



A Guide to Open Source PBX Systems

Introduction to Learn More:

A Guide to Open Source PBX Systems

You're likely interested in learning more about an open source PBX for one of three reasons:

- 1. You've heard the buzz**
- 2. You don't have a big business PBX budget**
- 3. You got skills (programming ones)**

Or maybe you're here for other reasons. Perhaps you want increased control over your PBX or the ability to integrate your PBX with the rest of your business.

Regardless of why you are interested in learning more about an open source PBX this guide will help you. What follows is a guide to VoIP Phone systems written in layman's terms that:

- Educates you on open source PBX systems
- Describes the different types of open source PBX systems
- Defines and demystifies the underlying components of an open source PBX
- Explains the important features and benefits of owning an open source PBX
- Highlights the types of companies using an open source PBX
- Gives guidelines to building your own open source PBX
- And provides sample open source PBX systems based on the size of your business

Due to the nature of open source PBX systems and the differences in every business it is possible that this guide will not answer all of your questions. After reading this guide to open source PBX systems you will find that you still have questions, help is just a phone call away.

Since 2002, VoIP Supply has helped over 100,000 people just like you create, deploy and maintain a VoIP solution. If at any point in this guide you get stuck, are unsure of what is being discussed or just want to skip the details and have someone select the right open source PBX system for you, then please give us a call at 800.398.8647.

One of our experienced, vendor-neutral representatives will be more than happy to walk you through the process of selecting the open source PBX system that is right for you.

Thank you for your time and enjoy the read.



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The background features a dark, textured area on the left with large white question marks. This transitions into a bright orange area on the right, which contains smaller, semi-transparent orange question marks. A large, semi-transparent orange triangle is positioned on the right side, partially overlapping the orange background.

Open Source PBX Systems Defined



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Types of open source PBX systems

Before we tear into the guts of an open source PBX system it is important for you to understand the two different types of open source PBX systems.

“Pure” open source

A “pure” open source PBX is what you just read about. It is a PBX system that has an underlying operating system and PBX software that is made generally available to the public (for free) under GPL (GNU General Public License). [Asterisk®](#) is an example of an open source PBX system.

Open source based

An open source based PBX system is a PBX system with underlying operating system and PBX software that is open source at the core – but proprietary code has been built on top of it. This proprietary code is comprised of additional features, functionality, graphical user interfaces or other advanced options not commonly found in an open source based PBX system. SwitchVox is an example of an open source based PBX system.

What is an open source PBX?


An open source PBX system is a PBX with underlying operating system and PBX software that is made generally available to the public (for free) under GPL (GNU General Public License). This means you can edit, access and control the system's software any way you want. Giving you a level of flexibility never before seen in a PBX.

Because the operating system and PBX software is free, an open source PBX system is very low in cost when compared to proprietary PBX systems of the past. All you need to pay for is the hardware and expertise (if you don't have it) to assemble, set-up and configure the system.

Unlimited flexibility and an ultra low cost – what more could you want!

If you don't have skills (or the desire to hire someone who does) when it comes to telephony and Linux® an open source based PBX system might be right for you. Open source based solutions represent the best value for many as it costs less than a proprietary PBX system for the same features and benefits, but doesn't require the hassle of self-assembly that is present with an open source PBX system.

Now don't go making a decision on which open source PBX is right for you just yet. Let's take a look at what makes up an open source PBX first.



Anatomy of an Open Source PBX

The Four Layers of an Open Source PBX

When you throw an open source PBX on a table and dissect its major components you'll find that it's really not that complex. An open source PBX is even easier to understand when you compare it to a lemon meringue pie.

You might not love a great lemon meringue pie, but know that it has a few "layers" to it. The same is true of an open source PBX system. Here are the four main layers of an open source PBX:



Layer One Hardware

This is typically a server, tower PC or some sort of appliance. Most think the hardware is "the" phone system because it is more tangible than software. In reality the hardware is like crust. It serves a purpose, but you wouldn't eat it as a standalone.



Layer Two Operating System

In the open source world, this is your favorite (or the recommended) Linux® distribution. The operating system is a piece of software that manages computer resources and provides programmers/users with an interface used to access those resources. It is the pie filling of the open source phone system.



Layer Three Open Source Software

With the third layer you are adding the actual PBX system software (Asterisk®, trixbox®, freeSwitch™, etc). This is the special layer, like the meringue that turns a lemon pie into a lemon meringue pie or a functional server/tower/appliance into an actual PBX.



Layer Four Connectivity Cards

Most servers, towers or appliances come with Ethernet NIC's, but some do not. The last layer to this open source phone system is connectivity to the LAN/WAN through an Ethernet NIC and PSTN connectivity through an analog/digital PCI card. Although they're called layer connectivity cards they are really more like a fork. They are an enabler of the PBX system's capabilities just as a fork enables you to eat that slice of pie.

Pies and PBX systems.
Who would've thought
they'd ever go together?

In reality this explanation is a generalization. Within each layer there are aspects that you will need to explore prior to building or selecting an open source PBX which are outside of the scope of this guide.

For more information give one of the open source [PBX system](#) experts at VoIP Supply a call at **800-398-8647**. They'd be happy to explore the anatomy on an open source PBX in further detail.



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Features of an Open Source PBX



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So an open source PBX system doesn't taste as good as a slice of pie. But they do come packed with features that should make your mouth water.

- Auto Attendant
- Interactive Directory Listing
- Interactive Voice Response (IVR)
- Direct Inward Dialing (DID)
- Caller ID, Call Transfers, Call Waiting, Call Forwarding, Three-way calling
- Call Park, Call Pick-up
- Call Monitoring and Call Recording
- Call Queues and Call Routing
- Voicemail (and voicemail to email)
- Local and Remote Call Agents
- Conference Calling
- Remote or Virtual Extensions
- Analytics and monitoring tools
- Music on hold
- Predictive Dialer
- SMS Messaging
- Call reporting
- Ability to utilize VoIP and PSTN calling methods
- Web based management

These are just the basics. Most open source PBX systems offer much more than this. To learn more about what features an open source or open source based PBX system boasts be sure to refer to its product documentation.





Benefits of an Open Source PBX



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Sure there are a lot of features that come with an open source PBX. But you're not about bells and whistles. You want to know how owning an open source PBX will benefit you and your business. Each individual open source PBX will have its own set of business boosting benefits, but in general open source PBX systems bring with them these eight benefits.

One Cost savings

As you read, previously open source PBX systems are very cost effective as the PBX software is free. With an open source PBX system you will save between 30 to 50 percent versus a proprietary PBX. In addition to the cost savings on the system itself you may also decrease your maintenance cost since most open source PBX systems can be maintained by your IT administrator.

Two Standards based technology

Open source PBX systems utilize open standards based technology. This means that all of the technology used within the system is license free, freely available and widely supported by multiple parties.

Three Vendor neutral

Thanks to the use of open standards your open source PBX system allows you the maximum amount of choice in selecting which system components to use. With an open source PBX system you are not locked-into one vendor. You can choose to use whatever server, connectivity cards, switches and phones you want (provided they support the same standards).

Four Increase control

Since open source PBX software is free and you can do with it whatever you wish; you will receive unmatched control over your PBX system. Gone are the days of wondering what that black box does or why you're shelling out big bucks to a "PBX consultant" to maintain your system.

Five Flexibility

With open standards and increased control you gain the flexibility of being able to integrate your PBX system with other business systems allowing you to streamline processes and enhance operations.

Six Visibility

Because you have increased control and flexibility you will also gain increased visibility into the PBX system itself. This visibility will allow you to see exactly how the system is set-up and managed, increasing your comfort level with the investment and resources dedicated to its upkeep.

Seven Rapid development

You no longer have to wait six months, one year or even a decade for that new feature release. Since the PBX system is open source, there are thousands of developers contributing new features and enhancements to the source code every month. This rapid development allows you to inexpensively upgrade your PBX as needed to keep up with the changing demands of your business.

Eight Productivity and efficiency increases

No, we didn't forget your top line. While many rave about the bottom-line savings that come with the use of an open source PBX system the real benefit comes in the productivity and efficiency increases that come with the use of an open source PBX. Given the increased control, flexibility and utilization of standards based technology that comes with an open source PBX you will be able to increase the productivity and efficiency of your workers allowing them to do more - faster.





Who's Using an Open Source PBX?



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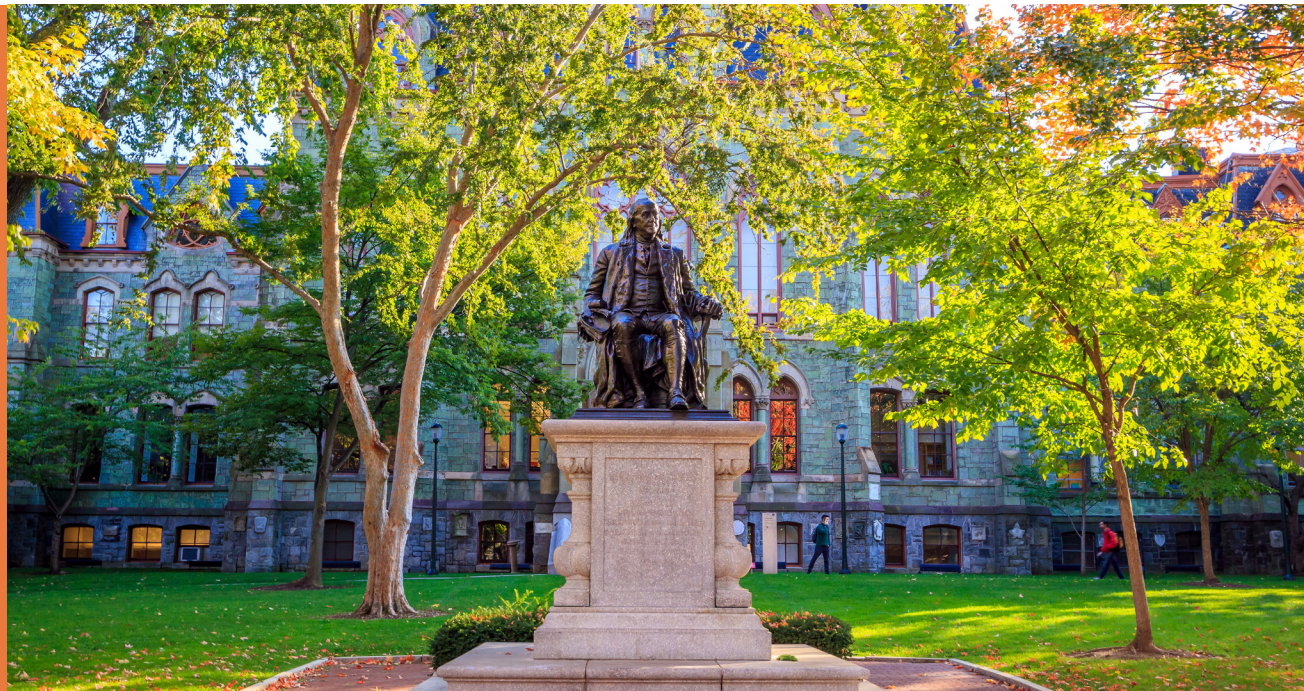
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Wow. Open source PBX systems come packed with as many business boosting benefits as they do mouth watering features!

Even though open source PBX systems have everything you could possibly ask for in a PBX you might not be convinced that an open source PBX system is for you.

Proprietary PBX system providers have spent truckloads of money painting open source PBX systems as bad. But as you've seen they're anything but bad. They're actually great.

Maybe learning more about who's using an open source PBX will help combat that? Let's take a look.



Who's using an open source PBX?

You shouldn't be surprised by what you're about to read. With all of the business boosting benefits and mouth watering features that come with owning an open source PBX system you should expect that anyone and everyone is using one.

Well, not quite. But there are tens of thousands of companies using an open source PBX. In fact according to a study conducted in 2008 by Eastern Management Group, open source PBX systems represent over 18% of the total North American PBX market.

As impressive as those numbers are it is even more impressive to see exactly who's using an open source PBX. Well-known open source PBX users include:

.....
The University of Pennsylvania
Amazon.com
Sterling Bancorp
Alderson Broadus College
Joe Gibbs Racing
.....

In addition to the well known names the following types of companies are a perfect fit for an open source PBX:

.....
Professional working from a home office
Technology start-up
Small town dental/medical practice
Multi-location real estate/
accounting/law firm
Century old manufacturing company
Nationwide retailers
Publicly traded
multi-national corporations
.....

What VoIP Phone system or VoIP service provider are you currently using? What good is a VoIP Phone if it is not compatible with the phone system or service provider that you are using? With the advent of open source phone systems, SIP and BYOD service providers it's easy to think that every VoIP Phone works with every phone system or service. Unfortunately this is not the case so make sure you know what protocols and codec's are supported by your VoIP Phone system and VoIP provider before buying.



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How to “Build” an Open Source PBX



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You've come a long way and have learned a lot about open source PBX systems. Before we get into the process for building your own open source PBX it is important for you to first consider whether an open source PBX is right for you and your business. The first step is the process of building (or buying) any piece of equipment should be assessment. But in this case you should first start by assessing whether it is best for you to buy an open source based PBX or build an open source PBX yourself. While no guide can answer that question for you, the open source PBX experts at VoIP Supply can. If you're not quite sure which solution is best for you, please give VoIP Supply a call at 800.398.8647. An experienced representative would be happy to help you make the right decision. With that out of the way, let's dig into the process for "building" your own open source PBX.

At this point, you will have all of the components necessary to construct an open source PBX. But it is also where you will need to find additional resources as the actual assembly and proper configuration of the system is outside of the scope of this guide. Don't be discouraged, you can always lean on the team at VoIP Supply for assistance.

One **Conduct a needs assessment**

The first step in building an open source PBX is to conduct a thorough needs assessment. This will uncover all of your various needs, wants and other business specifics related to what your open source PBX system must have.

Two **Select your PBX hardware**

Once you've decided on what exactly your open source PBX system needs to have it is time to decide on which hardware to use. The three most common choices are: a PC tower, a rack mountable server or a specialty VoIP server. Which one you choose will depend on your preference and budget as an open source PBX can be built from all three.

Three **Choose an Operating system**

Now that you have a physical piece of hardware it is time to choose the operating system to use. Most open source PBX software supports the various distributions of Linux®, but make sure that the open source PBX software you choose supports the operating system you choose.

Four **Match PBX software to your needs**

This is where your needs assessment will come in handy. Look to find open source PBX software that addresses the features, functions and benefits that you wish to achieve. This could be Asterisk®, Asterisk® Now, trixbox® or one of the dozens of other software's that are currently available.

Five **Connecting to the PSTN**

With the basics of the system complete it is now time to select a connectivity card so that you can gain access to the PSTN. You may elect to not connect to the PSTN (preferring to only use VoIP). In this case you will not need a connectivity card. Based on the number of POTS lines you need to connect (or T1/E1 PRI lines) you will want to select an FXO PCI card with the corresponding number of ports. (I.E. if you want to connect two POTS lines you will need a dual FXO PCI card.)

Six **Putting it all together**

At this point, you will have all of the components necessary to construct an open source PBX. But it is also where you will need to find additional resources as the actual assembly and proper configuration of the system is outside of the scope of this guide. Don't be discouraged, you can always lean on the [team at VoIP Supply](#) for assistance.



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Recommended Analog PCI Cards for Open Source PBX Software

In order to make the process of getting an open source PBX easier here are a few sample set-up's for you to consider.

Sangoma cards run best on open-sourced based software called Trixbox® and Asterisk®.

Instructions on how to install the Sangoma WanPIPE drivers for trixbox® can be found [here](#).

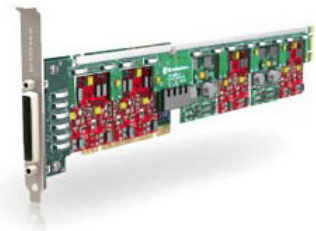
Instructions on how to install the Sangoma WanPIPE drivers for Asterisk® can be found [here](#).

Certain Server chassis and server hardware may require certain Sangoma PCI or PCI express cards

Analog:



[Sangoma A200 Series](#)

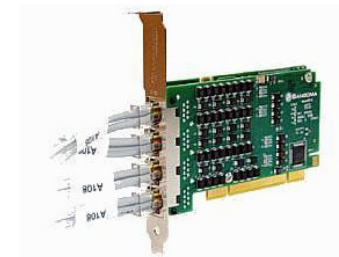


[Sangoma A400 Series](#)

Digital



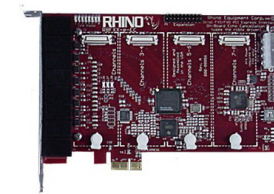
[Sangoma A101](#)
[Sangoma A101D](#)
[Sangoma A101DE](#)
[Sangoma A101E](#)



[Sangoma A108](#)
[Sangoma A108D](#)
[Sangoma A108DE](#)
[Sangoma A108E](#)



[Digium TE133F](#)
[Digium 1TE131F](#)
[Digium TE820B](#)



[R8FXX-E-EC-21](#)
[R24FXX-EC-0405 8FXS / 10FXO](#)
[R8FXX-e-EC-02](#)



Well, that's it.

We here at **VoIP Supply** appreciate the time you invested in Learning More about Open Source PBX systems and hope that you have found this content helpful in your pursuit of an IP PBX.

In closing we'd like to once again extend services here at VoIP Supply to you. Since 2002, VoIP Supply has helped over 100,000 people just like you create, deploy and maintain a VoIP solution - adding you as a customer would be a great privilege.

So after leaving this guide to further dive into the process of purchasing an open source PBX, if you ever find yourself confused, frustrated or simply in need of expert advice, please do not hesitate to give us a call at 800.398.8647 and we will do our best to give you honest, accurate and helpful information that will help you make the right choice.



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Thanks again for your time – the VoIP Supply team.



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