

Network

The local network's breakthrough came during the eighties, initially via centrally located mainframe or minicomputers with terminals connected in a star. The establishment of these networks also resulted in a need for reliable and secure data communication.

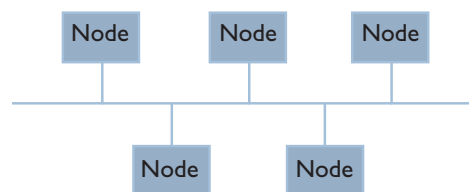
Transmission requires: A transmitter, a receiver, a medium, information and a protocol. The transmitter, receiver and media require a specification for the physical devices (how to connect to a network, etc). While the protocol manages the regulations for how the transfer is implemented, this is described in detail in a later section.

A local network can include data communication for offices as well as for industry, hospitals, mine operations or traffic surveillance. A powerful network and reliable communication is one of the basic elements in order for companies or organisations to develop through:

- ⌘ *Information being shared*, common databases can be used, e-mail and file sharing increases working efficiency yet further.
- ⌘ *Shared resources*, several users share valuable resources in the network such as colour printers or common software on a server.
- ⌘ *Security*, through access privileges to the network for individual users or groups of users access to individual applications can be controlled. And in doing so increasing the efficiency of administration on a central level.

Nodes are regularly mentioned when speaking about networks, a node is for example a computer, a printer or communication equipment. As there are many different types of nodes with a broad number of functions, it is extremely important that there are regulations for how these should communicate.

In the same way as we humans need to speak the same language to understand each other, equipment in the network must speak the same language. This is regulated via a protocol, which determines how communication is to take place, what may be said, by whom, when and how. These protocols must be harmonised so that all suppliers observe the same regulations. Standards can be developed by individual companies (de-facto standards) or by official decision-making bodies such as ISO, ANSI or IEEE.



The quality of a network depends, among others on:

- ⌘ Speed, which in turn depends on the number of simultaneous users, media, hardware and software.
- ⌘ How the transmission takes place, whether it reaches the right receiver and only the right receiver.
- ⌘ The quality of the data, minimization of communication disturbances.
- ⌘ Speed of the network.
- ⌘ Reliability, how well the network is protected against transients, earth currents and other phenomenon that can disturb communications.
- ⌘ Security – How secure is the network against attack and viruses.

The need to be able to link different local networks has constantly increased, so that data can be transferred between companies or within a company, nationally or internationally. How do the different computer systems and databases in a company communicate when they are spread across the world? The options are numerous:

- ⌘ LAN (**L**ocal **A**rea **N**etwok) fast network for local communication, for example, Ethernet.
- ⌘ MAN (**M**etropolitan **A**rea **N**etwork) fast network that covers a greater geographical area.
- ⌘ WAN (**W**ide **A**rea **N**etwork) a network with a very large geographical distribution, it may be a country or even the whole world.
- ⌘ VAN (**V**alue **A**dded **N**etwork) is a network that offers more developed services than just data communication.
- ⌘ GAN (**G**lobal **A**rea **N**etwork) is a network consisting of several local networks that can be interconnected via MAN and fast WAN.
- ⌘ AAN (**A**ll **A**rea **N**etwork) a network that can be used in both local and more geographically widespread networks.