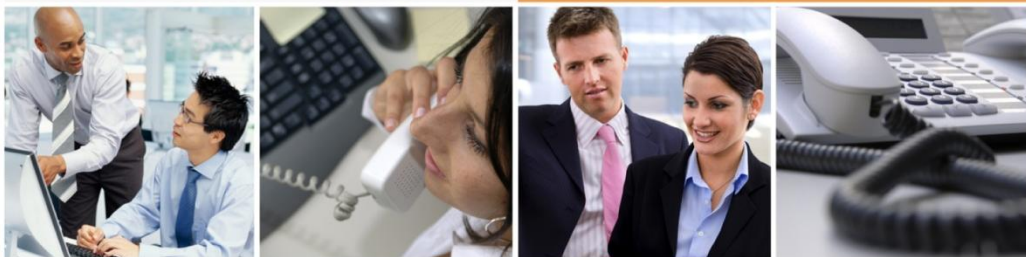


XO SIP Service

Customer Configuration Guide for
ComXchange IP PBX 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 the ComXchange IP PBX with software version 1.2.11.1 and subsequent releases, deployed with an XO-provided Cisco 2432 IAD as the router/demarcation device.

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) T.38 Fax is not supported.
- 2) In-band DTMF is not supported. Only DTMF via RFC2833 is supported.
- 3) Outbound caller ID block feature (feature code *67) is not supported.
- 4) ComXchange does not insert SIP Session timer headers in any SIP request or response. (No impact on call flows.)
- 5) Conference call with more than 3 parties was not tested.
- 6) Conference call hosted on IP PBX extension phone between 3 parties is dropped if host extension hangs up, which is a limitation of the Aastra 57i phone used during testing.
- 7) Call hold (from remote party using re-INVITE) fails on inbound calls when using Package 2 (G.729 codec).
- 8) Call Forward Always from PSTN to PSTN failed during testing on version 1.2.11.1. Fix will be included in ComXchange release 1.2.12.0 (planned for March 2010).
- 9) Call Forward Busy and Call Forward No Answer are supported on the IP PBX, however these features could not be tested, as they are not supported on the Aastra 57i phone used during testing.
- 10) Blind transfer using "transfer" button failed during testing on version 1.2.11.1. Fix will be included in ComXchange release 1.2.12.0 (planned for March 2010).
- 11) Blind transfer using "#" button does not work. A fix is planned for a future ComXchange release.
- 12) Outbound calls over trunk group limit are rejected with "403 Forbidden". Instead of failing the call, ComXchange PBX keeps trying to terminate calls by sending new INVITEs until user manually hangs up phone. This problem was identified as an Aastra 57i IP phone issue. Workaround: 'Outbound proxy server' should be configured as "0.0.0.0" on Aastra 57i IP phone.

Registration Method

Static registration is utilized between the ComXchange IP PBX and the XO call agent.

**XO SIP
Service
Packages
Supported**

Pkg	Codec	DTMF	Fax
1	G.711	RFC2833 is required for DTMF (in-band DTMF is NOT supported)	G.711 pass-through T.38 Fax is NOT supported.
2	G.729a	RFC2833 is required for DTMS (in-band DTMF is NOT supported)	G.711 pass-through T.38 Fax is NOT supported.

2. Testing of ComXchange IP PBX

2.1. Software and Hardware Versions Tested

1. 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"
2. ComXchange
Software version: 1.2.11.1
Configuration tool version: 1.2.11.0
3. IP Phones: Aastra model number 57i

ATA analog phone: Grandstream "Handy Tone 286"

3. ComXchange IP PBX Configuration

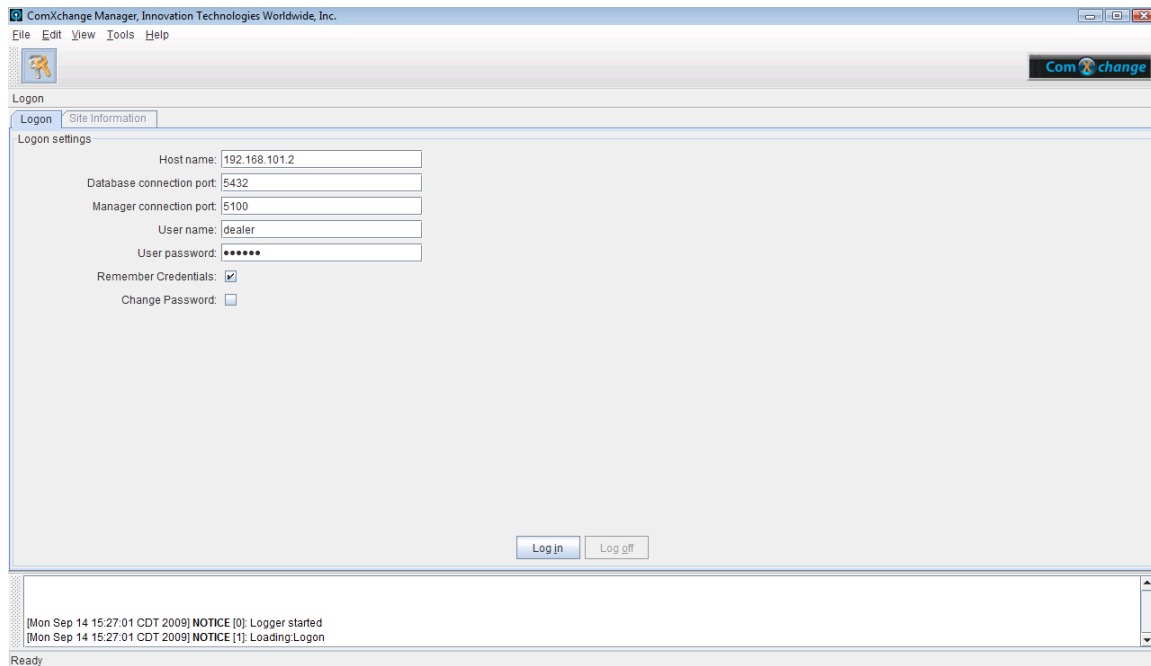
In This Section XO performed the minimum amount of configuration required to achieve successful completion of test calls over XO SIP. It is beyond the scope of this document and the testing efforts to show a complete configuration, therefore screenshots of the GUI interface are provided only for the 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.

Login screen:

If login via internal network use LAN IP: 192.168.101.2

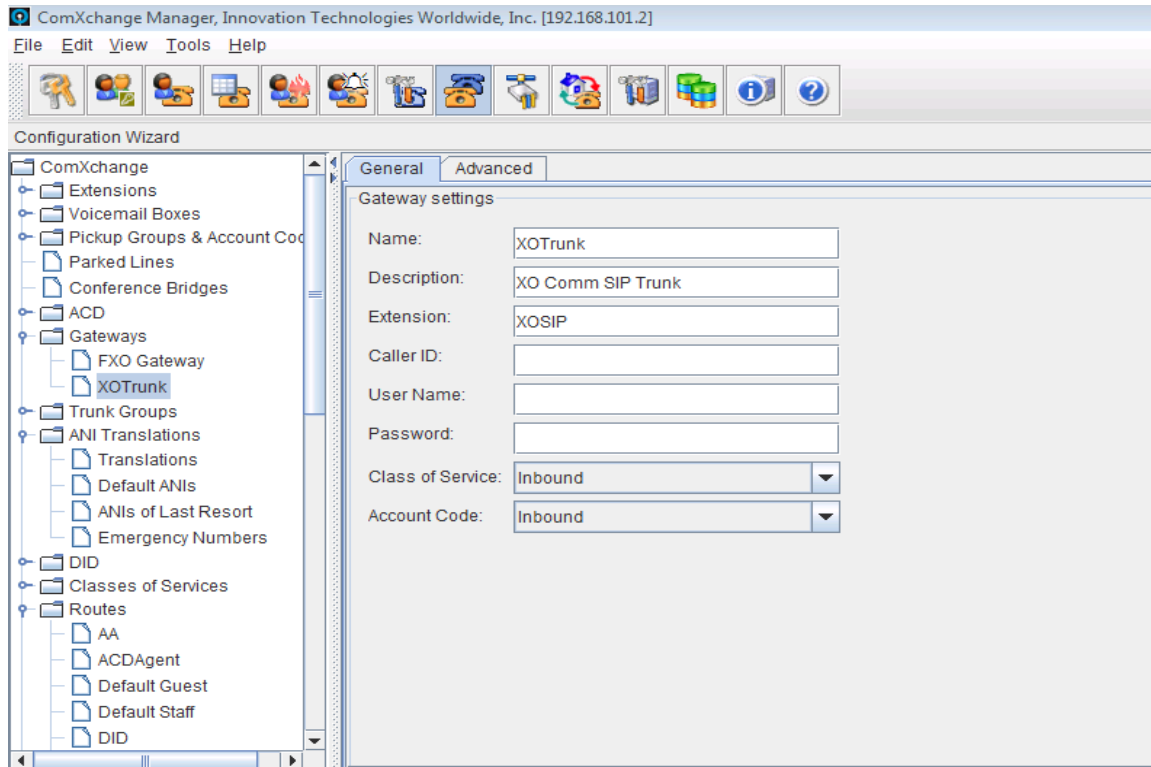
If login via external network use WAN IP: use IPPBX IP



Login/pass: dealer

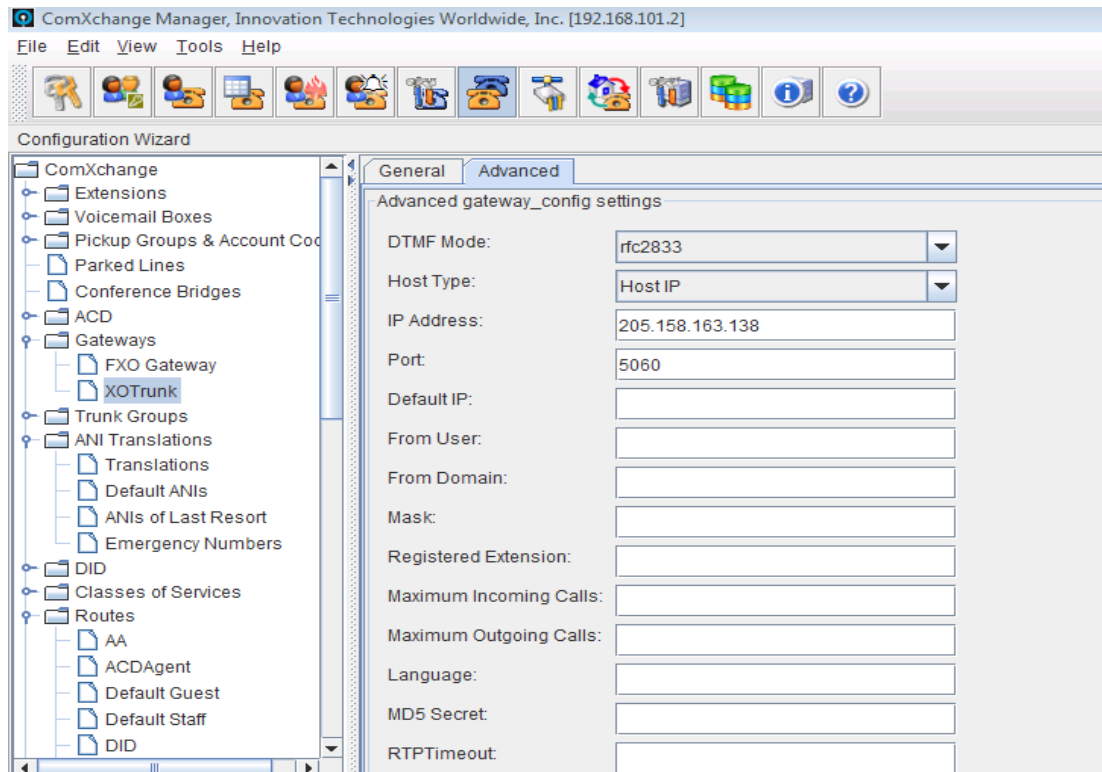
Trunk configuration:

General



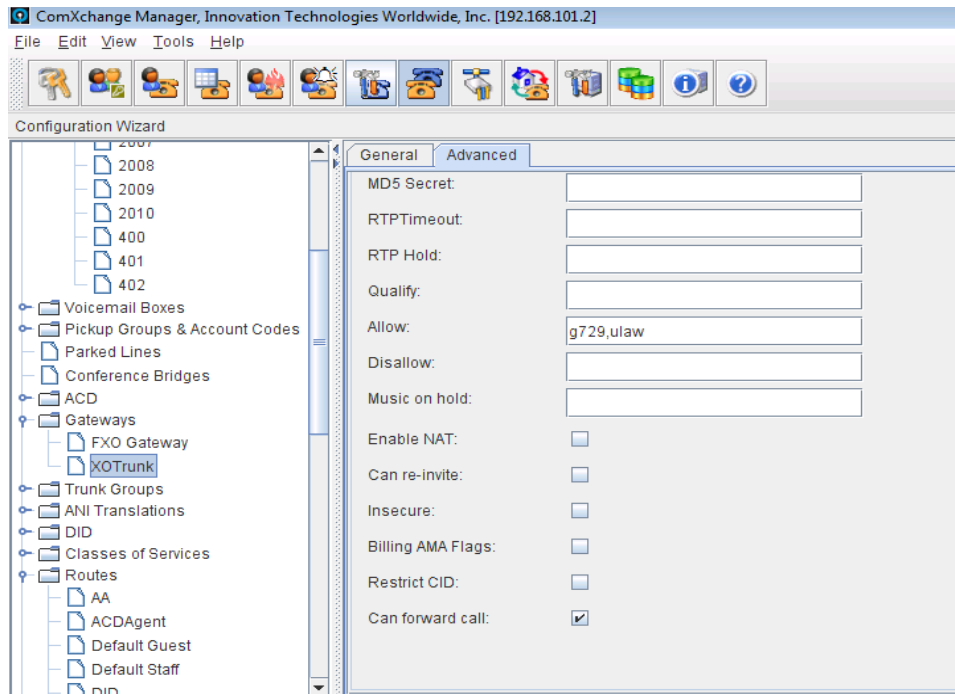
Advanced

Enter XO NBS IP in the “IP Address”
“Host Type” = “Host IP” for static registration.

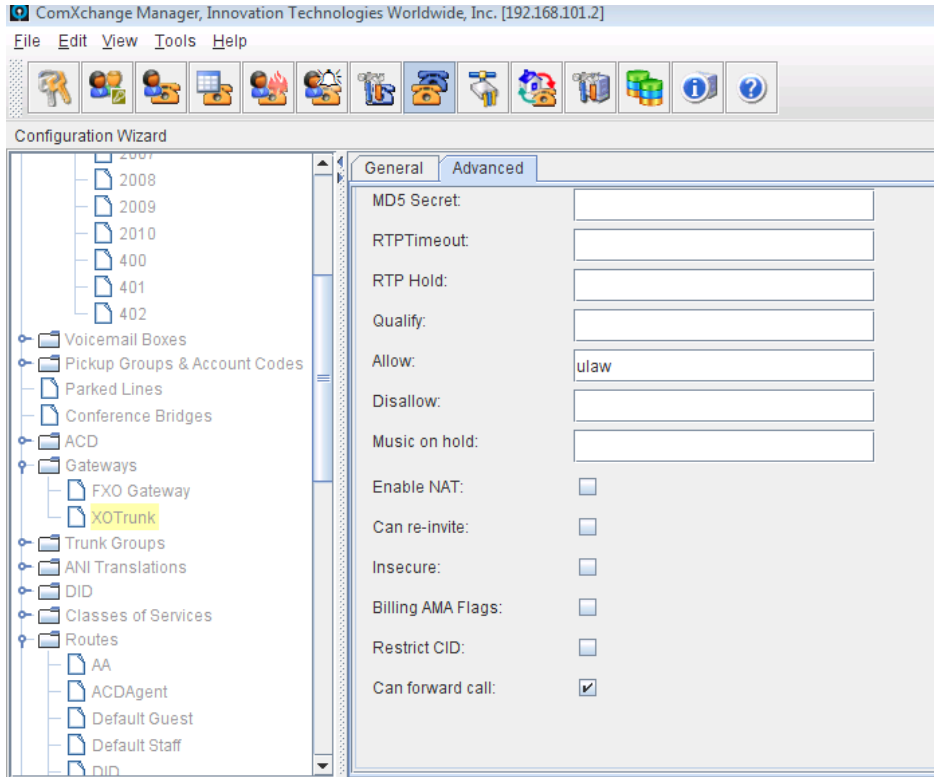


Advanced (continued)

For Package 2:



For package 1:



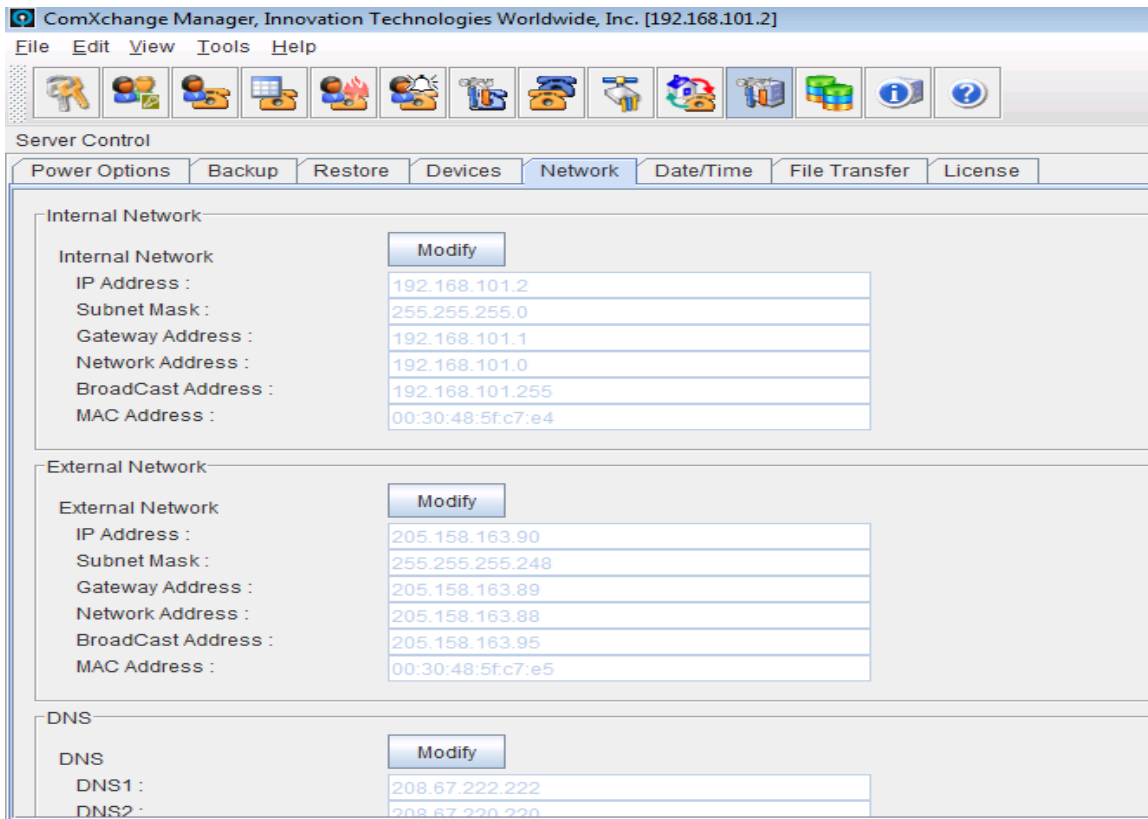
Network setup (Server control => Network)

Internal Network:

Enter IP PBX internal IP in “IP Address” field

Enter Subnet Mask in “Subnet Mask” field

Enter internal Gateway IP in “Gateway Address” field



External Network:

Enter IP PBX’s external IP in “IP Address” field

Enter Subnet Mask in “Subnet Mask” field

Enter external Gateway IP in “Gateway Address” field

Trunk Group => International

The screenshot shows the ComXchange Manager interface. The left sidebar displays a tree view of configuration categories, with 'Trunk Groups' expanded and 'International' selected. The main window shows the 'General' tab for the 'International' trunk group. The 'Name' field is set to 'International' and the 'Description' is 'International calling trunk group'. Below these fields is a table of trunks.

Priority	Type	Pattern	Gateway	Append	Strip
1	ANIXlate	_9011.	Not Defined		0
2	Match	_9011.	XOTrunk		0

Trunk Group => Local

ComXchange Manager, Innovation Technologies Worldwide, Inc. [192.168.101.2]

File Edit View Tools Help

Configuration Wizard

ComXchange

- Extensions
- Voicemail Boxes
- Pickup Groups & Account Codes
- Parked Lines
- Conference Bridges
- ACD
- Gateways
 - FXO Gateway
 - XOTrunk
- Trunk Groups
 - Emergency
 - International
 - Local
 - LongDistance
 - TollFree
- ANI Translations
 - Translations
 - Default ANIs
 - ANIs of Last Resort
 - Emergency Numbers
- DID
- Classes of Services
- Routes

General

Trunk group settings

Name: Local

Description: Local calling trunk group

Trunks:

Priority	Type	Pattern	Gateway	Append	Strip
1	ANIXlate	_90	Not Defined		0
2	Match	_90	XOTrunk		1
1	ANIXlate	_900	Not Defined		0
2	Match	_900	XOTrunk		1
1	ANIXlate	_90NXXX...	Not Defined		0
2	Match	_90NXXX...	XOTrunk		1
1	ANIXlate	_9411	Not Defined		0
2	Match	_9411	XOTrunk		1
1	ANIXlate	_9NXXXX...	Not Defined		0
2	Match	_9NXXXX...	XOTrunk		1

Trunk Group => Long distance

The screenshot shows the ComXchange Manager configuration interface. The left sidebar displays a tree view of configuration categories, with 'Trunk Groups' expanded to show 'LongDistance' selected. The main window is titled 'General' and contains the following settings:

- Name:** LongDistance
- Description:** Long distance calling trunk group
- Trunks:** A table with two entries:

Priority	Type	Pattern	Gateway	Append	Strip
1	ANIXlate	_91NXXX...	Not Defined		0
2	Match	_91NXXX...	XOTrunk		1

Trunk Group => Toll free

The screenshot shows the ComXchange Manager interface. The left sidebar displays a tree view of the configuration hierarchy, with 'TollFree' selected under 'Trunk Groups'. The main window shows the 'General' tab for 'Trunk group settings'.

Trunk group settings

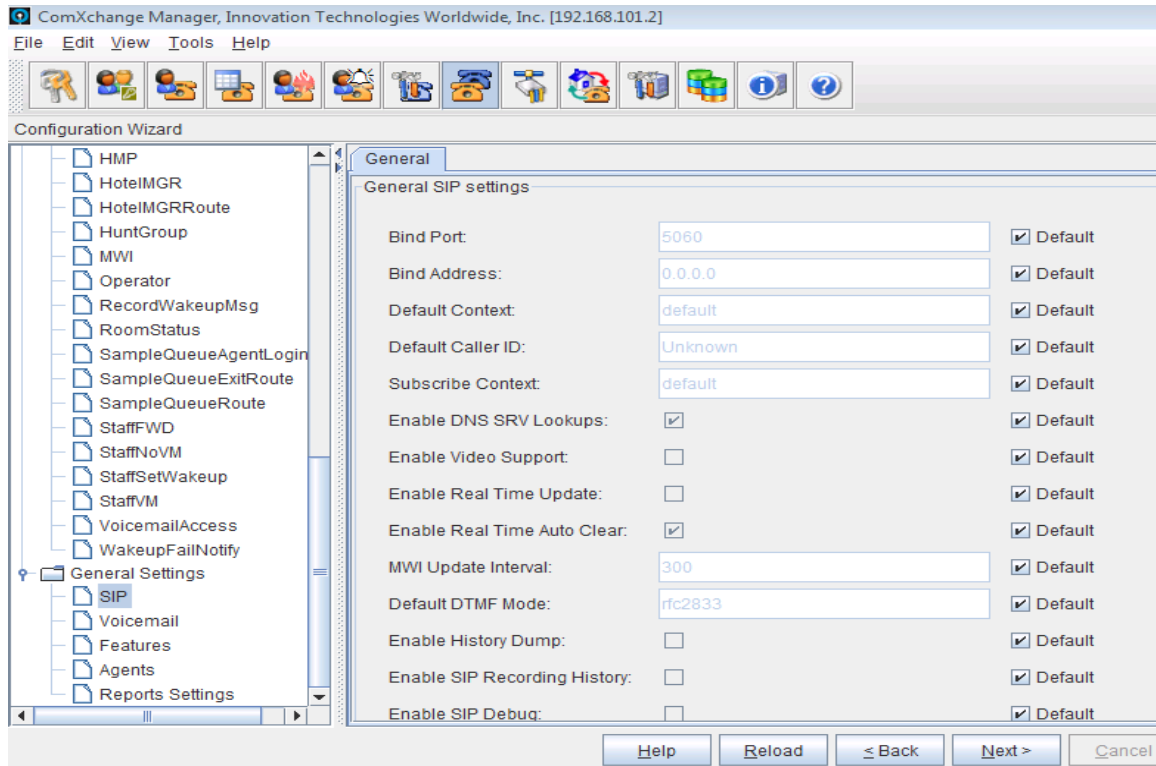
Name:

Description:

Trunks:

Priority	Type	Pattern	Gateway	Append	Strip
1	ANIXlate	_91800N...	Not Defined		0
2	Match	_91800N...	XOTrunk		1
1	ANIXlate	_91866N...	Not Defined		0
2	Match	_91866N...	XOTrunk		1
1	ANIXlate	_91877N...	Not Defined		0
2	Match	_91877N...	XOTrunk		1
1	ANIXlate	_91888N...	Not Defined		0
2	Match	_91888N...	XOTrunk		1

SIP settings (default)



Extension settings:

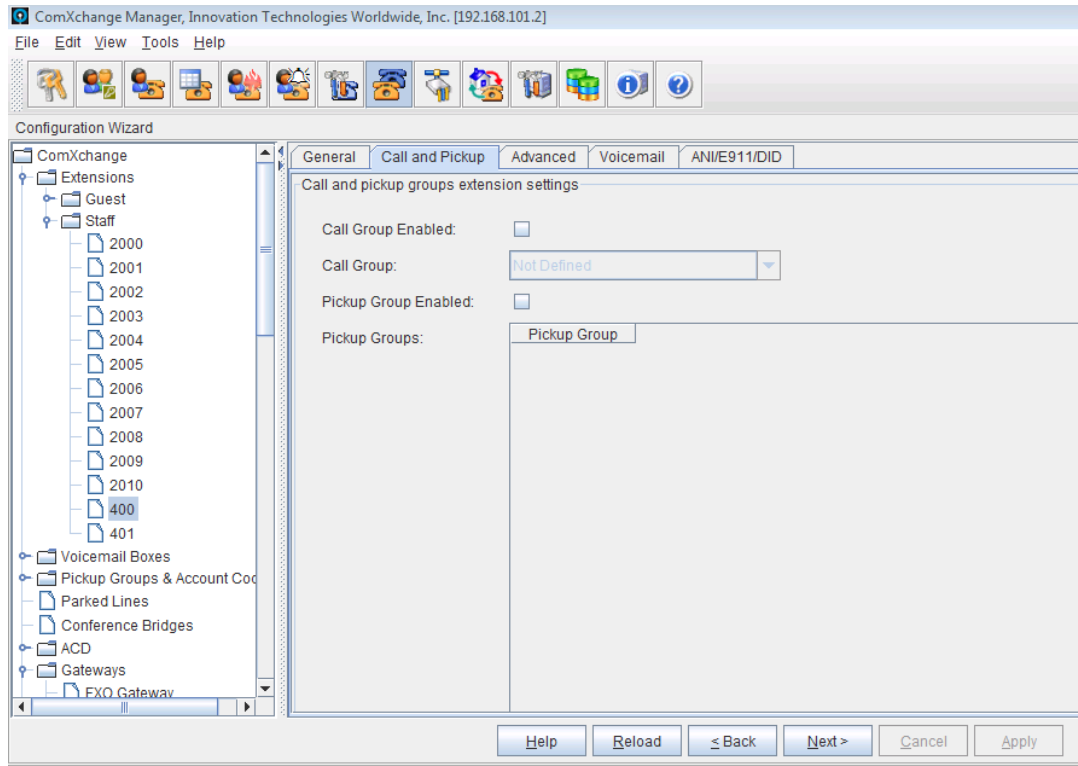
General

The screenshot shows the ComXchange Manager interface. The title bar reads "ComXchange Manager, Innovation Technologies Worldwide, Inc. [192.168.101.2]". The menu bar includes "File", "Edit", "View", "Tools", and "Help". Below the menu bar is a toolbar with various icons. The main window is titled "Configuration Wizard" and has a tree view on the left showing a hierarchy: ComXchange > Extensions > Staff > 400. The right pane shows the "General" tab for extension 400. The settings are as follows:

Field	Value
Extension Technology:	IP
Extension Name:	400
Extension Description:	400
Disabled:	<input type="checkbox"/>
Extension:	400
Room:	
Caller ID:	XO Lab 1
Password:	1234
Class of Service:	StaffUnrestricted
Routing:	Default Staff
Routing Class Of Service:	Internal
Account Code:	Staff
Line Number:	1

At the bottom of the window are buttons for "Help", "Reload", "≤ Back", "Next >", and "Cancel".

Call and pickup (default)



Advanced (default)

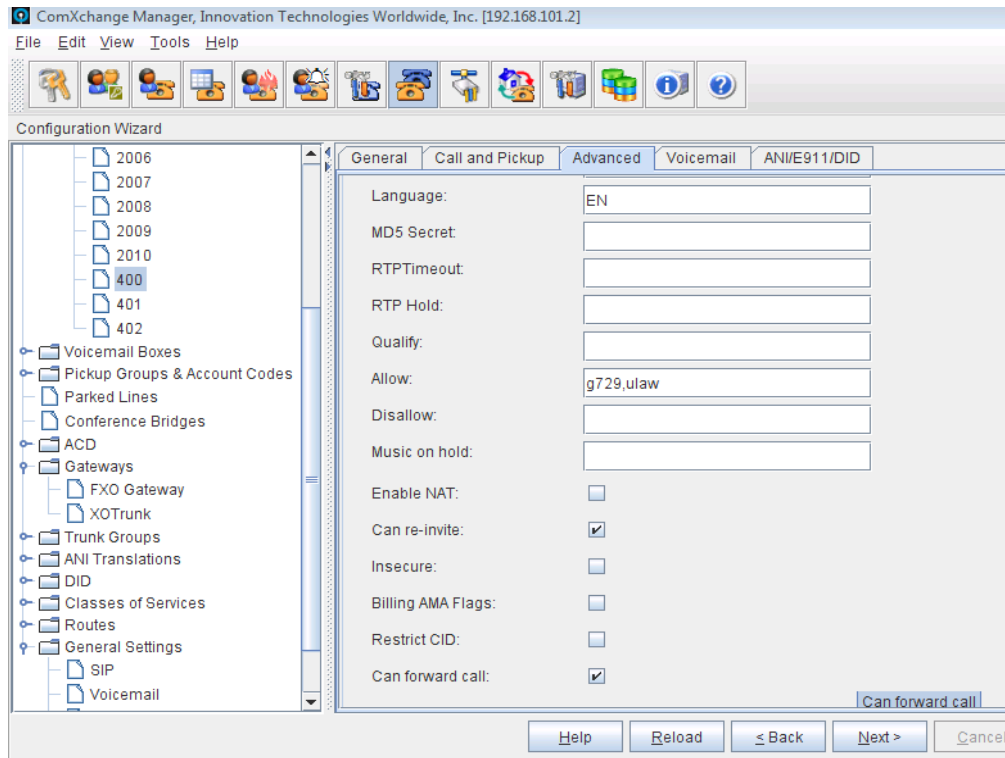
The screenshot shows the ComXchange Manager Configuration Wizard interface. The title bar reads "ComXchange Manager, Innovation Technologies Worldwide, Inc. [192.168.101.2]". The menu bar includes "File", "Edit", "View", "Tools", and "Help". A toolbar with various icons is located below the menu bar. The main window is titled "Configuration Wizard" and features a tree view on the left showing a hierarchy of "ComXchange" settings, including "Extensions" (Guest, Staff), "Voicemail Boxes", "Pickup Groups & Account Codes", "Parked Lines", "Conference Bridges", "ACD", "Gateways", and "EXO Gateway". The "Advanced" tab is selected, displaying "Advanced extension settings" for extension 400. The settings include:

- DTMF Mode: rfc2833
- Host Type: Dynamic
- IP Address: (empty field)
- Port: 5060
- From User: (empty field)
- From Domain: (empty field)
- Maximum Incoming Calls: 1
- Maximum Outgoing Calls: (empty field)
- Language: EN
- MD5 Secret: (empty field)
- RTPTIMEOUT: (empty field)
- RTP Hold: (empty field)
- Qualify: (empty field)
- Allow: (empty field)

At the bottom of the wizard, there are buttons for "Help", "Reload", "< Back", "Next >", "Cancel", and "Apply". A status bar at the very bottom displays several system notices:

```
[Mon Sep 14 15:29:35 CDT 2009] NOTICE [105]: Updated voicemail Tony Engel.
[Mon Sep 14 15:29:35 CDT 2009] NOTICE [106]: Finishing update.
[Mon Sep 14 15:29:36 CDT 2009] NOTICE [107]: Update configuration wizard finished.
[Mon Sep 14 15:29:36 CDT 2009] NOTICE [108]: Number of Enabled Extensions = 38
[Mon Sep 14 15:29:36 CDT 2009] NOTICE [109]: Number of Enabled Gateways = 2
```

Advanced (continued)



This setting Allow: 'g729,ulaw' only requires for package 2.

ANI Translations:

The screenshot shows the 'Configuration Wizard' window with the 'ANI Translations' configuration page. The left sidebar shows a tree view with 'ANI Translations' selected. The main area displays a table of ANI translations.

Extension	Custom ANI	Use Custom	Use DID	Use Default ANI	No ANI	E911 ANI
2000	4693873343	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input type="checkbox"/>	
2001		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2002		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2003		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2004		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2005		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2006		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2007		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2008		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2009		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
2010		<input type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input checked="" type="checkbox"/>	
400	4693873340	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input type="checkbox"/>	4693873340
401	4693873341	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input type="checkbox"/>	4693873341
402	4693873346	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not Defined	<input type="checkbox"/>	4693873340
7100		<input type="checkbox"/>	<input type="checkbox"/>	Default	<input type="checkbox"/>	0000000000
7101		<input type="checkbox"/>	<input type="checkbox"/>	Default	<input type="checkbox"/>	0000000000
7102		<input type="checkbox"/>	<input type="checkbox"/>	Default	<input type="checkbox"/>	0000000000
7103		<input type="checkbox"/>	<input type="checkbox"/>	Default	<input type="checkbox"/>	0000000000
7104		<input type="checkbox"/>	<input type="checkbox"/>	Default	<input type="checkbox"/>	0000000000
7105		<input type="checkbox"/>	<input type="checkbox"/>	Default	<input type="checkbox"/>	0000000000

DID

The screenshot shows the 'Configuration Wizard' window with the 'DID Table' configuration page. The left sidebar shows a tree view with 'DID' selected. The main area displays a table of DID entries.

DID	DNIS	Extension	Extension Context	Extension Priority	Static	Expire Date	Pool	Notes
4693873342	4693873342	2000	Internal	1	<input checked="" type="checkbox"/>	1	Voice	
4693873340	4693873340	400	Internal	1	<input checked="" type="checkbox"/>	1	Voice	
4693873341	4693873341	401	Internal	1	<input checked="" type="checkbox"/>	1	Voice	

Routes:

AA

The screenshot shows the ComXchange Manager interface. On the left is a tree view with categories like ACD, Gateways, Trunk Groups, ANI Translations, DID, Pools, Lines, Settings, Classes of Services, and Routes. Under 'Routes', 'AA' is selected. The main window shows the 'General' tab for 'Route settings'. The 'Name' field contains 'AA'. Below it is a 'Description' field. A 'Routes' table is displayed with the following data:

Priority	Extension	Variable	Value
1	*	Directory	Staff[COS:Internal]
1	1	Goto	[COS:Internal]400 1
1	2	Goto	[COS:Internal]401 1
1	3	Goto	[COS:Internal]2000 1
1	AAin	Answer	
2	AAin	Background	/var/lib/asterisk/sounds/voicemail/Staff/400/greeting
3	AAin	Goto	1

DID

The screenshot shows the Configuration Wizard interface for a DID route. The left sidebar lists various route categories, with 'DID' selected. The main window displays the 'General' tab for the 'DID' route.

Route settings

Name: DID
 Description: Direct Inward Dial Numbers

Priority	Extension	Variable	Value
1	4693873340	SetGlobalVar	DIALED=\${EXTEN}
2	4693873340	Goto	[COS:Internal]400 1
1	4693873341	SetGlobalVar	DIALED=\${EXTEN}
2	4693873341	Goto	[COS:Internal]401 1
1	4693873342	SetGlobalVar	DIALED=\${EXTEN}
2	4693873342	Goto	[COS:Internal]2000 1
1	4693873343	SetGlobalVar	DIALED=\${EXTEN}
2	4693873343	Goto	[COS:Internal]hunt 1
1	4693873344	SetGlobalVar	DIALED=\${EXTEN}
2	4693873344	Goto	[COS:Inbound]AAIn 1
1	4693873345	SetGlobalVar	DIALED=\${EXTEN}
2	4693873345	CheckVoicemail	

Hunt Group

The screenshot shows the Configuration Wizard interface for a HuntGroup route. The left sidebar lists various route categories, with 'HuntGroup' selected. The main window displays the 'General' tab for the 'HuntGroup' route.

Route settings

Name: HuntGroup
 Description:

Priority	Extension	Variable	Value
1	hunt	Dial	SIP/400 4 t
102	hunt	Dial	SIP/401 4 t
203	hunt	Dial	SIP/2000 4 t
304	hunt	SIPADDHEADER	Diversion: <sip:4693873340@192.168.101.2>
405	hunt	Dial	SIP/9724151076@XOSIP 4 t
506	hunt	Goto	[COS:Internal]1

Voice mail

ComXchange Manager, Innovation Technologies Worldwide, Inc. [192.168.101.2]

File Edit View Tools Help

Configuration Wizard

ComXchange

- Extensions
 - Guest
 - Staff
 - 2000
 - 2001
 - 2002
 - 2003
 - 2004
 - 2005
 - 2006
 - 2007
 - 2008
 - 2009
 - 2010
 - 400
 - 401
- Voicemail Boxes
- Pickup Groups & Account Codes
- Parked Lines
- Conference Bridges
- ACD
- Gateways
 - EXO Gateway

General Call and Pickup Advanced **Voicemail** ANI/E911/DID

Voicemail box extension settings

Voicemail box: Dan Post@Staff

Create new voicemail box:

Name: Dan Post

Description:

Override Name:

Type: Staff

Voicemail Extensions List: 400

Password: 9876

Override Password:

E-mail:

Override E-mail:

Pager:

[Mon Sep 14 15:29:35 CDT 2009] NOTICE [105]: Updated voicemail Tony Engel
 [Mon Sep 14 15:29:35 CDT 2009] NOTICE [106]: Finishing update.
 [Mon Sep 14 15:29:36 CDT 2009] NOTICE [107]: Update configuration wizard finished.
 [Mon Sep 14 15:29:36 CDT 2009] NOTICE [108]: Number of Enabled Extensions = 38
 [Mon Sep 14 15:29:36 CDT 2009] NOTICE [109]: Number of Enabled Gateways = 2

Voice mail (continued)

The screenshot shows the ComXchange Manager Configuration Wizard for extension 400. The 'Voicemail' tab is selected, showing various configuration options:

- Attach:
- Say caller ID:
- Override Say Caller ID:
- Say Message Envelope:
- Override Say Message Envelope:
- Say Duration:
- Override Say Duration:
- Say Duration Minimum (sec):
- Override Say Duration Minimum:
- New Mail Read Option:
- Saved Mail Read Option:
- Deleted Mail Read Option:
- Notify Missed Calls:
- Hide from directory:

At the bottom of the wizard, there are buttons for Help, Reload, < Back, Next >, Cancel, and Apply. A status bar at the very bottom displays several system notices:

```
[Mon Sep 14 15:29:35 CDT 2009] NOTICE [105]: Updated voicemail Tony Engel.
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[Mon Sep 14 15:29:36 CDT 2009] NOTICE [109]: Number of Enabled Gateways = 2
```

ANI/E911/DID:

