



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring QuesCom 300 IP/GSM Gateway with Avaya IP Office using H.323 trunks – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the QuesCom 300 IP/GSM to successfully interoperate with Avaya IP Office using H.323 trunks. The QuesCom 300 IP/GSM is an IP- Global System for Mobile communications GSM-gateway, supporting outgoing and incoming GSM calls. All GSM calls passed from Avaya IP Office will be routed to the QuesCom 300 IP/GSM gateway. The QuesCom 300 IP/GSM can also receive calls from the GSM network and pass them through to Avaya IP Office.

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

1. Introduction

These Application Notes describe the compliance tested configuration using a QuesCom 300 IP/GSM gateway and an Avaya IP Office 3.1 using H.323 trunks.

The QuesCom 300 IP/GSM is an IP-GSM-gateway, supporting outgoing and incoming GSM calls. All GSM outbound calls made from Avaya IP Office will be routed to the QuesCom 300 IP/GSM gateway to the GSM network. The QuesCom 300 IP/GSM can also receive calls from the GSM network and route the calls to Avaya IP Office. The QuesCom 300 IP/GSM can provide a backup route or be backed up by the PSTN, although this was not tested during compliance testing. These Application Notes focus on the configuration of Avaya IP Office and the QuesCom 300 IP/GSM via a H.323 IP trunk.

The Avaya IP Office is connected to the QuesCom 300 IP/GSM via a H.323 IP trunk. The QuesCom 300 IP/GSM in turn connects to the GSM network via Subscriber Identity Module (SIM) cards that reside on GSM boards inserted in the QuesCom 300 IP/GSM. Outbound calls made to mobile numbers from an Avaya station is routed from Avaya IP Office to the QuesCom 300 IP/GSM via the H.323 IP trunk. Inbound calls made to one of the QuesCom 300 IP/GSM SIM card numbers is normally routed from the QuesCom 300 IP/GSM to an attendant console on Avaya IP Office or an Interactive Voice Response (IVR) system where it is possible to enter the digits of the Avaya extension. During the compliance testing all SIM cards were routed to the same Avaya station. The management PC is used to administer the QuesCom 300 IP/GSM.

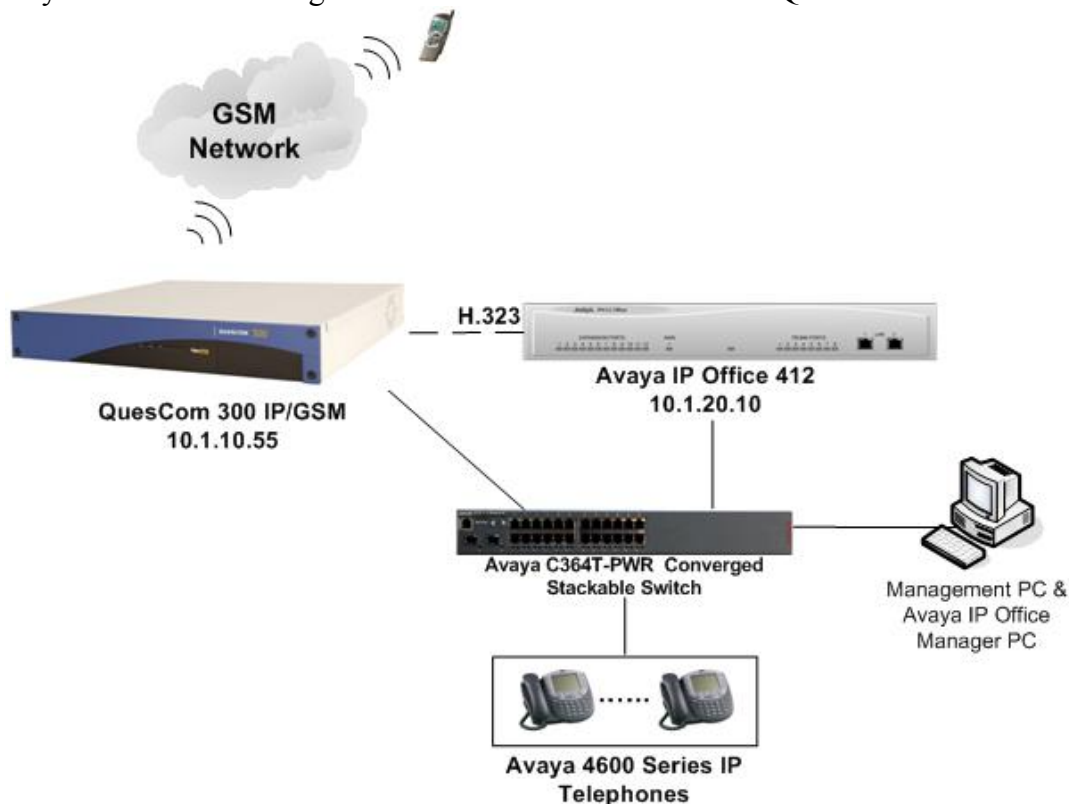


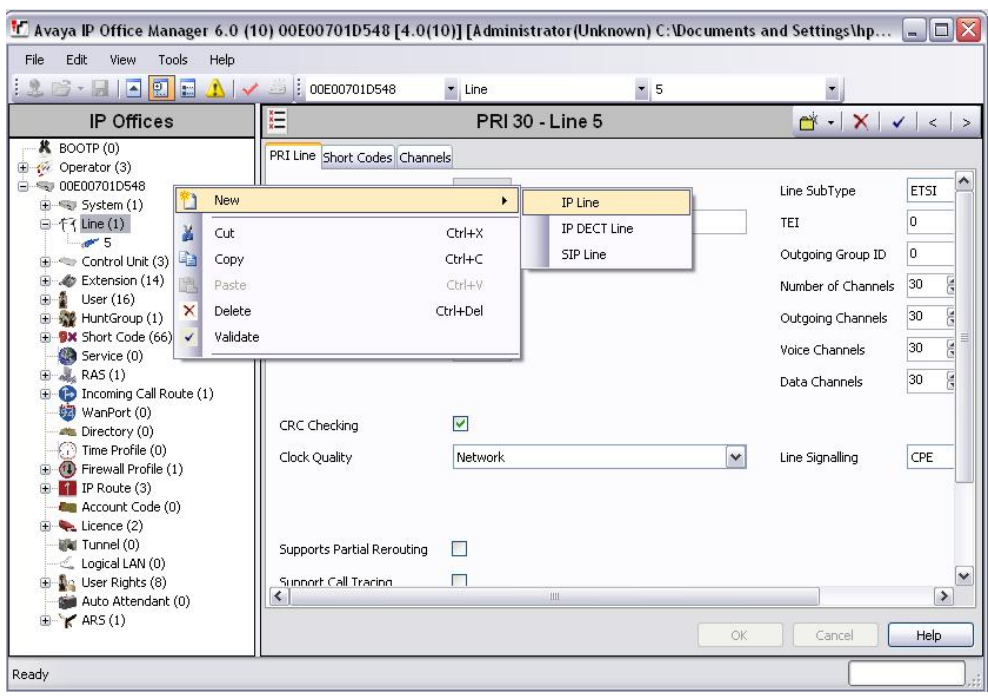
Figure 1: Avaya IP Office with QuesCom IP/GSM 300

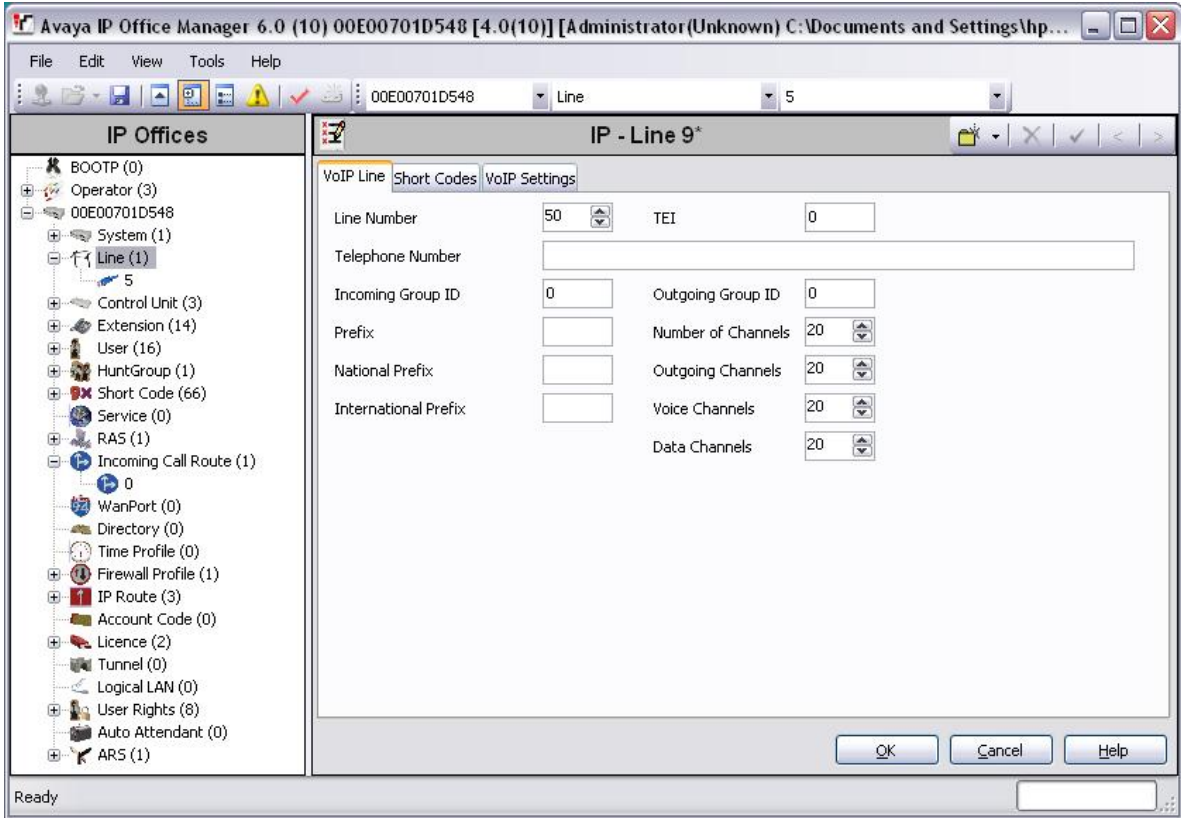
2. Equipment and Software Validated

Equipment	Software
Avaya IP Office 412	4.0(10)
Avaya IP Office Manager software	6.0(10)
Avaya C364T-PWR Converged Stackable Switch	4.3.12
Avaya 4600 Series IP Telephones (H.323)	2.8 (4620SW)
QuesCom 300 IP/GSM	IAD05.00B030P000

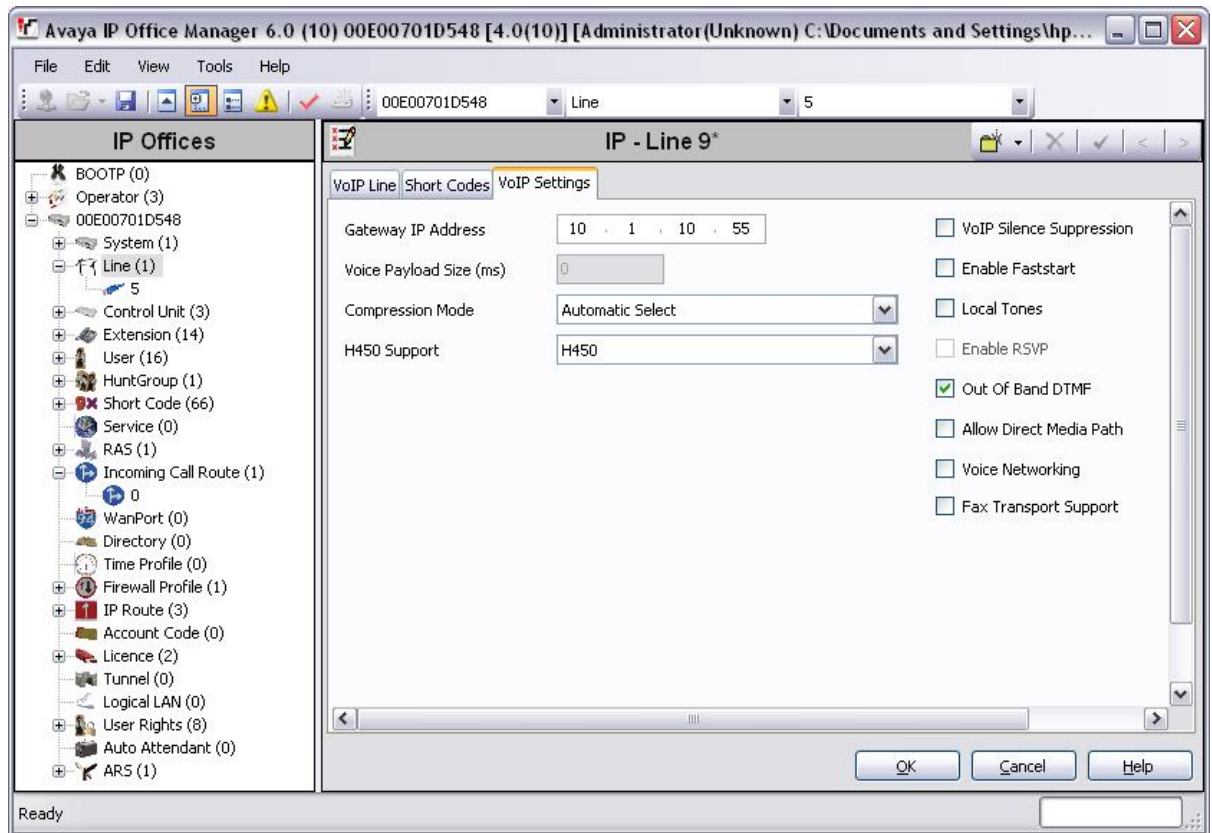
3. Configure Avaya IP Office

Basic configuration of Avaya IP Office is beyond the scope of these Application Notes. See Section 9 for Avaya documentation references. This section describes the steps for configuring H.323 IP trunk to the QuesCom 300 IP/GSM gateway and short codes for routing of outbound calls.

Step	Description
1.	<p>From the management PC shown in Figure 1, launch the Avaya IP Office Manager by selecting Start → Programs → IP Office → Manager. In the Manager window, select File → Open to search for the IP Office system in the network. Log in to the IP Office system using the appropriate login credentials. Expand the left menu by clicking on the unique Avaya IP Office name. Right click on Line and select New → IP Line as shown below.</p> 

Step	Description
2.	<p>In the IP Line screen, click on the VoIP Line tab and enter an available number in the Line Number field to be associated with the IP trunk to the QuesCom 300 IP/GSM gateway. This will be used in the configuration of the shortcode in Step 4. The remaining parameters on this screen can retain their default values.</p> 

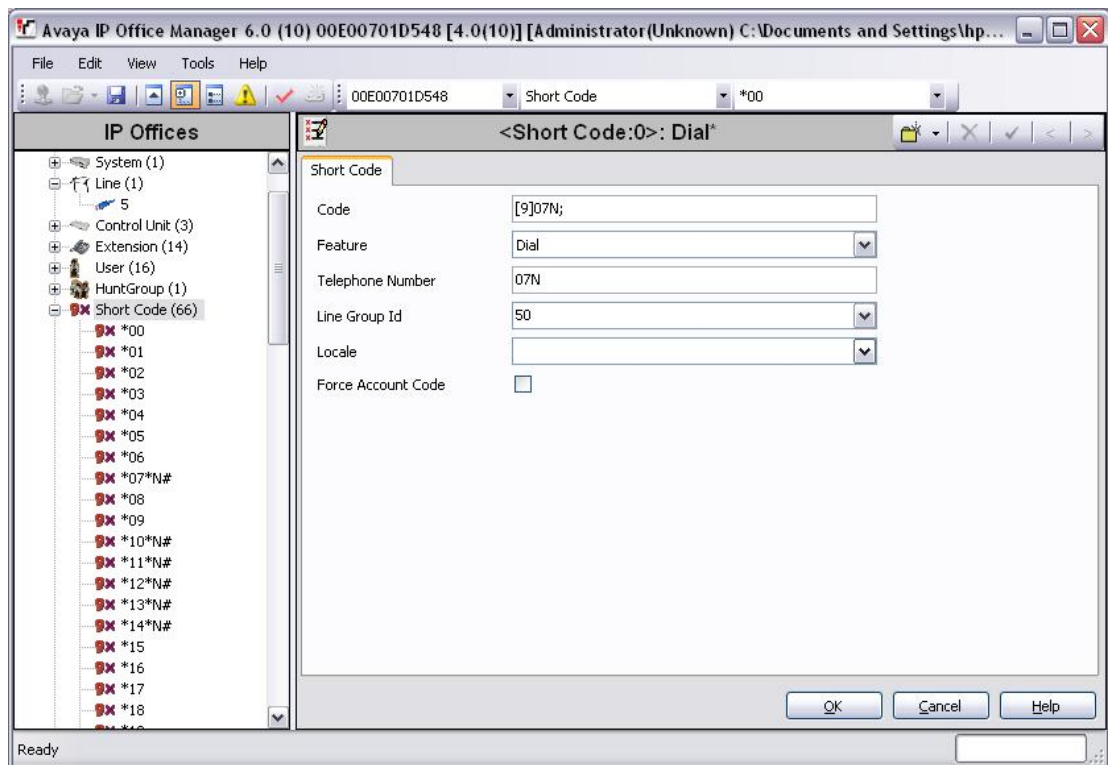
3. Click on the **VoIP Settings** tab. In the **Gateway IP Address** field, enter the IP address of the QuesCom 300 IP/GSM gateway. Uncheck the **Allow Direct Media Path** check box as IP direct media is not supported by the Quescom 300 IP/GSM gateway. The remaining parameters on this screen can retain their default values. Click **OK**.



4. A short code needs to be created to route outbound GSM calls to the QuesCom 300 IP/GSM gateway. In the Configuration tree, right click on **Short Code** and select **New** (not shown). In the Shortcode screen configure the following:

- **Code** – enter “[9]07N;”. This represents the digits used to perform a match against the user dialling, and “[9]” represents the prefix digit to dial for external numbers.
- **Feature** – From the drop down menu select “Dial”.
- **Telephone Number** – enter “07N”. This is the number to dial beginning with 07.
- **Line Group ID** – enter the Line Number “50” configured in step 3.

Click **OK**.



5. In the Manager window, select **File → Save Configuration**. The configuration to Avaya IP Office is saved and the user is prompted to reboot Avaya IP Office.

4. Configure the QuesCom 300 IP/GSM

This section describes the steps for configuring the QuesCom 300 IP/GSM gateway.

4.1. QuesCom 300 IP/GSM Configuration

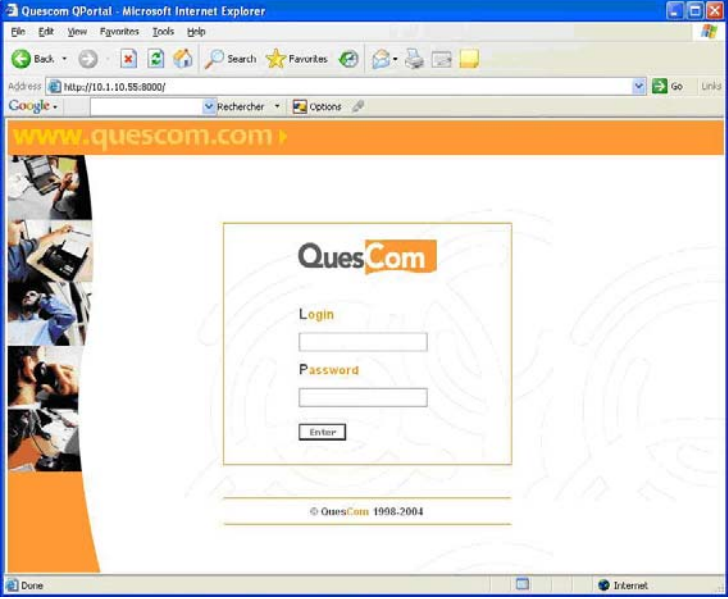
This section includes the necessary configuration steps to allow the QuesCom 300 IP/GSM gateway to make outbound calls to the GSM network once connected to the Avaya IP Office.



Step	Description
1.	<p>After the initial installation of the QuesCom server, telnet into the QuesCom server from the management PC shown in Figure 1, using the default IP address “192.168.1.1”. Log in using the appropriate username and password.</p> <pre>C:\> telnet 192.168.1.1 login: administrator Password: ***** Enterprise Series, Serial# Q300-A1-00010016, Version IAD05.00B030P000 BIOS Version 6.00 PG from 06/29/2004 Security Patch SP002 Copyright (c) 1998-2007 QuesCom S.A.</pre> <p>At the prompt, type the following command gwconfig /setup.</p> <pre>X:\>gwconfig /setup Application has been registered to the QCFGSvc QCFGSvc Version 5.00.000.006 Copyright (c) 1998-2007 QuesCom S.A.</pre> <p>Enter “1” for English.</p> <pre>Enter the Gateway Administration language [1]: 1 English 2 French 3 German > 1 GWconfig language: English</pre> <p>Enter a name for the QuesCom 300 gateway.</p> <pre>Setting up Gateway components... Enter the Gateway network name [Q300-00010016]: Q300 Gateway Network Name: Q300</pre> <p>Enter IP address, subnet mask and default gateway for the QuesCom gateway.</p> <pre>Enter the Gateway IP address [192.168.1.1]: 10.1.10.55 The Gateway IP address: 10.1.10.55 Enter the Gateway subnet mask [255.0.0.0]: 255.255.255.0 The Gateway subnet mask: 255.255.255.0</pre>

Step	Description
	<p>Enter the default Gateway [0.0.0.0]: 10.1.20.1 The default Gateway: 10.1.20.1</p>
	<p>Enter “N” for the following option</p>
	<p>Do you want to activate conferencing? [Y/N]: N</p>
	<p>Enter “0” for the server to operate in Stand-Alone mode.</p>
	<pre> Enter the 'Call Server' mode [0]: 0 Stand-Alone mode 1 Relay mode > 0 Call Server mode: Stand-Alone </pre>
	<p>Enter Company Name. This can be any alphanumeric name.</p>
	<p>Enter Company Name []: Avaya Company Name: Avaya</p>
	<p>Enter “1” to select the H.323 protocol.</p>
	<p>Do you want to activate SIP or H.323 connectivity now? [Y/N]: Y</p> <p>Declare VOIP Gateway/Softswitch which will be allowed to send calls to the QuesCom gateway</p> <pre> 0 Skip to next step/Do it later 1 H.323 (no registration) 2 SIP (no registration) > 1 </pre>
	<p>Enter the IP address and name for the Avaya IP Office.</p>
	<p>Enter the IP Address of the H.323 Gatekeeper: 10.1.20.10 H.323 Gatekeeper IP Address: 10.1.20.10</p> <p>Enter the name of the H.323 GateKeeper: IPO H.323 Gatekeeper name: IPO</p>
	<p>Enter “0” to configure the incoming calls to the Quescom gateway later.</p>
	<p>Declare VOIP Gateway/Softswitch which will be allowed to send calls to the QuesCom gateway</p> <pre> 0 Skip to next step/Do it later 1 H.323 (no registration) 2 SIP (no registration) > 0 </pre>
	<p>Enter “0” for the following Voice Box option.</p>


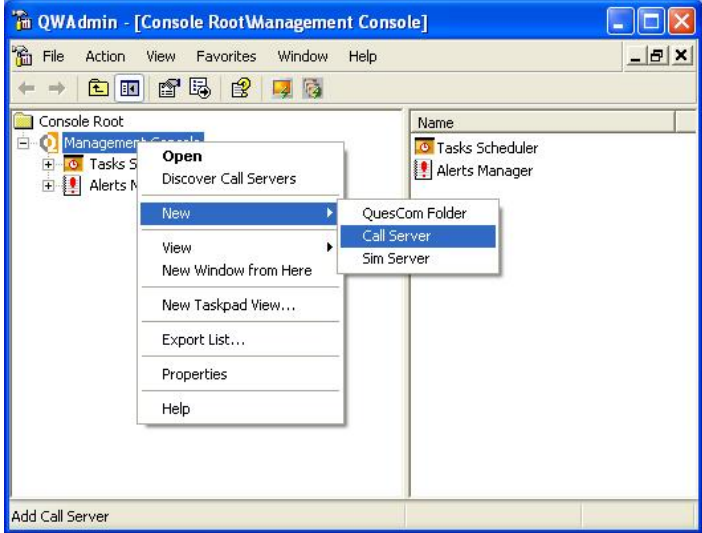
Step	Description
	<div data-bbox="277 226 1520 373"> <p>Do you want to use the 'Voice Box' service [0]? 0 No 1 Yes > 0</p> </div> <div data-bbox="277 415 1520 562"> <p>Configure the time zone and daylight saving settings. Enter Time Zone number (0 to skip / L to view the list): 27 Do you want to enable saving the TimeZone DayLight Information? [Y/N]: Y</p> </div> <div data-bbox="277 604 1520 1402"> <p>Verify the selected parameters press any key to continue and enter “1” to confirm the setup. Selected parameters for Quick setup mode are: Gateway Network Name: Q300 The Gateway IP address: 10.1.10.55 The Gateway subnet mask: 255.255.255.0 The default Gateway: 10.1.10.1 Press any key to continue... Gateway's serial number: Q300-A1-00010016 IVR language country: ENG - English Email language country: ENG - English Country Tones: United Kingdom Country Numbering: United Kingdom Call Server mode: Stand-Alone Company Name: Avaya Do you confirm this setup [1]: 0 No (to exit, and GWconfig /setup command can be re-entered) 1 Yes(to continue the setup and restart the QuesCom Gateway) > 1</p> </div> <div data-bbox="277 1444 1520 1663"> <p>Setting up QPortal Application... Please wait... Rebooting system... Warning: Do not restart the Gateway, update process in progress... Please, wait up to 3 minutes.</p> </div>

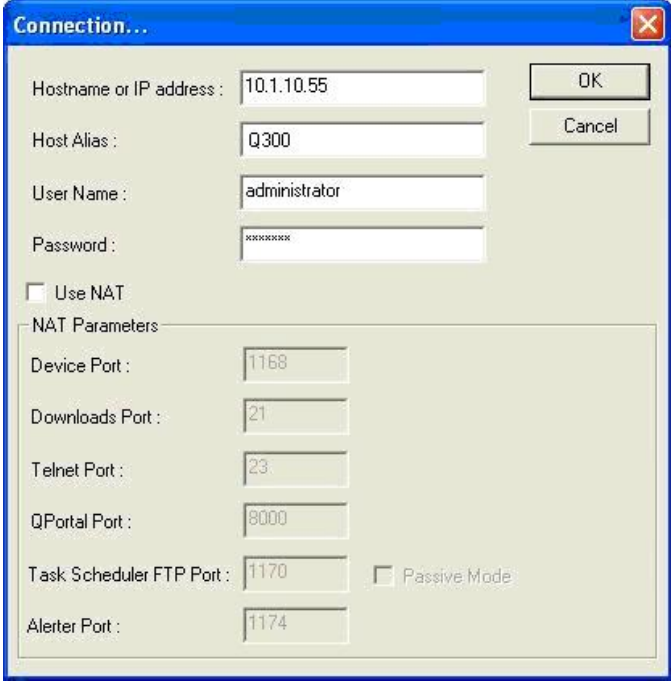
4.2. QuesCom Routing Configuration

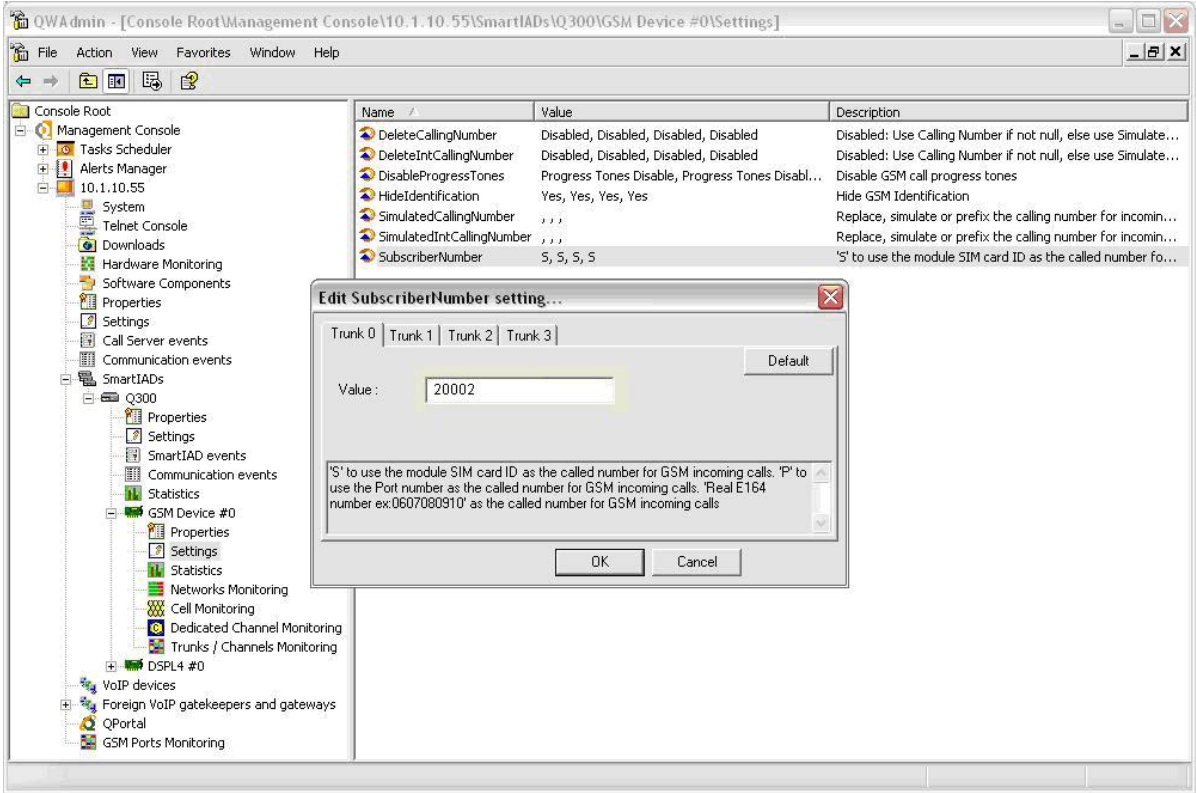
Step	Description
1.	<p>Open a web browser and enter the following URL <code>http://<QuesCom 300 IP/GSM gateway IPAddress:8000></code>. For this configuration “http://10.1.10.55:8000/” was entered. Log in using the appropriate user name and password.</p> 

Step	Description
2.	<p>On the left hand side of the screen under the QuesCom 300 menu, click on Objects → Foreign Gatekeeper. Verify an entry with the ID “IPOffice” and the IP address of Avaya IP Office is created by default due to the configuration in Section 4.1 Step 1.</p> 
3.	<p>Verify the outbound routing configuration by selecting on Services → Service. Four service entries are present by default. Service ID “3” is for routing outbound calls from Avaya IP Office to the QuesCom 300 IP/GSM gateway. Service ID “4” is for routing of outbound calls from the QuesCom 300 IP/GSM gateway to the GSM network. Service IDs “1” and “2” are also created by default, and are related to SMS (Short Message Service) that were not tested during compliance testing.</p> 

Step	Description
4.	<p>Routing of inbound calls to the QuesCom 300 IP/GSM gateway is created by clicking on the ADD RECORD button on the main Service screen, shown on step 6. On the Service screen, configure the following as shown below.</p> <ul style="list-style-type: none"> • Origin Type – select radio button “Device”. • Origin – select “Q300(SmartAD)”. • Called Prefix Number – enter “*”. Wildcard to match any number. • Call Type – select “GSM Incoming”. • Service type – select “VoIP”. • Destination Type – select radio button “Foreign GK”. • Device – select “IPOffice”. Configured in the initial configuration in Step 4.1. <p>The other parameters can be left with default values. Click on SAVE.</p>

Step	Description
5.	<p>The inbound call route pattern added in step 4 can be verified on the main Service screen, by clicking on Services → Service.</p> 
6.	<p>Additional configuration of the QuesComm 300 IP/GSM is performed from the management PC shown in Figure 1. Launch the QuesCom 300 QWA management console by selecting Start → Programs → QuesCom → QuesCom Management Console. Right click on Management Console and select New → Call Server, to add the QuesCom 300 IP/GSM gateway.</p> 

Step	Description
7.	<p>In the Connection dialog box, configure the following:</p> <ul style="list-style-type: none"> • Hostname or IP address – enter the IP address of the QuesCom 300 IP/GSM gateway. • Host Alias – enter a descriptive name for the QuesCom 300 IP/GSM gateway. • User Name and Password is populated by default. <p>Click OK.</p> 

Step	Description
8.	<p>Expand the Management Console tree by clicking on Management Console → Q300(10.1.10.55) → SmartIADs → Q300 → GSM Device #0 → Settings. In the main screen click on SubscriberNumber, this will bring up the Edit SubscriberNumber setting dialog box. Select on the Trunk 0 tab each trunk is associated with a SIM card. Enter an Avaya IP Office station that incoming calls will be routed to in the Value field. For the convenience of compliance testing, the calls were routed to a station on Avaya IP Office for all incoming trunks. Replicate this field for all 4 Trunks. Click OK.</p> <p>Right click on Q300 under SmartIADs and select Save configuration to save the configuration. Right click on Q300 and select Stop to stop the gateway (not shown) . Right click on Q300 and select Start, and wait for the SIM cards to register (not shown).</p> 

5. Interoperability Compliance Testing

The interoperability compliance testing focused on verifying the routing of inbound/outbound calls to/from Avaya IP Office to the GSM network via the QuesCom 300 IP/GSM gateway.

5.1. General Test Approach

The general approach was to place outbound calls from Avaya IP Office to the GSM network via the QuesCom 300 IP/GSM gateway and inbound calls from the GSM network via the QuesCom 300 IP/GSM gateway to Avaya IP Office, and verify successful call completion. The main objectives were to verify that:

- When internal extensions place outbound calls to GSM numbers, the calls are routed to the QuesCom 300 IP/GSM, QuesCom 300 IP/GSM decides on the least cost routing, and routes the call to the GSM network.
- Inbound calls from the GSM network to the QuesCom 300 IP/GSM are successfully forwarded to Avaya IP Office using both direct routing (mapping of a SIM card phone number to an Avaya IP Office extension) and post-dialing (SIM card answers an inbound call and upon a prompt, the external caller enters an Avaya IP Office).
- Transfers and conferences from Avaya IP Office stations on outbound and inbound calls were successfully routed through QuesCom 300 IP/GSM.
- Serviceability tests such as network failure were also carried out on the QuesCom 300 IP/GSM.
- Inbound and outbound calls were tested using G.711 and G.729 codec's.

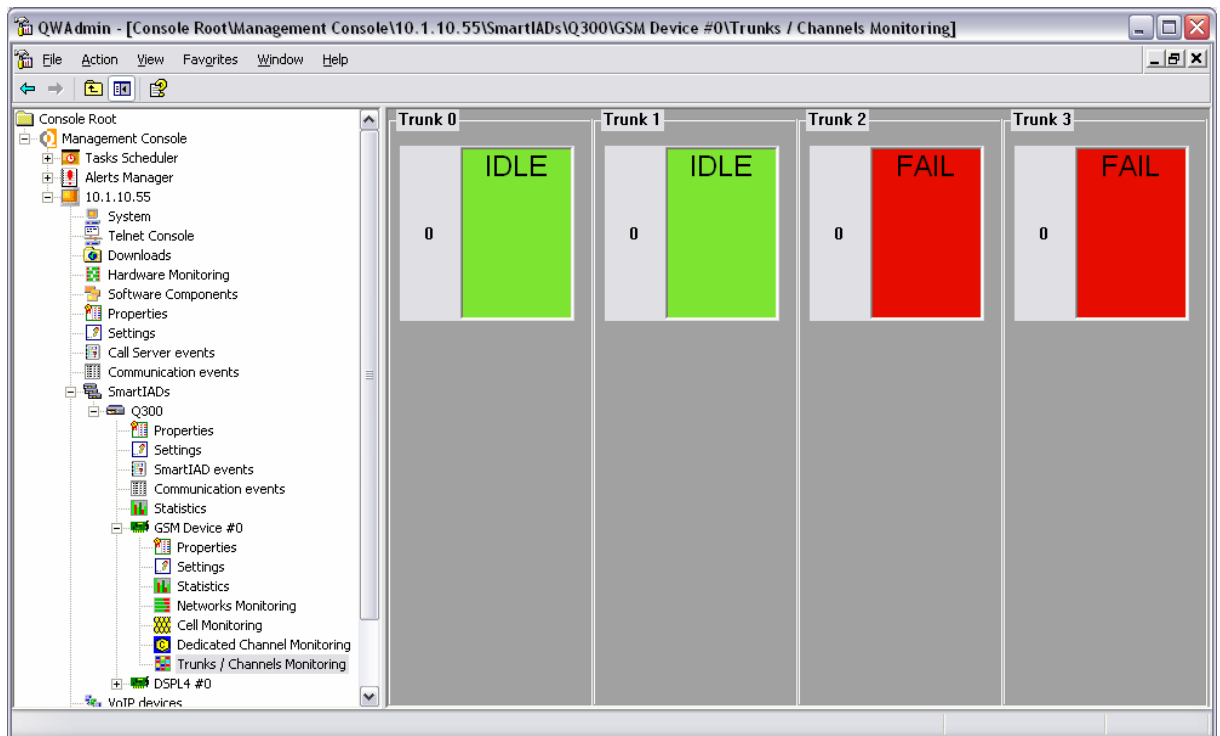
5.2. Test Results

The test objectives of Section 5.1 were verified. For serviceability testing, outbound and inbound calls routed through the QuesCom 300 IP/GSM completed successfully after recovering from failures such as Ethernet cable disconnects, and resets of Avaya IP Office and the QuesCom 300 IP/GSM. Both G.711 and G.729 audio codec's were tested successfully.

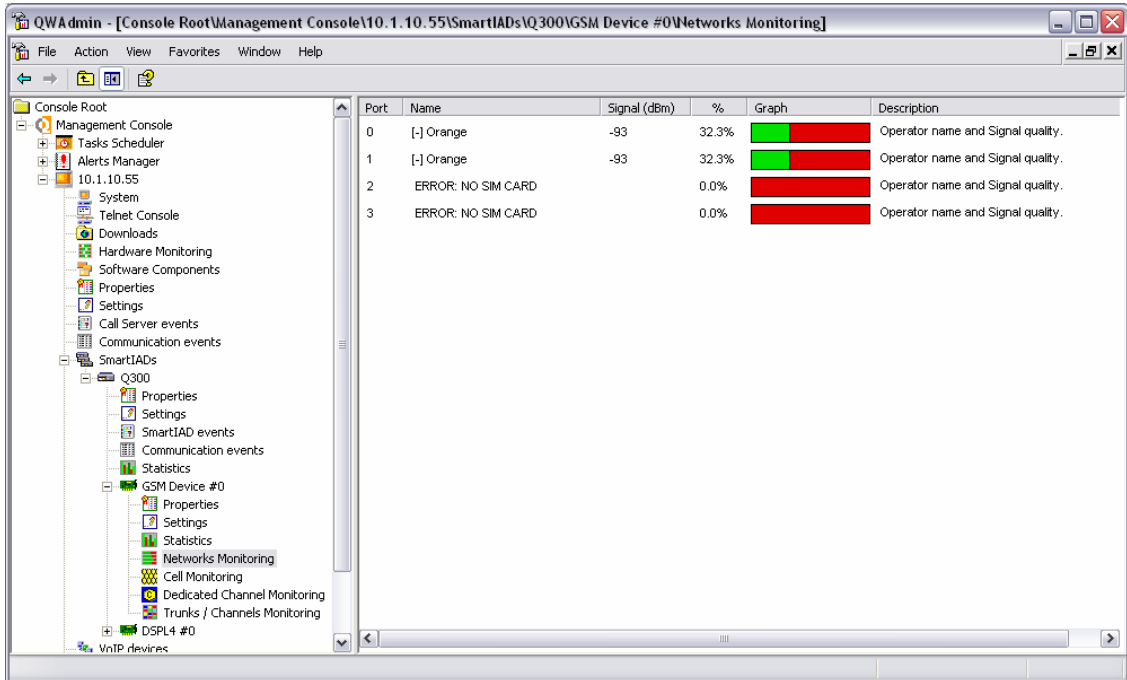
6. Verification Steps

This section provides the tests that can be performed to verify proper configuration of QuesCom 300 IP/GSM.

Step	Description
1.	Make calls to and from Avaya IP Office telephones to GSM phones via the Quescom 300 IP/GSM gateway to verify the Avaya IP Office trunk is up.
2.	Expand the Management Console tree by clicking on Q300(10.1.10.55) → SmartIADs → Q300 → GSM Device #0 → Trunks/Channels Monitoring . Ensure the Trunks configured are the colour green with IDLE .



Step	Description
3.	<p>Expand the Management Console tree by clicking on Q300(10.1.10.55) → SmartIADs → Q300 → GSM Device #0 → Networks Monitoring. Ensure the Signal(dBm) is above -90. If the Signal(dBm) is less than -90, then the GSM signal may be too weak to make a call to the GSM network. If this is the case, reposition the QuesCom 300 IP/GSM antennas.</p>



Port	Name	Signal (dBm)	%	Graph	Description
0	[-] Orange	-93	32.3%		Operator name and Signal quality.
1	[-] Orange	-93	32.3%		Operator name and Signal quality.
2	ERROR: NO SIM CARD		0.0%		Operator name and Signal quality.
3	ERROR: NO SIM CARD		0.0%		Operator name and Signal quality.

7. Support

Technical support from QuesCom can be requested in the following three ways.

- The corporate QuesCom Reporting Tool (QRT) account on the QuesCom web site at <http://support.quescom.com>.
- The Support Line number. +33 820203846 (France) Voice Message is available during off days and non working hours.
- Sending an email to support@quescom.com.

8. Conclusion

These Application Notes describe the configuration steps required for QuesCom IP/GSM 300 version IAD05.00B030P000 to successfully interoperate with Avaya IP Office 4.0 using H.323 IP trunks. All feature functionality and serviceability test cases were completed successfully.

9. Additional References

This section references the Avaya and QuesCom IP/GSM 300 product documentation that are relevant to these Application Notes.

Avaya product documentation can be found at <http://support.avaya.com>.

- *IP Office 4.0 Installation Manual*, Document ID 15-601042, Issue 15e, January 2007.

The following documents can be requested from QuesCom by sending an e-mail to support@quescom.com.

- Getting Started with QuesCom 300 IP/GSM: GS-Q300IPGSM300-V01.pdf
- QuesCom 300 IP/GSM Administrator Guide: AG-Q300IPGSM300-V01.pdf
- How to configure an IP-GSM linked with an external H.323 gateway: Configuration of a H323 IP-GSM.pdf
- How to configure GSM Incoming calls to a remote Gatekeeper: Configuring GSM incoming calls.pdf

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