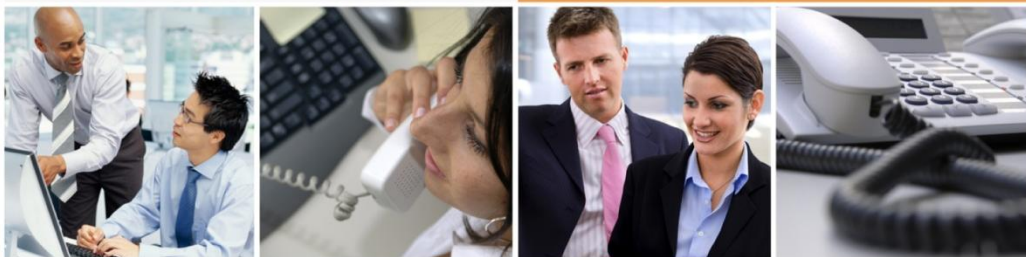


XO SIP Service

Customer Configuration Guide for
Vertical Wave IP Product Family
with XO SIP



1. Overview

About This Document

This document describes interoperability between XO SIP Package 1 (G.711) and Package 2 (G.729a) and Vertical Wave IP500 deployed with an XO-provided Cisco 2432 Integrated Access Device (IAD) as the router/demarcation device. The interoperability testing was done with a Wave IP500 but the same configuration and interoperability applies to a Wave IP2500 system too.

This document assumes the audience has a general understanding of network provisioning and the connectivity requirements of XO Communications SIP service offering.

Known Issues

While XO certifies interoperability between XO SIP service and the IP PBX as outlined herein, the following known issues were identified during Interoperability testing. The customer should be aware that certain features and functions may not be fully supportable. In some cases, special configurations and/or PBX software patches may be available from the vendor.

- 1) Incoming calls to the PBX failed when forwarded to the PSTN.
- 2) Call from extension to extension which was transferred to PSTN failed due to no voice path.
- 3) Outbound fax call failed on Package 2.
- 4) Outbound modem call failed on Package 2.
- 5) Wave IP Product Family can mark DSCP of RTP when it cannot mark DSCP of SIP Signaling – always send the value of 0x00.
- 6) Wave IP Product Family can send out multiple CODECS but always sends G.729 as the first preference and G.711 as the second.

Registration Method

Static registration is utilized between the Vertical Wave IP Product Family and the XO call agent.

XO SIP Service Packages Supported

Pkg	Codec	DTMF	Fax
1	G.711	In-band RTP or RFC2833 on analog extensions, RFC2833 only on IP phones	Inbound and Outbound G.711 Fax supported; Inbound and Outbound T.38 Fax not supported
2	G.729a	In-band RTP or RFC2833 on analog extensions, RFC2833 only on IP phones	Inbound Fax supported; Outbound G.729 Fax not supported; T.38 Inbound and Outbound Fax not supported

2. Testing of Vertical Wave IP Product Family

2.1. Software and Hardware Versions Tested

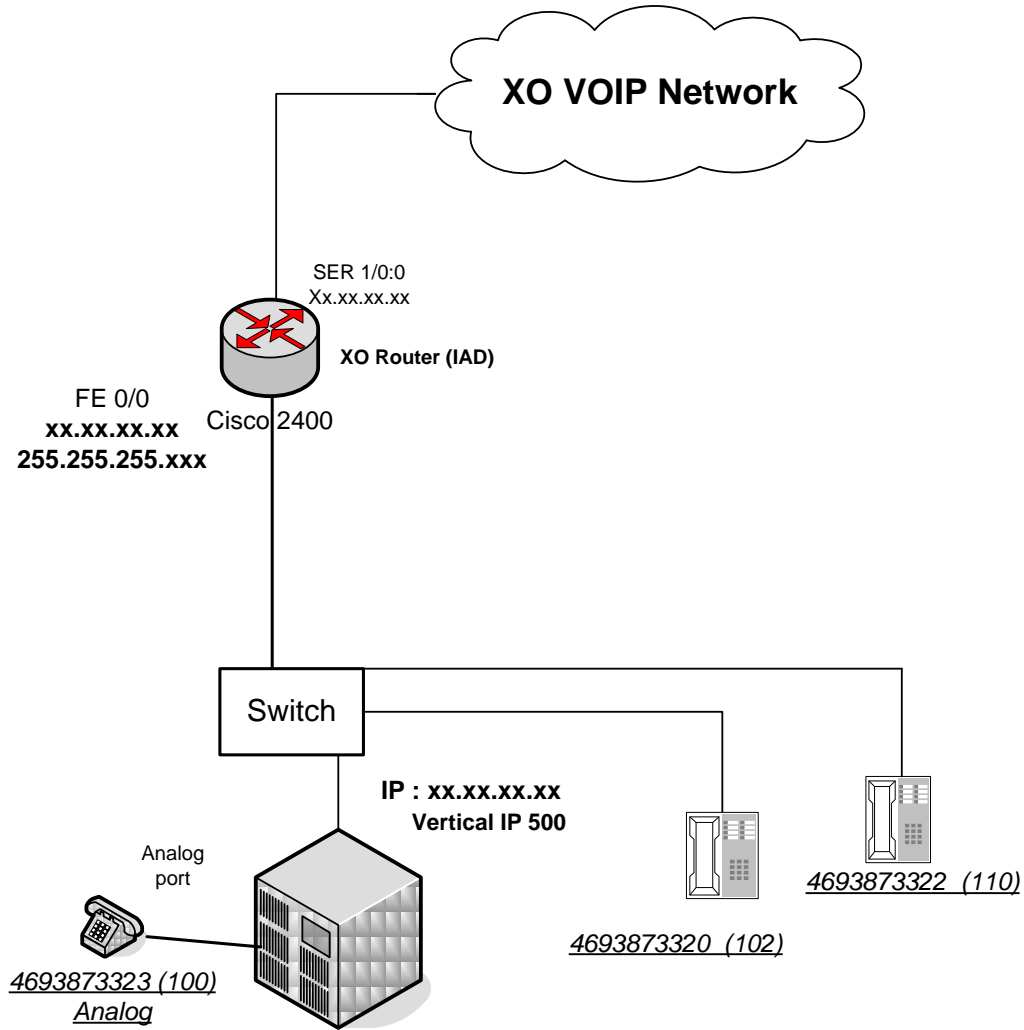
Cisco 2400 used as a router
Cisco IOS Software, 2400 Software (C2430-IS-M), Experimental Version
12.4(20060718:201451) [acphan-V124_4_T2_1 104]
System image file is "flash:c2430-is-mz.xo"

Vertical Wave IP500
Software version: Vertical Wave ISM 2.0

2 - IP Phone
Model : Edge 700

Fax machines:
G3: SHARP UX-B20
SG3: Brother - IntelliFax 1860c

2.2. Lab Test Configuration



Note: Above lab setup only shows main lab network elements.

3. Vertical Wave IP Product Family IP PBX Configuration

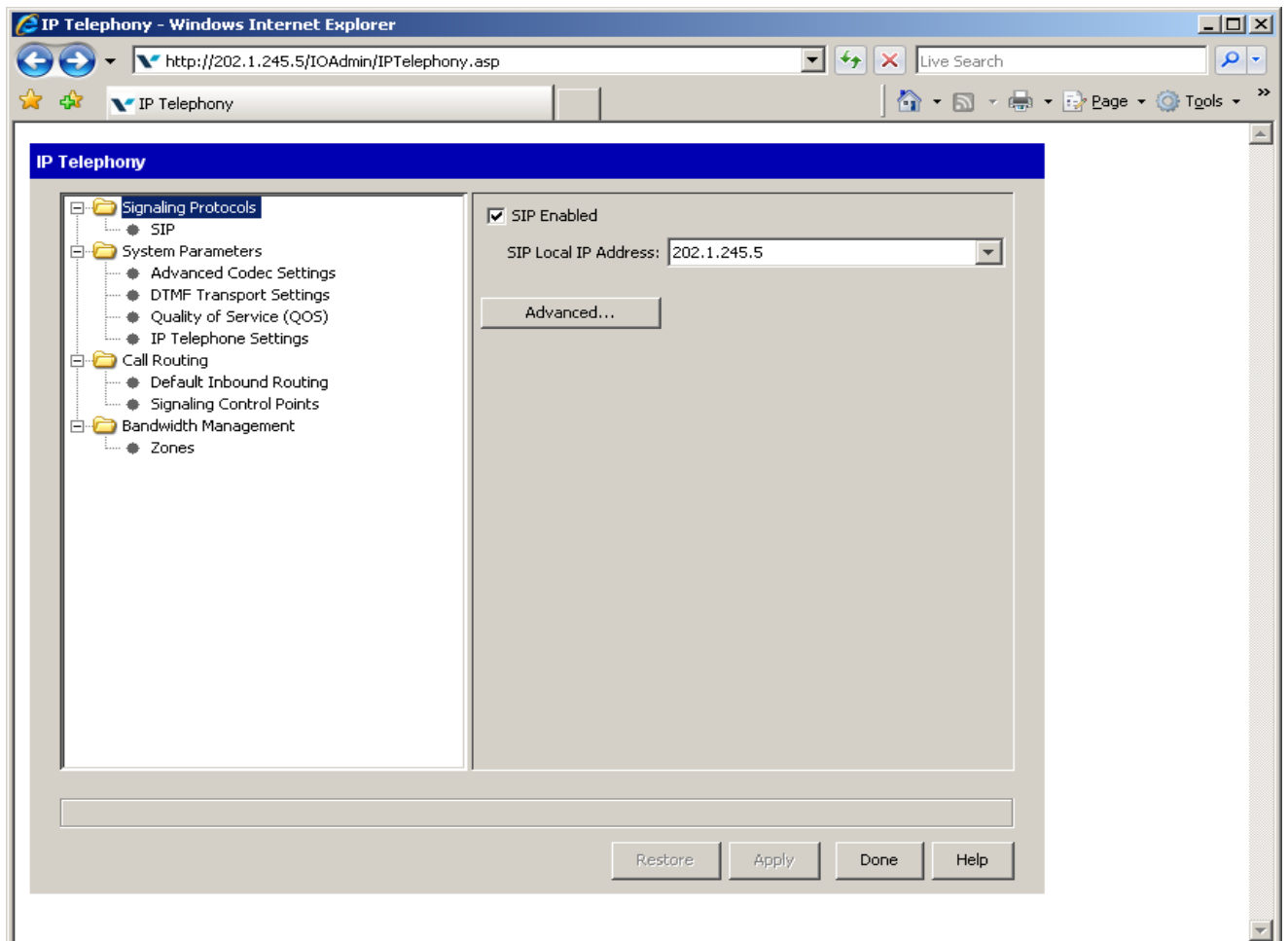
In This Section

XO performed the minimum amount of configuration required to achieve successful completion of test calls over XO SIP. It is beyond the scope of this document and the testing efforts to show a complete configuration, therefore screenshots of the GUI interface are provided only for the details of the SIP trunk configuration that are relevant to interfacing with XO’s SIP product.

This section contains screenshots which detail the SIP trunk configurations.

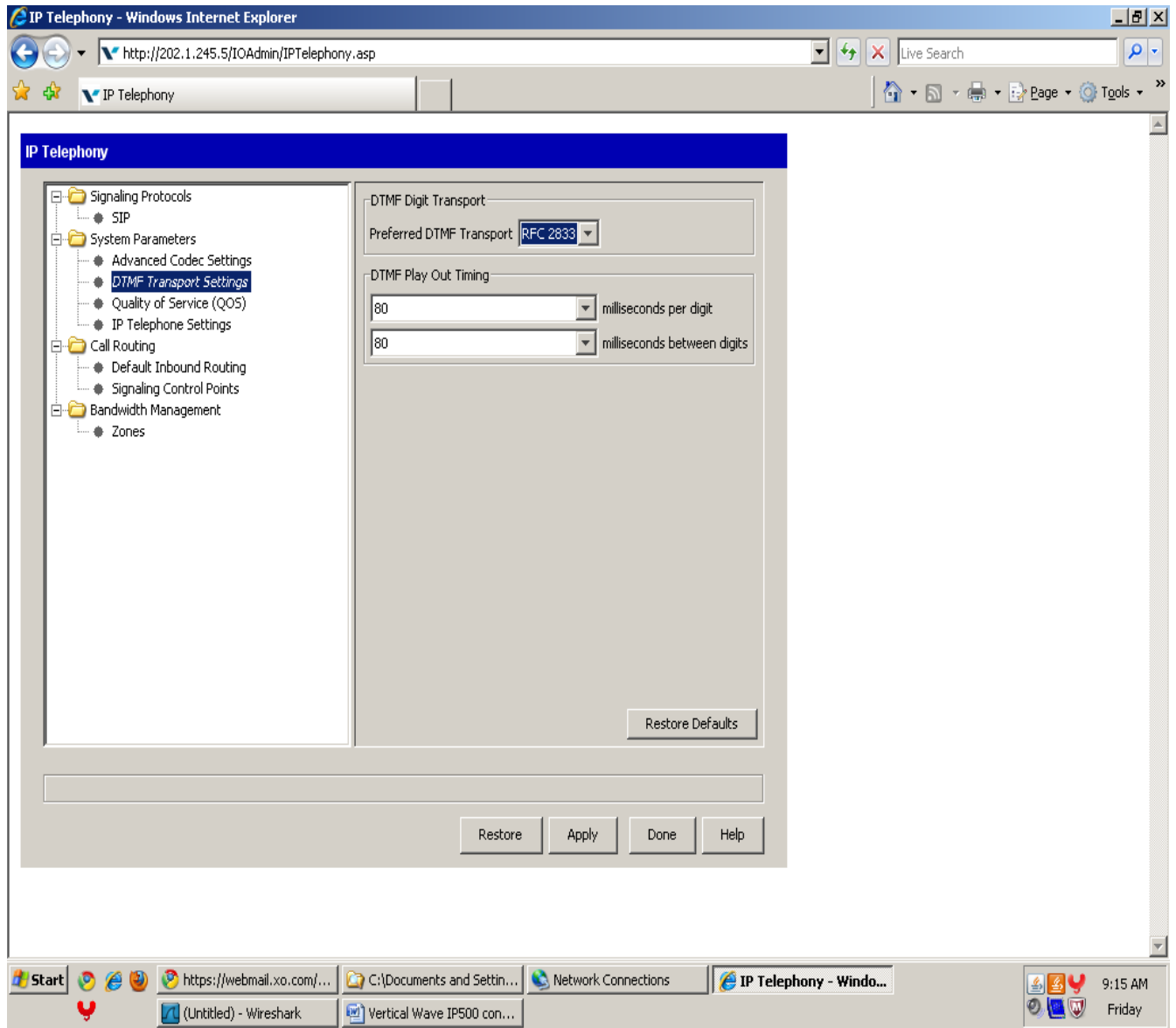
3.1 Vertical Wave IP Product Family Configuration

IP Telephony >> Signaling Protocol
“SIP Local IP Address” = PBX IP Address

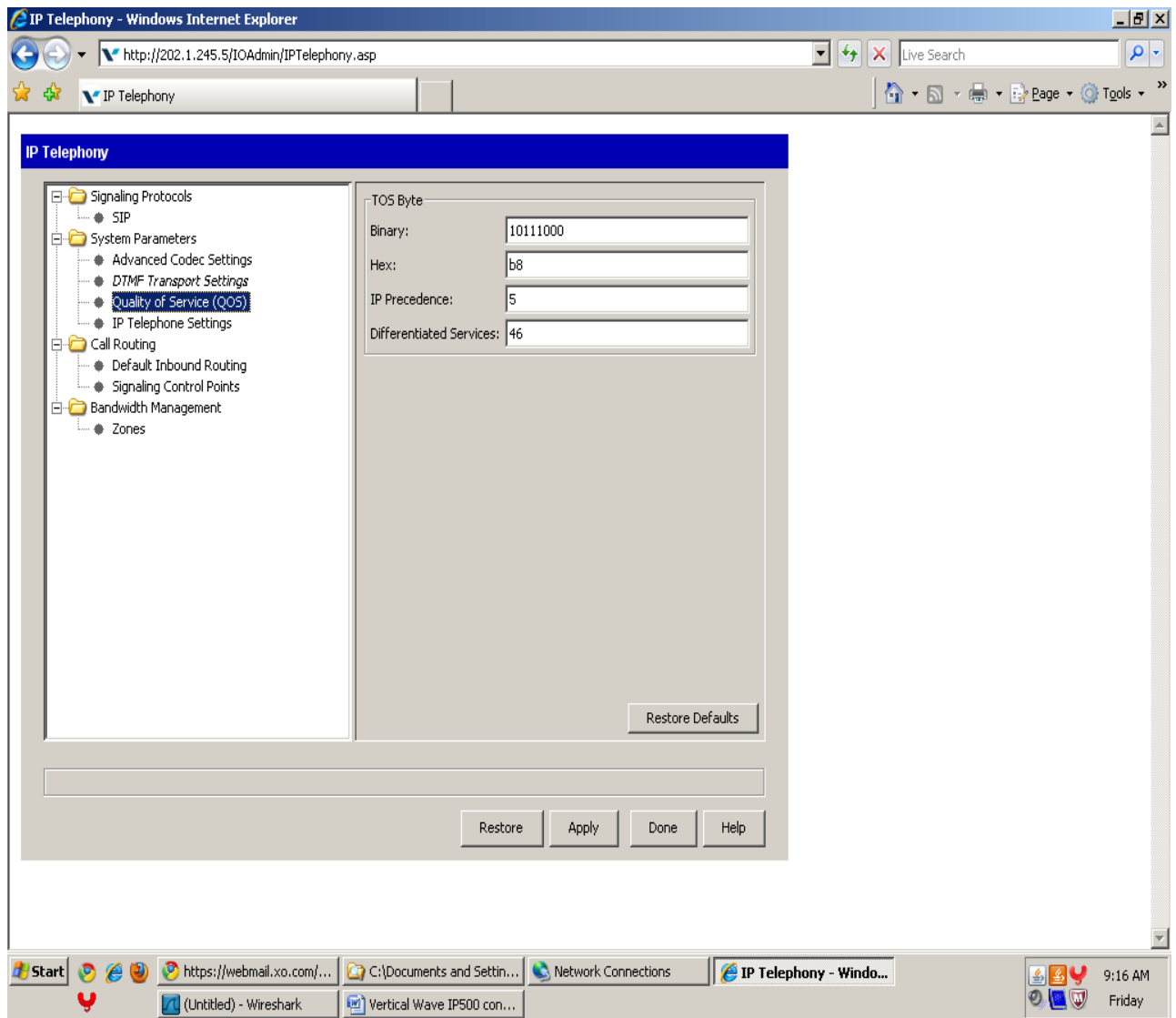


IP Telephony >> System Parameters

- DTMF Transport Setting

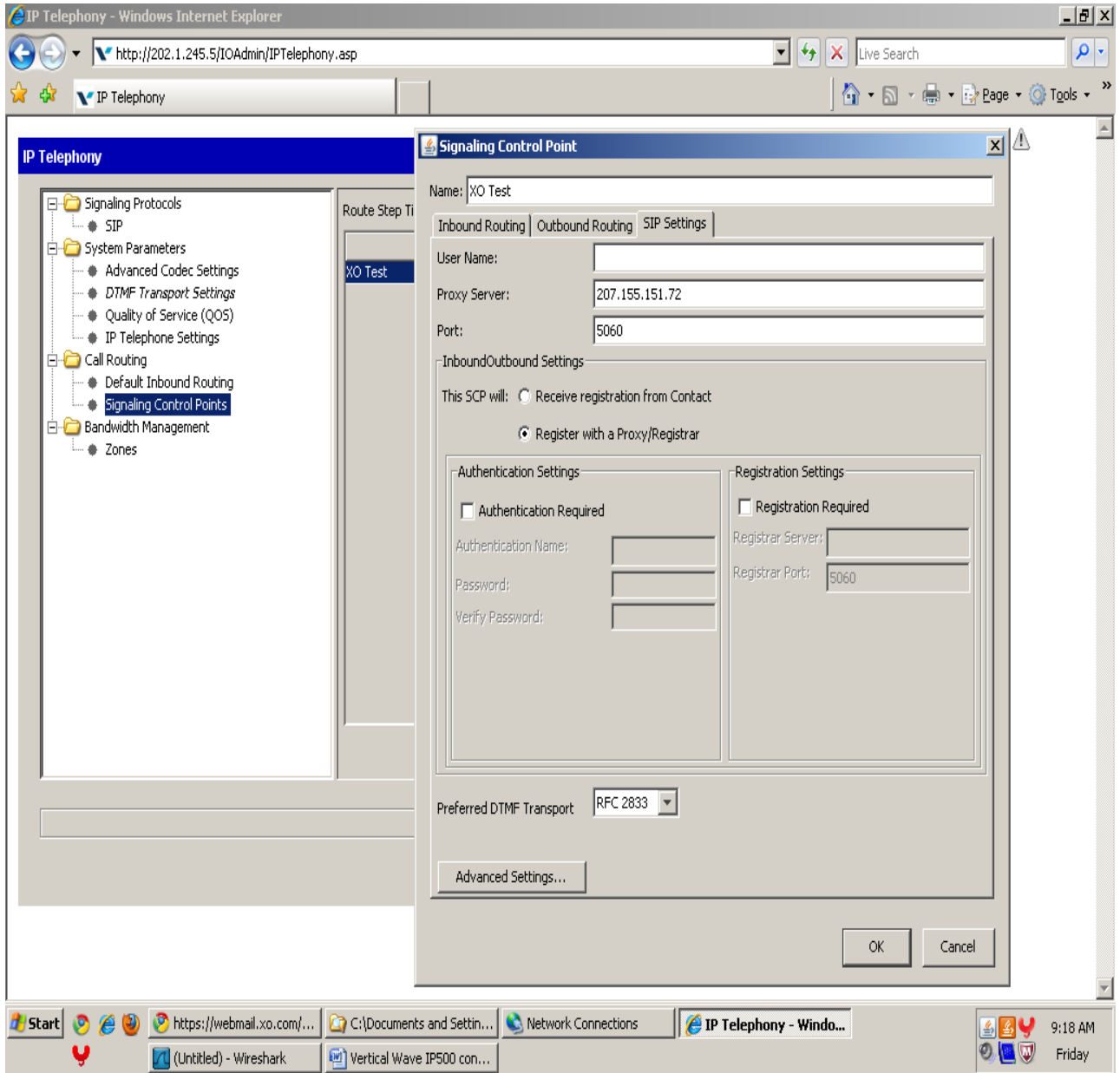


- Quality of Service



IP Telephony >> Call Routing >> Signal Control Point >> ‘XO Test’

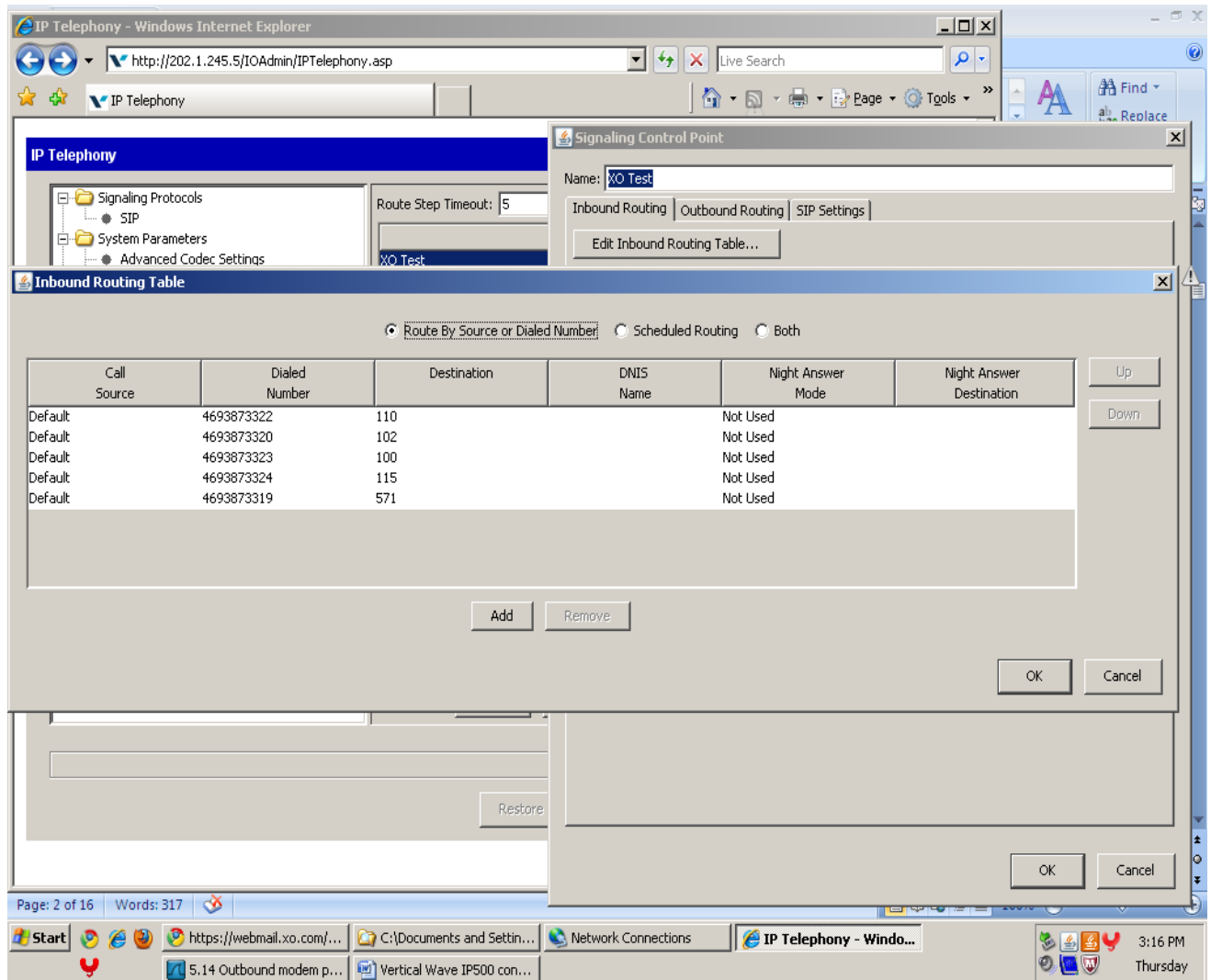
- **SIP Setup**
“Proxy Server” = NBS SIP port



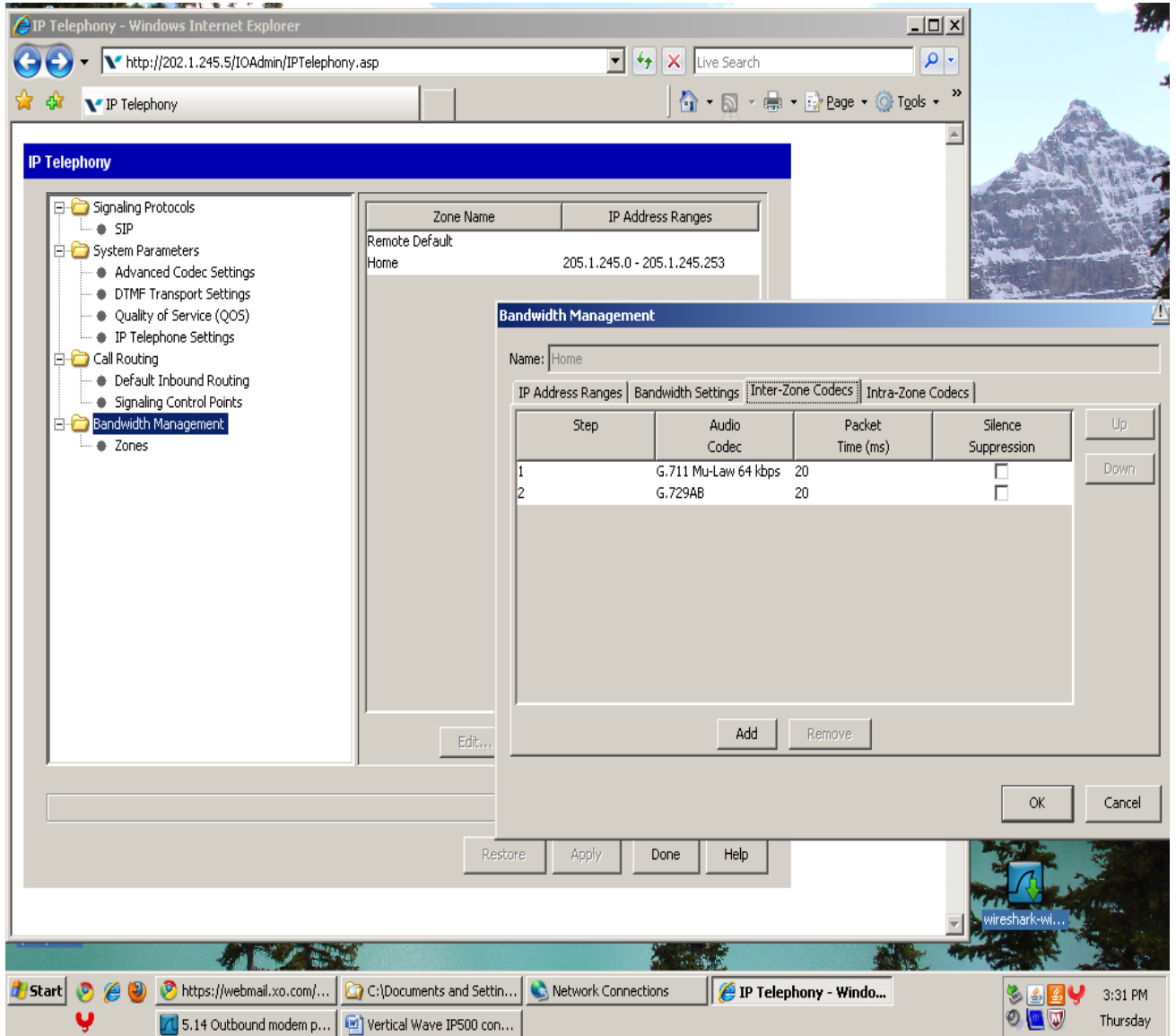
- **Inbound Routing**

Edit Inbound Routing Table

- 4693873322 -> extension 110 (Digital Station)**
- 4693873320 -> extension 102 (Digital Station)**
- 4693873323 -> extension 100 (Analog-1)**
- 4693873324 -> extension 115 (AutoAttendant / VM)**
- 4693873319 -> extension 571 (Hunt Group)**

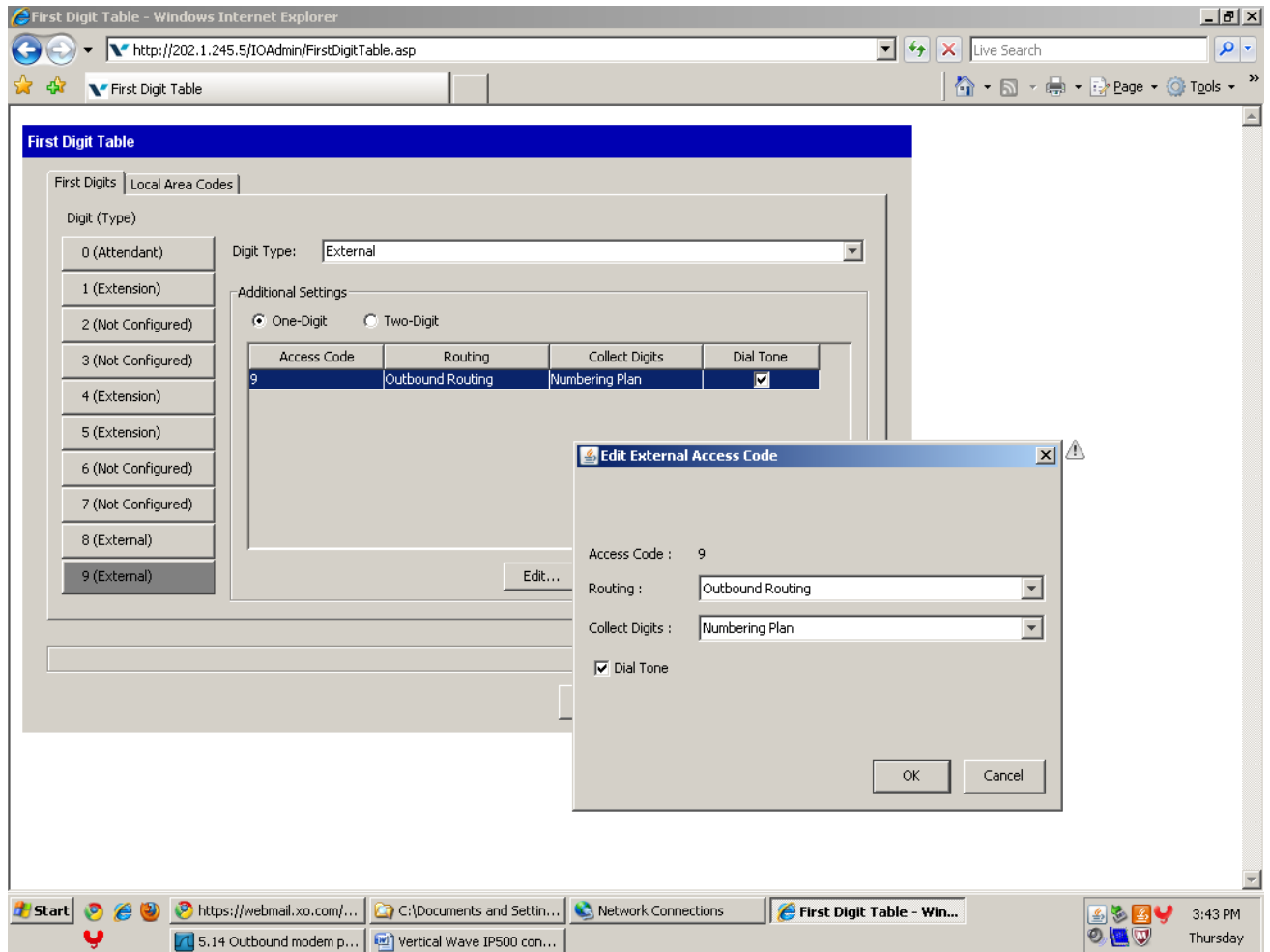


- **Bandwidth Management >> Zone Inter-Zone Codecs**

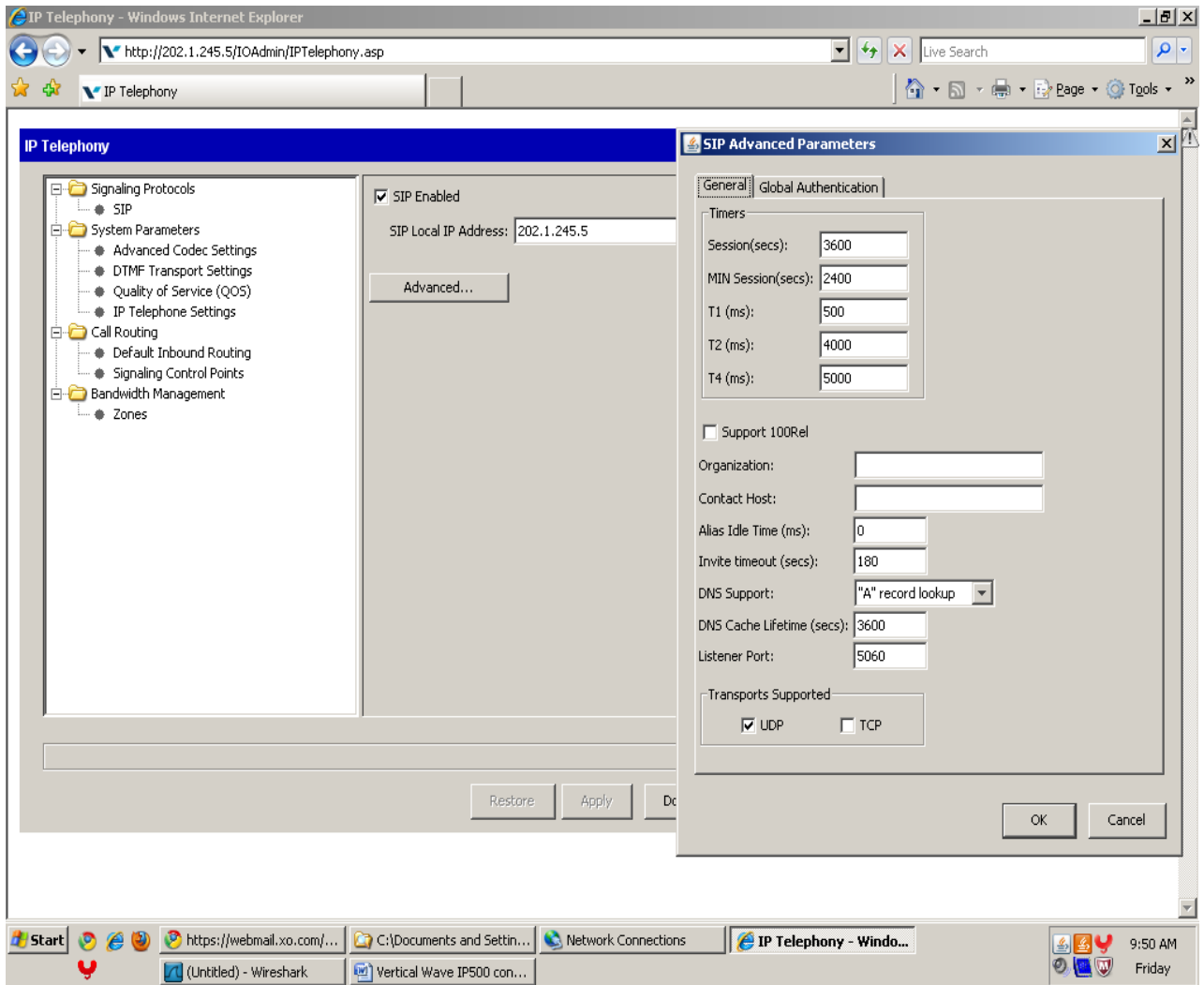


First Digit Table >> First Digit

- External Access Code



IP Telephony >> Signaling Protocol >> SIP Advanced Parameters



(Remote Desktop to Wave 202.1.245.5) >> TVAdmin

Digital Station 102 -

Phone >> Call Handling

The screenshot shows the 'Users - Vertical Wave Global Administrator' window. The main area displays a table of users with the following data:

Name	Extension	DID	Slot:Port / MAC Address	Device Type	Type	Agent	Locked Out	Personal Status	ACD DND	Mail Usage	Greeting Usa
Administrators											
Analog1	100		1 (Analog) : 1	Analog	User			Available		1.3%	3.4
Digital102	102		4 (Digital) : 1	Digital	User			Available		0.0%	3.4
Edge700	110		4 (Digital) : 4	Digital	User			Available		0.0%	3.7
Managers											
Users											
Virtual1	111		1 (Analog) : 2	Analog	User			Available		n/a	1.0

The 'Digital102 - User' dialog box is open, showing the 'Phone \ Call Handling' configuration. The left pane shows a tree view with 'Call Handling' selected. The right pane contains the following settings:

- Call Forwarding...** (button)
- Handle busy calls differently than calls not answered
- Action if the call is not answered:**
 - Play user's default greeting
 - Action: Take a message (dropdown menu)
- Action if the station is busy:**
 - Play user's default greeting
 - Action: Transfer to external number (dropdown menu)
 - Transfer to number: (972) 578-7777 (text field)

Buttons at the bottom of the dialog include 'Previous', 'Next', 'OK', 'Cancel', and 'Help'. The taskbar at the bottom shows the Start button, 'Users - Vertical Wave Gl...', 'Document - WordPad', and the system clock '10:09 AM'.

Phone >> Station Features

The screenshot shows the 'Users - Vertical Wave Global Administrator' application. The main window displays a list of users with columns for Name, Extension DID, Slot/Port / MAC Address, Device Type, Type, Agent, Locked Out, Personal Status, ACD DND, Mail Usage, and Greeting Usage. The 'Digital102' user is selected, and a 'Digital102 - User' dialog box is open, showing the 'Phone \ Station Features' configuration. The dialog includes a tree view on the left with 'Station Features' selected, a 'Telephone template' dropdown set to 'Basic', and a table of button features with parameters. A 'Ring volume' slider and a checkbox for 'Use voice-first answering' are also visible.

Button	Feature	Parameter
1	Speaker	
2	Hold	
3	Tap	
4	TRNS/CONF	
5	Primary	102
6	User Forward	
7	Call Appearance	
8	Auto Dial	99725786857
9	System Park	
10	Self Park	
11	Message Waiting	102
12	Auto Dial	

Digital Station 110 -

Phone >> Call Handling

Users - Vertical Wave Global Administrator

Name	Extension / DID	Slot/Port / MAC Address	Device Type	Type	Agent	Locked Out	Personal Status	ACD DND	Mail Usage	Greeting Usa
Administrators										
Analog1	100	1 (Analog) : 1	Analog	User			Available		1.3%	3.4
Digital102	102	4 (Digital) : 1	Digital	User			Available		0.0%	3.4
Edge700	110	4 (Digital) : 4	Digital	User			Available		0.0%	3.4
Managers										
Users										
Virtual1	111	1 (Analog) : 2	Analog	User			Available		n/a	1.0

Edge700 - User

Category: Phone \ Call Handling

Call Forwarding...

Handle busy calls differently than calls not answered

Action if the call is not answered or the station is busy

Play user's default greeting

Action: Take a message

Phone >> Station Features

The screenshot displays the 'Users - Vertical Wave Global Administrator' application. The main window shows a list of users under the 'Users' tab. A dialog box titled 'Edge700 - User' is open, showing the configuration for the 'Station Features' of the user 'Edge700'. The dialog box includes a tree view on the left with 'Station Features' selected, a 'Telephone template' dropdown set to 'Basic', and a table of button features.

Button	Feature	Parameter
1	Speaker	
2	Hold	
3	Tap	
4	TRANS/CONF	
5	Primary	110
6	User Forward	
7	Call Appearance	
8	Auto Dial	
9	System Park	
10	Self Park	
11	Message Waiting	110
12	Auto Dial	

Below the table, there is a 'Ring volume' slider and a checkbox labeled 'Use voice-first answering' which is currently unchecked. At the bottom of the dialog box are buttons for 'Previous', 'Next', 'OK', 'Cancel', and 'Help'.

Menu Choice -

Auto Attendants

Name	Extension	DID	Description
Default Auto Attendant	560		The Auto Attendant automatically assigned to a new trunk
DirectToVMExt102	577		
ExtXferFromHG	588		
Voicemail	550		Default voice mail system
XO AA	115		

XO AA - Auto Attendant

General | **Menu Choices** | Scheduled Actions | Audio | Advanced

Key	Description
1	Transfer to Edge700
2	Transfer to Digital102
4	Dial by name
5	User login
nothing	Transfer to Attendant

Buttons: Add..., Edit..., Delete

Number of seconds before performing 'nothing' menu choice: 3

Process all other digits as user extensions

Prevent type-ahead

Restrict dial-by-name and extension matching to members of:

< no groups defined >

Buttons: OK, Cancel, Help

Dial Plan -

Digits	DID	Name	Type	Owner	Comments
0		Attendant	Station Hunt Group	System	
100		Analog1	User	System	
102		Digital102	User	System	
110		Edge700	User	System	
111		Virtual1	User	System	
115		XO AA	Auto Attendant	System	
411		Dial by name	Special extension	System	
550		Voice mail access	Special extension	System	
560		Default Auto Attendant	Auto Attendant	System	The Auto Attendant automatically assigned to a new trunk
570		Modem Hunt Group	Station Hunt Group	System	
571		TestHG	Station Hunt Group	System	
577		DirectToVMExt102	Auto Attendant	System	
588		ExtferFromHG	Auto Attendant	System	
8			8 Dialing Service	System	
9		Phone number	Dialing Service	System	
911		Emergency	Special extension	System	