



Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Avaya IP Office R9.1 with Xarios Call Recorder with a PRI Trunk – Issue 1.0

Abstract

These Application Notes describe the configuration steps required for the Xarios Call Recorder to interoperate with Avaya IP Office. Xarios Call Recorder is a call recording solution that allows calls which traverse a PRI trunk to be recorded.

Readers should pay attention to **Section 2**, in particular the scope of testing as outlined in **Section 2.1** as well as the 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

The Xarios Call Recorder attaches via a passive tap to the PRI interface connecting Avaya IP Office to the PSTN, using an Avaya DevLink interface to supply call switching information. The Xarios Call Recorder has an embedded Web server which provides access to archived voice files and server status for users at Web clients.

The Xarios Call Recorder records the voice content of calls which traverse the PRI trunk to which the recorder passive tap is attached. The recorder can be configured with an exclusion list to not record calls to/from individual PSTN endpoints or local extensions. An inclusion list which contains extensions and PSTN numbers that should be recorded is also provided which takes precedence over the exclusion list. Thus, if a call from an extension included in the exclusion list is made to an endpoint on the inclusion list, the call will be recorded.

2. General Test Approach and Test Results

The compliance testing evaluated the ability of Xarios Call Recorder to successfully record calls in a number of scenarios and recover in the event of network or PSTN service failure.

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 test included both feature functionality and serviceability testing. The feature functionality testing focused on placing calls in different call scenarios, to ensure successful recording of the calls and accurate call data. The serviceability testing included removing and replacing PSTN and LAN cables. The testing can be summarized as follows:

- Basic call
- Hold/retrieve
- Enquiry Call
- Transfer / Blind transfer
- Conferencing
- Recording pause / resume
- Account Codes
- Call inclusion / exclusion
- Interruption of Xarios Call Recorder LAN connection
- Interruption of Xarios Call Recorder passive tap connection to the PSTN

2.2. Test Results

All functionality and serviceability test cases were completed successfully with the following observations:

- SIP endpoints were not tested as requested by Xarios. Xarios does not support SIP endpoints.
- Conference calls extension details are recorded against the conference initiator even after the conference initiator drops out of the conference leaving other parties in it.

2.3. Support

For technical support on the Avaya products described in these Application Notes visit <http://support.avaya.com>.

For technical support on Xarios products, please contact Xarios support at <http://www.xarios.com/support>.

3. Reference Configuration

The following diagram illustrates the configuration used for testing.

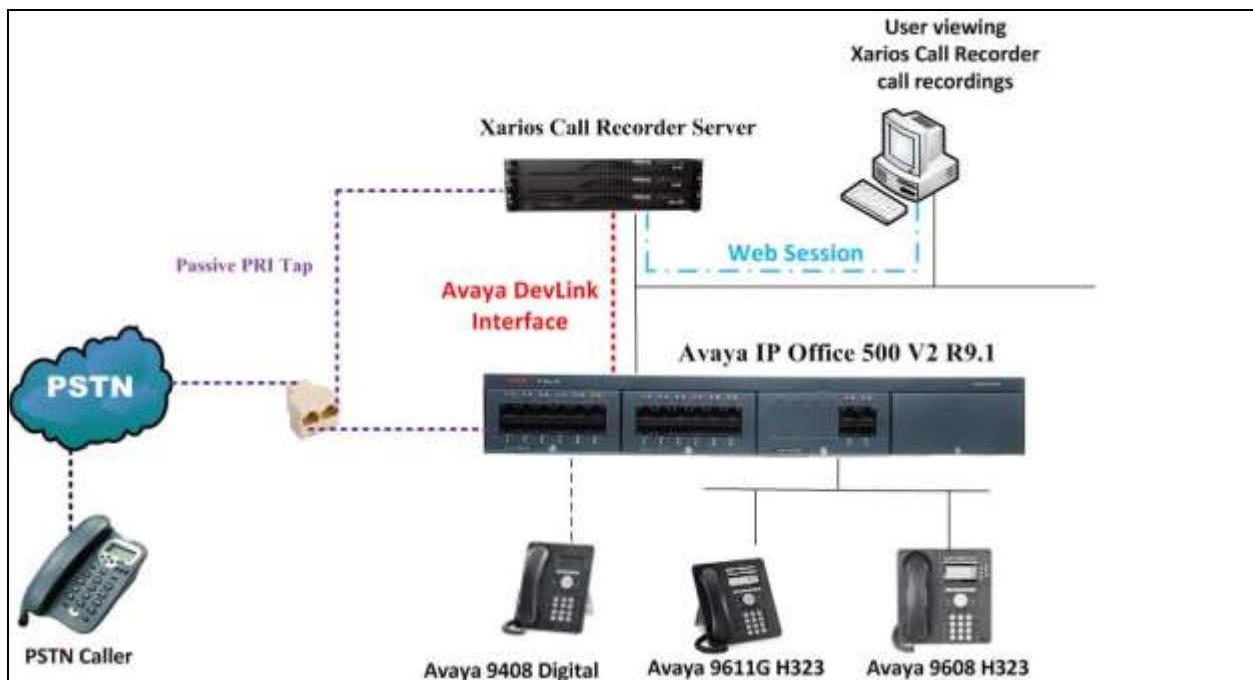


Figure 1: Avaya IP Office and Xarios Call Recorder PRI configuration

4. Equipment and Software Validated

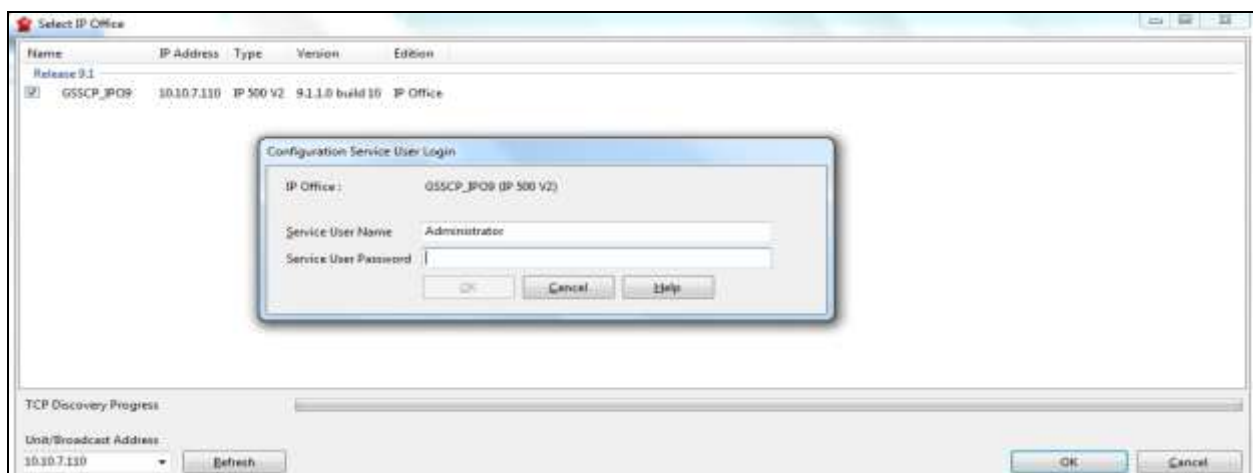
The following equipment and software were used for the sample configuration provided:

Equipment/Software	Release/Version
Avaya IP Office 500 V2	R9.1.0.0 build 208
Avaya 9608 IP Deskphone	96xx H.323 Release 6.4014U
Avaya 9611G IP Deskphone	96xx H.323 Release 6.4014U
Avaya 9408 Digital	Version 2
Avaya DevLink Interface	1.0.0.4
Xarios running on a an Dell PowerEdge T110 II Xarios Call Recorder	Windows 2008 Server R2 3.1.3187.2

Note – **Compliance testing is applicable when the tested solution is deployed with a standalone IP Office 500 V2 only.**

5. Configure Avaya IP Office

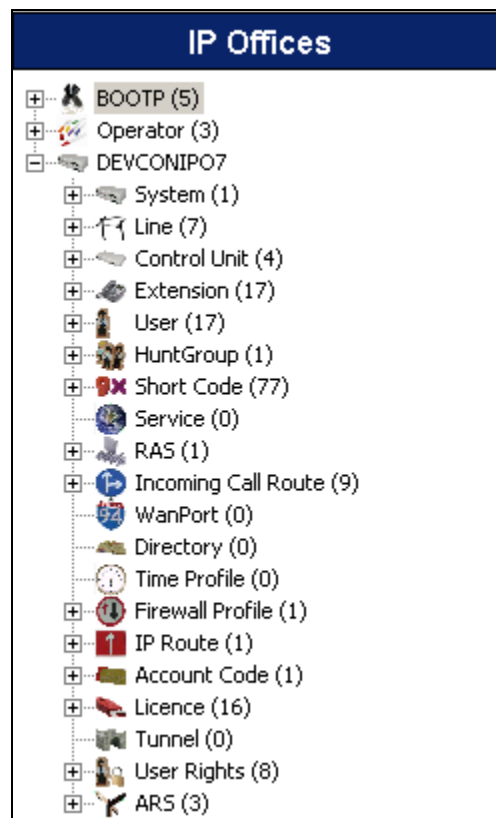
All configuration steps for Avaya IP Office were performed using the IP Office Manager application. From a PC running the Avaya IP Office Manager application, select **Start → Programs → IP Office → Manager** to launch the application. Navigate to **File → Open Configuration**, select the proper Avaya IP Office system from the pop-up window, and log in with the appropriate credentials.



A management window will appear. All the Avaya IP Office configurable components are shown in the left pane known as the Navigation Pane. The pane on the right is the Details Pane. These panes will be referenced throughout the Avaya IP Office configuration.



This application presents the administrator with a hierarchy of icons for configuring various components, as shown below.



Configuration steps can be summarized as follows:

- Verify CTI License
- Configure System-Wide Parameters
- Configure PRI Connection
- Configure Users
- Configure Outgoing Call Routing
- Configure Incoming Call Routing
- Configure Account Code

5.1. Verify CTI License

An IP Office CTI Link Pro license is required for the Xarios Call Recorder solution to connect to the IP Office for CTI events. Navigate to **License** → **CTI Link Pro** in the Navigation Pane. In the Details Pane verify that the **License Status** is **Valid**.

License						
Remote Server						
Serial Number (ADI)	1311049777					
PLDS Host ID	111311049777					
PLDS File Status	Not Present / Invalid					
Feature	Key	Instances	Status	Expiry Date	Source	
DECT Integration (ports)	eqORhOy9EjIvG2gBIzW64_PA_NsrMce	255	Obsolete	Never	ADI Nodal	
CTI Link Pro	9ADNahVy9VOVOC@XNo81wpmQa83Ym0u	255	Valid	Never	ADI Nodal	
CCC Designer (users)	SIWfyVVoQsidUuHuAzLbwK3UrqrQSemz	255	Valid	Never	ADI Nodal	
eBLF	ZIWW0kbFtVIXFKwVPipAxtskwW0SdR_C	255	Valid	Never	ADI Nodal	
Essential Edition Additional Voice...	CXe87PBnVGITabIHgymn6GpqNBztwWzH	255	Valid	Never	ADI Nodal	
Conferencing Center	WABVHdtQPAEzK5e5JEv1PGw199usRbJ	255	Obsolete	Never	ADI Nodal	
Microsoft CRM Integration (users)	@Xc47BLhtV3GvwuBJ4zRmRfZDI23juV5	255	Valid	Never	ADI Nodal	
Integrated Messaging	IGKHB0dvMK1EI_reaR8YHKg8I_92LPSz	255	Valid	Never	ADI Nodal	
IPSec Tunnelling	elzSZwg_vtLZbfxAya9m6FfiDUL5sfrB	255	Valid	Never	ADI Nodal	

5.2. Configure System-Wide Parameters

The IP500/IP500 V2 control units have 2 RJ45 Ethernet ports, physically marked as LAN and WAN. Within the system configuration, the physical LAN port is LAN1, the physical WAN port is LAN2

In the sample configuration, the LAN1 port was used to connect the Avaya IP Office to the enterprise network. Click on **System** → **LAN1** and verify the **IP Address** and **IP Mask** of the IP Office under the **LAN Settings** tab.

The screenshot displays the configuration interface for the IPO91(PG)V2Exp system. The top navigation bar includes tabs for System, LAN1, LAN2, DNS, Voicemail, Telephony, Directory Services, System Events, SMTP, and SMDR. The LAN1 tab is selected, and the LAN Settings sub-tab is active. The configuration fields are as follows:

IP Address	10 . 10 . 40 . 20
IP Mask	255 . 255 . 255 . 0
Primary Trans. IP Address	10 . 10 . 40 . 1
RIP Mode	None
Enable NAT	<input type="checkbox"/>
Number Of DHCP IP Addresses	10
DHCP Mode	<input type="radio"/> Server <input type="radio"/> Client <input type="radio"/> Dialin <input checked="" type="radio"/> Disabled

An Advanced button is located at the bottom right of the configuration area.

5.3. Configure PRI Connection

From the Navigation Pane, expand **Line** (not shown) and select the line corresponding to the physical PRI module, in this case “9”. The **PRI 30 (Universal)** screen is displayed in the details pane. Select the **PRI Line** tab. Enter the following values for the specified fields, and retain the default values for the remaining fields.

- **Incoming Group ID:** An available incoming group number, in this case “9”.
- **Clock Quality:** “Network”.
- **Line Sub Type:** “QSIG A”.
- **Outgoing Group ID:** An available outgoing group number, in this case “9”.
- **Number of Channels:** “30”

Click **OK** (not shown) when complete.

PRI 30 (Universal) - Line 9

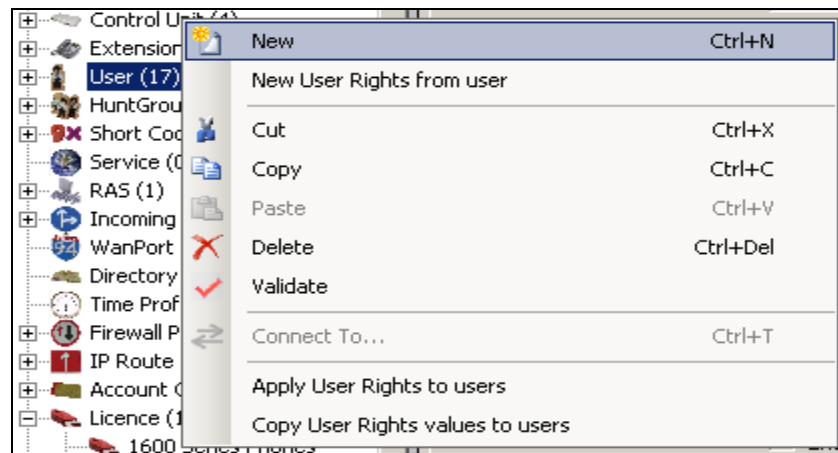
PRI Line | Short Codes

Line Number	09	Line SubType	QSIG A
Card	3		
Port	9	Admin	In Service
Telephone Number		TEI	0
Incoming Group ID	9	Outgoing Group ID	9
		Number of Channels	30
Prefix			
National Prefix			
International Prefix			
CRC Checking	<input checked="" type="checkbox"/>		
Clock Quality	Network		
Add 'Not end-to-end ISDN' Information Element	Never		
Progress Replacement	None		
Send Redirecting Number	<input checked="" type="checkbox"/>		
<input type="checkbox"/> Send original calling party for forwarded and twinning calls			
Originator number for forwarded and twinning calls			

5.4. Configure Users and Extensions

In this section, examples of IP Office Users and Extensions will be illustrated. In the interests of brevity, not all users and extensions shown in **Figure 1** will be presented, since the configuration can be easily extrapolated to other users.

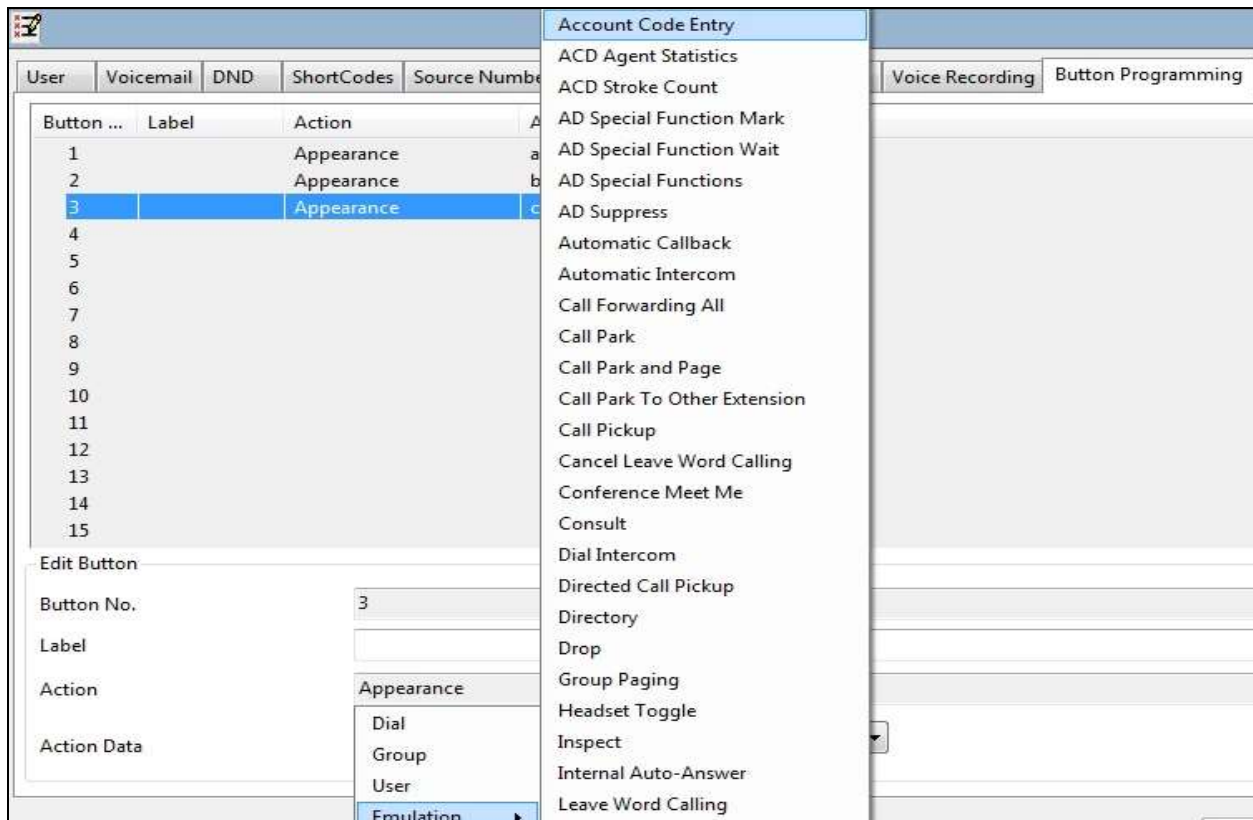
An IP extension must be added, right click **User** and select **New**.



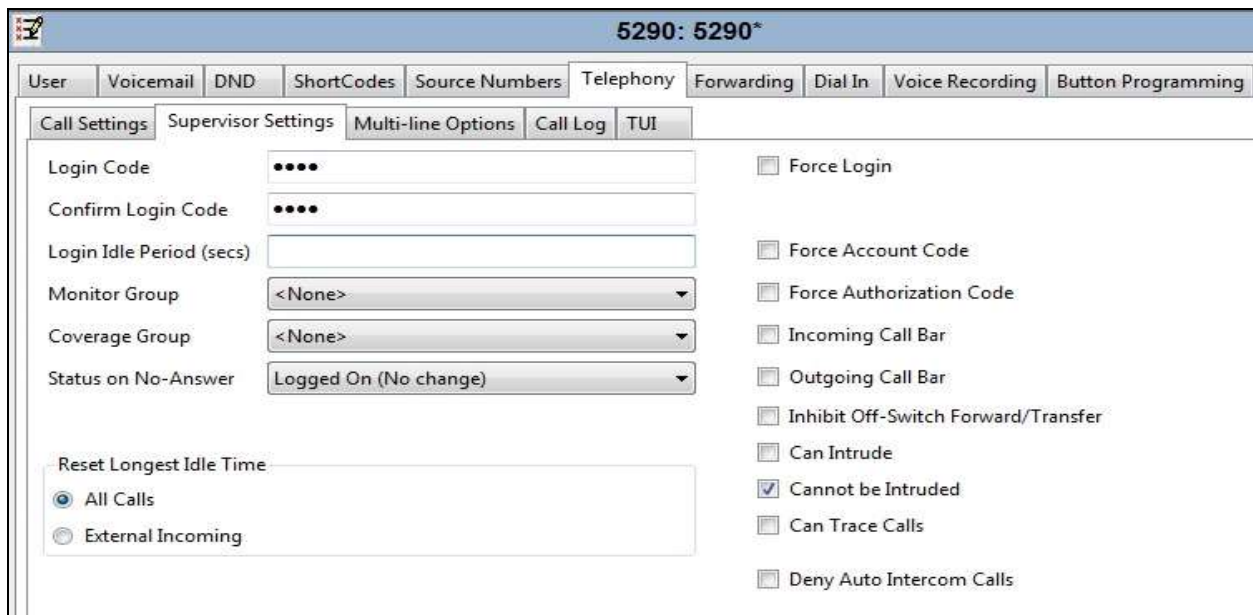
On the screen that appears enter an identifying **Name** and valid **Extension**, shown below:

5290: 5290									
User	Voicemail	DND	ShortCodes	Source Numbers	Telephony	Forwarding	Dial In	Voice Recording	Button Programming
Name	5290								
Password	••••••								
Confirm Password	••••••								
Conference PIN									
Confirm Conference PIN									
Account Status	Enabled								
Full Name									
Extension	5290								
Email Address									
Locale									
Priority	5								
System Phone Rights	None								
Profile	Basic User								
	<input type="checkbox"/> Receptionist								
	<input type="checkbox"/> Enable Softphone								
	<input checked="" type="checkbox"/> Enable one-X Portal Services								
	<input type="checkbox"/> Enable one-X TeleCommuter								

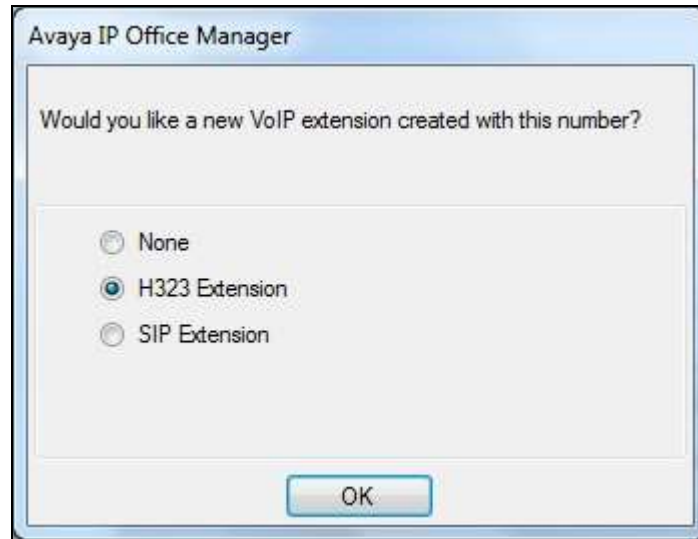
Click on the **Button Programming** tab and right click on an unconfigured button, click **Emulation** → **Account Code Entry** to define the button for account code entry use.



Click on the **Telephony** Tab followed by the **Supervisor Settings** tab and enter a **Login Code**. Click **OK** (not shown) when complete.

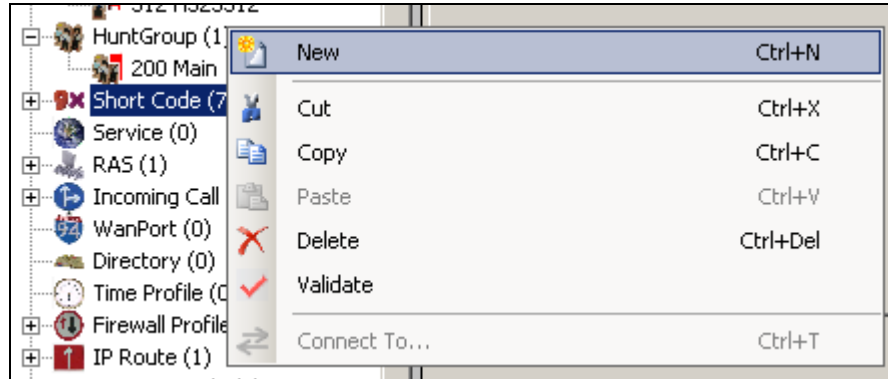


In the box that pops up, select the type of IP user being created, in this case **H323 Extension** and click **OK**. Repeat these steps for other IP Users.



5.5. Configure Outgoing Call Routing

Define a short code to route outbound traffic over the PRI trunk created in **Section 5.3**. To create a short code, right click on **Short Code** in the Navigation Pane and click **New**.



On the **Short Code** tab in the Details Pane, configure the parameters as shown below.

- In the **Code** field, enter the dial string which will trigger this short code, followed by a semi-colon. The example shows **9N;** which will be invoked when the user dials 9 followed by the dialed number.
- Set **Feature** to **Dial**. This is the action that the short code will perform.
- Set **Telephone Number** to **N** which will allow an IP Office user to dial the digit 9 followed by any telephone number, symbolized by the letter **N**.
- Set the **Line Group Id** to the outgoing line group number defined on the PRI in **Section Error! Reference source not found.**

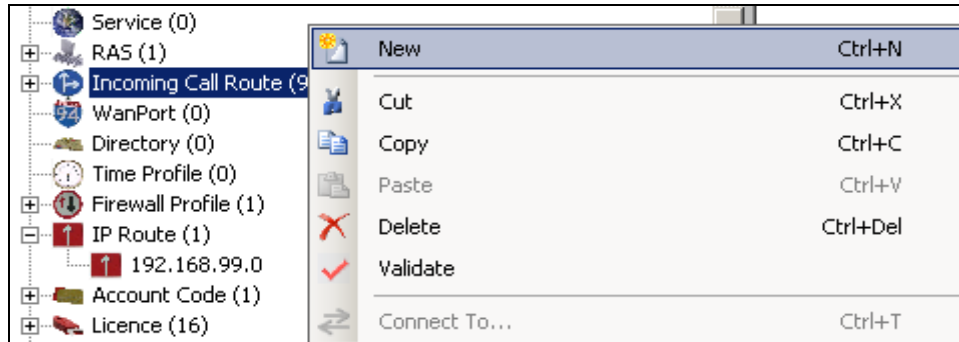
A screenshot of a configuration window titled '9N;; Dial'. It has a 'Short Code' tab selected. The form contains the following fields:

- Code**: 9N;
- Feature**: Dial (selected from a dropdown menu)
- Telephone Number**: N
- Line Group ID**: 9 (selected from a dropdown menu)
- Locale**: (empty dropdown menu)
- Force Account Code**: ☐
- Force Authorization Code**: ☐

5.6. Configure Incoming Call Routing

An incoming call route maps an inbound DDI number on a specific line to an internal extension. Incoming call routes must be configured so that inbound calls placed to the IP Office over the PRI trunk are routed to the correct destination.

To create an incoming call route, right-click **Incoming Call Routes** in the Navigation Pane and select **New**.



On the **Standard** tab of the Details Pane, enter the parameters as shown below:

- Set the **Bearer Capacity** to **Any Voice**.
- Set the **Line Group Id** to the incoming line group of the PRI defined in **Section Error!**
Reference source not found..
- Set the **Incoming Number** to the incoming number that this route should match on.
Matching is left to right.

Default values can be used for all other fields.

☰
9 091xxxx60

Standard
Voice Recording
Destinations

Bearer Capability

Line Group ID

Incoming Number

Incoming Sub Address

Incoming CLI

Locale

Priority

Tag

Hold Music Source

Ring Tone Override

Any Voice ▼

9 ▼

091xxxx60

1 - Low ▼

System Source ▼

None ▼

On the **Destinations** tab, select the destination extension from the pull-down menu of the **Destination** field. On completion, click the **OK** button (not shown). In this example, incoming calls to the test DDI number **091xxxx60** on line 9 are routed to extension 5290.

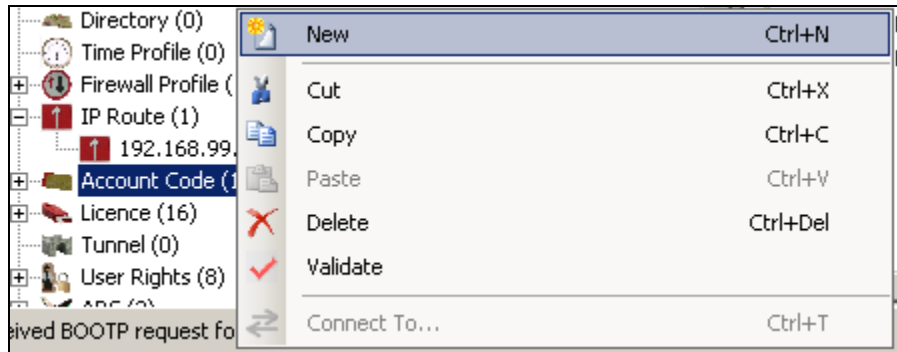
☰

Standard
Voice Recording
Destinations

	TimeProfile	Destination
✎	Default Value	5290 5290 ▼

5.7. Configure Account Code

Account codes are commonly used to control cost allocation and out-going call restriction. To create an account code, right click on **Account Codes** in the navigation pane and click on **New**.

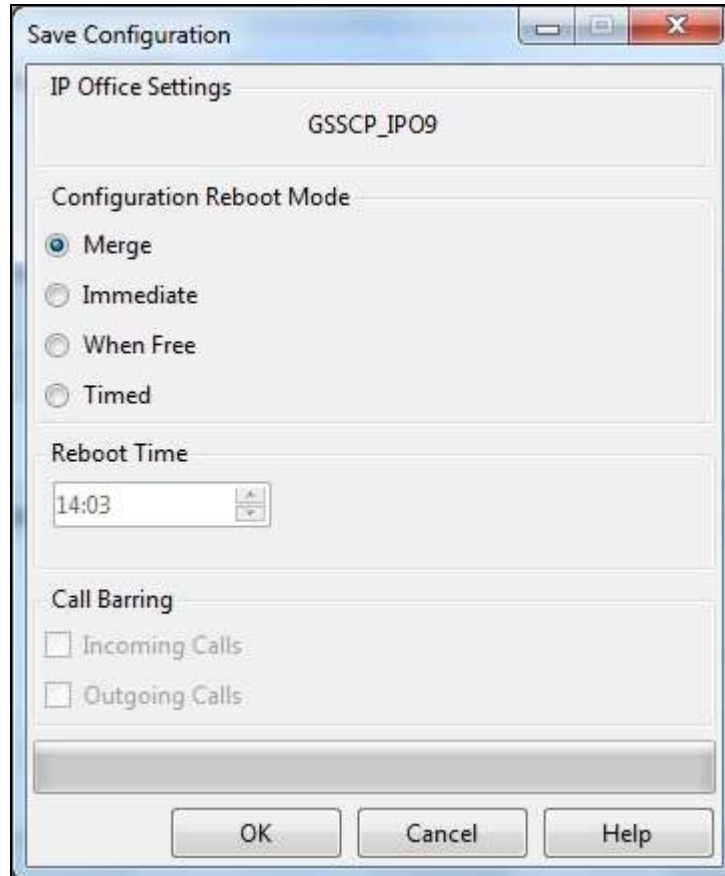


Enter an account code in the **Account Code** field and click **OK** when complete.

A screenshot of a configuration window titled '1122: 1122'. The window has two tabs: 'Account Code' and 'Voice Recording'. The 'Account Code' tab is active. It contains two input fields. The first field is labeled 'Account Code' and contains the text '1122'. The second field is labeled 'CLI' and is empty. The window has a standard Windows-style title bar and a close button in the top right corner.

5.8. Save Configuration

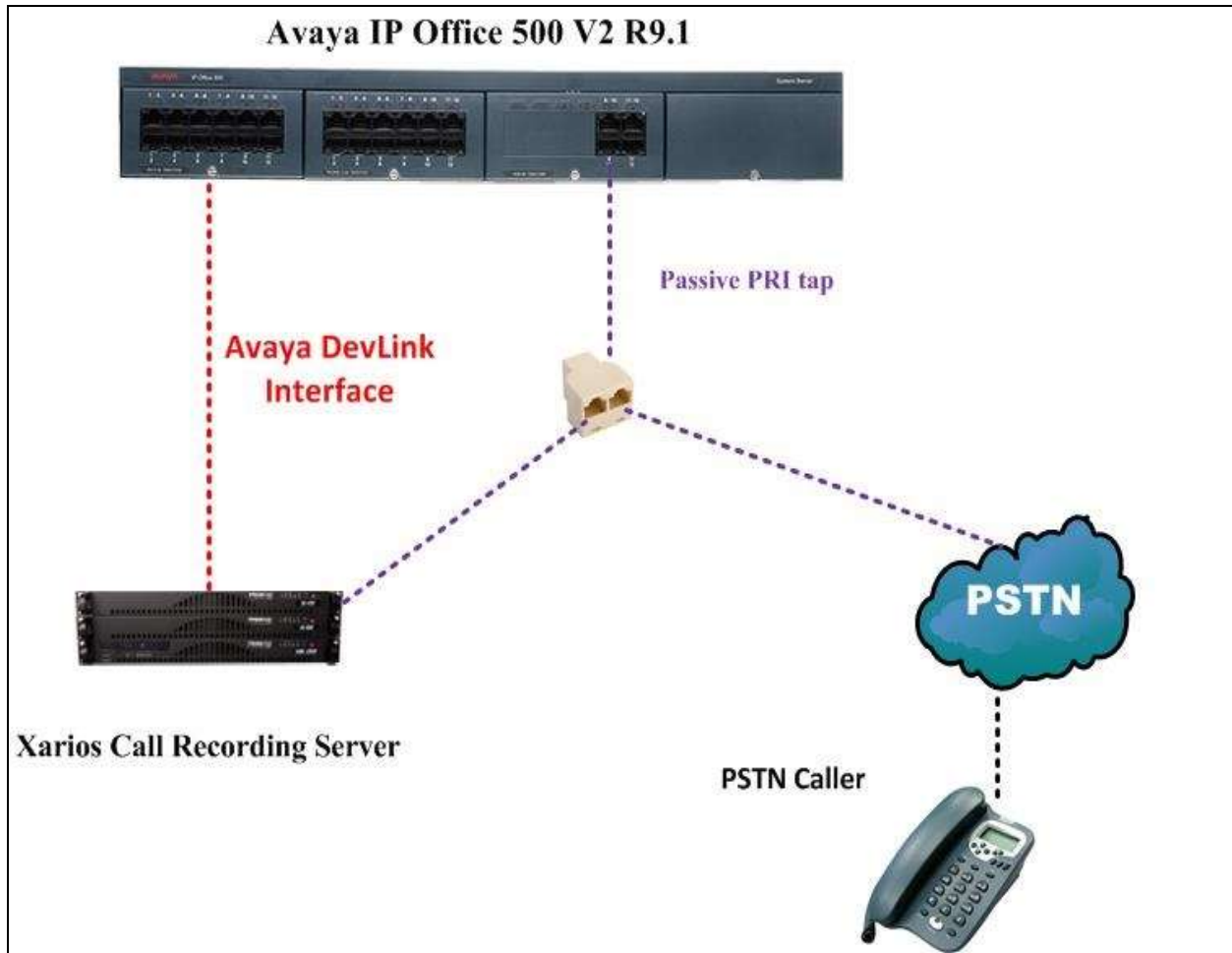
Navigate to **File → Save Configuration** in the menu bar at the top of the screen to save the configuration performed in the preceding sections. A screen like the one shown below is displayed where the system configuration has been changed and needs to be saved on the system. **Merge, Immediate, When Free** or **Timed** is shown under the **Configuration Reboot Mode** column, based on the nature of the configuration changes made since the last save. Click **OK** to save the configuration. Note that clicking **OK** may cause a service disruption.



The image shows a 'Save Configuration' dialog box with a title bar containing minimize, maximize, and close buttons. The dialog is divided into several sections. The first section, 'IP Office Settings', contains the text 'GSSCP_IP09'. The second section, 'Configuration Reboot Mode', contains four radio buttons: 'Merge' (selected), 'Immediate', 'When Free', and 'Timed'. The third section, 'Reboot Time', contains a time selection field showing '14:03' with up and down arrow buttons. The fourth section, 'Call Barring', contains two checkboxes: 'Incoming Calls' and 'Outgoing Calls', both of which are unchecked. At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

6. Splitting the PRI (QSIG A) feed to connect to Xarios Call Recorder

The passive PRI tap is achieved using an RJ45 Splitter in order to split the E1-ISDN cable coming from the PSTN to the IP Office PRI link as illustrated below. The split cables then connects to Avaya IP Office PRI link and the Xarios Call Recorder Server PRI LAN connection.



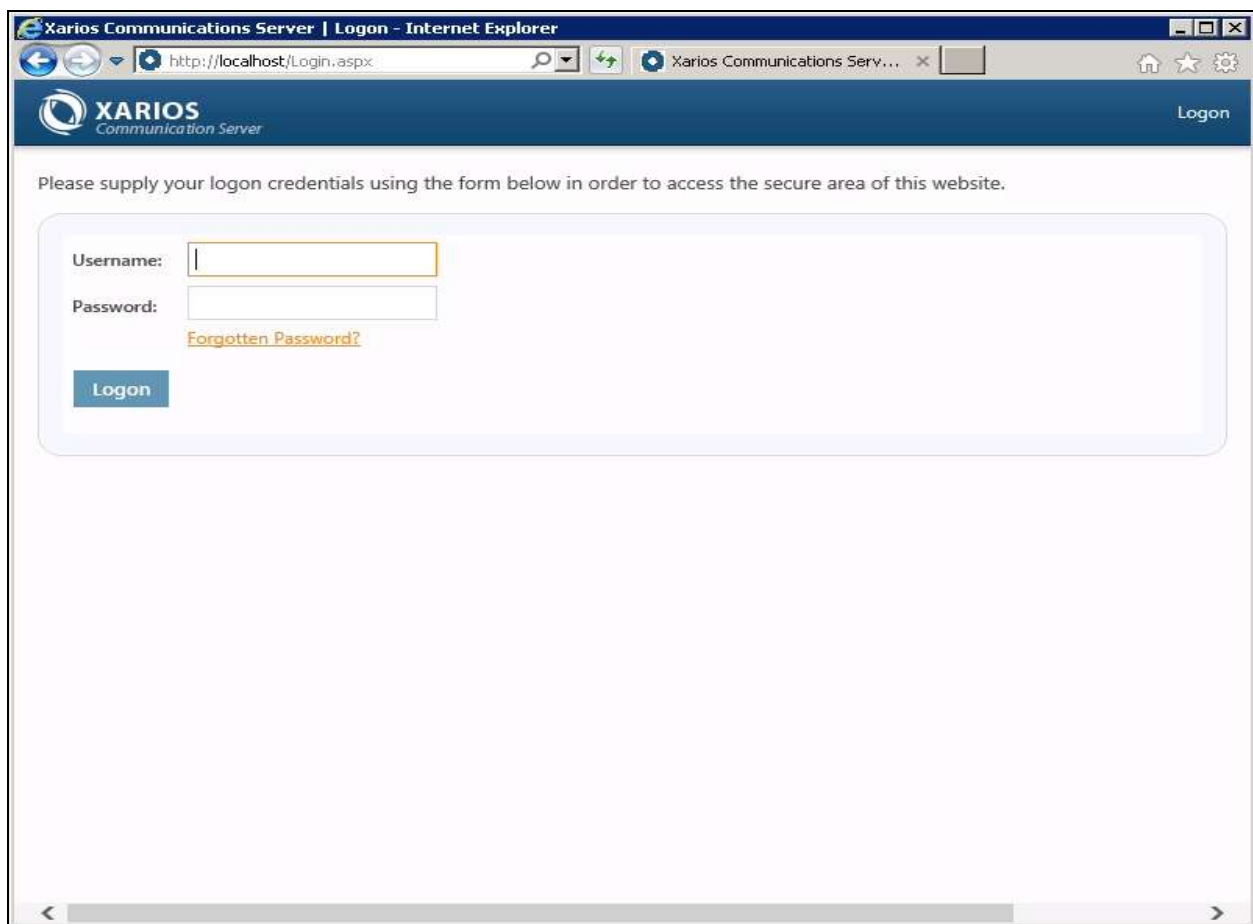
7. Xarios Call Recorder Configuration

Xarios Call Recorder is a bundled package including server, interface components, and software. The software is installed by Xarios prior to delivery to the customer. Configuration of the interface between the Call Recorder and the Avaya Solution is performed using the Xarios Communications Server and is summarized as follows:

- Configure General Recording Settings
- Configure PBX Integration
- Configure PRI Trunks
- Configure Voice Card Mapping
- Configure DTMF Pause/Resume
- Configure Call Exclusion

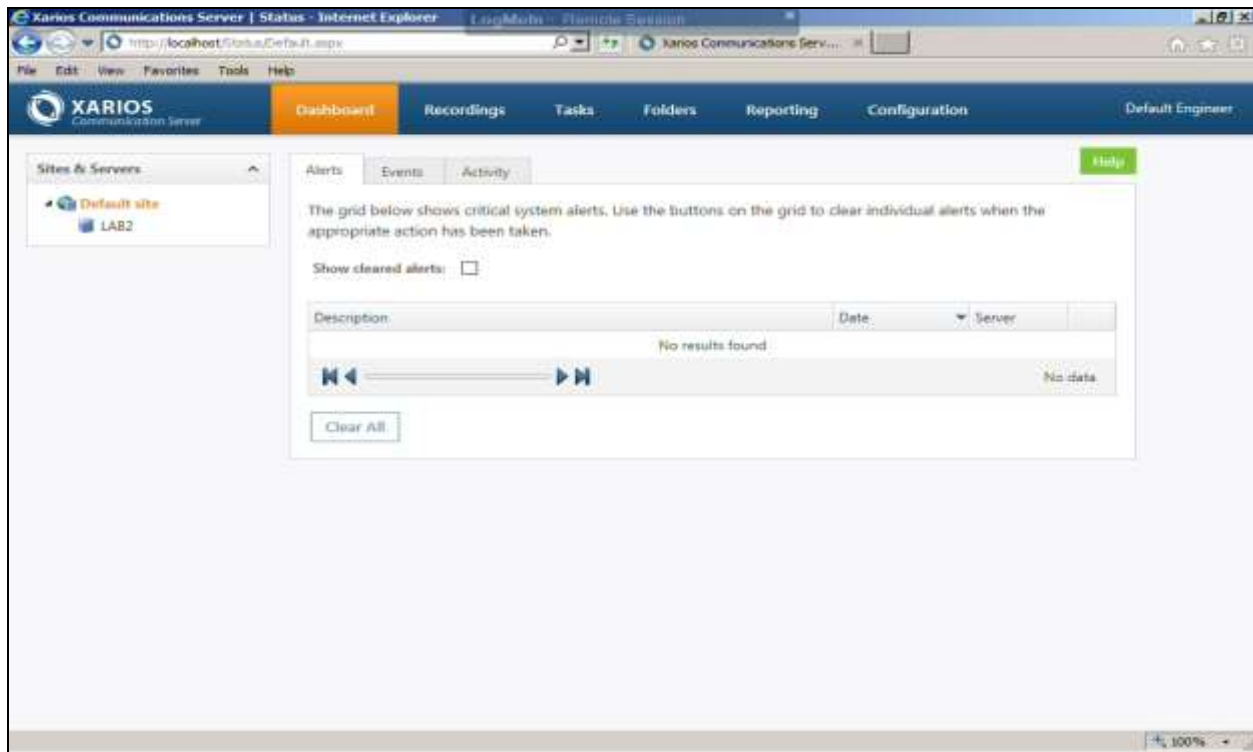
7.1. Configure Xarios Call Recorder

Access the Xarios Communication Server using a Web Browser by entering <http://<callrecorderipaddress>/Login.aspx>.



The screenshot shows a web browser window titled "Xarios Communications Server | Logon - Internet Explorer". The address bar displays "http://localhost/Login.aspx". The page header features the "XARIOS Communication Server" logo on the left and a "Logon" link on the right. Below the header, a message states: "Please supply your logon credentials using the form below in order to access the secure area of this website." The login form contains two input fields: "Username:" and "Password:". Below the password field is a link labeled "Forgotten Password?". A blue "Logon" button is positioned at the bottom left of the form area.

Log in using appropriate credentials (not shown) and the **Dashboard** page will be presented. The Dashboard view provides keys indicators of the systems health and current status of the Xarios call recorder.



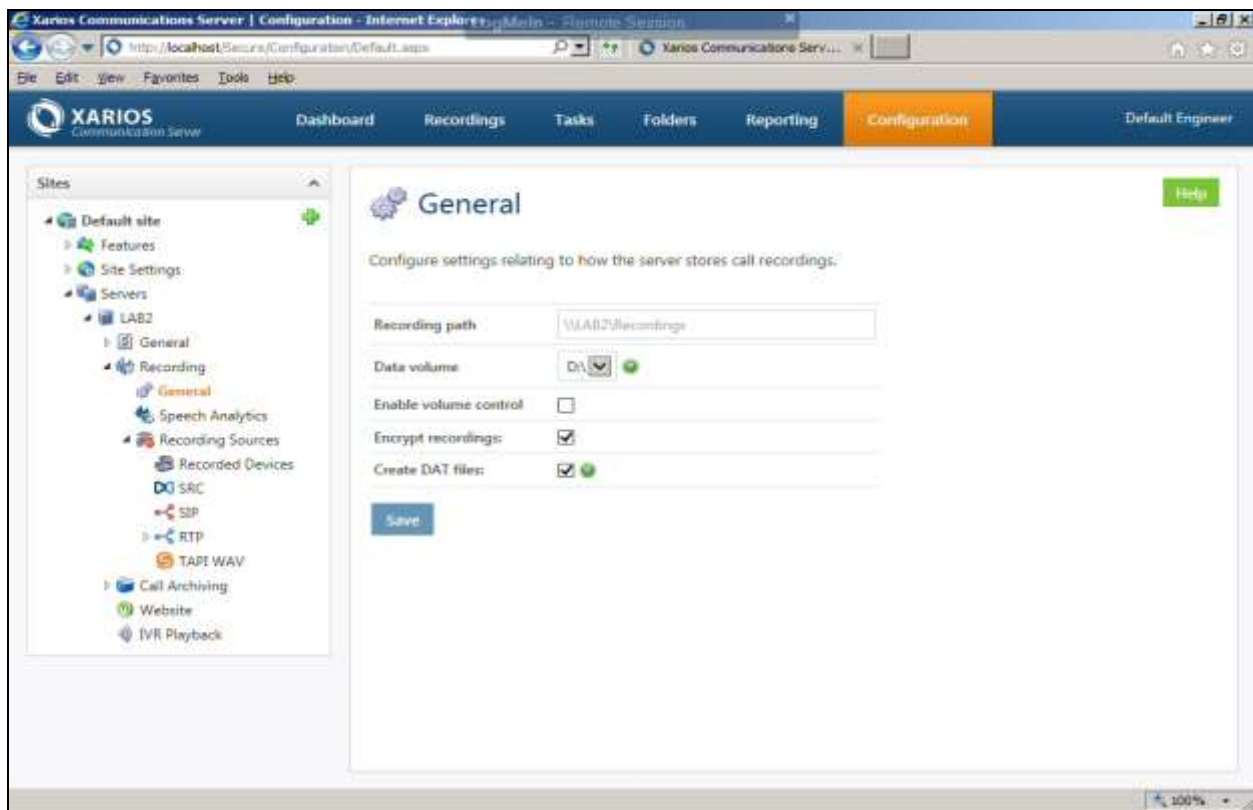
7.2. Configure General Recording Settings

General configuration on the Call recorder is required to configure how calls are recorded, encrypted and where they are stored etc.

Click on the **Configuration** tab. From the left-hand menu, navigate to **Server→Recording General**. On the **General** page, configure the parameters below.

- **Recording path:** Define a recording path in UNC format for the location of stored call recordings.
- **Data volume:** Set the local drive on the call recorder where the recordings are saved.
- Ensure **Encrypt recordings** is checked.
- Ensure **Create DAT files** is checked.

On completion, click the **Save** button.



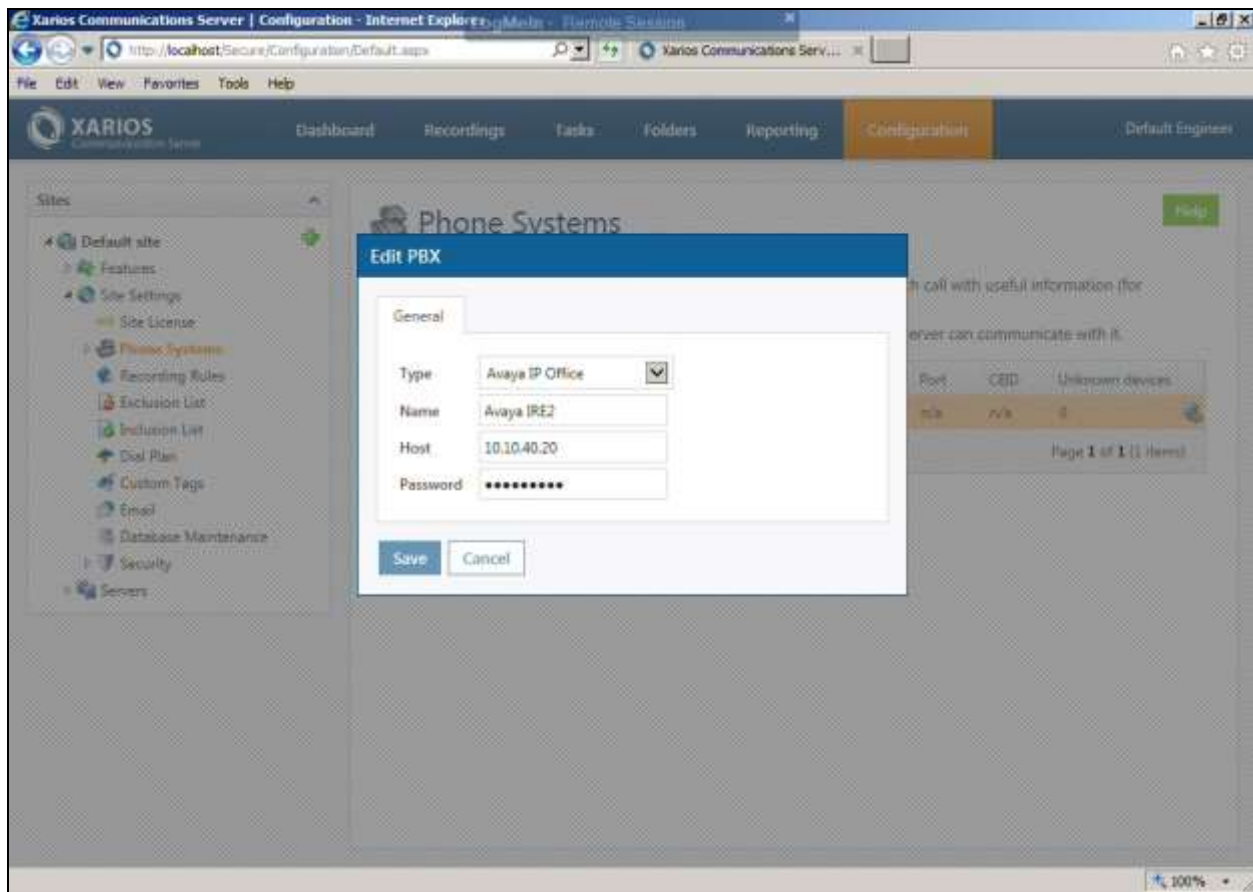
7.3. Configure PBX Integration

The Xarios call recorder needs to be able to communicate with IP Office in order to tag each call with endpoint, agent, group etc. information.

From the left-hand menu, navigate to **Phone Systems** and click **Add** (not shown) and configure as follows in the pop-up window shown below.

- Set **Type** to **Avaya IP Office**.
- Specify a **Hostname** such as **Avaya IRE2**.
- Set **Host** to the ip address of IP Office; in this case **10.10.40.20** was used.
- Set **Password** to the password of IP Office Service User password.

On completion, click the **Save** button.



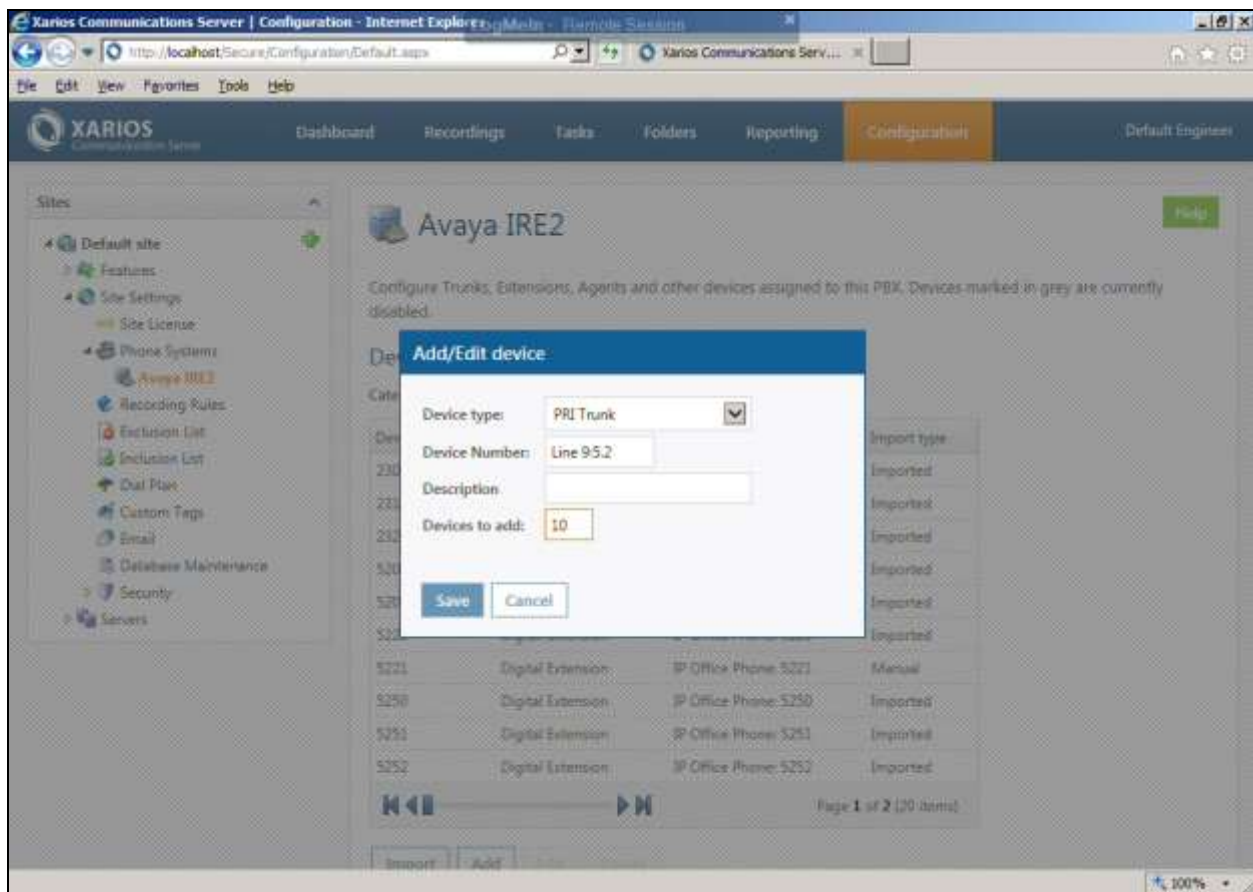
7.4. Configure PRI Trunks

Once the PBX configuration has been set, then devices such as trunks, extensions, agents etc. that are programmed on IP Office need to be configured on the call recorder.

From the left-hand menu, navigate to **Phone Systems**→**Avaya IRE2** (newly added PBX integration in **Section 7.3**) and click **Add** (not shown).

- Set **Device type** to **PRI Trunk** from the drop-down menu.
- Set **Device Number** to the required line number.
- Set **Devices to add** to the required number of channels.

On completion, click the **Save** button.



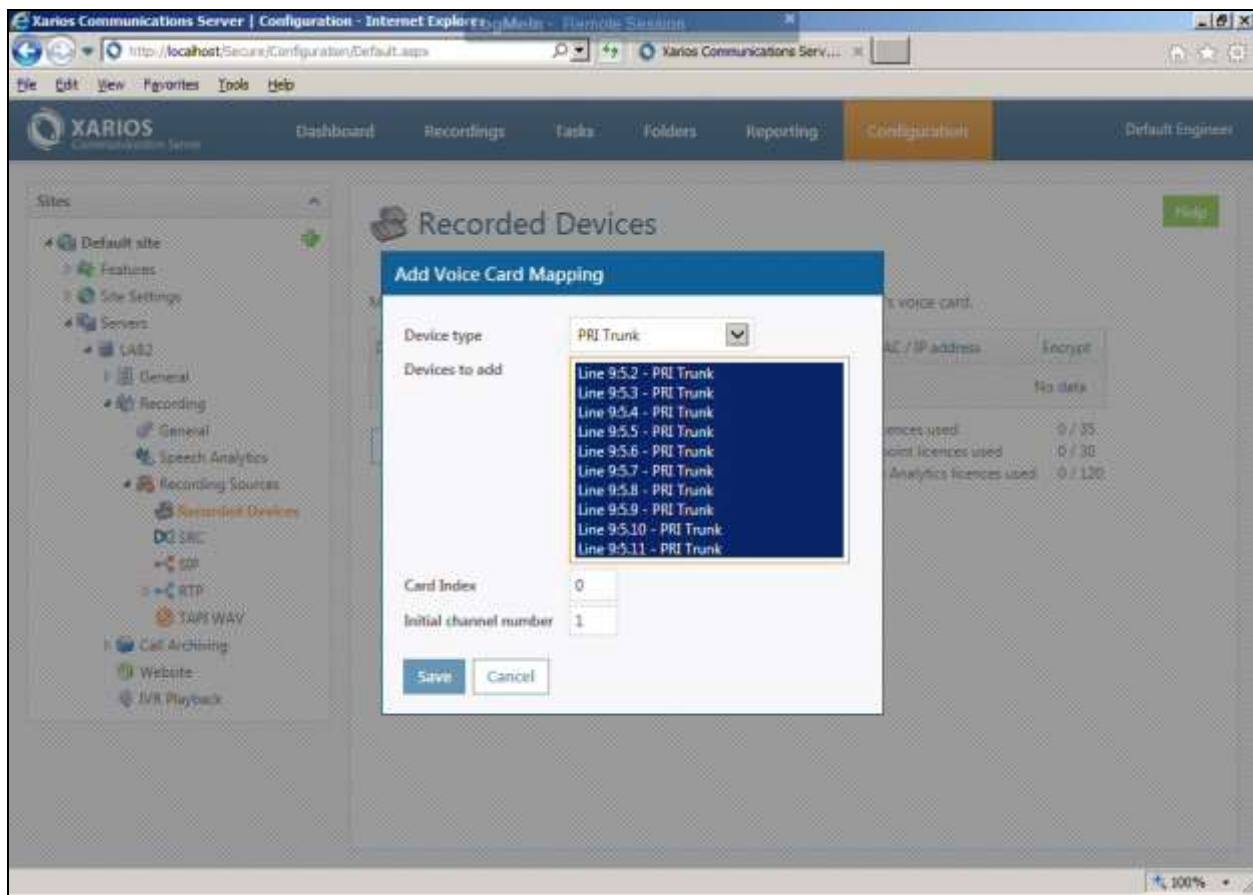
7.5. Configure Voice Card Mapping

Voice card devices, i.e. trunks, are connected to a physical card in the call recording server and require each device to be mapped to a voice channel on the card. This enables the call recorder to know which trunk is connected to each channel.

From the left-hand menu, navigate to **Servers**→**Recording Sources**→**Voice Card** and click **Add** (not shown).

- **Device type:** Select **PRI Trunk** from the drop-down menu.
- **Device to add:** Select or multi select the required devices.
- **Card Index:** Select the index number of the voice card that the device is added to.
- **Initial channel number:** Enter the starting timeslot number.

On completion, click the **Save** button.



7.6. Configure DTMF Pause/Resume

The call recorder system can be configured to pause the recording of a call when a sequence of DTMF digits is entered by the user on the telephone handset. A second sequence can then be entered to resume recording. This can be useful for compliance purposes for taking credit card payments for example.

From the left-hand menu, navigate to **Features→PCI Compliance→DTMF pause & resume** and configure the following parameters.

- Enter the sequence of digits to use for pausing a call in the **Pause DTMF** field. ***789** was used in the compliance testing.
- Enter the sequence of digits to use to resume recording a call in the **Resume DTMF** field. **#987** was used in the compliance testing.

On completion, click the **Save** button.



7.7. Configure Call Exclusion

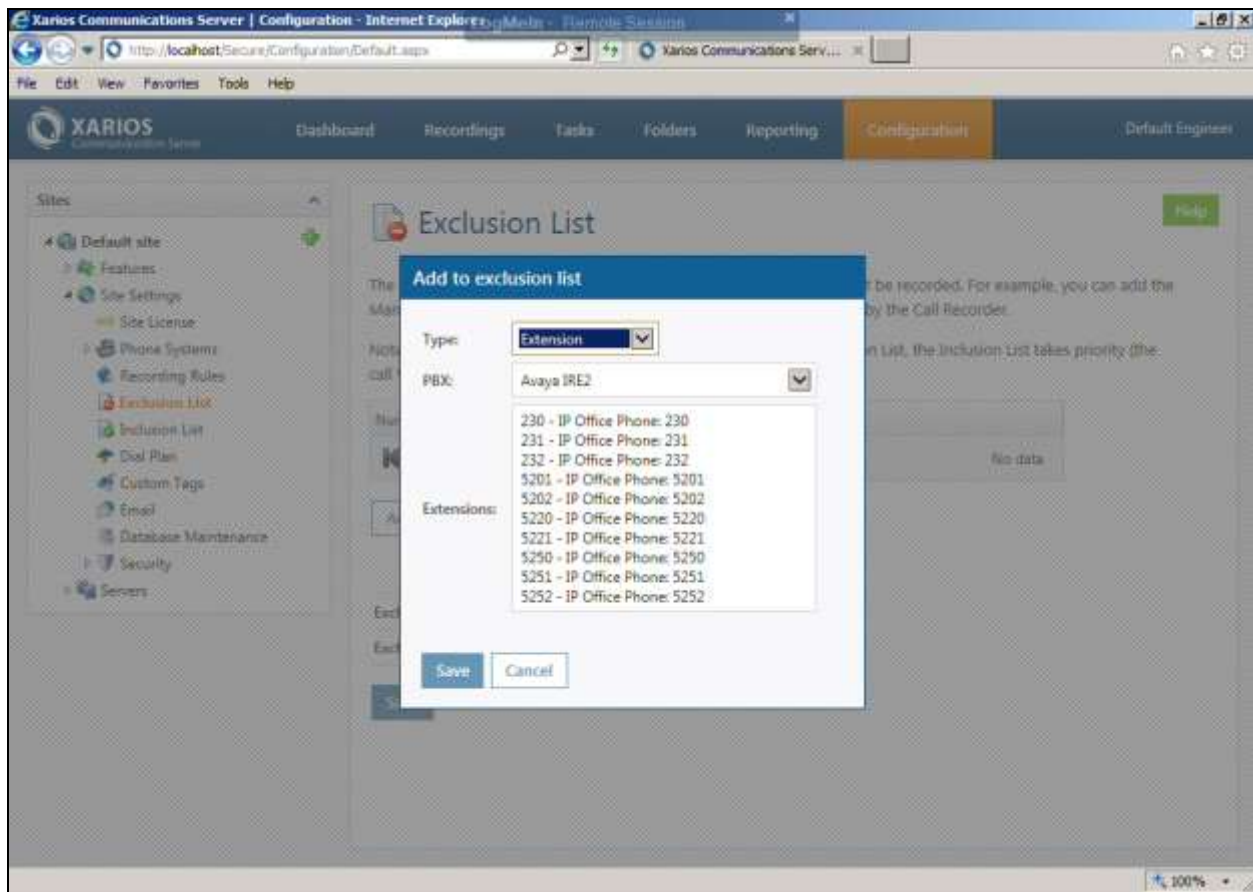
The Exclusion List allows you to define criteria for which calls should not be recorded. Exclusion lists work by discarding recordings based on a piece of data that is associated with a call. The following data can be used to match a recording against an exclusion list.

- Account Code
- Agent
- DDI/DID
- Outside number
- Endpoint
- Hunt group

To configure an exclusion list, from the left-hand menu click on **Exclusion list** and click on **Add** (not shown).

- Set **Type** to **Extension** from the drop-down menu.
- Set **PBX** to the integrated PBX (**Section 7.3**) available from the drop-down menu.
- Set **Extension** to the required value from the extension list to be excluded.

On completion, click the **Save** button.



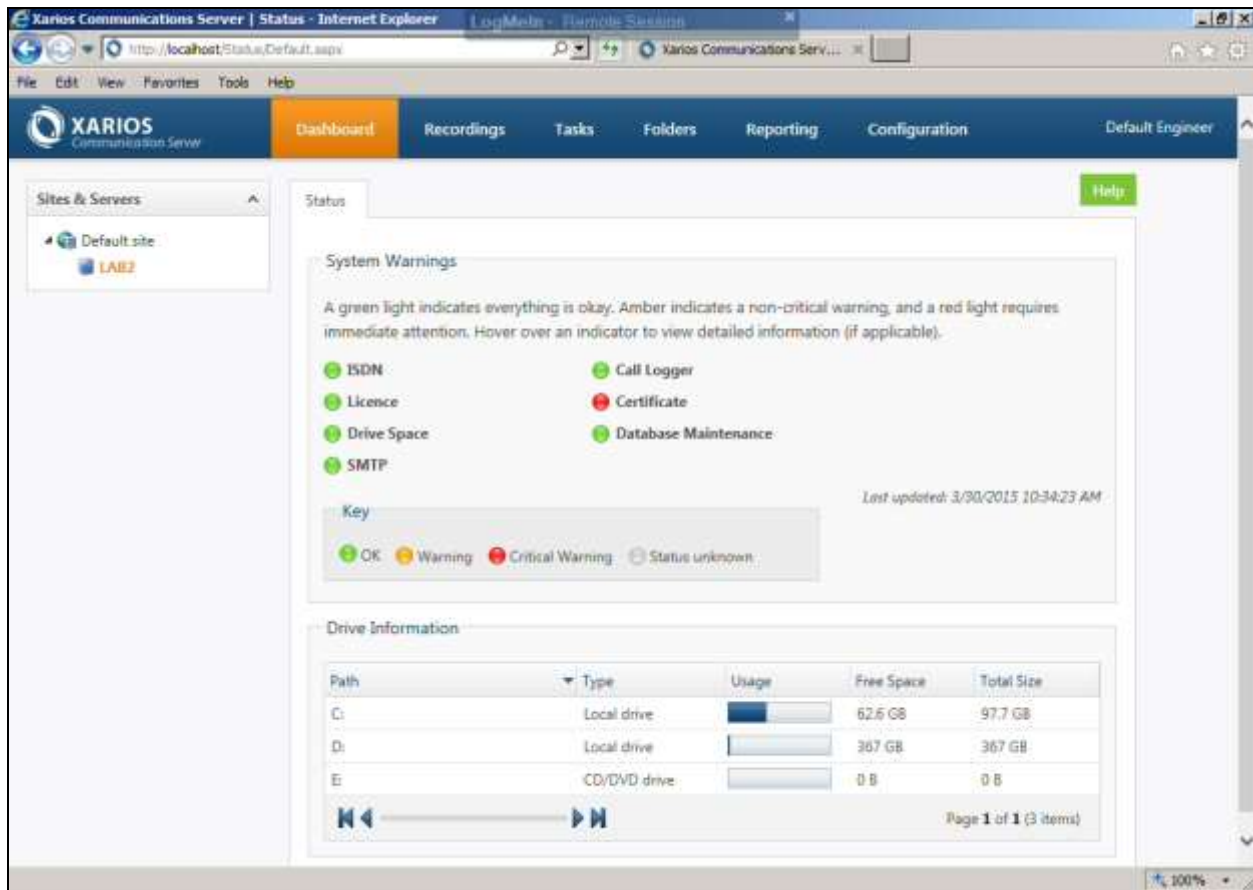
8. Verification Steps

The correct configuration of the solution can be verified by performing the following steps. Use the IP Office System Status program to verify that the PRI trunk interface channels configured in **Section 5.3** are in the **Idle** state. Place a call over the PSTN and ensure there is a channel in the **Connected** state.

The screenshot displays the Avaya IP Office System Status application. The left sidebar shows a tree view with 'System' expanded, leading to 'Trunks (1)', which is further expanded to 'Line 1'. The main window is titled 'IP Office System Status' and contains a 'Digital Trunk Summary' section. Below this summary is a table with 8 columns: Channel Number, Call Ref, Current State, Time in State, Routing Digits, Caller ID or Dialed Digits, Other Party on Call, and Direction of Call. The table lists 10 channels. Channel 5 is in a 'Connected' state, while all other channels (1, 2, 3, 4, 6, 7, 8, 9, 10) are in an 'Idle' state.

Channel Number	Call Ref	Current State	Time in State	Routing Digits	Caller ID or Dialed Digits	Other Party on Call	Direction of Call
1		Idle	00:02:58				
2		Idle	00:02:58				
3		Idle	00:01:57				
4		Idle	00:01:43				
5	269	Connected	00:00:36	0032388201	4000, PSTN,4000	Extn 201, Extn201	Incoming
6		Idle	00:02:58				
7		Idle	00:02:58				
8		Idle	00:02:58				
9		Idle	00:02:58				
10		Idle	00:02:58				

Log into the Xarios Call Recorder using a web browser and select **Dashboard** tab which displays key indicators of the call recorder's health. From the left-hand menu, navigate to the server dashboard **Default site**→**Lab2** and verify the status of each component.



Place a call over the PRI trunk, using the Xarios web browser click on **Dashboard → Activity** and verify an active call is observed.



9. Conclusion

These Application Notes describe the configuration steps required for Xarios Call Recorder to successfully interoperate with Avaya IP Office R9.1 over PRI. All functionality and serviceability test cases were completed successfully with observations noted in **Section 2.2**.

10. Additional References

This section references the Avaya and Xarios product documentation that are relevant to these Application Notes.

Product documentation for Avaya products may be found at <http://support.avaya.com>

[1] *Administrating Avaya IP Office R9.1 Platform with Manager*, Document Number 101005673

[2] *Avaya IP Office R9.1 Doc library*

[3] *Avaya IP Office Knowledgebase*, <http://marketingtools.avaya.com/knowledgebase>

Technical support can be obtained for Xarios from the website <http://www.xarios.com/support>.

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