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Docker
Containers Vs. Virtual Machines

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What is a Virtual Machine?

In basic terms, a virtual machine (often referred to as a "VM" for short), is an emulation of a specific computer system type. They operate based on the architecture and functions of that real computer and its implementation can involve specialized hardware, software or both.

When you think of a virtual machine, you probably think of VMWare, Citrix and/or VirtualBox. Virtualization software allows you to set up one operating system within another. Although they both share the same physical hardware, the virtual machine is isolated from that hardware and has to communicate with it through something called a Hypervisor.

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What is a Container?

A container is exactly what you might expect it to be based on the general definition of the word. It is an entirely isolated set of packages, libraries and/or applications that are completely independent from its surroundings.

In the simplest example, you place your leftovers in a plastic container and then set it on the table. Although the table lends the platform on which the leftovers are resting upon, they are independent of the table itself. What you do to one does not necessarily affect the other (although in certain instances it can).

Why is the difference important?

As in most things in life, the importance is in perspective. From the perspective of getting the most performance out of the hardware purchased, virtualization was invented to allow us to share but segregate server instances from each other. This way, we could protect one operating system from another without letting spare CPU cycles, memory or disk space go to waste.
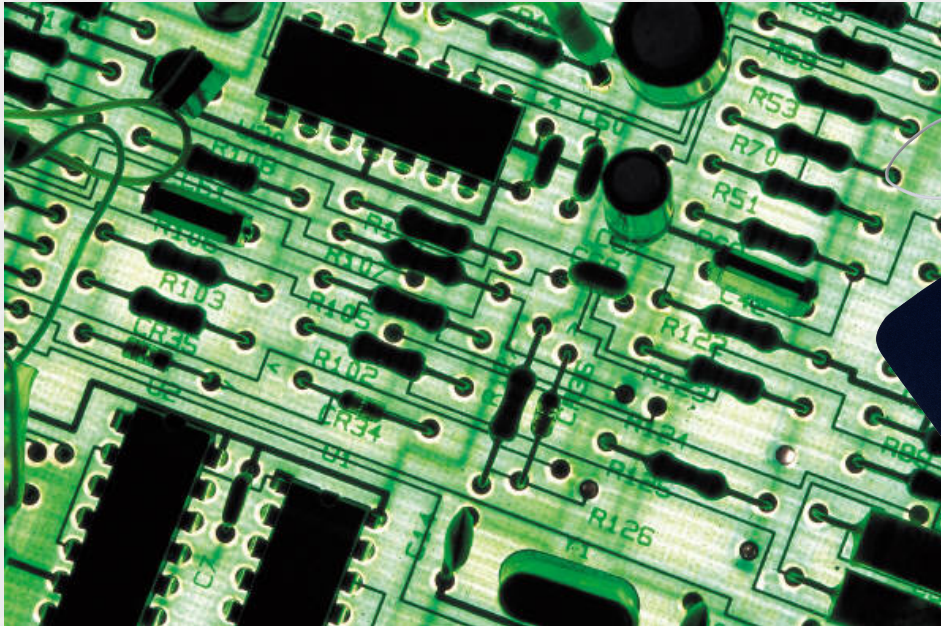
Now, virtualization is becoming more granular. We have virtual servers, but they are based on emulating virtual hardware through a hypervisor. This means that they are heavy in terms of system requirements. Containers however, use shared operating systems and are more efficient in system resource terms.

Summary:

Although the differences may seem subtle, as we continue our exploration of Docker, you will see the many difference in Virtual Machines vs. Containers as being extremely important. We continue to maximize what we get out of our systems by more and more granular management of our resources.