

TITLE: Xelatec XIPBX Voice Over IP Server Installation Process

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PURPOSE

Our goal is to enable a technically knowledgeable person to create their own VoIP PBX using an existing PC or server. This document explains an installation process for the XIPBX for the free Community Edition Xelatec Internet Private Branch Exchange software package. It is an Open Source Software Project provided on an "as-is" basis. Xelatec also offers professional support services for XIPBX systems and ready to run servers.

DESCRIPTION

This distribution includes several popular telecommunications packages and server administration tools. Most recognizable are the Asterisk IP-PBX, the FreePBX web based configuration tool, and Webmin for system administration. Unlike most VoIP packages, this package includes the complete source code and development environment for the software. This enables developers to work with users directly on the target system instead of having to duplicate the application in the laboratory. Also this allows updates to be compiled locally on the user's specific hardware.

PACKAGE COMPONENTS

The following Open Source Software packages are included in the XIPBX system.

Fedora 12 Linux Operating System and supporting packages.
Webmin System Administration
Asterisk VoIP-PBX
FreePBX Web based VoIP-PBX configuration tool.
Vtiger CRM
Shorewall Firewall
Various system and network utilities.

AUDIENCE

Persons who attempt to use this document to construct a XIPBX server should be well versed in telecommunications technology, Linux software, programs, tools and utilities.

These include but are not limited to:

- Open Source Software Development Practices,
- the Linux Operating System,
- the Webmin Linux server configuration tool,
- public and private IP Networking,
- the Asterisk IP-PBX and FreePBX

As this is an Open Source Software project. The documentation motto is "Read the Full Sources" (RTFS). The comments in the configuration files and the various software forums are your best references.

Xelatec provides professional services to assist in the implementation and detailed documentation of specific XIPBX systems.

COMPUTER HARDWARE REQUIREMENTS

PC, Intel Pentium III 863 MHz CPU or better,
(note that we do not recommend AMD processors for this application)
512 MB RAM, 5.0 GB Hard Drive,
Ethernet Network Interface Card (NIC),
During the installation only:
- CDROM Drive
- Monitor and Keyboard

IP NETWORK REQUIREMENTS

This application requires a network connection with DHCP and broadband Internet access. For connection to external VoIP services, ports 4569 UDP, 5060 TCP/UDP and 10000-20000 UDP must be routed to this server through any intervening routers or firewalls.

GENERAL INFORMATION

These instructions and the installation scripts require booting the target computer from a CDROM boot image and then accessing various Internet sites to download and install the Fedora Linux Operating System (OS) and the VoIP applications.

This installation will completely erase the computer's hard drive. Any information that existed on it before the installation will be irretrievably lost. Contact Xelatec for other options.

In our tests, an 863MHz Pentium III computer connected to a 6 Mb/s ADSL Internet service required about two hours to execute the complete installation process.

PRE-INSTALLATION PLANNING

INSTALLATION PROCEDURE

Before beginning the server installation you should plan your initial system so that you can properly answer the configuration options when prompted for them.

We recommend that you assign your computer a Fully Qualified Domain Name (FQDN). If your Internet connection has a dynamically assigned IP address, you should register for a free Dynamic DNS service at "<http://www.dyndns.com>" or use an equivalent service. The XIPBX installation process installs the 'inadyn' dynamic DNS client and places your DNS FQDN in the '/etc/inadyn.conf' file. If you use this service, when the automated portion of the installation

is complete, edit '/etc/inadyn.conf' to add your DynDNS account username and password and then change the ENABLED option.

Because of the large number of potential IP network configurations, we cannot describe them all in this document. Therefore we will cover a common case. This is where the node is attached to a network with a router that provides a DHCP service that assigns local NAT addresses to client computers.

In that case you must set the router so that incoming packets to the system's Internet address on port number 4569 (or another port number specified in the configuration files) must be routed to the node computer's local area network address through any intervening routers or firewalls.

For example: 1) determine your XIPBX computer's Ethernet MAC address, 2) set your router's DHCP server to always assign a fixed internal IP address to that MAC address, 3) set your router to forward traffic on that port the fixed internal address of the node computer.

Note that security issues are your responsibility, especially if you connect your server directly to the Internet or place it in a DMZ. The Shorewall firewall package is included in this package and can be an important part of securing your XIPBX server.

INSTALLATION PROCEDURE

The following procedure is for a simple, typical installation. Xelatec can assist you with special cases.

Connect the target computer to a LAN with NAT, DHCP and broadband Internet access.

You need an attached local video monitor and keyboard during the installation. If the computer BIOS permits it, you can remove these after the installation is complete.

Using another computer with a CDROM burner, create the CDROM with the network installation ISO image. The CDROM ISO image is available at "http://www.xelatec.com/xippr/xipbx_ce".

Start the target computer and press the keys necessary to enter its BIOS utility.

In the BIOS, enter the correct date and time. We recommend using UTC (also called GMT or Zulu) time. Setting the proper time is important for the software to build and operate properly.

Also in the computer BIOS, select the boot or start device to first boot from the CDROM and then the Hard Drive.

Finally, disable the BIOS Automatic Power Management (APM) options. It might be possible to re-enable these later but if the computer goes into standby or turns off during the installation process it will fail.

Save the BIOS settings and exit the BIOS setting menu.

Insert the installation CDROM into the computer CDROM drive.

Reboot the computer by pressing Ctl-Alt-Delete or power cycling.

The computer should boot from the CDROM and present you with an option prompt.

Select the XIPBX option and press the Enter key.

The installation then proceeds with several standard defaults.

The entire hard drive is erased, reformatted and written with operating system and applications.

The operating system "root" password is set to "madminx63". This should be changed to something more secure when the installation completes.

The system timezone is set to USA/New York.

After the Operating System is installed, the CDROM may eject. When the "Reboot" prompt appears, remove the CDROM from the drive and press the enter key.

The computer will prompt you for more information, reboot and then finally come to rest with a login prompt. Note that as advised in detail during the installation process, you must use the FreePBX utility to manually "Apply Changes" and reboot the computer one additional time.

After the installation is complete and confirmed to be operating properly, you may reboot the computer and enter the BIOS setup utility and change the Boot Order to only boot from the Hard Drive.

If you have an Internet connection with a dynamic external IP address, you can use the included inadyn dynamic DNS client as described at "<http://linux.die.net/man/8/inadyn>".

IMPORTANT: Almost any file in the directory "/etc/asterisk" without the keyword 'custom' in its filename is overwritten when you make changes using the FreePBX web interface. Therefore, add your text based dialplan elements to the various custom files in /etc/asterisk.

ASTERISK COMMAND LINE OPTIONS:

Log into the computer as root.

At the Linux command line enter the command "**amportal**". You then see a list of amportal command options that are mostly used to start and stop the VoIP server programs. The XIPBX server automatically starts the VoIP programs when it boots so Asterisk should be running.

Then enter the command "**asterisk -vvvr**". This enters the running Asterisk Command Line Interface (CLI). You will be presented with the Asterisk CLI prompt. Enter '**help**' for a list of commands. For details refer to our links page.

ADDITIONAL INSTALLED SOFTWARE PACKAGES

FreePBX - This is a browser based Asterisk configuration and operation program. You can see the FreePBX interface on your Asterisk app_rpt server by using a web browser to view "[http://\(your computer ip address or FQDN\)](http://(your computer ip address or FQDN))".

Webmin - The 'Webmin' Linux server administration utility is a wonderful interface to control the many complex features and services available on a Linux server. It is included in this installation. See "<http://www.webmin.com>" for full documentation. You can see the Webmin interface on your Asterisk app_rpt server by using a web browser to view "[http://\(your computer ip address or FQDN\):10000](http://(your computer ip address or FQDN):10000)".

Upgrade - This utility should be run after updating any of the server software including FreePBX or Webmin. It is available through the web based interface at "[http://\(your computer ip address or FQDN\)](http://(your computer ip address or FQDN))" underneath the System menu tab.

xipbx_update - This command line utility updates your XIPBX server's local copy of the Voice Over IP software sources and rebuilds and reinstalls them. Your existing configuration files are not replaced by this utility.

SPECIAL PURPOSE INSTALLATION OPTIONS

Contact Xelatec for assistance with these options including:

- Fedora 64 bit O/S
- Centos 32 and 64 bit O/S
- OpenVZ O/S
- Custom disk partitions
- Firewall configurations.
- Customer Resource Manager (CRM) Integration
- Predictive Dialers
- Dialplan Automation

RECOMMENDED REFERENCES

<http://www.xelatec.com/> which includes additional information and links including "Asterisk - The Future of Telephony - Second Edition".

NOTICES

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CONCLUSION

Thank you for your interest in this project.

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