



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Objectworld CallAttendant Office – Analog Integration to act as a Centralized Voicemail with Avaya IP Office - Issue 1.0

Abstract

These Application Notes describe the procedure for configuring Objectworld CallAttendant Office – analog integration to act as a centralized voicemail with Avaya IP Office. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the *DeveloperConnection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes focus on the steps required for configuring Objectworld CallAttendant Office – analog integration to act as a centralized voicemail with Avaya IP Office.

Objectworld CallAttendant Office (CAO) works with integrated e-mail systems such as Microsoft Exchange, Lotus Notes and IMAP compliant e-mail systems to provide users with a single storage and access point for voice, fax, and e-mail messages. Support for non-integrated e-mail systems is also supported through an integrated messaging client to allow users to visually manage their voice and fax messages. CAO provides full fax server capabilities including management of incoming and outgoing faxes. The steps outlined in these Application Notes address one possible configuration available with CAO.

The configuration information provided in these Application Notes assumes the prior successful configuration of the CAO – Analog Integration with Avaya IP Office as instructed in reference [1] for the Main Site. The differences in configuration are noted below:

| | Reference [1] configuration | Main Site configuration |
|--|--|--|
| CAO Dialogic Ports | 4 | 8 |
| CAO Dialogic port extensions | x233 – x236 | x211 – x218 |
| CAO Voicemail Hunt Group | cao vm (x6599) | caovm (x6570) |
| CAO Auto Attendant Hunt Group | cao auto aa (x6570) | caaaa (x6599) ¹ |
| Microsoft Active Directory and Exchange used | Yes | No |
| End User – Import from Active Directory | John Yaya (x6501) John Finnegan (x6510) | - |
| End User – Manual entry of new users (Local Message Store) | John Bigbootei (x6517) | John Yaya (x6501) John Finnegan (x6510) John Roberts (x6517) John Bigbootei (x2501) John Doe (x2510) |

Table 1 – Differences in configuration between Reference [1] and Main Site

Note about use of Avaya IP Office TAPI in a centralized voicemail scenario and use of TAPI Line Redirect function: Reference [4] states Avaya IP Office does not support centralized TAPI in an Avaya IP Office networked environment using Small Community Networking. The reference also states Avaya IP Office does not support the use of the Line Redirect function when controlling an individual extension via TAPI. Objectworld has implemented a solution for CallAttendant Office to act as a centralized voicemail in response to customer demand. Objectworld assumes responsibility for technical support issues arising from

¹ Called *CAO Main AA* in Main Site CAO configuration.

Objectworld's use of Avaya IP Office TAPI in a manner that is not supported as documented in reference [4].

The configuration in **Figure 1** shows a network consisting of two sites, Main Site and Site A. Both sites are connected via a T1/PPP link provided by Cisco 1841 routers.

At the Main Site, an Avaya IP Office 406v2 with Avaya IP400 Phone Expansion Module, Avaya IP Office Manager PC, Objectworld CAO server, and Avaya 4600-series IP telephone are connected to an Avaya C363T-PWR Stackable Switch. Avaya IP Office has T1/PRI and analog trunks to the central office. An Avaya 6408D+ digital telephone connects to Avaya IP Office and an Avaya analog telephone connects to Avaya IP400 Phone Expansion Module. The Main Site Avaya IP Office TAPI driver must be installed on the CAO server to establish a TAPI 3rd party call control connection to Main Site Avaya IP Office. A CAO hunt group, *caovm*, was created and configured as the system voicemail on Main Site Avaya IP Office. The hunt group was made up of the analog station ports connecting Main Site Avaya IP Office to the CAO server. Another CAO hunt group, *cao remote vm*, was created to receive voicemail coverage calls from Site A Remote Agent and overflow to the *caovm* hunt group.

At Site A, an Avaya IP Office Small Office Edition, Avaya IP Office Manager PC, Objectworld CAO Remote Agent PC, and an Avaya 4600-series IP telephone are connected to a CyberPath PowerPath POE4408 Switch. The Site A Avaya IP Office has an analog trunk to the central office. An Avaya 6408D+ digital telephone connects to Site A Avaya IP Office. The Site A Avaya IP Office TAPI driver must be installed on the CAO Remote Agent PC to establish a TAPI 3rd party call control connection to Site A Avaya IP Office. A CAO hunt group, *caovm remote*, was created and configured as the system voicemail on Site A Avaya IP Office. The hunt group was made up of analog station ports configured for this purpose.

The CAO Remote Agent at Site A is responsible for redirecting voicemail coverage calls and automated attendant calls to the *cao remote vm* hunt group at the Main Site Avaya IP Office as well as supplying the CAO server at the Main Site with all of the necessary information for answering the call correctly for the redirected call. The CAO Remote Agent operates as follows:

- Listens for calls forwarded to the Site A *caovm remote* hunt group via TAPI messages.
- Once a call is forwarded to the Site A *caovm remote* hunt group, the Remote Agent then does two things:
 - Redirects the call to the Main Site *cao remote vm* hunt group using TAPI *lineRedirect*².
 - Sends the called party information along with a unique call identifier to the CAO server running at the Main Site via TCP/IP.
- The Main Site Avaya IP Office then redirects the call to the CAO server, which handles the call as if it were placed to an extension at the Main Site.

The tested configuration is shown in **Figure 1**.

² Please refer to the *Note about use of Avaya IP Office TAPI in a centralized voicemail scenario and use of TAPI Line Redirect function* at the beginning of Section 1.

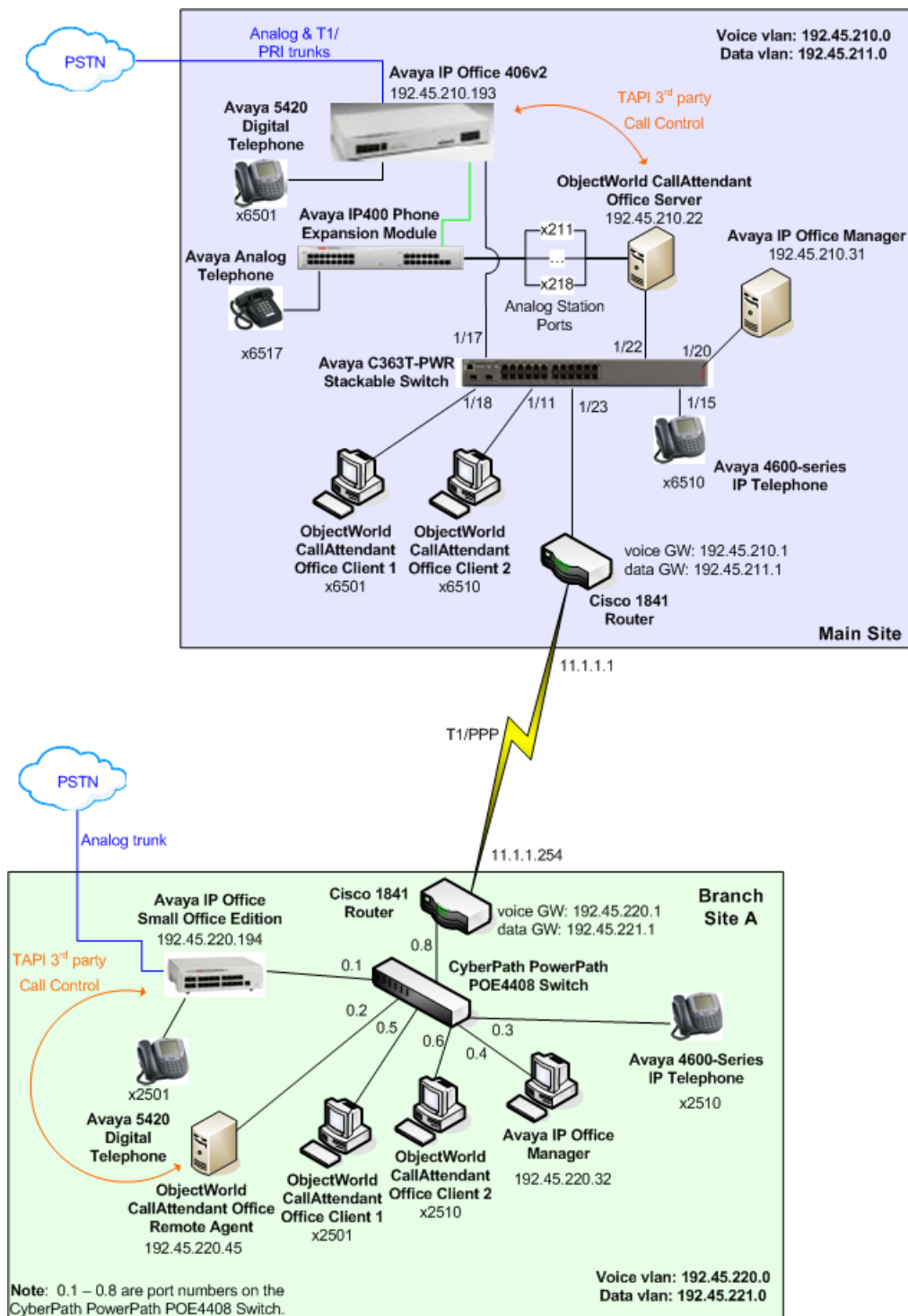


Figure 1 – Network Configuration Diagram

Note: For security purposes, Avaya IP Office does not support nested forwarding. In the event CAO becomes unavailable, calls to extensions, which are forwarded to the CAO hunt group as

coverage calls, will not be routed to the CAO hunt group's overflow or fallback path. If such a scenario occurs, the administrator must make alternate call routing arrangements until the CAO becomes available.

Table 2 lists all users and associated extension numbers for **Figure 1**.

| End User Name | Extension | Site | Note |
|-------------------------------|-----------|--------|--|
| John Yaya | 6501 | Main | |
| John Finnegan | 6510 | Main | |
| John Roberts | 6517 | Main | |
| John Bigbootei | 2501 | Site A | |
| John Doe | 2510 | Site A | |
| | | | |
| CAO Hunt Groups | | | |
| caovm | 6570 | Main | |
| cao remote vm | 6571 | Main | |
| caaaa | 6599 | Main | |
| caovm remote | 2570 | Site A | |
| caaaa remote | 2590 | Site A | Called <i>CAO Remote AA</i> in CAO configuration |
| | | | |
| CAO Ports | | | |
| cao port 1 | 211 | Main | |
| cao port 2 | 212 | Main | |
| cao port 3 | 213 | Main | |
| cao port 4 | 214 | Main | |
| cao port 5 | 215 | Main | |
| cao port 6 | 216 | Main | |
| cao port 7 | 217 | Main | |
| cao port 8 | 218 | Main | |
| | | | |
| CAO Remote Agent Ports | | | |
| caora port1 | 201 | Site A | Nothing connected to port ³ |
| caora port2 | 202 | Site A | “” |
| caora port3 | 203 | Site A | “” |
| caora port4 | 204 | Site A | “” |

Table 2 – User to Extension Mapping

³ The CAO Remote Agent analog ports should not have anything connected to them as they are used to redirect calls to the CAO at the Main Site. The redirection is performed using TAPI 3rd party call control (TAPI *lineRedirect*). Please refer to the *Note about use of Avaya IP Office TAPI in a centralized voicemail scenario and use of TAPI Line Redirect function* at the beginning of Section 1.

2. Equipment and Software Validated

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

| Equipment | Software/Firmware |
|--|-------------------|
| Avaya IP Office 406v2 | 3.2(54) |
| Avaya IP Office Small Office Edition | 3.2(54) |
| Avaya IP400 Phone Expansion Module | 5.2(54) |
| Avaya IP Office Manager | 5.2(54) |
| Avaya IP Office TAPI Driver | 1.0.0.27 |
| Avaya 4600-series IP Telephones (4610SW, 4620SW) | 2.3 |
| Avaya 5420 Digital Telephones | - |
| Avaya Analog Telephone | - |
| Avaya C363T-PWR Stackable Switch | 4.3.12 |
| Cisco 1841 Router | 12.3 |
| CyberPath PowerPath POE4408 Switch | 2.03.1.22PoE |
| Intel Dialogic card(s) – D/4PCIUF (installed in the Objectworld CallAttendant Office Server) | 6.0 SR71 |
| Objectworld CallAttendant Office Server | 4.0.9 |
| Objectworld CallAttendant Office Client | 4.0.9 |
| Objectworld CallAttendant Office Remote Agent | 4.0.9 |

Table 3 – Equipment and Software / Firmware Versions Validated

3. Configure Avaya IP Office

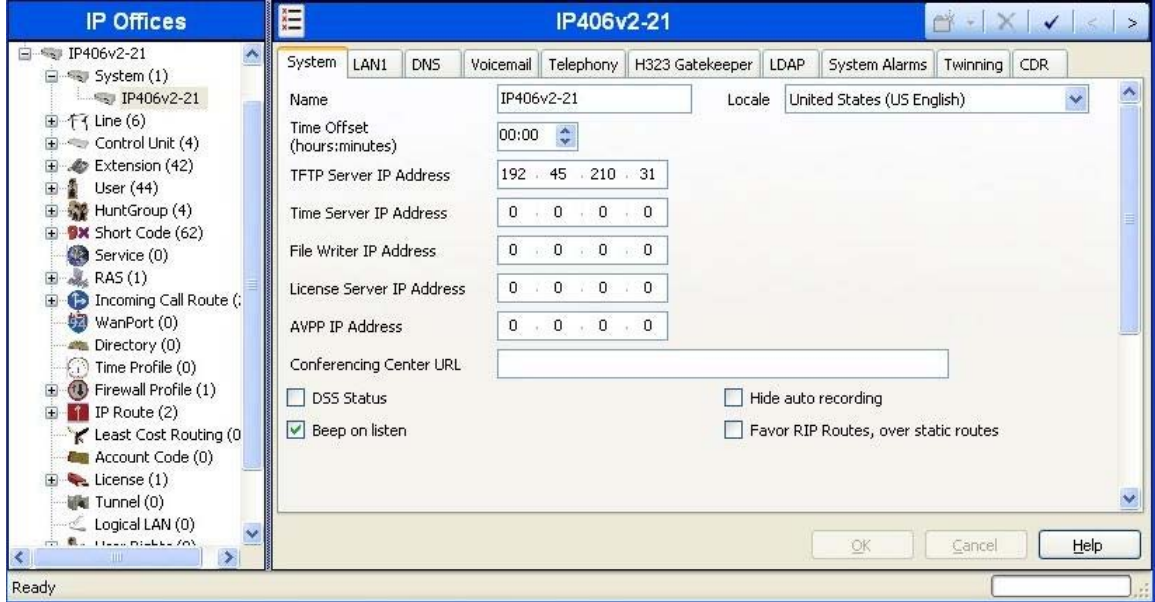
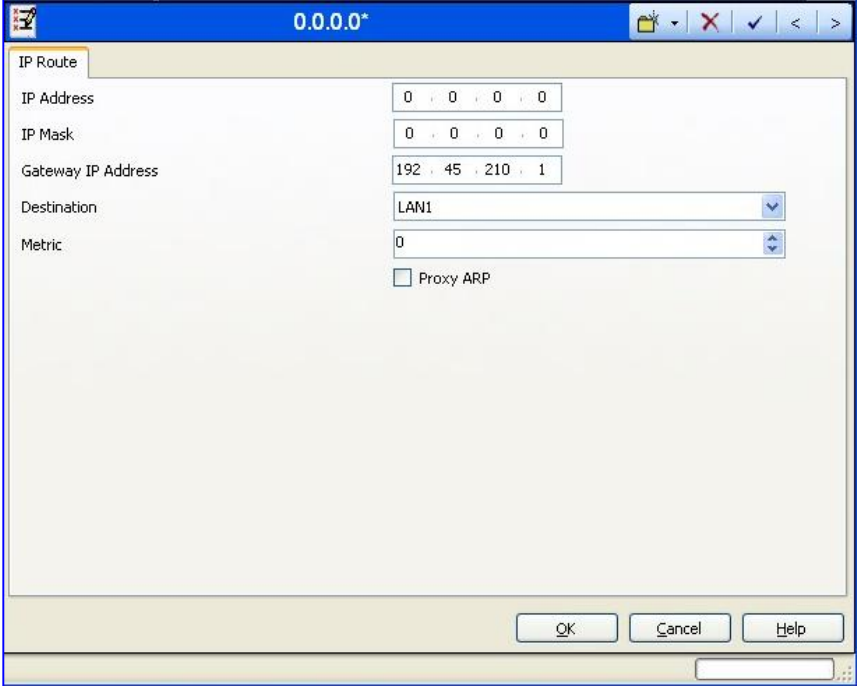
3.1. Configure Main Site Avaya IP Office

The configuration information provided in this section describes the steps required to modify the Main Site Avaya IP Office configuration for this solution.

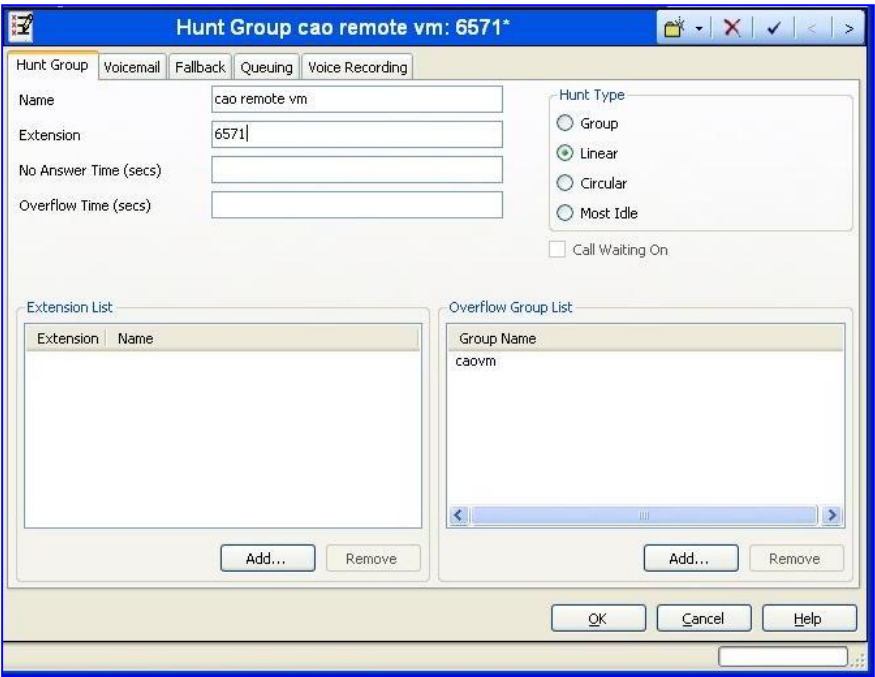

It is assumed the Main Site Avaya IP Office has already been configured as described in reference [1] with the exceptions noted in **Table 1**.

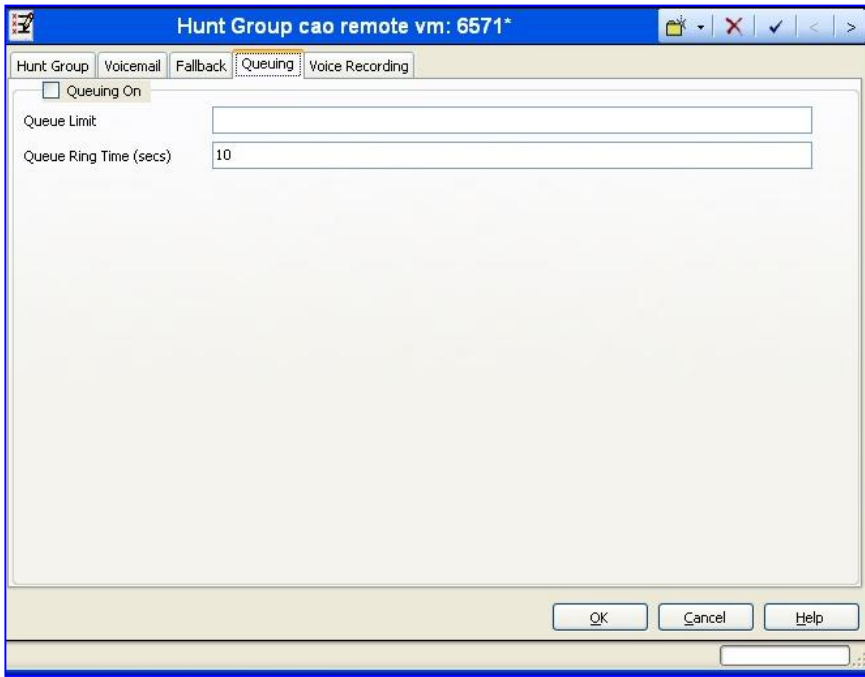
For all other provisioning information such as Avaya IP Office installation and configuration, please refer to Avaya IP Office product documentation in reference [2].

| Step | Description |
|------|--|
| 1. | Log into the Avaya IP Office Manager PC and go to Start → Programs → IP Office → Manager to launch the Avaya IP Office Manager application. |
| 2. | In the Manager window, select File → Open Configuration to search for Avaya IP Office in the network. |

| Step | Description |
|------|---|
| 3. | <p>Log into Avaya IP Office using the appropriate login credentials to receive its configuration.</p>  |
| | Configure default route |
| 4. | In the Manager window, go to the Configuration Tree and right-click IP Route . In the popup menu that appears, select New . |
| 5. | <p>In the IP Route window that appears set IP Address to 0.0.0.0, set IP Mask to 0.0.0.0, set Gateway IP Address to 192.45.210.1 and set Destination to LAN1. Click OK.</p>  |

| Step | Description |
|------|--|
| | Create IP trunk to Site A and enable Small Community Networking |
| 6. | In the Manager window, go to the Configuration Tree and right-click Line . In the popup menu that appears, select New → IP Line . |
| 7. | In the IP – Line window that appears, set Incoming Group ID and Outgoing Group ID to a unique number. Select the VoIP Settings tab. <div data-bbox="461 441 1360 1008" data-label="Image"> </div> |
| 8. | In the VoIP Settings tab, set Gateway IP Address to the IP address of the Site A Avaya IP Office. Check Voice Networking and check Fax Transport Support . Click OK . <div data-bbox="466 1131 1354 1696" data-label="Image"> </div> |
| | Create CAO remote voicemail hunt group |
| 9. | In the Manager window, go to the Configuration Tree and right-click Hunt Group . In the popup menu that appears, select New . |

| Step | Description |
|------|---|
| 10. | <p>In the hunt group window that appears, set Name to <i>cao remote vm</i> as listed in Table 2, set Extension to 6571 as listed in Table 2, add <i>caovm</i> to the Overflow Group List and select Linear for Hunt Type. Select the Voicemail tab.</p>  |
| 11. | <p>In the Voicemail tab, uncheck Voicemail On. Select the Queuing tab.</p>  |

| Step | Description |
|------|---|
| 12. | <p>In the Queuing tab, uncheck Queuing On. Click OK.</p>  |
| 13. | <p>In the Manager window, select File → Save to push the configuration to Avaya IP Office, select Immediate for reboot option (not shown), and wait for the system to update. This completes configuration of the Main Site Avaya IP Office for this solution.</p> |

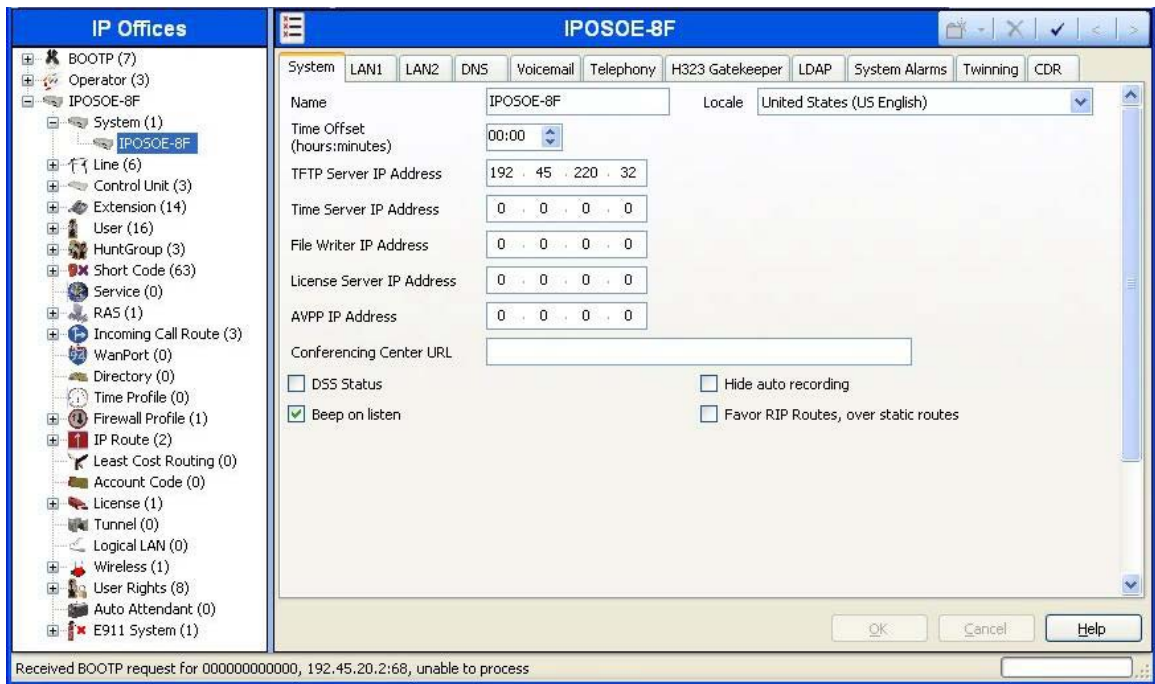
3.2. Configure Site A Avaya IP Office

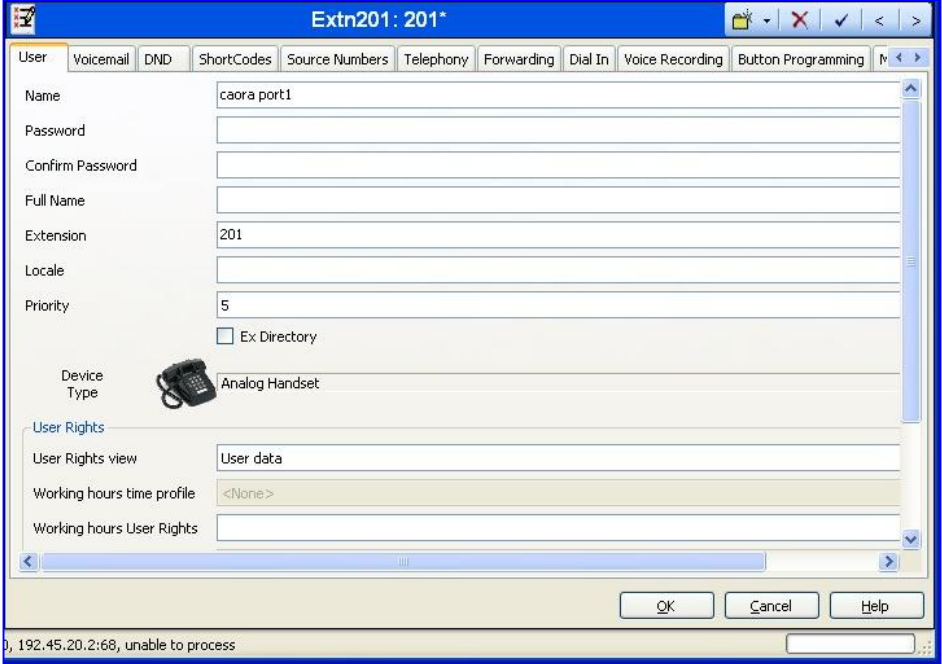
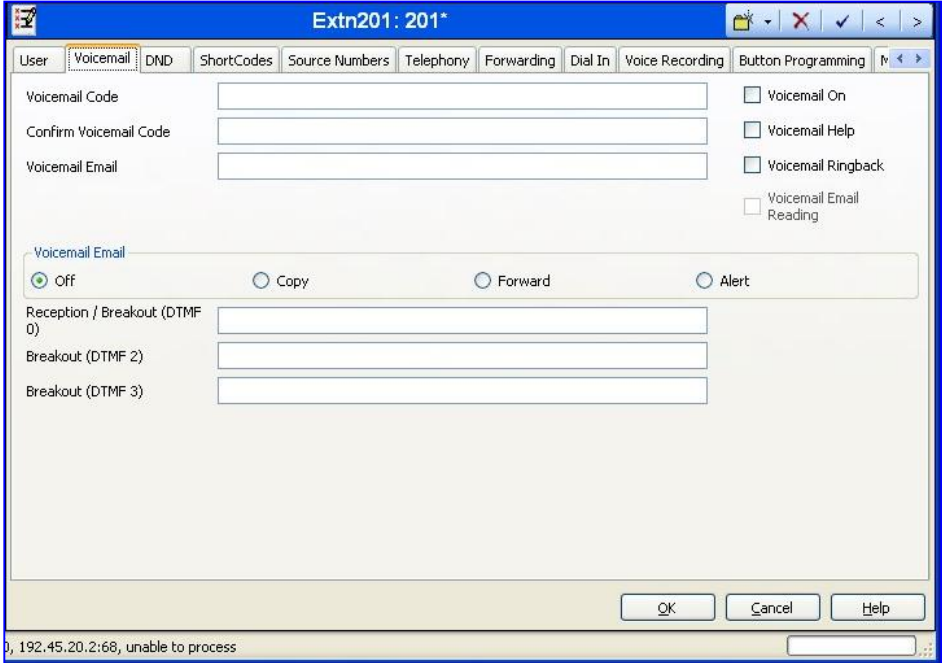
The configuration information provided in this section describes the steps required to setup the Site A Avaya IP Office for this solution.

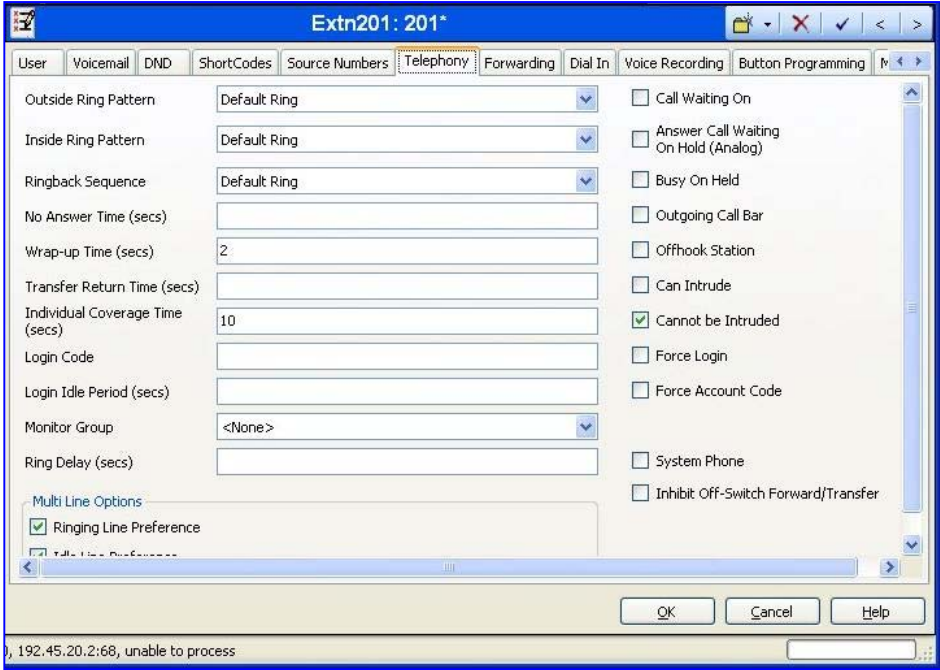
*Be sure to have the Site A **Avaya IP Office CTI Link Pro** license key on hand as it will be required as part of this configuration.*

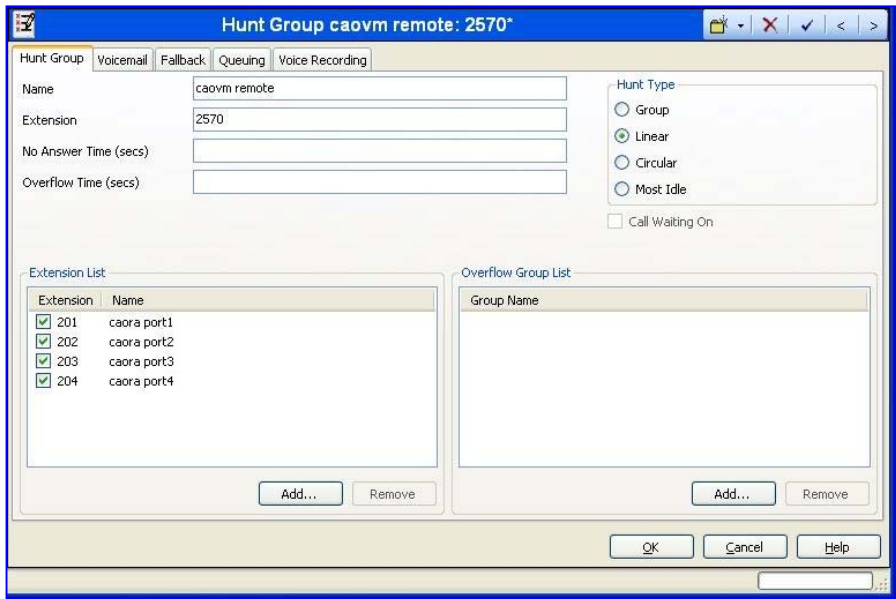
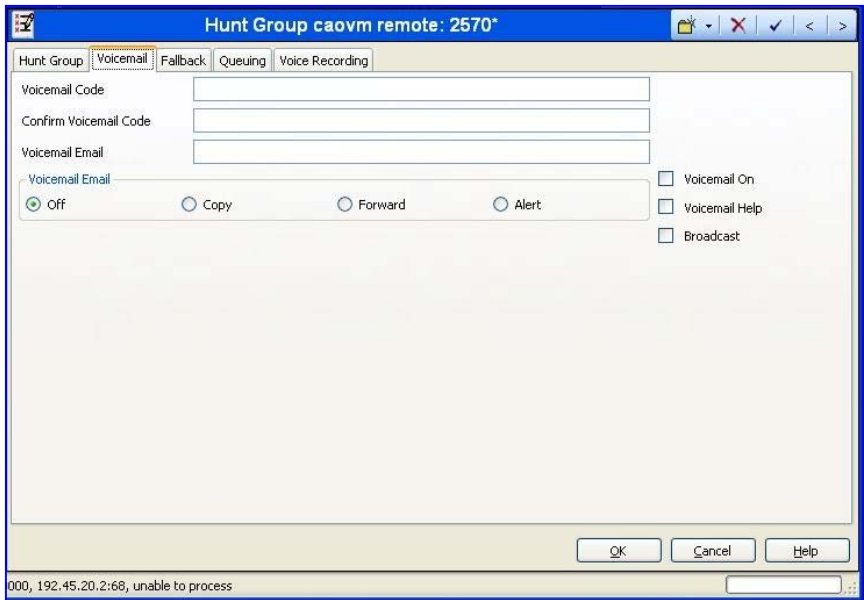
For all other provisioning information such as Avaya IP Office installation and configuration, please refer to Avaya IP Office product documentation in reference [2].

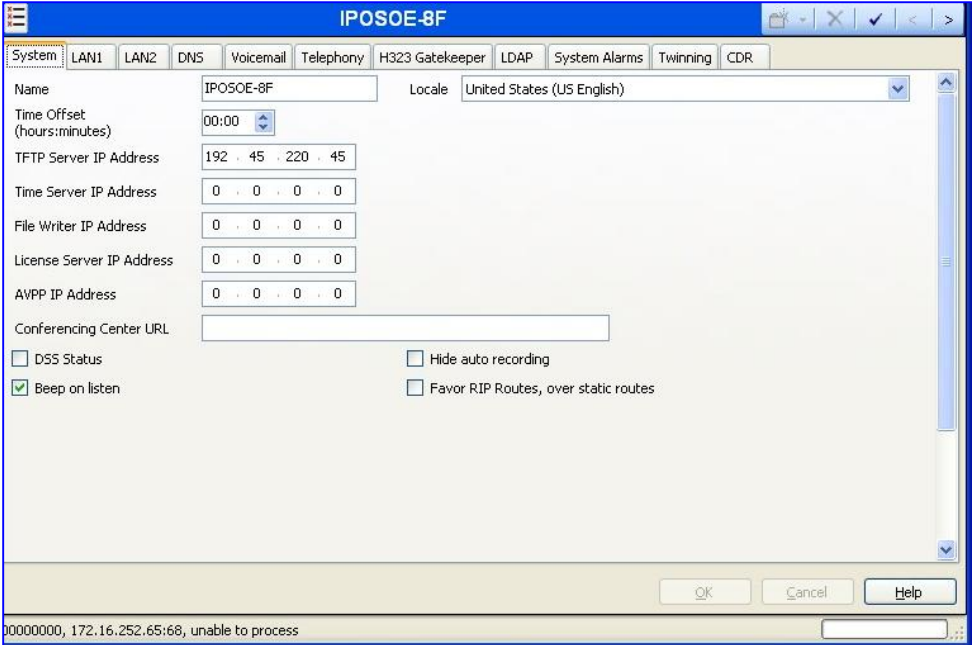
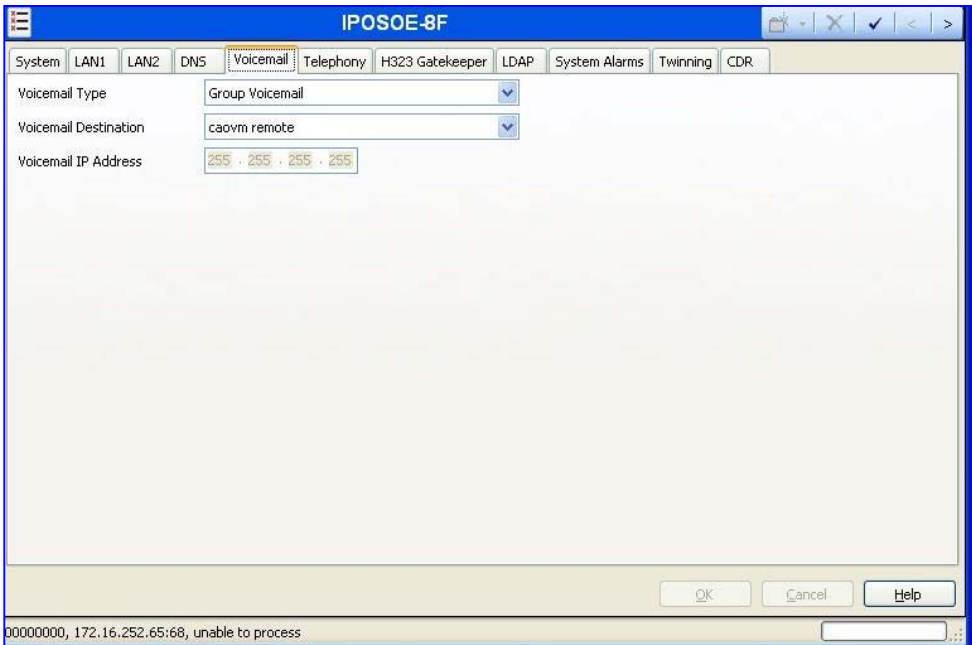
| Step | Description |
|------|---|
| 1. | Log into the Avaya IP Office Manager PC and go to Start → Programs → IP Office → Manager to launch the Avaya IP Office Manager application. |
| 2. | Repeat Section 3, Steps 2 – 7 of reference [1] to determine the System Password of the Avaya IP Office. Make a note of the password, as it will be required in Section 5.1, Step 7. |
| 3. | In the Manager window, select File → Open Configuration to search for Avaya IP Office in the network. |

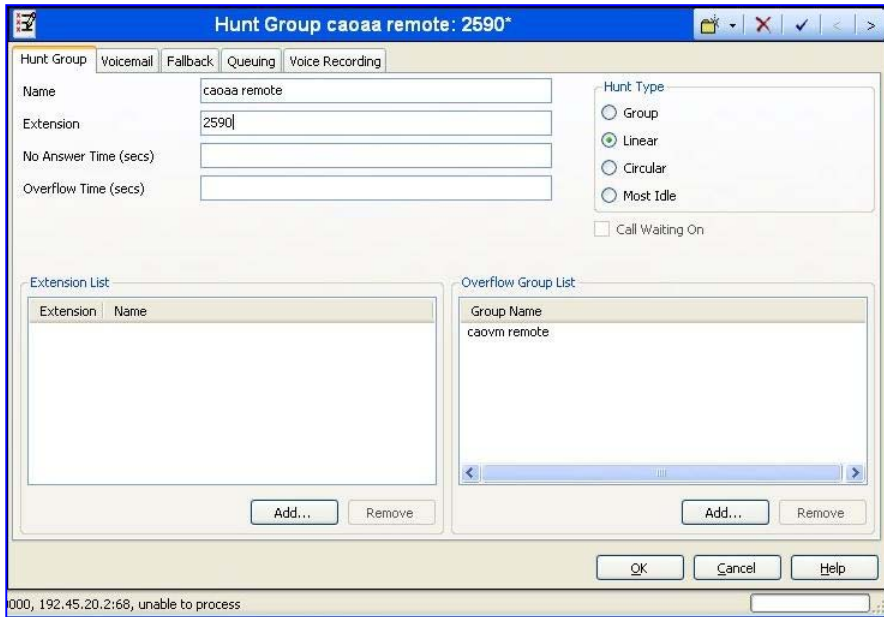
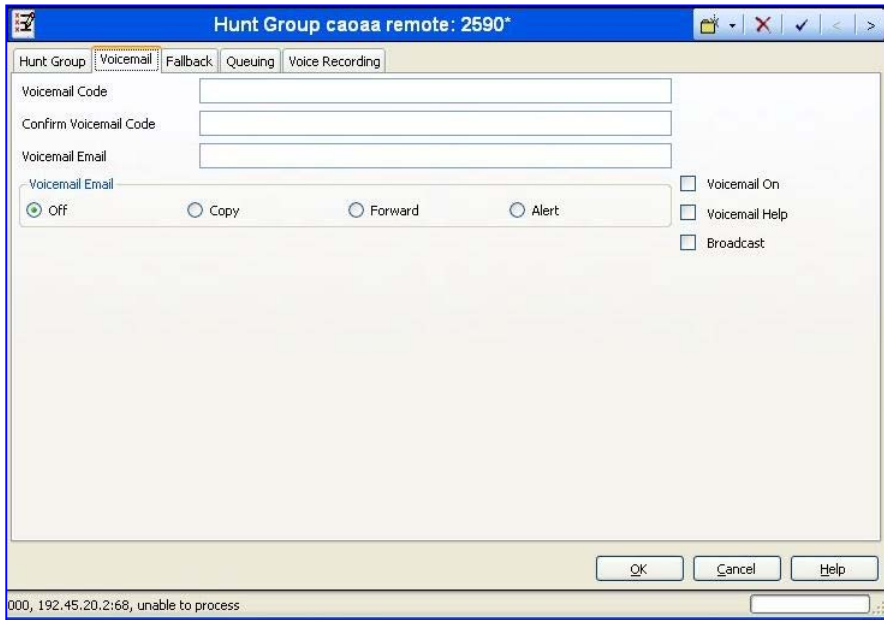
| Step | Description |
|------|--|
| 4. | Log into Avaya IP Office using the appropriate login credentials to receive its configuration. |
| |  |
| | Configure CAO Remote Agent Ports |
| 5. | In the Manager window, go to the Configuration Tree and double-click User . |
| 6. | In the list of users that appears, select the user corresponding to the first CAO Remote Agent port extension listed in Table 2 . |

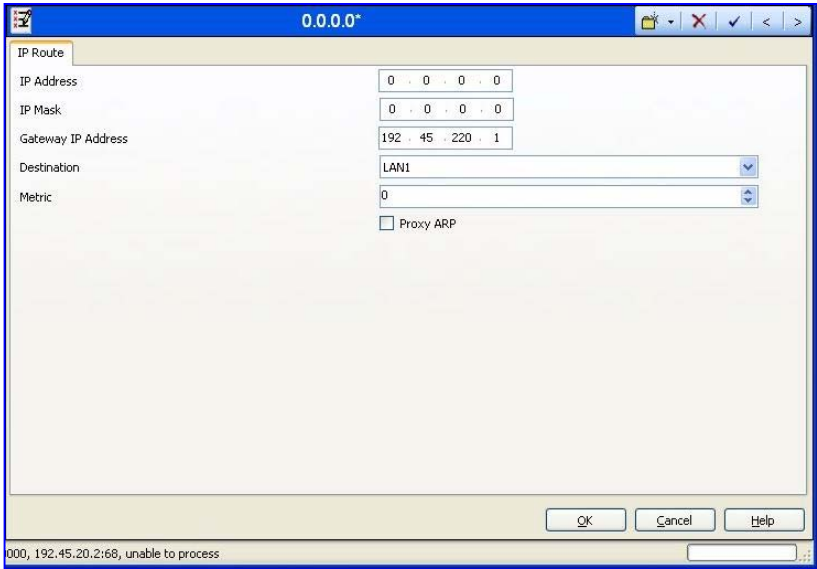
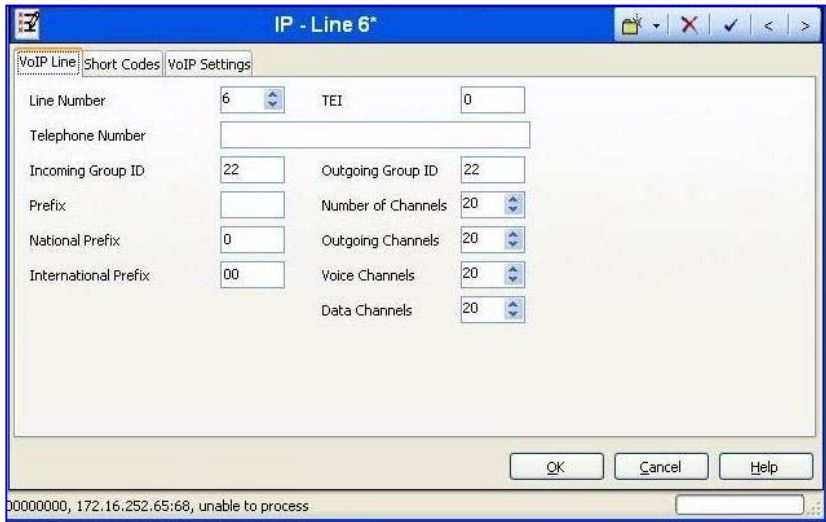
| Step | Description |
|------|---|
| 7. | <p>In the User window that appears, set Name to the name of the first CAO port listed in Table 2 and verify Extension is set to the extension number of the first CAO port listed in Table 2. Select the Voicemail tab.</p>  |
| 8. | <p>In the Voicemail tab, uncheck Voicemail On. Select the Telephony tab.</p>  |

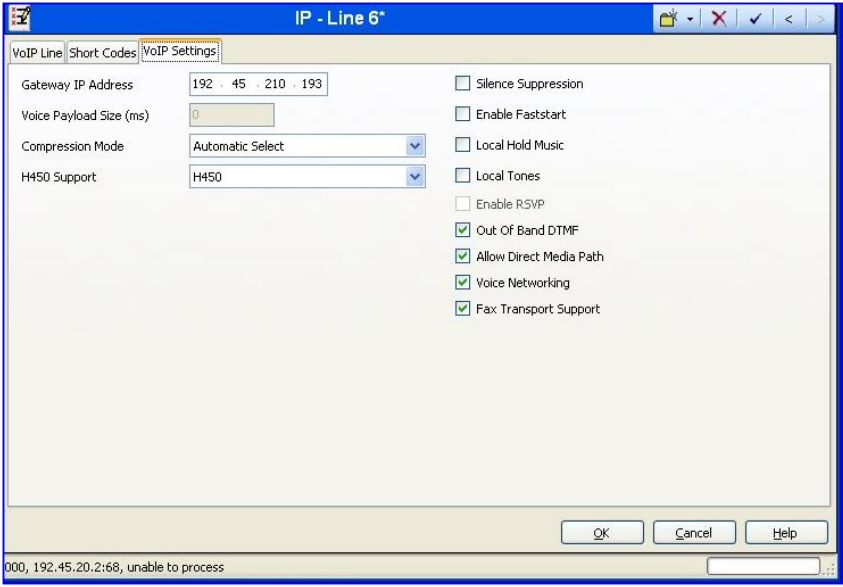
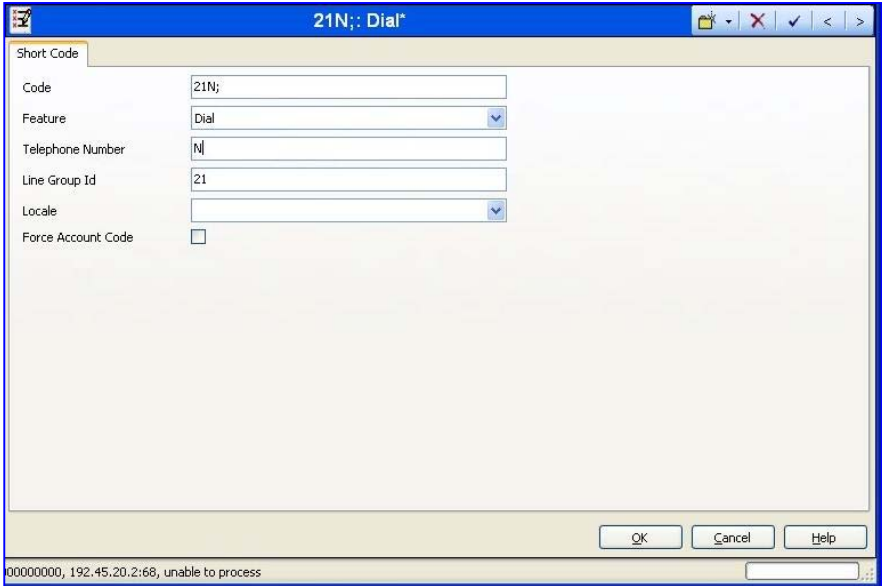
| Step | Description |
|------|--|
| 9. | <p>In the Telephony tab, uncheck Call Waiting On and uncheck Answer Call Waiting On Hold (Analog). Click OK.</p>  |
| 10. | Repeat Steps 6 – 9 for each CAO Remote Agent port listed in Table 2 . For the purposes of these Application Notes, CAO port extensions 201 – 204 were configured. |
| | Configure caovm remote hunt group |
| 11. | In the Manager window, go to the Configuration Tree and right-click Hunt Group . In the popup menu that appears, select New . |

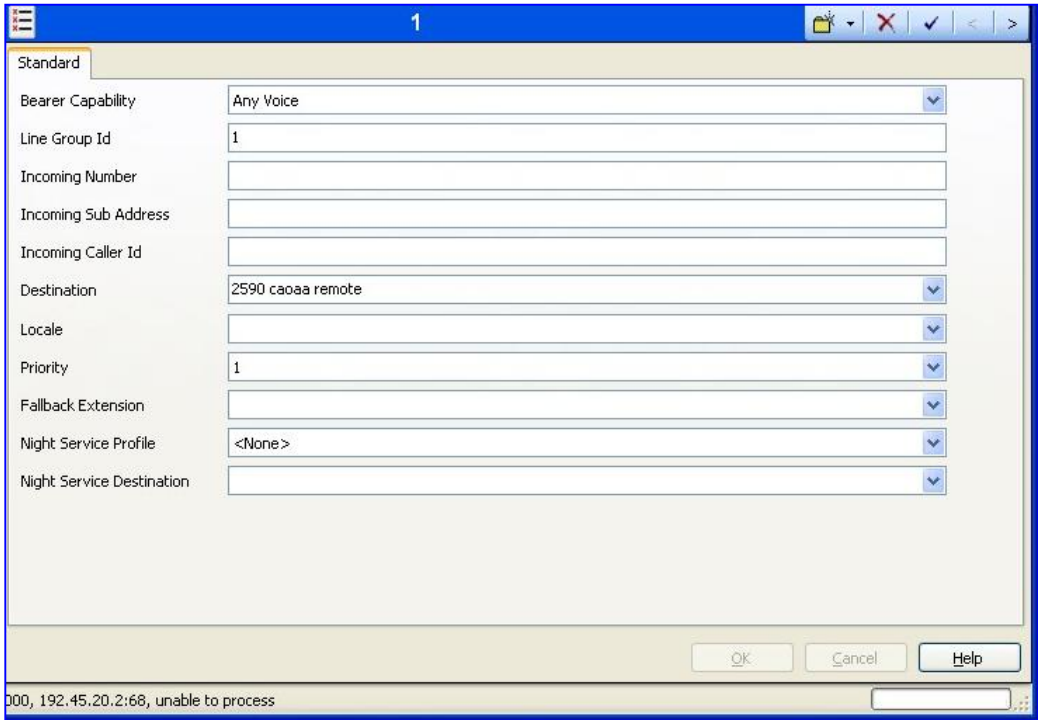
| Step | Description |
|---|---|
| 12. | <p>In the hunt group window that appears, set Name to the name of the CAO voicemail hunt group listed in Table 2, set Extension to the extension number listed for the Site A CAO voicemail hunt group in Table 2, add all the CAO Remote ports listed in Table 2 to the Extension List and select Linear for Hunt Type. Select the Voicemail tab.</p>  |
| 13. | <p>In the Voicemail tab, uncheck Voicemail On. Click OK.</p>  |
| Configure cao vm hunt group as system voicemail | |

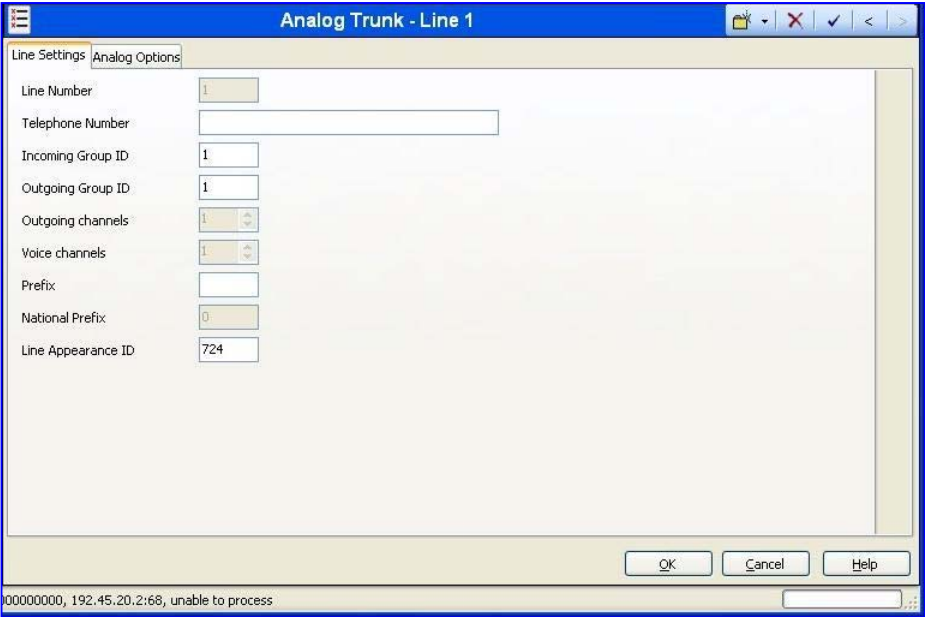
| Step | Description |
|------|--|
| 14. | <p>In the Manager window, go to the Configuration Tree and double-click System. In the System tab that appears, select the Voicemail tab.</p>  |
| 15. | <p>In the Voicemail tab that appears, set Voicemail Type to <i>Group Voicemail</i> and set Voicemail Destination to <i>caovm remote</i>. Click OK.</p>  |
| | Configure caooa remote hunt group |

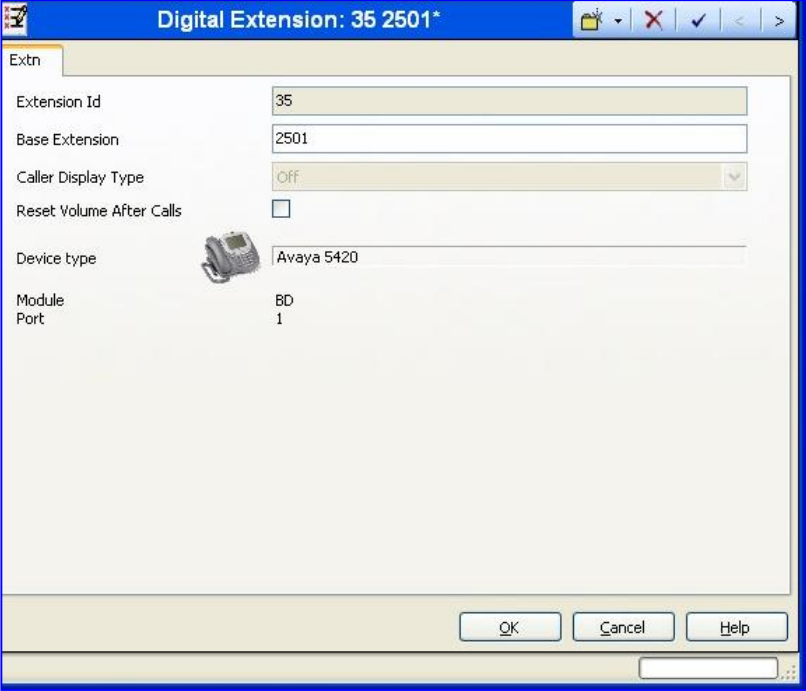
| Step | Description |
|-------------------------|---|
| 16. | In the Manager window, go to the Configuration Tree and right-click Hunt Group . In the popup menu that appears, select New . |
| 17. | <p>In the hunt group window that appears, set Name to the name of the Site A CAO Auto Attendant hunt group listed in Table 2, set Extension to the extension number listed for the Site A CAO Auto Attendant hunt group in Table 2, add <i>caovm remote</i> to the Overflow Group List, and select Linear for Hunt Type. Select the Voicemail tab.</p>  |
| 18. | <p>In the Voicemail tab, uncheck Voicemail On. Click OK.</p>  |
| Configure default route | |

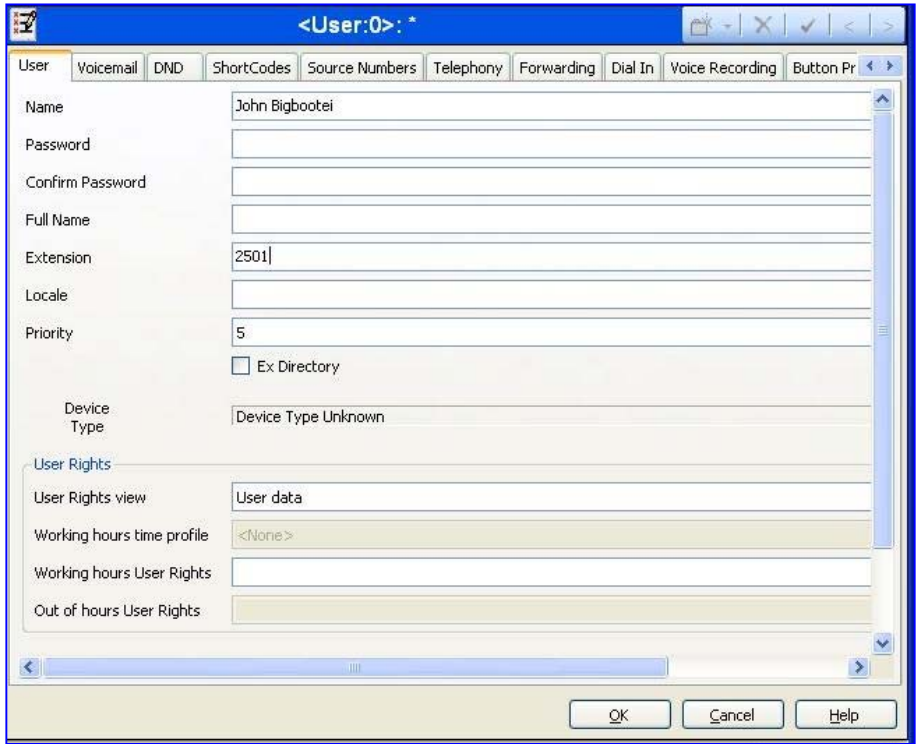
| Step | Description |
|--|---|
| 19. | In the Manager window, go to the Configuration Tree and right-click IP Route . In the popup menu that appears, select New . |
| 20. | <p>In the IP Route window that appears set IP Address to 0.0.0.0, set IP Mask to 0.0.0.0, set Gateway IP Address to 192.45.220.1 and set Destination to LAN1. Click OK.</p>  |
| Create IP trunk to Main Site and enable Small Community Networking | |
| 21. | In the Manager window, go to the Configuration Tree and right-click Line . In the popup menu that appears, select New → IP Line . |
| 22. | <p>In the IP – Line window that appears, set Incoming Group ID and Outgoing Group ID to a unique number, the number could be the same for both fields. Select the VoIP Settings tab. Note: Make a note of the value used for Outgoing Group ID as it will be required in Step 25 as well as in Section 4, Step 15.</p>  |

| Step | Description |
|------|--|
| 23. | <p>In the VoIP Settings tab, set Gateway IP Address to the IP address of the Main Site Avaya IP Office, check Voice Networking and check Fax Transport Support. Click OK.</p>  |
| | Configure short code used by CAO remote agent to redirect hunt group calls to Main Site |
| 24. | In the Manager window, go to the Configuration Tree and right-click Short Code . In the popup menu that appears, select New . |
| 25. | <p>In the Short Code window that appears, set Code to 21N;, set Feature to Dial, set Telephone Number to N and set Line Group Id to the value of the Outgoing Line Group Id configured in Step 20. Click OK.</p>  |

| Step | Description |
|------|--|
| | Configure incoming call route |
| 26. | In the Manager window, go to the Configuration Tree and right-click Incoming Call Route . In the popup menu that appears, select New |
| 27. | <p>In the Incoming Call Route window that appears, set Line Group Id to a unique number, set Destination to <i>2590 caaaa remote</i>. Click OK. Note: Make sure no other incoming call route with Bearer Capability set to <i>Any Voice</i> is configured with the same Line Group Id.</p>  |
| | Assign incoming call route to inbound trunks being used |
| 28. | In the Manager window, go to the Configuration Tree and click Line . In the list of lines that appear, click the line (analog or digital) whose incoming calls are to be routed to the CAO Automated Attendant hunt group extension. |

| Step | Description |
|------|---|
| 29. | <p>In the window that appears, set Incoming Group ID to the value used for Line Group Id in Step 27. A similar procedure is used on the T1/PRI lines. Click OK. Note: The Telephone Number field is optional.</p>  |
| 30. | Repeat Steps 28 – 29 for each line (trunk) assigned to the Incoming Call Route. |
| | Configure user extensions |
| 31. | In the Manager window, go to the Configuration Tree and click Extension . In the list of extensions that appear, click the Id that will be associated with the first Site A end user listed in Table 2 . |

| Step | Description |
|------|--|
| 32. | <p>In the Extension window that appears, set Extension to the extension number of the first Site A end user in Table 2. Click OK.</p>  |
| 33. | <p>In the Manager window, go to the Configuration Tree and double-click User. In the right hand pane, right-click New to add a user.</p> |

| Step | Description |
|------|---|
| 34. | <p>In the User window that appears, set Name to the name of the first Site A end user listed in Table 2, set Extension to the extension number associated with the first Site A end user in Table 2. Click OK.</p>  |
| 35. | <p>Repeat Steps 31 – 34 for each Site A end user extension listed in Table 2. For the purposes of these Application Notes, Site A end user extensions 2501 and 2510 were created.</p> |
| | Install CTI Link Pro license |
| 36. | <p>In the Manager window, go to the Configuration Tree and double-click System. In the right pane, verify License Server IP Address is set to the IP address of the machine to which the Avaya Software Sentinel key (dongle) is connected. If the dongle is connected to Avaya IP Office directly, it should be set to 0.0.0.0.</p> |
| 37. | <p>In the Manager window, go to the Configuration Tree and right-click License. In the popup menu that appears, select New.</p> |
| 38. | <p>In the License popup that appears, enter the license string for the CTI Link Pro license and click OK.</p> |
| 39. | <p>In the Manager window, select File → Save to push the configuration to Avaya IP Office, select Immediate for reboot option (not shown), and wait for the system to update. This completes configuration of the Site A Avaya IP Office for this solution.</p> |

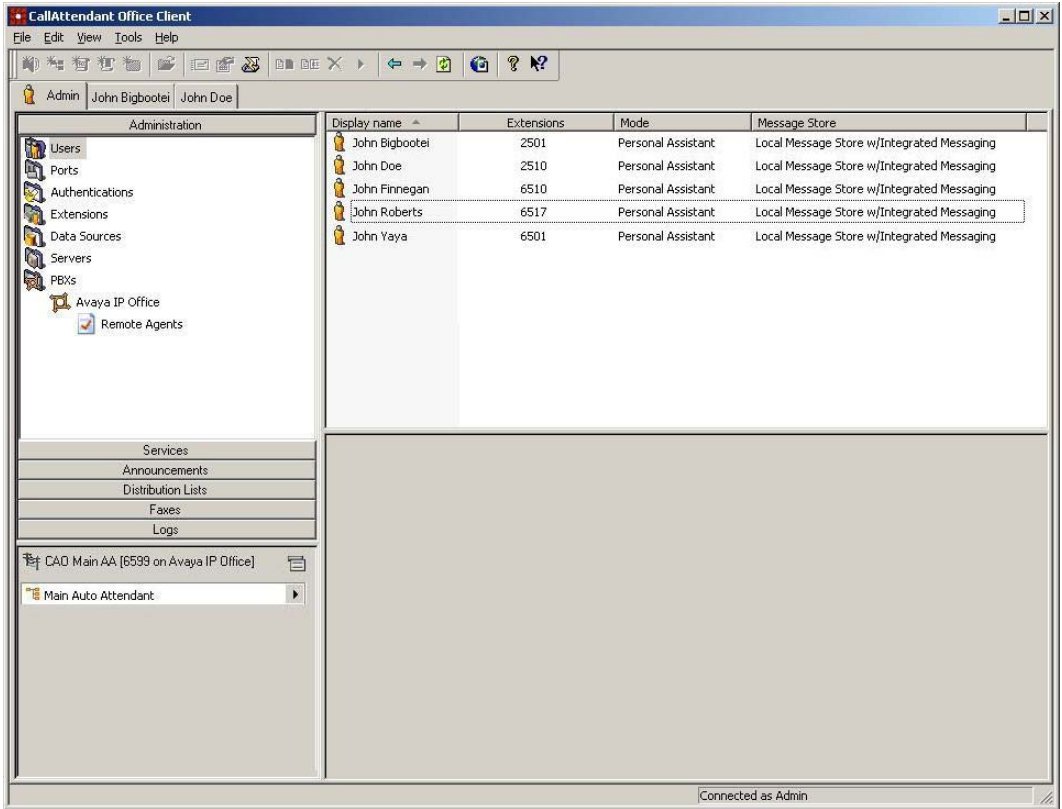
4. Configure Objectworld CAO

The configuration information provided in this section describes the steps required to modify the Objectworld Main Site CallAttendant Office configuration for this solution.

It is assumed the Main Site CallAttendant Office has already been configured as described in reference [1] with the exceptions noted in **Table 1**.

For all other provisioning information, such as software installation and/or the configuration of CAO, please refer to the Objectworld product documentation in reference [5].

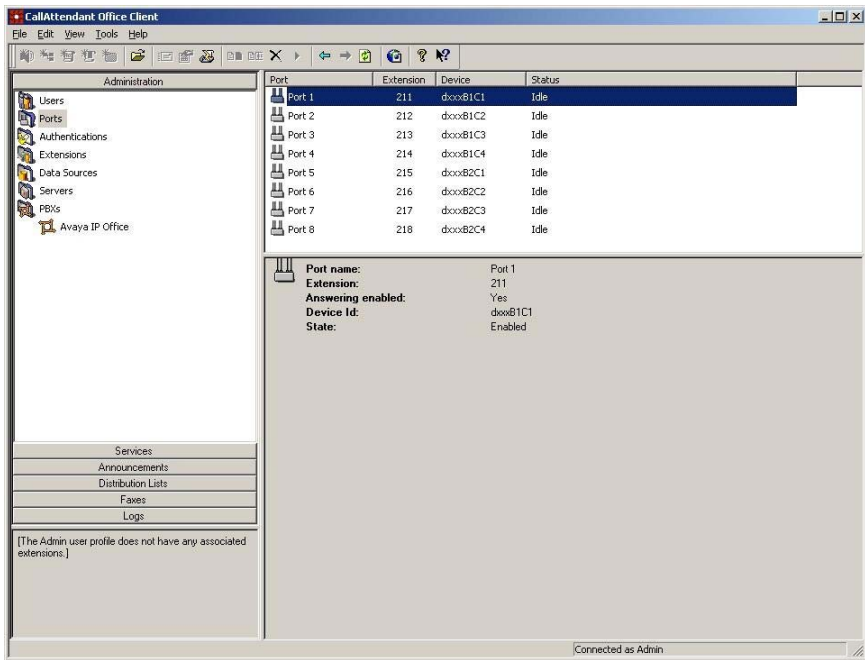
| Step | Description |
|------|---|
| | Verify Configuration |
| 1. | Go to Start → Programs → Objectworld CallAttendant Office → CallAttendant Office Client and login using the appropriate administrative privileges. |
| 2. | In the CallAttendant Office Client window that appears, click Users in the left pane and verify the end user names and corresponding extensions listed in Table 2 appear in the right pane. |


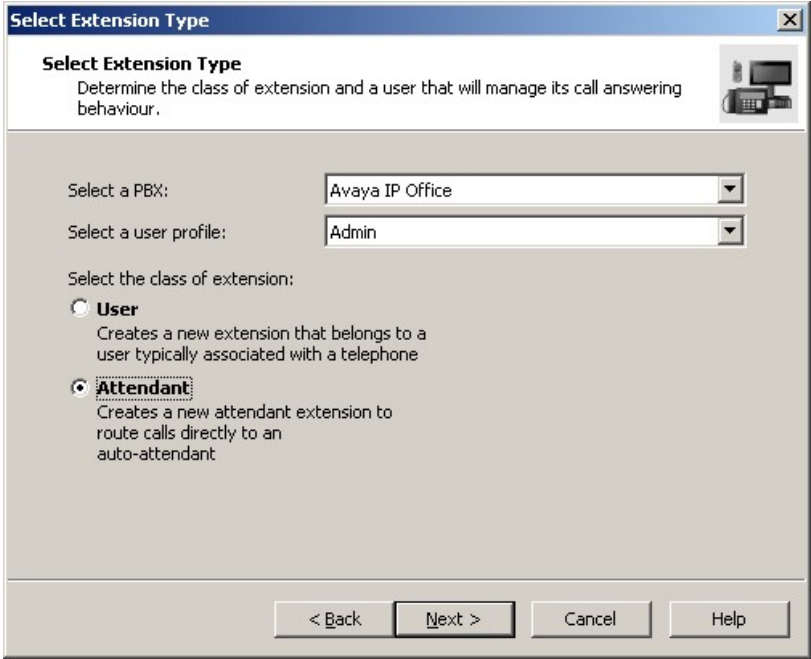


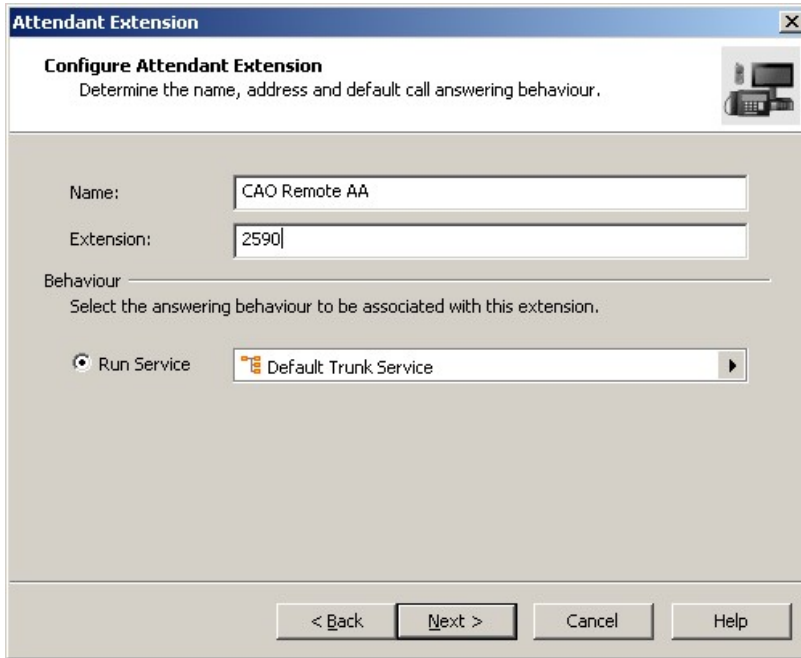
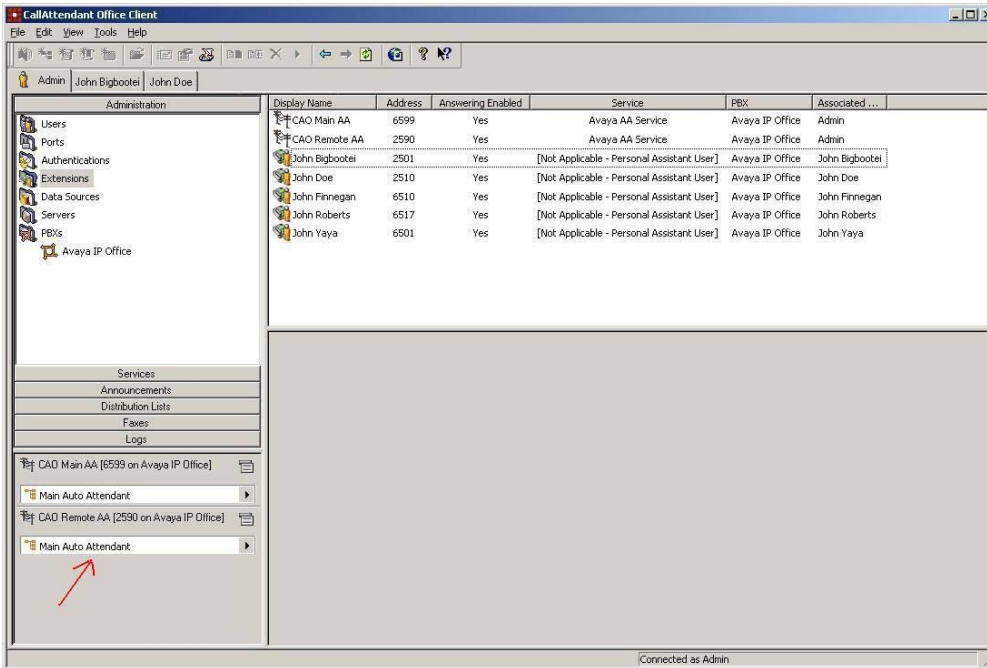
The screenshot shows the 'CallAttendant Office Client' window. The left pane is titled 'Administration' and contains a tree view with the following items: Users, Ports, Authentications, Extensions, Data Sources, Servers, PBXs, Avaya IP Office, and Remote Agents. The 'Users' item is selected. The right pane displays a table with the following data:

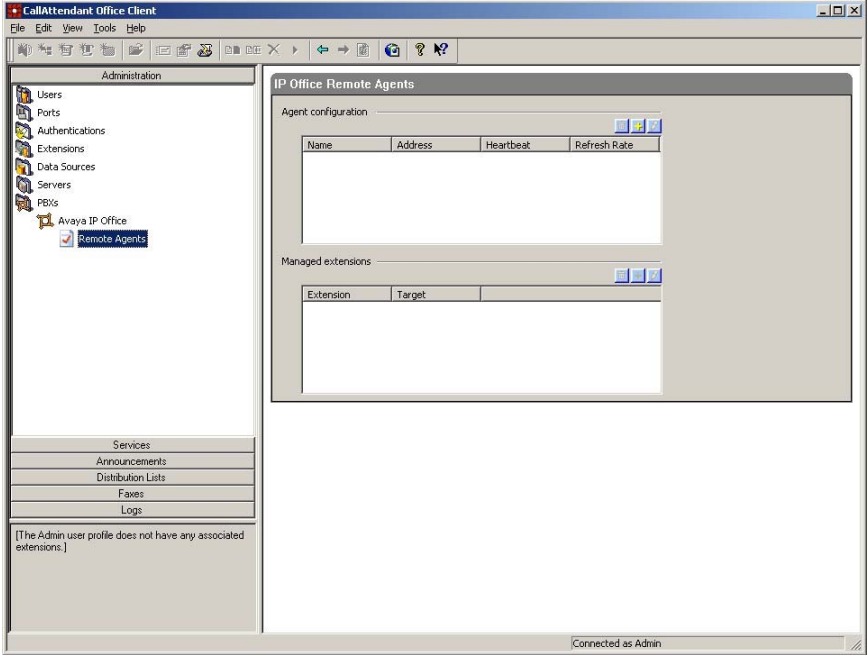
| Display name | Extensions | Mode | Message Store |
|----------------|------------|--------------------|--|
| John Bigbootel | 2501 | Personal Assistant | Local Message Store w/Integrated Messaging |
| John Doe | 2510 | Personal Assistant | Local Message Store w/Integrated Messaging |
| John Finnegan | 6510 | Personal Assistant | Local Message Store w/Integrated Messaging |
| John Roberts | 6517 | Personal Assistant | Local Message Store w/Integrated Messaging |
| John Yaya | 6501 | Personal Assistant | Local Message Store w/Integrated Messaging |

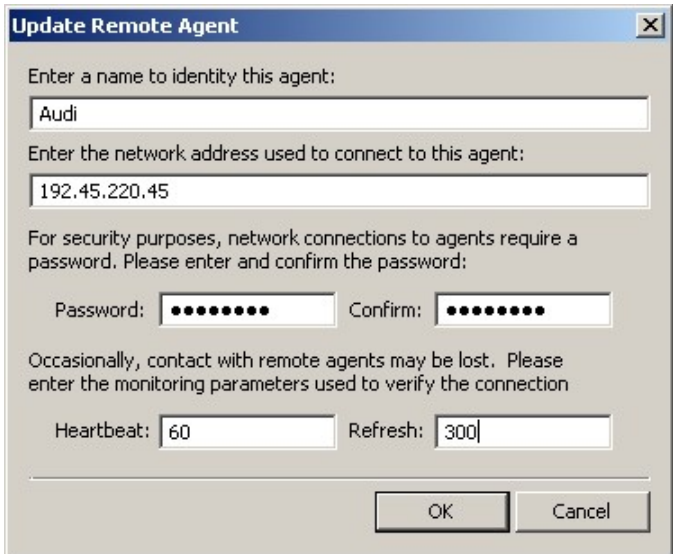
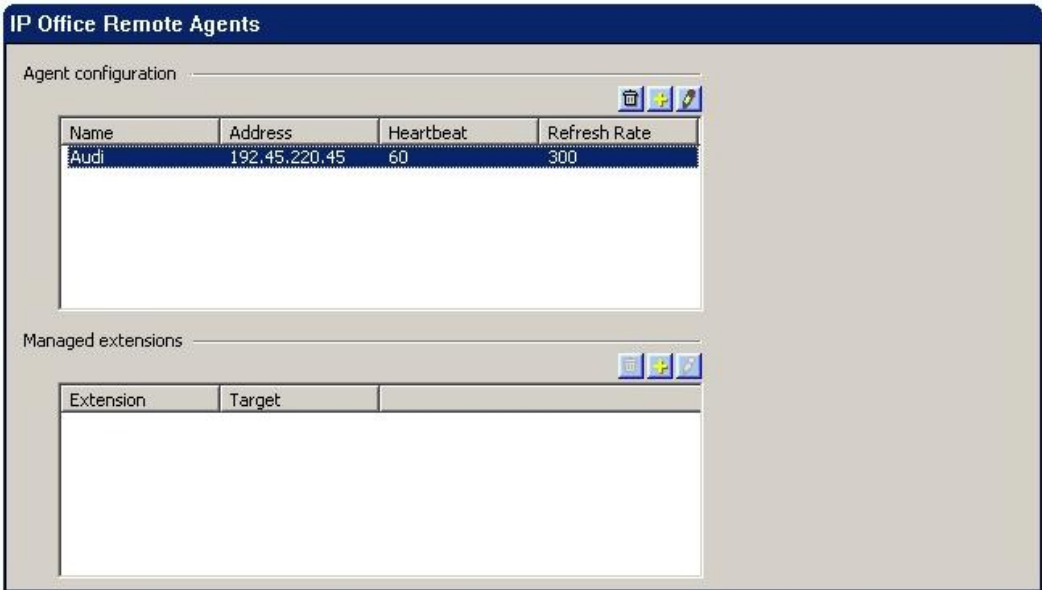
At the bottom of the window, there is a status bar that reads 'Connected as Admin'.

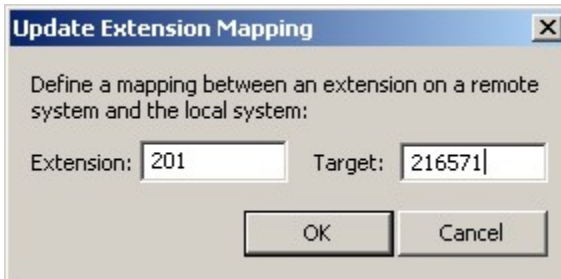
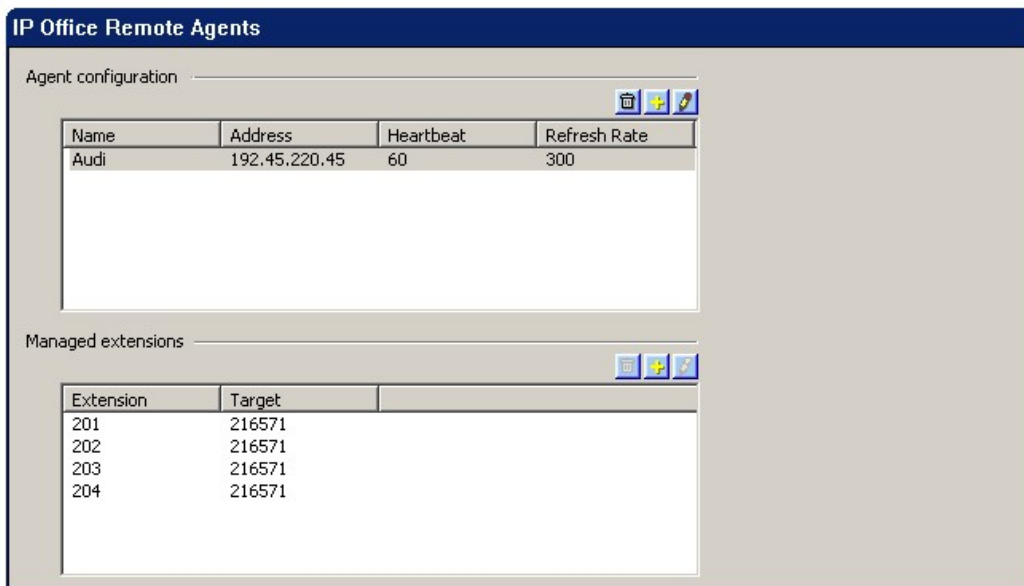
| Step | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|--|----------|-----------|--------|--------|--------|-----|----------|------|--------|-----|----------|------|--------|-----|----------|------|--------|-----|----------|------|--------|-----|----------|------|--------|-----|----------|------|--------|-----|----------|------|--------|-----|----------|------|
| 3. | <p>In the CallAttendant Office window, click Ports in the left pane and verify the CAO ports and corresponding extensions listed in Table 2 appear in the right pane.</p> <div><table><thead><tr><th>Port</th><th>Extension</th><th>Device</th><th>Status</th></tr></thead><tbody><tr><td>Port 1</td><td>211</td><td>dxooB1C1</td><td>Idle</td></tr><tr><td>Port 2</td><td>212</td><td>dxooB1C2</td><td>Idle</td></tr><tr><td>Port 3</td><td>213</td><td>dxooB1C3</td><td>Idle</td></tr><tr><td>Port 4</td><td>214</td><td>dxooB1C4</td><td>Idle</td></tr><tr><td>Port 5</td><td>215</td><td>dxooB2C1</td><td>Idle</td></tr><tr><td>Port 6</td><td>216</td><td>dxooB2C2</td><td>Idle</td></tr><tr><td>Port 7</td><td>217</td><td>dxooB2C3</td><td>Idle</td></tr><tr><td>Port 8</td><td>218</td><td>dxooB2C4</td><td>Idle</td></tr></tbody></table><div><p>Port name: Port 1 Extension: 211 Answering enabled: Yes Device Id: dxooB1C1 State: Enabled</p></div></div> | Port | Extension | Device | Status | Port 1 | 211 | dxooB1C1 | Idle | Port 2 | 212 | dxooB1C2 | Idle | Port 3 | 213 | dxooB1C3 | Idle | Port 4 | 214 | dxooB1C4 | Idle | Port 5 | 215 | dxooB2C1 | Idle | Port 6 | 216 | dxooB2C2 | Idle | Port 7 | 217 | dxooB2C3 | Idle | Port 8 | 218 | dxooB2C4 | Idle |
| Port | Extension | Device | Status | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port 1 | 211 | dxooB1C1 | Idle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port 2 | 212 | dxooB1C2 | Idle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port 3 | 213 | dxooB1C3 | Idle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port 4 | 214 | dxooB1C4 | Idle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port 5 | 215 | dxooB2C1 | Idle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port 6 | 216 | dxooB2C2 | Idle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port 7 | 217 | dxooB2C3 | Idle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Port 8 | 218 | dxooB2C4 | Idle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | <p>To verify proper function, place a call to extension 211 from an Avaya IP Office telephone extension. Verify that CallAttendant Office Voicemail answers. Repeat for each CAO extension configured, e.g., 211 – 218.</p> <p>Configure CAO Remote Auto Attendant (caaaa remote)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | <p>In the CallAttendant Office window, click Extensions in the left pane, right-click the right pane and select New Extension... in the popup menu that appears.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Step | Description |
|------|---|
| 6. | <p>In the Welcome window that appears, click Next.</p>  |
| 7. | <p>In the Select Extension Type window that appears, set Select a PBX to <i>Avaya IP Office</i>, set Select a user profile to <i>Admin</i>, and select <i>Attendant</i> for Select the class of extension. Click Next.</p>  |

| Step | Description |
|------------------------|---|
| 8. | <p>In the Attendant Extension window that appears, set Name to <i>CAO Remote AA</i>, set Extension to <i>2590</i> and set Run Service to <i>Default Trunk Service</i>. Click Next.</p>  |
| 9. | In the Complete window that appears (not shown), click Finish . |
| 10. | <p>In the CallAttendant Office window, select Main Auto Attendant as the service to run for CAO Remote AA.</p>  |
| Configure Remote Agent | |

| Step | Description |
|------|--|
| 11. | In the CallAttendant Office window, go to PBXs → Avaya IP Office → Remote Agents in the left pane. |
| 12. | In the Avaya IP Office Remote Agents window that appears, click the plus (+) icon in Agent configuration to add a remote agent.  |

| Step | Description |
|------|--|
| 13. | <p>In the Update Remote Agent popup that appears, set Enter a name to identify this agent: to the desired name for the remote agent. Set Enter the network address used to connect to this agent: to the IP address of the CAO Remote Agent PC as depicted in Figure 1. Set Password and Confirm to the desired password. Set Heartbeat to 60 and set Refresh to 300. Click OK. Note: Make a note of the values used for Password and Confirm, as they will be used in Section 5.2, Step 6.</p>  |
| 14. | <p>In the Avaya IP Office Remote Agents window, click the plus (+) icon in Managed extensions to add remote agent extensions.</p>  |

| Step | Description |
|------|---|
| 15. | <p>In the Update Extension Mapping popup that appears, set Extension to the first CAO Remote Agent Port extension listed in Table 2, set Target to the digit sequence made up of the 2-<i>digit short code</i> created in Section 3.2, Step 20 and the 4-<i>digit cao remote vm</i> extension number listed in Table 2 and used in Section 3.2, Step 10. Click OK.</p>  <p>The image shows a dialog box titled "Update Extension Mapping". It contains the text "Define a mapping between an extension on a remote system and the local system:". Below this, there are two input fields: "Extension:" with the value "201" and "Target:" with the value "216571". At the bottom, there are "OK" and "Cancel" buttons.</p> |
| 16. | <p>Repeat Steps 14 – 15 for each CAO Remote Agent Port extension listed in Table 2. For the purposes of these Application Notes, Remote Agent extensions were defined for port extensions 201 – 204. This completes configuration of the CallAttendant Office.</p>  <p>The image shows the "IP Office Remote Agents" configuration window. It has two main sections: "Agent configuration" and "Managed extensions". The "Agent configuration" section has a table with columns: Name, Address, Heartbeat, and Refresh Rate. The table contains one row: Audi, 192.45.220.45, 60, 300. The "Managed extensions" section has a table with columns: Extension and Target. The table contains four rows: 201, 202, 203, and 204, all with the target value 216571.</p> |

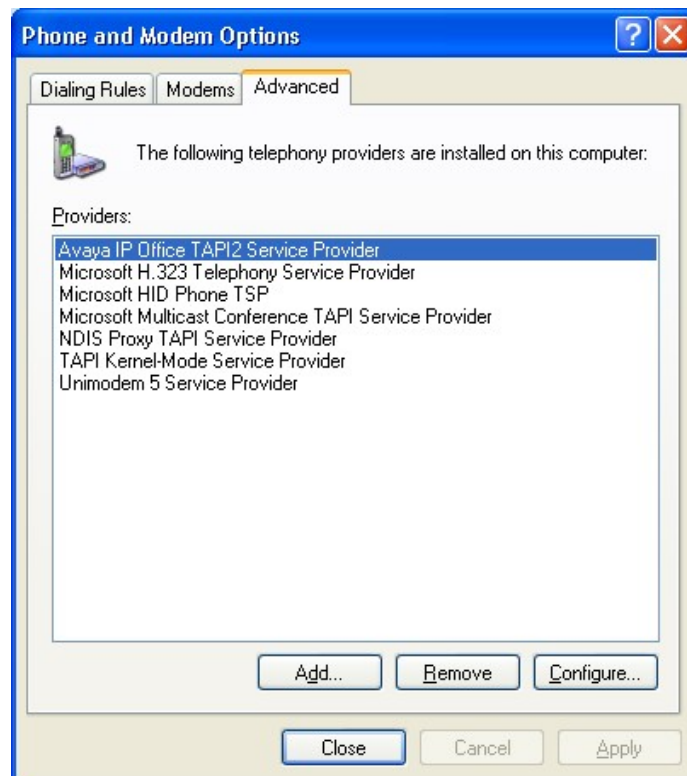
5. Configure Objectworld CAO Remote Agent PC

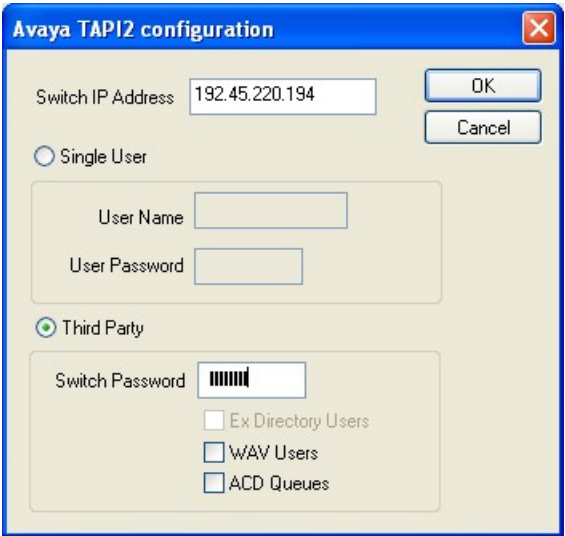
The configuration information provided in this section describes the steps required to setup the Site A CAO Remote Agent PC for this solution.

For all other provisioning information, please refer to the Objectworld product documentation in reference [5].

5.1. Install and Configure Avaya IP Office TAPI Driver

| Step | Description |
|------|---|
| 1. | From the CAO Remote Agent PC, launch the Avaya IP Office User Suite setup.exe in the CDROM drive from an account with administrative privileges. |
| 2. | Click Custom in the InstallShield wizard. Uncheck Phone Manager and check TAPI to install the Avaya IP Office TAPI driver on the PC. |
| 3. | Click Next to complete the installation of the Avaya IP Office User Suite. At the InstallShield Wizard Complete window, click Finish . |
| 4. | Go to Start → Control Panel and double-click the Phone and Modem Options icon in the Control Panel window that appears. |
| 5. | In the Phone and Modem Options window that appears, select the Advanced tab. |
| 6. | In the Advanced tab window that appears, highlight Avaya IP Office TAPI2 Service Provider and click Configure... |





| Step | Description |
|------|---|
| 7. | <p>In the Avaya TAPI2 configuration window that appears, set Switch IP Address to the IP address of the Site A IP Office, select Third Party, set Switch Password to the Avaya IP Office system password referenced in Section 3.2, Step 2, uncheck WAV Users, and uncheck ACD Queues. Click OK.</p>  |
| 8. | In the Phone and Modem Options window, click Close . |
| 9. | Reboot the PC for the changes to take effect. This completes configuration of the Avaya IP Office TAPI Driver on the CAO Remote Agent PC for this solution. |

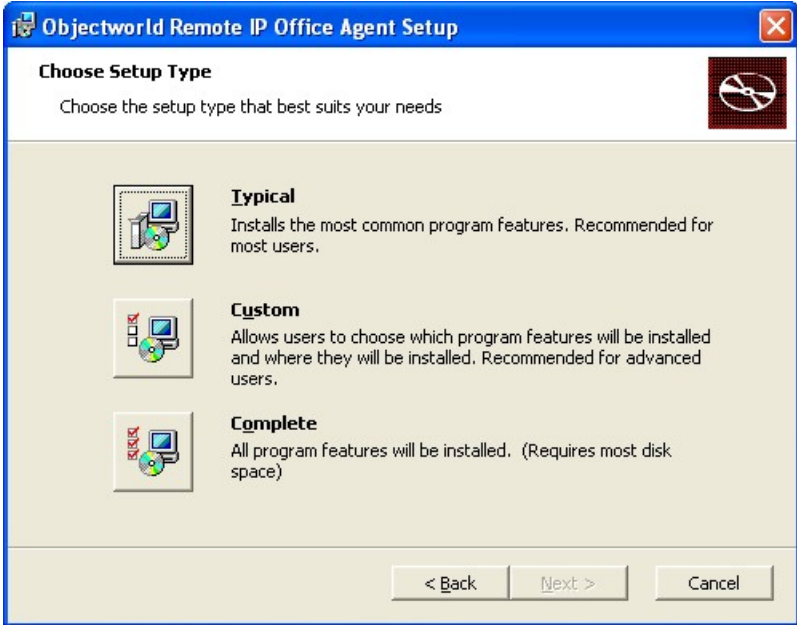
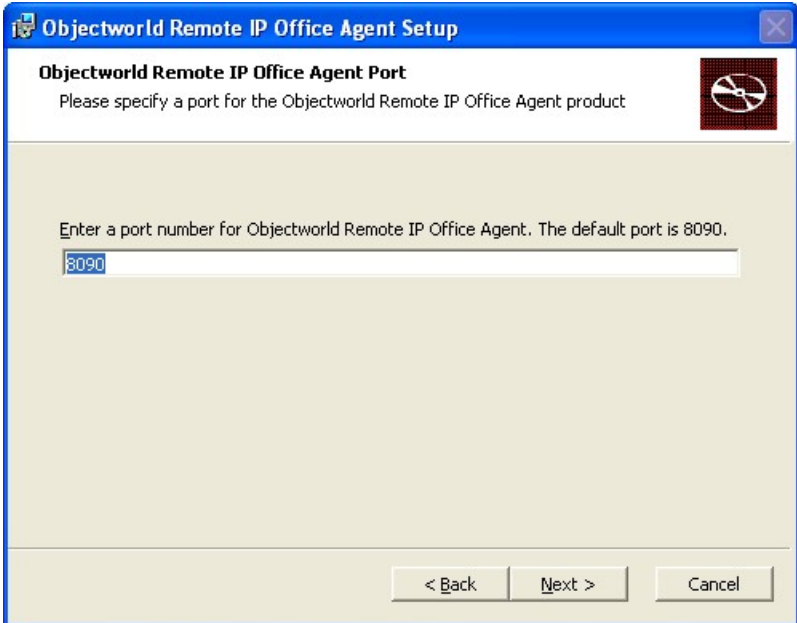
5.2. Configure Objectworld CAO Remote Agent

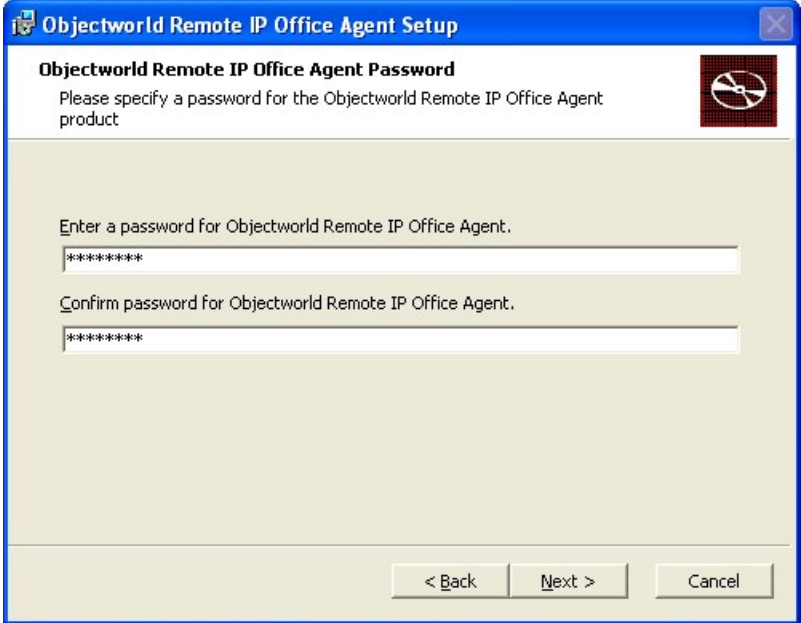
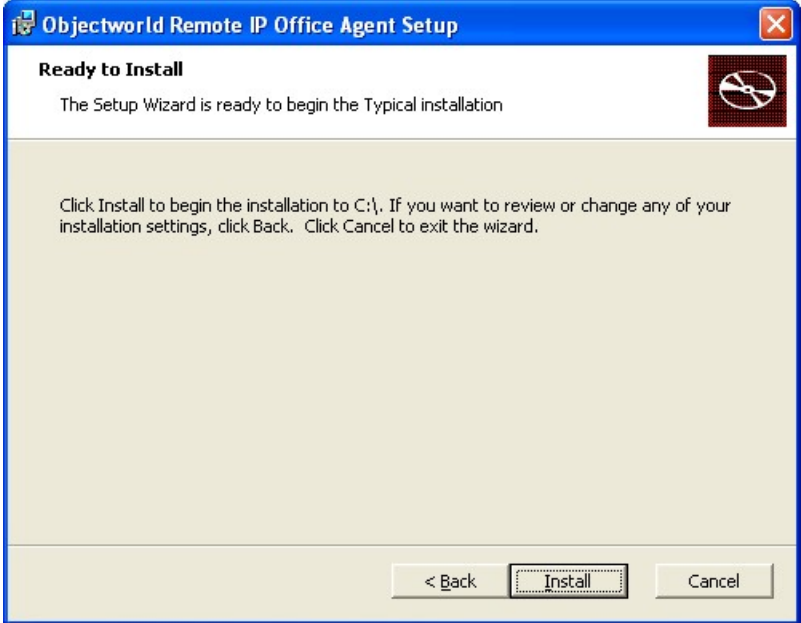
The configuration information provided in this section describes the steps required to install and configure the CAO Remote Agent for this solution.


For all other provisioning information, please refer to the Objectworld product documentation in reference [5].

| Step | Description |
|------|---|
| 1. | From the CAO Remote Agent PC, launch the Objectworld Remote IP Office Agent setup.exe in the CDROM drive from an account with administrative privileges. |
| 2. | In the Objectworld Remote IP Office Agent Setup Welcome screen that appears, click Next . |

| Step | Description |
|------|---|
| |  <p>The screenshot shows the 'Objectworld Remote IP Office Agent Setup' window. It features a blue title bar, a CD icon in a square, and a red abstract graphic on the left. The text reads: 'Welcome to the Objectworld Remote IP Office Agent Setup Wizard'. Below this, it says: 'The Setup Wizard will install Objectworld Remote IP Office Agent on your computer. Click Next to continue or Cancel to exit the Setup Wizard.' At the bottom are buttons for '< Back', 'Next >', and 'Cancel'.</p> |
| 3. | <p>In the End-User License Agreement screen that appears, click I Agree if you agree with the User License Agreement.</p>  <p>The screenshot shows the 'Objectworld Remote IP Office Agent License Agreement' window. It has a blue title bar and a CD icon. The text reads: 'End-User License Agreement' and 'Please read the following license agreement carefully'. A scrollable text area contains: 'OBJECTWORLD COMMUNICATIONS CORP. END USER LICENSE AGREEMENT', 'IMPORTANT NOTICE---READ BEFORE USING THIS SOFTWARE PRODUCT', and 'THIS IS A LEGAL AGREEMENT BETWEEN YOU, THE END USER, ("YOU") AND OBJECTWORLD COMMUNICATIONS CORP. ("VENDOR"). BEFORE OPENING THE PACKAGE CONTAINING THE SOFTWARE PRODUCT (AS DESCRIBED BELOW), CLICKING ON THE "I ACCEPT" BUTTON DURING THE REVIEW OF THIS LICENSE, OR INSTALLING OR USING THE SOFTWARE PRODUCT, PLEASE CAREFULLY READ THE TERMS AND CONDITIONS OF THIS AGREEMENT. THIS AGREEMENT CONTAINS THE'. At the bottom are buttons for '< Back', 'I Agree', and 'Cancel'.</p> |

| Step | Description |
|------|---|
| 4. | <p>In the Choose Setup Type screen that appears, click Typical.</p>  |
| 5. | <p>In the Objectworld Remote IP Office Agent Port screen that appears, set port number to the default port (8090). Click Next. Note: Objectworld strongly recommends using the default port value. Using a different port will require additional manual configuration of the CAO server.</p>  |

| Step | Description |
|------|---|
| 6. | <p>In the Objectworld Remote IP Office Agent Password Screen, set password to the value used for Password in Section 4, Step 13. Use the same value for Confirm password.</p>  |
| 7. | <p>In the Ready to Install screen that appears, click Install.</p>  |

| Step | Description |
|------|---|
| 8. | <p>In the Completing the Objectworld Remote IP Office Agent Setup Wizard screen that appears, click Finish.</p>  |
| 9. | <p>Reboot the PC for the changes to take effect. This completes configuration of the CAO Remote Agent for this solution.</p> |

6. Interoperability Compliance Testing

Interoperability compliance testing examined the ability of Objectworld CallAttendant Office Remote Agent to work with Avaya IP Office at Site A. The following CAO Remote Agent features were verified with Avaya IP Office at Site A: automated attendant, voicemail, transfer, assisted transfer, receiving fax, sending fax, pager notification, active message delivery, and one-time message. All inbound calls went over Site A trunks. **Note:** Objectworld does not believe there will be many users requiring outbound calls placed by the CAO server to go out of the remote site, Site A, trunks. Therefore, all testing involving the CAO server placing outbound calls was done using the Main Site trunks only. Using the CAO server to place outbound calls over the remote site, Site A, trunks is beyond the scope of this solution.

6.1. General Test Approach

Feature functionality testing was performed manually. Inbound calls were made to Site A Avaya IP Office through analog and T1/PRI trunks, as well as from internal extensions (analog, digital and IP Telephone). For automated attendant functionality, Site A Avaya IP Office routed inbound calls to the *caaaa remote* hunt group, which transferred calls based on caller DTMF input. For voicemail functionality, CAO Remote Agent redirected incoming voicemail calls from the Site A *caovm remote* hunt group to the Main Site *cao remote vm* hunt group. CAO

treated Site A covered calls according to the settings defined by the Site A extension owner via CAO's Personal Voicemail or Personal Auto Attendant interfaces. CAO emailed voice and fax messages to the extension owner's messaging server. Extension owners would then review messages using the CAO messaging client.

A load test was performed using a call generator to generate inbound calls over four channels on a PRI trunk to Site A Avaya IP Office. Four client PCs were configured with CAO client software and messaging clients, two at the Main Site and two at Site A and four user extensions were created at Site A. For the load test, the CAO Remote Agent redirected inbound calls from the call generator to the CAO hunt group at the Main Site. The call generator script would navigate the CAO automated attendant and select a transfer to a destination extension at Site A, which would not answer. Upon being routed to coverage, the call generator script would leave a voicemail message and hang up. The CAO server would then signal the CAO Remote Agent to enable the message waiting indicator (MWI) lamp of the extensions receiving voicemail at Site A. The voicemail message would also appear in the CAO user's messaging client. A second call generator script was then used to place another inbound call over the PRI trunk to Site A Avaya IP Office, navigate the CAO automated attendant, log into the called extension's voicemail, retrieve the voicemail, delete it and hang up. The CAO server would then signal the CAO Remote Agent to disable the MWI lamp of the extensions at Site A. The deleted message would also disappear from the CAO user's messaging client.

6.2. Test Results

Aside from the issues listed below, all remaining test cases were completed successfully. A load test at Site A with a call rate of ~384 call attempts per hour using 4 PRI trunk channels and calls averaging 30.35 seconds in length was run for two hours. The call generator was limited to placing no more than 4 calls at a time. The call generator reported 776 calls. The CAO server reported 388 voicemail accesses. These numbers correlate since there were two calls placed by the call generator for every voicemail access that took place at the CAO server, that is, $776/2=388$. At the conclusion of the load test, all message-waiting lamps on the Site A telephone extensions used for the load test were off as expected. All voicemail accounts were empty.

The following issues were found during testing:

- **Trunk calls to an extension with DND enabled** – Inbound trunk calls to an extension with Do Not Disturb (DND) enabled was not properly handled by CAO. Upon further investigation by Objectworld, it appeared that some Avaya IP Office TAPI messages were missing information used by CAO.
Status: *MRDB00038715* was filed with the Avaya IP Office team regarding this issue.
- **Trunk calls to an extension with Call Forwarding enabled** – Inbound trunk calls to an extension with Call Forwarding enabled was not properly handled by CAO. Upon further investigation by Objectworld, it appeared that some Avaya IP Office TAPI messages were missing information used by CAO.
Status: *MRDB00038715* was filed with the Avaya IP Office team regarding this issue

- **Assisted transfer over T1 trunk** – The CAO was not able to successfully perform assisted transfer to an outside number when placing the assisted transfer call over T1 trunk at the Main Site. Due to time constraints, there was not enough time to investigate the cause of the failure.
Status: This issue is under investigation by Objectworld.
- **Receiving Fax over Site A PRI trunk** – An incoming fax call over Site A PRI trunk would get successfully redirected to the CAO server at the Main Site to the point where the faxes would negotiate, however the call would fail. Due to time constraints, there was not enough time to investigate the cause of the failure. **Note:** Incoming fax calls over Site A analog trunk were received successfully.
Status: Objectworld has investigated this issue. Receiving a fax over Site A PRI trunk was successful in their environment.

The following observations were made during testing:

- **Assisted transfer behavior** – When a call goes to assisted transfer, the CAO server plays a wave file informing the caller that it will try to locate the called party. The caller then hears silence until connected to the located called party. According to Objectworld, if Music on Hold were configured on Avaya IP Office, the caller would hear music.
- **Restart CAO Remote Agent in case of Avaya IP Office reboot or network loss** – CAO Remote Agent was not able to reestablish a TAPI link to Site A Avaya IP Office once it came back up after having its power cable pulled or network link disconnected. In these scenarios, it is recommended that CAO Remote Agent be restarted after Avaya IP Office is back online.

7. Verification Steps

The following steps may be used to verify the configuration:

- To verify TAPI is enabled on Site A Avaya IP Office, confirm the CTI Link Pro license is installed and valid via Avaya IP Office Manager (Section 3.1).
- To verify the CAO Remote Agent PC is TAPI enabled, confirm the Avaya TAPI driver is installed and configured on the CAO Remote Agent PC (Section 5.1).
- To verify the CAO System Auto Attendant is operating properly from Site A: place a call to the *caaaa remote* hunt group from a Site A extension or via Site A trunk. Verify the CAO Welcome greeting plays and enter a valid Main Site or Site A extension number. Verify the call is transferred to the correct extension.
- To verify the CAO Personal Voicemail is operating properly for a Site A extension: place a call to a Site A extension and do not answer it. Verify the call is routed to the *caovm remote* hunt group and leave a message. Verify the MWI lamp at the Site A

user's extension is enabled, a voice message is emailed to the user's CAO messaging client and the user can play back the message via telephone or PC.

8. Support

For technical support on CallAttendant Office as well as issues arising from the use of Avaya IP Office TAPI in a manner not supported by Avaya as documented in reference [4], consult Objectworld at www.objectworld.com or contact the Objectworld Technical Support at:

- Phone: 613-599-9698 (Option 5)
- E-mail: CAOSupport@objectworld.com

9. Conclusion

These Application Notes describe the steps for configuring Objectworld CallAttendant Office to act as a centralized voicemail with Avaya IP Office. Please refer to the **Note about use of Avaya IP Office TAPI in a centralized voicemail scenario and use of TAPI Line Redirect function** in Section 1 as well as reference [4] for the Avaya IP Office statement of support for this scenario. Aside from the issues described in Section 6.2, all test cases completed successfully.

10. Additional References

Product documentation for Avaya products may be found at www.avaya.com.

[1] Application Notes for Configuring Objectworld CallAttendant Office – Analog Integration with Avaya IP Office – Issue 1.0, January 2007

[2] Avaya IP Office 3.2 Manager, Issue 18h, 14th December 2006

[3] Avaya IP Office CTI Link Installation Manual, 40DHB0002UKAB – Issue 11a, 22nd September 2005

[4] Avaya IP Office Technical Tip 116, 20 January 2006

Product documentation for Objectworld products may be found at www.objectworld.com.

[5] Objectworld CallAttendant Office Administration Guide, CAO-1011-003

11. APPENDIX A – Network Configuration

The configurations of the routers and switches for this solution are listed below for reference.

Main Site Avaya C363T-PWR Stackable Switch Configuration

C360-1(super)# show device-mode

Device mode is Layer2

C360-1(super)# show image version

| Mod | Module-Type | Bank | Version |
|-----|---|------|---------|
| 1 | 24 10/100Base-Tx-Pwr + 2 SFP ports switch | A | 0.0.0 |
| 1 | 24 10/100Base-Tx-Pwr + 2 SFP ports switch | B | 4.3.12 |

C360-1(super)# show boot bank

Boot bank set to bank-b

C360-1(super)# show port

| Port | Name | Status | Vlan | Level | Neg | Dup. | Spd. | Type |
|------|---------|-----------|------|-------|--------|------|------|------------------|
| 1/1 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/2 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/3 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/4 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/5 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/6 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/7 | NO NAME | no link | 211 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/8 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/9 | NO NAME | no link | 211 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/10 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/11 | NO NAME | connected | 211 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/12 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/13 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/14 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/15 | NO NAME | connected | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/16 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/17 | NO NAME | connected | 210 | 6 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/18 | NO NAME | connected | 211 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/19 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/20 | NO NAME | connected | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/21 | NO NAME | no link | 210 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/22 | NO NAME | connected | 210 | 6 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/23 | NO NAME | connected | 211 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/24 | NO NAME | connected | 1 | 0 | enable | full | 100M | 10/100BaseTx-Pwr |
| 1/51 | NO NAME | no link | 1 | 0 | enable | full | 1G | 1000Base-SX Port |
| 1/52 | NO NAME | no link | 1 | 0 | enable | full | 1G | 1000Base-SX Port |

C360-1(super)# show vlan

VLAN ID Vlan-name

| | |
|-----|---------------|
| 1 | vlan1 |
| 2 | vlan2 |
| 3 | vlan3 |
| 4 | vlan4 |
| 5 | vlan5 |
| 6 | vlan6 |
| 7 | vlan7 |
| 10 | vlan10-wan |
| 192 | V192 |
| 210 | vlan210-voice |
| 211 | vlan211-data |

Total number of VLANs: 11

C360-1(super)# show vlan 210

```

VLAN ID Vlan-name
-----
210      vlan210-voice
Switch Ports currently bound to this vlan:
  In module 1 : 1 2 3 4 5 6 8 10 12 13 14 15 16 17 19 20 21 22 23
Switch Ports statically bound to this vlan:
  In module 1 : 23

```

C360-1(super)# show vlan 211

```

VLAN ID Vlan-name
-----
211      vlan211-data
Switch Ports currently bound to this vlan:
  In module 1 : 7 9 11 18 23
Switch Ports statically bound to this vlan:
  In module 1 : 23

```

C360-1(super)# show trunk 1/23

| Port | Mode | Binding mode | Native vlan | Vlans allowed on trunk |
|------|-------|------------------|-------------|------------------------|
| 1/23 | dot1q | statically bound | 211 | 210-211 |

Main Site Cisco 1841 Router Configuration

```

!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 1841MainSite
!
boot-start-marker
boot-end-marker
!
mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
no aaa new-model
ip subnet-zero
ip cef
!
no ftp-server write-enable
!
class-map match-any voip
  match ip dscp ef
  match ip dscp af41
class-map match-any hotel
  match source-address mac 0013.72E6.A0CD
class-map match-any mainipo
  match source-address mac 00E0.0701.B721
!
policy-map avaya-voip
  class voip
    priority percent 75
  class class-default
    fair-queue
policy-map set-dscp

```



```

class hotel
  set ip dscp ef
!
interface FastEthernet0/0
  no ip address
  service-policy input set-dscp
  duplex auto
  speed auto
!
interface FastEthernet0/0.1
  encapsulation dot1Q 210
  ip address 192.45.210.1 255.255.255.0
!
interface FastEthernet0/0.2
  encapsulation dot1Q 211 native
  ip address 192.45.211.1 255.255.255.0
!
interface FastEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface Serial0/0/0
  ip address 11.1.1.1 255.255.255.0
  service-policy output avaya-voip
  encapsulation ppp
!
interface Serial0/1/0
  no ip address
  shutdown
!
ip classless
ip route 192.45.220.0 255.255.255.0 11.1.1.254
ip route 192.45.221.0 255.255.255.0 11.1.1.254
!
no ip http server
!
control-plane
!
line con 0
line aux 0
line vty 0 4
  login
!
end

```

Configure Site A Cisco 1841 Router

```

!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 1841SiteA
!
boot-start-marker
boot-end-marker
!
mmi polling-interval 60
no mmi auto-configure

```

```

no mmi pvc
mmi snmp-timeout 180
no aaa new-model
ip subnet-zero
ip cef
!
ip ips po max-events 100
no ftp-server write-enable
!
class-map match-any voip
  match ip dscp ef
  match ip dscp af41
class-map match-all siteAcaora
  match source-address mac 0001.6C83.CC4E
class-map match-any siteAipo
  match source-address mac 00E0.0701.498F
!
policy-map avaya-voip
  class voip
    priority percent 75
  class class-default
    fair-queue
policy-map set-dscp
  class siteAcaora
    set ip dscp ef
!
interface FastEthernet0/0
  no ip address
  service-policy input set-dscp
  duplex auto
  speed auto
!
interface FastEthernet0/0.1
  encapsulation dot1Q 220
  ip address 192.45.220.1 255.255.255.0
!
interface FastEthernet0/0.2
  encapsulation dot1Q 221 native
  ip address 192.45.221.1 255.255.255.0
!
interface FastEthernet0/1
  no ip address
  shutdown
  duplex auto
  speed auto
!
interface Serial0/0/0
  ip address 11.1.1.254 255.255.255.0
  service-policy output avaya-voip
  encapsulation ppp
!
ip classless
ip route 192.45.210.0 255.255.255.0 11.1.1.1
ip route 192.45.211.0 255.255.255.0 11.1.1.1
!
ip http server
no ip http secure-server
!
control-plane
!
line con 0
line aux 0

```

```

line vty 0 4
login
!
end

```

Configure Site A CyberPath POE4408 Switch

(L2SW) >show port all

| Port | Type | Admin Enable | Auto | Spd Dpx | Spd State | Link Status | FC Cfg | FC State | Rate(100K) | | Pri | Sec |
|------|--------|--------------|------|---------|-----------|-------------|--------|----------|------------|-----|------|-----|
| | | | | | | | | | In | Out | | |
| 0.1 | 100TX | Enable | Auto | 100F | 100F | Up | On | Off | 0 | 0 | High | Off |
| 0.2 | 100TX | Enable | Auto | 100F | 100F | Up | On | On | 0 | 0 | High | Off |
| 0.3 | 100TX | Enable | Auto | 100F | 100F | Up | On | On | 0 | 0 | None | Off |
| 0.4 | 100TX | Enable | Auto | 100F | 100F | Up | On | On | 0 | 0 | None | Off |
| 0.5 | 100TX | Enable | Auto | 100F | 100F | Up | On | On | 0 | 0 | None | Off |
| 0.6 | 100TX | Enable | Auto | 100F | 100F | Up | On | On | 0 | 0 | None | Off |
| 0.7 | 100TX | Enable | Auto | 100F | 100F | Up | On | Off | 0 | 0 | None | Off |
| 0.8 | 100TX | Enable | Auto | 100F | 100F | Up | On | Off | 0 | 0 | None | Off |
| 1.1 | 1000TX | Enable | Auto | 1000F | 1000F | Down | On | Off | 0 | 0 | None | Off |

(L2SW) >show vlan summary

VLAN Mode: 802.1Q
VLAN Learning: IVL

| VLAN ID | VLAN Name | VLAN Type | Protocol |
|---------|-------------|-----------|----------|
| 1 | DEFAULT | Static | none |
| 220 | SiteA-voice | Static | none |
| 221 | SiteA-data | Static | none |

Total: 3

(L2SW) >show vlan port

| Slot.Port | PVID | IngressFilter Non-Member Pkt | IngressFilter Untagged Pkt |
|-----------|------|------------------------------|----------------------------|
| 0.1 | 220 | Drop | Forward |
| 0.2 | 220 | Drop | Forward |
| 0.3 | 220 | Drop | Forward |
| 0.4 | 220 | Drop | Forward |
| 0.5 | 221 | Drop | Forward |
| 0.6 | 221 | Drop | Forward |
| 0.7 | 221 | Drop | Forward |
| 0.8 | 221 | Drop | Forward |
| 1.1 | 1 | Drop | Forward |

(L2SW) >show vlan 1 detailed 1

VLAN ID: 1
VLAN Name: DEFAULT
VLAN Type: Static
Protocol Type: none
Slot.Port Member

| | |
|-----|----|
| 0.1 | No |
| 0.2 | No |
| 0.3 | No |
| 0.4 | No |
| 0.5 | No |

| | |
|-----|----------|
| 0.6 | No |
| 0.7 | No |
| 0.8 | No |
| 1.1 | Untagged |

(L2SW) >show vlan detailed 220

VLAN ID: 220
VLAN Name: SiteA-voice
VLAN Type: Static
Protocol Type: none

| Slot.Port | Member |
|-----------|--------|
| ----- | ----- |
| 0.1 | No |
| 0.2 | No |
| 0.3 | No |
| 0.4 | No |
| 0.5 | No |
| 0.6 | No |
| 0.7 | No |
| 0.8 | Tagged |
| 1.1 | No |

(L2SW) >show l vlan detailed 221

VLAN ID: 221
VLAN Name: SiteA-data
VLAN Type: Static
Protocol Type: none

| Slot.Port | Member |
|-----------|----------|
| ----- | ----- |
| 0.1 | No |
| 0.2 | No |
| 0.3 | No |
| 0.4 | No |
| 0.5 | No |
| 0.6 | No |
| 0.7 | No |
| 0.8 | Untagged |
| 1.1 | No |

(L2SW) >show dot1p

QosMode:SP

802.1p Default Tag value 6 :

| | | | | | | | | |
|-----------------------|---|---|---|---|---|---|---|---|
| 802.1p User Priority: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Queue Priority: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |

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