BASIC COMPUTER USAGE

RAM
&
Hard Disk

EXPLORE

5 MIN

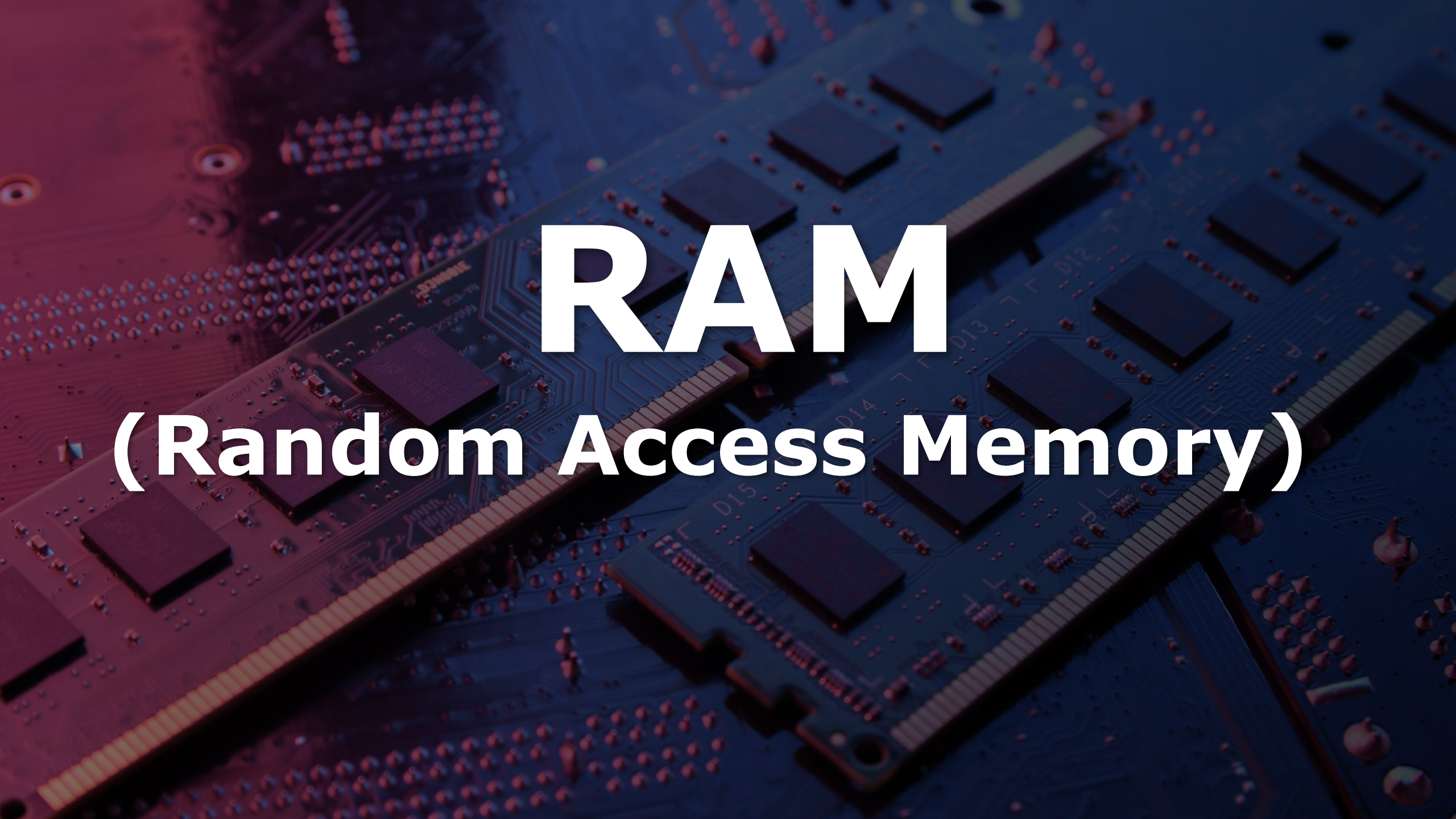
WHAT IS ...?

Permanent

Temporary

Storage

Processing


RAM
(Random Access Memory)

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RAM OVERVIEW

RAM (Random Access Memory), is the "**short-term memory**" of the computer.
RAM capacity measured in **GB**.

RAM is a **temporary** storage device. **More RAM** means **more capacity** to enhance system performance.

RAM is **volatile memory**, which means contents are erased when the computer is turned off.

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What does RAM do for computer?

Helps boot up your computer

Responsible for holding data while the applications is running

Provide the quickly access to data that CPU need for processing

More RAM allow you to access multiple programs at a time

Click me!

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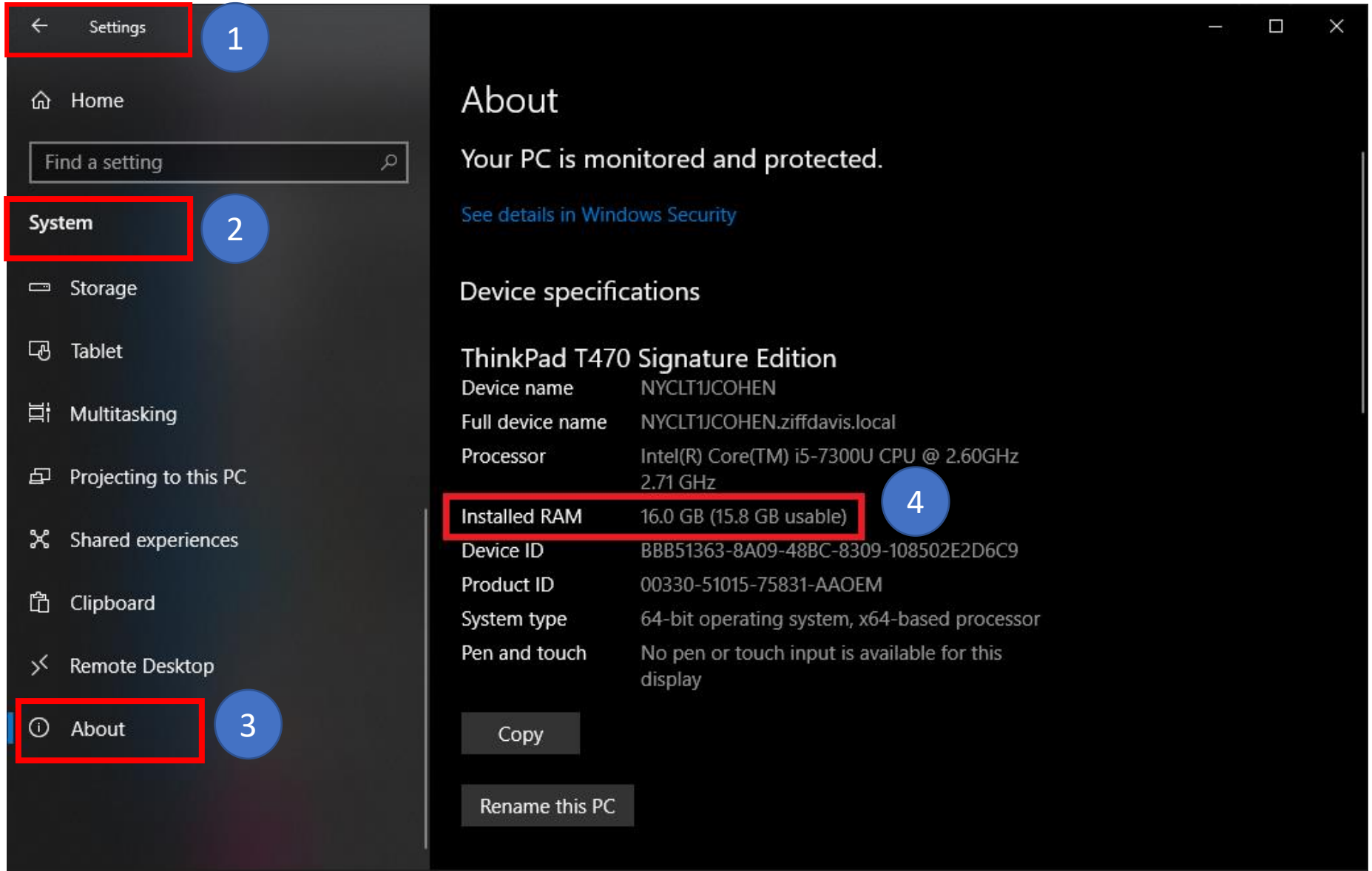
Finds out how much RAM you have



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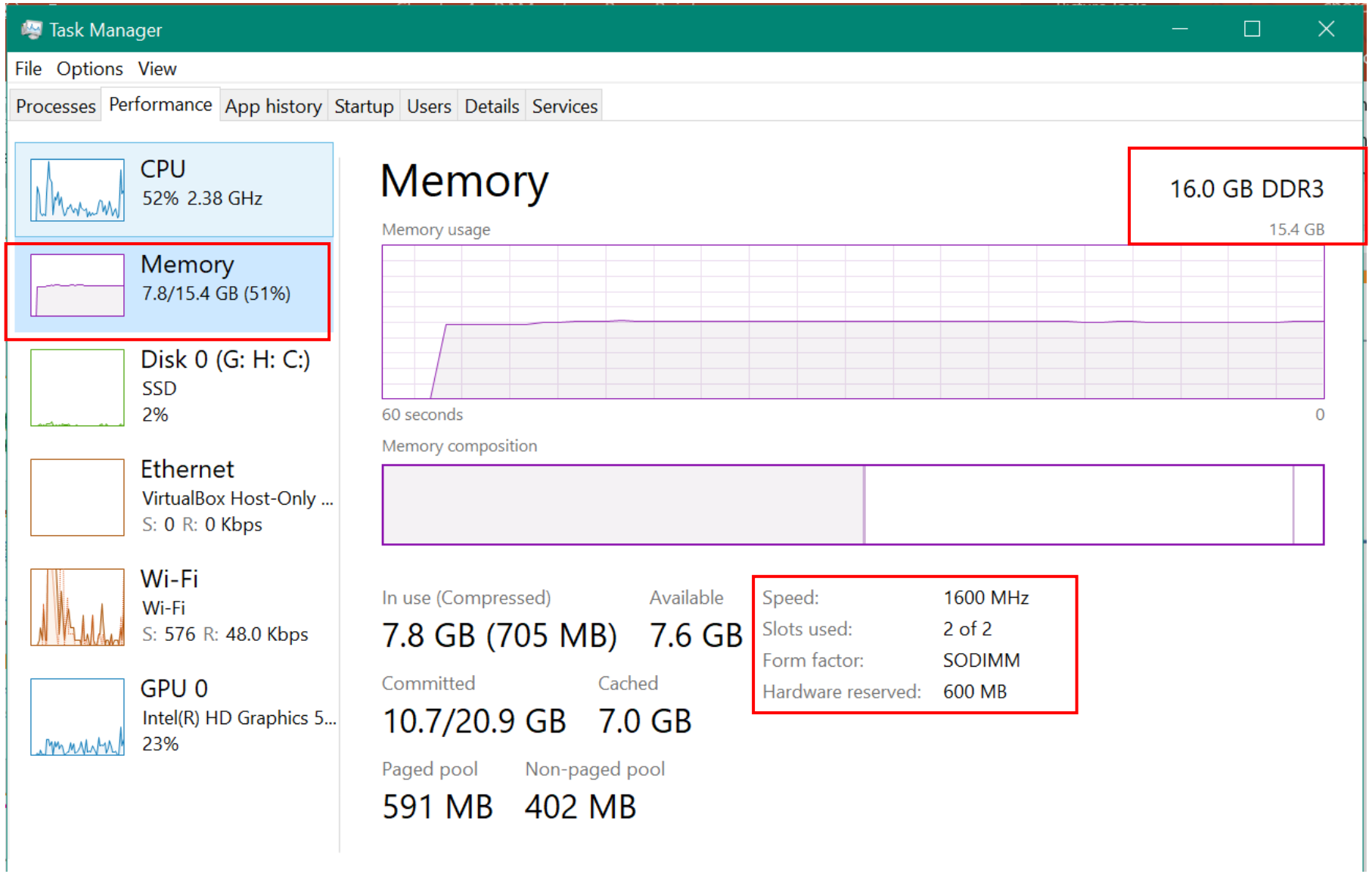
Finds out how much RAM you have

Task Manager

Right click on Taskbar
> Select Task manager



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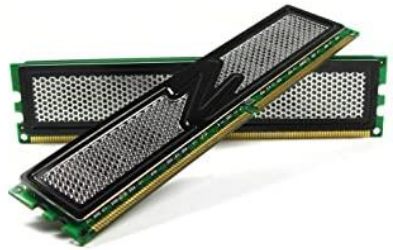
Top 10 Best RAM Manufacture



1. Corsair
2. G.Skill
3. Mushkin
4. Micron
5. Kingston
6. XTremeDDR
7. OCZ
8. Samsung
9. Transcend
10. Hynix

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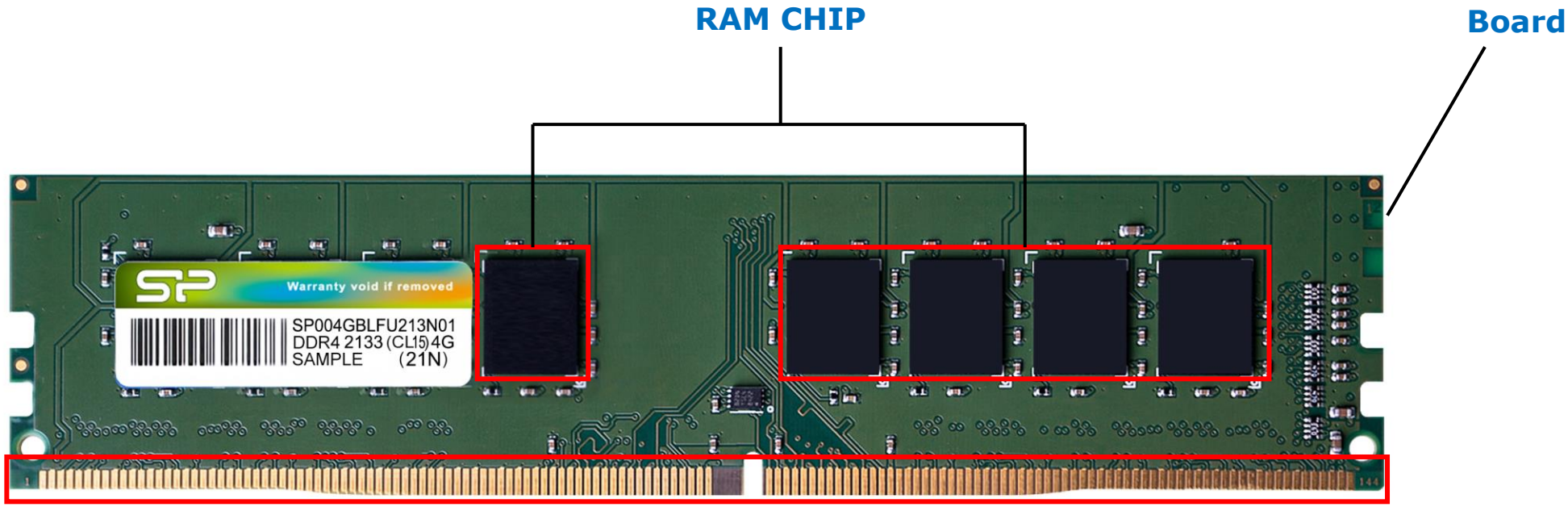
RAM Module consist of...



Note: **RAM Module** is a board that holds RAM chips used for easy installation and removal from motherboard.

Type of RAM Modules

The common architecture of memory module:

- **Desktop** use **DIMM** (Dual in-line memory module)
- **Laptop** use **SODIMM** (Small Outline DIMMs)

DIMM

SODIMM

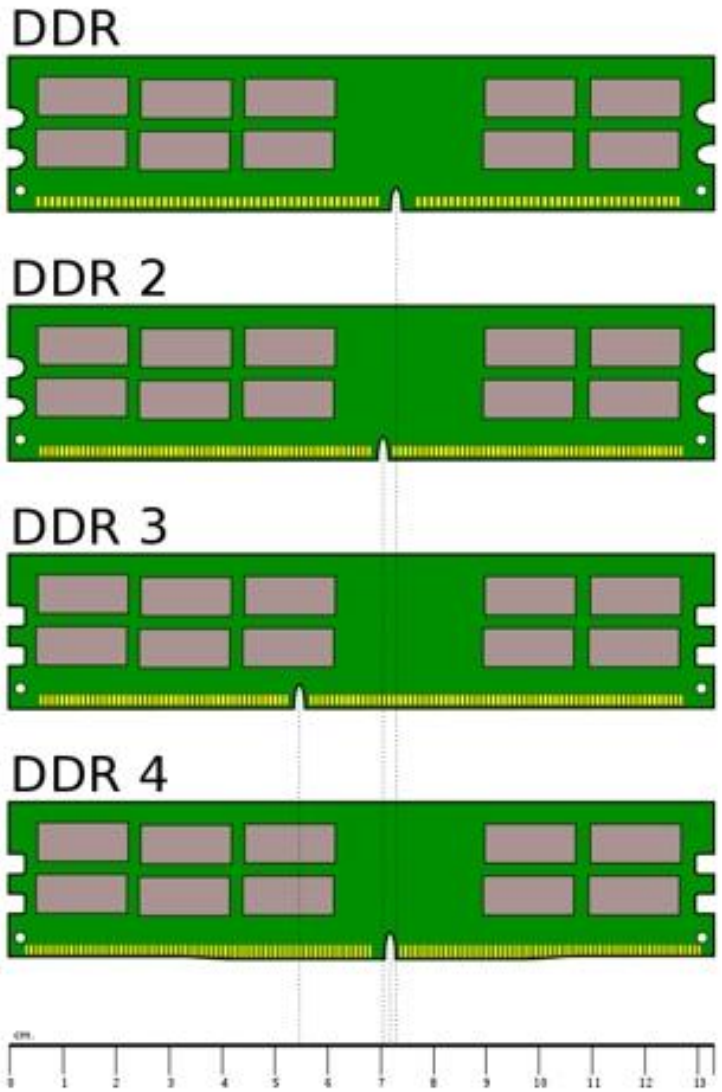
DIMM RAM Modules

Short for Dual In-line Memory Module (DIMM) is a module containing a circuit board and one more random access memory chips. DIMM holds SDRAM chip such as DDR DDR2 DDR3 and DDR4 …

DIMM module had 168-pins which can transfer 64 bits of data at a time and can support with 64-bits CPU type.

168-pins SDRAM DIMM

DIMM Memory Modules types



DDR (DIMM) 184-pins

DDR2 (DIMM) 240-pins

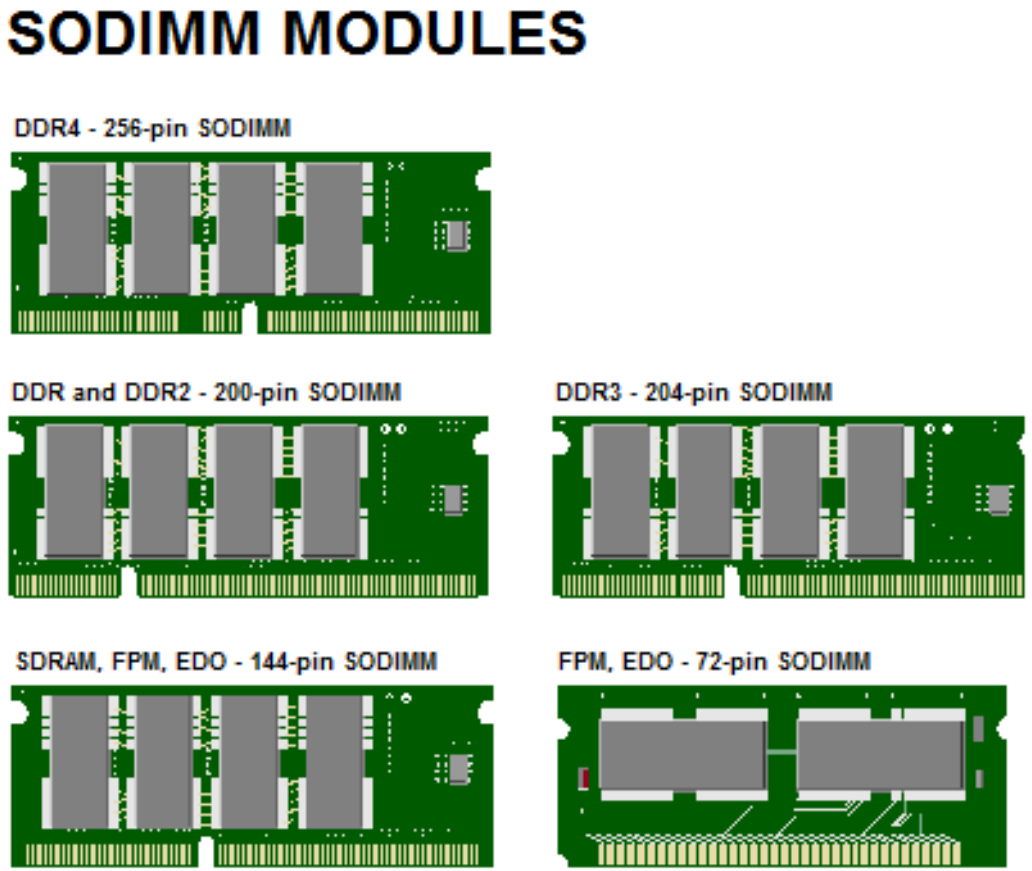
DDR3 (DIMM) 240-pins

DDR4 (DIMM) 288-pins

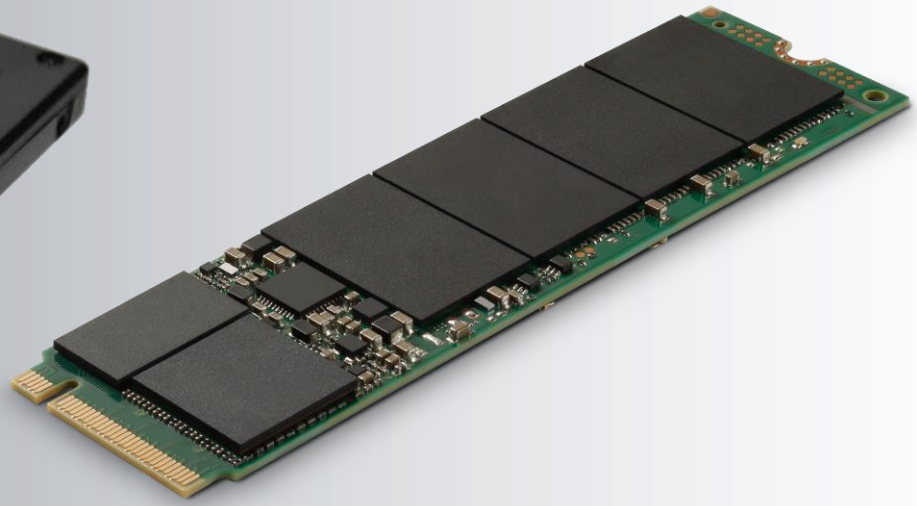
SO-DIMM Memory Modules

SO-DIMM, which is short for Small Outline DIMM. SO-DIMMs are commonly utilized in **laptop** computers. Below is an example picture of a 4GB SODIMM memory stick from Crucial.

Crucial 4GB SODIMM



Hard Disk



Type of Storage device in computer

There are **two type** of hard drive

Hard Disk Drive (HDD)

Solid State Drive (SSD)

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OVERVIEW of STORAGE DEVICE

Storage device is a non-volatile memory hardware device that permanently *stores* and *retrieves* data on a computer.

The Operating system, software, and data files are stored in HDD/SSD.

HDD/SSD capacity measured in GB

HDD/SSD is a main storage device in computer

Store information even after computer is turned off

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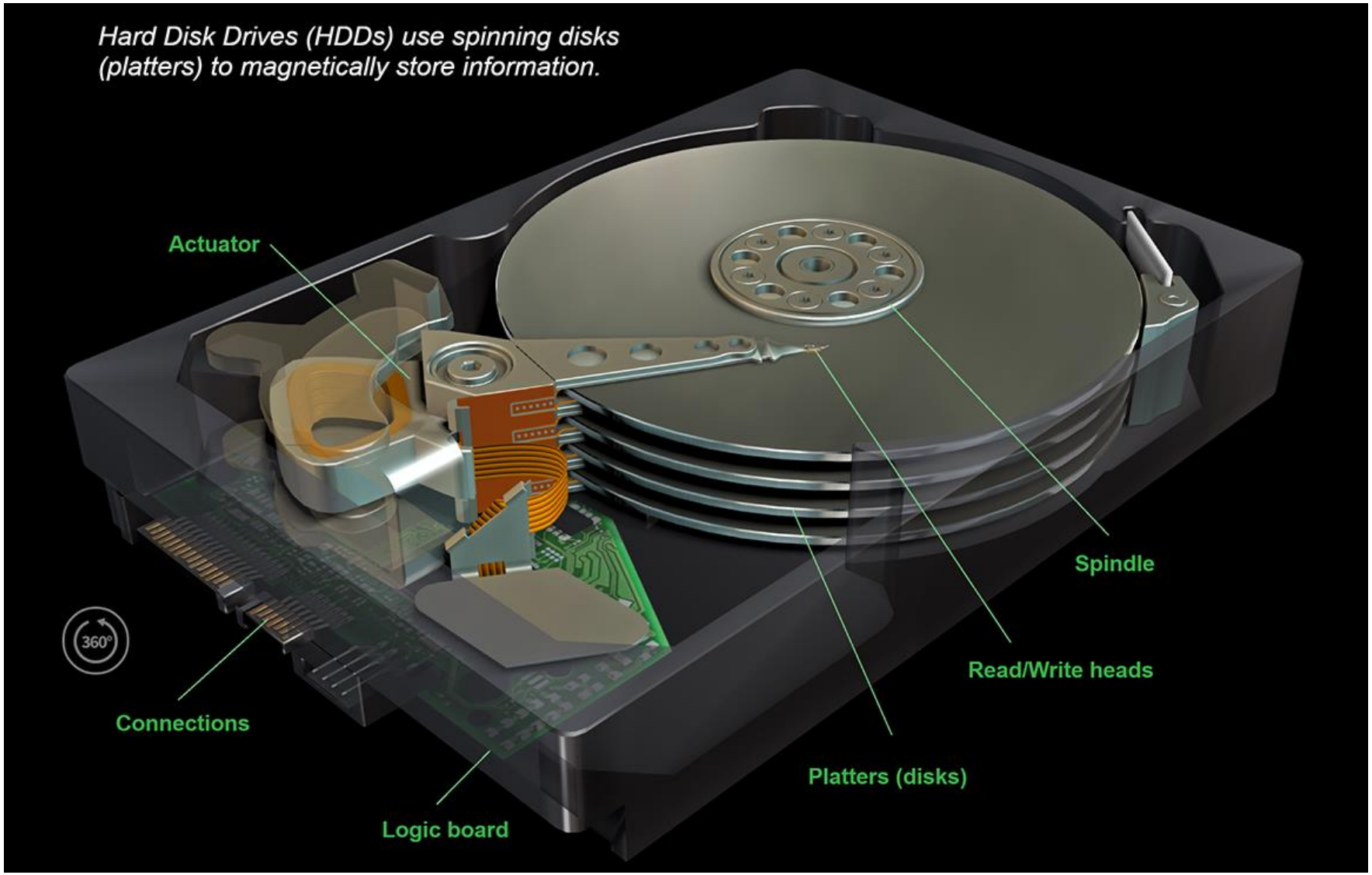
Hard Disk Drive (HDD)

Hard disk use magnetic *heads* on *actuator* arms controlled by a motor to read/write data from the *platters*. Two heads per platter. HDD write data on the platter in binary format **1** or **0**.



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HDD Interfaces Connection

Common drive interfaces are:

- Parallel ATA (**PATA**)
  - Integrated Drive Electronics (**IDE**)
  - Enhanced Integrated Drive Electronics (**EIDE**)
- Serial ATA (**SATA**) and External SATA (**eSATA**)
- Small Computer System Interface (**SCSI**)

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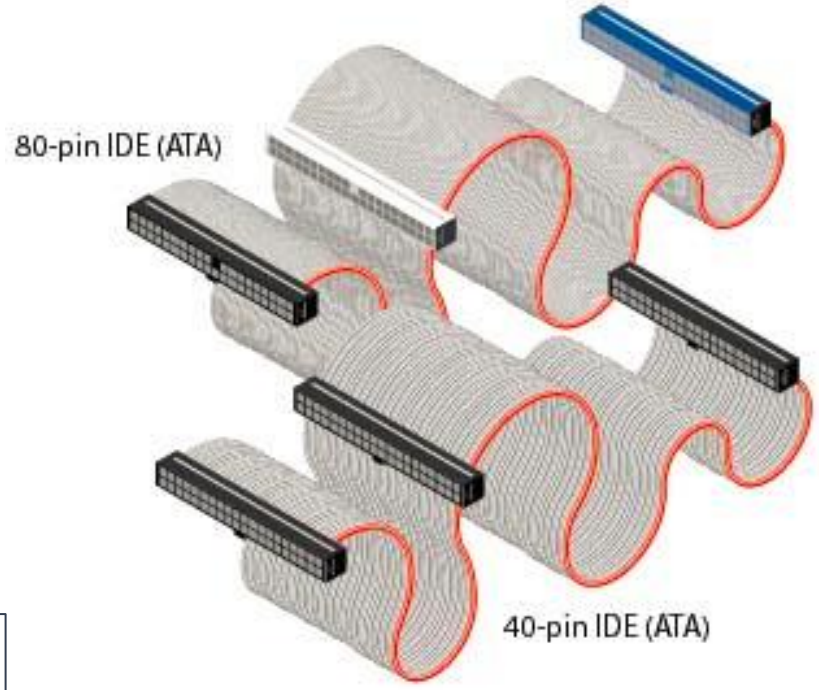
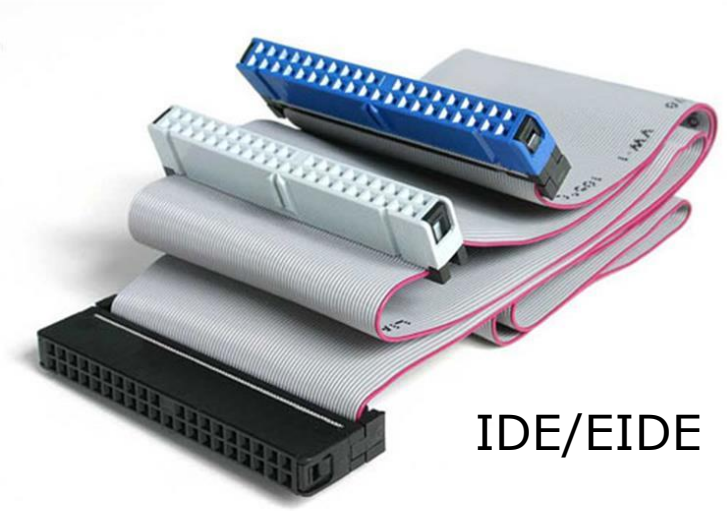
HDD Cable Connector





IDE/EIDE

SATA

SCSI

SCSI

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Solid State Drive

Short for **Solid-State Drive** or **Solid-State Disk**, **SSD** is a new generation of storage device used in a computers. SSD store data using **NAND flash memory** chip.

Unlike a hard drive, an SSD has no moving parts, which gives it advantages such as accessing stored information faster, no noise, often more reliable, and consuming less power.

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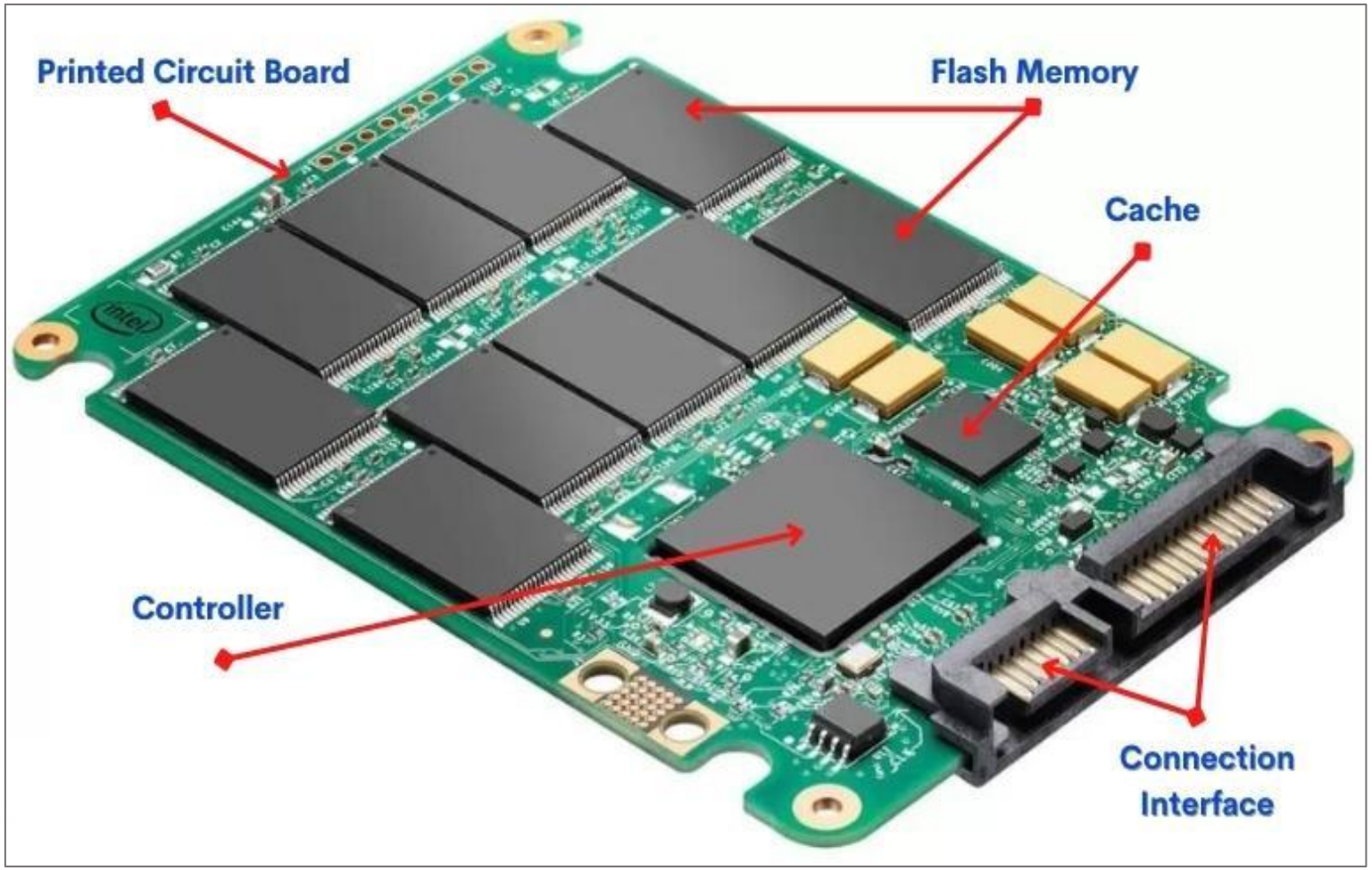
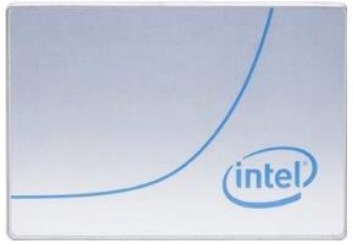
How SSD Work?

1. The **Flash Memory** is responsible for storing data (non-volatile memory NAND memory chip).
2. The **Controller** is responsible for how data gets stored in a flash memory.
3. The **Cache** is used to improves the performance of SSD.
4. The **Connection interface** is a physical connector for interact of SSD controller with the motherboard. (SATA, PCIe)



Different Type of SSD

	SATA 2.5"	U.2	M.2 SATA	M.2 NVMe	NVMe PCIe
Types of SSD					
Physical Connector	SATA	U.2	M.2		PCIe


WD
500 GB
SATA / 16 MB Cache
WD5000AAKX
Scan QR code here to learn about your hard drive or visit wd.com
MDL: WD5000AAKX
U.S. Patents: 6178056, 5956196,6289484, 6263459
Do not cover any drive holes
Canada ICES – 003 Class B/NMB – 003 Classe B
Product warranty will be void if seal, label or cover is removed or damaged
WD Blue™
Desktop Hard Drive

HDD vs SSD


SSD

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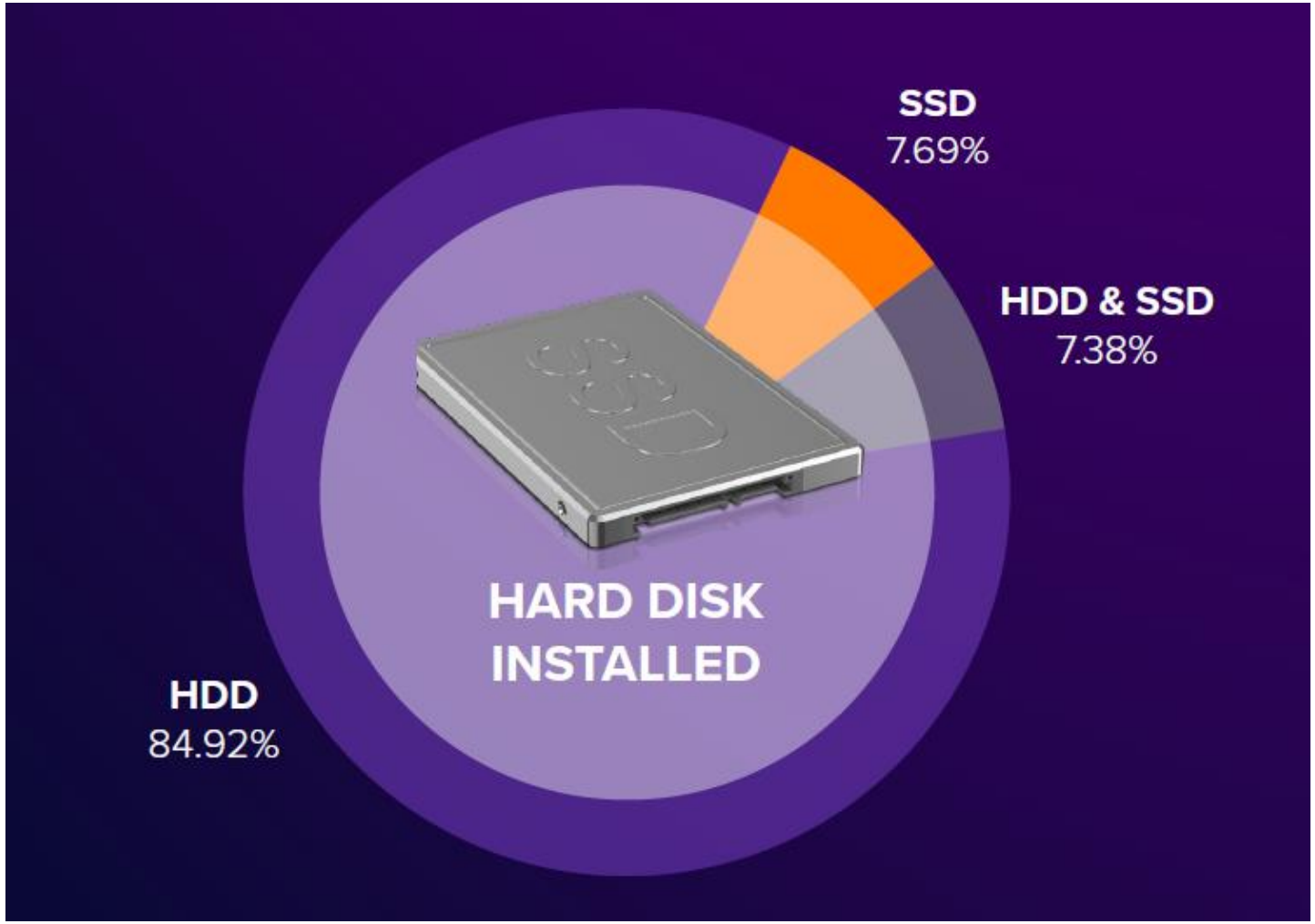
Advantages of SSD over HDD

SSD has advantages over HDD:

- **Access time**: speed to access data faster than HDD (2 or 3 times)
- **Reliability**: has no moving parts, it use flash memory to store data.
- **Power**: uses less power than a standard HDD
- **Noise**: With no moving parts SSD generates no noise
- **Size**: SSD is available in 2.5”, 1.8” and 1.0” – smaller and lightweight
- **Heat**: generate less heat, helping to increase its lifespan

But, SSDs aren’t as popular as you might think?

Percentage of people who use hard drive



Avast News, 29 January 2019

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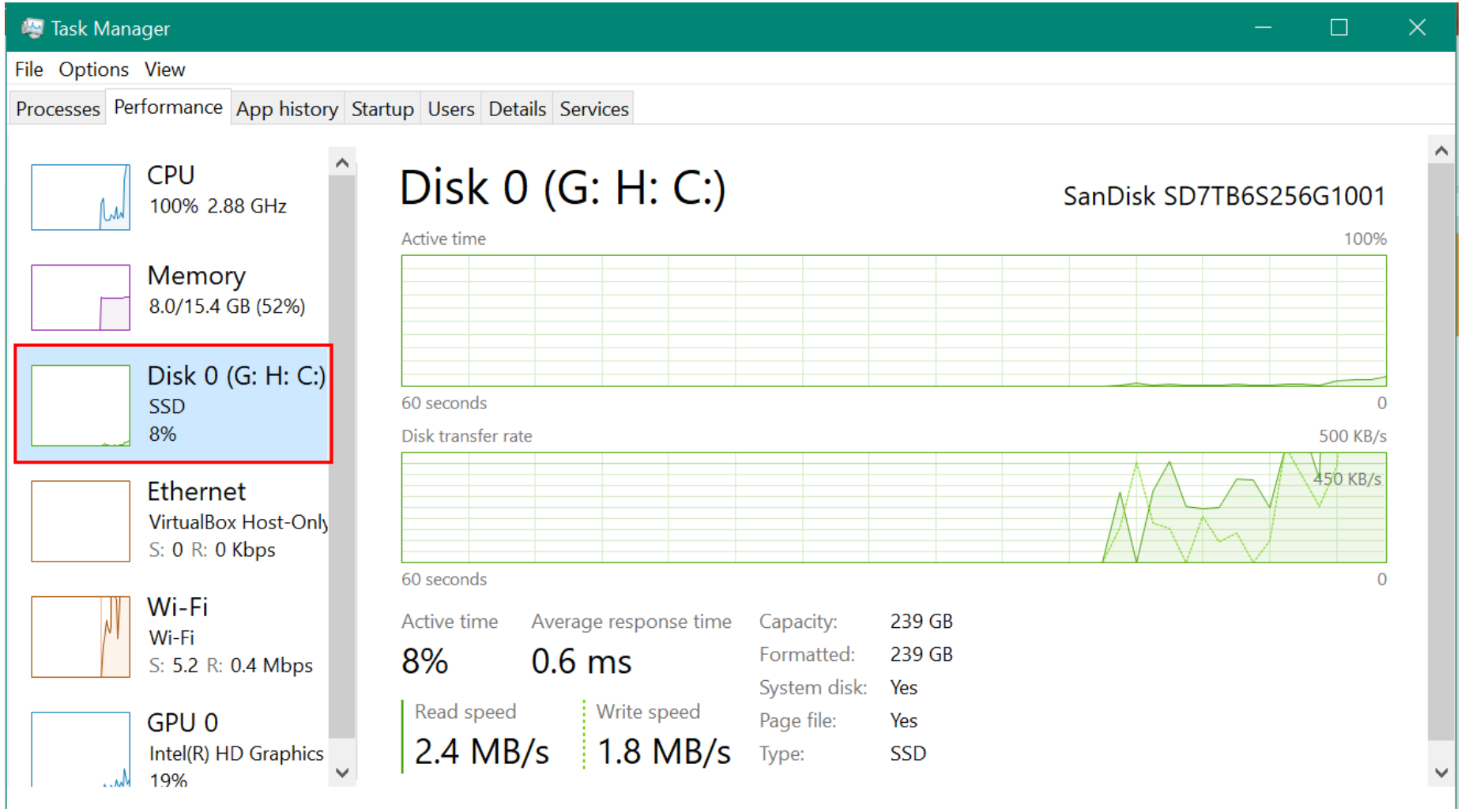
Finds out how much Storage Space you have

Task Manager



Relationship Between CPU, RAM, and HDD

VS

Relationship Between CPU and RAM