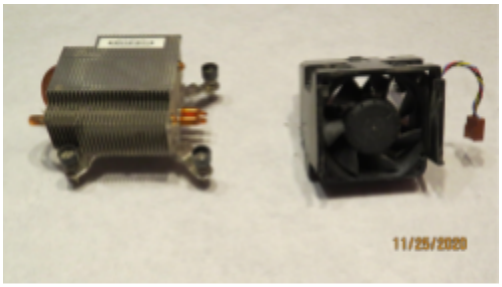
Me and the computer (Left) ready to go. The first look into the computer (top right). The computer before opening (bottom right).

Hi, My name is Jacob Smith, I am 17 and am from Hillsboro Ohio. Today, I got the chance to participate in the 2020-2021 TI Online Challenge and for this challenge I was given the opportunity to take apart and analyze the inside mechanics of a computer called the HP EliteDesk 800 G1 USDT. I chose to do this specific device because I already have a good base knowledge on the parts inside a computer, but I am wondering about what makes these tiny parts do what they do to complete their tasks.

Processor in the LGA1155 socket in the motherboard prior to being taken out for analysis.

To start, we will go over the brain of the whole system, the processor. The processor is a chip that goes straight into the motherboard and is made up of many different components such as Arithmetic Logic Units, control units, instruction blocks, code blocks, and address blocks while also controlling set and enable wires that stop processes for things to be stored and enable processes to happen. The processor is responsible for processing and sending data. Due to the large amount of things the processor is doing, the processor builds up a good amount of heat and to counter this, a cooling source is necessary. The source in this computer is a 2 piece fan/block combination. A fan blows

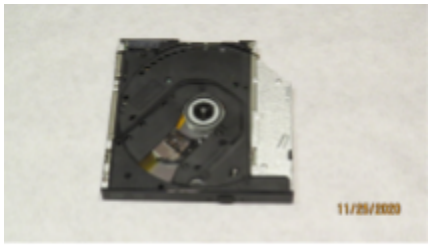
The processor capable of running 3.5 billion tasks per second by itself outside the motherboard. The bottom (Right) and the top (Left).



Cooling to keep the processor cold while it's running it's labor intensive tasks. The two pieces are the fan (Right) and the block (left).

directly into metal slats and these metal slats are connected to 2 copper pipes that touch directly to the processor to disperse the heat.

Next, we have the RAM (random access memory). RAM is made in the form of 2 sticks that go straight into the motherboard and run directly off the set and enable wires from the processor. The RAM is the memory that serves to hold quick access data for the processor, but as a result it loses all of its data when it loses power. The other type of memory in the system was a 3.5” SATA Hard Drive which is a disc covered in tiny magnetic circles and a needle that constantly moves on the disc as it spins on average 5400-7200 RPM. This memory stores a huge amount of data and even keeps it when it loses power.



DVD drive used to input, output, and read information.

Next we have the DVD-ROM Optical Drive. This DVD drive is a tray that exits the computer for a space for a DVD and when the disc is placed inside the tray it takes the disc and scans it with a laser. This allows for easy access to outside information. The other way to get outside information is through ports/jacks. These ports go directly into the motherboard and connect to things such as the keyboard and mouse.

The inputs and outputs of the computer used to connect it to outside devices.

From this experiment we learned the many different insides of many different parts in a computer from the super fast speeds of the processor to the super heavy data caches the hard drives are responsible to carry. We also learned the roles of each of these components in the computer and how essential each component is to the overall system.

Part List

- Intel Quad Core i5-4570s @ 2.90GHz Processor
- 8GB DDR3 RAM
- DVD-ROM Optical Drive
- 3.5” SATA HDD
- Cooling Block/Fan Combination
- Custom Case by HP
- Custom Motherboard
    - 8 USB Ports
    - 3 Video ports
    - Headphone/Microphone Jack
    - Ethernet Port
    - Keyboard/Mouse Connectors