

Avaya Solution & Interoperability Test Lab

Application Notes for VTech CTM-S2110/CTM-S2115/CTM-S2116 SIP IP Phones with Avaya Aura® Communication Manager 8.1 and Avaya Aura® Session Manager 8.1 – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the Vtech CTM-S2115 SIP Hotel Phone to interoperate with Avaya Aura® Communication Manager 8.1 and Avaya Aura® Session Manager 8.1. VTech CTM-S2115 SIP hospitality phone registers with Avaya Aura® Session Manager as a SIP endpoint in support of voice communications.

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

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

1. Introduction

These Application Notes describe the configuration steps required for the VTech CTM-S2115 SIP Hotel Phone to interoperate with Avaya Aura® Communication Manager and Avaya Aura® Session Manager. VTech CTM-S2110, CTM-S2115, and CTM-S2116 are cordless 1-line models. Testing used the CTM-S2115 as a representative model. See **Attachment 1**, which provides details of CTM-S2110/CTM-S2116 equivalency to the CTM-S2115 model for which this testing applies.

2. General Test Approach and Test Results

The general test approach was to place calls to and from VTech CTM-S2115 and exercise basic telephone operations. The main objectives were to verify the following:

- SIP registration
- Codecs (G.711, G.722, G.726, and G.729)
- Inbound calls and outbound calls
- Call termination (origination/destination)
- Avaya telephony features using FAC (Call Pickup, Call Forward, and Find Me)
- Message Waiting Indicator (MWI)
- Voicemail Coverage
- Serviceability

As the purpose of these phones is for hotel guest rooms, certain functionality considered to be standard on Avaya endpoints is not supported and therefore was not tested. For example, VTech CTM-S2115 does not support multiple line appearances. More details on these limitations are described in the Test Results in **Section 2.2**.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

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

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

For the testing associated with these Application Notes, the interface between Avaya systems and the VTech phones enabled capabilities of TLS/SRTP.

2.1. Interoperability Compliance Testing

VTech CTM-S2115 registers with Session Manager and thus is able to use Communication Manager telephony features in a similar manner to Avaya SIP endpoints. The following areas were evaluated in the compliance test:

- Registration of VTech CTM-S2115 to Session Manager.
- Basic call features: Answer, Hold/Resume, Mute/Un-mute, Drop, Message Waiting Indicator, DTMF, Call Pickup, Call Waiting, Call Forward.
- Codec negotiation, Media Shuffling, and Session Refresh Interval.
- Hospitality features: Automatic Wakeup Call and Housekeeping status.
- Serviceability testing to validate recovery from network connectivity loss.

2.2. Test Results

All test cases were executed. The following observations were made during the testing:

- CTM-S2115 does not support the following features
 - Call Park/unpark
 - o Transfer
 - Conference
 - o Programmable buttons do not support feature access codes with data input
- The VTech G.726 codec payload type of 2 is not supported by Communication Manager. This is acceptable to VTech.
- CTM-S2115 uses a flash hook to implement call waiting.
- CTM-S2115 does not support SDP negotiation capabilities per (RFC5939) between SRTP and non-SRTP modes so codec sets for the phones must not offer both modes. Employing a separate codec set for the phones' encryption capabilities is a possible alternative to support endpoints that use SDP negotiation in a mixed environment.

2.3. Support

Technical support for VTech CTM-S2115 SIP Phones can be obtained at:

- Phone: 1 (888) 907-2007
- https://vtechhotelphones.com

3. Reference Configuration

Figure 1 illustrates the test configuration diagram for VTech CTM-S2115 integrated to Avaya Aura Communication Manager and Avaya Aura System Manager. VTech CTM-S2115 registers to Session Manager via SIP and uses the telephony features from Communication Manager.

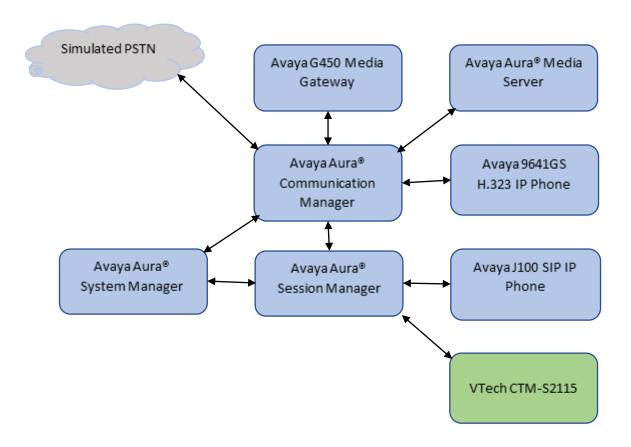


Figure 1: Avaya Test Configuration for VTech CTM-S2115

4. Equipment and Software Validated

The following equipment and software were used for the compliance test provided:

Equipment/Software	Release/Version
Avaya Aura® Communication Manager running on a virtual server	8.1.3.0.1.890.26685
Avaya Aura® System Manager running on virtual Machine	8.1.3.0.813014
Avaya Aura® Session Manager running on a virtual server	8.1.3.0.813014
Avaya G450 Media Gateway	41.34.1
Avaya 9641GS IP Phone (H.323)	R6_8_5_11-050321
Avaya J100 IP Phone (SIP)	R4_0_9_0-040821
VTech CTM-S2115 IP Phone	2.18.6.0
VTech CTM-4402 cordless handset included with CTM-S2115	1.1.26-0

5. Configure Avaya Aura® Communication Manager

This section describes the steps for configuring Communication Manager. The procedures include the following areas:

- Verify the Communication Manager OPS Licensed Capacity
- Administer IP Network Region
- Administer IP Codec Set

Use the System Access Terminal (SAT) to configure Communication Manager and log in with the appropriate credentials. The configuration steps illustrate field values changed for this reference configuration. Default values were used for all other fields.

Note: It is assumed that basic configuration of the Communication Manager has already been completed, such as the SIP trunk to Session Manager. The SIP station configuration for VTech CTM-S2115 is configured through System Manager in **Section 6.2.**

5.1. Verify Communication Manager OPS Licensed Capacity

Using the SAT, verify that the Off-PBX Stations (OPS) and SIP Trunks features are enabled on the **system-parameters customer-options** form. The license file installed on the system controls these options. If a required feature is not enabled, contact an authorized Avaya sales representative.

On **Page 1**, verify that the number of OPS stations allowed in the system is sufficient for the number of SIP endpoints that will be deployed.

```
display system-parameters customer-options
                                                             Page 1 of 12
                             OPTIONAL FEATURES
    G3 Version: V18
                                              Software Package: Enterprise
      Location: 2
                                               System ID (SID): 1
      Platform: 28
                                               Module ID (MID): 1
                             Platform Maximum Ports: 48000 111
                                 Maximum Stations: 36000
                            Maximum XMOBILE Stations: 36000
                  Maximum Off-PBX Telephones - EC500: 41000
                                                              0
                  Maximum Off-PBX Telephones - OPS: 41000
                  Maximum Off-PBX Telephones - PBFMC: 41000
                                                              0
                  Maximum Off-PBX Telephones - PVFMC: 41000
                                                               Ω
                  Maximum Off-PBX Telephones - SCCAN: 0
                       Maximum Survivable Processors: 313 0
       (NOTE: You must logoff & login to effect the permission changes.)
```

5.2. Administer IP Network Region

This IP network region is for the signaling group associated with the SIP trunk between Session Manager and Communication Manager. This form also specifies the **IP Codec Set** to be used for calls routed over the SIP trunk to Session Manager. Verify the following values:

Authoritative Domain: The applicable domain (e.g., avaya.com)
 Codec Set: The codec set number from Section 5.3

By default, **IP-IP Direct Audio** (shuffling) is enabled to allow audio traffic to be sent directly between IP endpoints without using media resources in the G450 Media Gateway or Media Server.

```
change ip-network-region 1
                                                                      1 of 20
                                                               Page
                              IP NETWORK REGION
  Region: 1
Location: 1
                Authoritative Domain: avaya.com
   Name: Main
MEDIA PARAMETERS
                               Intra-region IP-IP Direct Audio: yes
     Codec Set: 1
                               Inter-region IP-IP Direct Audio: yes
  UDP Port Min: 2048
                                          IP Audio Hairpinning? n
  UDP Port Max: 3329
DIFFSERV/TOS PARAMETERS
Call Control PHB Value: 46
       Audio PHB Value: 46
       Video PHB Value: 26
802.1P/Q PARAMETERS
Call Control 802.1p Priority: 6
       Audio 802.1p Priority: 6
       Video 802.1p Priority: 5
                                     AUDIO RESOURCE RESERVATION PARAMETERS
H.323 IP ENDPOINTS
                                                        RSVP Enabled? n
 H.323 Link Bounce Recovery? y
 Idle Traffic Interval (sec): 20
  Keep-Alive Interval (sec): 5
           Keep-Alive Count: 5
```

5.3. Administer IP Codec Set

In the **IP Codec Set** form, select the audio codec type supported for calls routed over the SIP trunk to VTech CTM-S2115. The form is accessed via the **change ip-codec-set 1** command. Note that IP codec set **1** is specified in **IP Network Region 1** from **Section 5.2**. The form shows the list of codecs tested. Enter values for the following:

Audio Codec: The audio codecs tested
 Media Encryption: Do not include none

Note: Avaya endpoints supporting both RTP/SRTP may be administered in a separate codec set.

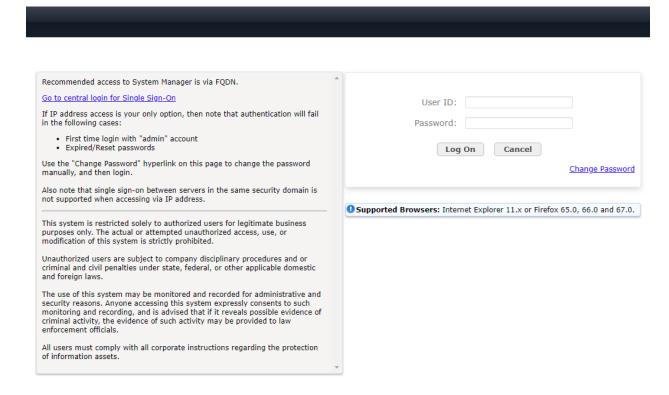
6. Configure Avaya Aura® Session Manager

This section provides the procedures for configuring Session Manager. The steps include the following areas.

- Launch System Manager
- Administer SIP Users

6.1. Launch System Manager

Access Session Manager Administration web interface by entering http://<ip-address>/SMGR in a web browser, where <ip-address> is the IP address of System Manager. Log in using the appropriate credentials.



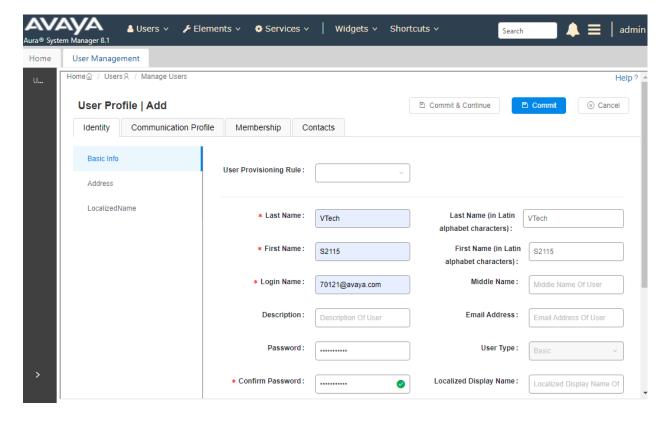
6.2. Administer SIP Users

VTech CTM-S2115 is administered as a SIP user on Session Manager by the following steps. This configuration is automatically synchronized with Communication Manager. In Session Manager, select Users → User Management → Manage Users to display the User Management screen (not shown). Click + New to add a user.

6.2.1. Identity

Enter values for the following required attributes for a new SIP user in the **New User Profile** screen:

Last Name: Enter the last name of the user, e.g., VTech
 First Name: Enter the first name of the user, e.g., S2115
 Login Name: Enter <extension>@<sip domain> of the user (e.g., 70121@avaya.com)



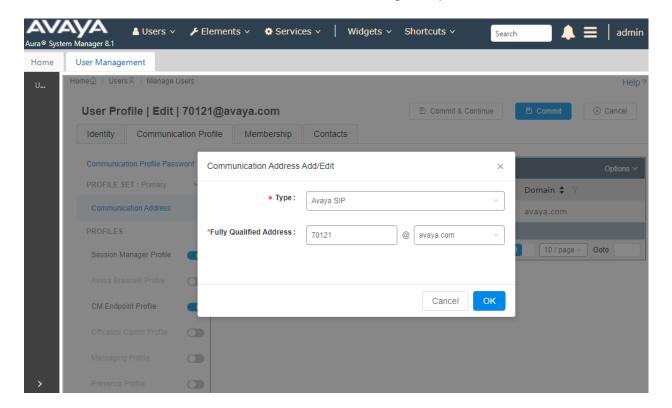
6.2.2. Communication Address

Select **Communication Address** in the left list and click + **New** (not shown).

Enter the following attributes for the **Communication Address**:

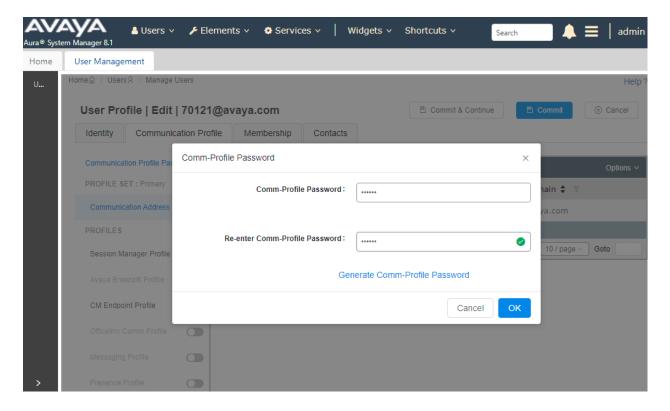
• **Type:** Select **Avaya SIP** from the drop-down list

Fully Qualified Address: Enter the extension number (e.g., 70121)
 Domain: Enter the domain (e.g., avaya.com)



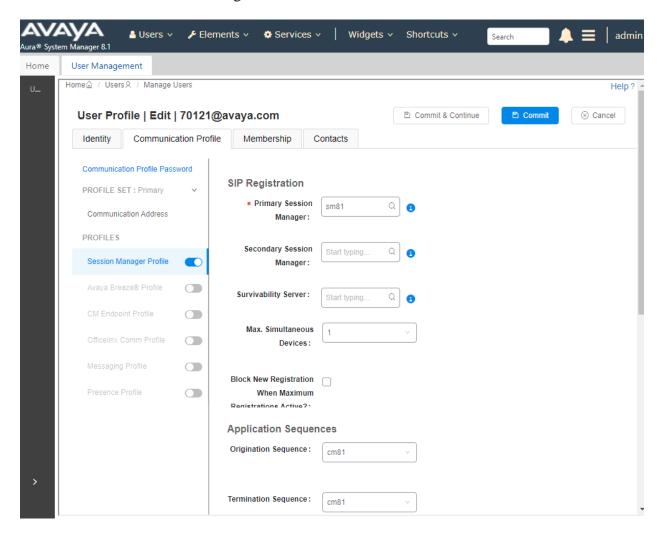
6.2.3. Communication Profile Password

Click the **Communication Profile Password** tab and in the **Comm-Profile Password** and **Reenter Comm-Profile Password** fields, enter a numeric password. This will be used to register the device. Click **OK**.



6.2.4. Session Manager Profile

Click on the **Session Manager Profile** slide button. For **Primary Session Manager**, **Origination Sequence**, **Termination Sequence**, and **Home Location** (not shown), select the values corresponding to the applicable Session Manager and Communication Manager. Retain the default values in the remaining fields.



6.2.5. CM Endpoint Profile

Click on the **CM Endpoint Profile** slide button. Fill in the following fields:

• System: Select the relevant Communication Manager SIP Entity

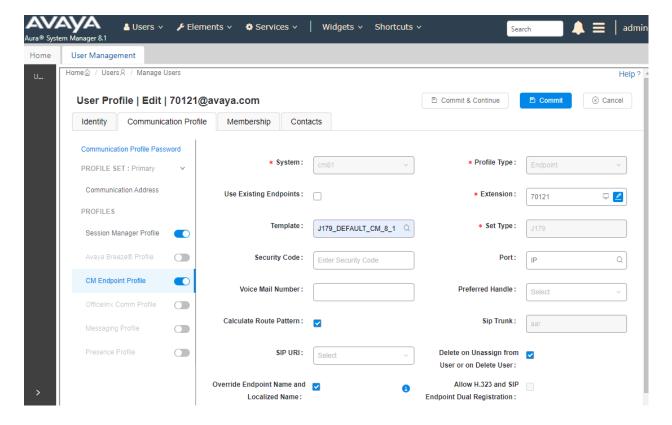
(e.g., cm81)

• Profile Type: Select Endpoint

• Template: Select J179_DEFAULT_CM_8_1

• Extension: Enter the extension number (e.g., 70121)

Click on **Endpoint Editor** in the Extension field to edit Communication Manager settings. Input the appropriate **Coverage Path 1** number (not shown) configured to route unanswered calls to voicemail. Click **Done** to close the Endpoint Editor. Click **Commit**.



7. Configure VTech CTM-S2115

The steps to configure VTech CTM-S2115 to integrate with Communication manager are as follows:

- Configure IP Address
- Launch Web Interface
- Configure SIP Account
- Modify Codec Settings as required

7.1. Configure IP Address

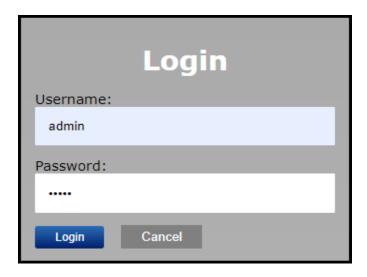
VTech CTM-S2115 is configured for DHCP as a factory default. The following steps provide network connectivity and determine the phone's IP address for use in launching administration detailed in **Section 7.2**:

- Connect the WAN port of VTech CTM-S2115 to a Power over Ethernet (PoE) switch
- Determine the assigned IP address. Use the built-in voice menu which will read out the IP address. The voice menu is accessed by pressing **TALK** ****. For more information, refer to VTech CTM-S2415 user manual obtained at http://vtechhotelphones.com.

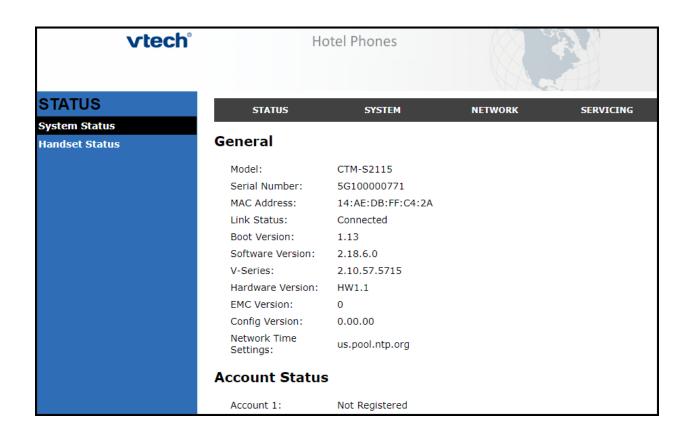
7.2. Launch Web Interface

The phone administration is done though a web interface. To access web administration, follow these steps:

- Invoke the web login page using the **IP address** from **Section 7.1** using the URL **https://<IP address>.**
- Enter admin for Username and the appropriate password for Password



Once logged in, the default settings are displayed.



Note: Cordless handset synchronization instructions for the **CTM-S2115** is listed in the user guide for the respective phone models. If firmware upgrades are needed, consult the analogous configuration guide for instructions. Refer to VTech CTM-S2115 user manual obtained at http://vtechhotelphones.com.

7.3. Configure SIP Account

To register VTech CTM-S2115 to Session Manager, Select **System** from the toolbar, then **Account 1** from the left-hand side list. Under the **General Account Settings** heading, input the following:

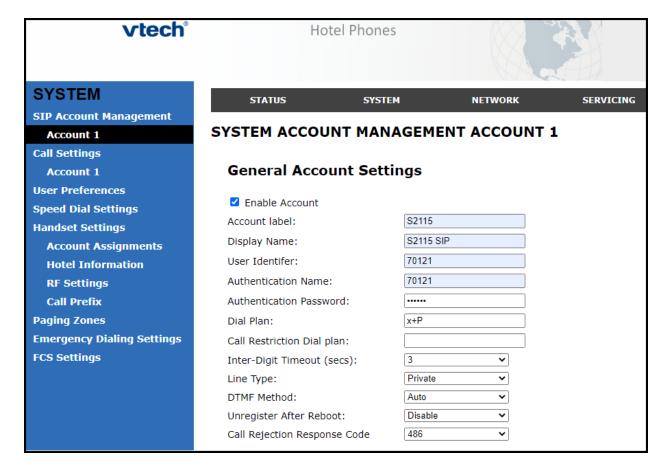
Enable Account: Click the corresponding checkbox
 Account Label: A descriptive string (e.g., S2115)

• **Display Name**: The desired display name (e.g., **S2115 SIP**)

• User Identifier: An appropriate string (e.g., 70121)

• Authentication Name: Enter the extension number (e.g., 70121)

• **Authentication Password**: Enter the password



Under the **SIP Server** heading, enter the following:

• Server Address: Session Manager IP address (e.g., 10.64.110.212)

• Port: 5061

Under the **Registration** heading, enter the following:

• Server Address: Session Manager IP address (e.g., 10.64.110.212)

• Port: 5061

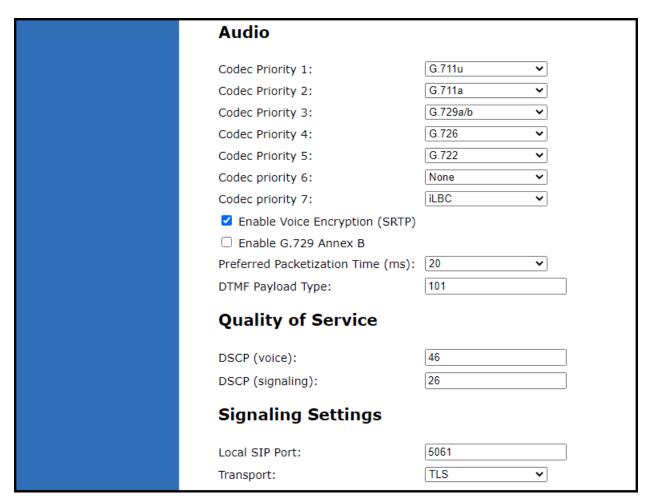
SIP Server		
Server Address:	10.64.110.212	
Port:	5061	
Registration		
Server Address:	10.64.110.212	
Port:	5061	
Expiration (secs):	3600	
Registration Freq (secs):	10	
Outbound Proxy		
Server Address:		
Port:	5060	
Backup Outbound Proxy		
Server Address:		
Port:	5060	

Under the **Audio** heading, select the following:

• Enable Voice Encryption (SRTP)

Under the **Signaling Settings** heading, input the following:

Local SIP Port: 5061Transport: TLS



Under the **Voicemail Settings** header, select the following (not shown):

• Enable MWI Subscription

Click Save.

Reboot the phone. Select **Servicing** on the toolbar and **Reboot** on the left hand side selections. Click the **Reboot** button.

7.4. Modify Codec Settings as Required

Modify the codec settings by selecting **System** in the toolbar and **Account 1** in the left hand side selections. Under the **Audio** heading, select the desired codecs in priority:

Audio		
Codec Priority 1:	G.711u	~
Codec Priority 2:	G.711a	~
Codec Priority 3:	G.729a/b	~
Codec Priority 4:	G.722	~
Codec Priority 5:	None	~
Codec priority 6:	None	~
Codec priority 7:	None	~
Enable Voice Encryption (SRTP)		
☐ Enable G.729 Annex B		
Preferred Packetization Time (ms):	20	~
DTMF Payload Type:	101	

Click Save.

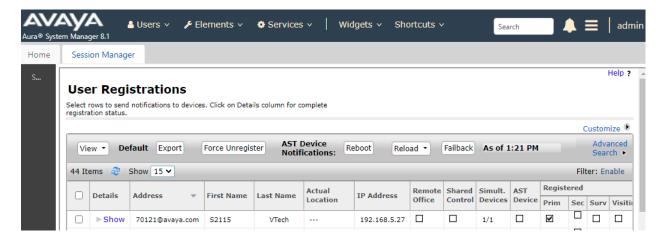
8. Verification Steps

The proper configuration of VTech CTM-S2115 with Avaya Session Manager and Avaya Communication Manager is verified by the following steps.

8.1. View Session Manager Status

Verify VTech CTM-S2115 has successfully registered with Session Manager. In System Manager, Navigate to Elements → Session Manager → System Status → User Registrations. Check the registration status by the following:

• Verify VTech CTM-S2115 (here **70121**) is registered with Session Manager by noting the registered users include **70121**.



8.2. Call Verification

Verify that basic calls can be made from and to VTech CTM-S2115 and another telephone registered to Session Manager.

9. Conclusion

These Application Notes describe the configuration steps required for VTech CTM-S2110/CTM-S2115/CTM-S2116 to successfully interoperate with the Avaya Aura® Communication Manager and Avaya Aura® Session Manager as described in these notes. All feature and serviceability test cases were completed with observations noted in **Section 2.2**.

10. Additional References

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

- [1] Administering Avaya Aura® Communication Manager, Issue 10, Release 8.1.x, March 2021.
- [2] Administering Avaya Aura® Session Manager, Issue 8, Release 8.1.x, February 2021.
- [3] Administering Avaya Aura® System Manager, Issue 11, Release 8.1.x, April 2021.

Product information for VTech SIP Hotel Phones may be found at http://vtechhotelphones.com.

Attachment 1 Declaration of Conformance



VTech Technologies Canada Ltd.

Date: June 8, 2021

Declaration of Conformance

We, VTech Technologies Canada LTD., declare under sole responsibility that product series CTM-S2115, CTM-S2110, CTM-S2116 all share the same hardware circuitry, software, SIP stack, and firmware version. Therefore the products are expected to behave in the same manner. The differences between the different models in the series are detailed in the table below.

Product Name	Model	Description
CTM-S2110	CTM-S2110	SIP 1-Line Hidden Base
CTM-S2115	CTM-S2115	SIP 1-Line Hidden Base with cordless handset & charger
CTM-S2116	CTM-S2116	SIP 1-Line Hidden Base with cordless handset & charger

Please do not hesitate to contact should you require further information. Thank you.

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