





## Primary Memory

RAM	ROM	Virtual Memory	Cache
Random Access Memory	Read Only Memory	Part of Hard disk acting as RAM when RAM gets full	Very high access temporary memory found in or near CPU.
Can be edited	Cannot be edited	Can be edited	Can be edited
<b>Stores</b> <ul style="list-style-type: none"> <li>• Data in <b>current use</b></li> <li>• Applications in <b>current use</b></li> <li>• Part of an operating system</li> </ul>	Store BIOS (Basic Input output system)  Stores <b>instructions to start up</b> a computer system.	<b>Stores</b> Data in <b>current use</b> Applications in <b>current use</b>  Operating system moves least used data items from RAM to VM and move them back when needed. When data is swapped excessively it causes disk thrashing.  Use of VM slows down the computer as moving hard disk heads takes much longer than accessing data in RAM.	Stores <b>instructions fetched from RAM</b> to be used in the Fetch-decode-execute cycle of the CPU
Can be expanded (Increase in size)	Generally can't be expanded		Expandable
Volatile (Lose data when power switched off)	Non-Volatile	Volatile	Volatile

### Advantage of VM:

If your RAM is full, you do not need to close some program in use to make room for opening another program.

## Secondary Storage

Storage Technology (Examples)	Technology	Capacity	Advantages	Disadvantages
<p>Magnetic</p> <p>Hard Disk Drive (HDD)</p>  <p>Magnetic tape</p> 	<p>Disks coated with <b>magnetic</b> material.</p> <p>Discs spin and read-write heads move across the disks.</p> <p>Electro-magnets in the read-write heads read and write the data.</p>	1-2TB	<p>Low cost per gigabyte of storage – cheapest of the three technologies</p> <p>Huge storage capacity</p> <p>HDD has fast access to data</p> <p>Magnetic tape can hold its data for decades</p>	<p>Not as portable as other technologies</p> <p>Data can be lost near strong magnetic fields</p> <p>Hard disk has mechanical moving parts so it can wear out</p> <p>Magnetic tape is serial access so it can be slow to retrieve files</p>
<p>Optical</p>  <p>CD DVD BLU-RAY</p>	Light from <b>lasers</b> is used to read and write data	<p><u>CD 700MB</u></p> <p><u>DVD 4.7GB</u></p> <p><u>Blu-ray 128GB</u></p>	<p>Cheapest of three technologies.</p> <p>Easy to transport but can get scratched.</p>	<p>Easily scratched or broken</p> <p>Some optical disks cannot be overwritten – once written, they become read only</p> <p>Slow to write data to.</p>
<p>Solid state / flash</p> 	Data stored electrically.	<p>CD 4-32GB</p> <p>SDXC 2TB</p> <p>USB drive 256Gb to 1TB</p>	<p>Very portable because no moving parts</p> <p>Immune to magnetic fields</p> <p>Tough – not easily damaged</p> <p>Fast data access</p>	<p>Expensive Limited number of erase/write cycles (up to 100,000) so cannot be used indefinitely.</p>