

# VASAVI COLLEGE OF ENGINEERING

(AUTONOMOUS)  
(Affiliated to Osmania University)  
Hyderabad - 500 031.

DEPARTMENT OF

: CSE

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Roll No. 1602-21-733-052 Page No. 1

## \* PRELAB QUESTIONS: WEEK - 1

- 1) Define and explain the 3 types of cloud services and the AWS products that are built based on them:

→ Infrastructure as a Service (IaaS): Provides virtualized computing resources over the internet. AWS products include EC2 (Elastic Compute Cloud) and EBS (Elastic Block Store)

→ Platform as a Service (PaaS): Offers hardware and software tools over the internet, typically for application development. AWS products include Elastic Beanstalk and AWS Lambda.

→ Software as a Service (SaaS): Delivers software applications over the internet, on a subscription basis. AWS products include Amazon Chime and AWS WorkSpaces.

- 2) Compare AWS, Google Cloud and Microsoft Azure relevant any 4 parameters.

→ Market Share: AWS has the largest market share, followed by Azure and then Google Cloud.

→ Global Reach: AWS offers the most extensive global

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DEPARTMENT OF : \_\_\_\_\_

NAME OF THE LABORATORY : \_\_\_\_\_

Name \_\_\_\_\_ Roll No. \_\_\_\_\_ Page No. 2

infrastructure, with a higher no. of regions and availability zones compared to Azure and Google Cloud.

→ Service Variety: AWS has a broad range of services and features. Azure is known for its strong integration with Microsoft products, while Google cloud excels in big data and machine learning services.

→ Pricing Model: AWS uses a pay-as-you-go pricing model with various pricing options. Azure offers similar models but also provides hybrid-pricing options, while Google cloud is noted for its sustained use discounts & innovative pricing strategies.

3) Explain about Amazon S3.

Amazon Simple Storage Service (S3) is a scalable object storage service for storing & retrieving any amount of data. It is designed for high durability, availability & scalability.

4) Explain the S3 bucket and how can you control the right of entry to an S3 bucket?

S3 bucket: A container for storing objects (files) in Amazon S3. Buckets are used to organize and manage data within S3.

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NAME OF THE LABORATORY : \_\_\_\_\_

Name \_\_\_\_\_ Roll No. \_\_\_\_\_ Page No. 3.

Access Control: You can control access to S3 buckets using bucket policies, IAM policies and Access Control Lists (ACLs).

- 5) How many S3 buckets can be created by default?  
You can create up to 100 S3 buckets per AWS account.  
This limit can be increased by submitting a service limit increase request.
- 6) How can you lock the object in AWS S3?  
We can lock object in AWS S3 using Object lock, which allows you to prevent objects from being deleted or overwritten for a specified retention period. This feature supports compliance & data protection requirements.

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NAME OF THE LABORATORY : \_\_\_\_\_

Name \_\_\_\_\_ Roll No. \_\_\_\_\_ Page No. \_\_\_\_\_

## PRELAB QUESTIONS-2 WEEK-2

- 1) What is EC2? Give an example of EC2.

Amazon EC2 is a web service that provides resizable compute capacity in the cloud, allowing users to run virtual servers (instances) with scalable processing power.

Ex: Running a web server on an EC2 instance to host a website.

- 2) Define Amazon EC2 regions & availability zones:

Regions: Geographical areas containing multiple data centers. Each region is isolated from others to ensure fault tolerance.

Ex: us-east-1.

Availability Zones: Distinct data centers within a region, designed to be isolated from failures in other zones; offering high availability & fault tolerance.

Ex: us-east-1a, us-east-1b, etc.

- 3) Explain T2 instances:

T2 instances are a type of EC2 instance that provides a balance of compute, memory & network resources. They are designed for workloads with moderate

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NAME OF THE LABORATORY : \_\_\_\_\_

Name \_\_\_\_\_ Roll No. \_\_\_\_\_ Page No. \_\_\_\_\_

baseline performance requirements that occasionally need bursts of high performance such as development & testing environments.

- 4) What are key-pairs in AWS?
- Key pairs are used to securely connect to EC2 instances. A key pair consists of a public key, which AWS stores, & a private key, which you download. The private key is used to securely connect to the instance via SSH (LINUX) or RDP (Windows).
- 5) On an EC2 instance, an application of yours is active. Once the CPU usage on your instance hits 80% you must reduce the load on it. What strategy do you use to complete the task?
- Implement Auto Scaling to automatically adjust the no. of instances based on CPU usage or other metrics. Alternatively, consider optimizing your application to reduce CPU consumption or use a more powerful instance type.
- 6) Can S3 be used with EC2 instances and if yes; how?

Yes, S3 can be used with EC2 instances. You can access S3 buckets from EC2 instances to store & retrieve data using the AWS SDKs (or CLI).

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NAME OF THE LABORATORY : DSCC Lab

Name: K.S.I.SIVANI

Roll No. 1602-21-733 DS Page No. :

## PRELAB QUESTIONS - WEEK-3:

- ① What is Amazon Elastic File System?  
→ EFS is a fully managed, scalable file storage service for use with AWS cloud service and on-premises resources, providing shared access to files across multiple EC2 instances.
- ② How do you access a file system from an EC2 instance?  
→ Accessing EFS from an EC2 instance requires mounting the EFS file system to the instance using the NFS protocol.
- ③ How many EC2 instances can connect to a file system?  
→ Many EC2 instances can connect to a single EFS file system concurrently, enabling shared access to files.
- ④ What are the 3 characteristics of an Amazon EFS?  
→ Elasticity, high availability & durability, performance modes (General purpose, max I/O).
- ⑤ What is the purpose of EFS in AWS?  
→ It is used to provide scalable, elastic & highly available file storage that can be accessed by multiple EC2 instances.
- ⑥ What are some limitations of EFS?  
→ Higher latency compared to local storage.  
→ Throughput limits  
→ More expensive.

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Name: K.S.I. SIVANI Roll No. 1602-21-733-052 Page No. :

## PRELAB QUESTIONS: WEEK-4

① What is Amazon RDS?

→ Amazon RDS is a fully managed service for setting up, running & scaling relational databases.

② What is difference between Amazon RDS and Amazon EC2?

→ RDS is a managed database service with automated administration.

→ EC2 provides virtual servers where you manually manage databases.

③ Is it possible to run multiple databases in a DB instance?

→ Yes, depending on the database engine, you can run multiple databases on a single DB instance.

④ What are the advantages of using AWS RDS?

→ RDS offers automated management, easy scalability, high availability with multi-AZ, and built-in security features.

⑤ What are differences b/w RDS, DynamoDB and Redshift?

→ RDS is for relational databases, DynamoDB is a NoSQL service and Redshift is a data warehouse optimized for analytics on large datasets.

\* PRELAB QUESTIONS - 5

1) Define serverless architecture and its purpose:

→ It is a cloud computing model where the cloud provider automatically manages the infrastructure, allowing developers to build & run applications without needing to manage servers.

2) What are the vulnerabilities of serverless architecture?

→ Insecure code dependencies, lack of visibility, control over infrastructure, issues with function permissions.

3) Why lambda is called serverless?

→ AWS Lambda is called serverless because it abstracts the underlying server management from developers.

4) Mention any 5 applications of serverless architecture:

→ Real-time data processing

→ Web Applications

→ API backend

→ Image and Video processing

→ Scheduled Tasks.

DEPARTMENT OF : CSE

NAME OF THE LABORATORY : DSCL LAB

Name K. S. I. SIVANI Roll No. 1602-21-733-052 Page No. \_\_\_\_\_

### PRELAB QUESTIONS - 6

1) Define Virtual Private Cloud:

→ A virtual private cloud is a private, isolated section within a public cloud that allows organizations to run their cloud resources in a controlled, secure environment.

2) What is the purpose of a VPC in cloud networking?

→ The primary purpose of a VPC is to provide a secure, isolated network environment within the public cloud where organizations can manage and configure their own network settings, ensuring data privacy, security & scalability.

3) Who invented VPC?

AWS pioneered the concept of VPC, launching Amazon VPC in 2009 as part of their cloud networking offerings.

4) How many VPC can be created per region and how many Subnets can be created per VPC?

→ In AWS, users can create upto 5 VPCs per region by default. Each VPC can have upto 200 subnets.

5) What IP address range can we use with VPC?

→ Users can specify any IPv4 address range using CIDR blocks, typically between /16 and /28.

Private IP ranges like 10.0.0.0/16 (or) 192.168.0.0/16 are used within VPCs.

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Name K.S.T.SIVANI Roll No. 1602-21-733-D52 Page No. \_\_\_\_\_

## PRELAB QUESTIONS - 7

- ① Difference between virtualization and containerization:
  - Virtualization creates multiple virtual machines on a single physical server, with each VM running on its own OS, using a hypervisor to manage resources.
  - Containerization runs multiple isolated applications on the same OS kernel using containers, making it more lightweight and efficient, as containers share the host OS.
- 2) What are docker containers and docker files?
  - Docker containers are lightweight, portable environments that package an application and its dependencies.
  - Docker files are scripts containing a series of commands to build docker images.
- 3) Describe the lifecycle of a docker container?
  - Created → running → paused → stopped → Deleted.
- 4) How do you create a docker container from an image?
  - docker run <image-name>
- 5) How are kubernetes and docker related?
  - Kubernetes is an orchestration platform for managing deploying & scaling docker containers across hosts, while Docker is a container platform for building & running containers.

PRELAB QUESTIONS - 8 :

① What is CloudFront?

\* CloudFront is a AWS content delivery network (CDN) service.  
It delivers data, videos, applications, and APIs securely  
with low latency and high transfer speeds.

② What are the uses of AWS CloudFront?

\* Content Delivery, Video Streaming, Security, Dynamic  
Content Acceleration.

③ How a video streaming protocol like HLS works?

\* HTTP Live Streaming (HLS) divides a video file into small  
segments and delivers them over HTTP.  
→ Video encoded into multiple bitrates and split into  
short chunks.

④ Is it possible to use CloudFront for Dynamic Content?

\* Yes, CloudFront can accelerate dynamic content delivery  
by caching and optimizing content with edge locations,  
maintaining low latency for APIs & dynamic web  
applications.

⑤ We are a company creating content & distribute it as a  
download file from our website. Can we use CloudFront?

\* Yes, CloudFront can be used to distribute downloadable  
files.

PRELAB QUESTIONS-9

① What is Kubernetes?

- \* Kubernetes is an open source container orchestration platform that automates the deployment, scaling & management of containerized applications.

② What is Amazon EKS?

- \* Amazon EKS is a fully managed Kubernetes service by AWS that simplifies running Kubernetes clusters on AWS infrastructure, offering scalability, high availability & integration with AWS integration.

③ Which OS does Amazon EKS support?

- \* Amazon EKS supports Linux and Windows Server operating systems for running containerized workloads.

④ Does Amazon EKS work with existing Kubernetes Applications and Tools?

- \* Yes, Amazon EKS is fully compatible with standard Kubernetes APIs, so existing Kubernetes applications & tools can run seamlessly on EKS.

⑤ How much does Amazon EKS cost?

- \* Charges a flat fee of \$0.10 per hr per cluster; plus the cost of underlying AWS services like EC2 instances.

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Name: K.S.T. SWANI Roll No. 1602-21-733-052 Page No. :

## PRELAB QUESTIONS - 10

① What is MapReduce?

\* MapReduce is a programming model used for processing large datasets in parallel across a distributed computing cluster. Map: (processing & filtering data); Reduce: Aggregating

② Benefits / Advantages Of MapReduce:

\* Scalability, Fault Tolerance, Efficiency, Simplicity.

③ What is meant by HDFS?

\* HDFS (Hadoop Distributed File System) is a distributed file system designed for storing large datasets across multiple machines.

④ Distinguish between Schedule tracker & Job tracker.

\* Job Tracker: Oversees the execution of MapReduce tasks, assigns tasks to Task trackers & monitors their progress.

\* Schedule Tracker: Ensures task scheduling and load balancing within a Hadoop cluster.

⑤ What is Input Format in Hadoop?

\* In Hadoop, Input Format defines how input files are split and read into data records for MapReduce jobs.

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Name: K.S.I.SIVAN]

Roll No. 1609-21-733-052 Page No. :

PRELAB QUESTIONS - 11

- ① Why is IAM (Identity & Access Management) important?  
\* IAM is critical for securely managing access to systems, applications & resources.
- ② What is an Identity Directory Service?  
\* An identity directory service is a centralized system that stores & manages user identities & their credentials.
- ③ Important Factors When designing an IAM system:  
\* Least Privilege principle, Scalability , auditing & monitoring, multi-factor authentication .
- ④ Method of getting the IP address of a computer:  
\* To get a computer's IP address:  
→ On Windows: ipconfig command in the command prompt  
→ On Linux/Mac: ifconfig (or) ip a command in terminal.

### PRELAB QUESTIONS-12

① What is load balancing?

\* Load balancing distributes incoming network or application traffic across multiple servers to ensure no single server is overwhelmed; improving application performance.

② What is auto-scaling?

\* Autoscaling automatically adjusts the number of compute resources in response to demand, ensuring optimal performance & cost efficiency by scaling up during high demand.

③ Types of Load Balancers in AWS:

\* ① Application Load Balancer.

② Network Load Balancer.

③ Classic Load Balancer.

④ How to improve Security when using load balancers?

\* Enable SSL/TLS.

Restrict Access

Integrate Web Application Firewall (WAF).

Use Authentication.

⑤ What happens if your load balancer fails? How to manage?

\* Use health checks to route traffic only to healthy instances.

\* Setup redundant load balancers.