



## Download speeds - Explanation and conversion tables

Download speeds are very deceiving. We speak of bandwidth in "Bits Per Second", but file sizes are read in "Bytes". A "Byte" is 8 "Bits". So, if you are downloading a 1 MegaByte file (1 MB) this chart will show you the approximate time to download the file, and the approximate download speed in K-Bytes per second.

Other factors can affect the speed of your data transfer. For example, overhead in the transport protocol can take up to 30% of the available bandwidth. Another factor to consider are the bottlenecks found at concentration points and the processing capacity of the server you are attached to. A good example of a bottleneck would be a DSL Access Multiplexer (DSLAM). This is the device that your DSL line connects to in the Central Office. There may be as many as 100 DSL lines served out of a single DSLAM. Each one of these DSL lines can download at a file at 1.544 Mbps. However, the system is engineered to share services, with the assumption that not everyone will try to use their DSL at the same time. The DSLAM may have a DS3 (equivalent to 28 T1's) connection to the Internet. This is plenty of speed if you are the only one using the DSL. But if all 100 subscribers try to download at the same time, then the bandwidth would be shared and everyone would get approximately 445 Kbps. This is about 1/3 of the speed that would be expected.

### File Sizes: measured in Bytes:

<u>File Size</u>	<u>Size in Bytes:</u>	<u>Size in Bits:</u>
1 KB	1,000	8,000
1 MB	1,000,000	8,000,000

### Bandwidth: measured in Bits Per Second (Kbps)

<u>Modem Speeds</u>	<u>Description</u>	<u>Actual Bps:</u>	<u>Download 1MB (seconds):</u>	<u>KB/sec</u>
28 Kbps	Modem	22,400	357	2.8
33 Kbps	Modem	26,400	303	3.3
56 Kbps	Modem	44,800	179	5.6

### Digital Channels

56 Kbps	DS0	56,000	143	7
64 Kbps	DS0	64,000	125	8
128 Kbps	ISDN	128,000	63	16
256 Kbps	F-T1	256,000	31	32
384 Kbps	F-T1	384,000	21	48
512 Kbps	F-T1	512,000	16	64
768 Kbps	F-T1	768,000	10	96
1.544 Mbps	T1	1,544,000	5	193
44.736 Mbps	T3	44,736,000	0.1788	5592

### LAN Speeds

10 Mbps	Ethernet	10,000,000	0.8000	1250
100 Mbps	Ethernet	100,000,000	0.0800	12500
1 Gbps	Ethernet	1,000,000,000	0.0080	125000
10 Gbps	Ethernet	10,000,000,000	0.0008	1250000