

Computer Network Components

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WHAT'S COVERED

Having a basic understanding of networks and networking concepts can provide you with the tools to be able to differentiate between the various types of networks. Regardless of the type of network you are trying to connect to, you will need to have the proper combination of hardware and software in order to make full use of a computer network. In this tutorial, we will take a closer look at network hardware and software.

Our discussion will break down as follows:

[1. Network Hardware](#)

[2. Network Software](#)

1. Network Hardware

A computer network can be either wired or wireless. A **wired network** is one that uses physical cables and connection boxes to connect devices to the network. **Ethernet** is the standard interface for all wired networks. A **wireless network** uses radio frequency signals to transmit data. Each device on a wireless network is required to have its own antenna to receive signals. **Wireless Fidelity (Wi-Fi)** is the standard interface technology for wireless networks.

Every device on a computer network is required to have a **network adapter**. The network adapter translates instructions from the operating system into information that can be transmitted over the network. It also manages the incoming and outgoing network request. A network adapter can be either wired or wireless. It is either built onto the computer's motherboard or connected as a peripheral device, such as a USB connected device.

A network must have a point at which all devices can connect. On a wired network, a switch or router functions in this capacity. A switch is a network connection box that manages traffic on devices that are plugged into it. A **router** is a switch that is able to route local network requests out to other networks, such as the Internet. On a wireless network, the point at which all devices can connect is called a **wireless access point (WAP)**. Sometimes there are situations in which two or more LANs, or devices on a LAN, have to be connected. In this situation, a

network bridge is required. A bridge is a device that gives two or more LAN networks the ability to connect to one another without the use of protocol. By avoiding the use of protocol, a bridge can pass information between networks and devices on a LAN network without the need to route the information.

Listed below are common network hardware and the function of each.

Network Hardware	Function
Network Adapter	Translates instructions from the operating system into data that can be sent over a network
Switch	A network connection box that all the cables for the computers on a network connect to
Router	An upper tier switch that can connect and route network local network traffic as well as traffic from outside networks such as the Internet
Wireless Access Point (WAP)	A wireless network connection box that enables computers on a network to connect wirelessly
Ethernet	The standard interface for all wired networks
Wireless Fidelity (Wi-Fi)	Standard interface technology for wireless networks
Bridge	A network device that connects two networks together



Learn more about the common network hardware below.



Wired Network

Network that uses physical cables and connection boxes to connect devices.

Ethernet

The standard interface for all wired networks.

Wireless Network

Network that uses radio frequency signals to transmit data.

Wireless Fidelity (Wi-Fi)

The standard interface technology for wireless networks.

Network Adapter

Translates instructions from the operating system into data that can be sent over a network.

Router

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Wireless Access Point (WAP)

Wireless network connection box that enables computers on a network to connect wirelessly.

2. Network Software

On a broad level, network software refers to software used to manage and monitor computer networks. Network administrators use network software to facilitate communication between computers, and to give access to shared files and programs to the computers in the network. Recall that computers and devices on a network use various protocols to facilitate communication between them. The most common protocol utilized today is the Transmission Control Protocol/Internet Protocol (TCP/IP). This is a type of networking software, because it provides a way for various computers to communicate with one another, specifically via the Internet.

Other types of network software allow computers within the network to share files, applications, or programs. Network software is not the same as software applications, such as a computer's operating system or word processing and spreadsheet software. Rather, network software is a "behind the scenes" set of software that allows network administrators to understand how the computer network functions. Network software also provides administrators with tools to control and manage how the computers in the network are connected.

Like many aspects of computer technology, the architecture of networks is changing and evolving. **Software-defined networking (SDN)** makes it easier to innovate and adapt the network to quickly meeting changing network demands.

The basic functionality of network software includes:

Network Software Provides	Description of Function
User Management	Enables administrators to add or remove users from the network
File Management	Allows administrators to define the location of data storage and user access to that data



TERM TO KNOW

Software-Defined Networking (SDN)

Computer networking concept that separates the software from the hardware, making it easier to innovate and adapt the network to quickly meet changing network demands.



SUMMARY

Computer networks play a critical role in the overall functionality of today's computer. Users expect to have access to information on demand and computer networks aid in the routing and delivery of information to computer users. In this tutorial, we discussed the **hardware** components of a computer

network and how these components rely on **network software** to ensure that the computer network will function appropriately.

Source: Derived from Chapter 5 of “Information Systems for Business and Beyond” by David T. Bourgeois. Some sections removed for brevity.

<https://www.saylor.org/site/textbooks/Information%20Systems%20for%20Business%20and%20Beyond/Textbook.html>



TERMS TO KNOW

Ethernet

The standard interface for all wired networks.

Network Adapter

Translates instructions from the operating system into data that can be sent over a network.

Network Software Application

Software used to manage and monitor networks of all sizes; helps administrators deploy, manage and monitor a network.

Router

An upper tier switch that can connect and route network local network traffic as well as traffic from outside networks such as the Internet.

Software-Defined Networking (SDN)

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