



Compute / Server Virtualization

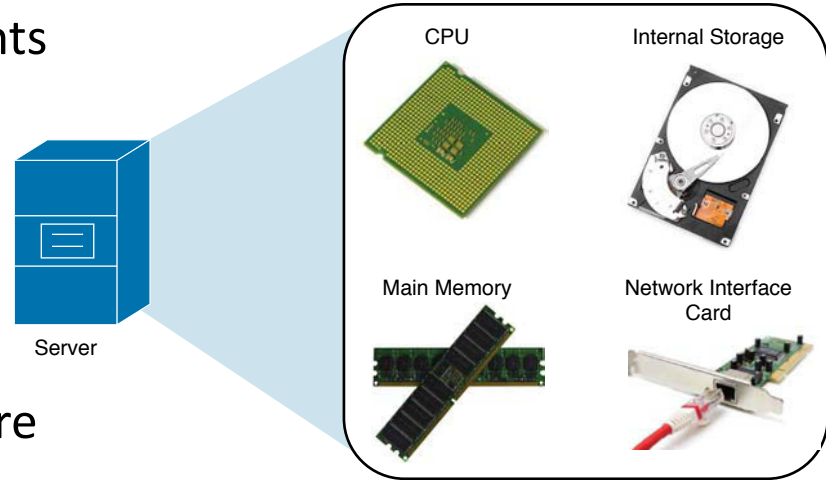
Kh. Rashedul Arefin

Outlines

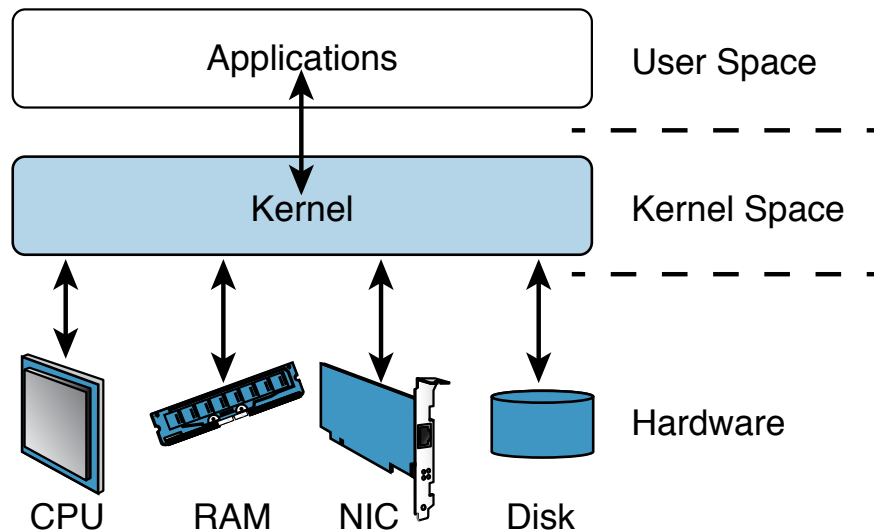
- Introduction to Server
- Server Virtualization History
- Server Virtualization Technology
- Server Virtualization Features
- Linux Container and Docker

Introduction to Server

- Software Component
 - Accept request from multiple clients
 - Process clients' request
 - Provide suitable Response
-
- Hardware that host Server Software



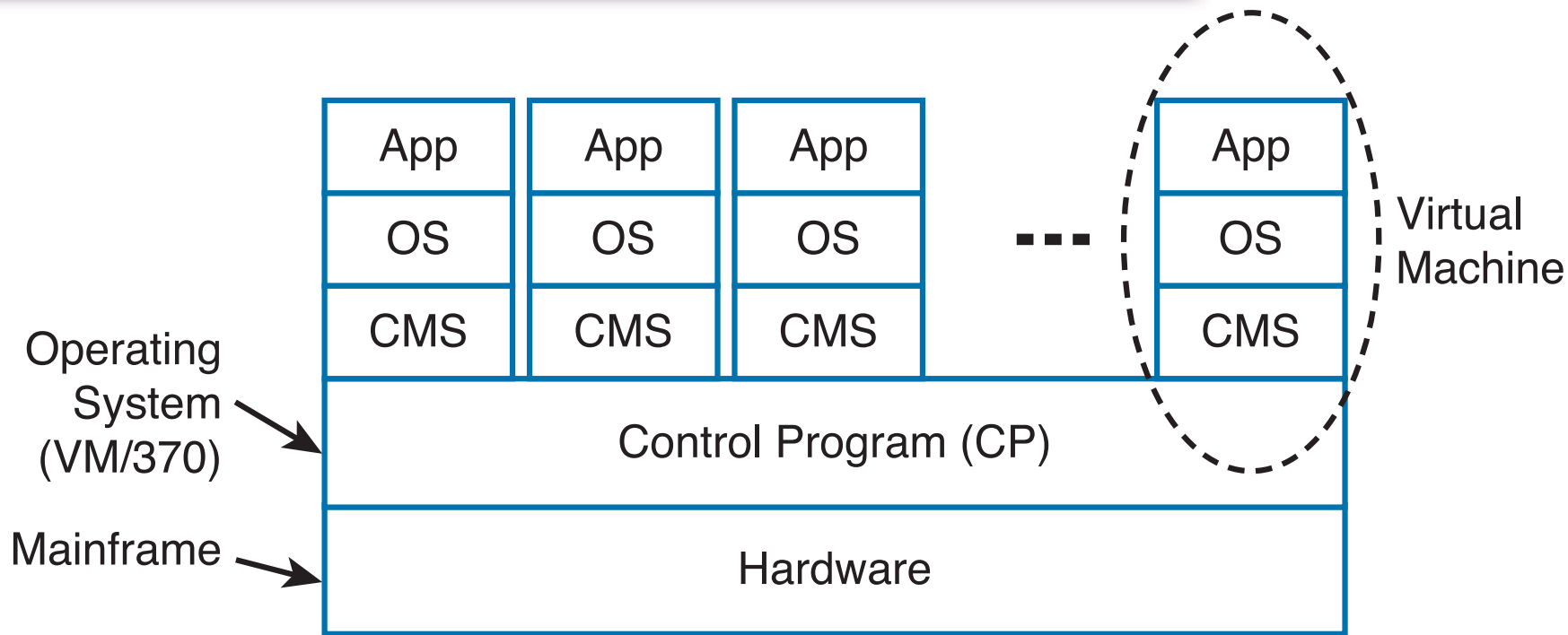
Introduction to Server



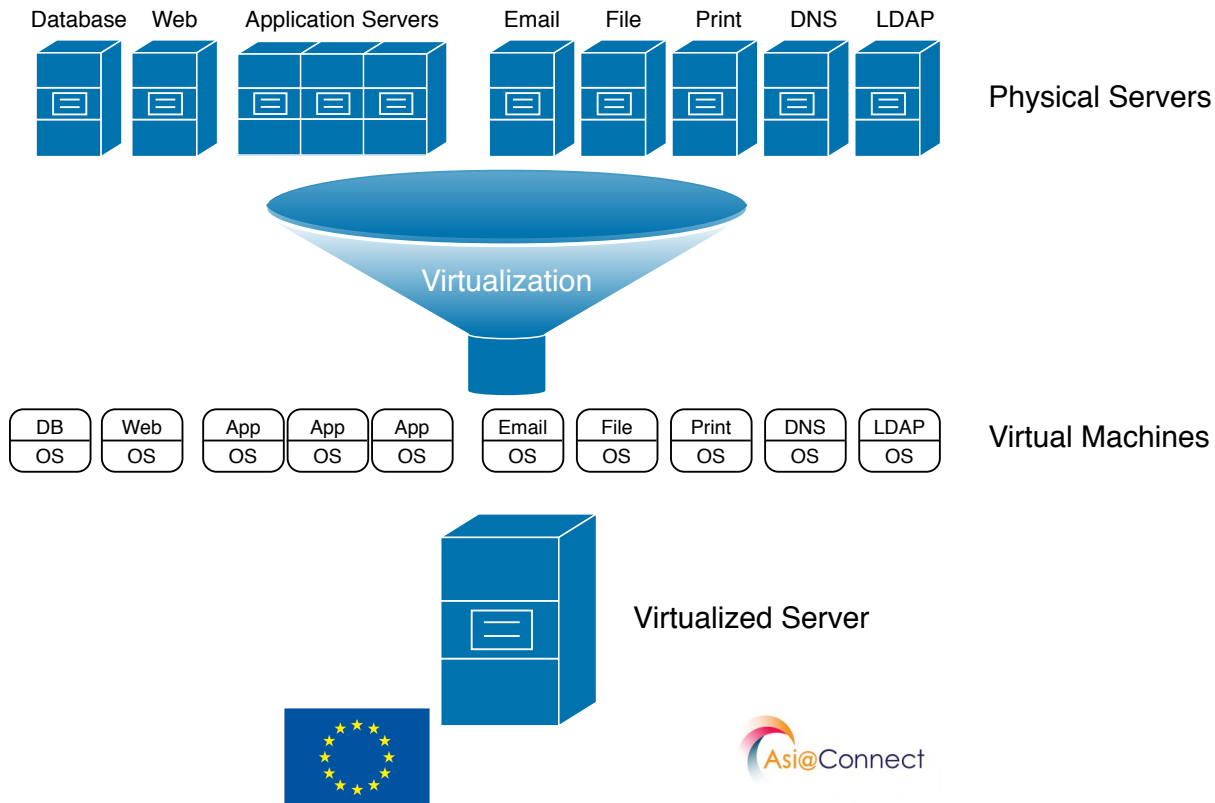
Monolithic: Entire Architecture of OS resides in Kernel Space (Linux and FreeBSD)

Microkernel: Processes are scattered across both Kernel and User Space (Mac OS X and Windows)

Server Virtualization History



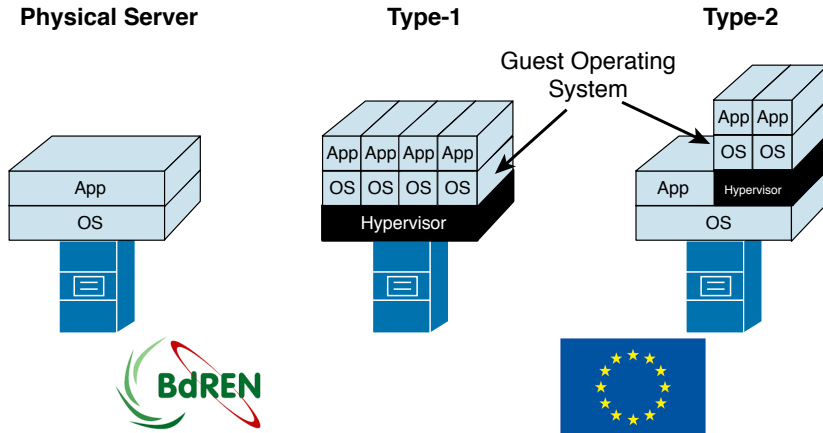
Server Virtualization History



Server Virtualization Technology

Hypervisors:

- ✓ A Software Component
- ✓ Create emulated hardware
 - CPU
 - Memory
 - Storage
 - Peripherals
- ✓ Allow to create Virtual Machine



Type - 1

- VMware ESXi
- Microsoft Hyper-V
- Linux KVM
- Red Hat Enterprise Virtualization (RHEV)
- Citrix XenServer
- Oracle VM

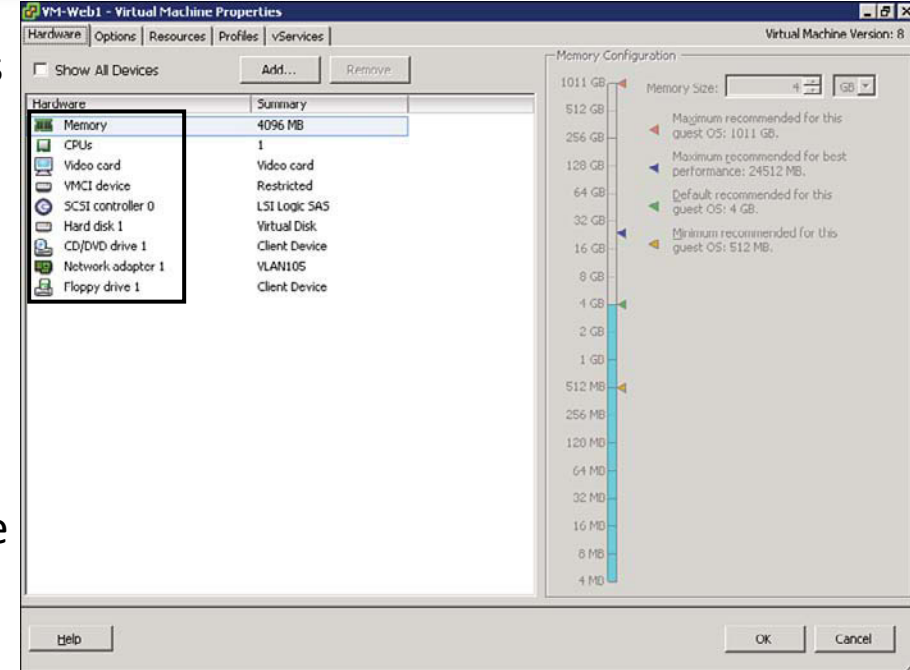
Type - 2

- VMware Workstation
- VMware Player
- VMware Fusion
- Microsoft Windows Virtual PC
- Oracle VM Virtual Box
- Parallels Desktop for Mac

Server Virtualization Technology

Virtual Machine Deploys Virtual Hardware Devices

- ✓ Virtual Central Processing Unit (vCPU)
- ✓ Virtual Random Access memory (vRAM)
- ✓ Virtual Hard Drive
- ✓ Virtual Storage Controller
- ✓ Virtual Network Interface Controller (vNIC)
- ✓ Virtual Video Accelerator Card
- ✓ Virtual Peripherals – CD, DVD, Floppy Disk Drive



Server Virtualization Technology

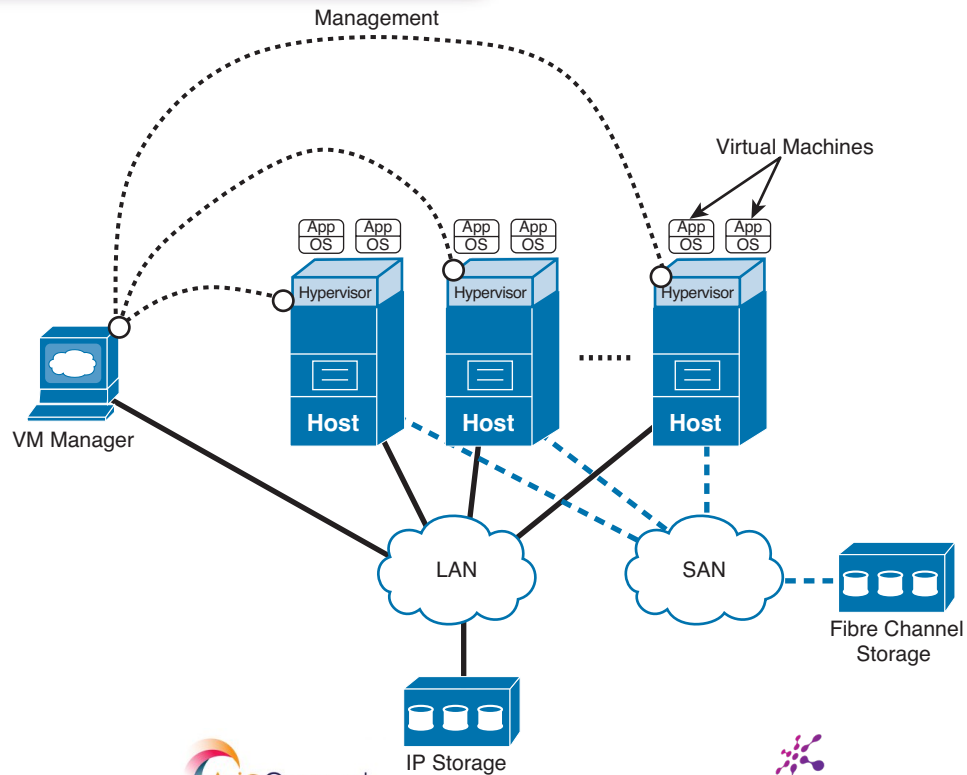
Virtual Machine is composed of a set of files which dictate how Hypervisor controls physical resources and shares them with guest OS.

File Type	File Extension	Functions
Virtual Disk	.vmdk	✓ Contains all the data ✓ VM uses as internal storage device
Swap Memory	.vswp	✓ Used as a replacement of virtual memory
Log	.log	✓ Stores all the information ✓ Used for troubleshooting purposes
Configuration	.vmx	✓ Contains all information of hardware settings ✓ vRAM Size, NIC information etc.
Nonvolatile RAM	.nvram	✓ Contains information for VM initialization ✓ Boot order, CPU usage etc.

Server Virtualization Technology

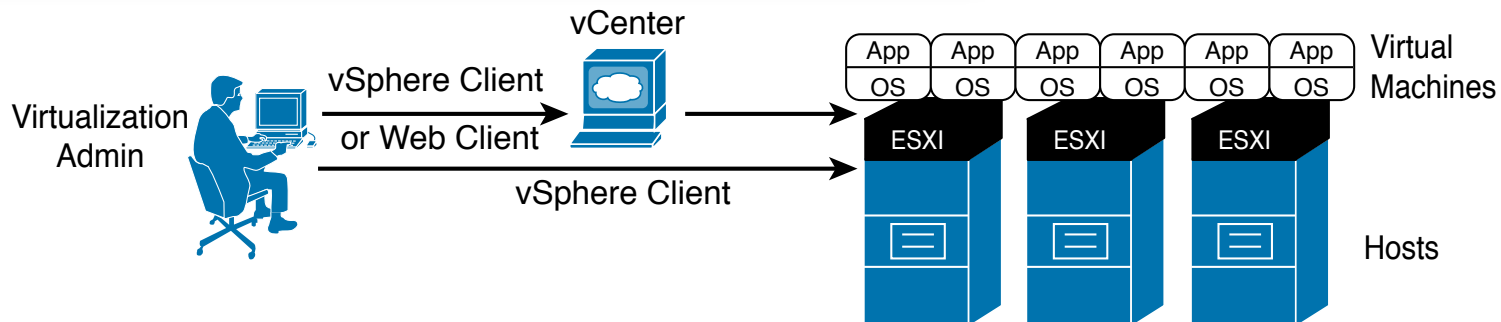
Virtual Machine Manager:

- ✓ Software Solution
- ✓ Create and Manage Virtual Machine

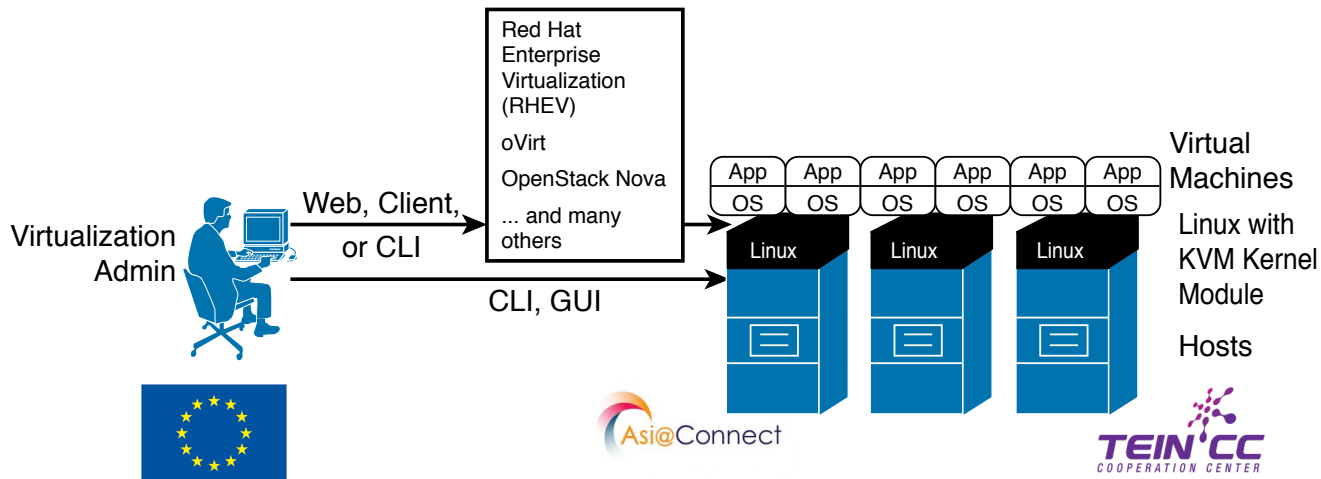


Server Virtualization Technology

VMware vSphere:

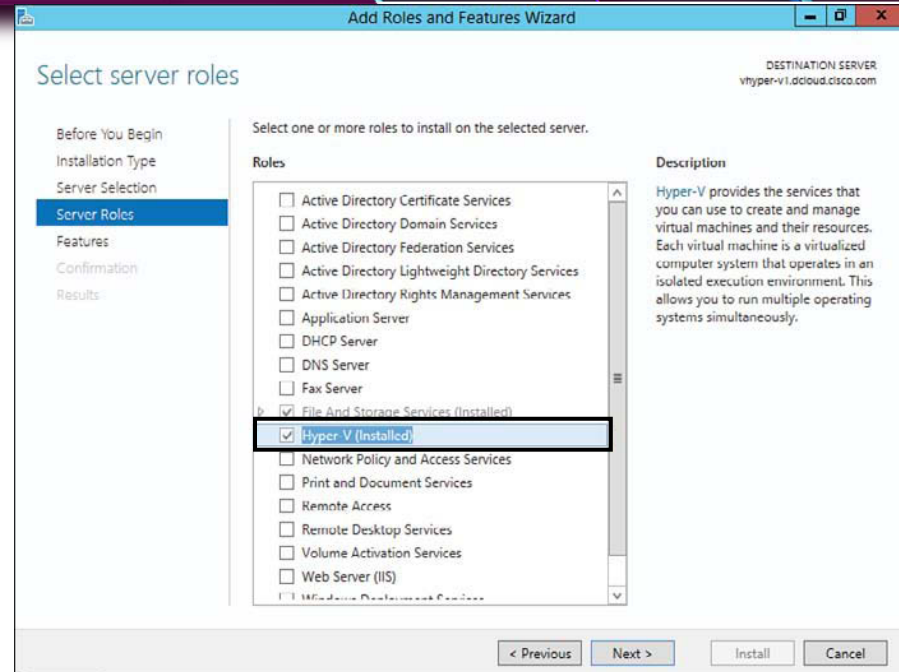
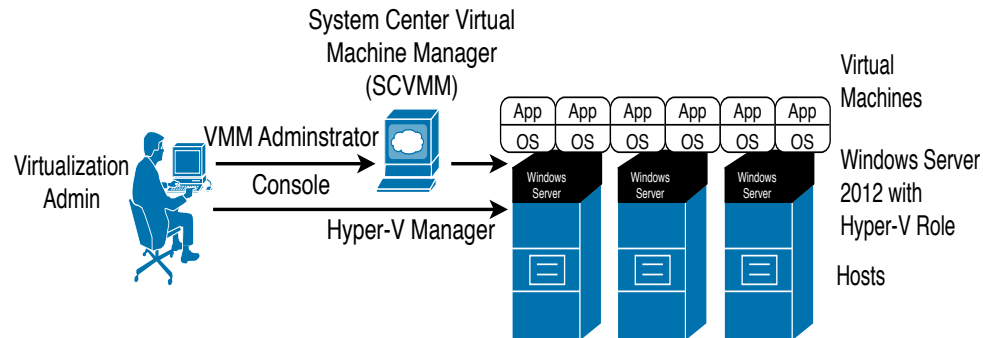


Linux KVM:



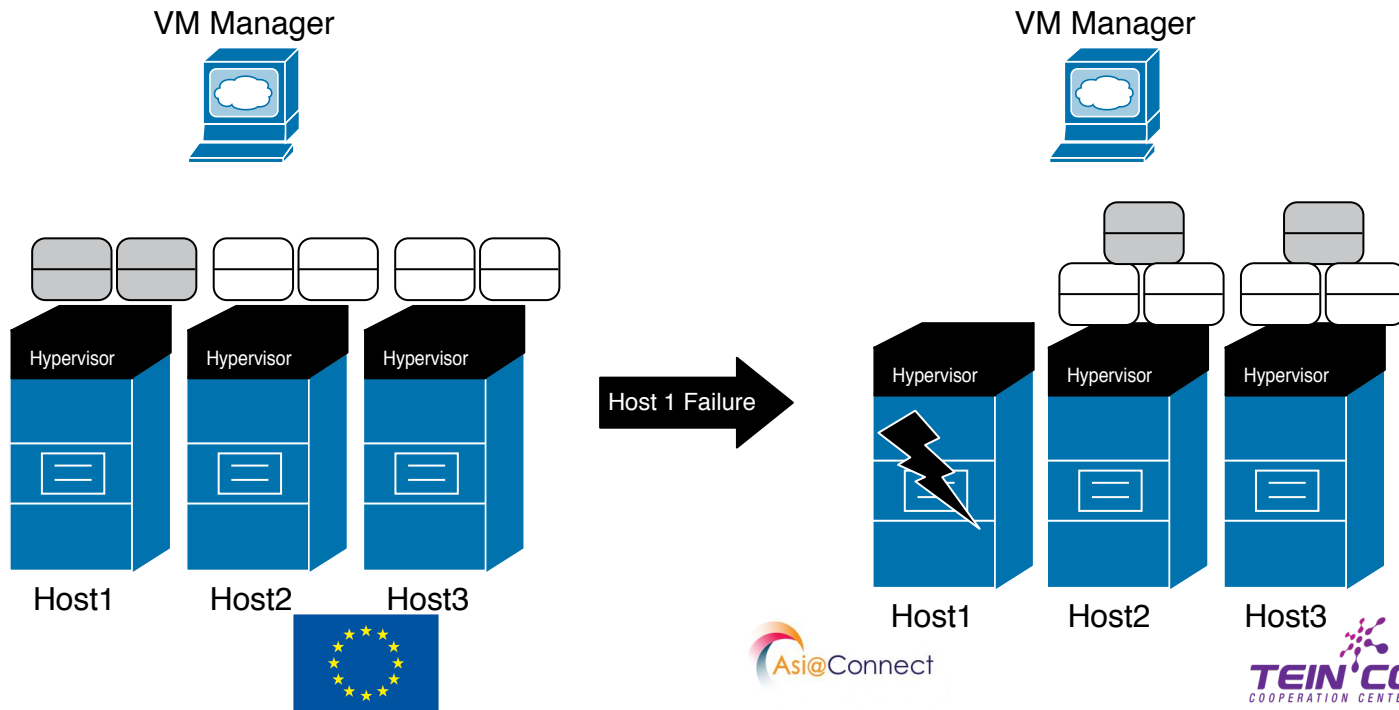
Server Virtualization Technology

Microsoft Hyper-V:



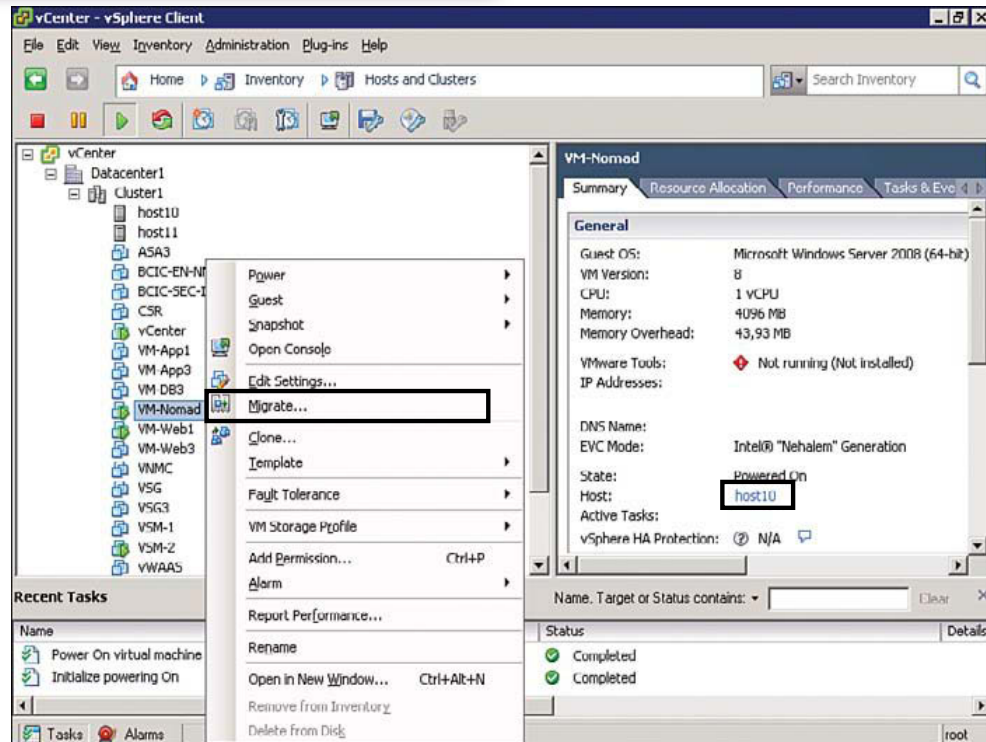
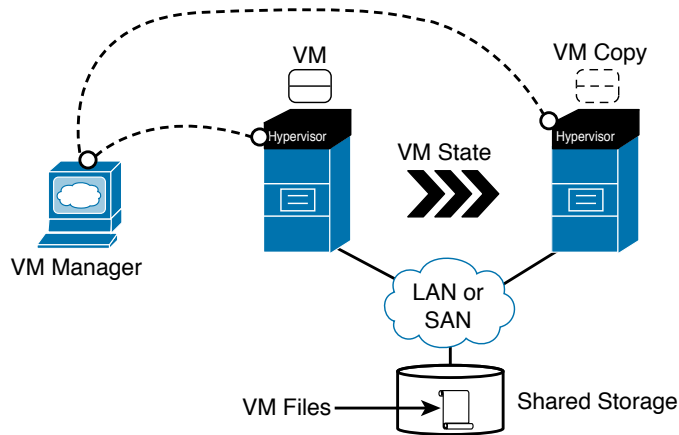
Server Virtualization Features

Virtualization Machine High Availability:



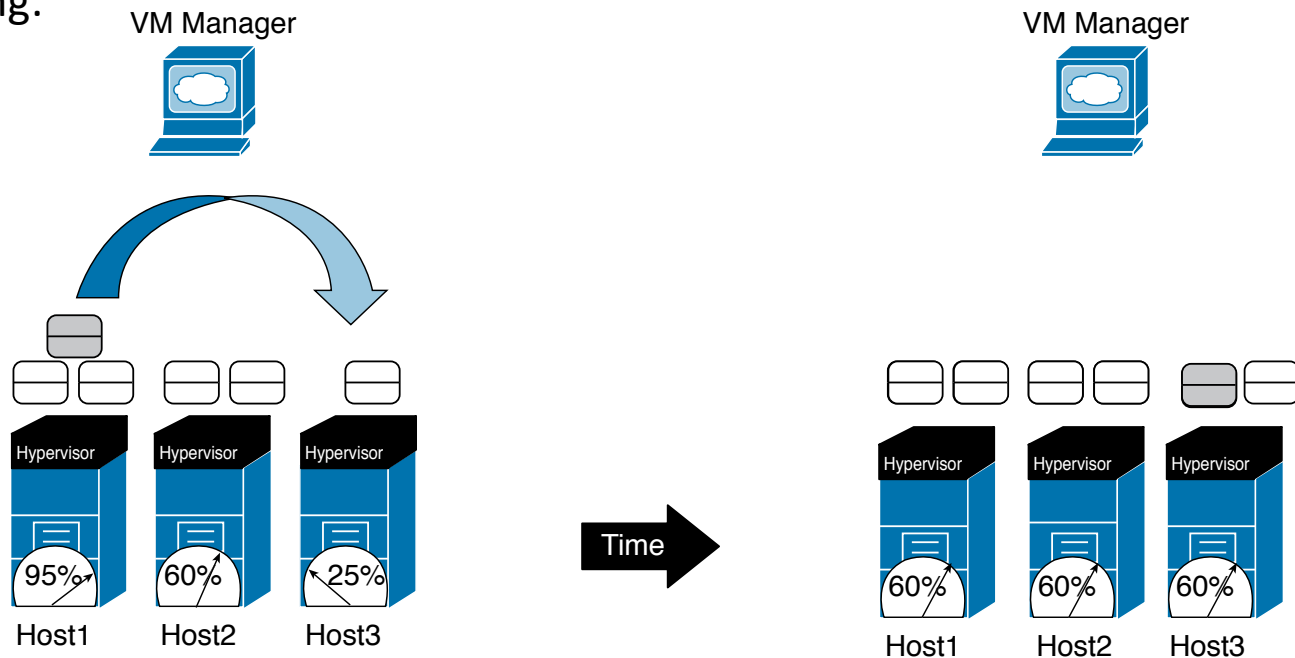
Server Virtualization Features

Virtualization Machine Live Migration:



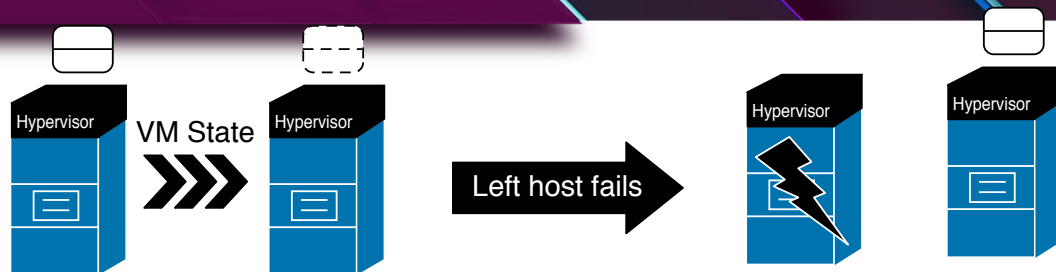
Server Virtualization Features

Resource Load Balancing:

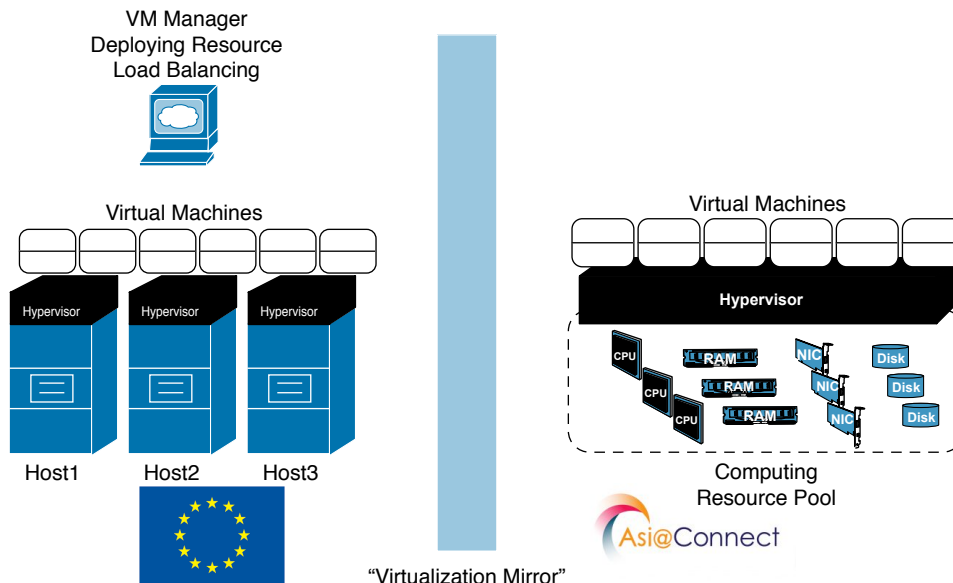


Server Virtualization Features

Virtual Machine Fault Tolerance:

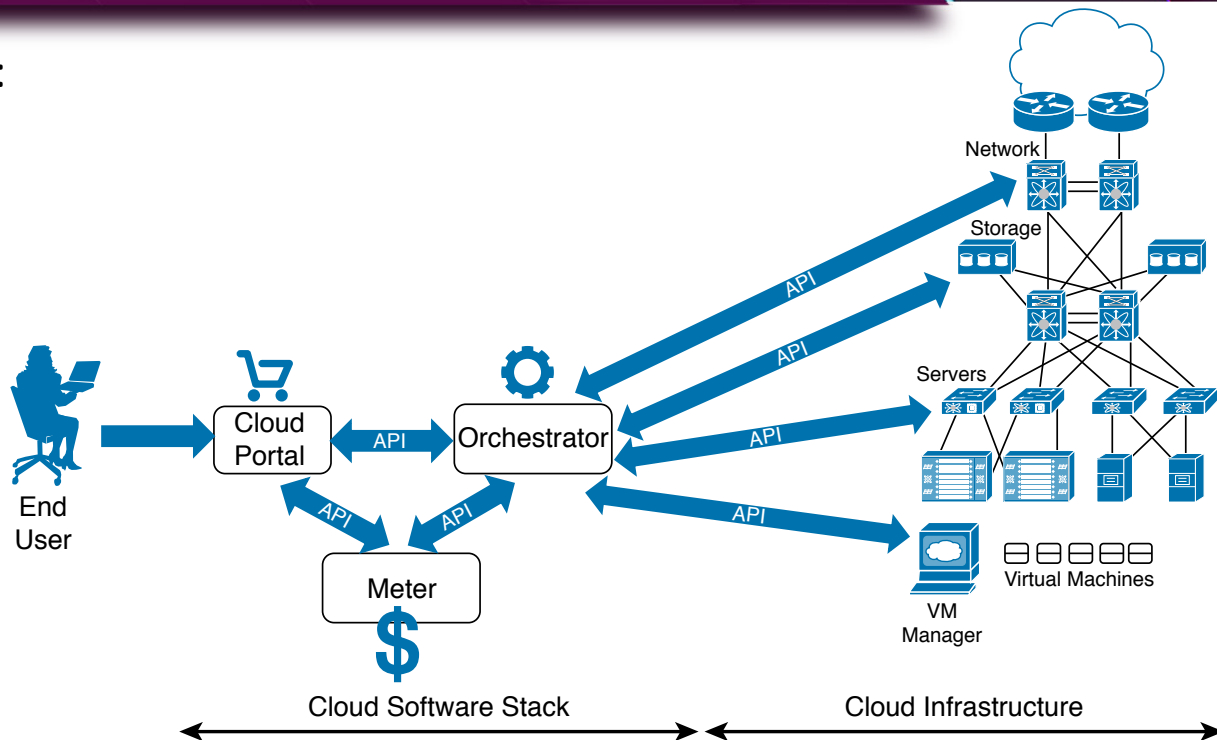


Resource Pooling:



Server Virtualization Features

Cloud Computing:



Linux Container and Docker

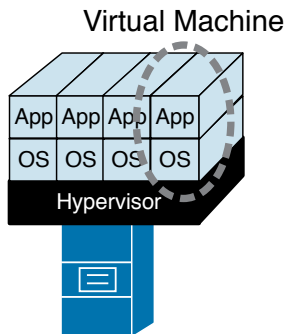
Linux Containers (LXC):

- ✓ Alternative to Hypervisors
- ✓ Provide OS-Level Virtualization

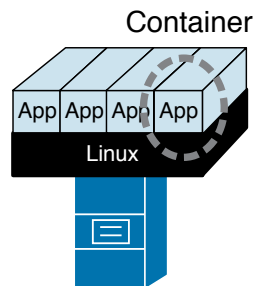
Docker:

- ✓ Automate Application Deployments using LXCs

Type-1 Hypervisor



Linux Container



Docker

