Lab 1:

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

**YES**

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.

**Three advantages:**

**1. Cost effectiveness: No upfront hardware investment, pay on demand to reduce operating costs.**

**2. Flexibility and scalability: Dynamic adjustment of resources to cope with peak business demands.**

**3. High availability and disaster recovery: multi-copy data storage and cross-region redundancy ensure service continuity.**

**Three disadvantages:**

**1. Data security and privacy risks: Data is stored on third-party platforms and may be exposed to leaks or government censorship.**

**2. Vendor lock-in: You may face compatibility and cost issues when migrating to different cloud platforms.**

**3. Network delay and bandwidth limitation: Depending on Internet connection, scenarios with high real-time requirements may be limited.**

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

**The core functions of the Hypervisor include:**

**1. Resource allocation and scheduling: Dynamically allocate physical resources such as CPU, memory, and storage resources to multiple VMS.**

**2. Vm lifecycle management: Create, start, stop, migrate, and destroy VMS.**

**3. Isolation and security: Isolate VMS using hardware virtualization technologies, such as Intel VT-x and AMD-V, to prevent mutual interference.**

**4. Performance monitoring and optimization: Monitor resource usage in real time and optimize load balancing.**

**5. High availability support: Implements VM live migration and failover to ensure service continuity.**

4. What is a virtual machine (VM)?

**A Virtual Machine (VM) is a complete computer system that is simulated by software and runs on a physical machine (host machine). Each virtual machine has its own operating system (client OS), virtual hardware resources (CPU, memory, etc.), and is isolated from other virtual machines and hosts.**

5. What are the benefits of using virtual machines?

**1. Efficient utilization of resources: A single physical machine can run multiple VMS, reducing hardware waste.**

**2. Environment isolation and security: VMS run independently and malicious software or faults do not spread.**

**3. Rapid deployment and testing: Clone VM templates with one click to accelerate the development and testing process.**

**4. Cross-platform compatibility: running different operating systems (such as Windows and Linux) on the same device.**

**5. Cost savings: Reduce physical server procurement and maintenance costs.**

6. List five use cases of virtual machines.

**1. Cloud computing services: Provide elastic computing resources (such as AWS EC2 and Azure VM).**

**2. Software development and testing \*\* : Create multi-environment test platforms (such as different OS versions).**

**3. Education and training: Safely learn the operating system or network configuration to avoid damaging the physical machine.**

**4. Malware analysis: Analyze virus behavior in an isolated environment.**

**5. Legacy compatibility: Run applications that only support older operating systems.**

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

**b**

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.

**c**

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.

**c**

10. What is the purpose of cloning a virtual machine?

**Clone VMS are used to quickly replicate the same environment (such as testing, backup, or batch deployment).**