



## **Avaya Solution & Interoperability Test Lab**

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# **Application Notes for FCS Gateway with Avaya Aura® Communication Manager R10.1 - Issue 1.0**

### **Abstract**

These Application Notes describe the procedures for configuring the FCS Gateway application to interoperate with Avaya Aura® Communication Manager R10.1. FCS Gateway is a Windows-based integrated billing and interfacing solution that supports all major PMS and PABX systems. FCS Gateway is also an Integrated Billing and Interface System for automated cost control and management of guest telephony and service usage.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as any observations noted in **Section 2.2**, to ensure that their own use cases are adequately covered by this scope and results.

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.

# 1. Introduction

These Application Notes describe the procedures for configuring FCS Gateway to interoperate with Avaya Aura® Communication Manager. FCS Gateway is a Windows-based integrated billing and interfacing solution that supports all major PMS and PABX systems. FCS Gateway is also an Integrated Billing and Interface System for automated cost control and management of guest telephony and service usage.

FCS Gateway provides a real-time multitasking interface between Avaya Aura® Communication Manager and a hotel 3<sup>rd</sup> party Property Management System (PMS). In addition to functioning as a call charge and billing system that manages the costs of telephony and service usage, FCS Gateway supports standard Hospitality feature requests to/from a PMS (e.g., guest room check-in/check-out/moves, Do Not Disturb (DND), Automatic Wakeup (AWU) through FCS Voice/PMS, Message Waiting Lamp (MWL) control, and Housekeeping/Room Status changes. The call charge and billing functionality is facilitated by a Call Detail Recording (CDR) interface to Avaya Aura® Communication Manager, while the Hospitality features are enabled by a PMS data link to Avaya Aura® Communication Manager.

When notified of a guest room check-in, FCS Gateway removes outbound call restrictions on the guest room extension and changes Hospitality Status of the extension to “occupied.” Conversely, when notified of a guest room check-out, FCS Gateway restricts outbound calls on the guest room extension and sets its Hospitality Status to “Vacant”.

# 2. General Test Approach and Test Results

Feature functionality testing was performed manually. Inbound calls were made to the Avaya IP Telephones (i.e., the guest telephones) over simulated PSTN trunks, as well as from other local extensions (analog, digital, and IP telephone). A simulated PMS application was used to launch changes to telephone message waiting lamps and phone privileges during room check-in / check-out / move requests, receive room status updates, and activate/deactivate DND.

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.

Avaya recommends our customers implement Avaya solutions using appropriate security and encryption capabilities enabled by our products. The testing referenced in these DevConnect Application Notes included the enablement of supported encryption capabilities in the Avaya products. Readers should consult the appropriate Avaya product documentation for further information regarding security and encryption capabilities supported by those Avaya products.

Support for these security and encryption capabilities in any non-Avaya solution component is the responsibility of each individual vendor. Readers should consult the appropriate vendor-supplied product documentation for more information regarding those products.

For the testing associated with these Application Notes, the interface between Avaya systems and the FCS Gateway did not include use of any specific encryption features as requested by FCS.

## **2.1. Interoperability compliance testing**

Interoperability compliance testing focused on the ability of FCS Gateway to work with Communication Manager. FCS Gateway features and capabilities that were verified included the following: receipt and processing of Call Detail Records, check-in/check-out/room change for guest extensions, receipt of Housekeeping/Room Status changes initiated at guest or non-guest telephones and forwarding to a simulated Property Management System, MWL activation for incoming voicemail, and DND activation/deactivation.

## **2.2. Test Results**

All executed test cases were completed successfully.

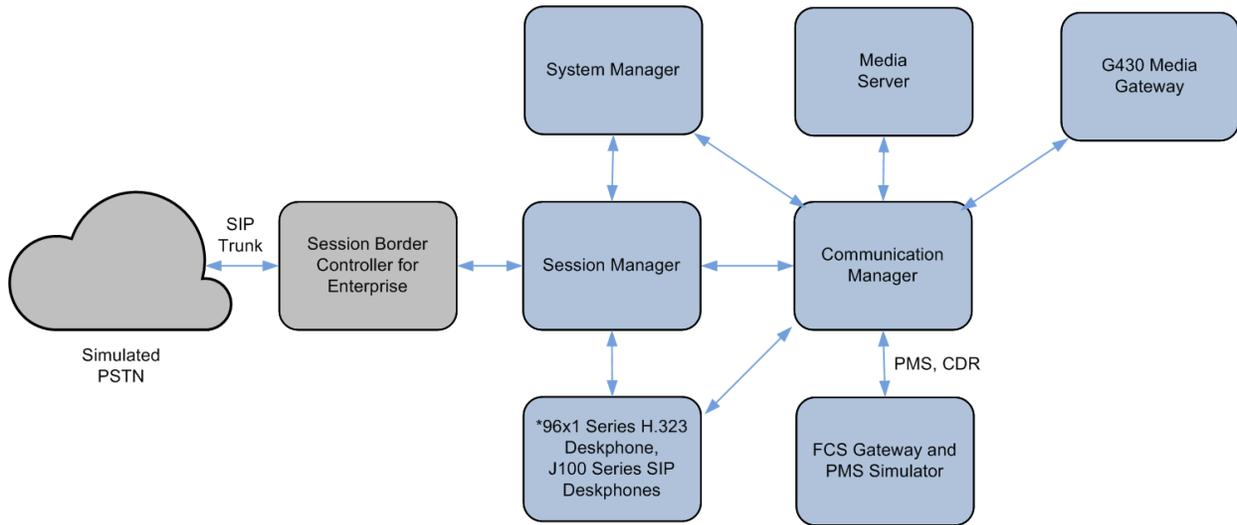
## **2.3. Support**

For technical support on FCS Gateway, contact FCS Global Customer Support at:

- Phone: +63-2-672-7860
- Email: [helpdesk.fcs@planet1world.com](mailto:helpdesk.fcs@planet1world.com)
- Web: <http://www.fcscs.com/support/>

### 3. Reference Configuration

The configuration used in performing compliance testing of FCS Gateway is shown in **Figure 1**. It shows a network consisting primarily of an Avaya Aura® Communication Manager with an Avaya G430 Media Gateway and Avaya Aura® Media Server. Avaya Aura® System Manager and Avaya Aura® Session Manager provided SIP support to the Avaya SIP endpoints. Avaya Session Border Controller for Enterprise was used to complete a SIP trunk connection to simulate a PSTN connection to the Enterprise solution. A server with FCS Gateway was installed with PMS Simulator, and a pair of phones for each guest room, which were either analog or digital with an Avaya IP Deskphones. Additional utility phones are set up to function as Operator, Admin and Front Desk. The CDR and PMS data links from FCS Gateway are carried over the IP network and terminated in Avaya Aura® Communication Manager as IP services.



\*Deskphones include Operator, Admin, Message Desk and Guest Rooms.

**Figure 1: Sample Test Configuration**

## 4. Equipment and Software Validated

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

Equipment/Software	Release Version
Avaya Aura® Communication Manager	10.1 (10.1.0.0.974.27372)
Avaya Aura® Media Server	10.1.0.77
Avaya G430 Media Gateway	42.4.0
Avaya Aura® Session Manager	10.1 SP2 (10.1.0.2.1010215)
Avaya Aura® System Manager	10.1 Build No. - 10.1.0.0.537353 Software Update Revision No: 10.1.0.0.0614119
Avaya Session Border Controller	10.1.0.0.-32-21432
Avaya J100 Series SIP Telephones	4.0.11.0
Avaya J100 Series H.323 Telephones	6.8532
Avaya 96X1 H.323 Deskphones	6.8532
Avaya 14XX Digital Telephones	2.0 SP9 (R20)
Analog Phones	-
FCS Gateway running on Windows Server 2019	2.1

*Note: The Avaya Aura® servers including FCS Gateway server used in the test configuration and shown on the table were deployed in a virtualized environment. These Avaya components ran as virtual machines on VMware® (ESXi 6.7) platforms.*

## 5. Configure Avaya Aura® Communication Manager

This section details the steps required to configure Communication Manager to interoperate with FCS Gateway. These Application Notes assume the Avaya Media Gateway, including modules, has already been administered. Please refer to [2] for additional details.

The commands listed in this section were issued at the System Access Terminal (SAT). For all steps where data are modified, submit the completed administration form for the changes to take effect.

### 5.1. Turn On Special Applications

Special-applications feature is required for this compliance testing in order to expand the numbering and character names for PMS from 5-digit extensions and 15-character names to 7-digit extensions and 27-character names. Enter **display system-parameters special-applications** and in **Page 5**, check the parameter **(SA8662) – Expanded PMS Name and Number** is set to **y**. Contact your Avaya representative if it is not turned on.

```
display system-parameters special-applications                               Page 5 of 11
                                SPECIAL APPLICATIONS

                                (SA8652) - No Hold Consult? n
(SA8654) - Crisis Alert Call Monitoring and Recording? n
                                (SA8661) - Increased Automatic Wakeup Calls? n
                                (SA8662) - Expanded PMS Name & Number? y
                                (SA8684) - PMS Wakeup Message? n
(SA8693) - Connectivity Check for Direct IP Shuffling? n

                                (SA8697) - 3rd Party H.323 Endpoint Support? y
(SA8701) - Net Region Support H.323 Endpoints Behind ALG? n
                                (SA8702) - CDR Enhancements for Network? n
(SA8731) - Block Outgoing Bridged Call Display? n
                                (SA8734) - Enhanced Extension Display? n
(SA8741) - CDR Identifier for IP Station Calls? n
                                (SA8744) - Block Name for Room to Room Calls? n
(SA8747) - Softphone Indication on DCP Terminals? n
```

## 5.2. Set Hospitality Parameters

Enter **display system-parameters customer-options**. On **Page 5**, check that the **Hospitality (Basic)** and **Hospitality (G3V3 Enhancements)** are set to **y**. Note that **Hospitality (Basic)** is provided as a standard software package for Communication Manager. Contact your Avaya representative if both are not turned on.

```
display system-parameters customer-options                               Page 5 of 12
                                OPTIONAL FEATURES

Emergency Access to Attendant? y                                       IP Stations? y
  Enable 'dadmin' Login? y
  Enhanced Conferencing? y                                           ISDN Feature Plus? n
    Enhanced EC500? y                                               ISDN/SIP Network Call Redirection? y
Enterprise Survivable Server? n                                       ISDN-BRI Trunks? y
  Enterprise Wide Licensing? n                                       ISDN-PRI? y
    ESS Administration? y                                           Local Survivable Processor? n
      Extended Cvg/Fwd Admin? y                                       Malicious Call Trace? y
External Device Alarm Admin? y                                       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? y                                       Multifrequency Signaling? y
  Global Call Classification? y                                       Multimedia Call Handling (Basic)? y
    Hospitality (Basic)? y                                       Multimedia Call Handling (Enhanced)? y
Hospitality (G3V3 Enhancements)? y                               Multimedia IP SIP Trunking? y
  IP Trunks? y

IP Attendant Consoles? y
(NOTE: You must logoff & login to effect the permission changes.)
```

Next, enter **change system-parameters hospitality**. Note that setting Hospitality features to **act-pms** means the PMS is controlling these parameter configurations. On **Page 1**, set the following values:

- Message Waiting Configuration: **act-pms**.
- Controlled Restrictions Configuration: **act-pms**. (PMS is controlling the guest telephones restrictions).
- Housekeeper Information Configuration: **act-pms**.
- Number of Housekeeper ID Digits: **4** (if Housekeeper ID is required for status update, number of Digits can be set here. Set to 0 if Housekeeper ID is not required).
- Client Room Coverage Path Configuration: **act-pms**.
- Default Coverage Path for Client Rooms: Set to the coverage path that provides the appropriate coverage treatment for an unoccupied guest room, e.g., coverage to the hotel operator. In this example, coverage path **100** is used.
- PMS Endpoint: **PMS** (this can only be administered if PMS link is defined in ip-services in **Section 5.6**).
- PMS Protocol Mode: **transparent** with ASCII mode: **y** (supported mode by FCS Gateway).
- Seconds before PMS Link Idle Timeout: Set the timeout to be greater than the FCS Gateway keep alive for Communication Manager to determine if the link is still alive (in this example, **20** seconds is used).
- Milliseconds before PMS Link Acknowledgement Timeout: **1000** (to allow for longer PMS response time).

```
change system-parameters hospitality                               Page 1 of 3
      HOSPITALITY

      Message Waiting Configuration: act-pms
      Controlled Restrictions Configuration: act-pms
      Housekeeper Information Configuration: act-pms
      Number of Housekeeper ID Digits: 4
      PMS Log Endpoint:
      Journal/Schedule Endpoint:
      Client Room Coverage Path Configuration: act-pms
      Default Coverage Path for Client Rooms: 100
      Forward PMS Messages to Intuity Lodging? n

      PMS LINK PARAMETERS
      PMS Endpoint: PMS
      PMS Protocol Mode: transparent ASCII mode? y
      Seconds before PMS Link Idle Timeout: 20
      Milliseconds before PMS Link Acknowledgement Timeout: 1000
      PMS Link Maximum Retransmissions: 3
      PMS Link Maximum Retransmission Requests: 3
      Take Down Link for Lost Messages? y
```

On **Page 2**, set the following values:

- Number of Digits from PMS: **Blank** for mixed numbering for guest rooms with extension of 5 and 6-digit length.
- Number of Digits in PMS Coverage Path: Set the number of digits for coverage path (in this example, **3** digits is used for coverage path).

```
change system-parameters hospitality                               Page 2 of 3
                                HOSPITALITY

Dual Wakeups? y      Daily Wakeup? y      VIP Wakeup? y
                                VIP Wakeups Per 5 Minutes: 5
                                Room Activated Wakeup With Tones? y
Time of Scheduled Wakeup Activity Report:
Time of Scheduled Wakeup Summary Report:
Time of Scheduled Emergency Access Summary Report:
                                Announcement Type: silence

Length of Time to Remain Connected to Announcement: 30
Extension to Receive Failed Wakeup LWC Messages:
Routing Extension on Unavailable Voice Synthesis:
Display Room Information in Call Display? y
Automatic Selection of DID Numbers? y
Custom Selection of VIP DID Numbers? y
                                Number of Digits from PMS:
                                PMS Sends Prefix? n
                                Number of Digits in PMS Coverage Path: 3
                                Digit to Insert/Delete:
```

### 5.3. Set Room Status Values

Advance to **Page 3** and enter the following values for the fields indicated:

- Definition for Rooms in State 1: **Vacant Dirty**
- Definition for Rooms in State 2: **Vacant Ready**
- Definition for Rooms in State 3: **Occupied Dirty**
- Definition for Rooms in State 4: **Occupied Clean**

The above definition for Room Status depends on what is agreed upon room state for PBX with PMS system.

```
change system-parameters hospitality                               Page 3 of 3
ROOM STATES              HOSPITALITY

Definition for Rooms in State 1: Vacant Dirty
Definition for Rooms in State 2: Vacant Clean
Definition for Rooms in State 3: Occupied Dirty
Definition for Rooms in State 4: Occupied Clean
Definition for Rooms in State 5:
Definition for Rooms in State 6:

HOSPITALITY FEATURES
                               Suite Check-in? n
Cancel Do-Not-Disturb for Wakeup Calls? y
```

## 5.4. Administer Feature Access Codes for Housekeeping Status

Enter **change feature-access-codes** (FACs) and advance to **Page 8**. Enter unique FACs for each of the four **Housekeeping Status (Client Room) Access Code** listed, each of which will correspond to the room status values administered in **Section 5.3** (in this example, **\*78, \*79, \*80** and **\*81** were used). Also, enter unique FACs for each of the four **Housekeeping Status (Station) Access Code** listed, each of which will correspond to the first four room status values administered in **Section 5.3** (in this example, **\*84, \*85, \*86** and **\*87** were used). This is for the housekeeper or hotel staff using phones not in the guest rooms to update housekeeping status. As the housekeeper is not dialing from the guest room deskphones, the corresponding room number needs to be entered after the feature code. If Housekeeper ID is required, the number of digits is set in **Section 5.2** will need to be entered after the access code (guest room) or after the room number (non-guest room). The Housekeeper ID will be captured by FCS Gateway via the PMS link.

<b>change feature-access-codes</b>	Page 8 of 11
FEATURE ACCESS CODE (FAC)	
Hospitality Features	
Automatic Wakeup Call Access Code: *77	
<b>Housekeeping Status (Client Room) Access Code: *78</b>	
<b>Housekeeping Status (Client Room) Access Code: *79</b>	
<b>Housekeeping Status (Client Room) Access Code: *80</b>	
<b>Housekeeping Status (Client Room) Access Code: *81</b>	
Housekeeping Status (Client Room) Access Code: *82	
Housekeeping Status (Client Room) Access Code: *83	
<b>Housekeeping Status (Station) Access Code: *84</b>	
<b>Housekeeping Status (Station) Access Code: *85</b>	
<b>Housekeeping Status (Station) Access Code: *86</b>	
<b>Housekeeping Status (Station) Access Code: *87</b>	
Verify Wakeup Announcement Access Code: *88	
Voice Do Not Disturb Access Code: *89	

## 5.5. Define the FCS Gateway Server as an IP Node Name

Enter **change node-names ip xxx**, where xxx is the appropriate initial alphabet and add an entry for the FCS Gateway server using a descriptive value for the **Name** (in this case, **FCSGW**) and the corresponding **IP Address** (in this example, **10.1.10.126**).

```
change node-names ip FCSGW                                     Page 1 of 2
IP NODE NAMES
Name                IP Address
FCSGW             10.1.10.126
Gateway001          10.1.10.1
Gateway002          10.1.50.1
IPOffice            10.1.30.10
IPOfficeExp         10.1.10.110
IPOfficePri         10.1.10.121
Medpro2a07          10.1.50.23
Medpro2a08          10.1.50.24
PC4                 10.1.10.154
PC6                 10.1.10.156
TelCAAP             10.1.10.125
VAL2a11            10.1.50.26
VirsaE              10.1.10.122
XFire2a09           10.1.50.25
aams1               10.1.10.13
aams2               10.1.10.12
( 16 of 35  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
```

## 5.6. Define IP Services in support of the PMS and CDR Data Links

Enter **change ip-services** and add entries with a Service Type of **PMS** and **CDR1** (or, if a CDR1 service is already defined, **CDR2**). In each case, enter the following values in the remaining fields:

- Local Node: The IP Node Name of a C-LAN board or PROCR (in this example, **procr** is used for IP service definition).
- Remote Node: The IP Node Name of the FCS Gateway server, as defined in **Section 5.5**.
- Remote Port: A valid unused port (in this example, the value needs to tally with the FCS Gateway setup where **5053** is used for **PMS** and **5052** is used for **CDR1** in **Section 6**).

```
change ip-services                                           Page 1 of 4
IP SERVICES
Service  Enabled  Local      Local      Remote      Remote      TLS
Type     Type     Node       Port       Node        Port        Encryption
AESVCS   y         procr      8765
CDR1   0         procr     0          FCSGW     5052     n
PMS   0         procr     0          FCSGW     5053
```

## 5.7. Administer CDR Output Format

Enter **change system-parameters cdr** and choose one of the standard output formats for the **Primary Output Format** field (in this example, **customized** was entered). With customized format, the data and length for the CDR output can be defined on **Page 2**. Set the **Primary Output Endpoint** to **CDR1** administered in **Section 5.6**. This selection will determine the expected call detail record format that will be administered in FCS Gateway. For more information on CDR output formats in Communication Manager, please refer to **[2]**.

```

change system-parameters cdr                                     Page 1 of 2
                                CDR SYSTEM PARAMETERS
Node Number (Local PBX ID): 1                                CDR Date Format: month/day
Primary Output Format: customized      Primary Output Endpoint: CDR1
Secondary Output Format:
  CDR Retention (days): 20
  Use ISDN Layouts? n
  Use Enhanced Formats? n
  Use Legacy CDR Formats? n
  Modified Circuit ID Display? n
                                Enable CDR Storage on Disk? n
                                Condition Code 'T' For Redirected Calls? n
                                Remove # From Called Number? 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
  Inc Trk Call Splitting? y
  Record Non-Call-Assoc TSC? n
  Record Call-Assoc TSC? n
  Privacy - Digits to Hide: 0
  Remove '+' from SIP Numbers? y
                                Record Agent ID on Outgoing? n
                                Inc Attd Call Record? y
                                Call Record Handling Option: warning
                                Digits to Record for Outgoing Calls: dialed
                                CDR Account Code Length: 15

```

```

change system-parameters cdr                                     Page 2 of 2
                                CDR SYSTEM PARAMETERS
                                Data Item - Length
1: date - 6
2: time - 4
3: sec-dur - 5
4: cond-code - 1
5: code-dial - 4
6: code-used - 4
7: dialed-num - 23
8: calling-num - 15
9: acct-code - 15
10: auth-code - 13
11: space - 1
12: frl - 1
13: in-crt-id - 4
14: out-crt-id - 4
15: feat-flag - 1
16: attd-console - 4
                                Data Item - Length
17: in-trk-code - 4
18: node-num - 2
19: ins - 5
20: ixc-code - 4
21: bcc - 1
22: ma-uui - 1
23: res_flag - 1
24: tsc_ct - 4
25: tsc_flag - 1
26: space - 1
27: return - 1
28: line-feed - 1
29: null - 1
30: null - 1
31: null - 1
32:
                                Data Item - Length
33: -
34: -
35: -
36: -
37: -
38: -
39: -
40: -
41: -
42: -
43: -
44: -
45: -
46: -
47: -
48: -
                                Record length = 134

```

The CDR condition code defines the type of call. Below is a subset of condition codes which the FCS Gateway will utilize to tag the calls to be charged. An example would be to use condition code **H** for identifying guest not answering incoming calls or the caller abandon the calls. Please refer to document in [3] under Call Detail Recordings for the full list.

<b>Condition Codes</b>	<b>Description</b>
7	Identifies calls that use the AAR or ARS feature.
8	Identifies calls that are served on a delayed basis by the Ringback Queuing feature.
9	Identifies: <ul style="list-style-type: none"> <li>• An incoming call</li> <li>• A tandem call</li> <li>• An incoming NCA-TSC call</li> <li>• A tandem NCA-TSC call</li> </ul>
H	Notes that the system abandoned a ringing call.

## 5.8. Add Client Room Properties and Console Permission to Class of Service

Enter **change cos-group x**, where **x** is Class of Service number. For Class of Service **5** to be assigned to guest telephones, set the **Client Room** field to **y**. For Class of Service **1** to be assigned to Operator/Front Office Deskphones, set the **Console Permissions** set to **y**.

change cos-group 5															Page	1 of	2
CLASS OF SERVICE	COS Group: 5					COS Name: Guest											
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Auto Callback	n	y	y	n	y	n	y	n	y	n	y	n	y	n	y	n	
Call Fwd-All Calls	n	y	n	y	y	y	n	y	y	n	n	y	y	n	n	y	
Data Privacy	n	y	n	n	n	y	y	y	y	n	n	n	n	n	y	y	
Priority Calling	n	y	n	n	n	n	n	n	n	y	y	y	y	y	y	y	
Console Permissions	n	y	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Off-hook Alert	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Client Room	n	n	n	n	n	y	n	n	n	n	n	n	n	n	n	n	
Restrict Call Fwd-Off Net	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	y	
Call Forwarding Busy/DA	n	n	n	n	n	y	n	n	n	n	n	n	n	n	n	n	
Personal Station Access (PSA)	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Extended Forwarding All	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Extended Forwarding B/DA	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Trk-to-Trk Transfer Override	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
QSIG Call Offer Originations	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Contact Closure Activation	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Automatic Exclusion	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	

change cos-group 1															Page	1 of	2
CLASS OF SERVICE	COS Group: 1					COS Name: Default											
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Auto Callback	n	y	y	n	y	n	y	n	y	n	y	n	y	n	y	n	
Call Fwd-All Calls	n	y	y	y	y	y	n	y	y	n	n	y	y	n	n	y	
Data Privacy	n	n	y	n	n	n	y	y	y	n	n	n	n	n	y	y	
Priority Calling	n	y	y	n	n	n	n	n	n	y	y	y	y	y	y	y	
<b>Console Permissions</b>	n	y	y	n	n	n	n	n	n	n	n	n	n	n	n	n	
Off-hook Alert	n	y	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Client Room	n	n	n	n	n	y	n	n	n	n	n	n	n	n	n	n	
Restrict Call Fwd-Off Net	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	y	
Call Forwarding Busy/DA	n	y	y	n	n	y	n	n	n	n	n	n	n	n	n	n	
Personal Station Access (PSA)	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Extended Forwarding All	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Extended Forwarding B/DA	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Trk-to-Trk Transfer Override	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
QSIG Call Offer Originations	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Contact Closure Activation	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	
Automatic Exclusion	n	n	y	n	n	y	n	n	n	n	n	n	n	n	n	n	

## 5.9. Create Coverage Path

Enter **add coverage path x**, where **x** is the number of the default coverage path define in **Section 5.2**. In this example, coverage path **100** set coverage for **Point1** to the operator at extension **10001**. Another coverage path **70** is created for coverage to Voice Mail is created for Operator or Front Desk Telephones. In this example, the coverage is set for **Point1** to **h70** (hunt group 70) for Voice Mail pilot number.

```

add coverage path 100                                     Page 1 of 1
                                COVERAGE PATH

                                Coverage Path Number: 100
                                Cvg Enabled for VDN Route-To Party? n      Hunt after Coverage? n
                                Next Path Number:                          Linkage

COVERAGE CRITERIA
  Station/Group Status   Inside Call   Outside Call
      Active?             n             n
      Busy?               y             y
      Don't Answer?      y             y      Number of Rings: 2
      All?                n             n
      DND/SAC/Goto Cover? y             y
      Holiday Coverage?  n             n

COVERAGE POINTS
  Terminate to Coverage Pts. with Bridged Appearances? n
Point1: 10001          Point2:
Point3:                Point4:
Point5:                Point6:

add coverage path 70                                     Page 1 of 1
                                COVERAGE PATH

                                Coverage Path Number: 70
                                Cvg Enabled for VDN Route-To Party? n      Hunt after Coverage? n
                                Next Path Number:                          Linkage

COVERAGE CRITERIA
  Station/Group Status   Inside Call   Outside Call
      Active?             n             n
      Busy?               y             y
      Don't Answer?      y             y      Number of Rings: 3
      All?                n             n
      DND/SAC/Goto Cover? y             y
      Holiday Coverage?  n             n

COVERAGE POINTS
  Terminate to Coverage Pts. with Bridged Appearances? n
Point1: h70           Rng:   Point2:
Point3:                Point4:
Point5:                Point6:
  
```

## 5.10. Set Guest Room Calling Party Restrictions in a Class of Restriction (COR)

Enter **change cor *n***, where *n* is the number of the Class of Restriction to be assigned to guest telephones (in this example, COR 5 is used). In the **Calling Party Restriction** field, enter **all-toll** for restricting guest room dial digits. The list of toll-restricted numbers can be administered by entering **change toll xxx** where xxx is the initial dialed number such as 1900 (not shown).

```

change cor 5                                     Page 1 of 43
                                     CLASS OF RESTRICTION

COR Number: 5
COR Description: Guest Room

FRL: 0                                           APLT? y
Can Be Service Observed? n                       Calling Party Restriction: all-toll
Can Be A Service Observer? n                     Called Party Restriction: none
Time of Day Chart: 1                             Forced Entry of Account Codes? n
Priority Queuing? n                               Direct Agent Calling? n
Restriction Override: none                       Facility Access Trunk Test? n
Restricted Call List? n                          Can Change Coverage? n
Unrestricted Call List:
Access to MCT? y                                 Fully Restricted Service? n
Group II Category For MFC: 7                     Hear VDN of Origin Annc.? n
Send ANI for MFE? n                             Add/Remove Agent Skills? n
MF ANI Prefix:                                  Automatic Charge Display? n
Hear System Music on Hold? y PASTE (Display PBX Data on Phone)? n
Can Be Picked Up By Directed Call Pickup? n     Can Use Directed Call Pickup? n
Group Controlled Restriction: inactive

```

## 5.11. Assign Class of Service and Class of Restriction Values to Guest Telephones and Operator/Front Office Deskphones

For each guest telephone extension *x*, enter **change station x** and specify **COS 5** and **COR 5** administered in **Section 0** and **Section 5.10**, respectively. **Coverage Path 1** will be **100** as shown below and can be changed by FCS Gateway via the PMS link to coverage path 70 upon check-in. Note the **Name** field is blank. It will be changed or updated via PMS upon Check-In/Move. The Class of Service **1** administered in **Section 0** with coverage path 70 will be set for Operator/Front Desk Deskphone.

<b>change station 71121</b>	Page 1 of 6
STATION	
Extension: 71121	Attendant? n Lock Messages? n BCC: 0
Type: J169	Security Code: * TN: 1
Port: S000019	<b>Coverage Path 1: 100</b> COR: 5
Name:	Coverage Path 2: COS: 5
Unicode Name? n	Hunt-to Station:
STATION OPTIONS	
Time of Day Lock Table:	
Loss Group: 19	Message Lamp Ext: 71121
Display Language: english	Button Modules: 0
Survivable COR: internal	IP SoftPhone? n
Survivable Trunk Dest? y	IP Video? n
<b>change station 10001</b>	Page 1 of 5
STATION	
Extension: 10001	Lock Messages? n BCC: 0
Type: 9611G	Security Code: * TN: 1
Port: S000002	<b>Coverage Path 1: 70</b> COR: 1
Name: Operator	Coverage Path 2: COS: 1
Unicode Name? n	Hunt-to Station: Tests? y
STATION OPTIONS	
Time of Day Lock Table:	
Loss Group: 19	Personalized Ringing Pattern: 1
Speakerphone: 2-way	Message Lamp Ext: 10001
Display Language: english	Mute Button Enabled? y
Survivable GK Node Name:	Button Modules: 0
Survivable COR: internal	Media Complex Ext:
Survivable Trunk Dest? y	IP SoftPhone? y
IP Video Softphone? n	
Short/Prefixed Registration Allowed: default	
Customizable Labels? y	

## 5.12. Controlled Restriction

The PMS can send Controlled Restriction command to FCS Gateway and instruct Communication Manager via the PMS link. Refer to [4] for additional details for the Controlled Restriction code list.

Controlled Restriction can activate four restrictions and they are:

- Outward: Station cannot make calls to Public Network
- Station to Station: Station cannot place or receive internal calls
- Termination: Station cannot receive incoming calls (this is used for DND)
- Total: Station cannot place or receive any calls

Enter **change system-parameters features** and in **Page 4**, the treatment for guest rooms is listed in the three parameters below. Options as available include attendant, announcement, tone (re-order), coverage and extensions. The selection will determine the type of intercept treatment the caller of guest room or calling party to guest rooms receives. Note that **Total Restriction** above uses the same treatment for **Controlled Station to Station Restriction** which is **tone** as below.

```
change system-parameters features                               Page 4 of 19
      FEATURE-RELATED SYSTEM PARAMETERS
Reserved Slots for Attendant Priority Queue: 5
      Time before Off-hook Alert: 10
      Emergency Access Redirection Extension:
Number of Emergency Calls Allowed in Attendant Queue: 5
      Drop Parking User From the Call After Timeout? n
      Deluxe Paging and Call Park Timeout to Originator? y
Controlled Outward Restriction Intercept Treatment: tone
Controlled Termination Restriction (Do Not Disturb): coverage
Controlled Station to Station Restriction: tone

AUTHORIZATION CODE PARAMETERS
      Authorization Codes Enabled? y
      Authorization Code Length: 7
      Authorization Code Cancellation Symbol: #
      Attendant Time Out Flag? n
      Display Authorization Code? n
      Controlled Toll Restriction Replaces: none
```

## 6. Configure FCS Gateway

This section details the essential portion of the FCS Gateway configuration to interoperate with Communication Manager. These Application Notes assume that the FCS Gateway application has already been properly installed by FCS services personnel. Further details of the FCS Gateway setup can be found in the FCS Gateway Installation Manual [6].

1. The FCS Gateway Avaya PMS interface module port and data configuration are defined in the AvayaAscii-PBX.xml file located in the “C:\Program Files (x86)\FCS\Gateway\Control\” directory. The host is set as Interface Type 2 (**tcp.ip**) listening on port **5053**. This corresponds with the setup of Communication Manager in **Section 5.6** for the **PMS** service type.

```
<PBX ID="AvayaAscii">
  <!-- need to match with the XML filename -->
  <CommunicationSetting>
    <Name>Avaya Ascii</Name>
    <!--
      1 = RS232      (<InterfaceSetting>3,9600,n,8,1</InterfaceSetting>)
      2 = TCPIP     (<InterfaceSetting>H,127.0.0.1:5050</InterfaceSetting>)
                   (<InterfaceSetting>C,127.0.0.1:5050</InterfaceSetting>)
      m
      3 = UDP       (<InterfaceSetting>H,127.0.0.1:5050</InterfaceSetting>)
                   (<InterfaceSetting>C,127.0.0.1:5050</InterfaceSetting>)
      4 = Telnet    (<InterfaceSetting>H,127.0.0.1:5050</InterfaceSetting>)
                   (<InterfaceSetting>C,127.0.0.1:5050</InterfaceSetting>)
      5 = BISYNC    (<InterfaceSetting>3,9600,n,8,1</InterfaceSetting>)
      6 = Cicso 4.x CDR File Sharing method (MS SQL Server)
                   (<InterfaceSetting>db connection string</InterfaceSetting>)
      7 = Cicso 5-7 CDR File Sharing method (CSV File)
                   (<InterfaceSetting>full path (&name) location of the CSV file</InterfaceSetting>)
      8 = Webservice
                   (<InterfaceSetting>URL string</InterfaceSetting>)
    -->
    <!--
      Examples:
      <InterfaceType>1</InterfaceType>
      <InterfaceSetting>1,9600,n,8,1</InterfaceSetting>
    -->
    <InterfaceType>2</InterfaceType>
    <InterfaceSetting>H,10.0.25.10:5053</InterfaceSetting>
    <UDPSvrInterfaceSetting/>
    <!--
      if tcp.ip, interfaceSetting could be "X,192.168.1.12:5600",
      where X = H = host, C=client
    -->
  </CommunicationSetting>
</PBX ID="AvayaAscii">
```

2. To support two types of Room Status records, two different feature codes were used:
  - HKR – Communicate housekeeper-dialed status changes originated from room
  - HKS – Communicate housekeeper-dialed status changes originated from designated station

```

</replydata>
  <RoomStatusConfiguration>
    <!-- 12345678901234567890 -->
    <!-- X!xHKR1001351FFFFFF Xx -->
    <ValidRecord>
      <ValidPL>4,3</ValidPL>
      <ValidString>HKR</ValidString>
      <ValidPL>4,3</ValidPL>
      <ValidString>HKS</ValidString>
    </ValidRecord>
    <MaidIdPL>15,3</MaidIdPL>
    <MaidPinPL/>
    <ExtensionPL>8,7</ExtensionPL>
    <RoomStatusPL>7,1</RoomStatusPL>
    <!-- PBX interface will map the room status code accordingly
    <ConfirmationPL/>

```

3. The FCS Gateway Avaya CDR interface module port and data configuration are defined in the Generic-CDR.xml file located in the “C:\Program Files (x86)\FCS\Gateway\Control\” directory. The host is set as type **2 (tcp.ip)** listening to port **5052**. This corresponds with the setup of Communication Manager in **Section 5.6** for the **CDR1** service type.

```

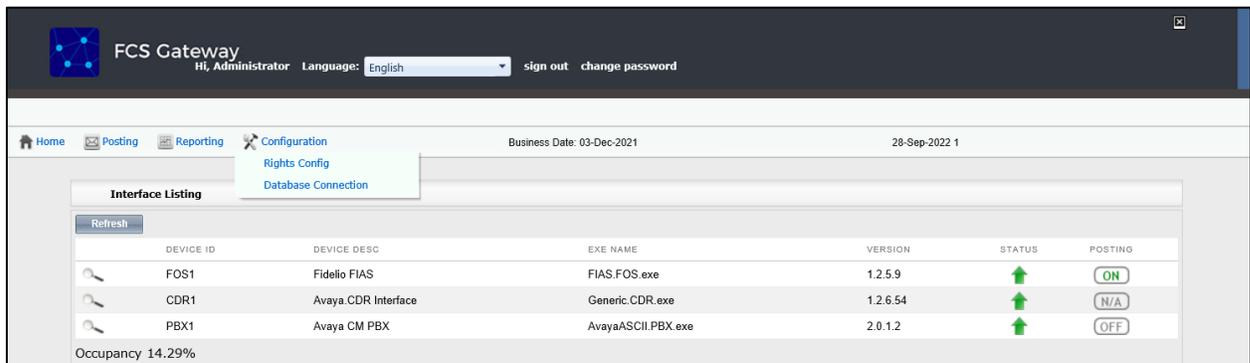
  <PBX ID="CDR1">
    <!-- need to match with the XML filename -->
    <CommunicationSetting>
      <Name>Avaya</Name>
      <ProtocolFormat>2</ProtocolFormat>
      <!-- 1 =[STX]xxxxx[ETX], 2=xxxxxxx[13][10] 3=[13][10]xxxxxxx, 4=Fixed Length -->
      <InterfaceType>2</InterfaceType>
      <!-- 1 = RS232, 2=tcp.ip 3=udp, 4=telnet,5=bisync 6=file sharing -->
      <InterfaceSetting>H,127.0.0.1:5052</InterfaceSetting>
      <!-- if tcp.ip, interfaceSetting could be "X,192.168.1.12:5600" , where X = H = host, C=client -->
      <!-- 3,9600,n,8,1 - com. port 3, baud rate 9600,n,8,1 -->
      <UDPSvrInterfaceSetting/>
      <InterPacketDelay>100</InterPacketDelay>
      <CheckRTSSignal>No</CheckRTSSignal>
      <!-- needed for RS232 Setting only -->

```

- FCS Gateway provides a Web interface for posting and reporting. Administrator can log in with the appropriate credentials from “*http://<server name or ip address>/FCSGateway.Web/Login.aspx*” by substituting the appropriate server ip address of the FCS Gateway.



- Click **Home** → **System** → **Interface Listing** to show the interface integrated and their status which should show up . Below are the **Device ID** list and their purpose. A Fidelio Open Interface Simulator was used as Front Office System to send PMS commands.
  - FOS1:** Front Office System using Fidelio Open Interface Simulator
  - CDR1:** Communication Manager Call Detail Recording
  - PBX1:** Communication Manager PMS



## 7. Verification Steps

This section describes steps that may be used to verify the configuration. To verify that the PMS data link between Communication Manager and FCS Gateway is operational, enter **status pms-link** at the SAT and look for a status of **up** in the **Physical Link State** and **Protocol State** fields.

```
status pms-link
PMS LINK STATUS
Physical Link State: up
Protocol State: up
Maintenance Busy? no
Data Base Swapping? no
```

To verify that the CDR data link between Communication Manager and FCS Gateway is operational, enter **Status cdr-link** at the SAT and look for a status of **up** in the **Link State** field of the CDR link to FCS Gateway (in this example, the **Primary** link).

```
status cdr-link
CDR LINK STATUS
Primary
Link State: up
Date & Time: 2022/09/27 10:43:20
Forward Seq. No: 0
Backward Seq. No: 0
CDR Buffer % Full: 0.00
Reason Code: OK
```

Initiate a check-in request for a guest extension from the associated Property Management System. At Communication Manager SAT, enter **status station x** and verify that **Room Status** is **occupied** and **User Cntrl Restr** is **none**.

```

status station 71121                                     Page 1 of 7
GENERAL STATUS
Administered Type: J169                               Service State: in-service/on-hook
  Connected Type: 9611                               Signal Status: connected
    Extension: 71121                                Network Region: 1
      Port: S000019                                Parameter Download: complete
        Call Parked? no                            SAC Activated? no
          Ring Cut Off Act? no
Active Coverage Option: 1                            one-X Server Status: N/A

EC500 Status: N/A                                  Off-PBX Service State: in-service/idle
Message Waiting:
Connected Ports:

Limit Incoming Calls? no
User Cntrl Restr: none
Group Cntrl Restr: none

HOSPITALITY STATUS
Awaken at:
User DND: not activated
Group DND: not activated
Room Status: occupied
  
```

Initiate a check-out for the guest extension from the associated Property Management System. At Communication Manager SAT, enter **status station x** again and verify that **Room Status** is **vacant** and **User Cntrl Restr** is **Outward** for DND. Make public call from the guest extension to verify that it is blocked.

```

status station 71222
GENERAL STATUS
Administered Type: 1408                               Service State: in-service/on-hook
  Connected Type: 9408                               Network Region: 13
    Extension: 71222                                Parameter Download: complete
      Port: 003V202                                SAC Activated? no
        Call Parked? no
          Ring Cut Off Act? no
Active Coverage Option: 1                            one-X Server Status: N/A

EC500 Status: N/A                                  Off-PBX Service State: N/A
Message Waiting:
Connected Ports:

Limit Incoming Calls? no
User Cntrl Restr: outward
Group Cntrl Restr: none

HOSPITALITY STATUS
Awaken at:
User DND: not activated
Group DND: not activated
Room Status: vacant
  
```

## 8. Conclusion

These Application Notes describe the procedures for configuring FCS Gateway to interoperate with Avaya Aura® Communication Manager R10.1. All interoperability compliance test cases executed against such a configuration were completed successfully.

## 9. Additional References

The following Avaya product documentation is available at <http://support.avaya.com>.

- [1] *Administering Network Connectivity on Avaya Aura® Communication Manager*, Release 10.1.x, Issue 2, Sep 2022
- [2] *Administering Avaya Aura® Communication Manager*, Release 10.1, Issue 1, Dec 2021
- [3] *Avaya Aura® Communication Manager Feature Description and Implementation*, Release 10.1, Issue 1, Feb 2022
- [4] *Guestworks® and DEFINITY® Enterprise Communications Server PMS Interface Specifications*, Issue 4, Dec 2001. Document ID 55-231-601
- [5] *Application Notes for FCS Voice (SIP) v3.1 with Avaya Aura® Communication Manager R10.1 and Avaya Aura® Session Manager R10.1*

The following documents are provided by FCS Computer Systems upon request.

- [6] *FCS Gateway v2 Installation Manual*, Version 2.7
- [7] *FCS Gateway v2 User Manual*, Version 2.2

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