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:

A network is a collection of computers, servers, mainframes, network devices, relays, or other devices connected to each other to allow data sharing. An example of a network is the Internet, which connects millions of people worldwide.

The network consists of two or more computers connected to share resources (such as printers and CDs), to exchange files, or to allow electronic communication. Computers on the network can be connected by cable, telephone cables, radio waves, satellites or light beams.

TYPES:

There are mainly three types of computer networks based on their size:
1. Local Area Network (LAN)
2. Metropolitan Area Network (MAN)
3. Wide area network (WAN)

1. **LOCAL AREA NETWORK (LAN)**

- Local area network is a group of computers connected with each other in a small places such as school, hospital, apartment etc.
- LAN is secure because there is no outside connection with the local area network thus the data which is shared is safe on the local area network and can't be accessed outside.
- LAN due to their small size are considerably faster, their speed can range anywhere from 100 to 100Mbps.

- LANs are not limited to wire connection, there is a new evolution to the LANs that allows local area network to work on a wireless connection.

2. **METROPOLITAN AREA NETWORK (MAN)**

MAN network covers larger area by connections LANs to a larger network of computers. In Metropolitan area network various Local area networks are connected with each other through telephone lines. The size of the Metropolitan area network is larger than LANs and smaller than WANs(wide area networks), a MANs covers the larger area of a city or town.

3. **Wide area network (WAN)**

Wide area network provides long distance transmission of data. The size of the WAN is larger than LAN and MAN. A WAN can cover country, continent or even a whole world. Internet connection is an example of WAN. Other examples of WAN are mobile broadband connections such as 3G, 4G etc.

CLOUD-BASED STORAGE

Cloud Based Storage: Cloud based storage is a cloud computing model where data is stored on remote servers that are accessible via internet, or "cloud". It is managed and maintained by the cloud based storage service provider on servers that are built by using virtualization techniques.

Cloud storage delivers a cost-effective, scalable alternative to storing files on on premise hard drives or storage networks. Computer hard drives can only store a finite amount of data. When users run out of storage, they need to transfer files to an external storage device. Traditionally, organizations built and maintained storage area networks (SANs) to archive data and files. SANs are expensive to maintain, however, because as stored data grows, companies have to invest in adding servers and infrastructure to accommodate increased demand.

Advantages of Cloud Based Storage:

- Cost Effective: It is way more cheaper than physically buying storage devices.
- Accessibility: It can accessed from anywhere around the World via Internet.
- Recovery: It is very easy for users to recover your lost data on a cloud than on your PC.
- Syncing and Updating: Any updates in the data on cloud is constantly updated and synced.
- Security: Data present on cloud is much secure than on PCs.

Disadvantages of Cloud Based Storage:

- Internet Connectivity: Without internet connection the data on cloud can't be accessed.
- Costly: Frequently uploading and downloading can have additional costs.
- Customers Support: Many providers refer you to a knowledge base or FAQs instead of supporting.

- ❖ Hard Drives: The Idea of shifting to cloud was to eliminate dependency on hard drives but some services providers still use them.
- ❖ Privacy: Since the data is located at a cloud of unknown location, one can't be sure about the privacy of the data.

Question No. 2: (20)

a. Explain in detail web application and multitenant technology.

Answer: <u>WEB APPLICATION:</u>

It is a client-server application program, stored on a remotely available server that uses web browsers and web technology to perform specific function over the Internet through a browser interface.

<u>Types of Web Application:</u>

There are six types of web applications:

- Static Web Applications
- Dynamic Web Applications
- Online Stores or E-Commerce
- Portal Web Applications
- Content Management System (CMS)

<u>Advantages of Web Applications:</u>

- It is able to execute on different types of platforms.
- Data is secure and easy to restore or take backups.
- You can easily update the applications.
- By using a web application, employees can work from anywhere via internet.

<u>MULTITENANT TECHNOLOGY:</u>

- ❖ The multitenant technology enables multiple users (tenants) to access the same application. Each tenant has its own view of the application that he customizes as a dedicated instance of the software while staying unaware of other tenants.
- ❖ Multitenant applications ensure the safety and privacy of employers so that they do not have access to information and configuration information that is not their own. Employers are able to customize app features, such as:

- **User Interface:** Tenants can define a specialized "look and feel" for their application interface.
- **Business Process:** Tenants can customize the rules, logic, and workflows of the business processes that are implemented in the application.
- **Data Model:** Tenants can extend the data schema of the application to include, exclude, or rename fields in the application data structures.
- **Access Control:** Tenants can independently control the access rights for users and groups.

Some Common Characteristics of multitenant applications are:

- Usage and Data Tier Isolation
- Application Upgrade
- Recovery
- Scalability

- Metered Usage
- Data Security and Privacy

b. Explain in detail cloud security threats.

Answer:

1) <u>DATA BREECH OR DATA LEAK:</u>

Data breaches and leaks are more vulnerable to cloud systems than those managed internally. This is simply due to large amounts of data flowing between employees and cloud systems, which can be interrupted by hackers looking for weaknesses in your systems.

2)**<u>DATA LOSS:</u>**

Data loss is another problem that afflicts cloud systems. After deploying your business processes to the cloud, the amount of data you store so far can quickly grow to uncontrollable size, making both backups difficult and expensive. Inactivity for a standard, complete backup is a major threat due to the increase in ransomware attacks, in which the hacker will encrypt your cloud storage and demand payment for returning data to you.

3) Human error.
4) Data loss with no backup.
5) Insider threats.
6) Advanced persistent threats.
7) DDoS attacks.
8) Insecure APIs.
9) Exploits.
10) Account hijacking.

Question No. 3: (10)

a. Briefly describe following.
    a. Advantages and disadvantages of cloud computing.

Answer: **<u>ADVANTAGES OF CLOUD COMPUTING</u>**

1. The cloud actually saves you money

One of the best parts of the cloud is that it actually saves you money in the long run. If you do not have to hire a technical support team to fix server issues, then that is already money in your pocket. Additionally, installing the clouds is the same. Traditional servers require more expensive upgrades beforehand. If your business does not go up the way you hoped, that's the money you've spent. Cloud service providers often allow you to move up and down without a seam. Buy as many gigs as you need and save them when you don't want to.

2. The cloud is always ON

Have you ever been mistaken for forgetting an important file at work? Maybe your flash drive wasn't saving properly or maybe your email never passed. You should not rush all the way back to the office to pick up something from your server when you die. The cloud is always open, so if you have an Internet connection you can find the applications you need from literally anywhere.

3. FLEXIBILITY:

Scalability Cloud infrastructure scales on demand to support fluctuating workloads.

Storage options Users can choose public, private or hybrid storage offerings, depending on security needs and other considerations.

Control choices Organizations can determine their level of control with as-a-service options. These include software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS).

Tool selection Users can select from a menu of prebuilt tools and features to build a solution that fits their specific needs.

Security features Virtual private cloud, encryption and API keys help keep data secure.

4. EFFICIENCY:

Accessibility Cloud-based applications and data are accessible from virtually any internet-connected device.

Speed to market Developing in the cloud enables users to get their applications to market quickly.

Data security Hardware failures do not result in data loss because of networked backups.

Savings on equipment Cloud computing uses remote resources, saving organizations the cost of servers and other equipment.

5. ENHANCED COLLABORATION:

Cloud applications enhance collaboration by authorizing various groups of people who almost meet and share information with the help of shared storage. Such capabilities help to improve customer service and product development and also reduce the marketing time.

DISADVANTAGES OF CLOUD COMPUTING:

1. Risk of data confidentiality

There is always a risk that user data can be accessed by other people. So data and cloud protection must be good because if it won't be dangerous for data confidentiality.

2. Data Mobility

which refers to the possibility of sharing data between cloud services and how to retrieve data if one day the user makes a process of terminating cloud computing services.And there is local storage where the data can be used at any time as needed.

3. Internet Connectivity

The Internet is the only way to do cloud computing. When there is no Internet connection in your area, or the Internet route to the cloud provider is in crisis, automatic access to your cloud computing will be terminated. Now this is where the biggest obstacle occurs in developing countries and remote areas with no Internet.

4. Technical Issue:

If you encounter any technical issues, you have no choice but to seek the technical assistance of your arrested provider. You can't fix your cloud computing problems indoors, and some providers don't always provide technical support.

5. Bandwidth issues:

For ideal performance, clients have to plan accordingly and not pack large amounts of servers and storage devices into a small set of data centers.

b. Collaborative meeting in cloud.

Answer:

COLLABORATIVE MEETING IN CLOUD:

It can be performed by using the software hosted on cloud. The organizations can Cannot support a cost effective virtual meeting so instead of virtual meeting they used face to face meetings.By being at their own places and form there through internet and cloud softwares get connect to each other. It Quickly enables meetings in the cloud with minimal on-premises investment, allowing everyone to meet from any device from any location.

Interacting with the cloud helps people work simultaneously on existing documents in the cloud, so the user can access files from anywhere through the internet connection. The beginning of the cloud collaboration process involves one user creating a file or document and granting access to other team members. Anyone who has access can make changes to the document at any time, including when other people are editing or viewing it. Any changes you make are saving and syncing - so every user sees the same version of the project anytime (anywhere) when they view it.