200677
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IOT Assignment – 08

(1) What do you mean by IOT cloud computing? List & explain the various cloud computing enabling technologies.

Ans) cloud computing refers to manipulating, configuring and accessing the hardware & software services remotely. Cloud computing is platform independent, mobile & collaborative.

Various cloud computing enabling technologies are :–

(1) Virtualization : The process of sharing single physical instance of application or resource among multiple clients. Multitenant architecture with virtual isolation.

(2) Service Oriented architecture : SOA allows organizations to access on-demand cloud based computing solutions according to the change of business needs.

(3) Grid computing : Also known as distributed computing. It is a processor architecture that combines various different computing resources from multiple locations to achieve a common goal.

(4) Utility computing : Provides on-demand computing resources and infrastructure based on the pay per use method. It minimizes cost & maximises efficiency.

(2) What are the important components of cloud computing ?

Ans) Important components of cloud computing are :— (4)

(1) client infrastructure : front end component that provides a GUI.

(2) Application : can be any software or platform that the client wants to access.

(3) Service : manages which type of service you can access according to the client's requirements. [SAAS / PAAS / IAAS]

(4) Runtime cloud : Offers the execution & runtime environment to the virtual machine.

(5) Storage : Provides a large amount of storage capacity in cloud to manage & store data.

(6) Infrastructure : Includes hardware & software components like servers, storage, network devices, virtualization services & storage resources.

(7) Management : manages components like application, service, runtime, storage, infra., and security in the backend. Establishes co-ordination b/w them.

(8) Security : implementation of different mechanisms for secure cloud systems, resources, files and infrastructure to the end-user.

(9) Internet : connection as the bridge or medium between frontend & backend. Allows you to communicate b/w front-end & back-end.

(3) Differentiate b/w elasticity and scalability.

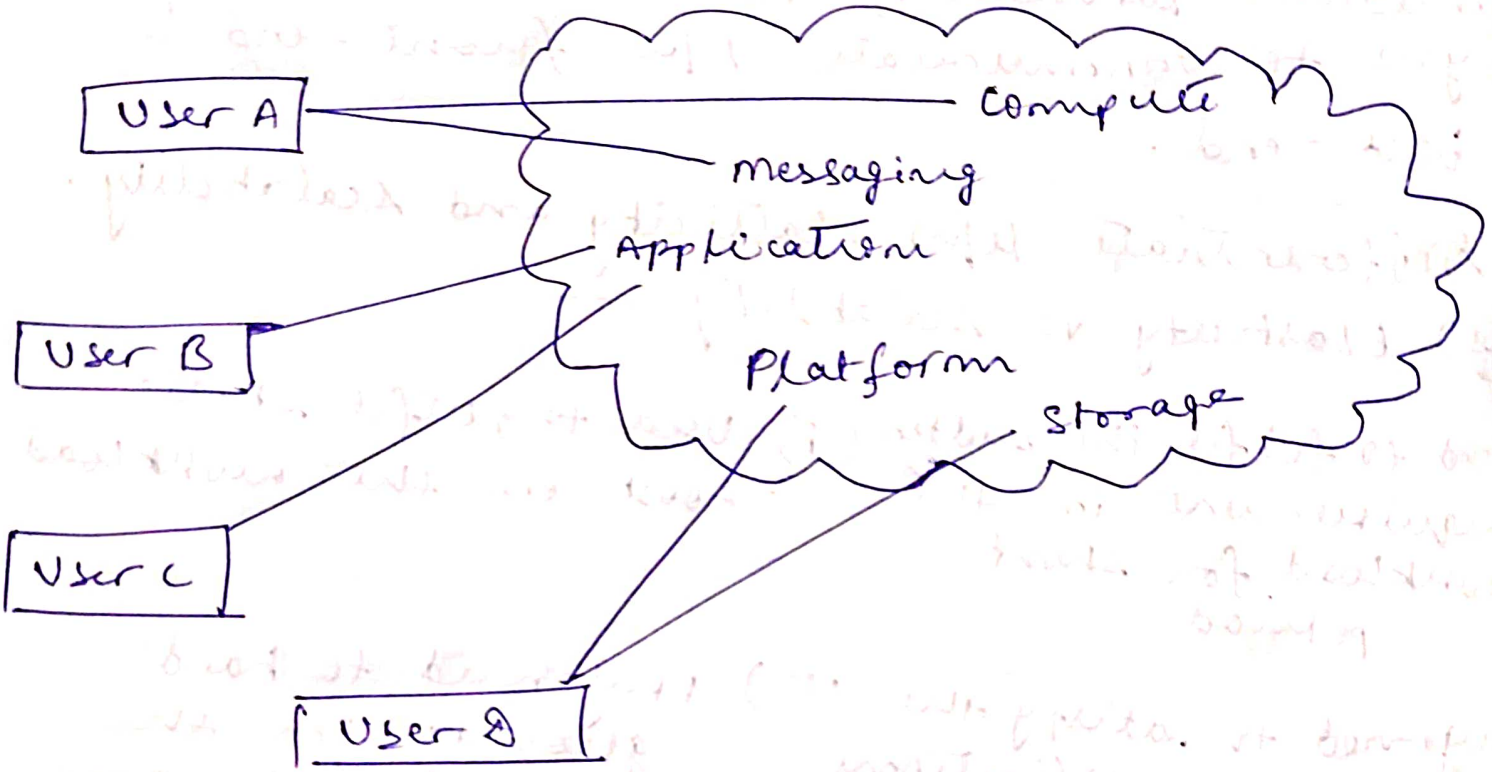
Ans) Elasticity vs scalability :—

Elasticity	Scalability
(i) Used to fulfil the sudden requirement in the workload for short period	Used to fulfil static boost in the workload
(ii) Preferred to satisfy the dynamic modifications, where required resources can improve ~~the~~ or reduce	Preferred to handle growth in the workload in an organization
(iii) Utilised by small enterprises whose work-load expands only for a short period.	Utilised by big enterprises
Short term event	(iv) Long term event

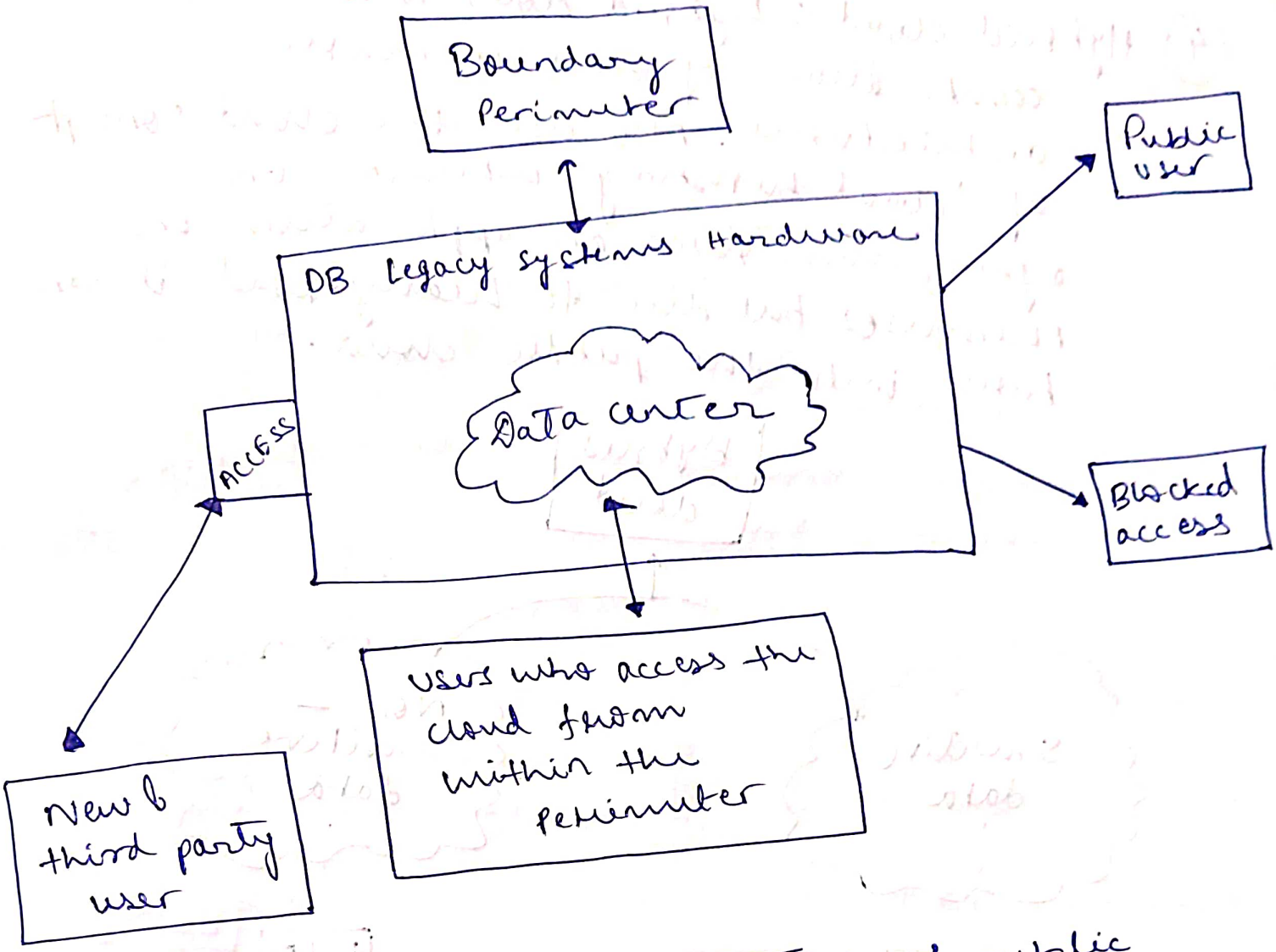
④ Explain different deployment models of cloud computing in detail with diagram.

Ans) There are 4 types cloud deployment models :-

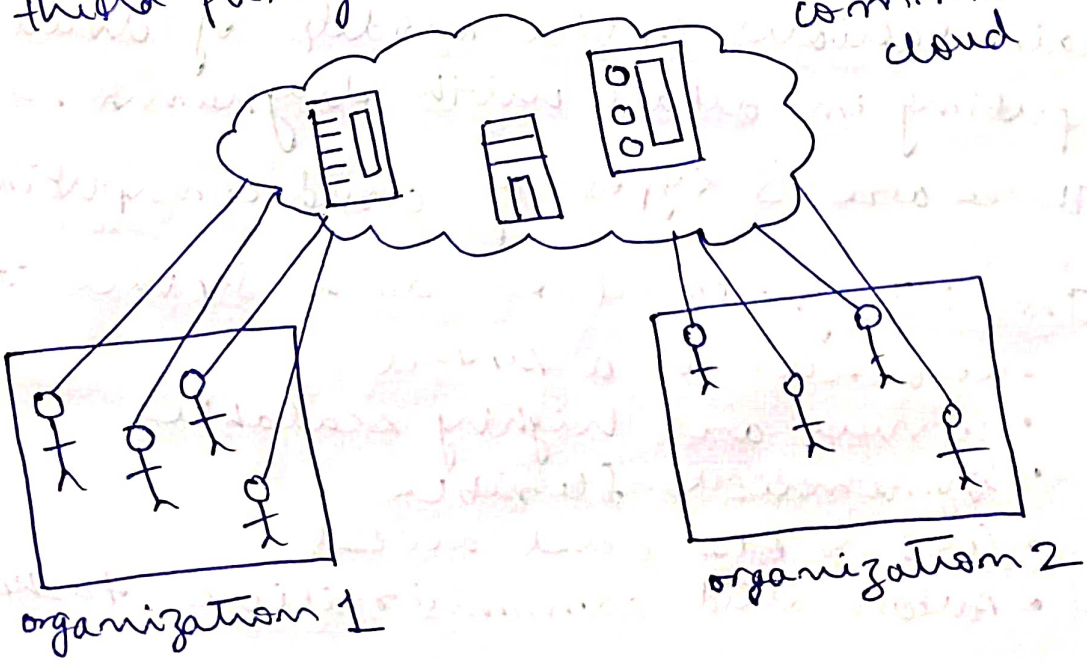
① Public cloud : used by organizations with growing & fluctuating demands. Used by organizations with low security concerns. Requires minimum investment.



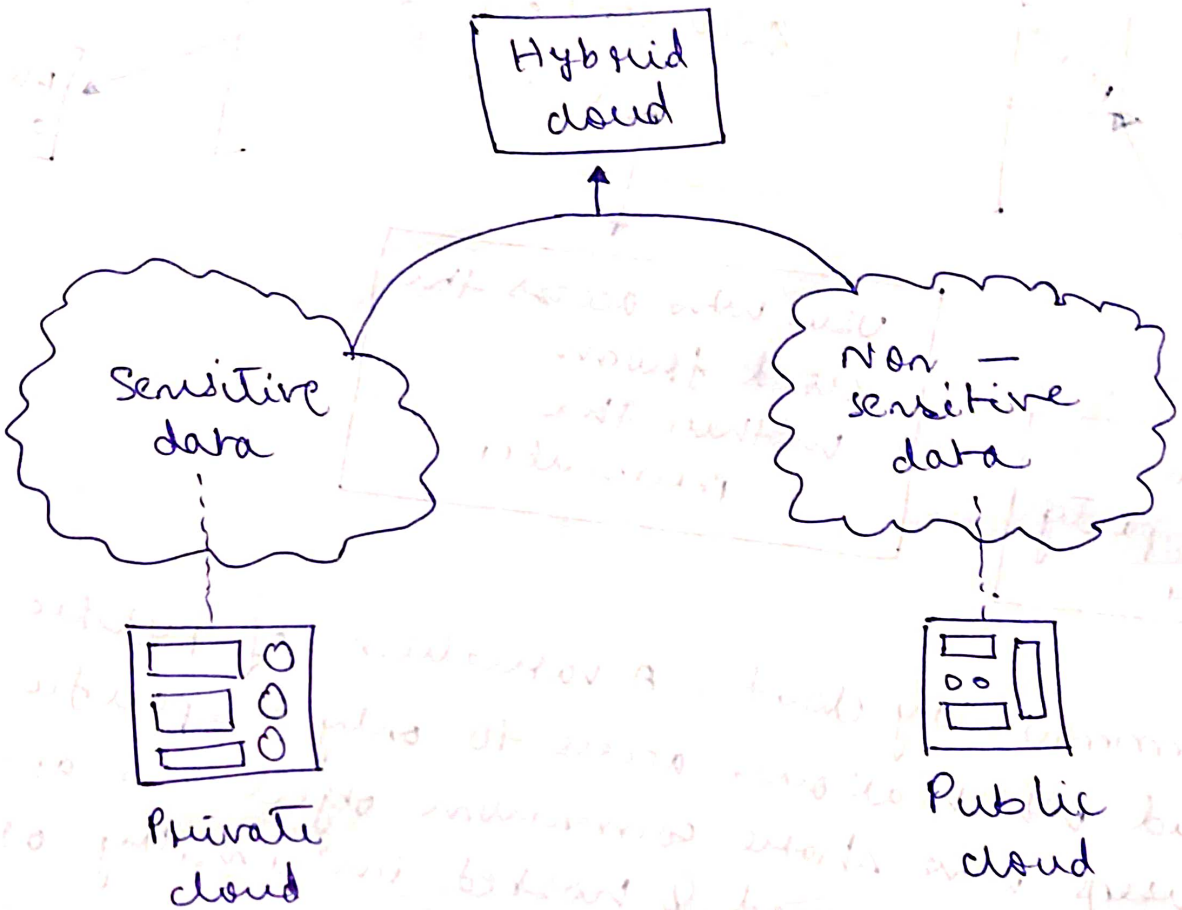
② Private cloud : Private cloud is used by big organizations with multiple mission control processes. Cloud will be integrated by providers with your data center and is managed by your IT teams. Provides better cost efficiency and greater control over data and resources.



③ Community cloud : A variation of public cloud which allows access to only a specific set of users who share common objectives and use cases. Managed & hosted internally or by a third party vendor.



(4) Hybrid cloud : hybrid cloud model is a combination of two or more architectures. Also uses the cloud concept of 'cloud bursting' wherein an organization runs an application on Premises but due to heavy load it can burst into the public cloud.

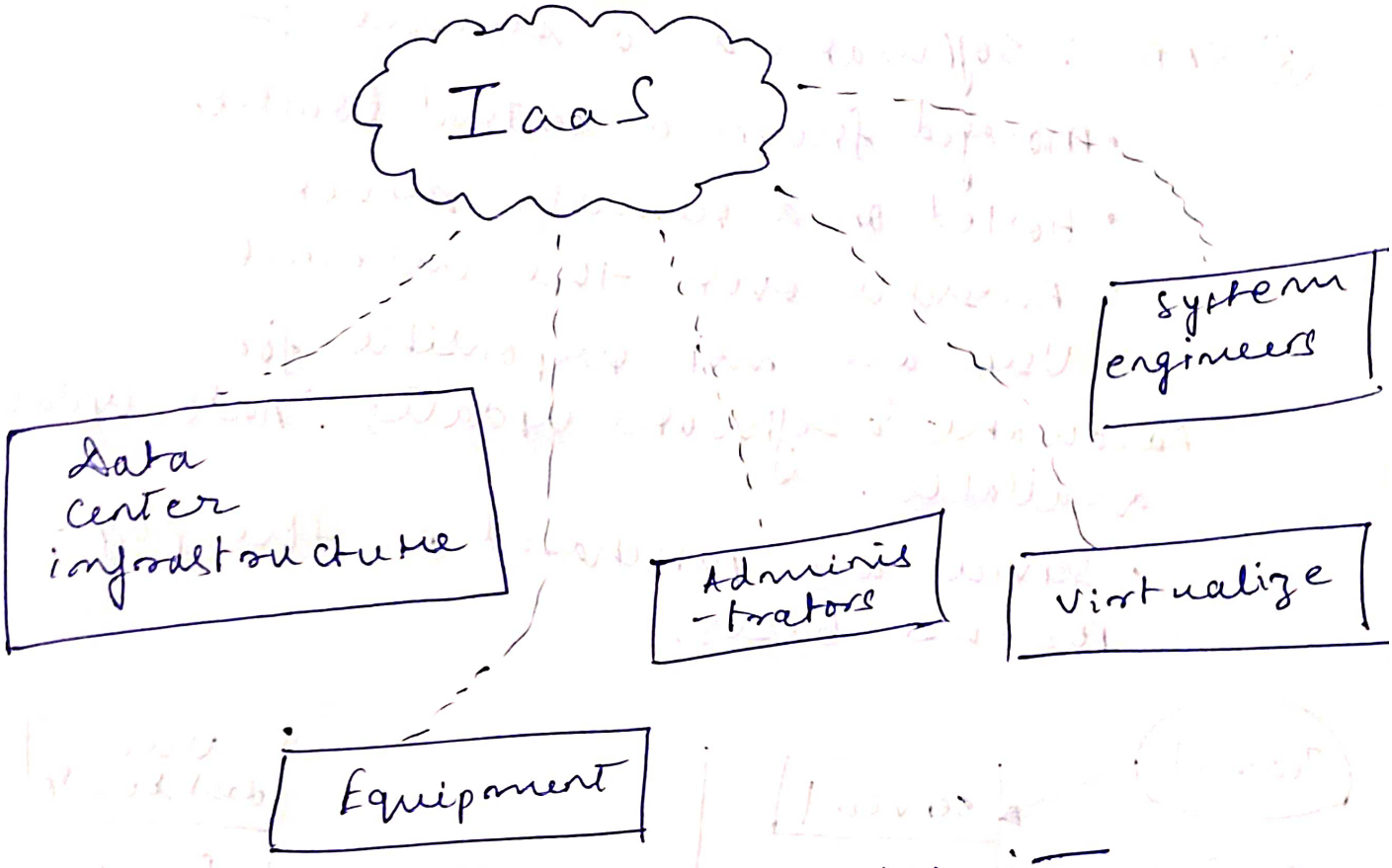


(5) Explain various service models of cloud computing in detail with diagram.

Ans) There are 3 types of cloud computing :-

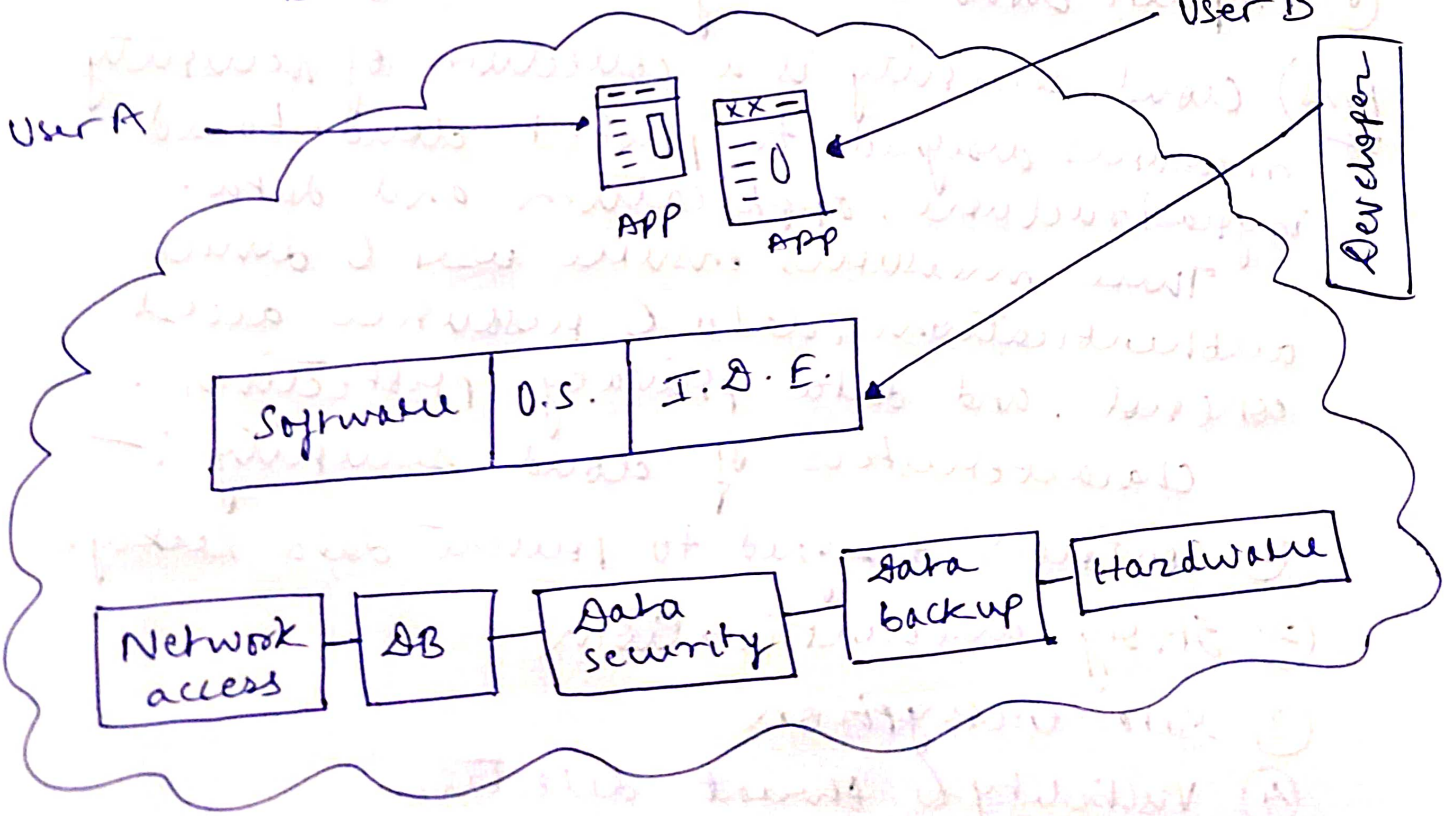
(1) IaaS : Infrastructure as a Service :-

- Resources as a service
- Services are highly scalable
- Dynamic & flexible
- GUI & API based access
- Automated administrative tasks



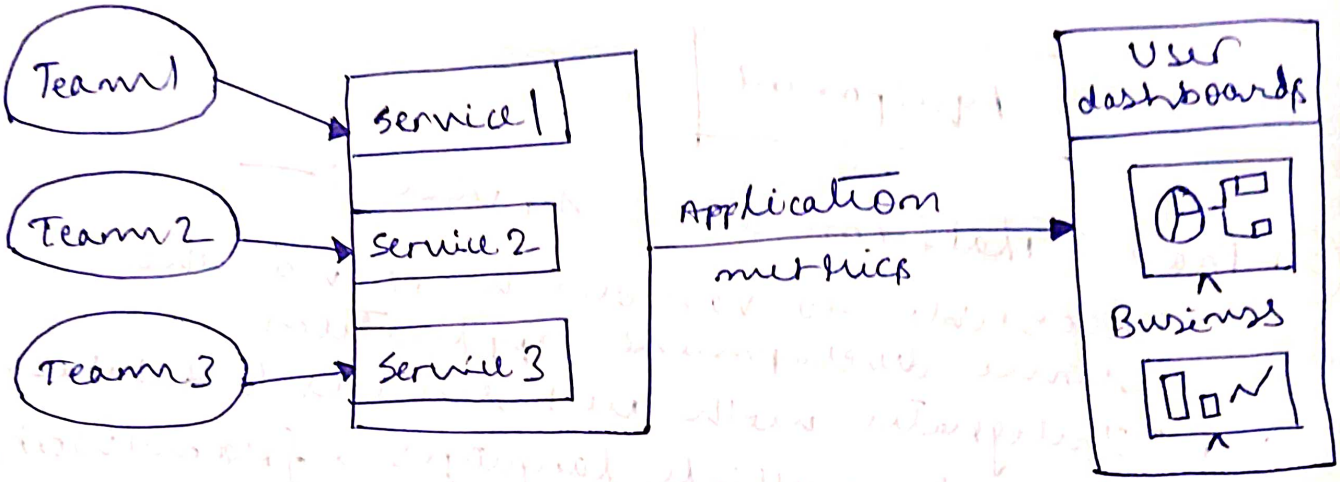
(2) PaaS : Platform as a service :—

- Accessible to various users via the same development application
- Integrates with web services & databases
- Support multiple languages & frameworks
- Provide ability to "auto-scale".
- Builds on virtualization technology.



③ SAAS : Software as a service :—

- Managed from a central location
- Hosted on a remote server
- Accessible over the internet
- Users are not responsible for hardware & software updates. Auto updates available.
- Services are purchased on the pay-as-per-use basis.



⑥ Explain cloud security in details.

Ans) Cloud security is a collection of security measures designed to protect cloud-based infrastructure, application and data. These measures ensure user & device authentication, data & resource access control, and data privacy protection.

Characteristics of cloud security :—

① Controls designed to prevent data leakage
② Strong authentication
③ Data encryption
④ Visibility & threat detection

(5) Continuous compliance
(6) Integrated security

→ Benefits of cloud security :—

(1) Lower upfront costs
(2) Reduced ongoing operational and administrative expenses.
(3) Increased reliability & availability
(4) Centralized security
(5) Greater ease of scaling
(6) Improved DDOS protection