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|  | **Computer networking** **Is the study of** [**engineering**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Engineering) **discipline concerned with communication between** [**computer systems**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Computer_system) **or** [**devices**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Peripheral_device)**.** * **Networking, routers, routing protocols, and networking over the public** [**Internet**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Internet) **have their specifications defined in documents called** [**RFCs**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/RFC) **or "Request for Comments"**
* **Computer networking is sometimes considered a sub-discipline of** [**telecommunications**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Telecommunications)**,** [**computer science**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Computer_science)**,** [**information technology**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Information_technology) **and/or** [**computer engineering**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Computer_engineering)
* **Computer networks rely heavily upon the theoretical and practical application of these scientific and engineering disciplines.**

**A computer network is any set of computers or devices connected to each other with the ability to exchange data.** **Types of Networks****Examples of networks are:*** [**Local Area Network**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Local_area_network) **(LAN), which is usually a small network constrained to a small geographic area.**
* [**Wide Area Network**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Wide_area_network) **(WAN) that is usually a larger network that covers a large geographic area.**
* [**Wireless LANs and WANs**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Wireless_network) **(WLAN & WWAN) is the wireless equivalent of the LAN and WAN**

**All networks are interconnected to allow communication with a variety of different kinds of media, which including** [**twisted-pair**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Twisted_pair) **copper wire cable,** [**coaxial cable**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Coaxial_cable)**,** [**optical fiber**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Fiber-optic_communication)**, and various wireless technologies.** * **The devices can be separated by a few meters (e.g. via** [**Bluetooth**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Bluetooth)**) or nearly unlimited distances (e.g. via the interconnections of the** [**Internet**](https://web.archive.org/web/20080719163637/http%3A/en.wikipedia.org/wiki/Internet)**)**
	+ **Most LANs connect together multiple devices so that users can use, for example, one printer or one set of applications instead of having an individual printer or application on each personal computer.**
	+ **LANs are capable of transmitting data at very fast rates, much faster than data can be transmitted over a telephone line; but the distances are limited, and there is also a limit on the number of computers that can be attached to a single LAN.**
* **The most common wiring technology for a LAN is Ethernet, although wireless technologies are evolving.**
* **3 types of Ethernet to consider:**
	+ **Standard Ethernet - 10Base-T. Operates at 10Mbps on Unshielded Twisted Pair (UTP) Cable. Suitable for small files.**
	+ **Fast Ethernet - 100Base-T. The most common type of Ethernet network. Supports a maximum transfer rate of 100Mbps and perfect for moving large files such as multimedia documents.**
	+ **Gigabit Ethernet - Scaleable and perfect for video files.**

**Benefits*** **Information can be easily shared allowing for quick and informed decisions to be made, saving time and money.**
	+ **A more productive and competitive environment is achieved through greater teamwork within the organization.**
* **Network-based communication such as email is considerably cheaper than using the phone or fax and sharing resources such as printers gives more efficient use of equipment at lower costs.**
	+ **Standard versions of procedures and directories can be made accessible to everyone.**
* **IT administration can be centralized.**
	+ **Data can be backed-up from a single point on a scheduled basis ensuring consistency.**
* **Everyone is working from real-time shared information and so reducing the risk of error**

**WAN Network** * **A Wide Area Network is a data communications network that spans a relatively large geographic area eg linking LANs between buildings, cities or countries.**
* **WANs make use of public networks, such as the Internet, phone lines or dedicated communication lines and may be privately owned or rented.**
* **WAN technologies generally function at the lower three layers of the OSI reference model: physical, data link and network layers.**
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