Final Term Paper (Spring - 2020)
Cloud Computing

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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: (20)

    a. Explain in detail network and cloud-based storage.

Question No. 2: (20)

    a. Explain in detail web application and multitenant technology.
    b. Explain in detail cloud security threats.

Question No. 3: (10)

    a. Briefly describe following.
        a. Advantages and disadvantages of cloud computing.
        b. Collaborative meeting in cloud.

Question No. 1:

Ans:
Network Storage:

Network storage is a file-level computer data storage server which is connected to a computer network providing access to the data to the miscellaneous number of clients. Network storage is dedicated for serving file either by its hardware, software or configuration.

Data storage in clouds (Network Storage):

•   Devices which are linked with Local Area Network (LAN) may require storage space for easy file sharing, copying files and storage for large files.

•   This additional space is provided through file server that have larger storage capacity.

•   As the computer networks evolved, the file server was extended with the evolution through Storage Area Network (SAN).

•   The storage devices which are enabled with SAN are linked to the network.

Advantages of Network storage (SAN) are:

•   Reliability of data and making more data through replication.

•   Provides a lot better performance than file server.

•   Compatible with different operating systems and with common file system.

Uses:

NAS is useful for more than just general centralized storage provided to client computers in environments with a large amount of data. NAS can provide simpler and cheaper system such as load-balancing and fault-tolerant email and web server systems by providing storage services. The potential emerging market for NAS is the consumer market where there is a large amount of multi-media data. Such consumer market appliances are available through out the market.

Benefits:

- Easy to access.

- Safety of personal data.

- Hard drive space.

Disadvantages:

- Accessibility.

- Security.

- Privacy.

- Cost.

Cloud Based Data Storage:

- Cloud storage comes after the evolution of network storage devices.

- Instead of storing the data in device, data can be stored on clouds and can be accessed from anywhere through web.

- The cloud storage can have unlimited virtual storage space which are available at affordable rates.

- There are different modes of accessing data on cloud:

  ➢ Access through web browser interfaces to move and copy files from devices to cloud.

  ➢ Through a disk drive which is mounted on local user's computer.

- There are different cloud storage providers, which offer file storage, file sharing and synchronization. Such as:

  ➢ Carbonite.

  ➢ pCloud.

➢ Dropbox.

Types of Cloud based Storage:

Hybrid Cloud:

As the name clarifies it that it is the combination of private and public cloud deployment models. It provides the benefits of both infrastructure to the company.

❖ **benefits:**

1. Flexibility and control.

2. Cost effectiveness.

3. Enhanced organizational agility.

❖ **disadvantages:**

1. More maintenance is required.

2. Initial costs for activating both infrastructures can be really high for many organizations.

3. Data and application integration.

Private Cloud:

Private cloud is a cloud in which deployment model is only for single organization, whether the company's on-site data center is physically located, or the third-party provider hosts or manages it. private cloud shares no resources with other organizations, and the company is entirely responsible for the management, maintenance and the regular updates.

❖ **Advantages:**

1. Customization of the cloud with more possibilities.

2. High security and privacy.

3. Greater control over the server.

Disadvantages:

1. Accessing data from remote areas can be difficult.

2. High costs on private cloud infrastructure.

3. Maintenance responsibility.

Public cloud

A cloud is said to be public when the services are made by the third-party providers over a network that is used publicly, which means the hardware, software and the network devices shares the same as the other client of the same provider.

❖ **Advantages:**

1. Time reduction in developing, testing and launching of new products.

2. Cost effectiveness

3. Payment on scalability

❖ **disadvantages:**

1. Higher security risks due to shared resources.

2. Networks performance can be affected.

3. Lack of customization

Advantages of cloud-based storage:

- **Reliability:** the storage providers offers assurance of reliability of data (through replication).

- **Scalability**: The user can rank the storage capacity as per user's requirement.

- Data on cloud can be accessed from anywhere in the world through internet.

- Data accessibility is available in various methods.

- Usability and accessibility.

- Cost saving.

- Easy sharing.

- Automation.

- Collaboration.

Disadvantages:

- **Data Orphans:** the users have to accept the policies of data deletion by provider. The data on cloud storage deleted by the user may not be deleted immediately from the cloud storage

- **Performance:** as the accessibility depends on internet, the cloud storage is slower than SAN or NAS based local storage.

- **Security:** not all users may be able to trust the cloud provider for the user's data.

Question No. 2:

(a):

Ans:

Web Applications: Those applications that use web technologies is called web applications, for example XML, HTML, HTTP, URL. Web browser are accessed through the web by the client with the operative internet connection.
Web applications can be designed from three layers, Presentation layer, data layer, application layer. Web applications can be used by anyone as it can be designed for many variety of uses included webmail, ecommerce, online calculators.
 Web applications does not have to be downloaded but when accessed through a network. Users will access an online application through online browser like Google Chrome, Mozilla Firefox.

Benefits: The most common are,
. It gives user an access to use the similar version of an application.
. We can use web application on various operating systems such as desktop, laptop, or mobile.
. You do not need to install it.
. From multiple browsers you can access it.

 Multi-tenant Technology: The multi-tenant applications enable isolation to concurrent users. The information and settings of one user cannot be accessed by other users. The tenants can edit their business methods, data models and can control multi tenant applications.

Characteristics:
. Can Secures and private your data.
. Protected usage.
. Backup and restore is different for each other users.
. Application upgrades does not effect on the present users.
. Scalability in terms of number of tenants,

-Metered usage
-Databases

Benefits:
. It maximizes the resource usage.
. Can control multiple tenants at one time.
. Adding a client is simple.
. Better use of resources.
. It gets more suitable to take care of a same application.

. It reduces cost.

(b):

Ans:
Data Security Threats:

- Data Breach: A data breach is the most common cloud security threat. When an unknown users or programs get access to our personal data while view, copy or transfer it, because of cloud computing security attacks.

- Data Loss: Data loss usually happens because of man-made disasters. It happens because of user fault. It can also be happens our data is targeted. However nothing changes, you will lose all of your collected data.

- Denial Of Service (DoS): A Denial of Service (DoS) attack can damage your cloud services and resources. DoS can temporarily ban your services. The threat can be caused by flooding the system with uncontrolled traffic of users and as a result the system cannot buffer the task and can be caused by bugs.

- Cryptojacking: In Cryptojacking, hackers will use your computing resources to process cryptocurrency transactions by putting in a crypto mining script on your servers without your approve. This can cause load on your processor and usually slower your system.

- Account Hijacking: In this threat hackers will guess the characters no matter your employees are using default passwords and as a result hackers steal and control your data.

Question No. 3:

(a):

Ans:
Advantages of Cloud Computing:

- Accessibility: Whenever you are connected to the internet you can simply get your information from anywhere at any time, which suggests that the information you need is always accessible.

- Data Security: Cloud computing has best security tools which can guarantee your data is safe and secure.

- Cost Reduction: A company will suffer debt for buying software package licenses for upgraded programs. Cloud based application reduce the cost of locally installed software.

- Collaboration: It permits bunch of individuals to share data or information within the cloud storage.

- Backup & Restore Data: If you store your data in cloud and if you lose data or your data become corrupt, you will easily restore that data from the cloud.

- Storage: Cloud has much space where you store your data.

Disadvantages:

- Downtime: If your connection is off your cloud is of no need, it can't provide you anything until you have internet access.

- Security: Security is also a disadvantage of cloud because in this the weak part is the user, for example, if you have door lock and cameras system on your home and if the user forgets to turned it on then the cloud is of no use.

- Vendor Lock-In: Some companies will have the issue due to different platforms provide by some companies when transferring data from one to another.

(b):

Ans: <u>Collaborative meeting in cloud:</u> When multiple individuals work together to achieve the objective then it is said to be collaboration. The collaboration is done through face to face meeting in the conference rooms. Some high rank member must need to attend the meetings no matter they are far from the office. If any member could not attend the meeting, he has two ways, either he call to the speaker phone which is there on the conference table or either to study how many minutes of meeting. A solution that might reduce the requirements of private conferences saves a lot of time and energy and to extend the productivity from the collaborations. When the webmail is ready, the web based collaboration starts. Users can send, receive the emails to one another by using the web browser and to access of Internet connection. Multiple receivers can be addressed by one user. Voice over Internet Protocol gives the permission to the users to do calls within the Internet. Through the computer or mobile, the conference calls can be easily attended with the use of VoIP tool like Skype.