

Mid Semester Assignment (Spring - 2020) Cloud Computing

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Total Marks: 30

Instructor: M Omer Rauf

Note: Attempt all Questions. Answers should be in your own words. Plagiarism will not be tolerated, if detected, it will lead to failure.

Question No. 1: (10)

- a. Explain essential characteristics of cloud computing

Ans: Essential Characteristics Of Cloud Computing:

1) On-Demand Self-Service:

In On-demand Self-service Cloud service providers provide on demand computer services like email, applications, network or server service are often utilized with none human interaction with each service provider. Some example of to such services that provides are Amazon Web Services (AWS), Microsoft, Google, IBM and Salesforce.com.

2) Broad Network Service:

Cloud Capabilities are available over the network refers to resources hosted in a private cloud network that are available for access from a wide range of devices, such as mobile phones, laptops and PDAs.

3) Resource Pooling:

Resource pooling is an IT term employed in cloud computing environments to elucidate a situation during which providers serve multiple clients, customers or "tenants" with provisional and scalable services. These services are often adjusted to suit each client's needs with none changes being apparent to the client or user.

4) Rapid Elasticity:

Cloud services may be rapidly and elastically provisioned, in some cases automatically, to quickly scale and more rapidly released by to quickly scale in the process. To the patron, the capabilities available for provisioning often appear to be unlimited and may be purchased in any quantity at any time.

5) Measured Service:

While using the services the customer are charged about their amounts too. They follow the metering concept for measuring the amount of usage, controlled that resources and provide a report regarding the services also give transparency for both the provider and consumer of the utilized service.

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

Ans: Properties Of Cloud Computing:

1. Cloud Computing Is User Centric:

When a user is connected to the cloud, can access all the data which is stored in the cloud it can be the user documents, images and application etc and the user can also share or edit the data. The devices that are connected to the cloud becomes the user devices.

2. Cloud Computing Is Task-Centric:

Instead of that specialize in the appliance and what it can do, the main focus is on what one need done how the appliance can pair for us. Traditional applications—word processing, spreadsheets, email, then on—are becoming shorter than the documents they create.

3. Cloud Computing Is Powerful:

Cloud computing is much powerful you can connect hundreds or thousands of devices at a time to the cloud for managing and controlling your data on the cloud which can be impossible on a single device.

4. Cloud Computing Is Accessible:

Because data is stored within the cloud, users can instantly retrieve more information from multiple repositories. We don't seem to be limited to one source of information, as we do with a desktop PC.

5. Cloud Computing Is Intelligent:

With all the various data stored on the computers in an exceedingly cloud, processing and analysis are necessary to access that information.

6. Cloud Computing Is Programmable:

Information stored on one computer within the cloud must be replicated on other computers within the cloud. If that one computer goes offline, the cloud's programming automatically redistributes that computer's data to a replacement computer within the cloud.

Some of the tasks that are necessary for processing with cloud computing must be automated.

Question No. 2:

(10)

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

Ans: Different service models of cloud computing:

7. Software as a Service(SaaS):

SaaS, or software as a service, could be a cloud service that revolves around, you guessed it, software. Easily the most important and most cloud-based service, SaaS uses the cloud to deliver software to users, which is then usually accessed via your applications programme. Unlike physical software that you simply install on your computer, SaaS solutions are hosted on a provider's services. This means that the provider is to blame for software maintenance and

updates, which translates to the very fact that users will all be using the identical version of software and find updates at the identical time.

8. **Platform as a Service (PaaS):**

PaaS could also be a cloud-based service that has users with computing platforms. Most companies who utilize PaaS do so to either host or develop their own software solutions, or to produce support for software utilized by employees. That are necessary for the custom-built applications that several businesses depend upon.

9. **Infrastructure as a Service (IaaS):**

IaaS, or infrastructure as a service, is actually cloud-based computers and resources. The foremost popular and well-known variety of IaaS is that the virtual machine which may be a digital version of a computer or server that's accessed over a web connection. The infrastructure is physically kept off site, and typically managed by a provider, but you access and interact with it as if it's located on your computer or in your office.

In other words, if you're looking to virtualize your systems via the cloud, IaaS can be an honest place to begin because it allows you to maneuver existing support systems into the cloud. Other solutions can then be migrated or introduced as required.

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

Ans: Models of Cloud Computing:

There are four models of cloud computing which are:

1. **Public cloud:**

Public cloud provides the chance for general public to access infrastructure and computational resources through the web. It's controlled and operated by a cloud provider and therefore the services are usually accessible free or on a pay-per-use model.

2. **Private cloud:**

A private cloud may be a deployment model that has core technologies like virtualization and multitenant application exclusively for one organization. It's clear that this deployment model is a smaller amount threatening than a public cloud. Most companies adopt cloud computing through a hybrid process which may be a mixture of both public and personal cloud services. e.g: mission, security requirements, policy, and compliance considerations.

3. **Hybrid cloud:**

When two or more than two infrastructures combine they are called hybrid cloud which can be private cloud or public or community cloud.

4. Community cloud:

This cloud infrastructure is used by specific organization for different purposes like mission, security requirements, policy, and compliance considerations. It can be owned or managed by someone or can operated by one or more then one of the organizations in the community.

Question No. 3:

(10)

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

Ans: Following are the roles and Boundaries in Cloud:

- **Cloud Provider:**

The organization that gives cloud-based IT resources is that the cloud supplier. once presumptuous the role of cloud supplier, a company is accountable for creating cloud services accessible to cloud shoppers, as per prescribed SLA guarantees. The cloud supplier is any tasked with any needed management and body duties to make sure the on-going operation of the cloud infrastructure.

- **Cloud Consumer:**

Wider to use IT resources created accessible by the cloud supplier. Specifically, the cloud shopper uses a cloud service shopper to access a cloud service

- **Cloud Service Owner:**

The person or organization that de jure owns a cloud service is termed a cloud service owner.

- **Cloud Resource Administrator**

It can be a person or organization responsible for administering a cloud-based IT resource. The cloud resource administrator can be the supplier of cloud service as an alternative, it will be (or belong to) a third-party organization contractile to administer the cloud-based IT resource.

- **Structure Boundaries**

An structure boundary represents the physical perimeter that surrounds a group of IT resources that area unit owned and ruled by a company. The structure boundary doesn't represent the boundary of associate actual organization, solely associate structure set of IT assets and IT resources. Similarly, clouds have associate structure boundary.

- **Trust Boundaries**

When a company assumes the role of cloud shopper to access cloud-based IT resources, it must extend its trust on the far side the physical boundary of the organization to incorporate components of the cloud atmosphere.

b. Explain in detail cloud risk and challenges.

Ans: **Risk and Challenges:**

- **A Lack Of Visibility/Control:**

One of the biggest benefits of using cloud-based technologies is that the customer doesn't must manage the resources needed to remain it working (such as servers). However, handing off the responsibility for managing the day-to-day maintenance of a software, platform, or computing asset may end in having less visibility and control over that asset.

- **Some Cloud Platforms won't befits Industry Regulations:**

Organizations often must meet special regulatory compliance requirements, like HIPAA, PCI DSS, GDPR, or FISMA. Failure to satisfy these standards may end in censures, fines, and other penalties that negatively impact the business. Unfortunately, not all cloud service providers have security measures that befits every industry regulation.

- **Data Privacy Issues:**

If a cloud service doesn't have strong cyber security, moving sensitive data thereto could expose that data to theft. Even with strong cyber security measures, moving data to the cloud could be a violation of knowledge privacy agreements between the company and its customers. this might end in fines and business restrictions

- **Notifying Customers filled with Data Breaches:**

One of the problems with not having absolute control and visibility of a network is that if the network is compromised, then it's difficult to establish what resources and data are affected. With a cloud service, if it doesn't offer strong visibility features and access to event logs, then it's nearly impossible to identify which customers are filled with a knowledge breach and what data was compromised.

- **User Access Control:**

As one of the components that's nearly always the user's responsibility, user access control is also a vital challenge for cloud security regardless of what form of cloud service is used. However, like on-premises security solutions, user access control within the cloud is difficult—especially if the cloud service doesn't have very robust control settings.

- **Vendor Lock-In for Security Features:**

One major potential challenge is that the chance of “vendor lock” when it involves security measures. Being restricted to 1 compatible security solution choice for a cloud service is extremely limiting—and it may end up in poor return on investment for security.

- **Lack of Personnel Experienced in Cloud Security Measures:**

There’s a good challenge to hunt out qualified security experts for any quite production environment. This problem is exacerbated with the cloud, as not everyone are visiting bear in mind of the protection measures that the solution will use right off the bat.