Avaya Solution & Interoperability Test Lab

Application Notes of Polycom H.323 Video Endpoints Consisting of VSX Endpoints and HDX Endpoints with Avaya Aura™ Communication Manager and Polycom CMA 4000 – Issue 1.0

Abstract

These Application Notes describe a compliance tested solution comprised of Avaya Aura™ Communication Manager, the Polycom CMA 4000, Polycom VSX Endpoints, and Polycom HDX Endpoints. The solution described in these Application Notes pertains only to H.323 interoperability between Avaya Aura™ Communication Manager and the aforementioned Polycom gatekeeper and videoconference endpoints.

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

1. Introduction

This Application Notes describes a compliance tested solution comprised of Avaya Aura™ Communication Manager, Polycom CMA 4000 Gatekeeper, and Polycom Voice and Video End points. Connectivity between Polycom and Avaya devices is via H.323 signaling. This configuration provides basic point-to-point and multipoint Video/Audio calls through Avaya Aura™ Communication Manager and Polycom CMA Gatekeeper.

1.1. Interoperability Compliance Testing

The interoperability compliance testing included basic feature testing.

Feature tests focused on:

- Point to point calls
- Multipoint audio and video calls
- Media shuffling
- Basic Telephony
    - Hold
    - Unhold
    - Mute Audio and Video
    - Unmute Audio and Video
    - Transfer
    - Video start/stop

1.2. Support

Technical support on Polycom can be obtained through the following:

Web: http://www.polycom.com/support/

2. Network Topology

The configuration in **Figure 1** was used to compliance test Polycom Video Solution interoperability with Avaya Video Solution where some of the Polycom video endpoints were registered to Communication Manager and the others were registered to the Polycom CMA. Various types of video and audio calls were tested across the H.323 trunk. The configuration in **Figure 2** was used to test Polycom Interop Test Configuration with Avaya Aura™ Communication Manager Neighbored Gatekeeper where only the Avaya video endpoints (one-X Communicator and IP Softphone) were registed to Communication Manager and all the Polycom endpoints were registered to the Polycom CMA. Various types of video and audio calls were tested across the H.323 trunk.

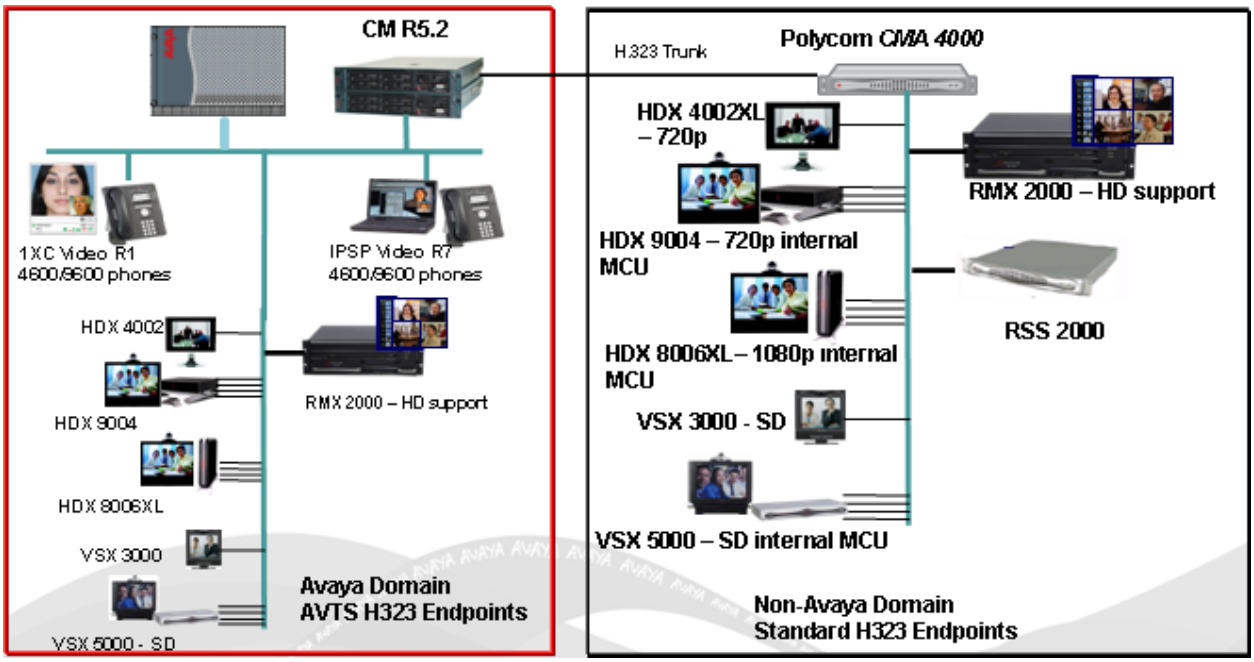


Figure 1: CM Integration & CM Neighbored Gatekeeper

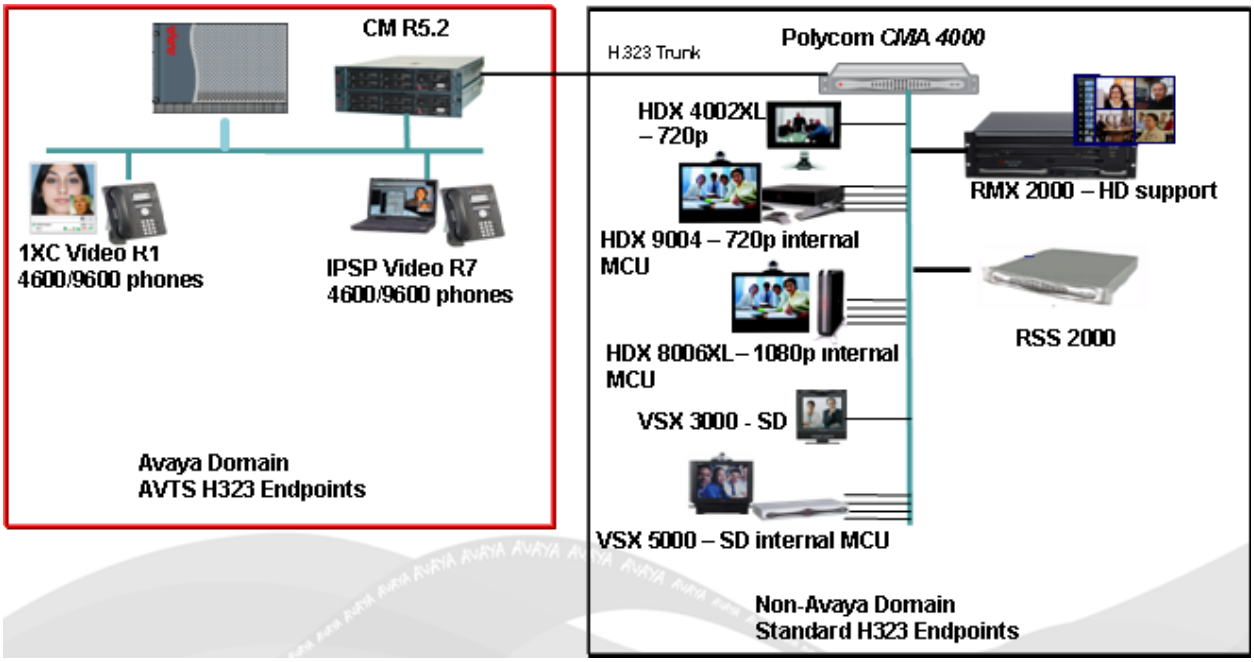


Figure 2 - CM Neighbored Gatekeeper

3. Equipment and Software Validated

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

Equipment	Software
Avaya Aura™ Communication Manager	5.02.0.947.3-17436
Avaya Gateway G650 IPSI CONTROL-LAN Medpro (TN2602AP)	 FW044 FW032 FW044
Polycom CMA 4000	4.01.00.ER030
Polycom HDX 4002 (h.323)	2.5.0.5
Polycom HDX 8006 (h.323)	2.5.0.5
Polycom HDX 9004 (h.323)	2.5.0.5
Polycom VSX 3000 (h.323)	9.05.1
Polycom VSX 5000 (h.323)	9.05.1

4. Configure Communication Manager

This section provides the procedures for configuring Avaya Aura™ Communication Manager necessities for video endpoints. The configuration page in this section are accessed using Communication Manager System Access Terminal (SAT). Log in with the proper login credentials. It is assumed that all of the other Communication Manager administration is complete, including but not limited to CM license, Dial Plan, Routing Patterns, AAR Analysis, and Uniform Dial Plan.

The procedures include the following areas:

- Administer Network Region
- Administer Codec Set

4.1. Administer Codec Set

Use the **change ip-codec-set *x*** command (where ***x*** is the chosen IP codec set) to:

- Define the codecs (page 1 of form). The following codecs are recommended:
  - SIREN14-32K (1 fpp, 20 ms)
    SIREN14-32K are wideband codecs. Since most Polycom systems are not configured for stereo, it is not recommended to use a stereo SIREN codec as a default.
  - G722-64K (1 fpp, 20 ms)
    G722-64K are wideband codecs. These codecs allow wideband with video endpoints that do not support SIREN codecs.
  - G.729A (no silence suppression, 2 fpp, 20 ms)

Polycom systems do not support all variants of G.729 codecs. If you want to use G.729, you must specify G.729A. If you specify G.729, audio problems arise. All variants of G.729 codecs are narrowband codecs.

NOTE:

Wideband codecs should appear before narrowband codecs in the codec set.

- Set **Allow Direct-IP Multimedia** to **y** (page 2 of form).
- Set **Maximum Call Rate for Direct-IP Multimedia**. This setting is the combined audio and video transmit rate or receive rate for non-priority (normal) video calls. You can use this setting to limit the amount of bandwidth used for normal video calls. For example, if you select 384 Kbits, a maximum of 384 Kbits will be used to transmit *and* to receive audio/video.
- **Maximum Call Rate for Priority Direct-IP Multimedia**. This setting is the combined audio and video transmit rate or receive rate for priority video calls. You can use this setting to limit the amount of bandwidth used for priority video calls. For example, if you select 384 Kbits, a maximum of 384 Kbits will be used to transmit *and* to receive audio/video.
- **Media Encryption** is currently not supported with video so this value needs to be set to **none**.

Repeat the above steps for each IP codec set that will be used for video.

```
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: SIREN14-32K                1        20
 2: G.722-64K                  2        20
 3: G.711MU           n        2        20
 4: G.729A            n        2        20
 5:
 6:
 7:

    Media Encryption
 1: none
 2:
 3:
```

It's important to set the correct Maximum Call Rate. Below is an example of how to configure the rates. Contact your Network Administrator for the Maximum Call Rate allowed.

```
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

                     Mode               Redundancy
    FAX              relay               0
    Modem            off                 0
    TDD/TTY          US                  3
    Clear-channel    n                   0
```

4.2. Administer Network Region

Use the **change ip-network-region *x*** command (where ***x*** is the chosen IP network region) to set the following parameters:

- **Intra-region IP-IP Direct Audio** to **yes**.
- **Inter-region IP-IP Direct Audio** to **yes**.
  NOTE: Shuffling is recommended. However, you can set shuffling to **no**, and video calls will work properly.
- **Security Profiles 1** to **any-auth** (page 2 of form).
- **Codec set** (page 3 of form) to one of the codec sets you defined in Section 4.1.
- **Video Norm** (page 3 of form) to the amount of bandwidth that you want to allocate for the normal video pool to each IP network region.
- **Video Prio** (page 3 of form) to the amount of bandwidth that you want to allocate for the priority video pool to each IP network region.
- **Video Shr** (page 3 of form). Specify whether the normal video pool can be shared with the audio pool for each link between IP network regions.

Repeat the above steps for each IP network region that will be used for video in this system.

```
change ip-network-region 1                                    Page   1 of  19
                             IP NETWORK REGION
  Region: 2
Location: 1       Authoritative Domain: dr.avaya.com
   Name: video_endpoints
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? y
   UDP Port Max: 65535
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: 36
802.1P/Q PARAMETERS
 Call Control 802.1p Priority: 7
        Audio 802.1p Priority: 0
        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
```

It's important to administer the H.323 SECURITY PROFILES appropriately. Below is an example of how to configure the profiles.

```
change ip-network-region 1                                    Page   2 of  19
                            IP NETWORK REGION

INTER-GATEWAY ALTERNATE ROUTING / DIAL PLAN TRANSPARENCY
 Incoming LDN Extension:
 Conversion To Full Public Number - Delete:    Insert:
 Maximum Number of Trunks to Use for IGAR:
 Dial Plan Transparency in Survivable Mode? n

BACKUP SERVERS(IN PRIORITY ORDER)    H.323 SECURITY PROFILES
 1                                   1   any-auth
 2                                   2
 3                                   3
 4                                   4
 5
 6                                   Allow SIP URI Conversion? y

TCP SIGNALING LINK ESTABLISHMENT FOR AVAYA H.323 ENDPOINTS
display ip-network-region 1                                   Page   3 of  19

 Source Region: 2     Inter Network Region Connection Management     I       M
                                                                    G  A    e
 dst codec direct   WAN-BW-limits   Video      Intervening      Dyn  A  G    a
 rgn  set   WAN  Units    Total Norm  Prio Shr Regions          CAC  R  L    s
 1    1     y    NoLimit                                        n
 2    1                                                          all
 3    1     y    NoLimit                                        n
 4
 5
 6
```

5. Configure Endpoints with Polycom CMA 4000 Gatekeeper

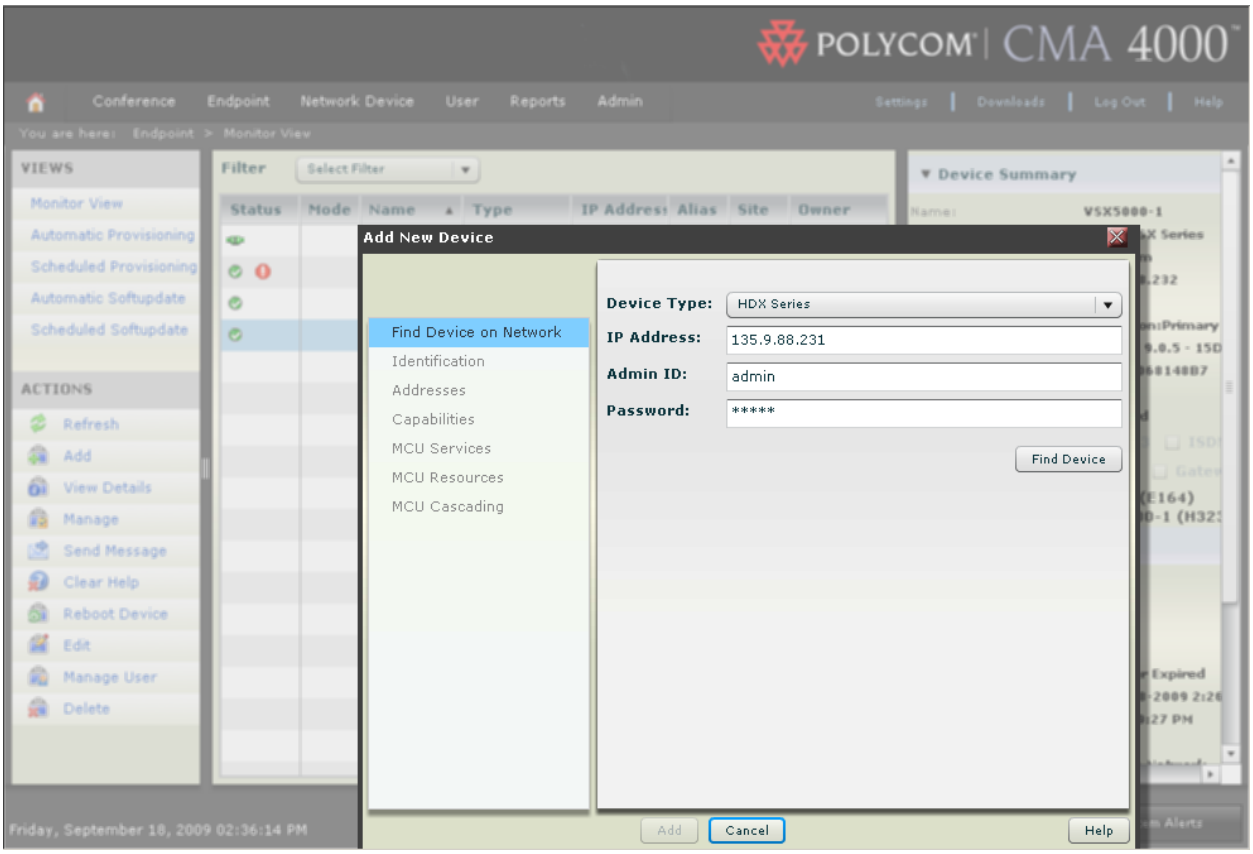
This section discusses the configuration of video endpoints with Polycom CMA Gatekeeper. Is it assumed that the basic configuration of the CMA including Neighboring Gatekeepers, Dial Rules, Sites, and Site-links are already in place.

5.1. Endpoints

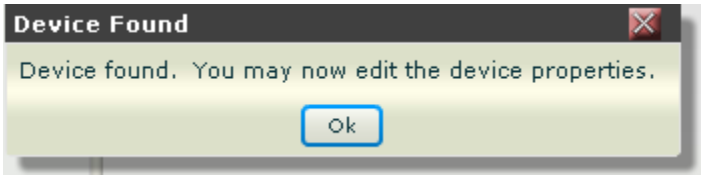
These are Polycom video endpoints registered to the Polycom CMA. As such they will be recognized only by the Polycom CMA and not by the Communication Manager as valid endpoints.

.

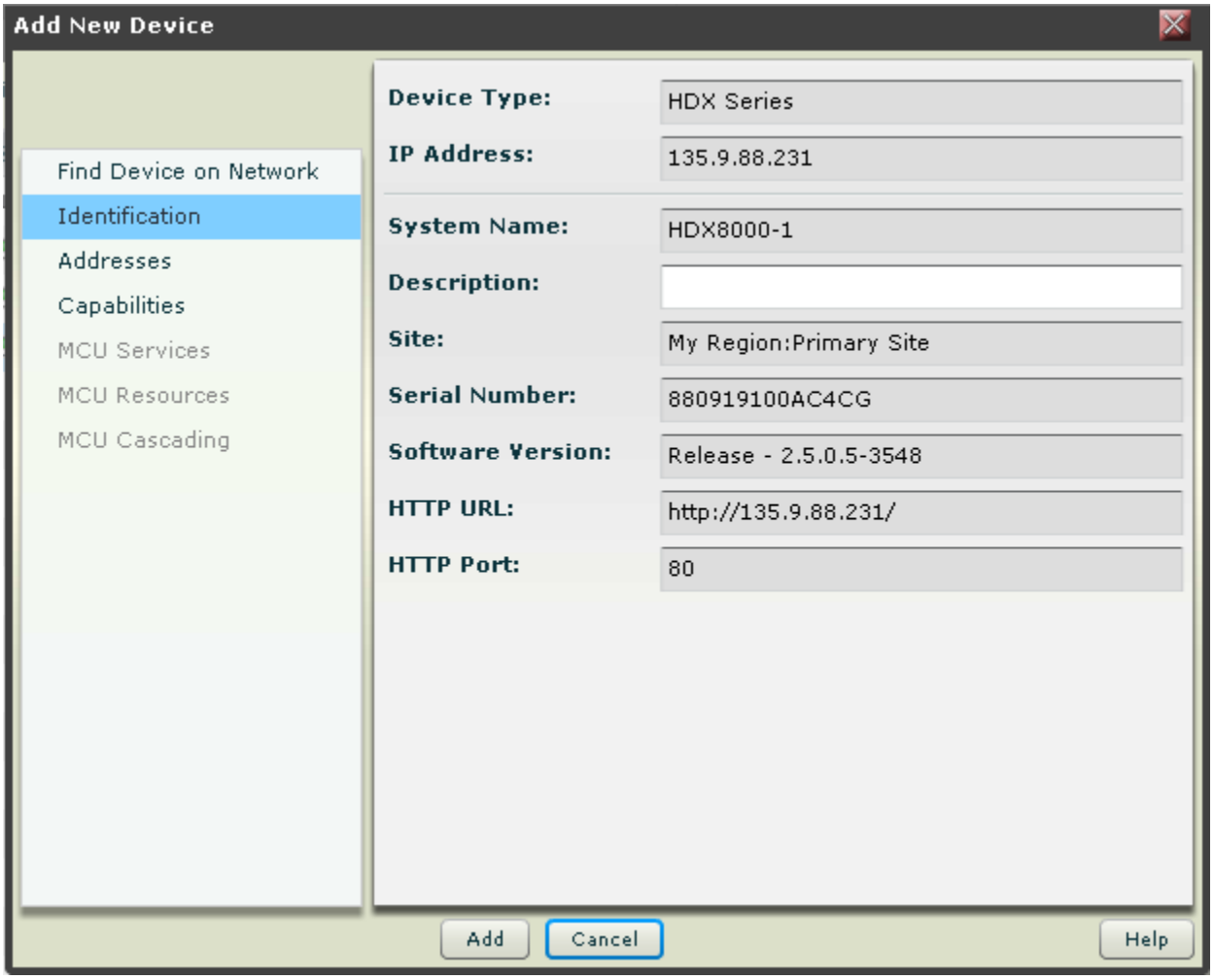
Click **Endpoint** tab and then **Monitor View**. Select **Add** to add a new endpoint to the table. Enter a **Device Type** from the drop down menu, **IP Address** of the device, the **Admin ID,** and the **Password**. Click **Find Device**.



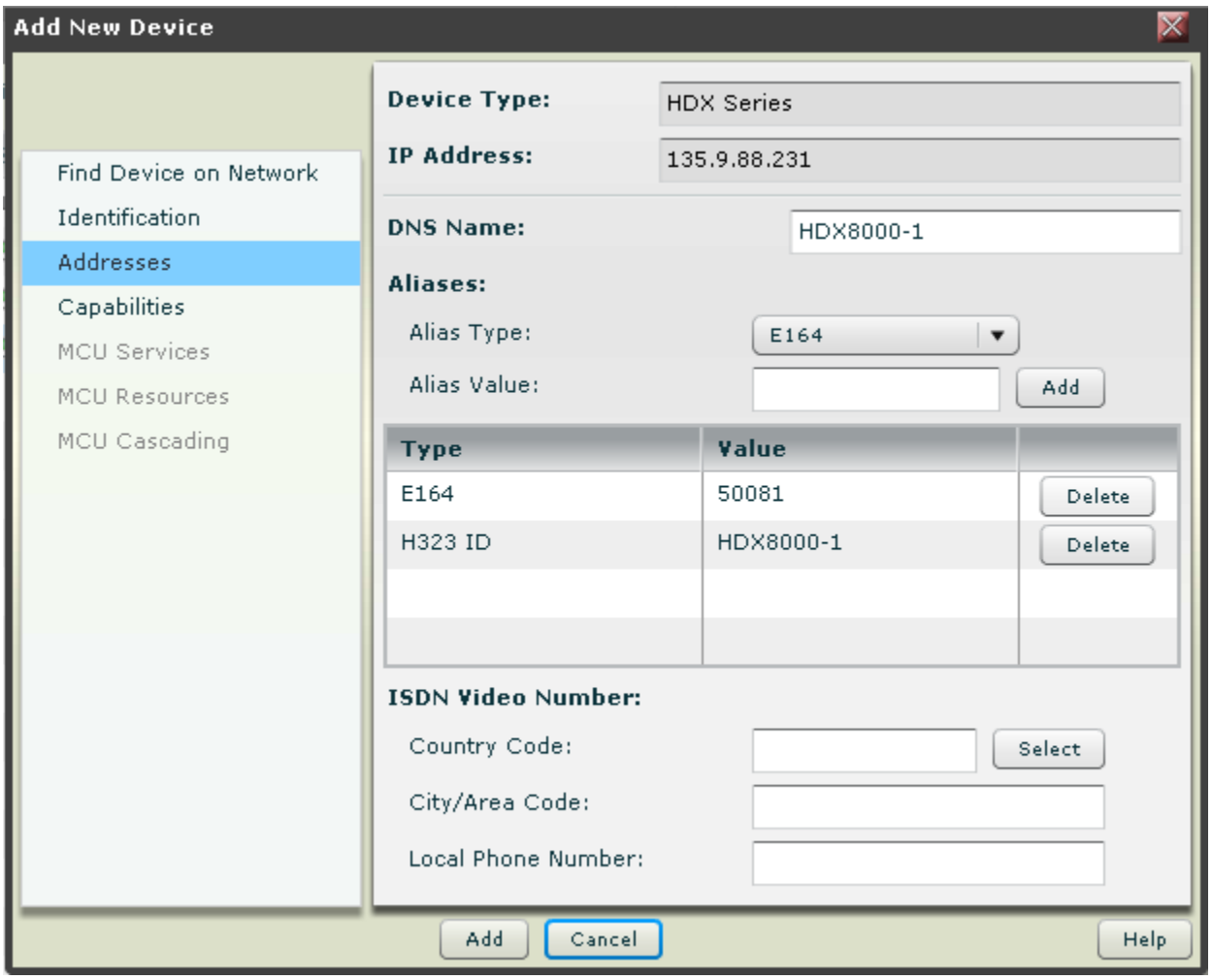
If the device was successfully found, you will see the following message displayed:



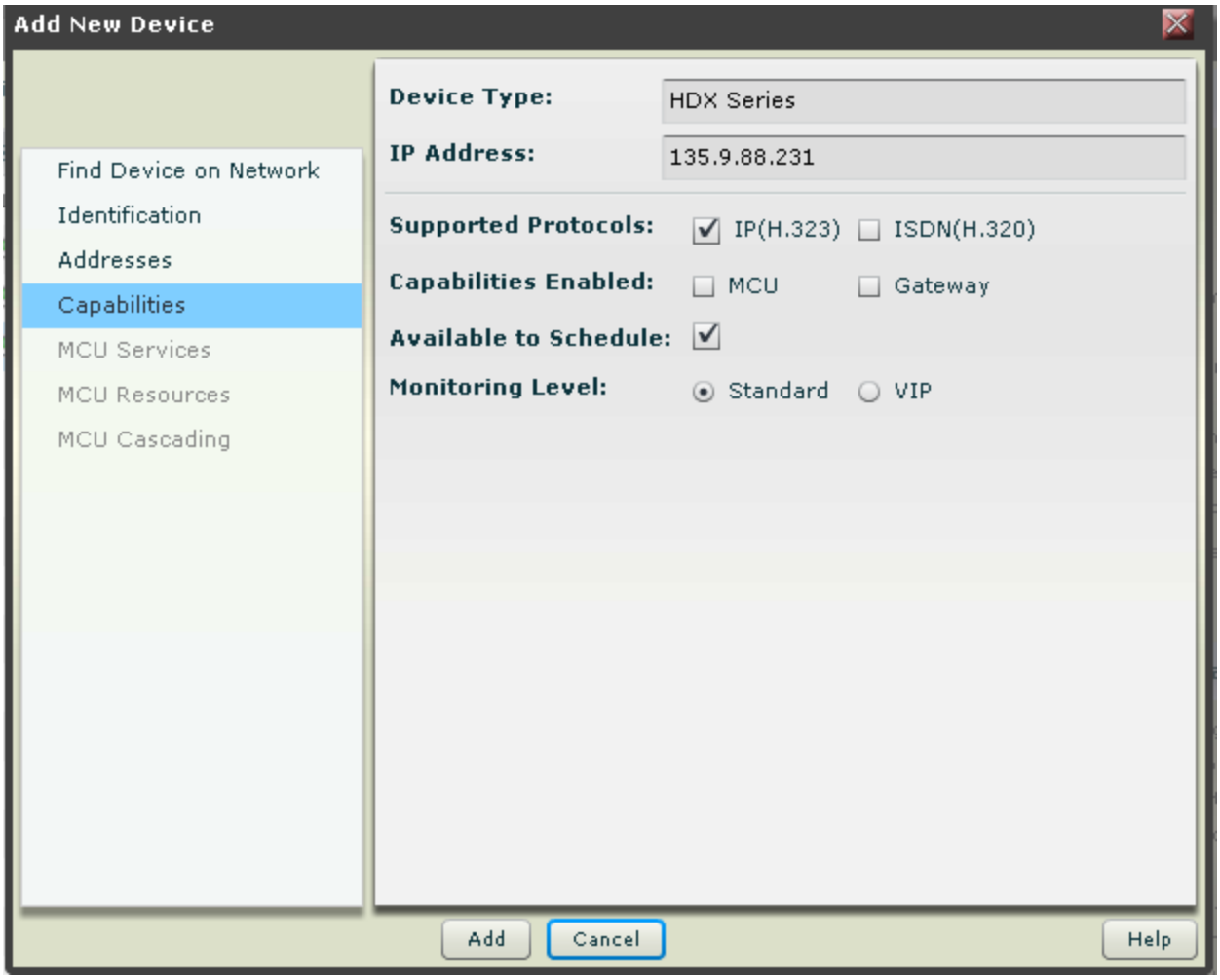
Select the **Identification** option from the Add New Device list. This is the data that was sent by the Polycom Endpoint that was found. Fill in a **Description** if necessary (see below).



Select the **Address** option from the Add New Device list. The values displayed below are all values that were automatically setup when the Device (Polycom Endpoint) was found with the exception of the E164 Type and Value. It's necessary to enter an Alias Value for the Alias Type of E164, which is the extension that the endpoint will be assigned. In the example below the extension (E164) of this endpoint is 50081. Add additional details to this form as necessary.



Select the **Capabilities** option from the Add New Device list. The values displayed below are all default values that were automatically setup when the Device (Polycom Endpoint) was found. Select the additional items to this form as necessary. Click **Add**. Repeat this **Section 4.5 Endpoints** to add additional Polycom Endpoints.



6. Configure Video Endpoints on Communication Manager

6.1. Configure Polycom VSX/HDX Series Video Conferencing Systems on Communication Manager

Use this procedure to configure Polycom VSX/HDX video conferencing systems. When setting up these systems, you will need to know the following information:

- Maximum number of VSX/HDX systems on your network
- PIN for each VSX/HDX system. The PIN can consist of a maximum of eight numeric characters and is defined by the System Administrator. The PIN must be the same number as is defined on the station form **Security Code**.
- The key code that combines the Avaya option with any other Polycom options.
- Whether the VSX/HDX system has the multipoint option. If so, you must combine the Polycom Software License for this capability with the "Avaya Option" Polycom Software License to create a single Key Code to input into the unit.
- IP address of the voice system.
- IP codec sets you want to use.
- IP network regions you want to use.

Perform the following steps to configure Polycom systems on Communication Manager:

1. Use the **display system-parameters customer-options** command to verify the M**aximum Video Capable Stations** (page 2 of form). This number is provided by the RFA license file. The **Maximum Video Capable Stations** was determined using the following criteria.
   - Each single-point VSX/HDX system is considered to be one station.
   - Each VSX multpoint system can be **three** to **six** stations.
   - Each HDX system can be three stations for multipoint plus 4 and seven for multipoint plus 8 multipoint licensed options for the HDX9004. The HDX9002 only has multipoint plus 4 as an option.
2. Use the **change cos** command to set **Priority Ip Video** (page 2 of form) for the appropriate COS levels.
3. Use the **add station** command to add a station for the Polycom system. Set the following parameters:
   - **Type** to **H.323**.
   - **Security Code** to the “pin” you will administer for the VSX or HDX system.
   - **IP Video** to **y**.
   - If you want this station to be able to make priority video calls, make sure you select a COS level that has **Priority Ip Video** enabled.
   - On page 2 of the form, set **Direct IP-IP Audio Connections** to **y** and set **IP Audio Hairpinning** to **y**.

   NOTE: You can create an alias for VSX/HDX stations.

```
display system-parameters customer-options                    Page   2 of  11
                              OPTIONAL FEATURES

IP PORT CAPACITIES                                             USED
                     Maximum Administered H.323 Trunks: 12000 211
          Maximum Concurrently Registered IP Stations: 18000 28
            Maximum Administered Remote Office Trunks: 0     0
Maximum Concurrently Registered Remote Office Stations: 0     0
             Maximum Concurrently Registered IP eCons: 414   0
  Max Concur Registered Unauthenticated H.323 Stations: 18000 0
                       Maximum Video Capable Stations: 18000 12
                   Maximum Video Capable IP Softphones: 18000 27
                       Maximum Administered SIP Trunks: 7000  1619
  Maximum Administered Ad-hoc Video Conferencing Ports: 12000 80
   Maximum Number of DS1 Boards with Echo Cancellation: 0     0
                            Maximum TN2501 VAL Boards: 128   1
                     Maximum Media Gateway VAL Sources: 250   0
           Maximum TN2602 Boards with 80 VoIP Channels: 128   0
          Maximum TN2602 Boards with 320 VoIP Channels: 128   3
   Maximum Number of Expanded Meet-me Conference Ports: 300   0

        (NOTE: You must logoff & login to effect the permission changes.)
```

```
change cos                                                    Page   2 of   2
                              CLASS OF SERVICE

                              0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
 VIP Caller                   n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n

 Masking CPN/Name Override    n  n  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Call Forwarding Enhanced     y  y  y  y  y  y  y  y  y  y  y  y  y  y  y  y
 Priority Ip Video            n  y  n  n  n  n  n  n  n  n  n  n  n  n  n  n
 Ad-hoc Video Conferencing    y  y  y  n  n  n  n  n  n  n  n  n  n  n  n  n
```

```
add station 50081                                             Page   1 of   4
                                   STATION

Extension: 50081                      Lock Messages? n                BCC: M
     Type: H.323                      Security Code: 123456            TN: 1
     Port: S01767                   Coverage Path 1:                  COR: 1
     Name: HDX8000                  Coverage Path 2:                  COS: 2
                                    Hunt-to Station:                Tests? y
STATION OPTIONS
                                       Time of Day Lock Table:
             Loss Group: 19          Message Waiting Indicator: none

                                     Authentication Required? y


          Survivable COR: internal
   Survivable Trunk Dest? y
            DTMF over IP: in-band
                                                      IP Video? y
```

```
add station 50081                                          Page   2 of   4
                                    STATION
FEATURE OPTIONS
           LWC Reception: spe
          LWC Activation? y                    Coverage Msg Retrieval? y
  LWC Log External Calls? n
             CDR Privacy? n                          Data Restriction? n
   Redirect Notification? y                  Call Waiting Indication: y
 Per Button Ring Control? n                Att. Call Waiting Indication: y
   Bridged Call Alerting? n
        Switchhook Flash? y

        H.320 Conversion? n          Per Station CPN - Send Calling Number?


    MWI Served User Type:
              AUDIX Name:
                                            Coverage After Forwarding? s
                                              Multimedia Early Answer? n
                                          Direct IP-IP Audio Connections? y
  Emergency Location Ext: 50081                   IP Audio Hairpinning? y
```

If the VSX/HDX system has the multipoint option, perform the following steps:

1. Use the **add station** command to add a second station for the Polycom system.
2. Set **Type** to **H.323**.
3. Set **Security Code** to the "pin" you will administer for theVSX/HDX. Make sure the security code is the same as the previous station. All the stations configured for a single VSX or HDX system must have the same security code.
4. Set **IP Video** to **y**.
5. On page 2 of the form, set **Direct IP-IP Audio Connections** to **y**.
6. Set **IP Audio Hairpinning** to **y**.
7. If you want this station to be able to make priority video calls, make sure you select a COS level that has **Priority Ip Video** enabled.
8. Repeat Steps 1 through 7 to create the third consecutive station. For VSX systems, you can have up to six stations.
9. Use the **change station *xx*** command (where ***xx*** is the first station you added for the Polycom system) to set **Hunt-to Station** to the second station you added for the Polycom system.
10. Use the **change station *xx*** command (where ***xx*** is the second station you added for the Polycom system) to set **Hunt-to Station** to the third station you added for the Polycom system.
11. Use the **change station *xx*** command (where ***xx*** is the third station you added for the Polycom system) to set **Hunt-to Station** to the first station you added for the Polycom system. All stations must be in a circular hunt. If you added more than three stations for the Polycom system, use the **change station *xx*** command to set **Hunt-to Station** for each station.

```
add station 50081                                          Page   1 of   4
                                  STATION

Extension: 50081                      Lock Messages? n               BCC: M
     Type: H.323                      Security Code: 123456           TN: 1
     Port: S01767                   Coverage Path 1:                 COR: 1
     Name: HDX8000                  Coverage Path 2:                 COS: 2
                                    Hunt-to Station: 50082         Tests? y
STATION OPTIONS
                                       Time of Day Lock Table:
             Loss Group: 19          Message Waiting Indicator: none

                                     Authentication Required? y

          Survivable COR: internal
   Survivable Trunk Dest? y
            DTMF over IP: in-band
                                                      IP Video? y
```

```
add station 50082                                          Page   1 of   4
                                  STATION

Extension: 50082                      Lock Messages? n               BCC: M
     Type: H.323                      Security Code: 123456           TN: 1
     Port: S01767                   Coverage Path 1:                 COR: 1
     Name: HDX8000                  Coverage Path 2:                 COS: 2
                                    Hunt-to Station: 50083         Tests? y
STATION OPTIONS
                                       Time of Day Lock Table:
             Loss Group: 19          Message Waiting Indicator: none

                                     Authentication Required? y

          Survivable COR: internal
   Survivable Trunk Dest? y
            DTMF over IP: in-band
                                                      IP Video? y
```

```
add station 50083                                          Page   1 of   4
                                  STATION

Extension: 50083                      Lock Messages? n               BCC: M
     Type: H.323                      Security Code: 123456           TN: 1
     Port: S01767                   Coverage Path 1:                 COR: 1
     Name: HDX8000                  Coverage Path 2:                 COS: 2
                                    Hunt-to Station: 50081         Tests? y
STATION OPTIONS
                                       Time of Day Lock Table:
             Loss Group: 19          Message Waiting Indicator: none

                                     Authentication Required? y

          Survivable COR: internal
   Survivable Trunk Dest? y
            DTMF over IP: in-band
                                                      IP Video? y
```

Perform the following steps to configure VSX/HDX Polycom Systems registered to Communication Manager Gatekeeper:

1. Install the Polycom system and connect it to your network.
2. Upgrade the Polycom system software (if necessary).
3. Using a web browser, access the Polycom home page for the unit, and select **Admin Settings**>**Network**>**IP Network**.
4. Select the **Enable IP H.323** check box.
5. Select the **Display H.323 Extension** check box.
6. In the **H.323 Extension (E.164)** box, enter the first station extension number you specified for this system on the Communication Manager system.
7. From the **Use Gatekeeper** box, select **Specify with PIN**.
8. In the **Gatekeeper IP Address** box, enter the IP address of the CLAN or Processor Ethernet (procr) followed by: 1719 (to specify the correct port to use).
9. In the **Authentication PIN** box, enter the security code you entered when administering the station on Communication Manager.
10. In the **Number** box in the Gateway area, enter the H.323 extension you specified.
11. Select the **Enabled PVEC** check box.
12. In the **Type of Service** box in the **Quality of Service** area, select the appropriate setting. Both **IP Precedence** and **DiffServ** are supported. Contact your Network Administrator for this information.
13. In the **Type of Service Value** boxes (**Video**, **Audio**, and **Control**), enter the QoS values for the IP Network Region settings in which the VSX/HDX station belongs.
14. Select the **Dynamic Bandwidth** check box.
15. From the **Maximum Transmit Bandwidth** box, select the setting that matches the Maximum Call Rate for Direct-IP Multimedia setting you specified for the Communication Manager system.
16. From the **Maximum Receive Bandwidth** box, select the setting that matches the Maximum Call Rate for Direct-IP Multimedia setting you specified for the Communication Manager system.
17. Complete the **Firewall** section as necessary.
18. When finished, click the **Update** button at the top (see **Figure 3** below).

Repeat above Steps for each Polycom system.

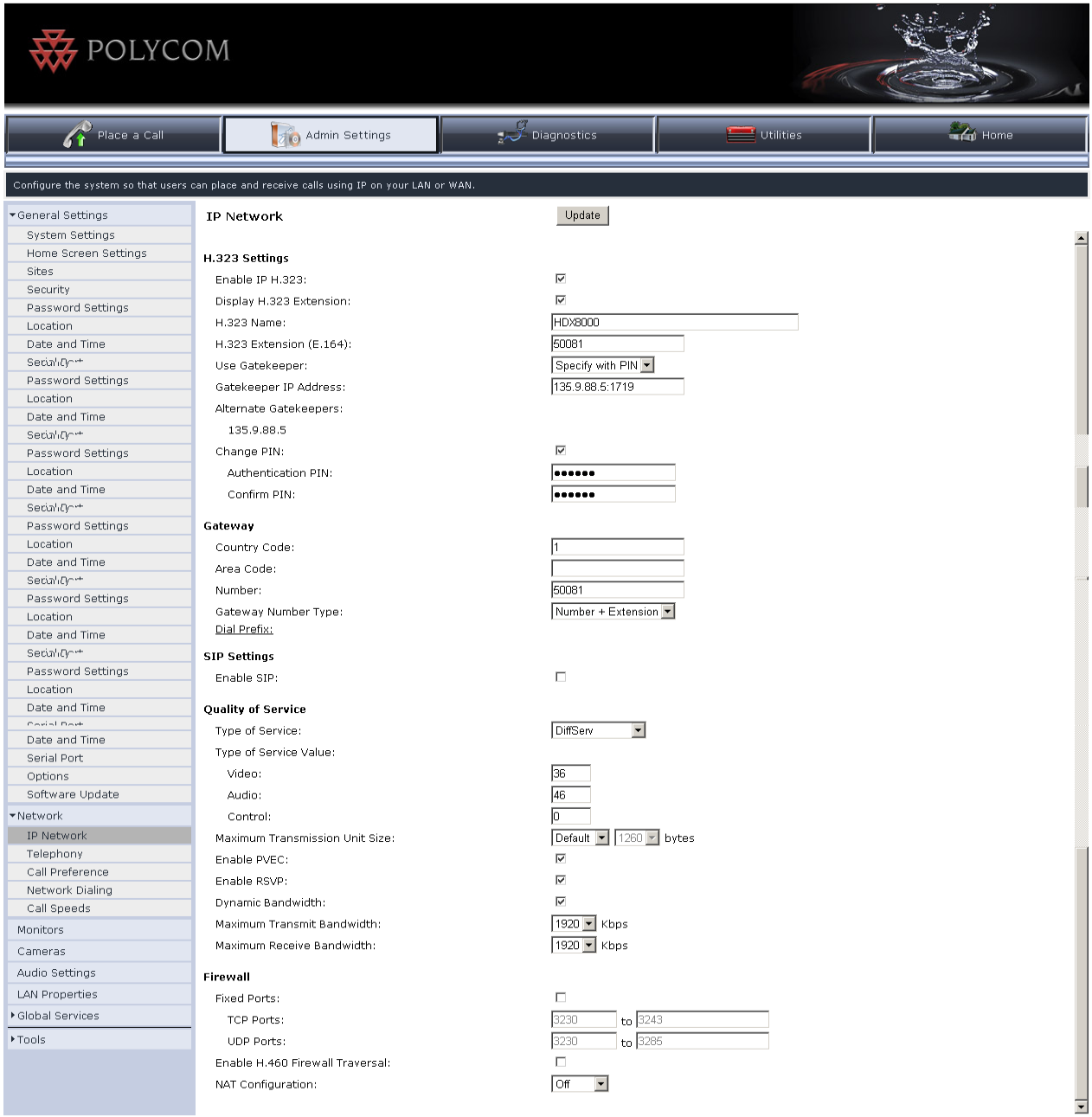


Figure 3. Example of a Polycom HDX8000 registered to Communication Manager

Perform the following steps to configure VSX/HDX Polycom Systems registered to Polycom CMA Gatekeeper:

1. Install the Polycom system and connect it to your network.
2. Upgrade the Polycom system software (if necessary).
3. Using a web browser, access the Polycom home page for the unit, and select **Admin Settings**>**Network**>**IP Network**.
4. Select the **Enable IP H.323** check box.
5. Select the **Display H.323 Extension** check box.
6. In the **H.323 Extension (E.164)** box, enter the first station number you specified for this system on the Polycom CMA Gatekeeper.
7. From the **Use Gatekeeper** box, select **Specify**.
8. In the **Gatekeeper IP Address** box, enter the IP address of the Polycom CMA Gatekeeper followed by: 1719 (to specify the correct port to use).
9. In the **Number** box in the Gateway area, enter the H.323 extension you specified.
10. Select the **Enabled PVEC** check box.
11. In the **Type of Service** box in the **Quality of Service** area, select the appropriate setting. Both **IP Precedence** and **DiffServ** are supported. Contact your Network Administrator for this information.
12. In the **Type of Service Value** boxes (**Video**, **Audio**, and **Control**), enter the QoS values necessary. Contact your Network Administrator for this information.
13. Select the **Dynamic Bandwidth** check box.
14. From the **Maximum Transmit Bandwidth** box, select the appropriate setting. Contact your Network Administrator for this information.
15. From the **Maximum Receive Bandwidth** box, select the appropriate setting. Contact your Network Administrator for this information.
16. Complete the **Firewall** section as necessary.
17. When finished, click the **Update** button at the top (see **Figure 4** below).

Repeat above Steps for each Polycom system.

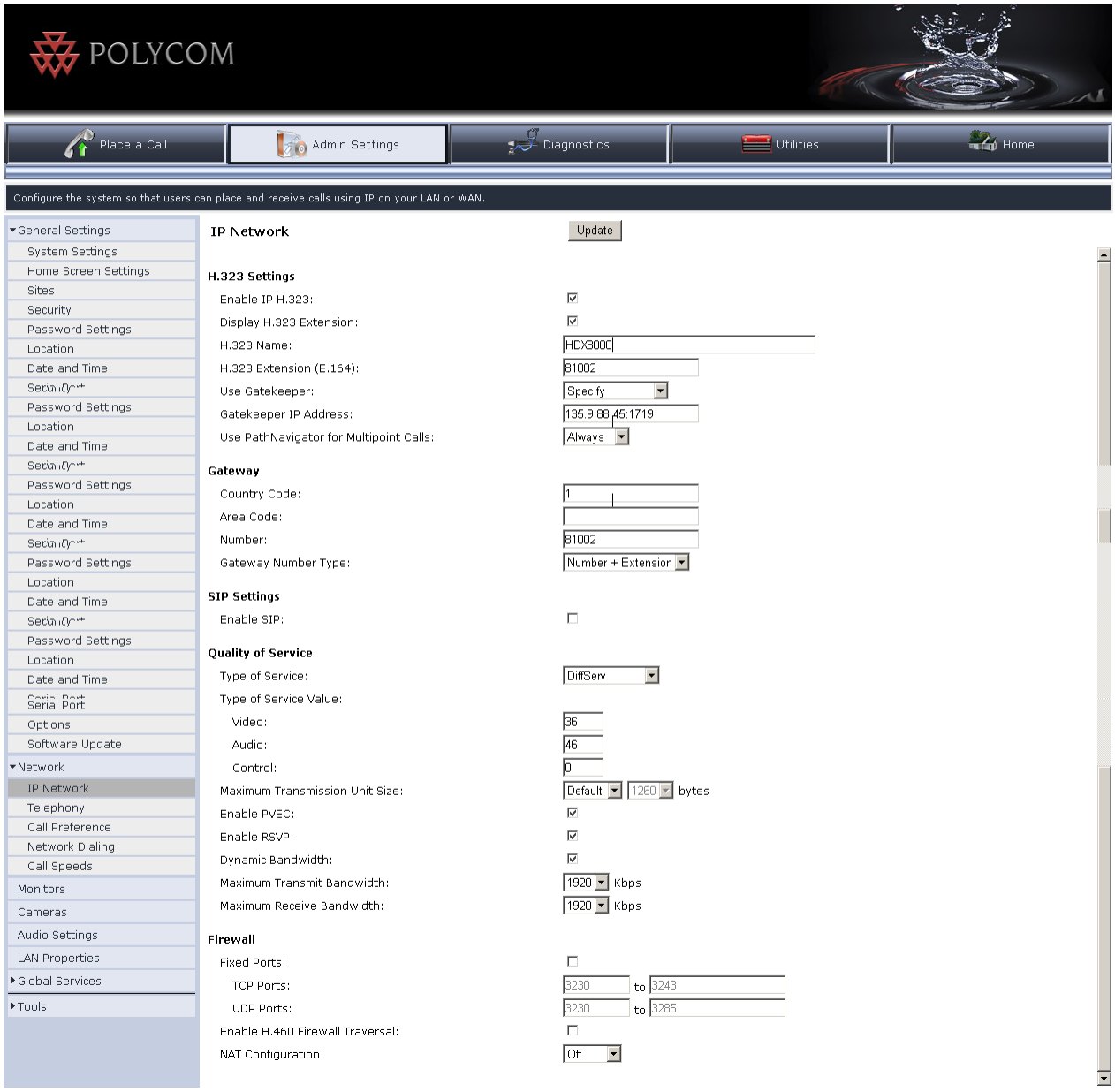


Figure 4. Example of a Polycom HDX8000 registered to Polycom CMA Gatekeeper

7. General Test Approach and Test Results

The testing was successfully concluded and it was not necessary to correct equipment deficiencies or failures.

8. Verification

This section provides the tests that can be performed to verify proper configuration of Communication Manager and Polycom Gatekeeper.

Use **Status Station** command to verify the status of the station. The following screen captures display the status of station 50090. The Service State is in-service/off-hook meaning that this user is active on a call. The following four screen captures are an example of the status of a Polycom video endpoint active on a call.

```
status station 50090                                          Page   1 of   8
                              GENERAL STATUS
     Administered Type: H.323              Service State: in-service/off-hook
        Connected Type: N/A             TCP Signal Status: connected
             Extension: 50090
                  Port: S01762         Parameter Download: not-applicable
           Call Parked? no                  SAC Activated? no
      Ring Cut Off Act? no
Active Coverage Option: 1             one-X Server Status: N/A

          EC500 Status: N/A         Off-PBX Service State: N/A
   Message Waiting:
   Connected Ports: T01844


  Limit Incoming Calls? no

 User Cntrl Restr: none                          HOSPITALITY STATUS
Group Cntrl Restr: none                        Awaken at:
                                                User DND: not activated
                                               Group DND: not activated
                                             Room Status: non-guest room
```

The **Switch-End** IP address is the IP address of the CLAN or Processor Ethernet that this endpoint is registered to. The **Set End** is the IP address of this endpoint.

```
status station 50090                                          Page   4 of   8
                              CALL CONTROL SIGNALING
Port: S01762         Switch-End IP Signaling Loc: 01B1217  H.245 Port: 01B1217
            IP Address                                Port  Node Name       Rgn
Switch-End: 135.9.88.5                                1720  sqa8730clan3B   1
   Set End: 135.9.88.233                              1720                  1
H.245 Near: 135.9.88.5                                13118
 H.245 Set: 135.9.88.233                              H.245 Set:33369
```

The **Other-End** IP address is the IP address of the endpoint that this endpoint is talking to. The **Set-End** is the IP address of this endpoint. In this example below the **Audio Connection Type** is **ip-direct**, meaning that the call has shuffled and therefore not using any Media Processor resources on the Communication Manager.

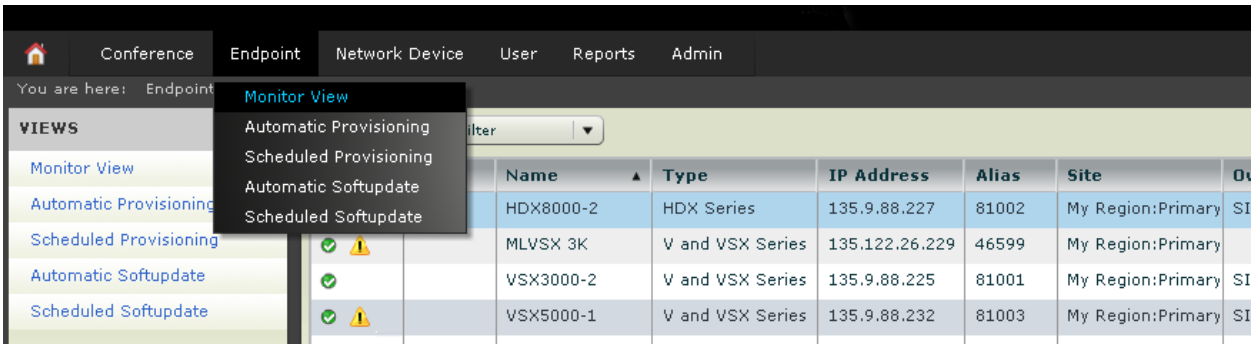
```
status station 50090                                          Page   5 of   8

                          AUDIO CHANNEL Port: S01762
SIREN14-32K   Switch-End Audio Location:
            IP Address                                Port  Node Name       Rgn
Other-End: 135.9.88.227                               49174                 1
  Set-End: 135.9.88.233                               49170                 2
Audio Connection Type: ip-direct
```

In this example below the call is using the codec **srn14-32** which was defined earlier on the **ip-codec set** form on Communication Manager.

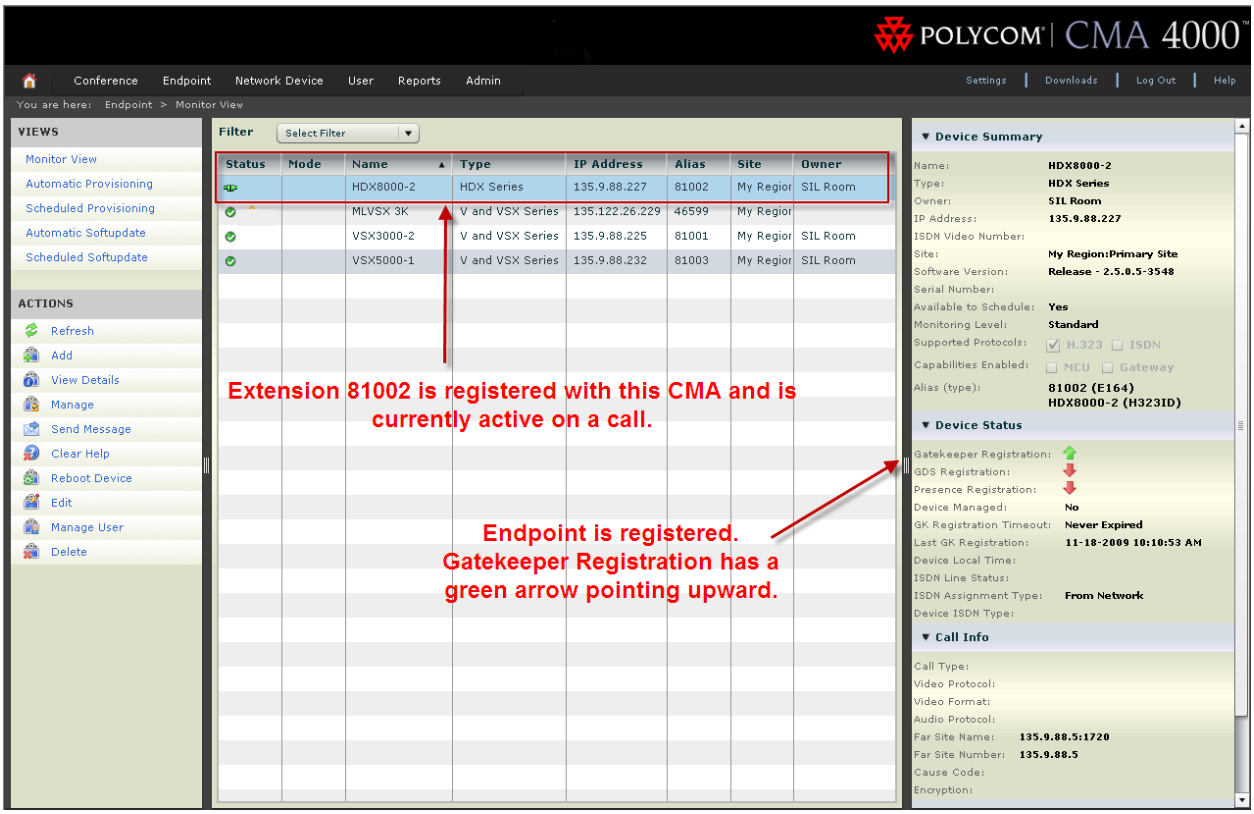
```
status station 50090                                          Page   7 of   8
                     SRC PORT TO DEST PORT TALKPATH
src port: S01762
S01762:TX:135.9.88.233:49170/srn14-32/20ms
T01844:RX:135.9.88.227:49174/srn14-32/20ms


Dst port:  T01844
```

8.1. Verify Polycom Endpoint Registered to CMA

Log in to the Polycom CMA web interface to verify registered endpoints. Under the **Endpoint** tab select **Monitor View**. This will bring up a list of registered endpoints and other relevant information including the Device Summary, Device Status, and Call Info.



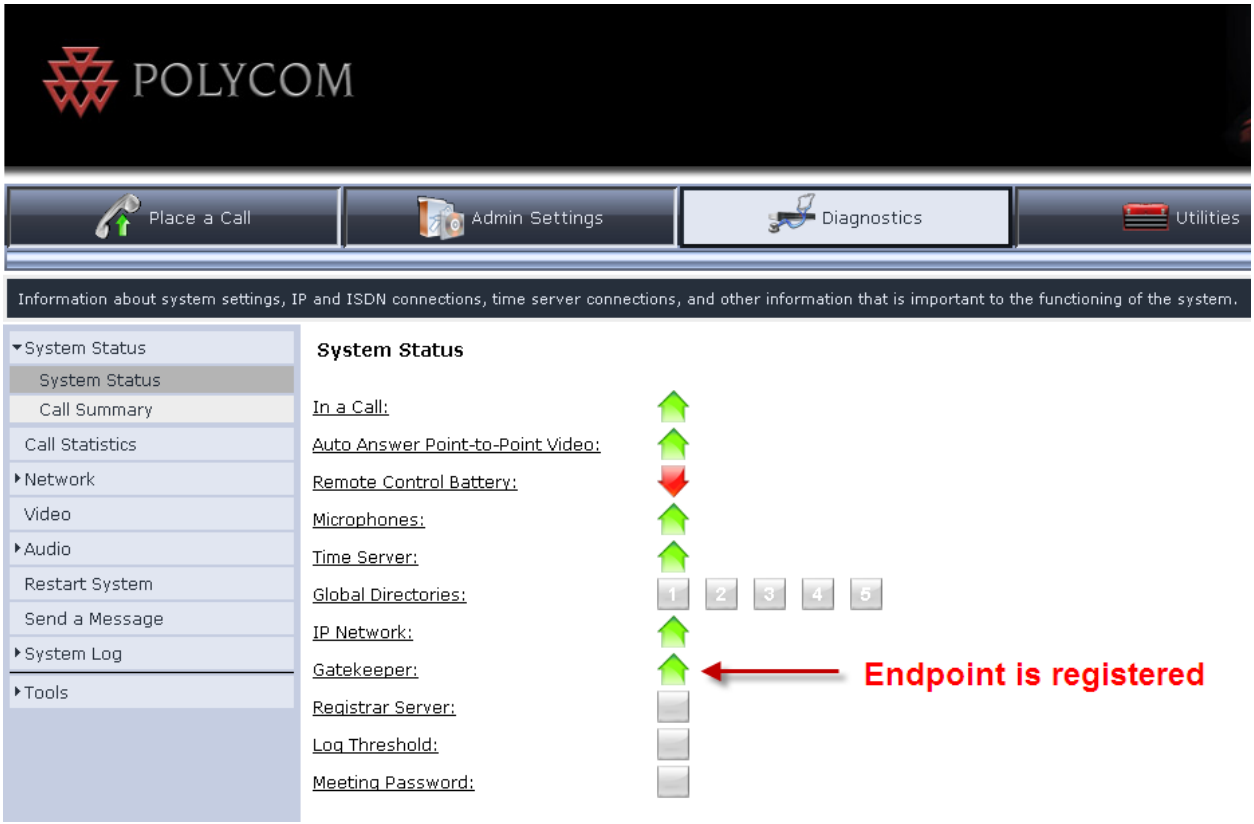
Below is an example of a Polycom HDX8000 device (81002) registered to the CMA and active on a call. Under the Status column there are various symbols that represent different things including active on a call (connected plug symbol) and registered (check mark). On the right hand side of the CMA screen capture below is the Device Summary which gives information pertaining to the device registered to the CMA, the Device Status which in this case shows the endpoint is registered by displaying a green up arrow, and the Call Info in this case displays the Far Site Name and Number which is the CLAN IP address located at the Neighboring CM Gatekeeper.



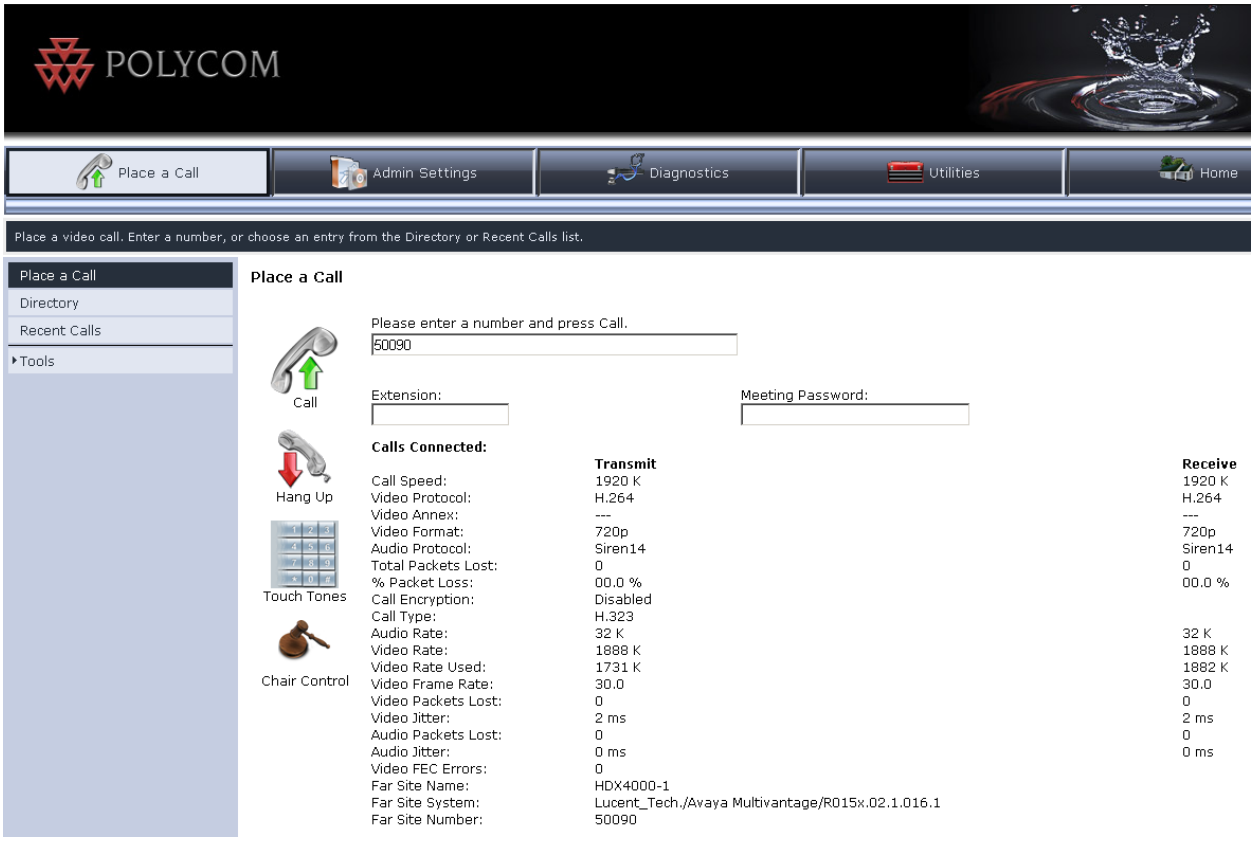
Here is an example of an endpoint that is administered on the CMA but not registered.

8.2. Verify Status of Polycom Endpoint

Log in to the Polycom endpoint's web interface and select the **Diagnostics** tab and then from the left column select **System Status**. This is an example of the Polycom video endpoint's web interface showing that it's registered with the Gatekeeper. Notice the green upward arrow next to Gatekeeper. If the endpoint was not registered a red arrow pointing downward would be displayed instead of the green upward arrow.



To see the status of an active Polycom endpoint from its web interface select the **Place a Call** tab. Under **Please enter a number and press Call** you will notice that the number **50090** was dialed in this example. All of the information that pertains to this call is displayed under **Calls Connected**.



9. Conclusion

The H.323 Video interoperability among Communication Manager Gatekeeper, Polycom CMA 4000 Gatekeeper, VSX 3000, VSX5000, HDX 4002, HDX 8006, and HDX9005 Endpoints has been tested and passed.

10. Additional References

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

Polycom references are available at http://www.polycom.com/support/