Mid Semester Assignment (Spring - 2020)
Cloud Computing

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Time: 6 days **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.
b. Explain in detail the key properties of cloud computing.

Question No. 2: (10)

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

Question No. 3: (10)

a. Explain in detail roles and boundaries in cloud.
b. Explain in detail cloud risk and challenges.

Question 1(a)
Answer:

Essential Characteristics of Cloud Computing:

1. Measure Service:

   Customers are being charged on the amount of different services they use and for how much time they use. Customer services usage is monitored controlled and reported which provides the customer and provider a clear image of the utilized service.

2. Broad network access:

   Services are available all over the internet which means it can be accessed through standard ways that can be availed through different devices like mobile phones, laptop, tablets, etc.

3. On-demand self-service:

   Customers can use computing capabilities automatically, without requiring a human interaction with the server. The capabilities include network storage and server time.

4. Rapid Elasticity:

   Capabilities of the cloud can be upgraded and released automatically like increasing CPU power or ability to handle multiple users. Customers feel that the services are seamless, limitless and responsive according to their requirements.

5. Resource Pooling:

   The provider's computer resources are shared so that multiple customers can use the services. Resources can be assigned and reassigned if the customer demands. Customers usually don't care that where the resources are located.

Question 1(b)
Answer:

Key Properties of Cloud Computing:

1. Cloud Computing is Task-Centric:

   Cloud computing focuses on what is needed to be done and how it can be done instead of focusing on the application and what these applications can do. Applications like spreadsheet, word processing and email are becoming less important than the information they provide.

2. Cloud Computing is Powerful:

   Cloud computing enables connection between hundred and thousands of computers which means computing power will be higher than a single computer.

3. Cloud Computing is Accessible:

   In cloud computing users can retrieve information instantly through multiple repositories. So the data is not limited to a single source like in a single computer.

4. Cloud Computing is Intelligent:

   Cloud computing uses data mining and analysis to access the information and to retrieve various data stored in an intelligent manner.

5. Cloud Computing is Programmable:

   In cloud computing the data stored in one computer is replicated on other computers so that if one computer goes offline then the data can be assessed from another computer. Cloud computing is automated.

Question 2(a)
Answer:

Service Models of Cloud Computing:

1. Infrastructure as a Service (IaaS):

   IaaS is the delivery of infrastructure as an on demand scalable service. IaaS provides access to resources such as virtual machines, virtual storage, etc. It is usually billed based on usage. It is a multi-rented virtual environment. It can be coupled with Managed Service for OS and application support.

2. Platform as a Service (PaaS):

   It provides the runtime environment for applications, development and deployment tools, etc. It provides all the services required to support the complete life cycle of building and delivering web applications and services online. It is also a multi-rented environments and highly scalable multi-tier architecture.

3. Software as a Service (SaaS):

   It enables user to use software applications as a service. It provides licensed multi-rented access to software and its functions as a Web based service. It is usually billed based on usage. It is usually a multi-rented environment. It has a highly scalable architecture.

Question 2(b)
Answer:

Deployment Models of Cloud Computing:

1. Public Cloud:

   Public Cloud allows general public to easily access system and services. Public cloud is usually less secure because it is available openly. The example of public cloud is email.
   Key features of public cloud are:

- Time reduction in developing, testing and launching of new products.
- Cost effectiveness
- Payment on scalability

2. Private Cloud:

   Private cloud allows users to access the system and services within an organization. It offers increased security because it can only be used within an organization and not outside.

Key features of private cloud are:

- Customization of the cloud with more possibilities.
- High security and privacy.
- Greater control over the server.

3. Community Cloud:

   Community cloud allows users to access system and information by a group of organization. This cloud is used by organizations which have common interests.

4. Hybrid Cloud:

   Hybrid cloud is a miscible of public and private cloud. In hybrid cloud the critical and important activities are performed through private cloud while non-critical is performed through public cloud.

Key features of hybrid cloud are:

- Flexibility and control.
- Cost effectiveness.
- Enhanced organizational agility.

Question 3(a)
Answer:

Roles in Cloud Computing:

1. Cloud Service Provider:

   This sector provides the cloud services. They own and control the cloud service platform.

2. Cloud Service Consumer:

   The users of the cloud services are the cloud service consumers. They consume the services of cloud.

3. Cloud Architects:

   This sector helps in the designing of the cloud solution and architecture.

4. Cloud Resource Administrator:

   This sector checks and manages the resources allocated to different users.

Boundaries of Cloud Computing:

1. Organizational Boundary:

   The cloud is surrounded, owned and governed by the organization. It represents the physical perimeter of cloud.

2. Trust Boundary:

   The cloud is surrounded by the IT resources that are trust worthy. It represents the logical perimeter of cloud.

Question 3(b)
Answer:

Risks in Cloud Computing:

The risks involving cloud computing are as follows:

1. If the server is slow there might be a chance of server to timeout.
2. If the cloud storage gets corrupted there is a chance that the stored data might be lost.
3. There a risk of security breaches if the server is not much secured and maintained, due to which there is a chance of data lost and the server might get hacked.

Challenges in Cloud Computing:

Challenges in Cloud Computing are as follows:

- Security and Privacy
- Service Quality
- Downtime and Accessibility.
- Access the data
- Transition to the cloud