

ITechword Reference Service:

Information Technology word and connotation

Bandwidth definition

There are three frequently used definitions of bandwidth in the context of Information Technology (IT) and general business.

In computer networks, bandwidth is used as a synonym for 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 per second (bps); 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).

Note that bandwidth is not the only factor that affects network performance: There is also packet loss, latency and jitter, all of which degrade network throughput and make a link perform like one with lower bandwidth. A network path usually consists of a succession of links, each with its own bandwidth, so the end-to-end bandwidth is limited to the bandwidth of the low speed link (the bottleneck).

Different applications require different bandwidths. An instant messaging conversation might take less than 1,000 bits per second (bps); a voice over IP (VoIP) conversation requires 56 kilobits per second (Kbps) to sound smooth and clear. Standard definition video (480p) works at 1 megabit per second (Mbps), but HD video (720p) wants around 4 Mbps, and HDX (1080p), more than 7 Mbps.

Effective bandwidth -- the highest reliable transmission rate a path can provide -- is measured with a bandwidth test. This rate can be determined by repeatedly measuring the time required for a specific file to leave its point of origin and successfully download at its destination.

2) Bandwidth is the range of frequencies -- the difference between the highest-frequency signal component and the lowest-frequency signal component -- an electronic signal uses on a given transmission medium. Like the frequency of a signal, bandwidth is measured in hertz (cycles per second). This is the original meaning of bandwidth, although it is now used primarily in discussions about cellular networks and the spectrum of frequencies that operators license from various governments for use in mobile services.

3) In business, bandwidth is sometimes used as a synonym for capacity or ability. In this sense, bandwidth usually refers to having time or staffing available to tackle something, e.g. "We just don't have the bandwidth to take on mobile app development, we're already short-staffed on developers."

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