Avaya Solution & Interoperability Test Lab

Application Notes for Imagine Soft CLARity with Avaya Communication Manager – Issue 1.0

Abstract

These Application Notes describe the compliance testing of Imagine Soft CLARity with Avaya Communication Manager. CLARity is a call accounting program which processes Call Detail Records generated by Communication Manager.

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

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1. Introduction

The Imagine Soft CLARity Server processes Call Detail Records which it receives from Avaya Communication Manager. It can produce call usage reports on incoming and outgoing calls involving internal, external, and network parties. It can calculate call charges for individual users or for groups of users.

CLARity calculates the cost of a call based on the duration, origin, and destination of the call. CLARity can differentiate calls made via trunks to the PSTN from calls made to local extensions or trunks to other PBXs, and compute calling charges accordingly.

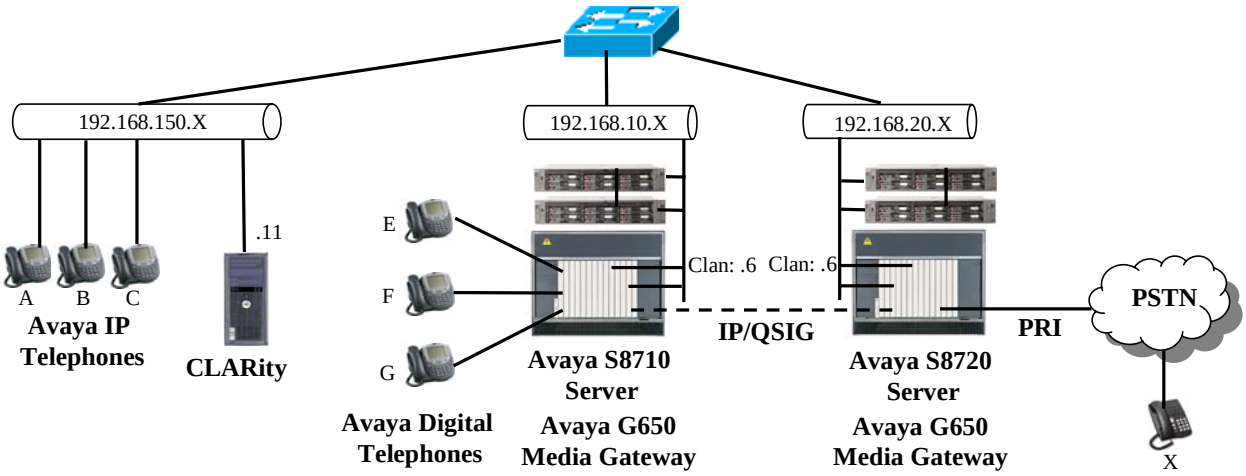

Figure 1: Test Configuration

The presence of Avaya S8710 Server in the above configuration is solely for the purpose of making calls via a trunk to another PBX, and is otherwise not essential for usage of CLARity. The S8710 system is not configured to generate CDR records. The IP/QSIG trunk between the Avaya S8710 Server and the Avaya S8710 Server could be replaced with any other type of trunk supported by both systems, i.e. PRI, SIP, etc. The function of each of the components in **Figure 1** is as follows:

- The CLARity server processes CDR records which it receives from the Avaya S8720 Server.
- The Avaya S8720 Server sends CDR records to the CLARity server as call events occur.
- The Avaya S8710 Server has a PRI trunk interface to the Avaya S8720 Server. The Avaya S8710 Server generates call activity over its PRI trunk, but does not generate CDR records itself.
- The Avaya S8720 Server has a PRI trunk interface to the Public Switched Telephone Network (PSTN) over which it can make and receive external calls.
- The Avaya IP Telephones with the designation “A”-“C” are registered with the Avaya S8720 Server.
- The Avaya Digital telephones with the designation “E”-“G” are attached to the Avaya S8710 Server.
- Telephone “X” is attached to the Public Switched Telephone Network (PSTN).

The following table contains additional information about each of the telephones contained in the above diagram.

Endpoint	Ext	PSTN Number	Endpoint
A	60113	+49 69 xxxxxxxx 60113	Avaya 4610
B	60114	+49 69 xxxxxxxx 60114	Avaya 4610
C	60126	+49 69 xxxxxxxx 60126	Avaya 4620
E	1000007		Avaya 4621
F	1000008		Avaya 4621
G	1000009		Avaya 4621
HG (A & B)	61234		
X		+49 69 xxxx 6630	ISDN

Table 1: Extensions Used for Testing

2. Equipment and Software Validated

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

Equipment	Software Version
Avaya S8720 Server	Avaya Communication Manager 5.1 (S8720 -015-01.1.415.0)
Avaya TN2312BP IP Server Interface	HW15 FW043
Avaya TN799DP Control LAN Interface	HW01 FW026
Avaya TN2302AP IP Media Processor	HW20 FW118
Avaya 4600 series IP Telephones	2.884
Imagine Soft CLARity	1.5.1
Microsoft Windows Server 2003 SE	SP2

Table 2: Version Numbers of Equipment and Software

3. Configuration

3.1. Configure Avaya Communication Manager

The configuration and verification operations illustrated in this section were all performed using the Avaya Communication Manager SAT terminal via SSH port 5022.

The information provided in this section describes the configuration of Avaya Communication Manager for this solution. For all other provisioning information such as installation and configuration, please refer to the product documentation in reference **[1].**

The configuration operations describe in this section can be summarized as follows:

- Verify that the licenses allocated to the system are sufficient to the support the required configuration.
- Configure the IP node name to be used by CLARity.
- Configure the telephone stations that are to be used for testing.
- Configure the CDR IP service which sends the CDR records to CLARity.
- Configure the format of the CDR records which are sent to CLARity.
- Designate the list of stations for which intra-switch CDR records are to be generated.

The configuration of the PRI trunks which attach to the PSTN and the Avaya S8710 Server is outside the scope of these Application Notes.

3.1.1. Verify system-parameters customer-options

Use the **display system-parameters customer-options** command to verify that Avaya Communication Manager is licensed to meet the minimum requirements to interoperate with the CLARity server. Those items shown in bold indicate required values or minimum capacity requirements. If these are not met in the configuration, please contact an Avaya representative for further assistance.

On page 2, the value configured for “Maximum Concurrently Registered IP Stations” must be sufficient to support the total number of IP stations used.

```
display system-parameters customer-options                      Page   2 of  10
                              OPTIONAL FEATURES

IP PORT CAPACITIES                                            USED
                     Maximum Administered H.323 Trunks: 30    5
          Maximum Concurrently Registered IP Stations: 10     3
            Maximum Administered Remote Office Trunks: 0     0
Maximum Concurrently Registered Remote Office Stations: 0     0
             Maximum Concurrently Registered IP eCons: 0     0
  Max Concur Registered Unauthenticated H.323 Stations: 0     0
                 Maximum Video Capable H.323 Stations: 0     0
                  Maximum Video Capable IP Softphones: 0     0
                      Maximum Administered SIP Trunks: 10    3

   Maximum Number of DS1 Boards with Echo Cancellation: 0     0
                            Maximum TN2501 VAL Boards: 0     0
                     Maximum Media Gateway VAL Sources: 0     0
          Maximum TN2602 Boards with 80 VoIP Channels: 0     0
         Maximum TN2602 Boards with 320 VoIP Channels: 0     0
   Maximum Number of Expanded Meet-me Conference Ports: 0     0
```

Figure 2: System-Parameters Customers-Options Form, Page 2

On page 4, the “IP Stations” parameter must be set to “y” so that IP stations can be configured.

```
display system-parameters customer-options                      Page   4 of  10
                              OPTIONAL FEATURES

   Emergency Access to Attendant? y                          IP Stations? y
            Enable 'dadmin' Login? y
            Enhanced Conferencing? n                      ISDN Feature Plus? n
                   Enhanced EC500? y           ISDN Network Call Redirection? n
    Enterprise Survivable Server? n                        ISDN-BRI Trunks? y
       Enterprise Wide Licensing? n                              ISDN-PRI? y
              ESS Administration? n              Local Survivable Processor? n
          Extended Cvg/Fwd Admin? n                   Malicious Call Trace? n
     External Device Alarm Admin? n                Media Encryption Over IP? n
  Five Port Networks Max Per MCC? n    Mode Code for Centralized Voice Mail? n
                Flexible Billing? n
   Forced Entry of Account Codes? n                Multifrequency Signaling? y
      Global Call Classification? n        Multimedia Call Handling (Basic)? n
             Hospitality (Basic)? y      Multimedia Call Handling (Enhanced)? n
 Hospitality (G3V3 Enhancements)? n
                       IP Trunks? y

            IP Attendant Consoles? n
```

Figure 3: System-Parameters Customers-Options Form, Page 4

3.1.2. Configure Node Names

Use the **change node-names ip** command to configure the IP address of the CLARity server and the local Control LAN interface (CLAN).

```
change node-names ip                                          Page   1 of   2
                                IP NODE NAMES
    Name                  IP Address
S8710-CLAN              192.168.10.6
clan                    192.168.60.6
clarity                 192.168.150.11
default                 0.0.0.0
rdt-monitor             192.168.150.8
```

Figure 4: Node-Names IP Form

3.1.3. Configure Telephone Stations

Use the **add station** command to configure the stations shown in **Table 1**.

Parameter	Usage
Type	Enter the type of station that is to be configured.
Security Code	Enter a numeric security code
Name	Enter a descriptive name for the user of the station.

Table 3: Station Parameters

```
add station 60113                                          Page   1 of   5
                                    STATION

Extension: 60113                        Lock Messages? n              BCC: 0
     Type: 4610                         Security Code:31106            TN: 1
     Port: S00006                     Coverage Path 1:                COR: 1
     Name: extn 60113                 Coverage Path 2:                COS: 1
                                      Hunt-to Station:
STATION OPTIONS
                                           Time of Day Lock Table:
             Loss Group: 19            Personalized Ringing Pattern: 1
                                                 Message Lamp Ext: 300-0136
           Speakerphone: 2-way                Mute Button Enabled? y
        Display Language: english                Expansion Module? n
 Survivable GK Node Name:
          Survivable COR: internal                 Media Complex Ext:
   Survivable Trunk Dest? y                             IP SoftPhone? n




                                          Customizable Labels? y
```

Figure 5: Add Station Form, Page 1

3.1.4. Configure IP Services

Use the **change ip-services** command to configure the IP service which sends CDR records to CLARity. Note that the CDR2 interface was used to attach a test program for verification purposes only: this need not be configured for normal operation.

Parameter	Usage
Service Type (p.1)	Enter "CDR1" to specify that the primary CDR interface is to be used to send CDR records to CLARity. This must correspond to the "Primary Output Endpoint" parameter which is shown in **Figure 8**.
Local Node (p.1)	Enter "clan" to specify that the CLAN interface is to be used to send CDR records. This value must be configured in **Figure 4**.
Remote Node (p.1)	Enter "CLARity" to specify that CDR records are to be sent to the CLARity server. This value must be configured in **Figure 4**.
Remote Port (p.1)	Enter "5010" to specify that CDR records are to be sent to the CLARity port which is defined in **Figure 16**.
Reliable Protocol (p.3)	Set this parameter to "y" to indicate that CDR records are to be sent using the Reliable Protocol to prevent data loss due to transmission errors.

Table 4: Station Parameters

```
change ip-services                                          Page   1 of   4

                                IP SERVICES
 Service      Enabled      Local       Local       Remote      Remote
   Type                    Node        Port        Node        Port
AESVCS         y       clan            8765
CDR1                   clan            0       clarity         5010
CDR2                   clan            0       rdt-monitor     9000
```

Figure 6: Node-Names IP Form, Page 1

```
change ip-services                                          Page   3 of   4

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

 CDR1             y         30               3          3         60
 CDR2             y         30               3          3         60
```

Figure 7: Node-Names IP Form, Page 3

3.1.5. Configure CDR Interface to CLARity

Use the **change system-parameters cdr** command to configure the Avaya S8720 Server to send CDR records using the format required by CLARity. Set the parameters on page 1 of this form as show in the following table. Note that the configuration values for the "Secondary Output" were included to cause CDR records to be written to a test tool, and are not required for normal operation.

Parameter	Usage
Primary Output Format	Set this field to "customized" so that CDR records can be generated using the format required by CLARity.
Primary Output Endpoint	Set this field to "CDR1" to use the CDR IP output device which was configured in **section 3.1.4**.

Table 5: Values Used for System-Parameters CDR, Page 1

```
change system-parameters cdr                                    Page   1 of   2
                           CDR SYSTEM PARAMETERS

 Node Number (Local PBX ID):                        CDR Date Format: day/month
      Primary Output Format: customized    Primary Output Endpoint: CDR1
    Secondary Output Format: customized  Secondary Output Endpoint: CDR2
           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? y
Modified Circuit ID Display? n                              Intra-switch CDR? y
                 Record Outgoing Calls Only? n     Outg Trk Call Splitting? y
  Suppress CDR for Ineffective Call Attempts? 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: group-ext
Record Called Vector Directory Number Instead of Group or Member? n
Record Agent ID on Incoming? n       Record Agent ID on Outgoing? y
     Inc Trk Call Splitting? 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
```

Figure 8: System-Parameters CDR Form, Page 1

The parameters on page 2 of the **system-parameters cdr** form define the format of the CDR record which is sent to CLARity. Set the parameters on this form as shown in the following table (formatting characters are not shown in the table). Additional information on this subject is contained in **[2].**

Parameter	Len	Usage	Parameter	Len	Usage
date	6	Call date	isdn-cc	11	ISDN condition code.
time	4	Call time	cond-code	1	Condition code.
out-crt-id	3	Trunk number within trunk group used for outgoing call	auth-code	7	User authorization code
code-used	4	Used for outgoing calls when trunk group differs from access code dialed by user	acct-code	15	The account code for the call
code-dial	4	Access code that the user dials to place an outgoing call	attd-console	2	attendant console number, if call participant
calling-num	10	The calling number	in-crt-id	3	Trunk number within trunk group used for incoming call
dialed-num	18	The called number	frl	1	Facility Restriction Level
sec-dur	5	Call duration in 1/10 of minute units	node-num	1	DCS node number of a switch within a DCS arrangement

Table 6: Values Used for System-Parameters CDR, Page 2

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

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

                              Record length = 114
```

Figure 9: System-Parameters CDR Form, Page 2

3.1.6. Configure Intra-Switch CDR Numbers

Use the **change intra-switch-cdr** command to specify that the CDR records are to be generated for locally-attached stations. Enter the local extensions "A" – "C" which are shown in **Table 1**.

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

                               Assigned Members:   3    of 5000   administered
   Extension          Extension          Extension          Extension
   60113
   60114
   60172
```

Figure 10: Intra-Switch CDR Form

3.2. Configure CLARity

Use a web browser to display the “main” page of the CLARity server. Note that although this web page displays the program name “Meteor SE”, this is really the configuration web page for CLARity. Enter an appropriate “Login” name and “Password”, and click “OK”.

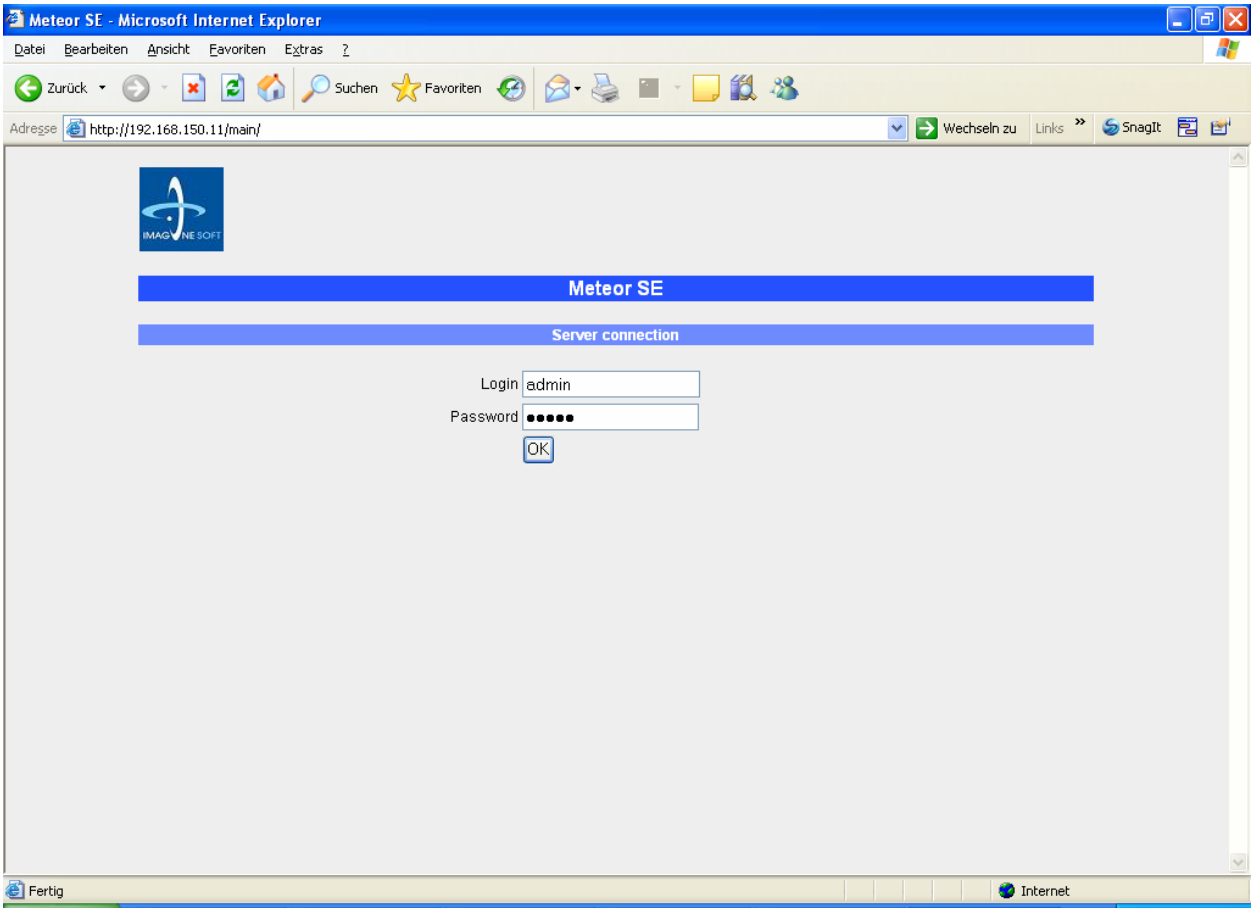

Figure 11: CLARity Login Screen

Select “Interface installation”

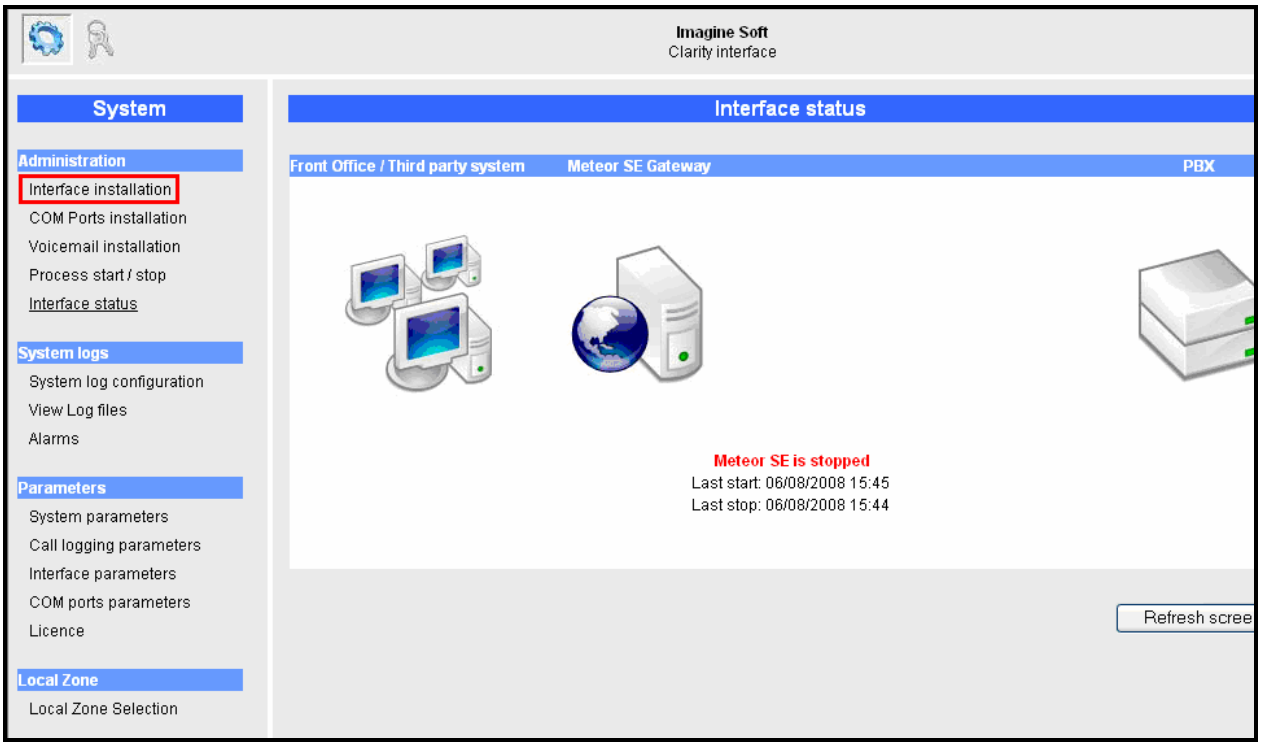

Figure 12: CLARity Interface Status Screen

Select “Avaya Com Man” and click “Install”.

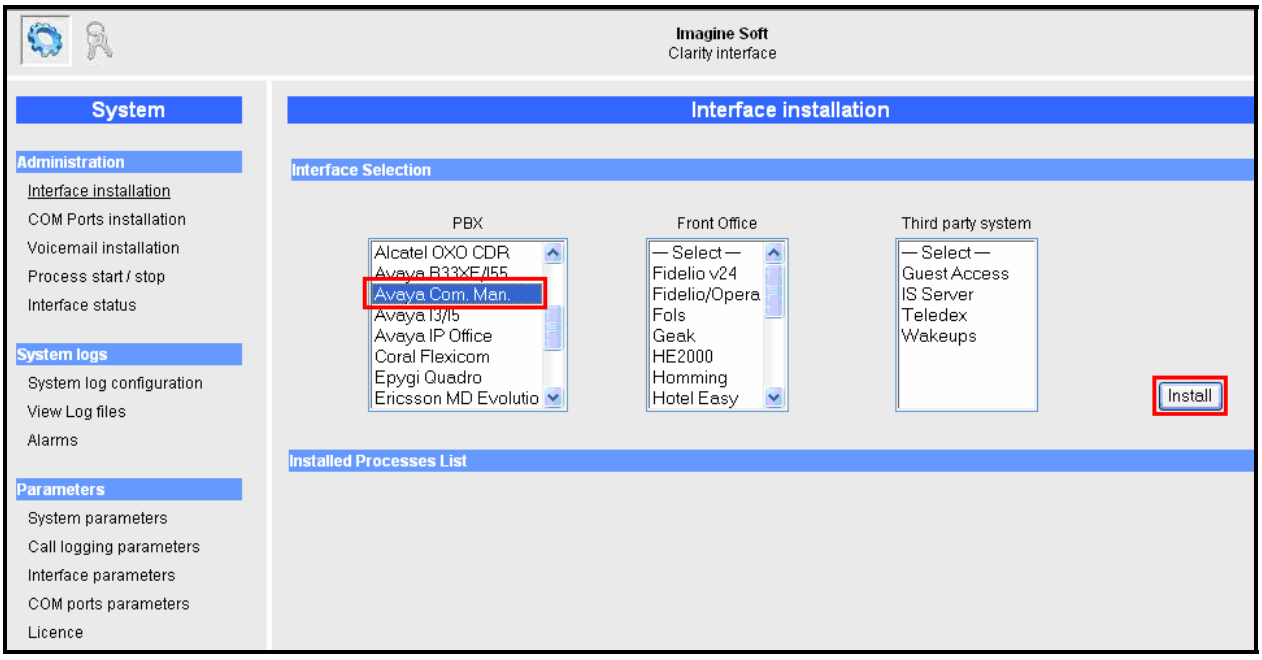

Figure 13: CLARity Interface Installation Screen

Click “interface parameters”.

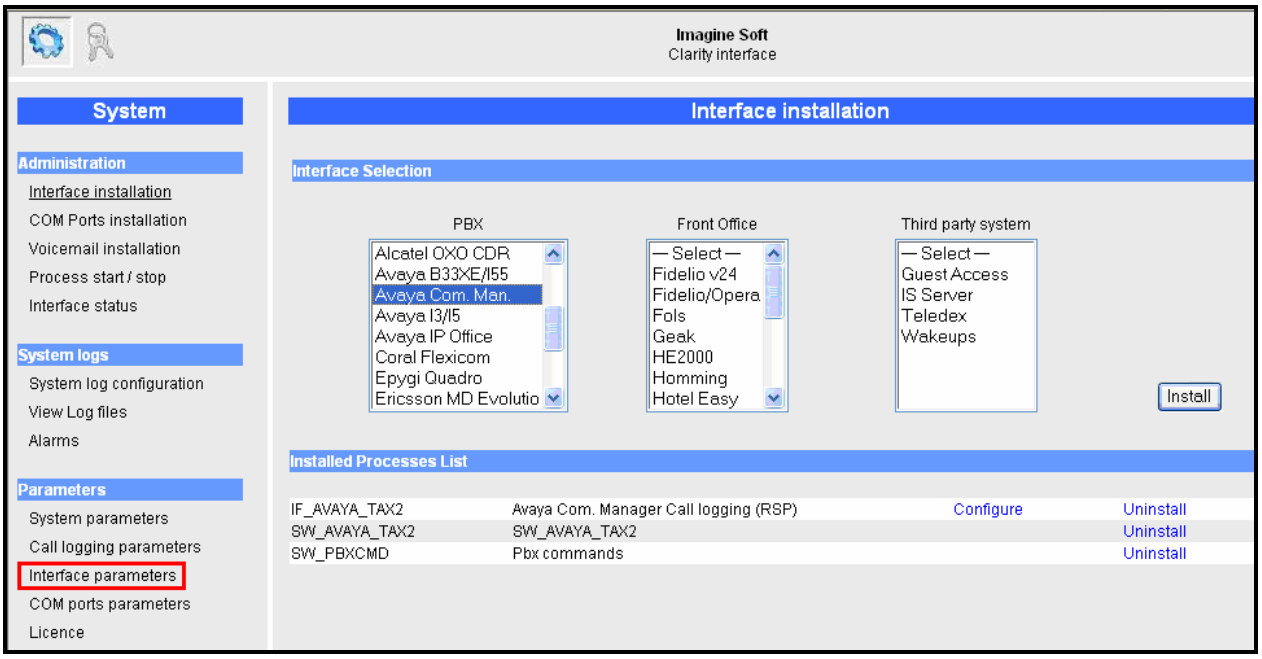

Figure 14: CLARity Installed Processes Screen

Click “Update” on “Port” and “Traffic analysis” entries.

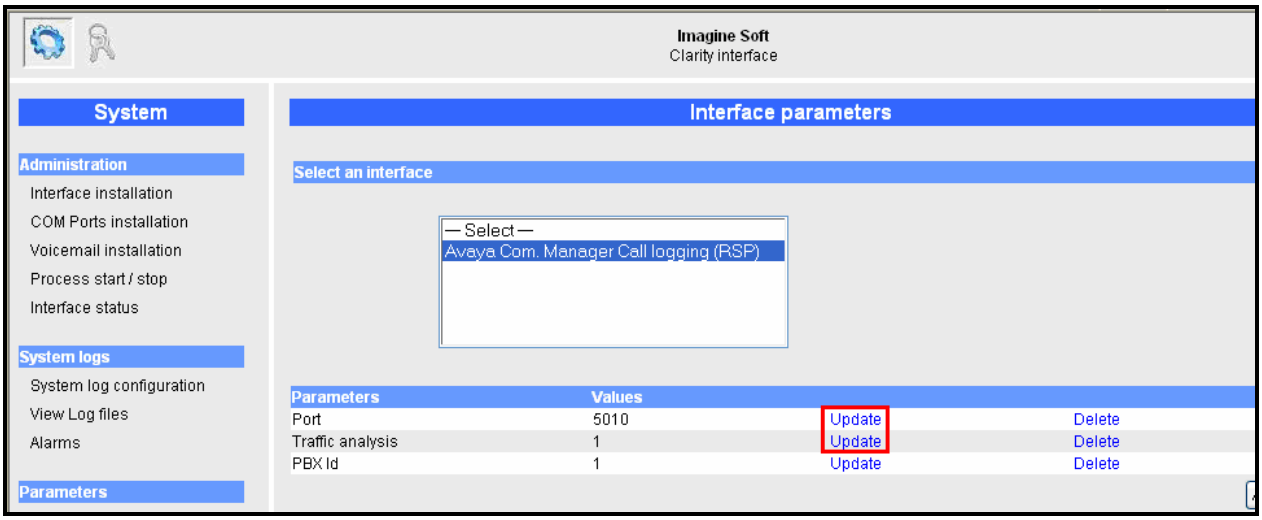

Figure 15: CLARity Interface Parameters Screen

Set the port number to which CM is to send CDR records. This must be the same value that is assigned as Remote Port in **Figure 6**.

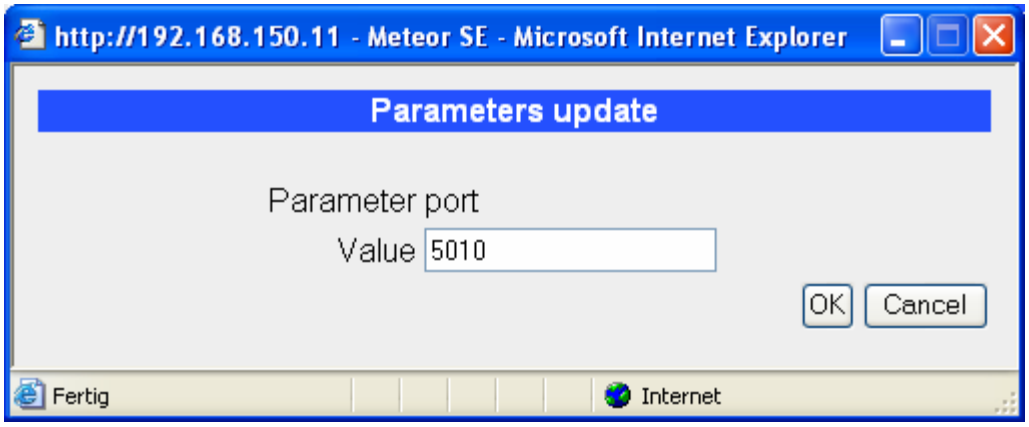

Figure 16: CLARity Port Setting Screen

Set the “Traffic analysis” parameter to “1” to enable CDR processing.

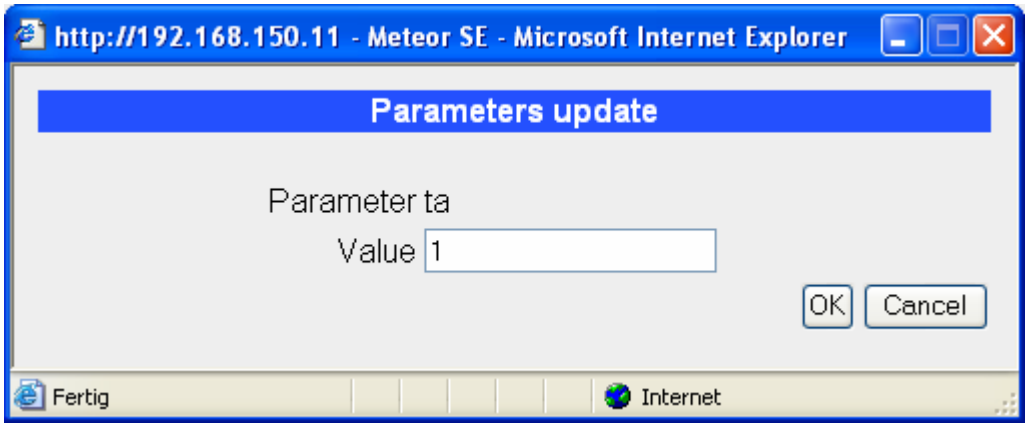

Figure 17: CLARity Traffic Analysis Setting Screen

4. Interoperability Compliance Testing

4.1. General Test Approach

The following tests steps were performed during compliance testing:

- Verify the ability of CLARity to process CDR records for intra-switch calls.
- Verify the ability of CLARity to process CDR records for inter-switch calls.
- Verify the ability of CLARity to process CDR records for calls to domestic external (PSTN) telephones.
- Verify the ability of CLARity to process CDR records for calls to international external (PSTN) telephones.
- Verify the ability of CLARity to process CDR records for incoming calls.
- Verify the ability of CLARity to process CDR records for held calls.
- Verify the ability of CLARity to process CDR records for transferred calls.
- Verify the ability of CLARity to process CDR records for conference calls.
- Verify the ability of CLARity to process CDR records for calls made from bridged appearances.
- Verify the ability of CLARity to process CDR records for calls answered from bridged appearances.
- Verify the ability of CLARity to process CDR records for calls made to hunt groups.
- Verify the ability of the CLARity server to recover from interface and power interruptions.

4.2. Test Results

All tests were performed without error.

5. Verification Steps

Enter **status cdr-link** from the SAT console and verify that the "primary" "Link State" is "up".

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

       Link State: up                           down
Number of Retries:                              999
      Date & Time: 2008/8 /7  3 :35:9           2008/8 /6 6 :35:19
  Forward Seq. No: 42                           0
 Backward Seq. No: 0                            0
CDR Buffer % Full: 0.00                         0.07
      Reason Code: OKchange ip-services         CDR connection is closed
```

Figure 18: Status cdr-link Screen

Click "Interface Status" on the CLARity console and verify that the "Avaya Comm. Manager Call Logging (RSP)" control is green.

6. Conclusion

These Application Notes describe the compliance testing of the Imagine Soft CLARity with Avaya Communication Manager. The various features of the CLARity which involve interaction with telephony were tested. A detailed description of the configuration required for both the Avaya and the Imagine Soft equipment is documented within these Application Notes.

7. Additional References

The CLARity documentation is contained in the following directory after the product has been installed: C:\CLARity\tomcat\webapps\ROOT\docs. This documentation is also available on the installation medium prior to installation or via the following icon from the CLARity console:

[1] *Administrator Guide for Avaya Communication Manager*, January 2008, Issue 4.0, Document Number 03-300509.

[2] *Feature Description and Implementation for Avaya Communication Manager,* January 2008, Issue 6, Document Number 555-245-205.

[3] *Technical Service Description CLARity 2.0*

[4] *D/4PCI Installation Guide*, 05-1341-002, 1999

[5] *Manuel de Pre-Installation CLARity,* Man 0038-4 (French)

[6] *Manuel de Configuration et d'Utilisation de CLARity,* Man 0036-6 (French)

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 DevConnect Program at devconnect@avaya.com.