



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

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# **Application Notes for H.323 video solution with TANDBERG Codian MCU 4501, TANDBERG 1700 MXP and T150 MXP endpoints and Avaya Aura<sup>TM</sup> Communication Manager – Issue 1.0**

### **Abstract**

These Application Notes describe the configuration steps required for TANDBERG Codian MCU 4501 to interoperate with Avaya Aura<sup>TM</sup> Communication Manager.

These Application Notes present a sample configuration with Avaya one-X Communicator, Avaya IP Softphone, TANDBERG T150 MXP and TANDBERG 1700 MXP endpoints.

Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab at the request of the Solutions Marketing Team and is supporting the Video Collaboration Solution.

# 1. Introduction

These Application Notes describe the configuration steps required for TANDBERG Codian MCU 4501 to interoperate with Avaya Aura™ Communication Manager. TANDBERG Codian MCU 4501 integration is via H.323 trunks to Avaya Aura™ Communication Manager.

These Application Notes present a sample configuration with Avaya Aura™ one-X Communicator, Avaya IP Softphone, TANDBERG T150 MXP, and TANDBERG 1700 MXP endpoints.

## 1.1. Interoperability Compliance Testing

The interoperability compliance testing included basic feature and serviceability testing. The specific tests included the following areas:

- Registration of TANDBERG T150 MXP and TANDBERG 1700 MXP endpoints as H.323 endpoints.
- Feature tests
  - Point to point calls with Avaya (audio and video) endpoints and TANDBERG T150 MXP and 1700 MXP (media shuffling enabled).
  - Multipoint audio and video calls with TANDBERG Codian MCU and Avaya Meeting Exchange Enterprise S6800 Conferencing Server.
  - Basic telephony features like hold, un-hold, video start/stop, audio and video mute/un-mute and transfer.

The serviceability testing focused on verifying the ability of TANDBERG Codian MCU to recover from adverse conditions, such as:

- Server Reset
- Disconnect/reconnect of Ethernet cable to TANDBERG MCU.

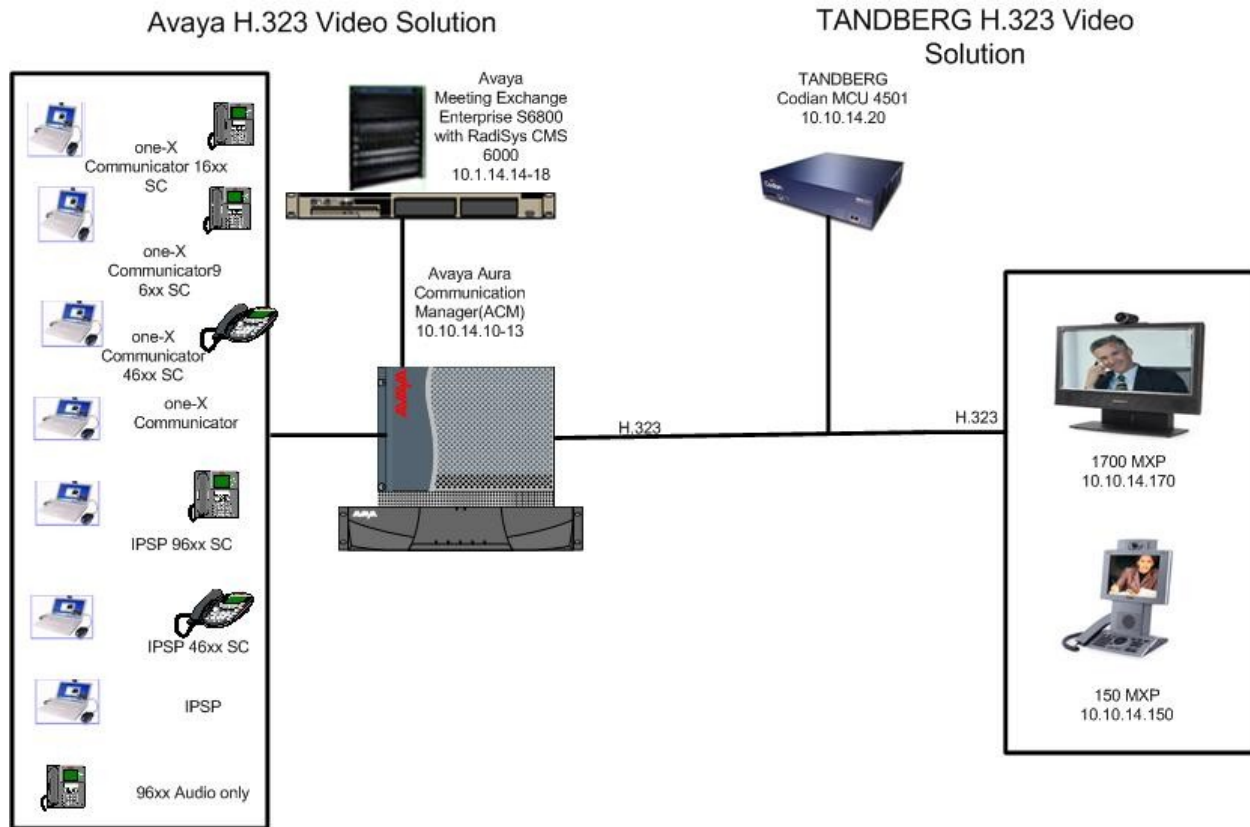
## 1.2. Support

Technical support on TANDBERG can be obtained through the following:

- **Web:** <http://www.TANDBERG.com/contact-TANDBERG-video-conferencing-telepresence.jsp>

## 2. Network Topology

The configuration in **Figure 1** was used to test TANDBERG Video Solution interoperability with Avaya Aura<sup>TM</sup> Communication Manager, and Avaya Meeting Exchange Enterprise S6800 Conferencing Server to support Avaya Video Collaboration Solution.



**Figure 1: TANDBERG and Avaya H.323 Video Solution**

### 3. Equipment and Software Validated

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

Equipment	Software
Avaya Aura™ Communication Manager	CM 5.2 SP2 (02.0.947.3-17584)
Avaya Media Gateway G650 IPSI C-LAN Medpro	FW046 FW032 FW047
Avaya IP Phones 96xx 46xx	2.0 2.9
Avaya Aura™ one-X Communicator	1.0.0.90
Avaya IP Softphone	R6 SP6
Avaya Meeting Exchange Enterprise S6800 Conferencing Server	5.1 build 5.1.0.0.161
TANDBERG Codian MCU	2.4 build 6.13 (1.20)
TANDBERG 1700 MXP	F8.0 Security
TANDBERG T150 MXP	L5.1 Security

### 4. Configure Avaya Aura™ Communication Manager

This section provides the procedures for configuring Avaya Aura™ Communication Manager. The configuration page in this section are accessed using Communication System Access Terminal (SAT). Log in with appropriate credentials.

The procedures include the following areas:

- Verify Communication Manager License
- Administer IP Node Name for Communication Manager
- Administer Dial Plan
- Administer Signaling and Trunk
- Administer Routing
- Administer AAR
- Administer Network Region
- Administer Codec Set
- Administer Avaya IP Softphone and Avaya Aura™ one-X Communicator
- Administer TANDBERG T150 MXP
- Administer TANDBERG 1700 MXP

**Note:** For configuring Communication Manager with Avaya Meeting Exchange Enterprise refer to **Additional Reference [2]**.

## 4.1. Verify Communication Manager License

Verify that the Avaya Aura™ Communication Manager license has proper permissions for features illustrated in these Application Notes. If not then contact the Avaya sales team or business partner for a proper license file.

Enter the **display system-parameters customer-options** command. On Page 2 of the **system-parameters customer-options** form, verify that there are sufficient licenses for the following:

- **Maximum Administered H.323 Trunks** – must be large enough to accommodate the number of H.323 trunks (channels) to the TANDBERG.
- **Maximum Video Capable H.323 Stations** – must be equal to or greater than the number of H.323 video stations.
- **Maximum Video Capable IP Softphones** – must be equal to or greater than the number of Avaya IP Softphones enabled with video capabilities.

display system-parameters customer-options		Page	2 of	10
OPTIONAL FEATURES				
IP PORT CAPACITIES		USED		
<b>Maximum Administered H.323 Trunks:</b>		<b>100</b>	<b>40</b>	
Maximum Concurrently Registered IP Stations:		18000	3	
Maximum Administered Remote Office Trunks:		0	0	
Maximum Concurrently Registered Remote Office Stations:		0	0	
Maximum Concurrently Registered IP eCons:		0	0	
Max Concur Registered Unauthenticated H.323 Stations:		0	0	
<b>Maximum Video Capable Stations:</b>		<b>100</b>	<b>6</b>	
<b>Maximum Video Capable IP Softphones:</b>		<b>100</b>	<b>4</b>	
Maximum Administered SIP Trunks:		100	10	
Maximum Administered Ad-hoc Video Conferencing Ports:		100	70	
Maximum Number of DS1 Boards with Echo Cancellation:		0	0	
Maximum TN2501 VAL Boards:		10	0	
Maximum Media Gateway VAL Sources:		0	0	
Maximum TN2602 Boards with 80 VoIP Channels:		128	0	
Maximum TN2602 Boards with 320 VoIP Channels:		128	1	
Maximum Number of Expanded Meet-me Conference Ports:		0	0	
(NOTE: You must logoff & login to effect the permission changes.)				

## 4.2. Administer IP Node Name

Enter the **change node-names ip** command and add an entry for the TANDBERG Codian as shown in the sample configuration screen below. The actual node name and IP address may vary. Submit these changes.

change node-names ip		Page	1 of	2
IP NODE NAMES				
Name	IP Address			
Clan	10.10.14.12			
DefaultGW	10.10.14.1			
<b>TCodian</b>	<b>10.10.14.20</b>			
<b>MX</b>	<b>10.10.14.14</b>			
default	0.0.0.0			
medpro	10.10.14.13			
procr	10.10.14.10			

### 4.3. Administer Dial Plan

Enter the **change dialplan analysis** command. Add an entry for local **ext** (extension), **dac** (dial access code), and **aar** (automatic alternate routing) as shown in the screen below.

**2xxxx** series is local extension

**5xxxx** is dial in number to TANDBERG Codian MCU from Avaya and TANDBERG endpoints

**3xxxx** is dial in number to Avaya Meeting Exchange server

change dialplan analysis			DIAL PLAN ANALYSIS TABLE			Page 1 of 12		
			Location: all			Percent Full: 1		
	Dialed String	Total Length	Call Type	Dialed String	Total Length	Call Type	Dialed String	Total Length
1		3	dac					
2		5	ext					
3		5	aar					
4		5	aar					
5		5	aar					
6		5	aar					

### 4.4. Administer Signaling and Trunk

Prior to configuring a H.323 trunk group for communication with TANDBERG Codian MCU, an IP signaling group must be configured. Enter the **add signaling-group 2** command and add an entry for TANDBERG as shown below.

- Set **Group Type** to **H.323**
- Set **IP Video** to **y**
- Set **Near-end Listen Port** to **1720**
- Set **LRQ Required** to **y**
- Set **RRQ Required** to **y**
- Set **Far-end Node Name** to the name you entered for the TANDBERG system – **TCodian**
- Set **Far-end Listen Port** to **1720**
- Set **Far-end Network Region** to the appropriate IP network region i.e. **2**
- Set **Direct IP-IP Audio Connections** to **y**
- Set **IP Audio Hairpinning** to **y**

```

add signaling-group 2                                     Page 1 of 5
                                     SIGNALING GROUP

Group Number: 2          Group Type: h.323
                          Remote Office? n          Max number of NCA TSC: 0
                          SBS? n                    Max number of CA TSC: 0
          IP Video? y    Priority Video? n          Trunk Group for NCA TSC: 2
          Trunk Group for Channel Selection: 2
          TSC Supplementary Service Protocol: a
                          T303 Timer(sec): 10
          H.245 DTMF Signal Tone Duration(msec):
          Near-end Node Name: Clan                    Far-end Node Name: TCodian
          Near-end Listen Port: 1720                  Far-end Listen Port: 1720
                          Far-end Network Region: 2
          LRQ Required? y                            Calls Share IP Signaling Connection? n
          RRQ Required? y
                          Bypass If IP Threshold Exceeded? n
                          H.235 Annex H Required? n
          DTMF over IP: out-of-band                    Direct IP-IP Audio Connections? y
          Link Loss Delay Timer(sec): 90                IP Audio Hairpinning? y
          Enable Layer 3 Test? n                        Interworking Message: PROGress
          H.323 Station Outgoing Direct Media? n      DCP/Analog Bearer Capability: 3.1kHz

```

Enter the **add trunk-group 2** command and add an entry for TANDBERG Codian MCU as shown in the sample configuration. Submit these changes.

```

add trunk-group 2                                     Page 1 of 21
                                     TRUNK GROUP

Group Number: 2          Group Type: isdn          CDR Reports: y
          Group Name: To_Codian          COR: 1          TN: 1          TAC: 102
          Direction: two-way          Outgoing Display? y          Carrier Medium: H.323
          Dial Access? y          Busy Threshold: 255          Night Service:
          Queue Length: 0
          Service Type: tie          Auth Code? n
                          Member Assignment Method: auto
                          Signaling Group: 2
                          Number of Members: 20

```

## 4.5. Administer Routing

Enter the **change route-pattern 3** command and add an entry for TANDBERG as shown in the sample configuration section. Submit these changes.

change route-pattern 3													Page 1 of 3	
Pattern Number: 2													Pattern Name: <b>Codian</b>	
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:	3	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	n	rest					none	
2:	y	y	y	y	y	n	n	rest					none	
3:	y	y	y	y	y	n	n	rest					none	
4:	y	y	y	y	y	n	n	rest					none	
5:	y	y	y	y	y	n	n	rest					none	
6:	y	y	y	y	y	n	n	rest					none	
none														

## 4.6. Administer AAR

Enter the **change aar analysis 0** command and add an entry for TANDBERG as show in the sample configuration section. Submit these changes.

**2xxxx** series is local extension

**5xxxx** is dial in number to TANDBERG Codian MCU from Avaya and TANDBERG endpoints

**3xxxx** is dial in number for Avaya Meeting Exchange Enterprise

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	
2		7	7	999	aar		n	
3		5	5	1	aar		n	
4		5	5	2	aar		n	
5		5	5	2	aar		n	
6		5	5	2	aar		n	
7		7	7	999	aar		n	



## 4.7. Administer Network Region

Enter the **change ip-network-region 4** command and add entries as shown in sample configuration below. Submit these changes.

```
change ip-network-region 3                                     Page 1 of 19

                                IP NETWORK REGION

  Region: 3
Location: 1      Authoritative Domain: avaya.com
  Name: CM
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                                   RTCP Reporting Enabled? y
  Call Control PHB Value: 46                             RTCP MONITOR SERVER PARAMETERS
    Audio PHB Value: 46                                   Use Default Server Parameters? y
    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
```

## 4.8. Administer Codec Set

Enter the **change ip-codec-set 1** command and add entries as shown in sample configuration below in bold. Submit these changes.

```
change ip-codec-set 1                                         Page 1 of 2

                                IP Codec Set

  Codec Set: 1

  Audio      Silence      Frames      Packet
  Codec      Suppression   Per Pkt    Size(ms)
1: G.711MU      n          2        20

change ip-codec-set 1                                         Page 2 of 2

                                IP Codec Set

                                Allow Direct-IP Multimedia? y
                                Maximum Call Rate for Direct-IP Multimedia: 1920:Kbits
                                Maximum Call Rate for Priority Direct-IP Multimedia: 1920:Kbits
```

## 4.9. Avaya Aura™ one-X Communicator and IP Softphone

Enter the **add station m** command, where **m** is an unused extension. Enter a descriptive **Name** and set **Type** to **9620** , **IP SoftPhone** to **y** and **IP SoftphoneVideo** to **y**. Repeat the same for Avaya IP Softphone.

add station 20003		Page 1 of 5
STATION		
Extension: 20003	Lock Messages? n	BCC: M
Type: 9620	Security Code: 20003	TN: 1
Port: S00004	Coverage Path 1:	COR: 1
Name: One-XCommunicator	Coverage Path 2:	
COS: 1	Hunt-to Station:	
STATION OPTIONS		
Loss Group: 19	Time of Day Lock Table:	
	Personalized Ringing Pattern: 1	
	Message Lamp Ext: 20003	
Speakerphone: 2-way	Mute Button Enabled? y	
Display Language: english		
Survivable GK Node Name:		
Survivable COR: internal	Media Complex Ext:	
Survivable Trunk Dest? y	IP SoftPhone? y	
	<b>IP Video Softphone? y</b>	
	Customizable Labels? y	

## 4.10. TANDBERG T150 MXP Station

Enter the **add station m** command, where **m** is an unused extension. Enter a descriptive **Name** and set **Type** to **H.323** and **IP Video** to **y**. Repeat this step for each TANDBERG T150 MXP.

add station 20010		Page 1 of 4
STATION		
Extension: 20010	Lock Messages? n	BCC: M
<b>Type: H.323</b>	Security Code: 20010	TN: 1
Port: S00010	Coverage Path 1:	COR: 1
<b>Name: T150</b>	Coverage Path 2:	COS: 1
	Hunt-to Station:	Tests? y
STATION OPTIONS		
Loss Group: 19	Time of Day Lock Table:	
	Message Waiting Indicator: none	
Survivable COR: internal		
Survivable Trunk Dest? y		
DTMF over IP: in-band		
	<b>IP Video? y</b>	

## 4.11. TANDBERG 1700 MXP Station

Enter the **add station m** command, where **m** is an unused extension. Enter a descriptive **Name** and set **Type** to **H.323**, and **IP Video** to **y**. Repeat this step for each TANDBERG 1700 MXP.

Note: 1700 MXP is multipoint can have up to four extensions. Repeat **this step** to add the second, third and fourth station for the TANDBERG 1700 MXP.

add station 20012		Page 1 of 4
STATION		
Extension: 20012	Lock Messages? n	BCC: M
<b>Type: H.323</b>	Security Code: 12345	TN: 1
Port: S00012	Coverage Path 1:	COR: 1
<b>Name: 1700-1</b>	Coverage Path 2:	COS: 1
	Hunt-to Station: 20013	Tests? y
STATION OPTIONS		
	Time of Day Lock Table:	
Loss Group: 19	Message Waiting Indicator: none	
Survivable COR: internal		
Survivable Trunk Dest? y		
DTMF over IP: in-band		
IP Video? y		

## 5. Configure the TANDBERG End Points with Avaya Aura™ Communication Manager

After completing **Section 4.9** and **4.10**, perform the following on TANDBERG Endpoints.

Log into the TANDBERG T150 and 1700 MXP with the appropriate credentials.

Enter the following commands:

### TANDBERG T150 MXP:

```
xConfiguration H323CallSetup Mode: Gatekeeper
xConfiguration H323Gatekeeper Discovery: Manual
xConfiguration H323Gatekeeper Address: 10.10.14.12
xConfiguration H323Gatekeeper Authentication Mode: Off
xConfiguration H323Gatekeeper Authentication ID: ""
xConfiguration H323Gatekeeper MultipleAlias: Off
xConfiguration H323Gatekeeper Avaya Mode: On
xConfiguration H323Gatekeeper Avaya AnnexH: On
```

xConfiguration H323Gatekeeper Avaya MultipointCount: 2  
xconfiguration H323Gatekeeper Avaya Password: 20010  
xConfiguration Conference H323Alias E164: 20010  
xConfiguration Conference H323Alias ID: ""

#### **TANDBERG 1700:**

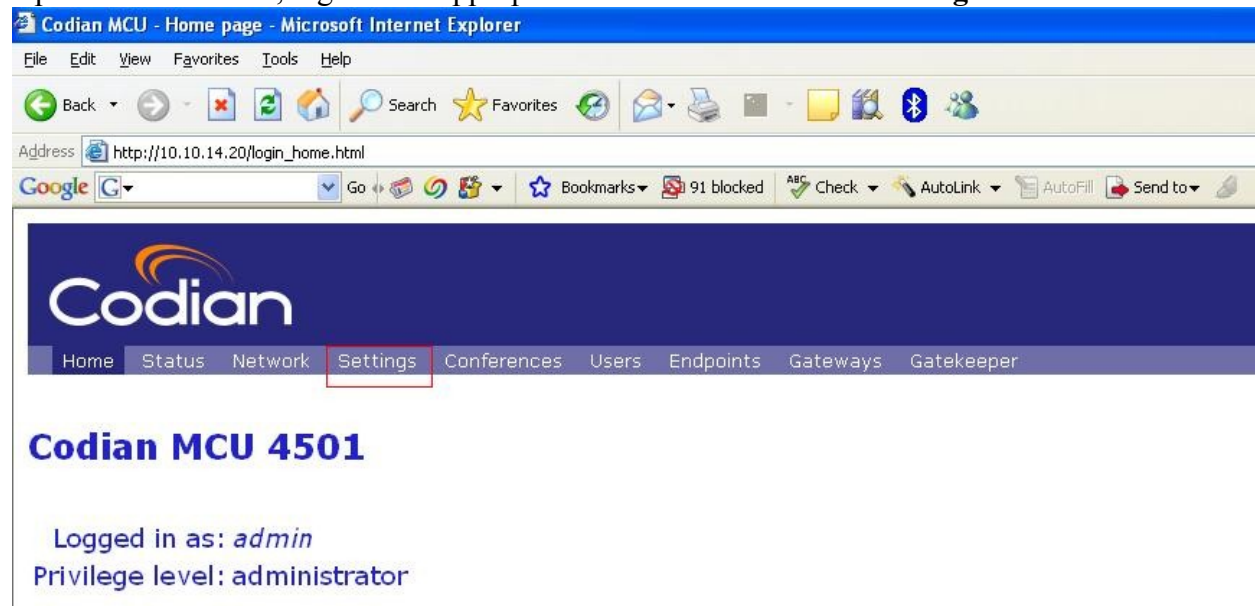
xConfiguration H323CallSetup Mode: Gatekeeper  
xConfiguration H323Prefix: ""  
xConfiguration H323Gatekeeper Discovery: Manual  
xConfiguration H323Gatekeeper Address: 10.10.14.12  
xConfiguration H323Gatekeeper Authentication Mode: Off  
xConfiguration H323Gatekeeper Authentication ID: ""  
xConfiguration H323Gatekeeper MultipleAlias: Off  
xConfiguration H323Gatekeeper Avaya Mode: On  
xConfiguration H323Gatekeeper Avaya AnnexH: On  
xConfiguration H323Gatekeeper Avaya MultipointCount: 0  
xconfiguration H323Gatekeeper Avaya Password: 12345  
xConfiguration Conference H323Alias E164: 20012  
xConfiguration Conference H323Alias ID: ""

## **6. Configure the TANDBERG Codian MCU**

This section provides the procedures for configuring TANDBERG Codian MCU, to allow TANDBERG and Avaya users to dial into Codian MCU via Avaya Aura™ Communication Manager.

### **6.1. Registering TANDBERG Codian MCU to Avaya Aura™ Communication Manager**

Open a web browser, log in with appropriate credentials. Click on **Settings**.



Navigate to the **Gatekeeper** sub-tab and enter the following details.

- Set **H.323 gatekeeper usage** to **Enabled**
- **H.323 gatekeeper address** to IP Address of CM or Clan
- **Gatekeeper registration type** to **MCU (standard)**
- **Mandatory H.323 ID to register**, enter a descriptive name
- Set **MCU service prefix** to **55555 sample configuration**

## 7. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Aura™ Communication Manager and TANDBERG Codian MCU.

### 7.1. Verify Avaya Communication Manager

On Avaya Aura™ Communication Manager, verify the status of trunk by using the **status trunk 2** command. Verify that the **Service State** is **in-service/idle** as shown below.

status trunk 2				Page 1
TRUNK GROUP STATUS				
Member	Port	Service State	Mtce Connected Ports Busy	
0002/001	T00031	in-service/idle	no	
0002/002	T00032	in-service/idle	no	
0002/003	T00033	in-service/idle	no	
0002/004	T00034	in-service/idle	no	
0002/005	T00035	in-service/idle	no	

On Avaya Aura™ Communication Manager, verify the status of trunk by using the **status signaling-group 2** command. Verify that the **Group State** is **in-service** as shown below.

```
status signaling-group 2
                        STATUS SIGNALING GROUP

      Group ID: 2                      Active NCA-TSC Count: 0
      Group Type: h.323                Active CA-TSC Count: 0
      Signaling Type: facility associated signaling
      Group State: in-service
```

Verify the TANDBERG endpoints and Codian MCU are registered to the Communication Manager by issuing **list registered ip-station** command as shown below.

```
list registered-ip-stations                                     Page 1

                        REGISTERED IP STATIONS

Station Ext  Set Type/ Prod ID/ TCP Station IP Address/
or Orig Port Net Rgn  Release Skt Gatekeeper IP Address
-----
20003        9620      IP_Soft  y  135.64.186.216
              1        5.660      10.10.14.12
20011        H.323    TANDBERG n  135.64.186.220
              1        0.0000    10.10.14.12
20012        H.323    TANDBERG M n  135.64.186.219
              1        0.0000    10.10.14.12
20013        H.323    TANDBERG M n  135.64.186.219
              1        0.0000    10.10.14.12
20014        H.323    TANDBERG M n  135.64.186.219
              1        0.0000    10.10.14.12
20015        H.323    TANDBERG M n  135.64.186.219
              1        0.0000    10.10.14.12
```

## 7.2. Verify TANDBERG Codian MCU

Open a web browser; enter <http://x.x.x.x> for the URL, where x.x.x.x is the IP address of the TANDBERG Codian MCU.

Navigate to **Settings→Gatekeeper** scroll to the bottom of the page, verify TANDBERG Video Communcaition Server and Avaya Aura™ Communication Manager status as shown below.

Current status	
H.323 gatekeeper status	registered with 10.10.14.12
Registered address	10.10.14.20:1720
Alternate gatekeepers available	0
Resource availability status	<indications not configured>
Number of active registrations	2 <a href="#">details</a>
H.323 ID registration	Codian registered
MCU service prefix	55555 prefix registered

## 8. Conclusion

These Application Notes demonstrate how to provision TANDBERG Codian MCU, TANDBERG 1700 MXP and T150 MXP endpoints with Avaya Aura™ Communication Manager.

The following observations were made during testing:

- G.722 Codec issue between Avaya one-X Communicator and 1700 MXP resulting in no audio.
- Avaya Meeting Exchange Enterprise conference Moderator or Operator dial out callers to 1700 or T150 callers drop after few seconds from the conference.

## 9. Additional References

Avaya references, available at <http://support.avaya.com>

[1] [Administering Avaya Aura™ Communication Manager](http://support.avaya.com/css/P8/documents/100059292), Document 03-300509

<http://support.avaya.com/css/P8/documents/100059292>

[2] Configuring the Avaya G860 Media Gateway to Provide Connectivity between the Public Switched Telephone Network (PSTN), Avaya Meeting Exchange Enterprise S6200 Conferencing Server and Avaya Aura™ Communication Manager 5.2 - Issue 1.0  
<https://enterpriseportal.avaya.com/ptlWeb/internal/support/CS200622895538890091>.

TANDBERG references are available at [www.TANDBERG.com/video-conferencing-support.jsp](http://www.TANDBERG.com/video-conferencing-support.jsp)

[1] *TANDBERG T150 MXP Administrators Guide (L5)*

[2] *TANDBERG 1700 MXP Administrator Guide (F8)*

[3] *TANDBERG Codian MCU Getting Started*

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