What is the difference between bare metal, virtual machine and containers ?

Bare metal :

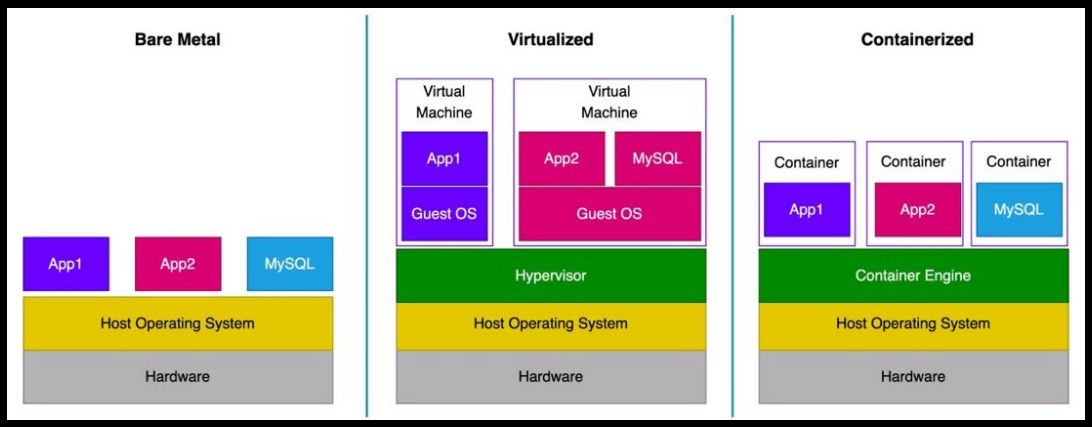
- This is a physical hardware with it's own operating system, apps, database etc.
- This is more secure and doesn't have noisy neighbour problem.
- This is expensive, not easy to scale and requires a good team to manage.

Virtual machine:

- Virtual machine is an emulation of a physical machine.
- It is deployed on top of bare metal hardware, which has a host operating system.
- The host operating system has a layer of software called hyper visor which monitors the virtual machines
- Each virtual machine has it's own guest operating system.
- Virtual machines have better resource utilisation because they can be run on the same bare metal hardware.
- Virtual machines are easy to scale and cheap.
- They are less secure than bare metal and have noisy neighbour problem.

Containers

- Containers are like lightweight virtual machines
- Each container is a package containing all the libraries, frameworks and dependencies needed to run the application.
- This package is portable and can be deployed anywhere
- The bare metal machine has a host operating system. Here we do not have a hyper visor as the containers run like processes on the host operating system.
- Since the containers share the same resource, they are less secure than VMs because they are only bound by operating system level rules.
- VMs can contain containers within themselves too. This makes them more secure



Note : containers cannot run on all OS. What actually happens is that docker containers run in a virtual machine on host environment. So people think containers can run on all Operating Systems.
