Avaya Solution and Interoperability Test Lab

How to Configure an H.323 IP Trunk between Avaya IP Office and Avaya Communication Manager - Issue 1.0

Abstract

These Application Notes describe how to configure an H.323 IP trunk between Avaya IP Office and Avaya Communication Manager. The H.323 IP trunk was established between an Avaya IP Office Small Office Edition and an Avaya S8300 Media Server with Avaya G700 Media Gateway but is also applicable to other Avaya media servers and media gateways.

1. Introduction

These Application Notes describe how to configure an H.323 IP trunk between Avaya IP Office and Avaya Communication Manager. The H.323 IP trunk was established between an Avaya IP Office Small Office Edition and an Avaya S8300 Media Server with Avaya G700 Media Gateway but is also applicable to other Avaya media servers and media gateways.

The network configuration diagram shown in **Figure 1** was used for these Application Notes. The Main Office consists of an Avaya S8300 Media Server with Avaya G700 Media Gateway. The Avaya IP Office Small Office Edition is located in the Branch Office.

The sample configuration in these Application Notes shows how the G.711 mu-law codec can be used for better voice quality for calls on the LAN and the G.729A codec can be used to reduce the amount of bandwidth used for calls going through a WAN link. In general, the phrase "shuffling to direct media" refers to a process that can result in final media paths that flow directly being IP devices such as IP Telephones, thus allowing resources to be conserved on the Media Processor for Avaya Communication Manager or Voice Compression Modules for the Avaya IP Office. However, shuffling to direct media must be disabled for the H.323 IP trunk described in these Application Notes. As a consequence of disabling shuffling to direct media, additional Voice Compression Modules (VCMs) may need to be engineered. For example, an inter-site call between two IP Telephones will require two VCM resources, one processing the RTP media stream from the telephone to Avaya IP Office, and another processing the RTP stream from Avaya IP Office to Avaya Communication Manager.

In addition to verifying successful inter-site bi-directional calls, the following features were tested using the H.323 IP trunk:

- DTMF (Dual Tone Multi-Frequency)
- Hold/Unhold
- Transfer
- Conference
- Displays

DTMF was verified by using PIN verification to join meet-me conferences administered on both Avaya Communication Manager and Avaya IP Office.

Section 5 contains tables describing what is shown on the display of each telephone for calling party name and number while a phone is ringing, and after the call is answered. The connected number is not displayed on the phones registered to Avaya IP Office.

The administration of the network infrastructure shown in **Figure 1** is not the focus of these Application Notes and will not be covered. For administration of the network infrastructure shown in **Figure 1**, refer to the appropriate documentation listed in Section 7.

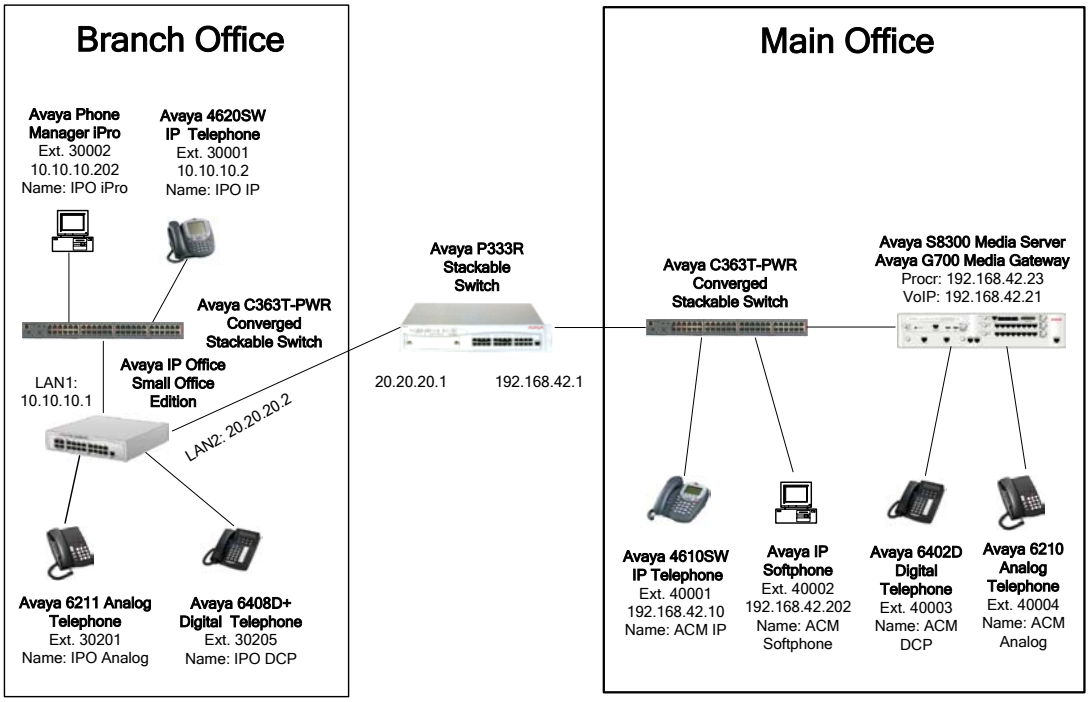


Figure 1 - Network Configuration Diagram

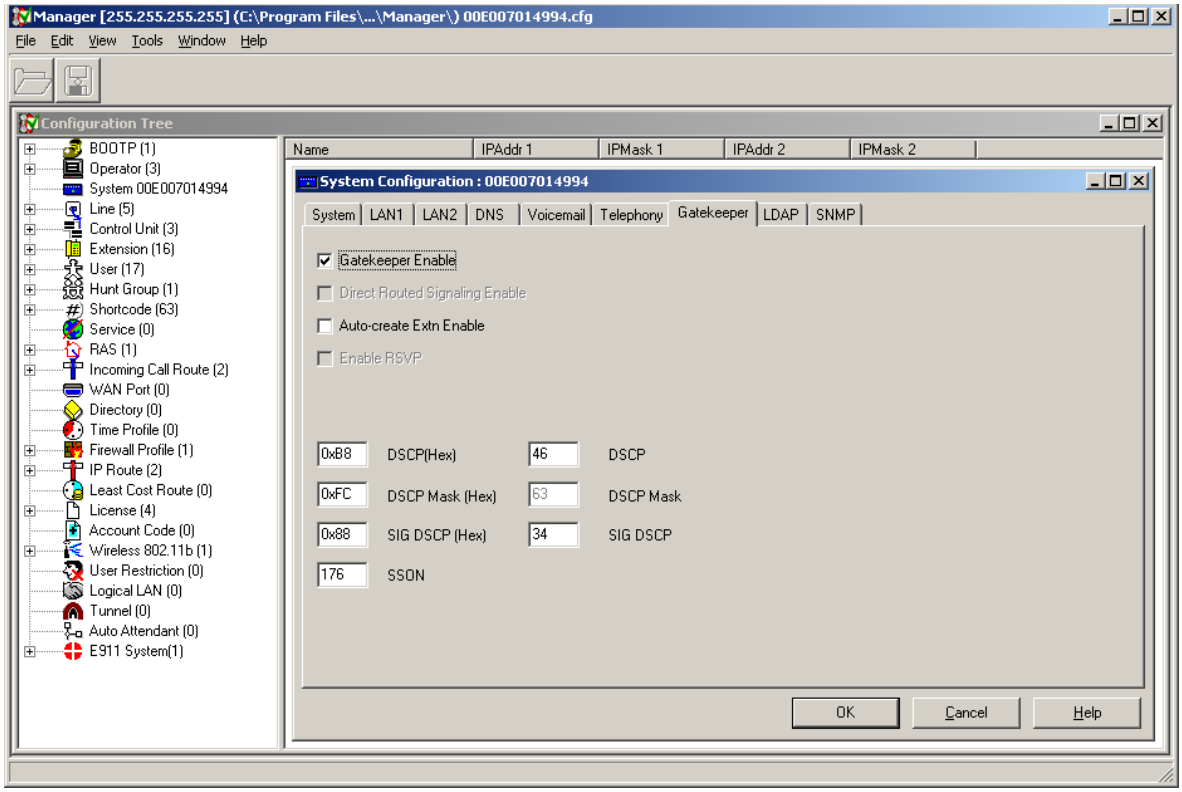
2. Equipment and Software Validated

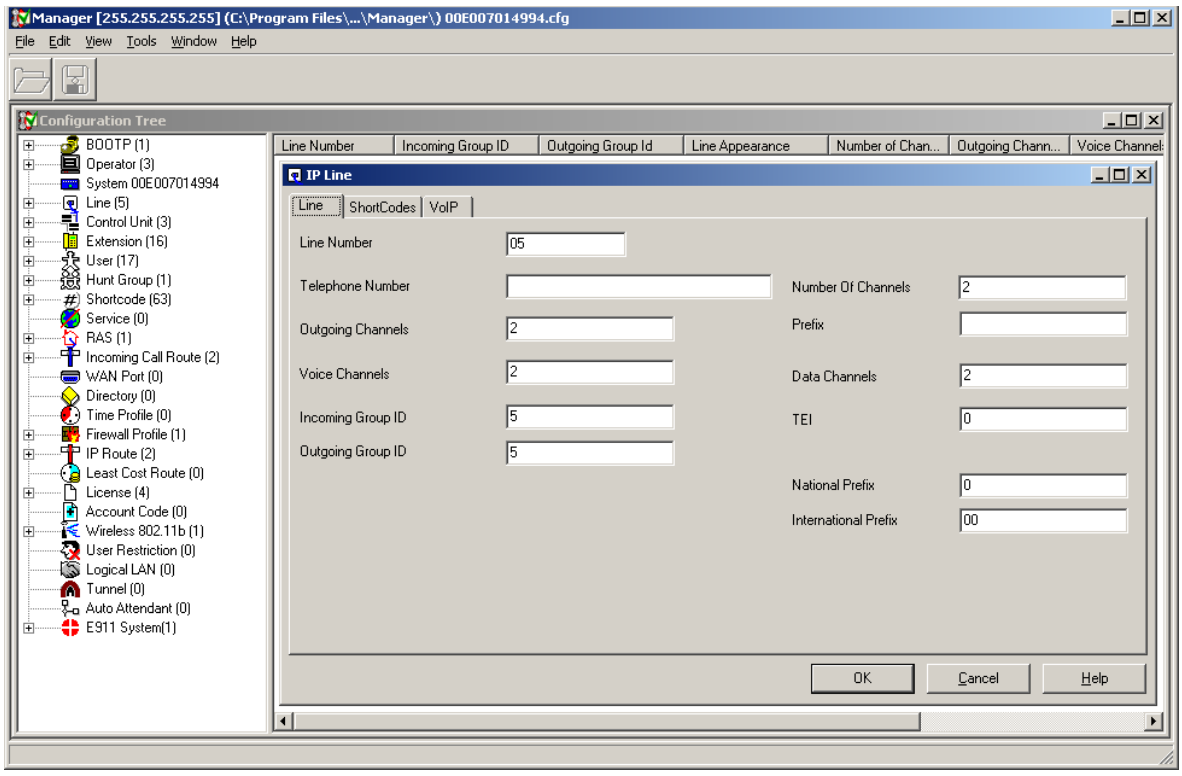
The following hardware and software versions were used for this configuration:

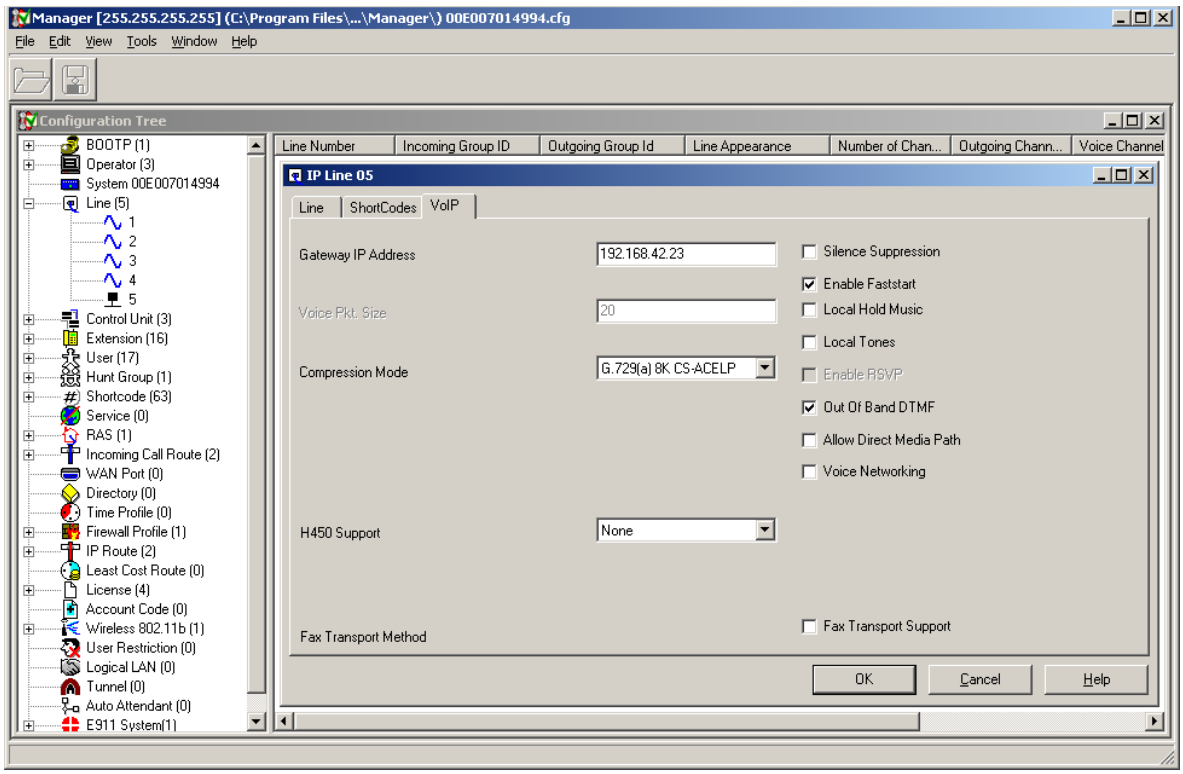
Equipment	Version
Avaya IP Office Small Office Edition	3.0 (40)
Avaya S8300B Media Server Avaya G700 Media Gateway	3.0 (340.3) 24.17.0
Avaya C363T-PWR Converged Stackable Switch	4.3.12
Avaya P333R Stackable Switch	4.1.1
Avaya 4610SW IP Telephone	2.2
Avaya 4620SW IP Telephone	2.1.3
Avaya 6402D Digital Telephone	---
Avaya 6408D+ Digital Telephone	---
Avaya 6210 Analog Telephone	---
Avaya 6211 Analog Telephone	---
Avaya IP Softphone	5.2.3.6
Avaya IP Office Phone Manager iPro	3.0.12

Table 1 - Equipment and Version Validated

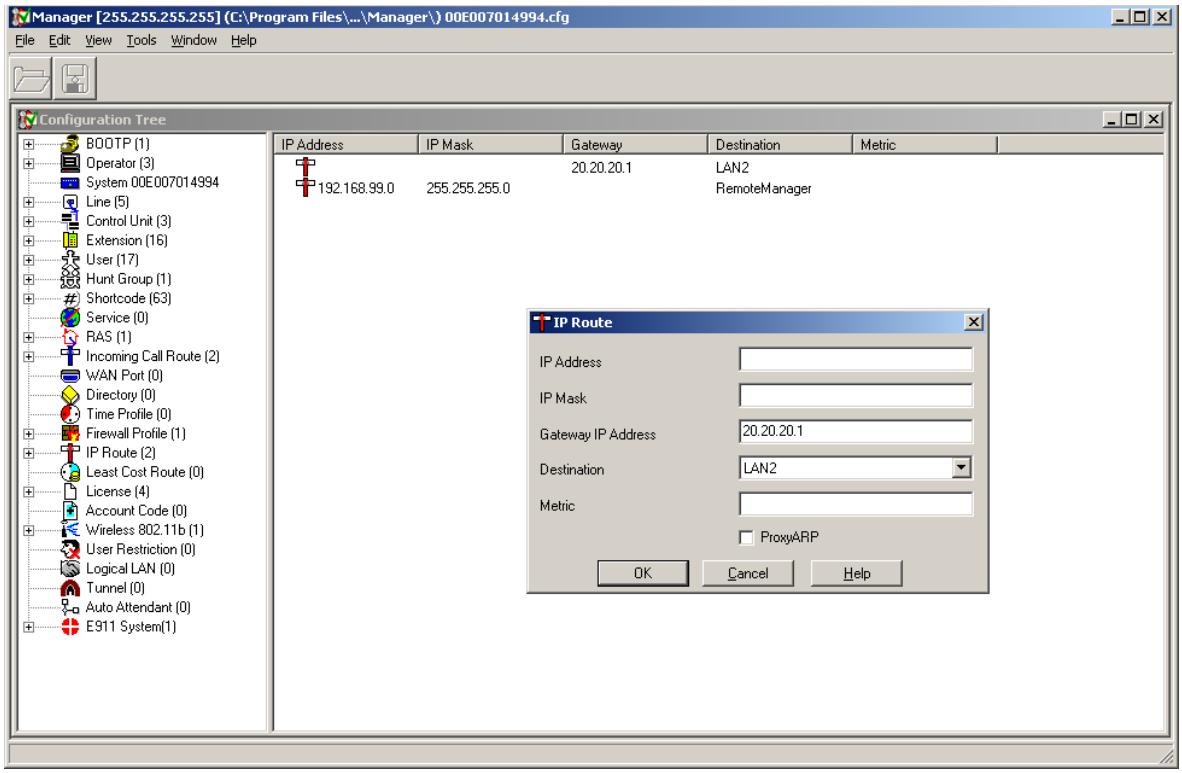
3. Configure Avaya IP Office Small Office Edition

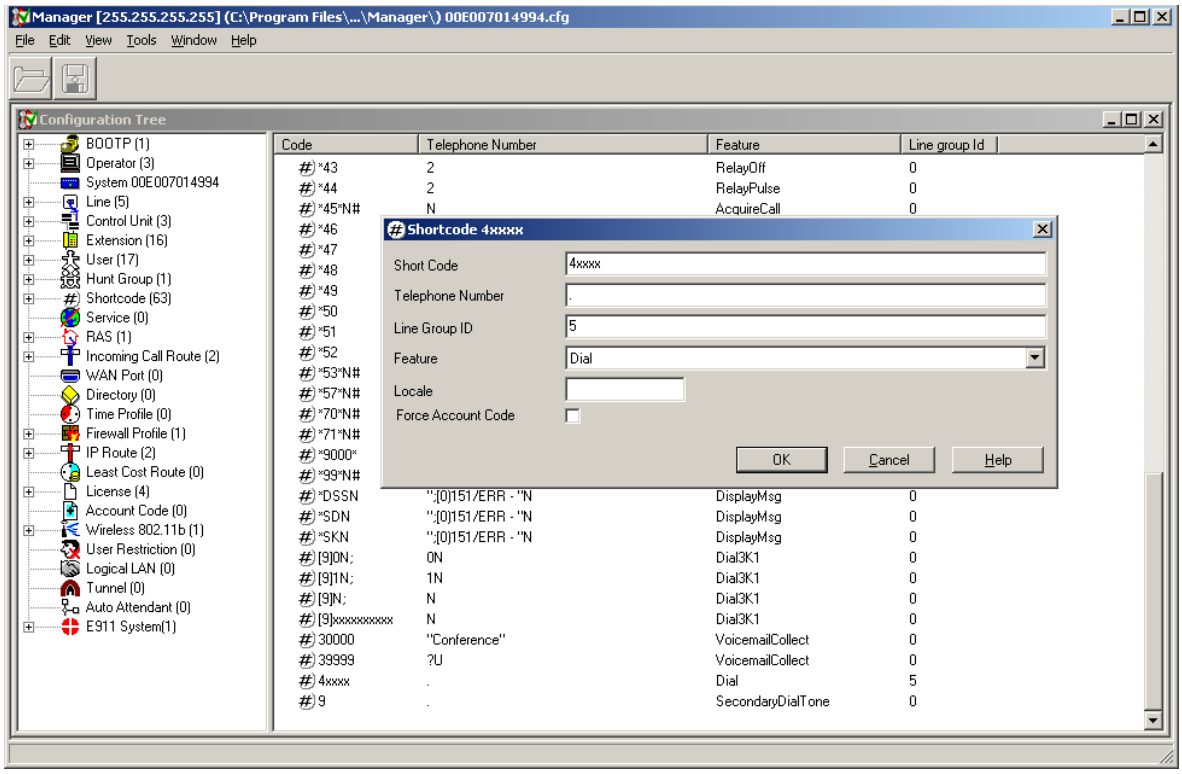
Step	Description
1.	Navigate to **Start → Programs → IP Office → Manager** to open the IP Office Manager Window. In the **Manager** window, double-click on **System** under the Configuration Tree. Click on the Gatekeeper tab and verify that the DiffServ values used for audio and signaling in the *DSCP* and the *SIG DSCP* fields are consistent with the *Audio PHB Value* and *Call Control PHB Value* fields in the Network Region form of Avaya Communication Manager as shown in Step 7 of Section 4. 

Step	Description
2.	Add a new line for the H.323 IP trunk between Avaya IP Office and Avaya Communication Manager. In the **Manager** window, click on **Line** under the Configuration Tree. Right-click in the **Line** window and click on **New** to add a line. Enter a unique number (e.g., **05**) for the *Line Number*. The *Outgoing Group ID* is used on the Short Code form to route calls using this line to Avaya Communication Manager. The number of channels (e.g., *Outgoing Channels, Voice Channels*, *Number of Channels*, and *Data Channels*) should match the number of trunk group members defined on the trunk group form in Avaya Communication Manager in Step 12 of Section 4. The number of channels specified must take into account the number of Voice Compression Modules installed in the Avaya IP Office and the bandwidth of the inter-site link. 

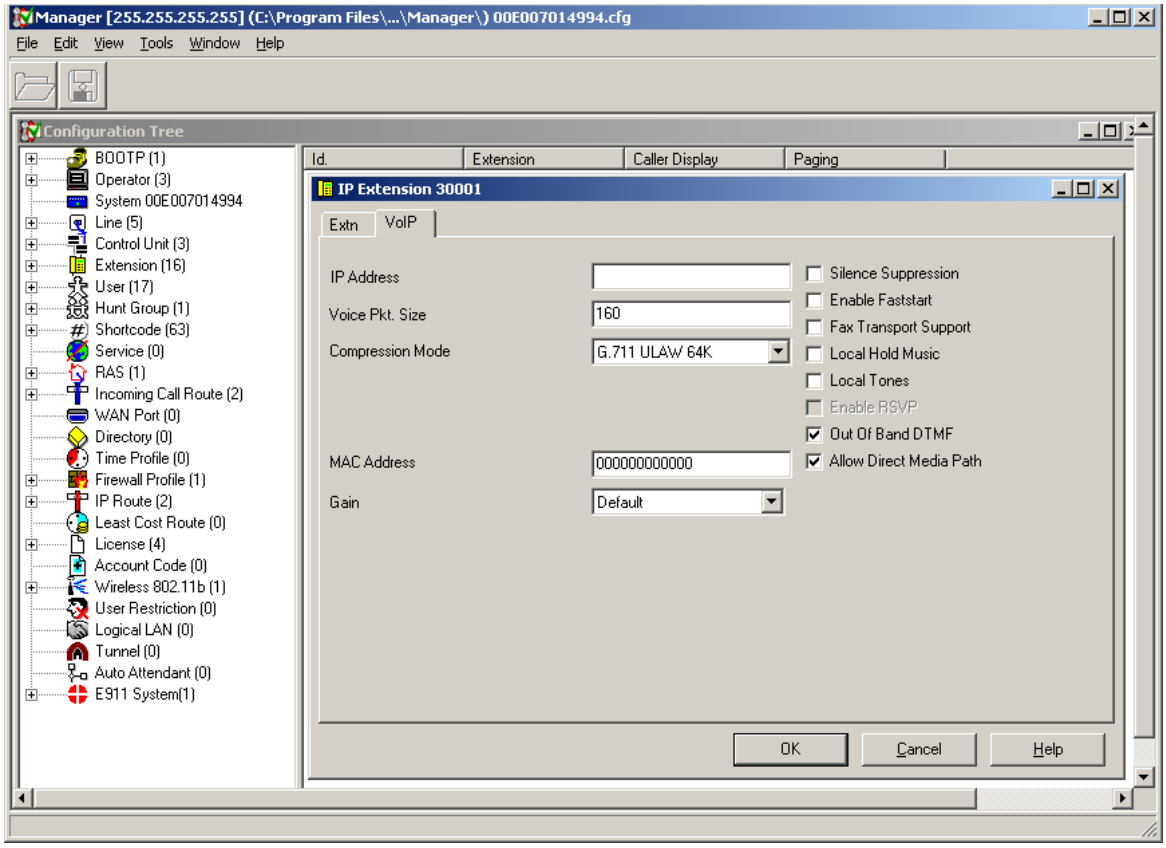
Step	Description
3.	Click on the **VoIP** tab. Enter the IP address of the Avaya S8300 Media Server processor interface. ***Note**: If an H.323 IP trunk is established to an Avaya S8500 or S8700 Series Media Server, use the IP address of a C-LAN instead.* Check the *Enable Faststart* and *Out of Band DTMF* checkboxes. Faststart reduces the number of messages that need to be exchanged before an audio channel is created. *Compression Mode* was set to G.729A to conserve bandwidth for calls going through the WAN link. Uncheck the *Allow Direct Media Path* checkbox to disable shuffling to direct media. Select **None** for the *H450 Support* drop-down list. Click **OK**. 

Step	Description
4.	Add a default route for the Avaya IP Office. In the **Manager** window, click on **IP Route** under the Configuration Tree. Right-click in the **IP Route** window and click on **New** to add an IP route. Leave the *IP Address* and *IP Mask* fields blank to make this entry the default route. Enter the IP address of the default gateway (e.g., **20.20.20.1**) in the *Gateway IP Address* field. Select **LAN2** for the *Destination* drop-down list. Click **OK**.



Step	Description
5.	Add a short code to route the calls to Avaya Communication Manager using the line specified in Step 2. In the **Manager** window, click on **Shortcode** under the Configuration Tree. Right-click in the **Short Code** window and click on **New** to add a new short code. The *Short Code* (e.g., **4xxxx**) shown below will route 5-digit calls beginning with a "4" to *Line Group ID* **5** which corresponds to the *Outgoing Group ID* used for the H.323 trunk to Avaya Communication Manager. Enter "**.**" for the *Telephone Number* so that all dialed digits are sent to Avaya Communication Manager. Select **Dial** for the *Feature* drop-down list. Click **OK**. 

Step	Description
6.	In the **Manager** window, click on **Extension** under the Configuration Tree. For each IP extension, click the **VoIP** tab and ensure that *Enable Faststart* is not checked for inter-working with Avaya 4600 and 5600 series IP Telephones. However, faststart should be enabled for extensions used for Avaya IP Office Phone Manager iPro. Although shuffling to direct media should not be used for the H.323 IP trunk, it can be used between IP endpoints connected to Avaya IP Office.



4. Configure Avaya Communication Manager

The following configuration was entered via the System Administration Terminal (SAT). In some examples, the "change" command was used instead of the "add" command to show the configuration.

A separate Network Region (i.e., Network Region 3) is used to assign the codec for the H.323 IP trunk. Using this approach, a different codec (e.g., G.729A) can be used to reduce the bandwidth requirements if the Avaya IP Office Small Office Edition is connected to Avaya Communication Manager via a WAN link.

H.323 IP trunks allow trunk groups to be defined as ISDN-PRI-equivalent tie lines between switches over an IP network.

Step	Description
1.	Ensure IP trunks can be provisioned. Use the "display system-parameters customer-options" command and go to Page 2 to verify that the following field is administered: • *Maximum Administered H.323 Trunks*: Maximum number of H.323 IP trunks that can be defined for this media server. ***Note:*** *The maximum values shown in the following screens were used for this sample configuration and may vary depending on your requirements. Contact an Avaya representative if the available unused capacity is insufficient.*

```
display system-parameters customer-options                    Page   2 of  10
                                OPTIONAL FEATURES

IP PORT CAPACITIES                                            USED
                     Maximum Administered H.323 Trunks: 100   24
          Maximum Concurrently Registered IP Stations: 100    1
            Maximum Administered Remote Office Trunks: 450    0
Maximum Concurrently Registered Remote Office Stations: 450   0
             Maximum Concurrently Registered IP eCons: 0      0
  Max Concur Registered Unauthenticated H.323 Stations: 0     0
                 Maximum Video Capable H.323 Stations: 0     0
                  Maximum Video Capable IP Softphones: 0     0
                      Maximum Administered SIP Trunks: 0     0

   Maximum Number of DS1 Boards with Echo Cancellation: 0     0
                            Maximum TN2501 VAL Boards: 0     0
                    Maximum G250/G350/G700 VAL Sources: 1     1
          Maximum TN2602 Boards with 80 VoIP Channels: 0     0
         Maximum TN2602 Boards with 320 VoIP Channels: 0     0
   Maximum Number of Expanded Meet-me Conference Ports: 0     0
```

Step	Description
2.	Use the "change node-names ip" command to add a new node name (e.g., **ipoffice**). Enter the IP address of the LAN2 interface (e.g., **20.20.20.2**) for the Avaya IP Office. change node-names ip Page 1 of 1 IP NODE NAMES Name IP Address Name IP Address default 0 .0 .0 .0 . . . g150 10 .10 .10 .1 . . . **ipoffice 20 .20 .20 .2** . . . msgserver 192.168.42 .20 . . . procr 192.168.42 .23 . . . .
3.	Use the "change ip-codec-set" command to assign a codec (e.g., **G.711MU**) to Codec Set 1. The G.711 mu-law codec is used for intra-site calls on the LAN. 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** 2: 3: 4: 5: 6: 7:
4.	Use the "change ip-codec-set" command to assign a codec (e.g., **G.729A**) to Codec Set 3. This codec is used for calls going through the H.323 IP trunk and was chosen to illustrate how bandwidth can be conserved if a WAN link is used between the Avaya IP Office and Avaya Communication Manager. change ip-codec-set 3 Page 1 of 2 IP Codec Set Codec Set: 3 Audio Silence Frames Packet Codec Suppression Per Pkt Size(ms) 1: **G.729A n 2 20** 2: 3: 4: 5: 6: 7:

Step	Description
5.	Use the "change ip-network-region" command to assign Codec Set 1 to Network Region 1. Codec Set 1 was administered to use G.711MU to ensure better voice quality when calls are made between telephones located at the Main Office. change ip-network-region 1 Page 1 of 19 IP NETWORK REGION Region: 1 Location: 1 Authoritative Domain: Name: Main Intra-region IP-IP Direct Audio: yes MEDIA PARAMETERS Inter-region IP-IP Direct Audio: yes **Codec Set: 1** IP Audio Hairpinning? y UDP Port Min: 2048 UDP Port Max: 65535 RTCP Reporting Enabled? y DIFFSERV/TOS PARAMETERS RTCP MONITOR SERVER PARAMETERS Call Control PHB Value: 34 Use Default Server Parameters? y Audio PHB Value: 46 Video PHB Value: 26 802.1P/Q PARAMETERS Call Control 802.1p Priority: 7 Audio 802.1p Priority: 6 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
6.	Go to Page 3 and assign Codec Set 3 to be used when calls are made between the Main Office (i.e., Network Region 1) and the Branch Office (i.e., Network Region 3). change ip-network-region 1 Page 3 of 19 Inter Network Region Connection Management src dst codec direct Dynamic CAC rgn rgn set WAN WAN-BW-limits Intervening-regions Gateway IGAR 1 1 1 1 2 2 y :NoLimit n **1 3 3 y :NoLimit** n 1 4 1 5 1 6 1 7 1 8 1 9 1 10 1 11 1 12 1 13 1 14 1 15

Step	Description
7.	Use the "change ip-network-region" command to define parameters for Network Region 3. Verify that the following fields are administered: • *Call Control PHB Value*: Set to "**34**" to match the DiffServ value used in the Avaya IP Office for signaling in Step 1 of Section 3. • *Audio PHB Value*: Set to '**46**' to match the Diffserv value used in the Avaya IP Office for audio in Step 1 of Section 3.

```
change ip-network-region 3                                    Page   1 of  19
                              IP NETWORK REGION
  Region: 3
Location:         Authoritative Domain:
    Name: ipoffice
                                Intra-region IP-IP Direct Audio: yes
MEDIA PARAMETERS                Inter-region IP-IP Direct Audio: yes
      Codec Set: 1                        IP Audio Hairpinning? y
   UDP Port Min: 2048
   UDP Port Max: 65535                 RTCP Reporting Enabled? y
DIFFSERV/TOS PARAMETERS          RTCP MONITOR SERVER PARAMETERS
 Call Control PHB Value: 34       Use Default Server Parameters? y
        Audio PHB Value: 46
        Video PHB Value: 26
802.1P/Q PARAMETERS
 Call Control 802.1p Priority: 7
        Audio 802.1p Priority: 6      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
```

Step	Description
8.	Go to Page 3 and assign Codec Set 3 to be used when calls are made between the Main Office (i.e., Network Region 1) and the Branch Office (i.e., Network Region 3). The far-end of the H.323 Signaling Group is set to 3 in the subsequent step.

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

                   Inter Network Region Connection Management

 src dst  codec  direct                                    Dynamic CAC
 rgn rgn   set    WAN    WAN-BW-limits  Intervening-regions    Gateway    IGAR
 3   1     3       y           :NoLimit                                    n
 3   2     2       y           :NoLimit                                    n
 3   3     1
 3   4
 3   5
 3   6
 3   7
 3   8
 3   9
 3   10
 3   11
 3   12
 3   13
 3   14
 3   15
```

Step	Description

9.	Add a new signaling group for the H.323 IP trunk using the "add signaling-group" command. Leave the *Trunk Group for Channel Selection* blank initially until the trunk group for this signaling group has been added.
	
	Enter the following values:
	• Group Type: **h.323**
	• *Near-end Node Name*: Enter the node name assigned to the processor interface of the Avaya S8300 Media Server. In the case of an Avaya S8500 or S8700 Series Media Server, the node name of a C-LAN would be used instead.
	• *Far-end Node Name*: Enter the node name assigned to the Avaya IP Office (e.g., **ipoffice**).
	• *Near-end Listen Port*: **1720**
	• *Far-end Listen Port*: **1720**
	• *Far-end Network Region*: Set to "**3**" to allow configurable control of the codec.
	• *Calls Share IP Signaling Connection*: **n**
	• *Direct IP-IP Audio Connections*: Set to "**n**" to disable IP call shuffling.
	• *IP Audio Hairpinning*: Set to "**n**" to disable hairpinning.
	
	Refer to reference [1] in Section 7 for additional information regarding these parameters.
	
	`add signaling-group 1 Page 1 of 5`
	`SIGNALING GROUP`
	
	`Group Number: 1 Group Type: h.323`
	`Remote Office? n Max number of NCA TSC: 0`
	`SBS? n Max number of CA TSC: 0`
	`IP Video? n Trunk Group for NCA TSC:`
	`Trunk Group for Channel Selection:`
	`Supplementary Service Protocol: a`
	`T303 Timer(sec): 10`
	
	`Near-end Node Name: procr Far-end Node Name: ipoffice`
	`Near-end Listen Port: 1720 Far-end Listen Port: 1720`
	`Far-end Network Region: 3`
	`LRQ Required? n` **`Calls Share IP Signaling Connection? n`**
	`RRQ Required? n`
	`Bypass If IP Threshold Exceeded? n`
	`H.235 Annex H Required? n`
	`DTMF over IP: out-of-band` **`Direct IP-IP Audio Connections? n`**
	`IP Audio Hairpinning? n`
	`Interworking Message: PROGress`
	`DCP/Analog Bearer Capability: 3.1kHz`

Step	Description
10.	Add a new H.323 IP trunk group using the "add trunk-group" command. Enter the following values: • *Group Type*: **isdn** • *Group Name*: Enter a name (e.g., **IP Office**) for the trunk group. • *TAC*: Enter a unique value for the Trunk Access Code. • *Carrier Medium*: **IP** • *Service Type*: **tie**

```
add trunk-group 1                                          Page   1 of  19
                              TRUNK GROUP

Group Number: 1                     Group Type: isdn          CDR Reports: y
  Group Name: IP Office                      COR: 1        TN: 1        TAC: 101
   Direction: two-way        Outgoing Display? n          Carrier Medium: IP
 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
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: a     Digit Handling (in/out): enbloc/enbloc

            Trunk Hunt: cyclical                    QSIG Value-Added? n
                                                  Digital Loss Group: 18
Incoming Calling Number - Delete:     Insert:                 Format:
              Bit Rate: 1200         Synchronization: async    Duplex: full
 Disconnect Supervision - In? y  Out? n
 Answer Supervision Timeout: 0
```

Step	Description
11.	Go to Page 2 and enter the following values: • *Send Name*: **y** • *Send Calling Number*: **y** add trunk-group 1 Page 2 of 19 TRUNK FEATURES ACA Assignment? n Measured: none Wideband Support? n Internal Alert? n Maintenance Tests? y Data Restriction? n NCA-TSC Trunk Member: **Send Name: y** **Send Calling Number: y** Used for DCS? n Suppress # Outpulsing? n Format: public 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? n Send UUI IE? y Modify Tandem Calling Number? n Send UCID? n Send Codeset 6/7 LAI IE? y SBS? n Network (Japan) Needs Connect Before Disconnect? n

Step	Description
12.	Go to Page 3 to associate this trunk group with the signaling group created in Step 9. Assign each group member to Signaling Group 1. Avaya Communication Manager will replace the initial value of "**IP**" for the *Port* field with a unique port (e.g., **T00001**). ***Note:*** *The number of trunk group members should match the number of channels defined on the Avaya IP Office in Step 2 of Section 3.*

```
change trunk-group 1                                          Page   3 of  19
                                  TRUNK GROUP
                                       Administered Members (min/max):   1/2
GROUP MEMBER ASSIGNMENTS                   Total Administered Members:   2

       Port    Code Sfx Name        Night            Sig Grp
  1: T00001             trktoipo1                      1
  2: T00002             trktoipo2                      1
  3:
  4:
  5:
  6:
  7:
  8:
  9:
 10:
 11:
 12:
 13:
 14:
 15:
```

Step	Description

13.	Use the "change signaling-group" command to enter the *Trunk Group for Channel Selection* (e.g., **1**) defined in Step 9.
	
	`change signaling-group 1 Page 1 of 5`
	`SIGNALING GROUP`
	
	`Group Number: 1 Group Type: h.323`
	`Remote Office? n Max number of NCA TSC: 0`
	`SBS? n Max number of CA TSC: 0`
	`IP Video? n Trunk Group for NCA TSC:`
	`Trunk Group for Channel Selection: 1`
	`Supplementary Service Protocol: a`
	`T303 Timer(sec): 10`
	
	`Near-end Node Name: procr Far-end Node Name: ipoffice`
	`Near-end Listen Port: 1720 Far-end Listen Port: 1720`
	`Far-end Network Region: 3`
	`LRQ Required? n Calls Share IP Signaling Connection? n`
	`RRQ Required? n`
	`Bypass If IP Threshold Exceeded? n`
	`H.235 Annex H Required? n`
	`DTMF over IP: out-of-band Direct IP-IP Audio Connections? n`
	`IP Audio Hairpinning? n`
	`Interworking Message: PROGress`
	`DCP/Analog Bearer Capability: 3.1kHz`

14.	Use the "change dialplan analysis" command to use Automatic Alternate Routing (AAR) to route 5-digit numbers beginning with a "3" by specifying **aar** as the *Call Type*.
	
	`change dialplan analysis Page 1 of 12`
	`DIAL PLAN ANALYSIS TABLE`
	`Percent Full: 3`
	
	`Dialed String / Total Length / Call Type` (repeated three times)
	`1 3 dac`
	`2 5 ext`
	`3 5 aar`
	`4 5 ext`
	`5 5 ext`
	`6 5 aar`
	`7 1 fac`
	`8 1 fac`
	`9 1 dac`
	`* 3 fac`

Step	Description
15.	Add entries in the AAR analysis table using the "change aar analysis 3" command so that calls beginning with "3" will use Route Pattern 3.

```
change aar analysis 3                                          Page   1 of   2
                          AAR DIGIT ANALYSIS TABLE
                                                          Percent Full:    3

          Dialed           Total     Route    Call   Node  ANI
          String          Min  Max  Pattern   Type   Num   Reqd
    3                     5    5    3         aar          n
    4                     7    7    254       aar          n
    41000                 5    5    9         aar          n
    5                     7    7    254       aar          n
    6                     5    5    6         aar          n
    7                     7    7    254       aar          n
    8                     7    7    254       aar          n
    9                     7    7    254       aar          n
                                                n
                                                n
                                                n
                                                n
                                                n
                                                n
                                                n
```

16.	Change Route Pattern 3 by using the "change route-pattern 3" command to route calls to Trunk Group 1 (i.e., the H.323 IP trunk).

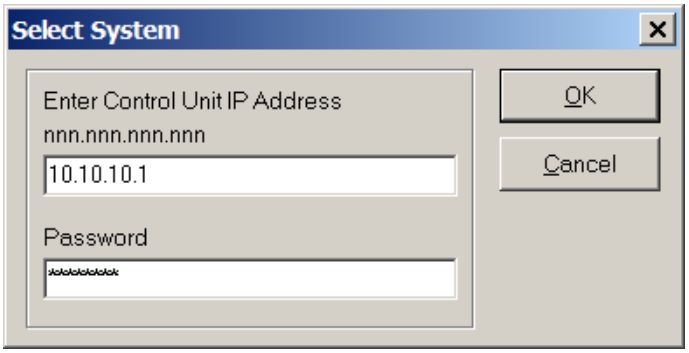
```
change route-pattern 3                                         Page   1 of   3
                  Pattern Number: 3   Pattern Name: IP Office
                                        Secure SIP? n
    Grp FRL NPA Pfx Hop Toll No.  Inserted                          DCS/ IXC
    No          Mrk Lmt List 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 BAND  No. Numbering LAR
    0 1 2 3 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
```

Step	Description

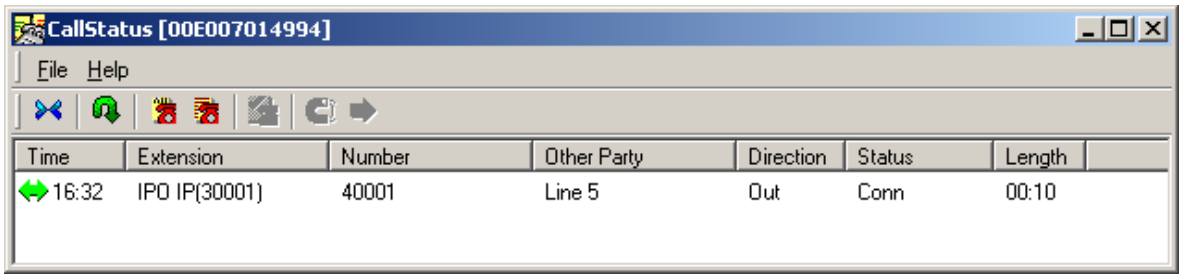
17.	Use the "change public-unknown-numbering 1" command to allow the calling party number to be passed along with the call to the Avaya IP Office. The entry shown below will cause calls originated from extensions in the range 40000-49999 to have the calling party number included with the call.
	
	`change public-unknown-numbering 1 Page 1 of 2`
	`NUMBERING - PUBLIC/UNKNOWN FORMAT`
	`Total Total`
	`Ext Ext Trk CPN CPN Ext Ext Trk CPN CPN`
	`Len Code Grp(s) Prefix Len Len Code Grp(s) Prefix Len`
	`5 4 1 5`

5. Verification Steps

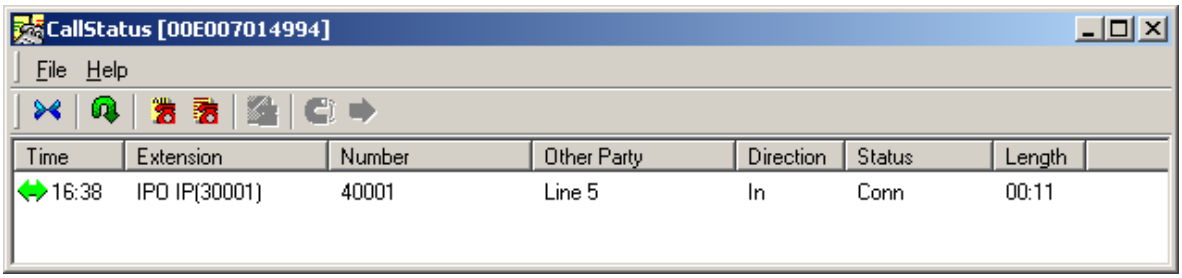
Step	Description
1.	Navigate to **Start → Programs → IP Office → Call Status** to monitor the status of a call. Click on **File → Open** and enter the IP address of the Avaya IP Office and the password. Click **OK**.



Place a call from extension 30001 located at the Branch Office to station 40001 located at the Main Office. The following screen shows that a call has been placed from extension 30001 to station 40001 using Line 5, which is the H.323 IP trunk between Avaya IP Office and Avaya Communication Manager.



Place a call from station 40001 located at the Main Office to extension 30001 located at the Branch Office. The following screen shows that a call has been placed from extension 40001 to station 30001 using Line 5.



Step	Description

2.	From the Avaya Communication Manager SAT, the "status signaling-group" command can be used to determine the status of the signaling group. The "Group State" should show the signaling group as **in-service**.
	
	`status signaling-group 1`
	`STATUS SIGNALING GROUP`
	
	`Group ID: 1 Active NCA-TSC Count: 0`
	`Group Type: h.323 Active CA-TSC Count: 0`
	`Signaling Type: facility associated signaling`
	`Group State: in-service`

3.	From the Avaya Communication Manager SAT, the "status trunk group" command can be used to determine the status of the H.323 IP trunk. The *Service State* for member 1 is "in-service" as well as "active" as a result of the call made in Step 1.
	
	`status trunk 1`
	`TRUNK GROUP STATUS`
	
	`Member Port Service State Mtce Connected Ports`
	`Busy`
	
	`0001/001 T00001 in-service/active no S00011`
	`0001/002 T00002 in-service/idle no`

Step	Description
4.	The "list trace tac xxx"command, where xxx represents the Trunk Access Code (TAC), can be used to trace the call from extension 30001 to station 40001 as it traverses the H.323 IP trunk. Observe that G.711MU is used within the Main Office and G.729A is used on the trunk between the two offices.

```
list trace tac 101                                                    Page   1

                                LIST TRACE

time           data

16:31:06     Calling party trunk-group 1 member 1  cid 0x243
16:31:06     Calling Number & Name 30001 IPO IP
16:31:06     active trunk-group 1 member 1  cid 0x243
16:31:06     dial 40001
16:31:06     ring station    40001 cid 0x243
16:31:06     G729A ss:off ps:20 rn:3/1 20.20.20.2:49280 192.168.42.21:2338
16:31:06     xoip: fax:Relay modem:off tty:US uid:0x50001 cid:0x243
16:31:06     G711MU ss:off ps:20 rn:1/1 192.168.42.10:44788 192.168.42.21:2340
16:31:06     xoip: fax:Relay modem:off tty:US uid:0x1 cid:0x243
16:31:08     active station    40001 cid 0x243
```

The trace shown below is for a call from station 40001 to extension 30001.

```
list trace tac 101                                                    Page   1

                                LIST TRACE

time           data

16:31:36     Calling party station    40001 cid 0x244
16:31:36     Calling Number & Name 40001 ACM IP
16:31:36     dial 30001 route:AAR
16:31:36     term trunk-group 1    cid 0x244
16:31:36     dial 30001 route:AAR
16:31:36     route-pattern  3 preference 1  cid 0x244
16:31:36     seize trunk-group 1 member 1  cid 0x244
16:31:36     Calling Number & Name NO-CPNumber NO-CPName
16:31:36     Setup digits 30001
16:31:36     Calling Number & Name 40001 ACM IP
16:31:36     Alert trunk-group 1 member 1  cid 0x244
16:31:36     G729A ss:off ps:20 rn:3/1 20.20.20.2:49282 192.168.42.21:2344
16:31:36     xoip: fax:Relay modem:off tty:US uid:0x50001 cid:0x244
16:31:38     active trunk-group 1 member 1  cid 0x244
```

Entries in the tables that follow include "names" in the display verifications. In the verification of these Application Notes, the names assigned in Avaya IP Office and Avaya Communication Manager matched the system and telephone type. For example, "IPO Analog" was assigned as the name of the analog telephone connected to IP Office. In production environments, such displays would show the actual name of the user in place of strings such as "IPO Analog".

Table 2 shows a sample call display table when calls are placed from telephones located at the Branch Office to telephones located at the Main Office during the ringing state.

Ringing					
Calling			Called		
Ext.	**Type**	**Display**	**Ext.**	**Type**	**Display**
30001	4620SW	40001 Call *40001:EXTERNAL	40001	4610SW	IPO IP 30001
		40002 Call *40002:EXTERNAL	40002	IP Softphone	a=IPO IP 30001
		40003 Call *40003:EXTERNAL	40003	6402D	a=IPO IP 30001
		40004 Call *40004:EXTERNAL	40004	6211	No Display
30002	iPro	Number: 40001 From: IP iPro To: 40001	40001	4610SW	IPO iPro 30002
		Number: 40002 From: IP iPro To: 40002	40002	IP Softphone	a= IPO iPro 30002
		Number: 40003 From: IP iPro To: 40003	40003	6402D	a=IPO iPro 30002
		Number: 40004 From: IP iPro To: 40004	40004	6211	No Display
30205	6408D+	40001 Call 40001	40001	4610SW	IPO DCP 30205
		40002 Call 40002	40002	IP Softphone	a= IPO DCP 30205
		40003 Call 40003	40003	6402D	a= IPO DCP 30205
		40004 Call 40004	40004	6211	No Display
30201	6211	No Display	40001	4610SW	IPO Analog 30201
		No Display	40002	IP Softphone	a=IPO Analog 30201
		No Display	40003	6402D	a=IPO Analog 30201
		No Display	40004	6211	No Display

Table 2 - Call Display Samples When Calling from Avaya IP Office (Ringing)

Table 3 shows a sample call display table when calls are placed from telephones located at the Branch Office to telephones located at the Main Office after the call is answered.

Answered					
Calling			Called		
Ext.	**Type**	**Display**	**Ext.**	**Type**	**Display**
30001	4620SW	40001 Conn 40001:EXTERNAL	40001	4610SW	IPO IP 30001
		40002 Conn 40002:EXTERNAL	40002	IP Softphone	a=IPO IP 30001
		40003 Conn 40003:EXTERNAL	40003	6402D	a=IPO IP 30001
		40004 Conn *40004:EXTERNAL	40004	6211	No Display
30002	iPro	Number: 40001 From: IP iPro To: 40001	40001	4610SW	IPO iPro 30002
		Number: 40002 From: IP iPro To: 40002	40002	IP Softphone	a=IPO iPro 30002
		Number: 40003 From: IP iPro To: 40003	40003	6402D	a=IPO iPro 30002
		Number: 40004 From: IP iPro To: 40004	40004	6211	No Display
30205	6408D+	40001 Conn 40001	40001	4610SW	IPO DCP 30205
		40002 Conn 40002	40002	IP Softphone	a= IPO DCP 30205
		40003 Conn 40003	40003	6402D	a= IPO DCP 30205
		40004 Conn 40004	40004	6211	No Display
30201	6211	No Display	40001	4610SW	IPO Analog 30201
		No Display	40002	IP Softphone	a=IPO Analog 30201
		No Display	40003	6402D	a=IPO Analog 30201
		No Display	40004	6211	No Display

Table 3 - Call Display Samples When Calling from Avaya IP Office (Answered)

Table 4 shows a sample call display table when calls are placed from telephones located at the Main Office to telephones located at the Branch Office during the ringing state. The values highlighted in yellow were observed when release 3.0 (50) of Avaya IP Office was used.

Ringing					
Calling			Called		
Ext.	**Type**	**Display**	**Ext.**	**Type**	**Display**
40001	4610SW	30001	30001	4620SW	40001 40001>IPO IP *40001 External 40001 ACM IP *40001 ACM IP
		30002	30002	iPro	Number: 40001 From: ACM IP To: IPO iPro
		30205	30205	6408D+	40001>IPO DCP 40001 ACM IP 40001
		30201	30201	6211	No Display
40002	IP Softphone	a=30001	30001	4620SW	40002 40002>IPO IP *40002:EXTERNAL 40002 ACM Softphone *40002:ACM Softphone
		a=30002	30002	iPro	Number: 40002 From: ACM Softphone To: IPO iPro
		a=30205	30205	6408D+	40002>IPO DCP 40002 ACM Softphone 40002
		a=30201	30201	6211	No Display
40003	6402D	a=30001	30001	4620SW	40003 4003>IPO IP *40003:EXTERNAL 40003 ACM DCP *40003:ACM DCP
		a=30002	30002	iPro	Number:40003 From:ACM DCP To: IPO iPro
		a=30205	30205	6408D+	40003>IPO DCP 40003 ACM DCP 40003
		a=30201	30201	6211	No Display
40004	6211	No Display	30001	4620SW	40004 40004>IPO IP *40004:EXTERNAL 40004 ACM Analog *40004:ACM Analog
		No Display	30002	iPro	Number:40004 From:ACM Analog To: IPO iPro
		No Display	30205	6408D+	40004>IPO DCP 40004 ACM Analog 40004
		No Display	30201	6211	No Display

Table 4 - Call Display Samples When Calling from Avaya Communication Manager (Ringing)

Table 5 shows a sample call display table when calls are placed from telephones located at the Main Office to telephones located at the Branch Office after the call is answered.

Answered					
Calling			Called		
Ext.	**Type**	**Display**	**Ext.**	**Type**	**Display**
40001	4610SW	IPO IP	30001	4620SW	IPO IP Conn *40001:EXTERNAL IPO IP Conn *40001:ACM IP
		IPO iPro	30002	iPro	Number: 40001 From: ACM IP To: IPO iPro
		IPO DCP	30205	6408D+	IPO DCP Conn 40001
		IPO Analog	30201	6211	No Display
40002	IP Softphone	a=IPO IP	30001	4620SW	IPO IP Conn *40002:EXTERNAL IPO IP Conn *40002:ACM Softphone
		a=IPO iPro	30002	iPro	Number: 40002 From: ACM Softphone To: IPO iPro
		a=IPO DCP	30205	6408D+	IPO DCP Conn 40002
		a=IPO Analog	30201	6211	No Display
40003	6402D	a=IPO IP	30001	4620SW	IPO IP Conn *40003:EXTERNAL IPO IP Conn *40003:ACM DCP
		a=IPO iPro	30002	iPro	Number:40003 From:ACM DCP To: IPO iPro
		a=IPO DCP	30205	6408D+	IPO DCP Conn 40003
		a=IPO Analog	30201	6211	No Display
40004	6211	No Display	30001	4620SW	IPO IP Conn *40004:EXTERNAL IPO IP Conn *40004:ACM Analog
		No Display	30002	iPro	Number:40004 From:ACM Analog To: IPO iPro
		No Display	30205	6408D+	IPO DCP Conn 40004
		No Display	30201	6211	No Display

Table 5 - Call Display Samples When Calling from Avaya Communication Manager (Answered)

6. Conclusion

These Application Notes describe how to configure an H.323 IP trunk for calls between Avaya IP Office and Avaya Communication Manager. Interoperability testing included verification of successful bi-directional calls among endpoints of varied types, display verifications as detailed in Table 2 through Table 5, and out-of-band DTMF verification. Calls using the IP Trunk do not utilize "shuffling" of the media paths to direct media.

7. References

The following Avaya product documentation can be found at http://support.avaya.com.

[1] *IP Office Manager 3.0*, Issue 16f, February 8, 2005.
[2] *Administrator Guide for Avaya Communication Manager*, 03-300509, June 2005.
[3] *Avaya C360 Reference Guide,* Software Version 4.3, Doc# 650-100-704, May 2004.
[4] *Avaya P333R Installation and Configuration Guide*, Software Version 4.0, April 2003.
[5] *Configuring an Avaya S8300 Media Server, Avaya G700 Media Gateway, and an Avaya IP Office 403 For Call Display Information via an H.323 Trunk – Issue 1.0*, February 2004.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title and filename, located in the lower right corner, directly to the Avaya Solution & Interoperability Test Lab at interoplabnotes@list.avaya.com