

Computer Network Types

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WHAT'S COVERED

Computer networks provide users, businesses, and organizations with the ability to share information and resources such as hardware and software. When resources such as these are shared, users are able to increase their capabilities by multiplying and adding capacity. Because computers are deployed in many different situations, various types of computer networks have been developed. These networks have been developed in order to satisfy the needs of computer users who require a network, depending on the situation the user and computer are in. In this tutorial, we will discuss the various types of networks and the situations in which each network type is most appropriate.

Our discussion will break down as follows:

1. Types of Computer Networks

Computers are able to be networked with other computers in the same office building, neighborhood, or with computers in other countries. One way to describe a computer network is based on the physical proximity of the network's devices in relation to each other. A **local area network or LAN** is a network in which the devices connected are located in a relatively small local area, such as a residential home. A subcategory of LAN is a personal area network (PAN). A **personal area network (PAN)** describes a small network in which personal devices such as a cell phone and a tablet PC are sharing data in a very close range (i.e. the same room). Listed below are the common types of computer networks.

TERMS TO KNOW

Personal Area Network (PAN)

A smaller local network in which personal devices are in close range with one another.

Local Area Network (LAN)

Computer network that links computers within a building.

Metropolitan Area Network (MAN)

A network within a large confined area such as a college campus, or company within an urban or suburban area.

Wide Area Network (WAN)

A computer network with all of the equipment spread over a large geographic; is typically inclusive of many small networks or LANs.

2. Internet, Intranet, and Extranet

As information technology has advanced, people have been afforded the ability to access information in a variety of ways at virtually any time needed. The modes by which people can access and share information has also diversified. One of the main ways in which people access information today is via the **Internet**. The Internet is a global network of smaller networks connecting devices using Transmission Control Protocol/Internet Protocol (TCP/IP). Recall that TCP/IP is what governs transmission on the Internet and on most Windows networks.

However, just as organizations set up websites to provide global access to information about their business, they also set up internal web pages to provide information about the organization to the employees. This internal set of web pages is called an **intranet**. An intranet is a private network that can only be accessed by users with special permission. It is typically set up in a private company or organization. Web pages on the intranet are not accessible to those outside the company; in fact, those pages would come up as "not found" if an employee tried to access them from outside the company's network.

Sometimes an organization wants to be able to collaborate with its customers or suppliers while at the same time maintaining the security of being inside its own network. In cases like this, a company may want to create an **extranet**. An extranet is a LAN that can be accessed by users with special access rights outside of a business or organization. The extranet, which is a part of the company's network, can be made available securely to those outside of the company. Extranets can be used to allow customers to log in and check the status of their orders, or for suppliers to check their customers' inventory levels.



Scope of computer networks for business

TERM TO KNOW

Internet

Global network of smaller networks linking devices through TCP/IP.

Intranet

Private network that can only be accessed by users with special permission and is typically set up in a private company or organization.

Extranet

A LAN that can be accessed by users with special access rights outside of a business or organization.

3. Wireless Networking

Today we are used to being able to access the Internet wherever we go. Our smartphones can access the Internet; even Starbucks provides wireless "hotspots" for our laptops or iPads. These wireless technologies

have made Internet access more convenient, and they have made devices such as tablets and laptops much more functional. Let's examine a few of these wireless technologies.

- Wi-Fi: Wi-Fi, short for wireless-fidelity, is a technology that takes an Internet signal and converts it into radio waves. These radio waves can be picked up within a radius of approximately 65 feet by devices with a wireless adapter. One of the primary places where Wi-Fi is being used is in the home. Home users are purchasing Wi-Fi routers, connecting them to their broadband connections, and then connecting multiple devices via Wi-Fi. Wi-Fi can be used to set up a PAN or LAN.
- Mobile Network: As the cellphone has evolved into the smartphone, the desire for Internet access on these devices has led to data networks being included as part of the mobile phone network. While Internet connections were technically available earlier, it was really with the release of the 3G networks in 2001 (2002 in the US) that smartphones and other cellular devices could access data from the Internet. This new capability drove the market for new and more powerful smartphones, such as the iPhone, introduced in 2007. In 2011, wireless carriers began offering 4G data speeds, giving the cellular networks the same speeds that customers were used to getting via their home connection.
- Bluetooth: Although Bluetooth is not generally used to connect a device to the Internet, it is an important wireless technology that has enabled many functionalities that are used every day. When created it was intended to replace wired connections between devices. Today, it is the standard method for connecting nearby devices wirelessly. Bluetooth has a range of approximately 300 feet and consumes very little power. Some applications of Bluetooth include: connecting a printer to a personal computer, connecting a mobile phone and headset, connecting a wireless keyboard and mouse to a computer, and connecting a remote for a presentation made on a personal computer.
- Near Field Communication: Near-field communication (NFC) is a set of communication protocols that enables two electronic devices, one of which is usually a portable device such as a smartphone, to establish communication by bringing them within four centimeters (1.6 inches) of each other. NFC devices are used in contactless payment systems, similar to those used in credit cards and electronic ticket smart cards. These devices allow mobile payment to replace/supplement these systems. NFC is used for social networking, and for sharing contacts, photos, videos or files. NFC-enabled devices can act as electronicidentity documents and key cards. NFC offers a low-speed connection with a simple setup that can be used to bootstrap more capable wireless connections.

TERMS TO KNOW

Wireless Fidelity (Wi-Fi)

The standard interface technology for wireless networks.

Near-Field Communication (NFC)

Set communication protocols that enable two electronic devices, one of which is usually a portable device such as a smartphone.

Bluetooth

Transmission standard that provides the protocol for mobile devices, computers, or smartphones to connect in order to communicate.

4. Appropriate Network Use Cases

Computer networks have made information readily available to users with devices that can connect to them.

As a computer user, you may find that, while your computer is able to connect to a network, the network you are connected to will enable you to share or access resources (information, hardware, software, etc.) depending on the type of network you are connected to. Below is a table listing the various types of computer networks and some example scenarios of how they can be used.

Network Type	Typical Use	Example Scenario
Personal Area Network (PAN)	Sharing data between personal devices in close range, such as a tablet PC and mobile phone, gaming console and a tablet PC, etc.	In a coffee shop with no wireless network, users can utilize their mobile phone network to provide Internet service to a computer or tablet
Local Area Network (LAN)	Sharing data between network devices in a small local area such as an entire home or group of homes	In a company office, users can connect to a company-owned LAN to share data and hardware such as a network printer, or to access company email messages
Metropolitan Area Network (MAN)	Sharing data and resources in a large but confined area, such as a college campus or large company	In a hotel, guests may connect to the hotel's network while at the hotel, or across the street at a restaurant close to the hotel
Wide Area Network (WAN)	Sharing data and resources over a very large geographic area, such as across states and countries	You need to access email; you need to share a file with your friend in another country; the Internet

🗇 SUMMARY

Computer networks are a valuable tool, used by people within business situations and outside of business situations, to share information and resources. There are multiple types of computer networks each with their own advantages for users, depending on the situation the user is in. Knowing what the various network types—**internet**, **intranet**, and **extranet**—are and how they work will only enhance your experience while **using a networked computer**.

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

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Extranet

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