

Q1.

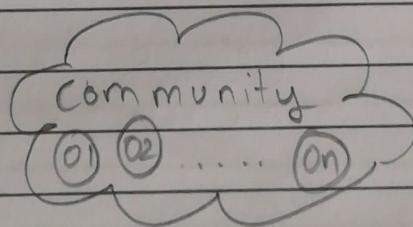
A) Importance of cloud computing for an organization.

- Cloud-computing helps an organization to reduce the investment because all the services are provided by the CSP (Cloud service provider).
 - Cloud-computing comes with the feature of increased scalability i.e. if the organization decides to increase and expand the network, cloud computing can help as well as it helps when company wants to downsize.
 - One of the major feature of cloud-computing is remote access. A cloud user can access from anywhere and the services provided are not device specific.
 - It is a pay as you use service and so the maintainance cost is also eradicated.
 - It is an alternative to super-computer because it can also provide with high computational power and also provides back-up facility.
- * Thus, looking at the above reasons, we can say that cloud-computing has become essential for an organization

B

Scenario I:

- The cloud computing is being delivered via internet across organizations.
- As the services are being accessed by multi organizations, it means that may share some common type of objectives.
- So here, the most suitable version would be the community type of cloud.
- One of the advantages of community cloud is it is a mixture of public cloud and private cloud and so it has the advantageous features of both. (Low cost of public cloud and high security of private cloud).



Common community cloud
shared by multiple organizations

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Scenario II:

- Cloud-computing is dedicated only to your organization.

- As the scenario itself suggest, that solely for an organization, it implies that the major concern is privacy and security.
 - The data must be kept confidential and should not be accessible to everyone
 - So the most suitable is private cloud.
 - Private cloud is the most secure and also has a feature of high flexibility and customization so as to provide with power of control over the resources to the cloud user.
- * So Scenario I suggests that best mode is community cloud and Scenario II should adopt private cloud.

Q.2.

Resource Management:

- One of the major reason of need of managing the resources is because they are limited
- A good and Properly managed resource cloud increases the efficiency
- Better the resources are managed, less is the response time to a user and so it is a crucial factor.
- The resources like processors, CPU cycles, memory are not unlimited so the proper distribution and allocation is expected.
- The resources should be allocated dynamically and when the users demanding them are in idle mode, their corresponding VMs should be turned to low-power mode or turned off
- Effective management leads to more number of cloud users
- If resources are managed dynamically, it leads to the decrease in energy utilization at the data centers.
- If certain blocks are made quickly available (like cache memory) the query time could also be reduced leading to decrease in overall average

response time

* Thus, resource management is one of the most important thing in cloud computing.

B Fault Tolerance and dynamic resource Allocation:

Fault Tolerance: It is a property that enables a service or a system to continue operating normally when a failure occurs.

→ If a failure occurs, if we restart for one user, if we restart the servers, then it would lead to increase in the overall response time so it is not a good choice in case of failure.

→ Instead, a better step would be to only restart that particular Virtual Machine, even though it takes a delay, it would be very less compared to when we restart the server.

→ One of the other challenges faced by Cloud Service Provider in the fault tolerance is Keeping track of progress

- Dynamic resource allocation: If we give fixed resources to a user, it will lead to wastage of resources. So a better idea is to provisioning of resources as per demand and freeing them when not in use i.e. idle.
- One of the major challenges is face the rare queries where a high allocation of resource is required. As it occurs very rarely and utilizes almost all of the resources, the response time during that time interval increases.
- Another challenge is the mapping of VMs to physical machines and its remapping.

Q 9A Virtualization: It is basically the process of creating resources and machines that are not present but virtualization makes it feel like they are. Ex: Virtual Machine, JVM etc.

→ With the help of virtualization, multiple users can share and access some common resources.

Para - Virtualization Full - Virtualization

1	The users are aware that they are sharing the services and resources.	User thinks he is not virtualized and that he is the only one using the services.
2	Additional drivers are needed (normal OS doesn't work).	Also works on normal OS.
3	Communication to the VMM (Hypervisor) is done through Hypercalls.	Communication can be done through a trap call from hardware to Hypervisor.
4.	Not possible to execute privileged instructions.	One of the main reasons of this concept is to be able to execute privileged instructions.

Para-Virtualization

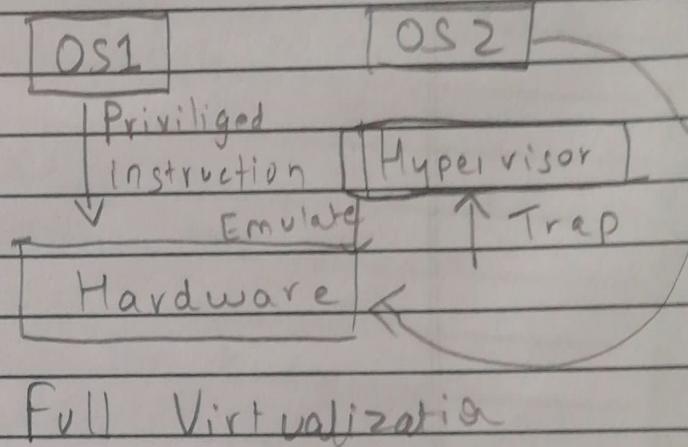
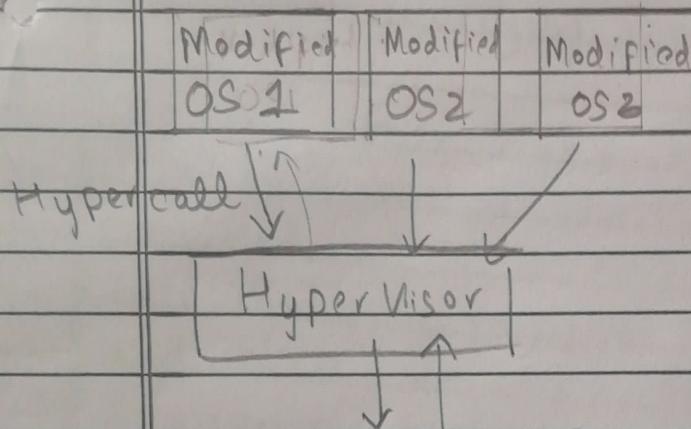
Full-Virtualization

5 Lower virtualization overhead.

High overhead.

6 Low portability and compatibility.

Highly compatible and high portability.



Para Virtualization

B Gmail: Gmail is a service that does not require any development i.e any End User can use it and he/she doesn't need to have any prerequisites.

- SaaS (Software as a Service) is a service where user does not have to develop anything. He/She can directly use the services without worrying about a single thing.
- On the other Hand, Platform as a Service (PaaS) is a service wherein, the user is provided with a environment and the user must be familiar with the Knowledge and tools required to develop on that Environment.
- PaaS has moderate admin control, whereas SaaS has zero admin control rights.
- PaaS is used for testing, deployment and development whereas software as a Service is used for only accessing the services created by the CSP.
- Gmail doesn't have any admin control rights and also we can't develop anything solely using Gmail.

→ So by considering all these points, GMail can be considered to be a SaaS

C Stake holders of cloud - computing Eco- Systems:

→ In the cloud - computing system, there are various types of Stake-Holders. They are mentioned and discussed as below.

- i) Cloud Service Provider : The owner of the resources and the allocator and distributor of them.
- ii) Cloud Consumer : A person or an organization abided in legal contract with the CSP to use and pay for the ~~IT~~ resources and services as per the agreement.
- iii) Cloud Admin : Responsible for administering the resources. Admin can be the consumer himself (remote) or the provider.
- iv) Cloud Auditor - It is a 3rd party that is responsible for assessing the cloud environment. Auditor's major concern is to develop better security and privacy.

v) Cloud Broker: Responsible for management and negotiation between OSP and cloud user. Services provided by them are aggregation.

vi) Cloud Carrier: Responsible for providing the wire-level setup and connection to the cloud users.

→ So, the above mentioned are the stakeholders involved in the cloud-computing Eco-system.