

# ASSIGNMENT - 1

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## CLOUD COMPUTING:

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Q.1. Explain about Cloud Computing Vs. Traditional Computing.

A.1. Cloud Computing is far more abstract as a Virtual hosting solution. Instead of being accessible via physical hardware, all servers, software and networks are hosted in the cloud off premises.

### Resilience and Elasticity:-

The information and application hosted in the cloud are evenly distributed across all the servers, which are connected to work as one. Therefore, if one server fails, no data is lost and downtime is avoided.

Traditional IT systems are not so resilient and cannot guarantee a consistently high level of server performance. They have limited capacity and are susceptible to downtime, which can greatly hinder workplace productivity.

### Flexibility and Scalability:-

Cloud hosting offers an enhanced level of flexibility and scalability in comparison to traditional data centers. The on-demand virtual space of cloud computing has unlimited storage space and more server resources.

With Traditional IT infrastructure, you can only use the resources that are already available to you. If you run out of storage space, the only solution is to purchase or rent another server.

### Automation:-

Cloud hosting is managed by the storage provider who take care of all the necessary hardware, ensures security measures are in place, and keeps it running smoothly. Traditional data centres require heavy administration in-house, which can be costly and time consuming for business. Fully trained IT personnel may be needed to ensure regular monitoring and maintenance of your servers.

### Running Cost:-

Cloud computing is more <sup>cost</sup> effective than traditional IT infrastructure due to methods of payment for data storage services. With cloud based systems, you only pay for what is used. Furthermore, the decreased likelihood of downtime means improved workplace performance and increased profits in the long run. With traditional IT infrastructure, you will need to purchase equipment and additional server space support to adapt to business growth.

### Security:-

Cloud computing is an external form of data storage and software delivery, which can make it seem less secure than local data hosting. Choosing a service provider that is completely transparent in its hosting of cloud performance and ensures optimum security. With traditional IT infrastructure, you are responsible for the protection of your data and it is easier to ensure that only approved personnel can access stored applications and data.

Q. 2.

A. 2.

Write about Cloud Benefits and Challenges.

The benefits of Cloud Computing have been spelled out extensively over a long time. Some of the stated benefits are closely related and are as follows.

(i) Scalability and Elasticity:-

Cloud is natively scalable and allows organizations to grow their ~~users~~ users from a handful to hundred virtually overnight. It only takes an order for additional subscriptions and a payment to the cloud service provider. Elasticity is similar and allows for a sudden change in cloud computing resources to respond to spikes in demand.

(ii) Accessibility and Reliability:-

Cloud service providers use redundant IT resources and a quick failover mechanism and many of them offer a 24/7/365 and 99.9% uptime guarantee.

(iii) Cost and Operational Efficiency:-

Cloud is cost-effective, since one uses the shared infrastructure of the cloud service provider via pay-as-you-go modes of payment. Cloud also enhances operational efficiency, since administrative tasks are off-loaded to the cloud service provider.

(iv) Rapid and Flexible Deployment:-

Cloud service providers offer an ecosystem of ready-to-use services that can be rapidly with simple migration and configuration. Users may have flexibility of choosing online or installed ~~to~~ deployment of cloud applications.

## (v) Security and Compatibility:-

Cloud service providers take the security of their systems very seriously to retain their customer base. They also keep their entire software stack updated and fully compatible to keep services up and running.

The challenges of cloud computing are known, but easily brushed aside or overlooked. Here are some of them.

- 1) Internet Connectivity:- You need good internet connectivity and a powered-up device to access the cloud. Accessing cloud services through public WiFi - could pose a risk, unless the necessary security measures are taken.
- 2) Financial Commitment:- For most subscription plans you must have a monthly or annual financial commitment. The service ends once you stop payment.
- 3) Data Security and Protection:- Hackers are increasingly targeting cloud storage for their abundance of sensitive data.

Q. 3.

Explain about the types of virtualizations.

A. 3.

Virtualization is of various types and the following.

### 1) Hardware Virtualization:-

This is one of the more common types of virtualization as it is related to the application uptime and utilization of hardware. The primary motive behind this technology brings together all the physical servers into one large physical server, thus making the processors work more efficiently and effectively.

## 2) Software Virtualization:

Software Virtualization comprises of the ability to the primary system to create and run more virtual environment. It enables a computer system to allow a guest OS to run. Further, Software Virtualization is also of 3 types

## 3) Memory Virtualization:-

When physical memory around different servers is combined to form a single virtual memory as a pool it is called memory virtualization. With this, you can get the benefit of bigger working memory. There are two subtypes of Memory virtualization. i.e. Application-level Control and Operating System level Control.

## 4) Storage Virtualization:-

It is a process which helps in the grouping of physical storage from a number of network storage devices. Therefore, it works as a single storage device. It also has many advantages with this as it has the capacity to ~~re~~ reduce downtime, speed, performance, and load balancing.

## 5) Data Virtualization:-

It helps in manipulating data as it is presented as an independent abstract layer of database systems. It helps in formatting errors and reduce data inputs.

## 6) Network Virtualization:-

It is a multiple sub-network that could be present on a similar physical network. It helps you to allow better supervision and identification of data usage. It also makes sure security by restricting file movement across multiple networks.

## 7) Desktop Virtualization:-

This is one of the most used and popular type of virtualization as in this form of user's desktops which are stored on remote servers. Therefore the user can access his desktop from any location as per his wish. There is no need to go to a particular place as anyone can work smoothly from their home.

Q.4.

Write about the types of Resources Provisioning techniques.

A.4.

Based on the application needs they are classified as:-  
Static Provisioning:- For applications that have predictable and generally unchanging demands / workloads, it is possible to use "Static Provisioning" effectively. With advance provisioning, the customer contacts with the provider for services and the provider prepares the appropriate resources in advance of start of service.

Dynamic Provisioning:- In cases where demand by applications may change or vary, "dynamic provisioning" techniques have been suggested whereby VMs may be migrated on-the-fly to new compute nodes.

Uses - Self Provisioning: With this, the customer purchases resources from the cloud provider through a web form, creating a customer account and paying for resources with a credit card. The provider's resources are available for customer use within hours, if not minutes.

Q.5. What is Scaling? How is it applicable to cloud computing?

A.5. Scaling in cloud computing is the ability to quickly and easily increase or decrease the size or power of an IT solution. Scalable cloud is why you can sign up and use most used solutions in just a few minutes - if not seconds.

When you move scaling into the cloud, you experience an enormous amount of flexibility that saves both money and time for a business. When your demand booms, it's easy to scale up to accommodate the new load. If they overestimate, they pay for unused resources. If they underestimate, they don't have the services and resources necessary to operate effectively. With cloud scaling, though, business get the capacity they need when they need it. The benefit of the scalable cloud are clear. You can support business growth without making expensive or timely changes to your current setup. With a managed cloud provider, it's quick and easy to get the resources.

Q.6.

What is capacity planning? How is it applying in

Cloud Computing?

A.6.

Capacity Planning is the process of determining the production capacity needed by an organization to meet changing demands for its products. In the context of capacity planning "design capacity" is the maximum amount of work that an organization is capable of completing in a given period.

Some steps to get capacity planning in line with cloud services.

i) Offer mixed deployments. Sometimes, its work implementing a solution that proposes both internal & external solutions. The business units can make the decision between whether an internal cloud is the right option.

ii) Implement rationing. You need to find ways to keep demand in check. Demand has to be relative to what's actually available. Rationing isn't usually an easy policy to implement, and many organizations will push back.

Q.7.

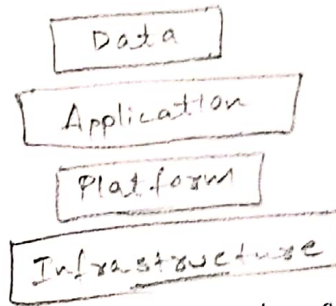
Explain about the cloud services and Traditional Computing.

A.7.

Both in the traditional and cloud computing systems, there are three layers of computing facilities where application comes on the top of the stack to operate on data. Down the stack, the two underlying layers there as platform and infrastructure facilities.



In traditional computing environment, anyone working at some layer of this stack will have to take the responsibility of managing of the underlying layers.



The working model of traditional Computing System

At PaaS level, provider not only take care of the computing infrastructure but platforms too. Consumers are free from managing anything of the platform on which they work. Platform is delivered as a service and the service provider manages everything up to the platform. The whole system remains transparent to the users.

Q-8. What is data centre commoditization? How is resource shared in Cloud Computing?

A-8. In computing, commodity hardware is a device component that is widely available, relatively inexpensive and more or less inter-changeable with other hardware of similar types. Commoditization of pools at data centers have been an attracting feature of cloud computing, especially for the data center owners. Specialized components are not required and commodity components are used to build the pools of servers, processors, storage disks and else.

Resource Sharing :- leads to higher resource utilization rate in cloud computing. As a large number of application run over a pool of resources, the average utilization of each resource components can be increased by sharing them among different applications since all of the applications do not generally attain their peak demands at same time.

Resource sharing in utility service environment does not come without its own set of challenges. The main challenge is to guarantee the Quality of Service (QoS) as performance isolation is a crucial condition for QoS. The sharing may affect the run-time behaviour of other applications as multiple applications compete for the same set of resources. It may also be difficult to predict the response and turnaround time. Thus the appropriate resource management strategies like optimization and decision-based self-organization of systems are required to maintain the requisite performance of the system.

