Abstract

These Application Notes describe the steps for configuring a H.323 Trunk between Avaya IP Office and Cisco Unified Communications Manager (CUCM).
1. Introduction
These Application Notes present the configuration steps to allow Avaya IP Office to communicate with Cisco Unified Communications Manager (CUCM) systems using H.323 connections.

2. Overview
The sample network shown in Figure 1 consists of an Avaya IP Office system capable of supporting a variety of Avaya 5600 (not shown in Figure 1) and 4600 Series IP Telephones along with digital and analog stations, and a of Cisco Unified Communications Manager (CUCM) system supporting Cisco SIP and SCCP stations along with analog station through the use of a Cisco 1751 router/gateway. A H.323 Trunk is configured between Avaya IP Office and CUCM to support calling between the Avaya and Cisco systems. With the use of the H.323 Trunk trans-coding, media and protocol conversion, calls between any two telephones are supported in this sample network regardless of whether the calls are between H.323, DCP, SCCP or analog stations.

3. Configuration
Figure 1 illustrates the configuration used in these Application Notes. All IP telephones in the 172.28.10.0/24 IP network are registered with Avaya IP Office and use extensions 122xx. All IP telephones in the 172.29.5.0/24 IP network are registered with CUCM and uses extensions 60xxx. A single H.323 Trunk between Avaya IP Office and CUCM manages call control between the Avaya and Cisco systems.
4. Equipment and Software Validated

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

<table>
<thead>
<tr>
<th>DEVICE DESCRIPTION</th>
<th>VERSION TESTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avaya IP Office 406v2</td>
<td>4.2(11)</td>
</tr>
<tr>
<td>Avaya IP Office Manager</td>
<td>6.2(11)</td>
</tr>
<tr>
<td>Avaya 4625SW IP Telephone (H323)</td>
<td>2.9</td>
</tr>
<tr>
<td>Avaya 6402D Digital Telephone</td>
<td>-</td>
</tr>
<tr>
<td>Analog Telephone</td>
<td>-</td>
</tr>
<tr>
<td>Cisco Unified Communications Manager</td>
<td>7.0.1.1.11000-2</td>
</tr>
<tr>
<td>Cisco 7965 Unified IP Phone (SIP)</td>
<td>SIP45.8-4-1S</td>
</tr>
<tr>
<td>Cisco 7912 Unified IP Phone (SCCP)</td>
<td>App Load ID</td>
</tr>
<tr>
<td></td>
<td>CP7912080003SCCP070409A</td>
</tr>
<tr>
<td></td>
<td>Boot Load ID</td>
</tr>
<tr>
<td></td>
<td>LD0100BOOT021112A</td>
</tr>
<tr>
<td>Cisco 1751v router</td>
<td>IOS 12.4(10a)</td>
</tr>
</tbody>
</table>

5. Configure Cisco Unified Communications Manager

This section describes the H.323 Trunk configuration for CUCM as shown in Figure 1. It is assumed that the basic configuration needed to interoperate with the 1751 router/gateway and support for Cisco IP telephones has been completed. For further information on CUCM, please consult reference [2], [3], and [4].

1. Open Cisco Unified CM Administration by entering the IP address of the CUCM into the Web Browser address field, and log in using an appropriate Username and Password.

![Cisco Unified CM Administration](image-url)
2. Select **Device → Gateway** from the top menu, then click **Add New** to begin adding a new H.323 trunk.

Select **H.323 Gateway** as the **Gateway Type**. Click **Next** to continue.
Enter the appropriate information for the H.323 Gateway. The following screen capture shows the configuration used in the sample network. Click **Save** to complete.
### Multilevel Precedence and Preemption (MLPP) Information

<table>
<thead>
<tr>
<th><strong>MLPP Domain</strong></th>
<th>&lt; None &gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MLPP Indication</strong></td>
<td>Not available on this device</td>
</tr>
<tr>
<td><strong>MLPP Preemption</strong></td>
<td>Not available on this device</td>
</tr>
</tbody>
</table>

### Call Routing Information - Inbound Calls

<table>
<thead>
<tr>
<th><strong>Significant Digits</strong></th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calling Search Space</strong></td>
<td>&lt; None &gt;</td>
</tr>
<tr>
<td><strong>AAR Calling Search Space</strong></td>
<td>&lt; None &gt;</td>
</tr>
<tr>
<td><strong>Prefix DN</strong></td>
<td></td>
</tr>
</tbody>
</table>

- ☑ Redirecting Number IE Delivery - Inbound
- ☑ Enable Inbound FastStart

### Call Routing Information - Outbound Calls

<table>
<thead>
<tr>
<th><strong>Calling Party Selection</strong></th>
<th>Originator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calling Party Presentation</strong></td>
<td>Default</td>
</tr>
<tr>
<td><strong>Called party IE number type unknown</strong></td>
<td>Cisco CallManager</td>
</tr>
<tr>
<td><strong>Called party IE number type unknown</strong></td>
<td>Cisco CallManager</td>
</tr>
<tr>
<td><strong>Called Numbering Plan</strong></td>
<td>Cisco CallManager</td>
</tr>
<tr>
<td><strong>Called Numbering Plan</strong></td>
<td>Cisco CallManager</td>
</tr>
<tr>
<td><strong>Caller ID DN</strong></td>
<td></td>
</tr>
</tbody>
</table>

- ☑ Display IE Delivery
- ☑ Redirecting Number IE Delivery - Outbound
- ☑ Enable Outbound FastStart
- ☑ Code for Outbound FastStart
- **Called Party Transformation CSS** | 9711 U-Law 64K |
- ☑ Use Device Pool Called Party Transformation CSS
- **Calling Party Transformation CSS** | < None > |
- ☑ Use Device Pool Calling Party Transformation CSS

### Incoming Calling Party Settings

If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

<table>
<thead>
<tr>
<th><strong>Incoming Calling Party</strong></th>
<th><strong>Clear Prefix Settings</strong></th>
<th><strong>Default Prefix Settings</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>National Number Prefix</td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td>International Number Prefix</td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td>Unknown Number Prefix</td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td>Subscriber Number Prefix</td>
<td>Default</td>
<td></td>
</tr>
</tbody>
</table>
3. Select **Call Routing → Route/Hunt → Route Pattern**, then click **Add New** to add a new route pattern for extensions 122xx which are for the telephones registered with Avaya IP Office.

The following screen capture shows the route pattern used in the sample network. The route pattern “122xx” will cause all 5-digit calls beginning with “122” to be routed to the “172.28.10.22” H.323 Gateway defined in **Step 2**. Click **Save** to complete.
### Calling Party Transformations
- **Use Calling Party's External Phone Number Mask**
- **Calling Party Transform Mask**: 
- **Prefix Digits (Outgoing Calls)**: 
- **Calling Line ID Presentation**: Default
- **Calling Name Presentation**: Default
- **Calling Party Number Type**: Cisco CallManager
- **Calling Party Numbering Plan**: Cisco CallManager

### Connected Party Transformations
- **Connected Line ID Presentation**: Default
- **Connected Name Presentation**: Default

### Called Party Transformations
- **Discard Digits**: None
- **Called Party Transform Mask**: 
- **Prefix Digits (Outgoing Calls)**: 
- **Called Party Number Type**: Cisco CallManager
- **Called Party Numbering Plan**: Cisco CallManager

### ISDN Network-Specific Facilities Information Element
- **Network Service Protocol**: Not Selected
- **Service Parameter Name**: Not Selected

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**Save  Delete  Copy  Add New**
6. Avaya IP Office

This section shows the configuration for Avaya IP Office. For further information on Avaya IP Office, please consult reference [1]. Initiate the Avaya IP Office Manager program by selecting Start → IP Office → Manager from the PC where IP Office Manager is installed, and log in to the Avaya IP Office system using the appropriate credentials.

1. Select **Line** from the left panel menu and then right-click and select **New → IP Line** to create a H.323 trunk to CUCM. The screen capture below shows the configuration used in the sample network.

   ![IP Line Configuration](image)

   In the **VolP Setting** tab, enter IP address of the CUCM as the Gateway IP Address and specify G.711 as the Compression.

   ![VolP Setting Configuration](image)
2. By default there should be a Short Code for 9N that routes call to a default ARS group called Main. These Application Notes will use ARS to route calls to CUCM. The screen capture below shows the default 9N Short Code.

![Screen Capture of Short Code](image1)

3. Select ARS → Main from the left panel menu, and then click on Add to create a new Code entry to route calls to CUCM.

![Screen Capture of Adding Code](image2)
Enter the appropriate information for the Code entry. The Code field is used to match dialed digits for routing. In this example, any dial digit beginning with 60 will be routed to Line Group 10 and the Telephone Number field will cause all digits after 60 to also be send to the line group. **Line Group ID** 10 created in **Step 1** will be used to send out the call.

4. Select **Incoming Call Route** from the left panel menu and then right-click and select **New** to create a new Incoming Call Route. Under the **Standard** tab, select the Line Group number created in **Step 1** in the **Line Group Id** field. The following screen capture shows the setting used in the sample network.
Under the **Destination** tab, enter “.” as the **Default Value**. The “.” indicate the incoming call can be routed to any extension. The following screen capture shows the setting used.
7. Verification

The following steps may be used to verify the configuration:

1. Call status can be monitored using Start → Programs → IP Office → Call Status. The following is a screen capture shows an out going call being made from extension 12203 to 60005 using Line Group 10.

2. From the computer where IP Office Manager is installed, select Start → Programs → IP Office → Monitor to show the signaling exchange between IP Office and CUCM. The following is a screen capture of the sysMonitor window.

3. The Real Time Monitoring Tool (RTMT) can be used to monitor events on CUCM. This tool can be downloaded by selecting Application → Plugins from the top menu of the Cisco Unified CM Administration Web interface. For further information on this tool, please consult with reference [5].
8. Conclusion

These Application Notes described the administrative steps required to configure a H.323 Trunk to support calls between Avaya IP Office and a Cisco Unified Communications Manager system. Basic calling including Hold, Transfer and Conference as well as supplemental features such as Call Forward All, and Call Park/Unpark are supported by this configuration. Please note that the version of IP Office shown in these Application Notes only supports faxing to other Avaya IP Office system through H.323 trunks. In addition, due to implementation differences in the G.729 codec, the use of G.729 codec through the H.323 trunk shown is these Application Notes is not supported in this version.
9. Additional References

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


Product documentation for Cisco Systems products may be found at http://www.cisco.com

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