

IT HARDWARE TERMS

802.11 Standards - a set of wireless networking standards developed by the Institute of Electrical and Electronics Engineers (IEEE) for wireless local area networks (LANs) specifying protocols for wireless communication, including Wi-Fi, with variations such as 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac, and 802.11ax

802.3 Standards - a set of networking standards developed by the Institute of Electrical and Electronics Engineers (IEEE) specifying the physical and data link layers of the OSI model for wired Ethernet networks, including specifications for hardware and protocols for data transmission

Adapter Cable - a cable used to connect devices or peripherals with different types of connectors or interfaces, typically having different connectors on each end

Adapter Card - a hardware component, also known as expansion cards or interface cards, that can be installed in a computer's expansion slot to provide additional functionality or connectivity, and can include network adapters, graphics cards, sound cards, and other specialized hardware

Analog - common in audio, video, and other natural phenomena, a signal or device that represents information using continuously varying physical quantities, such as voltage or amplitude, as opposed to discrete digital signals that use binary digits (0s and 1s)

ATX (Advanced Technology Extended) - a standard for computer motherboard and power supply design introduced by Intel

Audio Port - interface on a computer or audio device used for connecting headphones, microphones, speakers, or other audio equipment

Backwards-Compatible - the ability of a newer version of a technology, software, or hardware to work seamlessly with older versions, ensuring compatibility and allowing users to use older devices or software with newer ones without issues

Bandwidth - represents the capacity of the channel to transmit data within a given period of time and refers to the maximum data transfer rate of a network or communication channel, typically measured in bits per second (bps), kilobits per second (kbps), megabits per second (Mbps), or gigabits per second (Gbps)

Binary - a numbering system based on two digits, 0 and 1, used in digital electronics and computing, where each digit is referred to as a bit

BIOS (Basic Input/Output System) - firmware embedded in a computer's motherboard that initializes hardware components during the boot process and provides basic input/output services for the operating system

Blanking Plates - metal or plastic covers used to fill empty expansion card slots or drive bays in a computer case, helping to maintain proper airflow and aesthetics

Bus - a communication system, consisting of a set of parallel conductors or traces, that transfers data between components inside a computer, between computers, or carry signals between different parts of the computer

Capacitor - an electronic component that stores electrical energy temporarily and releases it when needed, commonly used for filtering, smoothing, and voltage regulation in electronic circuits

Capture Card - a device that captures video and audio signals from an external source, such as a gaming console or camera, and converts them into digital signals to be recorded, stored, or streamed via a computer

Central Processing Unit (CPU) - the primary processing component, or “brain”, of a computer responsible for executing instructions, performing calculations, and managing data and processes within the computer system

Chassis Fan - a fan mounted inside the computer case or chassis to provide airflow and dissipate heat generated by internal components, helping to prevent overheating and maintain system stability

Chipset - a set of integrated circuits on a motherboard or expansion card that manages communication between the processor, memory, peripherals, and other components, facilitating their interaction and operation

Clock Multipliers - circuitry within a processor or motherboard that increases the speed of the CPU by multiplying the external clock frequency, thereby allowing for faster data processing

CMOS (Complementary Metal-Oxide-Semiconductor) - a type of integrated circuit technology used in modern computer processors and memory modules, known for its low power consumption and high integration density

Component - individual hardware that make up a computer or electronic device

Computer - an electronic device capable of receiving, storing, processing, and outputting data, typically operated under the control of programs or instructions

Connector - a mechanical device used to join electrical circuits or components together, commonly found at the ends of cables, facilitating the transfer of signals, power, or data between them

CRT (Cathode Ray Tube) - a display technology used in older monitors and televisions, consisting of a vacuum tube with an electron gun that emits beams of electrons onto a phosphorescent screen, producing images

Daisy-Chaining - a method of connecting multiple devices in series, where each device is connected to the next one in line, typically used for connecting peripherals or external storage devices

DDR (Double Data Rate) - a type of computer memory technology that transfers data on both the rising and falling edges of the clock signal, effectively doubling the data transfer rate compared to single data rate (SDR) memory

DHCP (Dynamic Host Configuration Protocol) - a network protocol used to automatically assign IP addresses and other network configuration settings to devices on a local area network (LAN)

DIMM (Dual Inline Memory Module) - a type of memory module used in computers, containing one or more memory integrated circuits and connecting to the motherboard via pins on both sides of the module

DisplayPort Interface - a digital display interface used to connect monitors, TVs, and other display devices to computers, capable of transmitting high-resolution video and audio signals

DNS (Domain Name System) - a hierarchical naming system for translating domain names (e.g., example.com) into IP addresses, enabling users to access websites and other network resources using human-readable names

Down-Plugging - the act of inserting a connector or plug into a port in a downward direction, typically used to describe the orientation of connectors and ports for compatibility purposes

DP++ (DisplayPort++) - a feature of DisplayPort interfaces that allows them to output HDMI or DVI signals using passive adapters, enabling compatibility with devices that use HDMI or DVI connections

DVI (Digital Visual Interface) - a digital display interface used to transmit video signals between computers and display devices, supporting high-resolution digital video with various connector types, including DVI-I, DVI-D, and DVI-A

Edge Contacts - electrical contacts located along the edge of a connector or electronic component, typically used for establishing electrical connections with corresponding contacts on another device or circuit board

EIDE (Enhanced Integrated Drive Electronics) - a standard for connecting storage devices, such as hard drives and optical drives, to a computer's motherboard, offering improved performance and features compared to the original IDE standard

Electromagnetic Interference (EMI) - the disruption of electromagnetic signals caused by electromagnetic radiation emitted by electronic devices, cables, or other sources, leading to potential interference with the operation of nearby electronic equipment

Electrostatic Discharge (ESD) - the sudden flow of electricity between two electrically charged objects caused by contact or proximity, often resulting in damage to electronic components, particularly sensitive integrated circuits

eSATA (External SATA) - an external interface for connecting SATA hard drives and other storage devices to a computer, providing faster data transfer rates and hot-swapping capabilities compared to USB or FireWire connections

eSATAp (External SATA Power) - an external interface that combines eSATA and power connectors into a single cable, allowing for both data transfer and power delivery to compatible devices, such as external hard drives

Expansion Card Slots - slots on the motherboard or expansion card riser where expansion cards, such as graphics cards, sound cards, and network adapters, can be inserted to add additional functionality to a computer system

Firewall - a network security device or software application that monitors and controls incoming and outgoing network traffic based on predetermined security rules, protecting a network from unauthorized access and malicious activities

Front I/O Panel - the portion of a computer case's front panel that includes input/output ports for connecting peripherals and devices, such as USB ports, audio jacks, and card readers

Front Panel - the part of a computer case or device that contains various input/output ports, buttons, and indicators, typically located on the front-facing side for easy access

Full-duplex - a communication mode allowing simultaneous two-way data transmission, enabling both sending and receiving data at the same time

GB/s (Gigabytes Per Second) - a unit of data transfer rate representing the number of gigabytes transferred per second, commonly used to measure the speed of data transfer in storage devices and network connections

Gigahertz (GHz) - a unit of frequency equal to one billion cycles per second, typically used to measure the clock speed of computer processors

GPU (Graphics Processing Unit) Architecture - understanding different GPU architectures (e.g., NVIDIA CUDA, AMD RDNA) and their features can be beneficial for studying graphics rendering, parallel processing, and GPU computing

Graphics Memory - dedicated memory on a graphics card used to store graphical data and textures for rendering images and videos on a display

Graphics Processing Unit (GPU) - a specialized processor designed to accelerate the rendering of images and videos, commonly used in graphics cards for gaming, video editing, and other graphics-intensive tasks

GT/s (Gigatransfers Per Second) - a unit of data transfer rate representing the number of billions of transfers per second, often used to measure the speed of data transfer in computer interconnects

Half-duplex - a communication mode allowing data transmission in both directions, but not simultaneously, requiring alternating transmission and reception

Hard Disk Drive (HDD) - a data storage device that uses spinning magnetic disks to store and retrieve digital information, commonly used for long-term storage in computers and other electronic devices

Hardware Port - interface on a computer or electronic device that allows for the connection of external peripherals or devices and facilitates the transfer of data, power, or audio/video signals between the device and peripherals

HBA (Host Bus Adapter) - a hardware component that connects a computer or server to a storage device or network, facilitating data transfer between the host system and external storage devices

HDMI (High-Definition Multimedia Interface) - a digital interface for transmitting high-definition audio and video signals between devices, commonly used to connect displays, TVs, and multimedia devices

HDMI Port - interface used for transmitting high-definition audio and video signals between devices, such as computers, monitors, televisions, and video game consoles and support high-resolution digital video and multi-channel audio

Headers - connectors or terminals on a motherboard or other electronic device used for connecting cables, providing input/output interfaces for various components such as USB, audio, and front-panel controls

Heat Sink - a passive cooling device designed to dissipate heat generated by electronic components, such as processors or graphics cards, to prevent overheating and maintain optimal performance

IDE (Integrated Drive Electronics) - an interface standard for connecting storage devices such as hard disk drives and optical drives to a computer's motherboard

ITX (Information Technology Extended) - a form factor specification for small-sized computer motherboards, typically used in compact desktops and media center systems

Keying - a mechanism used in connectors or interfaces to ensure proper alignment and prevent incorrect insertion of plugs or cables by matching specific shapes, notches, or orientations

LCD (Liquid Crystal Display) - a flat-panel display technology that uses liquid crystals to produce images, commonly used in computer monitors, TVs, and mobile devices

LCD/TFT (Liquid Crystal Display Thin Film Transistor) - a type of LCD display that uses thin-film transistor technology to improve image quality and response time

LED (Light-Emitting Diodes) - semiconductor devices that emit light when an electric current passes through them, commonly used in electronic devices for indicators, displays, and lighting

Lightning - a high-speed data transfer interface developed by Apple, commonly used for connecting iOS devices to computers for syncing and charging

M.2 Interface - a small form factor interface for connecting solid-state drives (SSDs) and other expansion cards to a computer's motherboard, offering high-speed data transfer rates

Mass Storage Device - a device used to store large amounts of data permanently or semi-permanently, such as hard disk drives (HDDs), solid-state drives (SSDs), and optical discs

MB/s (Megabytes Per Second) - a unit of data transfer rate representing the number of megabytes transferred per second, commonly used to measure the speed of data transfer in storage devices and network connections

Megahertz (MHz) - a unit of frequency equal to one million cycles per second, often used to measure the clock speed of computer processors and memory

Micro-ATX / mATX (Micro Advanced Technology Extended) - a form factor specification for smaller-sized computer motherboards, offering a balance between compactness and expandability

Mini-ITX (Mini Information Technology Extended) - a small form factor specification for computer motherboards, commonly used in compact desktops and home theater PCs

MiniDP/mDP - a digital display interface used to connect monitors, projectors, and other display devices to computers, offering high-resolution video and audio transmission

Molex - a type of electrical connector commonly used in computer power supplies and peripherals to provide power to components such as drives and fans

Molex KK - a specific series of Molex connectors known for their reliability and versatility, often used in computer and electronic applications

Motherboard - the main circuit board in a computer that houses the CPU, memory, expansion slots, and other essential components, providing connectivity and support for the system

NIC (Network Interface Card) - a hardware component that enables a computer to connect to a network, facilitating communication with other devices and access to network resources

Non-Volatile Device - a storage device or memory technology that retains data even when power is removed, ensuring data persistence and durability

OLED (Organic LED) - a display technology that uses organic compounds to emit light when an electric current is applied, offering high contrast ratios and energy efficiency, commonly used in TVs, smartphones, and wearable devices

Optical Disc Drive - a hardware component used for reading and writing data from optical discs, such as CDs, DVDs, and Blu-ray discs

P1 Power Connector - a power connector typically found on computer motherboards, providing power to the CPU and other components

PATA (Parallel Advanced Technology Attachment) - an older interface standard for connecting storage devices, such as hard disk drives and optical drives, to a computer's motherboard using parallel data transfer

PCI (Peripheral Component Interconnect) - a standard for connecting expansion cards to a computer's motherboard, providing high-speed data transfer between the CPU and peripheral devices

PCIe (Peripheral Component Interconnect Express) - a high-speed expansion bus standard for connecting peripheral devices to a computer's motherboard, offering faster data transfer rates than traditional PCI

Peripheral Cable - a cable used to connect peripheral devices, such as printers, scanners, and external storage devices, to a computer, and transmitting data and power between the computer and the peripheral device

Peripheral Device - an external device connected to a computer that extends its functionality or provides additional input/output capabilities, such as printers, scanners, keyboards, and external storage devices

Power Supply Unit (PSU) - a device that converts AC power from a wall outlet into DC power suitable for use by a computer's internal components, while providing electrical power to the motherboard, drives, and other hardware components

PS/2 - a type of port used to connect keyboards and mice to a computer, named after the Personal System/2 series of IBM computers that popularized it

RAID (Redundant Array of Independent Disks) - a data storage technology that combines multiple physical disk drives into a single logical unit for redundancy, performance improvement, or both

RAM (Random Access Memory) - a type of computer memory that allows data to be accessed randomly, providing fast read and write speeds for temporary storage of data and program instructions

Raw Transfer Rate - the maximum data transfer rate of a storage device or interface before accounting for protocol overhead or encoding efficiency

Rear Panel - the backside of a computer case or device where various ports, connectors, and expansion slots are located, allowing for connectivity with external devices and expansion cards

RJ-45 Network/Ethernet Port - interface used for networking purposes, typically for connecting a computer or other device to a local area network (LAN) or the internet via Ethernet cables

SAS (Serial Attached SCSI) - a high-speed interface standard for connecting storage devices, such as hard drives and tape drives, to a computer's motherboard, offering faster data transfer rates than traditional SCSI

SATA (Serial Advanced Technology Attachment) - a popular interface standard for connecting storage devices, such as hard disk drives and solid-state drives, to a computer's motherboard, offering high-speed serial data transfer

SCA (Single Connector Attachment) - a type of hot-swappable SCSI connector used to connect SCSI hard drives to a server or storage device

SCSI (Small Computer System Interface) - a set of standards for connecting and transferring data between computers and peripheral devices, commonly used for connecting hard drives, tape drives, and scanners

Serial Port - a type of communication interface used to transfer data serially, one bit at a time, between computers and peripheral devices, commonly used for connecting modems, printers, and serial mice

Small Form Factor (SFF) - a design standard for compact computer components or systems, often used in small desktop computers or embedded systems

Solid State Drive (SSD) - a storage device that uses flash memory to store data, providing faster data access and improved durability compared to traditional hard disk drives (HDDs)

Sound Card - a hardware device that processes audio signals from a computer's motherboard, converting digital audio into analog signals for output to speakers or headphones

Standoffs - small metal or plastic spacers used to mount and support a motherboard inside a computer case, preventing electrical shorts and providing stability

System Clock - a circuitry component that generates timing signals to synchronize the operations of a computer's components, including the CPU, memory, and peripherals

Thermal Paste - a heat-conductive compound applied between a CPU or GPU and its heatsink to improve thermal conductivity and heat dissipation

Throughput - the rate at which data is successfully transmitted or processed through a system, typically measured in bits per second (bps) or bytes per second (Bps)

Thunderbolt - a high-speed input/output interface developed by Intel and Apple, capable of transferring data, video, and power over a single cable

Tower Case - a type of computer case characterized by its tall, vertical design, typically housing the motherboard, drives, and other components

Transistor - an electronic component used to amplify or switch electronic signals and electrical power, forming the building blocks of modern electronic devices

TRS (Tip, Ring, Sleeve) - a type of audio connector with three conductive areas, typically used for analog audio signals, supporting stereo or balanced connections

Up-Plugging - connecting a cable or connector in a way that goes against the device's or port's orientation, ensuring proper connectivity

USB (Universal Serial Bus) - an interface standard for connecting peripherals, such as keyboards, mice, printers, and external storage devices to computers and other devices

USB 2.0 - an earlier version of the Universal Serial Bus (USB) standard, offering data transfer speeds of up to 480 megabits per second (Mbps)

USB 3.0 - an updated version of the Universal Serial Bus (USB) standard, offering faster data transfer speeds and improved power management compared to USB 2.0

VGA (Video Graphics Array) - a video display standard used for connecting monitors and other display devices to computers, offering analog video signals

Video Card - a hardware component responsible for generating and outputting visual information to a display device, commonly used in desktop computers for gaming and multimedia applications

Volatile Device - a storage device or memory technology that loses its stored data when power is removed, requiring constant power to retain data

Wi-Fi Adapter - a hardware device that enables a computer or other device to connect to a wireless local area network (Wi-Fi), providing wireless internet access and communication capabilities