

Assignment-07

Aim: Study and demonstrate VMware ESXi and VMware vSphere.

1. VMware ESXi:

- VMware ESXi, also called VMware ESXi Server, is a bare-metal hypervisor developed by VMware for vSphere. ESXi is one of the primary components in the VMware infrastructure software suite.
- ESXi is a Type 1 hypervisor, meaning it runs directly on system hardware without the need for an OS. Type 1 hypervisors are also referred to as bare-metal hypervisors because they run directly on hardware. Hypervisors help run multiple VMs efficiently on a physical server. ESXi is targeted at enterprises, small organizations and individuals. ESXi's VMkernel interfaces directly with VMware agents and approved third-party modules.
- Administrators can configure VMware ESXi using a vSphere client and update it with the Lifecycle Manager plug in. ESXi is installed directly on a local disk in the host machine. When a VMkernel receives a resource request, the kernel sends the request to the host's physical hardware. New VMs can be created in ESXi 7.0 as well.
- **Key features of VMware ESXi:**
 - traffic shaping,
 - memory ballooning,
 - role-based security access,
 - vSphere PowerCLI, and
 - configuration of up to 768 processor cores
- **Benefits of VMware ESXi:**
 - Quick installation: Installing ESXi in a data center is quick and easy because of its lightweight footprint.
 - Fewer patches: ESXi's lightweight format of 150 MB requires fewer patches.
 - ESXi is considered more secure because of its small attack surface. In addition, encryption role-based access, logging and auditing capabilities are built into the VMkernel.
 - Simplified GUI: ESXi offers the direct console user interface, the vSphere client and a web client that can configure the vSphere environment. The web client, for example, enables an administrator to manage virtual infrastructures without installing vSphere.

- **Drawbacks of VMware ESXi:**

- Fewer configuration files: ESXi offers fewer configuration options to maintain its size. There's also a learning curve for those who haven't used a virtualization product.
- Reduced performance: Overhead created with additional CPU work and OS calls might cause an application to slow down in a VM.
- Limited CPUs: The free version of ESXi limits users to 480 CPUs. The number of vCPUs is also limited to eight per VM.

2. VMware vsphere:

- As defined by VMware, vSphere is an enterprise-scale virtualization platform. In fact, vSphere is the brand name for VMware's suite of virtualization products and features. This solution allows you to build a reliable and resilient infrastructure to suit basically any business needs while staying on budget.
- The functionality of vSphere greatly helps existing data centers shift to cloud computing, and offers a means of increasing hardware utilization from 5–15% to as much as 80% or higher without compromising on performance.
- One of the benefits of vSphere is its potential to reduce unplanned downtime and fully eliminate downtime required for storage and server maintenance.

- **VMware vsphere functionality:**

- Virtual data center management: Create and manage multiple VMs with ease.
- Migration: Perform live migration of your workloads and maintenance of your datacenters without downtime.
- Support for remote locations: Manage your remote offices with little to no local IT administrators.
- Flexibility: Build an environment to satisfy your needs using vSphere and the VMware stack, and open-source frameworks, such as OpenStack or VMware's Integrated OpenStack add-on.

- **VMware vSphere Features:**

- Support for Kubernetes Containers
- Improved Resource Management with Distributed Resource Scheduler (DRS)
- Centralized Lifecycle Management
- Enhanced Security

- Business Continuity
- VMware calls vSphere “the heart” of a modern software-defined data center (SDDC), which allows you to run, manage, connect, and protect your applications in a common environment across multiple clouds.
- There are two main versions of vSphere:
 - The VMware vSphere Standard is perfect for small businesses looking to get started with centralized VM management.
 - The vSphere Enterprise Plus Edition has features for migrating existing data centers into cloud computing environments.