

## Mid Semester Assignment (Spring - 2020) Cloud Computing

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**Note: Attempt all Questions.**

**Question No. 1:**

(10)

- a. Explain essential characteristics of cloud computing.

**Answer:**

**On-demand self-services:** The Cloud computing services doesn't need any human interaction, user themselves are ready to provision, monitor and manage computing resources as require.

**Broad network access:** The Computing services are typically give over normal network and heterogeneous devices.

**Rapid elasticity:** The Computing services ought to have IT resources that are ready to scale out and in quickly and on require basis. Whenever the user need services it's provided to him and it's scale out as presently as its demand gets over.

**Resource pooling:** The IT resource (e.g., networks, servers, storage, applications, services) exist are shared across multiple applications and resident in an uncommitted manner. Multiple client are given service from a same resource.

**Measured service:** The resource utilization is route for every application and resident, it'll give each the user and therefore the resource supplier with associate degree account of what has been used. this can be varied reasons like watching billing and effective use of resource.

- b. Explain in detail the key properties of cloud computing.

**Answer:** The key properties of Cloud computing are:

**Cloud Computing Is User Centric:** In user centric cloud computing once a user is joined to the cloud, each thing that's stored there documents, messages, photos, applications, whatever - is at the user's discretion. In addition, not only are the data, but one can share it with others. In fact, any device that accesses your data in the cloud is yours too.

**Cloud computing is task-centric:** It is concentrating in place of application and what it can do, concentrate on what one has to do and how the application can do it for us. Traditional applications word processing, spreadsheet, email and alike document are becoming less major than their making.

**Cloud computing is Powerful:** Cloud computing is a strong because connecting hundred or thousand of computers to the cloud makes it impossible to have computing power through a desktop PC.

**Cloud computing is Accessible:** In Cloud computing system the data is stored in the cloud, the end users can quickly get more data from multiple archive. We are not restricted to any single source of data, as with desktop PCs.

**Cloud computing is Intelligent:** In Intelligent Cloud Computing different data available on the computers in it, when the user want to approach and to get the data intelligently so its essential to do data mining and analysis.

**Cloud Computing Is Programmable:**

In Programmable Cloud Computing different tasks required to be automated. For instance, protect data integrity For this, the data stored on one computer in the cloud must be copied to the another computers in it. If that computer offline, cloud programming automatically distributes that data to a new computer in it.

**Question No. 2:**

(10)

- a. Explain in detail different service models of cloud computing.

**Answer:**

**Software-as-a-Service (SaaS):**

It is a software system distribution model. During this model, applications hosted by the cloud service supplier and the public for buyers on the net. In SaaS, the associated knowledge and software are hosted centrally on the cloud server. The user will access the SaaS through the online browser. Office suit , Email, games and etc. are the software system application that are given as a service via net. The companies like Google, Microsoft give their applications as a service to the top users.

**Platform-as-a-Service (PaaS):**

it is a programming platform for developers. This platform is generated for the programmers to make, test, run and manage the applications. A developer will simply write the application and deploy it directly into PaaS layer. PaaS offers the runtime atmosphere for application development and tools. Example of PaaS are Google Apps Engine(GAE), Windows Azure, Salesforce.com

**Infrastructure-as-a-Service (IaaS):**

It is the way of convey a cloud computing infrastructure like server, storage, network and OS. Customers will access these resources over cloud computing platform i.e. net as associate on-demand service. In IaaS, you purchase complete resources instead of buying server, software, data center house or network instrumentation. IaaS was earlier known as as Hardware as a Service(HaaS). it's a Cloud computing platform primarily based model. HaaS differs from IaaS in the means that users have the tolerate hardware on that they'll deploy their own infrastructure exploitation most applicable software system.

- b. Explain in detail different deployment models of cloud computing.

**Answer:**

**Private cloud:** A private cloud is owned by one organization. Private clouds modify a corporation to use cloud computing technology as a method of unifying access to those resources by completely different elements, locations, or departments of the institution. Once a private cloud exists as a controlled atmosphere, the issues delineated within the Risks and Challenges section don't tend to use.

**Public cloud:** It can be a mainly approachable cloud atmosphere via a third party cloud, from that the IT resources on public clouds are usually provided through a cloud delivery model. The cloud supplier is responsible for creating and controlling it.

**Hybrid Cloud:** A hybrid cloud could be a cloud atmosphere comprised of two or more completely different cloud models. Better of each World employment is deployed totally on personal cloud Resources may be used from public cloud once there's a surge in peak load.

**Community Cloud:** It is a reciprocally shared model between corporation that associate to a specific community like banks, government authority, or business company. Community members usually share connected problems with privacy, performance, and security. This kind of model of cloud computing is arranged and managed internally or by a third-party vendor.

**Question No. 3:**

(10)

- a. Explain in detail roles and boundaries in cloud.

**Answer:** The roles and boundaries of Cloud Computing are the following:

**Cloud Provider:** The organization that gives cloud based IT device is that the cloud Provider. When taking over the role of cloud provider, an organization is there liable for providing cloud services to cloud users, The cloud provider has been tasked with agreeing on SLA guarantees To ensure any required management and administrative duties Ongoing operation of the cloud infrastructure as a whole. Cloud providers are usually the owners of the IT resources that are made available Leased by cloud users. but, some cloud giver also sold IT resource has been leased from other cloud providers.

**Cloud Consumer:** A cloud consumer is an organization that uses the IT resources available by the cloud provider. There is a regular contract or arrangement with the cloud provider to make the goods. Typically, a cloud user uses a cloud service user to reach the cloud service. Cloud users are considered to be cloud users with remote access to cloud based IT resources. Human are considered to be cloud users with remote access to cloud-based IT resources.

**Cloud Service Owner:** The person that owns a cloud service legally is called a cloud service owner. The cloud service owner can be the cloud user, or the cloud provider who owns the cloud that has a cloud service. The reason a cloud service holder isn't called a cloud service owner is because the part of the cloud service owner only registers to cloud services.

**Cloud Resource Administrator:**

The single or company likely for administrating a cloud based IT services involving cloud service and persons of the cloud consumer or cloud giver.

**Organizational Boundary:** Organizational boundaries represent the physical circumstances that a set of IT resources around which is owned and managed by an organization. Organizational boundaries doesn't show the boundaries of an real organization, it is simply an organizational set of IT assets and IT resources. Similarly, clouds have an organizational boundaries.

**Trust Boundary:** When a company suppose the role of cloud user to access cloud form IT assets, it must to wide its belief far the physical boundary of the organization to incorporate components of the cloud environment. A logical circumstances that usually far physical boundaries to show the extent to which IT resources are trusted.

b. Explain in detail cloud risks and challenges.

**Answer:** Risk and challenges of cloud computing:

**Security and privacy:** These are the most challenges in cloud computing. These challenges are reduce by using security service application, encrypt file system, data lost software.

**Interoperability:** The application on one policy could be ready to incorporate services from the opposite platform. This is known as interoperability. It's becoming possible through web service

**Portability:** the application running on one cloud platform can move to new cloud platform and it should operate rightly without creating any change in design coding. The portability isn't possible, as a result of each of the cloud provides uses completely different standard languages to their platform

**Service Quality:** the service level agreement(SLA) of the providers aren't enough to ensure the availability and scalability. The business unprepared to modify to cloud without fit service quality contract.

**Computing performance:** High network bandwidth is required for date intensive applications on cloud, this end in high cost. In it low bandwidth doesn't connect the specified computing speed.

**Reliability and Availability:** Most of the trading are using in to service given by third party, hence it's necessary for the cloud system to be reliability and strong.

**Cost:** The cloud computing is low cost but on the choice of constumer it transform the cloud sometimes but not cheap. additionally, this will cause small-scale organizations to regulate to the cloud, which may sometimes cost more counting on their demand. additionally, data transfer from cloud to premises can sometimes be costly.

**Down time:** Down time Cloud computing is no cloud provider guarantees a policty that is free from time. Internet connection also plays a crucial role as if a corporation has unreliable internet connection then it can be a hassle as they will face time to time.

**Lack of resources And Expertise:** Lack of resources and expertise is additionally one among the most important challenges facing the cloud industry, and lots of companies are hoped to beat that challenge by hiring more workers. Not only will these workers help companies overcome challenges, they are going to also train existing staff to profit the company. These days too much of IT workers are functioning to develop cloud computing experties and therefore the owner of the company has a difficult time because the workers aren't very skilled. He believes that workers who realize the newest developments and related technologies will become more valuable within the business.

#### **Management of Multi-Cloud Environment**

Companies nowadays don't use one cloud instead they're using quite one cloud. On the average, the corporation is using 4.8 different public and personal clouds, which has hampered their management. When a corporation uses multi cloud, the IT member faces many difficulties.

