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Subject: Topics in Information Technology-2

(Cloud Computing)

Under the supervision of: Dr/ Nour Mahmoud

Lab Assignment: 1

Group: S1

1. Part 1 search report:

1. What are the differences between virtualization and containerization?

Resource Isolation: Virtualization isolates the entire operating system for each virtual machine (VM). Containers share the host operating system's kernel, isolating applications from each other but not the underlying system.

Operating System: VMs require a full guest operating system to be installed. Containers leverage the host's kernel, reducing resource consumption.

Performance: VMs can be slower to start and consume more resources due to guest OS overhead. Containers are lightweight and start up faster.

Use Cases: VMs are ideal for running applications requiring specific operating systems or for complete system isolation. Containers excel at deploying microservices and portable applications within a shared environment.

2. What is the architecture of a virtual machine and a container?

Virtual Machine Architecture:

Physical Hardware: The underlying physical server.

Hypervisor: Software that creates and manages VMs, providing a virtual layer above the hardware.

Guest Operating System: The operating system installed within each VM.

Application: The software running on the guest OS.

Container Architecture:

Physical Hardware: The underlying physical server.

Host Operating System: The main operating system running on the server.

Container Engine (e.g., Docker): Software that manages containers. Container Image: A lightweight, executable package containing the application and its dependencies.

Container: An isolated instance of a container image running on the host OS.

3. What is Docker?

Docker is a popular open-source platform for developing, deploying, and managing applications using containers. It provides tools for building container images, running containers, and sharing them across environments.

4. What is a Docker file, Docker image, and Docker container?

Docker file: A text file containing instructions for building a Docker image. It specifies the base operating system, dependencies, and application code to be included in the image.

Docker Image: A read-only template that encapsulates the application code, configuration files, and dependencies required to run the application. It's essentially a blueprint for creating containers.

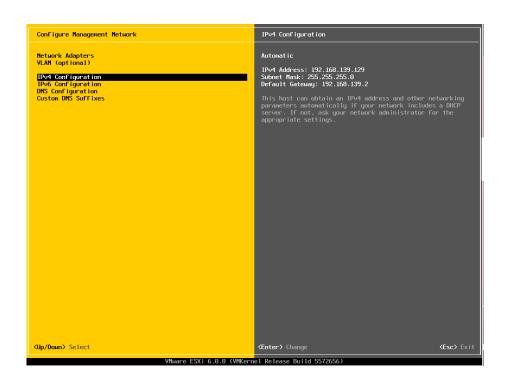
Docker Container: A running instance of a Docker image. It provides an isolated environment for the application to execute. Multiple containers can be created from a single image.

5. Differences between Kubernetes and Docker?

Purpose: Docker focuses on building, sharing, and running individual containers. Kubernetes is a container orchestration platform that manages the deployment, scaling, and networking of containerized applications. It allows you to automate container deployments across clusters of machines.

Scope: Docker deals with individual containers. Kubernetes manages the entire lifecycle of containerized applications at scale. Complexity: Docker is simpler to learn and use. Kubernetes requires a deeper understanding of container orchestration principles.

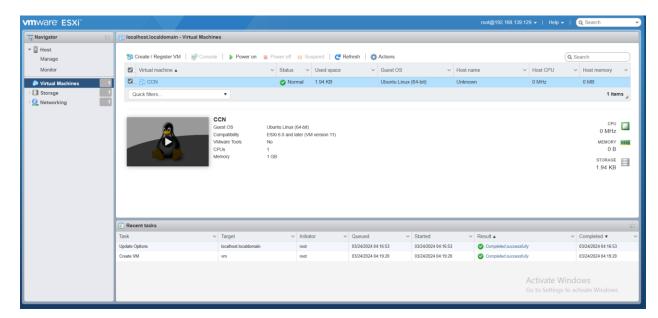
2. Part 2 Lab task:



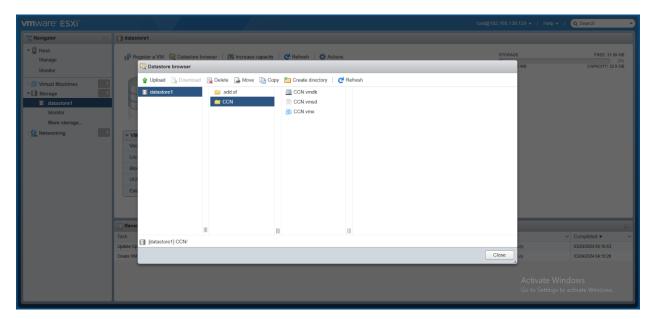
ESXi configuration

VMware ESXi Welcome Getting Started For Administrators If you need to access this host remotely, use the following program vSphere Remote Command Line to install vSphere Client software. After running the installer, start The Remote Command Line allows you to the client and log in to this host. use command line tools to manage vSphere from a client machine. These tools can be Download vSphere Client for Windows used in shell scripts to automate day-to-day Open the VMware Host Client To streamline your IT operations with vSphere, use the following Download the Virtual Appliance program to install vCenter. vCenter will help you consolidate and Download the Windows Installer (exe) optimize workload distribution across ESX hosts, reduce new system Download the Linux Installer (tar.gz) deployment time from weeks to seconds, monitor your virtual Web-Based Datastore Browser computing environment around the clock, avoid service disruptions Use your web browser to find and download due to planned hardware maintenance or unexpected failure, files (for example, virtual machine and centralize access control, and automate system administration virtual disk files). Browse datastores in this host's inventory Download VMware vCenter For Developers If you need more help, please refer to our documentation library: vSphere Web Services SDK vSphere Documentation Learn about our latest SDKs, Toolkits, and APIs for managing VMware ESX, ESXi, and VMware vCenter. Get sample code, reference documentation, participate in our Forum Discussions, and view our latest Sessions and Webinars. • Learn more about the Web Services SDK Browse objects managed by this host

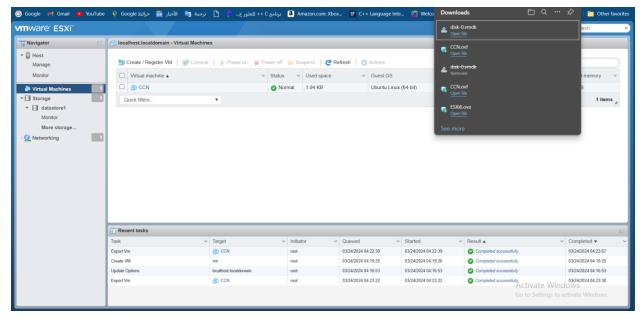
Remote connection to ESXi host



Create Empty VM on ESXi



Datastore



Export VM