



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

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# **Application Notes for Unicorn Version 1.1 with Avaya Communication Server 1000 Release 7.5 – Issue 1.0**

### **Abstract**

These Application Notes describe the procedures for configuring FCS Unicorn application to interoperate with Avaya Communication Server 1000. FCS Unicorn is a Windows-based integrated billing and interface solution that supports all major Call Detail Recording and Property Management System Interfaces in PABX systems.

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 Unicorn to interoperate with Avaya Communication Server 1000. FCS Unicorn is a Windows-based integrated billing and interface solution that supports all major Call Detail Recording (CDR) and Property Management Systems (PMS). FCS Unicorn provides a real-time multitasking interface between Avaya Communication Server 1000 (CS 1000) and a hotel's 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 Unicorn supports standard Hospitality feature requests to/from a PMS (guest room check-in/check-out/moves, Do Not Disturb (DND), Automatic Wake-Up (AWU), Message Waiting Lamp (MWL) control, Housekeeping/Room Status changes). The call charge and billing functionality is facilitated by a CDR interface to Avaya Communication Server 1000, while the Hospitality features are enabled by a PMS data link to Avaya Communication Server 1000. The data link used between Avaya CS 1000 and Unicorn server is RS232 serial cable that connects from the RS232 port of Media Gateway Controller (MGC) card on CS 1000 to serial COM port on the Unicorn server.

## 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 PRI and SIP 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 / checkout / 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 standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute a full product performance or feature testing performed by third party vendors, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a third party solution.

### 2.1. Interoperability Compliance Testing

Interoperability compliance testing focused on FCS Unicorn's ability to work with Avaya Communication Manager. FCS Unicorn features and capabilities that were verified included the following:

- Receipt and processing of Call Detail Records: internal, incoming, transfer, and local calls with charge code and authorization code.
- Property Management System features: check-in/check-out/room change for guest extensions, receipt of Housekeeping/Room Status changes initiated at guest telephones and forwarding to a simulated Property Management System, MWL activation for incoming voicemail, and DND activation/deactivation.

## 2.2. Test Results

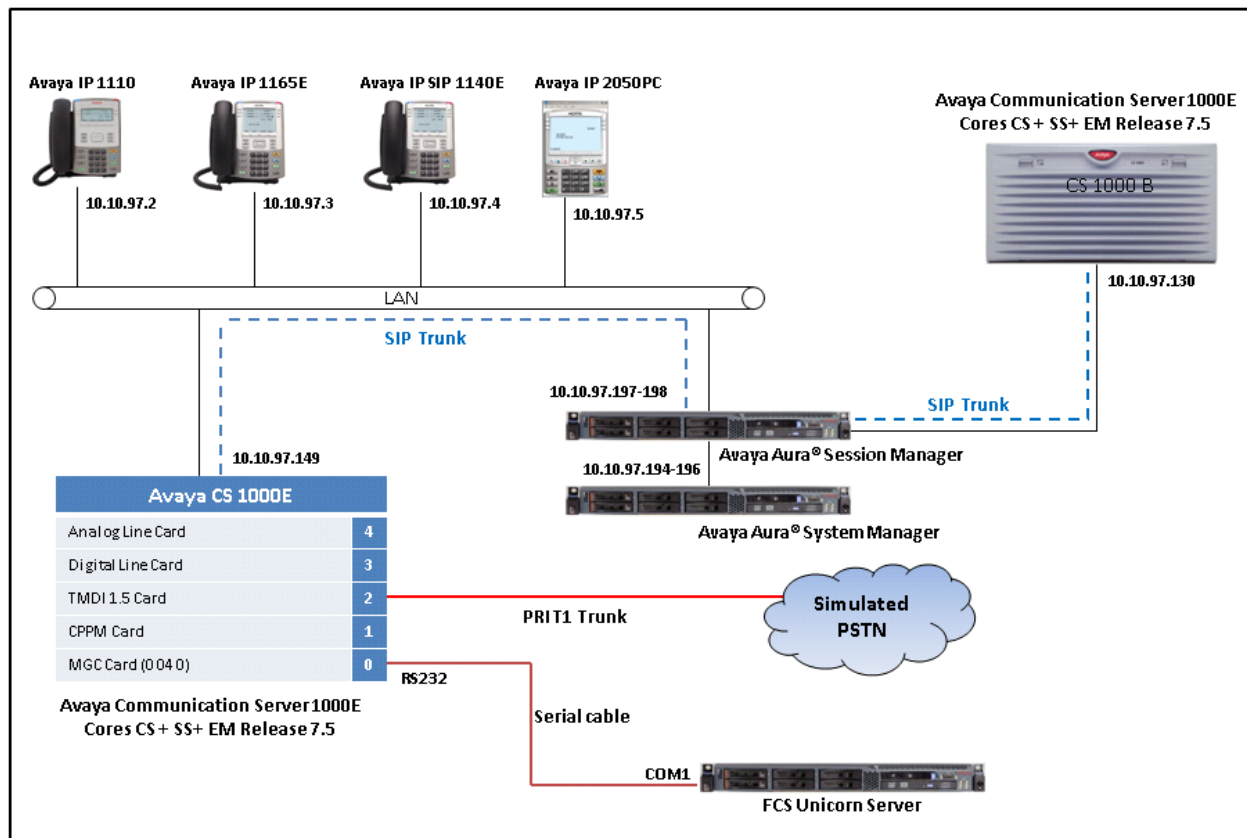
All executed test cases were completed successfully.

## 2.3. Support

For technical support on FCS Unicorn, contact FCS Computer Systems at Support Hotline at [+632-857-4000](tel:+632-857-4000).

## 3. Reference Configuration

Figure 1 below illustrates the test configuration diagram that has a serial cable connected from RS232 port on MGC card to serial com port on the Unicorn server. The diagram also has the SIP trunk between two Avaya CS 1000 systems and the T1 trunk from the main CS 1000 to the simulated PSTN. The SIP and T1 trunks are used for outbound and inbound calls to the main CS 1000.



**Figure 1: Test Configuration Diagram**

## 4. Equipment and Software Validated

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

Equipment	Software
Avaya S8800 server running Avaya Aura® Session Manager Server	6.2 (Build No 6.2.3.0.623006)
Avaya S8800 server running Avaya Aura® System Manager Server	6.2 (Build No: 6.2.0 Software Update Revision No: 6.2.12.1.1822)
Avaya Communication Server 1000E/CPPM	Avaya Communication Server Release 7.5 Q+ Deplist 1 (created: 2012-09-20) and Service Update 1 (Created: Sept 19, 2012)
Avaya IP SIP Phone 1140E	4.3
Avaya IP Unistim Phone 1165E	0x25C8J
Avaya IP Unistim Phone 1150E	0x27C8J
Avaya IP Unistim Phone 2004	0604DCN
Unicorn IBM Server x3350	Windows 2008 64-bit R2 Standard SP1
Unicorn software	1.1

## 5. Configure Avaya Communication Server 1000

This document assumes that the CS 1000 system used for the compliance test was already installed and configured. This section just provides necessary procedure to configure for CS 1000 to work with Unicorn application. For more detail on how to administer the CS 1000 system, please refer to **Section 9**.

### 5.1. Configure Property Management System Interface (PMSI)

The Property Management System Interface is an optional software package that allows the CS1000 system to interface directly with a customer-provided Property Management System (PMS) through a Serial Data Interface (SDI) port. This provides an effective means of information between the PMS and the CS 1000 system.

This section provides the procedure how to check the software package and to configure the Property Management System Interface on the CS 1000.

1. Use overlay LD 22 to print all necessary software packages that are required for the PMS feature on the CS 1000.

```
>ld 22

REQ prt
TYPE pkg
DNDI          9 (Do Not Disturb Individual package)
DNDG          16 (Do Not Disturb Group package)
MWC           46 (Message Waiting Center package)
CCOS          81 (Controlled Class of Service package)
BGD           99 (Background Terminal package)
RMS           100 (Room Status package)
MR            101 (Mange Registration package)
AWU           102 (Automatic Wake UP package)
PMSI          103 (Property Management Service Interface)
```

2. Use overlay (LD) 17 to create a TTY port number for a TTY connection on the MGC card of CS 1000. This TTY port was used to connect to the serial COM port on the Unicorn server via a serial cable.

```
>ld 17
Req chg
Type adan
ADAN new tty 8
CTYP MGC
  IPMG 4 0
  DNUM 8
  PORT 0
  DES CDR
  BPS 9600
  BITL 7
  STOP 1
  PARY NONE
  FLOW NO
  USER BGD PMS
  CUST 00
```

- Use overlay (LD) 17 to enable the PMS interface in the CS 1000 system.

```
>ld 17
REQ chg
TYPE parm
PMSI yes
  MANU PMS1
  PMCR 20
  PORT 8
    XTMR 2
    XNUM 1
    PMIN YES
    PTMR 0
```

- Use overlay (LD) 15 to enable the Controlled Class of Service (CCOS) feature in the customer data block.

```
>ld 15
MEM AVAIL: (U/P): 36345352      USED U P: 8362512 172005      TOT:
44879869
DISK SPACE NEEDED: 157 KBYTES
REQ: chg
TYPE: ccs

TYPE CCS_DATA
CUST 0
CCRS UNR
ECC1 FRE
ECC2 UNR
CNCS
PELK NO
```

- Use overlay (LD) 15 to enable Automatic Wake Up feature in the customer data block.

```
>ld 15
CDB000
MEM AVAIL: (U/P): 36345352      USED U P: 8362512 172005      TOT:
44879869
DISK SPACE NEEDED: 157 KBYTES
REQ: chg
TYPE: AWU

TYPE AWU_DATA
CUST 0
AWU YES
ATRC NO
RANF 016
RAN1 017
RAN2 018
```

6. User overlay (LD) 15 to enable Do Not Disturb feature in the customer data block (CDD).

```
>ld 15
CDB000
MEM AVAIL: (U/P) : 36345352      USED U P: 8362512 172005      TOT:
44879869
DISK SPACE NEEDED: 157 KBYTES
REQ: chg
TYPE: FTR

TYPE FTR_DATA
CUST 0
DN DL YES
```

7. Use overlay (LD) 15 to enable Message Waiting Indicator feature in the customer data block (CDB).

```
>ld 15
CDB000
MEM AVAIL: (U/P) : 36345352      USED U P: 8362512 172005      TOT:
44879869
DISK SPACE NEEDED: 157 KBYTES
REQ: chg
TYPE: FTR

TYPE FTR_DATA
CUST 0
OPT MCI
```

8. Use overlay (LD) 10 and 11 to administer analog, digital and IP phone.

```
>ld 11
REQ: chg
TYPE: 1165
TN 96 0 0 17
ECHG yes
ITEM cls ccsa mwa
ITEM key 1 RMK --> Room status key
ITEM key 2 WUK --> Wake up key
```

With definitions for class of services:

- **CCSA:** Controlled Class of service Allowed.
- **MWA:** Messaging Waiting Indicator Allowed.

## 5.2. Configure Call Detail Recording

The Call Detail Recording (CDR) feature provides information on incoming and outgoing calls for accounting and administration purposes. The information is assembled by software and sent through Serial Data Interface (SDI) ports to any EIA RS-232 compatible output or storage device. This section provides the steps to configure the Call Detail Recording feature to work with Unicorn application via serial cable.

1. Use overlay LD 22 to print all necessary software packages that are required for the CDR feature on the CS 1000.

```
>ld 22

REQ prt
TYPE pkg
CDR          4
CTY          5
CHG         23
BAUT        25
ICDR       108
CDRE       151
FCDR       234
SCDR       251
CDRX       259
```

2. Use overlay (LD) 17 to create a TTY port number for a CDR connection on the MGC card of CS 1000. This TTY port was used to connect to serial COM port on Unicorn server via a serial cable.

```
>ld 17
Req chg
Type adan
ADAN new tty 12
CTYP MGC
  IPMG 4 0
  DNUM 12
  PORT 1
  DES CDR
  BPS 9600
  BITL 8
  STOP 1
  PARY NONE
  FLOW NO
  USER CTY
```



3. Use overlay (LD) 15 to enable CDR feature on customer data block of CS 1000 system.

```
>ld 15
CDB000
MEM AVAIL: (U/P): 36345352      USED U P: 8362512 172005      TOT:
44879869
DISK SPACE NEEDED: 157 KBYTES
REQ: chg
TYPE: CDR

TYPE CDR_DATA
CUST 0
IMPH YES
  OMPH YES
  AXID YES
  TRCR NO
  CDPR YES
  ECDR YES
  BDI YES
  OTCR YES
  PORT 12
  CNI DGTS
  BCAP NO
CHLN 4
FCAF NO
```

4. Use overlay (LD) 16 to configure CDR in the route data block for PRI and SIP routes.

```
>ld 16
RDB000
MEM AVAIL: (U/P): 36345352      USED U P: 8362512 172005      TOT:
44879869
DISK SPACE NEEDED: 157 KBYTES
RAN RTE          AVAIL:    512    USED:      0    TOT:    512
REQ chg
TYPE RDB
CUST 0
ROUT 1
CDR YES
INC YES
LAST YES
TTA YES
ABAN YES
CDRB YES
QREC NO
OAL YES
AIA YES
OAN YES
OPD YES
NDP EXC 0
```

5. User overlay (LD) 11 to configure class of service (CLS) for CS 1000 phone to enable incoming call detail allowed and abandon call allowed. These class of services allow to issue call record for incoming call and abandon call.

```
>ld 20

PT0000
REQ: chg
TYPE: 1110
TN 96 0 0 19
ECHG yes
ITEM cls icda abda
```

## 6. Configure FCS Unicorn Application

This section details the essential portion of the FCS Unicorn configuration to interoperate with Avaya Communication Server 1000. These Application Notes assume that the FCS Unicorn application has already been properly installed by FCS services personnel. Further details of the FCS Unicorn setup can be found in the Unicorn (Standard) v1.1 - Installation Manual v1.0 in **Section 9**.

1. The Unicorn Avaya PMS interface module port and data configuration is defined in the Nortel-PBX.xml located in "C:\Program Files (x86)\FCS\Unicorn\Control\" directory. The parameter of the COM port has to be matched with the TTY connection configured in **Section 5.1**.

```
?xml version="1.0" encoding="utf-8"?>
<!-- <?xml version="1.0"? -->
<PBX ID="Nortel">
<CommunicationSetting>
<Name>Nortel PMS</Name>
<InterfaceType>1</InterfaceType>
  <InterfaceSetting>2,9600,n,7,1</InterfaceSetting>
  <UDPSvrInterfaceSetting></UDPSvrInterfaceSetting>
  <UDPSvrInterfaceSetting></UDPSvrInterfaceSetting>
  <InterPacketDelay>100</InterPacketDelay>
  <CheckRTSSignal>No</CheckRTSSignal>
  <CheckDTRSignal>No</CheckDTRSignal>
  <CheckCTSSignal>No</CheckCTSSignal>
  <CheckSumMethod>1</CheckSumMethod>
  <ReceiveChecksum>Yes</ReceiveChecksum>
  <InterCharDelay>10</InterCharDelay>
  <InterStringDelay>100</InterStringDelay>
  <SendRetry>1</SendRetry>
  <SendTimeout>3</SendTimeout>
</CommunicationSetting>
```

And modify on the child PBX1:

```
<Child Id="PBX1">
  <PropertyId>PropertyID</PropertyId>
  <EXEName>Nortel.PBX.exe</EXEName>
  <LogFilePattern>PBX\PBX1-</LogFilePattern>
  <Description>Nortel PMS</Description>
  <XMLFile>Nortel-PBX.xml</XMLFile>
  <IntfInQueueName>.\Private$\PBX2In</IntfInQueueName>
  <IntfOutQueueName>.\Private$\PBX2Out</IntfOutQueueName>
  <IntfOutQueueFilterThresholdInHour>99999
</IntfOutQueueFilterThresholdInHour>
  <UnicornMotherIPPort>9203</UnicornMotherIPPort>
  <MemoryPage>3</MemoryPage>
</Child>
```

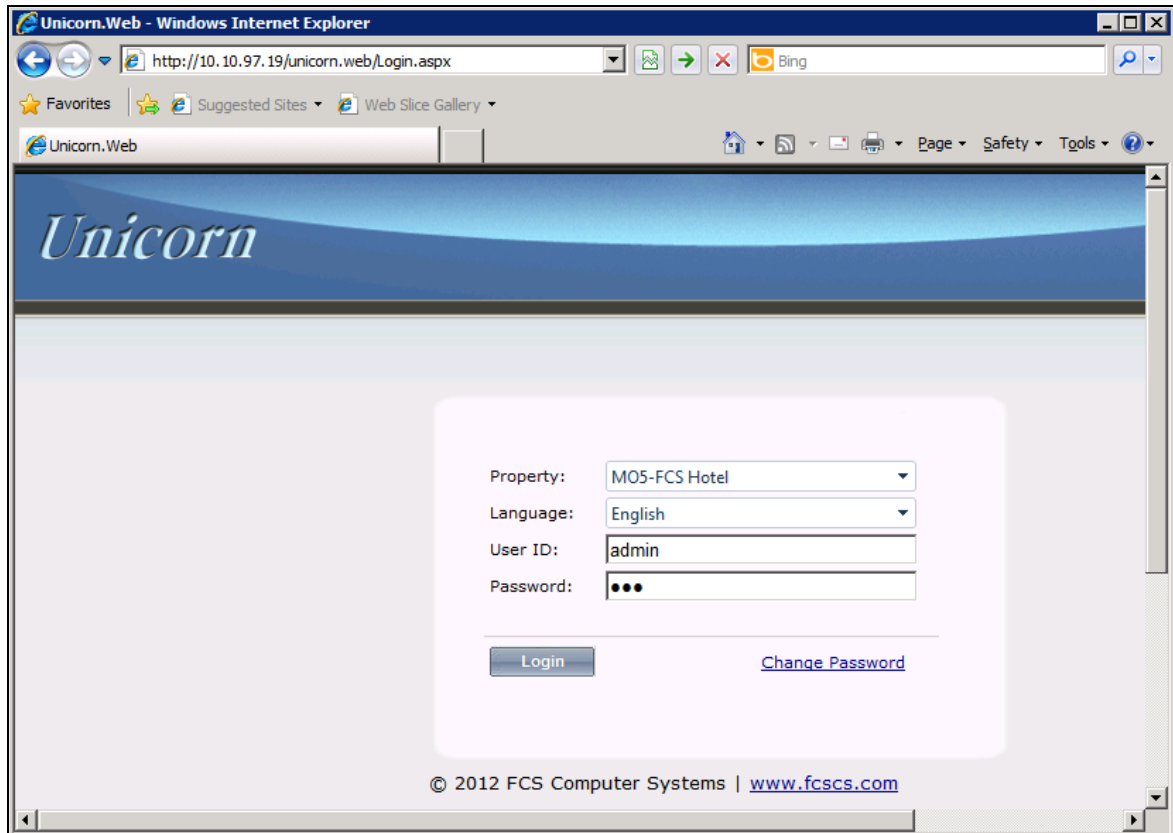
2. The Unicorn Avaya CDR interface module port & data configuration is define in the Nortel-CDR.xml located in "C:\Program Files (x86)\FCS\Unicorn\Control" directory. The parameter of the COM port has to be matched with the TTY connection configured in **Section 5.2**.

```
<?xml version="1.0" encoding="utf-8"?>
<!-- <?xml version="1.0"? -->
<PBX ID="CDR1">
  <CommunicationSetting>
    <Name>Nortel CDR1</Name>
    <ProtocolFormat>1</ProtocolFormat>
    <InterfaceType>1</InterfaceType>
    <InterfaceSetting>1,9600,n,8,1</InterfaceSetting>
    <UDPSvrInterfaceSetting></UDPSvrInterfaceSetting>
    <InterPacketDelay>100</InterPacketDelay>
    <CheckRTSSignal>No</CheckRTSSignal>
    <CheckDTRSignal>No</CheckDTRSignal>
    <CheckCTSSignal>No</CheckCTSSignal>
    <CheckSumMethod>1</CheckSumMethod>
    <ReceiveCheckSum>Yes</ReceiveCheckSum>
    <InterCharDelay>10</InterCharDelay>
    <InterStringDelay>100</InterStringDelay>
    <SendRetry>1</SendRetry>
    <SendTimeout>3</SendTimeout>
  </CommunicationSetting>
```

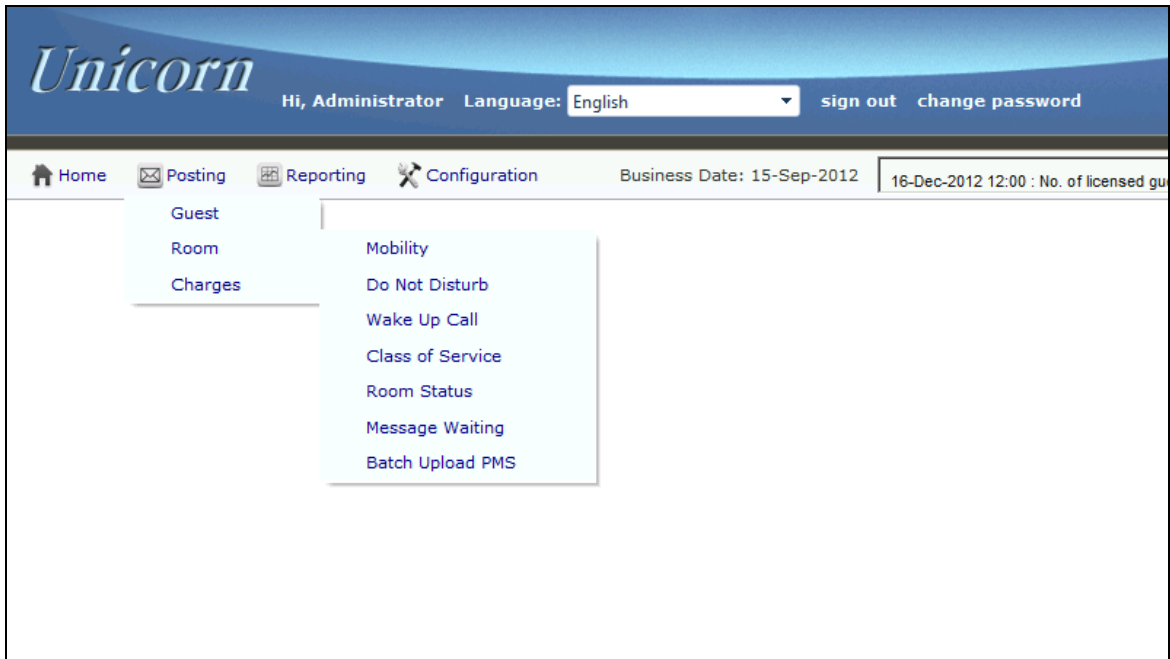
And modify on the child CDR1 file.

```
Child Id="CDR1">
<PropertyId> PropertyID </PropertyId>
  <LogFilePattern>CDR\CDR1-</LogFilePattern>
  <EXENAME>Nortel.CDR.exe</EXENAME>
  <Description>Nortel CDR Interface </Description>
  <XMLFile>Nortel-CDR.xml</XMLFile>
  <IntfInQueueName>.\Private$\SMDRIn</IntfInQueueName>
  <IntfOutQueueName>.\Private$\SMDROut
</IntfOutQueueName>
  <IntfOutQueueFilterThresholdInHour>99999
</IntfOutQueueFilterThresholdInHour>
  <UnicornMotherIPPort>4001</UnicornMotherIPPort>
  <MemoryPage>8</MemoryPage>
</Child>
```

3. FCS Unicorn provides a web interface for posting and reporting. Administrator can login with the appropriate credentials from <http://<ipaddress>/Unicorn.Web/Login.aspx> as shown below by substituting the appropriate server IP address where the FCS Unicorn is installed.



4. The **Posting** tab below shows the various PMS features such as DND, Check In/Out, Guest Profile, etc that can be administered from the web interface. For further details refer to the “Unicorn (Standard) v1.1 - User Manual v1.0” [4].



5. The **Billing** tab from **Home** → **System** → **Billing** below shows the CDR records that Unicorn application captures from the CS 1000 switch via serial port.

The screenshot shows the Unicorn web interface with the Billing tab selected. The page title is "Billing" and it says "Data last refreshed: 12:10:40 PM" and "Data will be refreshed every 30 sec". There is a "Refresh" button and a checkbox for "Auto refresh". Below the header, there is a table of CDR records. The table has columns: SENDER, EXTNN0, DATE, ROOM, TRUNK, TELEPHONE, DESTINATION, DURATION, COST, BASIC, and SURCHARGE. The records are as follows:

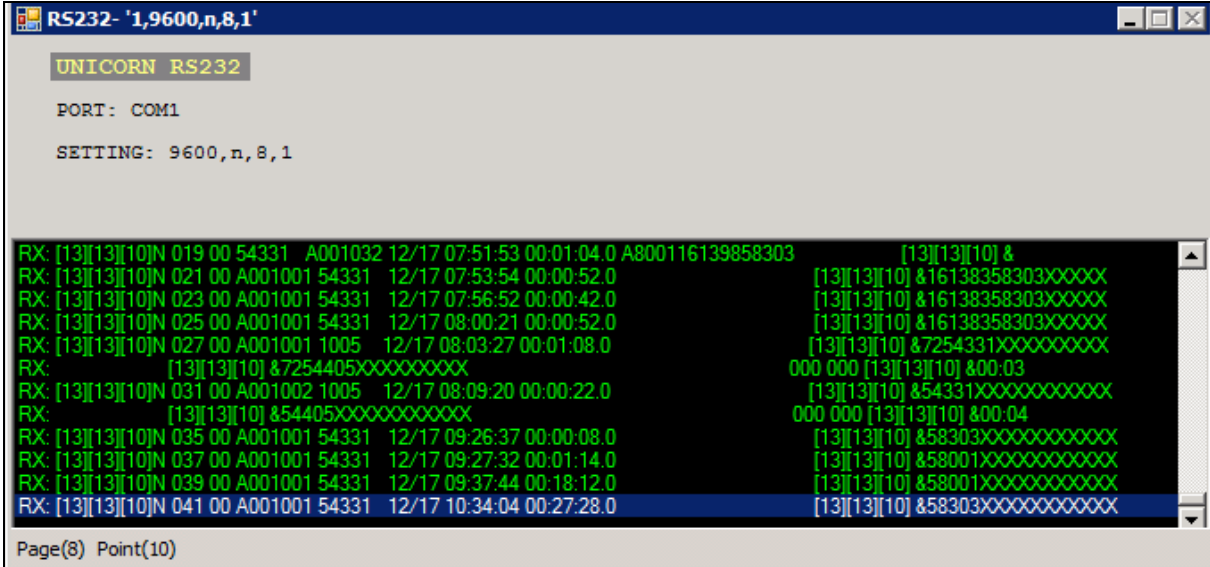
SENDER	EXTNN0	DATE	ROOM	TRUNK	TELEPHONE	DESTINATION	DURATION	COST	BASIC	SURCHARGE
CDR1	54331	2012/12/17 10:34:04	54331	A001001	58303	Incoming Call	27m 28s	0	0	0
CDR1	54331	2012/12/17 09:37:44	54331	A001001	58001	Incoming Call	18m 12s	0	0	0
CDR1	54331	2012/12/17 09:27:32	54331	A001001	58001	Incoming Call	1m 14s	0	0	0
CDR1	54331	2012/12/17 09:26:37	54331	A001001	58303	Incoming Call	8s	0	0	0
CDR1	54331	2012/12/17 08:08:54	54331	A001001	54405	Incoming Call	48s	0	0	0
CDR1	1005	2012/12/17 08:09:20	1005	A001002	54331	Incoming Call	22s	0	0	0
CDR1	1005	2012/12/17 08:03:27	1005	A001001	7254331	Incoming Call	1m 8s	0	0	0
CDR1	54331	2012/12/17 08:03:51	54331	A001002	7254405	Incoming Call	44s	0	0	0
CDR1	54331	2012/12/17 08:00:21	54331	A001001	16138358303	Incoming Call	52s	0	0	0
CDR1	54331	2012/12/17 07:56:52	54331	A001001	16138358303	Incoming Call	42s	0	0	0
CDR1	54331	2012/12/17 07:53:54	54331	A001001	16138358303	Incoming Call	52s	0	0	0
CDR1	1005	2012/12/14 14:40:00	1005	001032	58006	LOCAL CALL	6s	0	0	0
CDR1	1004	2012/12/14 14:37:43	1004	A001001	58000	Incoming Call	8s	0	0	0
CDR1	54331	2012/12/14 14:35:50	54331	A001001	58000	Incoming Call	8s	0	0	0
CDR1	54331	2012/12/14 14:06:08	54331	A001001	58007	Incoming Call	8s	0	0	0

At the bottom of the table, there is a "Page size: 15" dropdown menu.

## 7. Verification Steps

The following steps might be used to verify the serial connection between Avaya CS 1000 switch and Unicorn and the configuration.

1. To verify the CDR records are outputted successfully to Unicorn terminal console; make some calls from the switch and ensure the CDR records are displayed in the terminal console as the screen below.

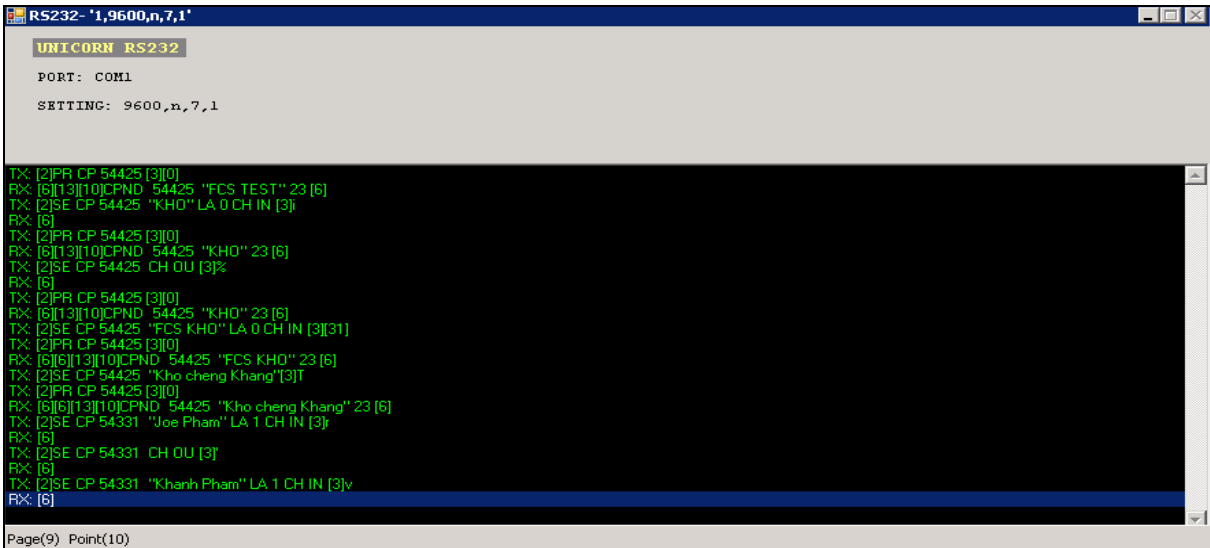


```
RS232- '1,9600,n,8,1'
UNICORN RS232
PORT: COM1
SETTING: 9600,n,8,1

RX: [13][13][10]N 019 00 54331 A001032 12/17 07:51:53 00:01:04.0 A800116139858303 [13][13][10] &
RX: [13][13][10]N 021 00 A001001 54331 12/17 07:53:54 00:00:52.0 [13][13][10] &16138358303XXXXX
RX: [13][13][10]N 023 00 A001001 54331 12/17 07:56:52 00:00:42.0 [13][13][10] &16138358303XXXXX
RX: [13][13][10]N 025 00 A001001 54331 12/17 08:00:21 00:00:52.0 [13][13][10] &16138358303XXXXX
RX: [13][13][10]N 027 00 A001001 1005 12/17 08:03:27 00:01:08.0 [13][13][10] &7254331XXXXXXXXXX
RX: [13][13][10] &7254405XXXXXXXXXX 000 000 [13][13][10] &00:03
RX: [13][13][10]N 031 00 A001002 1005 12/17 08:09:20 00:00:22.0 [13][13][10] &54331XXXXXXXXXXXXX
RX: [13][13][10] &54405XXXXXXXXXXXXX 000 000 [13][13][10] &00:04
RX: [13][13][10]N 035 00 A001001 54331 12/17 09:26:37 00:00:08.0 [13][13][10] &58303XXXXXXXXXXXXX
RX: [13][13][10]N 037 00 A001001 54331 12/17 09:27:32 00:01:14.0 [13][13][10] &58001XXXXXXXXXXXXX
RX: [13][13][10]N 039 00 A001001 54331 12/17 09:37:44 00:18:12.0 [13][13][10] &58001XXXXXXXXXXXXX
RX: [13][13][10]N 041 00 A001001 54331 12/17 10:34:04 00:27:28.0 [13][13][10] &58303XXXXXXXXXXXXX

Page(8) Point(10)
```

2. To verify the TTY connection for PMS, from the Unicorn webpage do a room check-in with guest name for an extension and verify that the CPND name is updated on this extension. The screen below shows the Unicorn terminal console with the check-in command sent to the switch.



```
RS232- '1,9600,n,7,1'
UNICORN RS232
PORT: COM1
SETTING: 9600,n,7,1

TX: [2]PR CP 54425 [3][0]
RX: [6][13][10]CPND: 54425 "FCS TEST" 23 [6]
TX: [2]SE CP 54425 "KHO" LA 0 CH IN [3]
RX: [6]
TX: [2]PR CP 54425 [3][0]
RX: [6][13][10]CPND: 54425 "KHO" 23 [6]
TX: [2]SE CP 54425 "FCS KHO" LA 0 CH IN [3][31]
TX: [2]PR CP 54425 [3][0]
RX: [6][16][13][10]CPND: 54425 "FCS KHO" 23 [6]
TX: [2]SE CP 54425 "Kho cheng Khang"[3]T
TX: [2]PR CP 54425 [3][0]
RX: [6][16][13][10]CPND: 54425 "Kho cheng Khang" 23 [6]
TX: [2]SE CP 54331 "Joe Pham" LA 1 CH IN [3]
RX: [6]
TX: [2]SE CP 54331 CH OU [3]
RX: [6]
TX: [2]SE CP 54331 "Khanh Pham" LA 1 CH IN [3]v
RX: [6]

Page(9) Point(10)
```

## 8. Conclusion

All These Application Notes describe the procedures for configuring FCS Unicorn to interoperate with Avaya Communication Server 1000. All interoperability compliance test cases executed against such a configuration were completed successfully.

## 9. Additional References

Product documentation for Avaya products may be found at <http://support.avaya.com>

[1] Hospitality Features Fundamentals, Release 7.0, Issue 04.01, Date June 2010.

[2] Call Detail Recording Avaya Fundamentals, Release 7.5, Issue 05.03, date Sep 2011.

Product documentation for Unicorn products may be found at <http://www.fscs.com>

[1] Unicorn (Standard) v1.1 - Installation Manual v1.0.

[2] Unicorn (Standard) v1.1 - User Manual v1.0.

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