

INTERACTIVE INTELLIGENCE®  
Deliberately Innovative

## **3<sup>rd</sup> Party Certified Equipment Supplemental Information**

Certification Completed On:  
March 27, 2011

## 4.7.2v85 – Network Equipment Technologies VX Series



### 1 Important Notes

- Check the *SIP 3<sup>rd</sup> Party Validation Website* for current validation status. The *SIP 3<sup>rd</sup> Party Validation Website* can be viewed at:
  - <http://testlab.inin.com>

### 2 Vendor Documentation

<https://support.net.com/display/VXDOC/Home>

### 3 Validated Firmware Version

4.7.2v85

### 4 Install

Download the VX1200 files from the Interactive Intelligence Testlab website:  
<http://testlab.inin.com>

### 5 Configuration

#### Methods:

- There are 2 steps for configuring the VX gateway:
  - Command Line Interface (CLI) step will be used to complete the initial configuration that includes network and user information completed with a serial RS-232 connection
  - A Graphical User Interface called VXbuilder will be used to complete the configuration that includes PSTN and VoIP level configurations

#### Initial Configuration:

- Before performing the initial configuration of the VX unit, gather the following information:
  - License - Software key provided from NET
  - User Name - Choose an administrative user name for the VX unit
  - User Password - Choose an administrative user level 0 password for the VX unit
  - Enabled Password - Level 15 provides full administrative access
  - IP Address - IP address for the VX unit
  - Subnet Address - Subnet mask for the VX unit
  - IP Default Route - IP address that identifies the device that will route IP network packets to and from the IP network the VX is configured on
  - Node Name - Text name for the VX unit
  - FTP User Name (Optional) - Choose a user name for FTP access to the VX unit.
  - FTP User Password (Optional) - Choose a user password for FTP access to the VX unit

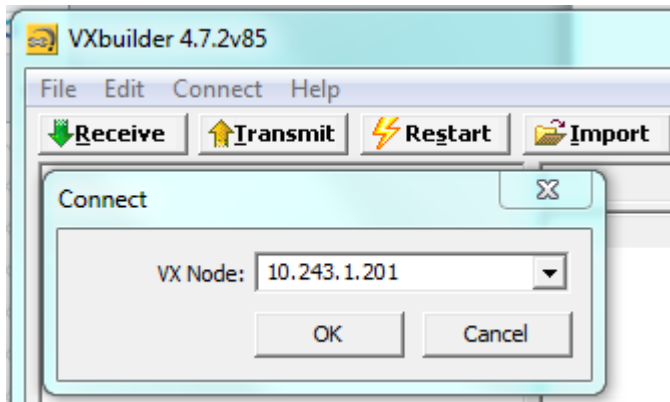
- Attach VT100 Terminal (DTE) to VX serial port (DTE) using a serial Null Modem Cable
  - VX uses VT100 terminal communication to perform the CLI initial configuration which requires a 9-pin serial DTE port on the VX and a VT100 terminal or PC equipped with a serial port and a terminal emulator application
  - Connect a 9-pin serial cable to the VX unit. For help in locating the serial connector on the VX chassis, see the VX Chassis Types page.
  - Connect the other end of the serial cable to a VT100 terminal or PC running a terminal emulator such as Microsoft HyperTerminal or PuTTY
  - Configure the terminal or terminal emulator for a speed of 9600 baud, 8 data bits, 1 stop bit and no parity
- Power on the VX unit.
- A copyright screen should appear in the VT100 terminal display
- When prompted, press Ctrl-D to start the setup script
- Follow the on-screen prompts to complete the initial configuration of the VX unit supplying the information collected above
- When prompted answer yes to exit configuration and yes to reboot to apply configuration

### VXbuilder Configuration:

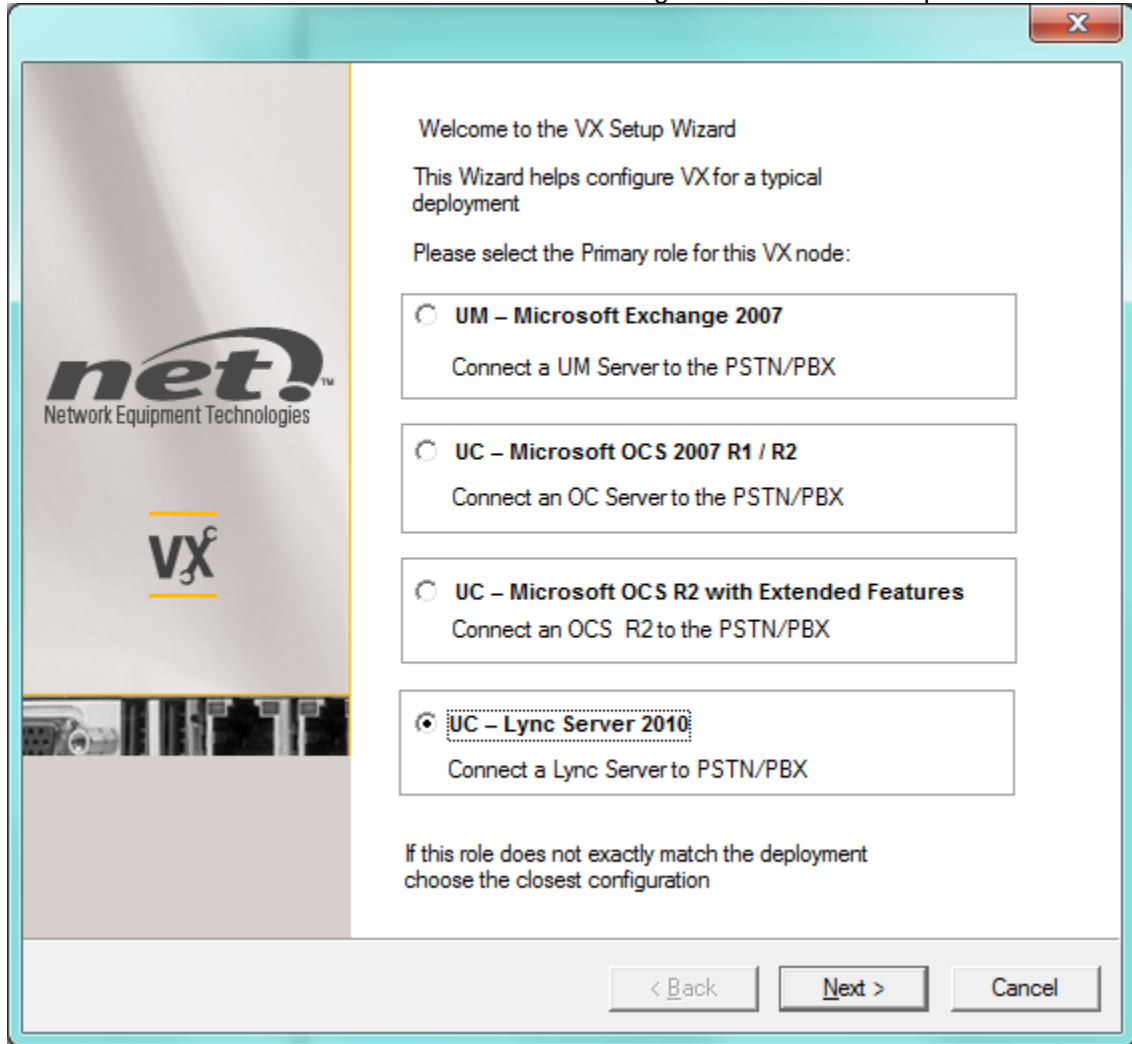
- Install the VXbuilder application that came with your VX unit
- Use the VXbuilder client application to connect to the VX unit (Node) by clicking on the 'Receive' tool bar button:



- Provide the IP address to the node in order to download the basic config completed in the 'Initial Configuration' section of this guide:

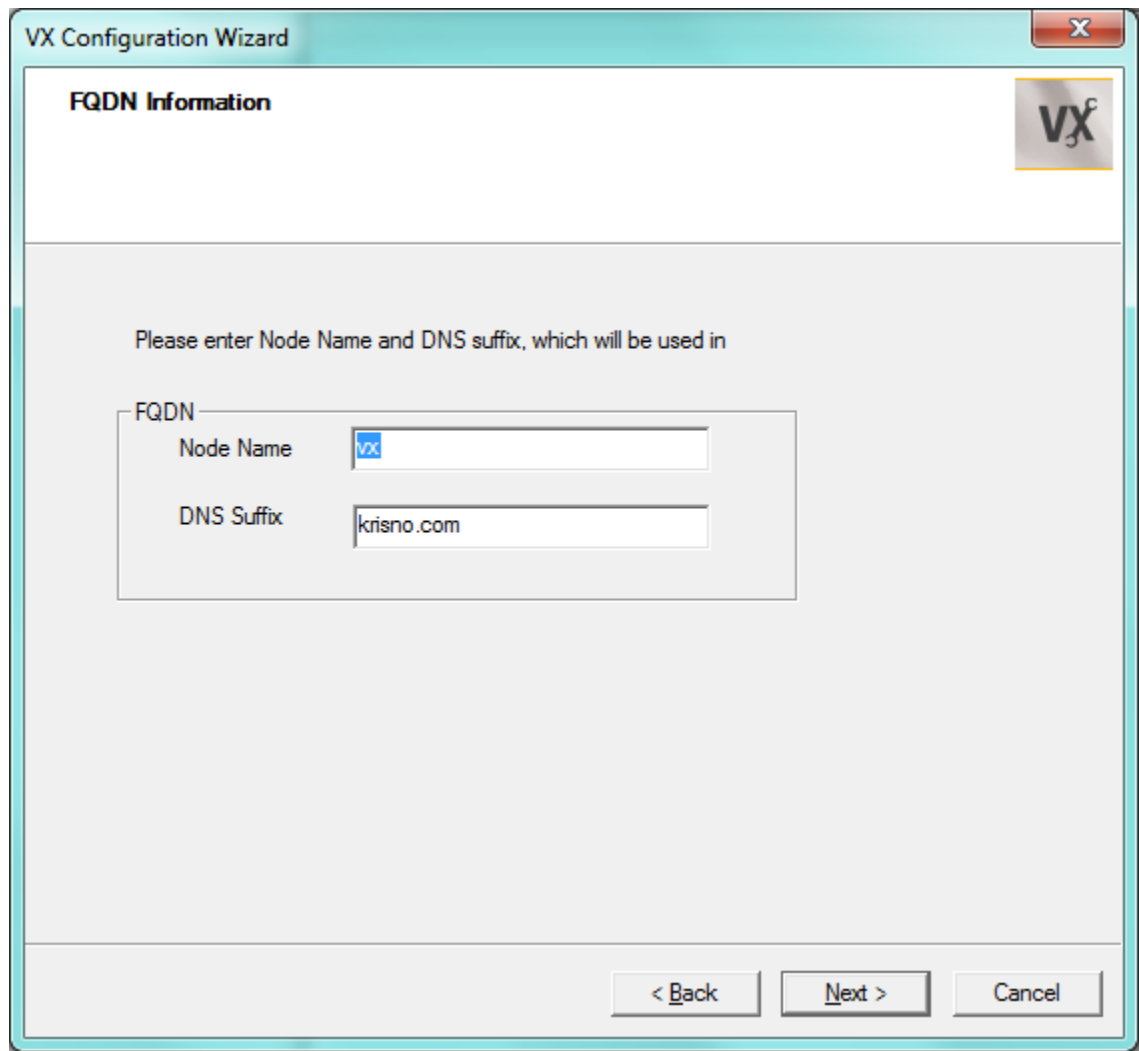


- On the first connection with VXbuilder to the VX a configuration wizard will be presented:



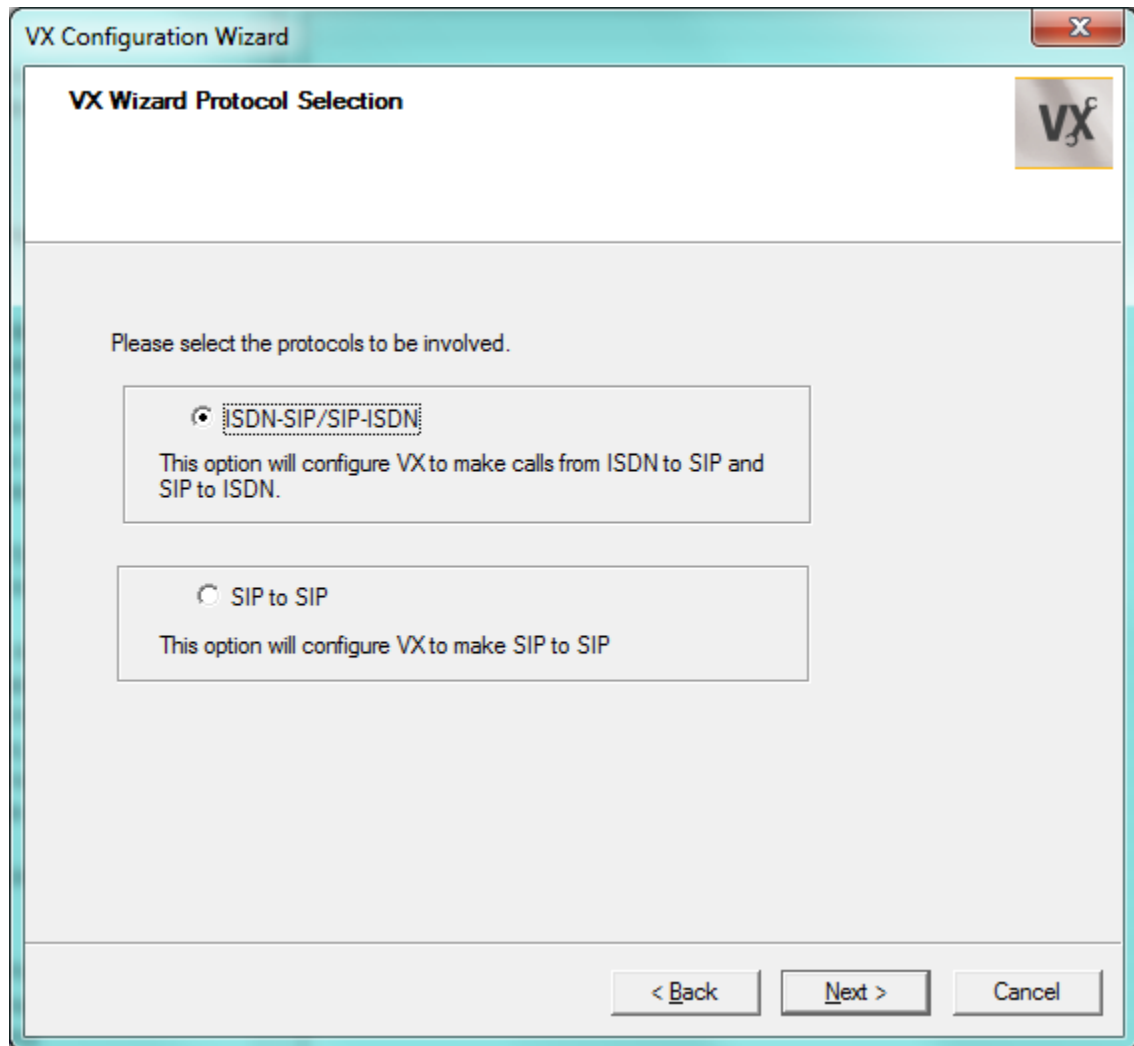
- If not selected, click the 'UX – Lync Server 2010' radio button. This option will create a configuration during the wizard steps that provides the necessary items to interoperate with IC server(s). Click 'Next'

- At the 'FQDN Information' screen supply the DNS host name and the DNS domain of the VX. Click 'Next':

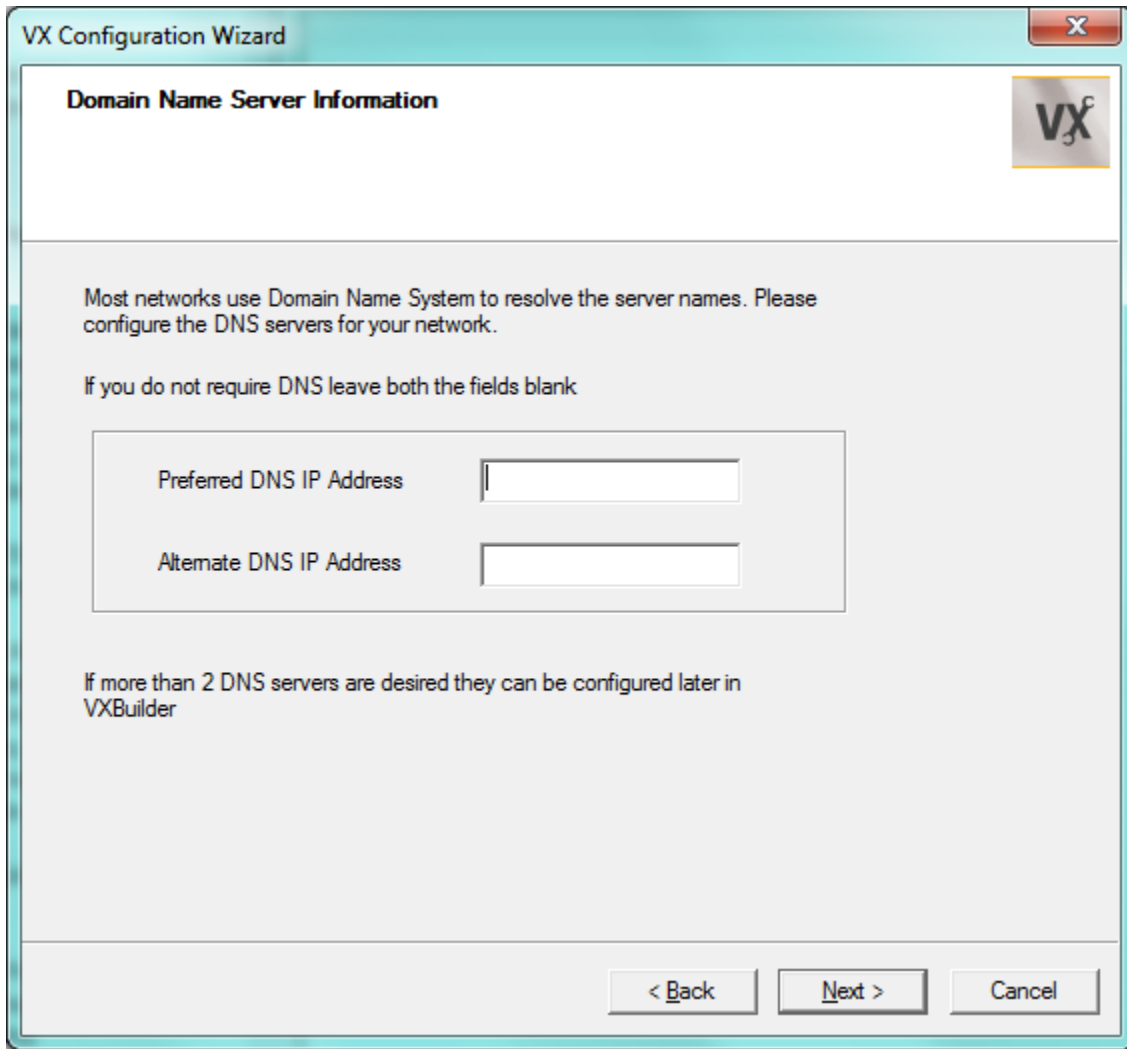


The image shows a screenshot of a software window titled "VX Configuration Wizard". The window has a light blue title bar with a close button (X) in the top right corner. Below the title bar, the text "FQDN Information" is displayed in bold. In the top right corner of the main content area, there is a small square icon with the letters "VX" in a stylized font. The main content area contains the instruction "Please enter Node Name and DNS suffix, which will be used in". Below this instruction, there is a section labeled "FQDN" containing two input fields. The first field is labeled "Node Name" and contains the text "vx". The second field is labeled "DNS Suffix" and contains the text "krisno.com". At the bottom of the window, there are three buttons: "< Back", "Next >", and "Cancel".

- On the 'VX Wizard Protocol Selection' screen select the 'ISDN-SIP/SIP-ISDN' Radio button and click 'Next':



- On the 'Domain Name Server Information' screen enter the IP address of the DNS server and the alternate if one is available and click 'Next':



The screenshot shows a window titled "VX Configuration Wizard" with a close button in the top right corner. The main heading is "Domain Name Server Information" with a small "VX" logo to its right. Below the heading, there is a paragraph of text: "Most networks use Domain Name System to resolve the server names. Please configure the DNS servers for your network." This is followed by another paragraph: "If you do not require DNS leave both the fields blank". In the center, there is a form with two input fields. The first is labeled "Preferred DNS IP Address" and the second is labeled "Alternate DNS IP Address". Below the form, there is a final paragraph: "If more than 2 DNS servers are desired they can be configured later in VXBuilder". At the bottom of the window, there are three buttons: "< Back", "Next >", and "Cancel".

**Domain Name Server Information**

Most networks use Domain Name System to resolve the server names. Please configure the DNS servers for your network.

If you do not require DNS leave both the fields blank

Preferred DNS IP Address

Alternate DNS IP Address

If more than 2 DNS servers are desired they can be configured later in VXBuilder

< Back   Next >   Cancel



- On the 'Office Communications Server Information' screen, enter the IP address or FQDN of the IC server that the VX will communicate with along with the port the VX will send to on the IC server. Select the proper protocol for the SIP transport and RTP type and then click 'Next':

The screenshot shows a window titled "VX Configuration Wizard" with a close button in the top right corner. The main heading is "Office Communication Server Information" with a "VX" logo to its right. Below the heading, there is a text prompt: "Enter the Fully Qualified Domain Name or IP Address of the Front End Server used in the Network".

The form contains several input fields and checkboxes:

- A "Front End Server" section with a label "FQDN/IP Address" and an empty text box.
- A "SIP" section with three checkboxes: "Enable SRTP", "Enable TCP", and "Enable TLS", all of which are currently unchecked.
- A "Certificate Name" label with an empty text box.
- A "SIP Transmit Port" label with a text box containing the value "5067".

At the bottom of the window, there are three buttons: "< Back", "Next >", and "Cancel".

The following text is located at the bottom of the main content area:

The FQDN can be of the Standard Edition (SE) or Enterprise Edition (EE) of the Front End Server.

- On the 'PSTN Port and Other Related Information' screen select from the drops downs the applicable Line Type and ISDN Protocol to use for the PSTN connection. If the installation calls for CAS, select the default and modify the settings after the wizard is applied, click 'Next':

VX Configuration Wizard

### PSTN Port and Other Related Information

Configure your ISDN settings to match your PSTN or PBX configuration

ISDN Port

Line Type: T1

ISDN Protocol: National ISDN 2

All ports in VX will be automatically configured to these settings. If additional configuration is required they can be configured later in VXBuilder.

< Back   Next >   Cancel

- On the 'Call Route Information' screen leave the default selection and the boxes empty and click 'Finish':

**VX Configuration Wizard**

### Call Route Information

Country Code/ Prefix     Location Profile

Enter the country code of the destination number. Leave the field blank if no country code is required.

Country Code

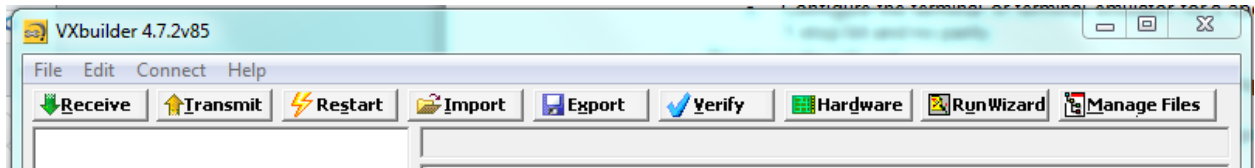
Enter the prefix required to convert internal numbers to external numbers. For example extension "XXXX" converts to "YYYYYXXXX" for a prefix "YYYYY". Leave the field blank if no prefix is required to convert the number.

Prefix number

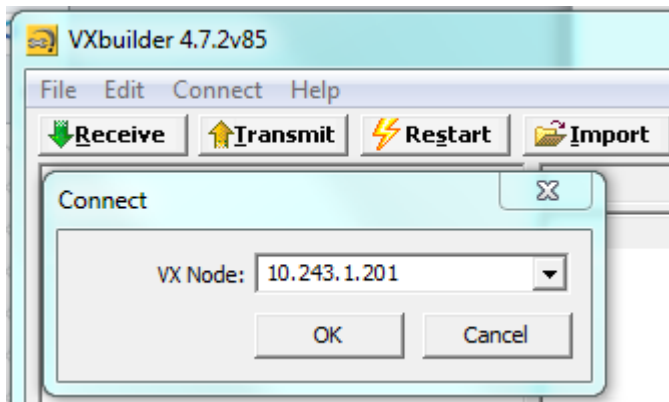
Location Profiles

< Back    Finish    Cancel

- When the wizard finishes it is waiting for the configuration to be sent back to the VX to complete the process. Click on the 'Transmit' button to initiate the transfer:



- Provide or select from the dropdown the IP address of the VX node in order to transmit the config completed in the wizard process:



## Routing Configuration:

- To route SIP traffic from an IC server or cluster (using IP addresses or an FQDN) the SIP Inbound Routing Table has to be configured with the proper IP address(s) or FQDN of the IC server(s) pointing to the applicable Trunk Group:

The screenshot shows the VXbuilder software interface. The main window displays the 'SIP Inbound Call Routing' table with the following data:

Item	Enabled	Desc	Address/FQDN	Mask	TrunkGrp
1	Enabled	WiFi Phone	10.243.1.240	255.255.255.255	#3 WiFi Phones
2	Enabled	WiFi Phone	10.243.1.241	255.255.255.255	#3 WiFi Phones
3	Enabled	WiFi Phone	10.243.1.37	255.255.255.255	#3 WiFi Phones
4	Enabled	IC	209.43.1.136	255.255.255.255	#4 IC
5	Enabled	IC	209.43.1.137	255.255.255.255	#4 IC
6	Enabled	From Public Side VX Refer	66.235.52.122	255.255.255.255	#4 IC
7	Enabled	Tenor FXS	10.243.1.206	255.255.255.255	#6 Tenor FXS
8	Enabled	LyncIT	10.243.1.110	255.255.255.255	#7 LyncIT

An 'Edit SIP Inbound Call Route # 4' dialog box is open, showing the configuration for item 4:

- Enabled: Enabled
- Desc: IC
- Address/FQDN: 209.43.1.136
- Mask: 255.255.255.255
- Trunk Group: #4 IC

- To route SIP traffic to the IC server or cluster the applicable Route table must be configured with the destination address of the IC server or FQDN. If using a cluster then populate the Route table with the IP addresses of the multiple servers as shown below:

**Edit Call Route # 2**

**General Parameters**

Enabled  Using Regular Expression  Desc: To IC Server 2 Priority: 0

**Input to Match**

Match Rule: 142555{+} Match Using AD Field: None

Match Exact Length  Expression Helper Numbering Type: Any Numbering Plan: Any

Advanced SIP Matching  CarrierSelectInfo: Any Carrier Code:

MLPP Namespace: Any MLPP Precedence: Any

**Translate to Output**

Translation Rule: \1 Translate Using AD Field: None

New MLPP Prec: Untranslated Numbering Type: Unknown Numbering Plan: Unknown

CarrierSelectInfo: Untranslated Carrier Code: Circuit Code: Untranslated

**On Match Parameters**

Msg Xlat Table: [None] CallingTransTable: None Signaling Priority: 0/00000000 (Best Effort)

Media Class: #1 G.711 mu-law Transfer Cap: Untranslated Media Priority: 0/00000000 (Best Effort)

Jitter Min Delay: 70 ms Jitter Optimization: 10

**Destination**

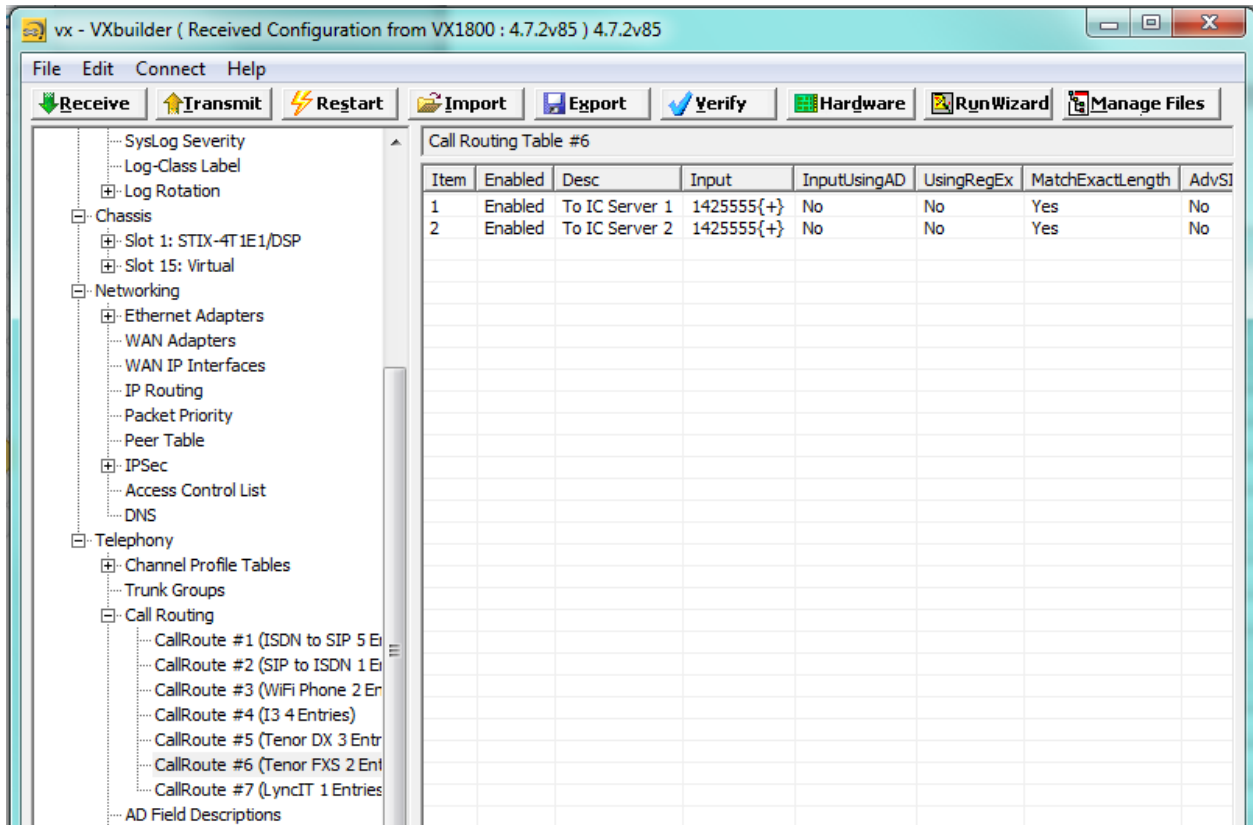
Deny Deny Cause code: 21 - call rejected  
 BSP TrunkGroup: #4 IC  
 SIP Proxy Node ID: [N/A]  
 SIP Registrar Table SIP Proxy: 209.43.1.136  
 Other Peer IP / IF: [Unchanged]  
 Call Route Table Call Route No.: None  
 [Unchanged]

**BSP Link Requirements**

Min Quality: 0 %  
Ping Limit: 0 ms

OK Cancel

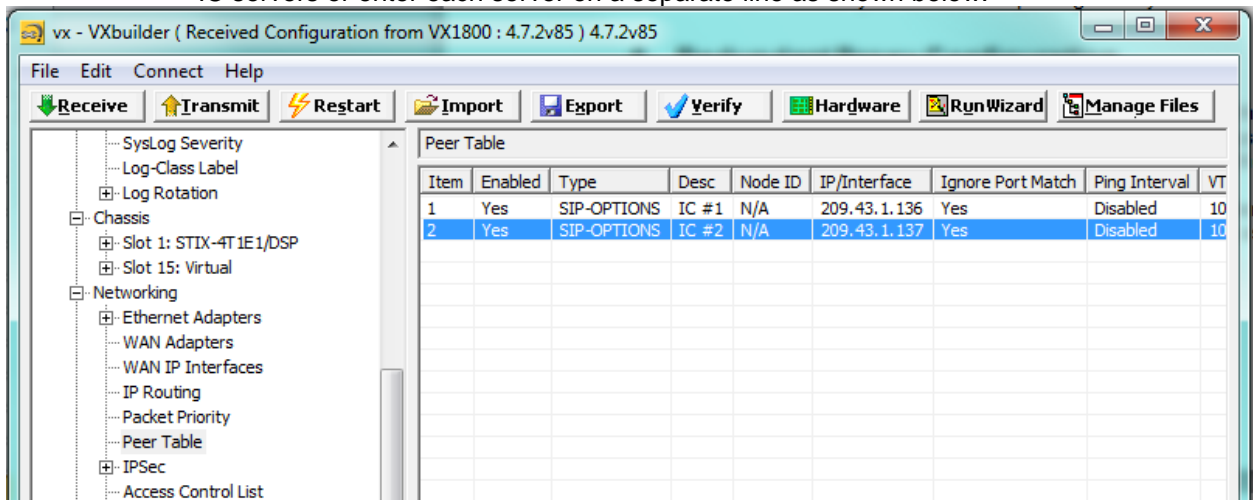
- To Route traffic to more than one IC server based on IC server redundancy, place 2 identical routes in the Route table with one identifying the first server and the second route identifying the second server:



- In Interaction Administrator, the line that is configured for the gateway should have 'Terminate Analysis on Connect' checked.

### Redundant Proxy Configuration:

- The VX node can use SIP Option messages to determine the status of IC servers in order to route properly to the online IC server. These can use either FQDN A record DNS resolutions of 1 or more IP addresses that are returned in the DNS A record lookup or it can use multiple IP addresses:
  - Using VX builder, populate the Peer table with either the FQDN of the cluster of IC servers or enter each server on a separate line as shown below:



## 6 Applying Firmware Upgrades

- Using VXbuilders 'ManageFiles' feature, connect to the VX Node and transfer the latest VX Firmware to the 'Upgrade' directory of the VX Node
- Establish a CLI connection to the VX Node using either the Serial port as shown above or by using a Telnet session:
  1. Elevate session to an enabled status
  2. Type 'install package titpftst' at the enabled prompt
  3. Answer 'yes' to install the package and 'yes' to reboot when prompted

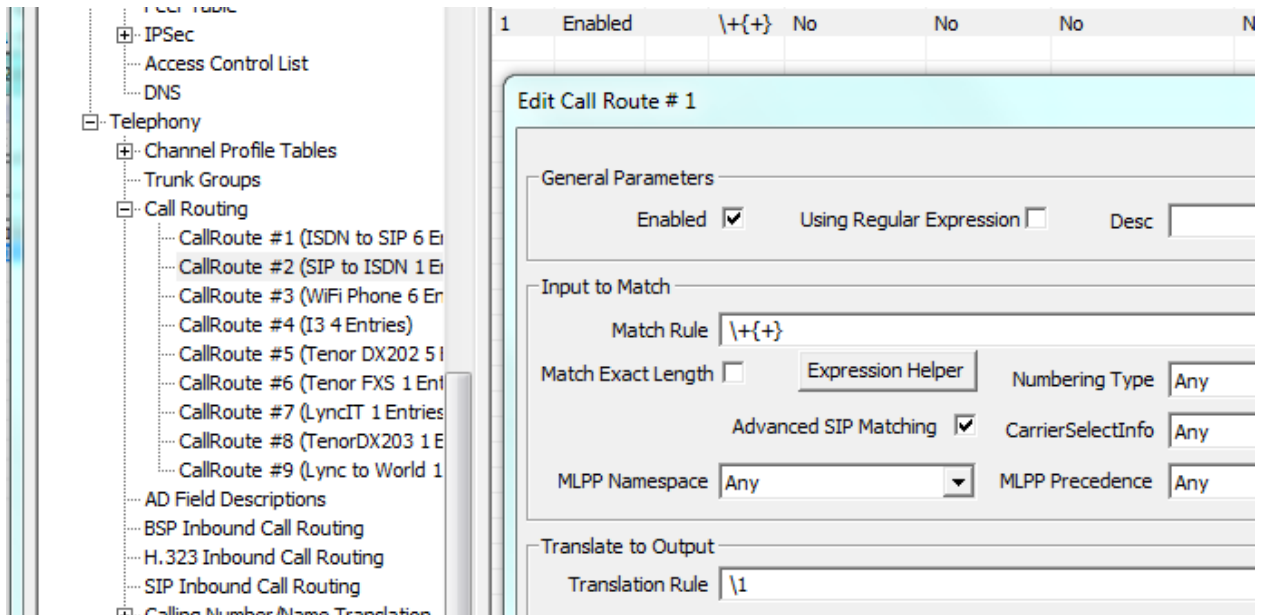


## 7 Route Table Usage and Troubleshooting

### Route Table Usage

The VX Route table has the ability to do simple or advanced SIP URI analysis in completing the route selection process. Normally advanced SIP matching is not needed for a simple SIP to PSTN routing. Using advanced SIP matching provides the ability to match on the SIP domain parameters along with the called number.

- To enable Advanced SIP Matching, click on the 'Advanced SIP Matching' as shown below in the routing table



With Advanced SIP Matching enabled the VX will include all of the SIP To Header in the matching process. If there is a collect all in the Input Match Rule section '{+}' then the Output will include all of the To header including the '@sipdomain' portion of the Called Number. This will cause issues with sending calls to the PSTN since the PSTN can not route the '@sipdomain' portion of the Called Number and the call will fail. To prevent this from happening in a simple routing of the dialed digits to the PSTN ensure the 'Advanced SIP Matching' is not checked.

## Debugging

The VX series has a very robust debugging system and provides the ability to perform network traces from the Ethernet interface(s).

### Debugging for telephony (SIP and PSTN) and Call Routing:

- From an enabled CLI session type the following at the start of a debugging session:
  - 'trace sip level info 0' – this turns on SIP debugging so that the SIP messaging is printed to the CLI session
  - 'trace ISDN level info 0' – this turns on ISDN debugging so that the ISDN messages are printed to the CLI session
  - 'trace tel level info 0' – this turns on the telephony events pertaining to route selection and number formatting to the CLI session
  
- At the end of the debugging session type 'trace none' to disable the debugging output to the CLI session

The combination of the above commands should provide a good indication if the calls are in fact making it to the VX and what routes the call is egressing to the next hop route.

### Ethernet Sniffing:

- From an enabled CLI session type 'set sniff enable' to start an Ethernet trace
- Perform the test call(s) that should be captured with the sniffing
- After test call(s) type 'set sniff disable' to stop the sniffing
- To retrieve the sniffing file from the VX hard drive use VXbuilder's 'Manage Files' tool to connect to the VX and select the sniff from the 'Sniff' directory for download to the VXbuilder's computer. The sniff files are stored in the 'Sniff' directory with the newest files at the bottom of the directory listing.