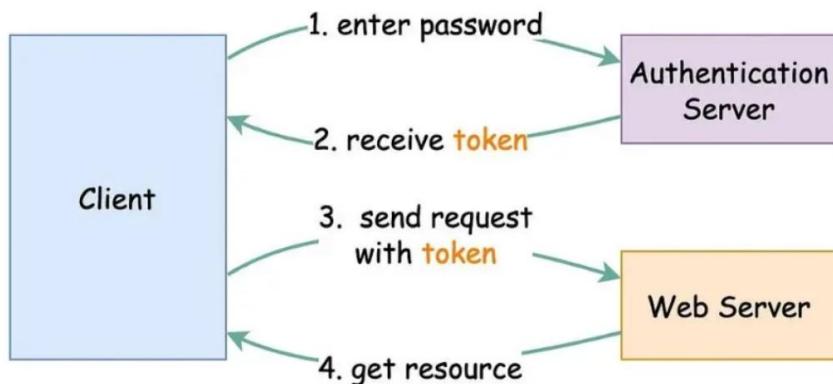
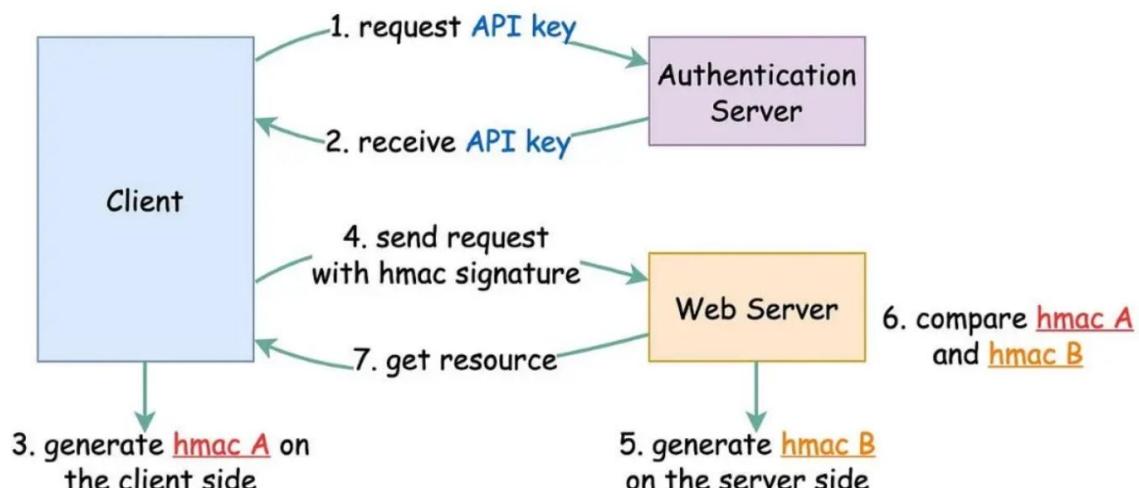


# How to Design Secure Web API?

## Token based authentication



## HMAC authentication



### hmac signature generation algorithm

```
public app ID  
request URI  
request content  
HTTP method  
request timestamp  
nonce
```

+ API key  
(private key) → HMAC signature

### **3.4 COMPUTER HARDWARE & MAINTENANCE**

**L T P**  
**4 - 6**

#### **Rationale :**

Servicing of computer peripherals and system such as Key Board, Disk Drives, Printers, Power Supplies and different stages of the computer results in increasing efficiency and life of the Computer Centre. A technician having skills of servicing the above peripherals and systems will prove useful for a Computer Centre.

#### **LEARNING OUTCOMES**

After undergoing the subject, the students will be able to:

- Assemble Computer System & it's peripherals
- Repair & Maintenance of Computer System & it's peripherals
- Understanding of various components of a computer system

#### **DETAILED CONTENTS**

1. Component and peripheral devices Connected with computer. (02 Periods)
2. Mother Board : BUS, Motherboard components & it's type, Battery, Connections on the Mother Board, Keeping CPU cool, Mother board trouble shooting. (10 Periods)
3. Key Board : Switches, Keyboard organization, Key board type trouble shooting. (03 Periods)
4. Mouse : Mouse type, Connecting Mouse: Wired & Wireless, Troubleshooting Mouse. (03 Periods)
5. HDD : Magnetic recording, Data Encoding Method, HDD feature, Head barking, HDD trouble shooting. (05 Periods)
6. SSD : SSD Concept, Structure, advantages, features, applications(02 Periods)
7. RAM: Definition, Types of RAM, advantages, Removable RAM Vs. Soldered RAM (02 Periods)
6. Compact Disc Drive : CD-R, CD-W, CD-RW, DVD-R, DVD-RW, Blue Ray. Working and Maintenance. (02 Periods)
7. Printers : Image formation method, Printing mechanism, DMP, Ink Jet, Laser Printer, Multi-functional printer. How printer works and Trouble shooting. (05 Periods)
8. Network Devices: Hub, Switch, Router, Bridge, Gateway, Ethernet Card, Network Cables (CAT-6 & OFC), Cabling Tools, Troubleshooting (08 Periods)
9. Scanner- Flat Bed. (02 Periods)
10. External Devices- Pen Drive, Flash Drive, External Hard Disk.

APPROVED IN CDC COMMITTEE MEETING OF BTE,UP,LKO DATED:26-09-2021

25. 34. 12. 56

✓ Class A range.  $\rightarrow \begin{matrix} \checkmark & N & HHH \\ 25 & .34 & .12.56 \end{matrix}$

Network / Host  $\Rightarrow \begin{matrix} I & \text{bits} & \text{last bits} \\ 8 & / & 24 \end{matrix}$

Subnet mask - 255.0.0.0 Default.

Subnet mask  $\Rightarrow \underline{\underline{255.255.0.0}}$

first address (Subnet address)

last address  $\Rightarrow$

1st N/W = 25.0.0.0 to 25.255.255.255

1111111. 1111111. 1111111. 1111111.

1st address - Network address  $\xrightarrow{\text{Subnet mask}}$  00000000

$\Rightarrow [25. \cancel{34}. 0. 0] \xrightarrow{\text{AND}} 25. \cancel{34}. 0. 0$

1st address / last address  $\xrightarrow{\text{Subnet Mask Complement}}$  00000000. 00000000. 111111. 1111111

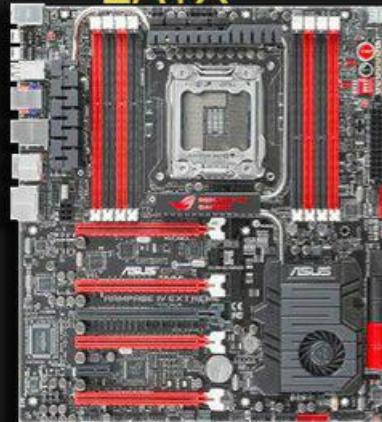
and last Address  $\rightarrow [25. \cancel{34}. 255. 255] \xrightarrow{\text{OR}} 00011001. \underline{1000010. 00001100. 00111000.}$

00011001. 00100010. (111111. 1111111)  $\underline{\underline{25.34.255.255}}$

## Motherboards and Form Factors Explained

Generally speaking, the larger the form factor the more features and support functionality it will have. Micro-ATX and Mini-ITX however, are perfect for compact builds. Their small size still manages to have all the essential features you would need for a quality gaming PC. Just to give you an idea I put some **average** support specs below.

EATX



ATX



Micro-ATX



Mini-ITX

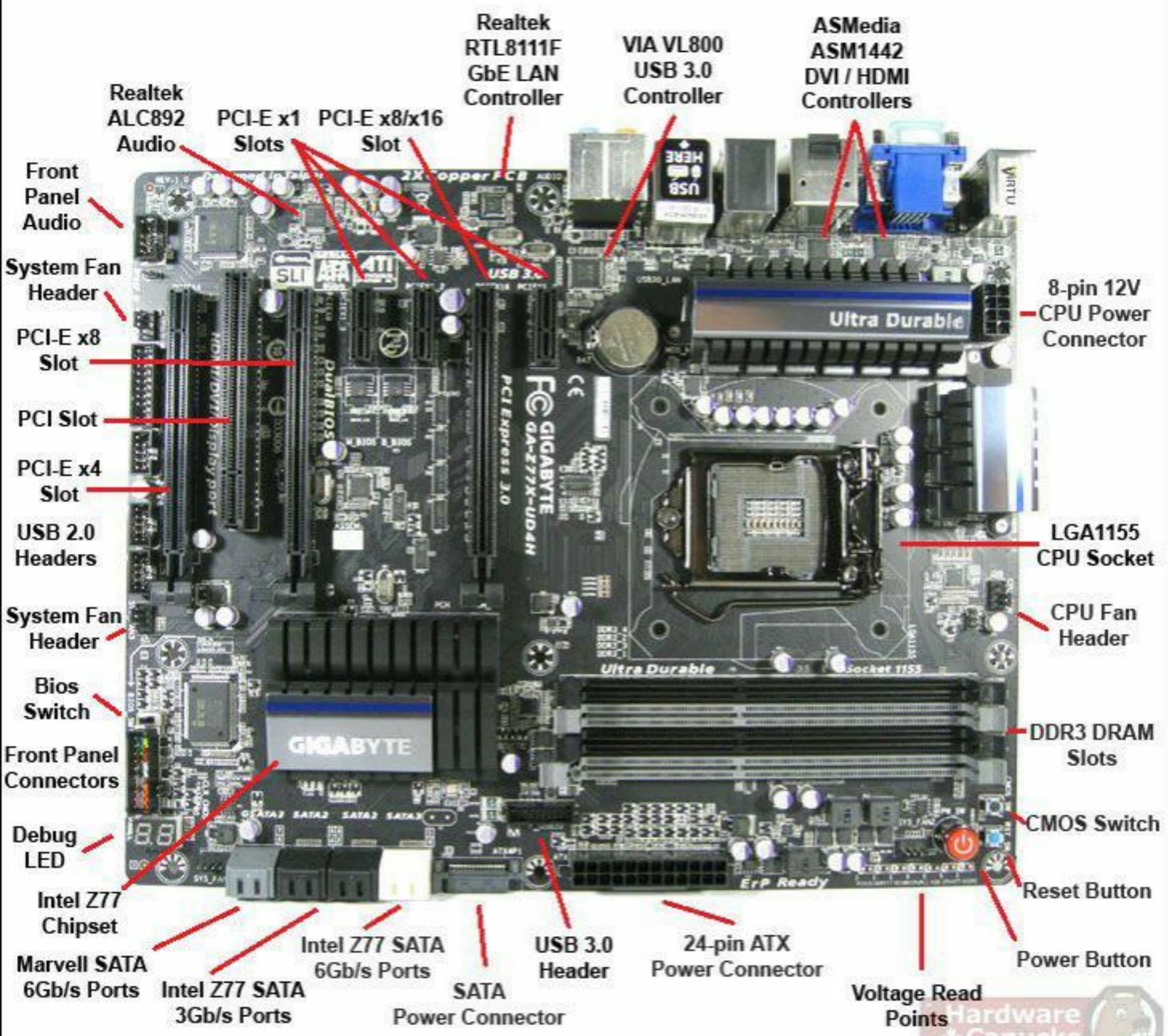


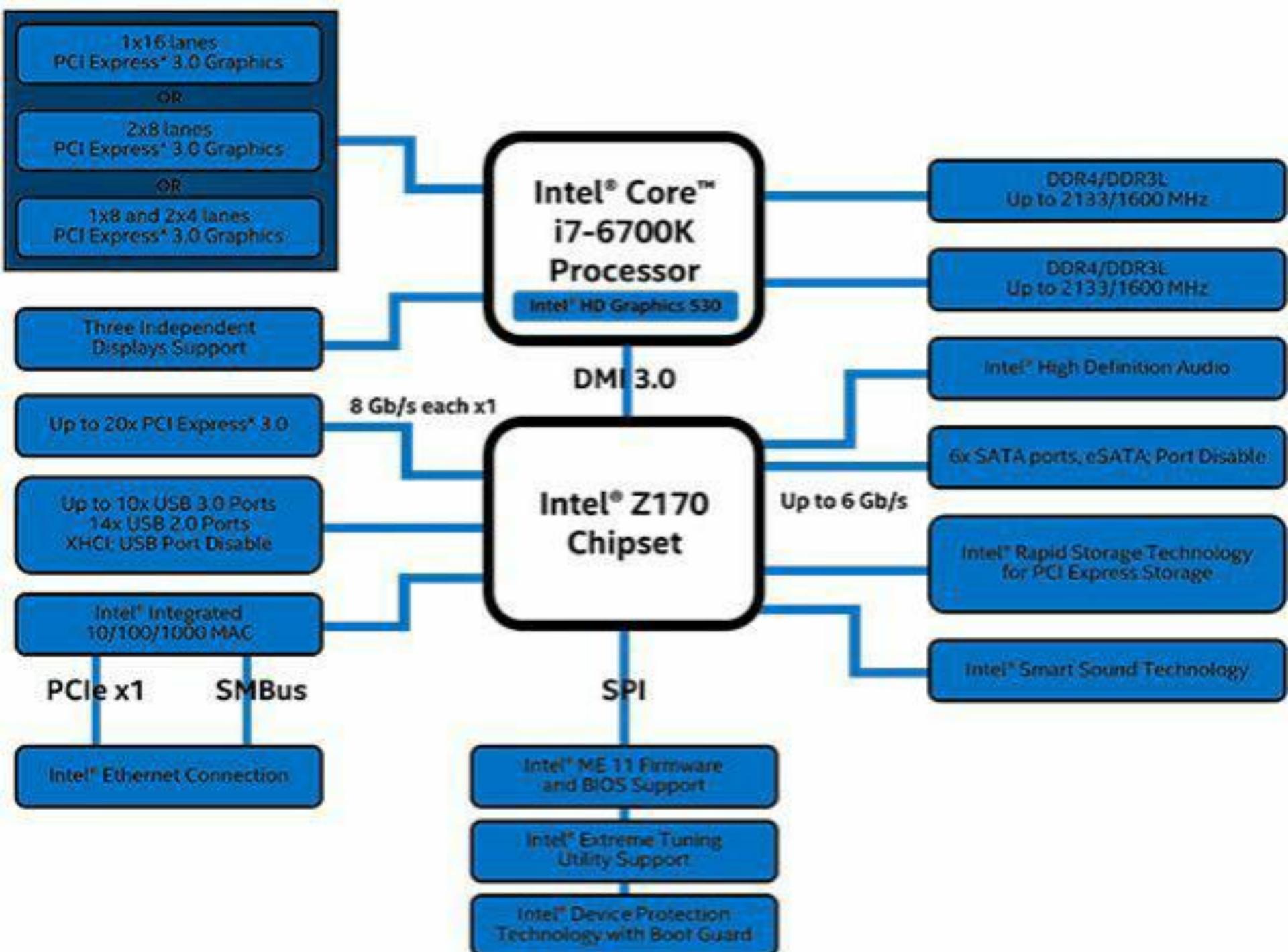
RAM Slots: 8-16+  
GPU Slots: 4-8  
Sata Ports: 6-16+  
CPU Sockets: 1-4+

RAM Slots: 4  
GPU Slots: 2-4  
Sata Ports: 6-12  
CPU Sockets: 1

RAM Slots: 2-4  
GPU Slots: 1-2  
Sata Ports: 4-8  
CPU Sockets: 1

RAM Slots: 2  
GPU Slots: 1  
Sata Ports: 2-6  
CPU Sockets: 1





## Types of CPU

There are two main CPU manufacturers: Intel and AMD. There are various different CPUs, each running at different speeds and manufactured for different computers such as laptops, desktops, or tablets. Each manufacturer has their own specs, names and series for their CPUs.

This is where things get a bit confusing. There are a lot of different processors out there with different numbers and series. However it all boils down to a few numbers to take note of, I've highlighted these in bold. Lets take a look at some common ones.

**Intel Pentium / Celeron.** These chips are common in cheap laptops, and offer the slowest performance, but can handle tasks such as web browsing, email and document editing. You'd be better off spending a bit extra and going with a Core i3 or i5.

**Intel Core i3.** Performance is about entry level for basic computer usage such as web browsing, email, social media, word processing, music and looking at a few photos.

**AMD A, FX or E Series.** Found on low-cost laptops, AMD's processors provide decent performance for the money that's good enough for web browsing, internet, email, streaming films or tv, photos and music, as well as word processing etc. For example:

AMD **A6-9220 APU 2.5GHz**

AMD Quad-Core Processor **FX-9830P**

**Intel Core i5.** If you're looking for a mainstream laptop with the best combination of price and performance, get one with an Intel Core i5 CPU. Always make sure the model number ends with a 'U', 'HK', or 'HQ' - these offer better performance. For example:

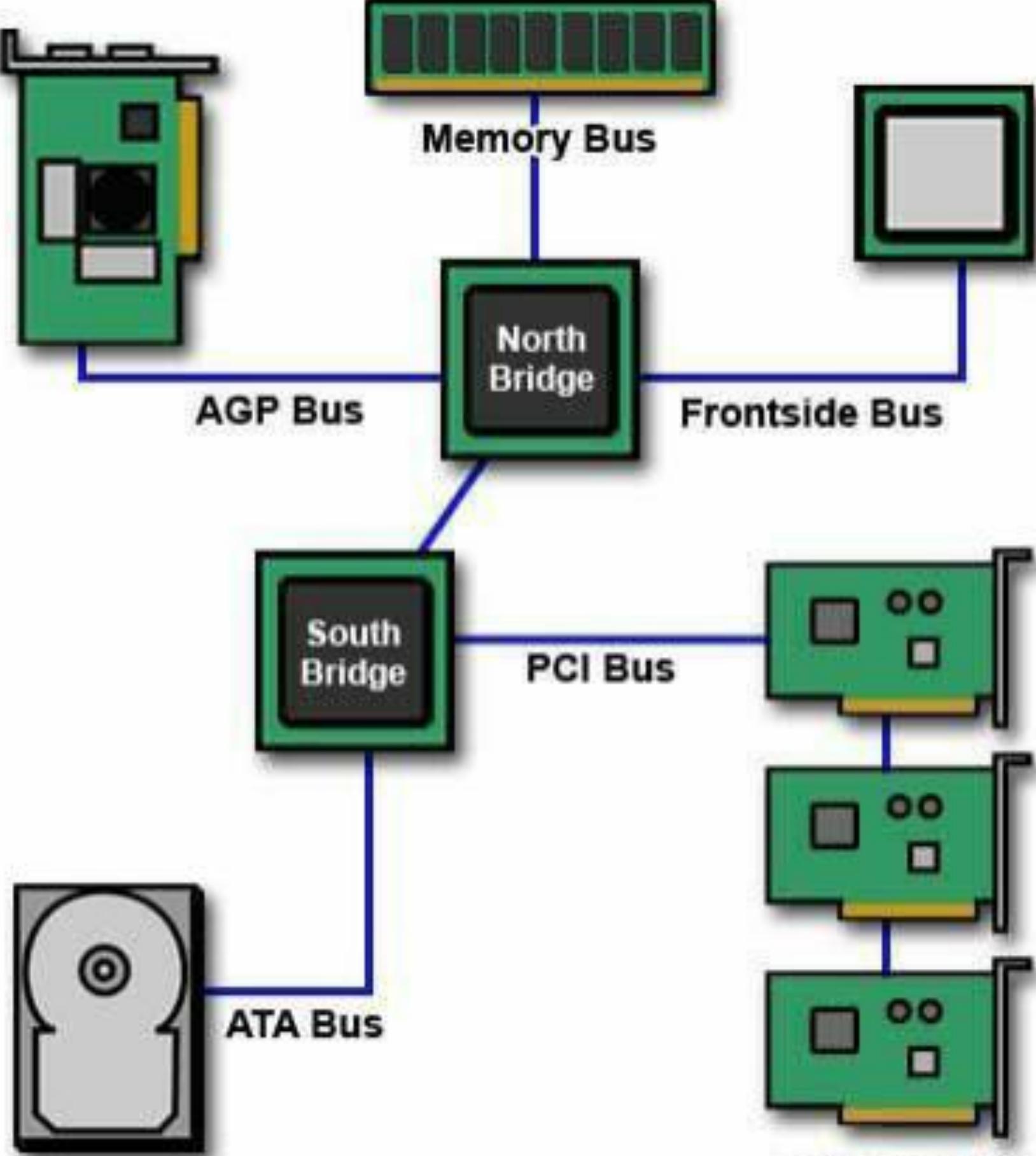
Intel Core i5-**7200U**

Intel Core i5-**7300HQ**

Also the higher the number after 'i5', eg 7300, the better the performance.

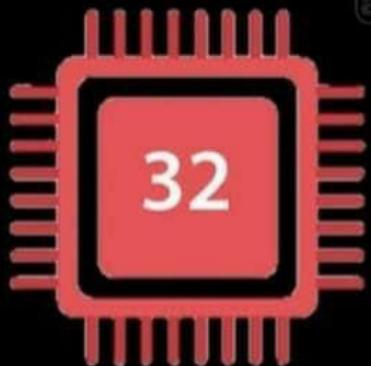
**Intel Core i7.** The successor to the Core i5.

**AMD Ryzen Series.** High powered chips from AMD designed to compete with Intel Core i5 and Core i7. Great alternative to Intel chips and good for gaming and high powered laptops. For example: AMD 8-Core **Ryzen R7 1700**.

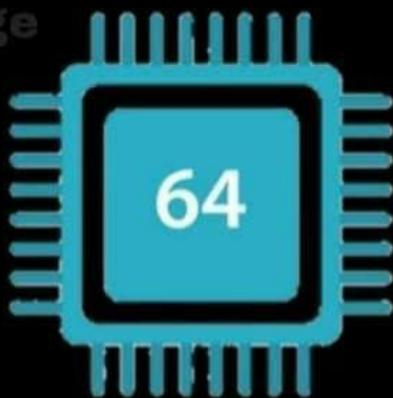


# Difference Between

@Computer\_Knowledge



vs

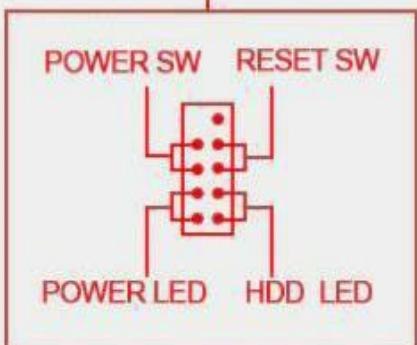
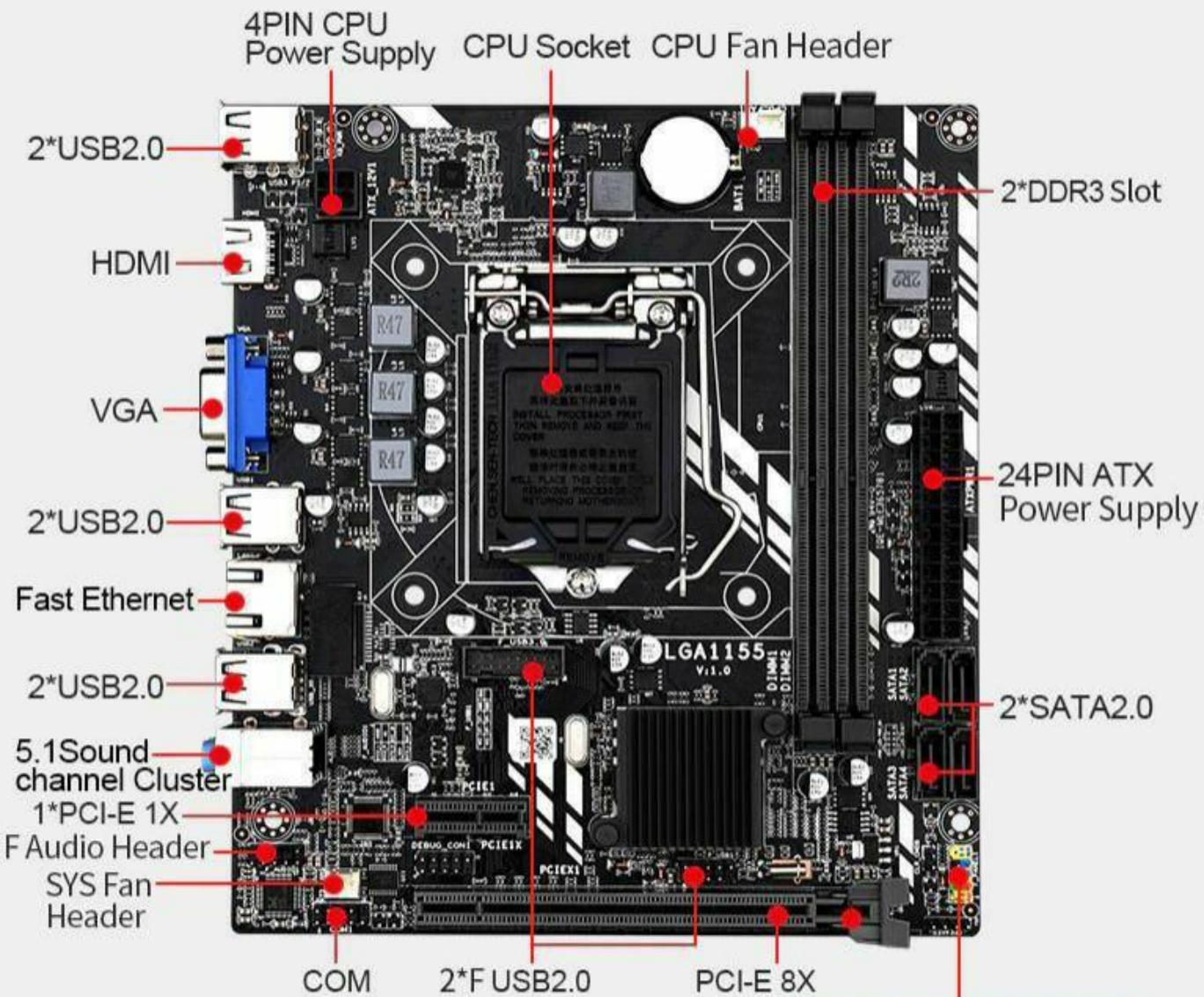


- |  |   |
|--|---|
| <b>1. Requires More Time To Process and Response</b>                         | <b>Requires a Minimum Time To Process and Response</b>  |
| <b>2. Can Address Memory Up To 4 GB of RAM</b>                               | <b>Can Address Memory Up To 16 Exabytes Of RAM</b>  |
| <b>3. Cheaper</b>  | <b>Expensive</b>  |
| <b>4. Can Be Used As a Personal Computer And To Run Office Routine Tasks</b> | <b>Can Be Used As Personal Computer And For video Edition Audio edition, and Server Application</b> |

# Flagship Level Layout, Easy to Build

Multiple interfaces, strong extensibility

H61M Board Layout ▾



# Ports



Optical Audio "Toslink"    USB A 1.0/1.1/2.0    Firewire 4 pin iLink    Firewire 400 1394a    Firewire 800/3200 1394b/c    Ethernet 8P8C common:RJ-45    Modem RJ-11    Apple Desktop Bus - ADB    Mac Serial



PS/2    USB A 3.0    DE-9F    DB-25 Serial/Com Port    DE-9 Serial RS232    e-SATA



Centronics Parallel 36pin    Centronics SCSI 50pin    AT Keyboard



50 pin SCSI 2    Surround sound    stereo/Headphones    Line In    Mic    Digital Audio RCA plug style



AAUI    Composite Audio/Video    S-Video    Component Video    F-Connector RF/COAX

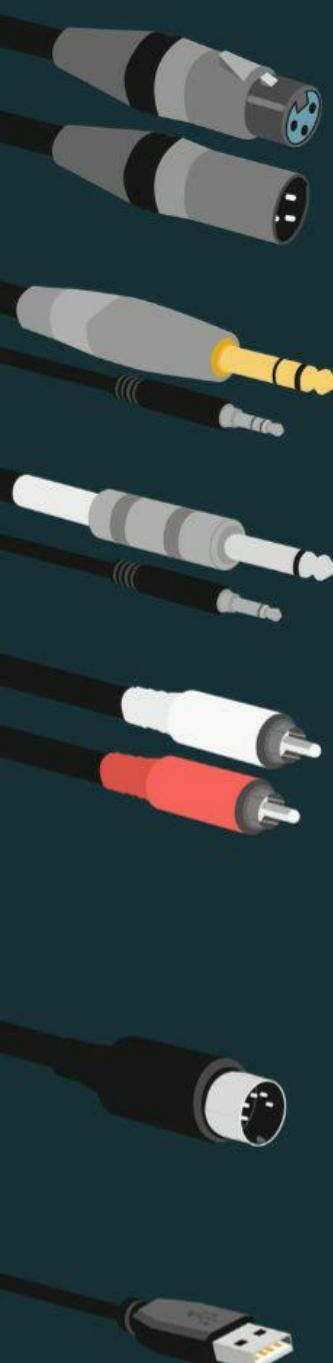


Parallel Port/SCSI 1/DB-25F    Mac Video/MIDI /gameport/AUI/DA-15    Mini DisplayPort    Mini-DVI    Mini-VGA    DMS59 (dual DVI-D)



Apple Hi-Density Video HD1-45    Apple Display Connector - ADC    LFH60 (dual DVI-D)    DMS59 (dual DVI-D)

# A Guide to Audio Cable Types



## ANALOG

- **XLR CABLES** are always balanced cables. They snap into place so you won't unplug them by mistake. XLR cables can be very long without picking up noise and interference.
- ● **TRS CABLES** (Tip–Ring–Sleeve) have three wires inside (two conductors and one ground). Together the conductors cancel out the noise. TRS is balanced if connected to balanced devices in mono. If not, they're unbalanced.  
**How to spot them:** **they have two stripes.**
- **TS CABLES** TS (Tip–Sleeve) are always unbalanced. They're the ones with a single stripe. These cables are mono. Remember: **keep TS cables as short as possible – or else they'll pick up noises and electrical hums.**
- **RCA CABLES** mostly come in pairs to achieve stereo. RCA connectors are the DJ's bread and butter. They're the most common wires used to connect CDJs and turntables to DJ mixers.  
  
Like TS cables, in each RCA cable you have one conductor and one ground, so they're always unbalanced. **Keep RCA as short as possible.**

## DIGITAL

**MIDI CABLES** do not transmit sounds. They transmit digital information called *event messages*. These are instructions that contain information about: Note ON/OFF, notes played, Velocity, Aftertouch, Tempo, Panning, Volume, etc.

**USB CABLES** are on MIDI keyboard controllers, audio interfaces, modern synths and drum machines. They make information exchange possible between music gear and computers. Some USB also transport MIDI information.

**What is the difference between balanced and unbalanced cables?**

**UNBALANCED** cables have more chances of picking up radio interference and noise. If you were to cut open an unbalanced cable you'd see two wires: a conductor wire and a ground wire.

**BALANCED** cables are designed to cancel out interferences and noises. They do it with the help of an added wire inside: two conductor wires and a ground wire. Together, both conductor wires cancel out the noise.

**Do balanced cables make a balanced connection?**

**No!** The key thing to remember: **all points in your cable circuit must be balanced for you to have a balanced connection.**

Including: the output on your gear, the cables, the input it's going into (like your mixer or PA)

**If just one of these is unbalanced, it'll make the connection unbalanced.**

- **BALANCED**
- **UNBALANCED**

# COMPUTER PORTS IDENTIFICATION

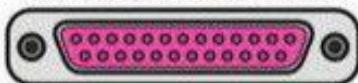
## Serial Port

Used for PDAs and serial devices.



## Parallel Port

Used for printers and data.



All Replaced by USB!

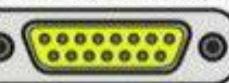
## PS/2 Port

Mouse Keyboard



## Games Port

Joysticks and Midi Input



## VGA Port

For External Monitor



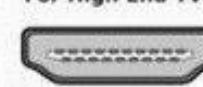
## S-Video

For Video in/out



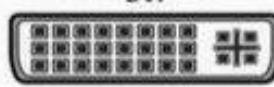
## HDMI

For High End TVs

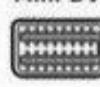


## Digital Video Interface

DVI



Mini-DVI

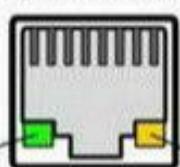


Micro-DVI



## Ethernet / RJ45

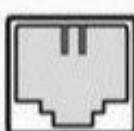
10Mb/s, 100Mb/s and 1Gb/s



Link Light  
Activity Light

## Modem / RJ14

56Kb/s



Used to connect to internet and intranet networks at high speed.  
Used to connect to internet via phone line, very slow.



## Universal Serial Bus (USB)

USB 1.1 - 12Mb/s  
USB 2.0 - 480Mb/s  
USB 3.0 - 5Gb/s



USB A

Back of Computers



USB B

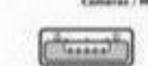
Printers / Scanners



Mini-A



Mini-B



Micro-AB



Micro-B

## Audio Mini-Jacks Sockets

- Audio Mini-Jack Sockets
- Microphone
- Stereo Line-In
- Stereo Line-Out
- Right-to-Left
- Center / Subwoofer

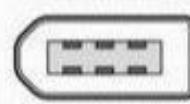
## S/PDIF Digital Audio



## Firewire / i.Link ieee1394

Video Cameras (DV) and Hard Drives

## Firewire 400Mb/s - ieee1394a



6-circuit connector



6-circuit connector

## Firewire 800Mb/s - ieee1394b



8-circuit connector

## IEC Power Connectors

C5 / C6  
Cloverleaf  
2.5 Amps



C7 / C8  
Figure of 8  
2.5 Amps



C13 / C14  
IEC Cord  
10 Amps



## eSata

External Hard Drive Port



## DisplayPort

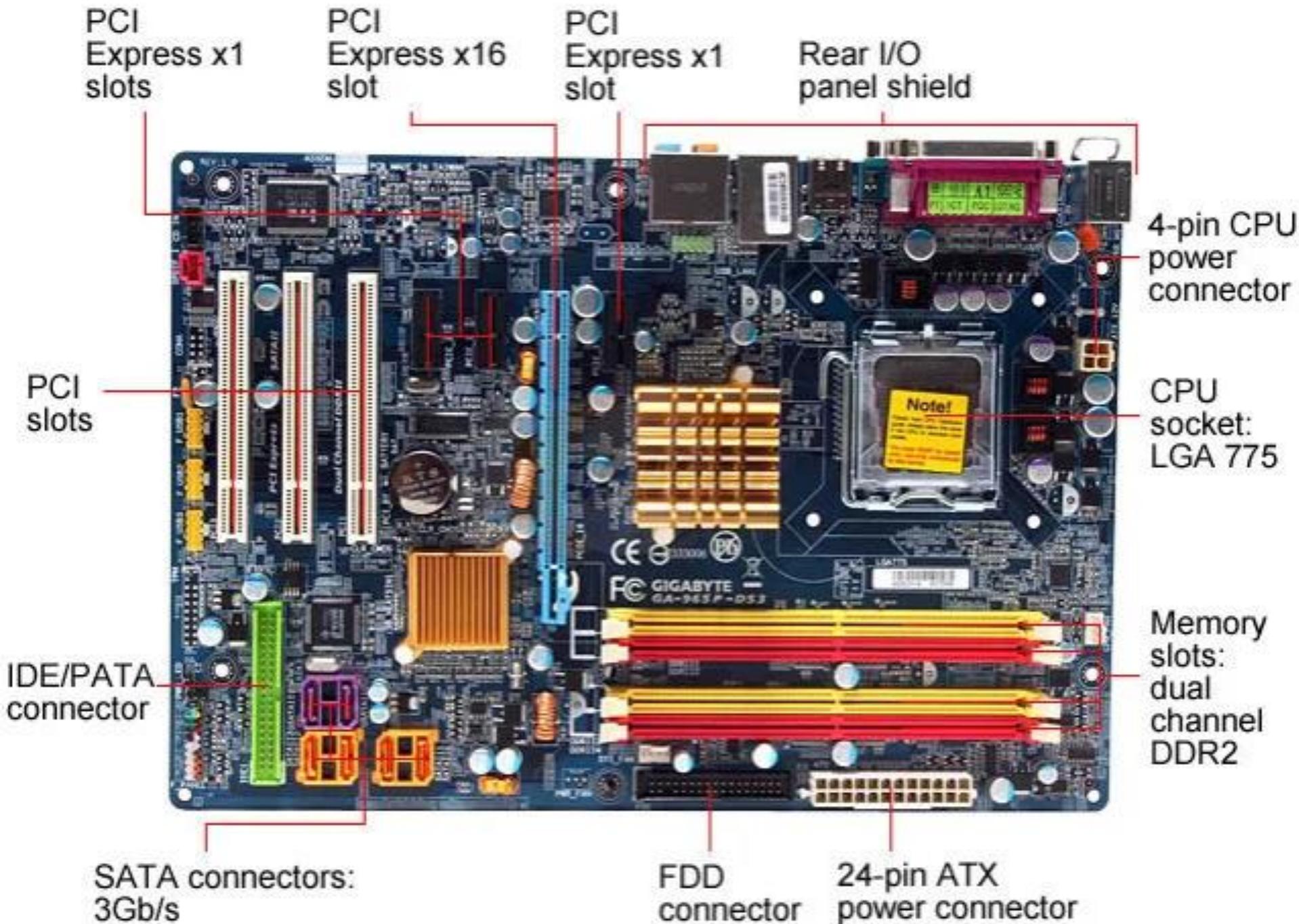
Video and Audio Port for Home Theater Systems

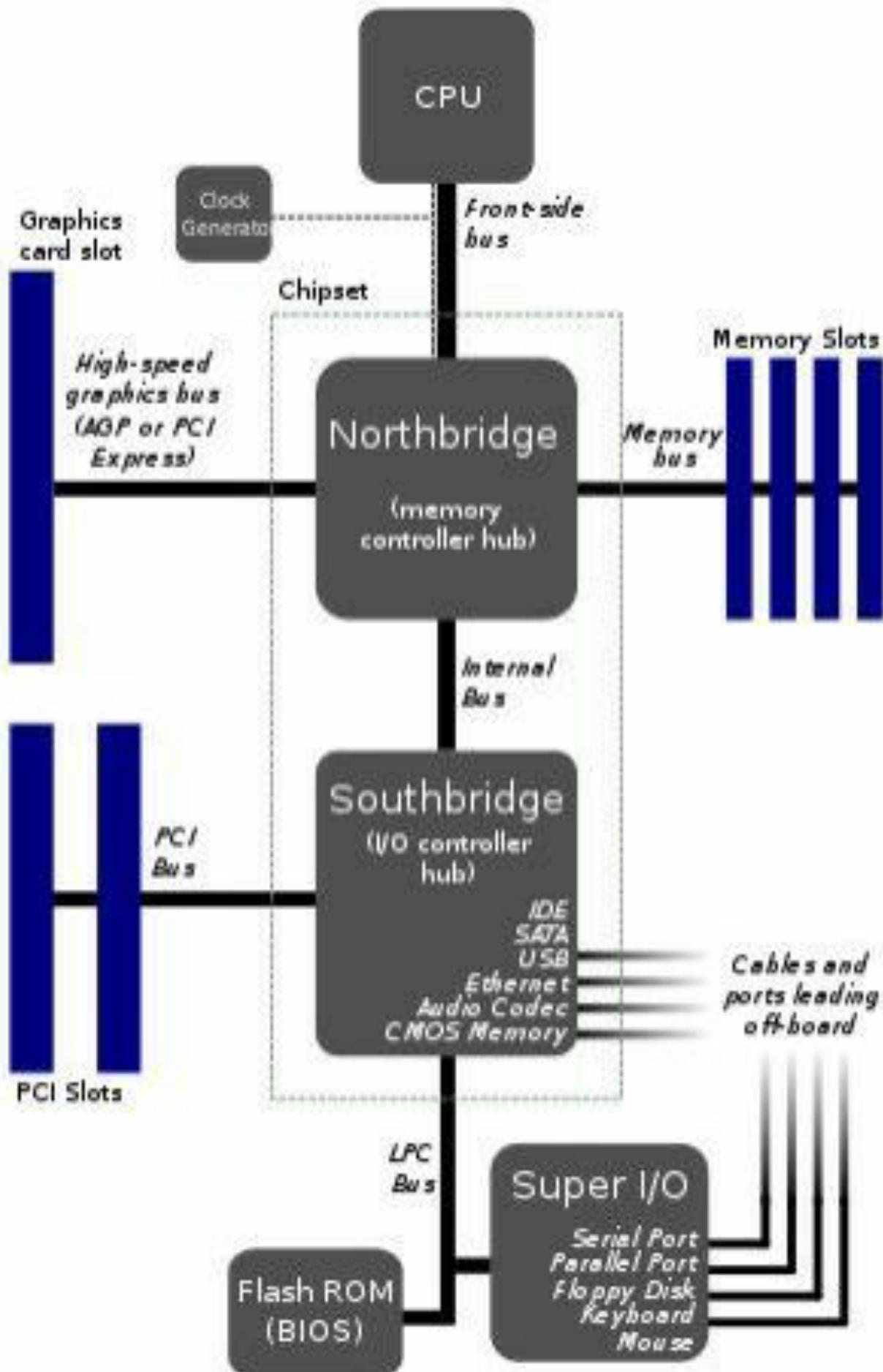


## PCMCIA / Cardbus

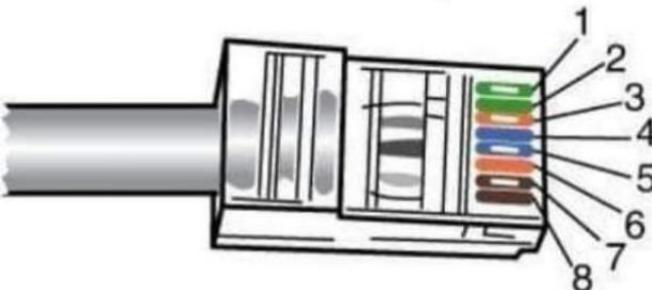
WiFi, Networking and Expansion Cards







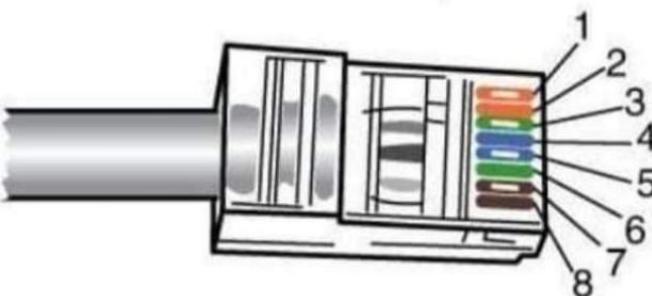
## Connector Head Bottom Side Up



#	T568A COLOR
1	White-Green
2	Green
3	White-Orange
4	Blue
5	White-Blue
6	Orange
7	White-Brown
8	Brown

(a)

## Connector Head Bottom Side Up



#	T568B COLOR
1	White-Orange
2	Orange
3	White-Green
4	Blue
5	White-Blue
6	Green
7	White-Brown
8	Brown

(b)

# IPv4 vs IPv6 Chart

	Internet Protocol version 4 (IPv4)	Internet Protocol version 6 (IPv6)
Deployed	1981	1999
Address Size	32-bit number	128-bit number
Address Format	Dotted Decimal Notation: 192.149.252.76	Hexadecimal Notation: 3FFE:F200:0234:AB00: 0123:4567:8901:ABCD
Prefix Notation	192.149.0.0./24	3FFE:F200:0234::/48
Number of Addresses	$2^{32} = \sim 4,294,967,296$	$2^{128} = \sim 340,282,366,$ $920,938,463,463,374,$ $607,431,768,211,456$

An IPv4 address (dotted-decimal notation)

172 . 16 . 254 . 1  
 ↓      ↓      ↓      ↓  
 10101100 . 00010000 . 11111110 . 00000001  
 One byte = Eight bits

Thirty-two bits (4x8), or 4 bytes

An IPv6 address (in hexadecimal)

2001:0DB8:AC10:FE01:0000:0000:0000:0000  
 ↓      ↓      ↓      ↓  
 2001:0DB8:ac10:FE01:: Zeros can be omitted  
 00100000000001:0000101101110001:0101100000100001:111111000000001:  
 0000000000000000:0000000000000000:0000000000000000:0000000000000000

## IPv4 Header

Version	IHL	Type of Service	Total Length						
Identification		Flags	Fragment Offset						
Time to Live	Protocol	Header Checksum							
<b>Source Address</b>									
<b>Destination Address</b>									
<b>Options</b>		<b>Padding</b>							

## IPv6 Header

Version	Traffic Class	Flow Label		
Payload Length		Next Header	Hop Limit	Source Address
<b>Destination Address</b>				

# **TYPES OF CABLES AND USB**



USB Type A

USB Type B

USB 3.0

USB Mini

USB Micro

USB Type C

USB Micro B

**ADAT**   **FIRE-WIRE**   **USB**   **S/PDIF**   **XLR**   **BNC**   **TS**   **TRS**   **RCA**   **MIDI**

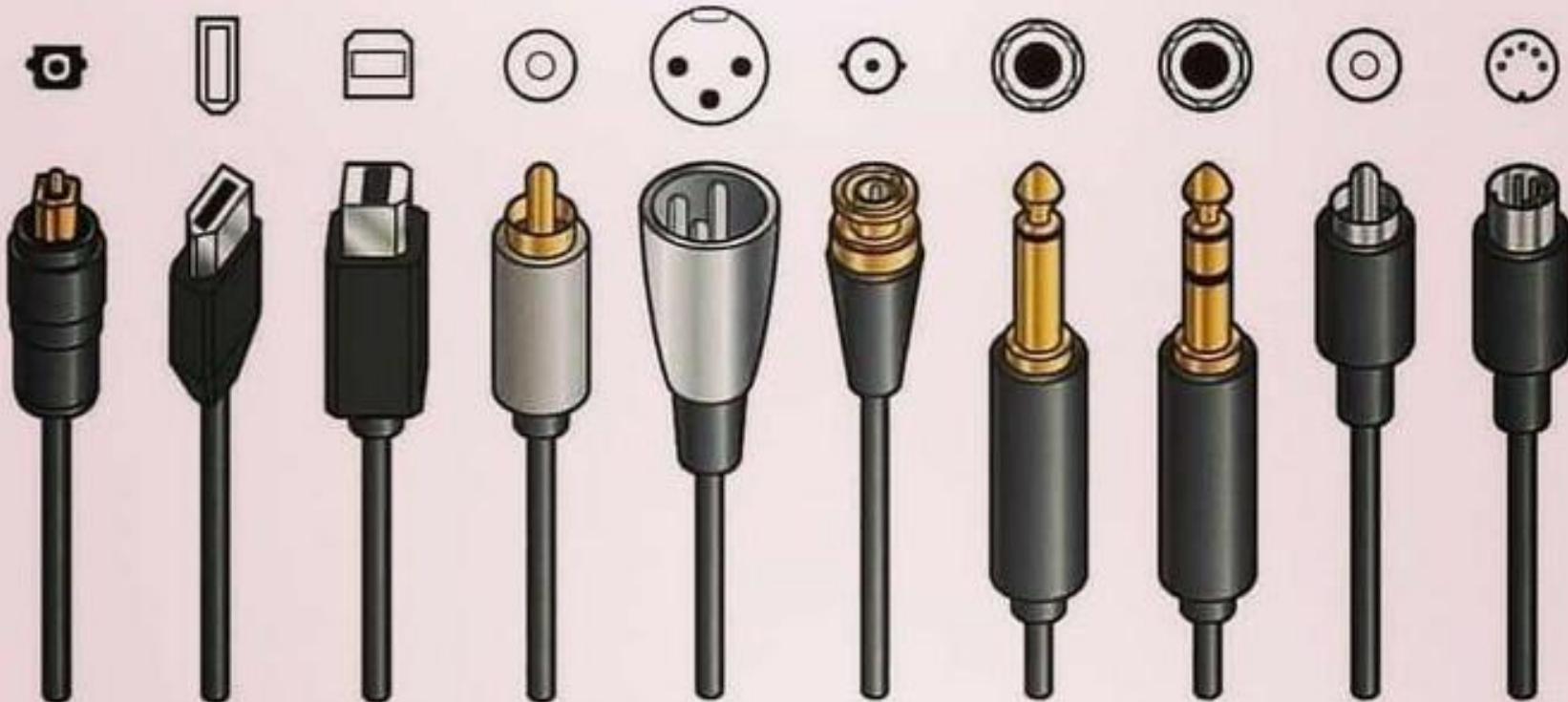
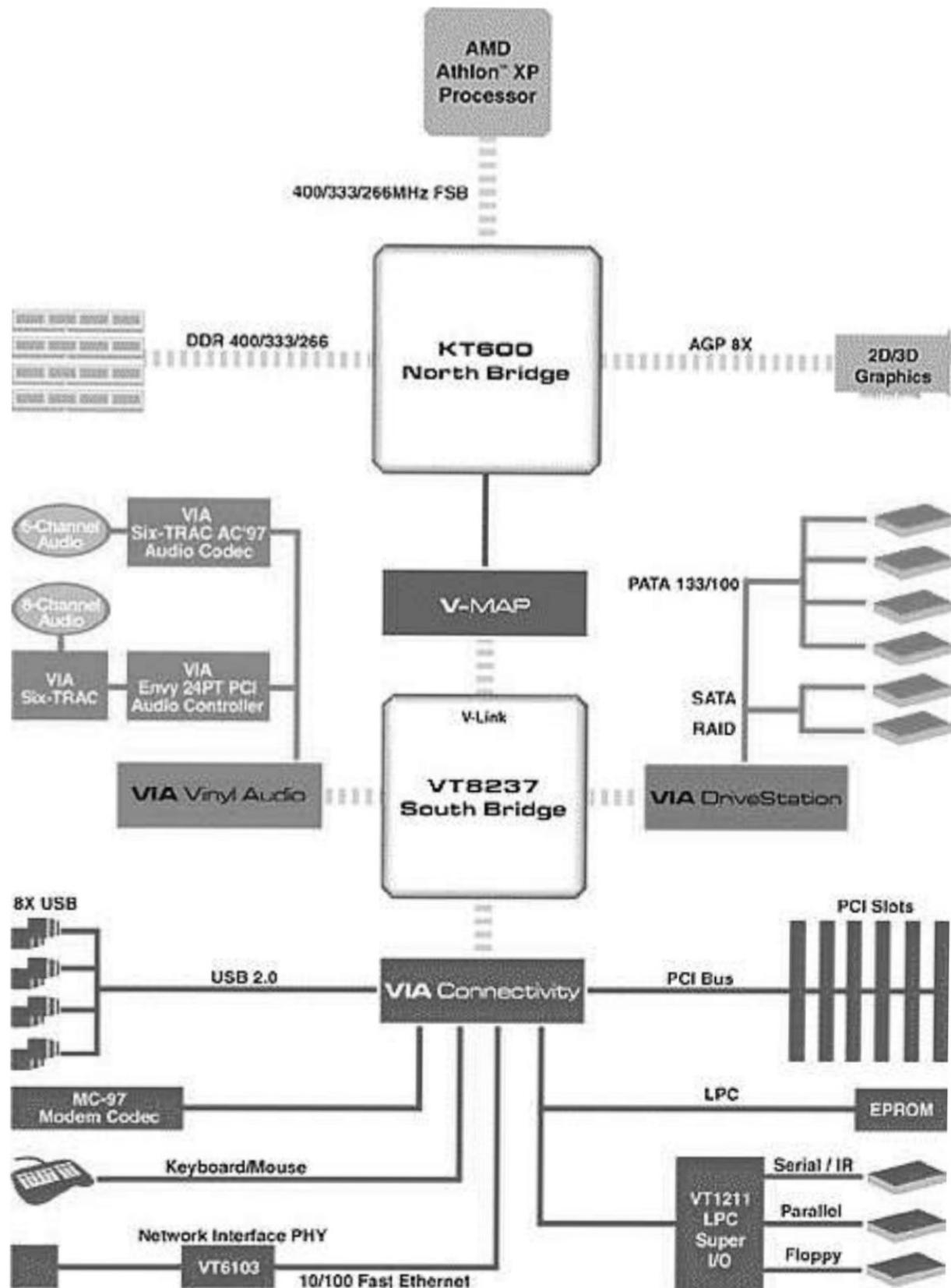
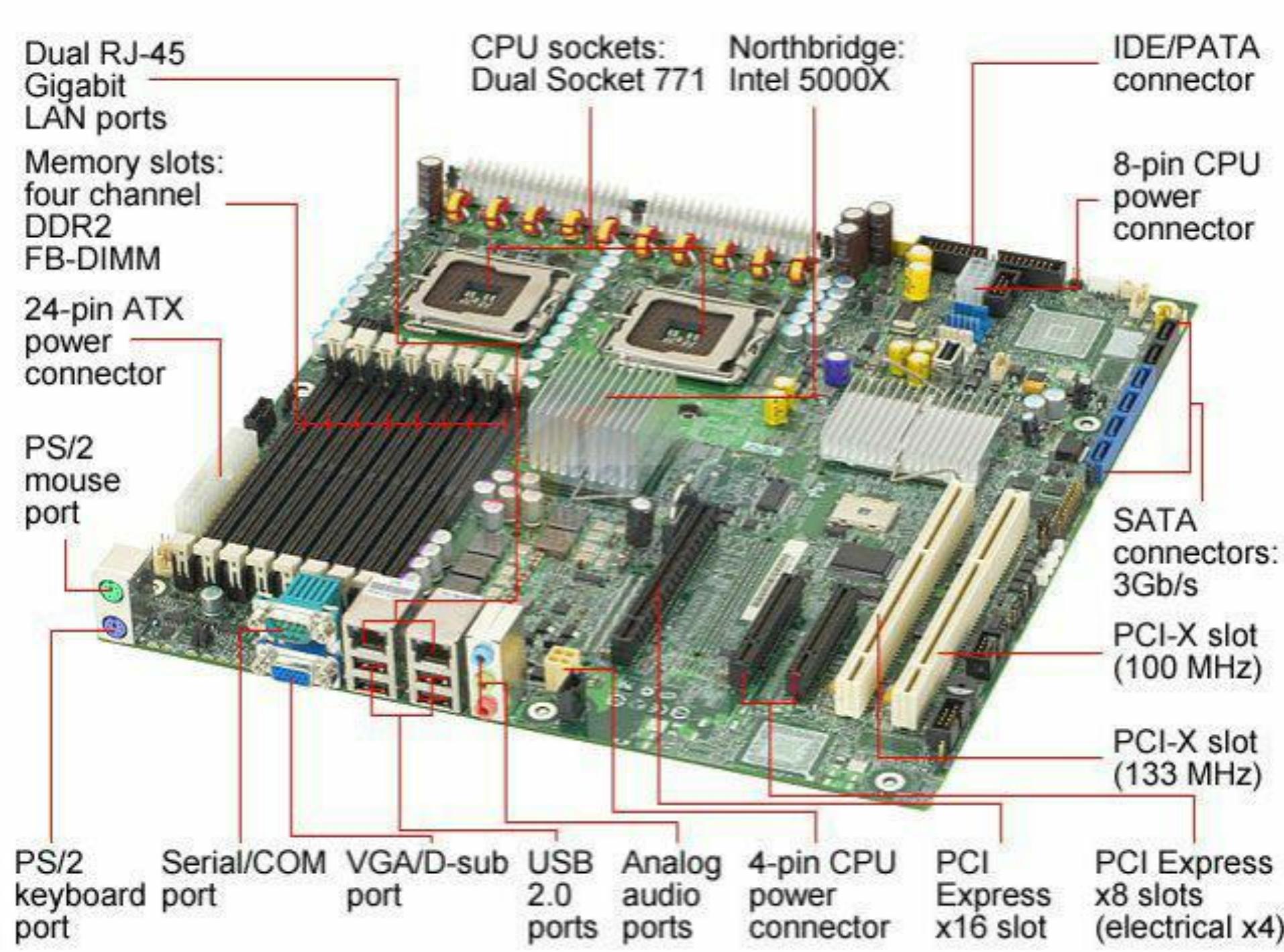


Figure 2.1: Components of your PC are connected to the chipset







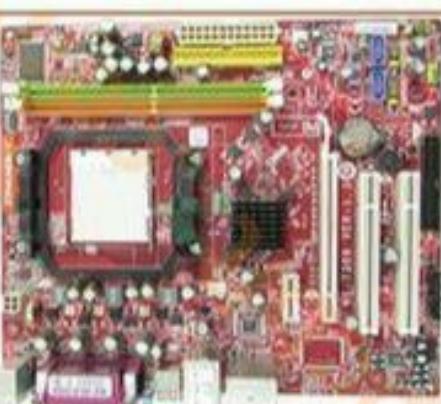
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Gigabyte



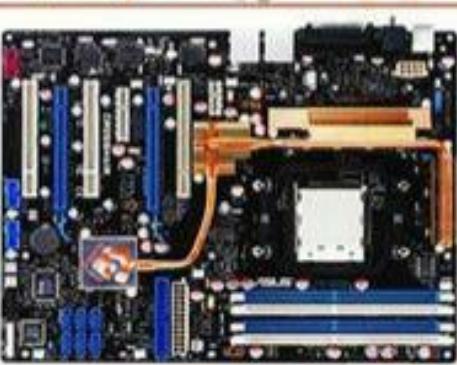
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Asrock



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MSI



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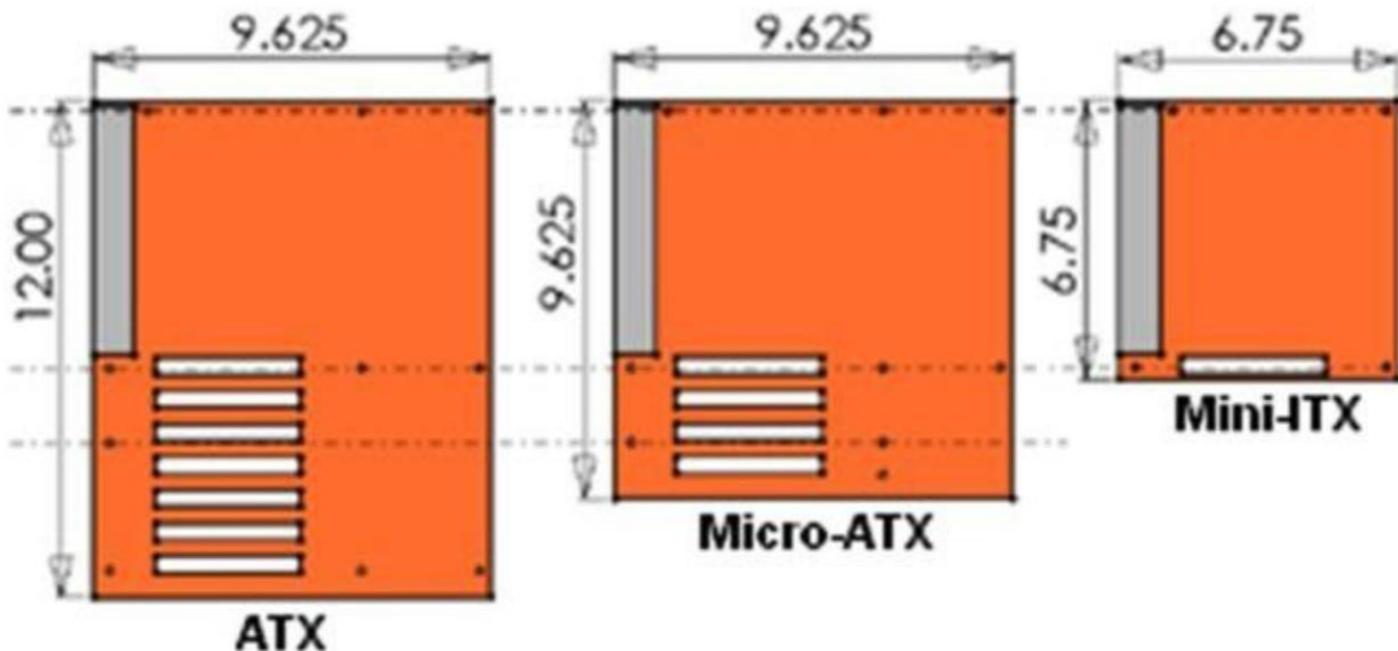
Asus



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Biostar





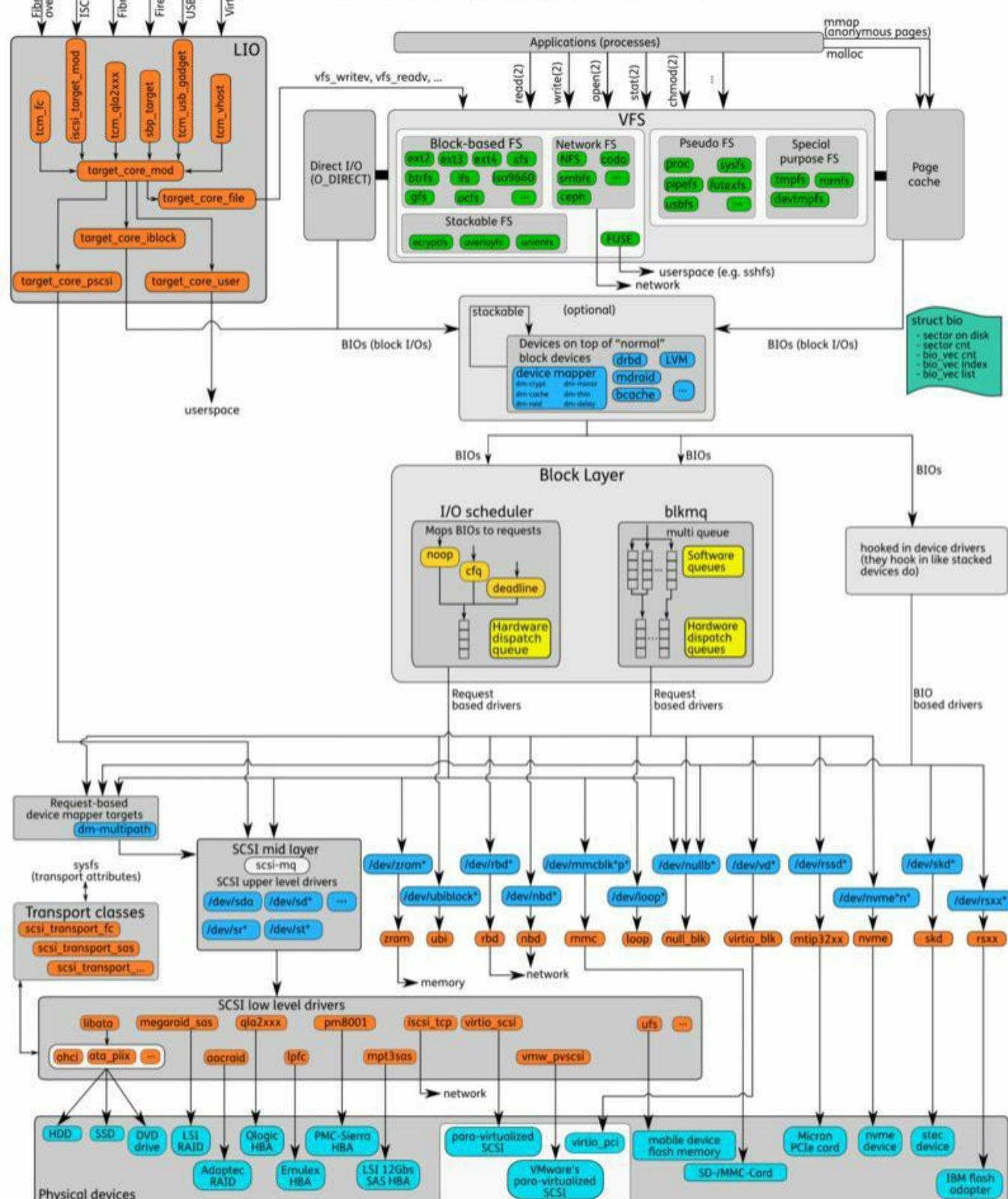
ATX is the de facto standard, and offers the most space for features and expansion. Mini-ITX allows for compact PCs that still have space for one graphics card, while Micro-ATX splits the difference in both size and expansion.

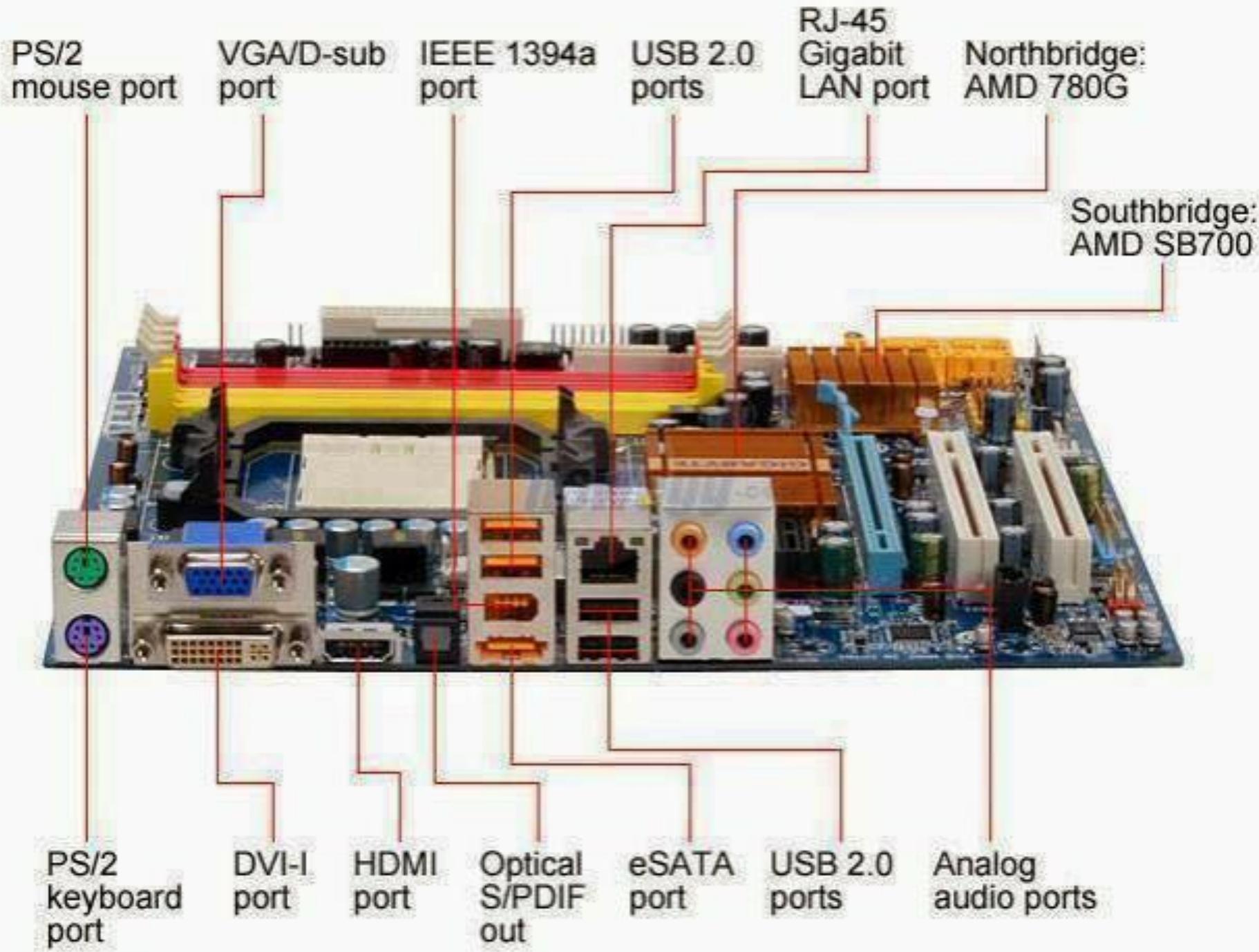
You may also run across E-ATX motherboards, which are larger than ATX, but those are primarily used in workstation systems. And a tiny Mini-STX form factor (5.5x5.7 inches) also exists, but is extremely rare. As of this writing, Newegg was

# The Linux Storage Stack Diagram

version 4.10, 2017-03-10

outlines the Linux storage stack as of Kernel version 4.10





# Processor Families

+ Intel® Core™ X-series

+ Intel® Core™ i9

+ Intel® Core™ i7

+ Intel® Core™ i5

+ Intel® Core™ i3

+ Intel® Pentium®

+ Intel® Celeron®

+ Intel® Xeon®

# Memory

## ROM

Read Only Memory

## RAM

Random Access Memory

### PROM

- Programmable Read Only Memory

**EPROM** - Erasable Programmable Read Only Memory

**EEPROM** - Electrically Erasable Programmable Read Only Memory

### SRAM

Static RAM

### DRAM

Dynamic RAM

### CACHE (L1, L2, L3)

## DRAM PACKAGES



## DRAM Types & Uses

SO DIMM (72, 100, 144, 200, 204pin)

Laptops

(SDRAM or DDR-SDRAM)  
DDR2-SDRAM  
DDR3-SDRAM

30-pin SIMM ————— FPM or EDO  
(Fast Page Mode or EDO)

72-pin SIMM ————— EDO or SDRAM  
(Extended Data Out)

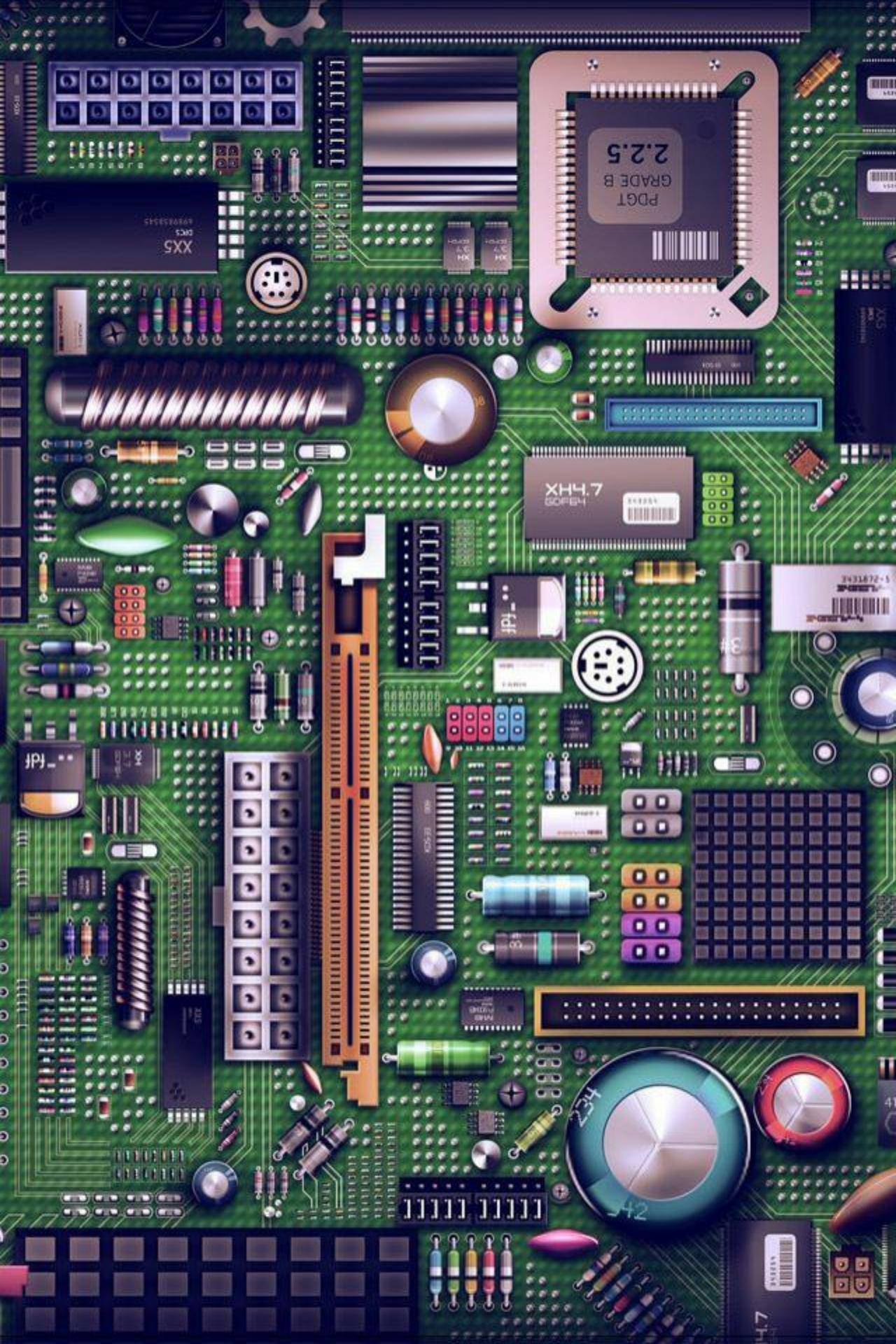
168-pin DIMM ————— SDRAM  
(Synchronous Dynamic RAM)

184-pin DIMM ————— DDR-SDRAM  
(Double Data Rate SDRAM)

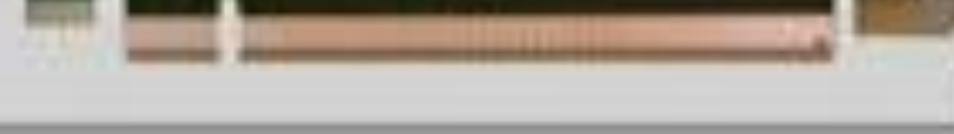
240-pin DIMM ————— DDR2-SDRAM  
(Double Data Rate 2 SDRAM)

184-pin RIMM ————— RDRAM  
(Rambus Dynamic RAM)

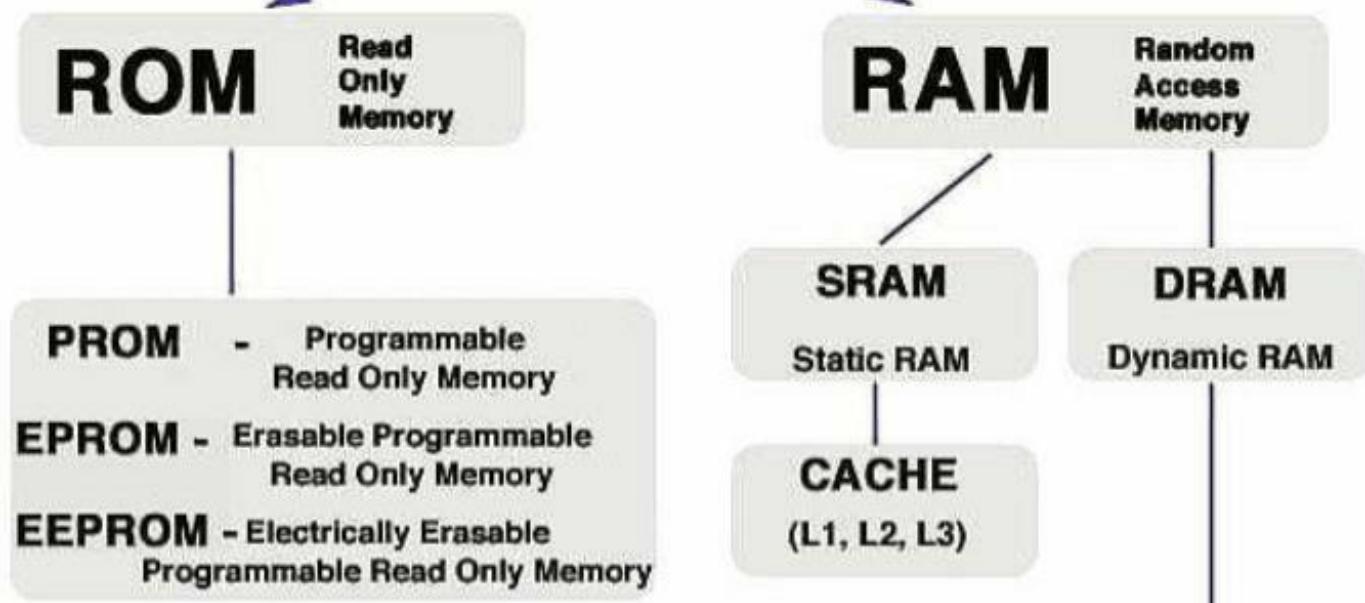
232-pin RIMM ————— RDRAM  
(Rambus Dynamic RAM)



# Peripheral Cards

NuBus	
eISA	
PDS	
ISA 8bit	
ISA 16bit	
PCI 5V	
PCI Universal	
PCI-X 5V	
AGP Universal	
AGP 3.3v	
PCIe x1	
PCIe x16	

# Memory



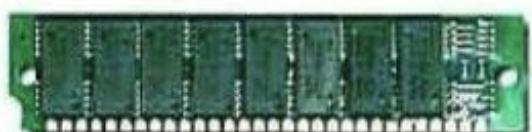
## DRAM PACKAGES



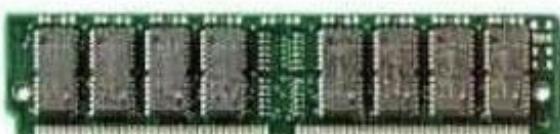
**SO DIMM** SDRAM, DDR, DDR2, DDR3 & DDR4 SDRAM  
72, 100, 144, 200, 204 & 260pin



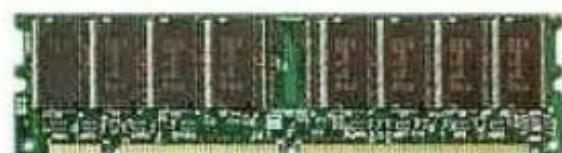
**Micro DIMM** SDRAM, DDR, DDR2, & DDR3 SDRAM  
172, 214pin



**30-pin SIMM** ————— **FPM or EDO**  
*(Fast Page Mode or EDO)*

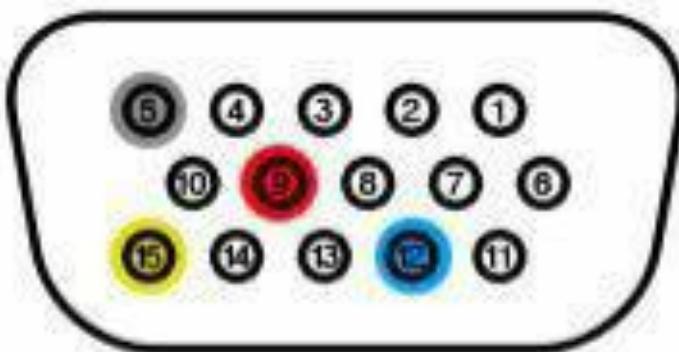


**72-pin SIMM** ————— **EDO or SDRAM**  
*(Extended Data Out)*



**168-pin DIMM** ————— **SDRAM**  
*(Synchronous Dynamic RAM)*

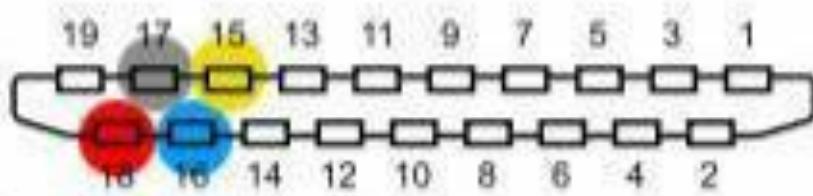
# VGA:



# DVI:



# HDMI:



● +5V  
● Ground

● Data  
● Clock



Connectors included on this power supply...



ATX 2.03 X 1



P4 ATX 12V X 1



IDE 4 PIN X 4

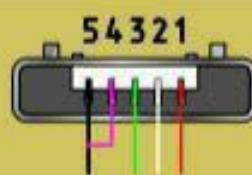


Floppy 4 PIN X 2

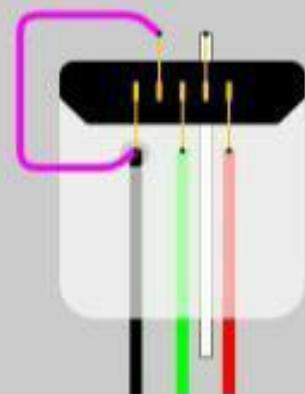
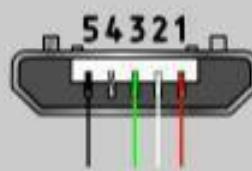
# USB-OTG



A micro



B micro



Назначение контактов  
Pin assignment

5

GND

4

ID

3

+Data

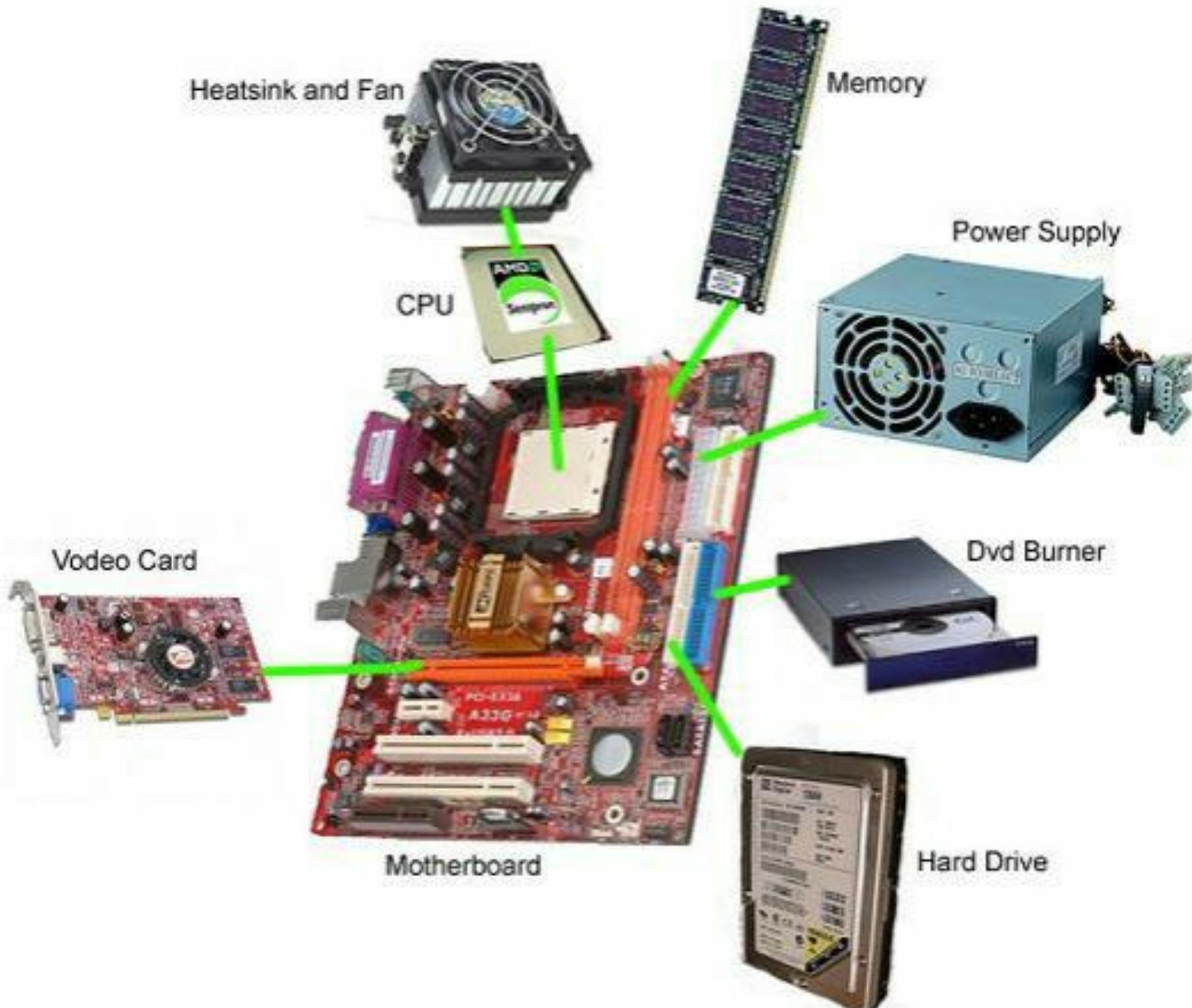
2

-Data

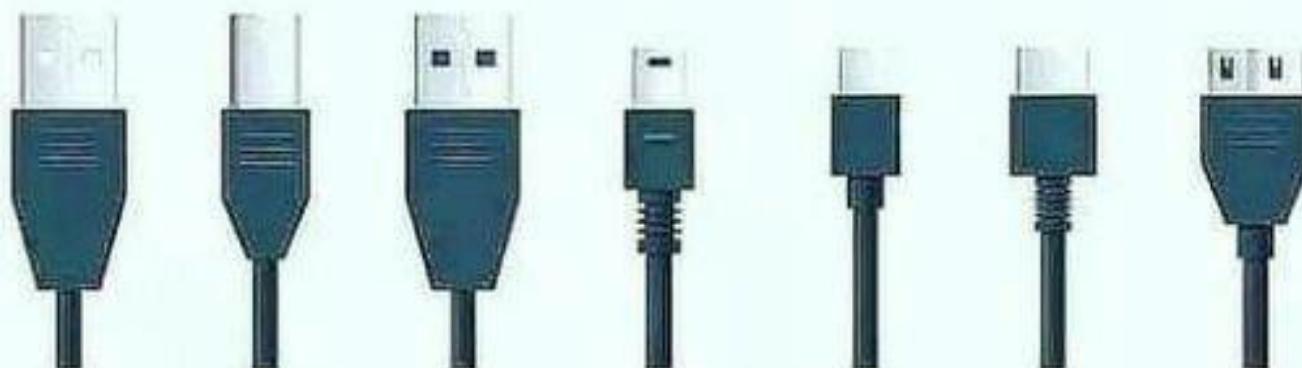
1

+5V

WWW.RONES.BU

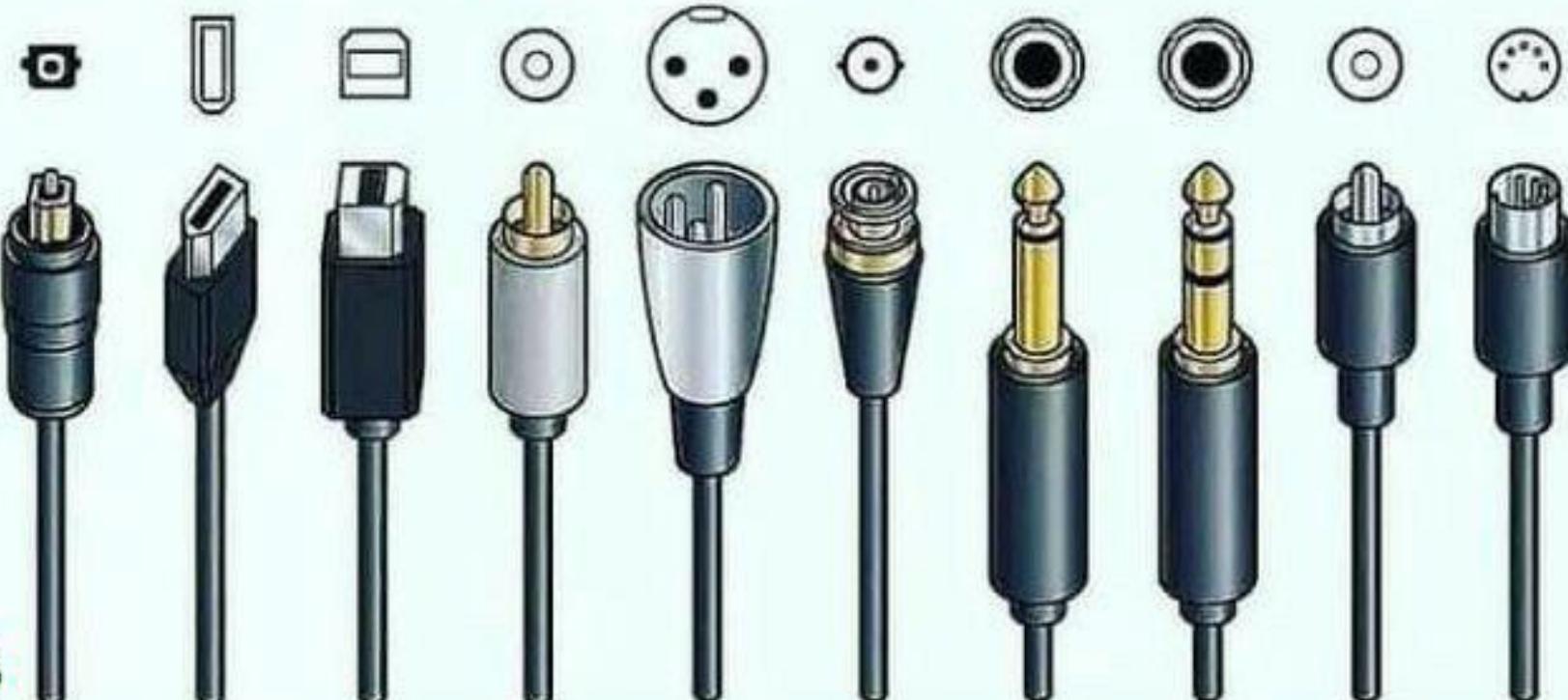


# **TYPES OF CABLES AND USB**

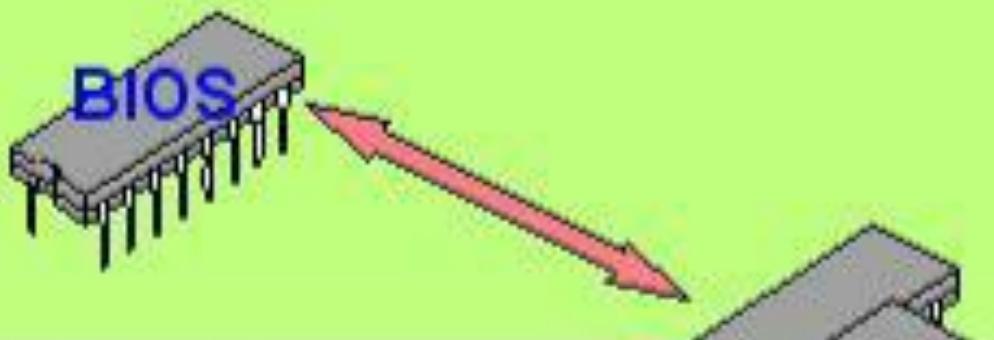


USB Type A    USB Type B    USB 3.0    USB Mini    USB Micro    USB Type C    USB Micro B

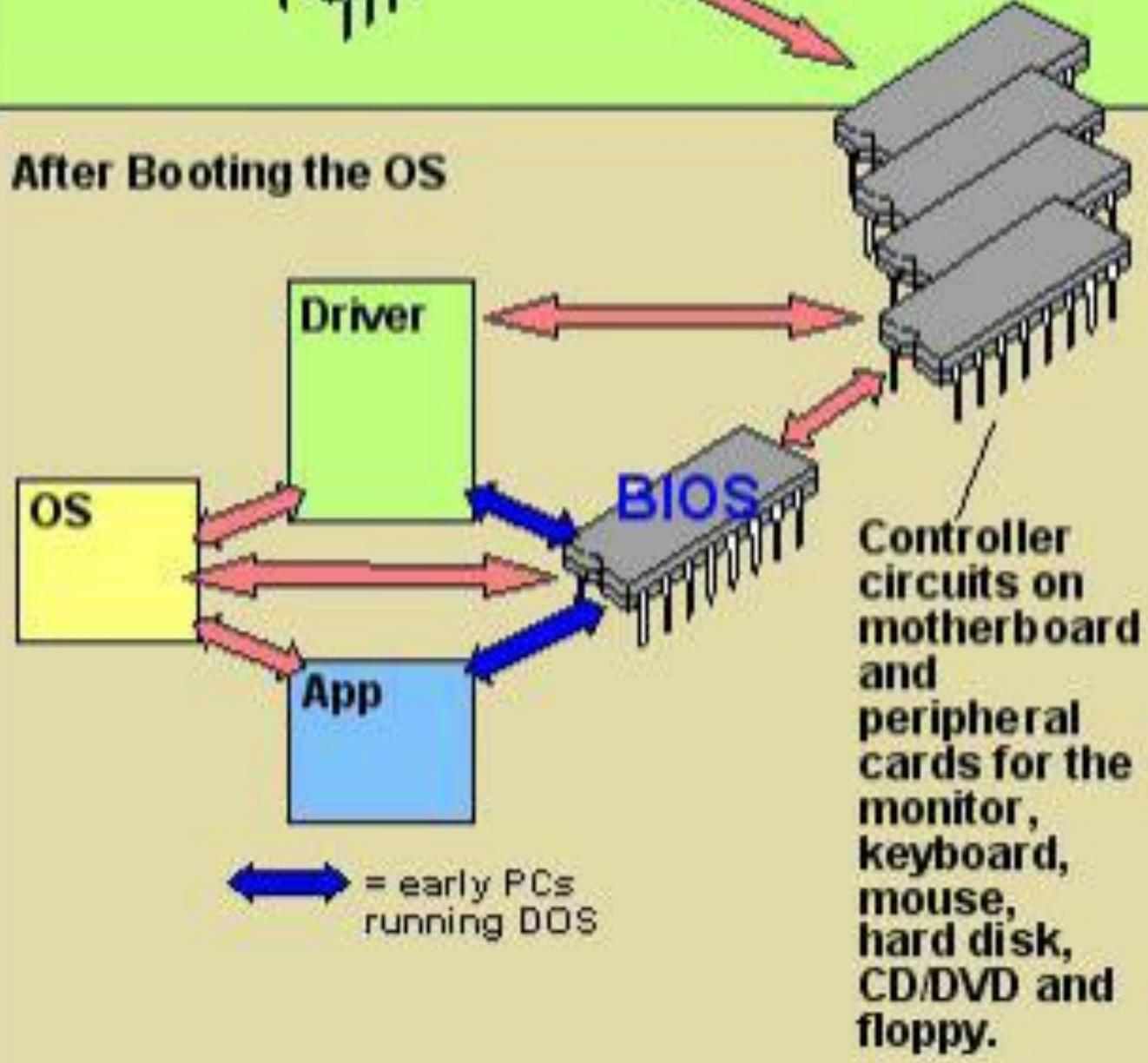
**ADAT**   **FIRE-**  
**WIRE**   **USB**   **S/PDIF**  
            **RCA**   **XLR**   **BNC**   **TS**   **TRS**   **RCA**   **MIDI**



## Pre-Boot Environment (before booting the OS)

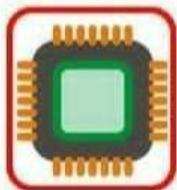


## After Booting the OS

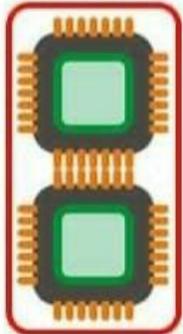


# **TYPES OF CPU**

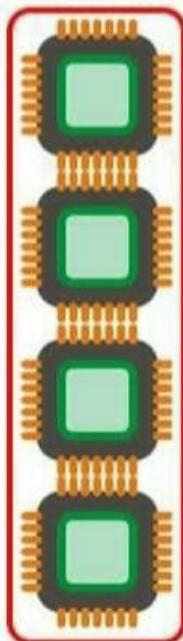
**SINGLE  
CORE**



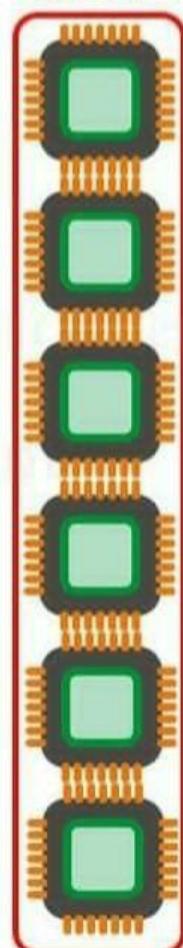
**DUAL  
CORE**



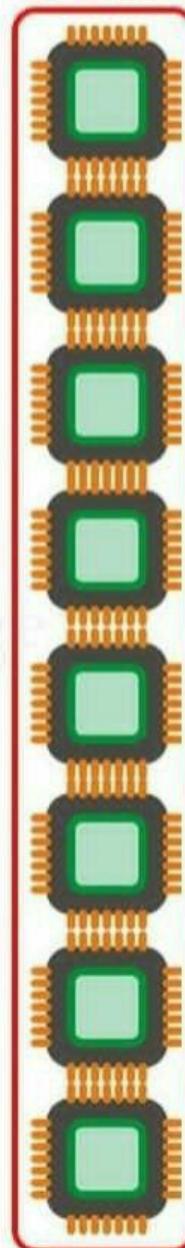
**QUAD  
CORE**



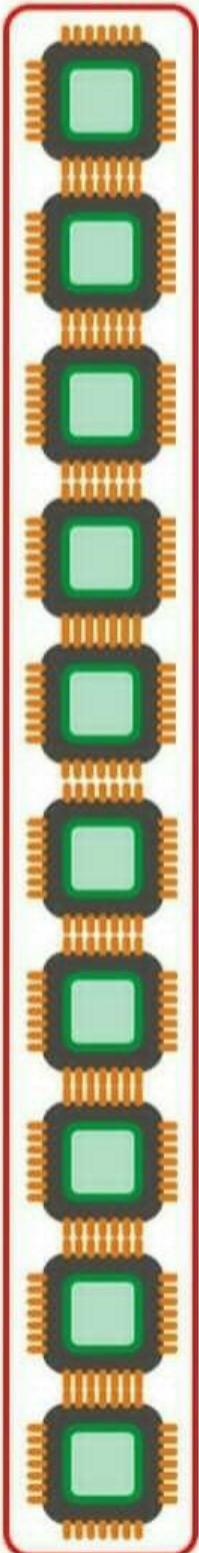
**HEXA  
CORE**



**OCTA  
CORE**



**DECA  
CORE**

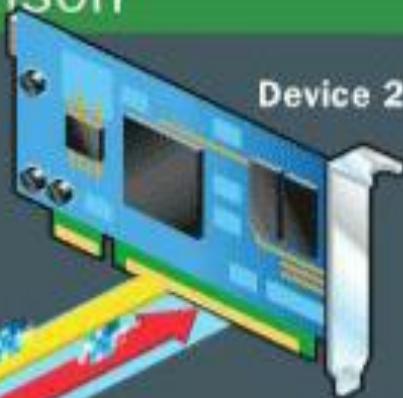


# PCI Express PCI Comparison

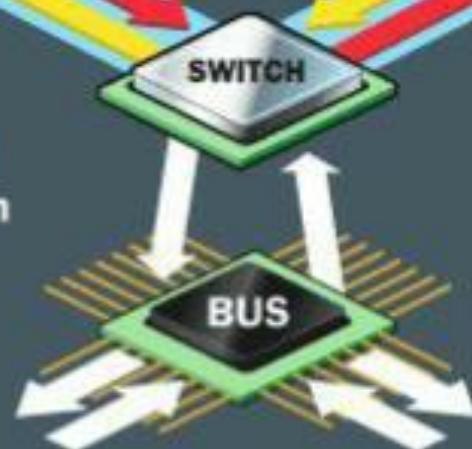
Device 1



Device 2



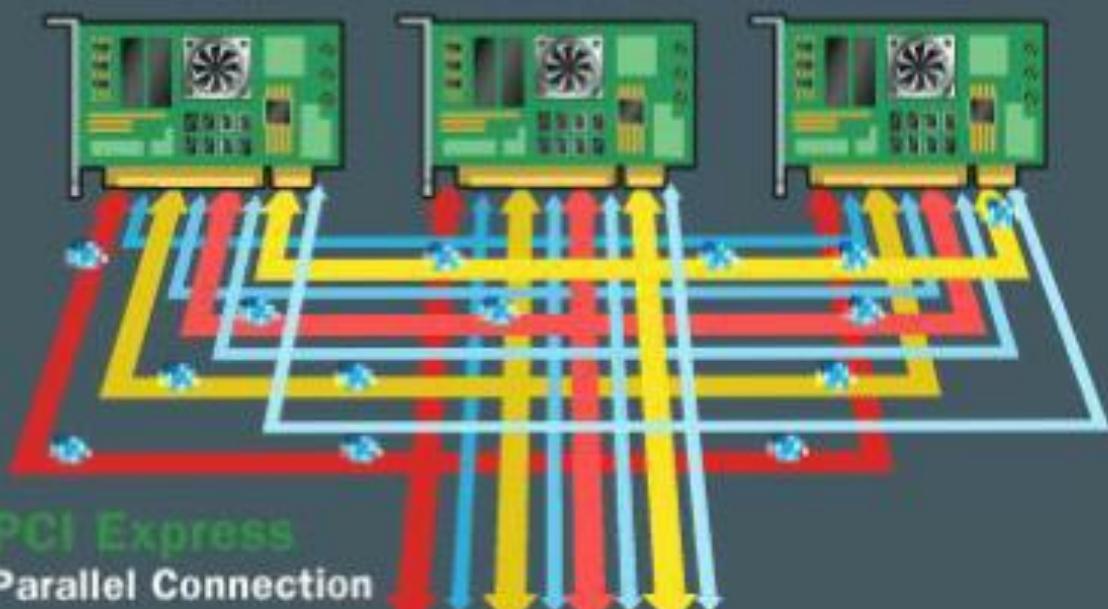
**PCI Express  
Serial Connection**



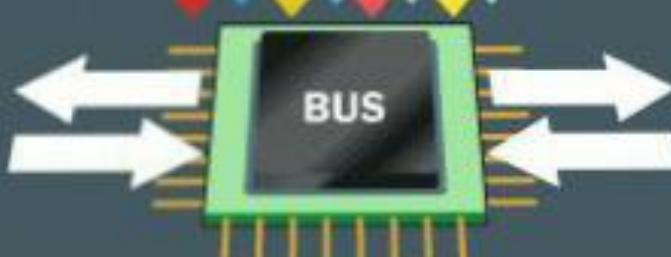
Device 1

Device 2

Device 3



**PCI Express  
Parallel Connection**





(Computer)

## MEMORY UNITS

1 Bit = Binary Digit

8 Bits = 1 Byte

1024 Bytes = 1 KB (Kilo Byte)

1024 KB = 1 MB (Mega Byte)

1024 MB = 1 GB(Giga Byte)

1024 GB = 1 TB(Tera Byte)

1024 TB = 1 PB(Peta Byte)

1024 PB = 1 EB(Exa Byte)

1024 EB = 1 ZB(Zetta Byte)

1024 ZB = 1 YB (Yotta Byte)

1024 YB = 1 (Bronto Byte)

1024 Brontobyte = 1 (Geop Byte)

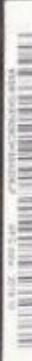
Lenovo

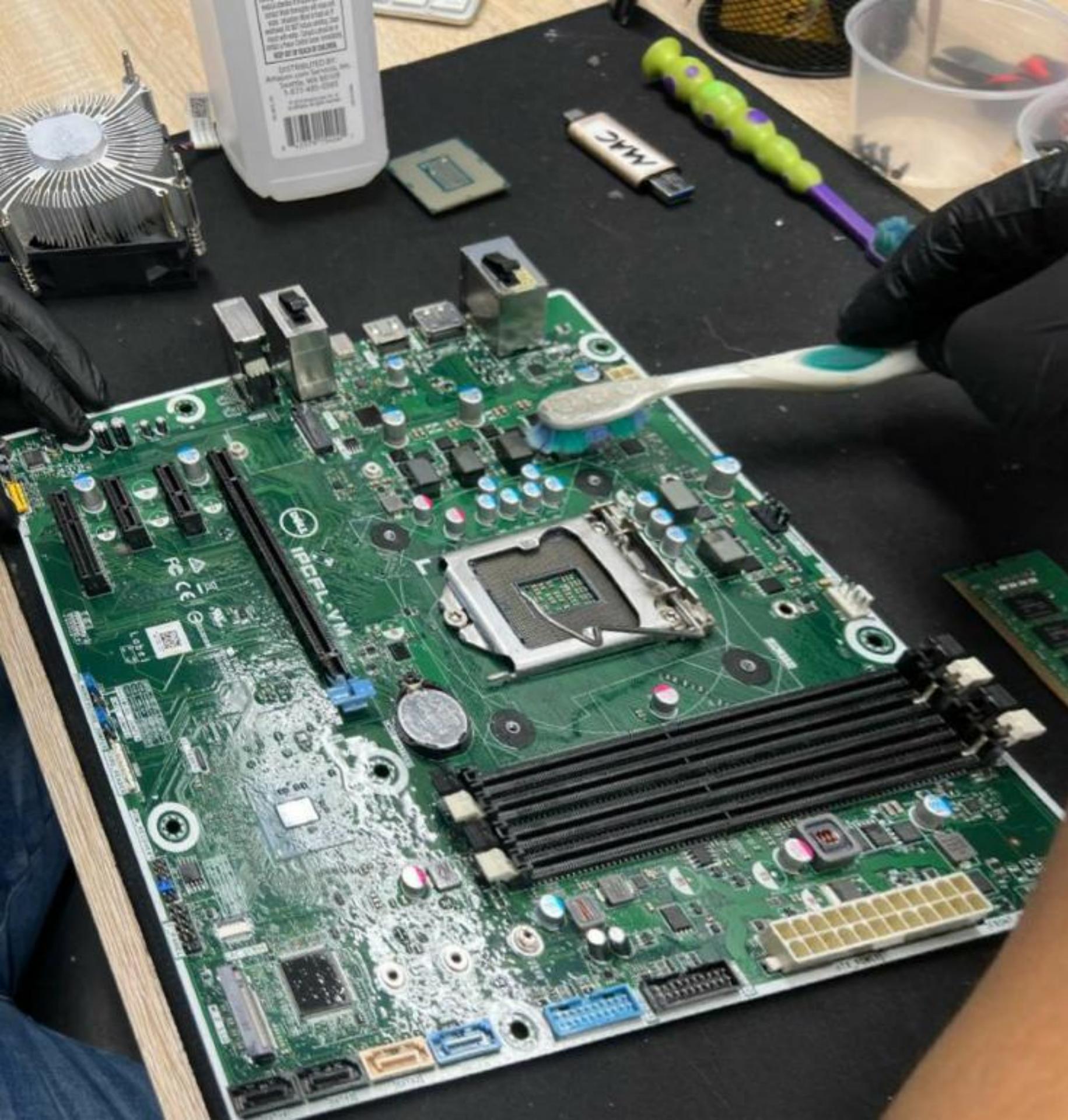
M2xL4



▲  
SCHERRE KENNT SIE DAS GESETZ FÜR ELEKTRONISCHE ALTGERÄTE?  
FREI: Elektronische Altgeräte dürfen nicht in den Hausmüll entsorgt werden.  
DIESE ALTGERÄTE MÜSSEN AUF SEINER WEGE DURCH DEN ZWECK-  
HALTERUNGSPUNKT GEbracht werden.  
ZWECKHALTERUNGSPUNKTE SIND IN DEN GEMEinden UND  
STADTEN VERSCHEIDET. SIE KÖNNEN AUCH BEI REPARATUR-  
FIRMEN, REPARATURDICHTELEN UND REPARATUR-  
FIRMS AUFGEFUNDEN WERDEN.  
WENN SIE ALTGERÄTE WERFEN, SIE MÜSSEN VOR DER ENTSCHEIDUNG,  
DASS SIE WIEDERVERWERTET WERDEN, VORBEREITET WERDEN.  
WICHTIG: KEINE SCHÄDLICHEN STOFFE WERDEN HIN-  
GEZOGEN.

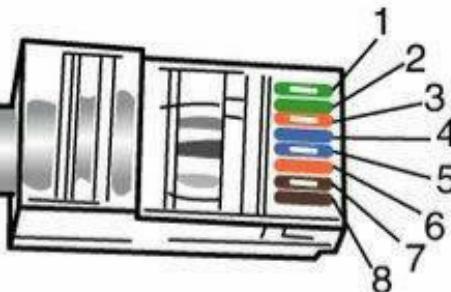
CAUTION: Please note that use of another battery may present a fire or explosion  
Hazard. We recommend the use of the original battery. If the battery is damaged, please do not use it.  
RECYCLING: We encourage you to recycle the battery. Please contact your local recycling center or  
household hazardous waste disposal center for information on how to do this.  
RECYCLING: Please do not dispose of the battery in regular trash.  
RECYCLING: Please do not incinerate the battery.  
RECYCLING: Please do not disassemble the battery.  
RECYCLING: Please do not damage the battery.  
RECYCLING: Please do not expose the battery to water.





## Connector Head

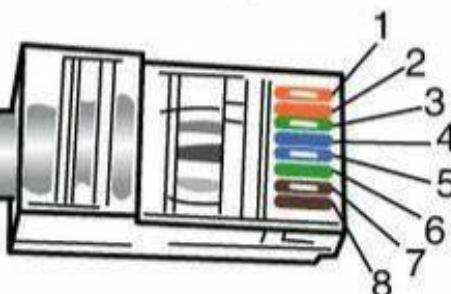
Bottom Side Up



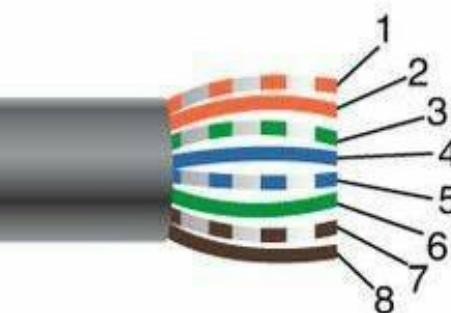
#	T568A COLOR
1	White-Green
2	Green
3	White-Orange
4	Blue
5	White-Blue
6	Orange
7	White-Brown
8	Brown

## Connector Head

Bottom Side Up



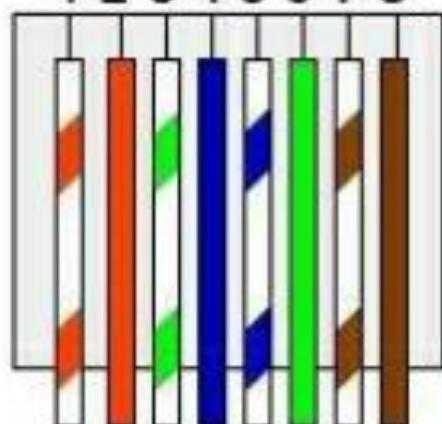
#	T568B COLOR
1	White-Orange
2	Orange
3	White-Green
4	Blue
5	White-Blue
6	Green
7	White-Brown
8	Brown



# RJ-45 Color Code

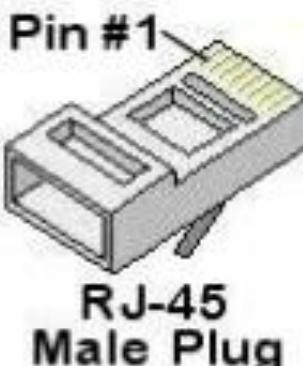
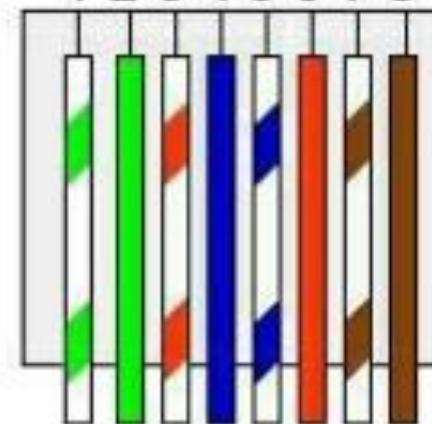
## T-568B Standard

1 2 3 4 5 6 7 8



## T-568A Standard

1 2 3 4 5 6 7 8



Pin #	Ethernet 10BASE-T 100BASE-TX	EIA/TIA 568A	EIA/TIA 568B or AT&T 258A
1	Transmit +	White with green stripe	White with orange stripe
2	Transmit -	Green with white stripe or solid green	Orange with white stripe or solid orange
3	Receive +	White with orange stripe	White with green stripe
4	N/A	Blue with white stripe or solid blue	Blue with white stripe or solid blue
5	N/A	White with blue stripe	White with blue stripe
6	Receive -	Orange with white stripe or solid orange	Green with white stripe or solid
7	N/A	White with brown stripe or solid brown	White with brown stripe or solid brown
8	N/A	Brown with white stripe or solid brown.	Brown with white stripe or solid brown.



Speakers



- 1.DISKPART**
- 2.list disk**
- 3.select disk disk\_no**
- 4.clean**
- 5. Convert MBR or GPT**
- 6.EXIT**

```
Administrator: X:\windows\SYSTEM32\cmd.exe
microsoft DiskPart version 10.0.19041.964
Copyright (C) Microsoft Corporation.
On computer: MININT-1MD07QA

DISKPART> list disk

Disk ### Status Size Free Dyn Gpt
----- -----
Disk 0 Online 931 GB 0 B
Disk 1 Online 119 GB 0 B *
Disk 2 Online 57 GB 25 GB

DISKPART> select disk 0

Disk 0 is now the selected disk.

DISKPART> clean

DiskPart succeeded in cleaning the disk.

DISKPART> convert mbr

DiskPart successfully converted the selected disk to MBR format.

DISKPART> exit

Leaving DiskPart...

X:\Sources>exit
```

# MBR vs GPT

You can create up to four partitions on a basic disk using the MBR partition scheme

GPT allows for a nearly unlimited amount of partitions, and the limit here will be your operating system

@akinfogeek

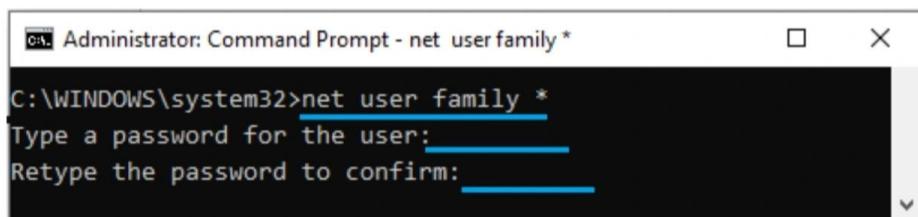
MBR does have its limitations. For starters, MBR only works with disk up to 2 TB in size

GPT uses 64 bit for logical block addresses , allowing a maximum disk size of 2<sup>64</sup> sectors. For disk with 512-byte sectors, the maximum size is 9.4 ZB

It's easy to call GPT far more superior than MBR. However, older OS like Windows XP will not be able to operate with GPT disks. They may only be able to see the protective MBR layer of the GPT disk. On the other hand, only the 64-bit editions of newer OS like Windows 7 and above or Windows Server 2003 and above that support booting on UEFI based system, but either the 64-bit or 32-bit editions can use GPT partition to store data.

## 2. Another Way to Change Windows Password Using Command Prompt

Open Command Prompt, type **net user** **Username \*** > press **Enter** key > Type **New Password** and Retype the **New Password** to confirm.



The screenshot shows an 'Administrator: Command Prompt' window. The title bar reads 'Administrator: Command Prompt - net user family \*'. The command 'C:\WINDOWS\system32>net user family \*' is typed in the prompt. Below it, two password fields are displayed: 'Type a password for the user:' and 'Retype the password to confirm:', both containing underscores.

**Note:** In above command, replace **Username** with your actual **User Name** (Family in this case).

Administrateur : X:\windows\system32\cmd.exe - diskpart

Microsoft Windows [version 10.0.15063]

X:\Sources>diskpart

Microsoft DiskPart version 10.0.15063.0

Copyright (C) Microsoft Corporation.

Sur l'ordinateur : MINWINPC

DISKPART> list disk

Nº disque	Statut	Taille	Libre	Dyn	GPT
Disque 0	En ligne	60 G octets	0 octets	*	

DISKPART> sel disk 0

Le disque 0 est maintenant le disque sélectionné.

DISKPART> clean

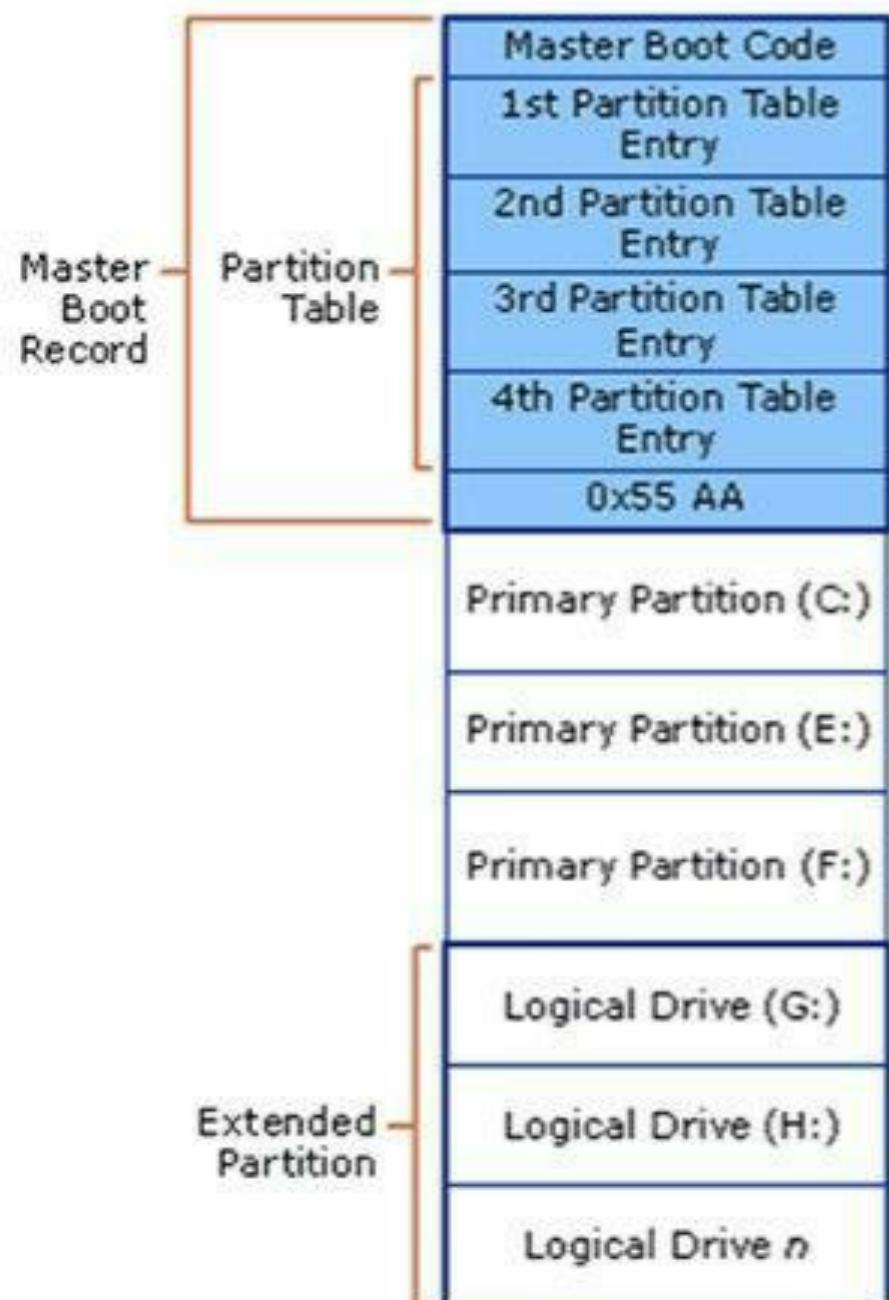
DiskPart a réussi à nettoyer le disque.

DISKPART> convert gpt

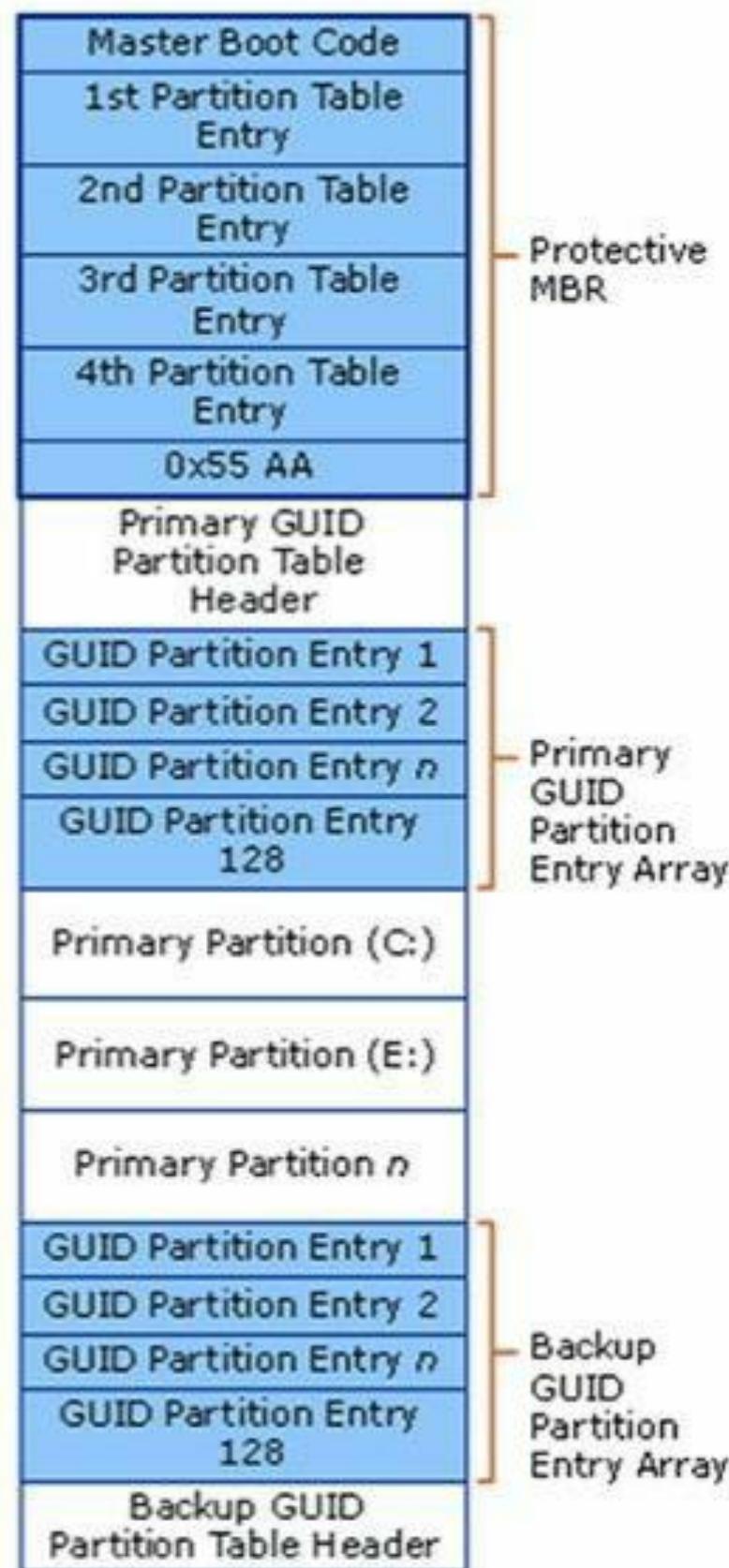
DiskPart a correctement converti le disque sélectionné au format GPT.

DISKPART>

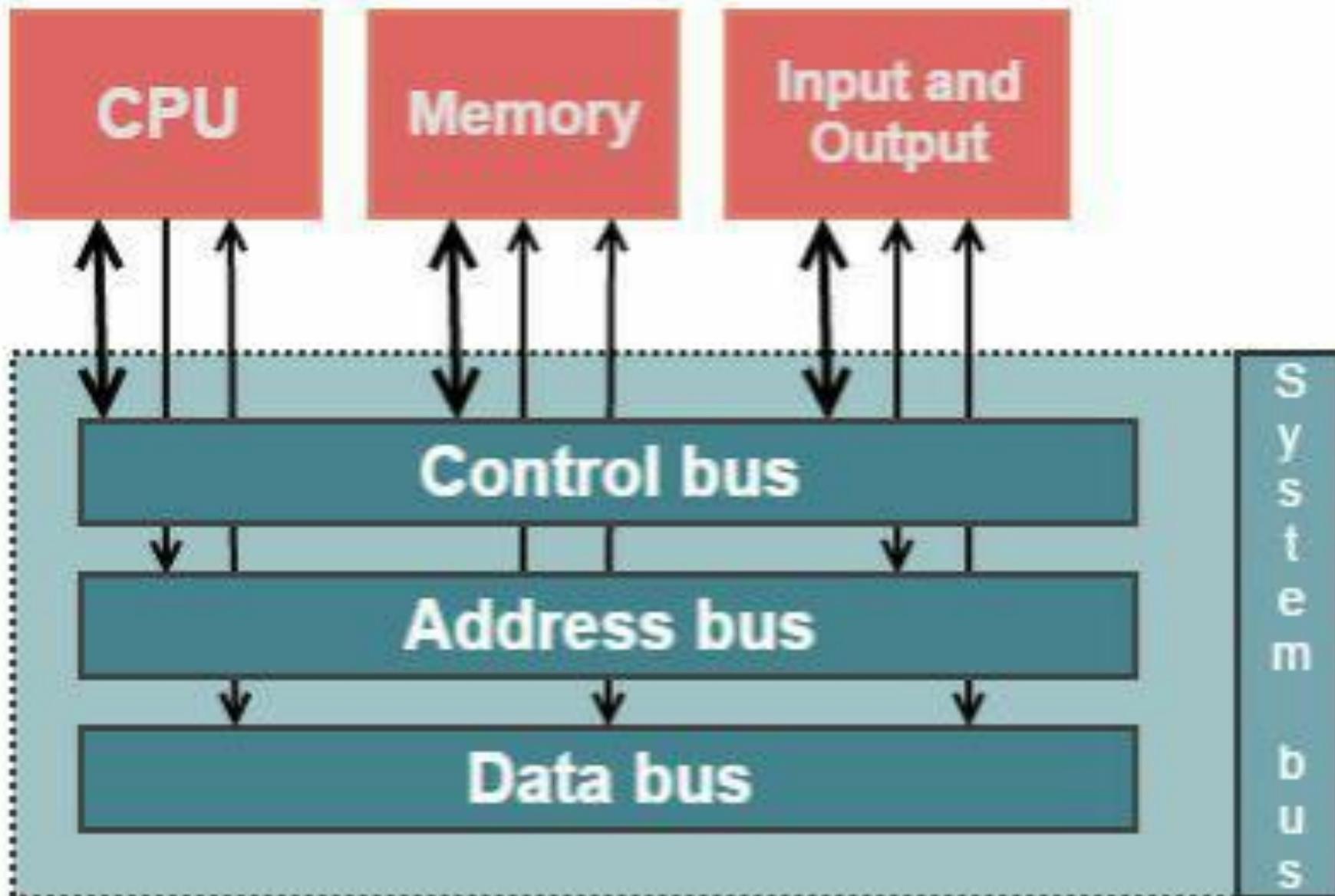
## MBR Partition Table Scheme

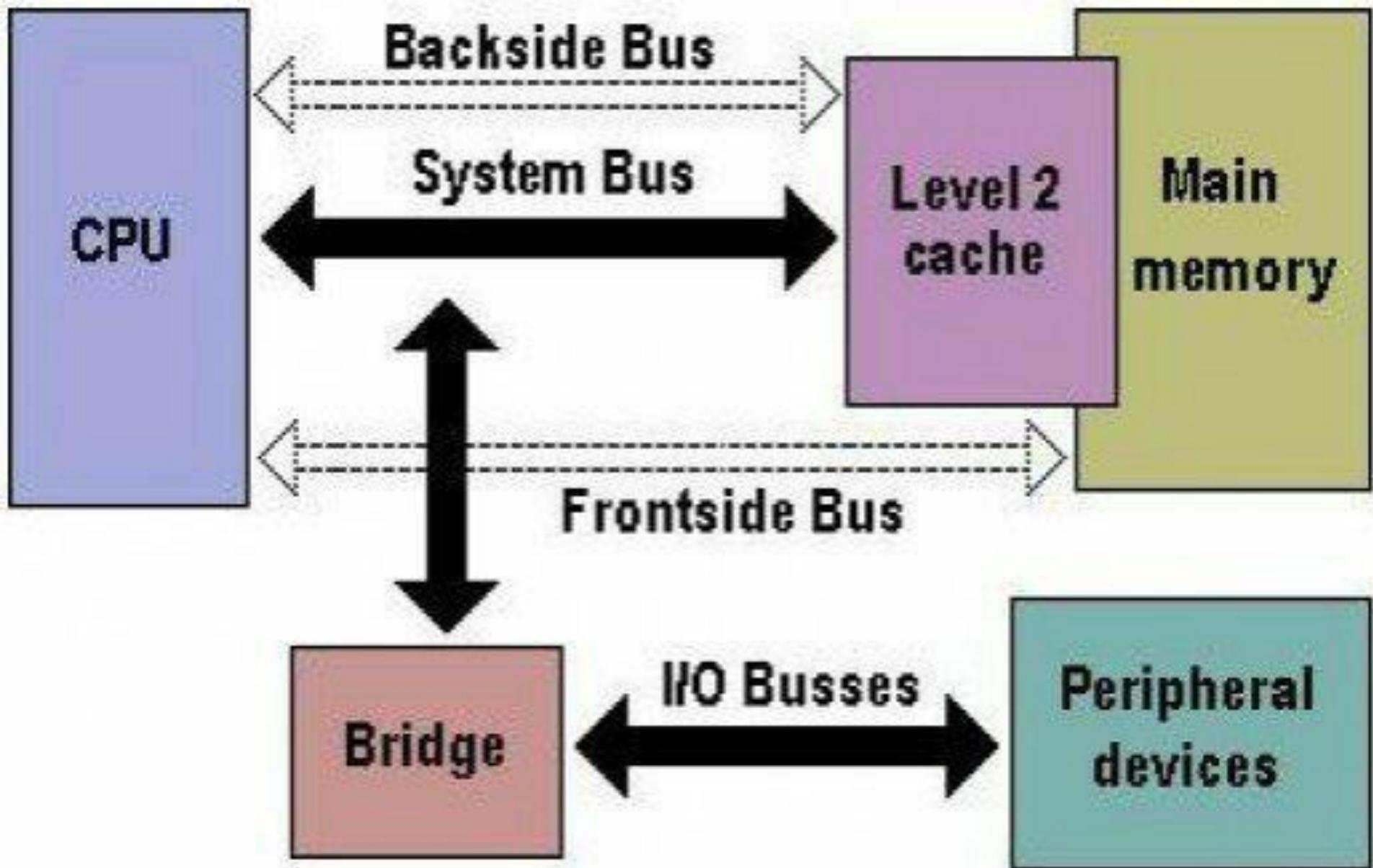


## GPT Partition Table Scheme



# System Bus Architecture





# What are the different types of computer buses?

Computers normally have two bus types:-

- **System bus** – This is the bus that connects the CPU to the motherboard's main memory. The system bus is also known as a front-side bus, a memory bus, a local bus, or a host bus.
- A number of **I / O Buses**, (I / O is an input/output acronym) connecting various peripheral devices to the CPU. These devices connect to the system bus through a 'bridge' implemented on the chipset of the processors. Other I / O bus names include "expansion bus," "external bus" or "host bus"

# What are the different components of a bus?

Each bus possesses three distinct communication channels.

Following are the three components of a bus: –

- The **address** bus, a one-way pathway that allows information to pass in one direction only, carries information about where data is stored in memory.
- The **data** bus is a two-way pathway carrying the actual data (information) to and from the main memory.
- The **control** bus holds the control and timing signals needed to coordinate all of the computer's activities.

# FILE EXTENSION

By: Codehub.py

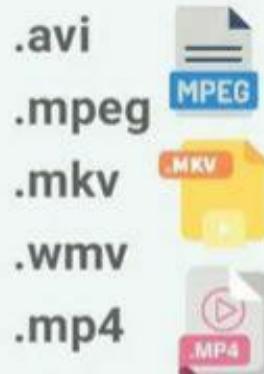
## TEXT



## COMPACTON



## VIDEOS



## AUDIOS



## EXECUTABLES



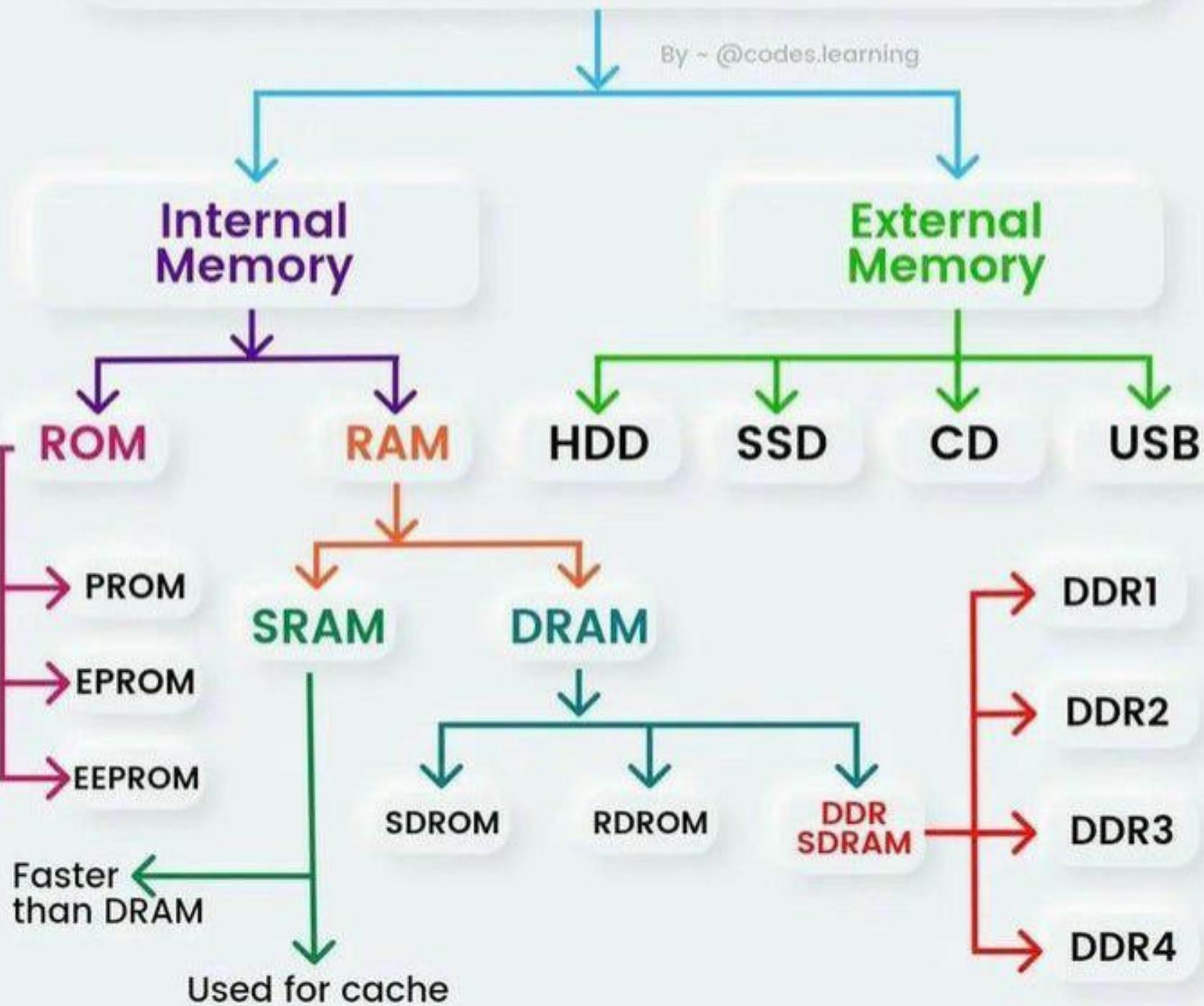
## IMAGES



Codehub.py

# TYPES OF COMPUTER MEMORY

By ~ @codes.learning



# Features of PowerShell



# SAMSUNG

[F2] for Setup, [F4] for Recovery



[F2] for Setup, [F4] for Recovery

Opening the tool on startup can be tricky, even if your computer doesn't show any hot-key listed on the logo screen, you can use these suggest hot keys according to your laptop's brand as I mentioned below:

- **Acer** – Alt + F10
- **Asus** – F9
- **Dell/Alienware** – F8
- **HP** – F11
- **Lenovo** – F11
- **MSI** – F3
- **Samsung** – F4
- **Sony** – F10



Hit it the appropriate key or the combination of keys again and again, until you see something like '**Please wait**' in Windows 8/8.1/10 or '**Loading files**' in Windows 7, to get to the recovery wizard.

# How to Manage Partitions with Disk Partition CMD in Windows 11/10?

## Overview of disk partition cmd

Cmd, the abbreviation for command, is a Microsoft Windows command that opens the Windows command line window.

Notes: Windows 95 & 98 users can only enter the command line by entering command; other Windows users can enter command or cmd to use.

### How to open Windows cmd

Method 1: You can input cmd in the Start Menu search bar to open the Windows Command Prompt.

Method 2: You can press Win+R to open the Run box, type cmd, and press Enter.

### What is Diskpart

After open cmd, you need to type 'diskpart' for disk partitioning.

Diskpart is a command-line utility in Windows 10, which enables you to operate disk partition by using Diskpart command prompt, including create, merge, extend, shrink, format, delete, wipe disk partition, and other features.

### How to use disk partition cmd in Windows 11/10

Steps to create a partition in Windows 11/10 using command prompt.

Warning: Do not use the Diskpart until a full backup.

Step 1: You can use the two methods mentioned above to open the command prompt or Run window.

Step 2: Enter Diskpart

Steps about essential partition functions are as follows:

- Create a partition using Diskpart

1. At the Diskpart prompt, type: List Disk

2. Input: Select Disk \* (\* represents the disk number)

3. Type: Create partition primary size=\*(\* means the partition size.)

4. Input: Assign letter=\*(\* represents Choose a drive letter not already being used.)

5. Type: Exit (Exit is the Esc on the top left of the keyboard.)

- Extending a partition using Diskpart

Microsoft DiskPart version 10.0.16299.15

Copyright (C) Microsoft Corporation.

On computer: DESKTOP-19ULK5G

DISKPART> list disk

Disk #	Status	Size	Free	Dyn	Gpt
Disk 0	Online	500 GB	380 GB		

DISKPART> select disk 0

Disk 0 is now the selected disk.

DISKPART> create partition primary size=20480

DiskPart succeeded in creating the specified partition.

DISKPART> assign letter=H

DiskPart successfully assigned the drive letter or mount point.

DISKPART> format fs=ntfs quick

100 percent completed

DiskPart successfully formatted the volume.

DISKPART>

(c) himanshu

Note: If you try it or any other method, make sure you have a full backup.

1. Verify that contiguous free space is available on the same drive and that free space is next to the partition you intend on extending, with no partitions in between.
2. Type: Select Disk \* (Selects the disk.)
3. Type: Select Volume \*(Selects the volume.)
4. Type: Extend Size=\*
5. Type: Exit

- **Deleting a partition using Diskpart**

Note: You cannot delete an active system or boot partition or a partition with a dynamic page file.

1. Input: Diskpart.exe
2. Select disk \*
3. Select Partition \*
4. Delete partition
5. Exit

- **Wiping a disk using Diskpart**

This operation deletes all data on the disk.

1. Type: Select disk \*
2. Type: Clean all(The CLEAN ALL command removes all partition and volume information from the hard drive being focused on.)
3. Exit

The diskpart also has other features, such as assign drive letters, shrink partition, mark partition as active, convert MBR/GPT. If you want to learn these parts, FAQ, at the end of the article, will bring you the right answer.

After reading the above guide, I believe you have a specific understanding of how to use cmd via Diskpart in Windows 11/10. Cmd is a powerful tool, but it is not suitable for a beginner. Misoperations can easily cause partition problems. There is a better software -- EaseUS Partition Master.

```
C:\Windows\system32\diskpart.exe
Microsoft DiskPart version 10.0.16299.15
Copyright (C) Microsoft Corporation.
On computer: DESKTOP-19ULKSG

DISKPART> list disk
Disk ### Status      Size     Free   Dyn Gpt
----- -----
Disk 0  Online       500 GB  380 GB

DISKPART> select disk 0
Disk 0 is now the selected disk.

DISKPART> create partition primary size=20480
DiskPart succeeded in creating the specified partition.

DISKPART> assign letter=M
DiskPart successfully assigned the drive letter or mount point.

DISKPART> format fs=ntfs quick
100 percent completed

DiskPart successfully formatted the volume.

DISKPART>
```

# System Troubleshooting.

## Reason & Solution

**A). Not getting Power to Both CPU and MONITOR,** then check Mains, UPS / Stabilizer, Spike busters Cables, Switches, Fuses, Sockets Etc..

**B). Not getting Power to Monitor,** Press Power Card at rear panel, Press plug on Spike buster, Insert into another socket. If not solved test with CPU Power Card If works Monitor Power Card has damaged, If not works there is problem in Monitor, then give it to repair.

**C). Not getting Power to CPU,** then press Power Card at SMPS, Switch on SMPS, press plug on Spike buster, insert into another socket . If not solved test with Monitor Power Card, If CPU works then CPU Power cable has damaged.

1

### Not Getting Power

If not solved open the cabinet and

1. Check Button connections at Button and Motherboard side in Cabinet by touching the power on pins by using tester.

2. Clear CMOS if not solved, then

3. Check SMPS by touching Black Wire and Green wires of Motherboard plug. If not working check SMPS Fuse.

If Fuse is OK, then check for damaged Capacitors. If Capacitors are damaged give it repair. Otherwise replace it

4. If SMPS works, check Capacitors on Motherboard. If Capacitors are damaged give it for repair. Otherwise replace Motherboard.

## Hear Beeps

**A). If you hear a single beep,** then the problem everything is ok in System Unit. Then the problem may with Monitor Data Cable or Problem within the Monitor. Tight Monitor Data Cable at both sides. If not solved test with another data cable. Otherwise there will be problem within Monitor.

**B). If you hear continuous long beeps,** then the problem is with RAM / Motherboard. Clean and Reinstall the RAM If not solved, test your RAM on another System and test with another RAM on your System If RAM has damaged replace with another one. If RAM is working there may problem within Motherboard.

**C). If you hear one long and 2/3 Short beeps,** then the problem is with Display Card / Motherboard. Clean and Reinstall the Display Card, If not solved test your Display Card on another System and test with another Card on your System. If Display Card has damaged Replace with another.

No Display /  
No Signal  
Message after  
switch on

2 CPU and Monitor  
Power Supply is  
OK

With Beeps from  
System Speaker

- If Display Card is working then there may be problem within Motherboard.

- If it is onboard display then Clear the CMOS.

- If not solved then the onboard GPU fail, install add-on graphics card.

**D). If you hear high frequency beeps,** then the problem is with CPU overheat, check cooling fans.

**E). If you hear low and high beeps,** then the

problem may be with CPU / Motherboard check  
CPU and Motherboard with another system.

No Display /

No signal  
message  
after switch on

This means Power Supply Unit, Motherboard,  
CPU and Memory is OK.

1) Then the problem with Monitor Data Cable.  
Tight both System Unit and Monitor side.

2). If not solved check with another cable.

3) If not solved, then the problem is with Display  
Card or Monitor. Then check Display Card and  
Monitor by attaching them to another System or  
check with another display Card or Monitor with  
you System.

4). If Display Card has damaged replace with  
new one

5). If Monitor is not working give it for repair

1). Clear CMOS, If not solved.

2). Check for damaged Capacitors on  
motherboard.

3). Problem may be with HDD, CD/DVD, and  
Expansion Cards, disconnect them and check.

4). May be RAM problem Clean and Reinstall  
RAM. If not solved check the RAM on another  
System.

5). If not solved the problem may with PSU,  
Motherboard or Processor. First check PSU.

6) If not solved check CPU on another  
Motherboard and check another CPU on this

No Beeps from  
System Speaker

Num-Lock

4  
SMPS and  
Monitor Power  
Supply is OK

## Doesn't Operates Motherboard.

7. If CPU is gone replace with new.

8. If CPU is ok, then replace Motherboard

## Resolution Problem

5 No Signal / Out of Sync / Frequency out of Range message after Starting Windows

In Windows XP Press F8 while booting and select VGA mode while booting. And change resolution in display properties.

5

Starting Windows In Windows 7 /8 Press F8 while booting and select Low Resolution Mode(640,480) And change resolution in display properties.

CMOS Check Sum error /

1). Check 3 Volts Battery and Replace the battery If necessary.

6 Battery failure message

2). If 3Volts Battery is ok. May with loose contact tight them.

Date and Time are not storing.

3). Check CMOS Jumpers.

7

Disk Boot failure

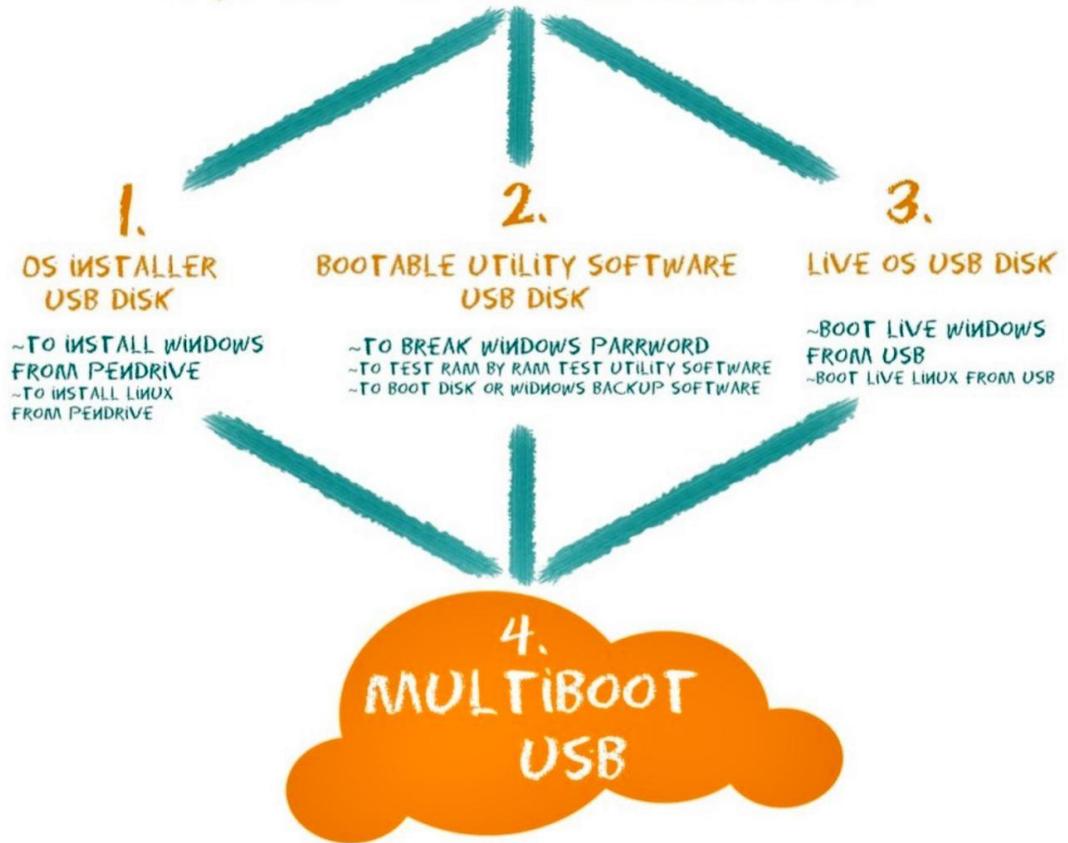
3). If not solved test them on another System or test another Drives on your System.

4). Check the Boot sequence in BIOS.

5) Boot Record may damaged, Rebuilt them (See Windows XP / Windows 7/8 troubleshooting given in previous pages.

Boot Record Troubleshooting.

# TYPES OF BOOTABLE USB



STORE EVERY BOOTABLE FILES IN A SINGLE PENDRIVE

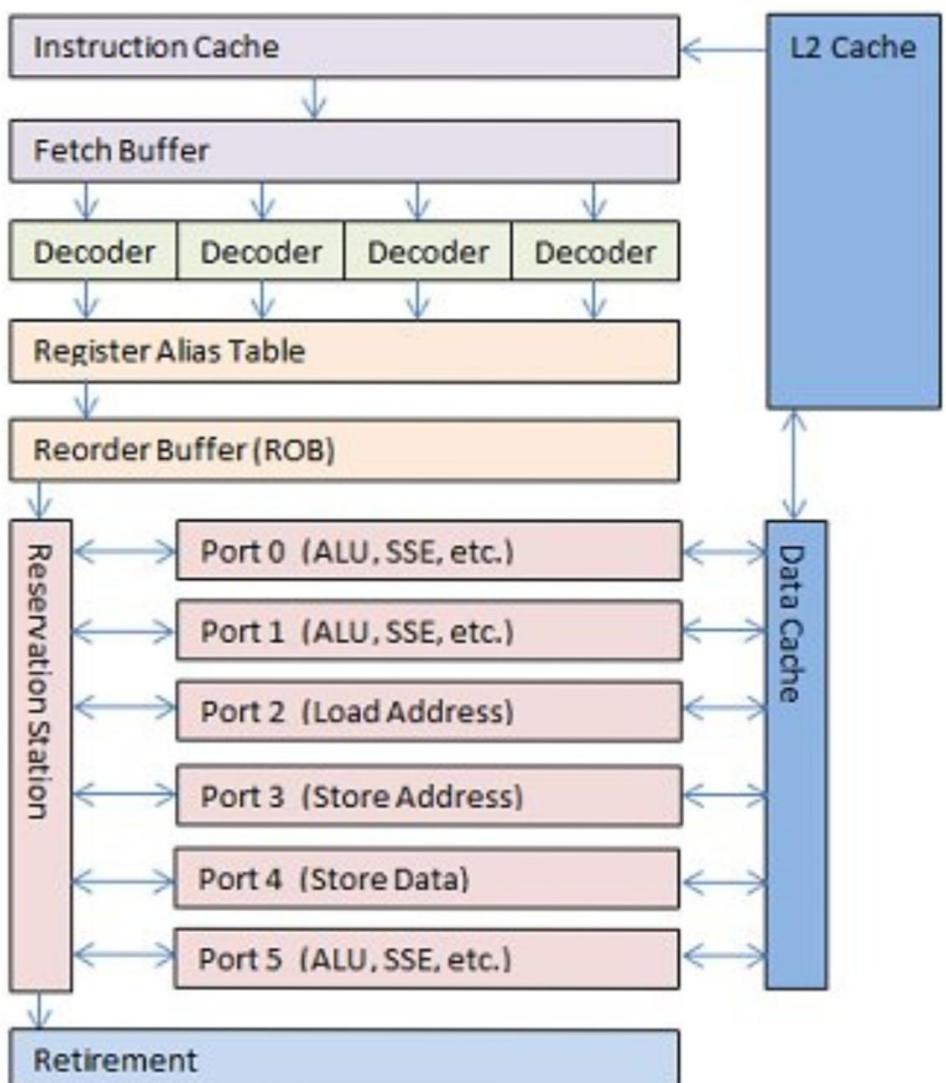
WINDOWS SETUP + SOFTWARES + LIVE USB = ONE PENDRIVE

- **Bootable USB To Install OS** – An OS Installer Disk is a type of bootable drive which we mainly use to install any kind of an operating system in your laptop or computer system, it's like installing Windows or Linux on your computer by just using a single USB stick.
- **Bootable USB To Boot Utility Software** – Bootable Software USB Disk is a type of bootable drive which we use to boot some useful Utility Software on our computer besides running an operating system. I mean using a bootable



Operating System	File System
DOS	FAT16
OS/2	HPFS
Unix/Linux	Unix/Linux file System.
Window 3.X	FAT/ VFAT
Windows 95	VFAT/ FAT16
Windows NT	NTFS
Windows 2000	NTFS
Windows XP	FAT32 / NTFS
Windows 7/ Vista	FAT32 / NTFS
Windows 8.1 / 10	NTFS
Windows 11	NTFS

A core is an individual block which fetches, decodes and executes instructions. A dual core processor has two of those blocks, a quad has four, an octa core has eight, etc. It usually consists the following components:



A simplified out-of-order x86 core design used by Intel since the Pentium Pro ([source ↗](#)).

With multiple cores, you need a ‘special glue’ to allow each core to ‘talk’ to one another and exchange data. This can either be a bus, a shared super fast cache or interconnects. Traditionally, that used to be the front-side bus (FSB) but modern processors now use a last level

## Network Connectors

Infiniband Connector



10G-CX4 Connector



ST Connector



SC Connector



LC Connector



RJ45 Male



MTRJ Connector



MTP Connector



# Cat8 ETHERNET CABLE

## Extremely Fastest

Support up to 25G and  
40GBASE-T Switch-to-server links

**CAT6**  
2400Mbps



50/95

**CAT7**  
10Gbps



**CAT8**  
40Gbps



The host interface is physically a connector with the signalling managed by the [SSD's controller](#). It is most often one of the interfaces found in HDDs. They include:

- [Serial attached SCSI](#) (SAS-3, 12.0 Gbit/s) – generally found on [servers](#)<sup>[123]</sup>
- [Serial ATA](#) and mSATA variant (SATA 3.0, 6.0 Gbit/s)<sup>[124]</sup>
- [PCI Express](#) (PCIe 3.0 ×4, 31.5 Gbit/s)<sup>[125]</sup>
- [M.2](#) (6.0 Gbit/s for SATA 3.0 logical device interface, 31.5 Gbit/s for PCIe 3.0 ×4)
- [U.2](#) (PCIe 3.0 ×4)
- [Fibre Channel](#) (128 Gbit/s) – almost exclusively found on servers
- [USB](#) (10 Gbit/s)<sup>[126]</sup>
- [Parallel ATA](#) (UDMA, 1064 Mbit/s) – mostly replaced by SATA<sup>[127][128]</sup>
- (Parallel) [SCSI](#) ( 40 Mbit/s- 2560 Mbit/s) – generally found on servers, mostly replaced by [SAS](#); last SCSI-based SSD was introduced in 2004<sup>[129]</sup>

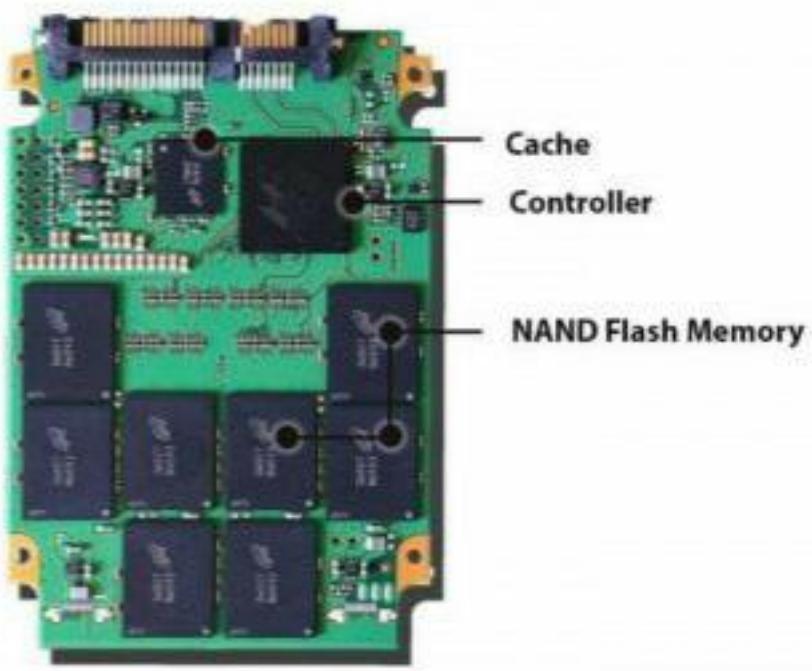
SSDs support various logical device interfaces, such as [Advanced Host Controller Interface](#) (AHCI) and NVMe. Logical device interfaces define the command sets used by [operating systems](#) to communicate with

**HDD**  
3.5"



Shock resistant up to 55g (operating)  
Shock resistant up to 350g (non-operating)

**SSD**  
2.5"



Shock resistant up to 1500g  
(operating and non-operating)

File name	Extension
<b>Text file</b>	.txt
<b>Program file</b>	.prg
<b>Library file</b>	.lib
<b>Command file</b>	.com
<b>Batch file</b>	.bat
<b>System file</b>	.sys
<b>Executable file</b>	.exe
<b>Database file</b>	.dbm

## SSD

SSD is a non volatile storage device,  
It stands for Solid State drive.

SSD stores data on flash memory chips & maintains the data  
in a permanent state, even when the power is off.

- \* In comparison to electromechanical devices (drives), SSD's have lower latency rate and access quickly. These storage devices store the data in Semiconductor Cells.
- \* They do not have moving parts.

### Types of SSD

- \* mSATA / SATA
- \* 2.5 / M.2
- \* PCIe
- \* NVMe

① SATA / mSATA — The first interface/generation used with SSD's is called SATA.  
SATA delivers speeds up to 600MB/s and its size fits most notebook & PC's.  
SATA also comes in smaller size called m-SATA.

"SATA is slowest among all SSD's, but it still has a data transfer rate upto 5x faster than HDD.

② NVMe: Non-Volatile Memory Express (NVMe) is a protocol for SSD that allows data exchange speeds to reach upto 2600 MB/s.

5x times as fast as SATA / mSATA SSDs

\* newer SSD than SATA SSDs.

\* more expensive

\* require more power than SATA SSDs

\* used for business needs.

The NVMe protocol also works with flash memory, which means that even external or portable External NVMe SSD will perform as fast as Internal NVMe SSD.

Based on Connector type, there are two types in SSD as -

① PCIe connector

② M.2 connector.

PCIe according to Connector used, we can categorize SSDs, which defines the data transfer speed.

PCIe is same connector that is used to connect high performing graphics card directly to the motherboard.

When NVMe SSDs used PCIe connectors, they deliver fastest possible data processing.

M.2 connector

\* Known as Next Generation form factor (NGFF).

\* [SATA M.2 / NVMe M.2] / PCIe NVMe M.2 SSD

\* M.2 connector ensures that as SSD reaches the fastest speed possible (2600 MB/s).

\* → if the Motherboard doesn't have an M.2 connector, then alternatively a PCIe card with an M.2 connector is used to connect the NVMe SSD to motherboard. M.2 connector is compatible with PCIe 4 even USB 3.0

## Difference between SSD & HDD

### SSD

\* SSD is abbreviation of Solid State drive

\* The time for reading & writing data in SSD is shorter.

There is lower latency in SSDs.

SSD supports the more operations of I/O per second

\* SSD do not have rotating disk, so it is having light space.

In the SSD's, the transfer of data is not sequential.

SSD does not produce noise

SSD's are expensive

SSD's are safe from magnetic effect.

SSD's generate little heat because there is no moving disk

it consumes less power than HDD

The average boot-up time of OS is 10-13 seconds.

The file opening speed of HDD is 30% faster than HDD.

### HDD

HDD is abbreviation of Hard disk drive.

\* The time for Reading / writing Data in HDD is longer.

\* There is higher latency in HDD

\* HDD supports fewer operations

\* The weight of HDD is heavy

In HDD, the transfer of data is sequential.

HDD produce noise due to mechanical movement.

HDD are cheaper.

In HDD, magnets can remove the data.

HDD generate more heat because of mechanical part.

it consumes more power.

The average boot-up time of OS is 30-40 Seconds.

The file opening speed is slightly slower.

## Advantages Of SSD

- ✓ SSD's consume less power.
- ✓ The speed of reading & writing the data is faster.
- ✓ The main advantage of SSD is that it produces less noise.
- ✓ Due to high speed of SSD's files are transferred quickly.

## Disadvantage of SSD

- ✓ Cost is high.
- ✓ Recovery of lost data is not possible.
- ✓ The storage capacity of SSD is also less.

# UMAX

## SWITCHING MODE POWER SUPPLY Support upto **450W**

USMPS 450

ID#: A05-82045N



Hazardous Area

Gefahrenzone

Caution

Do not remove this cover.

Trained service personal only.

No serviceable components inside.

pentium 4 /AMD

- 1.High Efficiency
- 2.Low Noise & Ripple
- 3.Short Circuit Protection
- 4.100% Burn-in test/Vibration test/  
Hi-port test/Leakage current test

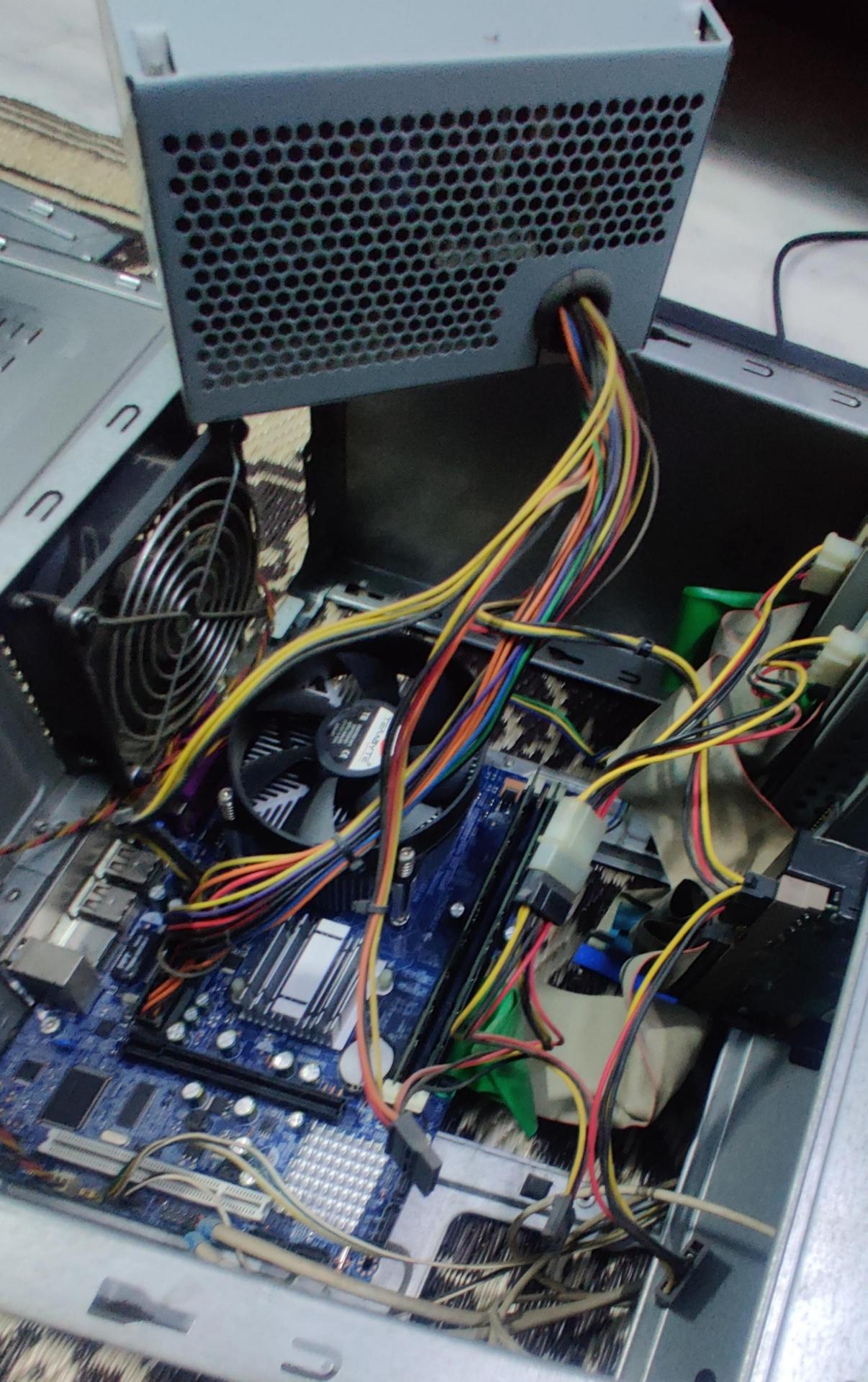
• AC Input: 230v~50Hz/3A

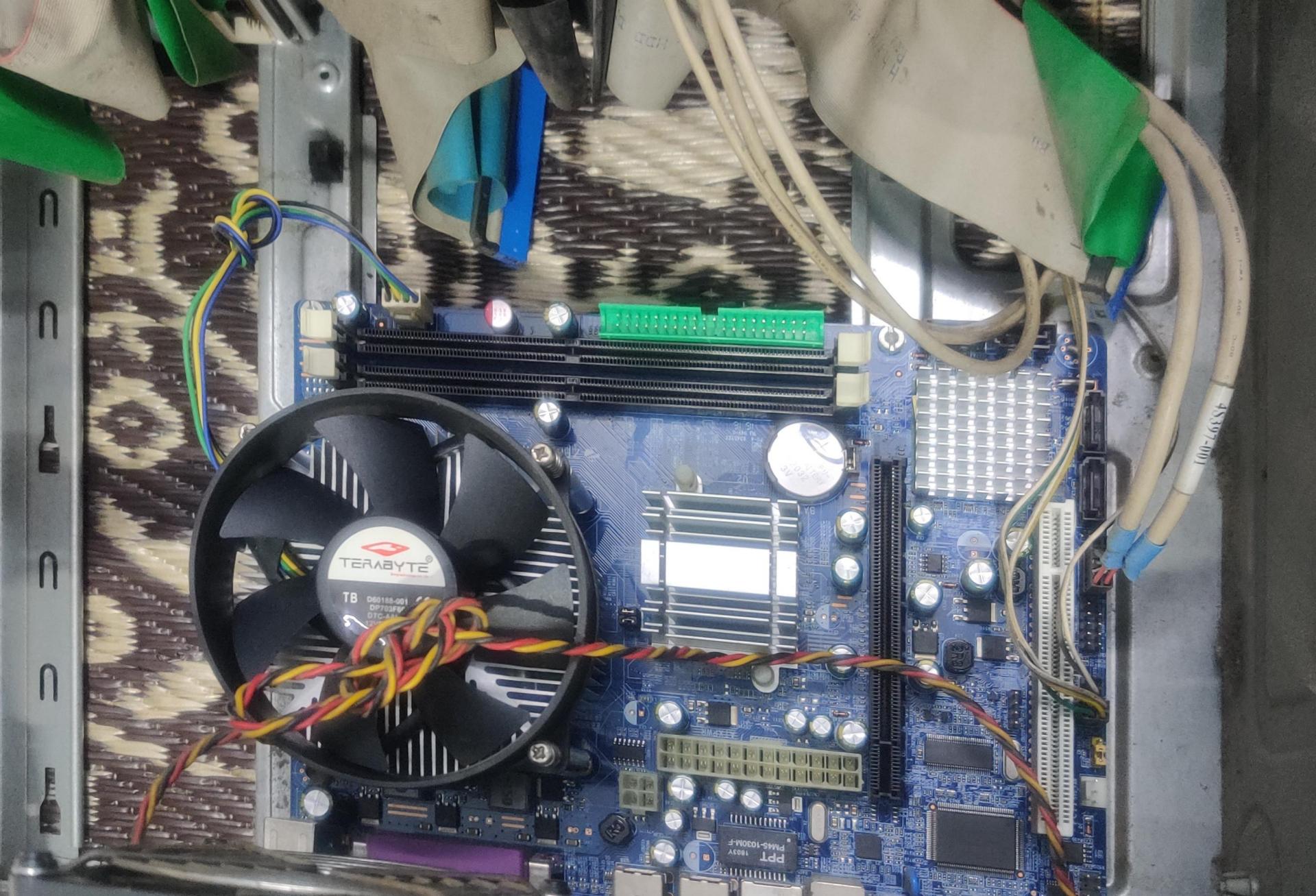
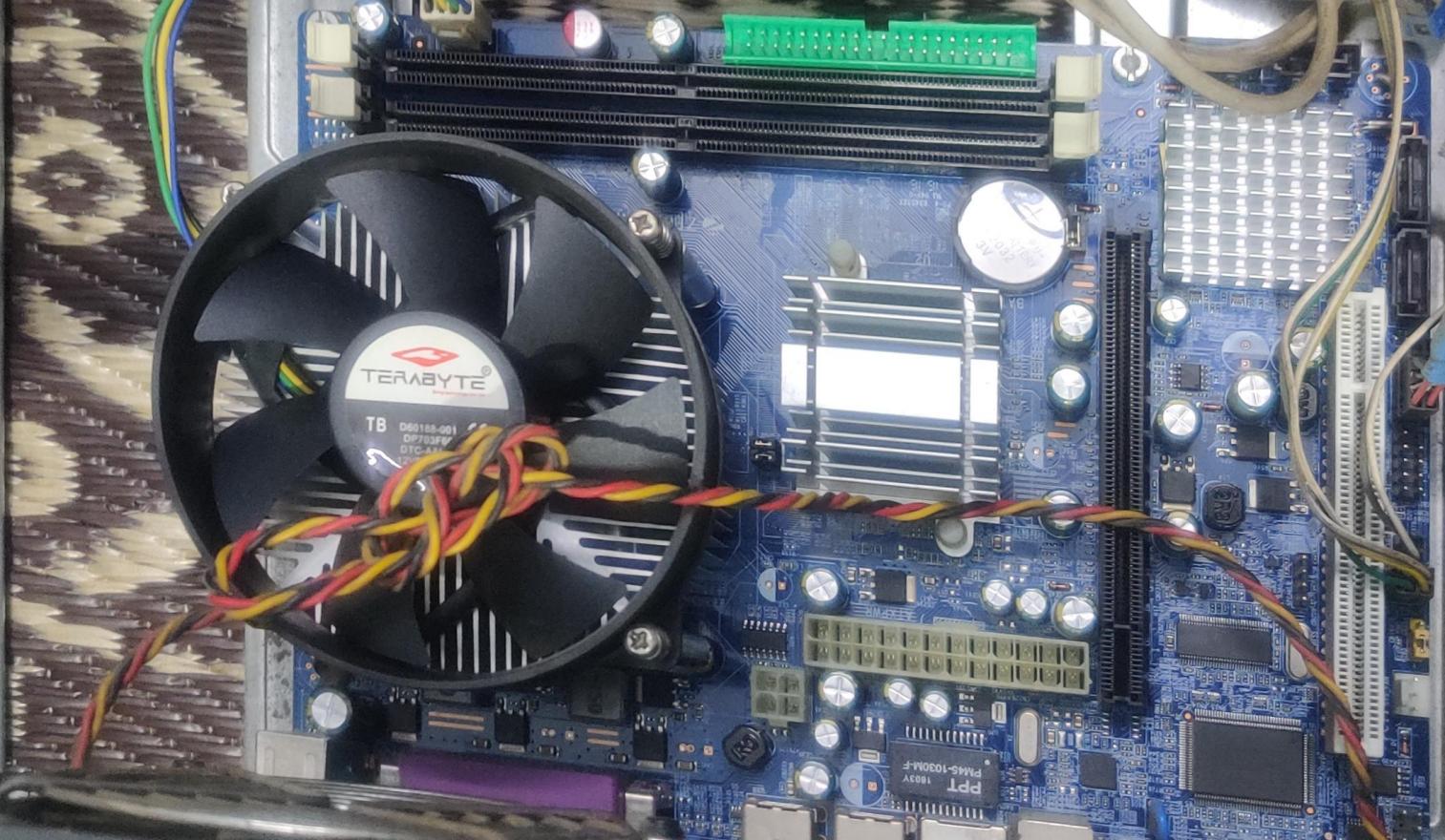
USMPS 450

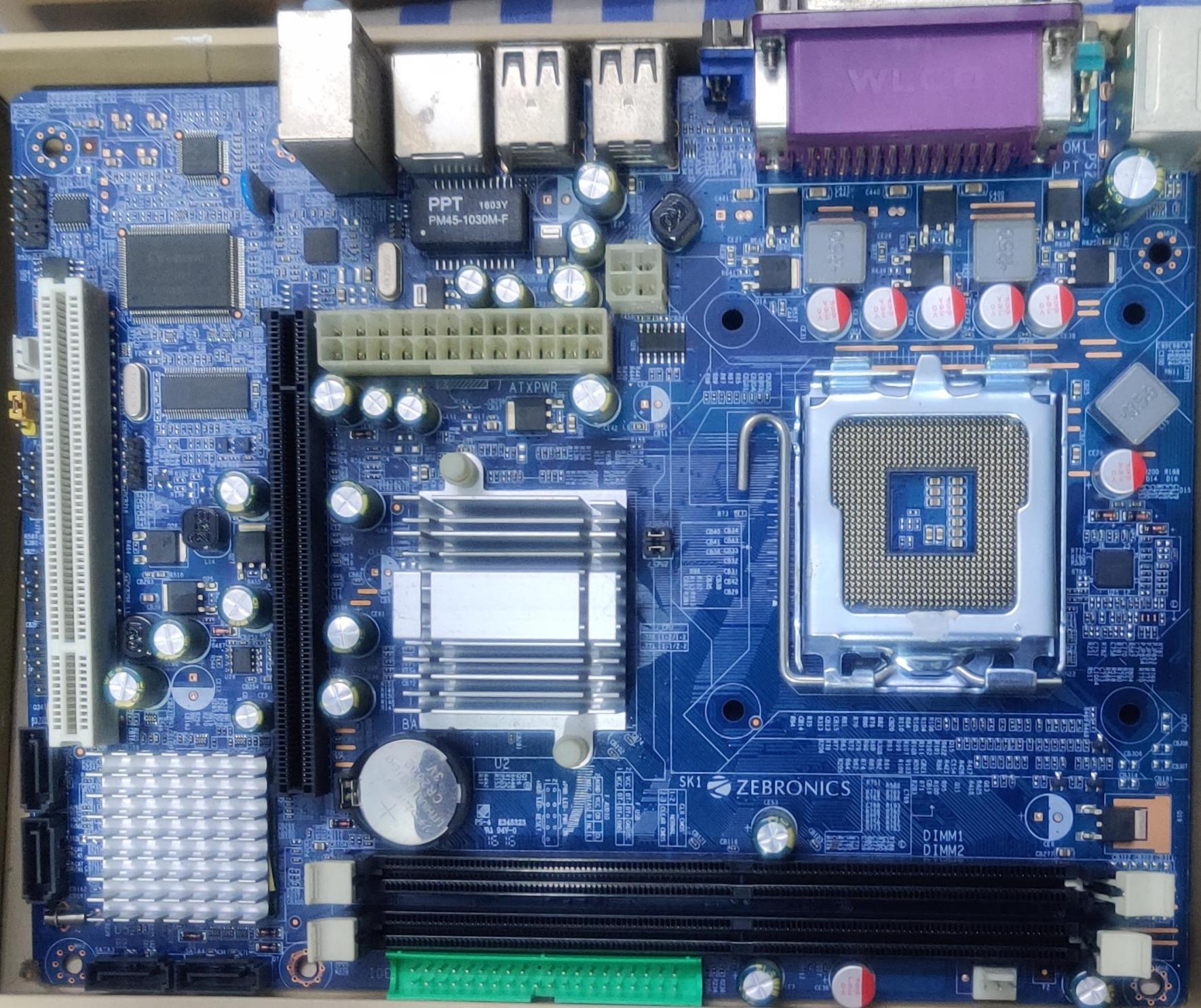
COLOR	ORANGE	RED	WHITE	YELLOW	BLUE	PURPLE	GREEN	BLACK	GRAY
DC	+3.3VDC	+5VDC	-5V	+12VDC	-12VDC	+5VSB	PS-ON	COM	POK
MAX OUTPUT	32A	40A	0.8A	25A	0.8A	2.5A	REMOTE	RETURN	PG

## nPOWER

CE







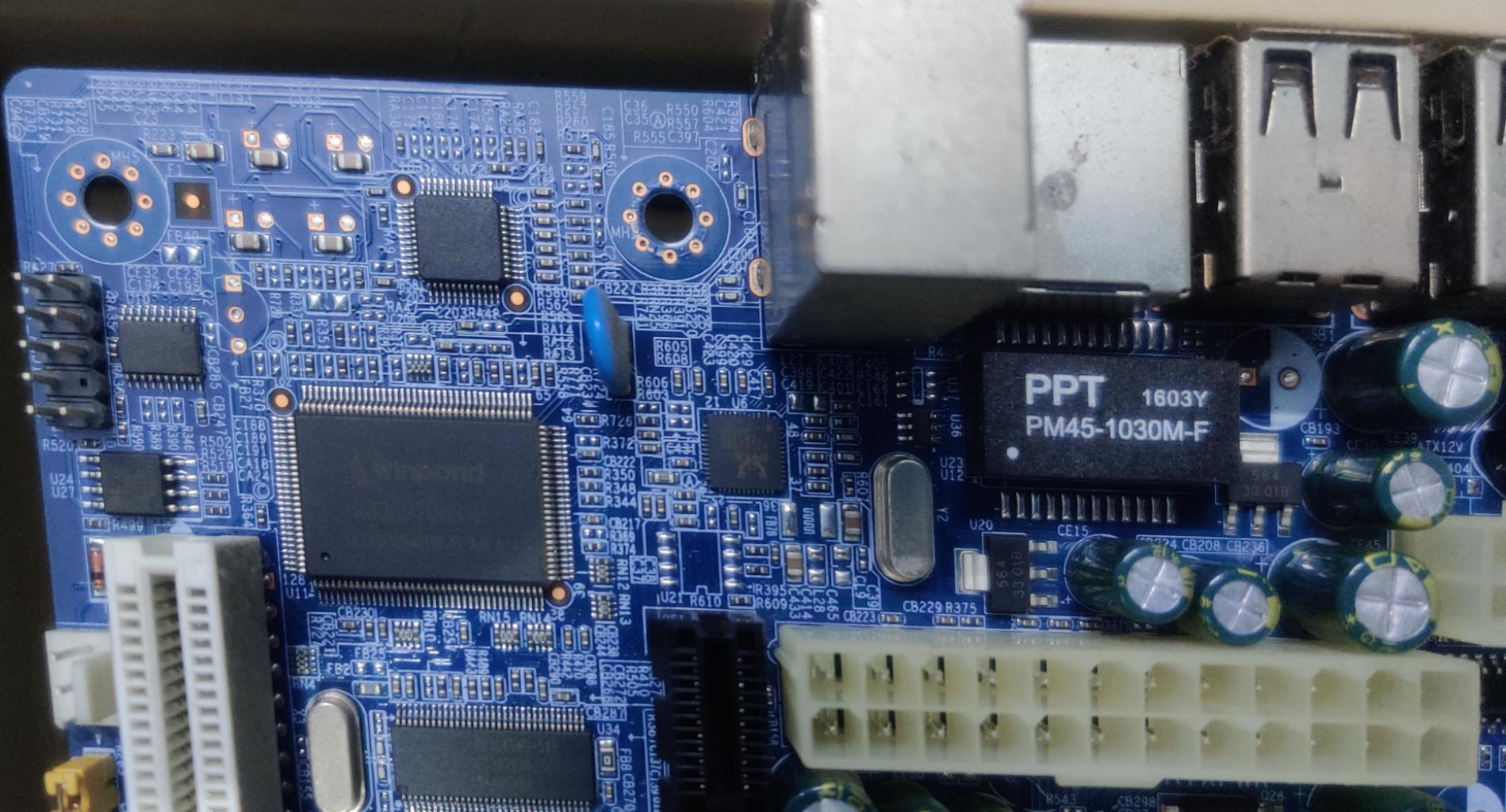
PPT  
1603Y  
PM45-1030M-F



ATXPWR

2R8

**PPT** 1603Y  
**PM45-1030M-F**





70%  
off

# How to connect 2.5"/3.5"/5.25" SATA Drive to computers





If you're using a standard desktop PC, you'll need to buy DIMM sticks.

**SO-DIMM RAM** sticks are for laptops and nano-PC builds. They have a much smaller form factor at 2.66 inches long.

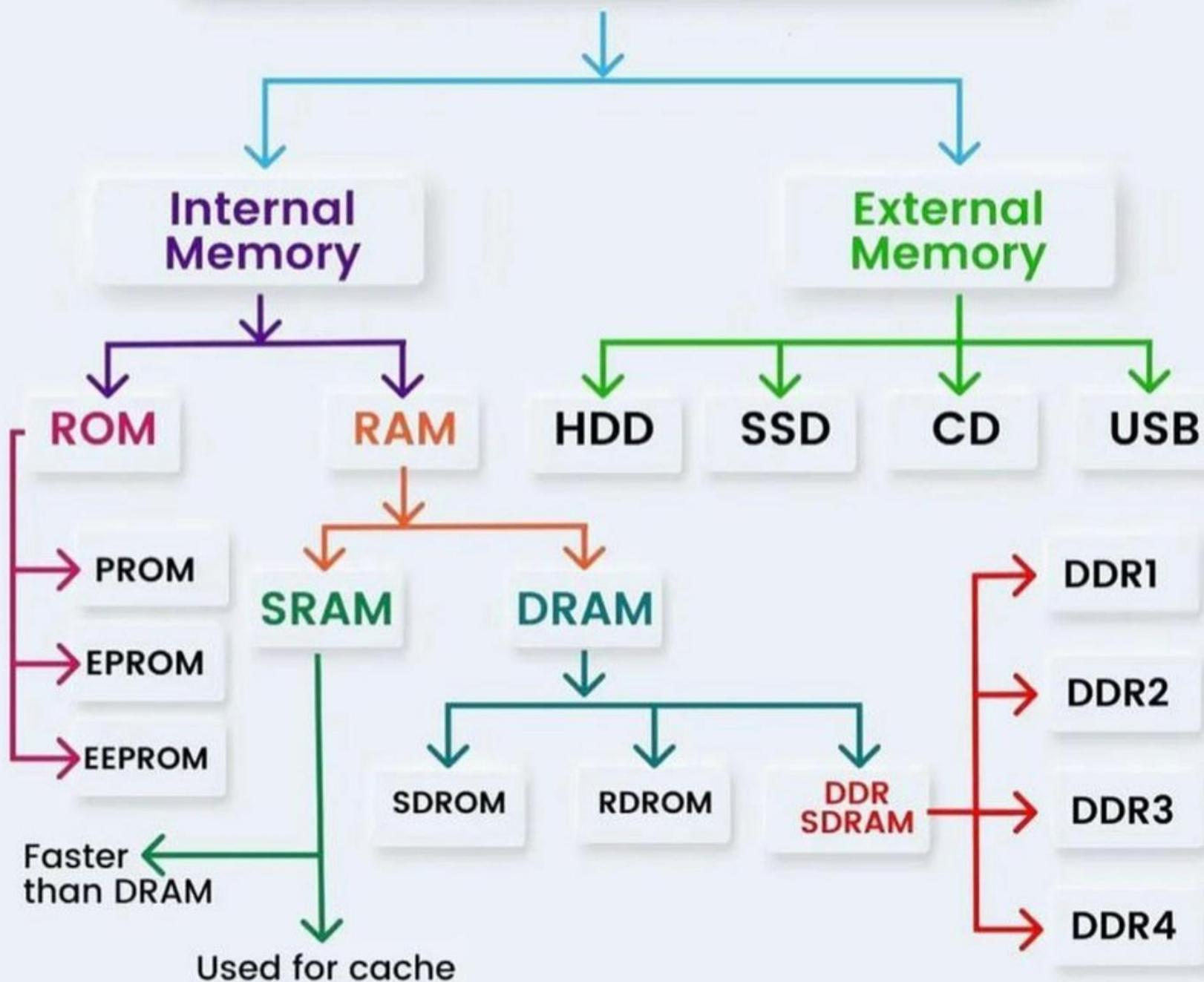
## DIMM



## SO-DIMM



# TYPES OF COMPUTER MEMORY



# TYPES OF NUMBER SYSTEM

DECIMAL

BIN<sub>ARY</sub>

OCT<sub>AL</sub>

HEXA  
DECIMAL

0  
1  
2  
3  
4  
5  
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15

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0110  
0111  
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1010  
1011  
1100  
1101  
1110  
1111

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D  
E  
F

# Popular Full Forms

**PDF**

Portable Document Format

**USB**

Universal Service Bus

**GPS**

Global Positioning System

**WiFi**

Wireless Fidelity

**URL**

Uniform Resource Locator

**SIM**

Subscriber Identity Module  
**Himanshu**

**SMS**

Short Message Service

**HTTP**

HyperText Transfer protocol

**JPG**

Joint Photographic Experts Group

**WWW**

World Wide Web