Avaya Solution & Interoperability Test Lab

Configuring Avaya Aura® Messaging 6.1 as a Voice Messaging Solution for Avaya Business Communication Manager 450 Release 6.0 with SIP trunking through Avaya Aura® Session Manager 6.1 – Issue 1.0

Abstract

These Application Notes describe a sample configuration of Avaya Aura® Messaging 6.1 as a voice mail solution for Avaya Business Communication Manager 450 6.0. In this configuration Avaya Aura® Messaging and Business Communication Manager 450 are connected to Avaya Aura® Session Manager R6.1 over SIP trunks. Avaya Aura® Session Manager provides SIP proxy/routing functionality, routing SIP sessions across a TCP/IP network with centralized routing policies. Avaya Aura® Messaging supports Business Communication Manager 450 endpoints for voice messaging features such as greeting menu, user mailbox services and transfer functionalities.

These Application Notes provide information for the setup, configuration, and verification of the call flows tested for this solution.

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1. Introduction

These Application Notes describe a sample configuration of Avaya Aura® Messaging 6.1 as a voice mail solution for Avaya Business Communication Manager (BCM) 450 6.0. In this configuration Avaya Aura® Messaging and Avaya BCM are connected to Avaya Aura® Session Manager over SIP trunks. Avaya Aura® Session Manager provides SIP proxy/routing functionality, routing SIP sessions across a TCP/IP network with centralized routing policies. Avaya Aura® Messaging provides unified communications features such as greeting menu, user mailbox services and transfer functionalities. Avaya Aura® Communication Manager is setup as an emulated PSTN connected to Avaya BCM through T1 connection.

2. Interoperability Testing and Test Result

Interoperability was tested between Avaya Business Communication Manager and Avaya Aura® Messaging with SIP trunking through Avaya Aura® Session Manager.

2.1. Interoperability Compliance Testing

Interoperability testing was executed between a variety of Avaya telephones such as Digital, UNIStim registered to Business Communication Manager, Avaya SIP phones registered to Session Manager and Avaya H323, Digital phones registered to Communication Manager. The focus was to verify call and messaging functionality between Communication Manager, Business Communication Manager and Avaya Aura® Messaging in a SIP network with trunking through Session Manager.

The following Avaya Aura® Messaging capabilities were covered:

- No Answer
- Personal Greetings
- Bypass Greetings
- Message Waiting Indication
- Reply
- Call Forwarding
- Multiple Call Forwarding
- Call Transfer
- Simultaneous Calls
- Personal Operator
- Personal Operator – No Answer
- Auto Attendant
- Auto Attendant – No Answer
- Call to Forward All (forward to messaging access number) endpoint.
- Call to Busy endpoint (messaging access number is set if this endpoint busy) All the call is forwarded to pilot number.

The following Avaya Aura® Messaging capabilities were not in scope for this testing:

- Call Sender
- Reach Me
- Notify Me

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2.2. Test Results and Observations

Interoperability testing of Avaya Aura® Messaging 6.1 Single Server as a voice mail solution for Avaya Business Communication Manager with SIP Trunking through Avaya Aura® Session Manager R6.1 was successful.

3. Reference Configuration

Figure 1 below illustrates the configuration used in these Application Notes. The sample configuration shows an enterprise with Avaya BCM communicating with the Avaya Aura® Messaging via a SIP trunk. The Avaya BCM has an analog, a digital and an IP Telephone connected as endpoints.

For security purposes public IP addresses have been masked out or altered in this document.

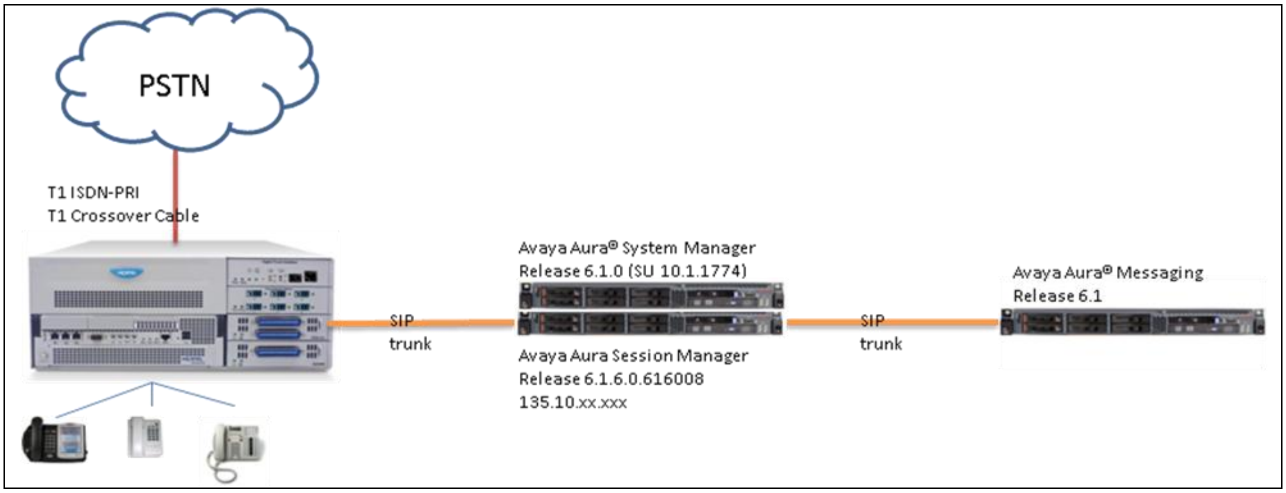

Figure 1: Network Configuration

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4. Equipment and Software Validated

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

Equipment	Software
S8800 Server	Avaya Aura® Messaging Release 6.1
S8800 Server	Avaya Aura® Session Manager Release 6.1
S8800 Server	Avaya Aura® System Manager Release 6.1
G450 with S8300D, emulated PSTN	Avaya Aura® Communication 6.0 PRI, Digital Trunk Interface Module
Business Communication Manager 450	Avaya BCM450 R6 SU 011-201205
2 – Avaya 1140E IP Telephone (SIP)	Firmware Version: 0625C8J
2- Digital Phones T7316	n/a
2 – Analog Phones	n/a

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5. Configure Avaya Business Communication Manager with SIP Trunking to Avaya Aura® Session Manager

This section describes the procedure for setting up Avaya BCM. The following administration activities will be described:

- Configure Proxy for Private SIP Trunking
- Configure the Global setting for SIP Trunking
- Configure general info for IP Trunks
- Configure the routing
- Configure the destination code
- Configure the private network for dialing plan
- Configuring the Public network for the dialing plan
- Configure Target Lines
- Assign a target line to a selected set
- Configure Active Sets

The highlights in the following screens indicate the values used during the compliance test. Default values may be used for all other fields. Please keep in mind that the values used in this guide may be unique to the example shown. User will have to use values unique to their site, where this solution is being deployed (e.g., site's IP address, extension numbers, etc).

Avaya BCM configurations can be performed through Business Element Management only.

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5.1. SIP Trunking Configuration

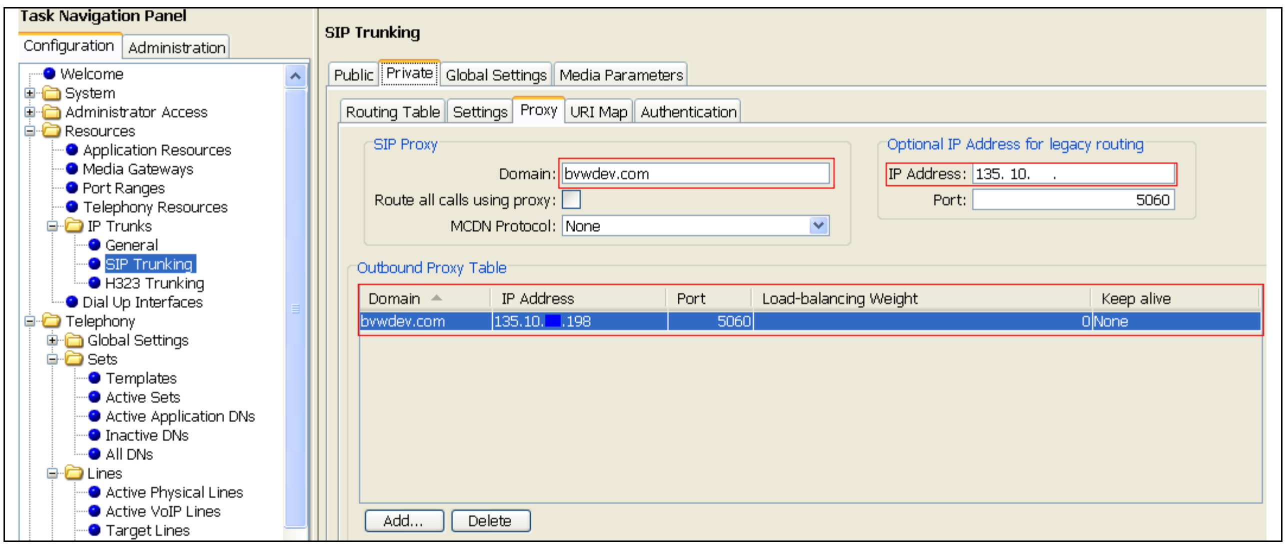
This section explains the steps to configure a SIP trunk routing entry that will access the Messaging via Session Manager from the Avaya BCM.

5.1.1. Configure Proxy for Private SIP Trunking

After logging into the BCM element manager, configure a private proxy for the SIP trunking by selecting, ***Configuration → Resources → IP Trunks → SIP Trunking***

Select the tab ***Private → Proxy*** to add a proxy as shown in figure below:

- **Domain**: the defined domain that the Avaya Aura® Messaging and Avaya Aura® Session Manager system is assigned to. During compliance test bvwdev.com domain is used.
- **IP Address:** is Session Manager's IP.



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5.1.2. Configure the Global settings for SIP Trunking:

Navigate to ***Configuration* → *Resources* → *IP Trunks* → *SIP Trunking***

Select the tab ***Global Settings*** as shown in figure below:

- **Local Domain**: is the defined domain that the AAM and ASM system is assigned to.
- **Call Signaling port**: 5060

5.2. IP Trunks Configuration

This section describes how to configure the general settings for IP trunk.

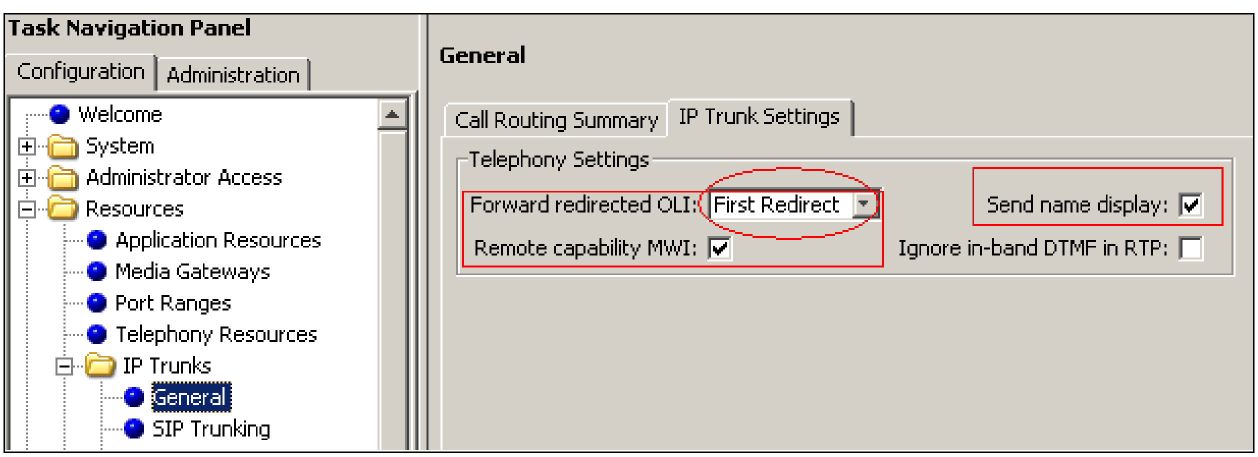
5.2.1. General IP trunk settings:

Navigate to ***Configuration* → *Resources* → *IP Trunks* → *General* →*IP Trunk Settings***

Setup the general information for the IP trunk as below:

- **Forward redirected OLI**: First Redirect.
- **Remote capability MWI**: checked
- **Send name display**: checked.

Note: for detail of these setting please refer to Avaya BCM documentation listed in reference **Section 12**



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5.3. Dialing Plan Configuration

This section describes how to configure the dialing plan, routes and pool that will be used by the Avaya BCM to communicate with the Avaya Aura Messaging.

5.3.1. Configure the routing:

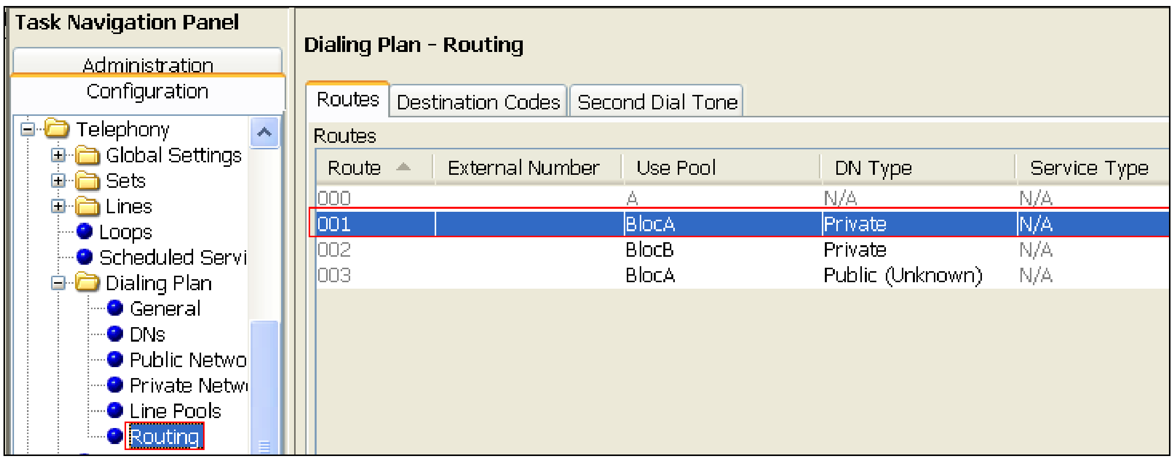
Navigate to ***Configuration → Telephony → Dialing Plan → Routing***

In ***Routes*** tab to add a new route by click on the ***Add*** button. Enter the route number 001 and click ***OK*** when Done.

Double click on new created Route and assign value to the route as below:

- **Use Pool**: BlocA.
- **DN Type**: Private

The rest of the values leave them as default.

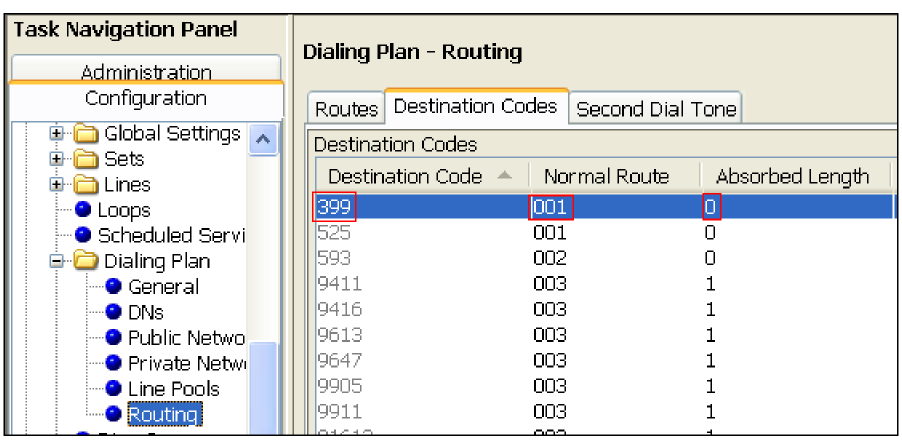


5.3.2. Configure the destination code:

Navigate to ***Configuration → Telephony → Dialing Plan → Routing***

In ***Destination Codes*** tab add a destination code as shown in figure below:

- **Destination Code:** 399. The destination code 399 is chosen because the AAM pilot number used in the example is 39990.
- **Normal Route**: 001
- **Absorbed Length**: 0



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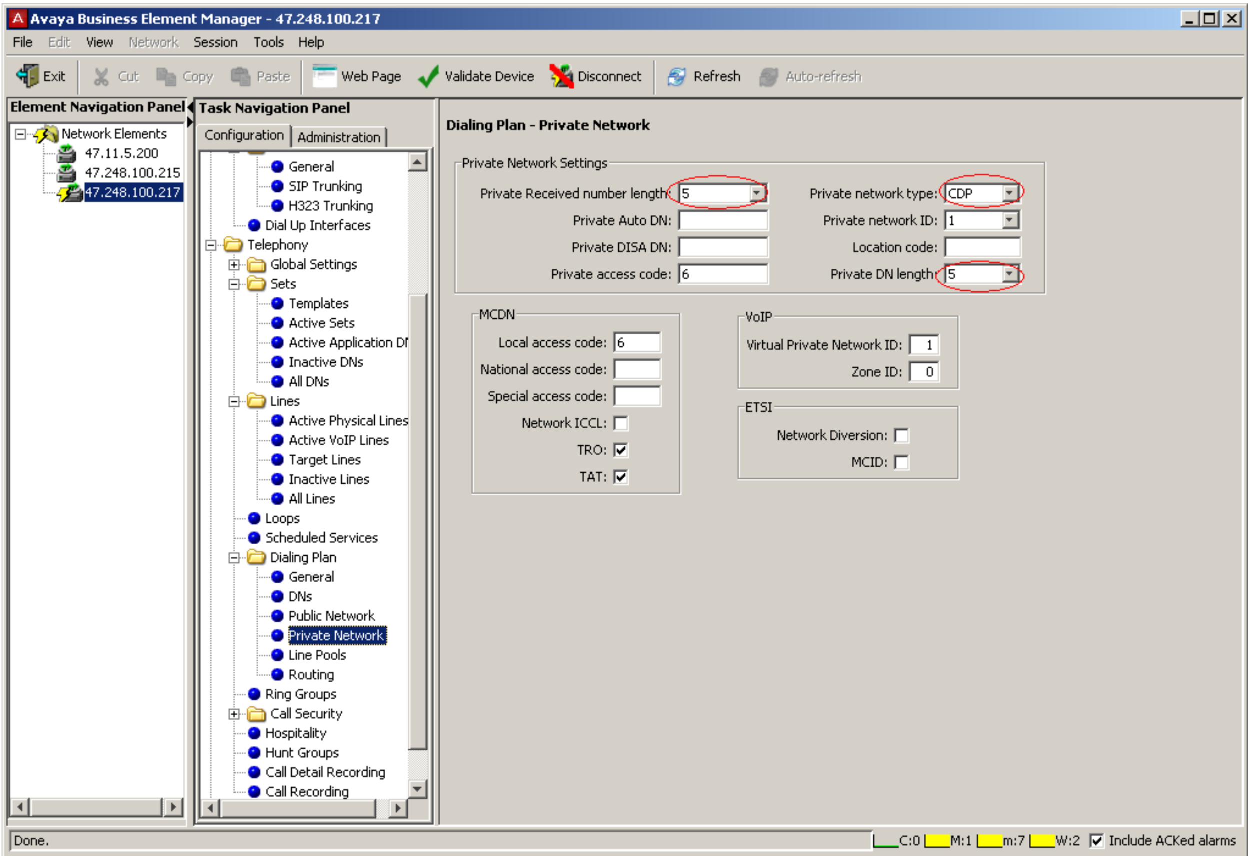
5.3.3. Configure the dialing plan private network:

Configuration → Telephony → Dialing Plan → Private Network

Configure the private network as shown in figure below:

- **Private Received number length**: 5.
- **Private network type**: CDP.
- **Private DN length**: 5



5.4. Target Lines Configuration

This section describes how to configure target lines which will be assigned to telephones that will be used as endpoints connected to the BCM.

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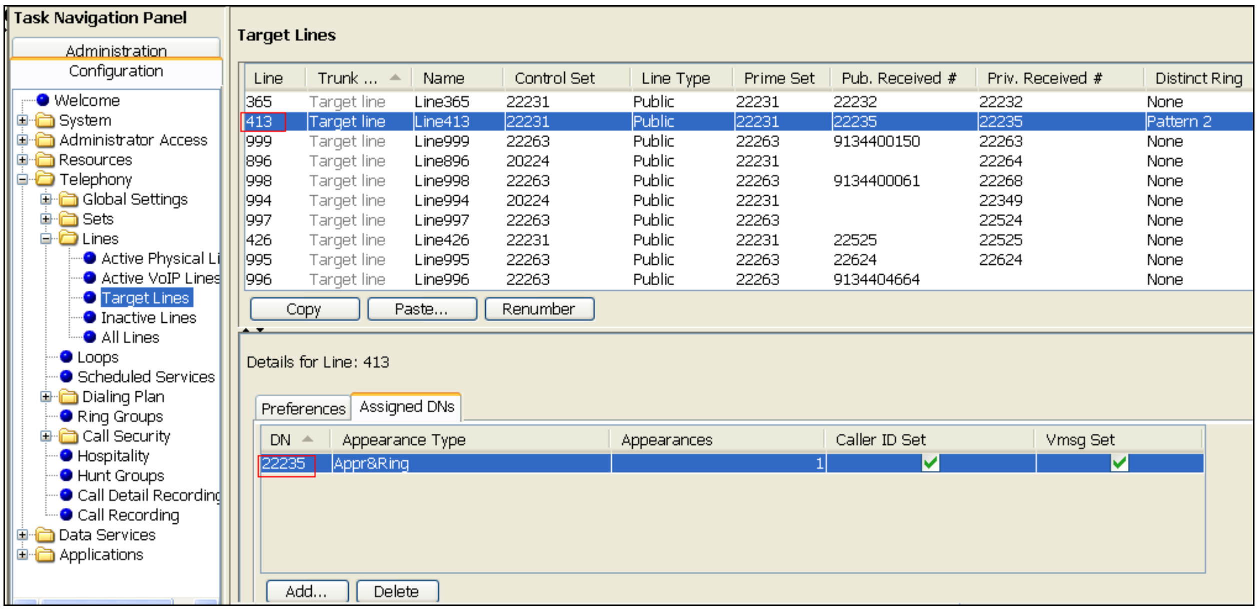
5.4.1. Configure a target line to a selected set:

Navigate to ***Configuration → Telephony → Lines → Target Lines***
In the Target Lines screen, select a **Line** and enter **DN** to selected **Line**
For example in the figure shown below:

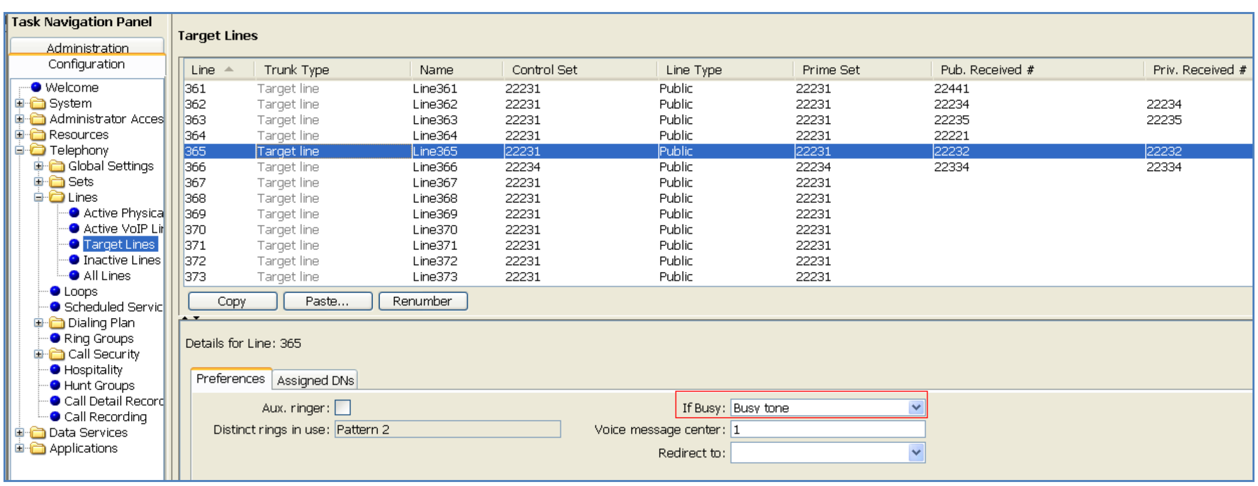
- **Line:** *413* has been selected.
- **DN:** *22235* has been assigned by clicking on the ***Add*** button under the ***Assigned DNs*** tab.

Note: Add unique set DN to one Target line. Require one line assignment for every telephone device in the system.



Also for the assigned set to generate busy tone while it is busy.
Select ***Preferences*** tab:

- **If Busy** field***:*** Busy tone has to be selected as shown in figure below.



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5.5. Active Sets Configuration

This section describes the steps to configure the sets that have been assigned to a line as explained in **Section 5.4**

5.5.1. Configure the Active sets:

Select ***Configuration*** → ***Telephony*** → ***Sets*** → ***Active Sets***

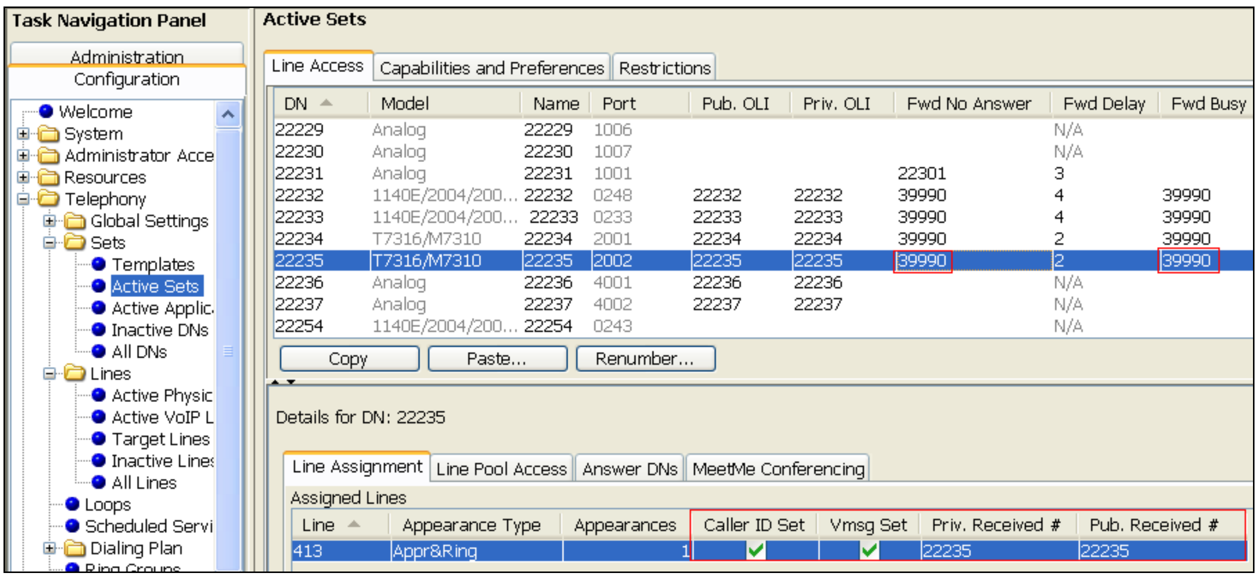
Example configuration for ***Line Access*** tab of selected active set:

- Select **DN**: 22235
- **Fwd No Answer**: 39990
- **Fwd Busy**: 39990

Note: ***39990*** is the pilot number of Avaya Messaging.

Example configuration for ***Line Assignment*** tab of selected active set:

- **Vmsg Set**: checked so that voice mail can be accessed by the DN 22235
- **Priv. Received#**: 22235
- **Pub. Received #***:* 22235.



Figures below show the additional configurations to be done to the selected DN which has to be member of the BlocA pool found in the ***Line Pool Access*** tab.

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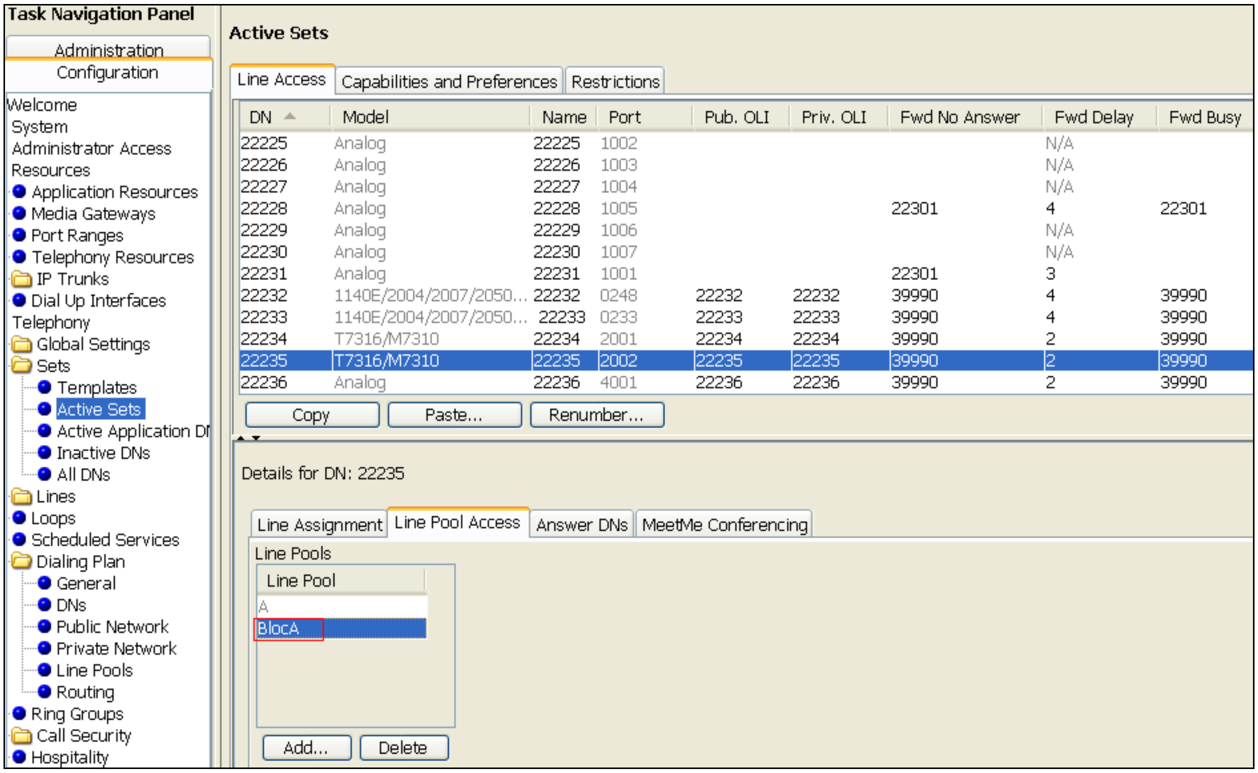
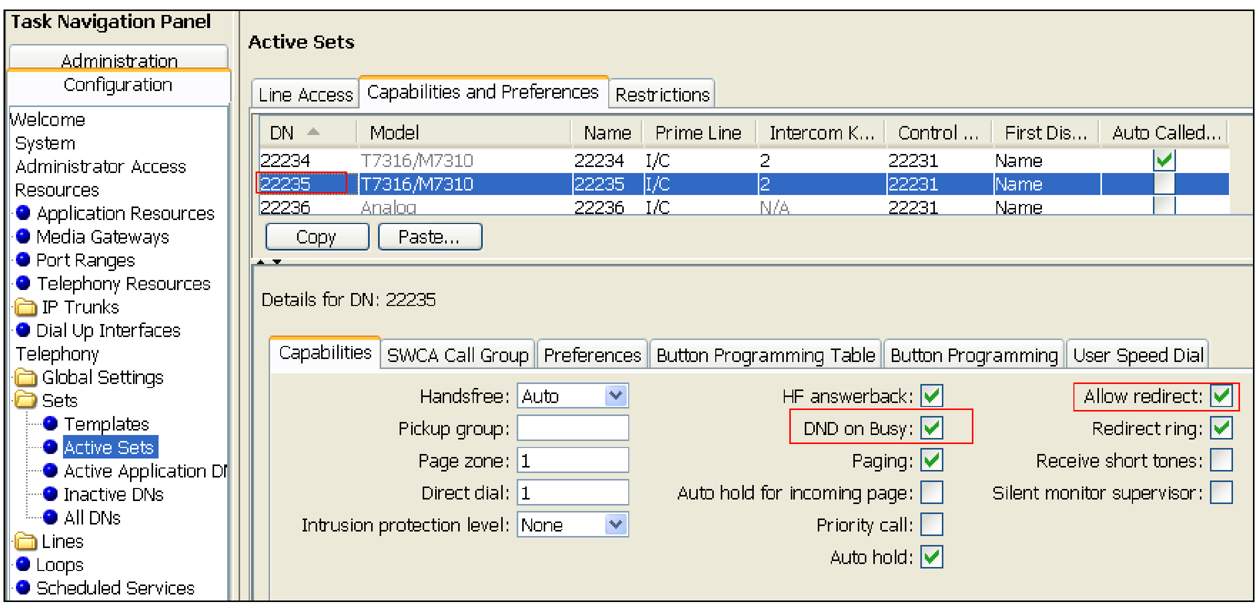


In the ***Capabilities and Preferences*** tab make sure the following options are selected:

- **DND on Busy**: checked.
- **Allow redirect**: checked.



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6. Configure Avaya Business Manager 450 with PRI trunk to PSTN

6.1. Administer Resources

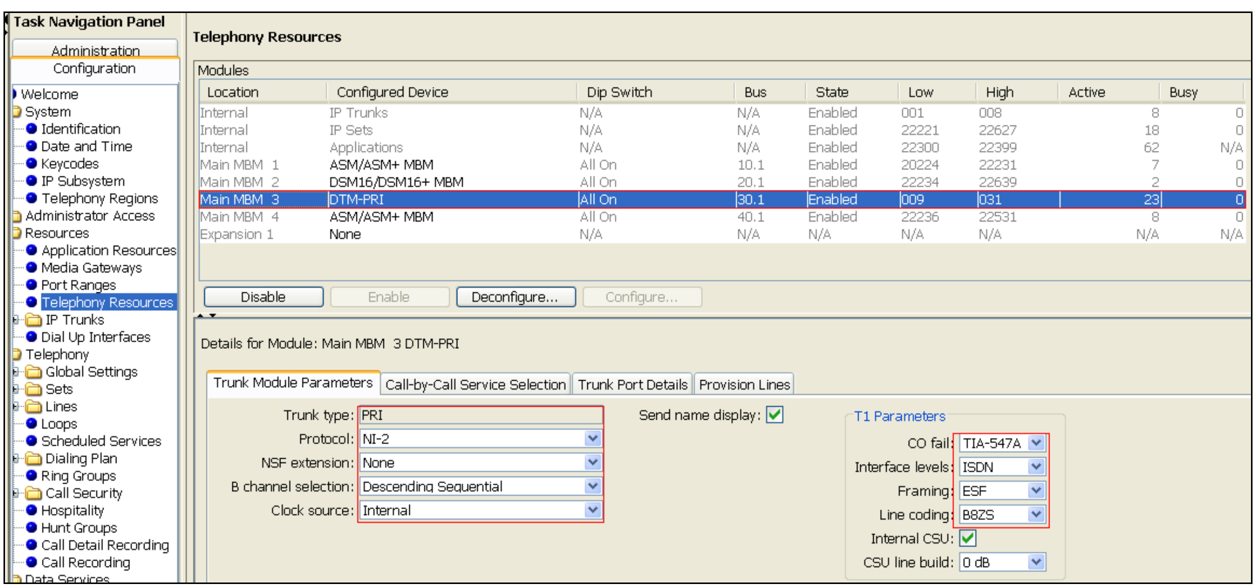
This section describes how to configure a PRI Trunk on BCM to PSTN.

6.1.1. Administer Application Resource for PRI Trunks

These Application Notes assume that the basic configuration has already been administered. This section describes steps for configuring Application Resource for PRI Trunks on BCM to work with Service Provider system.
For further information on Avaya Business Communication Manager 450 configuration, please consult references in **Section 12**.

Enable the PRI device on Avaya BCM by select ***Resources → Telephony Resources.***
Under **Configured Device** column, select DTM + PRI and then click **Enable** button if it is not already enable as show in figure below.
Configure PRI trunk parameter as highlighted in red box. Others are left as default:

- **Trunk type**: PRI
- **Protocol**: NI-2
- **NSF extension**: None.
- **B channel selection**: Descending Sequential.
- **Clock source**: Internal.
- **CO fail**: TIA-547A.
- **Interface levels**: ISDN.
- **Framing**: ESF.
- **Line config**: B8ZS.



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6.1.2. Routing Settings

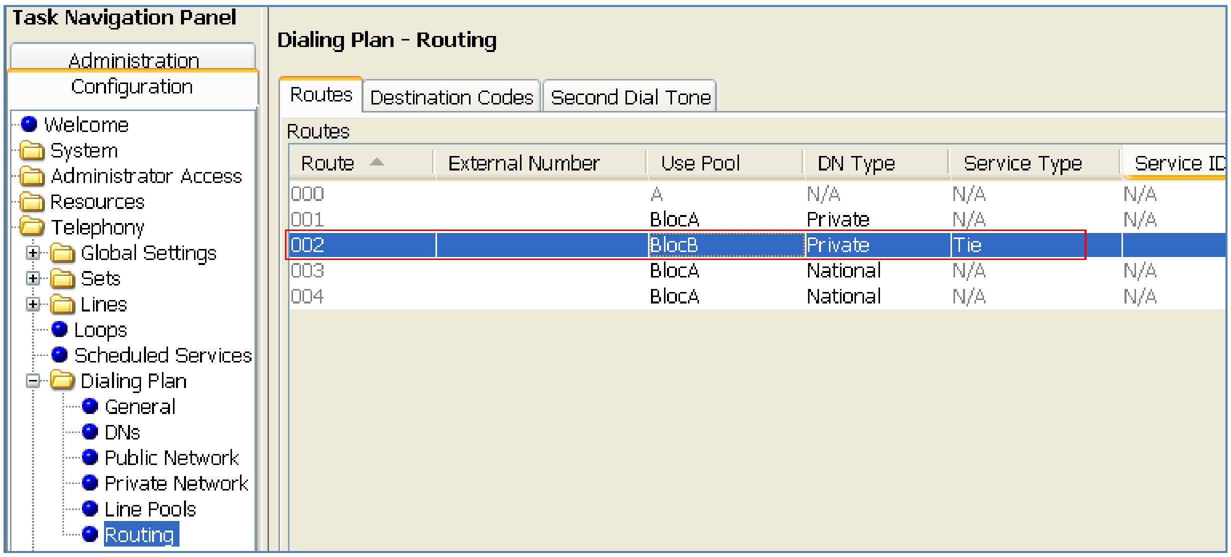
This section describes how to configure the dialing plan, routes and pool that will be used by the Avaya BCM to connect to PSTN.

Navigate to ***Telephony → Dialing Plan → Routing.***

In **Routes** tab to add a new route to PSTN by click on the ***Add*** button. Enter the route number 002 and click OK when Done.

Double click on new created Route and assign value to the route as below, other leave as default:

- **Use Pool**: BlocB.
- **DN Type**: Private.
- **Service Type**: Tie.



6.1.3. Administer Destination Codes

To assign Destination Codes to dial to PSTN via PRI. Perform similar step as shown in section **5.3.2** for with the following information

- **Destination Code**: 4521. Extension on Avaya Communication manager is 52xxx. Digit 4 to let Avaya BCM route the call through route 002
- **Normal Route**: 002.
- **Absorbed Length**: 1. Drop the first digit 4.

6.1.4. Administer Telephony Lines

Assign the pool to telephone line by navigate to ***Telephony → Lines → Active Physical Lines***. Double click on a selected line under the **Line Type**, choose **Pool:BlocB** in this example as shown below.

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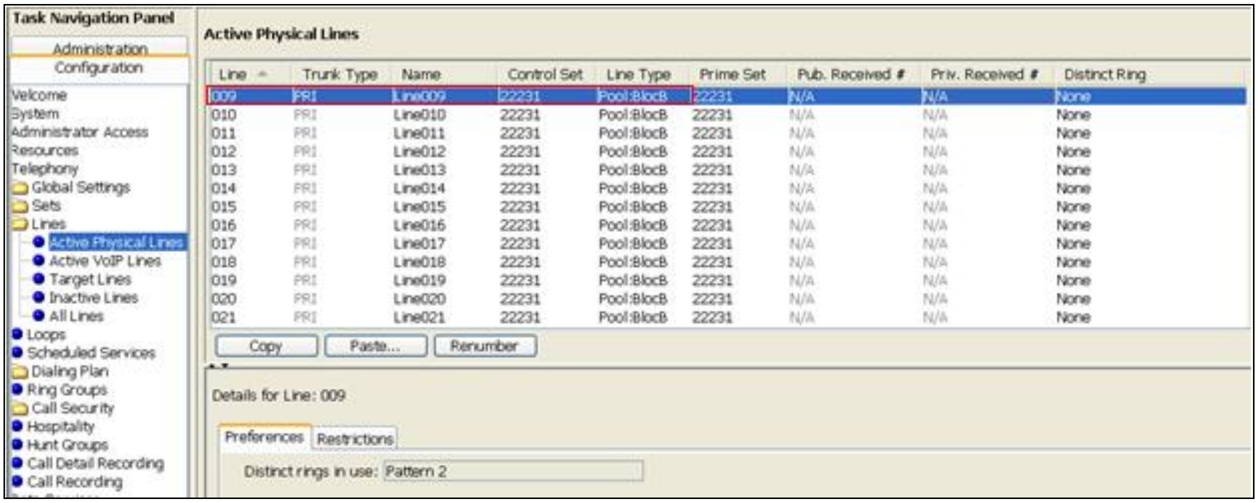


6.1.5. Administer Telephony Target Lines

Assign a **DN**: 22234 to an available target line **Line**: 362. See **Section 5.4** for detail procedure.

6.1.6. User/Telephone Sets Configuration for Incoming/Outgoing Call

This section show how to configure telephone sets to specific physical line for incoming/outgoing calls to/from a digital set.

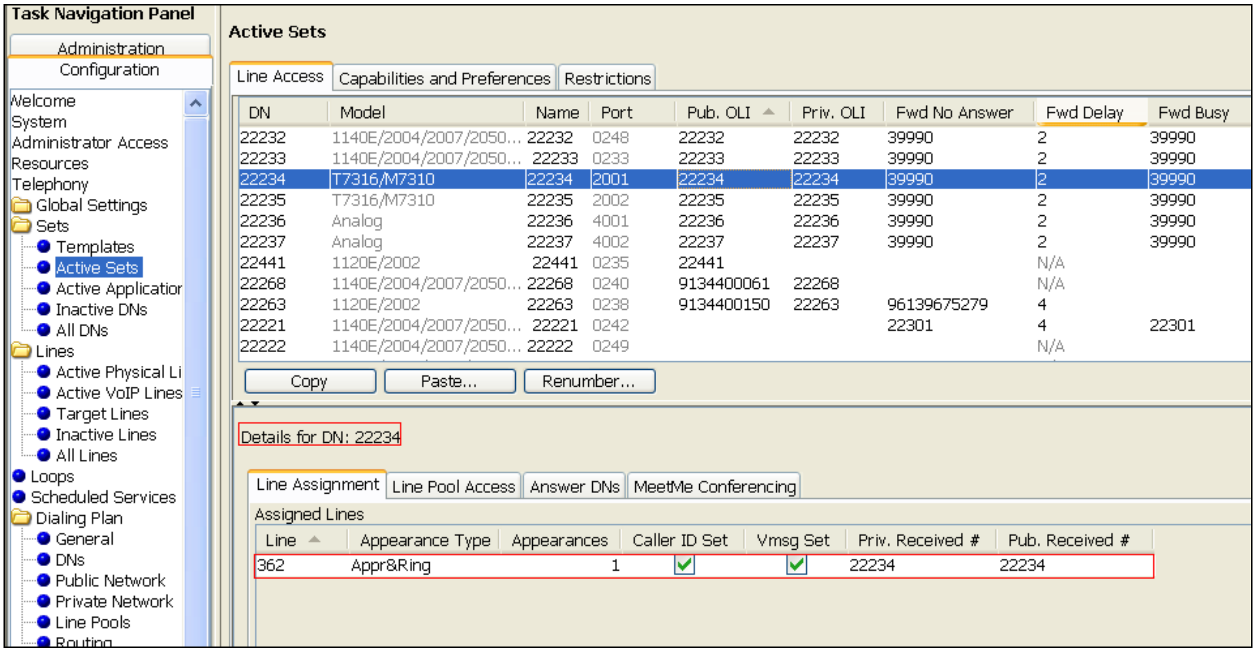
Select ***Telephony → Sets → Active Sets.*** In the ***Line Access***, select the available digital set which has the **Model** is T7316/M7310.

Assign **Priv. OLI**: 22234. This will allow the delivery of the **Calling Line Identification Display.**

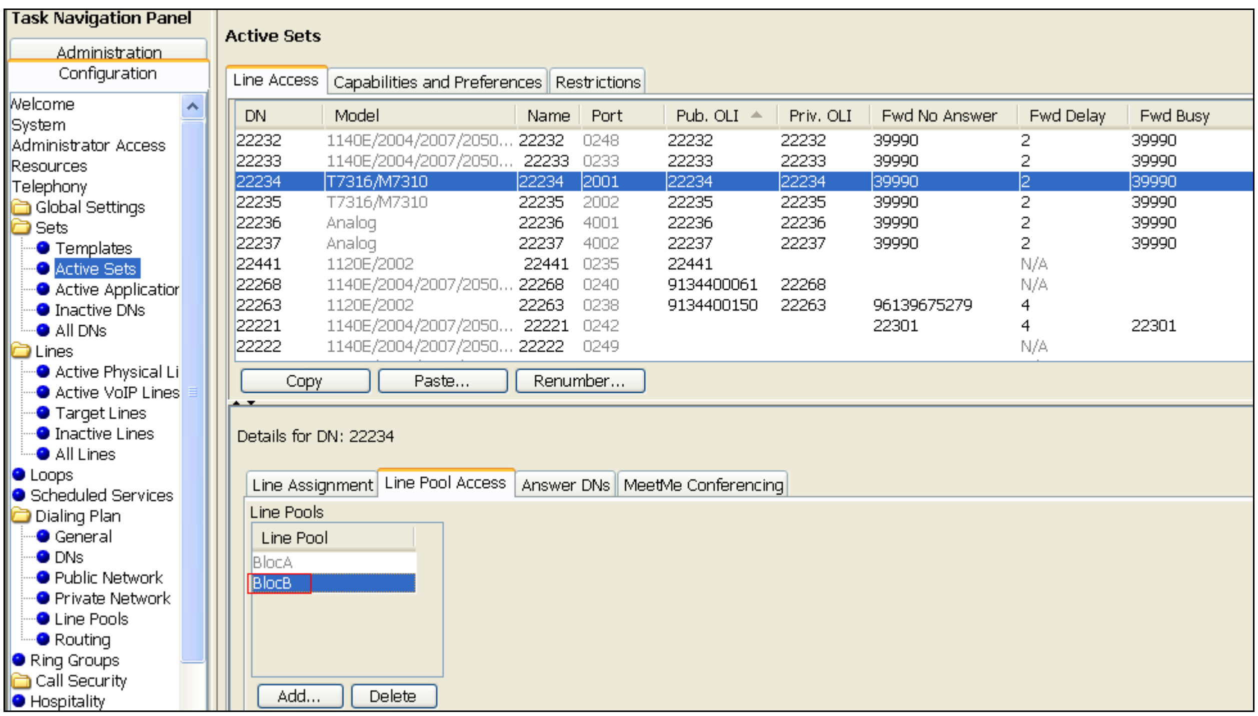
For incoming call: Assign the line that configured in Section **6.1.5** o this phone by click on the **Add** button in **Line Assignment** tab. Enter line number, in this example 362 and click OK.

Modify the detail information of the line parameters as values highlighted in red boxes in the below figure:

- **Caller ID Set**: checked.
- **Vmsg Set**: checked.
- **Priv. Received** #: 22234.
- **Pub. Received #**: 22234.



For Outgoing Call: Select tab ***Line Pool Access*** tab, click **Add** button to add **BlocB**. Click **OK** from the **Add Line Pool** pop up to complete as shown below:



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7. Configure Avaya Aura® Communication Manager as Emulated PSTN – PRI Trunk Configuration

This section focuses on configuring the T1 trunks on Avaya Communication Manager to serve as service provider to Avaya Business Communication Manager, and provides a sample routing using Automatic Alternate Routing (AAR). The configuration procedures include the following areas:

- Administer DS1 circuit pack
- Administer trunk group
- Administer signaling group
- Administer trunk group members
- Administer route pattern
- Administer public unknown numbering
- Administer uniform dial plan
- Administer AAR analysis

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7.1. Administer DS1 circuit pack

Log into the System Access Terminal (SAT), and administer a DS1 circuit pack to be used for Connectivity to BCM. Use the **add ds1 001v6** command. Note that the actual slot number may vary. In this case "001v6" is used as the slot number. Enter the following values for the specified fields, and retain the default values for the remaining fields. Submit these changes.

Note: The **Interface** field must be complementary on both switches. For the sample configuration, Avaya Communication Manager is administered as the ***network/master*** *("peer-master")*, and Avaya BCM is administered as the "*user/slave*".

```
add ds1 001v6                                                  Page    1 of    2
                           DS1 CIRCUIT PACK
        Location: 001V6                                Name: To BCM
         Bit Rate: 1.544                         Line Coding: b8zs
     Line Compensation: 1                            Framing Mode: esf
                              Signaling Mode: isdn-pri
      Connect: pbx                                Interface: peer-master
    TN-C7 Long Timers? n                              Peer Protocol: Q-SIG
     Interworking Message: PROGress                                Side: b
     Interface Companding: mulaw                                    CRC? n
                          Idle Code: 11111111
                 DCP/Analog Bearer Capability: 3.1kHz
                           T303 Timer(sec): 4
                          Disable Restarts? n
      Slip Detection? n                  Near-end CSU Type: other
                          Echo Cancellation? n
```

7.2. Administer Trunk Group

Administer an ISDN trunk group to interface with Avaya BCM. Use the **add trunk-group n** command; where **n** is an available trunk group number. Enter the following values for the specified fields, and retain the default values for the remaining fields.

```
add trunk-group 1                                              Page    1 of   21
                                TRUNK GROUP

Group Number: 1                    Group Type: isdn          CDR Reports: y
  Group Name: Tie Route to BCM            COR: 1        TN: 1        TAC: 100
Direction: two-way         Outgoing Display? n        Carrier Medium: PRI/BRI
 Dial Access? n                Busy Threshold: 255  Night Service:
Queue Length: 0
Service Type: tie                      Auth Code? n          TestCall ITC: rest
                           Far End Test Line No:
TestCall BCC: 4
```


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Navigate to **Page 2**. For the **Supplementary Service Protocol** field, enter “b” for Q-SIG. For the **Format** field, enter “unk-unk”. Retain the default values for the remaining fields.

```
add trunk-group 1                                                Page   2 of  21
      Group Type: isdn

TRUNK PARAMETERS
         Codeset to Send Display: 6     Codeset to Send National IEs: 6
        Max Message Size to Send: 260   Charge Advice: none
  Supplementary Service Protocol: b     Digit Handling (in/out): enbloc/enbloc

            Trunk Hunt: cyclical
                                                  Digital Loss Group: 13
Incoming Calling Number - Delete:     Insert:             Format: unk-unk
              Bit Rate: 1200         Synchronization: async     Duplex: full
Disconnect Supervision - In? y        Out? n
Answer Supervision Timeout: 0
        Administer Timers? n       CONNECT Reliable When Call Leaves ISDN? n
                                   Delay Call Setup When Accessed Via IGAR? n
```


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Navigate to **Page 3**. Enable the **Send Name**, **Send Calling Number**, and **Send Connected Number** fields. For the **Format** field, enter "unknown". Submit these changes.

```
add trunk-group 1                                                Page   3 of  21
TRUNK FEATURES
          ACA Assignment? n              Measured: none      Wideband Support? n
                                   Internal Alert? n       Maintenance Tests? y
                                 Data Restriction? n    NCA-TSC Trunk Member: 23
                                        Send Name: y      Send Calling Number: y
            Used for DCS? n               Hop Dgt? n     Send EMU Visitor CPN? n
   Suppress # Outpulsing? n    Format: unknown
 Outgoing Channel ID Encoding: preferred    UUI IE Treatment: service-provider

                                                 Replace Restricted Numbers? n
                                                Replace Unavailable Numbers? n
                                                     Send Connected Number: y
                                                  Hold/Unhold Notifications? y
             Send UUI IE? y     Modify Tandem Calling Number: no
               Send UCID? n
 Send Codeset 6/7 LAI IE? y                           Ds1 Echo Cancellation? n
    Apply Local Ringback? n
 Show ANSWERED BY on Display? y
                           Network (Japan) Needs Connect Before Disconnect? n
```

7.3. Administer Signaling Group

Administer an ISDN signaling group for the new trunk group to use for signaling. Use the **add signaling-group n** command, where **n** is an available signaling group number. For the **Primary D-Channel** field, enter the slot number for the DS1 circuit pack from **Section 7.1**.

For the **Trunk Group for NCA TSC** and **Trunk Group for Channel Selection** fields, enter the ISDN trunk group number. For the **Supplementary Service Protocol** field, enter "b" for QSIG. Maintain the default values for the remaining fields, and submit these changes.

```
add signaling-group 1
                               SIGNALING GROUP
 Group Number: 1             Group Type: isdn-pri
                   Associated Signaling? y        Max number of NCA TSC: 10
                      Primary D-Channel: 001V624   Max number of CA TSC: 10
                                                 Trunk Group for NCA TSC: 1
      Trunk Group for Channel Selection: 1    X-Mobility/Wireless Type: NONE
     TSC Supplementary Service Protocol: b         Network Call Transfer? n
```


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7.4. Administer Trunk Group Members

Use the **change trunk-group n** command, where **n** is the trunk group number added in **Section 7.2**. Navigate to **Page 3**. For the **NCA-TSA Trunk Member** field, enter the highest trunk group member number to use for routing of tandem QSIG call independent signaling connections.

```
change trunk-group 1                                            Page   3 of
21
TRUNK FEATURES
          ACA Assignment? n             Measured: none     Wideband Support? n
                                  Internal Alert? n        Maintenance Tests? y
                                Data Restriction? n    NCA-TSC Trunk Member: 23
                                       Send Name: y     Send Calling Number: y
            Used for DCS? n              Hop Dgt? n    Send EMU Visitor CPN? n
   Suppress # Outpulsing? n    Format: unknown
 Outgoing Channel ID Encoding: preferred     UUI IE Treatment: service-
provider

                                                 Replace Restricted Numbers? n
                                                Replace Unavailable Numbers? n
                                                      Send Connected Number: y
                                                  Hold/Unhold Notifications? y
             Send UUI IE? y     Modify Tandem Calling Number: no
               Send UCID? n
 Send Codeset 6/7 LAI IE? y                             Ds1 Echo Cancellation? n
    Apply Local Ringback? n
 Show ANSWERED BY on Display? y
                            Network (Japan) Needs Connect Before Disconnect? n
```

Navigate to **Page 4.** Shown below are default values that were used during testing.

```
change trunk-group 1                                    Page   4 of  21
                       QSIG TRUNK GROUP OPTIONS


   TSC Method for Auto Callback: drop-if-possible
           Diversion by Reroute? y
               Path Replacement? y
Path Replacement with Retention? n
        Path Replacement Method: better-route
                            SBS? n
  Display Forwarding Party Name? y
    Character Set for QSIG Name: eurofont
              QSIG Value-Added? n
```


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Navigate to **Page 5** and **6**. Enter all 23 ports of the DS1 circuit pack into the **Port** fields, and the corresponding **Code** and **Sfx** fields will be populated automatically. Enter the ISDN signaling group number into the **Sig Grp** fields as shown below. Submit these changes.

```
change trunk-group 1                                            Page   5 of  21
                                    TRUNK GROUP
                                        Administered Members (min/max):   1/23
GROUP MEMBER ASSIGNMENTS                   Total Administered Members:  23

      Port     Code Sfx Name          Night            Sig Grp
  1: 001V601  MM710  B                                    1
  2: 001V602  MM710  B                                    1
  3: 001V603  MM710  B                                    1
  4: 001V604  MM710  B                                    1
  5: 001V605  MM710  B                                    1
  6: 001V606  MM710  B                                    1
  7: 001V607  MM710  B                                    1
```

7.5. Administer Route Pattern

Create a route pattern for the new ISDN trunk group to use for routing. Use the **change route pattern n** command, where **n** is an available route pattern. Enter the following values for the specified fields, and retain the default values for the remaining fields. Submit these changes.

```
add route-pattern 1                                         Page   1 of   3
                    Pattern Number: 5  Pattern Name: BCM-Qsig-Route
                             SCCAN? n      Secure SIP? n
    Grp FRL NPA Pfx Hop Toll No.  Inserted                            DCS/ IXC
    No          Mrk Lmt List Del  Digits                              QSIG
                             Dgts                                     Intw
 1: 1   0                                                              n   user
 2:                                                                    n   user
 3:                                                                    n   user
 4:                                                                    n   user
 5:                                                                    n   user
 6:                                                                    n   user

     BCC VALUE  TSC CA-TSC    ITC BCIE Service/Feature PARM  No. Numbering LAR
    0 1 2 M 4 W     Request                                  Dgts Format
                                                          Subaddress
 1: y y y y y n  y as-needed rest                                 unk-unk    none
```


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7.6. Administer Public Unknown Numbering

Use the **change public-unknown-numbering 0** command, to define the calling party number to be sent to Avaya Business Communication Manager. Add an entry for the trunk group defined in **Section 7.2**. In the example shown below, all calls originating from a 6-digit extension beginning with 7 and routed to trunk group 1 will result in the 5-digit calling number to be sent. Submit these changes.

```
change public-unknown-numbering 0                                    Page   1 of   2
                      NUMBERING - PUBLIC/UNKNOWN FORMAT
                                          Total
Ext Ext              Trk        CPN        CPN
Len Code             Grp(s)     Prefix     Len
                                                    Total Administered: 1
 6  7222               1                     6         Maximum Entries: 9999
```

7.7. Administer Uniform Dial Plan

This section provides a sample AAR routing used for routing calls with dialed digits 7xxxxx to Avaya BCM. Use the **change uniform-dialplan 0** command, and add an entry to specify use of AAR for routing of digits 7xxxxx. Enter the following values for the specified fields and retain the default values for the remaining fields. Submit these changes.

```
change uniform-dialplan 0                                        Page   1 of   2
                       UNIFORM DIAL PLAN TABLE
                                                                  Percent Full: 0
  Matching                    Insert                Node
  Pattern            Len Del  Digits       Net Conv Num
  7222                 6   1                aar   n
```

7.8. Administer AAR Analysis

Use the **change aar analysis 0** command, and add an entry to specify how to route the calls to Avaya BCM. Enter the following values for the specified fields and retain the default values for the remaining fields. Submit these changes.

```
change aar analysis 0                                            Page   1 of   2
                              AAR DIGIT ANALYSIS TABLE
                                    Location: all         Percent Full: 1

            Dialed              Total     Route     Call    Node  ANI
            String            Min  Max   Pattern    Type    Num   Reqd
    7222                        6    6      1        aar            n
```


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8. Configure Avaya Aura® Session Manager

This section provides the procedures for configuring Session Manager as provisioned in the reference configuration. Session Manager is comprised of two functional components: the Session Manager server and the System Manager server. All SIP call provisioning for Session Manager is performed through the System Manager Web interface and is then downloaded into Session Manager.

The following sections assume that Session Manager and System Manager have been installed and that network connectivity exists between the two platforms.

In this section, the following topics are discussed:

- SIP Domains
- Locations
- SIP Entities
- Entity Links
- Time Ranges
- Routing Policy
- Dial Patterns
- Synchronization

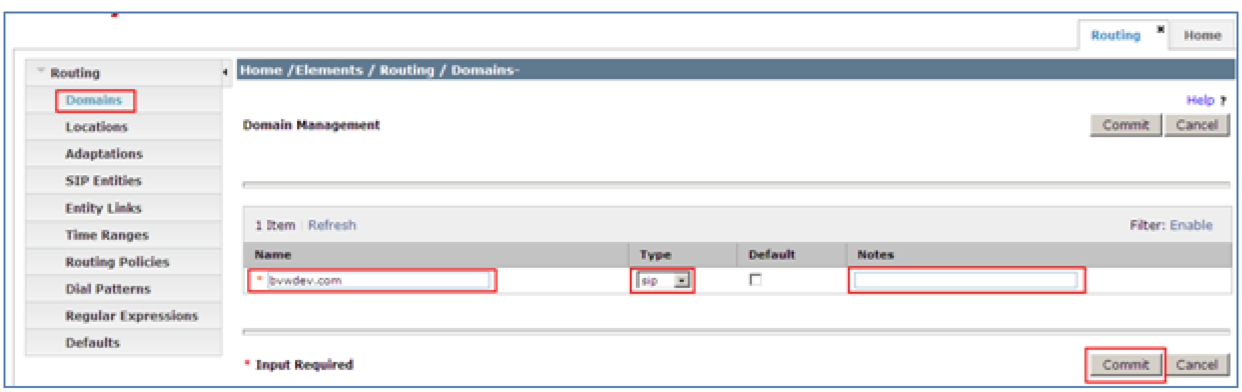
8.1. Configure SIP Domain

Launch a web browser, enter **http://<IP address of System Manager>/SMGR** in the URL, and log in with the appropriate credentials.

Navigate to ***Routing* → *Domains***, and click on the **New** button (not shown) to create a new SIP Domain. Enter the following values and use default values for remaining fields:

- **Name** – Enter the Authoritative Domain Name, e.g "bvwdev.com".
- **Type** – Select SIP

Click **Commit** to save. The following screen shows the Domains page used during the compliance test.



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8.2. Configure Locations

Locations are used to identify logical and/or physical locations where SIP Entities reside, for purposes of bandwidth management or location-based routing.

Navigate to ***Routing → Locations***, and click on the **New** button (not shown) to create a new SIP endpoint location.

<u>General section</u>

Enter the following values and use default values for remaining fields.

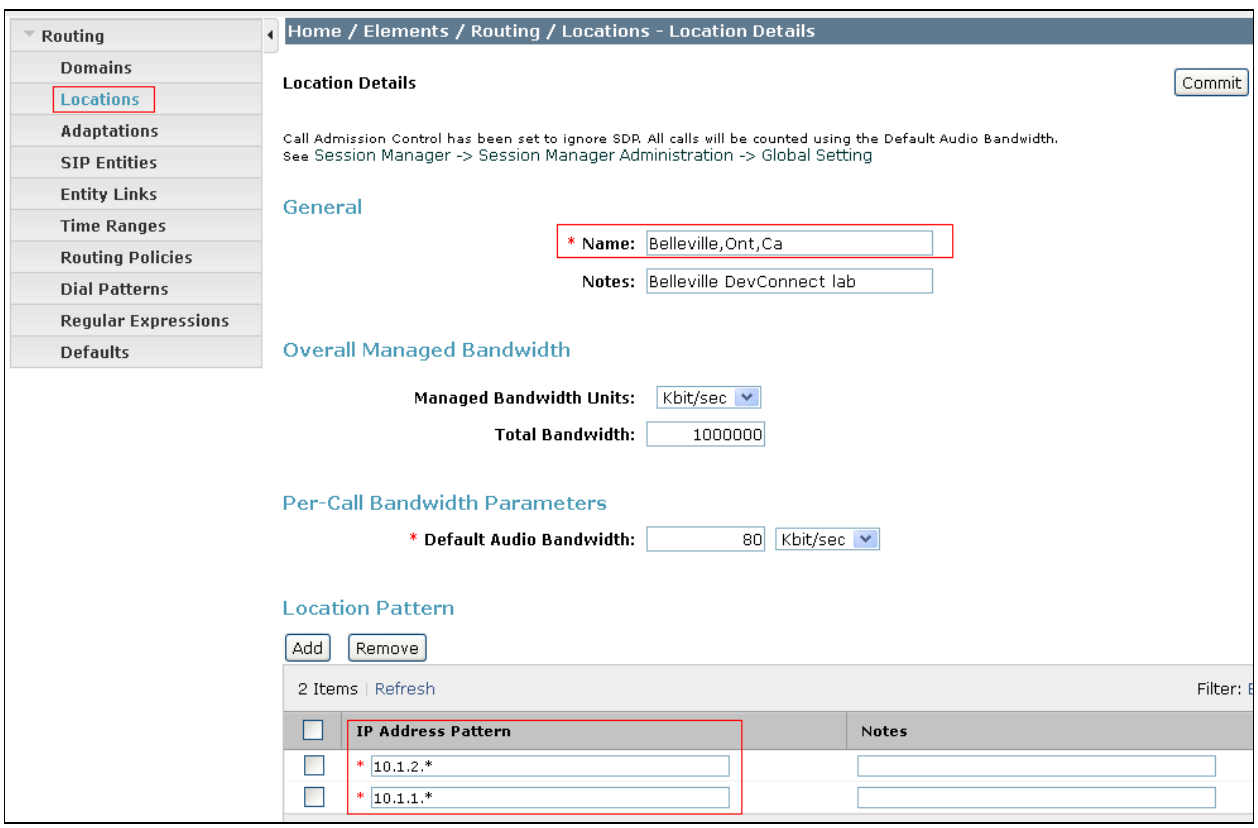
- Enter a descriptive Location name in the Name field.
- Enter a description in the **Notes** field if desired.

<u>Location Pattern section</u>

Click **Add** and enter the following values:

- Enter the IP address information for the IP address Pattern (e.g. “10.1.2.*”)
- Enter a description in the **Notes** field if desired.

Repeat steps in the Location Pattern section if the Location has multiple IP segments. Modify the remaining values on the form, if necessary; otherwise, retain the default values. Click on the **Commit** button. Repeat all the steps for each new Location. The following screen shows the Locations page used during the compliance test.



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8.3. Configure SIP Entities

A SIP Entity must be added for Session Manager and for each network component that has a SIP trunk provisioned to Session Manager. During the compliance test, the following SIP Entities were configured:

- Session Manager itself.
- Avaya Aura Messaging
- BCM

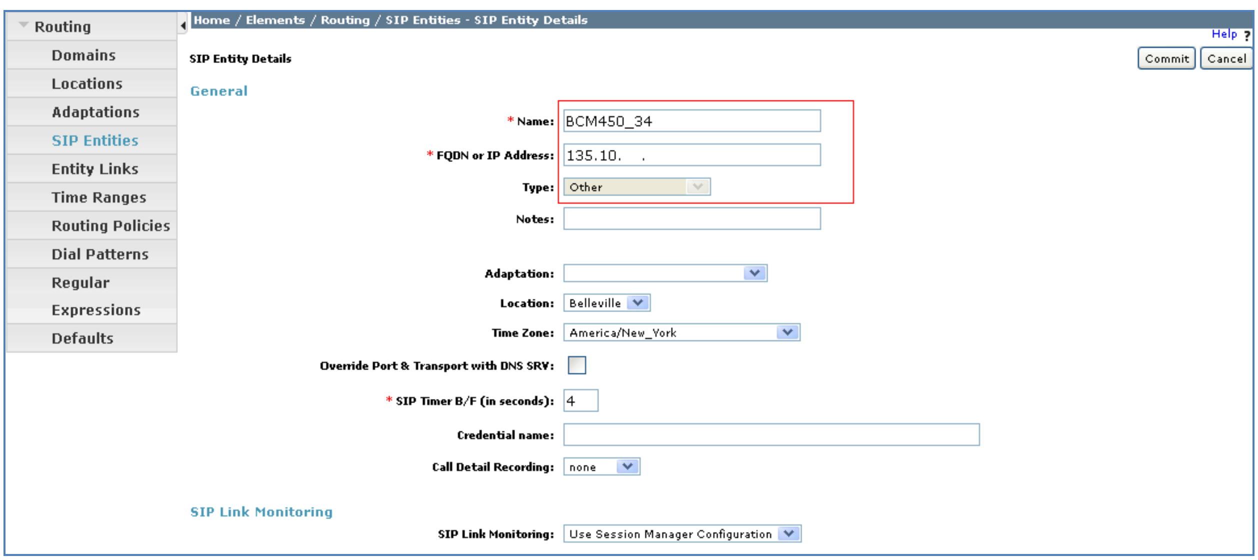
Navigate to ***Routing → SIP Entities***, and click on the **New** button (not shown) to create a new SIP entity. Provide the following information:

<u>General section</u>

Enter the following values and use default values for remaining fields.

- Enter a descriptive Location name in the Name field.
- Enter IP address for signaling interface on each BCM, Avaya Aura Messaging.
- From the **Type** drop down menu select a type that best matches the SIP Entity.
    - For Session Manager, select Session Manager
    - For Messaging, select Modular Messaging
    - For BCM, select Others
- Enter a description in the **Notes** field if desired.
- Select the appropriate time zone.
- Accept the other default values.

Click on the **Commit** button to save each SIP entity. The following screens show the SIP Entity page used during the compliance test.



Repeat all the steps for each new entity

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8.4. Configure Entity Links

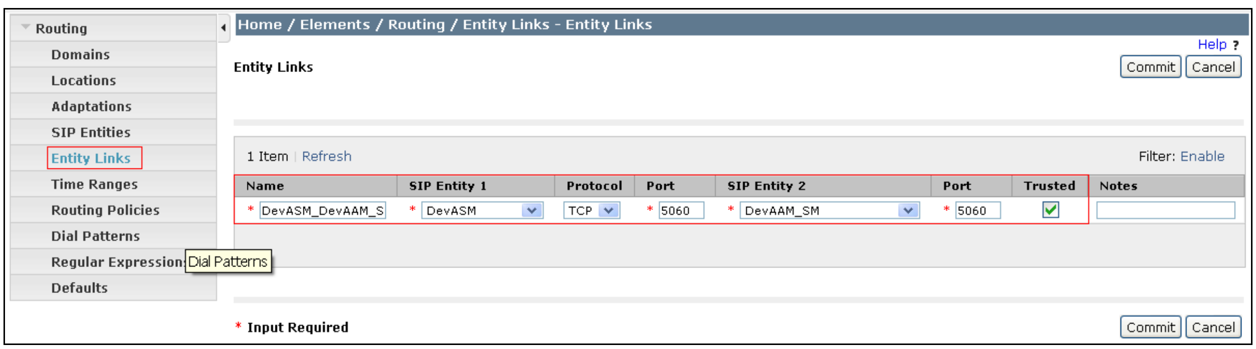
Entity Links define the connections between the SIP Entities and Session Manager. In the compliance test, the following entity links are defined from Session Manager.

- Session Manager ⇔ BCM
- Session Manager ⇔ Avaya Aura Messaging

Navigate to ***Routing → Entity Links***, and click on the **New** button (not shown) to create a new entity link. Provide the following information:

- Enter a descriptive name in the **Name** field.
- In the **SIP Entity 1** drop down menu, select the Session Manager SIP Entity created in **Section 0**.
- In the **Protocol** drop down menu, select the protocol to be used (e.g. “UDP” or “TCP”).
- In the **Port** field, enter the port to be used (e.g. “5060”).
- In the **SIP Entity 2** drop down menu, select an entity.
- In the **Port** field, enter the port to be used (e.g. “5060”).
- Check the **Trusted** box.
- Enter a description in the **Notes** field if desired.

Click on the **Commit** button to save each Entity Link definition. The following screen shows an Entity Links page (between Session Manager and Messaging) used during the compliance test.



Repeat the steps to define Entity Links between Session Manager and Avaya BCM.

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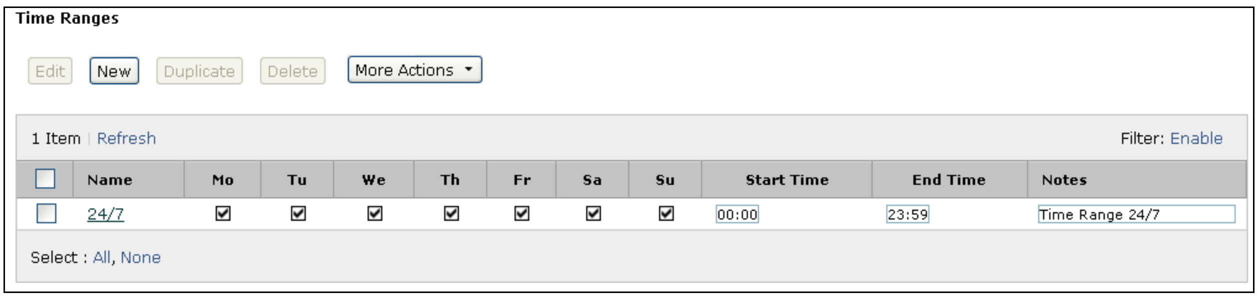
8.5. Time Ranges

The Time Ranges form allows admission control criteria to be specified for Routing Policies. In the reference configuration, no restrictions were used.

To add a Time Range, navigate to ***Routing → Time Ranges***, and click on the **New** button (not shown). Provide the following information:

- Enter a descriptive Location name in the **Name** field (e.g. “24/7”).
- Check each day of the week.
- In the **Start Time** field, enter “00:00”.
- In the **End Time** field, enter “23:59”.
- Enter a description in the **Notes** field if desired.

Click the **Commit** button. The following screen shows the Time Range page used during the compliance test.



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8.6. Configure Routing Policy

Routing Policies associates destination SIP Entities with Time of Day admission control parameters and Dial Patterns. In the reference configuration, Routing Policies are defined for: Business Communication Manager.

To add a Routing Policy, navigate to ***Routing → Routing Policy***, and click on the **New** button (not shown) on the right. Provide the following information:

<u>General section</u>

- Enter a descriptive name in the **Name** field.
- Enter a description in the **Notes** field if desired.

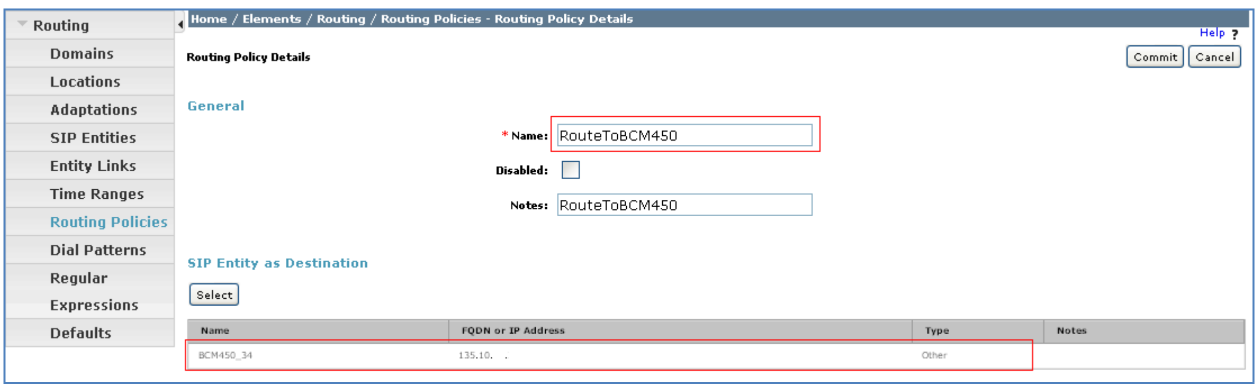
<u>SIP Entity as Destination section</u>

- Click the **Select** button.
- Select the SIP Entity that will be the destination for this call (not shown).
- Click the **Select** button and return to the Routing Policy Details form.

<u>Time of Day section</u>

- Leave default values.

Click **Commit** to save Routing Policy definition. The following screen shows the Routing Policy used for the compliance test.



Repeat the steps to define routing policies to others Entities.

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8.7. Dial Patterns

Dial Patterns define digit strings to be matched for inbound and outbound calls. In addition, the domain in the request URI is also examined. In the compliance test, the following dial patterns are defined from Session Manager.

- 222xx – SIP endpoints in BCM
- 39990 – Avaya Aura Messaging Pilot Number.

To add a Dial Pattern, select ***Routing → Dial Patterns*****,** and click on the **New** button (not shown) on the right. During the compliance test, 5 digit dial plan was utilized. Provide the following information:

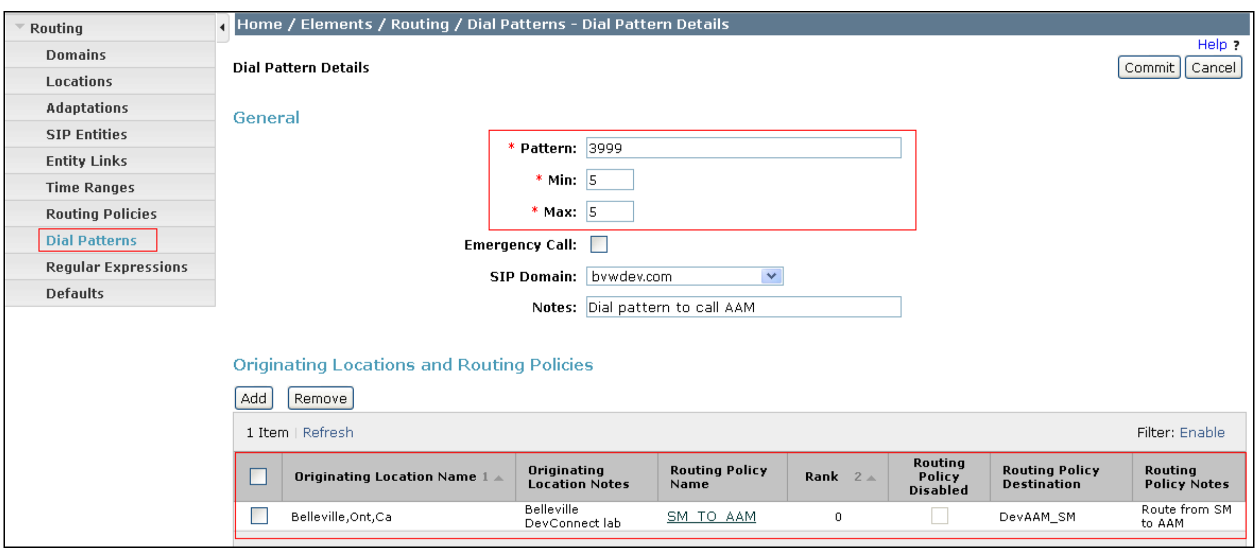
General section

- Enter a unique pattern in the **Pattern** field (e.g. "399").
- In the **Min** field enter the minimum number of digits (e.g. "5").
- In the **Max** field enter the maximum number of digits (e.g. "5").
- In the **SIP Domain** field drop down menu select the domain that will be contained in the Request URI *received* by Session Manager from BCM and AAM.
- Enter a description in the **Notes** field if desired.

Originating Locations and Routing Policies section

- Click on the **Add** button and a window will open (not shown).
- Click on the boxes for the appropriate Originating Locations and Routing Policies that pertain to this Dial Pattern.
  - Location All.
  - Routing Policies **SM_to_AAM**.
  - Click on the **Select** button and return to the Dial Pattern window.

Click the **Commit** button to save the new definition. The following screen shows the dial pattern used for Messaging during the compliance test. Repeat the same for Avaya BCM with Pattern: 222.



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9. Configure Avaya Aura® Messaging

Messaging was configured for SIP communication with Session Manager and also to add Avaya BCM, Communication Manager Subscribers. The procedures include the following areas:

- Administer Sites
- Administer Telephony Integration
- Administer Dial Rules
- Administer Class of Service to enable Message Waiting
- Administer Subscribers

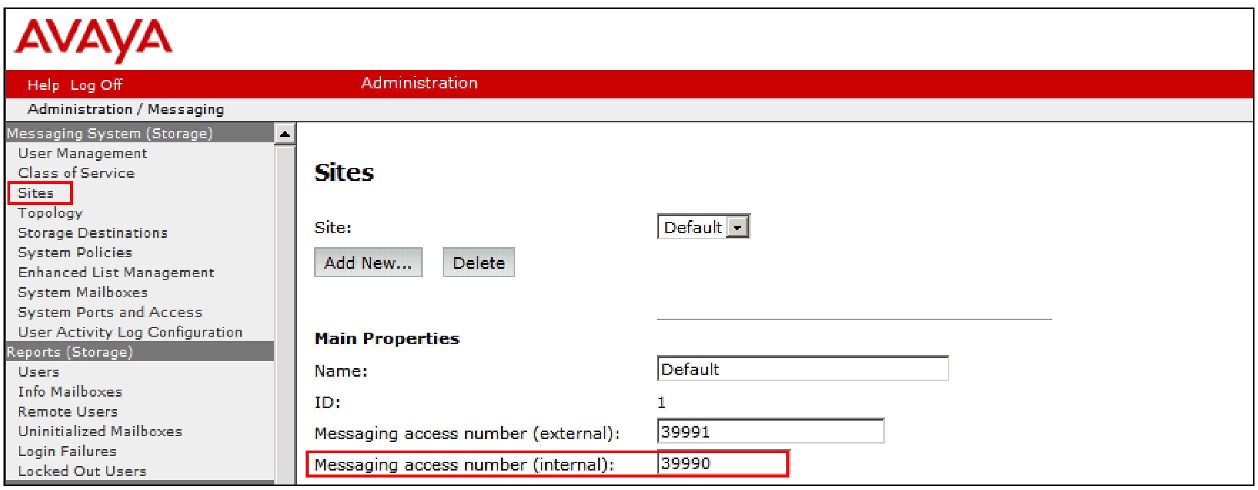
See references in **Section 12** for standard installation and configuration information. General knowledge of the configuration tools and interfaces is assumed.

9.1. Administer Sites

A Messaging access number and a Messaging Auto Attendant number needs to be defined. Log into the Avaya Aura Messaging System Management Interface (SMI) and go to ***Administration* → *Messaging* → *Messaging System (Storage)* → *Sites***. In the right panel fill in the following:

Under **Main Properties:**

- **Messaging access number (internal)** Enter a Messaging Pilot number



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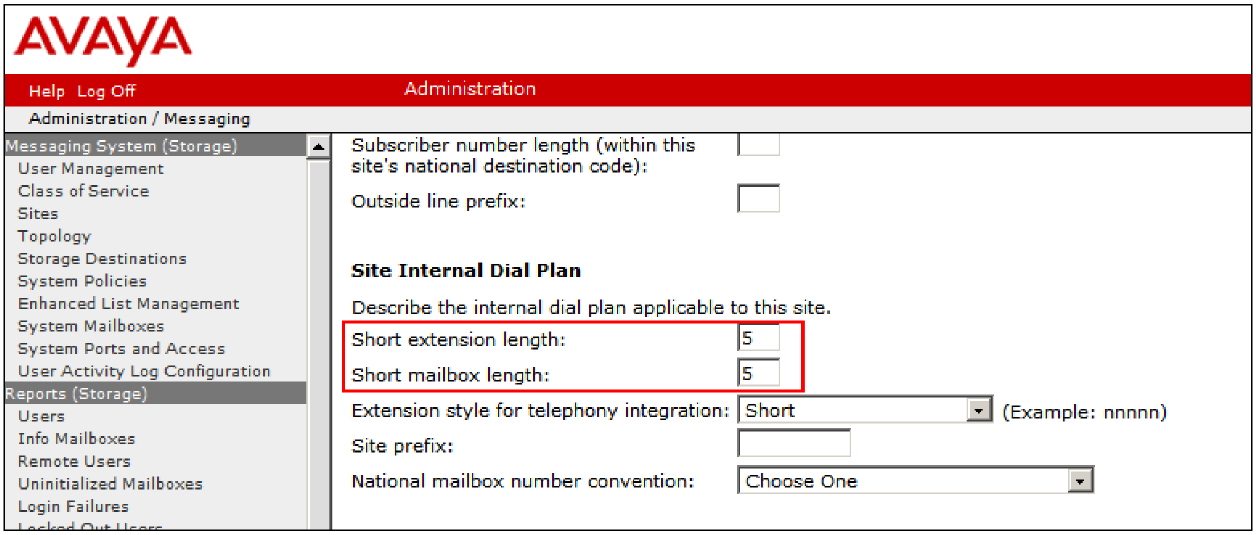
Scroll down to the **Site Internal Dial Plan** section.

Under **Site Internal Dial Plan:**

- **Short Extension Length** Enter the number of digits in extensions
- **Short Mailbox Length** Enter the number of digits in mailbox numbers



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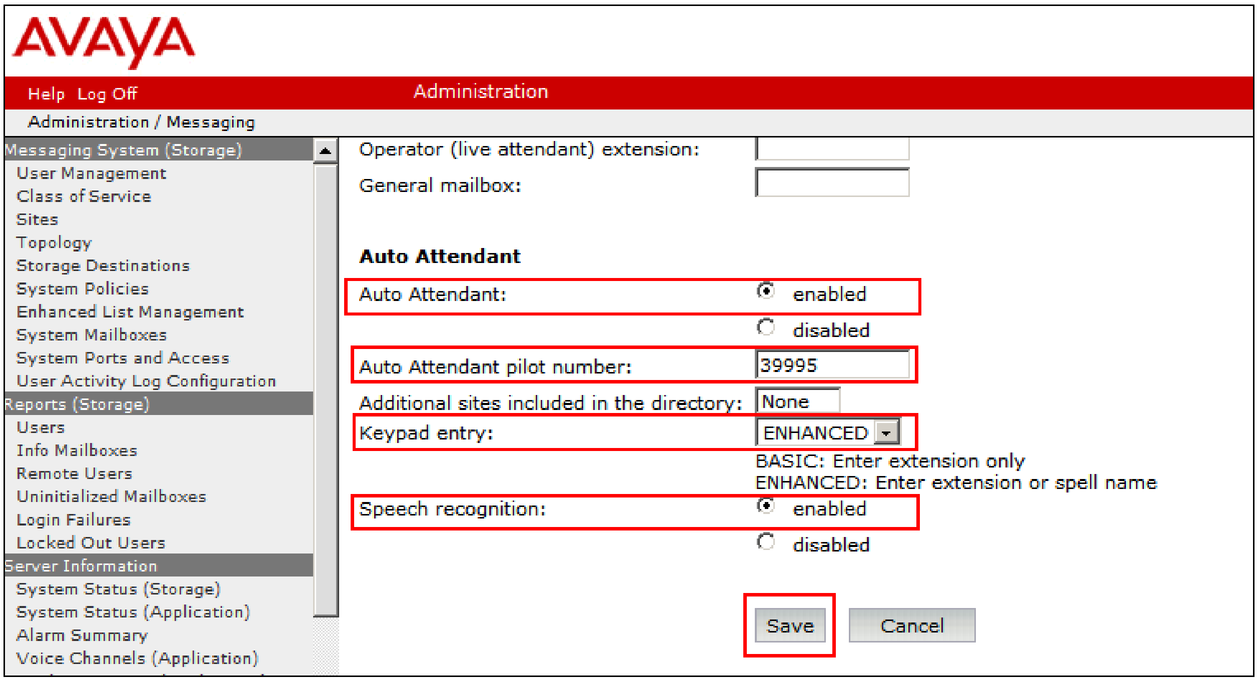
Scroll down to the **Auto Attendant** section.
Under **Auto Attendant:**

- **Auto Attendant** Select "Enabled"
- **Auto Attendant pilot number** Enter an Auto Attendant number
- **Keypad entry** Select "ENHANCED"
- **Speech recognition** Select "Enabled"

Click **Save** to save changes.



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9.2. Administer Telephony Integration

A SIP trunk needs to be configured from Messaging to Session Manager. Log into the Messaging System Management Interface (SMI) and go to ***Administration → Messaging →Telephony Settings (Application) →Telephony Integration***. In the right panel fill in the following:

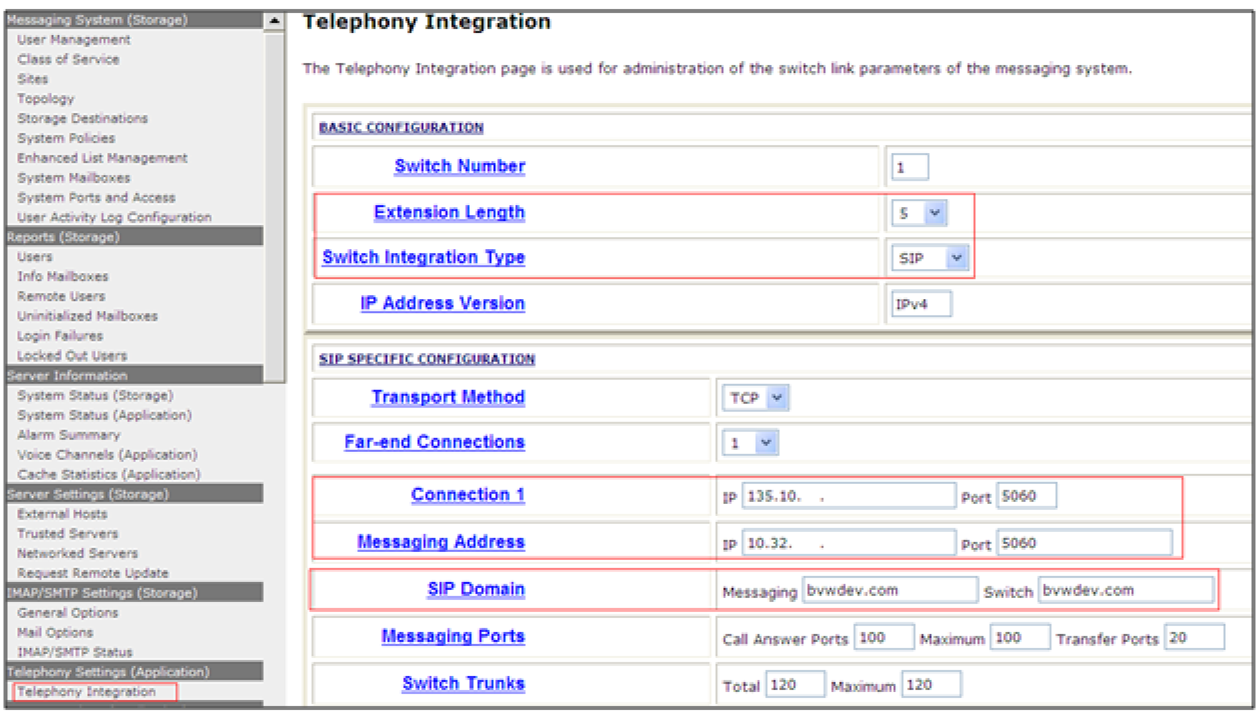
Under **Basic Configuration:**

- **Extension Length:** Enter the length of extensions
- **Switch Integration Type:** SIP

Under **SIP Specific Configuration:**

- **Transport Method:** "TCP"
- **Connection 1:** Enter the Session Manager signaling IP address and TCP port number
- **Messaging Address** Enter the Messaging IP address and TCP port number
- **SIP Domain** Enter the Messaging and Session Manager domain names

Click **Save** to save changes.



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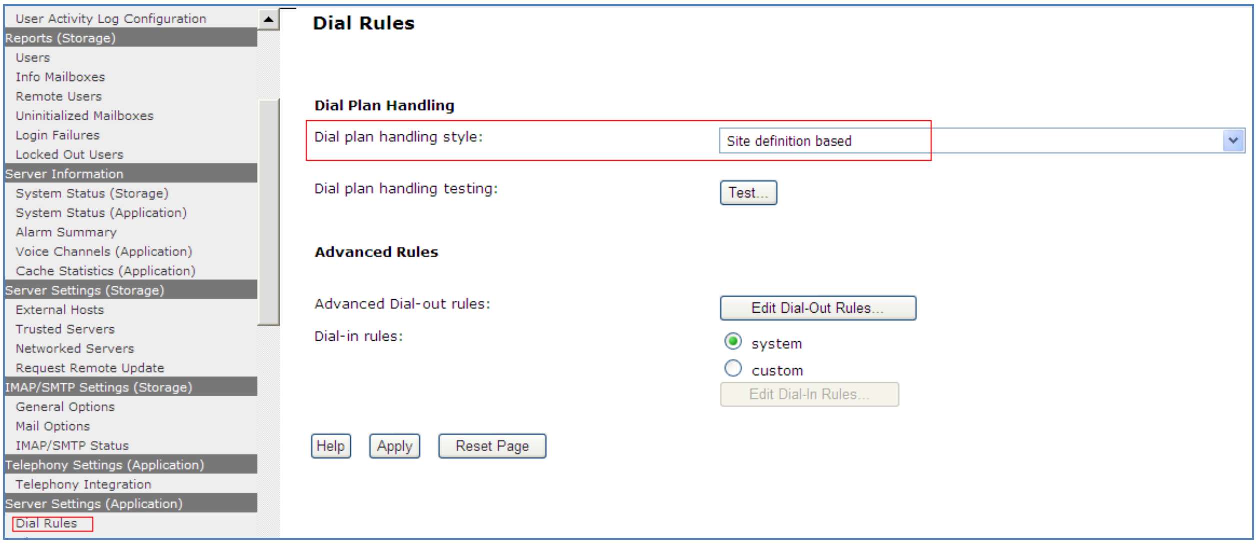
9.3. Configure Dial Rules

Navigate to Administration ***Messaging →Server Settings (Application) → Dial Rules*** to configure the dial rules. Set the **Dial plan handling style:** Site definition based**,** as shown below.



Next select the **Edit Dial-Out Rules** button to verify the appropriate parameters for outbound dialing from Avaya Aura® Messaging were set above. These dial rules help Avaya Aura® Messaging send the correct number and combination of digits when originating a call to Communication Manager, whether the call is destined for another extension or ultimately expected to be routed to the PSTN.

For the sample configuration, 7-digit extensions were used on Avaya Communication Manager so any time Avaya Aura Messaging originates a call to an extension it should send the 7-digit number and not attempt to insert or delete any digits.

Scroll down to the section titled **Dial-out Test Numbers**. Enter in a number in the appropriate section and select the **Test** button to see how Avaya Aura® Messaging would dial that number. As shown below the number **7785002** is treated as an internal number and is dialed intact, whereas the test number **408-555-7086** is treated as a long-distance national number which requires a **9** prefixed as an access code.

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Dial-Out Test Numbers

```
# Examples below.
# Add more phone numbers to test for your specific configuration.

# Extension (example):
2001
7785002
(212) 555-7086


# Local number (example):
555-7086
333-3030

# Long-distance number (example):
(408) 555-7086
```

Test Save

Dial-Out Test Results

Input Phone Number	→	Call Type	Output Phone Number
2001	→	INTERNAL	2001
7785002	→	INTERNAL	7785002
555-7086	→	INTERNAL	5557086
333-3030	→	INTERNAL	3333030
(408) 555-7086	→	LONGDISTANCE	914085557086

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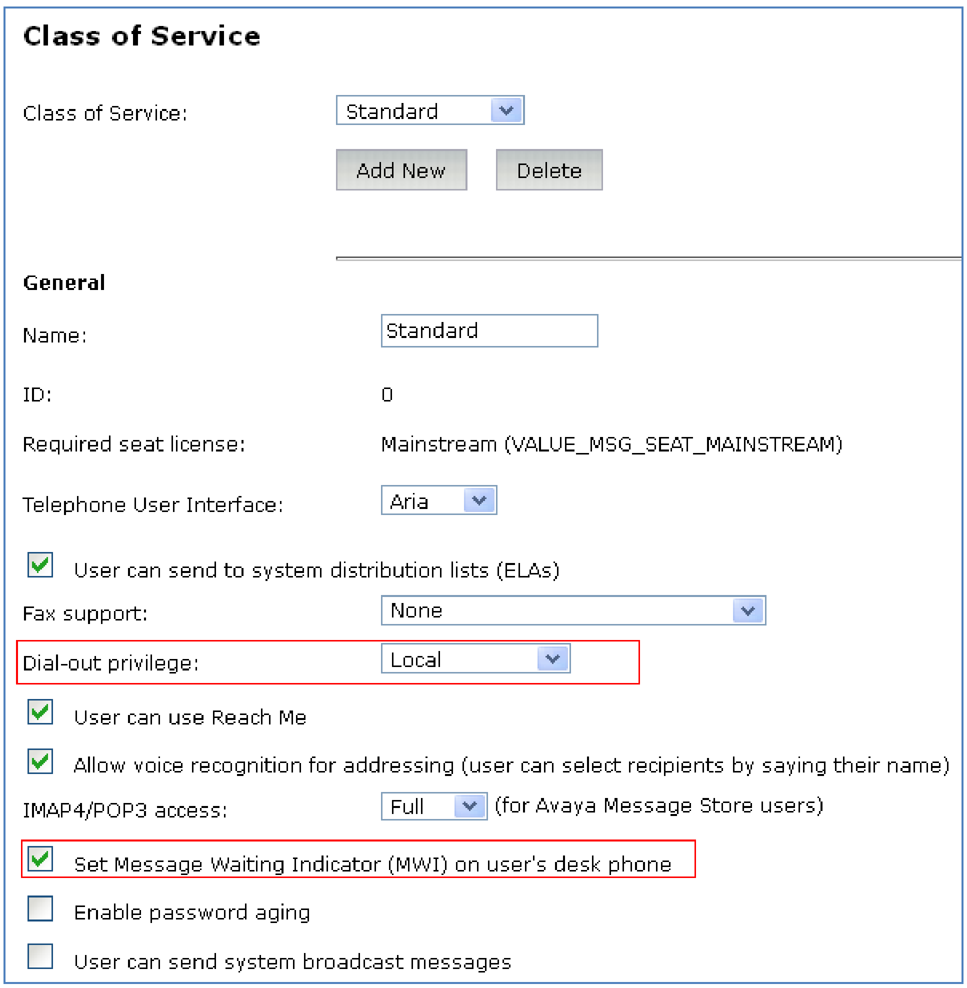
9.4. Configure Class of Service

Verify Messaging Waiting is enabled for all subscribers.
Use ***Administration → Messaging → Messaging System (Storage) → Class of Service***.
Select **Standard** from the **Class of Service** drop-down menu.
Under **General** section, enter the following value and use default values for remaining fields.

- **Set Message Waiting Indicator (MWI) on user's desk phone:** checked.
- **Dial-out privilege**: Local.

Under **Greetings** section, enter for **Two Greetings (different greetings for busy and noanswer)** field to allow subscribers to record different personal greetings for busy and no-answer scenarios.
Click **Save** (not shown) to save changes.

The following screen shows the settings defined for the "Standard" **Class of Service** in the test configuration.



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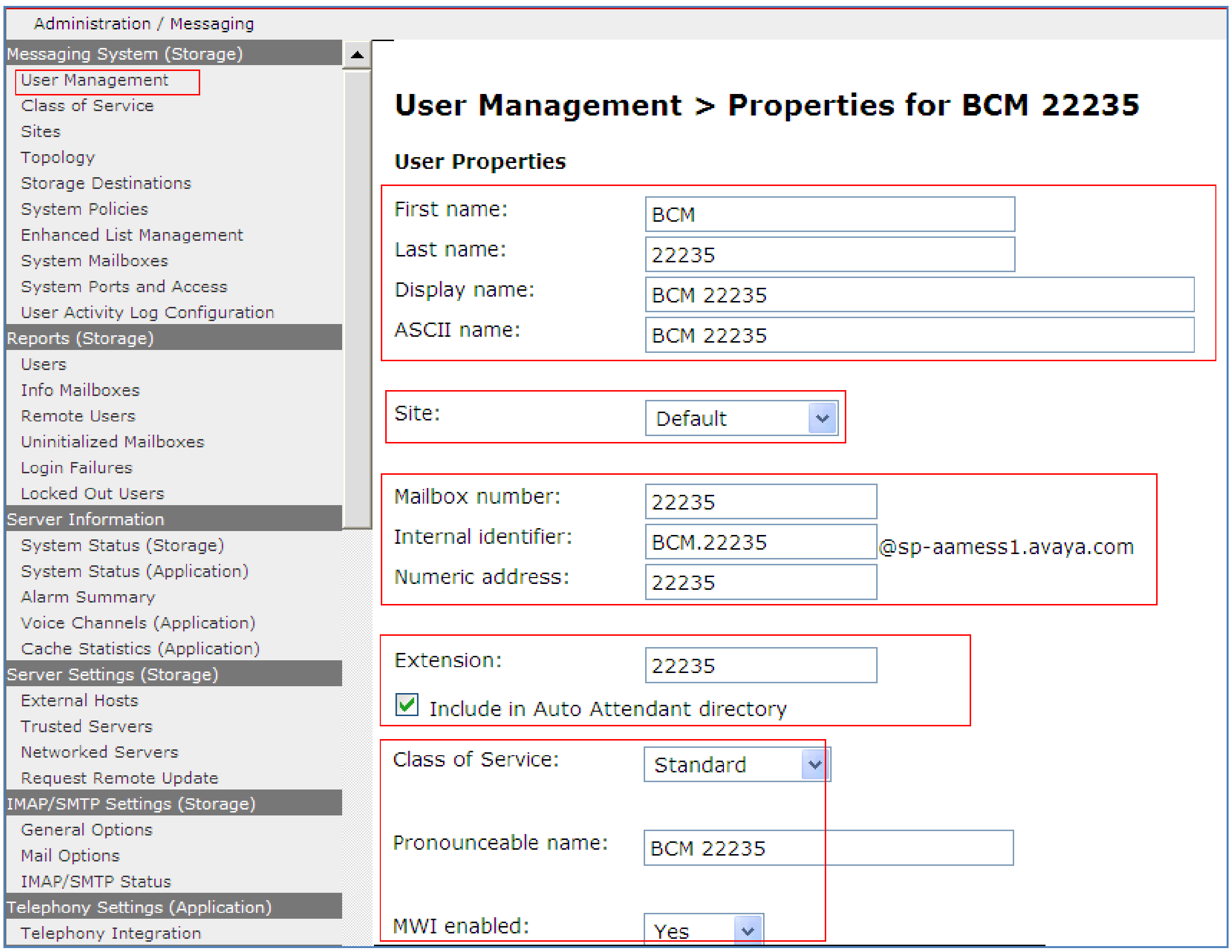
9.5. Administer Subscribers

Log into the Messaging System Management Interface (SMI) and go to ***Administration → Messaging***. In the left panel, under ***Messaging System (Storage)*** select ***User Management***. In the right panel fill in the following:

- **First Name** Enter first name
- **Last Name** Enter last name
- **Display Name** Enter display name
- **ASCII name** Enter the ASCII name
- **Site** Enter site defined in **Section 9.1**
- **Mailbox Number** Enter desired mailbox number i.e. "22235"
- **Internal identifier** Enter the name for internal use
- **Numeric address** Enter the mailbox number
- **Extension** Enter desired extension number i.e. "22235"



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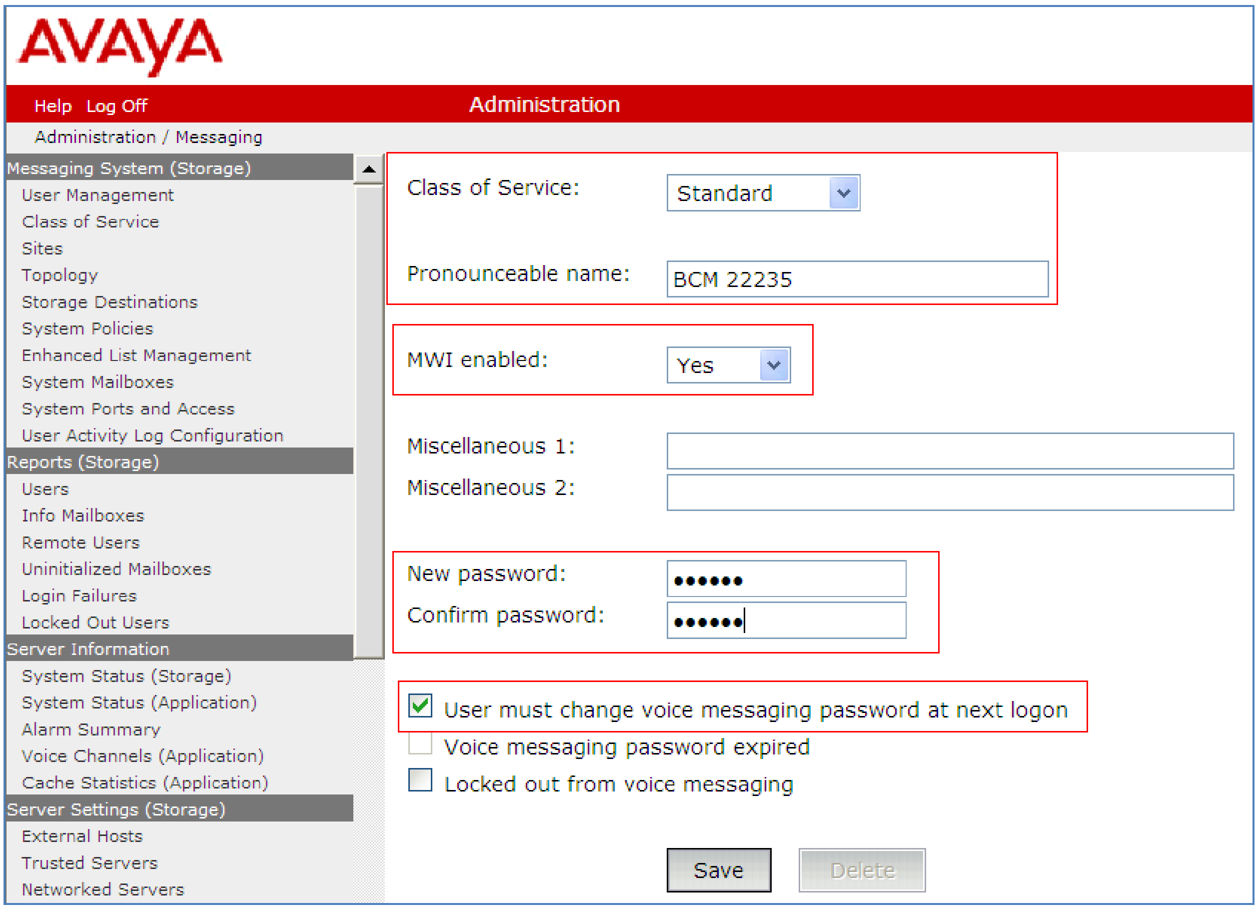
Scroll down on the page to Class of Service.

- **Class of Service** Select a Class of Service
- **Pronounceable Name** Enter a pronounceable name to be used when dialing the extension using voice commands
- **MWI Enabled** Select "Yes" to enable the MWI light on phones
- **New Password/Confirm Password** Enter desired extension password
- **Next logon password change** Select the **Checkbox**

Click **Save** to save changes.



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10. Verification Steps

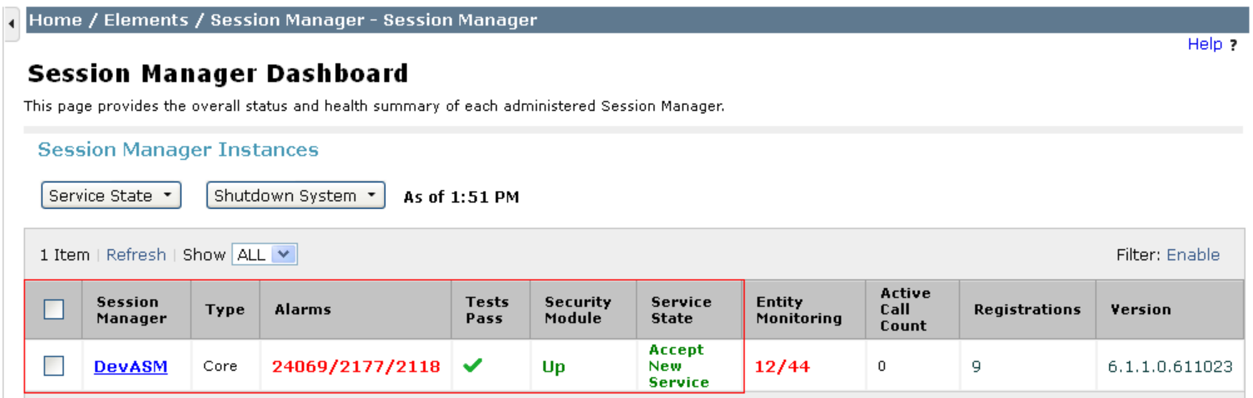
10.1. Verify Avaya Aura® Session Manager Operational Status

10.1.1. Verify Avaya Aura® Session Manager is Operational

Navigate to ***Elements → Session Manager → Dashboard*** (not shown) to verify the overall system status for Session Manager.

Specifically, verify the status of the following fields as shown below:

- **Tests Pass:** ✔
- **Security Module:** Up
- **Service State:** Accept New Service



Home / Elements / Session Manager - Session Manager

Help ?

Session Manager Dashboard

This page provides the overall status and health summary of each administered Session Manager.

Session Manager Instances

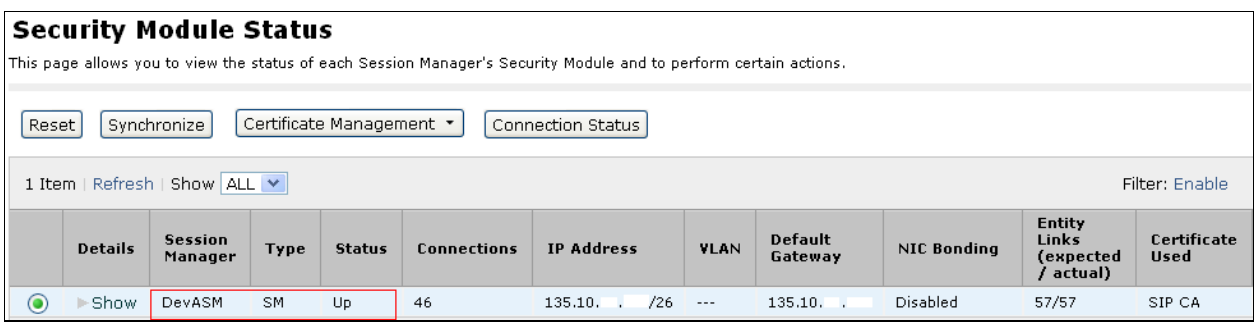
Service State ▾ | Shutdown System ▾ | As of 1:51 PM

1 Item | Refresh | Show ALL | Filter: Enable

	Session Manager	Type	Alarms	Tests Pass	Security Module	Service State	Entity Monitoring	Active Call Count	Registrations	Version
☐	DevASM	Core	24069/2177/2118	✔	Up	Accept New Service	12/44	0	9	6.1.1.0.611023

Session Manager Instances status.

Navigate to ***Elements → Session Manager → System Status → Security Module Status*** (not shown) to view more detailed status information on the status of Security Module for the specific Session Manager. Verify the **Status** column displays "**Up**" as shown below.



Security Module Status

This page allows you to view the status of each Session Manager's Security Module and to perform certain actions.

Reset | Synchronize | Certificate Management ▾ | Connection Status

1 Item | Refresh | Show ALL | Filter: Enable

	Details	Session Manager	Type	Status	Connections	IP Address	VLAN	Default Gateway	NIC Bonding	Entity Links (expected / actual)	Certificate Used
◉	▸ Show	DevASM	SM	Up	46	135.10. . /26	---	135.10. .	Disabled	57/57	SIP CA

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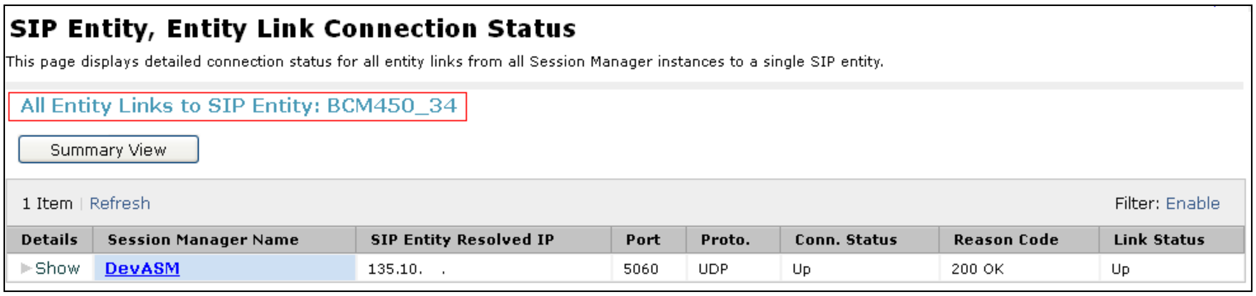
10.1.2. Verify SIP Entity Link Status

Navigate to ***Elements → Session Manager → System Status → SIP Entity Monitoring*** (not shown) to view more detailed status information for one of the SIP Entity Links.

Select the SIP Entity for BCM from the **All Monitored SIP Entities** table (not shown) to open the ***SIP Entity, Entity Link Connection Status*** page.

In the All Entity Links to SIP Entity: BCM450_34table, verify the **Conn. Status** for the link is "**Up**" as shown below.



SIP Entity, Entity Link Connection Status

This page displays detailed connection status for all entity links from all Session Manager instances to a single SIP entity.

All Entity Links to SIP Entity: BCM450_34

Summary View

1 Item | Refresh Filter: Enable

Details	Session Manager Name	SIP Entity Resolved IP	Port	Proto.	Conn. Status	Reason Code	Link Status
▶ Show	DevASM	135.10. .	5060	UDP	Up	200 OK	Up

As described above the Entity link connection status can also be viewed for the AAM. Verify that the **Conn. Status** is also **Up (**not shown).

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10.2. Verify Avaya Aura® Messaging

10.2.1. Verify no answer call

Make a call from a Avaya BCM endpoint to another Avaya BCM endpoint and verify that the call covers to Messaging upon no answer. Leave a voice message. Verify that the MWI light of the called phone turns on. From the receiving Avaya BCM endpoint, dial the Messaging access number to retrieve the message. Verify that the Messaging system identifies the Avaya BCM endpoint and that the voice message can be retrieved. Verify that the MWI light turns off.

Log into the Messaging System Management Interface (SMI) and go to ***Administration* → *Messaging***. In the left panel, under ***Logs*** select ***User Activity***. In the right panel fill in the following:

Under **User Activity Log:**

- **Mailbox Number** Enter the BCM extension that received the voicemail.
- **Start Date** Enter an appropriate start date and time.
- **End Date** Enter an appropriate end date and time.

Click **Display** button and verify that a listing of the detailed activities is displayed into the bottom portion of the right hand pane. Verify that there is an entry showing the message left by a subscriber (in this case 22234). Also verify that there is an entry showing the message being retrieved.

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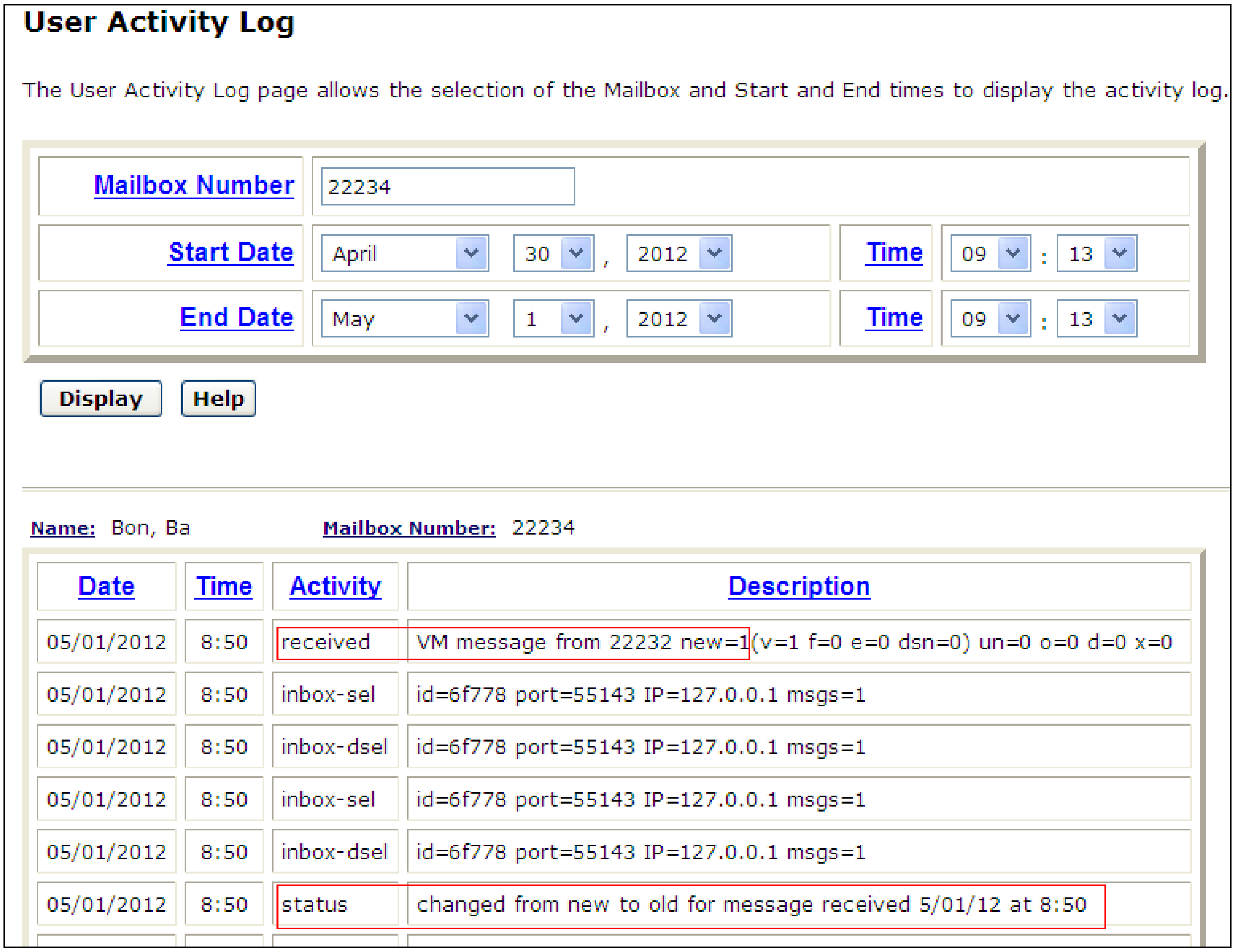

10.2.2. Test calls can be made from Avaya Aura Messaging to phones that are configured with mailboxes.

To perform this test, select ***Administration → Messaging***. In the left panel, under ***Diagnostics*** select ***Diagnostics (Application)***. In the right panel fill in the following:

- **Select the test(s) to run:** Select **Call-out** from the drop down menu.
- **Telephone number:** Enter the number to call.

Click on **Run Tests** to start the test. The phone will ring and when answered a test message is played. The **Results** section of the page will update indicating that the call was ok as shown below.

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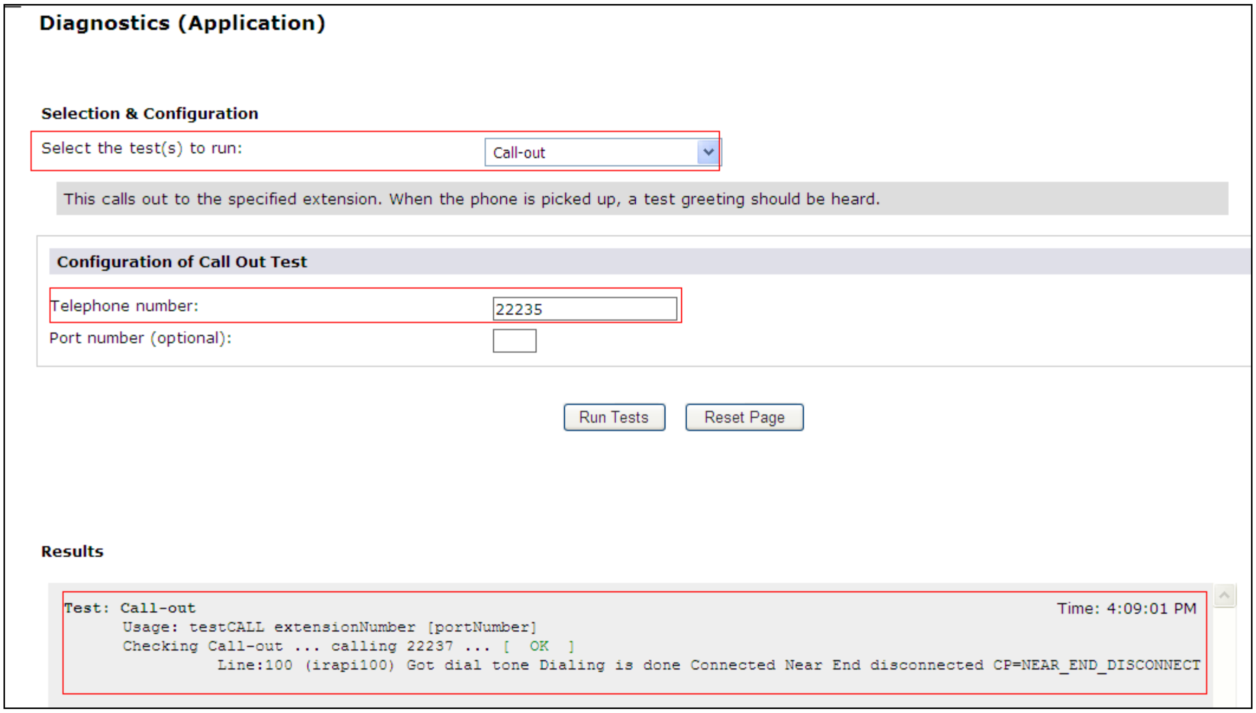

10.2.3. Message Waiting Indicator (MWI) light on phones.

To perform this test, select ***Administration*** → ***Messaging***. In the left panel, under ***Diagnostics*** select ***Diagnostics (Application)***. In the right panel fill in the following:

- **Select the test(s) to run:** Select **MWI** from the drop down menu.
- **Extension number:** Enter the number of the phone to test.

Click on **Run Tests** to start the test. The phones MWI light will turn on and off. The **Results** section of the page will update with information about the test as shown below.

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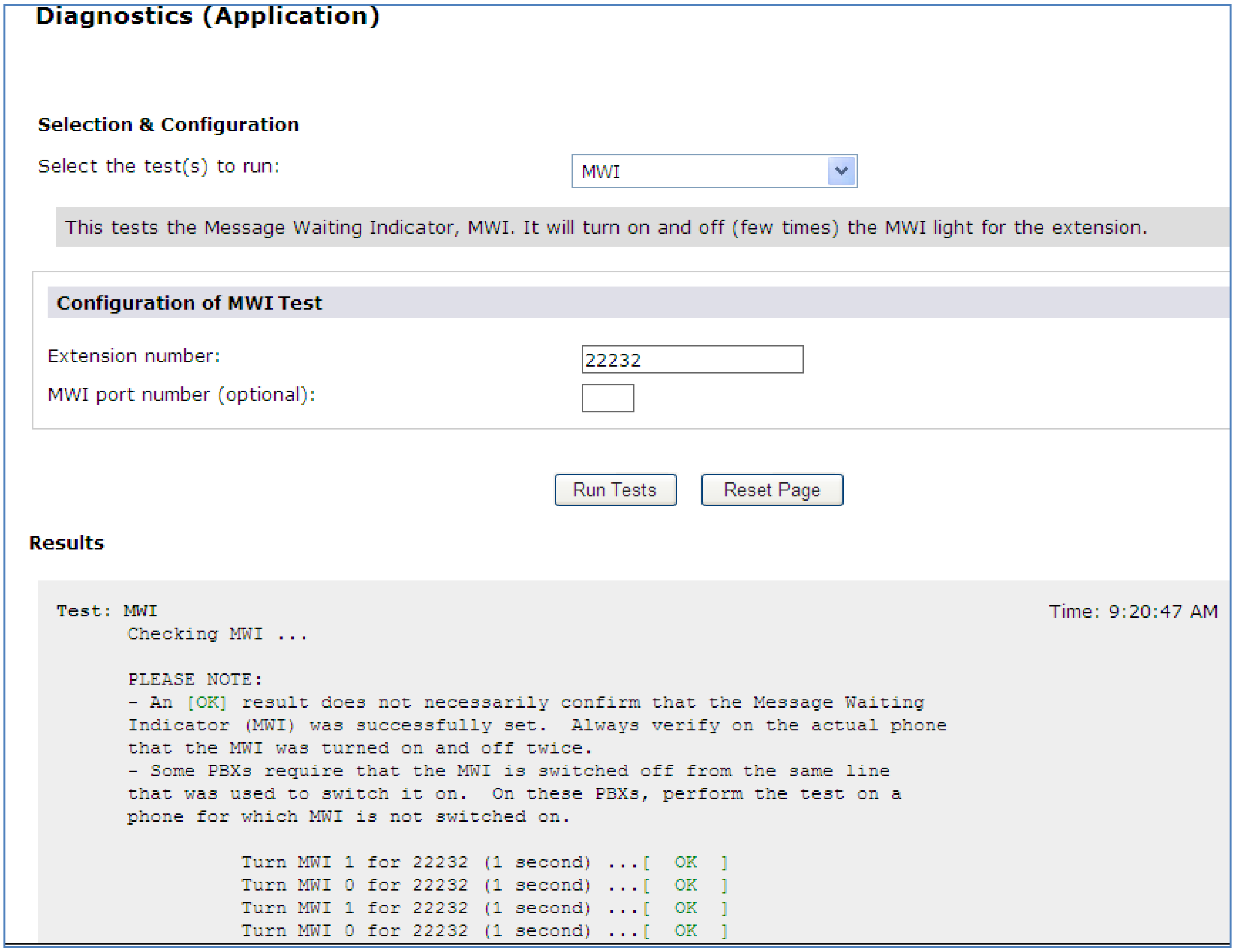

10.2.4. Other call scenarios

- Call to Forward All(forward to messaging access number) endpoint
- Call to Busy endpoint (messaging access number is set if this endpoint busy)

All the call is forwarded to pilot number.

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11. Conclusion

Interoperability testing of Avaya Aura® Messaging 6.1 Single Server as a voice mail solution for Avaya Business Communication Manager with SIP Trunking through Avaya Aura® Session Manager R6.2 was successfulm. See section **2.2**for detail of test result and observation.

12. Additional References

This section provides references to the product documentation relevant to this Application Note.

Documentation for Avaya products may be found at http://support.avaya.com.

Avaya Aura® Session Manager

1) Avaya Aura® Session Manager Overview, Doc ID 03-603323
2) Installing and Configuring Avaya Aura® Session Manager
3) Avaya Aura® Session Manager Case Studies
4) Maintaining and Troubleshooting Avaya Aura® Session Manager, Doc ID 03-603325
5) Administering Avaya Aura® Session Manager, Doc ID -3-603324

Avaya Aura® Messaging

6) Administering Avaya Aura® Messaging 6.1 CID: 151610 December 2011
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9) Avaya Business Communication Manager 6.0 Planning and Engineering NN40170-200

10) Avaya Business Communication Manager 6.0 Configuration - Telephony NN40170-502

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11) Avaya Aura® Communication Manager Screen Reference Release 6.2 03-602878 Issue 3.0 February 2012

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