When a physical machine is partitioned to run a separate operating system, it is called a virtual machine. A virtual machine does not have access to the CPU, RAM, disk space, or memory including the other virtual machine running on the same physical machine. A virtual machine has no awareness of it running on the physical machine.

What are the Advantages of Virtual Machine?

In our modern world, a physical machine is strong and fast which make virtual machine more efficient when computing. A strong physical machine allows itself to create many virtual machines to reduce the stranded capacity because a virtual machine size can be manipulated. When multiple programs are running on a physical machine, and if one of the programs is overloaded, it will affect the others due to the large consumption of CPU, disk space, or memory. However, if two programs are running on two different virtual machines, it will only affect that specific program. A virtual machine allows the user to allocate the CPU, disk space, or memory however they want.

Ephemeral Machine or Short Live Machine is a type of virtual machine that is known for fast creates and destroys. A modern physical machine can create a new virtual machine in less than a minute to do a task. When that task is completed, the virtual machine can be destroyed. A physical machine can create up to a hundred of ephemeral machines to run different tasks and once the task is done, it will be destroyed.

A factor that is beneficial to virtual machine is that it is created through a software, which means they are programmable. It can create, delete, and modify using API which is helpful because a task scale will allow the users to create a perfect-sized virtual machine. However, with physical machine, we must use cables and configured via manual labor which would take a longer time; it is also less effective compared to virtual machine.

What is a Container and its benefit?

If a virtual machine takes up a large chunk of RAM and disk space, then a container would only consume the right number of resources; therefore, it is less wasteful. A container has a limited memory configurated and anything processes in that container cannot exceed that limit. Similarly, a disk bandwidth also has a limit which will only affect the container. A benefit of the container is that it has its own copies of the packages, shared libraries, and other required supporting files. This allows the same machine to run two containers at the same time and not cause any conflict. Each container can use a specific version of libraries or supported files without conflicting another container. Containers are lightweight because they do not require an entire OS to run and the system only needs to copy specific files that are required.

When would you select a Physical Machine over a Virtual Machine?

A virtual machine is more cost-effective compared to a virtual machine. You can run as many virtual machines as you want on a physical machine but that would require the physical machine to have higher end computer parts.