## Part 1. Understanding How Your Computer Works

We'll start by looking at the physical components of your system the stuff we call computer *hardware*. A lot of different pieces and parts make up a typical computer system. Which includes Motherboard and Microprocessor has major parts described below in detail:

**MOTHER BOARD**

A motherboard is what everything plugs into, and without one you can't do much with your computer. It is what I would call the most important part of your computer.

There are three major types of motherboards. They are at, atx, and proprietary. You will only mostly deal with at and atx. There are four main buses on the motherboard. They are power bus, address bus, data bus, and a control bus. A bus is a bundle of wires that send info through them.

<p>MICROPROCESSORS &#160;<a href="http://en.wikipedia.org/wiki/Microprocessor">More..</a></p>

<p>Microprocessors are what we would call brains. They think for the computer and most info except for DMA (direct memory access) goes from application etc.. to CPU and then to memory. Most modern CPU chips have 8 registers on them. They are data, address, accumulator, program counter, instructions, flag, alu, and a fpu. Registers are storage places for data, numbers etc… the program counter stores the addresses of the next instructions to be done. The instruction register holds the current instruction. The address register contains memory addresses of the current instruction. The address register contains memory address of the next read or write. The accumulator holds one of the mathematical data to be used or the answer to the previous operation. Data registers hold the second part of the mathematical data for the current operation. Flag registers are special bits that are set individually by certain instructions. That's an into to what is inside the cup. FYI - the wires inside a CPU are smaller than a centimeter. The reason the chip is made so big is so that we can handle it. </p>

# Dig Deeper Into Your PC: Understanding Device Drivers

**Learn about the critical files that keep your PC components playing nicely together.**

**Have you ever wondered** how the dozens of different components within your computer know how to work together without running into each other?

* How does your printer know how to print documents?
* How do your speakers know how to play music?
* How does your screen know how to draw windows, icons, and pictures?
* How does your mouse know how to move your pointer around?

How do all of these different parts from various manufacturers stay organized and ensure your computer does what it’s supposed to do?

The unsung heroes that make all of the above possible are technically known as “device drivers” (or just “drivers” for short). Device drivers are system files that translate the complex commands issued by you, the operating system, and your familiar programs into simpler instructions that the hardware components (“devices”) of your PC can actually understand and execute.

For example, the software in your internet browser needs to be able to talk to the electronics in your network adapter to actually receive information that allows you to navigate web pages and load their content. Your games and other programs need to be able to tell your screen how to draw windows and graphics, and understand your keyboard and mouse actions.

**Drivers are the interpreters** for all this and more. Every device in your computer has its own very specialized driver that’s created, provided, and maintained by that device’s manufacturer. Most of the hundreds of device drivers on your computer today were installed along with Windows when your computer was originally manufactured, while others you may have actually added yourself without realizing it… by inserting a CD provided with a monitor, printer, digital camera or other peripheral you may have purchased separately.

**Let’s look at drivers in a different way…**

Imagine you’re in a foreign country where you don’t speak the local language. In order to help you communicate, you’ve brought along a dictionary with a list of common phrases and their translations.

If your dictionary contains the most authoritative, up-to-date, and accurate information available for both your language and the language of the country you’re in, then you will be able to communicate with everyone that you meet.

But if your dictionary is incomplete, out of date, or written for the wrong language or dialect, you will certainly run into problems and limitations. For example, you may think you’re asking for directions to the train station—but because one of the words in your dictionary is wrong, what you’re really asking for is directions to the harbor.

In the same way, **each hardware component in your computer speaks its own language**, and you can think of device drivers as files that act as the “dictionaries” that teach your PC’s hardware components how to communicate with one another and the programs and software you’ve installed on your computer.

Device drivers are loaded into and run within a very critical and sensitive part of your PC: the Windows kernel, which is the core of your computer’s operating system—so a communication error caused by an incompatible driver can severely affect the entire system.

## How to ensure drivers don’t let you down

**Establish a roll-back plan in case a faulty driver is installed: Using Windows Restore Points**

Because drivers play such a critical role in your computer’s overall stability, it’s important to avoid introducing problems by unintentionally installing incompatible or untested drivers. However, if a faulty driver accidentally makes its way into your PC, it’s important to have a plan in place that allows you to “roll-back” to a previously stable configuration.