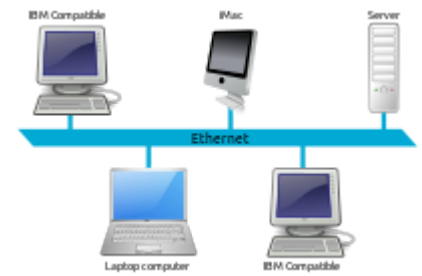


Local area network

A **local area network** (**LAN**) is a computer network that interconnects computers within a limited area such as a residence, school, laboratory, university campus or office building.^[1] By contrast, a wide area network (WAN) not only covers a larger geographic distance, but also generally involves leased telecommunication circuits

Ethernet and Wi-Fi are the two most common technologies in use for local area networks. Historical technologies include ARCNET, Token ring, and AppleTalk.



A conceptual diagram of a local area network.

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History

The increasing demand and use of computers in universities and research labs in the late 1960s generated the need to provide high-speed interconnections between computer systems. A 1970 report from the Lawrence Radiation Laboratory detailing the growth of their "Octopus" network gave a good indication of the situation.^{[2][3]}

A number of experimental and early commercial LAN technologies were developed in the 1970s. Cambridge Ring was developed at Cambridge University starting in 1974.^[4] Ethernet was developed at Xerox PARC between 1973 and 1974.^{[5][6]} ARCNET was developed by Datapoint Corporation in 1976 and announced in 1977.^[7] It had the first commercial installation in December 1977 at Chase Manhattan Bank in New York.^[8]

The development and proliferation of personal computers using the CP/M operating system in the late 1970s, and later DOS-based systems starting in 1981, meant that many sites grew to dozens or even hundreds of computers. The initial driving force for networking was generally to share storage and printers, which were both expensive at the time. There was much enthusiasm for the concept and for several years, from about 1983 onward, computer industry pundits would regularly declare the coming year to be, "The year of the LAN!"^{[9][10][11]}

In practice, the concept was marred by proliferation of incompatible physical layer and network protocol implementations, and a plethora of methods of sharing resources. Typically, each vendor would have its own type of network card, cabling, protocol, and network operating system. A solution appeared with the advent of Novell NetWare which provided even-handed support for dozens of competing card/cable types, and a much more sophisticated operating system than most of its competitors. Netware dominated^[12] the personal computer LAN business from early after its introduction in 1983 until the mid-1990s when Microsoft introduced Windows NT Advanced Server and Windows for Workgroups.

Of the competitors to NetWare, only Banyan Vines had comparable technical strengths, but Banyan never gained a secure base. Microsoft and 3Com worked together to create a simple network operating system which formed the base of 3Com's 3+Share, Microsoft's LAN Manager and IBM's LAN Server - but none of these was particularly successful.

In 1983, TCP/IP was first shown capable of supporting actual defense department applications on a Defense Communication Agency LAN test bed located at Reston, Virginia.^[13] ^[14]The TCP/IP-based LAN successfully supported Telnet, FTP, and a Defense Department Teleconferencing application.^[15] This demonstrated the feasibility of employing TCP/IP LANs to interconnect Worldwide Military Command and Control System ("WWMCCS") computers at command centers throughout the United States.^[16] However, WWMCCS was superseded by the Global Command and Control System(GCCS) before that could happen.

During the same period, Unix workstations were using TCP/IP networking. Although this market segment is now much reduced, the technologies developed in this area continue to be influential on the Internet and in both Linux and Apple Mac OS X networking—and the TCP/IP protocol has replaced IPX, AppleTalk, NBF, and other protocols used by the early PC LANs.

Cabling

Early LAN cabling had generally been based on various grades of coaxial cable. Shielded twisted pair was used in IBM's Token Ring LAN implementation, but in 1984, StarLAN showed the potential of simple unshielded twisted pair by using Cat3 cable—the same simple cable used for telephone systems. This led to the development of 10BASE-T (and its successors) and structured cabling which is still the basis of most commercial LANs today

While fiber-optic cabling is common for links between switches, use of fiber to the desktop is rare.^[17]

Wireless media

Many LANs use wireless technologies that are built into Smartphones, tablet computers and laptops. In a wireless local area network, users may move unrestricted in the coverage area. Wireless networks have become popular in residences and small businesses, because of their ease of installation. Guests are often offered Internet access via a hotspot service.

Technical aspects

Network topology describes the layout of interconnections between devices and network segments. At the data link layer and physical layer, a wide variety of LAN topologies have been used, including ring, bus, mesh and star. At the higher layers, NetBEUI, IPX/SPX, AppleTalk and others were once common, but the Internet Protocol Suite(TCP/IP) has prevailed as a standard of choice.

Simple LANs generally consist of cabling and one or more switches. A switch can be connected to a router, cable modem, or ADSL modem for Internet access. A LAN can include a wide variety of other network devices such as firewalls, load balancers, and network intrusion detection.^[18] Advanced LANs are characterized by their use of redundant links with switches using the spanning tree protocol to prevent loops, their ability to manage differing traffic types via quality of service (QoS), and to segregate traffic with VLANs.

LANs can maintain connections with other LANs via leased lines, leased services, or across the Internet using virtual private network technologies. Depending on how the connections are established and secured, and the distance involved, such linked LANs may also be classified as a metropolitan area network(MAN) or a wide area network(WAN).

See also

- LAN messenger
- LAN party
- Network interface controller

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External links

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