**What is Cloud Computing?**

• Cloud computing is the on-demand delivery of compute power, database storage, applications, and other IT resources

• Through a cloud services platform with pay-as-you-go pricing

• You can provision exactly the right type and size of computing resources you need

• You can access as many resources as you need, almost instantly

• Simple way to access servers, storage, databases and a set of application services

• Amazon Web Services owns and maintains the network-connected hardware required for these application services, while you provision and use what you need via a web application.

**The Five Characteristics of Cloud Computing**

• **On-demand self service:**

• Users can provision resources and use them without human interaction from the service provider

• **Broad network access:**

• Resources available over the network, and can be accessed by diverse client platforms

• **Multi-tenancy and resource pooling:**

• Multiple customers can share the same infrastructure and applications with security and privacy

• Multiple customers are serviced from the same physical resources

• **Rapid elasticity and scalability:**

• Automatically and quickly acquire and dispose resources when needed

• Quickly and easily scale based on demand

• **Measured service:**

• Usage is measured, users pay correctly for what they have used

**Six Advantages of Cloud Computing**

• Trade capital expense (CAPEX) for operational expense (OPEX)

• Pay On-Demand: don’t own hardware

• Reduced Total Cost of Ownership (TCO) & Operational Expense (OPEX)

• Benefit from massive economies of scale

• Prices are reduced as AWS is more efficient due to large scale

• Stop guessing capacity

• Scale based on actual measured usage

• Increase speed and agility

• Stop spending money running and maintaining data centers

• Go global in minutes: leverage the AWS global infrastructure

**Problems solved by the Cloud**

• Flexibility: change resource types when needed

• Cost-Effectiveness: pay as you go, for what you use

• Scalability: accommodate larger loads by making hardware stronger or

adding additional nodes

• Elasticity: ability to scale out and scale-in when needed

• High-availability and fault-tolerance: build across data centers

• Agility: rapidly develop, test and launch software applications

**Types of Cloud Computing**

• **Infrastructure as a Service (IaaS)**

• Provide building blocks for cloud IT

• Provides networking, computers, data storage space

• Highest level of flexibility

• Easy parallel with traditional on-premises IT

• **Platform as a Service (PaaS)**

• Removes the need for your organization to manage the underlying infrastructure

• Focus on the deployment and management of your applications

• **Software as a Service (SaaS)**

• Completed product that is run and managed by the service provider

**Example of Cloud Computing Types**

• **Infrastructure as a Service:**

• Amazon EC2 (on AWS)

• GCP, Azure, Rackspace, Digital Ocean, Linode

• **Platform as a Service:**

• Elastic Beanstalk (on AWS)

• Heroku, Google App Engine (GCP), Windows Azure (Microsoft)

• **Software as a Service:**

• Many AWS services (ex: Rekognition for Machine Learning)

• Google Apps (Gmail), Dropbox, Zoom