Reverse Engineering Design Challenge

Team 16699Y

Flushing, New York

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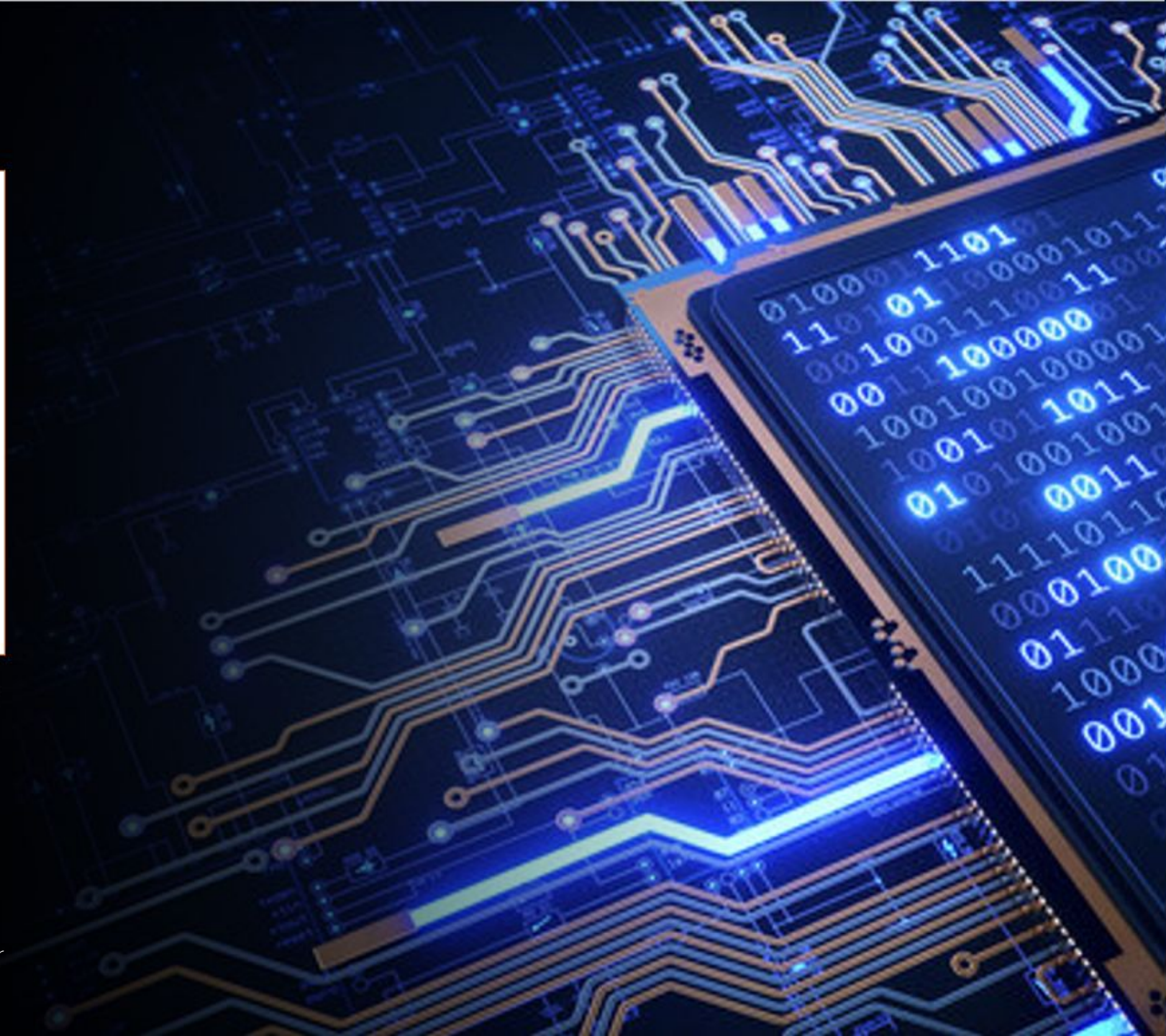
Disassembly and Analysis of a Desktop Computer

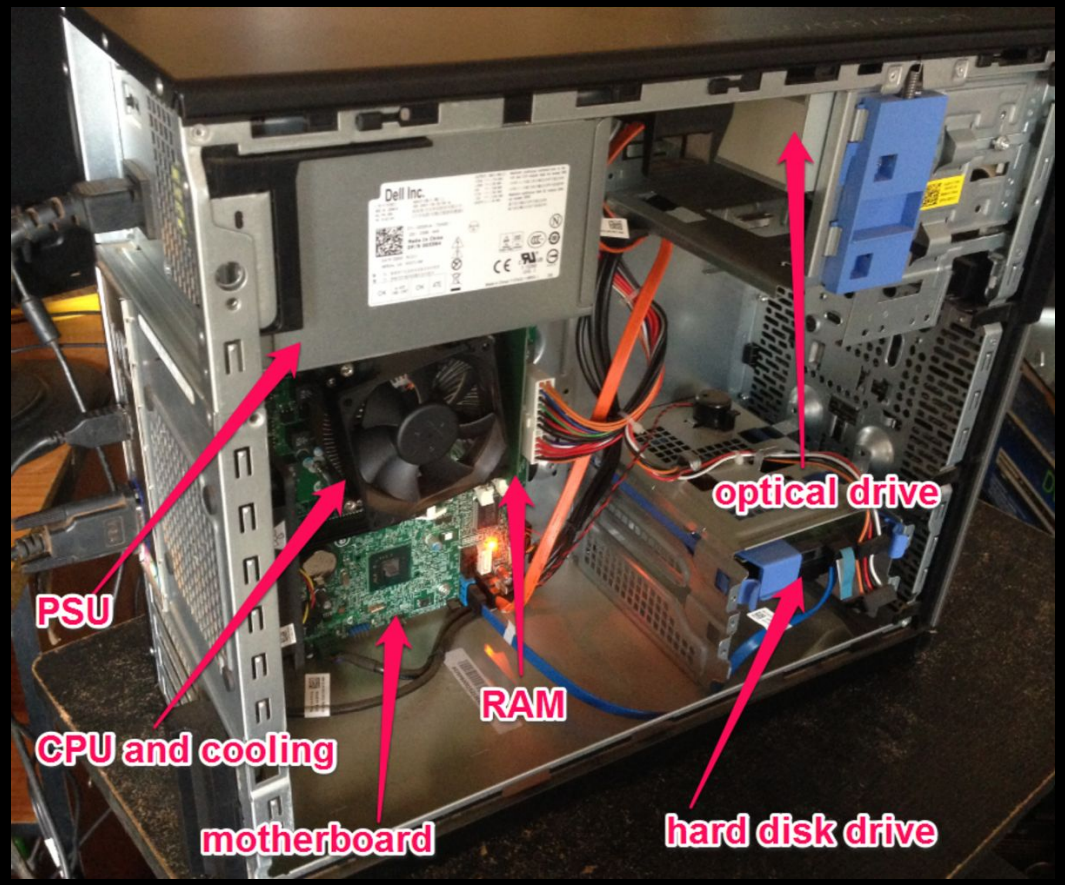


Introduction

What is a desktop computer?

A desktop is a personal computer that many people use in their everyday life. It does all the processing and computing for your computer. The desktop we chose to disassemble is a Dell Inspiron released in 2010. Although the components may be over a decade old, the concept behind the desktop has stayed relatively the same over the past years.

Diagram of a desktop



CPU

The model of the CPU in our system is the (intel Pentium..). The CPU is the central processing unit of the desktop. It does all the arithmetic and logic processing for the computer. Inside the CPU, there are cores, which are individual processing units, and allow the CPU to perform multiple tasks at the same time, increasing the efficiency in which it works. The CPU has its own fan, as it can get hotter than the other components while processing a variety of information

GPU

The GPU we have here is the Intel Pentium Dual Core and it is the part of the computer that speeds up the processing for rendering images to display onto your monitor. Without it, the computer wouldn't be able to display anything on the monitor. This GPU is integrated, which means its integrated into the CPU, and shares the system memory.

Location of the CPU on the motherboard

Fan for specifically the CPU:

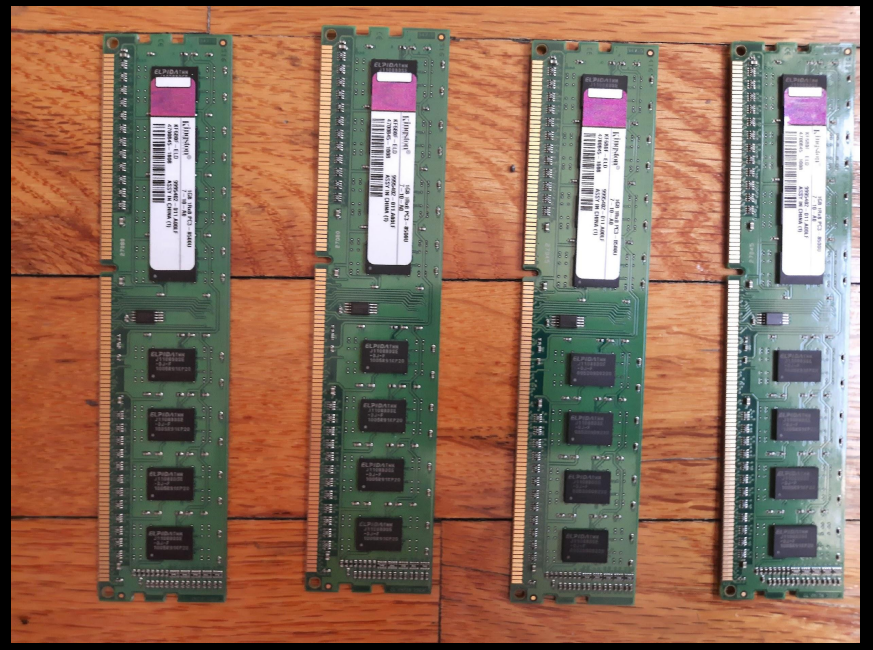
Front view of CPU

Back view of CPU

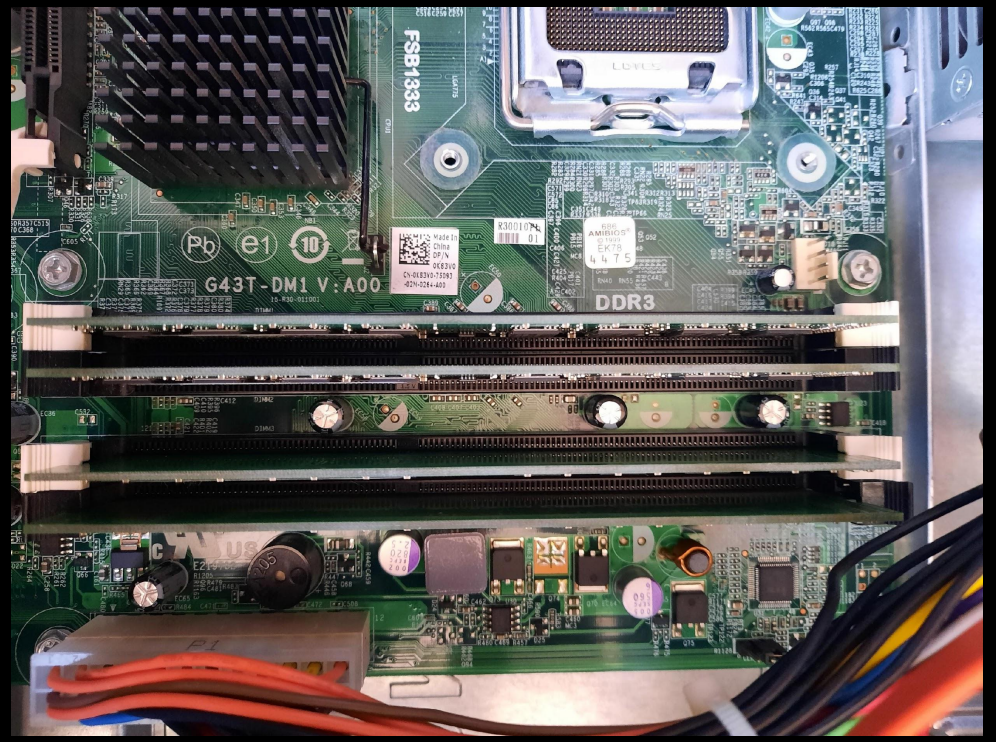
RAM

The RAM, also known as the random-access memory, is the computer's short-term memory. It allows the computer to reach and process information faster, as it doesn't require the computer to search for the information through the hard drive. The computer here has 4 gigabytes of RAM, which is also the amount of short-term memory the computer has.

Top view



Location of RAM



Hard Drive

The hard drive is the storage for the computer, and it stores all the information ranging from user downloads to the operating system. The hard drive has a mechanical arm, that reads information on a spinning platter in binary, and relays it to the rest of the system for the other components to use.

Bottom View

Top View

Power Supply

The power supplies power to the computer, by converting AC power from the outlet, to DC power for the computer to use. The reason the power supply needs to convert the current is due to how the computer processes information in 1's and 0's, a direct current, with has less ripples, and allows the CPU to better process signals without the noisy AC signals.

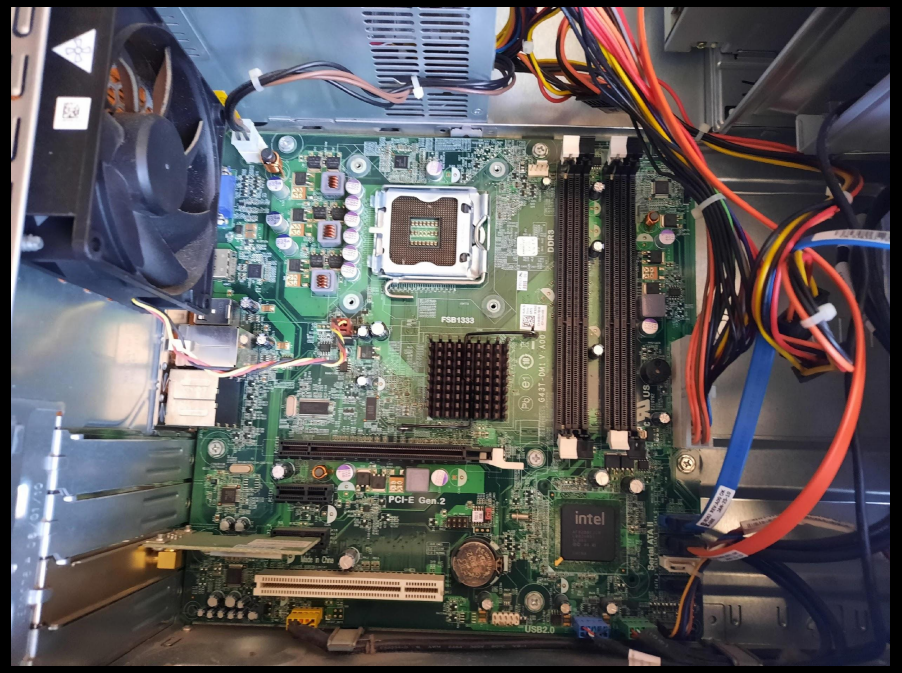
Back View

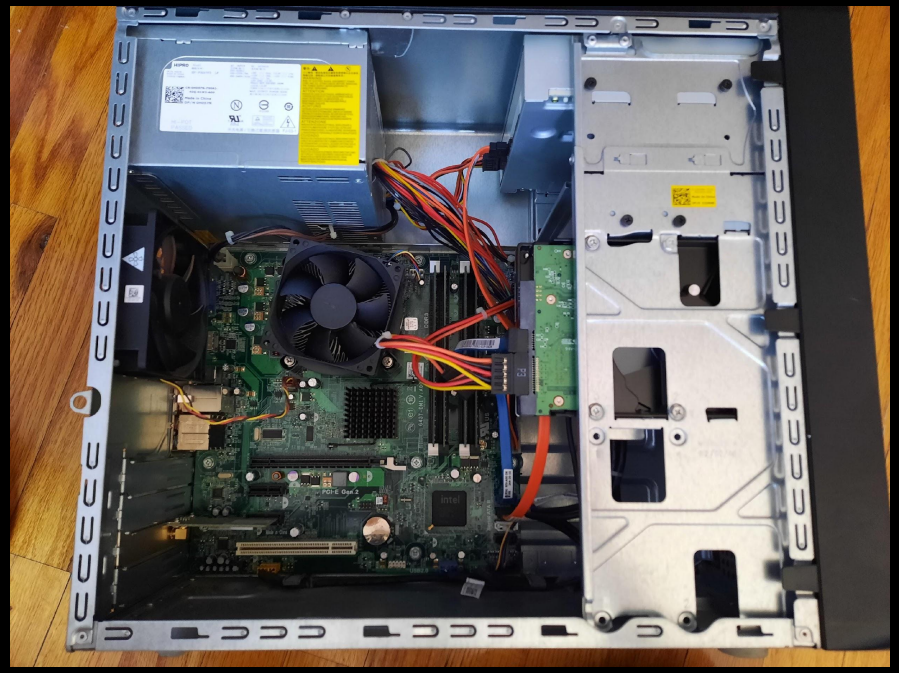
Front View

Motherboard

The motherboard is the backbone of the computer, that connects all the components together, and allows them to communicate. The motherboard distributes electricity from the power supply to the rest of the system and defines what components can be put into the system.

Barebones Motherboard





Completely assembled motherboard

Final report Summary

As many people were forced to work or learn remotely due to the ongoing pandemic, computers have been crucial parts of our lives. Millions of students were on the computer for long hours, and millions more of the workforce were on the computer working from home for long hours. Because of this, our team decided to disassemble a desktop computer, to learn more about such a pivotal part of our workday during this pandemic.

The desktop opened to reveal an ecosystem of electronics, Our team was able to identify a CPU, GPU, RAM, hard drive, and power supply, all connected to the motherboard directly or with wires. We began our research on our components and learned their functions, and how every part was essential to the system. To briefly summarize their roles in the computer, the CPU does all the processing for the computer, the GPU does all the processing and rendering of images to display, the RAM is the short-term memory that holds information for quick access, the hard drive stores all the data for the computer, the power supply converts electricity from the outlet for the rest of the system to use, and the motherboard allows all these components to communicate.

From all this research, our team absorbed new information on such a vital part of everyday life. We learned of the complicated and delicate structure of a computer, and how every component plays an important part in the system. Even one part missing would cause the computer to fail to work. However, it wasn't only knowledge we gained during this project. We also gained experience that wouldn't be possible without a hands-on deconstruction like we had done. We learned to deal with stripped screws that we encountered on the computer, and find trustable sources for our information, like articles written by some of the biggest part manufacturers. In sum, our knowledge and experience gained from our deconstruction of the desktop computer might seem to be complicated, but, with enough research and digging, we can learn anything.