



COMMUNICATION & NETWORKING

HISTORY OF INTERNET

The Internet had its roots during the 1960's as a project of the United States government's Department of Defense, to create a non-centralized network. This project was called ARPANET (Advanced Research Projects Agency Network), created by the Pentagon's Advanced Research Projects Agency established in 1969 to provide a secure and survivable communications network for organizations engaged in defense-related research.

In order to make the network more global a new sophisticated and standard protocol was needed. They developed IP (Internet Protocol) technology which defined how electronic messages were packaged, addressed, and sent over the network. The standard protocol was invented in 1977 and was called TCP/IP (Transmission Control Protocol/Internet Protocol). TCP/IP allowed users to link various branches of other complex networks directly to the ARPANET, which soon came to be called the Internet.

Researchers and academics in other fields began to make use of the network, and eventually the National Science Foundation (NSF), which had created a similar and parallel network, called NSFNet, took over much of the TCP/IP technology from ARPANET and established a distributed network of networks capable of handling far greater traffic. In 1985, NSF began a program to establish Internet access across the United States. They created a backbone called the NSFNET and opened their doors to all educational facilities, academic researchers, government agencies, and international research organizations. By the 1990's the Internet experienced explosive growth. It is estimated that the number of computers connected to the Internet was doubling every year.

Businesses rapidly realized that, by making effective use of the Internet they could tune their operations and offer new and better services to their customers, so they started spending vast amounts of money to develop and enhance the Internet. This generated violent competition among the communications carriers and hardware and software suppliers to meet this demand. The result is that bandwidth (i.e., the information carrying

capacity of communications lines) on the Internet has increased tremendously and costs have dropped. It is widely believed that the Internet has played a significant role in the economic success.

Development of the Internet and the World Wide Web:

The recent growth of the Internet and the World Wide Web makes it appear that the world is witnessing the arrival of a completely new technology. In fact, the Web—now considered to be a major driver of the way society accesses and views information—is the result of numerous projects in computer networking, mostly funded by the federal government, carried out over the last 40 years. The projects produced communications protocols that define the format of network messages, prototype networks, and application programs such as browsers. This research capitalized on the ubiquity of the nation's telephone network, which provided the underlying physical infrastructure upon which the Internet was built

This history is divided into four distinct periods. Before 1970, individual researchers developed the underlying technologies, including queuing theory, packet switching, and routing. During the 1970s, experimental networks, notably the ARPANET, were constructed. These networks were primarily research tools, not service providers. Most were federally funded, because, with a few exceptions, industry had not yet realized the potential of the technology. During the 1980s, networks were widely deployed, initially to support scientific research. As their potential to improve personal communications and collaboration became apparent, additional academic disciplines and industry began to use the technology. In this era, the National Science Foundation (NSF) was the major supporter of networking, primarily through the NSFNET, which evolved into the Internet. Most recently, in the early 1990s, the invention of the Web made it much easier for users to publish and access information, thereby setting off the rapid growth of the Internet.

In the mid-1980s, for example, hundreds of thousands of workers at IBM were using electronic networks (such as the VNET) for worldwide e-mail and file transfers; banks were performing electronic funds transfer; CompuServe had a worldwide network; Digital Equipment Corporation (DEC) had value-added networking services; and a VNET-based academic network known as BITNET had been established. These were proprietary systems that, for the most part, owed little to academic research, and indeed were to a large extent invisible to the academic computer networking community. By the late 1980s, IBM's proprietary SNA data networking business unit already had several billions of dollars of annual revenue for networking hardware, software, and services. The success of such networks in many ways limited the interest of companies like IBM and CompuServe in the Internet. The success of the Internet can therefore, in many ways, be seen as the success of an open system and open architecture in the face of proprietary competition.

ARPANET - the First Network

ARPANET – Advanced Research Projects Agency Network :

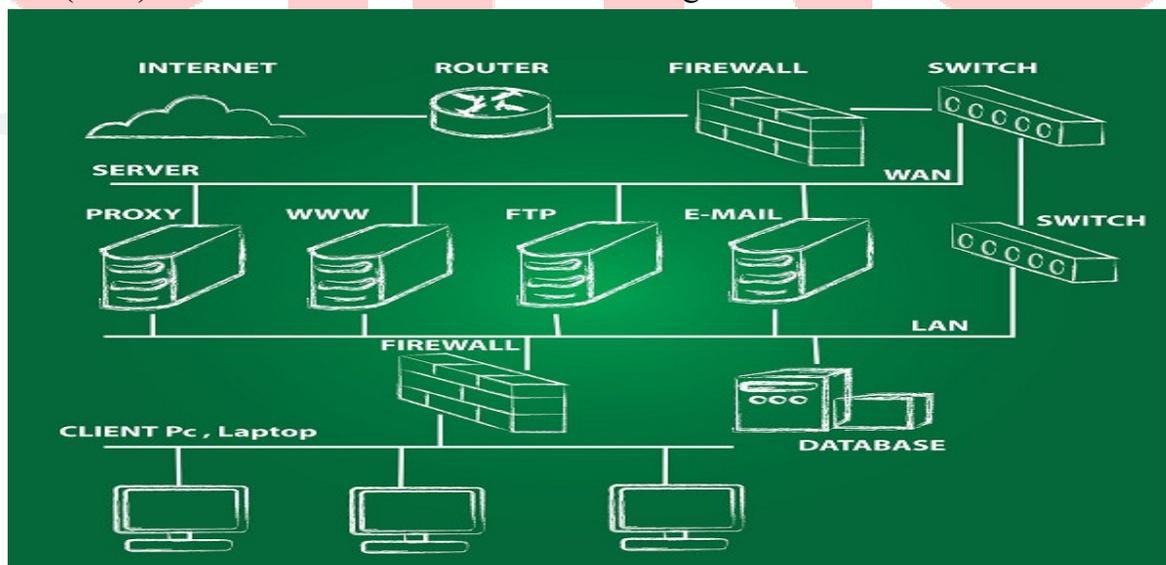
The granddad of Internet was a network established by the US Department of Defense (DOD). The work for establishing the network started in the early 1960s and DOD sponsored major research work, which resulted in development on initial protocols, languages and frameworks for network communication.

It had four nodes at University of California at Los Angeles (UCLA), Stanford Research Institute (SRI), University of California at Santa Barbara (UCSB) and University of Utah. On October 29, 1969, the first message was exchanged between UCLA and SRI. E-mail was created by Roy Tomlinson in 1972 at Bolt Beranek and Newman, Inc. (BBN) after UCLA was connected to BBN.

Internet

ARPANET expanded to connect DOD with those universities of the US that were carrying out defense-related research. It covered most of the major universities across the country. The concept of networking got a boost when University College of London (UK) and Royal Radar Network (Norway) connected to the ARPANET and a network of networks was formed.

The term Internet was coined by Vinton Cerf, Yogen Dalal and Carl Sunshine of Stanford University to describe this network of networks. Together they also developed protocols to facilitate information exchange over the Internet. Transmission Control Protocol (TCP) still forms the backbone of networking.



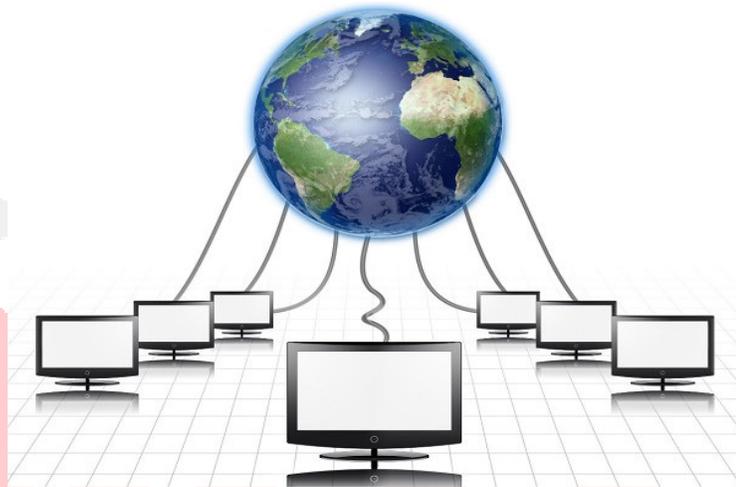
Telenet:

Telenet was the first commercial adaptation of ARPANET introduced in 1974. With this the concept of Internet Service Provider (ISP) was also introduced. The main

function of an ISP is to provide uninterrupted Internet connection to its customers at affordable rates.

World Wide Web

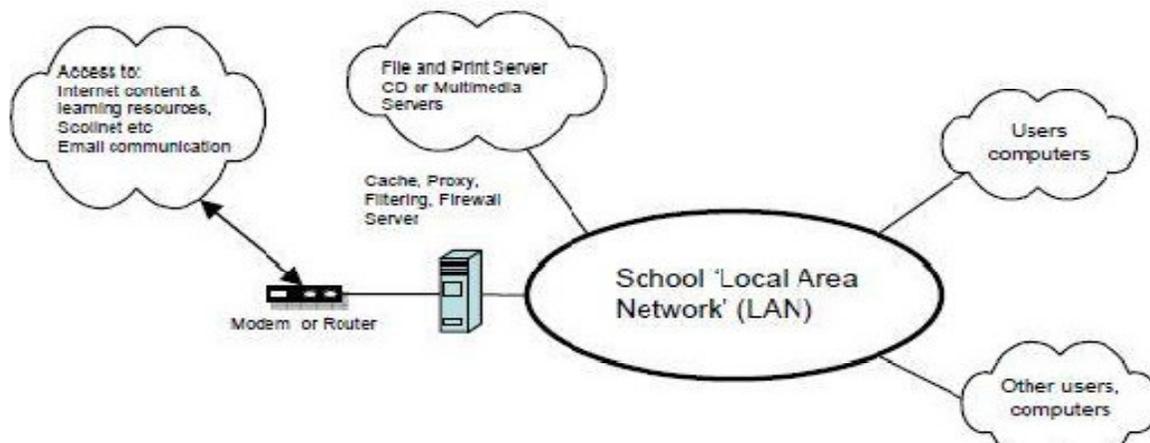
With commercialization of internet, more and more networks were developed in different part of the world. Each network used different protocols for communicating over the network. This prevented different networks from connecting together seamlessly. In the 1980s, Tim Berners-Lee led a group of Computer scientists at CERN, Switzerland, to create a seamless network of varied networks, called the World Wide Web (WWW).



World Wide Web is a complex web of websites and web pages connected together through hypertexts. Hypertext is a word or group of words linking to another web page of the same or different website. When the hypertext is clicked, another web page opens

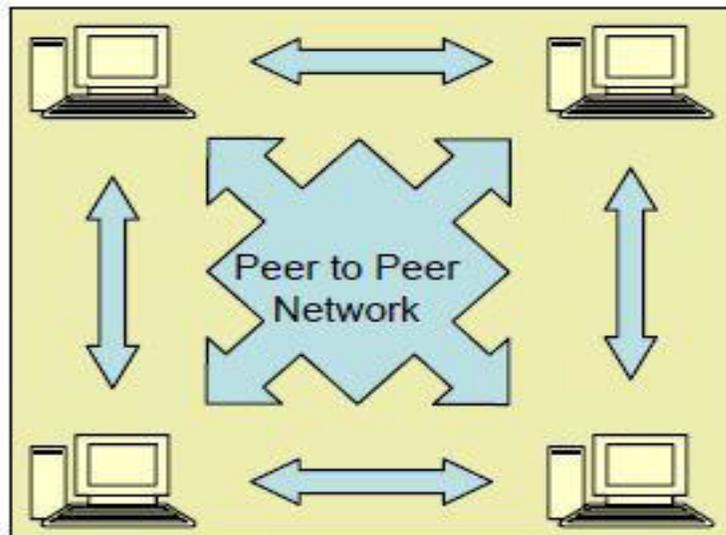
Define Network :

A network is a set of devices connected by physical media links. A network is recursively is a connection of two or more nodes by a physical link or two or more networks connected by one or more nodes. A computer network consists of a collection of computers, printers and other equipment that is connected together so that they can communicate with each other.



Peer-to-peer networks:

Peer-to-peer networks are more commonly implemented where less than ten computers are involved and where strict security is not necessary. All computers have the same status, hence the term 'peer', and they communicate with each other on an equal footing. Files, such as word processing or spreadsheet documents, can be shared across the network and all the computers on the network can share devices, such as printers or scanners, which are connected to any one computer



Client/server networks are more suitable for larger networks. A central computer, or 'server', acts as the storage location for files and applications shared on the network. Usually the server is a higher than average performance computer. The server also controls the network access of the other computers which are referred to as the 'client' computers. Typically, teachers and students in a school will use the client computers for their work and only the network administrator (usually a designated staff member) will have access rights to the server.

