**Introduction To Cloud Computing:**

**1. What is Cloud Computing?**

**Cloud Computing** is the delivery of **computing services**—like servers, storage, databases, networking, software, analytics, and intelligence—**over the Internet ("the cloud")** to offer faster innovation, flexible resources, and economies of scale.

**Example:** Google Drive, Microsoft Azure, AWS, Dropbox

**2. Describe Cloud Computing Deployment Models**

Deployment models define how the cloud is set up and who has access.

1. **Public Cloud:**
   * Provided by third-party vendors (e.g., AWS, Azure)
   * Shared infrastructure
   * Cost-effective and scalable
2. **Private Cloud:**
   * Used by a single organization
   * More secure and customizable
   * Hosted on-premises or by a third party
3. **Hybrid Cloud:**
   * Combination of public and private clouds
   * Balances security with scalability
   * Suitable for critical and non-critical workloads
4. **Community Cloud:**
   * Shared between organizations with similar requirements
   * Managed internally or by a third party

**3. What are Components of Cloud Computing?**

**Key components include:**

* **Frontend Interface:** Client devices and applications used to access the cloud (e.g., browser, mobile app)
* **Backend Infrastructure:** Servers, storage, databases, and other resources
* **Cloud Services:**
  + **IaaS (Infrastructure as a Service):** Virtual machines, storage (e.g., AWS EC2)
  + **PaaS (Platform as a Service):** Development platforms (e.g., Google App Engine)
  + **SaaS (Software as a Service):** Applications delivered over the internet (e.g., Gmail, Office 365)
* **Network & Internet:** Required for access and communication
* **Resource Management:** Virtualization and automation tools
* **Security:** Firewalls, IAM, encryption, etc.

**4. Cloud Computing Advantages and Disadvantages**

**Advantages:**

* **Cost-effective:** Pay-as-you-go pricing, no hardware cost
* **Scalable:** Easily scale up or down based on needs
* **Accessible:** Access data from anywhere
* **Reliable:** High availability and disaster recovery options
* **Automatic Updates:** Providers handle maintenance

**Disadvantages:**

* **Security concerns:** Data stored offsite can be vulnerable
* **Downtime risk:** Internet dependency can lead to service interruptions
* **Limited control:** Less control over infrastructure in public clouds
* **Compliance issues:** May not meet strict regulatory requirements