AVAYA

Avaya Solution & Interoperability Test Lab

Application Notes for Configuring QuesCom 400 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 400 IP/GSM to successfully interoperate with Avaya IP Office using H.323 trunks. The QuesCom 400 IP/GSM is an IP-GSM-gateway, supporting outgoing and incoming GSM calls. All GSM calls passed from Avaya IP Office will be routed to the QuesCom 400 IP/GSM gateway. The QuesCom 400 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 compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe the compliance tested configuration using a QuesCom 400 IP/GSM gateway and an Avaya IP Office 3.1 using H.323 trunks.

The QuesCom 400 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 400 IP/GSM gateway to the GSM network. The QuesCom 400 IP/GSM can also receive calls from the GSM network and route the calls to Avaya IP Office. The QuesCom 400 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 400 IP/GSM via a H.323 IP trunk.

The Avaya IP Office is connected to the QuesCom 400 IP/GSM via a H.323 IP trunk. The QuesCom 400 IP/GSM in turn connects to the GSM network via Subscriber Identity Module (SIM) cards that reside on GSM boards inserted in the QuesCom 400 IP/GSM. Outbound calls made to mobile numbers from an Avaya station is routed from Avaya IP Office to the QuesCom 400 IP/GSM via the H.323 IP trunk. Inbound calls made to one of the QuesCom 400 IP/GSM SIM card numbers is normally routed from the QuesCom 400 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 400 IP/GSM.
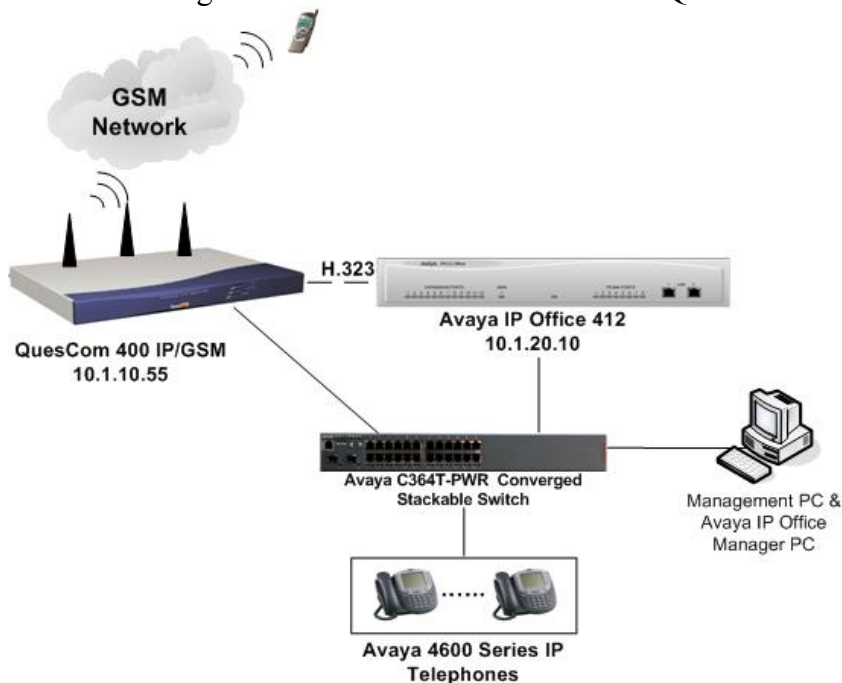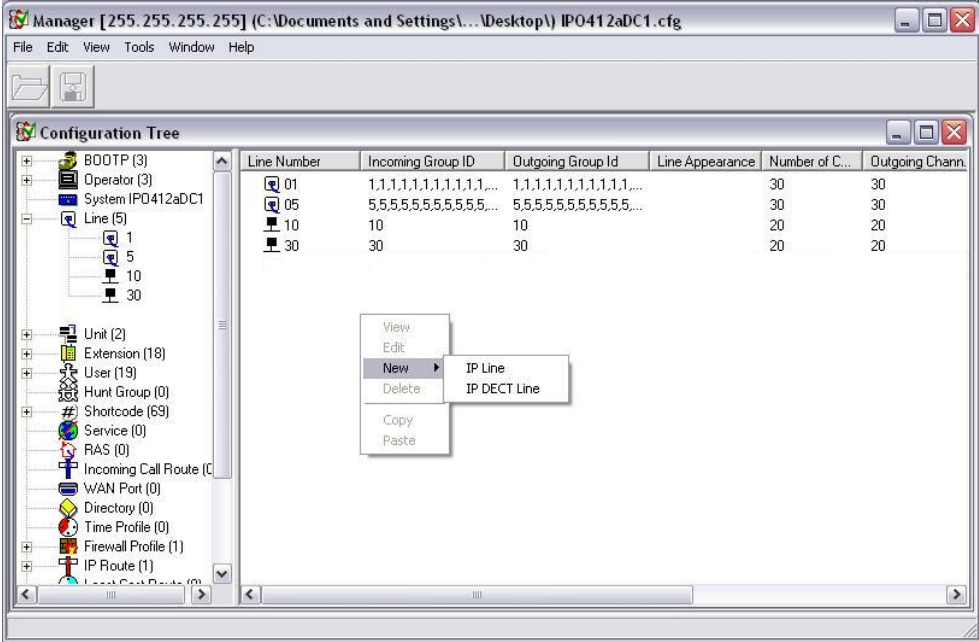

Figure 1: Avaya IP Office with QuesCom IP/GSM 400

2. Equipment and Software Validated

Equipment	Software
Avaya IP Office 412	3.1(56)
Avaya IP Office Manager software	5.1(56)
Avaya C364T-PWR Converged Stackable Switch	4.3.12
Avaya 4600 Series IP Telephones	2.2.3 (4620SW)
QuesCom 400 IP/GSM	IAD04.20 B029 P006 Additional patch ProxyH323.dll version 4.20.017

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 400 IP/GSM gateway and short codes for routing of outbound calls.

Step	Description
1.	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. To add an IP trunk, right click in the Line screen as shown below and select **New → IP Line**.

HJP; Reviewed:
SPOC 10/18/2006
Solution & Interoperability Test Lab Application Notes
©2006 Avaya Inc. All Rights Reserved.
3 of 18
Quescom_IPO_H.323.doc

2.	In the IP Line screen, click on the **Line** tab and enter an available number in the **Line Number** field to be associated with the IP trunk to the QuesCom 400 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.

3.	Click on the **VoIP** tab. In the **Gateway IP Address** field, enter the IP address of the QuesCom 400 IP/GSM gateway. Uncheck the **Allow Direct Media Path** check box. The remaining parameters on this screen can retain their default values. Click **OK**.

4.	Create a short code to route outbound GSM calls to the QuesCom 400 IP/GSM gateway. In the Configuration Tree double-click on **Shortcode**. In the Shortcode screen, right click and select **New**. In the Shortcode dialog box configure the following:

* **Short Code** – enter "[9]07N;". This is the digits used to perform a match against the user dialling, and "[9]" is the prefix digit to dial for external numbers.
* **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.
* **Feature** – From the drop down menu select "Dial".

Click **OK.**
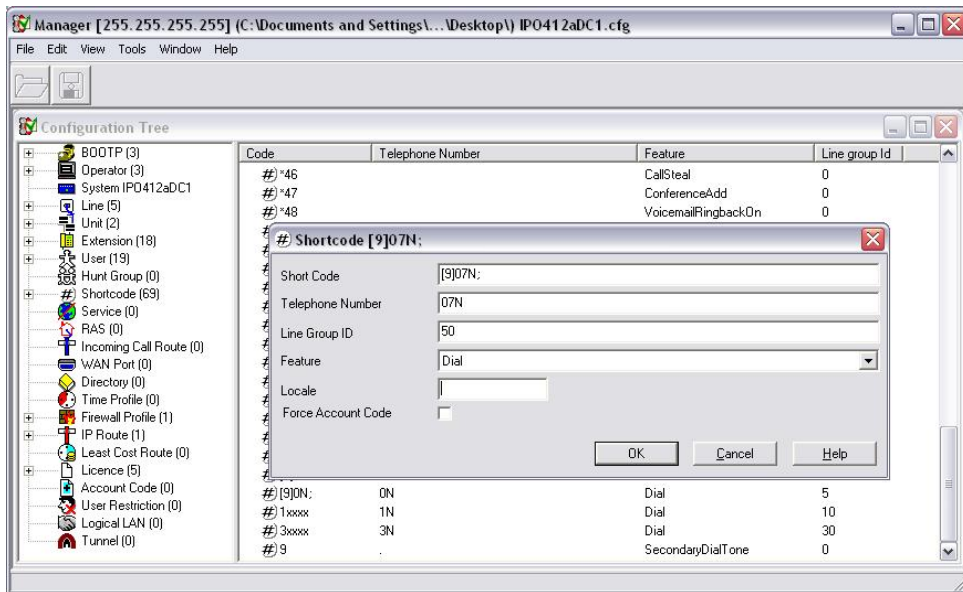
4. Configure the QuesCom 400 IP/GSM

This section describes the steps for configuring the QuesCom 400 IP/GSM gateway.

4.1. QuesCom 400 IP/GSM Configuration
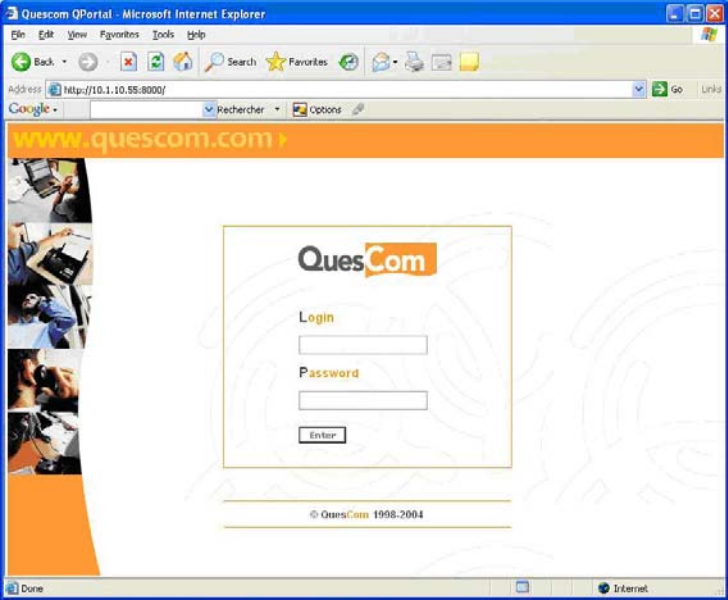
This section includes the necessary configuration steps to allow the QuesCom 400 IP/GSM gateway to make outbound calls to the GSM network once connected to the Avaya IP Office.

Step	Description
1.	After the initial installation of the QuesCom 400 IP/GSM gateway, telnet using a laptop with a direct connection into the QuesCom 400 IP/GSM with the default IP address "192.168.1.1". Log in using the appropriate administrative credentials.

```
C:\> telnet 192.168.1.1
login:
Password:

Q400 IP/GSM Series, Serial# Q400-B4-00010381, Version IAD04.20B029P006
Security Patch SP001
Copyright (c) 1998-2005 QuesCom S.A.
```

At the prompt, type the following command "gwconfig/setup" to initiate the stetup.

```
X:\>gwconfig/setup
Application has been registered to the QCFGSvc

QCFGSvc Version 4.20.000.012
Copyright (c) 1998-2006 QuesCom S.A.
```

Choose "1" for English.

```
Enter the SmartIAD Administration language [1]:
        1 English
        2 French
        3 German
> 1
GWconfig language: English
```

Enter a name for the QuesCom 400 IP/GSM gateway.

```
Setting up SmartIAD components...

Enter the SmartIAD network name [Q400]:Q400
SmartIAD Network Name: Q400
```

Enter IP address for the QuesCom 400 IP/GSM gateway.

```
Enter the SmartIAD IP address [192.168.1.1]: 10.1.10.55
The SmartIAD IP address: 10.1.10.55
```
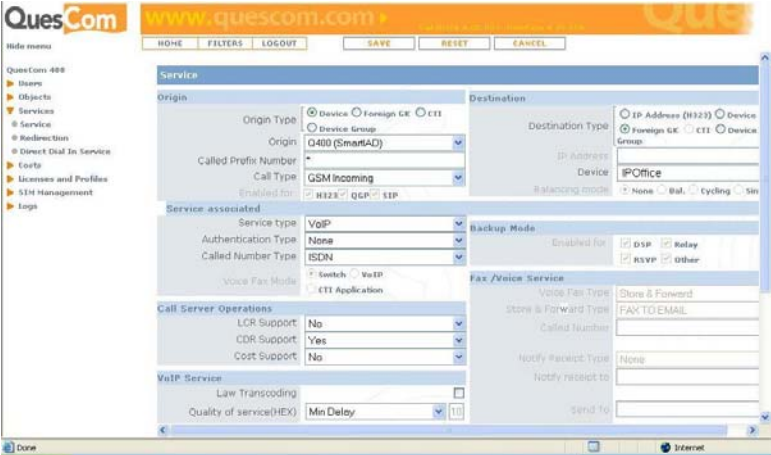
Step	Description

	Enter subnet mask or click enter to choose default.
	<pre>Enter the SmartIAD subnet mask [255.255.255.0]:
	The SmartIAD subnet mask: 255.255.255.0</pre>

	Enter default Gateway IP address.
	<pre>Enter the SmartIAD default Gateway [192.168.10.1]: **10.1.10.1**
	The SmartIAD default Gateway: 10.1.10.1</pre>

	Choose "2" for United Kingdom
	<pre>Enter the SmartIAD country code (ISDN, Tones, Numbering plan, Emails)
	[1]:
	        1 France
	        2 United Kingdom
	        3 Germany
	        4 Other
	> **2**
	ISDN Country: United Kingdom
	IVR language country: ENG - English
	Country Tones: United Kingdom
	Country Numbering: United Kingdom
	Network Operator: EuroISDN</pre>

	Choose "0" for the server to operate in Stand-Alone mode. It is possible to use multiple QuesCom 400 IP/GSM gateway's in Relay Mode.
	<pre>Enter the 'Call Server' mode [0]:
	        0 Stand-Alone mode
	        1 Relay mode
	> **0**
	Call Server mode: Stand-Alone</pre>

	Enter Company Name. This can be any alphanumeric name. <pre>Enter Company Name []: **Avaya**</pre>

	Enter "0" to select the H.323 protocol.
	<pre>Select the VoIP Protocol to use[0]:
	        0 H.323
	        1 SIP
	> **0**
	VoIP Protocol: H.323</pre>

	Enter "N", as the QuesCom 400 IP/GSM does not register to a GateKeeper for this configuration. <pre>Does the QuesCom IP/GSM need to register to a GateKeeper [Y/N]: **N**</pre>

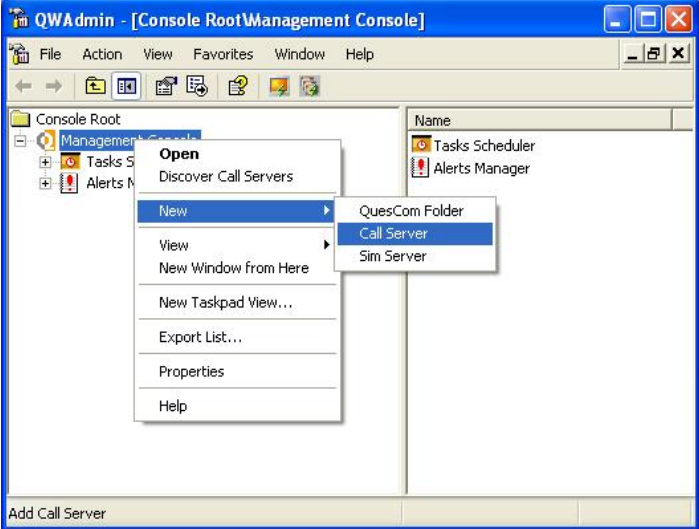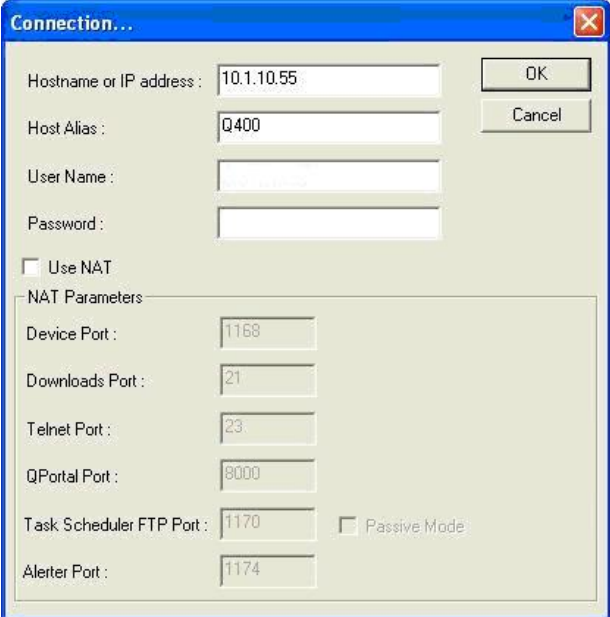| Step	Description

	Enter a descriptive name for Avaya IP Office.
	
	``
	Enter the name of the H.323 Gateway: IPOffice
	H.323 Gateway name: IPOffice
	``
	
	Enter the IP address for Avaya IP Office.
	
	``
	Enter the IP Address of the VoIP Gateway: 10.1.20.10
	VoIP Gateway IP Address: 10.1.20.10
	``
	
	Follow the instruction and press any key to continue.
	
	``
	Selected parameters for Quick setup mode are:
	SmartIAD Network Name: Q400
	The SmartIAD IP address: 10.10.1.55
	The SmartIAD subnet mask: 255.255.255.0
	The SmartIAD default Gateway: 10.1.10.1
	
	Press any key to continue..
	``
	
	Enter "1" to confirm the setup.
	
	``
	SmartIAD's serial number: Q400-B4-00010381
	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
	VoIP Protocol: H.323
	H.323 Gateway name = IPOffice
	H.323 Gateway IP Address = 10.1.20.10
	
	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 Q400)
	> 1
	Setup is confirmed.
	``

	Wait for 3 minutes for the QuesCom 400 IP/GSM gateway to reboot. ``` Setting up SmartIAD System Configuration... Setting up Gateway Application... Please wait... Setting up Call Server Application... Setting up QuesCom QGsm Application... Setting up QuesCom Web Server Application... Setting up QuesCom ODBC Socket Server Application... Setting up QPortal Application... Please wait... Setting up NTPClient Application... Setting up Pilot Application... Setting up GeoPort Application... Rebooting system... Warning: Do not restart the SmartIAD, update process in progress... Please, wait up to 3 minutes. ```

Solution & Interoperability Test Lab Application Notes
©2006 Avaya Inc. All Rights Reserved.

4.2. QuesCom Routing Configuration

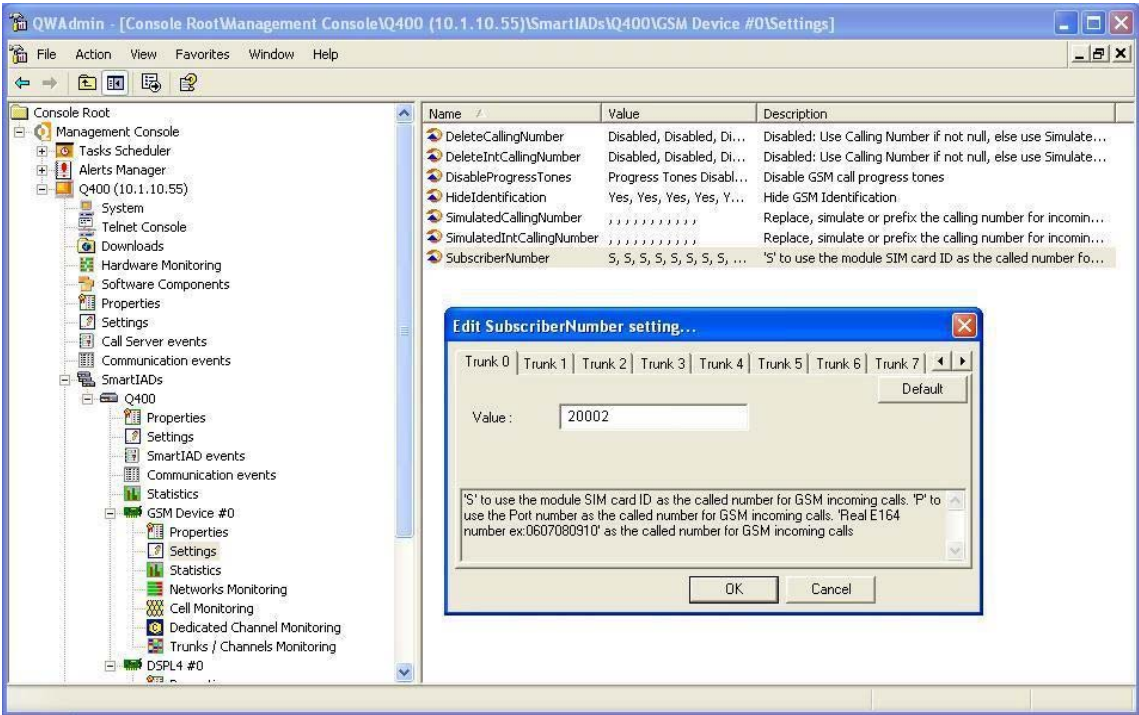| Step	Description
1.	Open a web browser and enter the following URL http://<QuesCom 400 IP/GSM gateway IPaddress:8000>. For this configuration "http://10.1.10.55:8000" was entered. Log in using the appropriate user name and password.
2.	On the left hand side of the screen under the QuesCom 400 menu, 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.

Step	Description
3.	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 400 IP/GSM gateway. Service ID "4" is for routing of outbound calls from the QuesCom 400 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.

Step	Description
4.	Routing of inbound calls to the QuesCom 400 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. • **Origin Type** – select radio button "Device". • **Origin** – select "Q400(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. The other parameters can be left with default values. Click on **SAVE**.
5.	The inbound call route pattern added in step 4 can be verified on the main Service screen, by clicking on **Services → Service**.

Solution & Interoperability Test Lab Application Notes
©2006 Avaya Inc. All Rights Reserved.

Step	Description
6.	Additional configuration of the QuesComm 400 IP/GSM is performed from the management PC shown in Figure 1. Launch the QuesCom 400 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 400 IP/GSM gateway.
7.	In the Connection dialog box, configure the following: • **Hostname or IP address** – enter the IP address of the QuesCom 400 IP/GSM gateway. • **Host Alias** – enter a descriptive name for the QuesCom 400 IP/GSM gateway. • **User Name** and **Password** is populated by default. Click **OK.**

Step	Description
8.	Expand the Management Console tree by clicking on **Management Console → Q400(10.1.10.55) → SmartIADs → Q400 → 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 and enter the extension that the 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. Repeat this assignment for all 12 Trunks. Click **OK**.

The changes that have been made on the QuesCom 400 IP/GSM need to be saved, and the QuesCom 400 IP/GSM gateway needs a reset. Right click on **Q400** under **SmartIADs** and select **Save** configuration to save the configuration. Right click on **Q400** and select **Stop** to stop the gateway. Right click on **Q400** and select **Start**, and wait for the SIM cards to register.

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 400 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 400 IP/GSM gateway and inbound calls from the GSM network via the QuesCom 400 IP/GSM gateway to Avaya IP Office, and verify successful call completion. The main objectives were to verify that:
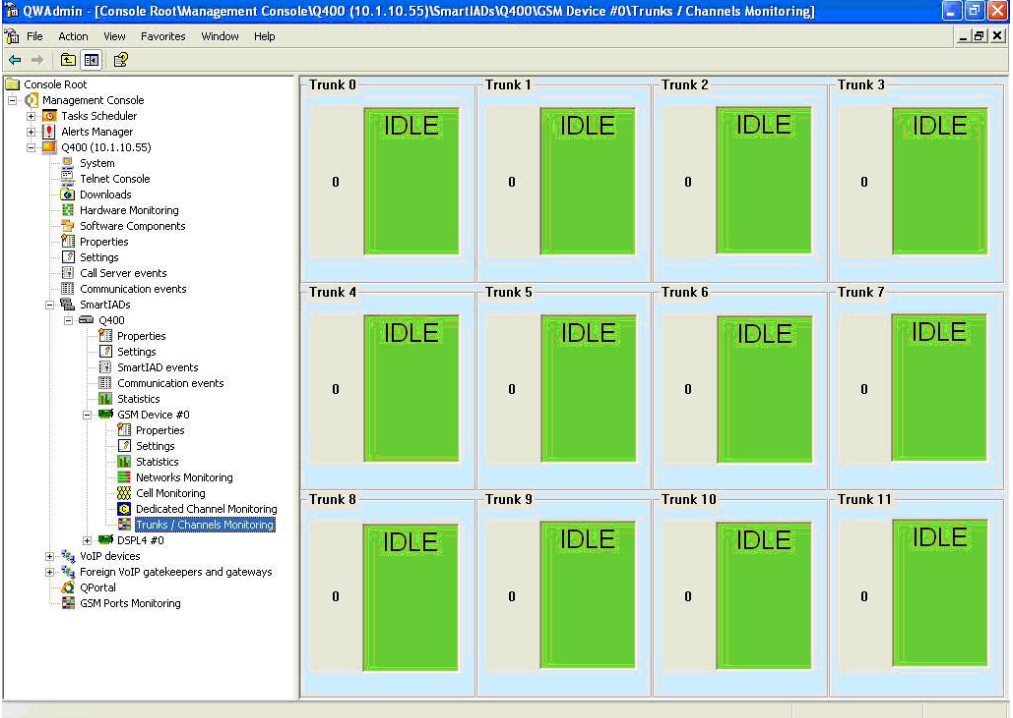
- When internal extensions place outbound calls to GSM numbers, the calls are routed to the QuesCom 400 IP/GSM, QuesCom 400 IP/GSM decides on the least cost routing, and routes the call to the GSM network.
- If the PSTN is operational, then Avaya IP Office can successfully re-route calls rejected by the QuesCom 400 IP/GSM to the PSTN due to a number of reasons such as no more free minutes left on the SIM cards.
- Inbound calls from the GSM network to the QuesCom 400 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 400 IP/GSM.
- Serviceability tests such as network failure were also carried out on the QuesCom 400 IP/GSM.
- Inbound and outbound calls were tested using G.711 and G.729 codec's.
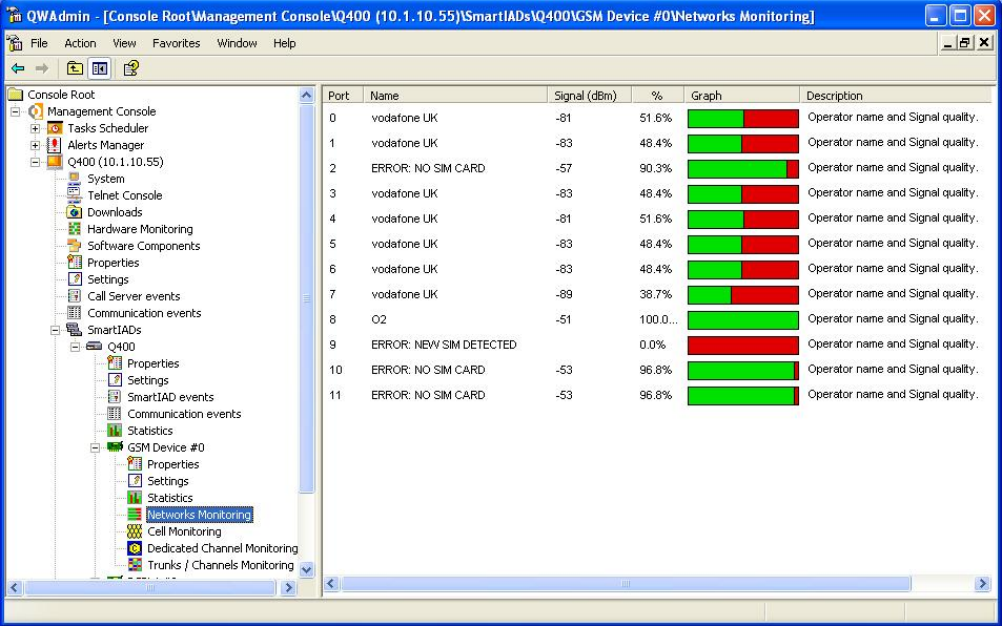
5.2. Test Results

The test objectives of Section 5.1 were verified. For serviceability testing, outbound and inbound calls routed through the QuesCom 400 IP/GSM completed successfully after recovering from failures such as Ethernet cable disconnects, and resets of Avaya IP Office and the QuesCom 400 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 400 IP/GSM.

Step	Description
1.	Expand the Management Console tree by clicking on **Q400(10.1.10.55)** → **SmartIADs** → **Q400** → **GSM Device #0** → **Trunks/Channels Monitoring**. Ensure the Trunks configured are the colour green with **IDLE**.

Step	Description
2.	Expand the Management Console tree by clicking on **Q400(10.1.10.55)** → **SmartIADs** → **Q400** → **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 400 IP/GSM antennas.

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 400 version IAD04.20 B029 P006 to successfully interoperate with Avaya IP Office 3.1 using H.323 IP trunks. All feature functionality, performance and serviceability test cases were completed successfully.

9. Additional References

This section references the Avaya and QuesCom IP/GSM 400 product documentation that are relevant to these Application Notes.

Avaya product documentation can be found at http://support.avaya.com.
- Avaya IP Office 3.1 Installation Manual, Issue 13j (Dec 2005)
- Avaya IP Office 3.1 Manager Manual, Issue 17d (Sept 2005)

The following documents can be requested from QuesCom by sending an e-mail to support@quescom.com.
- Getting Started with QuesCom 400 IP/GSM: GS-Q400IPGSM400-V01.pdf
- QuesCom 400 IP/GSM Administrator Guide: AG-Q400IPGSM400-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

©2006 Avaya Inc. All Rights Reserved.

Avaya and the Avaya Logo are trademarks of Avaya Inc. All trademarks identified by ® and ™ are registered trademarks or trademarks, respectively, of Avaya Inc. All other trademarks are the property of their respective owners. The information provided in these Application Notes is subject to change without notice. The configurations, technical data, and recommendations provided in these Application Notes are believed to be accurate and dependable, but are presented without express or implied warranty. Users are responsible for their application of any products specified in these Application Notes.

Please e-mail any questions or comments pertaining to these Application Notes along with the full title name and filename, located in the lower right corner, directly to the Avaya Developer*Connection* Program at devconnect@avaya.com.