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Mother Boards

1. What are some of the slots on a mother board?

   The slots on a motherboard are for the primary RAM modules to be inserted.

2. What is the purpose of the bus slot?

   The bus slots are used to add additional devices to add capabilities to your computer like video or sound cards.

3. What is the difference between the SATA connector and M.2 slot?

   The SATA connector is used for storage devices like SSDs, while the M.2 slot is used for a newer M.2 solid-state drive.

4. What is the difference between integrated video and expansion video cards?

   Integrated video cards are directly connected to the CPU and are used for everyday graphics usage, and it is weaker than an expansion video card which is used for higher demanding applications like gaming.

5. What is the purpose of the Network Interface Card or NIC?

   The purpose of the NIC is to connect your computer to the internet through an ethernet cable.

NVMe SSD

1. Why is an SSD drive faster than a mechanical hard drives?

   An SSD drive is faster than a mechanical hard drive because the SSD doesn't use moving parts.

2. Explain the difference between SATA (AHCI) and M.2 with NVMe PCIe and why M.2 is much faster for data transfer.

   The M.2 is much faster than the SATA because it uses the PCIe express bus, which is optimized for a faster transfer rate than AHCI.

3. Explain what NVMe is and some of the reasons it has such a fast data transfer capacity.

   NMVe is a communications protocol designed explicitly for SSDs. It has a fast data transfer capacity because it streamlines operations and increases IOPS.

4. What is the command queue and the purpose of the command queue?

   The command queue is a queue that enables the delay of a command to be executed. The purpose of the command queue is to speed up operations by allowing more queues to be in line and have more commands per queue.

5. Open up Device Manager on your computer. Go to Disk Drives. What disk drive(s) do you have? Do you have a SATA or NVMe?

   When opening Device Manager, I see I have a SATA disk drive.

Chipset

1. What is a chipset and what is the purpose of a chipset?

   A chipset is a smaller set that has replaced a larger number of chips. The purpose of a chipset is to control data flow between the CPU, peripherals, bus slots, and memory.

2. What is the purpose of the north bridge chipset?

   The purpose of the north bridge is to be a communication middleman between the CPU, memory, and PCI-E.

3. What is the purpose of the south bridge chipset?

   The purpose of the south bridge chipset is to handle the communication between the PCI, USB, SATA, and IDE.

4. Why is the north bridge faster than the south bridge?

   The north bridge is faster than the south bridge, because the CPU, PCI-E, and the memory are the most used and important components of the motherboard.

5. What is a bus and what is the purpose of the bus?

   A bus is a set of pathways that allows data and signals to travel between the components and the motherboard. The purpose of the bus is to send data.

CPU Cache

1. What is the difference between DRAM and SRAM? What is used for CPU Cache?

   The difference between DRAM and SRAM is that DRAM uses capacitors, and SRAM uses static storage.

2. What is CPU cache and what is the purpose of CPU cache?

   A CPU cache is the CPU's internal memory. The purpose of the CPU cache is to store copies and instructions from the RAM waiting to be used by the CPU.

3. Why is CPU cache important?

   A CPU cache is important because it helps a computer run faster by storing essential data that the computer needs and gives the data faster than RAM.

4. Explain the difference between L1, L2 and L3 cache.

   L1 cache is the primary cache with the same speed as the processor. L2 cache is an external cache used to catch recent data accesses from the processor that were not caught by the level 1 cache. The L3 cache is used to catch recent data accesses from the processor that were not caught by the L2 cache.

5. Look at task manager on your computer. Look at the Performance tab. Do you have L1, L2 and L3 cache? What are the values? Which cache values are larger?

   I have all three levels of cache. The L2 and L3 cache values are larger. The L1 cache can store 384 KB, the L2 cache can store 1.5 MB, and the L3 cache can store 12 MB.

Hyper Threading

1. What is hyper-threading?

   Hyper-threading is a technology developed by Intel to increase the performance of the CPU cores.

2. Explain what a dual core CPU is.

   A dual-core CPU is a CPU that has two processing units on a single chip.

3. Look at task manager on your computer. Look at the Performance tab. How many sockets do you have? How many cores do you have? How many logical processors do you have? Is a logical processor hyper-threading?

   Under the performance tab on my computer, I can see my computer has 1 socket, 6 cores, and 12 logical processors. The logical cores are hyper-threading.

4. Open up Device Manager on your computer. Go to Processors. Do you have Intel or AMD? How many entries do you have? Does the number in Device Manager match the number of logical processors in task manager? Why?

   I have twelve entries of Intel processors. The number of processors does match the number given in the device manager because the system is set up so that both tools have the same information of the processor configuration.