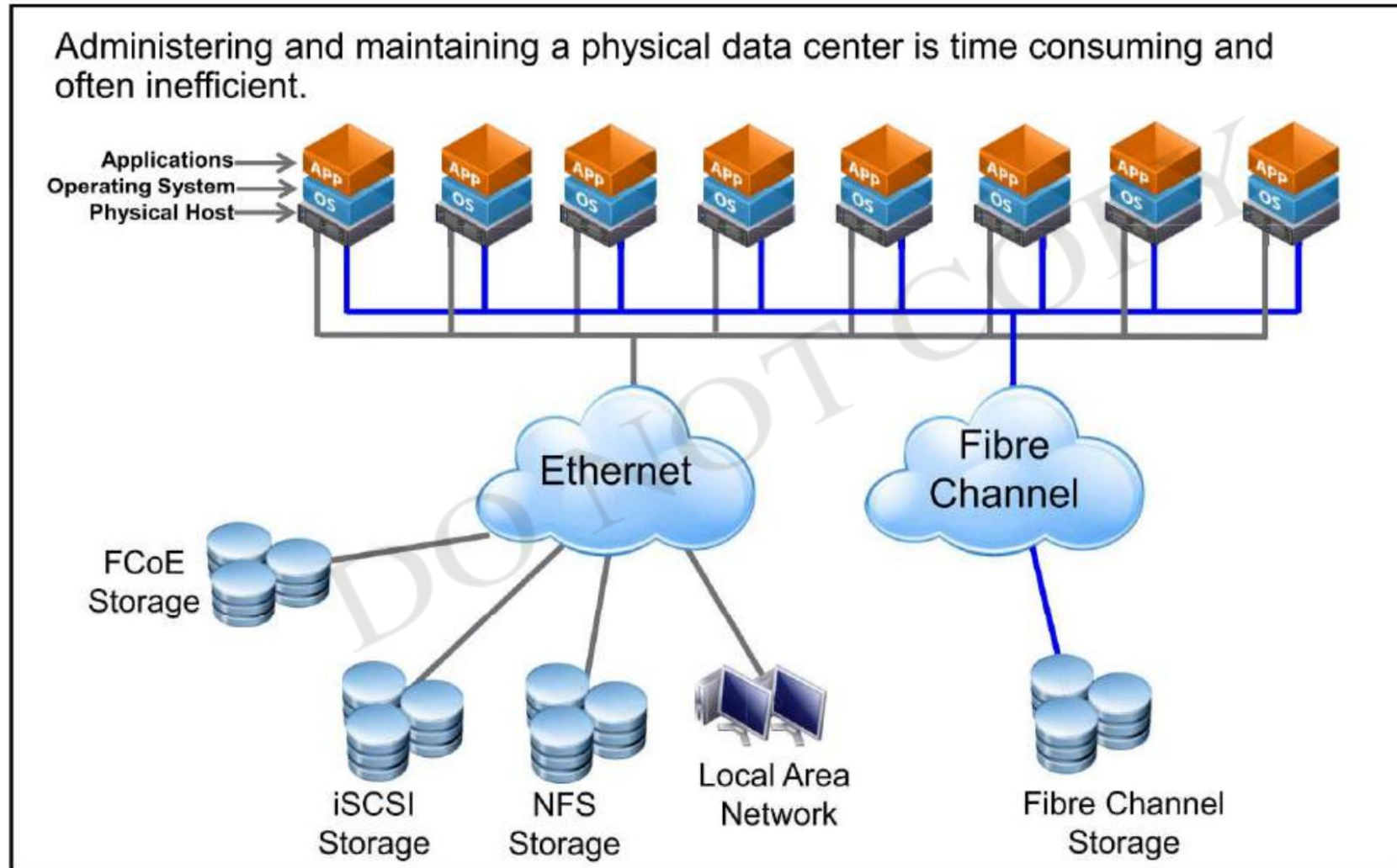




# VIRTUALIZATION

# Physical Infrastructure





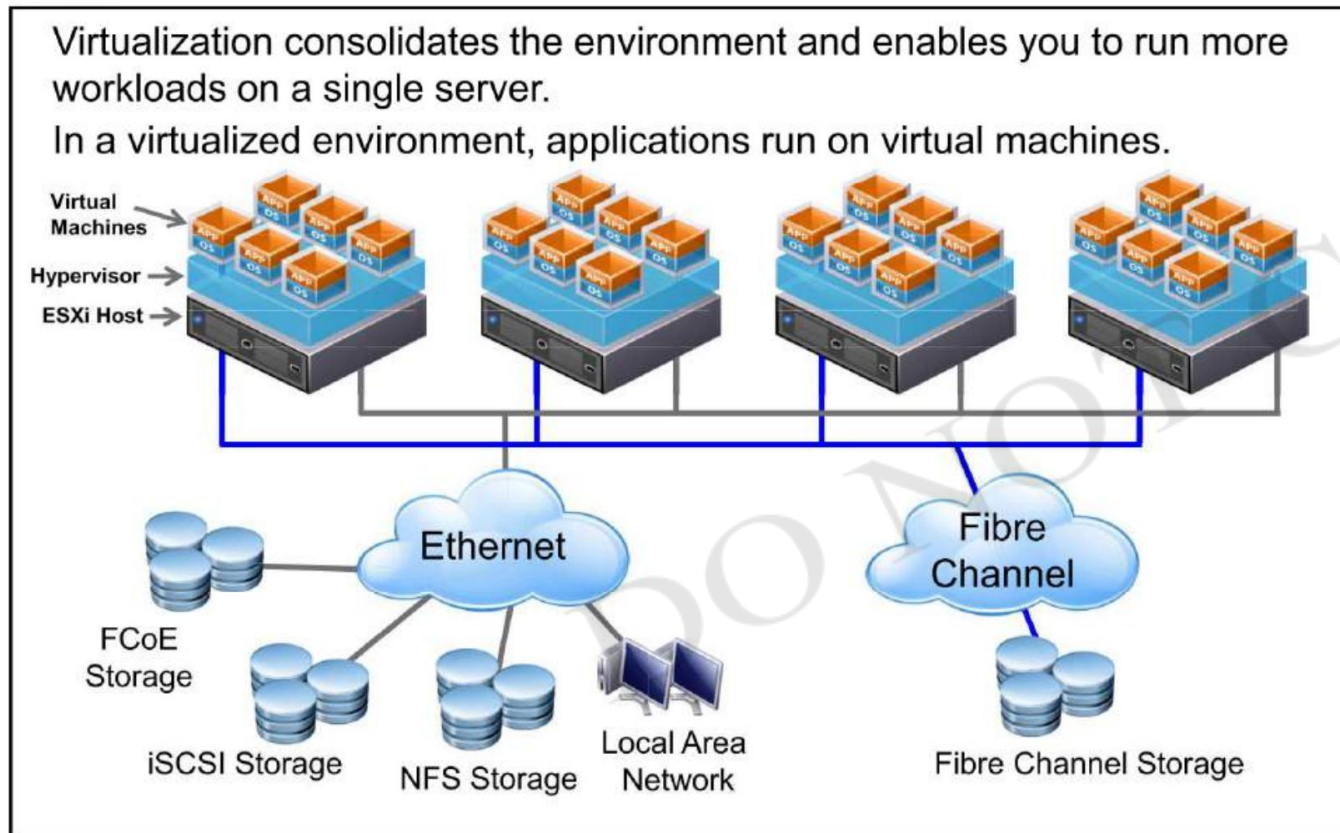
# Challenges of Physical Infrastructure

Traditionally, Operating Systems and software were on a physical computer. Large physical infrastructures pose several challenges in a data center. The model depicted in the diagram is not flexible and can be inefficient. The planning and costs of proper infrastructure (square footage, rack space, power, cooling, cabling and server provisioning) are a few of the challenges that the IT staff must address.

In this physical model, a one-to-one relationship exists between a physical computer and the software running on it. This relationship leaves most computers vastly underutilized. Often, between only 5%-10% of physical server capacity is in use.

Further, provisioning physical servers is a time-consuming process. In nonvirtualized environments, time must be allotted to procure new hardware, place it in the data center, install an operating system, patch the operating system and so forth. Installing and configuring the required applications can take weeks.

# Virtual Infrastructure

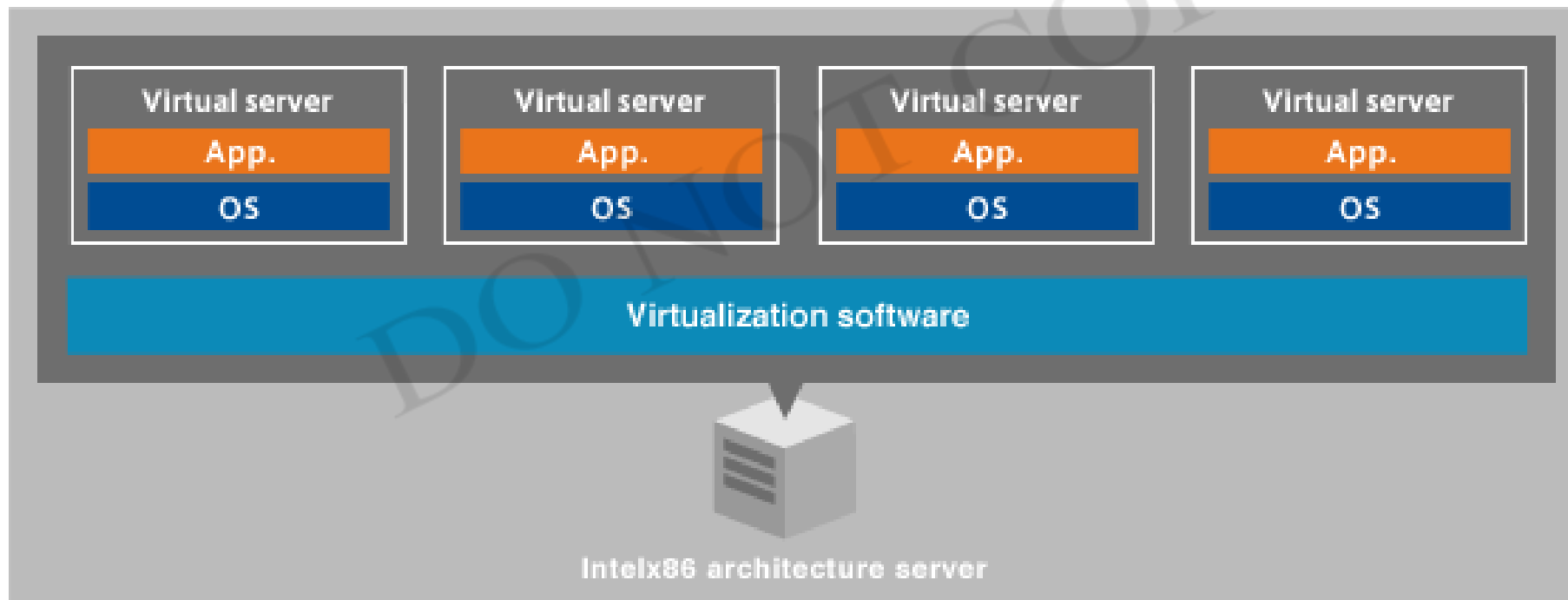


Using virtualization technology changes the way servers are provisioned. You do not need to wait for the hardware to be procured or cabling to be installed. Virtual machine provisioning is performed through a GUI. In contrast to the long process of deploying physical servers, virtual machines can be deployed in a matter of minutes.

# Virtualization



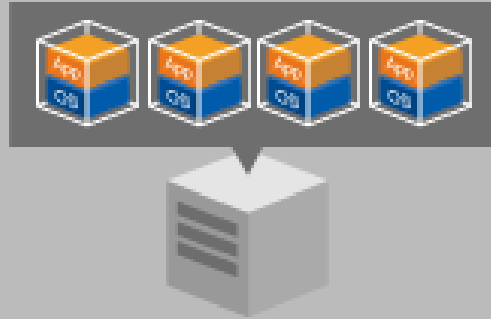
Server virtualization is a technology for partitioning one physical server into multiple virtual servers. Each of these virtual servers can run its own operating system and applications, and perform as if it is an individual server. This makes it possible, for example, to complete development using various operating systems on one physical server or to consolidate servers used by multiple business divisions.



# Features of Virtualization

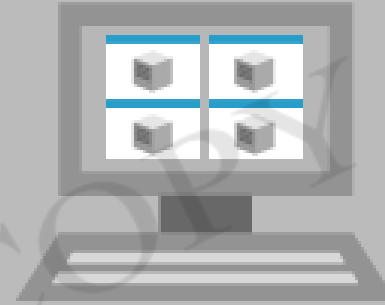


## Partitioning



Multiple virtual servers run on one physical server at the same time.

## Isolation



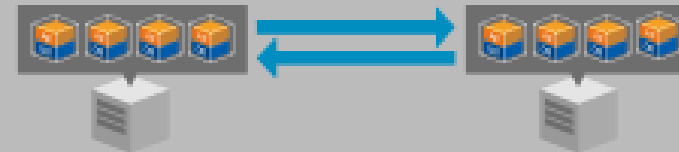
The virtual servers running on a physical server are safely separated and do not affect each other.

## Encapsulation



All information on virtual servers, including boot disks, is saved in file format.

## Hardware-independence



Virtual servers run as is after migration to different hardware platforms.

# Virtual Machine



## Virtual Machine



## Virtual Machine Components

- Operating system
- VMware Tools™
- Virtual resources such as:
  - CPU and memory
  - Network adapters
  - Disk controllers
  - Parallel and serial ports

The Virtual machine includes a set of specification and configuration files and is backed by the physical resources of a host. Every virtual machine has virtual devices that provide the same functionality of physical hardware but are more portable, more secure and easier to manage.



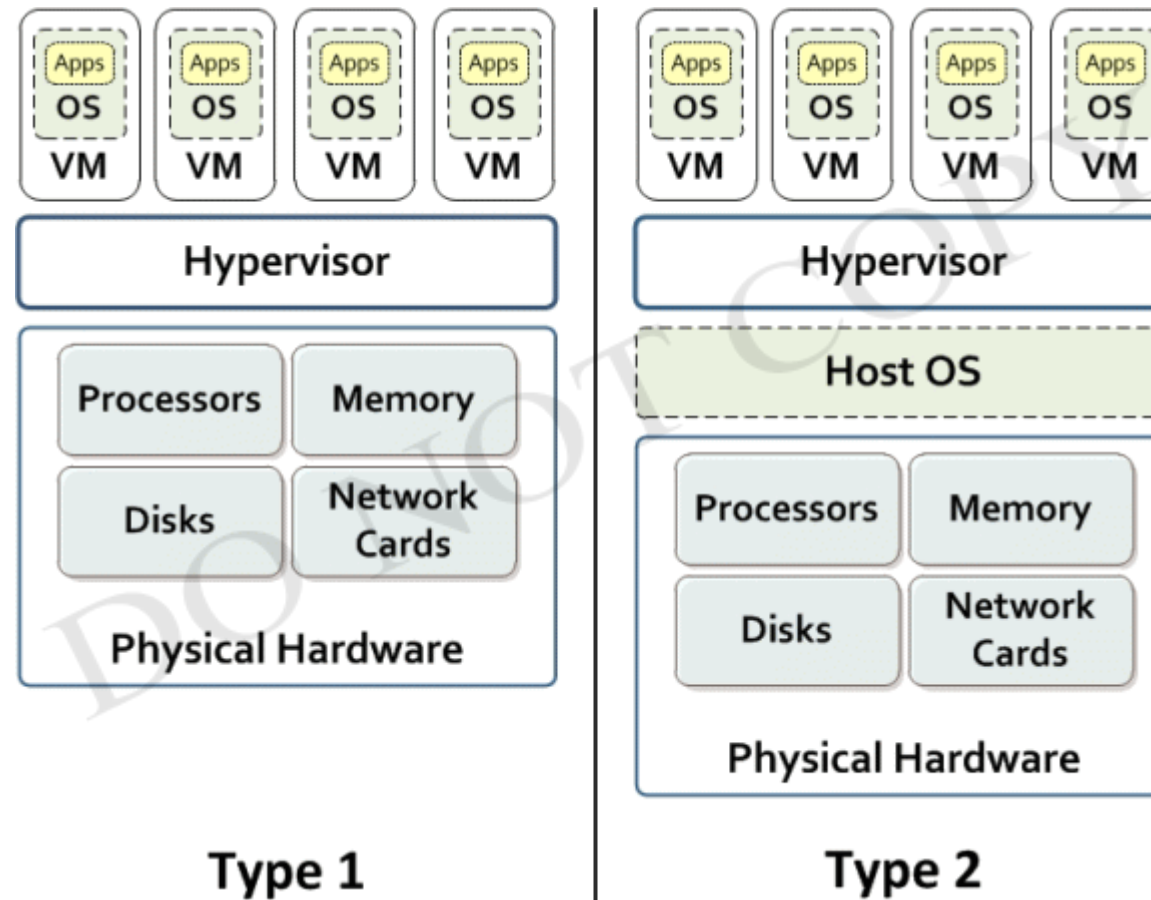
# Hypervisor

A hypervisor or virtual machine monitor (VMM) is a piece of computer software, firmware or hardware that creates and runs virtual machines. A computer on which a hypervisor runs one or more virtual machines is called a host machine, and each virtual machine is called a guest machine.

The hypervisor presents the guest operating systems with a virtual operating platform and manages the execution of the guest operating systems. Multiple instances of a variety of operating systems may share the virtualized hardware resources: for example, Linux, Windows, and OS X instances can all run on a single physical x86 machine.



# Types of Hypervisor



# Bare-Metal Hypervisor



Type 1, which is considered a bare-metal hypervisor and runs directly on top of hardware. The Type 1 hypervisor is often referred to as a hardware virtualization engine.

A Type 1 hypervisor provides better performance and greater flexibility because it operates as a thin layer designed to expose hardware resources to virtual machines (VMs), reducing the overhead required to run the hypervisor itself.

Because a Type 1 hypervisor runs directly on the hardware, it is a function in and of itself. Servers that run Type 1 hypervisors are often single-purpose servers that offer no other function. They become part of the resource pool and are designed specifically to support the operation of multiple applications within various VMs.

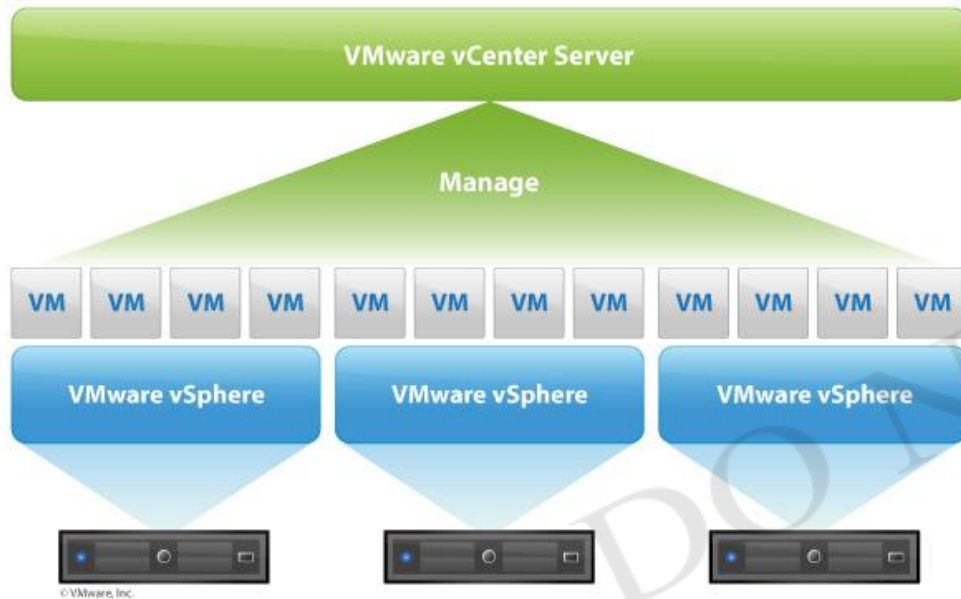


# Hosted Hypervisor

These hypervisors run on a conventional operating system just as other computer programs do. A guest operating system runs as a process on the host. Type-2 hypervisors abstract guest operating systems from the host operating system. VMware Workstation, VMware Player, VirtualBox, Parallels Desktop for Mac and QEMU are examples of type-2 hypervisors.

DO NOT COPY

# VMware Esxi



VMware ESXi (formerly ESX) is an enterprise-class, type-1 hypervisor developed by VMware for deploying and serving virtual computers. As a type-1 hypervisor, ESXi is not a software application that one installs in an operating system (OS); instead, it includes and integrates vital OS components, such as a kernel.

After version 4.1 (released in 2010), VMware renamed ESX to ESXi. ESXi replaces Service Console (a rudimentary operating system) with a more closely integrated OS. ESX/ESXi is the primary component in the VMware Infrastructure software suite.

VMware ESXi is the industry-leading, purpose-built bare-metal hypervisor. ESXi installs directly onto your physical server enabling it to be partitioned into multiple logical servers referred to as virtual machines.

- VC.vepsun.com
  - Vepsun Datacenter
    - HP Cluster
      - 192.168.1.21 (s)
      - 192.168.1.22
      - aarif Esxi1
      - aarif Esxi2
      - aarif OPF
      - aarifDC
      - aarifVC
      - abcdvm
      - Afreen-AD
      - amitVM dc
      - Ani AD
      - Ani ESXi1
      - Ani ESXi2
      - Ani ESXi3
      - Ani Member\_Ser
      - Ani Open\_Filer
      - Anpans DC
      - Anpans Esxi1
      - Anpans Esxi2
      - anpans openfile
      - Anpans Vcentre
      - Anpans Vcentre
      - Arun ESXI 6.0 5
      - Arun ESXI 6.0 5
      - Arun ESXI-1 6.0
      - Arun Open

## HP Cluster

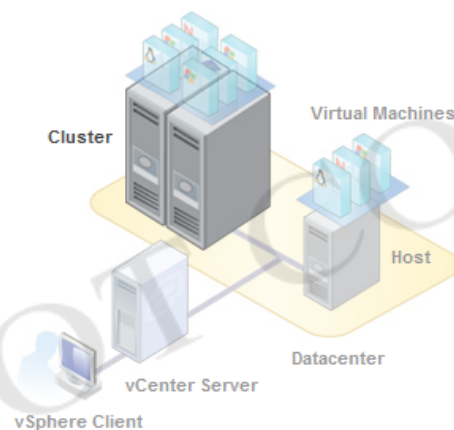
[Getting Started](#) [Summary](#) [Virtual Machines](#) [Hosts](#) [DRS](#) [Resource Allocation](#) [Performance](#) [Tasks & Events](#) [Alarms](#) [Permissions](#) [Maps](#) [Profile Compliance](#)[close tab](#) X

## What is a Cluster?

A cluster is a group of hosts. When you add a host to a cluster, the host's resources become part of the cluster's resources. The cluster manages the resources of all hosts within it.

Clusters enable the vSphere High Availability (HA) and vSphere Distributed Resource Scheduler (DRS) solutions.

## Basic Tasks

[Create new virtual machine](#)

## Explore Further

[Learn more about clusters](#)

## Recent Tasks

Name, Target or Status contains:  Clear X

Name	Target	Status	Details	Initiated by	vCenter Server	Requested
Set console window screen resolution	Udayaw2008	Completed		VEPSUN\student	VC.vepsun.com	4/25/2016
Set console window screen resolution	Udaya W2012	A general		VEPSUN\student	VC.vepsun.com	4/25/2016

Tasks Alarms

VEPSUN\student



# Networking in VMware

VMware Infrastructure provides a rich set of networking capabilities that integrate well with sophisticated enterprise networks. These networking capabilities are provided by VMware ESX Server and managed by VMware vCenter.

With virtual networking, you can network virtual machines in the same way that you do physical machines and can build complex networks within a single ESXi Server host or across multiple ESXi Server hosts, for production deployments or development and testing purposes. Virtual switches allow virtual machines on the same ESXi Server host to communicate with each other using the same protocols that would be used over physical switches, without the need for additional networking hardware.

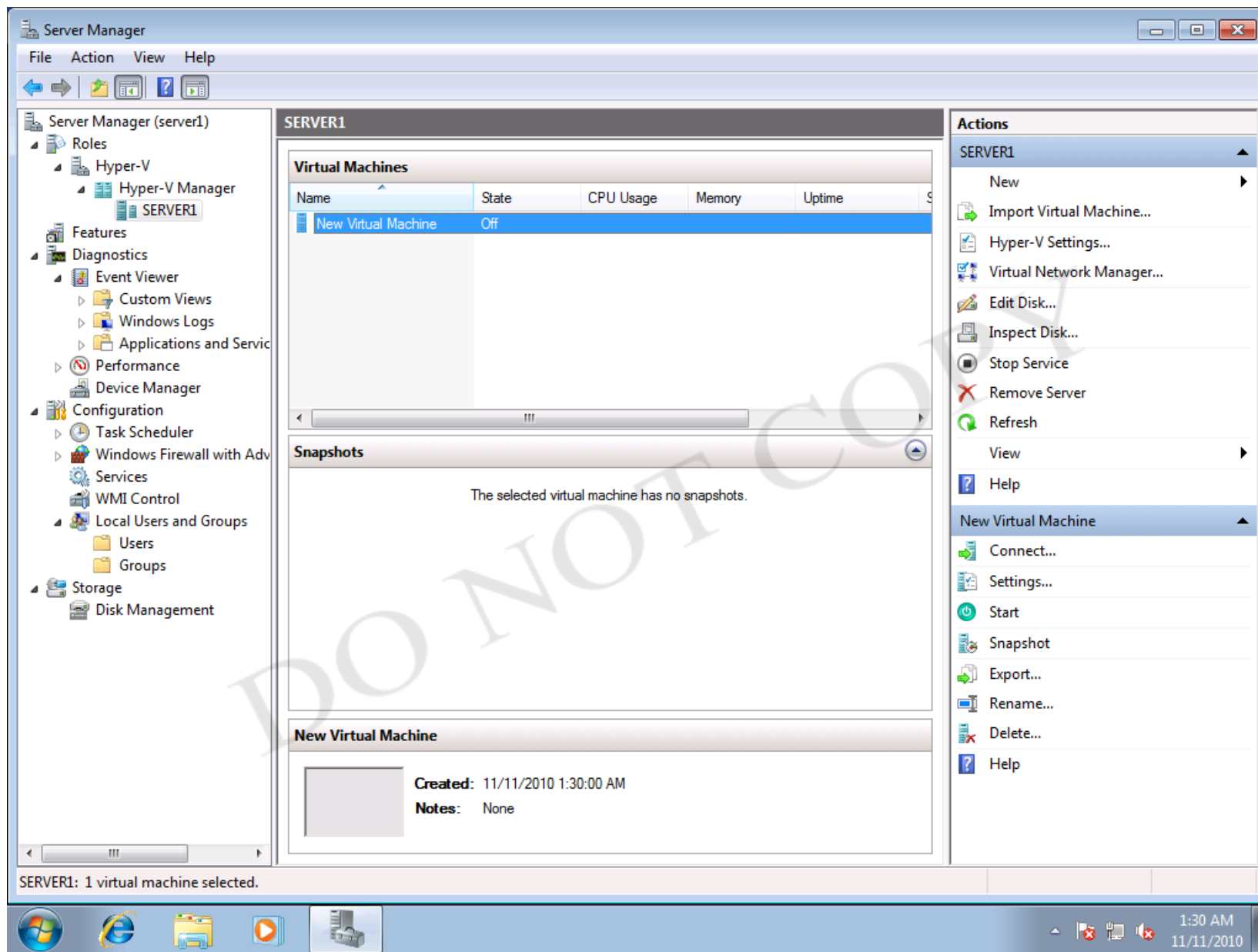
ESXi Server virtual switches also support VLANs that are compatible with standard VLAN implementations from other vendors. A virtual machine can be configured with one or more virtual Ethernet adapters, each of which each has its own IP address and MAC address. As a result, virtual machines have the same properties as physical machines from a networking standpoint. VMware Virtual Networking Concepts In addition, virtual networks enable functionality not possible with physical networks today.



# Microsoft Hyper-V

Microsoft Hyper-V, codenamed Viridian and formerly known as Windows Server Virtualization, is a native hypervisor; it can create virtual machines on x86-64 systems running Windows. Starting with Windows 8, Hyper-V supersedes Windows Virtual PC as the hardware virtualization component of the client editions of Windows NT. A server computer running Hyper-V can be configured to expose individual virtual machines to one or more networks.

Hyper-V was first released alongside Windows Server 2008, and has been available without charge for all the Windows Server and some client operating systems since.





# Citrix XenServer



Citrix XenServer is an industry and value leading open source virtualization platform for managing cloud, server and desktop virtual infrastructures. Organizations of any size can install XenServer in less than ten minutes to virtualize even the most demanding workloads and automate management processes – increasing IT flexibility and agility and lowering costs. With a rich set of management and automation capabilities, a simple and affordable pricing model and optimizations for virtual desktop and cloud computing, XenServer is designed to optimize private datacenters and clouds today and in the future.

XenServer is based on the Xen Project™ hypervisor. The Xen Project hypervisor is a bare metal virtualization platform used by XenServer to deliver near native application performance for x86 workloads in an Intel and AMD environment.





**THANK YOU**