



Choosing Telephone Systems - Internet (VoIP) or Traditional?



Image: wikipedia.org

This guide will provide you with a basic understanding of VoIP (Voice Over Internet Protocol) telephone systems and describes the common terms and equipment that a VoIP system requires.

You will learn about the advantages and disadvantages of a VoIP system as compared with POTS (Plain Old Telephone Service). A cost comparison template will help you to choose between one system and another.

This guide is intended for all school staff who are unfamiliar with VoIP and would like to know more about how VoIP could be used in a school.

It seems likely that VoIP telephony will eventually dominate the telephone services sector, not least because VoIP offers significant cost savings and beneficial features when compared to POTS. There are a large number of providers in the market and schools need to understand the key concepts and potential issues to ensure that they make the best decisions going forward.

Contents

- [Comparison of POTS and VoIP](#)
- [What you will need to move to VoIP](#)
- [Costs](#)
- [Contract Terms](#)
- [Providers](#)
- [VoIP readiness considerations](#)

Once you have read this guide you are welcome to contact the Connected Learning Advisory to get more personal assistance. We aim to provide consistent, unbiased advice and are free of charge to all state and state-integrated New Zealand schools and kura. Our advisors can help with all aspects outlined in this guide as well as provide peer review of the decisions you reach before you take your next steps.

- Call the Advisory on 0800 700 400
- Complete the [online form](#) in the Advisory Helpdesk
- View more information and resources on our website - www.connectedlearning.org.nz

Comparison of POTS and VoIP



A traditional Plain Old Telephone Service (POTS) runs over copper phone lines and is referred to as a circuit-switched network. It uses a dedicated circuit that extends all the way from your phone to the recipient and only carries one call at a time.

On the other hand, VoIP is packet-switched. This means your voice call is carried as data over your local network and the internet to reach the party you are calling. Your call is broken into numerous small packets of data and each of them are sent and re-assembled at the other end in order for the recipient to hear what you have said to them.

A POTS phone line is very reliable, but most schools connect their phone lines to an on-site Personal Branch Exchange (PBX) which needs power to run, so in many cases they are susceptible to power outages. VoIP is dependent on a working network connection and so is susceptible to internet outages and power outages to some degree. Most schools have cell phones, whether school-owned or personal, that could be used in an emergency if their phone system was offline.

Summary of POTS versus VoIP:

	POTS	VoIP
Standard Features: caller ID, call waiting, voice messaging, faxability	good, tend to be charged for	good, tend to be bundled as part of the product
Voicemail to email	seldom	usually
Reliability	exceptionally high	very high
Quality	high	variable, but if done correctly should still be very good
Line costs	high	low
Call costs	higher	lower, often come with bundles of minutes
Contract period	can often be 2 years on lines and up to 5 on phone systems	often have short or no contract period

What you will need to move to VoIP



VoIP requires a:

1. Calling plan
2. PBX (either on-site or cloud-based)
3. Device to talk into
4. Reliable internal network
5. Suitable internet service

1. Calling Plan

You will need an arrangement with a VoIP provider who will charge you for the minutes of calling used and the number of concurrent calls you wish to be able to make. For example, a medium-sized school might subscribe to a monthly bundle that includes the ability to make 5 concurrent calls, 6000 local minutes, 2000 national minutes and 50 mobile minutes.

When moving to VoIP, or between different VoIP providers, you will port (move) your existing phone numbers from your existing provider to a new provider. In doing so you should be wary of losing direct control of your phone numbers and it is preferable that they are still associated with an account in your name.

2. Hardware or Cloud-based VoIP PBX

Some kind of VoIP management system is required to interconnect calls, allowing you to transfer to other extensions, put people on hold, and record and send messages via email. The school could have its own hardware VoIP PBX/Gateway running at the school but it is probably more cost-effective and flexible to use a system that runs in the cloud. This is often called a Cloud PBX.

Using a Cloud PBX means you are paying for capacity on an offsite PBX rather than investing in one of your own. If there is a situation where your school is offline a Cloud PBX will usually still be online so your callers can leave voicemail messages. Alternatively you could ask your Cloud PBX provider to redirect calls to a cellphone number if you are offline.

A single provider may deliver both the calling plan and the PBX.

3. Phones, Adapters or Software

Specialist equipment or software will be needed to make calls using a VoIP service. There are three options to make calls using VoIP:

- a. A specialist [VoIP telephone handset](#) which is connected via an Ethernet cable to the school's network will give the best functionality and overall experience.

VoIP phones require power. All phones should allow you

to use a normal power adapter plugged into the mains and some will also allow you to provide power via the Ethernet cable (this requires special equipment).

VoIP phones commonly come with one or more additional network ports so that a computer can also be connected to it. This means that a computer and phone can share one data outlet.

- b. An existing analogue phone which is connected by an [Analogue Telephone Adapter](#) (ATA) to the school's network. While this allows you to use your existing analogue phones on your VoIP system it does not give you all of the features you might otherwise expect. If you ever replace your handsets with VoIP ones then the ATA adapter will be redundant.

Like VoIP phones ATA adapters require power and sometimes provide an additional Ethernet outlet to allow for connecting both a phone and a computer to one data outlet.

- c. A special software that can run on a computer, tablet or smartphone and use the local computer network to make calls. This is commonly referred to as a [Softphone](#). While this can be set up to work well it is generally not recommended for the following reasons:
- Ideally you will need a headset with a microphone if you use a softphone on a computer
 - If you connect over Wi-Fi infrastructure or the device's mobile data allowance then the quality is generally less reliable.
 - If the computer is not turned on then it cannot accept calls

4. Reliable Internal Network

Your school will need a robust cabled network and a sturdy internet connection. If your school has been SNUPped and has an N4L connection this should meet the required standards.

You may wish to speak with your IT staff or provider about the possibility of configuring VLANs (Virtual Local Area Network) and QoS (Quality of Service). A VLAN will ensure that the voice traffic

	<p>is separate from other data traffic and in theory QoS allows you to prioritise voice traffic over data traffic. Both require technical expertise to set up. Some VoIP providers like to see VLANs and QoS while others are not concerned.</p> <p>5. Suitable Internet Service</p> <p>Your Internet Service Provider will need to support your VoIP system. N4L can work with most VoIP services as long as they use the internet-based SIP protocol which is the underlying protocol that VoIP runs on. The school can liaise with N4L at no cost to get the connection up and running using the school's chosen VoIP provider. You should tell any prospective VoIP providers if your school is connected to N4L, and that their service will need to work over your N4L connection.</p>
<p>Costs</p> 	<p>The Connected Learning Advisory team are unable to supply details on costs. Only VoIP providers can supply these details and they will need to be negotiated directly. Often the actual VoIP service is relatively inexpensive - the expense comes from the need to purchase additional handsets or ATA adapters for existing phones.</p> <p>To get the maximum financial benefit from a VoIP system you will need to stop using (and paying for) the copper phone lines. Before you cancel your subscription to use the copper phone lines though, be aware of all of the services they are providing and have a plan to either transfer this functionality or to keep a copper phone line in place to retain this particular service.</p>
<p>Contract Terms</p> 	<p>Regardless of which providers you use, you need to be sure that you are aware of the contract terms. Some providers may seek to contract with you for extended periods of time and you should take that into account when deciding who to work with.</p>

Providers



An internet search will provide you with many options. Your current phone system providers or technical support may also offer VoIP services.

VoIP readiness considerations



To ensure a smooth transition you should check the following:

- is the school currently committed to a contract for either phone lines or toll calls? If so, are there fees or penalties to break the contract?
- is the school currently committed to a contract for the existing phone system? If so, are there fees or penalties to break the contract?
- does the school's phone bill bundle lines and tolls with other services like broadband or mobile phones? Will those other services become more expensive when unbundled?
- does the school require outbound faxing? VoIP providers capture inbound faxes and then email them to someone at the school. Outbound faxes can be replaced by scanning and emailing from a photocopier.
- does the EFTPOS terminal have an Ethernet outlet and is it configured to use it? Most EFTPOS terminals have network terminals on them as well as phone jacks. The EFTPOS terminal just needs to be attached to a data outlet and configured to make it use the Ethernet instead of phone network.
- does the school have monitored burglar/fire alarms? If so they will need to be changed to allow monitoring over cellular, radio or IP. Monthly monitoring costs may also be slightly higher over something other than the copper phone lines. Prices should be checked with whoever maintains your alarm system.

Cost Comparison Template

Complete the table below to get an idea of the cost differences between POTS and VoIP for your school. Before you start, have ready all costs for your existing phone system, including any service contracts and costs that you may currently have for e.g. fire or security alarm systems.

Ensure that you know about all the current services that run over your existing phone system (fax, alarms, EFTPOS, payphones etc) so that you can be aware of what will be involved to replicate these on the new system.

Monthly costs	POTS	VoIP
Calls	\$	\$
Lines	\$	\$
Additional Features	\$	\$
PBX	\$	\$
Handsets	\$	\$
Technician time	\$	\$
Alarm Monitoring	\$	\$
Total	\$	\$

One off costs	POTS	VoIP
Alarm Upgrade	\$	\$
EFTPOS Terminal	\$	\$
Other	\$	\$
Total	\$	\$

This guide has been produced in response to a number of specific queries about telephony solutions from schools. It should not be read as a recommendation or endorsement of any specific product. The Connected Learning Advisory is a Ministry of Education supported

service that provides schools with technology information relevant to their queries and does not recommend one product over another.



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/). Produced for the Ministry of Education's [Connected Learning Advisory](#) by [CORE Education](#)
Last Updated: 12/7/17