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DIIAD, 22
CLOUD COMPUTING

Q1) Explain the charateristics of cloud computing with benefits of each.

ANS) There are basically 5 essential characteristies of cloud computing

1) On-demand self-services
The cloud computing services do not require any human administrator, user themselves are able to provision, monitor and manage computing resources as needed.

2) ~~Broad network acess:~~ Rapid elasticity
The computing services should have IT resources that are able to scale out and in quickly and on as needed. Whenene the user requires services, it is provided to him and it is scaled out as soon as the requirement is over
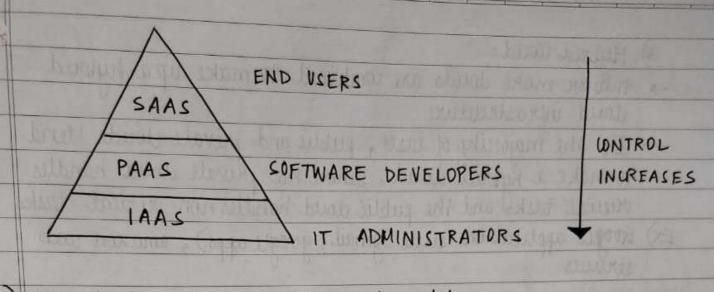
3) ~~Rapid dastivity:~~ Broad network access:
The computing services are generally provided over standard networks and helerogeneous devices.

4) Resource pooling:
The IT resources (networks, server, storage, applications and services) present are shared across multiple applications and occupant in an uncommiteed manner. Multiple clients are provided services from the same physical resource.

5) Measured service:
The resource utilization is tracked for each application and

occupant and both the user and the resource provider are provided with an account of what has been used. This is done for various reasons like monitoring billing and effective use of resource.

Q2) Explain different types of cloud services.

ANS) Cloud services covers a wide range of services that a service provider delivers to the customer via the internet

1) Software as a service (SaaS)
→ on demand service
→ independant platform
→ no need to install on PC
→ resources managed by vendor
→ used by end customer

2) Platform as a service (PaaS)
→ Programming language + OS + server + database
→ provides encapsulation
→ build, compile and run programs
→ users manage data and application resources.
→ used by developers.

3) Infrastructure as a service (IaaS)
→ Provides computing architecture and infrastructure.
→ Data storage + visualisation + servers + networking
→ vendors manage the above resources.
→ users handle data and middleware.
→ used by system administrator.

END USERS

SAAS

PAAS   SOFTWARE DEVELOPERS

CONTROL
INCREASES

IAAS

IT ADMINISTRATORS

Q3) Explain the different deployment models.

ANS) Cloud deployment models indicate how the cloud services are made available to users. The four deployment models associated with cloud computing are as follows :

1) Public cloud:
→ The public cloud infrastructure makes systems and services available to anyone with an internet connection.
→ Because of it's openess, the public cloud is much less secure
EX) microsoft, windows Azure services platform

2) Private cloud :
The private cloud infrastructure makes systems and services available to anyone within an organisation. It is more secure
EX) OpenNebula, Openstack

ORGANISATION   PRIVATE   SECURITY
                    CLOUD

3) Hybrid cloud:

→ two or more clouds are combined to make up a hybrid cloud infrastructure

→ In the majority of cases, public and private clouds blend to make a hybrid cloud, where the private cloud handles crucial tasks and the public cloud handles non-critical tasks.

EX) Google application suite (gmail, google apps), amazon web services

4) community cloud:

→ The community cloud infrastructure makes systems and other capabilities available among various organisations groups.
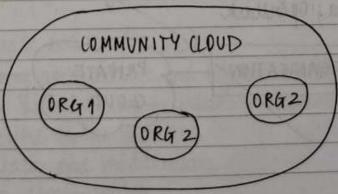
→ it is owned, managed and operated by one or more organizations in the community, a third party or a combination of them.

→ It allows us to share cloud resources, infrastructure and other capabilities among various organisations.

EX) health care community cloud.

→ community clouds are multi-tenant platforms and make it possible for various companies to function on a shared platform.

COMMUNITY CLOUD

ORG1   ORG 2   ORG 2

Q4) Explain the concept of virtualization

ANS) Virtualization is the creation of a virtual version of something, such as a server, a desktop, a storage device, an operating system or network resources.

→ Basically, virtualization is a technique which allows to share physical instance of a resource or an application, among multiple customers and organisations.

→ It does this by assigning a logical name to a physical storage and providing a pointer to that physical resource when demanded.

→ Types of virtualization:

A) Hardware Virtualization:
   when the virtual machine software or virtual machine manager (VMM) is directly installed on the hardware is known as hardware virtualization.

→ A virtual machine provides an environment that is logically separated from the underlying hardware.

→ Mainly done for server platforms

B) Operating system virtualization:
→ when virtual machine manager (VMM) is installed on the host operating system instead of directly on the hardware system.

→ mainly used for testing the applications on different platforms of OS.

C) Server virtualization.
→ when VMM is directly installed on the server system.
→ This is done because a single physical server can be divided into multiple servers on the demand basis and for balancing the load.

D) storage virtualization:

→ storage virtualization is the process of grouping the physical storage from multiple network storage devices so that it looks like a single storage device.

→ Implemented by using software applications.

→ Mainly done for back up and recovery purposes.

Q5) Explain concept of IaaS, PaaS, DBaaS, storage as a service, security as a service.

ANS)

A) Database as a service (DBaaS):

Is a cloud computing managed service offering that provides access to a database without requiring the setup of physical hardware, the installation of software or need to configure the database

→ Most database administration and maintainance tasks are handled by the service provider, enabling users to quickly benefit from the database service.

→ Most DBaaS environments run on the public cloud infrastructure, but some cloud providers will also install their DBaaS technologies in on-premise data centres and manage them remotely for customers in private clouds or hybrid cloud infrastructures.

B) Storage as a service (STaaS)

→ Is the practice of using public cloud storage resources to store your data. Using STaaS is more cost efficient than building private storage infrastructure.

→ With STaaS you can rent data storage based on either quantity or a service level agreement that defines parameters such as access speed and uptime.

c) Security as a service (SECaaS)

→ Security as a service is described as a cloud delivered model for outsourcing cybersecurity services.

→ SECaaS provides security services on a subscription basis, hosted by cloud providers.

→ SECaaS solutions have become increasingly popular for corporate infrastructures as a way to ease the in-house security team's responsibility, scale security needs as the business grows and avoid the costs and maintenance of on-premise alternatives.