



**Avaya Solution & Interoperability Test Lab**

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**Application Notes for SATMAP with Avaya Aura®  
Application Enablement Services, Avaya Aura®  
Communication Manager and Avaya Call Management  
System – Issue 1.0**

**Abstract**

These Application Notes contain instructions for SATMAP and Avaya Aura® Application Enablement Services, Avaya Aura® Communication Manager and Avaya Call Management System to successfully interoperate.

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

This document contains a sample configuration that was used for interoperability compliance testing between SATMAP and Avaya products.

## 2. General Test Approach and Test Results

Interoperability testing contained functional tests that tested the following interfaces/products:

- Avaya Aura® Application Enablement Services – TSAPI Interface
- Avaya Aura® Application Enablement Services – SMS Interface
- Avaya Call Management System – ODBC Interface
- Avaya Call Management System – RT Socket Interface
- Avaya Call Management System – CMS Web/CMS Supervisor for custom reports

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

During Interoperability Compliance testing, call center call routing scenarios were tested along with CMS reports that were impacted by SATMAP taking control of calls. Alternative CMS reports were tested on SATMAP Reporting Portal with no impact. Scenarios that were tested are, SATMAP's ability to:

- Monitor agent status and Skill Levels
- Queue calls in single and multiple skills
- Deliver calls to single skill and multi-skill agents
- Deliver calls to agents based on algorithms similar to Avaya's UCD-MIA, EAD-MIA, UCD-LOA, EAD-LOA and Service Objective
- Route calls based on specific caller number (ANI)
- Route calls based on SATMAP estimated wait-time, number of calls in queue and time of the day check
- Route calls in compatible with Avaya's converse-on command
- Route calls based on agent skill levels and call priorities in a queue.
- Synchronize agent skill level in SATMAP by using Avaya's SMS service
- Connect with multiple CTI links (single or multiple AESs)
- Load balance calls using Single site and Multi-Site BSR equivalent functionality
- Handle routing race conditions using RONA via Coverage path on a VDN.
- Support adjunct (vector) fail-safe mechanism with and without UUI based SATMAP integration
- Support wait-time threshold mechanisms for both agents and caller surplus scenario for SATMAP intelligent call routing.

- Not to impact VDN label information using Avaya configuration
- Provide alternative for VUStats / skill based statistics
  - SATMAP Notifier application for queue statistics
- Support all fail-safe scenarios
- Insert custom tables into CMS database
  - SATMAP inserts impacted data into custom tables
- Generate custom reports to be viewed in CMS Web or SATMAP portal

Please note that performance testing or load testing were not part of this test effort.

## 2.2. Test Results

All planned test cases were passed with following observations:

- Since call routing capabilities are taken over by SATMAP, all calls are routed to agents based on algorithms configured in SATMAP. During compliance, testing algorithms that are similar to Avaya's methods UCD-MIA, EAD-MIA, UCD-LOA, EAD-LOA and Service Objective were tested. Also, BSR equivalent functionality was also tested for Single Site and Multi Site configurations.
- Since call routing capabilities are taken over by SATMAP, all calls are queued in SATMAP. Queue statistics like number of calls in queue and EWT based announcements/routing are also tested.
- SATMAP's ability of routing calls to single skill or multiple skills are also tested and with Agent skill level and call priorities.
- SATMAP routing is also tested with Avaya's converse-on command.
- SATMAP's ability to automatically synchronize agent skill level periodically
- SATMAP has the ability to connect with different CTI links. This allows SATMAP to integrate with different AES and can route calls to multiple sites.
- Since calls are queued in SATMAP and not in Avaya, Fail-Safe scenarios are also tested in which if SATMAP goes down or CTI link disconnects; then calls are queued and route by Avaya.
- Due to the call routing capabilities taken over by SATMAP, CMS Reports that are related to Split/Skill and Agent are impacted. Real time reports are provided by SATMAP and viewed on SATMAP portal. For Historical Reports, custom tables are inserted into CMS database and custom reports are defined by SATMAP, which can be viewed on CMS Web or CMS Supervisor.
- Though the data on custom CMS Reports, which is impacted by SATMAP, was verified, Avaya is not responsible for the accuracy of the data that is provisioned in CMS reports by SATMAP.
- Avaya is not responsible for the state of data in custom tables nor the maintenance of custom tables inserted by SATMAP
- In a scenario where all the data is lost (system or hard drive crash) on CMS and a restore is performed on the Database, SATMAP will need to insert the custom tables, in order for the data to be restored.
- Post CMS upgrade (to a future release), custom tables may have to be re-examined by SATMAP as these tables are not part of CMS upgrade process.

- SATMAP acts as a proxy for RT Socket feed. SATMAP modifies the RT Socket feed to insert Skill/Split and Agent data. Though verified, Avaya is not responsible for any data that is inserted by SATMAP.

### **2.3. Support**

Support for SATMAP can be obtained via following means:

Email address: [satmaphelpdesk@satmapinc.com](mailto:satmaphelpdesk@satmapinc.com)

Toll free numbers:

855.625.4193 (US)

800.998.7006 (UK)

### 3. Reference Configuration

Figure 1 illustrates a sample configuration that consists of Avaya Products and SATMAP.

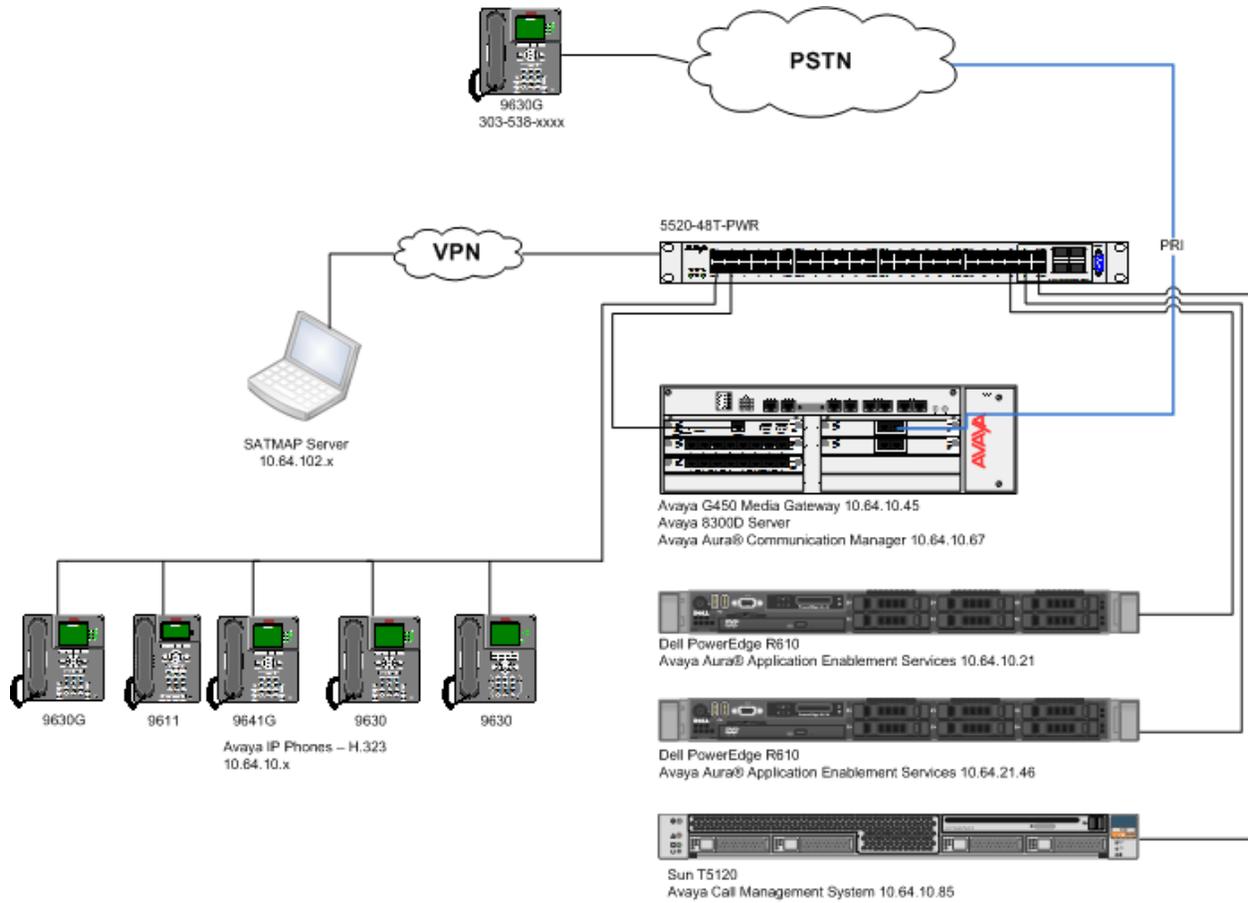


Figure 1: Test Configuration

## 4. Equipment and Software Validated

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

Equipment/Software	Release/Version
Avaya S8300D Server Avaya Aura® Communication Manager	6.3 SP5
Avaya G450 Media Gateway	31.20.0
Avaya Aura® Application Enablement Services	6.3.0.0.212-0
Avaya Call Management System	17.0
SATMAP	3.8

## 5. Configure Avaya Aura® Communication Manager

This section contains steps necessary to configure SATMAP successfully with Communication Manager.

All configurations in Communication Manager were performed via SAT terminal.

The table below shows a sample call center data that was used during compliance testing.

Station	Agent	Hunt Group/Extension	VDN	Vector
25001	2501	1/11001	10001	1
25002	2502	2/11002	10002	2
25003	2503	3/11003	10003	3
25004	2504	4/11004		91
25005	2505	5/11005		
		25/11005		

**Table 1:** Sample Data

## 5.1. Configure Stations

Use **add station *n*** command to add a station, where *n* is an available station extension.

Configure the station as follows, on Page 1:

- In **Name** field, enter a descriptive name
- Set **Type** to the type of the telephones
- Enter a **Security Code**
- Set **IP SoftPhone** to **y**

```
add station 25001                                     Page 1 of 5
                                                    STATION
Extension: 25001                                     Lock Messages? n          BCC: 0
  Type: 9630                                         Security Code: 123456     TN: 1
  Port: IP                                           Coverage Path 1: 1       COR: 1
  Name: IP Station 1                                Coverage Path 2:         COS: 1
                                                    Hunt-to Station:
STATION OPTIONS
Loss Group: 19                                       Time of Day Lock Table:
Speakerphone: 2-way                                  Personalized Ringing Pattern: 1
Display Language: english                            Message Lamp Ext: 25001
Survivable GK Node Name:                             Mute Button Enabled? y
Survivable COR: internal                             Button Modules: 0
Survivable Trunk Dest? y                             Media Complex Ext:
                                                    IP SoftPhone? y
                                                    IP Video Softphone? n
Short/Prefixed Registration Allowed: default
```

On Page 4, under **BUTTON ASSIGNMENTS**, add **call-disp**, **auto-in**, **after-call** and **manual-in**, as shown below:

```
add station 25001                                     Page 4 of 5
                                                    STATION
SITE DATA
Room: D4-H30                                         Headset? n
Jack:                                                Speaker? y
Cable:                                               Mounting: d
Floor: 4                                             Cord Length: 0
Building: D                                          Set Color:
ABBREVIATED DIALING
List1:                                               List2:                    List3:
BUTTON ASSIGNMENTS
1: call-appr                                         5: auto-in               Grp:
2: call-appr                                         6: aux-work              RC:   Grp:
3: call-appr                                         7: after-call            Grp:
4: call-disp                                         8: manual-in             Grp:
                                                    Customizable Labels? y
```

## 5.2. Configure Hunt Group

Use **add hunt-group *n*** command to add a hunt group, where ***n*** is an available hunt group. On Page 1:

- In the **Group Name** field, enter a descriptive name.
- Set **ACD, Queue, Vector** to **y**.
- Enter an available **Group Extension**

```
add hunt-group 1                                     Page 1 of 4
                                                    HUNT GROUP
    Group Number: 1                                ACD? y
    Group Name: Skill 1                            Queue? y
    Group Extension: 11001                          Vector? y
    Group Type: ucd-mia
    TN: 1
    COR: 1
    Security Code:                                MM Early Answer? n
    ISDN/SIP Caller Display:                       Local Agent Preference? n
    Queue Limit: unlimited
    Calls Warning Threshold: Port:
    Time Warning Threshold: Port:
```

On Page 2, set **Skill** to **y** and **Measured** to **both**.

```
add hunt-group 1                                     Page 2 of 4
                                                    HUNT GROUP
    Skill? y                                       Expected Call Handling Time (sec): 20
    AAS? n                                         Service Level Target (% in sec): 80 in 20
    Measured: both
    Supervisor Extension:
    Controlling Adjunct: none
    VuStats Objective:
    Multiple Call Handling: none
    Timed ACW Interval (sec): 1                   After Xfer or Held Call Drops? n
```

### 5.3. Configure Agents

Use **add agent-loginID *n*** to add an agent, where *n* is an available agent id. On Page 1:

- In the **Name** field, type in a descriptive name
- Enter a password in **Password** and **Password (enter again)**

```
add agent-loginID 2501                                     Page 1 of 2
                                     AGENT LOGINID
Login ID: 2501                                           AAS? n
Name: IP Agent 1                                         AUDIX? n
TN: 1                                                    LWC Reception: spe
COR: 1                                                   LWC Log External Calls? n
Coverage Path:                                          AUDIX Name for Messaging:
Security Code: 1234
LoginID for ISDN/SIP Display? n
Password: 123456
Password (enter again): 123456
Auto Answer: station
MIA Across Skills: system
ACW Agent Considered Idle: system
Aux Work Reason Code Type: system
Logout Reason Code Type: system
Maximum time agent in ACW before logout (sec): system
Forced Agent Logout Time: :
```

On Page 2, set skill number and skill level in **SN** and **SL** fields. Skill number is the hunt group that was added in previous section.

```
add agent-loginID 2501                                     Page 2 of 2
                                     AGENT LOGINID
Direct Agent Skill: 1                                     Service Objective? n
Call Handling Preference: skill-level                     Local Call Preference? n
SN  RL SL      SN  RL SL
1:  1    1      16:
2:  2    1      17:
3:                                     18:
4:                                     19:
5:                                     20:
6:
7:
8:
9:
10:
11:
12:
13:
14:
```

## 5.4. Configure Vectors

Use **change vector *n*** to configure a Vector, where *n* is an available Vector number. For test scenarios, two Vectors were used during compliance test. Vector 1 had a step that pointed to Vector 91, for sanity tests. Both Vectors were configured as follows:

```
change vector 1                                     Page 1 of 6
                                                    CALL VECTOR
Number: 1                                           Name: Satmap
Multimedia? n      Attendant Vectoring? n      Meet-me Conf? n      Lock? n
Basic? y           EAS? y   G3V4 Enhanced? y   ANI/II-Digits? y   ASAI Routing? y
Prompting? y       LAI? y   G3V4 Adv Route? y   CINFO? y   BSR? y   Holidays? y
Variables? y       3.0 Enhanced? y
01 wait-time      0      secs hearing ringback
02
03
04
05 goto vector    91      @step 1   if unconditionally
06 goto step      8              if available-agents in skill 1      > ZZ
07 goto step      9              if ZF              =      1
08 queue-to       skill 25   pri m
09 adjunct        routing link 3
10 wait-time      2      secs hearing silence
11 announcement   10101
12 wait-time      2      secs hearing silence
13 goto step      5              if ZF              =      1
14 goto step      11             if unconditionally
15 disconnect     after announcement none
16 disconnect     after announcement none
17 stop
```

Please note that in **step 8** in Vector was added as a failover step. In a scenario where SATMAP is unavailable, calls will route or queue based on Avaya's algorithm.

A complex vector example is placed **Appendix A** for reference.

change vector 91

Page 1 of 6

CALL VECTOR

```

Number: 91 Name: Satmap Sanity
Multimedia? n Attendant Vectoring? n Meet-me Conf? n Lock? n
Basic? y EAS? y G3V4 Enhanced? y ANI/II-Digits? y ASAI Routing? y
Prompting? y LAI? y G3V4 Adv Route? y CINFO? y BSR? y Holidays? y
Variables? y 3.0 Enhanced? y
01 goto step 14 if ZE = 0
02 goto step 10 if ZV = 1
03 set ZB = none ADD ZT
04 adjunct routing link 3
05 wait-time 3 secs hearing music
06 set ZD = ZT ADD ZB
07 goto step 17 if ZD >= 2
08 goto step 14 if unconditionally
09
10 set ZS = none CATR 0
11 adjunct routing link 3
12 wait-time 3 secs hearing music
13 goto step 17 if ZS = 1
14 set ZF = none CATR 0
15 return
16
17 set ZF = none CATR 1
18 #
19 #
20 return

```

Vector variable definitions are as follows:

change variables

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VARIABLES FOR VECTORS

Var	Description	Type	Scope	Length	Start	Assignment	VAC
ZA	Satmap	collect	L	16	1		
ZB	Satmap	collect	L	16	1		
ZD	Satmap	collect	L	16	1		
ZE	Satmap	collect	G	16	1	1	
ZF	Satmap	collect	L	16	1		
ZQ	Satmap	asaiuui	L	1	12		
ZR							
ZS	Satmap	asaiuui	L	1	16		
ZT	Satmap	vdn	L			active	
ZU							
ZV	Satmap	collect	G	16	1	1	
ZW	Satmap	asaiuui	L	3	3		
ZX	Satmap	asaiuui	L	1	14		
ZY							
ZZ	Satmap	collect	G	16	1	10	

## 5.5. Configure VDN

Use **add vdn *n*** to add a vdn, where *n* is an available vdn extension. On Page 1:

- In the **Name** field, enter a descriptive name
- In the **Destination** field, set **Vector Number** to the vector configured earlier in this document. i.e., Vector Number 1.
- Set **Measured** to **both**

```
add vdn 10001                                     Page 1 of 3
          VECTOR DIRECTORY NUMBER
          Extension: 10001
          Name*: SATMAP
          Destination: Vector Number 1
Attendant Vectoring? n
Meet-me Conferencing? n
  Allow VDN Override? n
          COR: 1
          TN*: 1
          Measured: both
Acceptable Service Level (sec): 20
VDN of Origin Annc. Extension*:
          1st Skill*:
          2nd Skill*:
          3rd Skill*:
```

On Page 3, configure **VDN Variables** as needed.

## 5.6. Configure CMS connection

Use **change node-names ip** command to add an entry to CMS. Type in a **Name** for CMS and CMS IP address in **IP Address**.

```
change node-names ip                                     Page 2 of 2
                                     IP NODE NAMES
Name                                IP Address
CMS                               10.64.10.85

( 16 of 26 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
```

Use **change communication-interface processor-channels** command to add a TCP connection for CMS. On an available processor channel line:

- Set **Enable** to **y**
- Set **App.** To **mis**
- Set **Mode** to **s**
- Set **Interface Link/Chan** and **Port** to **pv4** and **5001** respectively
- Set **Node** to **CMS**
- Set **Session Local/Remote** to available session ids

```
change communication-interface processor-channels                               Page 1 of 24
PROCESSOR CHANNEL ASSIGNMENT
```

Proc Chan	Enable	Appl.	Gtwy To	Mode	Interface Link/Chan	Destination Node	Port	Session Local/Remote	Mach ID
1:	y	ccr		s	pv4 5004	AvayaIQ	0	1 1	
2:	<b>y</b>	<b>mis</b>		<b>s</b>	<b>pv4 5001</b>	<b>CMS</b>	<b>0</b>	<b>2 2</b>	
3:	n						0		
4:	n						0		
5:	n						0		
6:	n						0		
7:	n						0		
8:	n						0		
9:	n						0		
10:	n						0		
11:	n						0		
12:	n						0		
13:	n						0		
14:	n						0		
15:	n						0		
16:	n						0		

## 5.7. Configure AES connection

Use **change ip-services** command to add an entry for AES. On Page 1 (not shown),

- In the **Service Type** field, type **AESVCS**.
- In the **Enabled** field, type **y**.
- In the **Local Node** field, type the Node name **procr** for the Processor Ethernet Interface.
- In the **Local Port** field, use the default of **8765**.

On Page 4 of the IP Services form, enter the following values:

- In the **AE Services Server** field, type the name obtained from the Application Enablement Services server.
- In the **Password** field, type a password to be administered on the Application Enablement Services server.
- In the **Enabled** field, type **y**.

```
change ip-services
```

Page 4 of 4

Server ID	AE Services Server	Password	Enabled	Status
1:	<b>aes6_tr1</b>	<b>devconnect123</b>	<b>y</b>	<b>in use</b>
2:	AES_21_46	Interop123456	y	in use
3:				
4:				
5:				
6:				
7:				
8:				
9:				
10:				
11:				
12:				
13:				
14:				
15:				
16:				

## 5.8. Configure CTI Link

Use **add cti-link *n*** command, where *n* is an available CTI link number.

- In the **Extension** field, type **<station extension>**, where **<station extension>** is a valid station extension.
- In the **Type** field, type **ADJ-IP**.
- In the **Name** field, type a descriptive name.

```
change cti-link 1                                     Page 1 of 3
                                                    CTI LINK
CTI Link: 1
Extension: 6201
Type: ADJ-IP
Name: TSAPI                                           COR: 1
```

## 5.9. Configure SMS User

User profile 18 was used for SMS User. This profile is one of the default profiles.

```
list user-profiles
                                                    USER PROFILES
Profile      Extended
             Profile   User Profile Name
0            n           services super-user
1            n           services manager
2            n           business partner
3            n           services
16           n           call center manager
17           n           snmp
18           n           customer super-user
```

Log onto Communication Manager System Management Interface via a browser, <http://<IP-Address>>, where IP-Address is the IP Address of Communication Manager. Navigate to **Administration → Server (Maintenance) → Administrator Accounts**, and select **Add Logon → Privileged Administrator**.

The screenshot displays the Avaya Aura Communication Manager (CM) System Management Interface (SMI) for server TR18300. The page title is "Administrator Accounts". The left sidebar contains a navigation menu with categories: Alarms, Diagnostics, Server, Server Configuration, Server Upgrades, and Data Backup/Restore. The main content area includes a description: "The Administrator Accounts SMI pages allow you to add, delete, or change administrator logins and Linux groups." Below this is a "Select Action:" section with radio buttons for "Add Login", "Change Login", "Remove Login", "Lock/Unlock Login", "Add Group", and "Remove Group". The "Add Login" option is selected. Under "Add Login", there are radio buttons for "Privileged Administrator", "Unprivileged Administrator", "SAT Access Only", "Web Access Only", "CDR Access Only", "Business Partner Login (dadmin)", "Business Partner Craft Login", and "Custom Login". The "Privileged Administrator" option is selected. Below these are three dropdown menus: "Change Login" (with "satmap" selected), "Remove Login" (with "Select Login" selected), and "Lock/Unlock Login" (with "Select Login" selected). At the bottom, there are "Submit" and "Help" buttons.

Type in a desired **Login name**, Select **prof18** for **Additional Groups**, and type in password in **Enter password or key** and **Re-enter password or key**.

**Administrator Accounts -- Add Login: Privileged Administrator**

This page allows you to add a login that is a member of the **SUSERS** group. This login has the greatest access privileges in the system next to root.

Login name	<input type="text" value="satmap"/>
Primary group	<input type="text" value="susers"/>
Additional groups (profile)	<input type="text" value="prof18"/>
Linux shell	<input type="text" value="/bin/bash"/>
Home directory	<input type="text" value="/var/home/satmap"/>
Lock this account	<input type="checkbox"/>
SAT Limit	<input type="text" value="none"/>
Date after which account is disabled-blank to ignore (YYYY-MM-DD)	<input type="text"/>
Select type of authentication	<input checked="" type="radio"/> Password <input type="radio"/> ASG: enter key <input type="radio"/> ASG: Auto-generate key
Enter password or key	<input type="password" value="*****"/>
Re-enter password or key	<input type="password" value="*****"/>
Force password/key change on next login	<input type="radio"/> Yes <input checked="" type="radio"/> No

## 6. Configure Avaya Aura® Application Enablement Services

Configuration of Avaya Aura® Application Enablement Services requires a user account be configured for SATMAP.

### 6.1. Configure User

All administration is performed by web browser, <https://<aes-ip-address>/>

A user needs to be created for SATMAP to communicate with AES. Navigate to **User Management** → **User Admin** → **Add User**.

The screenshot displays the Avaya Application Enablement Services Management Console. The top right corner shows a welcome message for user 'craft' and system information including the last login time (Wed May 28 16:42:00 2014), number of failed login attempts (0), host name/IP (aes6\_tr1/10.64.10.21), server offer type (VIRTUAL\_APPLIANCE\_ON\_SP), SW version (6.3.0.0.212-0), and server date and time (Fri Jun 06 15:53:32 MDT 2014). The navigation bar includes 'User Management | User Admin | Add User' and 'Home | Help | Logout'. The left sidebar lists various management options, with 'User Management' expanded to show 'User Admin' and 'Add User' selected. The main content area is titled 'Add User' and contains a form with the following fields: \* User Id, \* Common Name, \* Surname, \* User Password, \* Confirm Password, Admin Note, Avaya Role (set to None), Business Category, Car License, CM Home, Csm Home, CT User (set to No), and Department Number. A note indicates that fields marked with an asterisk are required.

Fill in **User Id**, **Common Name**, **Surname**, **User Password** and **Confirm Password**. Set the **CT User** to **Yes**, and **Apply** (not shown).

Navigate to **Security** → **Security Database** → **CTI Users** → **List All Users**.

User ID	Common Name	Worktop Name	Device ID
<input type="radio"/> acqueon	acqueon	NONE	NONE
<input type="radio"/> cala	calabrio	NONE	NONE
<input type="radio"/> calabrio	Calabrio	NONE	NONE
<input checked="" type="radio"/> devcon	devcon	NONE	NONE
<input type="radio"/> devconn	Developer	NONE	NONE
<input type="radio"/> DevConnect	DevConnect	NONE	NONE
<input type="radio"/> interop	interop	NONE	NONE
<input type="radio"/> qfiniti	Autonomy	NONE	NONE
<input type="radio"/> rtitele1	rtitele1	NONE	NONE
<input type="radio"/> utry	utry	NONE	NONE
<input type="radio"/> vhtaes	vhtaes	NONE	NONE

Select the recently added user and click **Edit**. Check the box for **Unrestricted Access** and click **Apply Changes**.

**Edit CTI User**

User Profile:

User ID: devcon  
 Common Name: devcon  
 Worktop Name: NONE ▼  
 Unrestricted Access:

---

Call and Device Control:

Call Origination/Termination and Device Status: None ▼

---

Call and Device Monitoring:

Device Monitoring: None ▼  
 Calls On A Device Monitoring: None ▼  
 Call Monitoring:

---

Routing Control:

Allow Routing on Listed Devices: None ▼

## 6.2. Configure Communication Manager Switch Connections

To add links to the Communication Manager, navigate to the **Communication Manager Interface → Switch Connections** page and enter a name for the new switch connection and click the **Add Connection** button. This was previously configured as **TR18300** for this test environment:

**Switch Connections**

Connection Name	Processor Ethernet	Msg Period	Number of Active Connections
<input type="radio"/> CM3010	Yes	30	1
<input checked="" type="radio"/> TR18300	Yes	30	1

Use the **Edit Connection** button shown above to configure the connection. Enter the **Switch Password** and check the **Processor Ethernet** box if using the **procr** interface, as shown below. This must match the password configured when adding AESVCS connection in Communication Manager.

**Connection Details - TR18300**

Switch Password

Confirm Switch Password

Msg Period  Minutes (1 - 72)

SSL

Processor Ethernet

Use the **Edit PE/CLAN IPs** button (shown in this section's first screen shot above) to configure the **procr** or **CLAN IP** Address (es) for TSAPI message traffic.

**Edit Processor Ethernet IP - TR18300**

Name or IP Address	Status
10.64.10.67	In Use

Use the **Edit H.323 Gatekeeper** button (shown in this section's first screen capture above) to configure the **procr** or **CLAN IP** Address(es).

**Edit H.323 Gatekeeper - TR18300**

Name or IP Address

10.64.10.67

### 6.3. Configure TSAPI Link

Navigate to the **AE Services** → **TSAPI** → **TSAPI Links** page to add the TSAPI CTI Link. Click **Add Link** (not shown).

Select a **Switch Connection** using the drop down menu. Select the **Switch CTI Link Number** using the drop down menu. The **Switch CTI Link Number** must match the number configured in the **cti-link** form for Communication Manager.

If the application uses Encrypted Links, select **Encrypted** in the **Security** selection box.

Click **Apply Changes**.

Configuration shown below was previously configured.

#### Edit TSAPI Links

Link	1
Switch Connection	TR18300 ▼
Switch CTI Link Number	1 ▼
ASAI Link Version	5 ▼
Security	Both ▼

## 7. Configure Avaya Call Management System

This section covers the configuration of Call Management System to communicate to Communication Manager

### 7.1. Configure ACD for Communication Manager

Telnet or SSH into Call Management System. Using proper credentials, log in as root.

- Type in **cmssvc** command to view the Avaya Call Management System Services Menu.
- Select **4, Turn Avaya CMS on or off**, to go to the CMS service menu.

```
BDL093562F# cmssvc

Avaya(TM) Call Management System Services Menu

Select a command from the list below.
 1) auth_display Display feature authorizations
 2) auth_set     Authorize capabilities/capacities
 3) run_ids      Turn Informix Database on or off
 4) run_cms      Turn Avaya CMS on or off
 5) setup        Set up the initial configuration
 6) swinfo       Display switch information
 7) swsetup      Change switch information
 8) patch_inst   Install a single CMS patch from CD
 9) patch_rmv    Backout an installed CMS patch
10) load_all     Install all CMS patches found on CD
11) back_all     Backout all installed CMS patches from machine
Enter choice (1-11) or q to quit: 4
```

- Select **2, Turn off CMS but Leave IDS running**.

```
Select one of the following
 1) Turn on CMS
 2) Turn off CMS but Leave IDS running
 3) Turn off both CMS and IDS
Enter choice (1-3): 2
```

- Wait until CMS is shut down; the **CMS is now off** message will be displayed when CMS is shutdown.

```
Notifying users of impending shutdown...
. . . . .
Proceeding with cms shutdown.

*** Turning off CMS, Please wait ***
. . . . .

*** Cleaning up, Please wait ***

*** CMS is now off ***
```

- Type in **cmsadm** command and select **1, acd\_create**, from the service menu. At each prompt type in information as follows:
  - **Enter switch name:** Type in a descriptive name
  - **Select the model of switch for this ACD:** Select **6**
  - For next three prompts, type **y**
  - **Enter the local port assigned to switch:** Type **1**
  - **Enter the remote port assigned to switch:** Type **1**
  - **Select the transport to the switch:** Select **1**
  - **Enter switch host name or IP Address:** Type in the Communication Manager's IP Address
  - **Enter switch TCP port number:** Set it to default
  - For rest of the prompts leave the values at default or enter desired values

```
BDL093562F# cmsadm

Avaya(TM) Call Management System Administration Menu

Select a command from the list below.
 1) acd_create      Define a new ACD
 2) acd_remove     Remove all administration and data for an ACD
 3) backup         Filesystem backup
 4) pkg_install    Install a feature package
 5) pkg_remove     Remove a feature package
 6) run_pkg        Turn a feature package on or off
 7) run_ids        Turn Informix Database on or off
 8) run_cms        Turn Avaya CMS on or off
 9) passwd_age     Set password aging options
10) dbaccess       Change Informix DB access permissions
Enter choice (1-10) or q to quit: 1

Information for ACD 3

Enter switch name (up to 20 characters): S8300_TR1

Select the model of switch for this ACD
 1) Communication Mgr 2
 2) Communication Mgr 3.0
 3) Communication Mgr 3.1
 4) Communication Mgr 4/5
 5) Communication Mgr 5.2
 6) Communication Mgr 6.x
Enter choice (1-6): 6

Is Vectoring enabled on the switch? (y/n): y

Is Expert Agent Selection enabled on the switch? (y/n): y

Does the Central Office have disconnect supervision? (y/n): (default: y) y

Enter the local port assigned to switch (1-64): 1

Enter the remote port assigned to switch (1-64): 1
```

```
Select the transport to the switch
  1) TCP/IP
Enter choice (1-1): 1

Enter switch host name or IP Address: 10.64.10.67

Enter switch TCP port number (5001-5999): (default: 5001)

Number of splits/skills (0-8000): (default: 500)

Total split/skill members, summed over all splits/skills (0-1250): (default: 1250)

Number of shifts (1-4): (default: 1)

Enter the start time for shift 1 (hh:mmXM): (default: 8:00 AM)

Enter the stop time for shift 1 (hh:mmXM): (default: 5:00 PM)

Number of agents logged into all splits/skills during shift 1 (0-1250): (default:
1250)

Number of trunk groups (0-2000): (default: 500)

Number of trunks (0-12000): (default: 1000)

Number of unmeasured facilities (0-6000): (default: 500)

Number of call work codes (1-500): (default: 500)

Enter number of vectors (0-8000): (default: 500)

Enter number of VDNs (0-18000): (default: 4000)

Updating database.

Computing space requirements and dbspace availability.

ACD S8300_TR1 (3) created successfully.
```

- Type in **cmssvc** command and select **4** from the services menu.
  - Select **1** to **Turn on CMS**

```
BDL093562F# cmssvc
```

```
Avaya(TM) Call Management System Services Menu
```

```
Select a command from the list below.
```

- 1) `auth_display` Display feature authorizations
- 2) `auth_set` Authorize capabilities/capacities
- 3) `run_ids` Turn Informix Database on or off
- 4) `run_cms` Turn Avaya CMS on or off
- 5) `setup` Set up the initial configuration
- 6) `swinfo` Display switch information
- 7) `swsetup` Change switch information
- 8) `patch_inst` Install a single CMS patch from CD
- 9) `patch_rmv` Backout an installed CMS patch
- 10) `load_all` Install all CMS patches found on CD
- 11) `back_all` Backout all installed CMS patches from machine

```
Enter choice (1-11) or q to quit: 4
```

```
Select one of the following
```

- 1) Turn on CMS
- 2) Turn off CMS but Leave IDS running
- 3) Turn off both CMS and IDS

```
Enter choice (1-3): 1
```

```
Please wait for initialization
```

```
. .
```

```
*** CMS is now up ***
```

## 8. Configure SATMAP

### 8.1. Setup Connectivity with the Avaya components

Hardware and network infrastructure need to be setup to host and aid connectivity to the various Avaya components. The connectivity is tested by logging in to the Communication Manager using the credentials provided and verifying from the Avaya and SATMAP logs that the connectivity has been established. SATMAP needs connectivity information based on connection type.

All configurations in this section are performed via the SATMAP Portal. The SATMAP Portal can be accessed via a web browser using `http://<ip-address>/SATMAPPortalSuite`, where the ip-address is the IP address of the SATMAP Portal.

SATMAP can be connected by using the following connection types.

#### 8.1.1. TSAPI

To configure the TSAPI connection, navigate to **SATMAP Portal → Switch Configurator** and configure as follows:

- Type in a name in **Connection ID**
- Select **TSAPI** for **Connection Type**
- Type in IP address of AES server in **AES Server IP**
- Type in the TLink configured in AES in **ServerID**
- Type in the login information for AES in **Username** and **Password** fields
- Check box for **Active**

Select **Add Connection** to add this connection.

Note: TLinks configured in AES can be obtained via AES console by Navigating to **AE Services, TSAPI → TSAPI Links → Edit Link → Advanced Settings**.

**Add New Connection**

---

Connection ID:

Connection Type:  ▼

AES Server IP:

ServerID:

Username:

Password:

Active:

## 8.2. Setup VDNs / Skills / RONA Information

### 8.2.1. VDNs

SATMAP needs to monitor/ register all the queuing VDNs for routing and receiving call events. VDN and Vectors mentioned in this section are the same as those configured in Communication Manager.

Navigate to **SATMAP Portal** → **Add VDN** page:

- Type in VDN number in the **VDN** field
- Type in a name for VDN in the **Name/Label** field
- Type in the Vector number in the **Vector** field

Click the **Save** button to save the VDN information entered.



The screenshot shows a web form titled "Add VDN". It contains three input fields: "VDN:" with the value "10001", "Name/Label:" with the value "VDN 1", and "Vector:" with the value "1". At the bottom right, there are two buttons: "Save" and "Cancel".

The following configurations were added through the SATMAP Portal for the functional testing;

VDN	VDN Name / Label	Avaya Vector No:
10001	VDN 1	1
10002	VDN 2	9
10003	VDN 3	50
10010	VDN 4	10
55510	VDN 5	150

### 8.2.2. Skills

Skills are also configured to monitor agent login/logout activity for dynamic station monitoring associations. SATMAP does not need to configure stations as they are picked up automatically via agent login/logout events.

To add a Skill, navigate to the **SATMAP Portal → Add Skill** page.

- Enter Skill Number in the **Skill Number** field
- Type in the extension for the Skill in the **Skill** field
- Provide a name in **Skill Name**

Click **Save** to save changes.

The screenshot shows a web form titled "Add Skill". It has three text input fields: "Skill Number" containing "1", "Skill" containing "11001", and "Skill Name" containing "Skill 1". Below these fields is a checkbox labeled "Occupancy Based Routing" which is currently unchecked. At the bottom of the form are two buttons: "Save" and "Cancel".

The following skills were configured during testing;

Skill#	Skill Extension	Skill Name	Routing Method (MIA/LOA)
1	11001	Skill 1	MIA,LOA
2	11002	Skill 2	MIA,LOA
3	11003	Skill 3	MIA,LOA
4	11004	Skill 4	MIA,LOA
5	11005	Skill 5	MIA,LOA

### 8.2.3. Agent Skill Levels (Optional)

Agent skill levels can be configured in SATMAP. To configure agent skill, go to the **SATMAP Portal** → **Add mapping** screen:

- Type in the Agent ID in the **Agent ID** field
- Type in Skill extension and Priority in their respective fields.

### 8.2.4. RONA

RONA VDN is configured in SATMAP in order to take call control in case of no answer / busy / unknown / route failure if a call has left the queuing vector. Adding a RONA VDN is similar to adding a new VDN in SATMAP. Please refer to section 8.2.1

## 8.3. SATMAP ROUTING SCRIPTS

SATMAP needs to replicate the routing logic defined in the Avaya vector into its routing scripts, which support unconditional/conditional call queuing to multiple skills, variables assigned, time based conditions, route to VDN/external numbers except announcement/music/digits collection.

The following SATMAP routing scripts were used during the functional testing;

SATMAP Vector Script	Function
VS_11001	Single QueueToSkill
VS_SingleSite_BSR	Single Site BSR
VS_MultiSite_BSR	Multi-site BSR

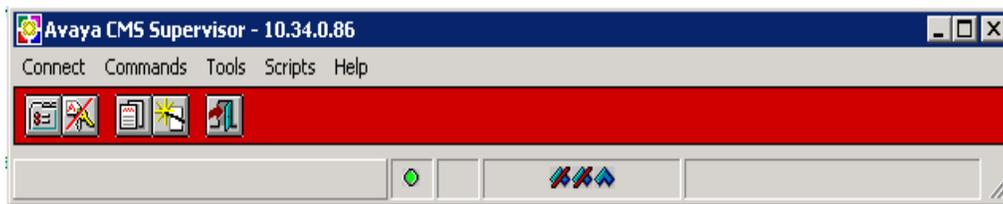
## 8.4. Reporting

The following configurations need to be made for the SATMAP Reporting module.

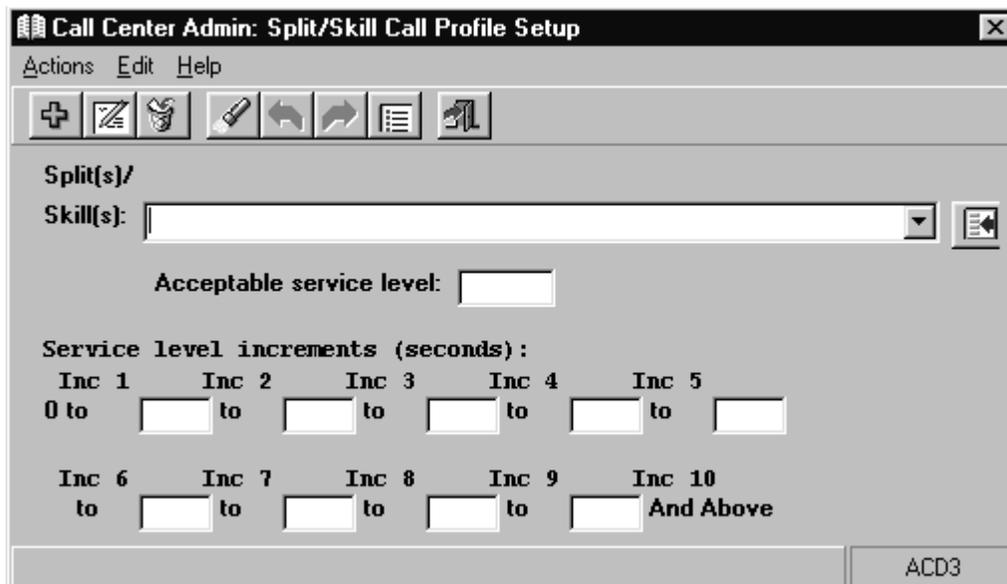
### 8.4.1. Historical Reporting

The following permissions need to be assigned to the user that will be used by SATMAP to generate reports:

- Informix ODBC Access on CMS
  - Permissions to create custom tables in CMS
  - Permissions to insert/update/delete information from custom tables in CMS
  - Permissions to read data from CMS standard tables
  - Permissions to view and export CMS Supervisor reports
  - Permissions to upload SATMAP modified reports on CMS Supervisor
  - Permissions on all the SATMAP skills and VDNs.
- 
- Once access and permissions on CMS Supervisor are granted, an instance of CMS supervisor is started.



- Service level and Period1 – Period9 values are required for all the SATMAP skills.



- VDN Skill Mapping required as per the table shown;

Skill #	Skill	Skill Name	Skill Extension	Vector #	VDN	VDN Description
1	1	Skill 1	11001	1	10001	VDN 1

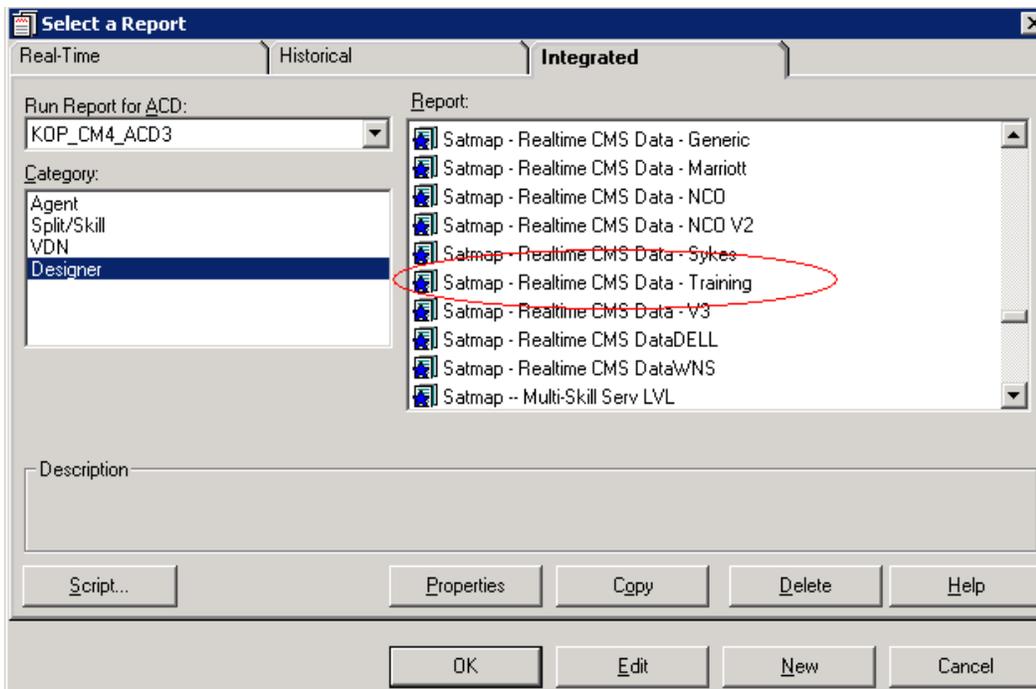
- Skill Number and Skill Extension Mapping required as per the table shown;

Skill#	Skill Extension	Skill Name	Routing Method (MIA/LOA)
1	11001	Skill 1	MIA,LOA
2	11002	Skill 2	MIA,LOA
3	11003	Skill 3	MIA,LOA
4	11004	Skill 4	MIA,LOA
5	11005	Skill 5	MIA,LOA
510	50510	Skill 6	MIA,LOA

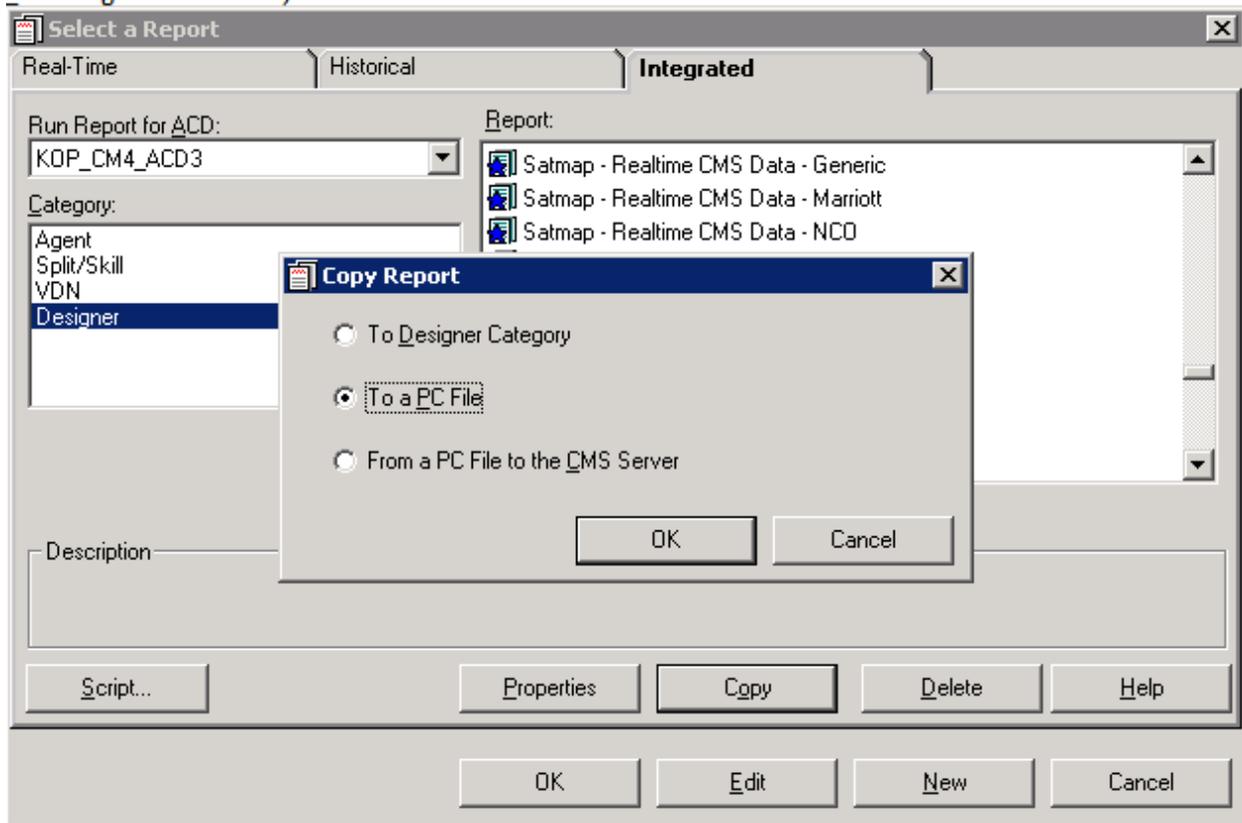
## 8.4.2. Real-Time Reporting – Portal

### 8.4.2.1 Real-Time Reporting – Portal (CMS Supervisor Based)

- Permissions to upload SATMAP modified reports on CMS Supervisor
- Permissions to view and export CMS Supervisor reports
- Permissions on all the SATMAP skills and VDNs.
- Select the report that needs to be exported;



- The CMS reports are exported in .REP format;



- Refresh rate of 3 seconds is configured for the SATMAP user on CMS Supervisor

The screenshot shows a window titled "User Permissions User Data" with a menu bar (Actions, Edit, Help) and a toolbar. The form contains the following fields:

- User ID: [text box]
- User name: [text box]
- Room number: [text box]
- Telephone number: [text box]
- Default printer name: [dropdown menu, value: (none)]
- Login type (select only one):
  - Normal user
  - Administrator
- Maximum user window count (1-12): [text box, value: 4]
- Minimum refresh rate (seconds): [text box, value: 3]** (highlighted with a red oval)
- Login ACD: [dropdown menu, value: (none)]

#### 8.4.2.2 Real-Time Reporting – Portal (RT Socket Based)

- Load SATMAP provided custom report in CMS
- Enabled RT Socket feed for this report to SATMAP
- Set data relay frequency to 5 seconds
- Set skills to relay data for SATMAP enabled skills only

#### 8.4.3. RT Gateway

- Redirect RT Sockets feed to the SATMAP provided port
- SATMAP will then provide the data feed to the port where the RT sockets feed was being sent.

## 9. Verification Steps

- From Communication Manager, verify that Application Enablement Services is enabled and listening using the **status aesvcs interface** command.

```
status aesvcs interface

                                AE SERVICES INTERFACE STATUS

Local Node      Enabled?  Number of  Status
                Connections

procr           yes       2          listening
```

- Verify communication between Communication Manager and the Application Enablement Services server using the **status aesvcs link** command.

```
status aesvcs link

                                AE SERVICES LINK STATUS

Srvr/ AE Services  Remote IP      Remote  Local Node  Msgs  Msgs
Link  Server       Remote IP      Port    Node        Sent  Rcvd

02/01 AES_21_46      10.64.21.46    58103  procr       619   605
01/02 aes6_tr1       10.64.10.21    57132  procr       635   625
```

- Verify that the CMS connection is established using the **status processor-channels 2** command on the SAT).

```
status processor-channels 2

                                PROCESSOR-CHANNEL STATUS

Channel Number: 2
Session Layer Status: In Service
Socket Status: TCP connected
Link Number: pv4
Link Type: processor ethernet
Message Buffer Number: 0

Last Failure: None
At:
```

## 10. Conclusion

SATMAP was able to successfully interoperate with Avaya Aura® Communication Manager, Avaya Aura® Application Enablement Services and Avaya Call Management System. All executed test cases were passed.

## 11. Additional References

This section references the product documentation relevant for these Application Notes.

- [1] Administering Avaya Aura® Communication Manager, Document 03-300509, Release 6.3, Issue 10, June 2014.
- [2] Administering Avaya Aura® Application Enablement Services Administration and Maintenance Guide, Release 6.3, Document 02-300357, June 2014.
- [3] Avaya Call Management System Administration, Release 17.0.

Documentation related to SATMAP can be directly obtained from SATMAP.

# Appendix A

Voice System name: TEST CALL VECTOR

```
Number: 101                Name: Satmap test
Multimedia? n      Attendant Vectoring? n      Meet-me Conf? n      Lock? n
  Basic? y    EAS? y    G3V4 Enhanced? y    ANI/II-Digits? y    ASAI Routing? y
  Prompting? y    LAI? y    G3V4 Adv Route? y    CINFO? y    BSR? y    Holidays? y
  Variables? y    3.0 Enhanced? y
01 #    Check Skill 1st for Agents Staffed
02 goto step    72                if staffed-agents    in skill 1st        <    1
03 #    Holiday Treatment Check
04 goto step    75                if holiday            in    table 1
05 #    Hours of Operation Check
06 goto step    72                if service-hours     not-in table V8
07 #    Max Calls in Queue Check
08 goto step    68                if calls-queued     in skill 1st    pri m    >    V4
9
10
#
12 goto step    15                if V6                <    1
3 announcement V6
14 wait-time    2    secs hearing silence
15 #    Announcement
16 announcement 32545
17 wait-time    1    secs hearing silence
18 #    GOTO SATMAP Santity Vector and get SATMAP Status and SATMAP EWT
19 goto vector  91    @step 1    if unconditionally
20 #
21 #    Check Number SATMAP Calls in Queue
22 goto step    24                if V4                <    1
23 goto step    68                if ZQ                >    V4
24 #    Failsafe - If agents are avail; SATMAP down; route call via Avaya
25 goto step    30                if available-agents in skill 1st        >    ZZ
26 #    If SATMAP is UP then skip Queue to Skill
27 goto step    32                if ZF                =    1
28 #
29 #
30 queue-to    skill 1st    pri m
31 goto step    35                if ZF                =    0
32 #    Provide another routing window to SATMAP
```

```

33 adjunct      routing link 3
34 wait-time    0    secs hearing music
35 #    Skip announcement 1181002 if return to Queue VDN
36 goto step    55          if ZA          =      1
37 #    Check SATMAP expected-wait and goto next step in queue
38 goto step    64          if ZW          >     120
39 #    If SATMAP is UP then Skip Avaya's expected-wait command
40 goto step    43          if ZF          =      1
41 #    Longer then Usual Hold Times
42 goto step    64          if expected-wait for skill 1st pri m > 120
43 #    SET ZA = 1 announcement 71102 to be played once
44 set          ZA      = none   CATR  1
45 #    Check if SATMAP is UP
46 goto vector  91  @step 1  if ZF          =      1
47 goto step    52          if ZF          =      0
48 #    Second SATMAP Routing Window
49 adjunct      routing link 3
50 #    Required after Adjunct Request
51 wait-time    0    secs hearing music
52 announcement 71102
53 #    If SATMAP is down then queue the call to Avaya Skill
54 goto step    30          if ZF          =      0
55 #    Return to step 16 after system checks to continue
56 wait-time    120 secs hearing music
57 announcement 71103
58 wait-time    60    secs hearing music
59 announcement 71104
60 goto step    68          if staffed-agents in skill 1st          <  1
61 #    Call SATMAP Sanity Vector to get current SATMAP Status
62 goto step    18          if ZF          =      1
63 goto step    55          if unconditionally
64 #    If Expected Wait is > 120 Seconds, play some announcement
65 announcement 71169
66 wait-time    2    secs hearing music
67 goto step    43          if unconditionally
68 #    Closed Treatment - Call will route to V2 in VDN
69 #    or if V2 is Null, will route to Disconnect Treatment
70 goto step    72          if V2          <      1
71 route-to     number V2          with cov n if unconditionally
72 #    Dynamic Disconnect Treatment
73 route-to     number 23234          with cov n if unconditionally
74 disconnect   after announcement 64000

```

```
75 #      Holiday Routing
76 goto step    72      if V7      in      table 7
77 goto step    72      if V7      in      table 8
78 goto step    5       if unconditionally
```

---

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