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.

Answer:

Network Storage:

Network Storage is devoted file storage that permits multiple users and heterogeneous client devices to receive data from centralized disk capacity. Users are on the local area network (LAN) access the shared storage via a standard Ethernet connection. Network storage devices typically don't have a keyboard or display and are configured and managed with a browser-based utility. Each network storage resides on the Local area networks as an independent network node, defined by its own unique Internet Protocol (IP) address.

 With the evolution of computer networks, file servers have expanded with the use of storage area networks (SAN). The storage area networks enable storage devices are connected to the devices.

The storage area networks device allow running software direct access to those devices connected through network. Later, a class of storage devices was implemented as Network Storage (NAS).

Advantages of Network Storage

- Reconstruction and Data reliability through duplicate.
- Better data security
- Better performance
- Rapid Data migration
- Great Scalability
- Faster backups
- Global file systems
- High availability

Cloud Based Data Storage:

- Cloud storage comes after the development of network storage devices.
- Instead of storing the data in device, data can be stored on clouds and can be retrieved from anywhere through web browser.
- The cloud storage can have unlimited virtual storage space which is available at cheap rates.
- There are multiple modes of retrieving data on cloud:
  - Access through web browser interfaces to move and copy files from devices to cloud.
  - Through a disk drive which is organized on local user's computer.
  - Through API calls to retrieve the cloud storage.
- There are different cloud storage providers, which offer file storage, file sharing and synchronization. Such as:
  - Drop box
  - Google drive
  - Apple icloud
  - Amazon cloud drive

- These givers offer specific quantity of free storage and paid storage at low price.

Advantages of cloud based storage:
- **Scalability:** The user can rank the storage capacity (high or low) as per user's need.
- Different convenient payment options are available. One-time payment, monthly payment or payment as per use of cloud storage.
- **Reliability:** The storage donors offers guarantee of reliability of data (through replication).
- Data on cloud can be retrieve from anywhere in the world through internet.
- Data accessibility is available in various methods.

Disadvantages of cloud based storage:

- **Performance:** as the accessibility depends on internet, the cloud storage is slower than Storage Area Network or Network Attached Storage based local storage.
- **Security:** Not all users may be able to believe the cloud provider for the user's data.
- **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.

Question No. 2: (20)

a. Explain in detail web application and multitenant technology.
Answer:
Web Applications:

A web application may be a computer program that utilizes web browsers and web technology to perform tasks over the web. These applications use web technologies i.e URL, HTTP, HTML, XML and

usually use web browser based interface. And web applications can be modeled on the basis of three tier model

1. Presentation layer
2. Application layer
3. Data layer

In web architecture the presentation layer in server side is web server while in client side is web client The application layer in server side is application server and the data layer in service side is data storage server.

Multi-tenant technology:

A multi-tenant technology is allows customers to share computing resources in a public or private cloud. Each tenant's data has been isolated and remained disable to other tenants. The tenants can customize the user interface, business process, data model and access control of the multi-tenant application

Common characteristics of multitenant applications include:

- **Usage Isolation –** The usage behavior of 1 tenant doesn't affect the appliance availability and performance of other tenants.
- **Data Security –** Tenants cannot approach information that belongs to other tenants.
- **Recovery –** Backup and restore procedures are separately executed for the information of every tenant.
- **Application Upgrade –** Tenants aren't negatively suffering from the synchronous upgrading of shared software artifacts.
- **Scalability –** the appliance can scale to accommodate increases in usage by existing tenants and/or increases within the number of tenants.
- **Metered Usage –** Tenants are charged just for the appliance processing and features that are literally consumed.
- Databases, tables and/or schema isolation for every user

b. Explain in detail cloud security threats.

Answer:
These are the cloud Security threats:

Traffic Eavesdropping

- This happened when data is being shifted to or within a cloud (commonly from the cloud consumer to the cloud donor)
- it's passively intercepted by a malicious service agent for illegitimate operation purposes

- The aim of this attack is to directly compromise the confidentiality of the info and confidentiality of relationship between the cloud consumer and cloud provider
- because it is passive attack it are often undetected for extended periods of your time

Malicious Intermediary
- When messages are interrupted and adjust by a malicious service agent
- This leads to compromising the message's confidentiality and integrity
- it's going to also insert harmful data into the message before forwarding it to its destination
- Malicious intermediary attack also can be administered by a malicious cloud service consumer program

Denial of Service
- Objective is to overload IT resources in order that they can't function properly. this type of attack is usually launched in one among the subsequent ways:
- The workload on cloud services is unnatural expand with continual communication requests
- The network is overloaded with traffic to scale back its responsiveness and cripple its performance
- Multiple cloud service appeals have been sent, every one which is meant to ingest large memory and proceeding resources

Insufficient Authorization
- Occurred when access has been permitted to an attacker too widely, leading to attacker getting access there to resources that are normally protected.
- When weak passwords or shared accounts are wont to protect IT resources.
- Weak authentication based attacks: Happen when weak passwords or shared (login) accounts are wont to protect the IT resources.

Question No. 3:   (10)

a. Briefly describe following.
   a. Advantages and disadvantages of cloud computing.
   Answer:
                    ADVANTAGES OF CLOUD COMPUTING
- **Flexibility:** there's a high rate of flexibility.
- **Low Cost:** Companies can save big by employing cloud computing because it eliminates cost for hardware and software.
- **Speed & Scales :** Traditional methods to shop for and configure hardware and software are time consuming. Easier Management of knowledge and Information: Since all data are located on a centralized location, data are more organized making it easy to manage.
- **Device Diversity:** we will access our applications and data anywhere within the world, on any system.
- **Increased Storage Capacity:** Increased Storage Capacity is another advantage of the cloud computing, because it can store more data as compared to a private computer.

- **Easy to find out and Understand:** Since people are quiet wont to cloud applications like GMail, Google Docs, so anything associated with an equivalent is presumably to be understood by the users.
- **Automatic Updating:** It saves companies time and energy to update multiples server.
- **Customize Setting:** it is also allowing you to customize your business applications.

DISADVANTAGES OF CLOUD COMPUTING

- **Dependency:** One of the main disadvantages of cloud computing are users dependency on the donor.
- **Risk:** Cloud computing services procedure taking services from rarely servers.
- **Requires a continuing internet connection:** the foremost obvious disadvantage is that Cloud computing completely relies on network connections.
- **Security:** Security and privacy are the most important concerns about cloud computing.
- **Migration Issue :** Migration problem is additionally an enormous concern about cloud computing.
- Store data won't be secure
- are often slow
- Features could be limited

b. Collaborative meeting in cloud.

Answer:

Collaborative meetings can be held using cloud-hosted software. Organizations get an effective virtual meeting as an alternative to face-to-face meetings

The Features of Cloud collaborative Meetings are:

- Face to face streaming interaction is allowed.
- Share Screen to Control the Presentation
- Record the meeting and for the play and share with people
- Share application to direct the software in live atmosphere
- The video recording of virtual meeting is also used for virtual training
- Support face to face meeting and seminars with a lot of attendees.