Creating a local area network

Why set up a local area network?

When you have several computers, it can be convenient to connect them to each other to create a local area network (LAN). Setting up such a network costs very little, contrary to what people may think.

Here are a few advantages you could enjoy by setting up a local area network:

- File transfers;
- Sharing of resources (internet connection sharing, printer sharing, shared disks, etc.);
- Mobility (in the case of a wireless network);
- Discussion (mainly when the computers are remote);
- Network games.

The two types of local area networks

There are two main types of local network architecture:

- Wired networks, based on the Ethernet technology, which represent almost all local area networks. Given that Ethernet networks generally use RJ45cables, people often talk of RJ45 networks;
- Wireless networks, which generally use the WiFi technology.

Necessary hardware

To create an **RJ45** local area network in Windows, you will need:

- Several computers running Windows (computers running two different versions of Windows can be part of the same network);
- **Ethernet** cards on a PCI or ISA port (with an RJ45 plug) or built into the motherboard. When applicable, make sure the diodes on the back of the network card light up when the computer is on and that a cable is plugged in! There are also network adapters for USB ports, particularly in the case of wireless network adapters;
- **RJ45** cables in the case of wired networks;
- A hub, a device you can connect the RJ45 cables from the network's various computers to, which are fairly inexpensive (expect to pay around â,¬50), or aswitch, or, as an alternative option, a crossover cable if you want to connect just two computers.

Network architecture

To create an **RJ45** local area network, it is recommended that you adopt a so-called "star" structure, where the computers are each connected to the hub via an RJ45 cable. A hub is a device that transfers data from one computer to another. The choice of hub will be made in function of the number of connected computers in order to have enough plugs (called "ports") on the hub.

In the event of a large network or a network with substantial bandwidth requirements, a switch will favorably replace the hub, as it makes it possible to distribute packets only to the computers concerned, whereas a hub systematically sends packets to all connected computers.
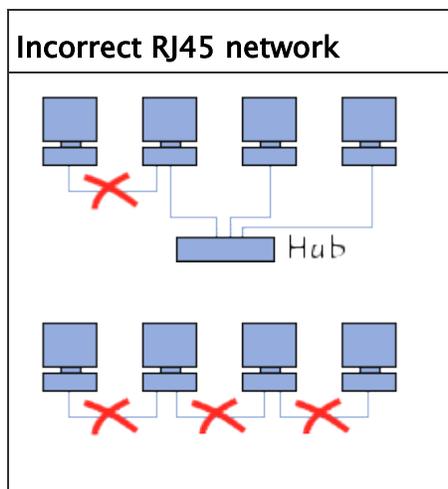
The structure of such a network looks like this:
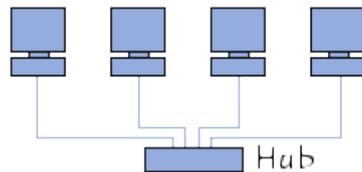
If you want to connect two computers only, it is possible to avoid using a hub, by directly connecting the two computers with a crossover RJ45 cable.

Architectures to avoid

The following network structures will not work, even if they appear to be correct at first, unless the computers have several network interfaces (several cards) and the cables used between two computers are crossover cables:

Incorrect RJ45 network