# AVAYA

## Avaya Solution & Interoperability Test Lab

# Application Notes for Configuring Avaya Aura® Communication Manager 6.2 with Nu Technologies™ ORBi-TEL[7] using an IP Buffer - Issue 1.0

## Abstract

These Application Notes describe the configuration steps required for Avaya Aura® Communication Manager 6.2 with Nu Technologies ORBi-TEL[7] 18.2 using an IP Buffer.

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

Nu Technologies ORBi-TEL[7] is a set of integrated tools to measure quality of service, usage trends, and performance to optimize the network. Nu Technologies ORBi-TEL[7] consists of four modules. Cost management, also referred to as call logging and reporting module, was the only module that was tested. Call logging and Reporting module collects, stores and processes Call Detail 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. Nu Technologies ORBi-TEL[7] retrieves Call Detail Records via an IP Buffer from Avaya Aura® Communication Manager. The IP Buffer is configured via a web interface to receive and buffer Call Detail Records from the Avaya Aura® Communication Manager which then pushes these reports to the ORBi-TEL[7] at scheduled intervals where they are converted into a common internal format. Avaya Aura® 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. Nu Technologies ORBi-TEL[7] can support any Call Detail Records format provided by Avaya Aura® Communication Manager. Nu Technologies ORBi-TEL[7] creates a custom PBX configuration file to accurately parse the CDR data. For the compliance testing, a customized format was used. Nu Technologies ORBi-TEL[7] server is capable of receiving Call Details Records from multiple sites.

# 2. General Test Approach and Test Results

The general test approach was to configure the ORBi-TEL[7] to communicate with the Avaya Aura® Communication Manager (Communication Manager) as implemented on a customer's premises. Testing focused on verifying that Call Detail Records (CDR) are collected by the IP buffer and received in the format as generated by the Communication Manager. The ORBi-TEL[7] application would collect the CDR data using File transfer Protocol from the IP Buffer. Various call scenarios were preformed to simulate real call types as would be observed on a customer premises. See **Figure 1** for a network diagram. The interoperability compliance test included feature functionality tests.

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

## 2.1. Interoperability Compliance Testing

The testing included:
- Verification of connectivity between ORBi-TEL[7]/IP buffer and Communication Manager using a TCP connection.
- Verification that CDR data was collected as output by the Communication Manager.
- Link Failure\Recovery was also tested to ensure successful reconnection after link failure.

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- CDR data collected included:
  - Local internal call handling
  - Handling of Incoming Network calls over PRI and SIP trunks
  - Handling of External Calls
  - Call Forwarding on busy or No Answer
  - Transfers – Blind and Supervised
  - Conference Calls
  - Call Park and Call Pick Up
  - Account Codes
- Daylight Savings
- Handling of calls to and from Avaya H323, SIP, and Soft phones
- Handling of calls over SIP and QSIG trunks
- Defence Tests to ensure recovery following LAN interruptions

## 2.2. Test Results

Tests were performed to insure full interoperability between ORBi-TEL[7]/IP buffer and Communication Manager. The tests were all functional in nature and performance testing was not included. All the test cases passed successfully.

## 2.3. Support

Technical support from Nu Technologies can be obtained through the following:

Phone:        +44 1582 814700
E-mail:        support@nut.eu.com.
Web:          http://www.nut.eu.com

# 3. Reference Configuration

**Figure 1** illustrates the network topology used during compliance testing. The Avaya solution consists of a Communication Manager, System Manager, Session Manager and a G250 Gateway. The Communication Manager is configured to output Call Detail Records data over a TCP/IP port. A Node is configured on the Communication Manager to point to the Scannex IP buffer. The Call Detail Records are sent in customized format, stored in the buffer and retrieved by the ORBi-TEL[7] application at defined periods. A variety of Avaya 96XX H323 SIP and Soft phones were used to generate intra-switch calls (calls between phones on the same system), and outbound/inbound calls to/from the PSTN. QSIG and SIP trunks were configured to connect to the PSTN.

**Note:** During compliance testing to test the Multi-Site feature of the ORBi-TEL[7] two Node Names were created pointing to two IP buffers. A secondary CDR Link was also created. ORBi-TEL[7] collected these records as to simulate a second site.
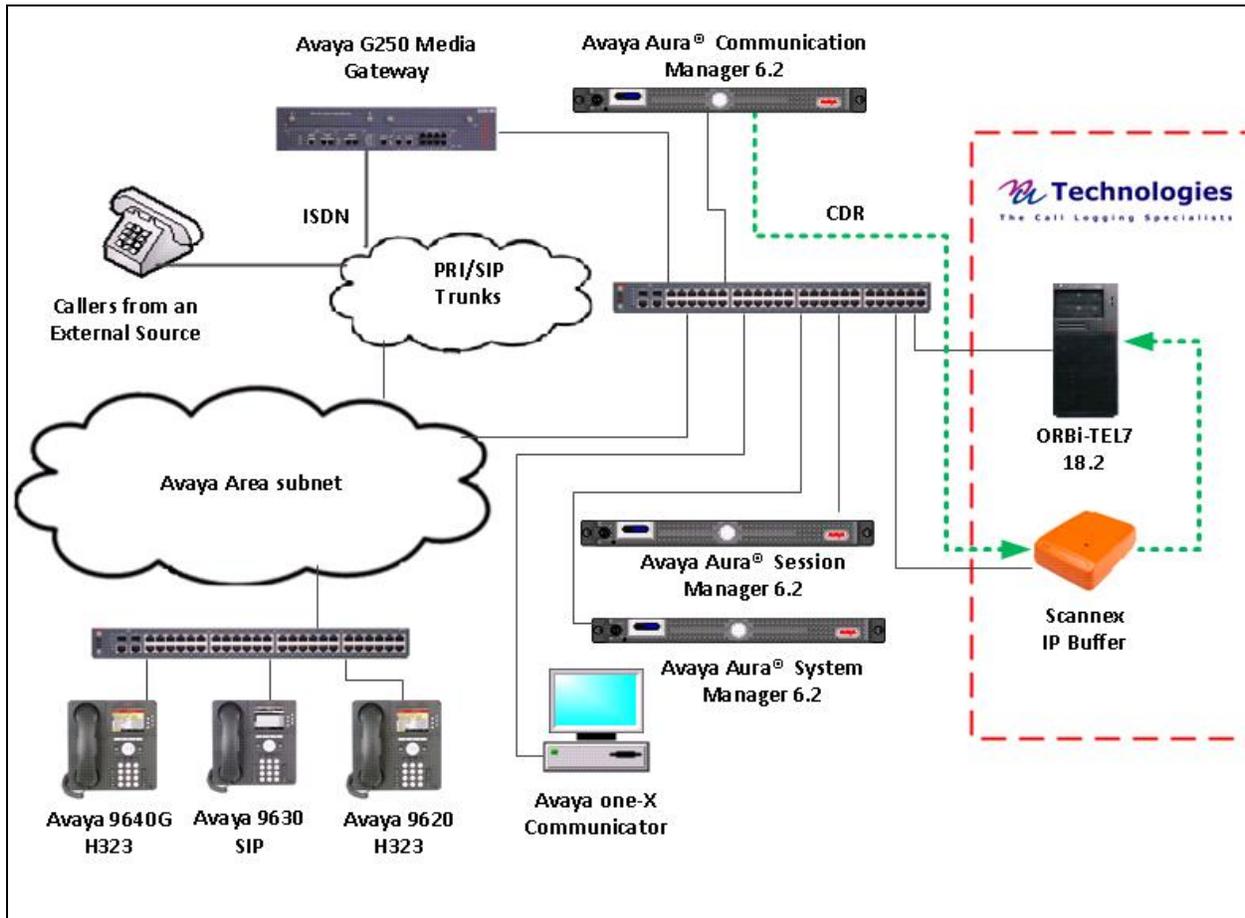


**Figure 1:** Avaya Aura® Communication Manager and Nu Technologies ORBi-TEL[7] Reference Configuration

# 4. Equipment and Software Validated

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

| Avaya Equipment | Software / Firmware Version |
|---|---|
| Avaya Aura® Communication Manager running on S8800 Server | R6.2, Build R016x.02.0.832.0 |
| Avaya Aura® System Manager running on S8800 Server | R6.2, Build 6.2.2.0.622005 |
| Avaya Aura® Session Manager running on S8800 Server | R6.2, Build 6.2.0.0.15669-2.12.9 |
| Avaya G250 Media Gateway | 30.18.1 |
| Avaya 96xx Deskphones <br> - H323 9620 <br> - H323 9640G <br> - SIP | <br> S3.186a <br> S3.105s <br> 2.6.2 |
| Avaya One-X communicator | 6.1.5.07 |
| **Nu Technologies Equipment** | **Software / Firmware Version** |
| Dell Latitude running Windows XP Professional SP3 | ORBi-TEL[7] Version 18.2 |
| Scannex IP Buffer | Release IPBCF2.75.199 2012-02-09 / i5.0.10 |

# 5. Configure Avaya Aura® Communication Manager

Configuration and verification operations on the Communication Manager illustrated in this section were all performed using Avaya Site Administrator Emulation Mode. The information provided describes the configuration of the Communication Manager for this solution. It is implied that a working system is already in place. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 10**. The configuration operations described in this section can be summarized as follows:

- Create Node Name for IP buffer
- Define the CDR Link
- Change system-parameters cdr
- Set Intra-Switch Extensions
- Configure Trunks for CDR Reporting

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## 5.1. Create Node Name for IP buffer

A Node Name needs to be created to associate the IP buffer with the Communication Manager
Use the **change node-names ip** command to configure the following:
Page **1**

- **Name**         Enter an informative name i.e. **IP buffer**
- **IP address**   Enter the IP address of the **IP buffer**

Press **f3** button to save the new settings.

```
change node-names ip                                        Page   1 of
2
                              IP NODE NAMES
   Name             IP Address
IP buffer           192.168.50.26
```

## 5.2. Define the CDR Link

A CDR link needs to be defined between the Communication Manager and the IP buffer. Use the
**change ip-services** command to configure the following:

- **Service Type**   Enter **CDR1**
- **Local Node**     Enter **procr**
- **Remote Node**    Enter **IPBuffer1**
- **Remote Port**    Enter **9000**

```
change ip-services                                          Page   1 of   3
                              IP SERVICES
 Service      Enabled     Local         Local        Remote        Remote
  Type                    Node          Port         Node          Port
CDR1                      Procr         0            IPBuffer1     9000
```

Navigate to **Page 3** and set the **Reliable Protocol** field to **y**. This will enable Reliable Session
Protocol (RSP) for CDR transmission. In this case, the CDR link will use TCP with RSP.

- **Reliable Protocol**         Enter **y**

Press **F3** button to save the new settings.

```
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            y          30              3            3        60
```

## 5.3. Change CDR System Parameters

Certain parameter changes are required for Communication Manager to interoperate with ORBi-TEL[7]. The screen shots below show the settings used during compliance testing. Use the **change system-parameters cdr** command to configure the following:

- **CDR Date Format:** Set it to **month/day.** The date format will be used for the date stamp that begins each new day of call records.
- **Primary Out Format:** Set this to **customized** format.
- **Primary Output Endpoint:** Set to **CDR1** to correspond with CDR link set in **Section 5.2**.
- **Intra-switch CDR:** Set this to **y** to allow call records for internal calls involving specific stations. Those stations must be specified in the **inter-switch-cdr** form as set in **Section 5.4**.
- **Record Outgoing Calls Only**: Set this to **n** to allow incoming trunk calls to appear in the CDR records along with the outgoing trunk calls.
- **Suppress CDR for Ineffective Call Attempts?** Set this to **n** so that calls that are blocked do not generate CDR.
- **Outg Trk Call Splitting:** Set this to **y** to allow a separate call record for any portion of an outgoing call that is transferred or conferenced.
- **Inc Trk Call Splitting**: Set this to **y** to allow a separate call record for any portion of an 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                 Enable CDR Storage on Disk? n
          Use Enhanced Formats? n     Condition Code 'T' For Redirected Calls? n
       Use Legacy CDR Formats? y              Remove # From Called Number? n
Modified Circuit ID Display? n                           Intra-switch CDR? y
              Record Outgoing Calls Only? n      Outg Trk Call Splitting? y
  Suppress CDR for Ineffective Call Attempts? n       Outg Attd Call Record? y
     Disconnect Information in Place of FRL? n       Interworking Feat-flag? n
 Force Entry of Acct Code for Calls Marked on Toll Analysis Form? n
                                     Calls to Hunt Group - Record: member-ext
Record Called Vector Directory Number Instead of Group or Member? n
Record Agent ID on Incoming? n       Record Agent ID on Outgoing? y
     Inc Trk Call Splitting? 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
```

Navigate to **Page 2** and enter the following information.
- Enter **Data Item** and **Length** as shown in the screen below

Press **F3** button to save the new settings.

```
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      - 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: isdn-cc       - 11   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
```

## 5.4. Set Intra-Switch Extensions

If the Intra-switch CDR field is set to **y** in the CDR SYSTEM PARAMETERS form in **Section 5.3**, use the **change intra-switch-cdr** command to define the extensions that will be subject to CDR. On **Page 1** of the **INTRA-SWITCH CDR** form, enter a specific extension whose usage will be tracked with a CDR. Add an entry for each additional **Extension**

```
change intra-switch-cdr                                   Page   1 of   3
                        INTRA-SWITCH CDR

                        Assigned Members:   0    of 5000   administered
  Extension          Extension           Extension          Extension
  3000
  3001
  3011
  3014
```

## 5.5. Configure Trunks for CDR Reporting

For each trunk group for which CDRs are desired, verify that CDR reporting is configured to generate CDRs. 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 9                                          Page   1 of  21
                             TRUNK GROUP

Group Number: 9                      Group Type: isdn          CDR Reports: y
  Group Name: OUTSIDE CALL                 COR: 1       TN: 1         TAC: 109
   Direction: two-way       Outgoing Display? y        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. Configuration of Scannex IP buffer

This section provides the procedures to configure the Scannex IP buffer. It is implied that the Scannex IP buffer is already in place and configured with an IP address on the same subnet as the Communication Manager. For all other provisioning information, such as initial installation and configuration, please refer to the product documentation in **Section 10**.

**Note:** The procedures described below are normally carried out by a Nu Technologies engineer during installation and subsequent re-configuration.

## 6.1. Logging into the Scannex IP Buffer

To access the web-based interface of the Scannex IP Buffer, use the URL **http://x.x.x.x,** where **x. x. x. x** is the selected IP address of the IP Buffer. In the windows login box that appears, enter the default username and password and click on the **OK** button.
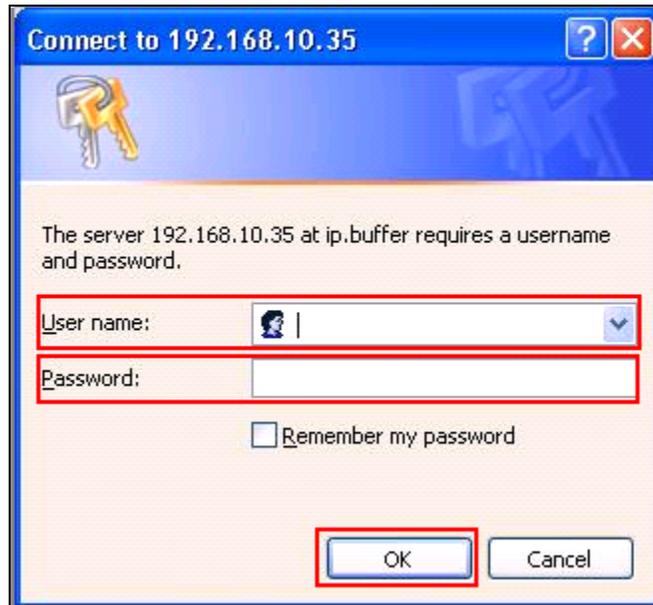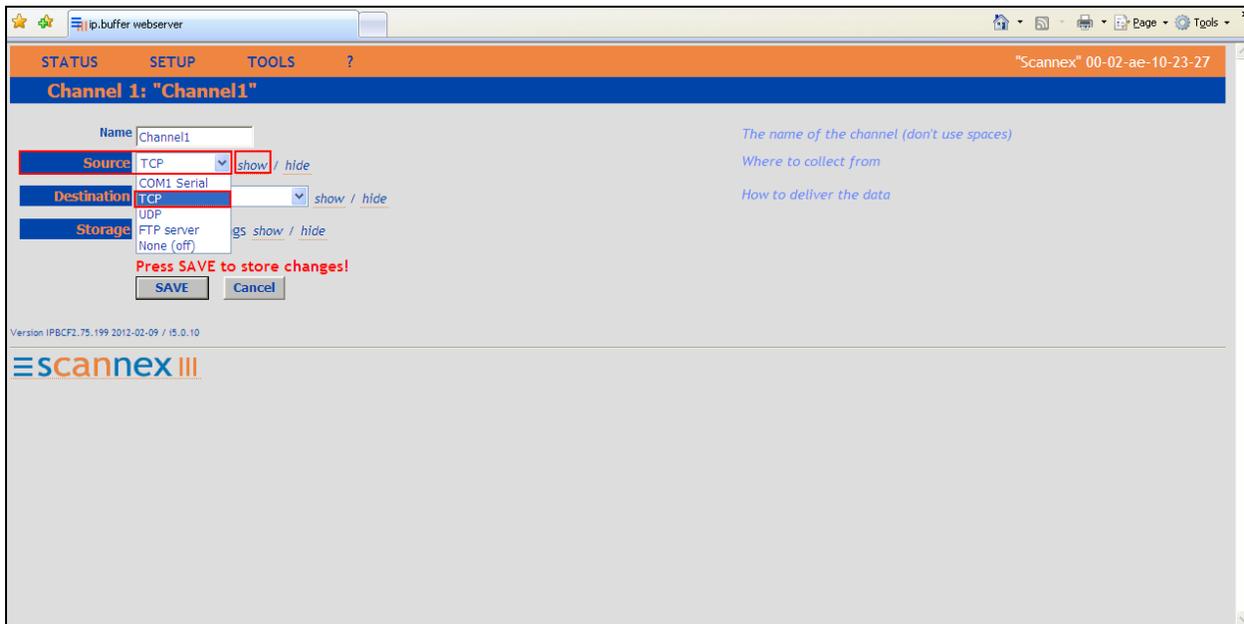
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## 6.2. Setup Scannex IP Buffer

After logging in the **Status** page is displayed Select **SETUP** followed by **Channel 1** (Not shown)**.**
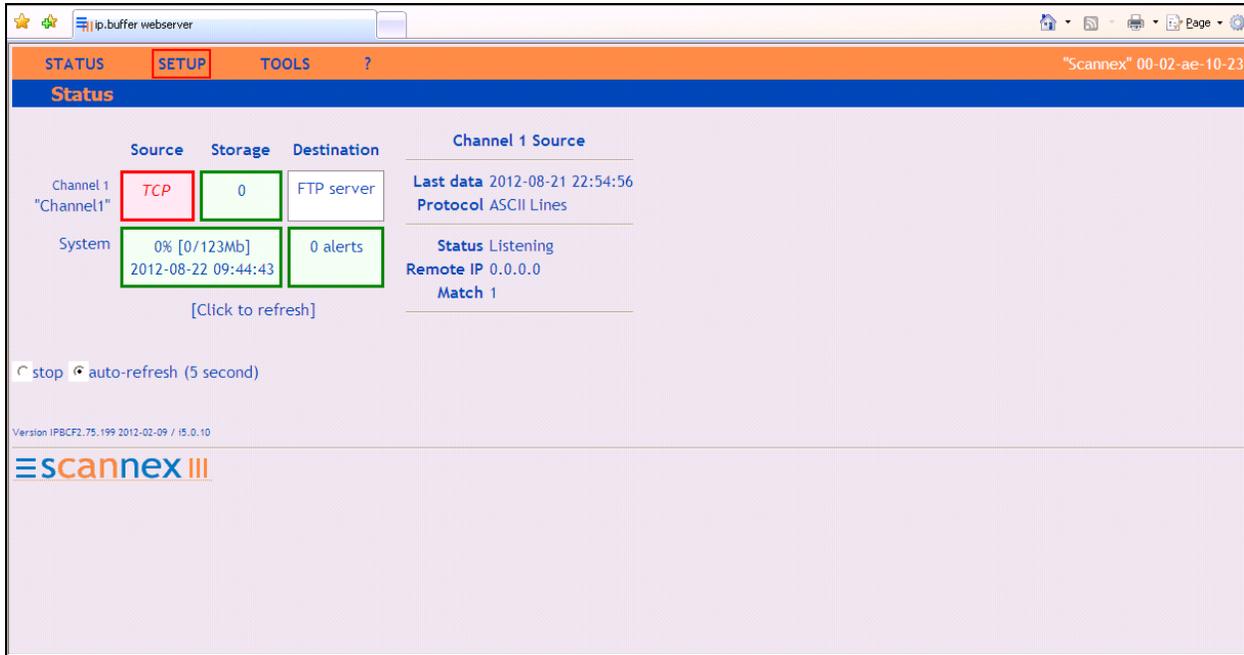


Once the **Channel 1** page is opened, select **TCP** from the **Source** dropdown box, then select **show.**

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Once the next page opens, enter **9000** in the **TCP/IP port** box. The port number used should match the **Remote Port** configured on the Communication Manager in **Section 5.2**. From the **Protocol** drop down box, enter **Avaya RSP TCP/IP**. Use the scroll bar on the right side of the page and scroll to the bottom.



From the **Destination** dropdown box, select **FTP push (client)** and then select **show**.

Once the **FTP push (Client)** window opens, enter the following:
- **Address**  Enter the IP Address of the ORBi-TEL[7] Server
- **Username**  Enter the **Username** of the ORBi-TEL[7] Server
- **Password**  Enter the **Password** of the ORBi-TEL[7] Server
- **Directory**  Enter the file location where the CDR data is stored
- **Command**  Select **Append** from the drop down box
- **Filename**  Enter **FILE1**

Use the scroll bar on the right side of the page and scroll down to **Push Schedule.**
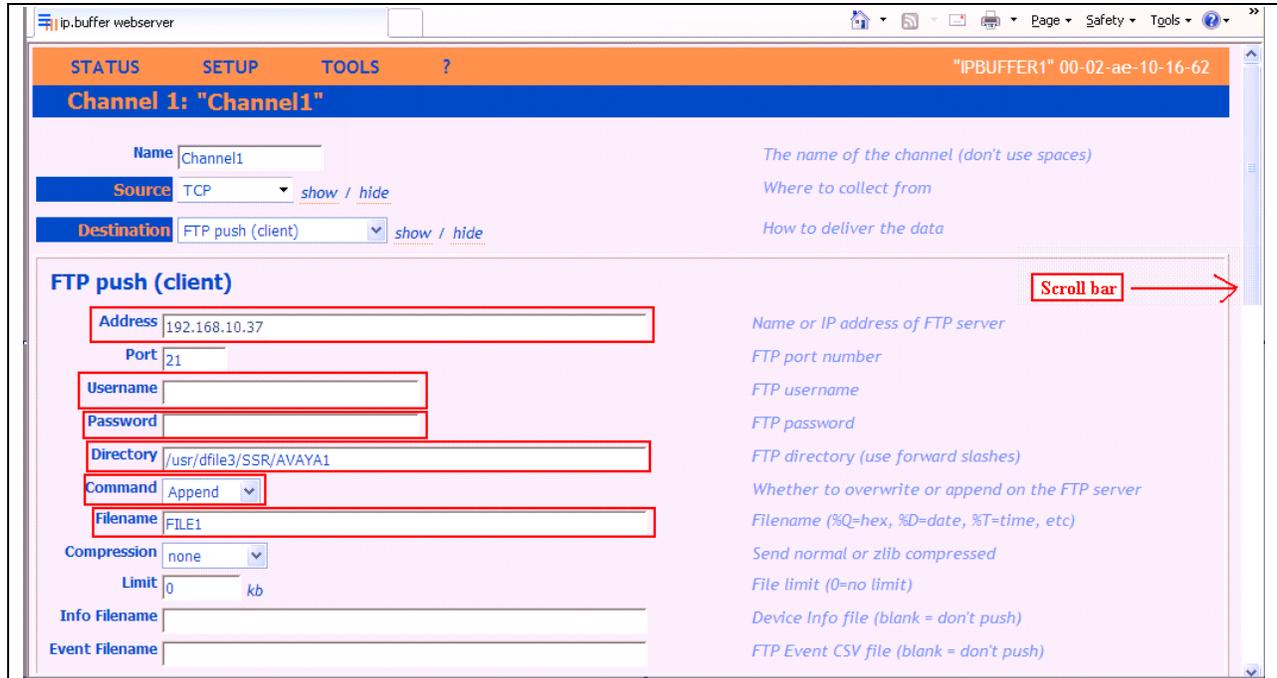
The screen shot below shows the Push Schedule as set during compliance testing. Once the schedule is complete, click on the **Save** button.

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# 7. Configure ORBi-TEL[7]

This section provides the procedures to configure ORBi-TEL[7] server to receive CDR data from the Communication Manager via the IP buffer.

## 7.1. Configure the ORBi-TEL[7] Server

The ORBi-TEL[7] server needs to be configured for site details and setting up the Collection and Translation script for receiving CDR data. This procedure is normally carried out by a Nu Technologies engineer during installation and subsequent re-configuration.

## 7.2. Add Extensions to the ORBi-TEL[7] Server Database

The database on the ORBi-TEL[7] Server must be populated with Communication Manager extensions and trunks prior to running reports. Enter the following url **http://<IPaddr ORBi-TEL[7] >/ oribitel.html.** Select **dbAdmin** and then select **New** on the dbAdmin page (not shown) to access the **Add Extension** form.

On the Add Extension form complete the following fields:
- **Site Name**     Choose a pre-configured site name**.**
- **Extension**     Enter a valid extension as configured on Communication Manager
- **Status**     Choose **Ext Owner**

Click the **Add Extension** button. Repeat these steps to add all necessary extensions

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# 8. Verification Steps

This section provides tests that can be performed to verify correct configuration of the Avaya and ORBi-TEL[7] solution.
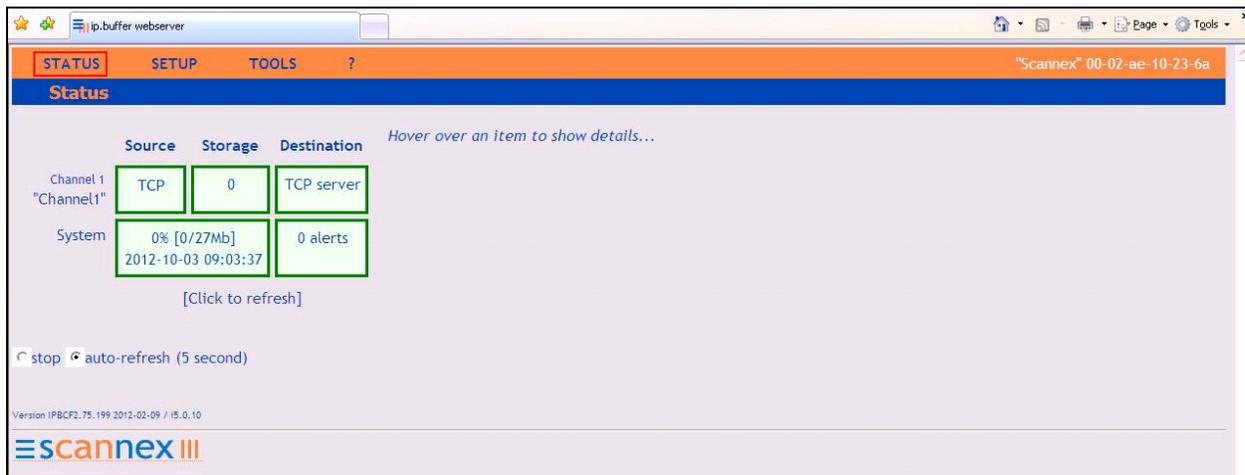
## 8.1. Verify the Avaya Aura® Communication Manager CDR Link

Use the **status cdr-link** command to verify that the link between the Communication Manager and the IP buffer is in service. **Link State: up** and **Reason Code: OK** confirms successful connection.

```
status cdr-link
                                CDR LINK STATUS
                   Primary                        Secondary
        Link State: up                        CDR administered
Number of Retries: 999
      Date & Time: 2012/10/04 18:01:12          0000/00/00 00:00:00
  Forward Seq. No: 0                            0
 Backward Seq. No: 0                            0
CDR Buffer % Full: 0.03                         0.00
      Reason Code: OK
```

## 8.2. Verify the connection between Scannex IP buffer and Avaya Aura® Communication Manager

On the IP Buffer select **Status**, the completed **Status** screen is displayed. The **TCP Source** displays in green indicating that the IP Buffer has successfully connected to the Avaya solution.

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Once some test calls, including internal, inbound trunk and outbound trunk calls, have been made then run the ORBi-TEL[7] report to ensure correct collection of results. Compare to the IP Buffer output. The following screen shows a sample report after some calls were made.

| Date | Start Time | End Time | Duration (hh:) mm:ss | Ring Time | Source Extn | Source Trunk | Dest Extn | Dest Trunk | Auth Code | Dialled Digits | OLI | Destination | Exch | Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/10/2012 | 15:39:48 | 15:40:00 | 00:12 | | | 505010 | 6611 | | | | 1610 | | | 0.00 |
| 07/10/2012 | 15:56:39 | 15:57:00 | 00:21 | | 6611 | | | 505002 | | 50502075551610 | | | | 0.00 |
| 07/10/2012 | 16:29:44 | 16:30:00 | 00:16 | | | 505005 | 6621 | | | | 1610 | | | 0.00 |
| 07/10/2012 | 16:33:46 | 16:34:00 | 00:14 | | | 508001 | 6620 | | | | 1610 | | | 0.00 |
| 07/10/2012 | 16:39:44 | 16:40:00 | 00:16 | | 6619 | | | 505003 | | 5051610 | | | | 0.00 |
| 07/10/2012 | 17:48:54 | 17:49:00 | 00:06 | | | 505010 | 6620 | | | | 1610 | | | 0.00 |
| 07/10/2012 | 17:52:54 | 17:53:00 | 00:06 | | | 505001 | 6620 | | | | 1610 | | | 0.00 |

# 9. Conclusion

A full and comprehensive set of feature functional test cases were preformed during Compliance testing. ORBi-TEL[7] 18.2 is considered compliant with Avaya Aura® Communication Manager 6.2. All test cases have passed and met the objectives outlined in **Section 2.2**.

# 10.  Additional References

These documents form part of the Avaya official technical reference documentation suite. Further information may be had from *http://support.avaya.com* or from your Avaya representative.

[1] *Avaya Aura® Communication Manager Feature Description and Implementation*, Release 6.2, Issue 9.0, February 2012, Document Number 555-245-205.

[2] *Administering Avaya Aura® Communication Manager*, Release 6.2, Issue 7.0, February 2012, Document Number 03-300509.

Product Documentation for ORBi-TEL[7] and Scannex IP Buffer can be obtained from Nu Technologies Ltd. or may be requested at http://www.nut.eu.com/nutech/contactus.html

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