

## Unit - 1

## History and Evolution of Cloud Computing

Ques - 1 Define Cloud Computing . Give two major pros & cons .

Ans - Cloud computing means on demand delivery of IT resources via the internet with pay - as - you - go pricing .

⇒ 2 Major advantages / pros. of Cloud Computing are -

1. Less Cost
2. Security

⇒ 2 major disadvantages/ cons of Cloud Computing are -

1. Downtime
2. Vulnerability to attack

Ques - 2 Give few characteristics of Cloud Computing .

Ans - Characteristics of Cloud Computing are -

1. Agility
2. High availability and reliability

3. High Scalability
4. Multi-Sharing
5. Device and Locating independence
6. Maintenance
7. Low Cost
8. Services in pay-per-use mode

Que-3 What are the challenges of Cloud Computing?

Aus -

1. Security issues
2. Cost Management
3. Lack of resources
4. Performance
5. Multiple management

Que-4 Give the applications of cloud computing.

Aus -

1. Online file Storage
2. Photo editing software
3. Digital video software
4. Twitter related applications
5. Creating image album
6. Web application for antivirus
7. Word processing
8. Spreadsheets

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9. Presentation Software
10. finding a way on map
11. E-commerce software
12. Miscellaneous Apps

Que-5

Ans -

Define SMTP :

SMTP stands for Simple Mail Transfer Protocol. It is used when e-mails are delivered from clients to servers and from servers to other servers.

Que-6

Define POP3 server ?

Ans -

POP3 is an acronym for Post Office Protocol. When you download emails to your email program that program will connect to a server on the net that is known as POP3 server.

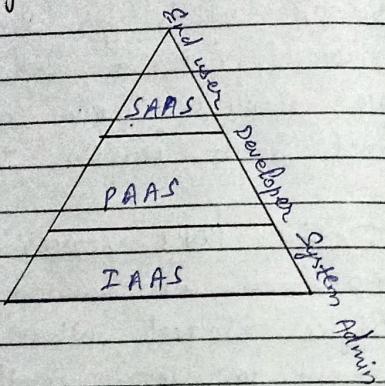
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## Unit - 2

## Cloud Computing Service Models

Ques-1 Explain cloud computing service model with their two advantages and two disadvantages.

Ans -



⇒ Cloud computing service models are of three types -

1. IaaS (Infrastructure as a service)
2. PaaS (Platform as a Service)
3. SaaS (Software as a Service)

(+) IaaS - It stands for Infrastructure as a service. It was earlier known as Hardware as a service (HAAS). It eliminates the need of every organization to maintain the IT infrastructure.

• Advantages ⇒

1. You can easily access the vast computing power available on IaaS cloud platform.
2. You can eliminate the need of investment in rarely used IT hardware.

• Disadvantages ⇒

1. Data risk
2. Dependent on virtualization services

(2) PaaS - It stands for platform as a service. It is a developer programming platform which is created for the programmer to develop, test, run and manage the applications.

• Advantages ⇒

1. Simplified Development

2. Lower Risk

• Disadvantages ⇒

1. Vendor lock-in
2. Data privacy

## 3. Software-as-a-Service (SaaS) :-

It is defined as software delivery model that is developed on internet in which applications are provided by cloud service providers.

## • Advantages →

1. Easy to buy
2. Low Maintenance

## • Disadvantages →

1. Security
2. Latency issue

deployment

Ques-2 Explain cloud deployment models? Give its two advantages and disadvantages.

Ans- Cloud deployment models are of four types :-

1. Public Cloud
2. Private Cloud
3. Hybrid Cloud
4. Community Cloud

1) Public Cloud :- It is a type of cloud hosting that allows the

accessibility of system and its services to its client / user easily. Some companies which provides public cloud are IBM, Google, Amazon, Microsoft etc.

## • Advantages →

1. Low Cost
2. Reliable

## • Disadvantages →

1. Low security
2. Less customizable

2) Private Cloud :- It is also termed as 'Internal Cloud', which allows the accessibility of systems and services within a specific boundary or organization.

## • Advantages →

1. Highly private
2. Control oriented

## • Disadvantages →

1. Restriction
2. More cost

③ Hybrid cloud :- It is another cloud computing type, which is integrated. It can be a combination of two or more cloud servers i.e. private, private or community combined as one architecture.

• Advantages →

1. Scalable
2. Cost Effective

• Disadvantages →

1. Networking issues
2. Setting Security Compliance

④ Community cloud :- A community cloud is a cloud deployment model that provides a cloud computing solution to limited number of individuals or organizations that is governed, managed and secured commonly by all the participating organizations as a third-party managed service provider.

• Advantages →

1. Cost Effective
2. Flexible and Scalable

• Disadvantages →

1. Fixed storage among all
2. Sharing is Difficult

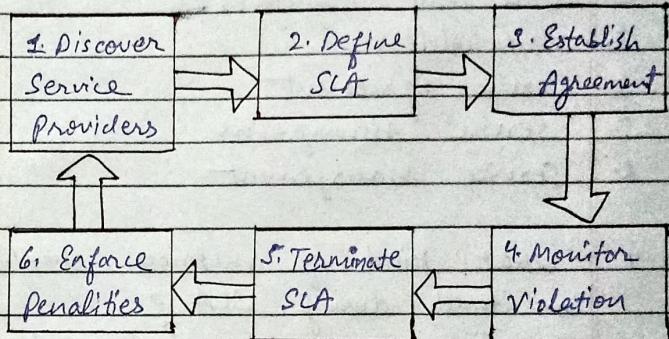
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## Unit - 3

### Service Level Agreement Management

What do you mean SLA?

SLA stands for Service Level Agreement. It usually refers to the contract between an end user and a service provider.



Give the aspects that the standard SLA aim to satisfy.

1. A complete and concise description of services and maintenance.
2. Responsiveness of requests for service.
3. Reliability of the particular product.
4. Established Problem Solving/reporting procedure

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5. Guidelines pertaining to who will be responsible for maintaining performance and collected information.
6. Ensure that there is a clear understanding of limitations and the potential cause for termination of the SLA.

Ques-3 Give the key components of SLA.

Ans - key components of SLA are :-

1. Agreement overview
2. Goals and Objectives
3. Stakeholders
4. Service Agreement
5. Service Assumptions
6. Service Management

Ques-4 What kind of metrics should be monitored during SLA?

Ans - Depending on the services, the type of metric to monitor may include

1. Service Availability
2. Defect rates
3. Technical Quality
4. Security
5. Business Results

Ques-5 What should I consider when selecting metrics for my SLA?

Ans - Following are the metrics to consider

while selecting metrics for SLA! -

- 1) Choose measurements that motivate the right behaviour.
- 2) Ensure that metrics reflect factors within the service provider's control.
- 3) Choose measurements that are easily collected.
- 4) Less is more!
- 5) Set a proper baseline.
- 6) Define with care.

## Unit - 4

## Virtualization Concepts

**Ques-1** What is virtualization? What are its benefits?

**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.

\* Benefits of Virtualization -

1. Reduction in costs
2. Efficient utilization of resources
3. Better accessibility and minimization of risk among them.

**Ques-2** Explain the different types of virtualization.

**Ans -**

1) **Hardware Virtualization -**

It is also known as server virtualization. It runs on the concept that an individual independent segment of hardware can be made up of multiple smaller hardware servers.

2) **Software Virtualization -**

It also involves the creation of an operating system.

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of multiple virtual environments on the host machine. It creates a computer system complete with hardware that lets the guest operating system to run.

3) **Memory Virtualization -**

It also involves the creation of an operating system. Physical memory across different servers is aggregated into a single virtualized memory pool. It provides the benefit of an enlarged contiguous working memory.

4) **Storage Virtualization -**

Multiple physical storage devices are grouped together, which then appear as a single storage device.

5) **Data Virtualization -**

It lets you easily manipulate data, as the data is presented as an abstract layer completely independent of data structure and database systems.

6) **Network Virtualization -**

In this, multiple sub-networks can be created.

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created on the same physical network.

### Q) Desktop Virtualization -

In this type of virtualization, desktop is stored on a remote server allowing the user to access his desktop from any device or location.

Ans-3 Compare pre-copy and post-copy techniques.

Pre-copy Technique	Post-copy Technique
1. It includes transferring remaining dirty pages to another minimal execution state.	It includes transferring another minimal execution state.
2. Transfer number of pages during preparation time period.	Transfer number of pages during resolution time period.
3. Total migration time is more.	Total migration time is less.

### Unit-5

#### Cloud Security

Define Data Leaks?

Data in the cloud is exposed to the same threats as traditional infrastructure as a service providers. Data leaks can lead to a chain of unfortunate events for IT companies and infrastructure as a service providers.

What is API?

API stands for Application Programming Interface, which is a software intermediary that allows two applications to talk to each other.

Name some privacy and legal issues in cloud computing.

1. Data Breaches

2. Network Security

3. Data Locality

4. Data Access

5. DDoS Attacks

6. System Vulnerabilities

7. Account Hijacking
8. Malicious Insiders
9. The API parasite
10. Permanent Data loss
11. Shared Technology, Shared Dangers
12. Compromised Credentials and Broken Authentication
13. Hacked Interfaces and APIs.

Que-4 What do you mean by abuse Cloud Service?

Ans- When cloud is used by illegal business, it is known as abuse cloud service. The purpose of the latter is to use cloud server resource for legal process and ignoring criminal activities via the cloud service.

Que-5 Define Vulnerabilities?

Ans- A common mistake when using cloud based solutions in the IaaS model is paying too little attention to security of application and the vulnerability of applications become a bottleneck in enterprise infrastructure security.

Que-6 What are the protection methods of a cloud?

- Ans -
- 1) Regular software update scheduling
  - 2) Patching procedures
  - 3) Monitoring and audit requirements
  - 4) Regular testing and vulnerability analysis.

Que-7 Explain ~~CASB~~ CASB.

CASB stands for Cloud Access Security broker. It is a unified security tool that allows administrators to identify potential data loss risks and ensure a high level of protection.

Que-8 Define DOS attack.

DOS attack can cause business critical services to slow down or even stop. They consume a large amount of computing power that comes with a hefty bill.

## Unit - 6

## Cloud Security

Ques-1 What do you mean by storage as a service (SaaS) ?

Ans- Storage as a Service is a business model in which a company leases or rents its storage infrastructure to another company or individual to store data. A company providing SaaS may be called as Storage Service provider (SSP).

Ques-2 Give some cloud storage use cases.

Ans- In general, the available cloud storage services fall in one of following categories -

1. File sync and share
2. Backup and Disaster Recovery
3. Simplified Management
4. Speed of Deployment
5. Scalability
6. Availability
7. Security

Ques-3 List some cloud storage management challenges.

Ans- Some of the challenges are -

1. Security
2. Compliance
3. Cost
4. Cloud Storage Management Complexity
5. Interoperability
6. Vendor lock-in
7. Connectivity
8. Migration

Ques-4 Define SAN.

Ans- SAN stands for Storage Area Network. A storage area network is a secure high speed data transfer network that provides access to consolidated block level storage.

Ques-5 Define Data Encryption.

Ans- Encryption is the main and also the most popular method of data protection. Data when encrypted is safe and protected from hackers.

Ques-6 What is CASB ?

Ans- CASB stands for Cloud Access Security Broker. A CASB is a unified security tool that allows

administrations to identify potential data loss risks and ensure a high level of protection.

Ques-7 Name some privacy and legal issues in Cloud Computing.

Ans -

1. Data Breaches
2. Network Security
3. Data Locality
4. Data access
5. DDoS Attacks
6. System Vulnerabilities
7. Account Hijacking
8. Malicious Insiders
9. The APT parasite
10. Permanent Data Loss
11. Shared Technology
12. Compromised credentials and broken authentication
13. Hacked Interfaces and APIs.

Ques-8 Define Threats.

Ans - Threats are potentials for vulnerabilities to turn into attacks on computer systems, networks & more. Threats can include everything from viruses, trojans, back doors to outright attack from hackers.

## Unit - 7

## Scheduling In Cloud

Ques-1

Explain Scheduling problem in brief.

Ans -

Scheduling problem is the problem of matching elements from different data sets, which is formally expressed as a triple  $\langle E, S, O \rangle$ , where

- $E$  is the set of examples, each of which is an instance of problem.
- $S$  is the set of feasible solutions for example.
- $O$  is the set of the problem.

Ques-2

Explain different types of scheduling  
Below are different categories -

1.

First come first serve (FCFS) -

It is a basic scheduling technique used in cloud computing which works on the basis of the cloud first process enters in queue will execute first.

2.

Priority Queue Scheduling -

Priority Queue Scheduling avoids processes to go starve. User assigns priority to processes and highest priority process executes first and the lowest priority will execute in the last.

priority to processes and highest priority process executes first and the lowest priority will execute in the last.

Round Robin Scheduling -

Cloud Computing uses this method to transmit data. In this a time quantum is used and every process executes in the given quantum.

4.

Shortest Job First Scheduling -

It is best where small size process needs to execute first. This is best to execute processes but as the scheduling depends on the basis of user requirement somewhere it is not suitable.

5.

Multi-Level Feedback Queue -

MLFQ have both advantages of Round Robin and First Come First Serve (FCFS).

6.

Multi-level Queue -

It uses multiple queue with having different priority assigned to each queue. In MLQ CPU

utilization occurs maximum.

Ques - 3

Compare Static vs Dynamic Scheduling

Ans -

### Static Scheduling

1. Performed at static or compile time.
2. Assigned to stack
3. Size must be known at compile time
4. First in Last Out
5. It is best if required size of memory is known in advance.

### Dynamic Scheduling

1. Performed at dynamic or run time.
2. Assigned to heap
3. Size may be unknown at compile time
4. No particular order of assignment
5. It is best if we don't have idea about how much memory require.