**Cloud Computing Learning Material**

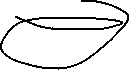
**1. What is Cloud Computing?**  
Cloud computing means using the internet to access computing services such as storage, servers, software, and more. Instead of owning physical hardware, you can rent these services from a cloud provider (like AWS, Google Cloud, or Microsoft Azure) whenever you need them. You only pay for what you use, making it more cost-effective and flexible.

**Why is it useful?**

* **Cost-Effective**: You don’t need to spend money on expensive servers or equipment.
* **Scalable**: You can easily add or reduce resources as needed.
* **Accessible**: You can access your data and applications from anywhere using the internet.
* **Secure**: Cloud providers offer strong security to protect your data.

**2. Before Cloud vs. After Cloud**

* **Before Cloud**:  
  Companies had to buy and maintain physical servers, storage devices, and data centers. This was expensive, time-consuming, and required a lot of IT experts to manage.
* **After Cloud**:  
  With cloud computing, companies rent services like storage and servers from providers over the internet. This means no more spending on hardware, and it’s easier to scale up or down based on needs.



**3. Types of Cloud Computing**

* **Public Cloud**:  
  Resources like storage and servers are shared by many users. Providers like AWS, Google Cloud, and Microsoft Azure offer these services at lower prices because they share the resources with everyone.
* **Private Cloud**:  
  This cloud is used by just one company. It’s more expensive but gives the company full control over security and privacy.
* **Hybrid Cloud**:  
  A mix of public and private clouds. Companies can keep some data in private clouds for security and use public clouds for other less-sensitive data.

**4. Cloud Computing Service Models**  
There are three main types of cloud services, based on what you need:

* **IaaS (Infrastructure as a Service)**:  
  Provides the basic infrastructure like virtual machines, storage, and networks that you can manage yourself. Example: AWS EC2, Google Compute Engine.
* **PaaS (Platform as a Service)**:  
  Gives you a platform to build and deploy applications without worrying about the underlying hardware. Example: AWS Elastic Beanstalk.
* **SaaS (Software as a Service)**:  
  Offers ready-to-use software over the internet. You don’t need to install anything; just access it through a browser. Example: Google Docs, Microsoft 365.

**5. Overview of Cloud Service Providers**  
Cloud providers offer different services to meet the needs of businesses and individuals. The biggest ones are:

* **Amazon Web Services (AWS)**:  
  AWS is the largest cloud provider, offering many services for computing, storage, databases, and more. It’s known for its reliability and security.
* **Microsoft Azure**:  
  Azure is Microsoft's cloud platform and works well with other Microsoft services like Windows and Office.
* **Google Cloud**:  
  Google Cloud is known for its strength in data analytics, machine learning, and other services for developers.

**6. Why Choose AWS for Cloud Computing?**

* **Trusted and Popular**: AWS is used by millions of customers worldwide, making it a reliable choice.
* **Lots of Services**: AWS offers a wide variety of services for different needs (storage, computing, databases, etc.).
* **Flexible and Scalable**: AWS lets you add or remove resources quickly based on your needs.
* **Global Infrastructure**: AWS has data centers around the world, ensuring fast and secure access to services.

**7. How to Create an AWS Account**  
To start using AWS, follow these steps:

1. Go to [AWS Website](https://aws.amazon.com/).
2. Click “Create a Free Account.”
3. Fill in your email, password, and account details.
4. Enter payment information (AWS has a free tier with limited resources).
5. Complete the verification process and choose a support plan.

**8. AWS Global Infrastructure**  
AWS has data centers all over the world to make sure its services are fast and reliable.

* **Regions**:  
  AWS has multiple regions around the world. Each region is a collection of data centers that host AWS services.
* **Availability Zones (AZs)**:  
  Each region has several Availability Zones. These are separate data centers in different locations within a region, making sure services stay up even if one data center fails.
* **Edge Locations**:  
  AWS uses edge locations to deliver content (like videos or websites) to users quickly. These locations are closer to the end-users, reducing delays.