



Upgrading your Practice Phone Systems

Introduction

In discussing the topic of phone systems in GP surgeries, many will say that if it is not broken then do not fix it. Many practices are using outdated, expensive telephone systems. In the past few months, there have been reports that GP phone systems have broken down and have had to be replaced. Older phone systems do not cope well with sudden surges in usage as has been experienced during the recent COVID 19 pandemic and are liable to fail. Loss of a phone line to a GP surgery is a severe issue and carries with it the threat of both significant financial loss and medico-legal risk.

The purpose of this article is to give an overview of the phone systems which are available to use in practice. It is worth having a basic understanding of the different phone systems, including the commonly used jargon, this article aims to prepare you for talking to a telephone network salesperson.

The critical question to ask yourself is- Do I stick with the traditional PBX (personal branch exchange) system or migrate to a VoIP (voice over internet protocol) system? Hopefully, after reading this, you will be better versed in answering this question.

Traditional Phone Systems

The traditional phone network dating back over 100 years is circuit-switched, meaning there is a dedicated line (circuit) for each call, with a high level of reliability we have come to expect.

When a call is made between two parties, the connection is maintained for the duration of the call. Because you are connecting two points in both directions, the connection is called a circuit. This circuit is the foundation of the Public Switched Telephone Network (PSTN). Let us say you talk for 10 minutes. During this time, the circuit is continuously open between the two phones. In the early phone system, up to 1960 or so, every call had to have a dedicated wire stretching from one end of the call to the other for the duration of the conversation.

Telephone conversations over today's traditional phone network are somewhat more efficient because your voice is digitised, sent off in little packets, and your voice along with thousands of others can be combined onto a single fibre optic cable for much of the journey.

Computer data networks do not use circuit switching. Your Internet connection would be a lot slower if it maintained constant contact to the Web page you were viewing at any given time. Instead, data networks send and retrieve data in packets as you need it. Instead of routing the data over a dedicated line, the data packets flow through a chaotic system along thousands of possible paths. This process is called packet switching.

It is this packet switching that is used in telephone conversation exchange that forms the basis of the VoIP system.

So, when you make a traditional phone call

Pick up the phone- Get a dial tone (that's connecting to the PSTN); dial the number (generate the circuit); have the conversation (telecom exchange compresses and sends the voice as packets of data, where the recipient's exchange translate these digital packets back into analogue sound); hang up (disconnect the circuit and the PSTN).

Key System- For a small surgery say one GP, nurse and secretary, the secretary's telephone can act as the telephone exchange for the practice. They can take incoming calls or route them to the GP or nurse, where they, in turn, can make internal or external calls through the secretary's phone. This process is the basis of a simple key system.

Centrex- For larger surgeries, this system will not work, and you will have to invest in a PBX (private branch exchange) system. For medium-sized surgeries, this can be run by the telecommunication company where the switchboard for the practice resides offsite with the telecommunications company. This type of switchboard is called a Centrex.

Premise PBX- For larger practices over ten users, then they need to invest in a premise-based PBX. That is more expensive hardware to run and maintain and nearly always needs external technicians to sort any problems.

ISDN System

ISDN or Integrated Services Digital Network is a circuit-switched telephone network system that transmits both data and voice over a digital line. It was designed to move outdated landline technology to digital.

ISDN connections have a reputation for providing better speeds and higher quality than traditional connections. ISDN was born out of necessity. Analogue phone networks failed constantly and proved to be unreliable for long-distance connections. Sometime in the 1960s, the system began to change over to a packet-based, digital switching system. The UN-based International Telecommunications Union, or ITU, started recommending ISDN in 1988 as a new system for operating companies to deliver data. Today, ISDN has been largely replaced by broadband internet access connections like DSL (digital subscriber line), WAN (wide area network), and cable modems. There are a few critical differences between ISDN and DSL. For starters, DSL transmits data far faster than an ISDN line can. That is because ISDN is a dial-up service that goes through a single line. DSL connections never need to dial. They are sometimes called “always-on connections.” Because of that, DSL sends its packets at speeds up to 100 Mbps, while ISDN tops out around 128 Kbps. With ISDN, digital signals are broadcast through telephone lines. ISDN is beneficial in GP surgeries as it can connect devices and allow them to operate over a single line. These devices would include credit card readers, fax machines, and other manifold devices.

The cost of ISDN is much higher than some traditional broadband options, because of this, it is starting to get phased out from big telecommunication companies like ‘BT’, and ‘Eircom’ will probably follow in the future. This cost has forced people to search for alternatives. One popular choice is VoIP.

VOIP Phone Systems

VoIP is a way to make calls across your Local Area Network (LAN). It uses your LAN as the backbone of the system – connecting your VoIP phones and your VoIP service provider to the VoIP PBX. That makes a VoIP phone system a phone system that uses IP (Internet) technology to handle your call control and manage your connection to the Wide Area Network over which your VoIP service comes.

Even though a VoIP phone system uses VoIP and is connected to your LAN, most systems can connect directly to the Publicly Switched Telephone Network. This gives you the ability to use both VoIP and the PSTN for your calling. This system is sometimes called a hybrid network.

A VoIP phone system is quite the change from your existing PBX.

- Your existing PBX uses TDM technology (Time-division multiplexing). A VoIP phone system uses IP technology.
- Your existing PBX uses its closed network. A VoIP phone system uses your current LAN (local area network).
- Your existing PBX uses the PSTN for dial tone. A VoIP phone system uses a VoIP service provider and the PSTN for dial tone.

VoIP Phone Systems give you many Advanced Features and Functionality

- Auto Attendant
- Direct Inward Dialling (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)
- Conference Calling
- Remote or Virtual Extensions
- Analytics and monitoring tools
- Call reporting
- Ability to utilise VoIP and PSTN calling methods
- Web-based management
- Application integration

Advantages of VoIP

- Cost savings – Not only will you save money by using VoIP for your calls. You will also see a reduction in the maintenance and support costs since you will no longer need to maintain a separate network for your PBX or pay for call out for external technicians.
- Remote Deployments – Whether you are looking to have someone work from home. With an IP PBX you can deploy IP Phones anywhere there is an Internet connection and control them from your central location.

Disadvantages of Using VoIP

The current Public Switched Telephone Network is a robust and reasonably bulletproof system for delivering phone calls. Phones work, and we have all come to depend on that. So, what the PSTN may lack in efficiency it more than makes up for in reliability. But the network that makes up the Internet is far more complex and therefore functions within a far greater margin of error. What this all adds up to is one of the significant flaws in VoIP, reliability.

- VoIP is dependent on wall power. Your current phone runs on phantom power that is provided over the line from the central office. Even if your power goes out, your phone still works. With VoIP, no power means no phone. A stable power source must be created for VoIP.
- Another consideration is that many other systems in your practice may be integrated into the phone line. Digital video recorders, security systems, credit card readers all use a standard phone line.
- Emergency 999 calls also become a challenge with VoIP. VoIP uses IP-addressed phone numbers. There is no way to associate a geographic location with an IP address.
- Because VoIP uses an Internet connection, it is susceptible to all the problems usually associated with broadband services. All these factors affect call quality: latency, jitter and packet loss. Phone conversations can become distorted, garbled, or lost because of transmission errors.
- VoIP is susceptible to worms, viruses, and hacking. Although this is exceedingly rare, VoIP developers are working on VoIP encryption to counter this.
- Another issue associated with VoIP is having a phone system dependant on individual PCs of varying specifications and power. A call can be affected by processor drain. If you are chatting away on your softphone, and you decide to open a program that is taxing on your processor. Quality loss will become immediately evident. In a worst-case scenario, your system could crash in the middle of an important call.

There are four different types of VoIP phone services in everyday use today

- ATA - The simplest and most common way is using a device called an ATA (analogue telephone adaptor). The ATA allows you to connect a standard phone to your computer or your Internet connection for use with VoIP. The ATA is an analogue-to-digital converter. It takes the analogue signal from your traditional phone and converts it into digital data for transmission over the Internet. You plug the cable from your phone that would typically go in the wall socket into the ATA, and you are ready to make VoIP calls.
- IP Phones - These specialised phones look just like standard phones with a handset, cradle, and buttons. But instead of having the standard RJ-11 phone connectors, IP phones have an RJ-45 Ethernet connector. IP phones connect directly to your router and have all the hardware and software necessary onboard to handle the IP call.
- Computer-to-computer - This is undoubtedly the easiest way to use VoIP. This system provides free computer-to-computer calls, no matter the distance as used in "Skype".
- Softphone- A softphone is client software that loads the VoIP service onto your desktop or laptop. The softphone has an interface on your screen that looks like a traditional telephone. If you have a headset/microphone, you can place calls from your computer anywhere in the broadband-connected world.

What options are available to upgrade my network?

These are options to get more phone lines for you today and save money; they all assume you have access to stable broadband. Where broadband coverage is lacking, you can consider converting some of your analogue lines to ISDN and doubling your line numbers.

Transition to a Cloud-based PBX, convert your system to complete VOIP

There are many companies out there happy to take over the running of your PBX; they will host and maintain the infrastructure in the cloud. This method is the best solution for overall saving money and reducing the number of steps that can go wrong with a phone network. They can significantly reduce the number of phone lines a practice needs to function so rental costs are reduced as well as individual call charges. You will still have a contract with your phone provider, but you can save money on cancelling traditional phone line rental, and call costs will be significantly reduced.

Go for a Hybrid System

The hybrid system can be obtained by using a third-party provider who will fit a 'SIP trunk' box to one of your analogue lines and convert those calls from analogue to VOIP. This switching will expand the number of phone lines available to you, but the third-party operator would bill call charges for those lines at a reduced cost.

Get Softphone Functionality on your Workstation

With having to call so many patients for triage, I find it frustrating to have to type phone numbers into the phone, inadvertently hitting wrong digits, straining over and back from my screen to the phone. Life can be much more comfortable with a softphone where you copy the phone number from your practice management software and paste it into the softphone application on your computer and hit dial. Keeping your existing phone structure but use your work PC as your phone to call patients, it has the advantage of freeing up a phone line on the practice network. To work requires a good microphone and headset attached to the computer. You can do this easily through 'Skype' or 'Microsoft Teams', but the monthly charges and phone call costs can be prohibitive. Companies are offering this service nationally at significantly reduced prices.

An Irish company to consider, who can provide for all the solutions listed above are 'Intellicom', for more see www.intellicom.io.

In Summary

VoIP is a vast improvement over the current phone system in efficiency, cost, and flexibility. The running costs can be reduced as much as 70% for your phone system. A hosted VoIP system is much cheaper and quicker to install. If VoIP is being considered, you need to have a fast and reliable broadband connection. Like any emerging technology, VoIP has some challenges to overcome, but developers will keep refining this technology until it eventually replaces the current phone system.

Keep in mind if broadband goes down with VoIP, the calls will always go to voicemail or can be automatically routed to a mobile number, and you will get an email notification for all voicemails.

If migrating to a VoIP system, consider a hybrid network where your phones will still operate if the broadband goes down. In the future, it is hoped our practice management software developers will integrate VoIP into the patients' notes, so calling patients can be refined to a single click.

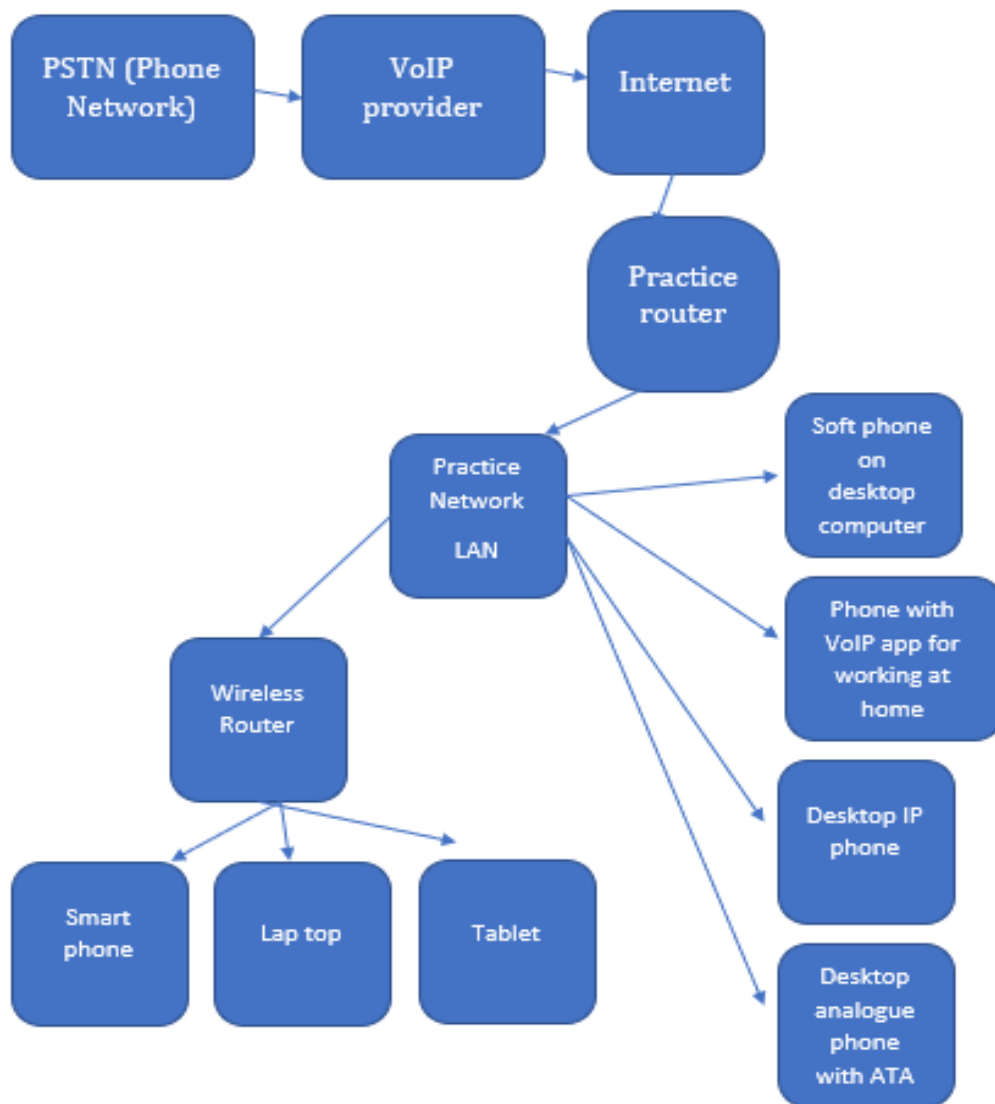


Figure 1: How a Hosted VoIP operates For a GP Surgery