**Glossary**

**Intro to Computer Systems**

**Exponent:** The value of which a number is calculated to the power of.

**Mantissa:** The numbers that follow a

**Binary:** A value with base 2. Utilized by computer systems as the smallest readable value to perform computational logic.

**Decimal:** A value with base 10. Most common “readable” base type.

**Integer:** A whole number. Not a fraction.

**Float:** Fractional number. Has “decimal point” but not necessarily decimal.

**Double** precision floating point number.

**Sign bit:** A bit that takes the place of a normal value, in place of representing positive (0) and negative (1). Integer value must be “signed” to represent negative values.

**Boolean algebra:** Based on the notation of true and false. Is represented by 1 (true) and 0 (false).

**AND operator:** Returns true when both operations are true. Written as x.y or x&&y.

**OR operator:** Returns true when either operation is true. Written as x+y or xVy

**NOT operator:** Returns the opposite value. Only takes one value. Written as -x or !x.

**XOR operator:** Similar to OR operator except it is true when only one input is true.

**Bit masking:** Used to set, or reset, binary values. Can also be used to retrieve a single bit, or to reset a length of bits (byte etc.).

**Expansion Cards:** Offer a way to add extra functionality to a computer system. For example:

**3D Graphics Cards:** Enhance gaming graphics and experiences.

**Audio Cards:** Offer high quality audio output.

**Networking Cards:** Allow computers to connect to networks.

**TV Tuner Cards:** Allow computers to view and record television.

**Peripheral Interface Cards:** Allow additional external peripherals.

**Storage Interfaces:** Connectivity options that specialize for adding mass storage. Mostly internal expansion but sometimes external.

**PCI (Peripheral Component Interconnect):** The first expansion slot to gain popularity. Suffered from low bandwidth allowances due to bus topology.

**AGP (Accelerated Graphics Port):** A slot for a graphics card that connected directly to the northbridge, allowing for greater bandwidth due to high graphics card data requirements.

**PCIe (PCI Express):** The contemporary version of PCI. Unlike PCI, PCIe is a point-to-point system that guarantees each device a certain amount of bandwidth.

**ATA (Advanced Technology Attachment):** The most common desktop computer standard for connecting mass storage. Developed to cater for other storage devices such as CD and DVD drives.

**Direct Memory Access:** Data transfer method that allows for the CPU to not be required when storing data, allowing the CPU to be free to perform other tasks.

**Parallel ATA:** Cables that ran data in parallel between interfaces. Suffered from bad interference due to the large number of cables in a small space and could not be made very long. Implied a “Master and Slave” system where the master was the device that was interacted with first, although there was no direct relationship between systems.

**Serial ATA:** Solved many of the issues of Parallel ATA and allowed for longer cables and far greater speeds between interfaces.

**AHCI (Advanced Host Controller Interface):** A mode that allows for the full support of SATA’s advanced features. The two major features made available by SATA ARE:

* **Hot-Plugging (Hot-Swapping)** allows SATA devices to be plugged and unplugged while the device is running.
* **Native Command Queuing** a features that allows a device to optimize the order of operations to improve overall performance and minimize unnecessary wear.

**eSATA:** An electronically compatible extension of SATA that allows for external mass-storage to be connected to a system with similar performance to internal storage.

**mSATA/M.2:** A SATA solid-state disk in the form of a mini PCIe interface. Intended to improve the compatibility of SSD’s.

**SCSI (Small Computer System Interface):** Used mostly in workstations and servers. Offers far greater speed than ATA connections.

**Form Factor Considerations:** Applies to the external shape and design of computer systems.

**Processor Sockets:** Are designed specific to a particular family of CPU’s, based on signaling requirements and the level of integration between CPU internals and other core components. Often include low-power variants designed for compact computers which reduces the thermal requirements of the case, but also lower space requirements.

**Memory Modules:** Are arranged on circuit board packages known as **Dual In-Line Memory Modules (DIMM)** – A module with memory chips, with edge-card adapters on each side. Compact computers use a smaller standard **Small Outline DIMM (SO-DIMM)** that are about half the size of a standard DIMM. They allow comparable performance electronically but are not physically compatible.

**General Purpose Expansion:** The solution the inferiority of serial and parallel connections.

**USB (Universal Serial Bus):** The most ubiquitous of these new standards. A high-speed interface that is designed to be as flexible as possible and used with many devices. They also carry a small amount of power, so can be used to power, or charge, small devices.