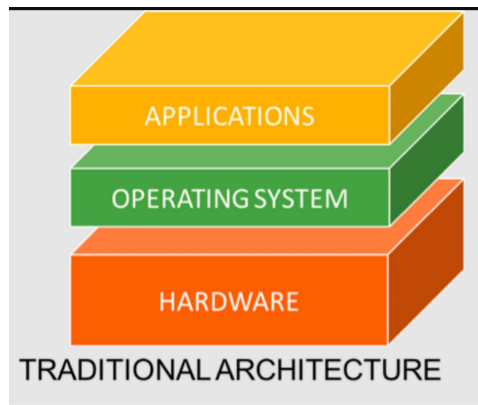


Chapter-3 (Virtualization)

29 July 2022 02:57

Evolution of virtualization

When virtualization did not exist in IT industry. Industries used to consume one machine for one application.



Configuration

- 600 GB SSD
- 45 GB RAM
- 12 Core Processor

Drawbacks :

- * If application uses 1GB SSD , 2 GB RAM & 1 Core of CPU unused resource are of no use.
- * Industry has to bear the load of maintenance of such servers even the application uses less resources.
- * Not cost efficient.

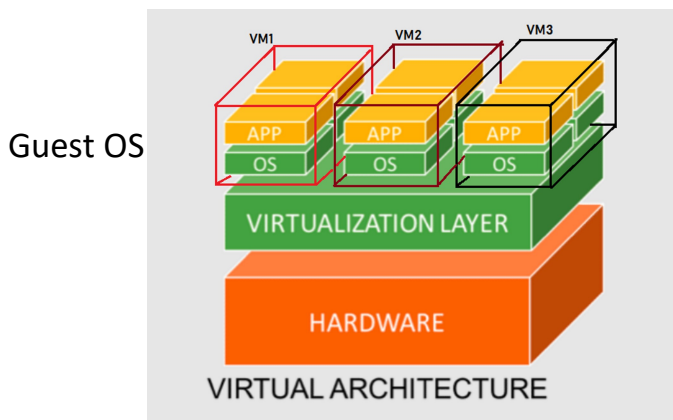
To overcome the drawbacks of traditional way of deployment of an application in single machine, Server Virtualization was introduced to use a server more cost efficiently.

Server Virtualization

Server virtualization is the process of using software to divide physical hardware into separate unique virtual servers.

Once divided, these independent virtual servers are able to host a different operating system.

VM is a digital version of a physical computer. Its software can run programs and operating systems, store data, connect to networks, and do other computing functions. Multiple VMs can be hosted on a single physical machine (often a server) and then managed using VM software.

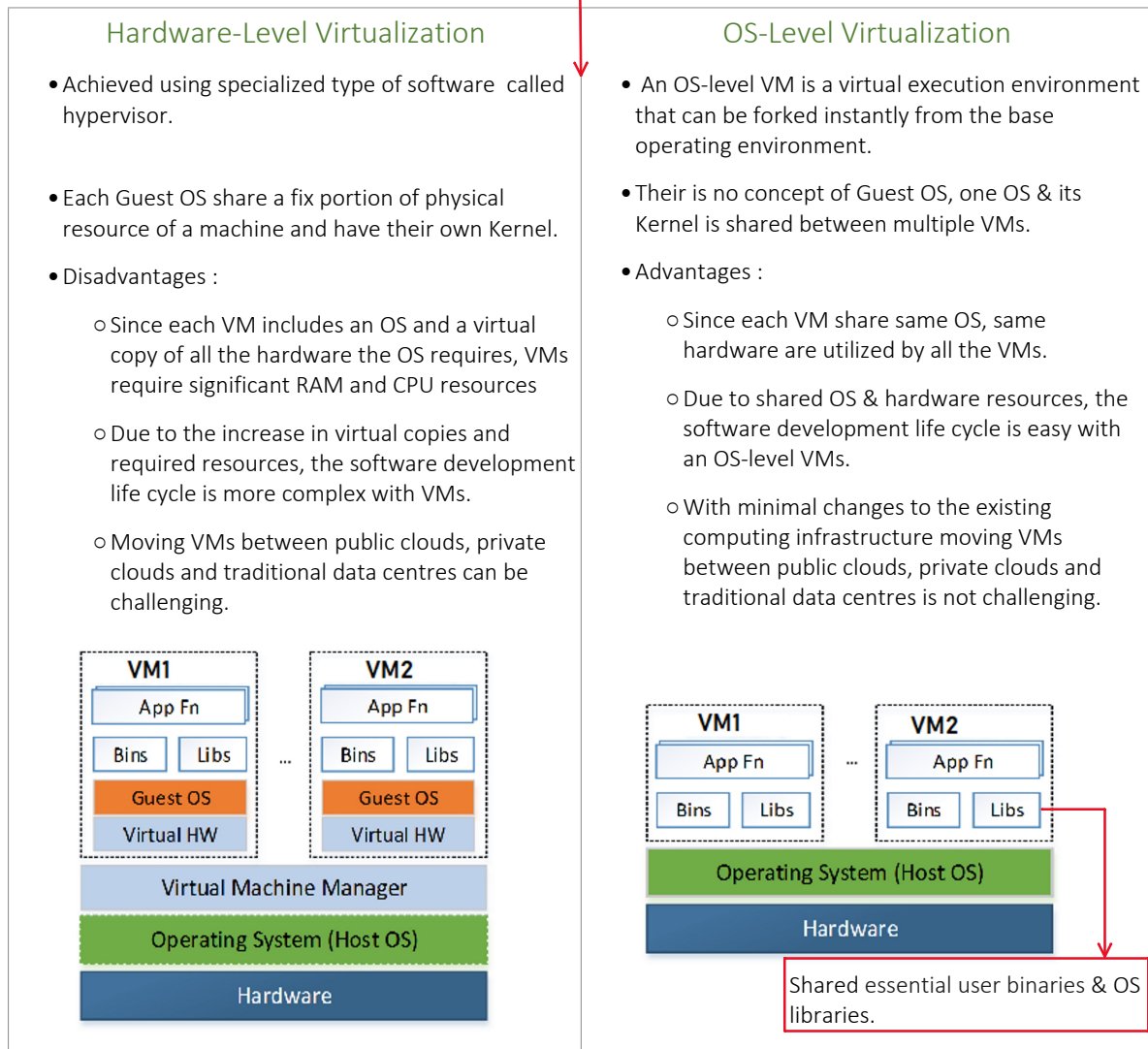


Configuration

- VM1
 - 200GB SSD, 15GB RAM & 4 Core
 - OS - Ubuntu
- VM2
 - 150GB SSD, 10GB RAM & 2 Core
 - OS - Deepin
- VM3
 - 250GB SSD, 20GB RAM & 6 Core
 - OS - Debian

Server Virtualization

Server Virtualization



What is a hypervisor?

A hypervisor, or virtual machine monitor, is the software or firmware layer that enables multiple operating systems to run side-by-side, all with access to the same physical server resources. **The hypervisor orchestrates and separates the available resources (computing power, memory, storage, etc.), aligning a portion to each virtual machine as needed.**

Challenges of OS-level virtualization:

- **Portability:** VMs are tied to or dependent upon the host operating system, and hence, not portable and are not able to run uniformly and consistently across any platform or cloud.
- **Agility:** Running VMs has no industry standard for VMs with simple developer tools and a universal packaging approach that works on both Linux and Windows operating systems.
- **Ease of management:** No VMs orchestration platform that automates the installation, scaling, and management of virtualized workloads and services which can ease management tasks such as scaling VMs apps, rolling out new versions of apps, and providing monitoring, logging and debugging, among other functions.
- **Security:** As VMs share the Kernel of shared operating system the isolation of applications is challenging as inherently invasion of malicious code from affecting other VMs or the host system.

Solution of challenges faced in implementation of OS-level virtualization:

Technologies like Docker, Podman etc are now adding a new level of abstraction as well as automation to the OS-Level Virtualization platform running on Linux servers.