

Virtualization

- Virtualization is a technology that allows you to create virtual, simulated environments from a single, physical machine.

Virtual machines

- A virtual machine (VM) is a computing environment that functions as an isolated system
- it can be moved from 1 computer to another, opened in either, and be expected to work the same
- Virtualization allows virtual machines with multiple different operating systems to run simultaneously on a single physical device

Hypervisor

- software that separates a system's physical resources and divides those resources so that virtual environments can use them as needed
- takes physical resources from the hardware and allocates them to multiple VMs at once.
- The physical hardware is called the host, while the many VMs are guests.

Types of hypervisors

- Type 1: native or bare-metal hypervisor
- Type 2: hosted hypervisor

Type 1: native or bare-metal hypervisor

- runs directly on the host's hardware
- VM resources are scheduled directly to the hardware by the hypervisor
- most common in an enterprise datacenter or other server-based environments.

Type 2: hosted hypervisor

- runs on a conventional operating system as a software layer or application.
- VM resources are scheduled against a host OS
- Better for individual users who want to run multiple operating systems on a personal computer.

Benefits

- Server consolidation
- Cost savings
- Isolated environments
- Faster application migration
- Efficient environments
- Disaster recovery

Types

- Server
- Desktop
- Data
- Storage
- Application
- Network functions

Virtualization vs. containerization

- virtualization allows VMs to function at full capacity apart from their physical hardware with differing operating systems
- containerization allows software or applications to be packaged in a container that shares the host OS and can be moved and run in any environment for increased flexibility.