**Lab 1**

***1. Check if your processor supports Intel/AMD virtualization technology. Enable Intel virtualization technology in BIOS if possible.***

***2. The cloud is almost everywhere in our lives now. What do you think are the fundamental reasons behind its success? Name three pros and three cons of cloud.***

* **Scalability:** Cloud services offer the ability to scale resources up or down based on demand, providing flexibility to businesses.
* **Cost Efficiency:** Cloud computing allows organizations to pay for the resources they use, reducing the need for upfront investments in hardware.
* **Accessibility:** Users can access cloud services and data from anywhere with an internet connection, promoting collaboration and remote work.

**Pros:**

* **Flexibility and Scalability:** Easily scale resources based on demand, adapting to changing business needs.
* **Cost Savings:** Pay as you go models and shared resources lead to potential cost savings for businesses.
* **Accessibility and Collaboration:** Enables users to access data and applications from anywhere, fostering collaboration among teams.

**Cons:**

* **Security Concerns:** Storing data in the cloud raises security and privacy concerns, as businesses rely on external providers to safeguard their information.
* **Downtime and Reliability:** Dependence on internet connectivity and service providers may lead to downtime and reliability issues.
* **Limited Customization and Control**: Some cloud services may limit the level of customization and control organizations have over their infrastructure.

***3. What is the primary function of a hypervisor in virtualization?***

The primary function of a hypervisor in virtualization is to manage and allocate physical resources (CPU, memory, storage, etc.) among multiple virtual machines (VMs). Acting as a mediator between the hardware and VMs, the hypervisor provides isolation, abstraction of hardware, and scheduling to ensure efficient and secure operation of virtual environments.  
  
***4. What is a virtual machine (VM)?***

A virtual machine (VM) is a software-based emulation of a physical computer. It runs an operating system and applications, just like a physical machine, but is created and managed by virtualization software. Multiple virtual machines can coexist on a single physical host, each operating independently. VMs are isolated from each other, allowing different operating systems and applications to run concurrently on the same hardware. This virtualization technology enhances resource utilization, scalability, and flexibility in managing computing environments. ***5. What are the benefits of using virtual machines?***

**Resource Efficiency:** Virtualization enables optimal use of physical resources, allowing multiple virtual machines to share the same hardware.

**Isolation:** VMs operate independently, providing a secure and isolated environment for different applications and operating systems.

**Flexibility and Scalability:** Easily scale resources up or down based on demand, adapting to changing workloads.

**Snapshot and Cloning:** VMs support snapshotting for backup and cloning for quick replication, streamlining deployment and recovery processes.

**Cost Savings:** Virtualization reduces hardware costs, power consumption, and maintenance expenses through consolidation of resources.

***6. List five use cases of virtual machines.***

**Server Consolidation:** Run multiple virtual servers on a single physical host to optimize resource usage and reduce hardware requirements.

**Development and Testing:** Create isolated virtual environments for software development, testing, and debugging without affecting production systems.

**Legacy Application Support:** Host legacy applications on virtual machines, ensuring compatibility with modern infrastructure without requiring dedicated hardware.

**Desktop Virtualization (VDI):** Deploy virtual desktops for users, providing remote access, centralized management, and improved security.

**Disaster Recovery:** Implement virtual machine backups and replication for efficient disaster recovery, ensuring quick restoration of services in case of system failures. ***7. In virtualization, what is the guest operating system?***  
a) The main operating system running on the physical machine  
**b) The operating system installed on a virtual machine**  
c) The operating system running on a remote server  
d) The operating system running on a mobile device  
  
***8. What does virtual machine isolation mean?***  
a) Virtual machines can communicate directly with the physical hardware.  
b) Virtual machines share the same resources and cannot be isolated.  
**c) Virtual machines run independently and are isolated from each other and the host system.**  
d) Virtual machines can only be accessed locally.  
  
  
***9. What is the benefit of virtual machine portability?***  
a) It allows virtual machines to communicate with each other easily.  
b) It ensures faster boot times for virtual machines.  
**c) It allows virtual machines to be moved between different physical machines with compatible hypervisors.**  
d) It reduces the need for hardware virtualization.  
  
***10. What is the purpose of cloning a virtual machine?***

The purpose of cloning a virtual machine is to create an identical copy of an existing virtual machine, including its operating system, applications, and configurations. This is useful for quick and efficient replication, backup, and deployment of standardized virtual environments.