

WEEK 7(05.11.24) Listening Activity for Memory

In this unit you will learn the differences between computer and computer storage. Memory and storage are important concepts to master in Information Technology. The two terms are often used interchangeably, so it is important to understand the differences.

Computer memory needs to be quick. It is constantly feeding the CPU with data to process. Since nobody likes to wait for a computer, high-quality computers will have fast processors with lots of quick memory. This type of memory is commonly known as This type of memory is which means that the actual data disappears when the computer loses power.

Because memory needs to be much faster than storage, it is rather more expensive than storage per GB. A typical desktop computer today (in 2016) has between 2GB and 32GB of memory running at speeds of anywhere from 1.2 GHz to 3.2 Speeds tend to go up about 10% every two years.

If you are a gamer, video editor, or physics, you may be aware of **video memory**. Video memory is special RAM which is even faster and more expensive than normal system RAM. This RAM is reserved only for the graphics and is thus kept separate from the main system, which sits on the motherboard close to the CPU. A typical dedicated video card will have anywhere between 2GB and 12 of dedicated RAM.

But of course computers do not process all the data they have at once. They also need to save some data for long term use. This is where comes in. Think of all the video files, mp3s, photos, and documents on your PC. These files are not always being processed by the They are mostly just hanging around waiting to be used at some point. does not need to be as quick as memory, but there does need to be a lot more of it. And storage of course needs to be **non-.....**, meaning it will not get erased when you power off or restart your computer. These are the two key differences between memory and storage.... speed and volatility.

Storage today comes in many different types including **semiconductor storage**, **magnetic storage**, and **optical storage**. A typical today comes with anywhere between 128GB to 2TB of storage. Low end computers normally come with a magnetic **disk drive** which reads data at around 75 to 200 MB/sec. These devices use rotating, magnetically-charged platters to store Hard disk drives are still popular because they can store a lot of data with relatively quick access times very cheaply. Other examples of storage devices include the **tape drive** and **diskette**, both are which are obsolete. These dinosaurs of storage were painfully slow and prone to data loss with no warning. Ouch.

Another type of storage is network, typically referred to as a **SAN**. This storage is usually found in a datacentre. This type of storage goes by other names such as "cloud storage" or "network drive". It is of course highly limited by network speeds. If you are offline and need a file then you are out of luck. That is why it's always a good idea to get as much on your PC as you can afford.

In the future all magnetic storage types will become obsolete. They will soon all be by **SSDs** using semiconductor technology. SSDs have 3 key advantages over magnetic storage devices: speed, lack of moving parts, and low power consumption. This makes them ideal for laptops where battery life and durability are huge issues. SSDs are fast as well, and can read data at around 200MB to 800 MB per second. Unfortunately, SSDs are currently expensive magnetic storage per GB, but this should change soon.

..... storage is another technology which is quickly becoming legacy. Very popular in the 90's and early 2000's, optical storage works by a laser either burning or reading data off a plastic coated with various types of light sensitive materials. Due to reliability and speed limitations, optical storage is not used as a primary means of data storage. It is (or increasingly was) used mostly to affordably deliver large like movies, games, and systems. In case you still don't understand what optical storage is, typical examples are DVD or Blu-Ray drives.

Well, that about covers it for the current state of memory and storage. But there are some grey areas and as always, such as **ROMs** and **EPROMs**, which are somewhere in between memory and storage. Embedded systems, BIOS' and older video game used these for various reasons, mainly copy protection and cost.

What about the? Expect a gradual convergence where there is no longer a need for both storage and memory in PCs. Some new such as **quantum memory** may arrive which has the advantages of both memory and storage. Until that time arrives, always buy a with the most memory and storage you can afford. Computer companies typically charge you a lot more for PCs with a decent amount of and fast storage. Why? Because they know without it, your computer will be slow and completely full very quickly, forcing you to upgrade or buy into their cloud storage solutions like Apple's iCloud, and 's OneDrive.

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