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

done

​​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.​​

​​Fundamental Reasons for Success:​​

​​Economies of Scale:​​ Large providers can buy hardware in massive quantities and operate data centers much more efficiently than individual companies, driving down costs.

​​The Shift from CapEx to OpEx:​​ Companies can avoid large capital expenditures (CapEx) on hardware and instead use operational expenditure (OpEx) to pay only for what they use, making technology more accessible.

​​Globalization and Internet Proliferation:​​ High-speed internet access is widespread, enabling the reliable, fast connections needed to access remote services.

​​Three Pros:​​

​​Cost Efficiency:​​ Eliminates the upfront cost of buying and maintaining physical hardware.

​​Scalability and Elasticity:​​ Resources can be scaled up or down instantly to meet demand.

​​Reliability and Availability:​​ Major providers offer high uptime with redundant infrastructure across global regions.

​​Three Cons:​​

​​Security and Compliance Concerns:​​ Entrusting sensitive data to a third party requires strong trust in their security measures and compliance certifications.

​​Potential for Vendor Lock-in:​​ It can be difficult and expensive to migrate services and data from one cloud provider to another.

​​Limited Control and Customization:​​ Users have less control over the underlying hardware and must operate within the constraints of the provider's platform.

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

​The primary function of a hypervisor (or virtual machine monitor - VMM) is to create and run virtual machines (VMs). It abstracts the physical hardware of the host machine and allocates resources (CPU, memory, storage, network) to each guest virtual machine, allowing multiple OSes to run concurrently on a single physical host.

​​4. What is a virtual machine (VM)?​​

​​A virtual machine (VM) is a software-based emulation of a physical computer. It runs its own operating system (guest OS) and applications as if it were a physical machine, but it shares the resources of the underlying host machine, which is managed by the hypervisor.

​​5. What are the benefits of using virtual machines?​​

​​Isolation:​​ VMs are isolated from each other and the host, so a problem in one VM doesn't affect others.

​​Consolidation:​​ Multiple VMs can run on a single physical server, improving hardware utilization.

​​Portability:​​ VMs can be easily moved between different physical hosts.

​​Security:​​ VMs provide a sandboxed environment for testing software or isolating untrusted applications.

​​Disaster Recovery:​​ VMs can be easily backed up, snapshotted, and restored.

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

​​Server Consolidation:​​ Running multiple server workloads (e.g., web, database, email) on a single physical machine.

​​Development and Testing:​​ Creating isolated, replicable environments for developing and testing software.

​​Running Legacy Applications:​​ Hosting applications that require an outdated operating system.

​​Sandboxing:​​ Testing potentially malicious software in an isolated environment without risking the host machine.

​​Cloud Computing:​​ Providing the foundational compute service in Infrastructure as a Service (IaaS) models (e.g., AWS EC2, Azure VMs).

​​7. In virtualization, what is the guest operating system?​​

​​b) The operating system installed on a virtual machine.​​

​​8. What does virtual machine isolation mean?​​

​​c) Virtual machines run independently and are isolated from each other and the host system.​​

​​9. What is the benefit of virtual machine portability?​​

c) It allows virtual machines to be moved between different physical machines with compatible hypervisors.​​

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

The purpose of cloning a virtual machine is to create an exact, identical copy of the original VM. This is used for:

​​Rapid Provisioning:​​ Quickly deploying multiple identical environments (e.g., for a development or testing team).

​​Creating Backups:​​ Preserving a known good state of a system before making changes.