

# Lab 1: Virtualization and Cloud Computing

## 1. Check processor virtualization support

The command `sysctl kern.hv_support` returned '1', which indicates that the processor has virtualization support enabled.

## 2. The success of the cloud

### Fundamental Reasons for Success

- **Scalability:** Cloud computing allows users to easily scale their resources up or down as needed.
- **Cost-Effectiveness:** It eliminates the need for large upfront investments in hardware and infrastructure.
- **Accessibility:** Cloud services can be accessed from anywhere with an internet connection.

### Three Pros of Cloud

- **Cost Savings:** Pay-as-you-go models reduce capital expenditure.
- **High Availability:** Cloud providers offer robust infrastructure with high uptime.
- **Scalability:** Easily adjust resources to meet changing demands.

### Three Cons of Cloud

- **Security and Privacy Concerns:** Entrusting data to a third-party provider can be a risk.
- **Downtime:** Outages can occur, impacting business operations.
- **Limited Control:** Users have less control over the underlying infrastructure compared to on-premises solutions.

## 3. Primary function of a hypervisor

The primary function of a hypervisor is to create and manage virtual machines (VMs) by abstracting the underlying physical hardware and allocating resources to each VM.

## 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 and applications, and it is completely isolated from the host system and other VMs.

## 5. Benefits of using virtual machines

- **Resource Optimization:** Multiple VMs can run on a single physical server, maximizing hardware utilization.
- **Cost Savings:** Reduced hardware and maintenance costs.
- **Improved Disaster Recovery:** VMs can be easily backed up and migrated to other servers.
- **Isolation:** VMs are isolated from each other, providing a secure environment for running applications.

## **6. Five use cases of virtual machines**

1. Server consolidation.
2. Software development and testing.
3. Running legacy applications.
4. Disaster recovery and business continuity.
5. Cloud computing.

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

The correct answer is **(b) The operating system installed on a virtual machine.**

## **8. What does virtual machine isolation mean?**

The correct answer is **(c) Virtual machines run independently and are isolated from each other and the host system.**