**The History of the Internet: How Internet was born:** Computer science was an emerging discipline in the late 1950s that began to consider time-sharing between computer users, and later, the possibility of achieving this over wider area networks.

**The lack of direct communication between computers:**

The concept of data communication – transmitting data between two different places through an electromagnetic medium such as radio or an electric wire – pre-dates the introduction of the first computers. Such communication systems were typically limited to point to point communication between two end devices. It did not allow for direct communication between any two arbitrary systems; a physical link was necessary. The technology was also considered vulnerable for strategic and military use because there were no alternative paths for the communication in case of a broken link.

In October 1962, **Licklider** was hired by Jack Ruina as director of the newly established Information Processing Techniques Office (IPTO) within DARPA, with a mandate to interconnect the United States Department of Defense's main computers at Cheyenne Mountain, the Pentagon, and SAC HQ. There he formed an informal group within DARPA to further computer research.

It was his vision of universal networking that helped Robert Taylor, to initiate the ARPANET development.

**Packet switching**

In the 1960s, Paul Baran of the RAND Corporation produced a study of survivable networks for the U.S. military in the event of nuclear war. Information transmitted across Baran's network would be divided into what he called "**message blocks**". Independently, Donald Davies proposed and put into practice a local area network based on what he called **packet switching**, the term that would ultimately be adopted.

Packet switching is a rapid store and forward networking design that divides messages up into arbitrary packets, with routing decisions made per-packet. It provides better bandwidth utilization and response times than the traditional circuit-switching technology used for telephony, particularly on resource-limited interconnection links.

**ARPANET**

Robert Taylor was promoted to the head of the Information Processing Techniques Office (IPTO) at Defense Advanced Research Projects Agency (DARPA) in 1966. He intended to realize Lickliter’s ideas of an interconnected networking system.

As part of the IPTO's role, three network terminals had been installed: one for System Development Corporation in Santa Monica, one for Project Genie at University of California, Berkeley, and one for the Compatible Time-Sharing System project at Massachusetts Institute of Technology (MIT). Taylor's identified need for networking became obvious from the waste of resources apparent to him.

For each of these three terminals, he had three different sets of user commands. So if he was talking online with someone at S.D.C. and wanted to talk to someone he knew at Berkeley or M.I.T. about this, he had to get up from the S.D.C. terminal, go over and log into the other terminal and get in touch with them. He believed there ought to be one terminal that goes anywhere you want to go where you have interactive computing. That idea is the ARPAnet.

He initiated a project to build such a network. Roberts and Thomas Merrill had been researching computer time-sharing over wide area networks. Wide area networks (WANs) emerged during the 1950s and became established during the 1960s. Roberts presented a proposal for the "ARPA net", based on Wesley Clark's proposal for using Interface Message Processors to create a message switching network.

ARPA awarded the contract to build the network to Bolt Beranek & Newman, and the first ARPANET link was established between the University of California, Los Angeles (UCLA) and the Stanford Research Institute at 22:30 hours on October 29, 1969.

**A revolution had begun"** ....

The software for establishing links between network sites in the ARPANET was the Network Control Program (NCP).

ARPANET became the technical core of what would become the Internet, and a primary tool in developing the technologies used.

**TCP/IP**

First Internet demonstration, linking the ARPANET to other networks: Yogen Dalal proposed separating TCP's routing and transmission control functions into two discrete layers, which led to the splitting of the Transmission Control Program into the Transmission Control Protocol (TCP) and the IP protocol (IP) in version 3 in 1978. Originally referred to as IP/TCP, version 4 was described in IETF publication RFC 791 (September 1981), 792 and 793. It was installed on SATNET in 1982 and the ARPANET in January 1983 after the DoD made it standard for all military computer networking. This resulted in a networking model that became known informally as TCP/IP. It was also referred to as the ARPANET model.

**NSFNET**

The networks based on the ARPANET were government funded and therefore restricted to noncommercial uses such as research; unrelated commercial use was strictly forbidden. During the 1980s, the connections expanded to more educational institutions, and even to a growing number of companies such as Digital Equipment Corporation and Hewlett-Packard, which were participating in research projects or providing services to those who were.In the mid-1980s, all three of these branches developed the first Wide Area Networks based on TCP/IP. NASA developed the NASA Science Network, NSF developed CSNET and DOE evolved the Energy Sciences Network or ESNet.

**Transition towards the Internet**

The term "internet" was reflected in the first RFC published on the TCP protocol (RFC 675:[90] Internet Transmission Control Program, December 1974) as a short form of internetworking, when the two terms were used interchangeably. In general, an internet was a collection of networks linked by a common protocol. In the time period when the ARPANET was connected to the newly formed NSFNET project in the late 1980s, the term was used as the name of the network, Internet, being the large and global TCP/IP network.

As interest in networking grew by needs of collaboration, exchange of data, and access of remote computing resources, the TCP/IP technologies spread throughout the rest of the world.

Many sites unable to link directly to the Internet created simple gateways for the transfer of electronic mail, the most important application of the time. Sites with only intermittent connections used UUCP or FidoNet and relied on the gateways between these networks and the Internet. Some gateway services went beyond simple mail peering, such as allowing access to File Transfer Protocol (FTP) sites via UUCP or mail.[92]

**World Wide Web and introduction of browsers**

Tim Berners-Lee is credited with inventing the World Wide Web in 1989 and developing in 1990 both the first web server, and the first web browser, called WorldWideWeb (no spaces) and later renamed Nexus. Many others were soon developed, with Marc Andreessen's 1993 Mosaic (later Netscape), being particularly easy to use and install.

Other major web browsers have been Internet Explorer, Firefox, Google Chrome, Microsoft Edge, Opera and Safari.

**The Internet Society**

**The Internet Society (ISOC) is an international, nonprofit organization founded during 1992 "to assure the open development, evolution and use of the Internet for the benefit of all people throughout the world".**

**Email and Usenet**

E-mail has often been called the killer application of the Internet. It predates the Internet and was a crucial tool in creating it. Email started in 1965 as a way for multiple users of a time-sharing mainframe computer to communicate.

The ARPANET computer network made a large contribution to the evolution of electronic mail. Email could be passed this way between a number of networks, including ARPANET, BITNET and NSFNET, as well as to hosts connected directly to other sites via UUCP. See the history of SMTP protocol.