



Avaya Solution & Interoperability Test Lab

Application Notes for configuring Capita Secure Information Solutions DS3000 with Avaya IP Office R9.0 using SIP Trunks - Issue 1.0

Abstract

These Application Notes describe the configuration steps for provisioning Capita Secure Information Solutions DS3000 to interoperate with Avaya IP Office R9.0.

Readers should pay particular attention to the scope of testing as outlined in Section 2.1, as well as observations noted in Section 2.2 to ensure that their own use cases are adequately covered by this scope and results.

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 configuration steps for provisioning DS3000 from Capita Secure Information Solutions to interoperate with Avaya IP Office R9.0 using SIP trunks to make calls between the DS3000 and the Avaya IP Office. The DS3000 is an Integrated Communication Control System that is used by emergency service customers for answering 999/112 calls and then from the same application using radio communication (TETRA digital radio or analogue PMR) to pass details to mobile resources.

As a radio dispatch deployment with basic PTN/PSTN the DS3000 acts as an end Private Branch Exchange (PBX) and performs call prioritisation and distribution to DS3000 operators as defined by the profile in which they have logged in to the DS3000 application. In this type of configuration the DS3000 has one primary connection to the Avaya IP Office, a SIP connection over SIP trunks. The DS3000 supports basic call control including hold and transfer.

2. General Test Approach and Test Results

The interoperability compliance testing evaluates the ability of the DS3000 application to make and receive calls to and from IP Office endpoints. All calls destined for the DS3000 both locally and from the PSTN are routed to the DS3000 over SIP trunks between the DS3000 and IP Office.

DevConnect Compliance Testing is conducted jointly by Avaya and DevConnect members. The jointly-defined test plan focuses on exercising APIs and/or standards-based interfaces pertinent to the interoperability of the tested products and their functionalities. DevConnect Compliance Testing is not intended to substitute full product performance or feature testing performed by DevConnect members, nor is it to be construed as an endorsement by Avaya of the suitability or completeness of a DevConnect member's solution.

2.1. Interoperability Compliance Testing

The interoperability compliance testing focuses on various technical testing scenarios to verify the usage of DS3000 with the Avaya solution. In addition, serviceability tests were also performed to assess the reliability and accuracy of the joint solution. The testing focused on the following types of calls:

- **Calls to IP Office Endpoints** – Ensure that calls can be made to IP Office extensions from the DS3000.
- **Calls to DS3000 Operators**– Ensure that calls can be made to the DS3000 operators from IP Office extensions.
- **Calls to PSTN from DS3000 Operators** – Ensure that calls can be made from the DS3000 to PSTN across the SIP trunk through IP Office.
- **Calls from PSTN into DS3000 Operators** – Ensure that calls can be made to the DS3000 from the PSTN by calling into IP Office and across the SIP trunk to the DS3000.
- **Hold/transfer and conference functionality**– Verify that calls can be placed on hold and transferred and conferenced.
- **Caller information is preserved on all calls to/from DS3000** – Ensure that the correct CLID information is preserved.
- **Failover testing** – Verify the behaviour of DS3000 application under different simulated LAN failure conditions on the Avaya platform.

Note: All test cases were performed using the following set types:

- Ext 4201 (2420 Digital deskphone).
- Ext 4210 (Analog deskphone).
- Ext 4220 (9630 H323 deskphone).

2.2. Test Results

All test cases passed with the following issue observed.

1. If an IP Office phone calls to Operator A and wishes to be transferred to Operator B – Using the “Transfer PABX” function on the DS3000 Operators console transfer of the call cannot be completed – using standard “Trans Call” functionality on the DS3000 Operators console works perfectly.
2. When transferring to an IP Office set that is CFNA to voicemail- when the operator then hears VM and decides to go back to the original caller – the call to the voicemail appears not to drop and that call remains up. A CANCEL or BYE is not sent by the DS3000. This is because the DS3000 does not send a BYE during a “recall” once the call has been answered.
3. DS3000 does not support SIP updates and when a call is transferred the CLID is not updated upon completion of the transfer.

2.3. Support

Support from Avaya is available by visiting the website <http://support.avaya.com> and a list of product documentation can be found in **Section 9** of these Application Notes. Technical support for the Capita DS3000 product can be obtained as follows.

- Tel : + 44 (0) 8456 041999
- Email: csis.info@capita.co.uk

3. Reference Configuration

Figure 1 shows the setup for compliance testing Capita's DS3000 with IP Office using SIP signalling over SIP trunks to pass callers from IP Office extensions to the DS3000 Operators.

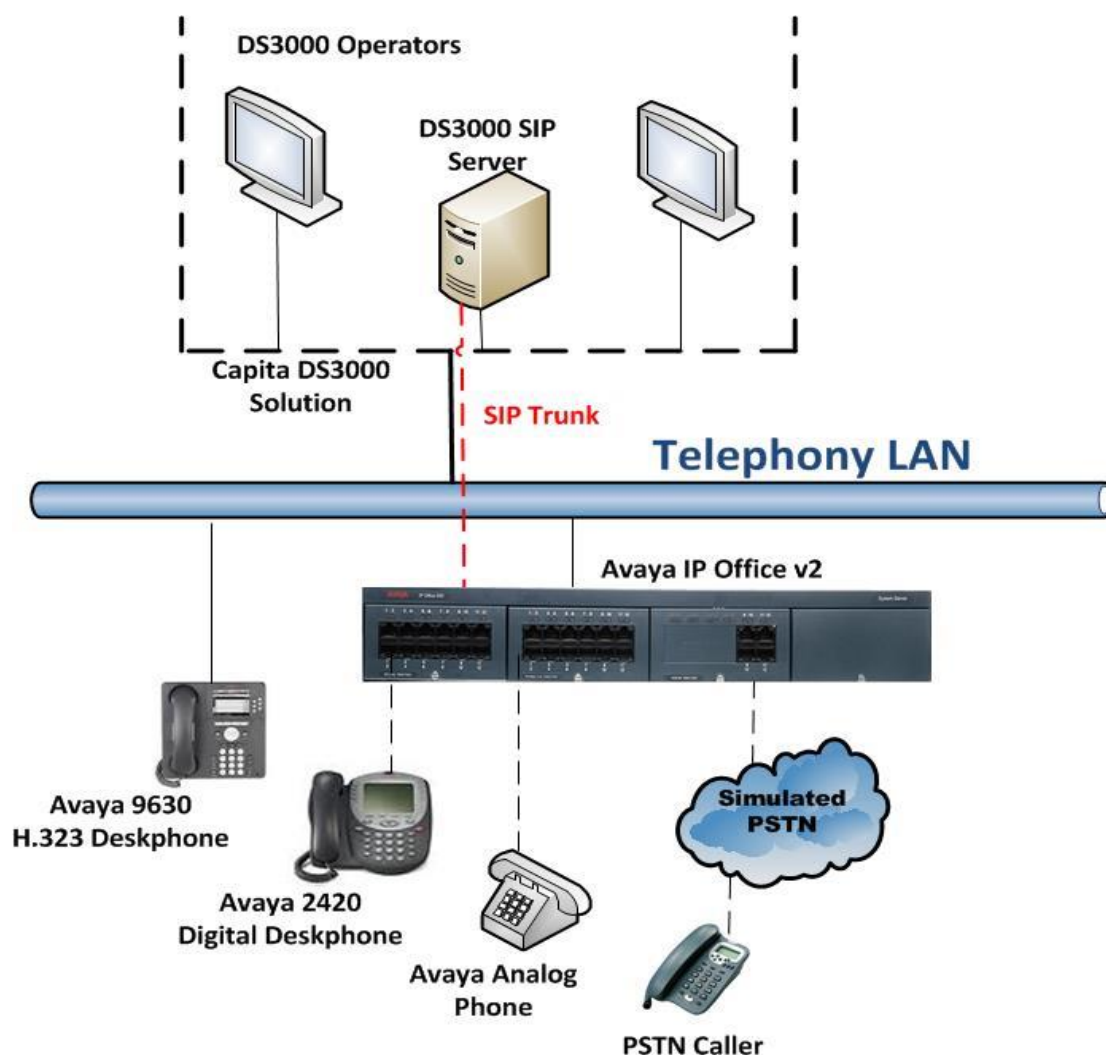


Figure 1: Connection of Capita DS3000 with Avaya IP Office R9.0

4. Equipment and Software Validated

The following equipment and software was used for the compliance test.

Device Description	Versions Tested
Avaya IP Office V2	R9.0 build 946
Avaya 9620 H323 Deskphone	H.323 Release s3.186a
Avaya 2420 Digital Deskphone	R2.5
Avaya Analog Phone	N/A
Capita DS3000 Solution Kit (DSX Converged Versions)	Release 2x Series
- Aculab Dual Redundant SIP Server	V6.5.13

5. Configure Avaya IP Office

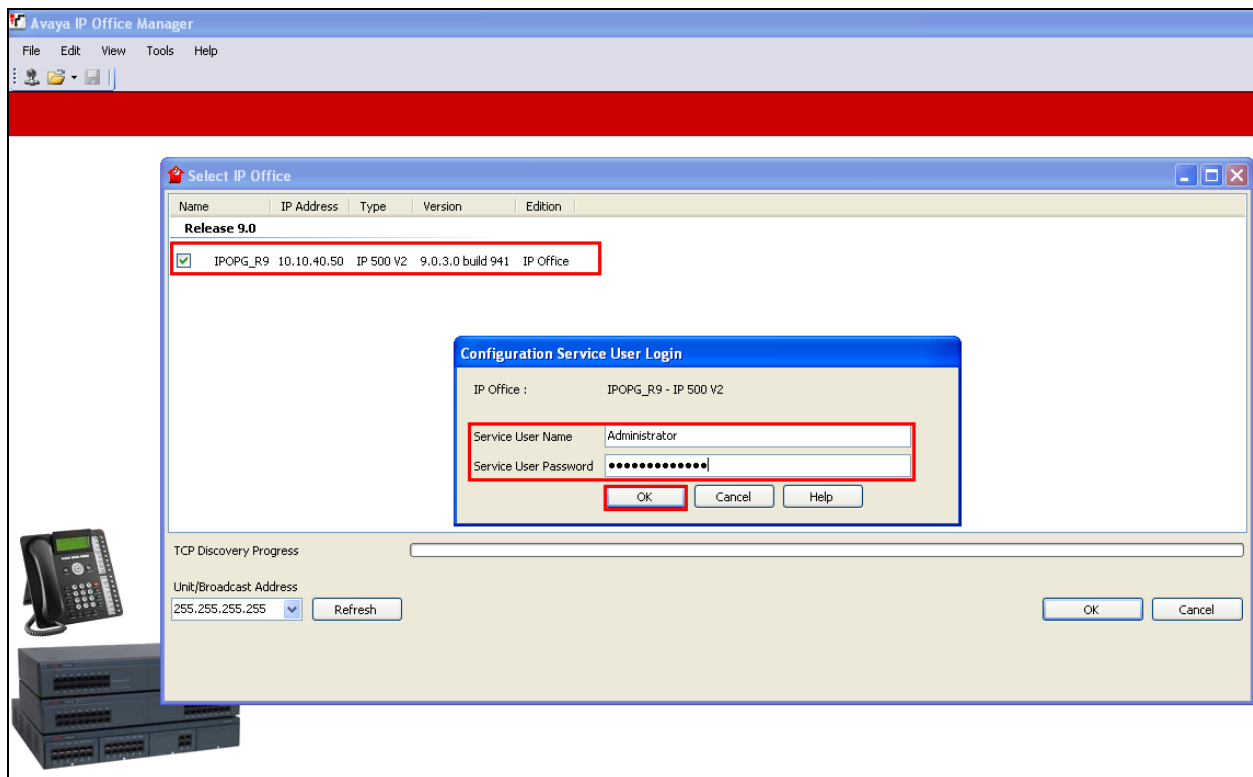
It is assumed that a fully functioning IP office is in place with the necessary licensing. The configuration and verification operations illustrated in this section were all performed using Avaya IP Office Manager. The information provided in this section describes the configuration of IP Office for this solution. For all other provisioning information such as initial installation and configuration, please refer to the product documentation in **Section 9**. The configuration operations described in this section can be summarized as follows:

- Launch Avaya IP Office Manager
- Configure SIP Trunks
- Configure Short Codes
- Save Configuration

Note: The configuration of PSTN trunks and routes are outside the scope of these Application Notes.

5.1. Launch Avaya IP Office Manager

Open the Avaya IP Office Manager by double clicking on the shortcut (not shown). The **Select IP Office** window is opened, showing the IP Office that is available to connect to. Tick the IP Office and enter the correct credentials and click on **OK**.



5.2. Configure SIP Trunks

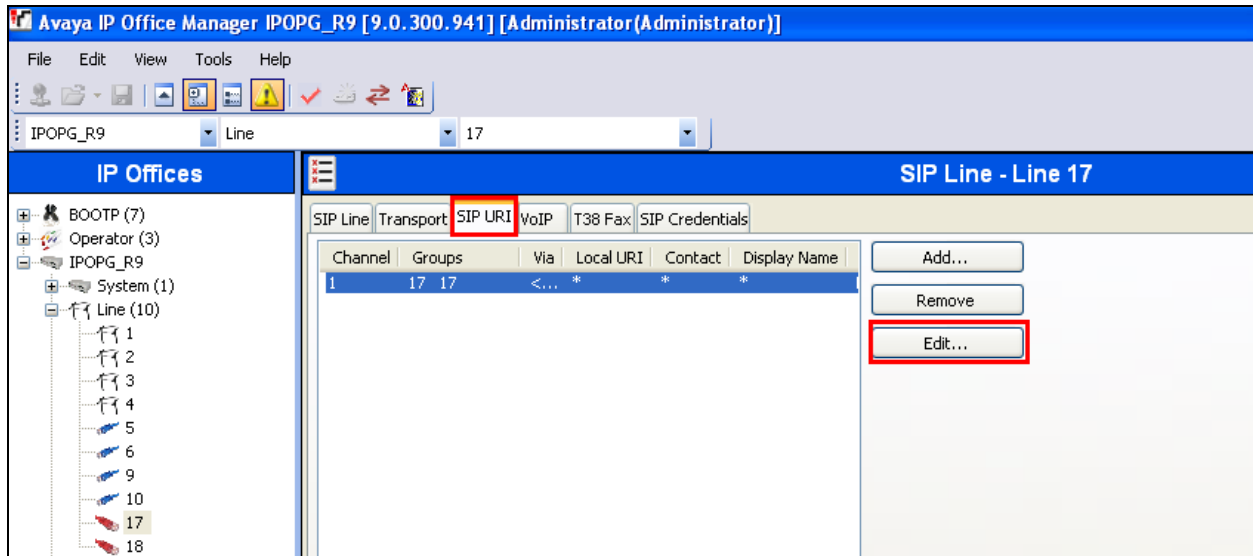
In the left window select the IP Office system (**IPOPG_R9**) and expand that navigate to **Line** and select the SIP line that needs to be configured (**17**). The SIP lines details are displayed in the main window. At the top of the main window select the SIP Line tab; enter the IP address of the DS3000 SIP server for the **ITSP Domain Name**. The other fields can be left as shown below, as this was the setup used for compliance testing.

The screenshot shows the Avaya IP Office Manager interface. On the left, the 'IP Offices' tree is expanded to 'Line 17'. The main window displays the 'SIP Line - Line 17' configuration. The 'SIP Line' tab is selected. The 'ITSP Domain Name' field is highlighted with a red box and contains the value '10.253.144.206'. Other fields include 'Line Number' (17), 'Prefix' (empty), 'National Prefix' (0), 'Country Code' (empty), 'International Prefix' (00), 'Send Caller ID' (P Asserted ID), 'Association Method' (By Source IP address), 'In Service' (checked), 'URI Type' (SIP), 'Check OOS' (checked), 'Call Routing Method' (Request URI), 'Originator number for forwarded and twinning calls' (empty), 'Name Priority' (Favour Trunk), 'Caller ID from From header' (checked), 'Send From In Clear' (unchecked), 'User-Agent and Server Headers' (empty), 'Service Busy Response' (486 - Busy Here), and 'Action on CAC Location Limit' (Allow Voicemail). There is also a 'REFER Support' section with 'Incoming' and 'Outgoing' set to 'Auto'.

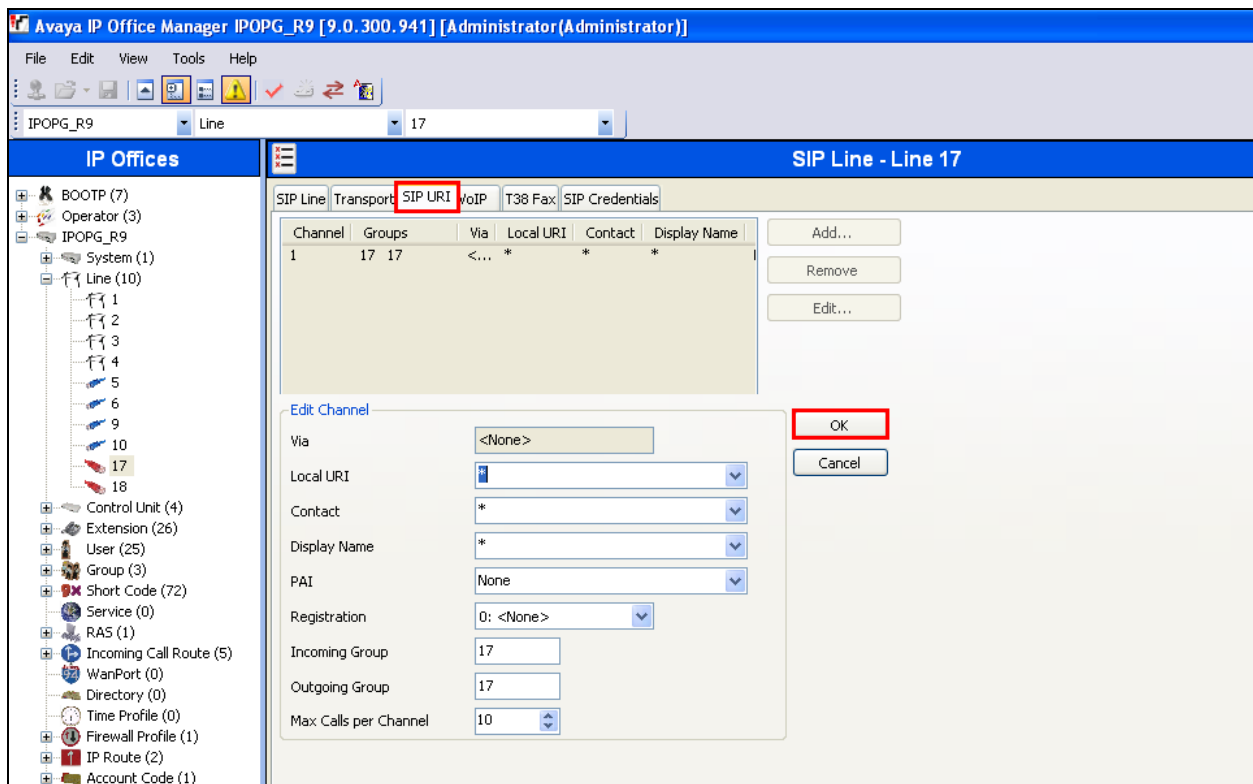
Select the **Transport** tab and enter the DS3000 SIP server IP address for the **ITSP Proxy Address**, ensure that **UDP** is selected for the **Layer 4 Protocol** and the port is set to **5060**.

The screenshot shows the Avaya IP Office Manager interface. On the left, the 'IP Offices' tree is expanded to 'Line 17'. The main window displays the 'SIP Line - Line 17' configuration. The 'Transport' tab is selected. The 'ITSP Proxy Address' field is highlighted with a red box and contains the value '10.253.144.206'. The 'Network Configuration' section is expanded, showing 'Layer 4 Protocol' set to 'UDP' and 'Send Port' set to '5060'. Other fields include 'Use Network Topology Info' (None), 'Listen Port' (5060), 'Explicit DNS Server(s)' (0 . 0 . 0 . 0), 'Calls Route via Registrar' (unchecked), and 'Separate Registrar' (empty).

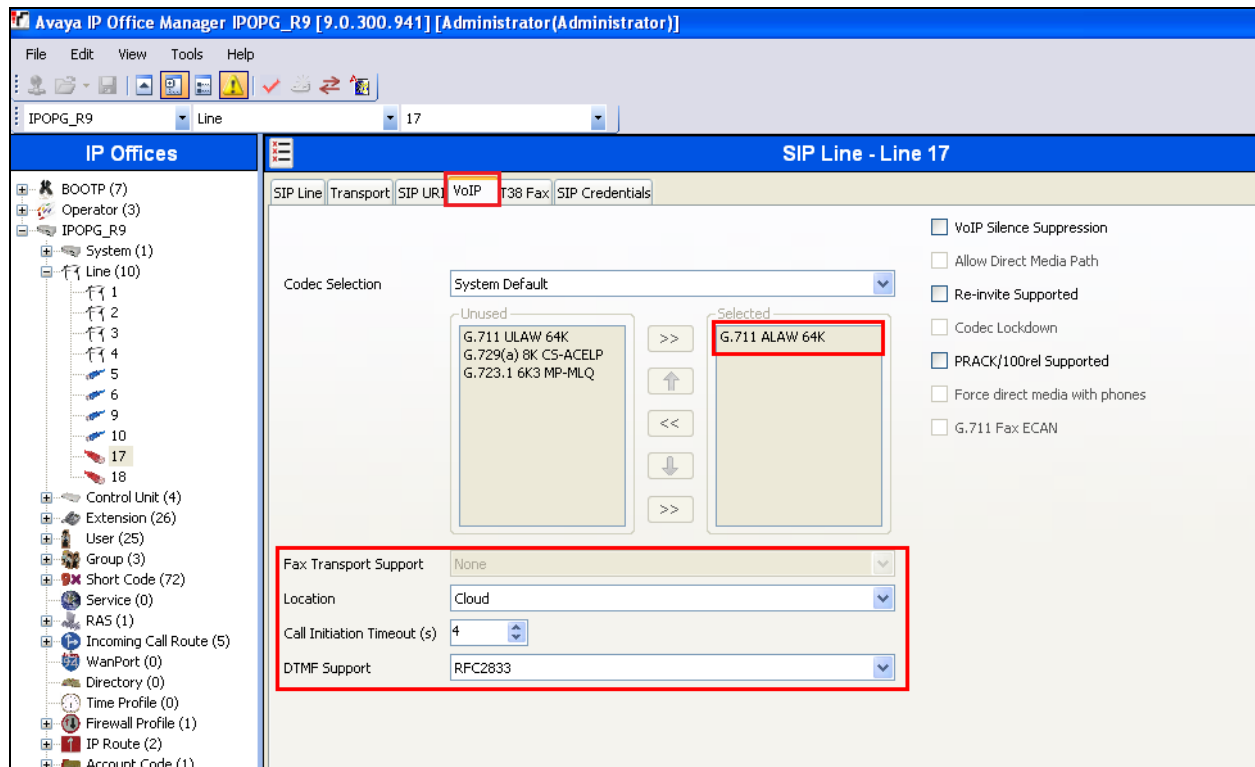
Select the **SIP URI** tab and if there is no existing **Channel** present click on **Add** but in the example below an existing **Channel** is edited so **Edit** is selected.



Below is the setup used for compliance testing. Click on **OK** once this is set correctly.

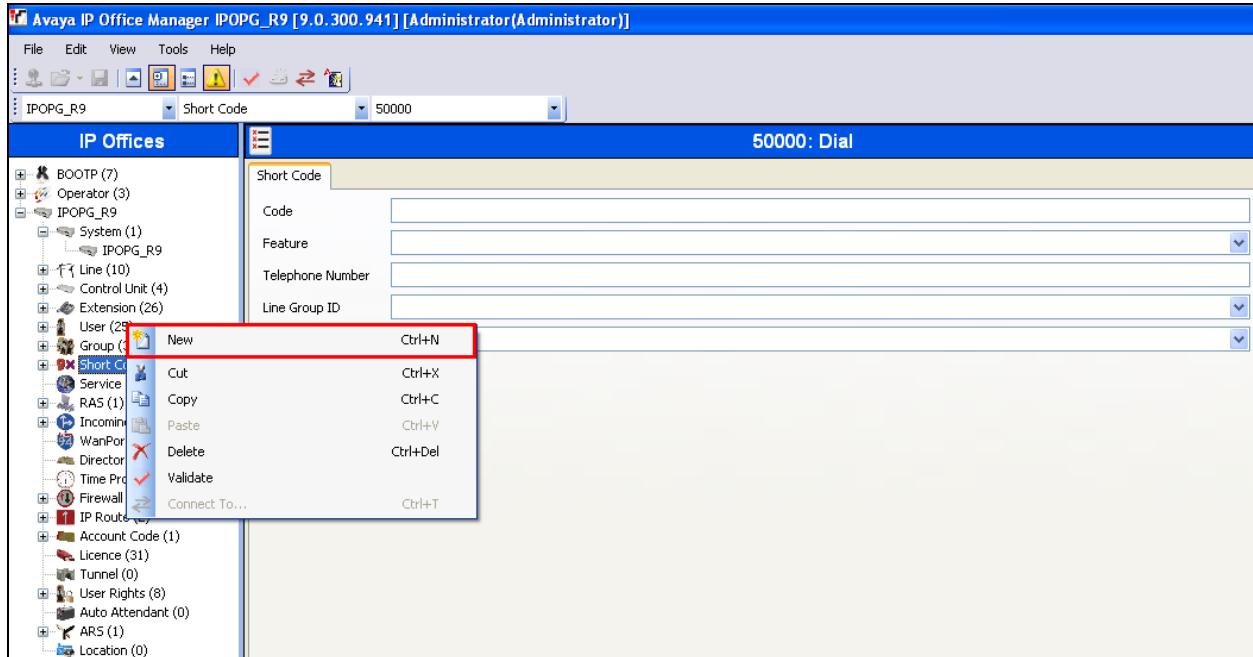


Click on the **VoIP** tab and select the appropriate **Codec** to be used and the suitable **DTMF Support**, below is what was used for compliance testing. Click on **OK** once complete, (not shown).

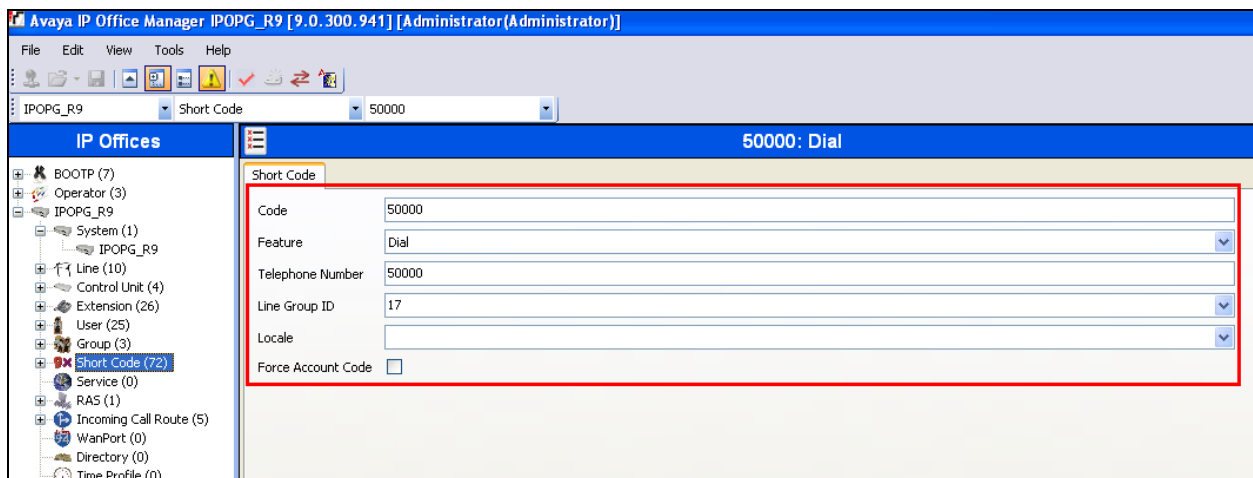


5.3. Configure Short Codes

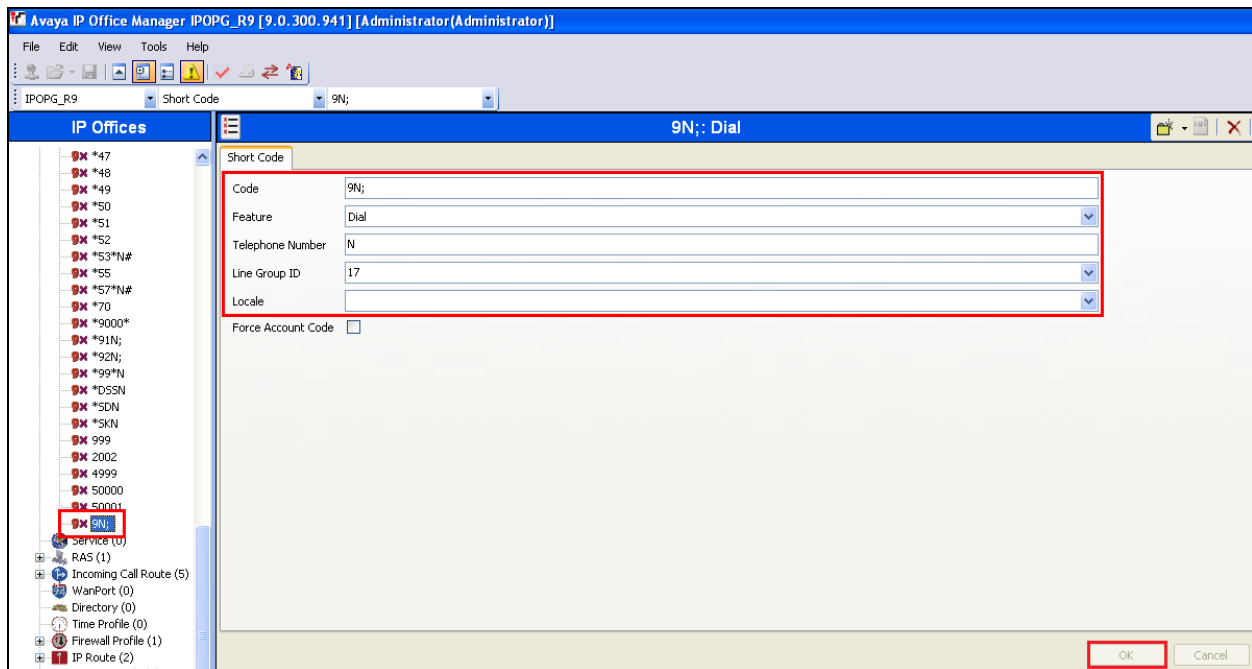
Short Codes are used to route calls to various lines configured on the IP Office. From the left window, right-click on **Short Codes** and select **New**.



A short code is created in order to directly route to the DS3000 hunt group, enter the number of the DS3000 operators queue, **50000** and ensure that the **Line Group ID** configured in **Section 5.2** is chosen.

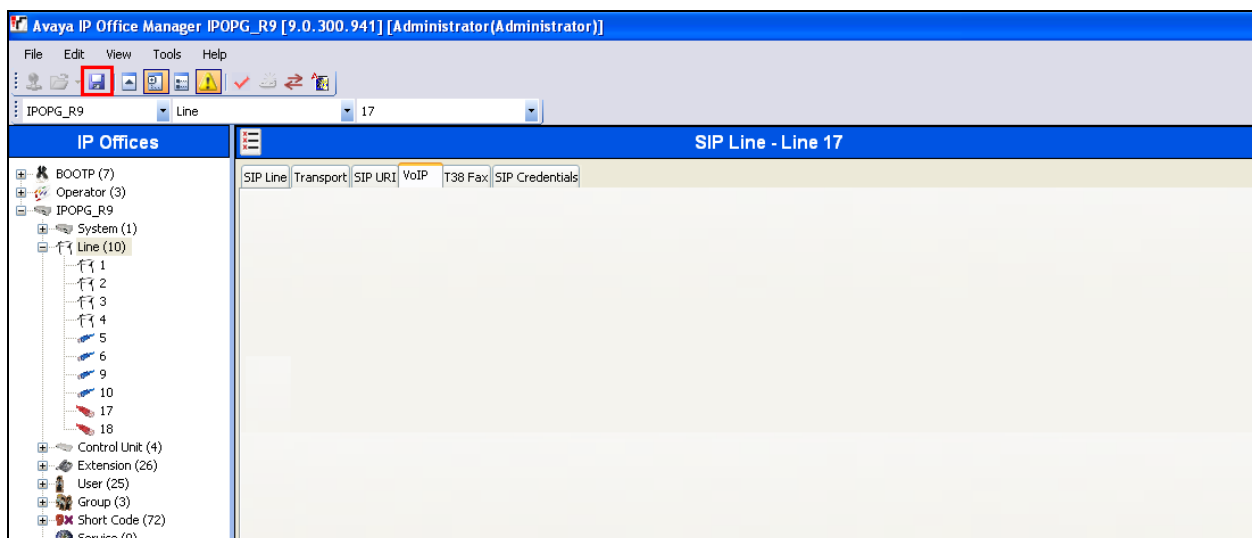


Alternatively an existing **Short Code** can be edited in order to route all calls beginning with 9 to the DS3000 in the example shown below. Ensure that the **Line Group ID** configured in **Section 5.2** is chosen. Click on **OK** once this completed.

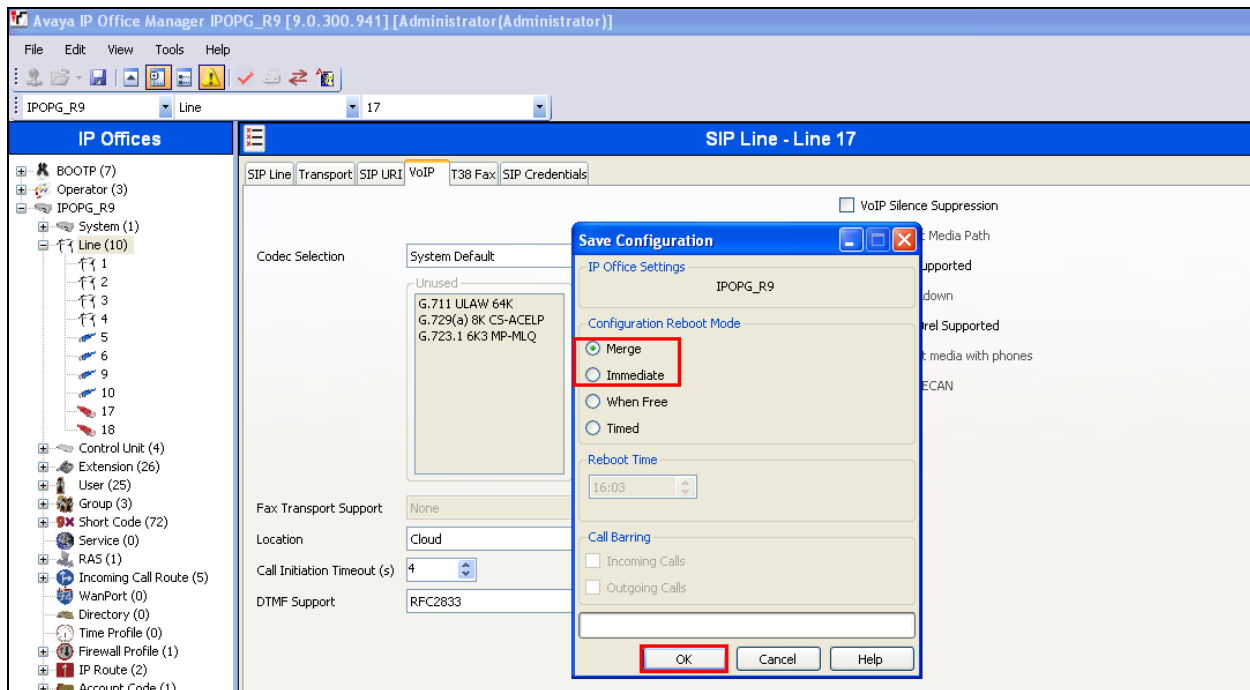


5.4. Save Configuration

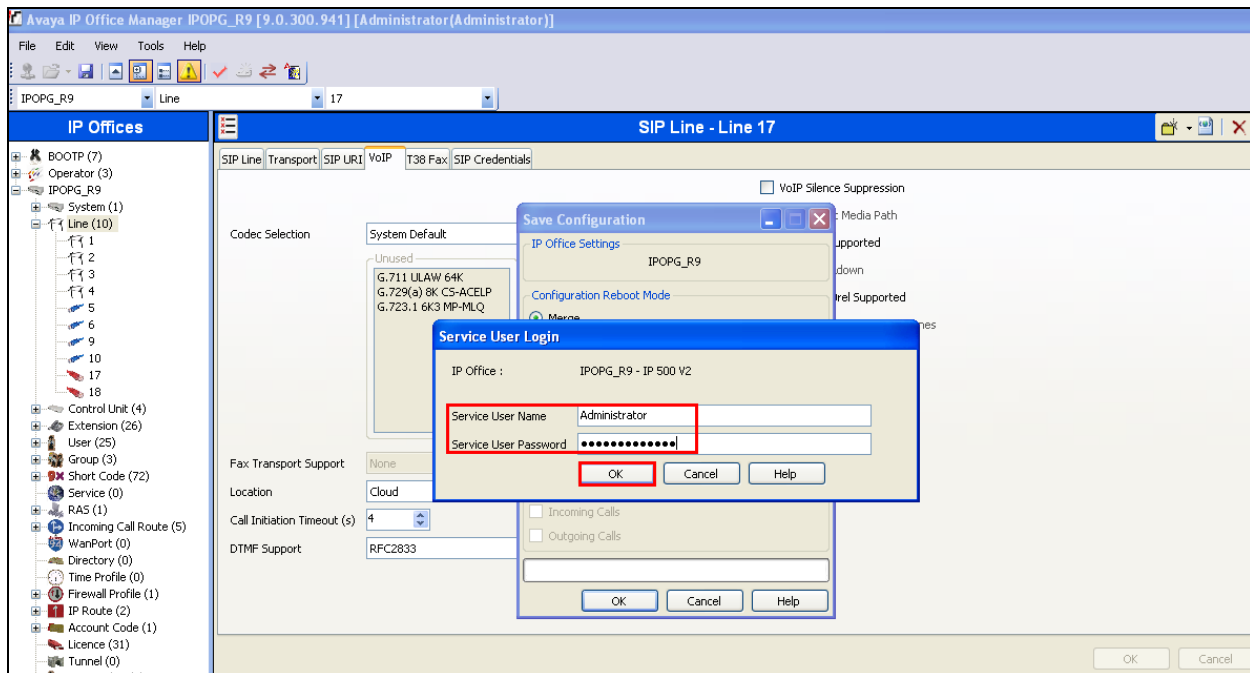
Once all the configuration is setup as required, click on the **Save** icon at the top right of the screen.



The **Save Configuration** window is opened and the **Configuration Reboot Mode** will either be **Immediate**, which will reboot the IP Office, or **Merge**, as is shown below that will not require a reboot of the IP Office. Click on **OK**.



Enter the **Administrator** credentials and click on **OK** to complete the **Save Configuration** procedure.



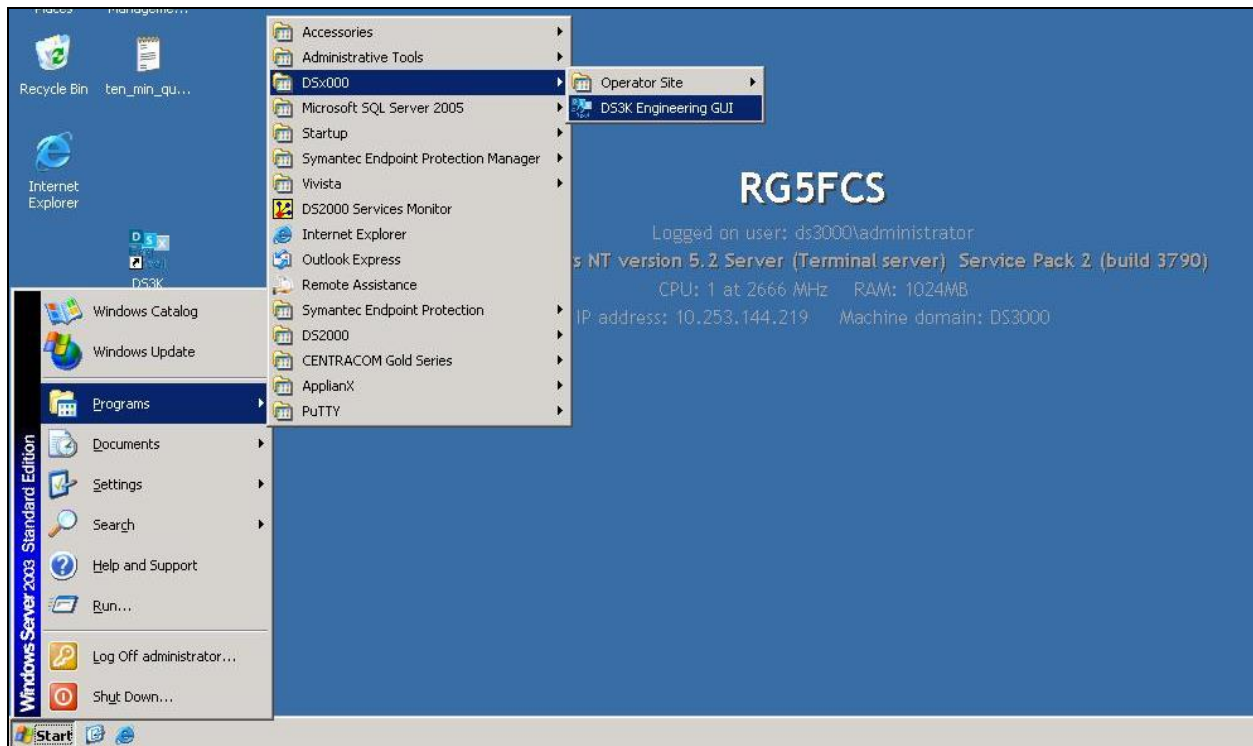
6. Configure Capita Secure Information Solutions DS3000

The following sections describe the steps required to configure the DS3000 application in order to connect successfully with IP Office using SIP trunks.

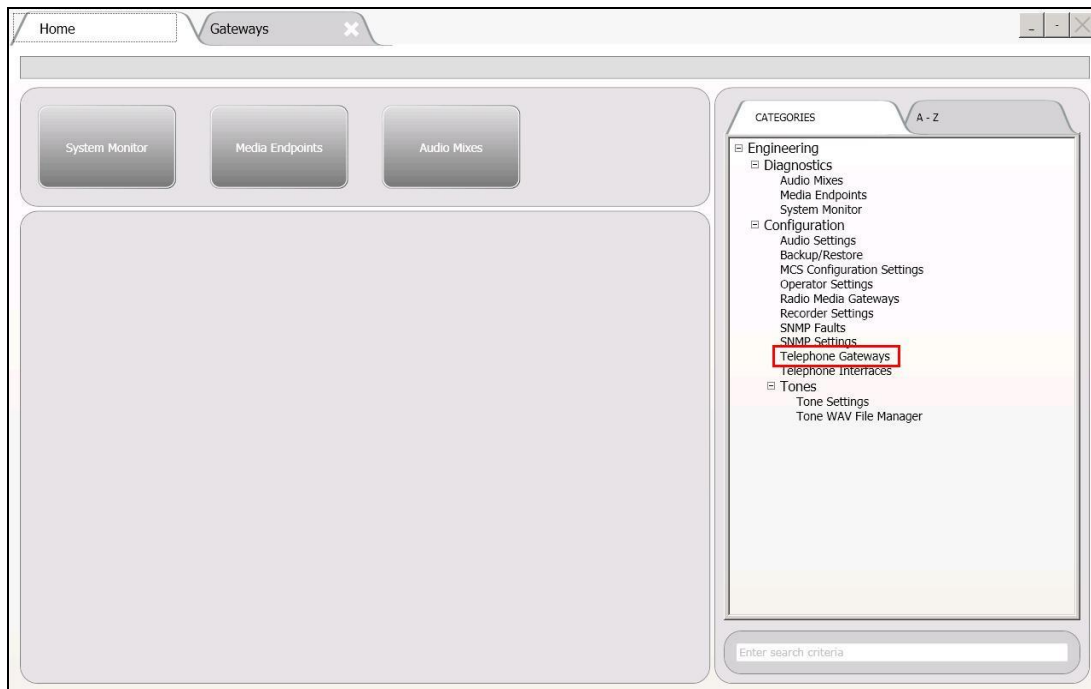
6.1. Configure DS3000 connection to Avaya IP Office

The configuration for the connection to IP Office is performed on the DS3000 FCS machine.

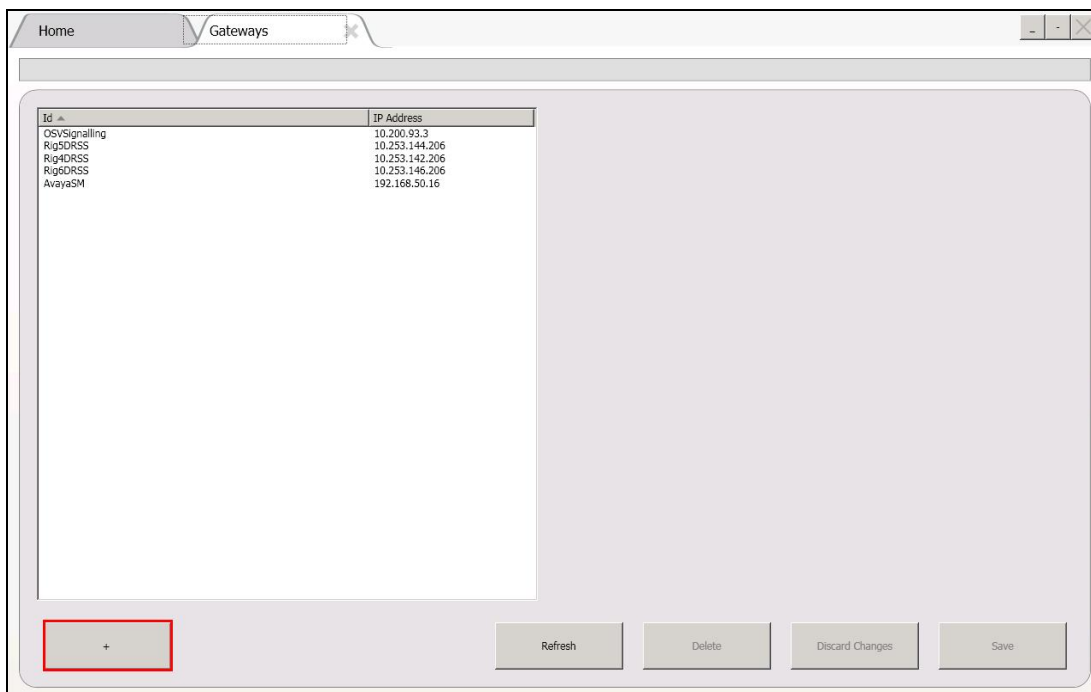
Log into **DS3K Engineering GUI** as shown below on the DS3000 FCS Server.



Once logged in the following screen appears. Select **Telephone Gateways** in the right column, highlighted below.



The **Gateways** tab is opened. Select the + icon at the bottom left of the screen.



Fill in the **Gateway Id** and **IP Address** information. This will be the IP address of the IP Office. Click on **Save** once this is done.

Engineers Tool

Home Gateways

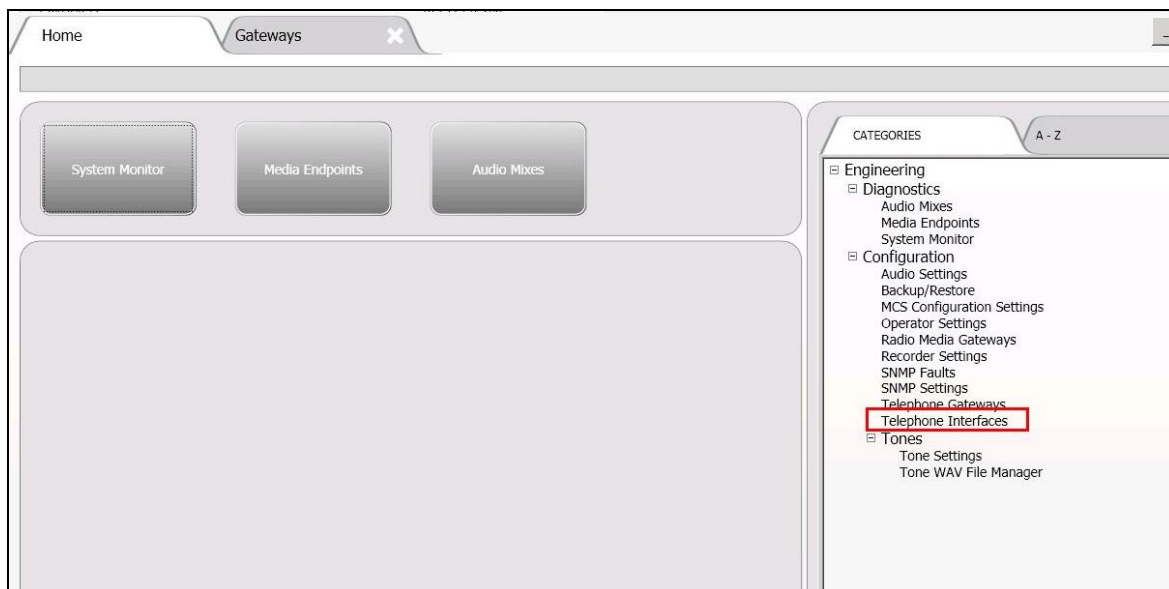
Id	IP Address
Asterisk99	10.253.100.99
Avaya	10.12.17.14
Mediant2000	10.253.146.125
Mediant1000B	10.253.146.126
AvayaGalwaySM	10.10.40.34
AvayaGalwayIPO	10.10.40.50

Gateway Id: AvayaGalwayIPO

IP Address: 10, 10, 40, 50

+ Refresh Delete Discard Changes **Save**

Click on the **Home** tab and select **Telephone Interfaces** in the right column as highlighted below.



The **Telephone Interfaces** tab is opened. Select the + icon at the bottom left of the screen to add a new Telephone interface.

Id	Gateway	Interface Number	Type	Group	Start Line	No of Lines	Card Number
AvayaSM	AvayaSM	2	SIP		31	30	N/A
OS-SIP	OS/Signalling	1	SIP		1	30	N/A
RG4	Rig4DRSS	3	SIP		61	10	N/A
RG6	Rig6DRSS	4	SIP		71	10	N/A

All the information in the right column must be filled in. The screen below shows the information that was used during compliance testing. Click on **Save** at the bottom right of the screen once all the information has been entered correctly. Note, set the **Operator ringing tone generation** to **Generate only when there is no early media**.

Id	Gateway	Interface Number	Type	Group	Start Line	No of Lines	Card Number
Asterisk99	Asterisk99	2	SIP		61	30	N/A
AvayaLabSM	Avaya	3	SIP		91	30	N/A
AvayaGalwayIPO	AvayaGalwayIPO	6	SIP		151	30	N/A
AvayaGalwaySM	AvayaGalwaySM	4	SIP		121	30	N/A
1	Mediant1000B	5	DPNSS	03	1	30	1

Telephone Interface: AvayaGalwayIPO

Gateway: AvayaGalwayIPO

Interface Number: 6

Type: SIP

Group:

Start Line Number: 151

Number of Lines: 30

Operator ringing tone generation: Generate only when there is no early media

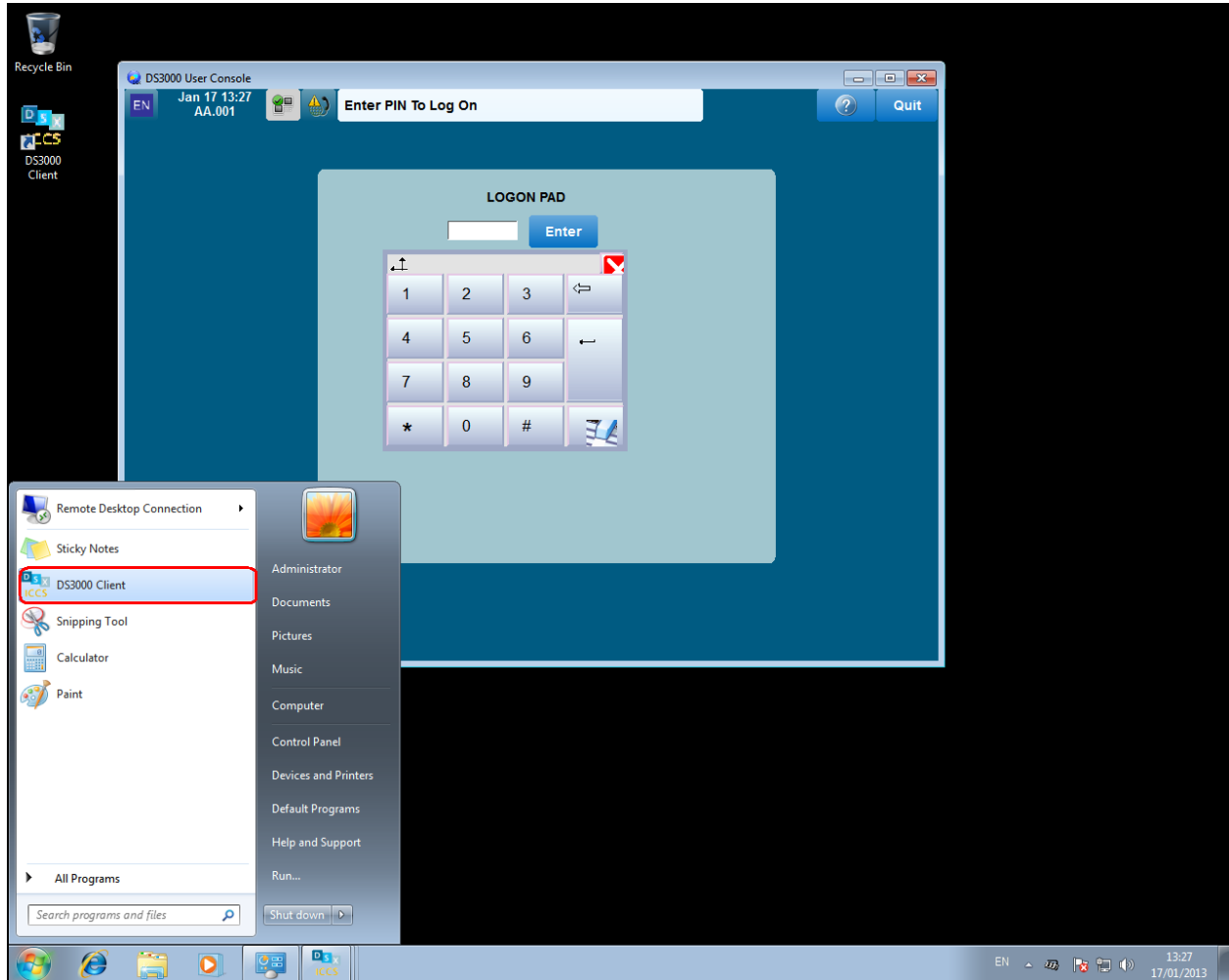
Monitor Interface: ☐

Inter Site: ☐

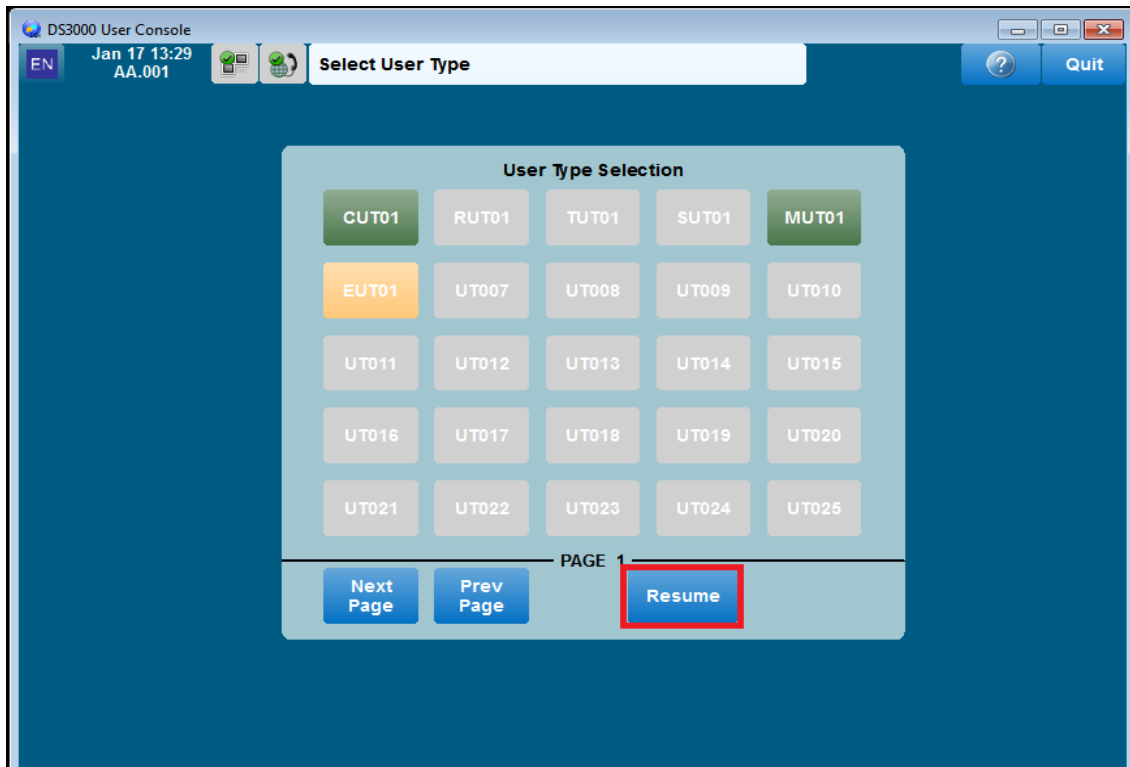
Save

6.2. Configure the DS3000 extension numbers

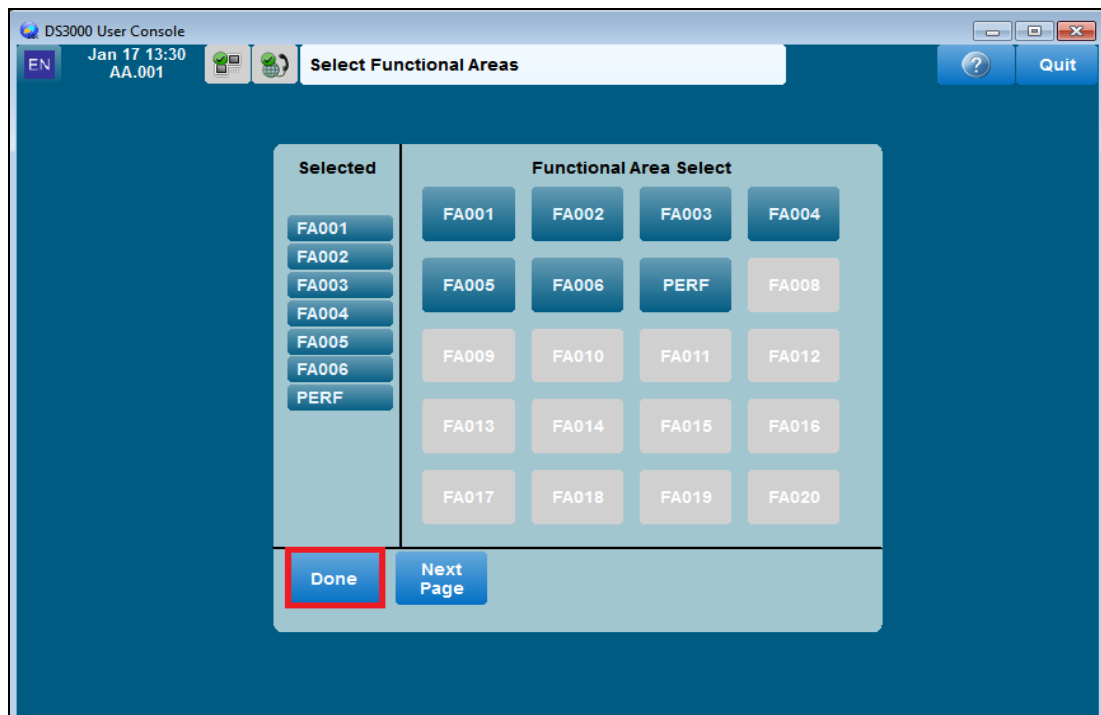
Open the **DS3000 Client** on the DS3000 Client machine. Enter the correct credentials on the **LOGON PAD**.



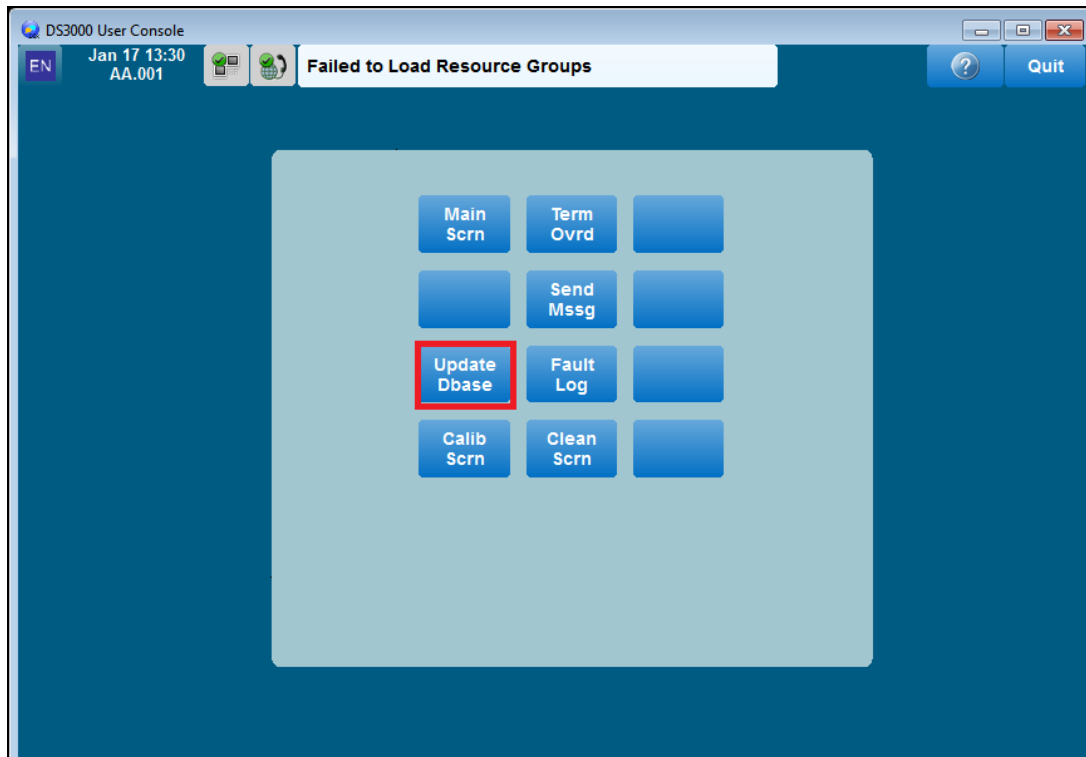
Click on **Resume** at the bottom of the screen as highlight.



Select **Done** at the bottom of the screen as highlighted.



Click on the **UpdateDbase** button highlighted.



Click on the **Call Routes** icon highlighted in the left window. The highlighted row in the right window shows that when 3xxx is dialed that Interface 2 is used. Note: The interface numbers are as defined by the configuration entered in **Section 6.1**.

Call Routes											
	Undo	Edit	DigitsCompare	Leng	Digits	InsertLength	RoutingDigits	GSIC(0)	GSIC(1)	GSIC(2)	GS
1			1	0	0			255	255	255	255
2			1	1	0			0	255	255	255
3			1	2	0			0	255	255	255
4			1	3	0			6	255	255	255
5			1	4	0			1	255	255	255
6			1	5	0			1	255	255	255
7			1	6	0			1	255	255	255
8			1	7	0			1	255	255	255
9			1	8	0			255	255	255	255
10			1	9	0			1	255	255	255
11			2	01	0			255	255	255	255
12			2	22	0			255	255	255	255
13			2	21	0			255	255	255	255
14			2	31	0			255	255	255	255
15			2	4444444	0			255	255	255	255
16			2	51	0			255	255	255	255

Select **DPNSS Extensions** in the left column highlighted. Note the entry highlighted is for the DS3000 Extension **50000**. Ensure **Accept Type** is set to **Telephone**.

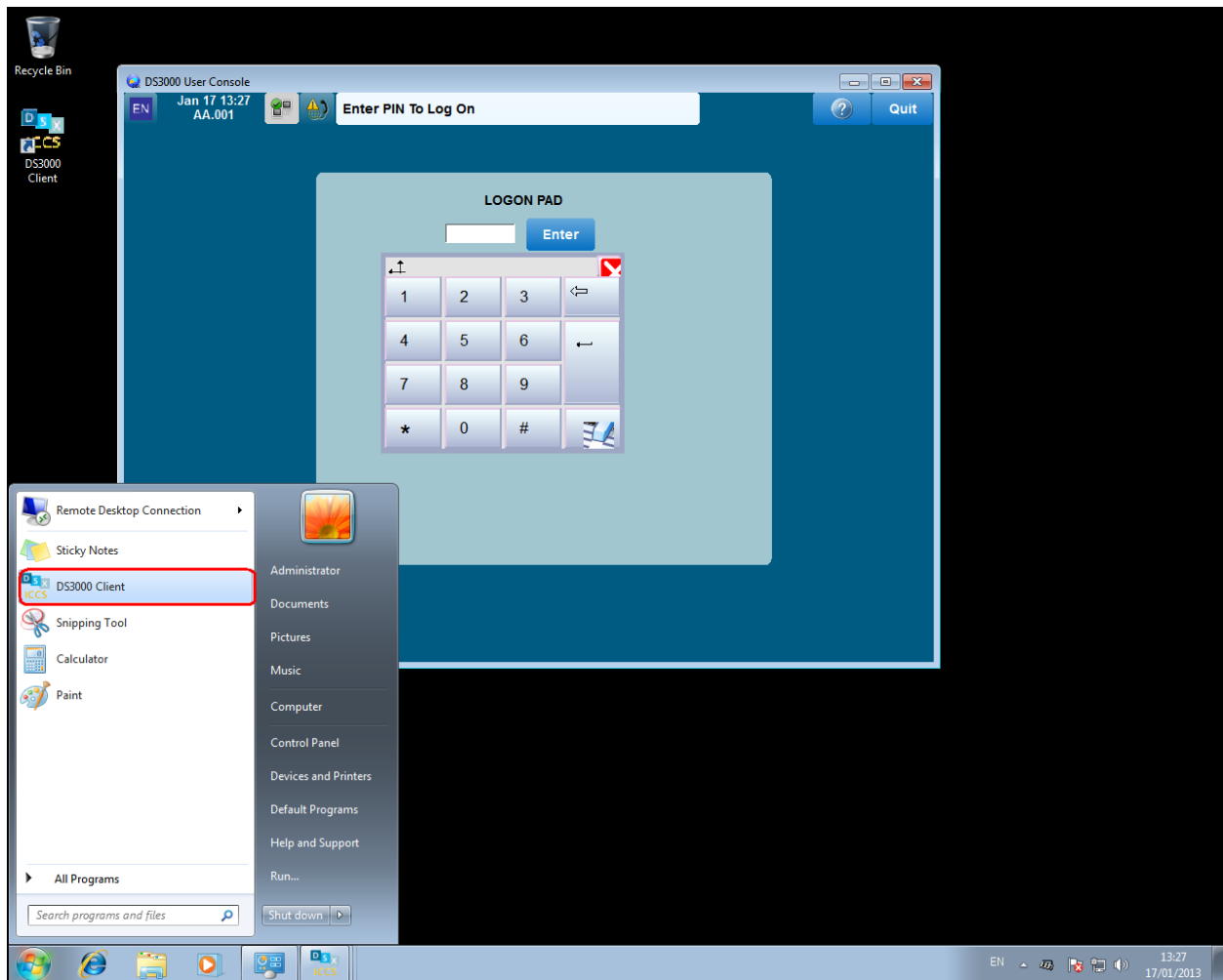
Call Routes	Tele Lines	Tele Groups	PABX Setup	DPNSS Extensions						
	Undo	Edit	KeyText	QueueText	Accept Type	PageNo	Priority	DisplayGroup	DisplaySubGroup	Col
1			EXT 49900		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	1: T
2			EXT 49901		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-02	1: T
3			EXT 49902		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	1: T
4			EXT 49903		Telephone	1: PAGE 1 (3...	0	GRP-16	SUBGRP-32	1: T
5			EXT 49904		Telephone	1: PAGE 1 (3...	0	GRP-7	SUBGRP-01	1: T
6			EXT 49905		Telephone	1: PAGE 1 (3...	0	GRP-8	SUBGRP-32	1: T
7			EXT 49906		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	1: T
8			COMB 1142		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	3: T
9			EXT 49908		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	1: T
10			EXT 49909		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	1: T
11			EXT 49910		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	1: T
12			EXT 49911		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	1: T
13			EXT 49912		Telephone	1: PAGE 1 (3...	0	GRP-2	SUBGRP-01	1: T
14			50000		Telephone	24: Avaya	0	GRP-1	SUBGRP-01	1: T
15			50001		Telephone	1: PAGE 1 (3...	0	GRP-1	SUBGRP-01	1: T
16			50002		Telephone	1: PAGE 1 (3...	0	GRP-1	SUBGRP-01	1: T

7. Verification Steps

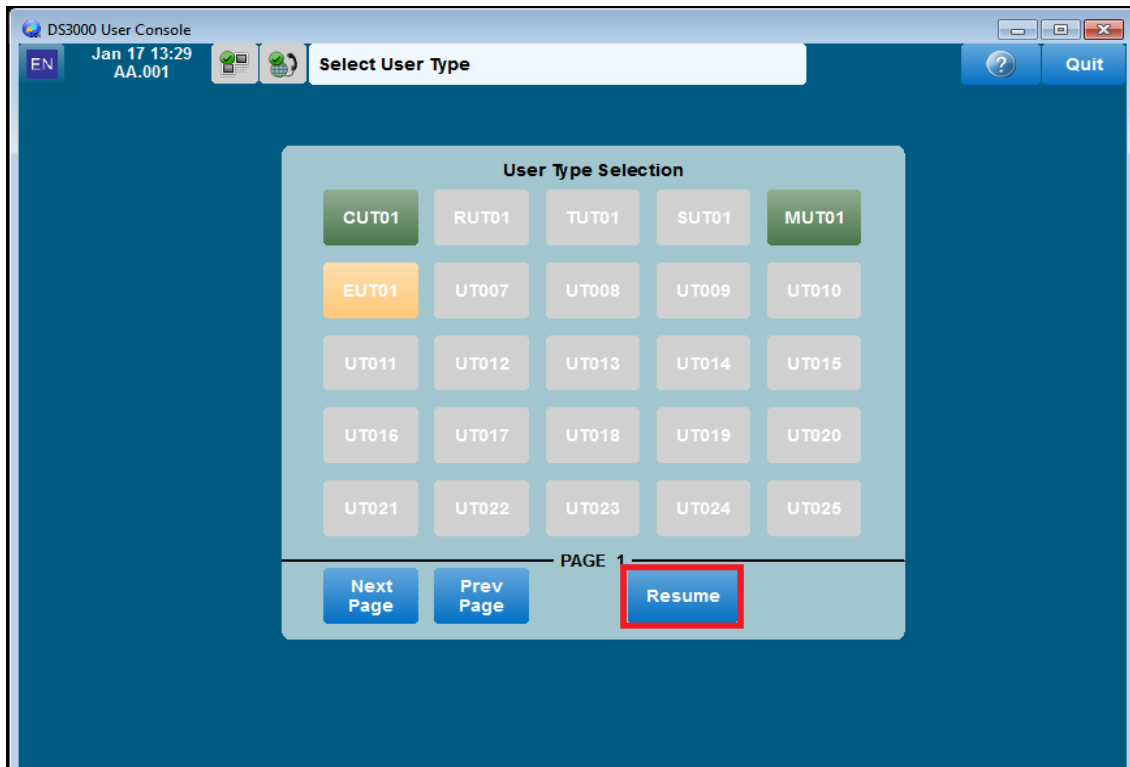
The following step can be taken to ensure that the connection between Capita's DS3000 solution and the Avaya solution is configured correctly. Make a call to and from the DS3000 and verify that the caller can be heard.

7.1. Verify that calls can be made to the DS3000

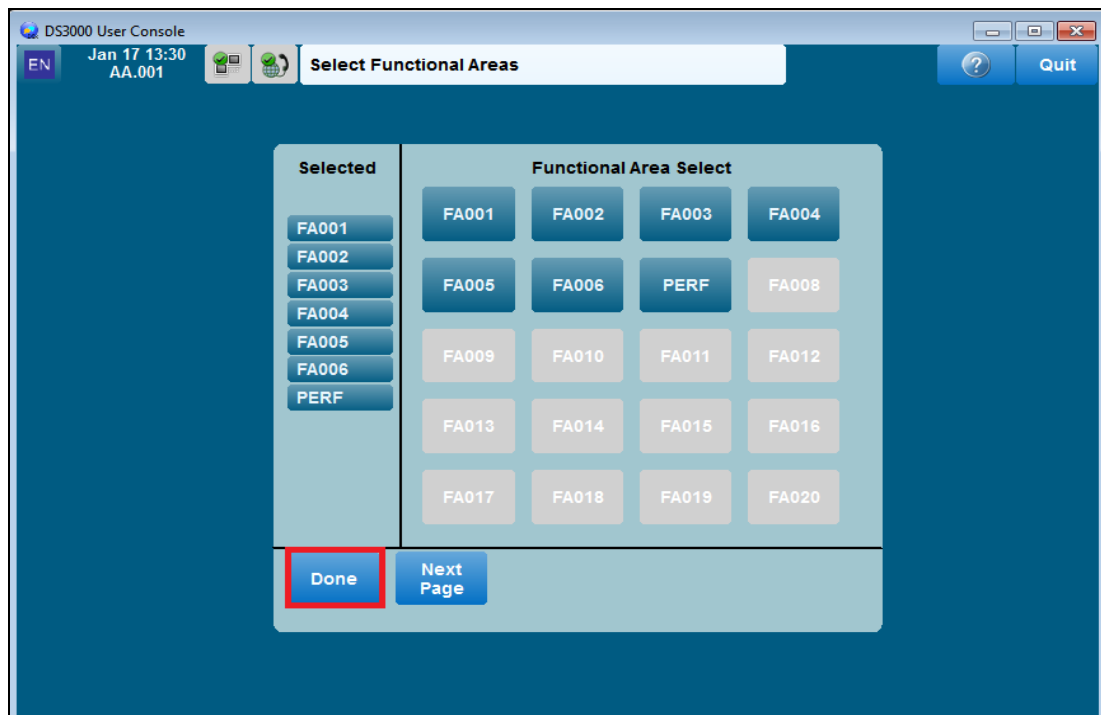
Open the **DS3000 Client** on the DS3000 Client machine. Enter the correct credentials on the **LOGON PAD**.



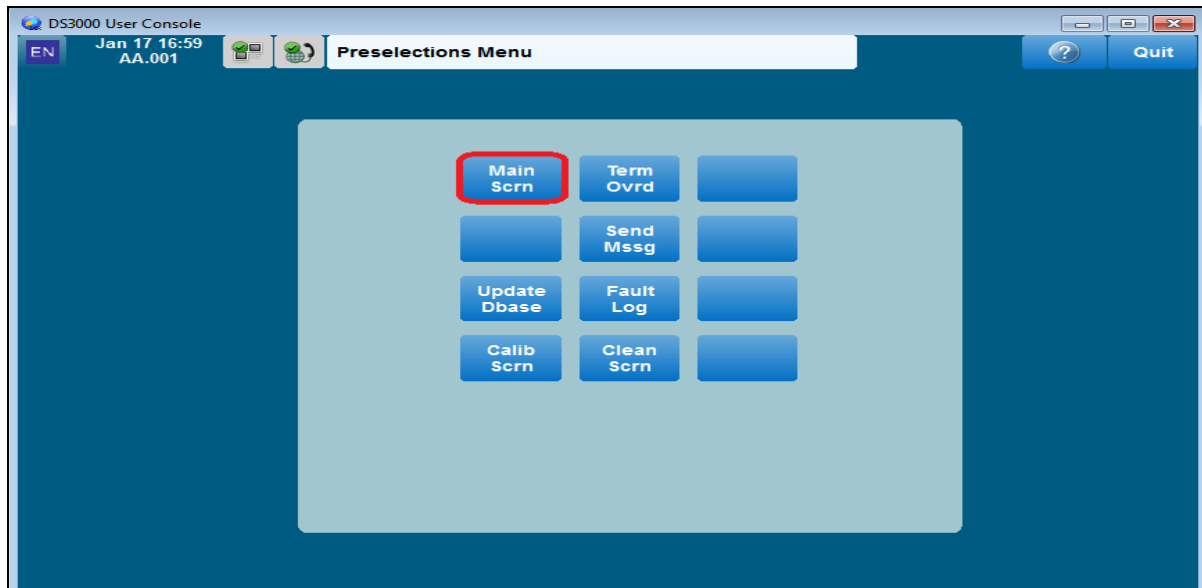
Click on **Resume** at the bottom of the screen as highlight.



Select **Done** at the bottom of the screen as highlighted.



Click on the **Main Scrn** button highlighted below.



Once a call is presented to the DS3000 the following screen should appear. Click on the **Take Call** button on the bottom right of the screen to take the call.



8. Conclusion

These Application Notes describe the configuration steps required for DS3000 from Capita Secure Information Solutions to successfully interoperate with Avaya IP Office R9.0. Please refer to **Section 2.2** for test results and observations.

9. Additional References

This section references documentation relevant to these Application Notes. The Avaya product documentation is available at <http://support.avaya.com>, where the following documents can be obtained.

- [1] *IP Office 9.0 IP500/IP500 V2 Installation*, Document Number 15-601042, Issue 27m, July 2, 2013.
- [2] *IP Office Release 9.0 Manager 9.0*, Document Number 15-601011, Issue 29u, April 5, 2013.
- [3] *IP Office System Status Application*, Document Number 15-601758, Issue 07a, November 26, 2012.
- [4] *IP Office System Monitor*, Document Number 15-601019, Issue 03c, March 1, 2013
- [5] *Application Notes for Configuring Capita Secure Information Solutions DS3000 with Avaya Aura® Session Manager R6.3 and Avaya Aura® Communication Manager R6.3 using SIP Trunks*

Product documentation for DS3000 can be requested from Capita or may be downloaded from <http://www.capitasecureinformationsolutions.co.uk>

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