

VoIP Trends

What to Expect in 2016

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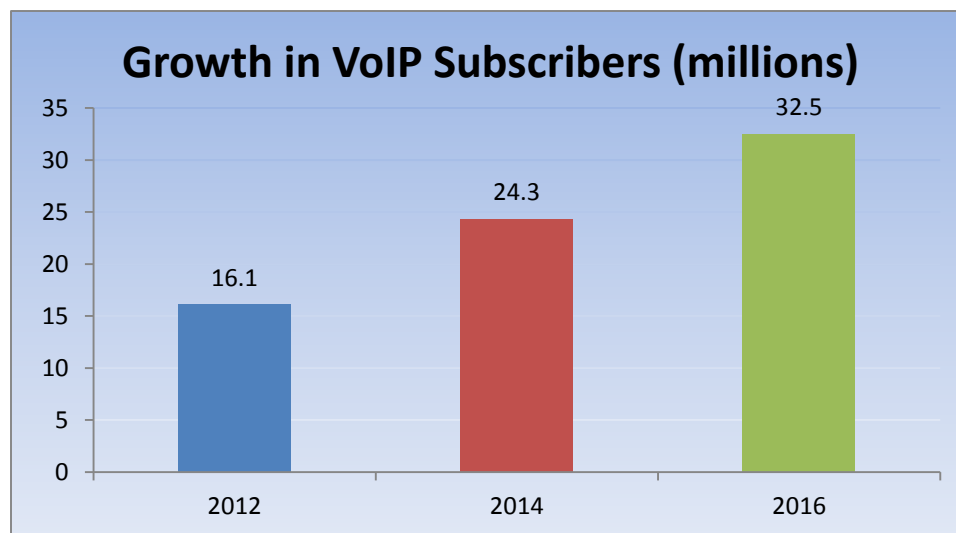
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The VoIP Market Is Set to Grow

On January 30, 2014, the FCC (Federal Communication Commission) agreed to a proposal from the telecom industry to oversee large scale trials to convert the Plain Old Telephone Service (POTS) to an all IP broadband-based system. The implications are profound, and as expected, the telecom industry has praised the decision.

A closer look at the decision and the situations surrounding it show that the industry is eager for the switch to take place soon because it is finding it difficult to maintain older analog systems and to compete with IP-based telecom services. The FCC is being cautious, and wants to be convinced that the 100% VoIP infrastructure the telecom companies want will be able to completely replace POTS all over the country.

POTS-based telecom systems have been in decline over the last few years. AT&T has reported that its POTS lines decreased from 15.7 million to 12.4 million lines in the period 2012 – 2013. On the other hand, the VoIP subscriber base is seeing rapid expansion, as shown below :



The relevance of any technology to a business can be found in the value it adds to businesses. It has been [estimated](#) that the benefits VoIP brings to businesses will grow at an average of 15.3% till 2017.

This rate is expected to increase further beyond this as the user base increases, and more innovative service providers add more IP enabled applications.

It is very clear that given a few more years, VoIP will replace POTS infrastructure in most countries in the world. Over the last few years, as this technology has gathered steam and the underlying networks have improved, certain trends have become clearly visible. These indicate the shape of things to come.

Nomadic VoIP Stakes a Claim

Nomadic VoIP describes a portable VoIP device, most likely a smartphone or a tablet, that users can carry along with them. These devices can connect to the network from any location using broadband, Wi-Fi or 3G services. Such devices constitute more than 59% of all VoIP instruments in use, and their numbers continue to grow.

The growing popularity of “Bring Your Own Device” (BYOD) is leading to ever larger numbers of employees using their smartphones to conduct VoIP calls. This is helping them become more efficient, giving them better communication capabilities.

It has been [reported](#) that business use of mobile-based VoIP devices will grow tenfold in the coming years. By 2016, it has been estimated that cloud-based mobile services will generate more than \$45 billion in revenue and that by 2017 more than a billion mobile users will opt for VoIP services.

All of this growth comes from a large and growing number of VoIP service providers. This naturally translates to lower costs and a richer feature set as service providers compete with each other. Fortunately, the growing subscriber base ensures there are enough customers to keep innovation going.

- 59% of all VoIP phones are 3G or Wi-Fi enabled
- Mobile VoIP will see 10x growth in the next few years
- By 2017, more than one billion users will register for VoIP services

Some Key Technologies for 2016

Any discussion of future trends in VoIP will necessarily have to include a few recently developed technologies on their way to becoming mainstream in 2016 or the near future. Many of these relate to voice communication over mobile devices. There is a rapidly emerging field of machine to machine (M2M) communication as well. This section will look at some of these technologies and explain the issues involved.

VoLTE

The LTE in VoLTE stands for Long Term Evolution. This basically pertains to voice over the cellular network, where LTE offers a substantial upgrade over 3G capabilities without going into domains reserved for 4G. The improvement in capability is so large that 3G LTE is sometimes even called 3.99G coverage – i.e. just short of 4G.

LTE came into being because the rapid increase in data transfer needs for most users demanded better capability networks. LTE technology offers downlink speeds of 100 MBPS and uplinks of 50 MBPS. These are many times faster than basic 3G speeds. The latency or time delay in LTE circuits is on the order of 10 milli-seconds, this is again far better than typical 3G latencies. To the user, this means that the quality of VoIP calls using mobile phones improves dramatically.

The impact of these improved performance figures on basic VoIP calls over mobile phones is so large that TIME magazine discussed the issue in an [article](#) in 2014. VoLTE technology is not something all smartphones can use. In most cases, it is the newer handsets that are VoLTE enabled. Even so, as VoLTE proliferates it is taking traffic out of traditional VoIP data streams, so the older IP networks are becoming less congested.

Voice over Wi-Fi

Voice over Wi-Fi (VoWi-Fi), sometimes also called Voice over Wireless LAN or VoWLAN is easy to understand. This is basically a subset of VoIP where voice packets are carried over Wi-Fi networks that are now present in most homes and offices. Since Wi-Fi has become so prevalent (practically 100%

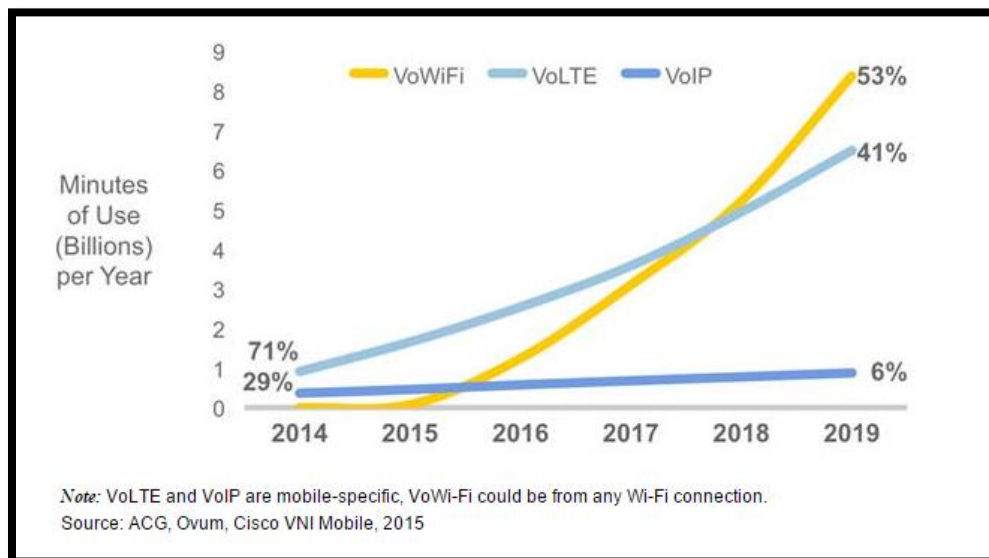
offices and close to 90% homes in the US have Wi-Fi), in many cases a VoIP call that originates from a smartphone never travels over the cellular network.

As a result, many smaller VoIP service providers who do not hold enough spectrum or are only regional players can now begin to offer services at par with larger operators. This will introduce greater competition to the VoIP services market.

A popular use of VoWi-Fi is in large complexes such as hospitals and airports. The staff can keep in touch with each other using this technology, at hardly any cost.

In many cases, users face problems accessing VoLTE inside buildings or in areas where cellular coverage isn't ideal. Business users have the option of putting in LTE femtocells – these are small mobile phone base stations that are connected to the cellular network over the Internet. However, this can involve significant costs and so VoWi-Fi can be a better option. Advanced devices now switch between voice over Wi-Fi and voice over LTE when required, without the user becoming aware of the switch over.

The graph below shows how VoLTE, VoWi-Fi and mobile VoIP will grow over the next few years (Cisco [data](#)).



What is the lesson? Any business investing in new VoIP equipment must look for the capability to exploit Wi-Fi and / or 3G LTE as well. The growth curves make this very clear.

OTT VoIP and Other Technologies

A new phase of VoIP innovation has hit the market in recent years and is fast becoming an accepted way of business communication. This is “Over the Top” VoIP, abbreviated to OTT VoIP. OTT consists of creating voice applications that ride the Internet bandwidth. As an example, consider a cell phone with a 3G or a 4G connection. If a user were to make a normal international call using the phone, she would incur a certain cost. However, if the same user were to use Skype or a similar service, her costs would be much lower. In such a case, the VoIP service she uses is running on top of the 3G connection.

OTT services will grow. The telecom providers tried to fight this movement but have lost battles in courts and are now resigned to offering OTT services of their own. As many OTT providers have shown, VoIP integrates very well with software applications, and combined VoIP / CRM applications are now available that allow businesses much greater functionality. These applications will continue to increase. Buyers of new equipment in 2016 must ask vendors for the new functionality that their equipment will be able to provide.

There are several key trends that are influencing the development of OTT applications. These are:

- A rapid increase in the numbers of smartphones and mobile broadband services
- Increased partnerships between device vendors, mobile operators, and OTT service providers
- Integration of OTT voice with social media, websites and applications
- Integration with software to offer innovative features. Automated translations, conversion of voicemail to text, and verbal activation of features and services are some emerging examples with obvious business benefits
- A clear trend towards net neutrality will help OTT providers and create conditions favorable for their growth
- Large infusion of capital and great investor interest – Microsoft acquiring Skype is an example

Another OTT service is VoIP over Instant Messaging (IM). As instant messaging tools gained in popularity, service providers experimented with providing VoIP capability through the IM platform. This is

Voice over Instant Messaging (VoIM). While the application may appear trivial to begin with, it has evolved over time and now incorporates file sharing as well. It thus supports a number of business communication needs. Participants can chat, send files and call each other up over the IM interface.

Cloud-Based VoIP Services

Most readers should be familiar with the differences between an on-premise IP phone system and cloud-based VoIP services. A hosted solution is much simpler to deploy, has lower initial costs and can be used from anywhere with broadband Internet.

However, businesses must compare the long-term costs of setting up on premise systems with SaaS offerings over the same period. In many cases when the number of users of the system is large (say over 100), it may make more sense to buy and deploy a system outright rather than go in for rentals.

It is also important to study the fine print of any service agreements to ensure that all desired features are part of the service being provided. There are numerous cases where businesses rent a basic system and end up paying extra for features that are essential to their needs.

Iowa University Moves to the Cloud

A well-managed migration to cloud-based VoIP services can pay rich dividends. Iowa University, for example, was using 8,000 conventional phones to provide communication between its staff and faculty and between departments. The University recently decided to switch to cloud-based VoIP systems, and selected a service provider that had already provided similar services to 220 other institutions of higher learning in the US. One key benefit Iowa obtained was getting instantaneous connectivity to all of these institutions simply by being on the same platform.

The Iowa campus had intended to replace its handsets slowly to better manage the change, but they found that they could proceed much faster because they encountered no difficulties.

The University estimates savings of \$600,000 annually because of the switch.

VoIP Security

As VoIP becomes mainstream, there are a number of security issues that must be understood and addressed. With unified communications putting a number of technologies together, the areas of vulnerability tend to increase. System administrators have to anticipate these issues and ensure that they are taken care of early in the implementation process. Key areas of concern are:

- VoIP traffic travels through the Internet. It is possible that a hacker could use a packet sniffer to listen to unencrypted VoIP traffic. The solution lies in setting up a virtual private network (VPN) between the endpoints, but that introduces additional complications.
- Many older firewalls may not recognize VoIP packets. In addition, some intrusion detection systems may try and inspect voice packets, thereby inducing delays and jitter. Bypassing the traffic inspection rules in the firewall may create additional vulnerability. Eventually the business may have to go in for a modern firewall.
- Many of the older VoIP phones may require security patches for their software. This is seldom done as many administrators are not even aware that phone software needs patching. Some VoIP phones are set up to apply patches directly without even asking for authentication. Such phones can be very vulnerable to hackers.
- Phones also inherit the security flaws of the operating systems (OS) they use.
- Systems used out of the box may have default passwords and open ports that need to be managed and secured. In many cases this is ignored.
- Denial of Service attacks can also be launched against the phone system just as they can be against any other computer application.

Summary

VoIP systems have matured considerably and are now considered mainstream applications. There is a clear trend of reducing the number of copper connections and while rapidly increasing VoIP seats. Businesses need to understand the change that is going on and realize that in a few years POTS systems will not be supported. Decision makers need to understand VoIP technology and the way it is evolving so that they can make best possible use of the communication capabilities available to them.

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