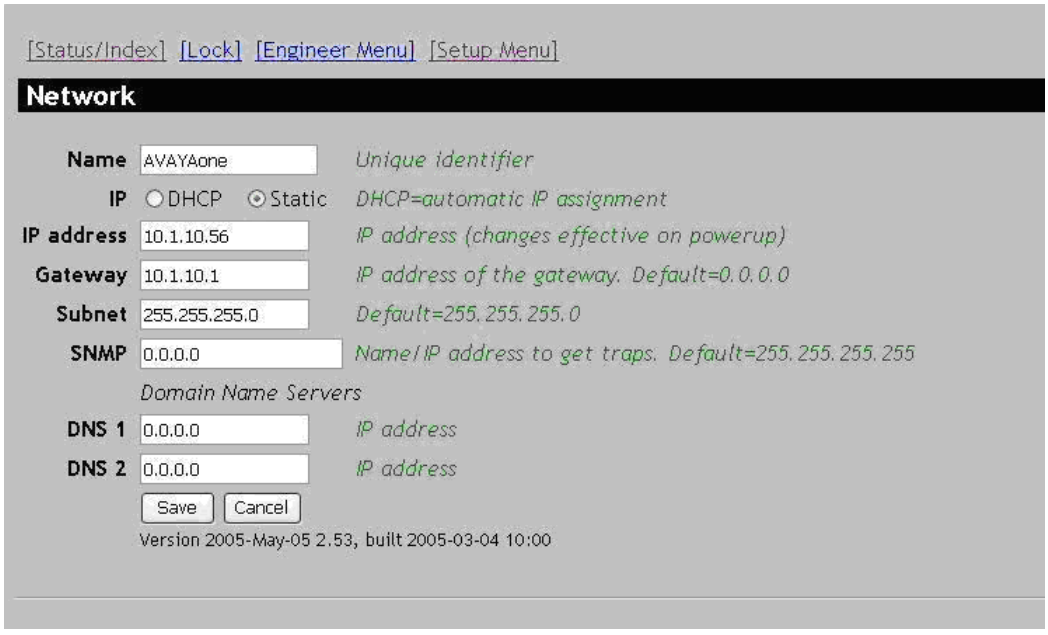
4.1. Configure the ORBi-TEL[7] Server

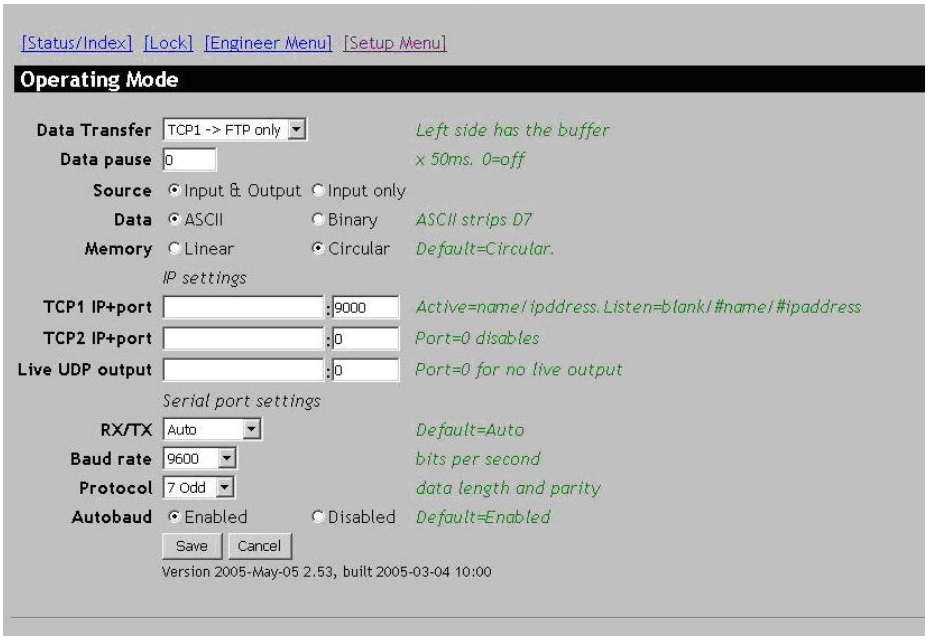
Step	Description
1.	To add site details to the ORBi-TEL[7] Server, telnet from the ORBi-TEL[7] Web Server to the ORBi-TEL[7] Server, and log in with the preconfigured ORBi-TEL[7] Server username and password. From the UNIX prompt type the following command: **# isql –f sites.** Select **u** for update and enter the relevant fields as shown below. **sitenam** "AVAYAone" to match the NetBuffer name in Section 4.2, Step 4. **transprog** "defvx" Defines the format, set for customized format. **transopts** "–cdm" translator options. The rest of the fields can be left as default. Select **esc** to save. 

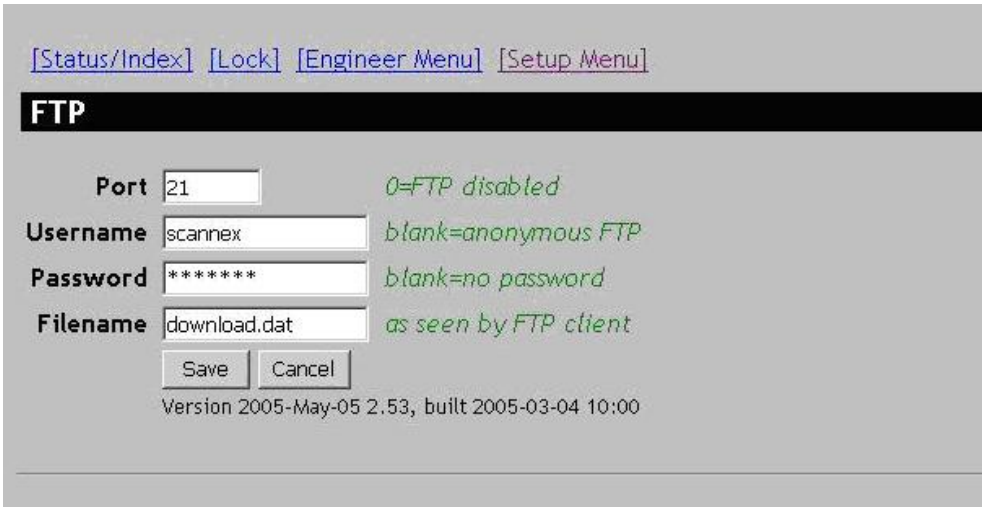
Step	Description
2.	To configure the automatic/on-demand CDR collection and translation script, from the UNIX prompt, edit the file /usr/prog3/stran using a vi editor. Enter the site name= “AVAYAone” **SITENUM**= “50” **TRAN**= “defvx” **OPT**= “cdm” **PORT** and **FILE1** remain at default values The rest of the fields can be left as default. Save the file and exit. 

4.2. Configure the NetBuffer

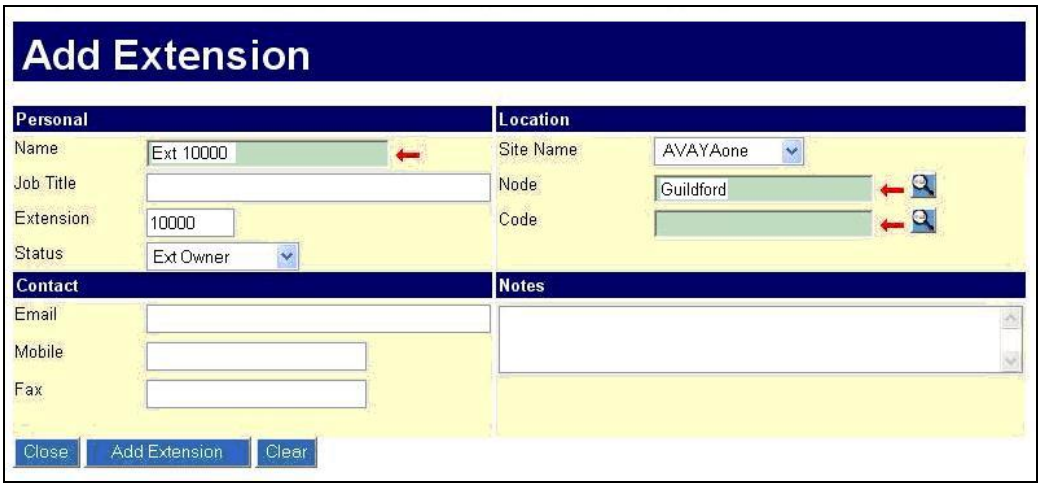
Step	Description
1.	**Setting the NetBuffer IP address:** The NetBuffer is shipped with the following factory set IP Address: 192.168.0.234. The NetBuffer IP address is set by identifying the NetBuffer by its MAC address. Open a DOS window on the ORBi-TEL[7] Web Server by clicking on Start → Run, typing "cmd", and issuing the following command: **arp –s x.x.x.x yy-yy-yy-yy-yy-yy** Where x.x.x.x will be the new IP Address of NetBuffer and yy-yy-yy-yy-yy-yy is the MAC address found on the reverse side of the NetBuffer. Power off the NetBuffer for 30 seconds and reconnect the power. Enter the following ping command in the DOS window to check the NetBuffer IP configuration: **ping x.x.x.x** and verify a successful reply.
2.	**Configuring the NetBuffer with Internet Explorer (IE):** Enter the following URL Address in the IE address bar: http://x.x.x.x where x.x.x.x is the IP address of the NetBuffer. Select the **Setup Menu**. In the windows login box that appears, enter the default username and password for the NetBuffer. In the **Source** section the ***Address:Port*** field has the default value of listening on Port 9000, matching the **Remote Port** configured on Avaya Communication Manager in Section 3, Step 2. The rest of the fields can be left with the default values. 

Step	Description
3.	In the **Setup Menu** screen select **Network** under **Global Settings**. 
4.	In the **Name** field, enter the name that matches the ORBi-TEL[7] site name configured on the ORBi-TEL[7] Server in Section 4.1 Step 1. Select the **Static** radio button for **IP**. The **IP address** of the NetBuffer is pre populated with the IP address configured with the **arp** command issued in Step 1. Enter the **Gateway** and **Subnet** IP address as shown below. The rest of the fields can be left with the default values. Click on **Save**. 

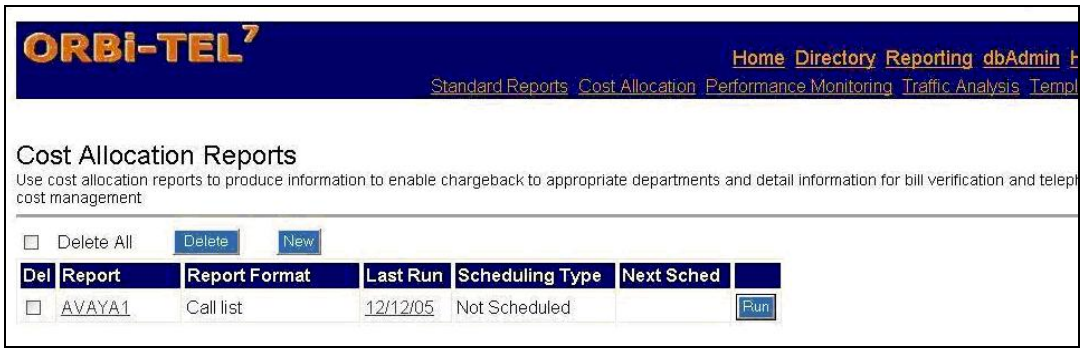
Step	Description
5.	In the Setup Menu screen (see Step 3), select **Operating Mode, Serial, TCP1/TCP2**. Set **Data Transfer** to "TCP1 -> FTP only". Leave the **TCP1 IP+port** address field blank; the NetBuffer will accept connections from any IP address. It is possible to increase security by entering # followed by the IP address of Avaya Communication Manager. Enter a port number in the **TCP1 IP+port** port field, 9000 is the default, matching the **Remote port** configured on the Avaya Communication manager in Section 3, Step 2. The rest of the fields can be left with the default values. Click on **Save**. 
6.	In the Setup Menu screen (see Step 3), select **Login TCP1 Match/Send**. Ensure all fields are blank. Click on **Save**. 

Step	Description
7.	In the Setup Menu screen (see Step 3), select **FTP**. The ORBi-TEL[7] Server acts as the FTP client with the NetBuffer being the FTP server. Leave **Port** set to the default value of "21" and set to **Filename** to "download.dat". Change **Username** and **Password** to the FTP client (ORBi-TEL[7] Server) required values. Click on **Save**. 

4.3. Adding Extensions in the ORBi-TEL[7] Server database

Step	Description
1.	The database on the ORBi-TEL[7] Server must be populated with Avaya Communication Manager extensions and trunks prior to running reports. From the Web client PC enter the following url **http://<IPaddr ORBi-TEL[7] WebServer>/ oribitel.html.** Select **DbAdmin** and then select **New** on the dbAdmin page. 
2.	In the Add Extension form, complete following fields. **Name:** Descriptive name **Site Name:** Choose "AVAYAone" **Node:** Descriptive name **Extension:** Extension configured on Avaya Communication Manager **Status:** Choose "Ext Owner" Click the **Add Extension** button. 

Step	Description
3.	The CDR is collected automatically/on-demand and made available to the web based front end reporting application. Select Reporting → Cost Allocation. Click the Run button to run the most recent reports as shown below.



AVAYA1

Period Start 12/12/05 **Last Run** 12/12
Period End 16/12/05 **Call list**

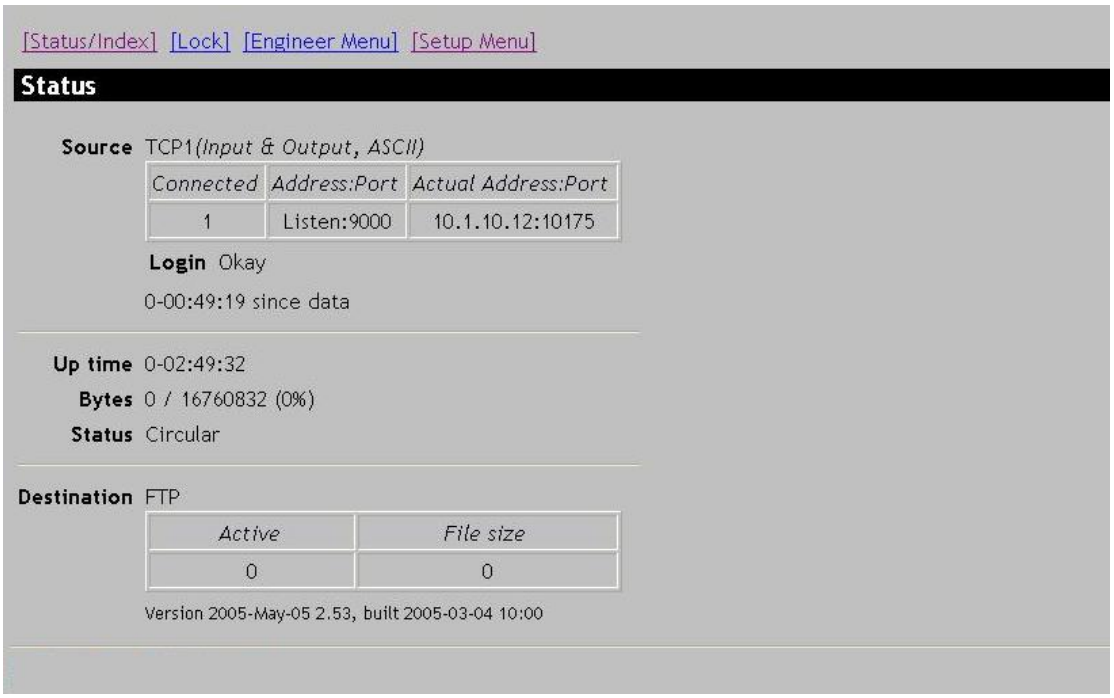
Date	Start Time	Duration	Source Ext	Source T	Dest Extn	Dest Tru	Dialled Digits	Originating Line ID	Auth Code	Co
12/12/05	16:10:55	00:00:05	10000		10001		10001			0.0
12/12/05	16:11:55	00:00:05		813001	10000			813		0.0
12/12/05	16:11:55	00:00:05	10001			713006	71310000			0.0
12/12/05	16:22:50	00:00:10	10001		10000		10000			0.0
12/12/05	16:29:44	00:00:16	10001			713001	71330007			0.0
12/12/05	16:30:56	00:00:04	10001			813001	81330007		711	0.0
12/12/05	16:35:58	00:00:02	10001			813001	81330007		713	0.0
12/12/05	16:36:58	00:00:02	10001			813001	81330007			0.0
12/12/05	16:55:59	00:00:01	10001		10000		10000			0.0
12/12/05	17:07:56	00:00:04		713006	10000			713		0.0
12/12/05	17:24:57	00:00:03		813001	10000			813		0.0

Total Number Of Calls	**11**
Extn to Trunk	5
Extn to Extn	**3**
Trunk to Extn	3
Trunk to Trunk	**0**
Total Cost	0.00
Total Duration	**00:00:57**
Average Ringtime	00:00

5. Verification Steps

1. **Connection between ORBi-TEL[7] Server and the NetBuffer.**
   Access the NetBuffer from a DOS or UNIX prompt and issue the following command:
   #ftp *x.x.x.x*
   Enter Username and Password of the ftp server (NetBuffer).
   #Connected
   DIR enter DIR return
   #download.dat will be displayed
   BYE enter BYE return to return to Unix or DOS)

2. **Connection between Avaya Communication Manger and the NetBuffer.**
   Select **Status/Index**. Under the **Source** section, look for the **Connected** value. It should be "1". If it is zero, the NetBuffer has not connected to Avaya Communication Manager - review the settings in Avaya Communication Manager and the NetBuffer.



3. **Testing the CDR Link on Avaya Communication Manager**
   On the Avaya Communication Manager SAT, enter the **status cdr-link** command and verify that the CDR link state is up.

6. Interoperability Compliance Testing

The interoperability compliance testing included feature, serviceability and performance testing. The feature testing evaluated the ability of ORBi-TEL[7] to collect and process CDR records for various types of calls. The source and destination of each call was verified on the ORBi-TEL[7] application to see if it was the same as the Avaya Communication Manager output. The serviceability testing introduced failure scenarios to see if ORBi-TEL[7]can resume CDR collection after failure recovery. The performance testing produced bulk call volumes to generate a substantial amount of CDR records.

6.1. 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 attached to Avaya Communication Manager and verify that ORBi-TEL[7] 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.

6.2. Test Results

All feature and performance tests passed. The ORBi-TEL[7] successfully captured and processed call records from Avaya Communication Manager. ORBi-TEL[7] also successfully processed the CDR data, performed call costing, and produced call accounting reports.

All executed test cases passed. ORBi-TEL[7] 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 ORBi-TEL[7] could collect call records during a sustained, high volume of calls. For serviceability testing, ORBi-TEL[7] was able to resume collecting CDR records after failure, but not for CDR records for calls that were placed during the outages between Avaya Communication Manager and NetBuffer as only the standard CDR link was used

Important Note: The ORBi-TEL[7] Release 16 application uses the standard CDR link, instead of using the Reliable Session Protocol (RSP) link to communicate with Avaya Communication Manager. This means if the network cable is unplugged from the NetBuffer it will be ten minutes before Avaya Communication Manager starts buffering the call detail records using due to RSP link not being used between Avaya Communication Manager and the NetBuffer.

7. Support

For technical support on ORBi-TEL[7], contact the Nu Technologies Customer Service Center at +44(0)1582 814700. Technical support email can be sent to support@nut.eu.com

8. Conclusion

These Application Notes describe the required configuration steps for the Nu Technologies ORBi-TEL[7] application to collect call detail records from Avaya Communication Manager.

9. Additional References

This section references the Avaya and Nu Technologies 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

Visit the website http://www.nut.eu.com/ for company and product information on Nu Technologies ORBi-TEL[7]

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.