Work Book: Cloud Computing
Learning Aim: Basics & Virtualization

Cloud Computing and its Application (18CS643)

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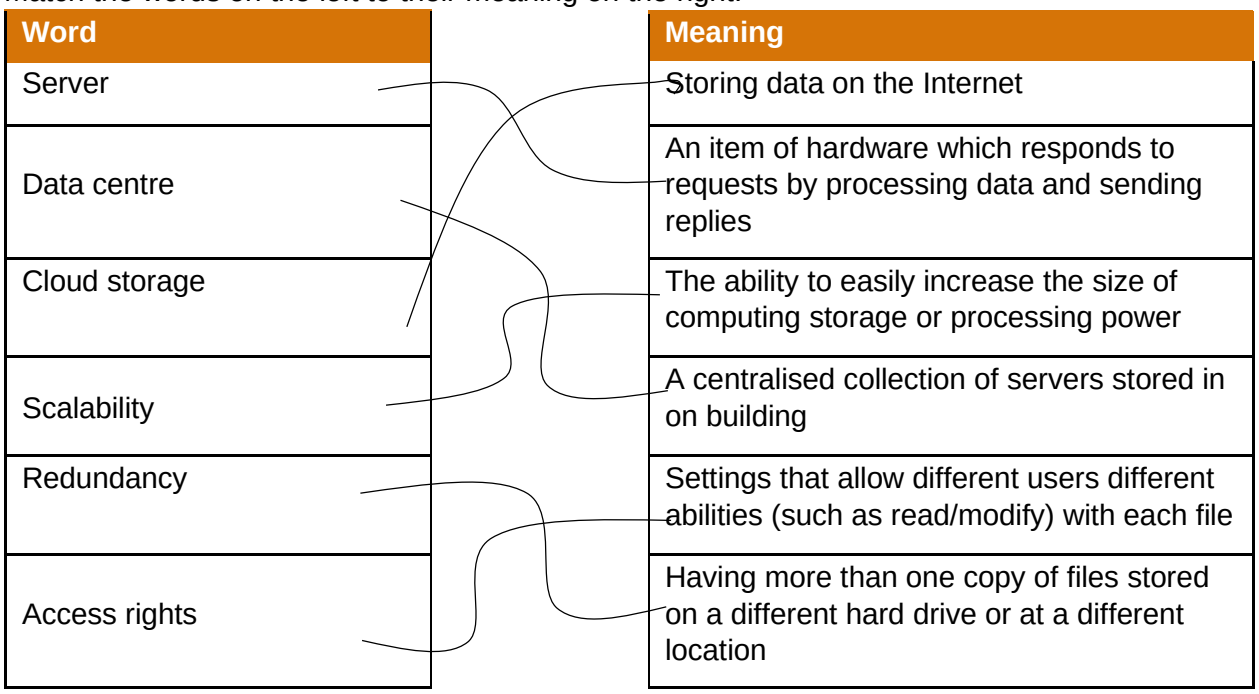
Task 1

Match the words on the left to their meaning on the right.



Word	Meaning
Server	Storing data on the Internet
Data centre	An item of hardware which responds to requests by processing data and sending replies
Cloud storage	The ability to easily increase the size of computing storage or processing power
Scalability	A centralised collection of servers stored in on building
Redundancy	Settings that allow different users different abilities (such as read/modify) with each file
Access rights	Having more than one copy of files stored on a different hard drive or at a different location

Task 2

Following exercise will help to understand buzz words in Cloud Computing Explain the following terms briefly:

1. Cloud Computing: Cloud computing refers to both the applications delivered as services over the Internet and the hardware and system software in the datacenters that provide those services.

2. IaaS: Infrastructure- as-a-Service solutions deliver infrastructure on demand in the form of virtual hardware, storage, and networking. Virtual hardware is utilized to provide compute on demand in the form of virtual machine instances.

3. PaaS: Platform-as-a-Service solutions are the next step in the stack. They deliver scalable and elastic runtime environments on demand and host the execution of applications. These services are backed by a core middleware platform that is responsible for creating the abstract environment where applications are deployed and executed.

4. SaaS: Software-as-a-Service solutions provide applications and services on demand. Most of the common functionalities of desktop applications. Each layer provides a different service to users. IaaS solutions are sought by users who want to leverage cloud computing from building dynamically scalable computing systems requiring a specific software stack.

5. Virtualization: Virtualization is core technology for cloud computing. It encompasses a collection of solutions allowing the abstraction of some of the fundamental elements for computing, such as hardware, runtime environments, storage, and networking**. It is essentially a technology that allows creation of different computing environments**. These environments are called virtual because they simulate the interface that is expected by a guest. The most common example of virtualization is hardware virtualization.

Activity 1

10 Minutes

Following exercise will help you to understand cloud computing benefits, challenges and types of virtualizations.

1.Write the benefits of Cloud Computing.

Benefit 1: Increased economical return due to the reduced maintenance costs and operational costs related to IT software and infrastructure.

Benefit 2: Scalability; can easily increase the size of computing storage or processing power

Benefit 3: End users can benefit from cloud computing by having their data and the capability of operating on it always available, from anywhere, at any time, and through multiple devices.

2. Name the types of Virtualization

1. Machine reference model
2. Hardware-level virtualization
   a) Hypervisors
   b) Hardware virtualization techniques
   c) Operating system-level virtualization
3. Programming language-level virtualization
4. Application-level virtualization

3.Write the three challenges in Cloud Computing

1. Dynamic Provisioning of Cloud Computing Services.
2. Security and Privacy: Should be set up w.r.t country and according to their level of privacy.
3. Reliability and Availability: Should be available 24/7*365 days and hence it plays as major challenge providing the service throughout this time.

Activity 2

05 Minutes

Following exercise will help you to understand historical developments in cloud computing and basic concepts

a) Name three major milestones have led to Cloud Computing

Milestone 1**: Mainframes:** These were the first examples of large computational facilities leveraging multiple processing units**.**

Milestone 2**: Clusters:** Cluster computing started as a low-cost alternative to the use of mainframes and supercomputers.

Milestone 3**: Grid computing:** appeared in the early 1990s as an evolution of cluster computing. In an analogy to the power grid, grid computing proposed a new approach to access large computational power, huge B storage facilities, and a variety of services.

2. Define Hypervisor

A fundamental element of hardware virtualization is the hypervisor, or virtual machine manager (VMM). It recreates a hardware environment in which guest operating systems are installed. There are two major types of hypervisor: Type I and Type II.