

The concept of networks

What is a network?

The generic term "**network**" refers to a group of entities (objects, people, etc.) which are connected to one another. A network, therefore, allows material or immaterial elements to be circulated among all of these entities, based on well-defined rules.

- **network**: A group of computers and peripheral devices connected to each other. Note that the smallest possible network is two computers connected together.
- **networking**: Implementing tools and tasks for linking computers so that they can share resources over the network.

Depending on what kind of entity is involved, the term used will differ:

- **transportation network**: A combination of infrastructure and vehicles used for transporting people and goods between different geographic areas.
- **telephone network**: Infrastructure for transporting voice signals from one telephone station to another.
- **neural network**: A group of brain cells connected to each other
- **criminal network**: A group of con artists in cahoots (wherever there's one con artist, there's usually another!)
- **computer network**: A group of computers linked to each other with physical lines, exchanging information as digital data (binary values, i.e. values encoded as a signal which may represent either 0 or 1)

The articles you're now reading, obviously, deal with computer networks.

There isn't just one kind of network, as there have historically been different kinds of computers, which communicate using various different languages. The need for multiple types of networks also arises from the heterogeneity of the physical transmission media that link them together, whether that means the data is transferred the same way (such as by electrical pulses, light beams, or electromagnetic waves) or uses the same kind of physical medium (such as coaxial cable, twisted pairs, or fibre-optic lines).

Each chapter describes the characteristics of physical transmission media, as well as the way data travels over the network.

How the networking chapters are organized

The networking section of commentcamarche is divided into several chapters:

- The chapter Introduction to networking describes what a network is and the different types of networks that exist

- The chapter Data transmission is about how each data is transmitted in each type of medium
- The chapter Network equipment describes the different kinds of equipment that are used to connect computers to one another
- The chapter Protocols explains how information is sent (logically speaking) over networks, and in particular over the Internet
- The chapter Technologies lays out the different physical means that can be used to send information

In the section **Practical information**, the chapter **Getting the most from the Internet** gives information for learning to use the Internet!

Why networks are important

A computer is a machine used to manipulate data. Humans, being communicative creatures, quickly understood why it would be useful to link computers to each other in order to exchange information.

A computer network can serve several distinct purposes:

- Sharing resources (files, applications or hardware, an Internet connection, etc.)
- Communication between people (email, live discussions, etc.)
- Communication between processes (such as between industrial computers)
- Guaranteeing full access to information for a specified group of people (networked databases)
- Multiplayer video games

Networks are also used for standardizing applications. The term groupware is generally used to refer to tools that let multiple people work over a network. For example, email and group scheduling can be used to communicate more quickly and efficiently. Here's a glimpse of the advantages that such systems have:

- Lower costs, due to sharing data and peripherals,
- Standardizing applications,
- Providing timely access to data,
- More efficient communication and organization.

Today, with the Internet, networks have become more unified. It is clear, then, that there are several reasons to install a network, whether for a business or an individual.

Similarities between types of networks

The different types of networks generally have the following points in common:

- **Servers:** computers which provided shared resources to users, by means of a network server.
- **Clients:** computers which access the shared resources provided by a network server.
- **Connection medium:** how the computers are linked together.
- **Shared data:** Files that can be accessed on the network servers
- **Printers and other shared peripherals:** files, printers, or other elements employed by the network's users
- **Miscellaneous resources:** other resources provided by the server

Types of networks

There are usually said to be two types of networks:

- Peer-to-peer networks
- Networks organized around servers (Client/Server)

These two types of networks have different capabilities. Which type of network to install depends on the following criteria:

- Size of the business
- Level of security required
- Type of activity
- Skills of the administrators available
- Volume of traffic over the network
- Needs of the network's users
- Budget set aside for operating the network (not just purchasing it, but also upkeep and maintenance)

Source: <http://en.kioskea.net/contents/261-the-concept-of-networks>