Tutorial 1

1. Define the following terms

a. **Cloud computing**

Cloud computing can be defined as a model to enable on-demand network access to a shared pool of computing system resources such as storage, servers, applications, services and network.

b. **Utility computing**

Utility computing can be defined as a model in which hardware and software resources are concentrated in large data centers and computing. Its storage and communication resources are provided to users based on specific demand in which user can pay-as-consume

1. Briefly explain **FIVE (5)** attributes of cloud computing.

**Elasticity**

Cloud computing offers elastic services which provide the ability to dynamically provision and release the computing system resources to rapidly scale up and down with the corresponding demand and support a variable workload. The cloud service providers maintain a massive infrastructure to support elastic services.

**Measured services**

The computing resources used for cloud computing services such as network, storage, servers are able to be metered and users will be charged only for the resources they consume.

**On demand self services**

Cloud computing resources can be provisioned without requiring human interaction with the service provider. To illustrate, a user can provision additional computing capabilities such as storage, virtual machine instance, or server based on his need without interacting with the service providers.

**Resources Pooling**

The computing resources are pooled by the Cloud provider to serve multiple consumers by using a multi-tenant model.

**Broad network access**

Cloud computing resources and services are available over the network and can be accessed through different platforms. Users can access or upload data to the cloud as long as they have an internet connection.

1. What is network-centric computing?

* Network-centric computing reflects the fact that data processing and data storage takes place on remote computer systems accessed via the ubiquitous Internet, rather than locally.

1. What is network-centric content?

* The term *content* refers to any type or volume of media, be it static or dynamic, monolithic or modular, live or stored, produced by aggregation, or mixed.
* The “Future Internet” will be content-centric. The creation and consumption of audio and visual content is likely to transform the Internet to support increased quality in terms of resolution, frame rate, color depth, stereoscopic information.

1. Briefly explain **FOUR (4)** types of cloud.

**Public Cloud**

This infrastructure is made available and easily accessible to the general public or a large industry group as its computing infrastructure is located on the premises of a cloud computing organization.

**Private Cloud**

This infrastructure is solely used for one organization.

**Community Cloud**

This infrastructure is shared by one or more organizations in a community that has shared concerns such as mission, vision and policy.

**Hybrid Cloud**

This cloud infrastructure composites two or more clouds infrastructures such as public, private, or community as a unique entity but is bound by standardized

1. Discuss any **THREE (3)** challenges of cloud computing application.

**Data confidentiality and auditability**

The data confidentialityof cloud computing is a big concern for cloud users as they are unable to see the exact location where the data is stored or being processed. This increases the risk that might arise such as hacking and data theft during the implementation or management of clouds.

**Vendor lock-in**

Once a customer is hooked to one service provider, it is hard to migrate to another because of the differences between the new and current vendor platforms such as their data organization, services, or user interface which will limit their mobility.

**Performance unpredictability: Downtime**

There might be some unexpected situations happening in cloud computing applications such as downtime as the cloud service providers cannot guarantee a platform that is free from this issue. Cloud computing makes small and medium enterprises (SME) reliant on internet connectivity, organization might experience downtime if its internet connection frequently suffers from outages.

**Data transfer bottleneck**

Many applications are data-intensive. A very important strategy is to store the data as close as possible to the site where it is needed.

**Availability of service**

There is no predicting when a cloud computing service is down, it might be offline during a critical period, thus unreliable for some business that requires high up time.

**Migration**

One of the main cloud computing industry challenges in recent years concentrates on migration. This is a process of moving an application to a cloud. And although moving a new application is a straightforward process, when it comes to moving an existing application to a cloud environment, many cloud challenges arise.