



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

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# **Avaya IP Office - Small Office Edition Providing IP Trunk and Virtual Private Networking Capabilities for an Avaya PARTNER® Advanced Communication System - Issue 1.0**

### **Abstract**

These Application Notes describe a configuration of an Avaya IP Office - Small Office Edition providing IP Trunk and Virtual Private Networking Capabilities for an Avaya PARTNER® Advanced Communications System. PARTNER® Advanced Communication System Lines are connected to the IP Office - Small Office Edition “POT” ports. The IP Office - Small Office Edition also has IP Trunks over a Virtual Private Network over the Internet to an Avaya IP412 Office Server at another of the customer’s locations. Stations of the PARTNER® Advanced Communication System can place calls over any facility using line buttons. *Please Note:* This configuration is based on common methods of Internet access and transport and, as such, includes no provisions for cross-network Quality of Service. Thus, packets can be lost and delayed to an extent that impacts the callers’ perception of call quality. Many acceptable calls can be made, but there can be instances of noticeable echo, gaps in speech, and even dropped calls.

# 1. Introduction

These Application Notes describe a configuration of IP Office - Small Office Edition providing IP Trunk, Virtual Private Networking and Internet access for a customer using a PARTNER® Advanced Communication System (ACS). The intention is to preserve the PARTNER ACS feature operation from a user perspective and yet extend the benefits of IP telephony and future expansion.

**Figure 1** shows the configuration verified. For PSTN calls, the PARTNER ACS is configured with lines connected directly to the PSTN as it would normally be.

There are also lines between PARTNER ACS and the IP Office - Small Office Edition for inter-site calling. Selecting these lines from PARTNER ACS Telephones will result in “Intercom” dial tone from IP Office - Small Office Edition, allowing the user to dial the corresponding remote site extension. These calls will be routed over IP trunks over the inter-site VPN. Also, when that “line number” (assigned as a IP Office - Small Office Edition Extension) is dialed from the remote site, the call will ring in on that line button on PARTNER ACS Telephones.

All PARTNER ACS features are available, but as in any “Key Behind PBX” architecture, feature operation can be restricted to the system providing the feature. For example, a PARTNER ACS Manual Signaling button can only point to a PARTNER ACS extension. PARTNER ACS Group Pickup can only operate on a group member of the PARTNER ACS system. IP Office Voicemail Pro or Lite would not be able to light message waiting indicators on PARTNER ACS stations.

Interworking features that were stressed in test include:

## PARTNER ACS (Key Mode) Features

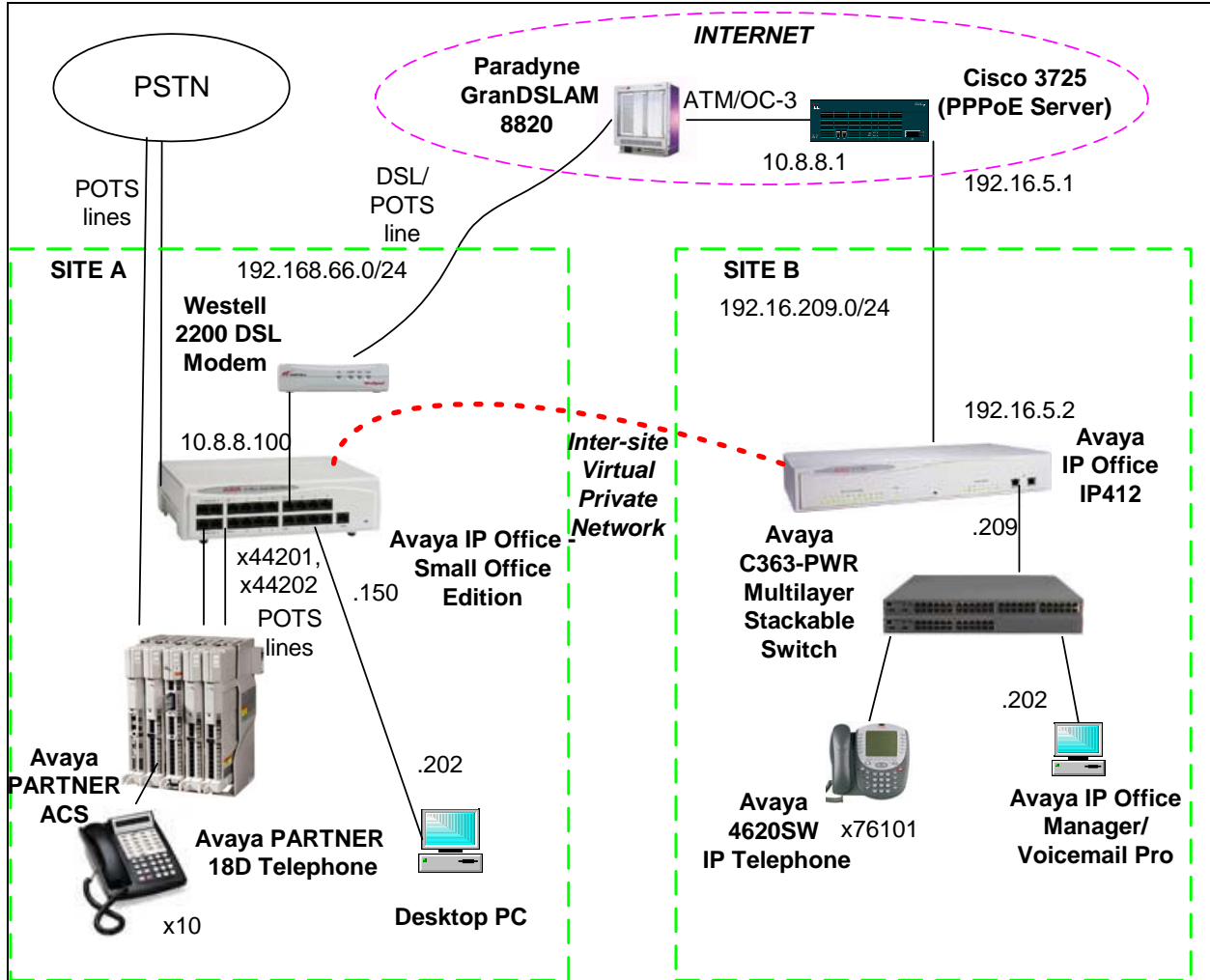
- Recall
- Transfer
- Remote Call Forwarding
- Disallowed/Allowed Lists
- Fax Machine Extensions

## IP Office – Small Office Edition features:

- Short Codes
- Small Community Networking
- Fax over IP
- IPsec Virtual Private Network
- IP Trunk
- Conference (Meet-Me)
- Network Address Translation

Examples of features not supported between the two systems:

- Caller ID, Calling Line ID is not passed from IP Office to PARTNER ACS on the lines.



**Figure 1: Tested PARTNER/IP Office Configuration**

An alternative model, using the same physical configuration would be to have all PARTNER ACS lines act as IP Office extensions, receiving IP Office dial tone and ringing when the corresponding extension was called. This would have more flexibility in the use of the PARTNER ACS lines, but would require changes for the users (e.g., dialing 9 to get an outside trunk) and so would have to be planned carefully.

Another alternative would be to configure analog lines from IP Office to PARTNER ACS ETR ports such that calls routed to PARTNER ACS can be delivered as Intercom calls. PARTNER ACS "Intercom" calls dialed to this extension could be routed by an Incoming Call Route to an extension or to a Voicemail Pro Automated Attendant for digit collection and transfer to the destination.

The DSL configuration followed a previous application note, listed in Section 8 of these Application Notes and so will not be documented here.

Since the IP address of the IP Office - Small Office Edition is part of the VPN configuration data, the IP address must be permanently assigned to the IP Office - Small Office Edition location, rather than dynamically assigned by the service provider from an IP address pool.

*Please Note:* This configuration is based on common methods of Internet access and transport and, as such, includes no provisions for cross-network Quality of Service. Thus, packets can be lost and delayed to an extent that impacts the callers' perception of call quality. Many acceptable calls can be made, but there can be instances of noticeable echo, gaps in speech, and even dropped calls. Alternatively to using the Internet, an inter-location network with an appropriate Service Level Agreement can provide consistent service quality.

Regardless, it is important to consider basic engineering of the network (e.g., number of voice calls that can be supported, given inter-site bandwidth limitations) and of the IP Office. An example is the number of simultaneous Voice Compression Module resources required for conversion from the "TDM" interface (e.g., POTS) to the "IP" interface (the IP trunks).

## 2. Software Validated

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

Equipment	Version
Avaya PARTNER Advance Communication System 308EC	R5.0
Avaya IP Office - Small Office Edition	2.1(27)
Avaya IP412 Office Server	2.1(27)
Avaya 4600 Series IP Telephones	2.0
Westell 2200 ADSL Modem	1.06.53
Paradyne 8820 Hotwire DSLAM with ADSL Card 8365-B1-000	Firmware Revision: 02.03.55 Hardware Revision: 4402-83B Line Code Revision: 03.07.17 PLD Revision: 01.00.01
Cisco 3725 Router	12.3

## 3. Configure the PARTNER® Advanced Communication System

This section describes administration steps to take on an existing PARTNER Advanced Communication System. Unless otherwise stated, System Programming mode is entered from extension 10, configured with the appropriate PARTNER ACS Telephone Programming Overlay, by pressing:

Feature 0 0 'System Program' 'System Program'

Where the 'System Program' button is the first Intercom button.

**Step 1:** Assign the Line that will be used for calls through IP Office - Small Office Edition to buttons on PARTNER ACS sets.

**Step 1(a):** Enter System Program mode.

**Step 1(b):** Enter the Line Assignment procedure code (#301)

**Step 1(c):** Enter the Extension number.

**Step 1(d):** Enter the Line Number (e.g., 03 for Line 3).

**Step 1(e):** Enter “Next Data” to assign the Line to the next button on the set.

**Step 1(f):** Ensure that the button shows green to indicate assignment.

**Step 1(g):** Enter another procedure or exit system program mode (Feature 00).

**Step 2:** For each line to the IP Office, ensure that the Hold Disconnect Time is less than the Disconnect Pulse width setting on the corresponding IP Office Extension form.

**Step 2(a):** Enter System Program mode.

**Step 2(b):** Enter the Hold Disconnect Time procedure code (#203).

**Step 2(c):** Enter the Line Number (e.g., 03 for Line 3)

**Step 2(d):** Ensure that the setting in milliseconds is less than the IP Office Extension form Disconnect Pulse width setting.

**Step 2(e):** Enter another procedure or exit system program mode (Feature 00).

**Step 3:** Check the Recall Timer Duration is consistent with IP Office Extension forms. The Recall Timer specifies how long a “switch-hook flash” from PARTNER ACS will last.

**Step 3(a):** Enter System Program mode.

**Step 3(b):** Enter the Recall Timer Durations procedure code (#107).

**Step 3(c):** Note the given length in milliseconds for use in later programming of the IP Office Extension for PARTNER ACS Lines.

**Step 4:** If Recall button operation is desired:

**Step 4(a):** Enter Program mode at the extension, or centralized Telephone Program mode from extension 10 by pressing Central Tel Program from System Program mode and entering the extension.

**Step 4(b):** Press the desired button to be programmed.

**Step 4(c):** Enter the Recall button code (Feature 03).

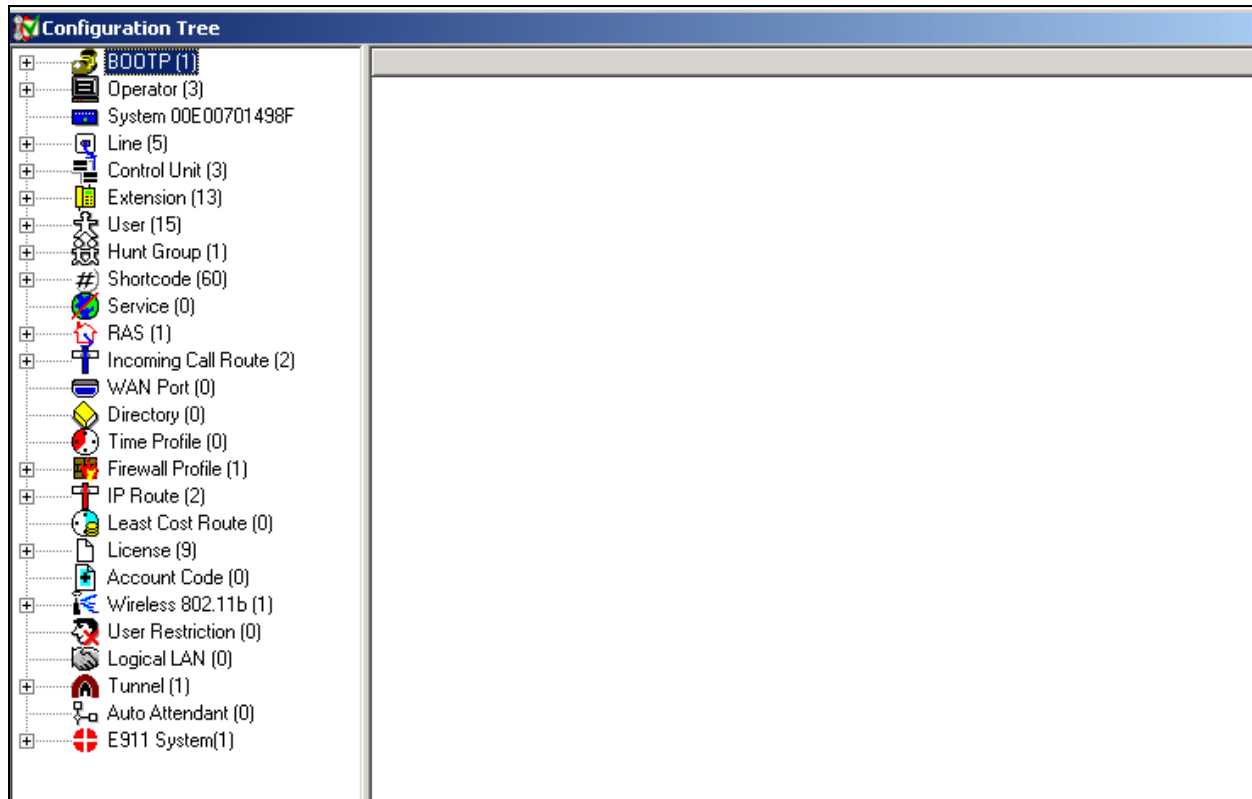
**Step 4(d):** Verify that the Display shows “Recall”

**Step 4(e):** Enter another procedure or exit program mode.

## 4. Configure the Avaya IP Office - Small Office Edition

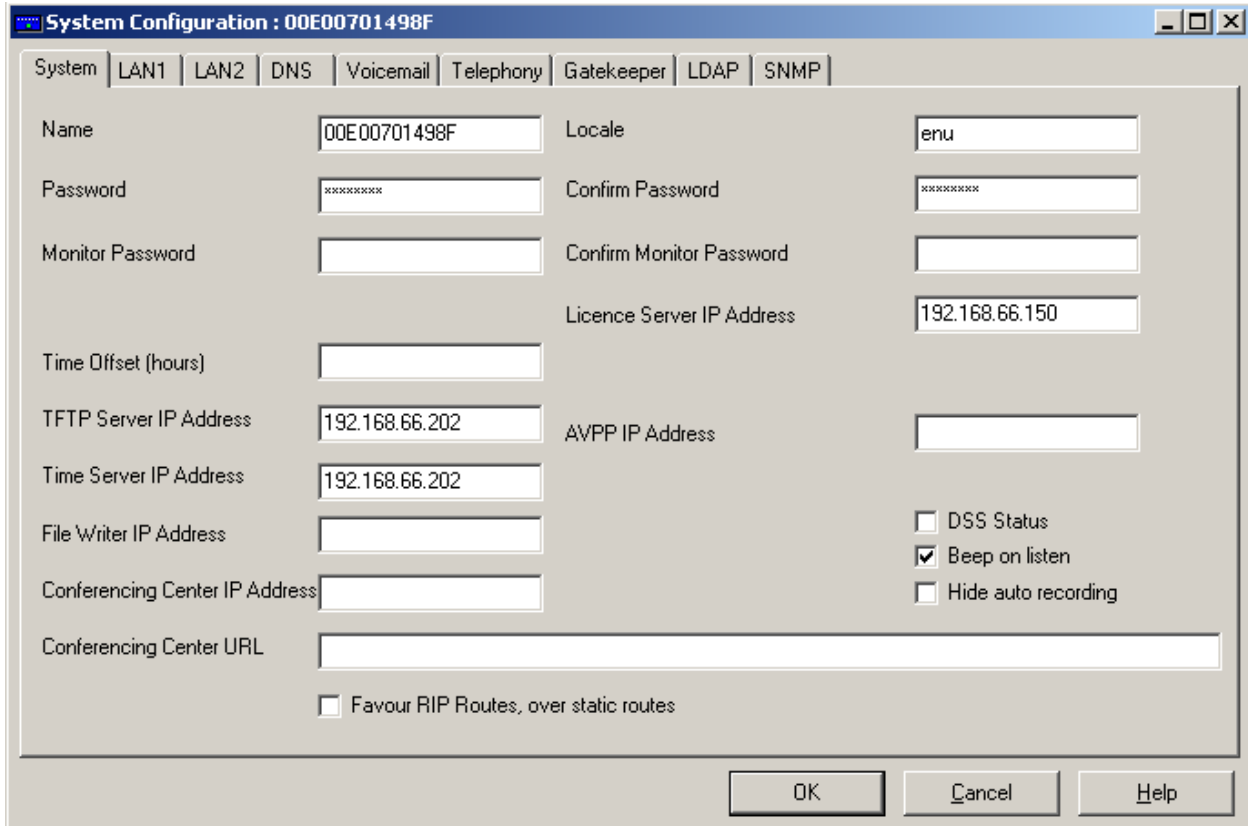
This section describes the configuration of the IP Office Small Office - Edition. IP networking, Virtual Private Networking and IP trunks to the IP412 at site B are among the items included.

**Step 1** ) From a PC that can network to the IP Office - Small Office Edition, run the IP Office Manager and access the Configuration Tree.



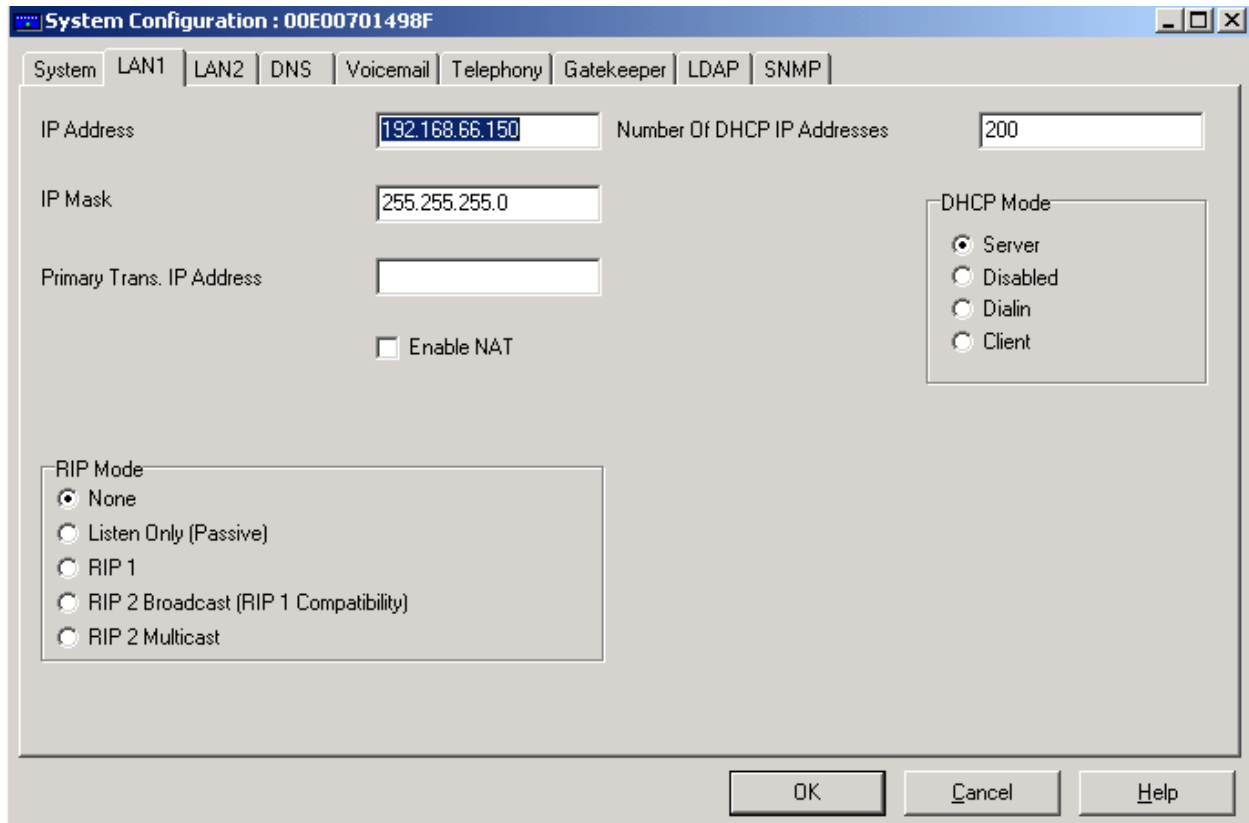
**Figure 2: IP Office Manager Configuration Tree**

**Step 2** ) Navigate to the **System**→**System** tab. Ensure that the License Server IP Address is configured to the license server. In this configuration, the License key is plugged directly into the IP Office - Small Office Edition, so the IP Office Address is entered as the **License Server IP Address**.



**Figure 3: License Server IP Address**

**Step 3 )** Configure the **System→LAN1** (Private Side) form as shown.

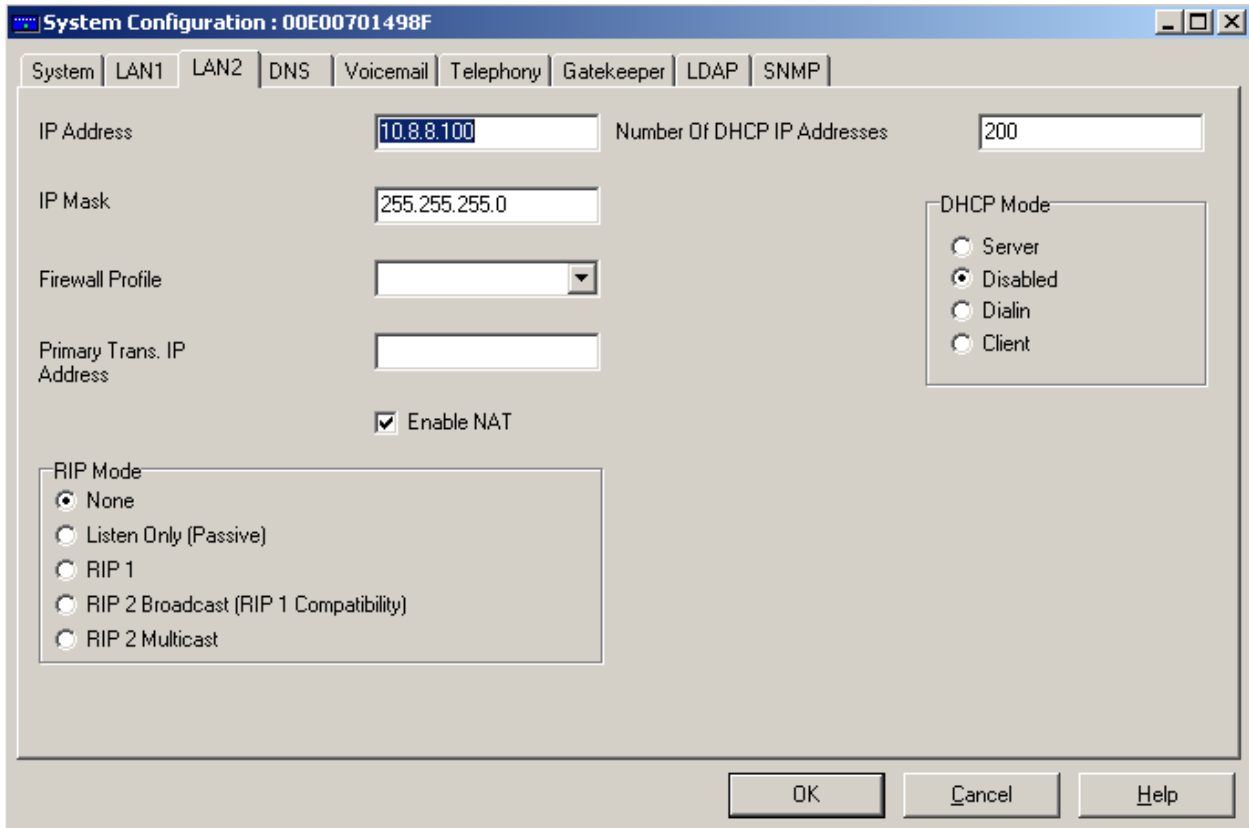


**Figure 4: System LAN1 Tab**



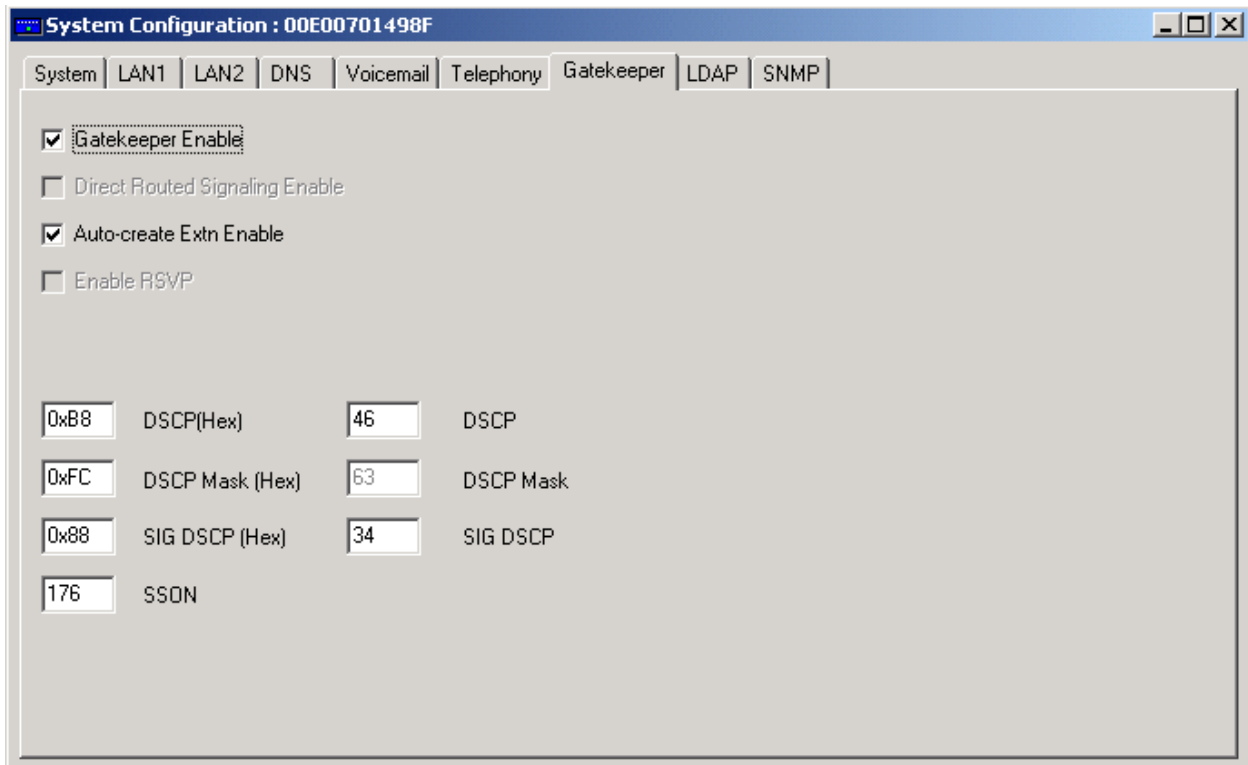
**Step 4 )** Configure the **System→LAN2** form. The **IP address** is the public IP address that the Service Provider will assign. NAT is enabled to allow endpoints on the private side of IP Office - Small Office Edition to address the Internet using the same public IP address. Set the **DHCP Mode** to **Disabled**.

*Note: An alternative is to set LAN2 to be a DHCP client and the Modem to be the DHCP server. Be aware that the IP Office must be rebooted for any address change with NAT to take effect.*



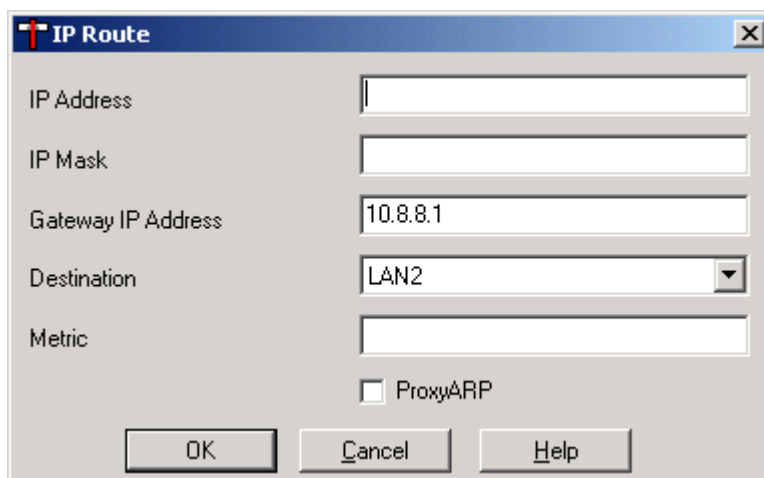
**Figure 5: System LAN2 Tab**

**Step 5 )** Configure the **System→Gatekeeper** form with (RTP) **DSCP** and **Signaling DSCP** values to match any quality of service plan that may be in place in the network. As noted in the abstract, though, there is likely no provision for Quality of Service across the Internet.



**Figure 6: System Configuration Gatekeeper**

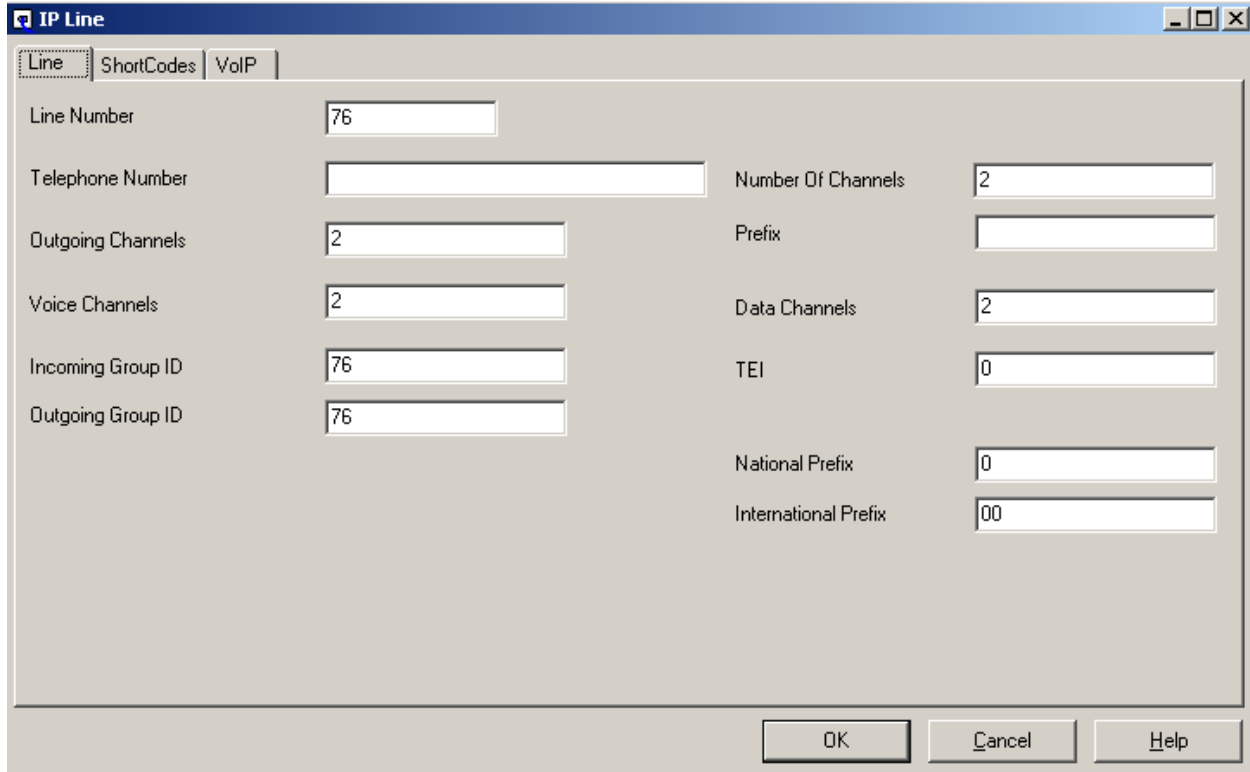
**Step 6 )** From **IP Route** create a new default IP Route to the Service Provider Internet Gateway IP Address.



**Figure 7: Default IP Route**

**Step 7 )** From **Line**, create a **New IP** Trunk line to the IP412.

**Step 7 a)** Enter the desired unique **Line Number** and **Incoming** and **Outgoing Group IDs**. Set the **Outgoing Channels** within the expected site-to-site bandwidth limitations.



The screenshot shows a window titled "IP Line" with three tabs: "Line", "ShortCodes", and "VoIP". The "Line" tab is active. The window contains the following fields and values:

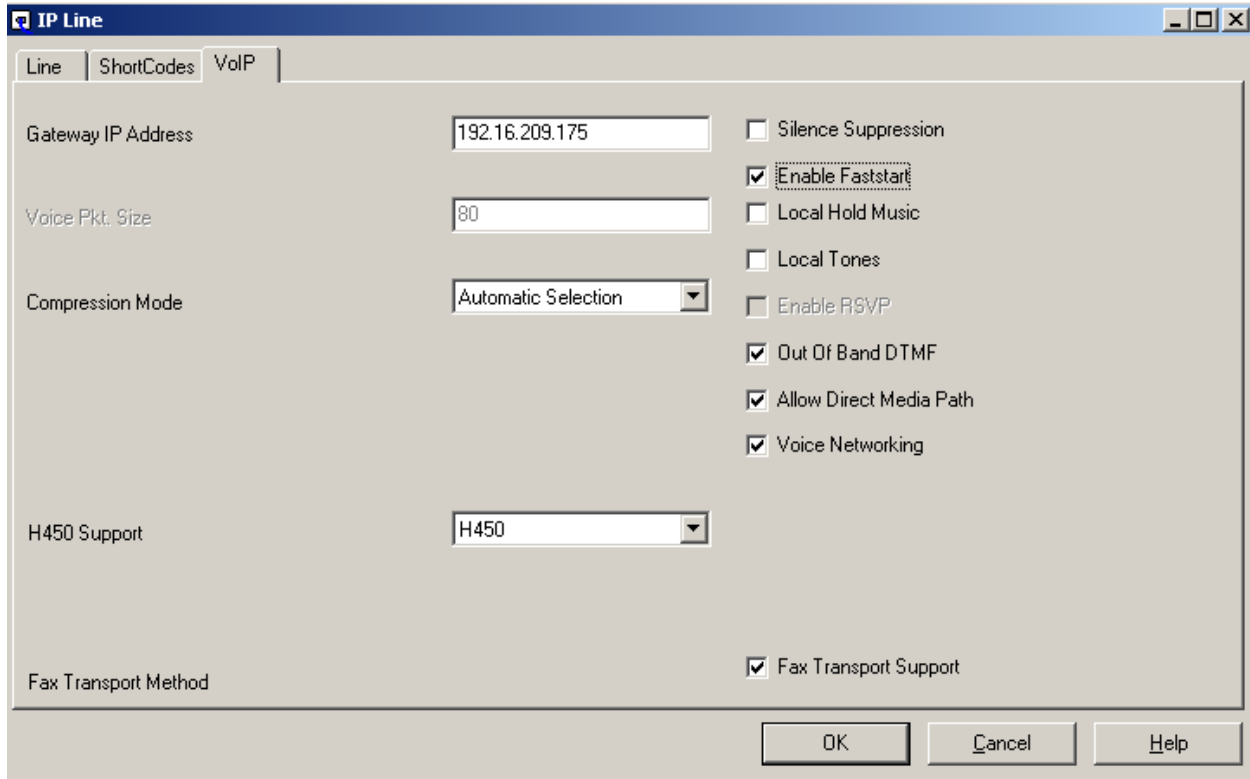
Field	Value
Line Number	76
Telephone Number	
Outgoing Channels	2
Voice Channels	2
Incoming Group ID	76
Outgoing Group ID	76
Number Of Channels	2
Prefix	
Data Channels	2
TEI	0
National Prefix	0
International Prefix	00

At the bottom of the window are three buttons: "OK", "Cancel", and "Help".

**Figure 8: Line→Line Tab**

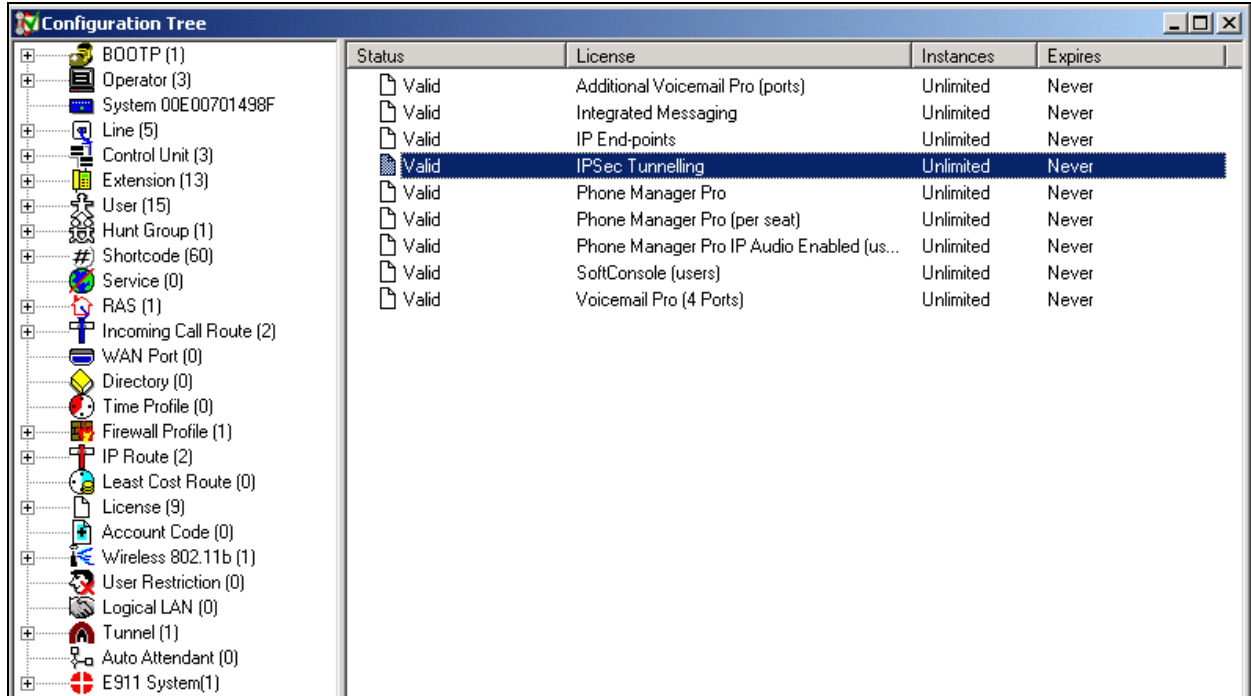
**Step 7 b)** Select the **Line VoIP** tab. Set the values as follows:

VoIP Tab Item	Explanation
Gateway IP Address	IP412 LAN1 IP address
Compression Mode	“Automatic” defaults to G.729A for typical tradeoff of good voice quality with some compression.
Enable Fast Start	Fastest “cut-through” of the IP voice path.
H.450 Support	Recommended for best inter-IP Office feature support.
Out of Band DTMF	Passes DTMF button press information in messages to avoid compression issues.
Allow Direct Media Path	Media for calls to and from IP endpoints (e.g., IP Phones) can go directly between endpoints without processing by IP Office.
Voice Networking	Passes information needed by the IP Office Small Community Network feature, such as dial plan information sharing.
Fax Transport Support	Passes Fax calls via an IP-based mechanism for best performance over an IP network.



**Figure 9: Line→VoIP Tab**

**Step 8 )** Ensure that the **IPSec tunneling** license is valid.



**Figure 10: IPSec Tunnel License**

**Step 9 )** From the configuration tree item **Tunnel**, create a **new IPSec tunnel**.

**Step 9 a)** The Local Configuration entries correspond to the IP Office - Small Office Edition LAN1 subnet (private interface) **IP Address** and **IP Mask entries**. The Remote Configuration **IP Address** and **IP Mask** correspond the IP412 LAN1 (private interface) subnet. The Remote Configuration “Gateway” is the public address of the IP412.

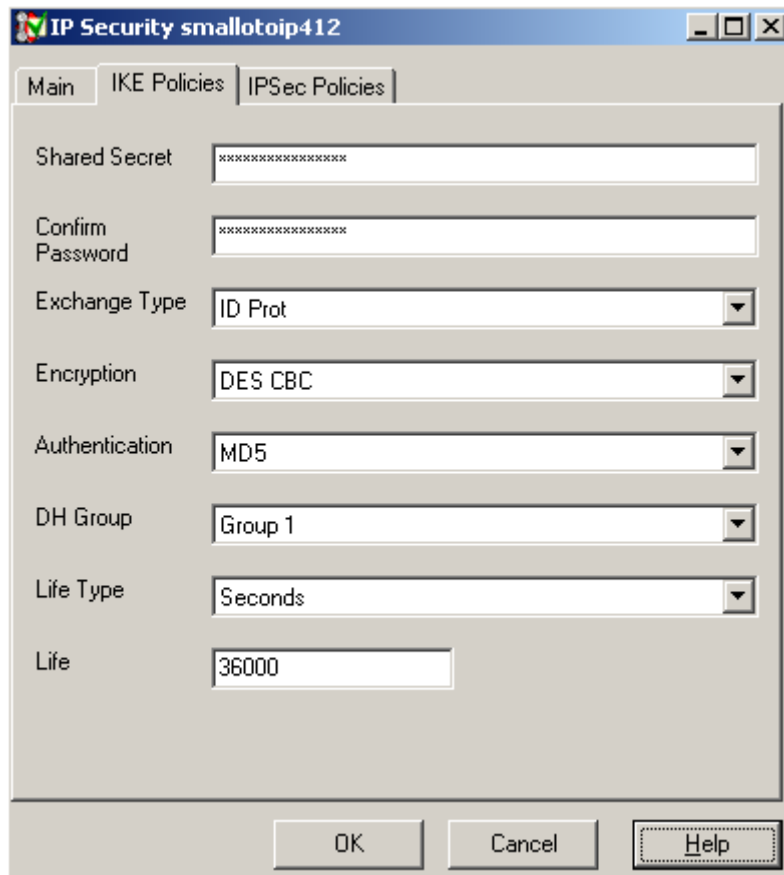
The screenshot shows a window titled "IP Security smalltoip412" with three tabs: "Main", "IKE Policies", and "IPSec Policies". The "Main" tab is selected. The window contains the following fields:

- Name:** smalltoip412
- Local Configuration:**
  - IP Address:** 192.168.66.0
  - IP Mask:** 255.255.255.0
  - Tunnel Endpoint IP Address:** <LocalInterface>
- Remote Configuration:**
  - IP Address:** 192.16.209.0
  - IP Mask:** 255.255.255.0
  - Tunnel Endpoint IP Address:** 192.16.5.2

At the bottom of the window are three buttons: "OK", "Cancel", and "Help".

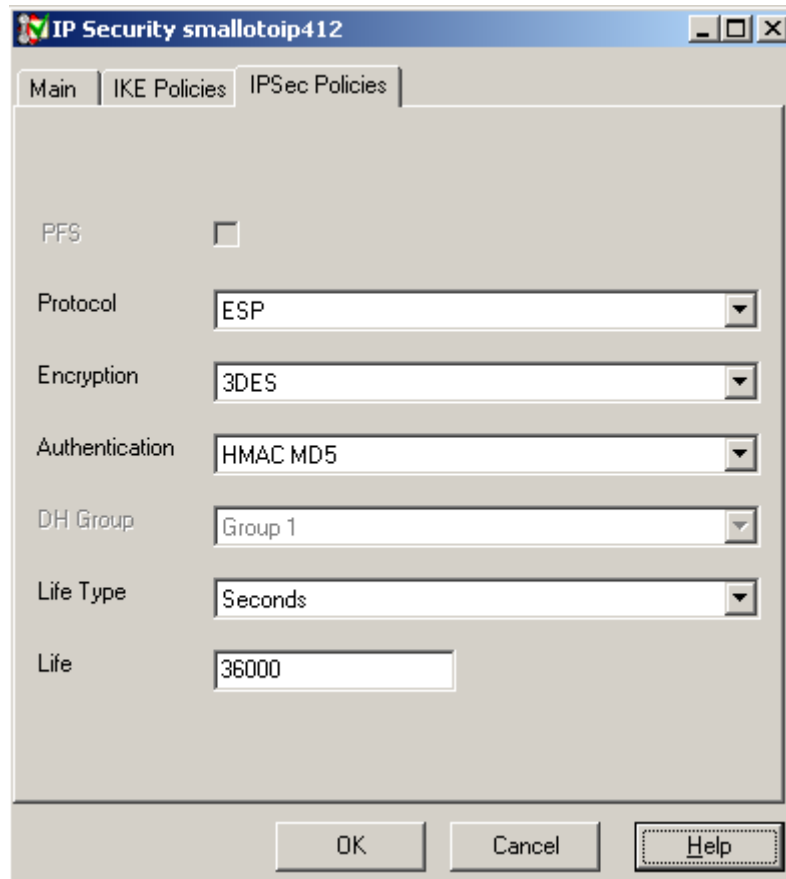
**Figure 11: IPSec Tunnel Main**

**Step 9 b)** Select the **IKE Policies** tab. Ensure that all the entries, including the Shared Secret are the same as those on the corresponding IP412 **IKE Policies** tab.



**Figure 12: IPSec Tunnel IKE Policies**

**Step 9 c)** Select the **IPSec Policies** tab. Ensure that the settings are the same as the corresponding IP412 IPSec Policies settings.



**Figure 13: IPSec Tunnel IPSec Policies**



**Step 10 )** Configure Extensions for each PARTNER ACS station. To ensure that far end disconnect is passed to PARTNER ACS, select the Equipment Classification to **IVR Port**. Since the default setting of 800 ms for a Disconnect Pulse from IP Office is greater than the PARTNER ACS line Hold Disconnect timing setting of 200 ms, PARTNER ACS will recognize this signal. Note that PARTNER ACS uses this signal to tear down calls in the on-hold state.

The PARTNER ACS is set at a system wide default for the Recall Duration Time of 800 ms. “Recall Duration” is the length of a “flash-hook” signal sent by PARTNER ACS toward IP Office when a “Recall” button is pressed on PARTNER ACS to place a call on hold on the IP Office. If this feature is to be used, deselect the *Flash Hook Pulse Width User System Defaults* box and set the minimum and maximum widths for the flash hook to values less than and greater than 800 ms respectively.

The screenshot shows a configuration window titled "Extension 44203". It contains the following fields and options:

- Extn** tab selected.
- Extension ID:** 11
- Extension:** 44203
- Caller Display Type:** On
- Equipment Classification:**
  - Quiet Headset
  - Paging Speaker
  - Standard Telephone
  - IVR Port
- Disconnect Pulse Width:** Units - 10ms, 80
- Flash Hook Pulse Width:**
  - Use System Defaults
  - Minimum Width: 50 Unit - 10ms
  - Maximum Width: 90 Unit - 10ms
  - Message Waiting Lamp Indication Type: None
  - Reset Volume After Calls
- Hook Persistency:** Units - 1ms, 100
- Buttons: OK, Cancel, Help

**Figure 14: PARTNER ACS Line Extension Form**

**Step 11 )** Configure a User for each PARTNER ACS Line.

**Step 11 a)** Select the **User** form **User** tab for the extension of the PARTNER ACS line and enter an identifying **Name** and **Full Name** to be displayed on calls from this line. If it is a personal line, the name of the owner may be appropriate.

The screenshot shows a window titled "User Partner Line 1" with a tabbed interface. The "User" tab is selected. The form contains the following fields and options:

- Name:** "Partner Line 1" (highlighted with a blue selection box). An "Ex Directory" checkbox is present and unchecked.
- Password:** Empty text box.
- Confirm Password:** Empty text box.
- Full Name:** "Partner Line 1".
- Extension:** "44201".
- Locale:** Empty text box.
- Priority:** "5".
- Restrictions:** Empty dropdown menu.
- Phone Manager Type:** "Lite" (dropdown menu). A "Book with Conference Centre in Phone Manager" checkbox is present and unchecked.

At the bottom of the window are three buttons: "OK", "Cancel", and "Help".

**Figure 15: User form→User Tab**

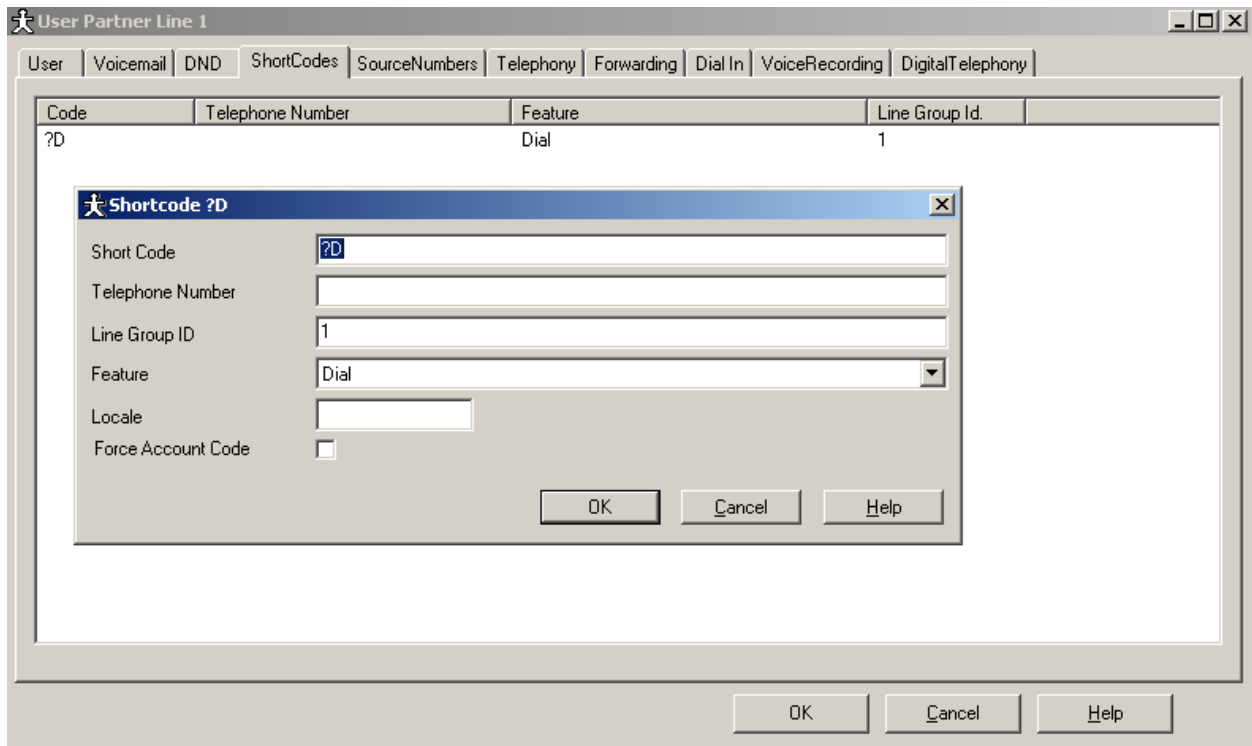
**Step 11 b)** On the **Voicemail** tab, disable voicemail since any voicemail features will be enabled on the PARTNER ACS. Voicemail and Voice Recording can be enabled from the IP Office side, but could be confusing to users if not handled properly. For example, if there was voicemail enabled on both the PARTNER ACS System and on the IP Office, users may be confused about which system held particular messages. Also, the IP Office Voicemail system will not light the PARTNER ACS station message-waiting lamp.

The screenshot shows a window titled "User Partner Line 1" with a tabbed interface. The "Voicemail" tab is active. The form contains the following elements:

- Voicemail Code:** A text input field followed by a checkbox labeled "Voicemail On".
- Confirm Voicemail Code:** A text input field followed by a checkbox labeled "Voicemail Help".
- Voicemail Email:** A text input field followed by a checkbox labeled "Voicemail Ringback".
- Voicemail Reception:** A text input field followed by a checkbox labeled "Voicemail Email Reading".
- Voicemail Email:** A group box containing four radio buttons: "Off" (selected), "Copy", "Forward", and "Alert".
- Buttons:** "OK", "Cancel", and "Help" buttons at the bottom right.

**Figure 16: User Form-->Voicemail Tab**

**Step 11 c)** If Central Office dial tone is desired on this line upon seizure, rather than IP Office dial tone, select the **Short Codes** tab and configure a User short code as shown that seizes the given line group upon off-hook.



**Figure 17: User Short Code for CO Dial Tone**

**Step 11 d)** Tab to the Telephony tab; enable **Call Waiting On** and **Answer Call Waiting on Hold (Analogue)** if desired. This provides a tone indication to an off-hook user that a new call is ringing. The initial call can be dropped in favor of the new call, or the PARTNER ACS “Recall” button can be used to place the first call on hold and answer the new incoming call.

The screenshot shows the 'User Telephony' configuration window for 'User Partner Line 1'. The 'Telephony' tab is selected. The configuration includes several dropdown menus for call sequences (all set to 'DefaultRing') and text input fields for time-based settings (No Answer Time, Wrap-up Time set to 2, Transfer return Time, Individual Coverage Time set to 10, Login Idle Period). A list of checkboxes is present, with 'Call Waiting On', 'Answer Call Waiting on Hold (Analogue)', and 'Cannot be Intruded' checked. A 'Multi Line Options' sub-section contains 'Ringing Line Preference' and 'Idle Line Preference', both checked. The window concludes with 'OK', 'Cancel', and 'Help' buttons.

**Figure 18: User Telephony Form**

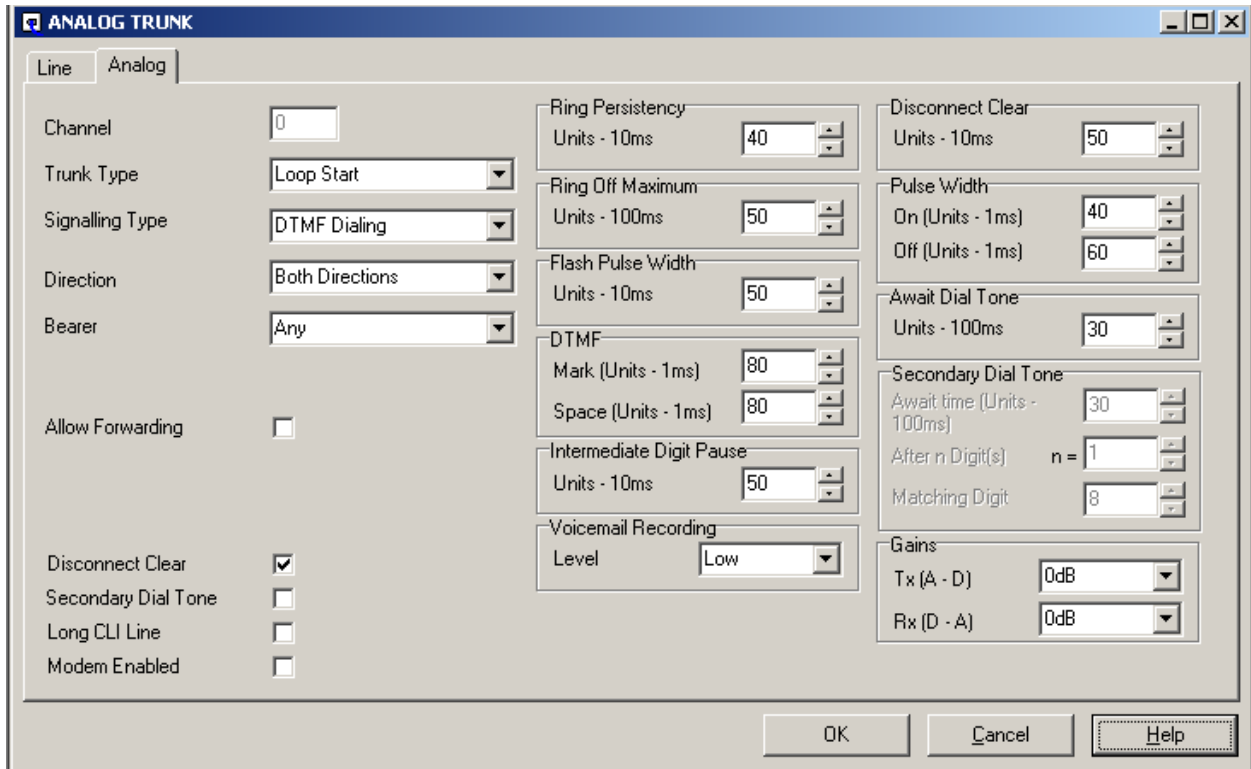
**Step 12 )** If the IP Office - Small Office Edition also has analog PSTN lines that may be accessed by PARTNER ACS users, complete the following steps.

**Step 12 a)** Assign a Line Group to each line.

Line Number	<input type="text" value="01"/>		
Telephone Number	<input type="text" value="732-123-1234"/>		
Outgoing Channels	<input type="text" value="1"/>	Prefix	<input type="text"/>
Voice Channels	<input type="text" value="1"/>		
Incoming Group ID	<input type="text" value="1"/>		
Outgoing Group ID	<input type="text" value="1"/>		
Line Appearance ID	<input type="text"/>	National Prefix	<input type="text" value="0"/>

**Figure 19: Analog Trunk Line Form**

**Step 12 b)** Click on the **Analog** tab. Set the Trunk type to Loop Start if there is no ICLID expected. Otherwise, there will be unnecessary delay while IP Office waits for ICLID delivery. Other settings shown are default.



**Figure 20: Analog Line Analog Tab**

**Step 13 )** Configure the IP Office - Small Office Edition for routing PSTN calls to and from PARTNER ACS lines. Incoming IP Trunk calls can be dialed directly to the extension that was configured for each PARTNER ACS line earlier and no further configurations is required. For some other incoming call types, such as Analog lines where, an **Incoming Call Route** for each line directed to the station that represents the PARTNER ACS line calls can be routed to that Line as shown. Set the **Line Group ID** to correspond to the Line Group ID of the Line form. Set the **Destination** to the intended PARTNER ACS Line.

The screenshot shows the 'Incoming Call Route' configuration window. The 'Line group ID' field is set to '1'. The 'Destination' dropdown menu is set to '44201 Partner Line 1'. The 'Priority' dropdown menu is set to '1'. The 'Bearer Capability' section has 'AnyVoice' selected. The 'OK', 'Cancel', and 'Help' buttons are visible at the bottom right.

**Figure 21: Incoming Call Route**



**Step 14 )** Optionally, the Extensions for PARTNER ACS can be placed into a Hunt Group. With this operation, callers would dial a single number to reach the PARTNER ACS systems lines and the call would be delivered on the next available line. This would be most appropriate for a “pooled” line operation.

**Hunt Group Partner**

HuntGroup | Voicemail | Fallback | Queuing | VoiceRecording

Name: Partner

Extension: 44234

Allocated Answer Interval (secs):

Overflow Time (secs):

Hunt Type:

- Group
- Linear
- Circular
- Most Idle

Call Waiting On

**Extension List**

Extension	User
44201	Partner Line 1
44202	Partner Line 2
44203	Partner Line 3

**Overflow Group List**

Name
------

OK Cancel Help

**Figure 22: Hunt Group Configuration**

**Step 15 )** Save the changes to the IP Office - Small Office Edition.

## 5. Configure the Avaya IP412 Office Server

This section describes the configuration steps needed to configure the IP412 Office. Instructions will be brief as there are no configuration aspects that are specific to the PARTNER ACS behind IP Office configuration.

**Step 1** ) Access the IP Office Configuration Menu. Select **System**→**System** and ensure that the License Server address is set properly. In this configuration, the IP412 is configured with a serial port license key, and so the **License Server IP Address** is the LAN1 IP address of the IP412 itself.

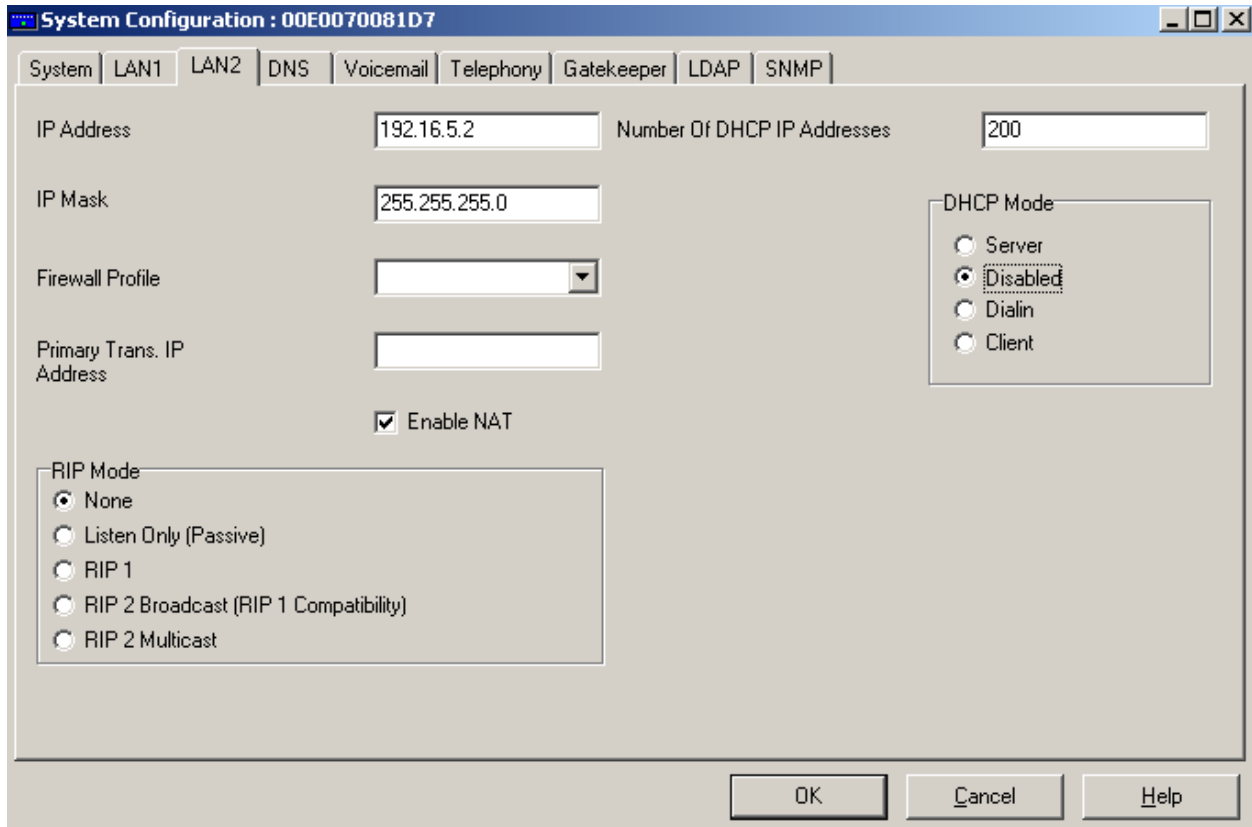
The screenshot shows a 'System Configuration' window for device '00E0070081D7'. The 'System' tab is active. The configuration includes:

- Name: 00E0070081D7
- Locale: enu
- Password: [masked]
- Confirm Password: [masked]
- Monitor Password: [empty]
- Confirm Monitor Password: [empty]
- Licence Server IP Address: 192.16.209.175
- Time Offset (hours): [empty]
- TFTP Server IP Address: 192.16.209.202
- AVPP IP Address: [empty]
- Time Server IP Address: 192.16.209.202
- File Writer IP Address: [empty]
- Conferencing Center IP Address: [empty]
- Conferencing Center URL: [empty]
- DSS Status
- Beep on listen
- Hide auto recording
- Favour RIP Routes, over static routes

Buttons: OK, Cancel, Help

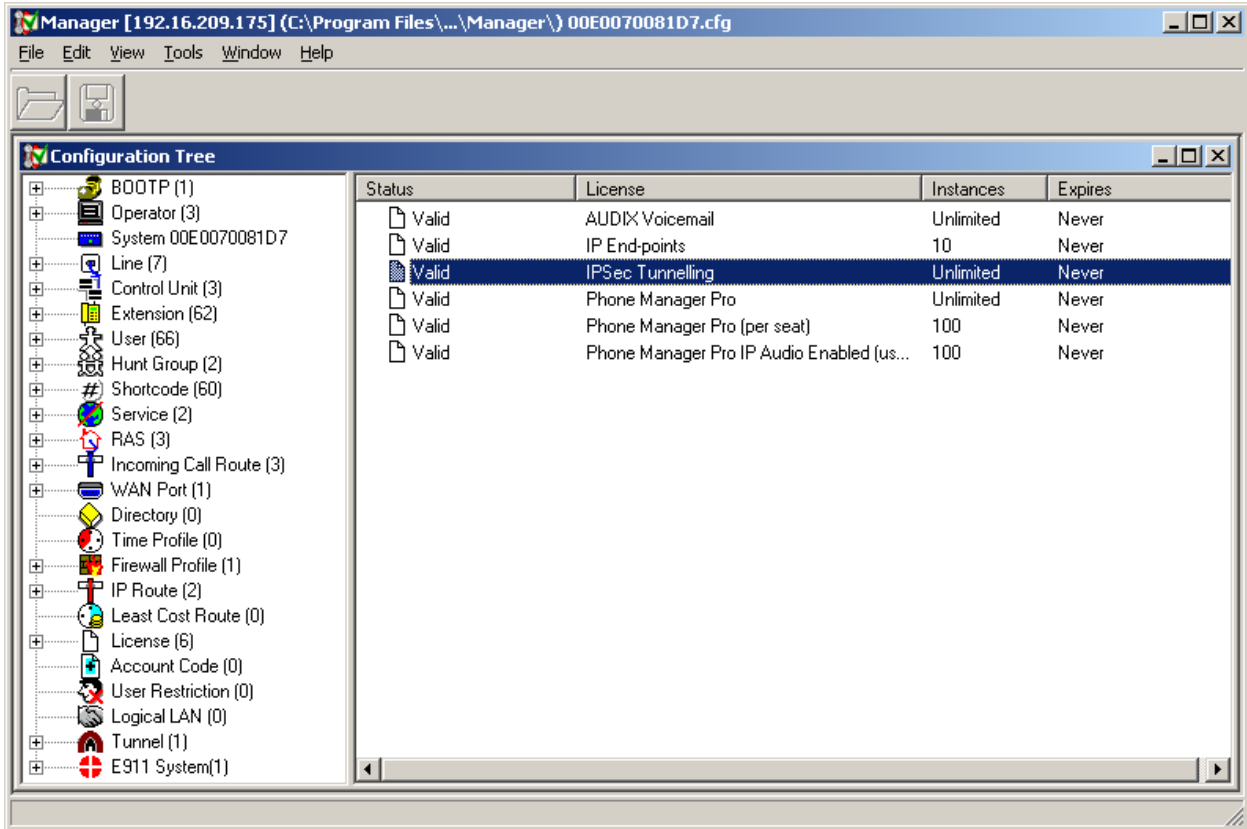
**Figure 23: System**→**System**

**Step 2 )** Set the LAN2 IP address assigned by the Service Provider. Activate NAT to share that IP address with devices behind the IP Office. Disable the DHCP server function.



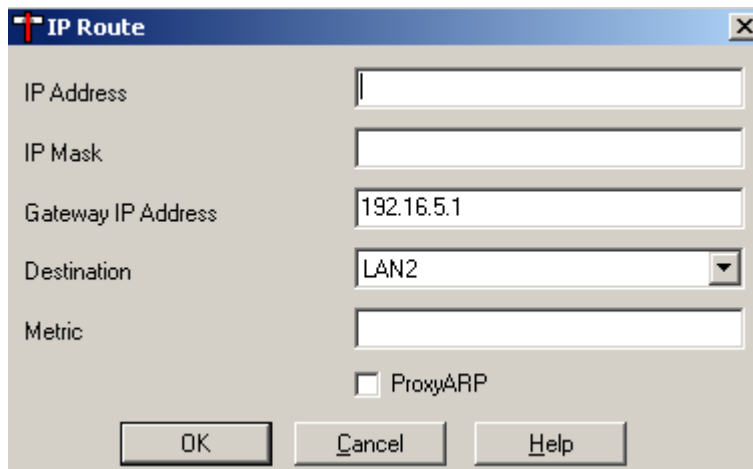
**Figure 24: LAN2 IP Address**

**Step 3 )** Ensure that the **IPSec tunneling** license is valid.



**Figure 25: IPSec Tunneling License**

**Step 4 )** Include an IP route to the Internet Gateway specified by the Service Provider.



**Figure 26: IP Route**

**Step 5 )** From the configuration tree item **Tunnel**, create a **new** IPsec tunnel.

**Step 5 a)** The Local Configuration entries correspond to the IP412 LAN1 subnet (private interface) **IP Address** and **IP Mask** entries. The Remote Configuration **IP Address** and **IP Mask** correspond the IP Office - Small Office Edition LAN1 (private interface) subnet. The Remote Configuration “Gateway” is the public address of the IP Office - Small Office Edition.

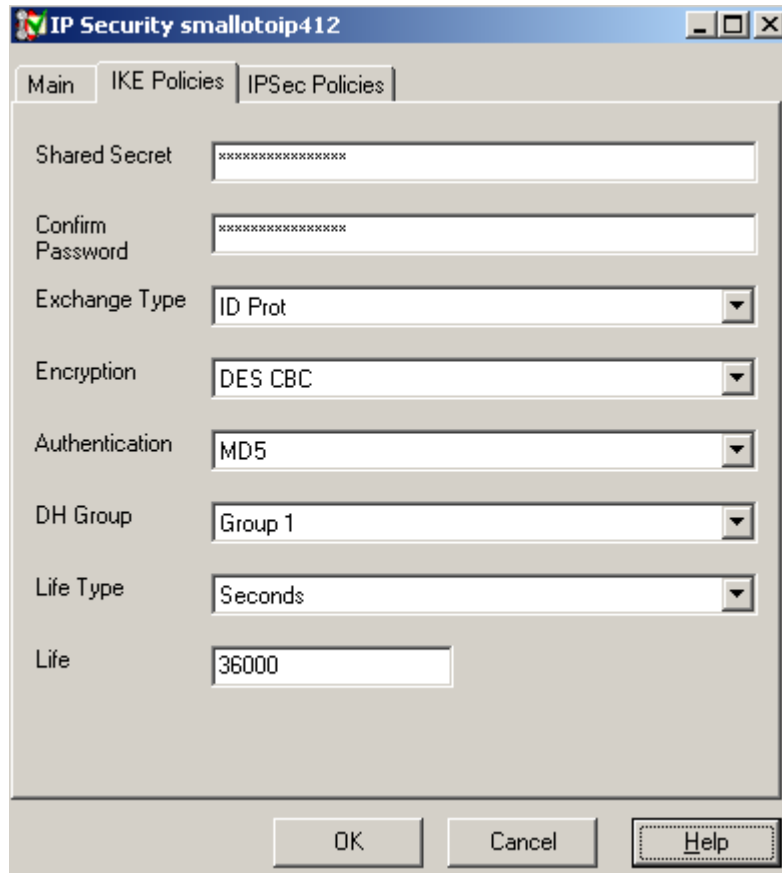
The screenshot shows a window titled "IP Security smalltoip412" with three tabs: "Main", "IKE Policies", and "IPSec Policies". The "Main" tab is active. The "Name" field contains "smalltoip412". Below this are two sections: "Local Configuration" and "Remote Configuration".

Configuration Type	Field	Value
Local Configuration	IP Address	192.16.209.0
	IP Mask	255.255.255.0
	Tunnel Endpoint IP Address	<LocalInterface>
Remote Configuration	IP Address	192.168.66.0
	IP Mask	255.255.255.0
	Tunnel Endpoint IP Address	10.8.8.100

At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

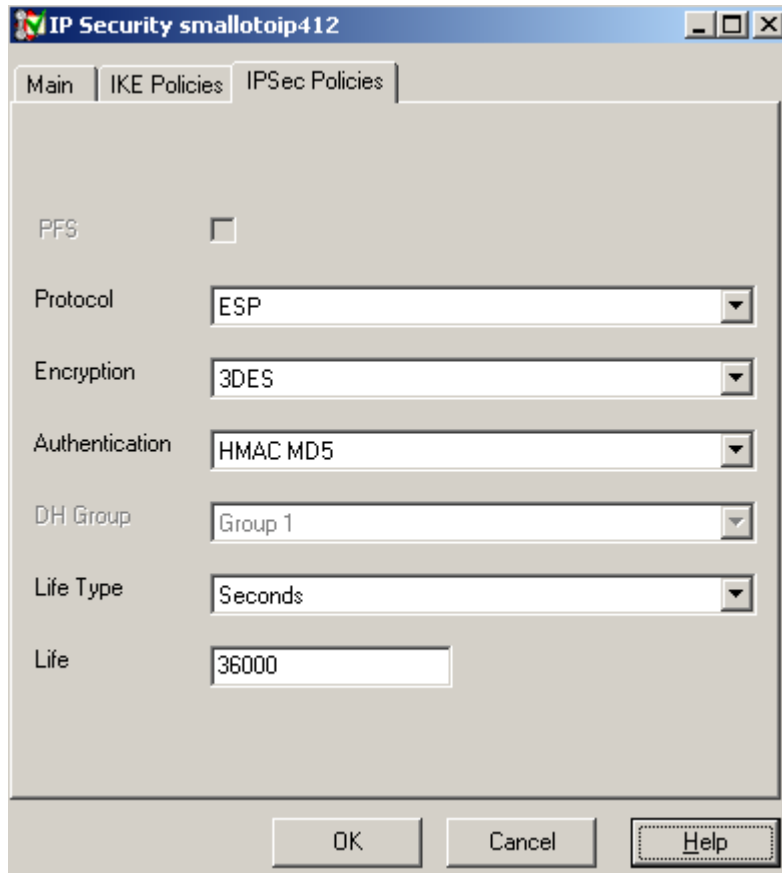
**Figure 27: IPsec Tunnel Main**

**Step 5 b)** Select the **IKE Policies** tab. Ensure that all the entries, including the Shared Secret are the same as those on the corresponding IP Office - Small Office Edition **IKE Policies** tab.



**Figure 28: IPSec Tunnel IKE Policies**

**Step 5 c)** Select the **IPSec Policies** tab. Ensure that the settings are the same as the corresponding IP Office - Small Office Edition IPSec Policies settings.



**Figure 29: IPSec Policies**

**Step 6 )** From **Line**, create a **New IP** Trunk line to the IP Office - Small Office Edition  
**Step 6 a)** Enter the desired unique **Line Number** and **Incoming** and **Outgoing Group IDs**. Set the **Outgoing Channels** within the expected site-to-site bandwidth limitations, consistent with the corresponding IP Office - Small Office Edition line settings.

The screenshot shows a window titled "IP Line" with three tabs: "Line", "ShortCodes", and "VoIP". The "Line" tab is active. The form contains the following fields:

Line Number	44		
Telephone Number		Number Of Channels	2
Outgoing Channels	2	Prefix	
Voice Channels	2	Data Channels	2
Incoming Group ID	44	TEI	0
Outgoing Group ID	44	National Prefix	0
		International Prefix	00

At the bottom of the window are three buttons: "OK", "Cancel", and "Help".

**Figure 30: Line→Line Form**



**Step 6 b)** Select the **Line VoIP** tab. Set the values as follows, consistent with the corresponding IP Office - Small Office Edition settings:

VoIP Tab Item	Explanation
Gateway IP Address	IP Office - Small Office Edition LAN1 IP address
Compression Mode	“Automatic” defaults to G.729A for typical tradeoff of good voice quality with some compression.
Enable Fast Start	Fastest “cut-through” of the IP voice path.
H.450 Support	Recommended for best inter-IP Office feature support.
Out of Band DTMF	Passes DTMF button press information in messages to avoid compression issues.
Allow Direct Media Path	Media for calls to and from IP endpoints (e.g., IP Phones) can go directly between endpoints without processing by IP Office.
Voice Networking	Passes information needed by the IP Office Small Community Network feature, such as dial plan information sharing.
Fax Transport Support	Passes Fax calls via an IP-based mechanism for best performance over an IP network.

The screenshot shows the 'IP Line' configuration window with the 'VoIP' tab selected. The settings are as follows:

- Gateway IP Address: 192.168.66.150
- Voice Pkt. Size: 80
- Compression Mode: Automatic Selection
- H450 Support: H450
- Fax Transport Method: (checkbox checked) Fax Transport Support
- Silence Suppression: (checkbox unchecked)
- Enable Faststart: (checkbox checked)
- Local Hold Music: (checkbox unchecked)
- Local Tones: (checkbox unchecked)
- Enable RSVP: (checkbox unchecked)
- Out Of Band DTMF: (checkbox checked)
- Allow Direct Media Path: (checkbox checked)
- Voice Networking: (checkbox checked)

**Figure 31: Line→VoIP Form**

**Step 7 )** Save this configuration to the IP Office IP412.

## 6. Verification Steps

This section describes steps that can be taken to verify that the configuration has been done correctly.

- ✓ Go Off-hook on each PARTNER ACS Line key for Lines to the IP Office - Small Office Edition, listen for dial tone and dial a test number.
  - If no dial tone:
    - Check that the PARTNER ACS Line is assigned as expected and that there is a physical wiring connection to the appropriate IP Office - Small Office Edition “POT” port.
    - Plug a standard POTS phone to the IP Office port and test.
    - Run the IP Office System Monitor to trace the call progress.
- ✓ Place a call through the IP Office on hold at the PARTNER ACS set and disconnect from the far end.
  - If the call is not dropped, recheck the Hold Disconnect Timing on the PARTNER ACS side and the associated IP Office - Small Office Edition Extension Form Disconnect Pulse Width.
- ✓ If the Recall Feature is to be used, place a call and put it on hold using the Recall Key.
  - If there is no reaction at all, check the button programming.
  - If there is a click, but no other effect, the Recall Duration timing is probably set too short relative to the IP Office Extension Flash-hook Pulse Width settings.
- ✓ Ping the public interface of the IP412 from a PC behind the IP Office - Small Office Edition and the public interface of the IP Office - Small Office Edition from behind the IP412. If the pings do not succeed, the routing problem must be solved before the Virtual Private Network and the IP trunk can succeed.
- ✓ Ping the LAN1 interface of the IP412 from a PC behind the IP Office - Small Office Edition and the LAN1 interface of the IP Office - Small Office Edition from a PC behind the IP412. If the pings do not succeed the VPN tunnel is not up. The VPN tunnel must be up for the IP trunks and the Small Community Network service to operate. Check that the settings on the respective tunnel forms are set consistently. Enable the System Monitor Traces/VPN tab settings to see if the tunnel is working properly.

- ✓ Place a call from PARTNER ACS Line to an extension at the far end of the VPN tunnel.
  - If the call does not complete:
    - Verify, through the system monitor with default settings that after the call is dialed, an entry similar to the one below is provided. Note that the Calling and Called Number as expected.

```
7705mS CMTARGET: LOOKUP CALL ROUTE:11 type=100 called_party=76101 sub= calling=44202 in=0
complete=0
7706mS CMTARGET: ADD TARGET:11 number=76101 type=100 depth=1 nobar=1 setorig=1
7706mS CMTARGET: SET USER:11 Extn76101 orig=1
7707mS CMTARGET: ADD USER:11 Extn76101(76101, state=UNKNOWN) (depth=2 B=0) cw=0
7707mS CMTARGET: OVERLAP LOOKUP CALL ROUTE:11 returned 1
```

- If the last line says “returned 0” the called number did not match a known destination. Possibly the IP trunk is not up, or it is up and the Voice Networking box is not enabled on one side or the other.
  - Enter a short code for the destination pointing to the trunk group and try the call again. If the call now works, there is likely a Voice Networking issue, otherwise, if it matches but does not complete, investigate the problem as a VPN or IP trunk issue.

## 7. Conclusion

By following the steps of these Application Notes, a user will have successfully configured IP Office for PARTNER ACS customer Internet access and VPN operations across a DSL network.

## 8. Additional References

- “IP Office 2.1 Manager Application”
- “A Configuration of Avaya IP Office with the Westell 2200 ADSL Modem for Internet Access and Voice over IP Virtual Private Networking – Issue 1.0”

These documents and other Avaya product information and similar Application Notes can be found at [www.avaya.com](http://www.avaya.com)

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