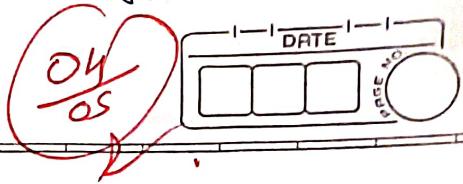


Assignment-01



Q.1 Use S3 bucket and host video streaming steps

→ 1. Create an S3 Bucket

- Sign in to your AWS management console.
- Go to S3 and click Create Bucket.
- Provide a bucket name (globally unique) & select the region
- Uncheck ~~Block all public Access~~ (required for public video hosting)
- Click Create Bucket.

2. Upload Video Files to the Bucket.

- Open the newly created Bucket
- Click Upload, and then Add Files to upload your video files
- Click Upload to store the video files in bucket

3. Set Permissions for the Bucket.

- Go to Permissions tab
- Under Bucket Policy, create a policy to allow public access to the video files
- change policy.

4. Enable Static Website Hosting

- In the Properties tab of your S3 bucket, scroll to static website hosting section.
- Select Use this bucket to host a website.
- Provide an index document if needed
- Click Save.

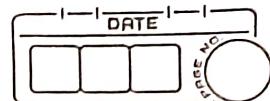
5. Create a simple HTML Page for video streaming.

6. Upload the HTML Page to S3

- Upload the index.html to your S3 bucket in the same way as you uploaded the video files
- Ensure the index.html file is publicly accessible by checking the permissions

7. Access the video streaming page:

- After setting up static website hosting you'll receive a website endpoint URL
- Visit the URL (eg `http://<your-bucket-name>.s3-website-<region>.amazonaws.com`) to stream the video from your S3 bucket.



Q2. Discuss BMW and Hotstar case studies using AWS

→ What is AWS

AWS stands for Amazon Web Services. It is a subsidiary of Amazon.com that provides on demand cloud computing platforms to individual, companies and governments, on a paid subscription basis with a free-tier option available for 12 months.

AWS work as "pay as you go" basis.

Cloud Computing: It is a base through which the network of the remote servers hosted on internet to manage, store and process data rather than a personal computer and local servers.

AWS's version of virtual computers have most of the attributes of real computer including hardware (CPUs & GPUs) for processing, local / RAM memory, hard-disk, a choice of operating system

Advantage of AWS

- 1) Global Infrastructure
- 2) Speed to Market
- 3) Secured Environment
- 4) Extensive Ecosystem.

BMW case study

BMW, one of the world's leading luxury auto-makers, leverages AWS (Amazon Web Services) to accelerate digital transformation, drive innovation, and streamline operations.

Key Challenges BMW Faced :

1) Scaling Connected Car Service:

BMW needed a scalable, reliable platform to support its growing fleet of connected vehicles.

2) High Data Volumes :

The connected cars generate terabytes of data daily, requiring a powerful & scalable infrastructure.

3) Accelerating Innovation :

Cloud-based machine learning and artificial intelligence to improve autonomous driving technologies.

AWS Services Utilized by BMW

1) Amazon S3 (Simple Storage Service)

BMW stores vast amounts of data generated by its connected cars, which provides secure, durable and scalable storage.

2) Amazon EC2 (Elastic Cloud Computing)

EC2 helps BMW run high-performance computing (HPC) workloads needed for simulations, data analytics, and AI/ML models.

3) AWS Lambda:

BMW uses AWS Lambda to process event-driven functions, reducing the need for servers manage.

4) Amazon CloudFront:

BMW uses CloudFront for content delivery, ensuring low-latency access to web services and multimedia application.

Impact of AWS on BMW

1) Scalable and Secure Global Infrastructure:

AWS provides BMW with the scalability needed to support millions of connected vehicles.

2) Improved Connected Car Features:

The use of AWS's IoT, analytics & AI services allows BMW to enhance its connected car platform, offering real-time traffic updates.

3) Data Driven Innovation:

BMW is using AWS to accelerate its research and development in autonomous driving.

4) Reduced Time to Market

5) Cost Optimization:

AWS has empowered BMW to innovate across its value chain, from connected car services and digital customer experiences to autonomous driving research.

Hotstar Case Study on AWS

Disney + Hotstar, one of India's largest OTT platforms, uses AWS to deliver scalable high-performance streaming for millions of viewers. Hotstar's success is due in part to AWS's robust cloud infrastructure, which supports real-time video streaming.

Key Challenges:

1) High Concurrent Viewership:

During events like the IPL, Hotstar handles millions of simultaneous viewers.

2) Cost effective Scalability:

Hotstar needed a platform that could scale dynamically based on user demand without high infrastructure cost.

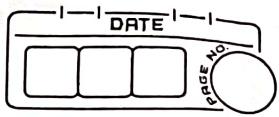
3) Reliable Content Delivery:

Ensuring low-latency, high-quality video streaming to millions of viewers across different geographies.

AWS services Used:

1) Amazon CloudFront:

A content delivery network (CDN) that delivers video with low latency, enabling Hotstar to handle over 25 million concurrent viewers.



Q3. Why kubernetes and advantages and disadvantages of kubernetes. Explain How Adidas uses kubernetes.

→ Kubernetes, also known as K8s, is an open source platform for automating deployment, scaling and managing containerized applications.

It is highly popular because it allows developers to manage clusters of containers efficiently making it easier to deploy and scale operations.

Key Reasons:

1) Scalability:

Allows automatic scaling of applications based on traffic or resource usage.

2) Portability:

Kubernetes is cloud agnostic and can run on any cloud provider or on-premise.

3) Automation:

Automate tasks like deployment, scaling, load-balancing and self handling.

4) Resource Efficiency:

Optimizes resources usage across your infrastructure, using resources without waste.

Advantages of kubernetes:

1) High Availability & Fault Tolerance.

If a container crashes, Kubernetes automatically restarts it or replaces it.

2) Efficient Resource Utilization:

Kubernetes ensures optimal use of infrastructure resources, reducing cost.

3) Automated Rollouts and Rollbacks:

Supports automated application updates and rollbacks if issue is detected.

4) Load Balancing and Service Discovery:

Automatically balances the load between different containers to ensure high availability.

Disadvantages of Kubernetes:

1) Complex Setup and Management:

Setting up & managing Kubernetes clusters can be complex, requiring in-depth knowledge of networking, container orchestration.

~~2) Steep Learning Curve:~~

Difficult to learn for newcomers due to its complex architecture.

3) Overhead in Small Applications

For smaller applications, Kubernetes may be overkill due to the operational overhead it introduces. Other simpler container orchestration tools might be more efficient in such cases.

4) Resource Consumption:

Kubernetes itself requires a significant amount of resources (CPU, memory), which can add up in terms of infrastructure costs.

Q4. What are Nagios and explain how Nagios are used in E-services?

Nagios is an open-source monitoring tool used to monitor the health and performance of systems, networks and applications.

It provides real-time monitoring & alerting ensuring that critical IT infrastructure components such as servers, switches, applications, services and databases remain operational & perform optimally.

Key Features:

1. Real Time Monitoring:
monitors health of network infrastructure, servers, services & applications in real time.
2. Alerts & Notifications:
sends alerts when issues are detected.
3. Plugins:
Highly customizable using plugins that extend Nagios to monitor specific services
4. Web Interface:
Provides a web-based dashboard to view system statuses & reports.
5. Scalability:
suitable for both small and large-scale infrastructures.
6. Event Handlers:
Allows for automatic restarting of failed services or execution.

How Nagios is Used in E-services?

E-services are online services, Nagios plays a critical role in monitoring these digital services to ensure high availability, reliability & performance.

1. Application Health Monitoring:

Monitors web servers, databases and applications, ensuring users can access services without issues.

2. Network Monitoring:

Tracks switches, routes, firewalls, bandwidth, latency & packet loss.

3. Server Monitoring:

Monitors CPU, memory, disk usages & uptime to detect & resolve hardware issues.

4. Service Availability:

Ensures continuous availability of key services by checking their status.

5. Security and Compliance:

Tracks unusual activities and unauthorized access attempts.

6. Performance Reporting:

Provides detailed reports to optimize infrastructure & forecast future needs.

Example of Nagios in E-services:

- 1) E-commerce websites
- 2) Online Banking Systems
- 3) Government E-services
- 4) Healthcare E-services