

# What is a Network?



## Introduction

A computer network is a collection of computers, printers and other equipment, which are connected together so that they can communicate with each other. Special cables usually link the computers together, although wireless networks — which use radio waves as the mode of communication — are becoming increasingly common.

A computer network that spans a relatively small area is known as a LAN or local area network. All of the devices connected together to create this network may be located within a single room, spread out over several classrooms or spread out over several buildings. Most of the networks implemented in schools are local area networks.

## Why Install a Network?

The time and energy required to plan the installation of a school network undoubtedly bears fruit in terms of the subsequent benefits afforded to the school. Apart from the being an infrastructural 'backbone' from which advanced ICT integration can extend, there are several practical advantages to having a networked environment, some of which are outlined below.

### Sharing Files

If some basic networking rules are in place, information that is stored on any device attached to the network can be accessed by any of the users of the network. Text documents, images, sound files and even video clips can be shared among users in this way.

Software can also be shared across the network. This may lead to a reduction in the time needed to maintain the software on each computer. However, it is of utmost importance that the terms of the software licence are not breached in any way.

### Sharing Devices

Sharing a device across a computer network makes maximum use of that device as it is available for use by all the users on the network. A whole range of devices can be connected to a network and shared, including:

Printers	DVD drives	Zip drives
Scanners	Hard disks	Tape drives (or other storage devices)
Plotters	Floppy disks	Modems
CD-ROM drives	Certain fax machines	ISDN lines

A printer is usually one of the first devices to be shared across a network. To make such sharing initiatives as cost-effective as possible, the following considerations should be borne in mind:

- As all users can print directly to a printer, only a small number of strategically located printers are required
- Reducing the number of printers produces a cost saving, which may be translated into purchasing higher quality, more powerful printers or printers with extra features
- With fewer printers, maintenance costs are lower
- With fewer printers, the time spent on maintenance is reduced

Sharing printers across a network undoubtedly makes practical and economic sense. The same is also true for other devices. In fact, schools should only consider purchasing certain ICT equipment if a network is in place. For example, relatively expensive items such as a colour laser printer or a plotter (for producing charts) should be accessible to all users so that they can be used regularly and effectively.

**Administration and Security**

If the network in place has a server, i.e., a central computer, and the appropriate software or network operating system, various levels of security can be implemented across the network. This means that the network administrator, i.e., the person in charge of the network, can set up security features such as:

- Granting access to sensitive documents only to those users who require access
- Providing various groups/classes with access to specific software only
- Restricting user access to certain times during the day
- Recording patterns of usage
- Providing a central backup of all user data
- Controlling when the Internet is available and to what groups or classes

The administration of the computer network involves, among other things, updating software on the computers, managing user information and accounts, and controlling network security. These functions can be performed from any location on the network.

**Possible Educational Uses**

The following are some of the more common educational uses for a school network:

- Students and staff can print to any printer on the network.
- All work can be saved to the network fileserver and is available to students, irrespective of the computer they are using.
- Students can actively engage in collaborative project work.
- Teachers can develop resources that can be stored on the fileserver, shared with other staff and used by students from any location on the network.
- Internet access can be distributed to all computers, rather than just the one with the modem, and usage can be monitored centrally.
- Scanned images (from a scanner connected to the network) can be saved and accessed from other computers on the network. This allows the school to build up a central repository of images for use by students in their projects.
- Centralised administration systems can be set up for writing reports and tracking the academic progress of students.
- An intranet can be established enabling students and staff to make their work available to the whole school community. See Advice Sheet 25 for more information on intranets.

**Other Considerations**

Network requirements need to be prioritised and the implementation of a network needs to be planned in a co-ordinated way so as to enhance the teaching and learning environment. The financial cost of the network installation is not the primary consideration when deciding what kind of network to install. Questions like, 'What will the network be used for?' and 'Who is going to administer the network?' will have a large bearing on the kind of network that should be implemented. As a general rule, the bigger the network the greater the need for security and the more time will be needed to administer the network.

Some schools have found a gradual move to networking has suited them best. They started with a number of stand-alone machines, which they later networked in a peer-to-peer network (see Advice Sheet 18). This enabled them to get to grips with the fundamentals of networking without the considerable learning curve associated with client/server administration. Then, as more computers were added to various locations around the school, they moved to a client/server solution with a server operating system running on the server and more familiar operating systems on the client computers, as this better suited their needs. Eventually, they moved to a full network operating system on the client computers as they found that this gave them a more robust network.

## Related Web Sites

NCTE Web site Networking Guidelines:

[www.ncte.ie/SchoolNetworking](http://www.ncte.ie/SchoolNetworking)

This web site provides a range of essential and suitable information and advice to schools on all aspects of school networking.

PC Technology Guide

[www.pctechguide.com/63Networking.htm](http://www.pctechguide.com/63Networking.htm)

A useful introduction to the technologies and protocols used in networking.

*Note: While the advice sheets aim to act as a guide, the inclusion of any products and company names does not imply approval by the NCTE, nor does the exclusion imply the reverse. The NCTE does not accept responsibility for any opinions, advice or recommendations on external web sites linked to the NCTE site.*

This Advice Sheet and other relevant information are available at:

[www.ncte.ie/ICTAdviceSupport/AdviceSheets/](http://www.ncte.ie/ICTAdviceSupport/AdviceSheets/)