

Difference Between Megabyte, Megabit and Mebibyte

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Bottom line

Ever since the inception of computers, storage has played a big part in us choosing devices that are suitable for us. Storage options like 128 GB, 512 GB, 1 TB, and higher have become increasingly common.

Ever since the inception of computers, storage has played a big part in us choosing devices that are suitable for us. Storage options like 128 GB, 512 GB, 1 TB, and higher have become increasingly common. But all these are recent inventions. A few decades ago, many computer games used to fit into a 5 KB floppy. Now, it takes a graphically heavy game such as Red Dead Redemption 2 to a whopping 150 GB on your hard drive.

Since there are two types of memory: Read-Only Memory(ROM) and Random Access Memory(RAM), storage sizes apply to both. Computers needed only a few KB worth of memory to run intensive software a few decades ago. These days, it has slowly reached a point where computers need at least 8 GB of RAM to run Google Chrome properly. Some common RAM sizes are 8 GB, 16 GB, and 32 GB.

But all that's about gigabytes of storage. Let's go a little bit smaller and see the different memory sizes and units.

Various Data Storage Units

Data comes in various sizes and units. All data is stored in binary, that is, 0s and 1s. Here '0' means an off state and '1' means an on state. Here are a few of the main data storage units.

Bit (b)

The bit is the building block of all data. It is like an electron or a proton in an atom. Hence it is also the most basic unit in data storage and processing. The bit is a combination of 'binary' and 'unit' since one bit contains a 0 and a 1.

Byte (B)

When 8 of the above bits are grouped, you are presented with the Byte. This is the most commonly used data unit in computers and other devices, as one byte can store at most a single character. This is the foundation for the other major storage units.

Kilobyte (KB)

A kilobyte is a collection of 1000 bytes if we are going with the SI unit of kilo. But in the storage and memory allocation sense, a kilobyte is usually 1024 bytes. 4KB of memory and 32 KB of storage was enough for NASA's Apollo Mission in 1969. But that memory was a huge accomplishment four decades ago.

The International Electrotechnical Commission(IEC) has a different name for 1024 bytes, known as kibibyte, denoted as KiB. More on that later.

Megabyte (MB)

Similar to the kilobyte being 1000 bytes, a megabyte is 1000 kilobytes, according to SI units. For storage and memory, a megabyte is 1024 kilobytes. Most normal-size files have megabytes of storage. A 720p movie 2 hours in length does not typically exceed 1000 MB.

The IEC has also put forth a different name for 1024 kilobytes, known as mebibyte, denoted as MiB.

Gigabyte (GB)

A Gigabyte is a collection of 1000 megabytes, according to SI. But for us tech nerds, a gigabyte is a collection of 1024 megabytes. A typical RAM module contains GBs of data, while there are USB flash drives and lower-end hard drives that contain anywhere from 128 to 512 GB of storage, maybe more.

Most movies of 2 hours at 1080p or even 4K resolution come at around a few GB of storage.

Gibibyte is the name given by the IEC for a collection of 1024 megabytes, denoted as GiB.

Terabyte (TB)

A storage unit that has become common among normal users in the past decade, a terabyte is a collection of 1000 gigabytes (SI) or 1024 gigabytes in storage and memory terms. Many hard drives such as solid-state Drives(SSDs) and hard disk drives(HDDs) come with 1 TB or more storage. Given the size of the current software, games, and other data, a storage device with at least 1 TB has become a must.

The IEC has named the collection of 1024 gigabytes as tebibyte, denoted as TiB.

Now, let's look at another set of units when it is 1000 bits or 1024 bits and their exponents.

Kilobit (Kb)

A kilobit is a collection of 1000 bits. Kilobit and its subsequent exponents are used to express the rate of data transfer in digital communications with kilobits per second, commonly abbreviated as Kbps.

A movie can be choppy or smooth if its bitrate falters. As a rule of thumb, the higher the bitrates, the better the quality.

A kilobit is also equal to 125 bytes.

Megabit (Mb)

This is the most common data transfer unit. It is a collection of 1000 kilobits. Most internet speeds are denoted in megabits per second or Mbps. Rates of 150 Mbps for internet speeds are considered good for most users.

Data transfer between storage devices also most commonly uses Mbps. Most USB 2.0 devices can transfer data at a bitrate of up to 480 Mbps.

A megabit is equal to 125 kilobytes. Also, an internet connection requires at least 8 megabits per second speed to get 1 megabyte per second speed. So if you have a 150 Mbps internet connection, you will get around 18.75 MBps.

Gigabit (Gb)

A gigabit is a collection of 1000 megabits. Gigabits per second is a very high rate of transfer, only achievable by higher-end devices. It is denoted as Gbps. USB 3.0 devices can reach a maximum bitrate of 4.8 Gbps speeds, which is a whopping 10 times higher than USB 2.0 rates.

A gigabit is equal to 125 megabytes. Also, a gigabyte is equal to 8 times a gigabit.

So, What Is The Difference Between Megabyte, Megabit and Mebibyte?

Well, as stated earlier, a megabyte(MB) and mebibyte(MiB) are units of storage, while a megabit(Mb) is a unit of data transfer.

So a megabyte is always 1000 kilobytes, while a mebibyte will be 1024 kilobytes. Even though storage device manufacturers report their devices as having MBs of storage, many Operating Systems report them in MiBs, which shows that the storage in that device is less.

It is just megabytes converted to mebibytes with the equation 1 megabyte is equal to 0.95 mebibyte.

Similarly, 1 megabyte is 8 megabits, and 1 megabit is 0.119 mebibytes.

Conclusion

We hope you got to learn the difference between the various standards of storage and data transfer. This article was made in a detailed way so that you can learn a little more than just the basics.

So, store this in your memory, and until next time!