Avaya Solution & Interoperability Test Lab

Application Notes for Configuring QuesCom 400 IP/GSM Gateway with Avaya Communication Manager using H.323 Trunks – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the QuesCom IP/GSM 400 to successfully interoperate with Avaya Communication Manager using H.323 trunks.
The QuesCom 400 IP/GSM is an IP-GSM-gateway, supporting outgoing and incoming GSM calls. All GSM calls made from Avaya Communications Manager 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 Communications Manager. The QuesCom 400 IP/GSM can provide a backup route for the PSTN and also be backed up by the PSTN.

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 a compliance-tested configuration consisting of a QuesCom 400 IP/GSM gateway networked with Avaya Communication Manager 3.1 using H.323 trunks.

The QuesCom 400 IP/GSM is an IP-GSM-gateway, supporting outgoing and incoming GSM calls. All calls made from Avaya Communications Manager destined for the GSM network will be routed to the QuesCom 400 IP/GSM gateway. The QuesCom 400 IP/GSM can also receive calls from the GSM network and route the calls to Avaya Communications Manager. The QuesCom 400 IP/GSM can provide a backup route for the PSTN and also be backed up by the PSTN. This can be configured in Avaya Communication Manager using Automatic Route Selection (ARS). These Application Notes focus on a configuration where an H.323 IP trunk connects Avaya Communication Manager and the QuesCom 400 IP/GSM.

In **Figure 1**, Avaya Communication Manager runs on the Avaya S8500 Media Server. The solution described herein is also extensible to other Avaya Media Servers and Media Gateways. The Avaya G650 Media Gateway is connected to the PSTN via an E1 ISDN-PRI line and to the QuesCom 400 IP/GSM via an H.323 IP trunk. The QuesCom 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.

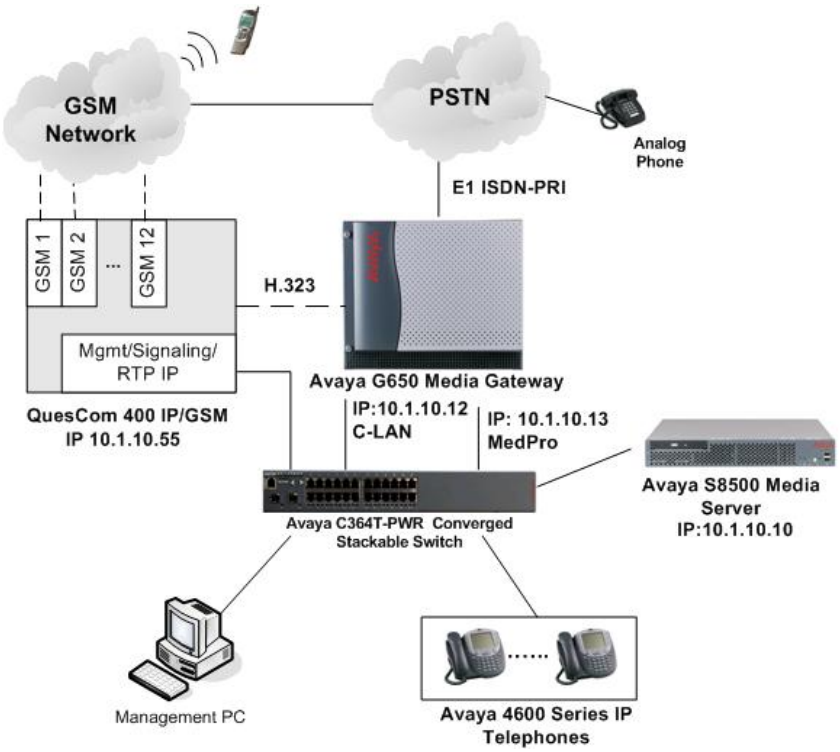


Figure 1: Avaya Communication Manager with QuesCom IP/GSM 400

2. Equipment and Software Validated

Equipment	Software
Avaya S8500 Media Server – Avaya Communication Manager	3.1.2 (03.1-01.0.632.1)
Avaya C364T-PWR Converged Stackable Switch	4.3.12
Avaya 4620SW IP Telephones	2.2.3
Avaya G650 Media Gateway	-
TN2312BP IP Server Interface	30
TN799DP C-LAN Interface	17
TN2302AP IP Media Processor	110
TN464CP DS1 Interface	18
QuesCom 400 IP/GSM Additional patch needed during compliance testing	IAD04.20 B029 P006 ProxyH323.dll version 4.20.017

3. Configure Avaya Communication Manager

Initial configuration of Avaya Communication Manager is beyond the scope of these Application Notes. See Section 9 for Avaya documentation references. This section illustrates the configuration of the H.323 trunk groups and signalling groups, dial plan, ARS analysis, and route patterns used in the compliance-tested configuration. The steps are performed from the System Access Terminal (SAT) interface.

3.1. Avaya Communication System parameters Special Applications

Step	Description

1.	Display the **system-parameters special-applications** command and ensure that **(SA8507) - H245 Support With Other Vendors**? is set to "y". If not, contact your Avaya authorized sales representative to enable this feature. Note: This feature only needs to be enabled if FastStart is enabled on the QuesCom 400 IP/GSM.
	
	`display system-parameters special-applications Page 4 of 6`
	`SPECIAL APPLICATIONS`
	
	`(SA8481) - Replace Calling Party Number with ASAI ANI? n`
	`(SA8500) - Expanded UUI Display Information? n`
	`(SA8506) - Altura Interoperability (FIPN)? n`
	`(SA8507) - H245 Support With Other Vendors? y`
	`(SA8508) - Multiple Emergency Access Codes? n`
	`(SA8510) - NTT Mapping of ISDN Called-Party Subaddress IE? n`

3.2. PSTN E1 ISDN-PRI

This section displays the PSTN E1 ISDN-PRI configuration on Avaya Communication Manager in the sample configuration of **Figure 1**. See Section 9 for Avaya documentation references.

Step	Description

1.	Enter the **display ds1** <board location> to display the PSTN DS1 Circuit Pack configuration.
	
	`display ds1 01A12`
	`DS1 CIRCUIT PACK`
	
	`Location: 01A12 Name: PRI to BT`
	`Bit Rate: 2.048 Line Coding: hdb3`
	
	`Signaling Mode: isdn-pri`
	`Connect: network`
	`TN-C7 Long Timers? n Country Protocol: etsi`
	`Interworking Message: PROGress Protocol Version: b`
	`Interface Companding: alaw CRC? y`
	`Idle Code: 01010100`
	`DCP/Analog Bearer Capability: 3.1kHz`
	
	`T303 Timer(sec): 4`
	`Slip Detection? n Near-end CSU Type: other`

2.	Enter the **display trunk-group** <number> to display the PSTN trunk-group configuration.
	
	`display trunk-group 19 Page 1 of 22`
	`TRUNK GROUP`
	
	`Group Number: 19 Group Type: isdn CDR Reports: y`
	`Group Name: PRI to BT COR: 1 TN: 1 TAC: 719`
	`Direction: two-way Outgoing Display? n Carrier Medium: PRI/BRI`
	`Dial Access? y Busy Threshold: 255 Night Service:`
	`Queue Length: 0`
	`Service Type: public-ntwrk Auth Code? n TestCall ITC: rest`
	`Far End Test Line No:`
	`TestCall BCC: 4`
	
	`display trunk-group 19 Page 2 of 22`
	`Group Type: isdn`
	
	`TRUNK PARAMETERS`
	`Codeset to Send Display: 6 Codeset to Send National IEs: 6`
	`Max Message Size to Send: 260 Charge Advice: none`
	`Supplementary Service Protocol: a Digit Handling (in/out): enbloc/overlap`
	
	`Trunk Hunt: cyclical QSIG Value-Added? n`
	`Digital Loss Group: 13`
	`Incoming Calling Number - Delete: Insert: Format:`
	`Bit Rate: 1200 Synchronization: async Duplex: full`
	`Disconnect Supervision - In? y Out? n`
	`Answer Supervision Timeout: 0`

Step	Description
	display trunk-group 19 Page 3 of 22 TRUNK FEATURES ACA Assignment? n Measured: both Wideband Support? n Maintenance Tests? y Data Restriction? n NCA-TSC Trunk Member: Send Name: n Send Calling Number: y Used for DCS? n Send EMU Visitor CPN? n Suppress # Outpulsing? y Format: public Outgoing Channel ID Encoding: preferred UUI IE Treatment: shared Maximum Size of UUI IE Contents: 128 Replace Restricted Numbers? n Replace Unavailable Numbers? n Send Connected Number: y Hold/Unhold Notifications? y Send UUI IE? y Modify Tandem Calling Number? n Send UCID? n BSR Reply-best DISC Cause Value: 31 Send Codeset 6/7 LAI IE? y Ds1 Echo Cancellation? n Apply Local Ringback? n US NI Delayed Calling Name Update? n Network (Japan) Needs Connect Before Disconnect? n display trunk-group 19 Page 6 of 22 TRUNK GROUP Administered Members (min/max): 1/5 GROUP MEMBER ASSIGNMENTS Total Administered Members: 5 Port Code Sfx Name Night Sig Grp 1: 01A1201 TN2464 C 19 2: 01A1202 TN2464 C 19 3: 01A1203 TN2464 C 19 4: 01A1204 TN2464 C 19 5: 01A1205 TN2464 C 19
3.	Enter the **display signaling-group** <number> to display the PSTN signaling-group configuration. display signaling-group 19 Page 1 of 5 SIGNALING GROUP Group Number: 19 Group Type: isdn-pri Associated Signaling? y Max number of NCA TSC: 5 Primary D-Channel: 01A1216 Max number of CA TSC: 5 Trunk Group for NCA TSC: 19 Trunk Group for Channel Selection: 19 X-Mobility/Wireless Type: NONE Supplementary Service Protocol: a

3.3. H.323 Trunks and Signaling Groups

The steps in this section create an H.323 IP trunk group to the QuesCom 400 IP/GSM.

Step	Description
1.	Enter the **change node-names ip** command. Specify the node name and IP address for the QuesCom 400. Observe the node name of the C-LAN card shown in bold. These node names will be used in the configuration of the H.323 signalling group in Step 4. `change node-names ip` Page 1 of 1 IP NODE NAMES Name / IP Address / Name / IP Address AEServer 10.1.10.20 Abacus 10.1.10.31 IPO412a_DC1 10.1.20.10 **Quescom 10.1.10.55** S8300a_DC1 10.1.30.10 S8500_Val1 10.1.10.14 SEServer 10.1.10.22 **clan1a_DC1 10.1.10.12** default 0.0.0.0 medpro1a_DC1 10.1.10.13 procr 10.1.10.10
2.	Enter the **add trunk-group n** command, where "n" is an available trunk group number. On Page 1 of the **trunk-group** form, configure the following: • **Group Type** – set to "isdn". • **Group Name** – enter a meaningful name/description. • **TAC** – enter a Trunk Access Code that is valid under the provisioned dial plan. • **Carrier Medium** – set to "H.323". • **Service Type** – set to "tie". `add trunk-group 27` Page 1 of 21 TRUNK GROUP Group Number: 27 **Group Type: isdn** CDR Reports: y **Group Name: H.323 Quescom** COR: 1 TN: 1 **TAC: 727** Direction: two-way Outgoing Display? n **Carrier Medium: H.323** Dial Access? y Busy Threshold: 255 Night Service: Queue Length: 0 **Service Type: tie** Auth Code? n Member Assignment Method: manual

Step	Description
3.	On the TRUNK FEATURES screen (Page 3 of the trunk-group form), set the **Send Name**, **Send Calling Number** and **Send Connected Number** to "y" and verify the **Format** is set to "public" as shown below. add trunk-group 27 Page 3 of 21 TRUNK FEATURES ACA Assignment? n Measured: none Internal Alert? n Maintenance Tests? y Data Restriction? n NCA-TSC Trunk Member: 1 **Send Name: y** **Send Calling Number: y** Used for DCS? n Send EMU Visitor CPN? n Suppress # Outpulsing? n **Format: public** UUI IE Treatment: service-provider Replace Restricted Numbers? n Replace Unavailable Numbers? n **Send Connected Number: y** Hold/Unhold Notifications? n
4.	Enter the **add signaling-group n** command, where "n" is an unused signalling group number. On Page 1 of the form, configure the following: • **Group Type** – set to "h.323". • **Trunk Group for Channel Selection** – enter the number of the trunk group configured in Step 2. • **Near-end Node Name** – enter the node name of a local C-LAN board from Step 1. • **Near-end Listen Port** – specify the local listen port, typically 1720. • **Far-end Node Name** – enter the node name of the QuesCom configured in Step 1. • **Far-end Listen Port** – specify the listen port, typically 1720. • **Direct IP-IP Audio Connections** – set to "n". add signaling-group 27 Page 1 of 5 SIGNALING GROUP Group Number: 27 **Group Type: h.323** Remote Office? n Max number of NCA TSC: 5 SBS? n Max number of CA TSC: 5 IP Video? n Trunk Group for NCA TSC: 27 **Trunk Group for Channel Selection: 27** Supplementary Service Protocol: a T303 Timer(sec): 10 **Near-end Node Name: clan1a_DC1** **Far-end Node Name: Quescom** **Near-end Listen Port: 1720** **Far-end Listen Port: 1720** Far-end Network Region: 1 LRQ Required? n Calls Share IP Signaling Connection? n RRQ Required? n H245 Control Addr On FACility? n Bypass If IP Threshold Exceeded? n H.235 Annex H Required? n DTMF over IP: out-of-band **Direct IP-IP Audio Connections? n** IP Audio Hairpinning? n Interworking Message: PROGress

Step	Description

5.	Enter the **change trunk-group n** command, where "n" is the trunk group number configured in Step 2. On Page 3 of the **trunk-group** form, configure the following:
	• "IP" for **Port**. The number of ports configured should be coordinated with the number of SIM cards available in the QuesCom 400 gateway.
	• The number of the signaling group configured in Step 3 for **Sig Grp**.
	
	`change trunk-group 27 Page 5 of 21`
	`TRUNK GROUP`
	`Administered Members (min/max): 1/10`
	`GROUP MEMBER ASSIGNMENTS Total Administered Members: 10`
	
	`Port Name Night Sig Grp`
	`1: IP 27`
	`2: IP 27`
	`3: IP 27`
	`4: IP 27`
	`5: IP 27`

3.4. ARS Tables and Route Patterns

In the sample configuration described in these Application Notes, when placing outbound calls to the public network, stations on Avaya Communication Manager must first dial the ARS Feature Access Code (FAC) before dialing an external number. The single digit "9" was used as the ARS FAC in the compliance-tested configuration (configuration step not shown).

Step	Description

1.	Enter the **change ars analysis** 0 command. Configure **Dialed String** entries according to customer requirements. In the example below, the entries match dialed numbers as follows:
	• The "078" **Dialed String** matches 11-digit dialed numbers that begin with 078, and routes calls to **Route Pattern 78**. For example, a dialed number of 07891 900 128 would be matched by this entry.
	
	`change ars analysis 0 Page 1 of 2`
	`ARS DIGIT ANALYSIS TABLE`
	`Location: all Percent Full: 0`
	
	`Dialed Total Route Call Node ANI`
	`String Min Max Pattern Type Num Reqd`
	`01 11 11 9 pubu n`
	`078 11 11 78 pubu n`
	`079 11 11 79 pubu n`
	`123 3 3 9 pubu n`
	`n`

Step	Description
2.	Enter the **change route-pattern n** command, where "n" is the route pattern that processes dialed numbers configured in Step 1. Add two routing preference entries as follows: 1) First Routing Preference – H.323 IP trunk to QuesCom 400 • **Grp No** – enter the trunk group number routed to the QuesCom 400 gateway (see Section 3.3, Step 2) • **FRL** - assign a Facility Restriction Level to this routing preference. • **LAR** - set Look Ahead Routing to "**next**" to rehunt within the next routing preference if calls are rejected. LAR allows Avaya Communication Manager to re-attempt the call on another channel if the call is rejected with certain cause values. 2) Second Routing Preference – PSTN E1 ISDN-PRI • **Grp No** – enter the trunk group that contains trunk members from the PSTN E1 ISDN-PRI (see Section 3.2 Step 2). • **FRL** - assign a Facility Restriction Level to this routing preference.

```
change route-pattern 78                                        Page   1 of   3
                  Pattern Number: 78  Pattern Name: Quescom H.323
                           SCCAN? n     Secure SIP? n
    Grp FRL NPA Pfx Hop Toll No.  Inserted                          DCS/ IXC
    No          Mrk Lmt List Del  Digits                            QSIG
                           Dgts                                     Intw
 1: 27   0                                                           n   user
 2: 19   0                                                           n   user
 3:                                                                  n   user
 4:                                                                  n   user
 5:                                                                  n   user
 6:                                                                  n   user

     BCC VALUE  TSC CA-TSC    ITC BCIE Service/Feature PARM  No. Numbering LAR
    0 1 2 3 4 W     Request                                    Dgts Format
                                                            Subaddress
 1: y y y y y n  n            rest                                      next
 2: y y y y y n  n            rest                                      none
 3: y y y y y n  n            rest                                      none
 4: y y y y y n  n            rest                                      none
 5: y y y y y n  n            rest                                      none
 6: y y y y y n  n            rest                                      none
```

3.5. Avaya Extension to Cellular(EC500) Configuration

Avaya Extension to Cellular allows a cell phone to be treated as if it were an extension defined in Avaya Communication Manager. This is accomplished by mapping the user's main office phone to the cellular telephone number. All other types of calls, such as direct calls to and from the published cell phone number, are unaffected by Extension to Cellular.

Step	Description
1.	Verify that the Avaya Communication Manager license has permissions for EC500 extensions. Enter the command **display system-parameters customer-options**. On the OPTIONAL FEATURES screen, verify that the **Maximum Off-PBX Telephones - EC500** is sufficient.
2.	Enter the **display system-parameters customer-options** command. On the OPTIONAL FEATURES screen, ensure that **Enhanced EC500?** is set to "y" as shown below.

```
display system-parameters customer-options                      Page   1 of  11
                              OPTIONAL FEATURES

     G3 Version: V13
       Location: 2                          RFA System ID (SID): 1
       Platform: 12                         RFA Module ID (MID): 1

                                                          USED
                              Platform Maximum Ports: 3200  259
                                   Maximum Stations: 2400  209
                              Maximum XMOBILE Stations: 2400  0
                    Maximum Off-PBX Telephones - EC500: 2400  1
                    Maximum Off-PBX Telephones -   OPS: 2400  32
                    Maximum Off-PBX Telephones - SCCAN: 2400  0
```

```
display system-parameters customer-options                      Page   4 of  11
                              OPTIONAL FEATURES

   Emergency Access to Attendant? y                               IP Stations? y
            Enable 'dadmin' Login? y                Internet Protocol (IP) PNC? n
            Enhanced Conferencing? y                          ISDN Feature Plus? n
                  Enhanced EC500? y             ISDN Network Call Redirection? n
    Enterprise Survivable Server? n                            ISDN-BRI Trunks? n
       Enterprise Wide Licensing? n                                   ISDN-PRI? y
              ESS Administration? n                Local Survivable Processor? n
          Extended Cvg/Fwd Admin? y                      Malicious Call Trace? n
     External Device Alarm Admin? n                   Media Encryption Over IP? n
  Five Port Networks Max Per MCC? n     Mode Code for Centralized Voice Mail? n
                Flexible Billing? n
   Forced Entry of Account Codes? n                   Multifrequency Signaling? y
      Global Call Classification? y Multimedia Appl. Server Interface (MASI)? n
             Hospitality (Basic)? y          Multimedia Call Handling (Basic)? n
 Hospitality (G3V3 Enhancements)? n       Multimedia Call Handling (Enhanced)? n
                        IP Trunks? y
```

Step	Description

3.	Enter the **change off-pbx-telephone configuration-set n**, command, where "n" is an available configuration set number. Enter a descriptive name for the **Configuration Set Description**. The rest of the parameters can be left with default values.
	
	`change off-pbx-telephone configuration-set 2 Page 1 of 1`
	`CONFIGURATION SET: 2`
	`**Configuration Set Description: H323**`
	`Calling Number Style: network`
	`CDR for Origination: phone-number`
	`CDR for Calls to EC500 Destination? y`
	`Fast Connect on Origination? n`
	`Post Connect Dialing Options: dtmf`
	`Cellular Voice Mail Detection: none`
	`Barge-in Tone? n`
	`Calling Number Verification? y`
	`Identity When Bridging: principal`

4.	Enter the **change off-pbx-telephone station-mapping n**, command where "n" is the station that will be mapped to the cell phone. In the example below station "10000" is mapped to cell number "07891900128"
	• **Station Extension** – set to the office extension that will be mapped to the cell number.
	• **Application** – enter "EC500".
	• **Phone Number** – enter the cell phone number.
	• **Trunk Selection** – specify the outgoing trunk selection to "ars".
	• **Configuration Set** – enter the number of the configuration set configured in Step 3.
	
	`change off-pbx-telephone station-mapping 10000 Page 1 of 2`
	`STATIONS WITH OFF-PBX TELEPHONE INTEGRATION`
	`Station Application Dial Phone Number Trunk Configuration`
	`Extension Prefix Selection Set`
	`**10000 EC500 - 07891900128 ars 2**`
	`-`
	`-`

5.	Outside callers may use the QuesCom 400 to reach Avaya Communication Manager extensions by first calling a SIM card number on the QuesCom 400. The QuesCom 400 may be configured to directly route incoming calls from the SIM card to a specific extension on Avaya Communication Manager. If the extension is a Vector Directory Number (VDN), the vector associated with the VDN may then prompt and collect digits from the caller. Alternatively, the QuesCom 400 may be configured to prompt the caller to enter digits. The QuesCom 400 then forwards the call to Avaya Communication Manager with the Called Party Number set to the entered digits.

Step	Description
6.	Enter the **change off-pbx-telephone feature-name-extensions** and enter extensions to be associated with Avaya Communication Manager features. For example, **Idle Appearance Select** can be used by an EC500 cell phone to make a call from an idle call appearance on the mapped office extension.

```
change off-pbx-telephone feature-name-extensions               Page   1 of   1
     EXTENSIONS TO CALL WHICH ACTIVATE FEATURES BY NAME

     Active Appearance Select: 10600           Idle Appearance Select: 10617
          Automatic Call Back: 10601               Last Number Dialed: 10618
   Automatic Call-Back Cancel: 10602             Malicious Call Trace:
            Call Forward All: 10603      Malicious Call Trace Cancel:
  Call Forward Busy/No Answer: 10604              Off-Pbx Call Enable: 10621
          Call Forward Cancel: 10605             Off-Pbx Call Disable: 10622
                   Call Park: 10606                   Priority Call: 10623
        Call Park Answer Back: 10607                  Send All Calls: 10624
                Call Pick-Up: 10608            Send All Calls Cancel: 10625
         Conference on Answer: 10609              Transfer On Hang-Up: 10626
         Calling Number Block: 10610           Transfer to Voice Mail: 10627
       Calling Number Unblock: 10611         Whisper Page Activation: 10628
        Directed Call Pick-Up: 10612
        Drop Last Added Party: 10613
    Exclusion (Toggle On/Off): 10614
   Extended Group Call Pickup:
       Held Appearance Select: 10616
```

4. Configure the QuesCom 400 IP/GSM

This section describes the steps for configuring the QuesCom 400 gateway. The steps are provided for illustration only; users should consult with Quescom for specific instructions.

4.1. QuesCom Server Configuration

Step	Description
1.	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.

```
C:\> telnet 192.168.1.1
login: administrator
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.

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

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

Enter "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 gateway.

```
Setting up SmartIAD components...

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

Enter IP address for the QuesCom 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 press enter to choose default.
	`Enter the SmartIAD subnet mask [255.255.255.0]:` `The SmartIAD subnet mask: 255.255.255.0`
	Enter default Gateway IP address.
	`Enter the SmartIAD default Gateway [192.168.10.1]: **10.1.10.1**` `The SmartIAD default Gateway: 10.1.10.1`
	Enter "2" for United Kingdom

	`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`

	Enter "0" for the server to operate in Stand-Alone mode.

	`Enter the 'Call Server' mode [0]:`
	`0 Stand-Alone mode`
	`1 Relay mode`
	`> **0**`
	`Call Server mode: Stand-Alone`

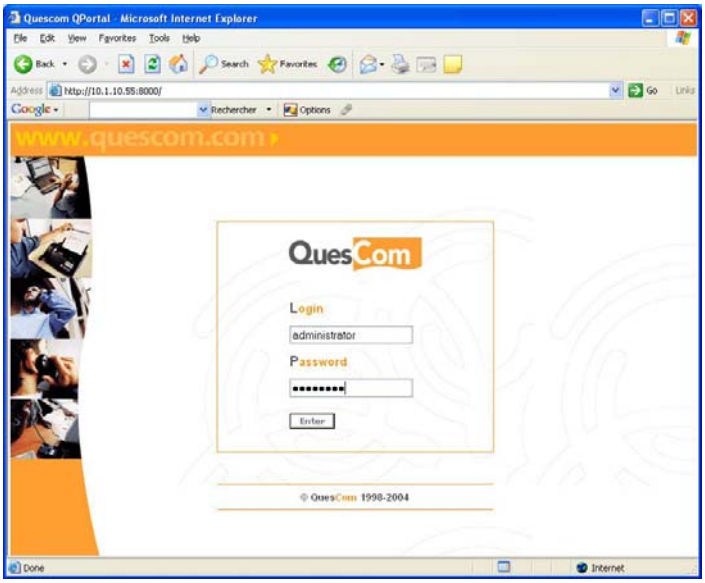
	Enter Company Name. This can be any alphanumeric name.
	`Enter Company Name []: **Avaya**`
	Enter "0" to select the H.323 protocol.

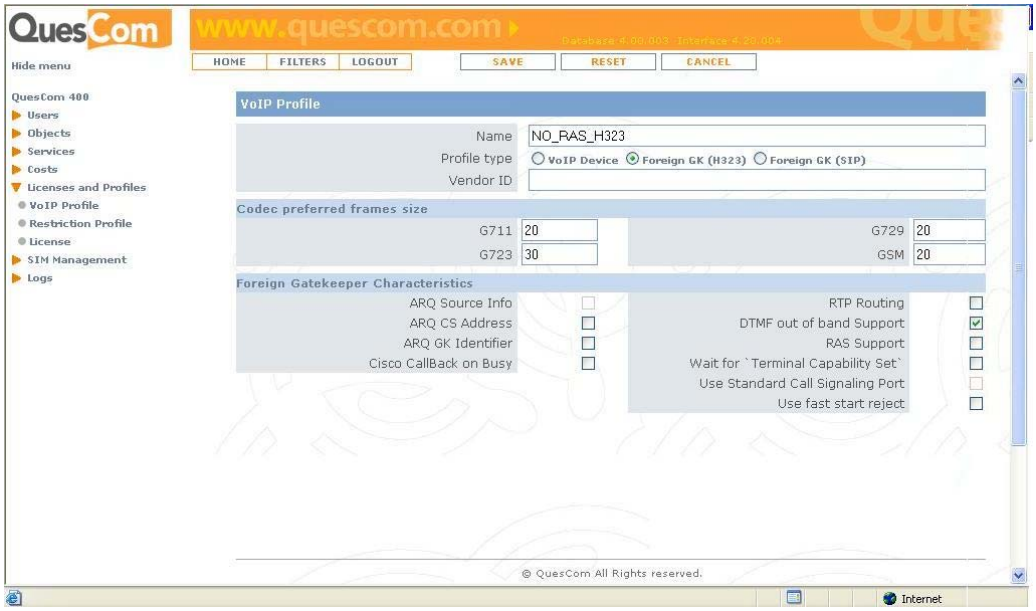
	`Select the VoIP Protocol to use[0]:`
	`0 H.323`
	`1 SIP`
	`> **0**`
	`VoIP Protocol: H.323`

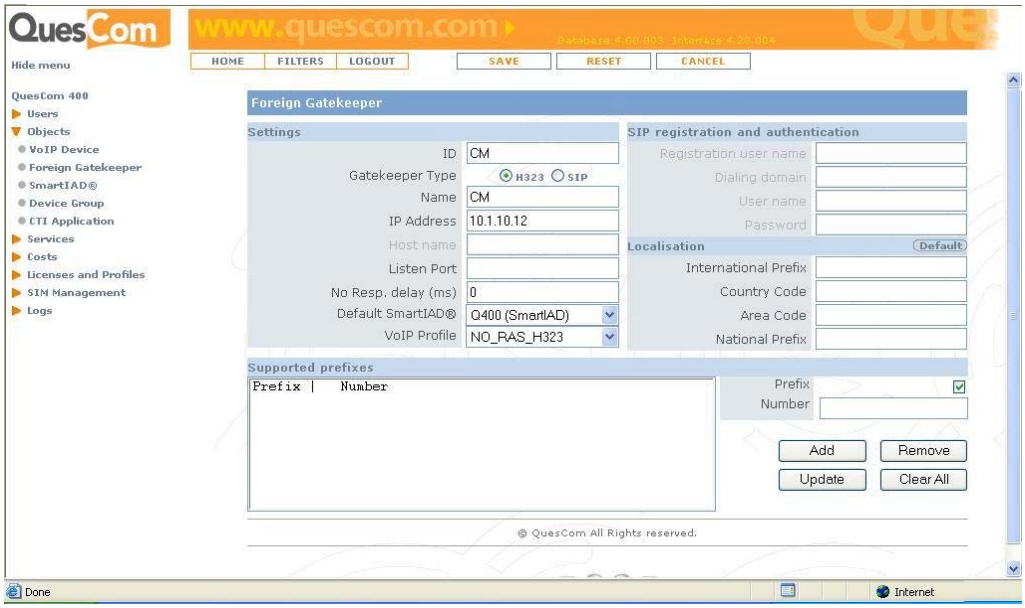
	Enter "N" as the QuesCom 400 IP/GSM does not need to register to a GateKeeper in this configuration.
	`Does the QuesCom IP/GSM need to register to a GateKeeper [Y/N]: **N**`

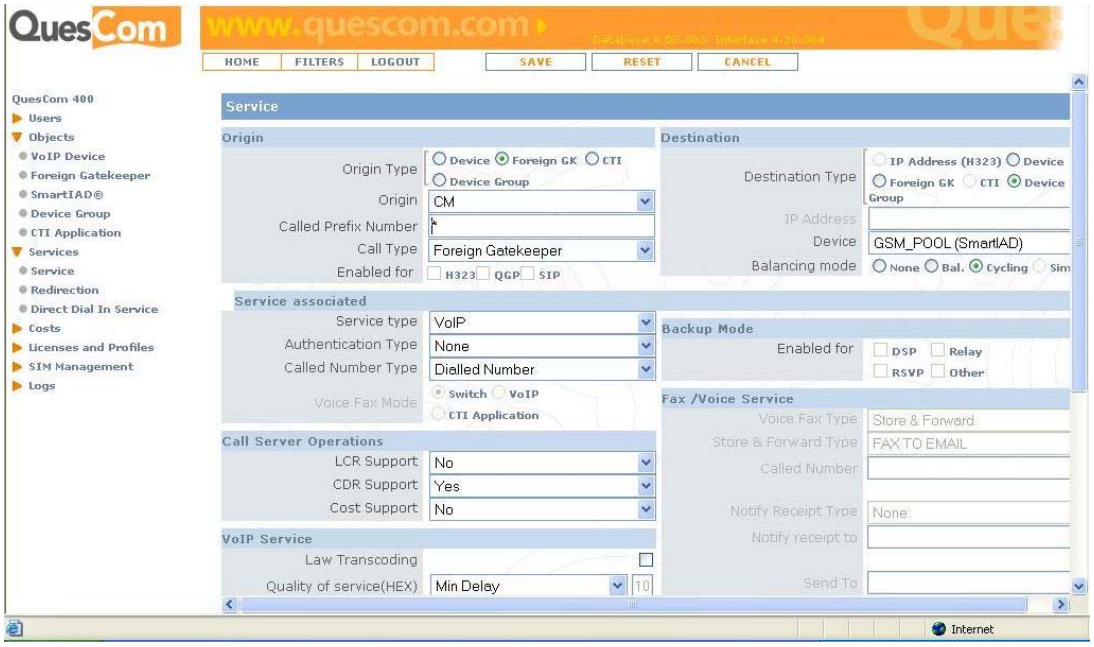
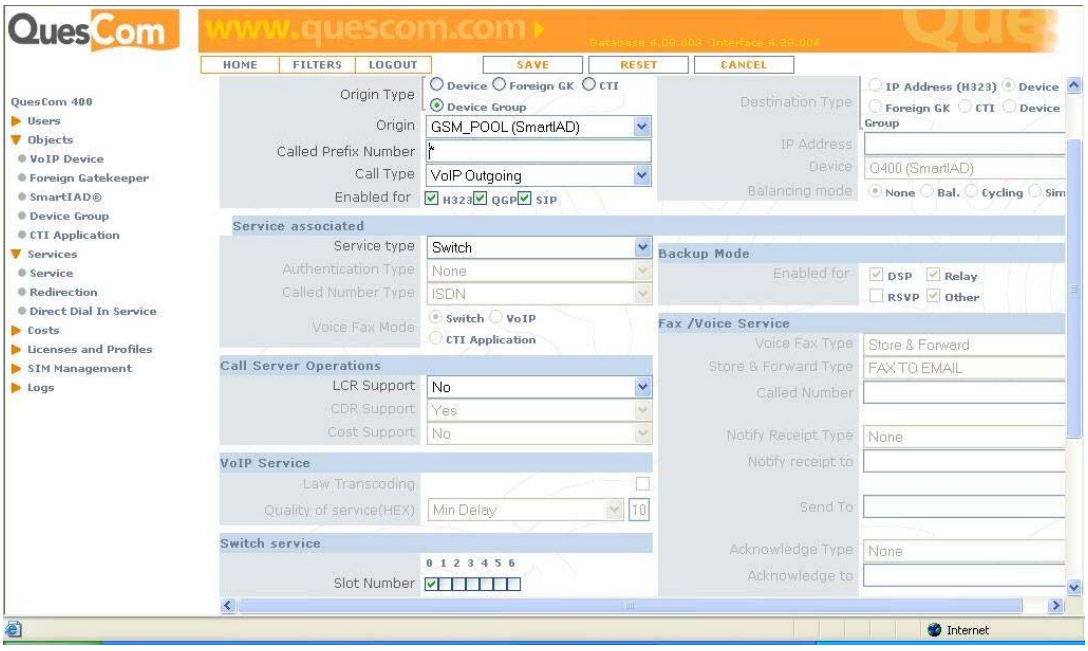
Step	Description
	Enter the name for Avaya Communication Manager C-LAN board.
	Enter the name of the H.323 Gateway: **CM** H.323 Gateway name: CM
	Enter the IP address for Avaya Communication Manager C-LAN board.
	Enter the IP Address of the VoIP Gateway: **10.1.10.12** VoIP Gateway IP Address: 10.1.10.12
	Follow the instruction and press any key to continue.
	Selected parameters for Quick setup mode are: SmartIAD Network Name: Q400 The SmartIAD IP address: 10.1.10.55 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 = CM H.323 Gateway IP Address = 10.1.10.12 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 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**.

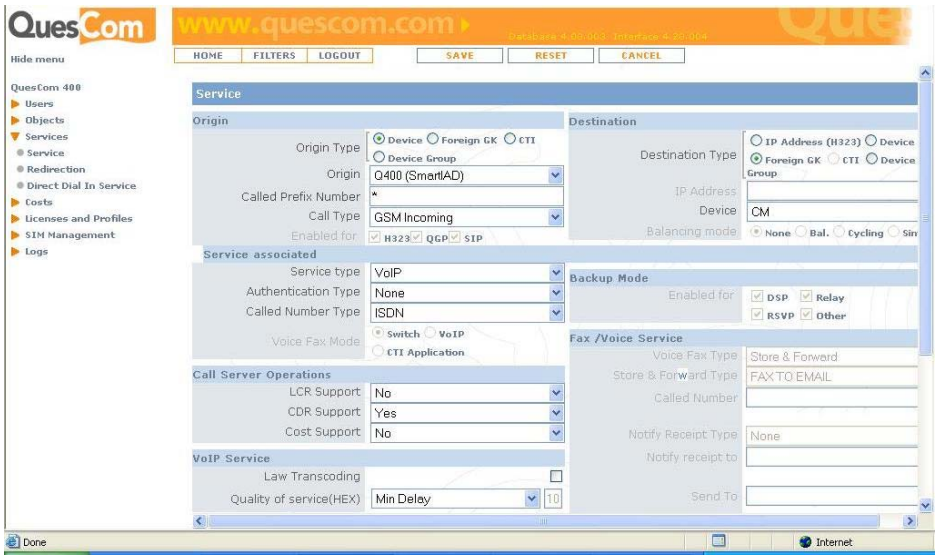
4.2. QuesCom Routing Configuration

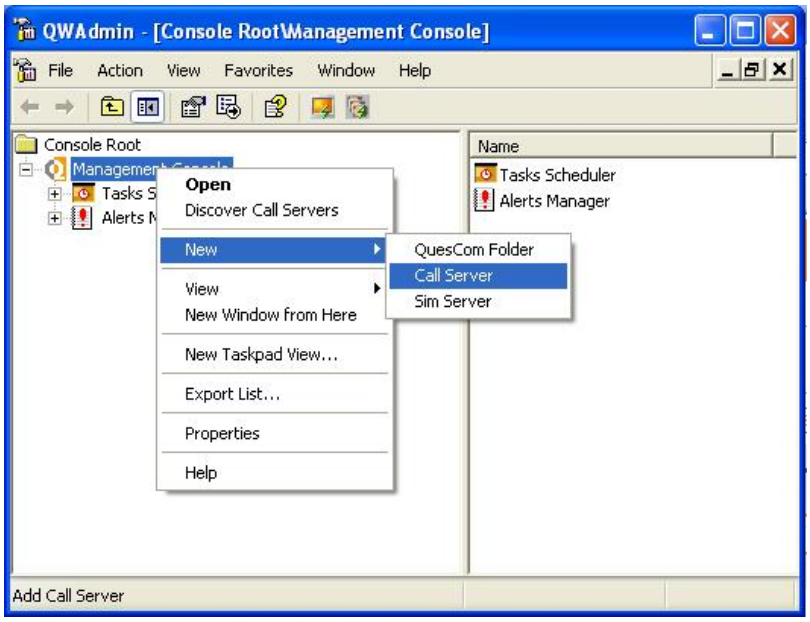
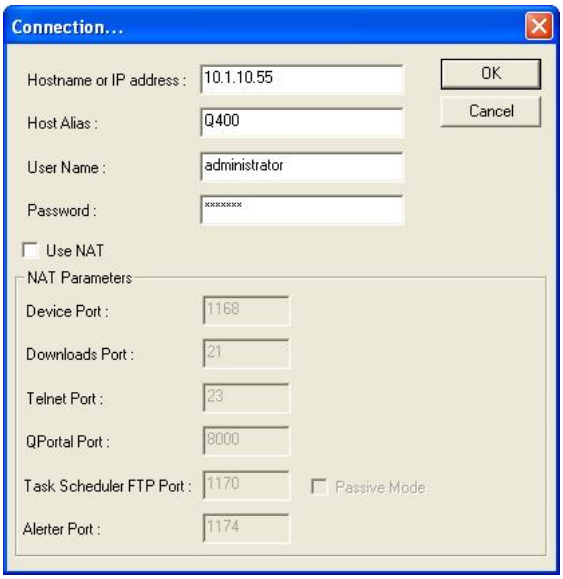
Step	Description
1.	Open a web browser from the management PC and enter the following URL http://<QuesCom gateway IPaddress:8000>. For this configuration "http://10.1.10.55:8000" was entered. Log in using the appropriate user name and password. 
2.	On the left hand side of the screen under the QuesCom 400 menu. Click on **Licenses and Profiles → VoIP Profile**. A default entry is created with **Name** "NO_RAS_H323" due to the initial configuration in Section 4.1. Click on the pencil(edit) button next to the "NO_RAS_H323" record. 

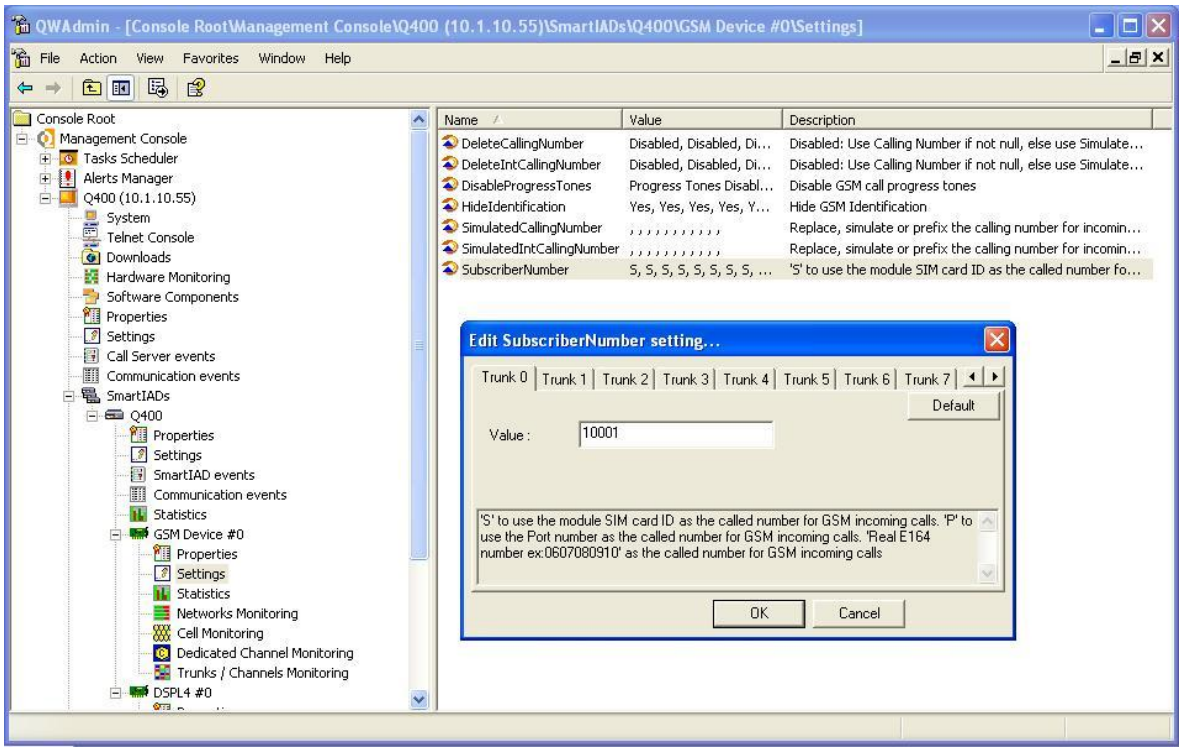
Step	Description
3.	The following screen is presented for illustration. Default values may be retained on the VoIP Profile screen below. 
4.	On the left hand side of the screen under the QuesCom 400 menu, click on **Objects → Foreign Gatekeeper**. An entry with the **ID** "CM" and the IP address of Avaya Communication Manager C-LAN board is created due to the initial configuration in Section 4.1. Click on the pencil (edit) button next to the "CM" record. 

Step	Description
5.	Verify the **VoIP Profile** is set to "NO_RAS_H323". No other changes need to be made to the default values on the Foreign Gatekeeper screen below. 
6.	Click on **Services → Service**. Four entries are present by default. **ID** "3" is created by default and is routing for calls from Avaya Communication Manager to the QuesCom 400 gateway. **ID** "4" is routing of outbound calls from the QuesCom 400 gateway to the GSM network. Click on the pencil (edit) button next to **ID** "3" record. 

Step	Description
7.	Verify the **Call Type** is set to "Foreign Gatekeeper". No other changes need to be made to the default values for the record **ID** 3 on the Service screen below. 
8.	From the screen shown in Step 6, click the pencil (edit) button next to ID "4". Verify the **Call Type** is set to "VoIP Outgoing". No other changes need to be made to the default values for the record **ID** 4 on the Service screen below. 

Step	Description
9.	Routing of inbound calls to the QuesCom 400 gateway from the GSM network is created by clicking on the **ADD RECORD** button on the main Service screen shown in 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 "*" • **Call Type –** select "GSM Incoming" • **Service type –** select "VoIP" • **Destination Type –** select radio button "Foreign GK" • **Device –** select "CM" The other parameters can be left with default values. Click on Save. 
10.	The inbound call route pattern added in Step 9 can be displayed on the main Service screen by clicking on **Services → Service**. 

Step	Description
11.	From the management PC shown in **Figure 1,** launch the QuesCom 400 QWA management console by clicking **Start → Programs → QuesCom → QuesCom Management Console**. Right click on **Management Console** and click **New → Call Server**. 
12.	In the Connection dialog, configure the following, and click **OK**: • **Hostname or IP address** – enter the IP address of the QuesCom 400 gateway • **Host Alias** – enter a descriptive name for the QuesCom 400 gateway • **User Name** and **Password** 

Step	Description
13.	Expand the Management Console tree by clicking on **Q400(10.1.10.55) → SmartIADs → Q400 → GSM Device #0 → Settings → SubscriberNumber**. In the **Edit SubscriberNumber** setting dialog box, click on the Trunk 0 tab and enter the extension that incoming calls will be routed to in the **Value** field. Replicate this field for all Trunk tabs 1 to 12 and click **OK**. Right click on **Q400** under **SmartIADs** and click on **Save** configuration, then right click back on **Q400** and click on **Stop**. Right click Q400 and click on **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 the QuesCom 400.

5.1. General Test Approach

The general approach was to place inbound and outbound calls through the QuesCom 400 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, and the QuesCom 400 decides on the least cost routing and routes the call to the GSM network.
- When the landline is out of service, all outbound calls can successfully be routed via the QuesCom 400 if need be.
- If the landline is operational, then Avaya Communication Manager will successfully re-route calls rejected by the QuesCom 400 to the landline. This can be configured to occur for various reasons, such as no more free minutes left on the SIM cards.
- Inbound calls from the GSM network to the QuesCom 400 are successfully forwarded to Avaya Communication Manager using both direct routing (mapping of a SIM card phone number to an Avaya Communication Manager extension) and post-dialing (SIM card answers an inbound call and upon a prompt, the external caller enters an Avaya Communication Manager extension).
- Transfers and conferences between Avaya Communication Manager stations complete properly on outbound and inbound calls routed through the QuesCom 400.

5.2. Test Results

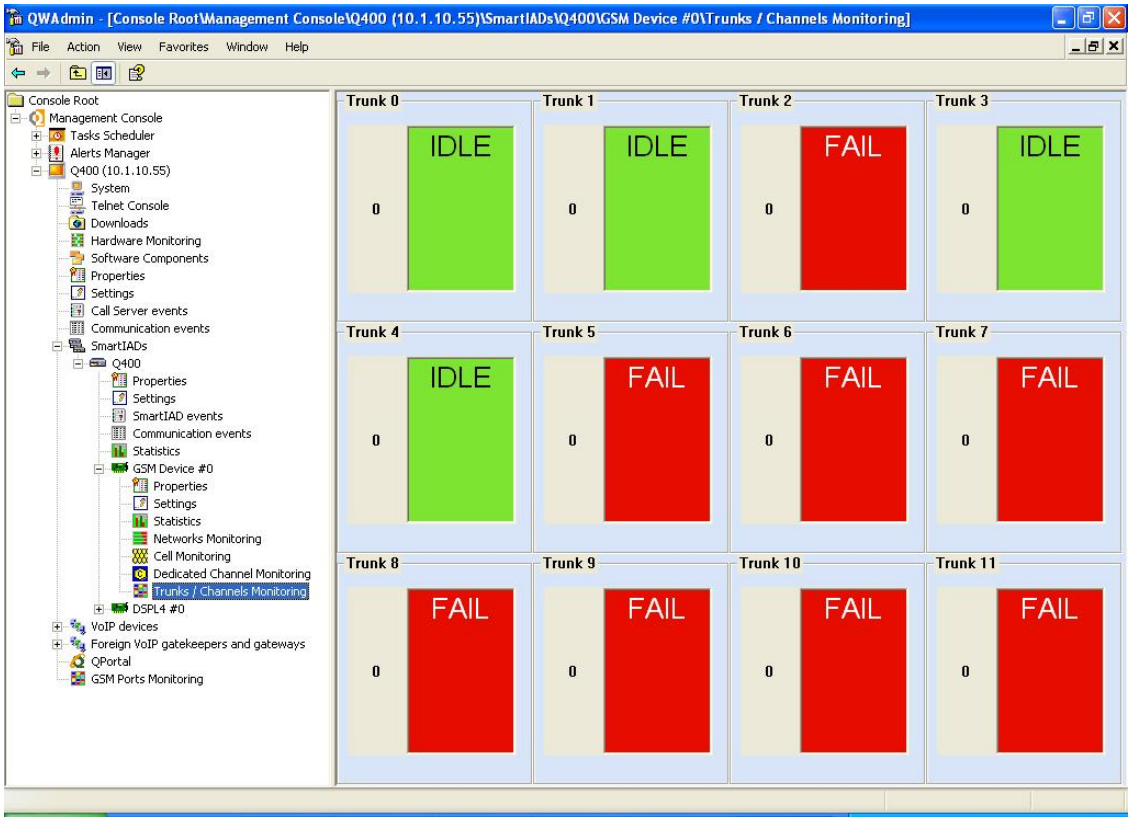
The test objectives of Section 5.1 were verified. For serviceability testing, outbound and inbound calls routed through the QuesCom 400 complete successfully after recovering from failures such as Ethernet cable disconnects, and resets of Avaya Communication Manager and the QuesCom 400.

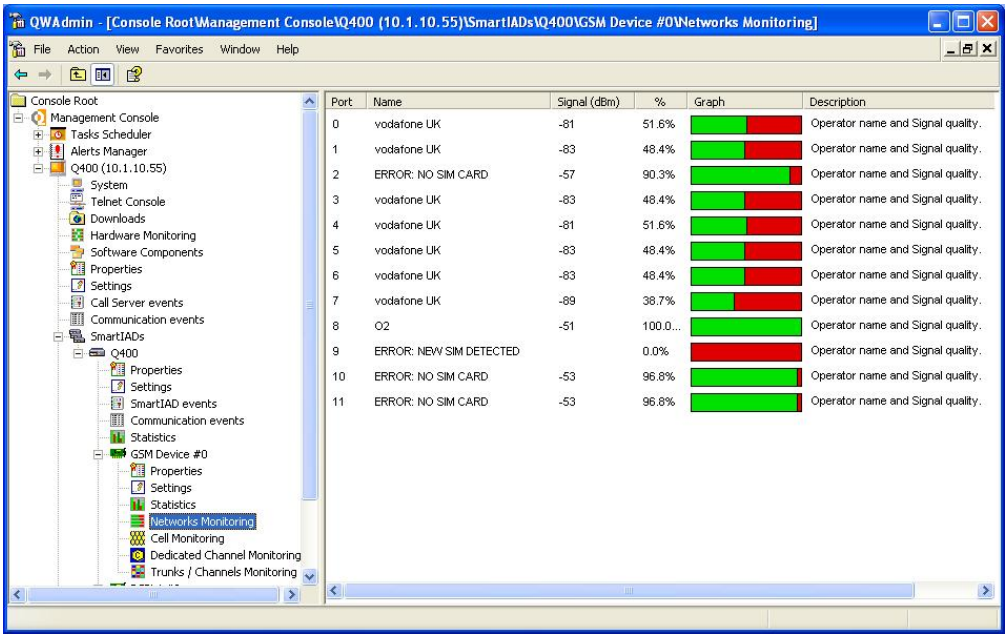
The following are observations obtained from testing Avaya Extension to Cellular (EC500) with QuesCom 400:

- Calls placed to EC500-enabled telephones on Avaya Communication Manager were successfully extended to EC500-mapped external wireless telephones through the QuesCom 400.
- EC500-mapped external wireless telephones successfully placed calls to Avaya Communication Manager telephones through the QuesCom 400, and the displays of the answering telephones showed the name and extensions of the corresponding EC500-enabled telephones as the calling party.
- Avaya Extension to Cellular Feature Name Extensions were verified. For example, EC500-mapped external wireless telephone callers successfully activated the Exclusion, Idle Appearance Select, and Transfer on Hangup EC500 features through the QuesCom 400 by dialing the corresponding EC500 Feature Name Extensions.

6. Verification Steps

This section provides the tests that can be performed to verify proper configuration of Avaya Communication Manager and QuesCom 400.

Step	Description
1.	From the SAT, enter the command **status signaling-group s**, where s is the number of a signaling group configured in Section 3.3, and verify that the Group State is "in service". From the SAT, enter the command **status trunk-group t**, where t is the number of a trunk group configured in Section 3.3, and verify that the Service States of all trunks are "in-service/idle" or "in-service/active".
2.	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
3.	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. 

7. Support

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

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

8. Conclusion

These Application Notes describe the configuration steps required for QuesCom IP/GSM 400 to successfully interoperate with Avaya Communication Manager 3.1 using H.323 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.

The following Avaya Documents are available at http://support.avaya.com

- Administrator Guide for Avaya Communication Manager, Document ID 03-300509, Issue 2, Feb 2006.
- Administration for Network Connectivity for Avaya Communication Manager, Document ID 555-233-504, Issue 11, Feb 2006.

The following documents can be obtained from QuesCom.

- 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

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.