Resource allocation via the OS

Now we're ready to discuss a different aspect of your operating system.
Not only does the OS interact with other parts of your computer, but it's also responsible for managing the resources of the system.
This is a big task that requires a lot of balance to make sure all the resources of the computer are used efficiently.
Think of this like the concept of energy.
A person needs energy to complete different tasks.
Some tasks need more energy, while others require less.
For example, going for a run requires more energy than watching TV.
A computer's OS also needs to make sure that it has enough energy to function correctly for certain tasks.
Running an antivirus scan on your computer will use more energy than using the calculator application.

Imagine your computer is an orchestra.
Many different instruments like violins, drums, and trumpets are all part of the orchestra.
An orchestra also has a conductor to direct the flow of the music.
In a computer, the OS is the conductor.
The OS handles resource and memory management to ensure the limited capacity of the computer system is used where it's needed most.
A variety of programs, tasks, and processes are constantly competing for the resources of the central processing unit, or CPU.
They all have their own reasons why they need memory, storage, and input/output bandwidth.
The OS is responsible for ensuring that each program is allocating and de-allocating resources.
All this occurs in your computer at the same time so that your system functions efficiently.

Much of this is hidden from you as a user.
For example, your browser's task manager will list all of the tasks that are being processed, along with their memory and CPU usage.
As an analyst, it's helpful to know where a system's resources are used.
Understanding usage of resources can help you respond to an incident and troubleshoot applications in the system.
For example, if a computer is running slowly, an analyst might discover it's allocating resources to malware.
A basic understanding of how operating systems work will help you better understand the security skills you will learn later in this program.

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