**Protocol:**

In information technology, a protocol is the special set of rules that end points in a telecommunication connection use when they communicate. Protocols specify interactions between the communicating entities.

Or

In [telecommunications](https://en.wikipedia.org/wiki/Telecommunications), a **communications protocol** is a system of rules that allow two or more entities of a [communications system](https://en.wikipedia.org/wiki/Communications_system) to transmit [information](https://en.wikipedia.org/wiki/Information) via any kind of variation of a [physical quantity](https://en.wikipedia.org/wiki/Physical_quantity). These are the rules or standard that defines the [syntax](https://en.wikipedia.org/wiki/Syntax), [semantics](https://en.wikipedia.org/wiki/Semantic) and [synchronization](https://en.wikipedia.org/wiki/Synchronization) of [communication](https://en.wikipedia.org/wiki/Communication) and possible [error recovery methods](https://en.wikipedia.org/wiki/Error_detection_and_correction). Protocols may be implemented by [hardware](https://en.wikipedia.org/wiki/Computer_hardware), [software](https://en.wikipedia.org/wiki/Software), or a combination of both.[[1]](https://en.wikipedia.org/wiki/Communications_protocol#cite_note-1)

Communicating systems use well-defined formats ([protocol](https://en.wiktionary.org/wiki/protocol)) for exchanging messages. Each message has an exact meaning intended to elicit a response from a range of possible responses pre-determined for that particular situation. The specified behavior is typically independent of how it is to be [implemented](https://en.wikipedia.org/wiki/Implementation). Communications protocols have to be agreed upon by the parties involved.[[2]](https://en.wikipedia.org/wiki/Communications_protocol#cite_note-2) To reach agreement, a protocol may be developed into a [technical standard](https://en.wikipedia.org/wiki/Technical_standard). A [programming language](https://en.wikipedia.org/wiki/Programming_language) describes the same for computations, so there is a close analogy between protocols and programming languages: *protocols are to communications as programming languages are to computations*.[[3]](https://en.wikipedia.org/wiki/Communications_protocol#cite_note-AnalogyII-3)

The **TCP/IP Internet** protocols, a common example, consist of: **Transmission Control Protocol** (**TCP**), which uses a set of rules to exchange messages with other **Internet** points at the information packet level. **Internet Protocol** (**IP**), which uses a set of rules to send and receive messages at the **Internet** address level.

Sometimes referred to as an access method, a **protocol** is a standard used to define a method of exchanging data over a computer network such as [local area network](http://www.computerhope.com/jargon/l/lan.htm), [Internet](http://www.computerhope.com/jargon/i/internet.htm), [Intranet](http://www.computerhope.com/jargon/i/intranet.htm), etc. Each protocol has its own method of how data is formatted when sent and what to do with it once received, how that data is compressed or how to check for errors in data.

One of the most common and known protocols is [HTTP](http://www.computerhope.com/jargon/h/http.htm) (HyperText Transfer Protocol), which is a protocol used to transmit data over the world wide web (Internet).

**Bandwidth:**

In computing, **bandwidth** is the [bit-rate](https://en.wikipedia.org/wiki/Bit-rate) of available or consumed information capacity expressed typically in metric multiples of bits per second. Variously, bandwidth may be characterized as **network bandwidth**,[[1]](https://en.wikipedia.org/wiki/Bandwidth_%28computing%29" \l "cite_note-1) **data bandwidth**,[[2]](https://en.wikipedia.org/wiki/Bandwidth_%28computing%29#cite_note-2) or **digital bandwidth**.[[3]](https://en.wikipedia.org/wiki/Bandwidth_%28computing%29#cite_note-3)[[4]](https://en.wikipedia.org/wiki/Bandwidth_%28computing%29#cite_note-4)

Variously, **bandwidth** may be characterized as network **bandwidth**, data **bandwidth**, or digital **bandwidth**.

Or

In computer networks, bandwidth is used as a synonym for [data transfer rate](http://searchunifiedcommunications.techtarget.com/definition/data-transfer-rate), the amount of data that can be carried from one point to another in a given time period (usually a second). Network bandwidth is usually expressed in [bits](http://whatis.techtarget.com/definition/bit-binary-digit) per second ([bps](http://searchnetworking.techtarget.com/definition/bits-per-second)); modern networks typically have speeds measured in the millions of bits per second (megabits per second, or Mbps) or billions of bits per second (gigabits per second, or Gbps).

**data transfer rate (DTR)**

The data transfer rate (DTR) is the amount of [digital](http://searchcio-midmarket.techtarget.com/definition/digital) [data](http://searchdatamanagement.techtarget.com/definition/data) that is moved from one place to another in a given time. The data transfer rate can be viewed as the speed of travel of a given amount of data from one place to another. In general, the greater the [bandwidth](http://searchenterprisewan.techtarget.com/definition/bandwidth) of a given path, the higher the data transfer rate.

In telecommunications, data transfer is usually measured in bits per second. For example, a typical low-speed connection to the Internet may be 33.6 [kilobit](http://searchcio-midmarket.techtarget.com/definition/kilobit)s per second (Kbps). On [Ethernet](http://searchnetworking.techtarget.com/definition/Ethernet) local area networks, data transfer can be as fast as 10 [megabit](http://searchcio-midmarket.techtarget.com/definition/megabit)s per second.

Internet Protocol:

The Internet Protocol (IP) is the method or protocol by which data is sent from one computer to another on the Internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet.

**Routing** is the process of selecting best paths in a network. In the past, the term routing also meant forwarding network traffic among networks. However, that latter function is better described as [forwarding](https://en.wikipedia.org/wiki/Packet_forwarding). Routing is performed for many kinds of networks, including the [telephone network](https://en.wikipedia.org/wiki/PSTN) ([circuit switching](https://en.wikipedia.org/wiki/Circuit_switching)), [electronic data networks](https://en.wikipedia.org/wiki/Computer_network) (such as the [Internet](https://en.wikipedia.org/wiki/Internet)), and [transportation networks](https://en.wikipedia.org/wiki/Transport_network). This article is concerned primarily with routing in electronic data networks using [packet switching](https://en.wikipedia.org/wiki/Packet_switching) technology.