EJERCICIO Nº 7

Computer network

A **computer network** is a set of computers sharing resources located on or provided by network nodes. The computers use common communication protocols over digital interconnections to communicate with each other. These interconnections are made up of telecommunication network technologies, based on physically wired, optical, and wireless radio-frequency methods that may be arranged in a variety of network topologies.

The nodes of a computer network may include personal computers, servers, networking hardware, or other specialised or general-purpose hosts. They are identified by network addresses, and may have hostnames. Hostnames serve as memorable labels for the nodes, rarely changed after initial assignment. Network addresses serve for locating and identifying the nodes by communication protocols such as the Internet Protocol.

Computer networks may be classified by many criteria, including the transmission medium used to carry signals, bandwidth, communications protocols to organize network traffic, the network size, the topology, traffic control mechanism, and organizational intent.

Computer networks support many applications and services, such as access to the World Wide Web, digital video, digital audio, shared use of application and storage servers, printers, and fax machines, and use of email and instant messaging applications.

History

Computer networking may be considered a branch of computer science, computer engineering, and telecommunications, since it relies on the theoretical and practical application of the related disciplines. Computer networking was influenced by a wide array of technology developments and historical milestones.

- In the late 1950s, a network of computers was built for the U.S. military Semi-Automatic Ground Environment (SAGE) radar system using the Bell 101 modem. It was the first commercial modem for computers, released by AT&T Corporation in 1958. The modem allowed digital data to be transmitted over regular unconditioned telephone lines at a speed of 110 bits per second (bit/s).
- In 1959, Christopher Strachey filed a patent application for time-sharing and John McCarthy initiated the first project to implement time-sharing of user programs at MIT. Stratchey passed the concept on to J. C. R. Licklider at the inaugural UNESCO Information Processing Conference in Paris that year. McCarthy was instrumental in the creation of three of the earliest time-sharing systems (Compatible Time-Sharing System in 1961, BBN Time-Sharing System in 1962, and Dartmouth Time Sharing System in 1963).

- In 1959, Anatoly Kitov proposed to the Central Committee of the Communist Party of the Soviet Union a detailed plan for the re-organisation of the control of the Soviet armed forces and of the Soviet economy on the basis of a network of computing centres. Kitov's proposal was rejected, as later was the 1962 OGAS economy management network project.
- In 1960, the commercial airline reservation system semi-automatic business research environment (SABRE) went online with two connected mainframes.
- In 1963, J. C. R. Licklider sent a memorandum to office colleagues discussing the concept of the "Intergalactic Computer Network", a computer network intended to allow general communications among computer users.
- Throughout the 1960s, Paul Baran and Donald Davies independently developed the concept of packet switching to transfer information between computers over a network. Davies pioneered the implementation of the concept. The NPL network, a local area network at the National Physical Laboratory (United Kingdom) used a line speed of 768 kbit/s and later high-speed T1 links (1.544 Mbit/s line rate).
- In 1965, Western Electric introduced the first widely used telephone switch that implemented computer control in the switching fabric.
- In 1969, the first four nodes of the ARPANET were connected using 50 kbit/s circuits between the University of California at Los Angeles, the Stanford Research Institute, the University of California at Santa Barbara, and the University of Utah. In the early 1970s, Leonard Kleinrock carried out mathematical work to model the performance of packet-switched networks, which underpinned the development of the ARPANET. His theoretical work on hierarchical routing in the late 1970s with student Farouk Kamoun remains critical to the operation of the Internet today.
- In 1972, commercial services were first deployed on public data networks in Europe, which began using X.25 in the late 1970s and spread across the globe. The underlying infrastructure was used for expanding TCP/IP networks in the 1980s.
- In 1973, the French CYCLADES network was the first to make the hosts responsible for the reliable delivery of data, rather than this being a centralized service of the network itself.
- In 1973, Robert Metcalfe wrote a formal memo at Xerox PARC describing Ethernet, a networking system that was based on the Aloha network, developed in the 1960s by Norman Abramson and colleagues at the University of Hawaii. In July 1976, Robert Metcalfe and David Boggs published their paper "Ethernet: Distributed Packet Switching for Local Computer Networks" and collaborated on several patents received in 1977 and 1978.
- In 1974, Vint Cerf, Yogen Dalal, and Carl Sunshine published the Transmission Control Protocol (TCP) specification, RFC 675, coining the term Internet as a shorthand for internetworking. In 1976, John Murphy of Datapoint Corporation created ARCNET, a token-passing network first used to share storage devices.
- In 1977, the first long-distance fiber network was deployed by GTE in Long Beach, California.

- In 1977, Xerox Network Systems (XNS) was developed by Robert Metcalfe and Yogen Dalal at Xerox. In 1979, Robert Metcalfe pursued making Ethernet an open standard.[25]
- In 1980, Ethernet was upgraded from the original 2.94 Mbit/s protocol to the 10 Mbit/s protocol, which was developed by Ron Crane, Bob Garner, Roy Ogus, and Yogen Dalal.
- In 1995, the transmission speed capacity for Ethernet increased from 10 Mbit/s to 100 Mbit/s. By 1998, Ethernet supported transmission speeds of 1 Gbit/s. Subsequently, higher speeds of up to 400 Gbit/s were added (as of 2018). The scaling of Ethernet has been a contributing factor to its continued use.