



Voice over IP – VoIP

VoIP stands for Voice over Internet Packet Protocol; this may be used on private or the public Internet. Analogue voice calls are digitised into data packets and then transmitted over the IP network. Then at the receiving end the voice data packets are reassembled into an analogue signal.

VoIP is a new technology. It has been likened to the cellular phone industry a few years ago when that was in its infancy. VoIP allows the transmission of digitised voice data over IP networks at a fraction of the cost of current long distance services. Some predictions say that VoIP will replace some long distance services in a few years.

To run a VoIP system there needs to be a VoIP gateway at each end of the call. The VoIP gateway is a computer system that contains the hardware and software required establishing connections and routing the calls over, either the regular telephone system or IP network. The gateways contain Digital Signalling Processors (DSP). These chips encode and decode the digital data packets into and from analogue voice signals. Multiple gateways may be used to connect to various networks. This will give flexibility in choosing the most efficient way of routing calls depending on time of day, route loading and least cost routing.

The voice quality on VoIP systems can be compared to cell phone systems, although this will depend on the network used.

There are three types of IP network to be considered. The Internet and it's World Wide Web. The Corporate or Enterprise IP network sometimes referred to as Intranet. The IP Virtual Private Network (IP-VPN), sometimes called the Extranet.

An enterprise IP network consists of one or more LANs at each location connected by a WAN. The LAN may be of various types, Ethernet, Token Ring, ATM and FDDI. The WAN may use leased lines, Public Frame Relay, ATM satellite or ISDN connections that support IP.

Each remote location will have routers the remote LANs to the IP WAN. The enterprise network will be managed to provide an optimised service between locations. This means data will be subject to low delays with high predictability.

The Internet, in contrast, can have large delays and arrival times can be highly unpredictable.

The IP-VPN is a new type of public network service that aims to provide the predictability of the private network on a public system. IP-VPNs are designed with plenty of bandwidth, high-speed routers and security features that make delays times low and arrival of data predictable. IP-VPNs try to provide the same managed IP network characteristics as an enterprise network. These guarantees make up a performance characteristic called Quality of Service (QoS). QoS is the major key difference between the Internet and the IP-VPN.

The main goal of VoIP is to piggyback voice and FAX calls over an IP network to save on call charges. The second goal is to incorporate IP voice and FAX into applications. These two goals are the primary focus of the seven main VoIP markets that have been identified.

1. Corporate Bypass. Charge free calls between corporate locations for voice and FAX.
2. Fax over the Internet. Charge free or reduced rate Fax machine Fax between any two locations.
3. PC-phone to PC-phone Charge free voice calls between any two PCs on the Internet
4. IP-based public phone. New public phone services, at reduced rates where voice is sent via the Internet or over public IP networks.
5. Call Centre IP Telephony Agent Click. A new IP voice application that allows a PC user on the Internet to click on a phone icon in a catalogue at a customer service home page and talk to an agent via the PC as a phone.
6. IP line doubler A PC user at home or in an Hotel with just one connection to the Internet would subscribe to a new service that allows a single phone line to carry one or more phone calls in addition to the PC data.
7. Premise IP Telephony PCs on an IP LAN would be able to make phone calls to ordinary

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phones in same building or to make outside calls, using special VoIP equipment on the premise.