

09
03

ASSIGNMENT NO. 1

Q.1 Use S3 bucket and host video streaming.

→ Step 1) Set up Amazon S3 bucket

(i) Search for S3 on the services section click on S3 then click on create bucket. This will direct you to the bucket creation page. Here, give a name to your bucket.

(ii) After creating the bucket, add the video to this bucket. Click on the name of the bucket, this will redirect you to Objects screen. Click on upload.

(iii) Select the required mp4 file and upload it.

(iv) This will start the uploading process.

So, we have created the S3 bucket and added our mp4 file as well.

Step 2) Set up CloudFront

(i) Search for CloudFront on services tab. Open it in a new tab.

(ii) On the left pane, under security, click on origin access. Here, go to Identities (legacy). Create an origin access identity.

(iii) Go back to distributions and create a CloudFront distribution.

(iv) In the origin field → select the S3 bucket where video is uploaded.

Under origin access, select Legacy access Identifier.

Select the Identity that has been created.

Click on Yes, Update bucket policy.

In default cache behaviour, under viewer, select Redirect HTTP to HTTPS.

Under web Application Firewall, select Enable security protections.

Create the distribution. This will deploy it.

Step 3) Accessing the hosted video :

- (i) Once the distribution is deployed , copy its name.
- (ii) Go to the video in the bucket where it is uploaded.
Click on its name. Copy the key of the video.
- (iii) On your address URL bar, use the link as
<domain name>/key of video>

Thus we have deployed a video on an s3 bucket using a Content Distribution Network (CDN):- cloudflare.

Q.2 Discuss BMW and Hot star case studies using AWS.

→ Hotstar's Use of AWS.

- Hotstar, a leading streaming platform in India relies heavily on AWS for its streaming infrastructure, especially during high traffic events like the IPL and popular TV shows and movies.

1) Handling massive Traffic spikes :

- Hotstar has one of the largest live streaming platforms globally. AWS provides the auto-scaling infrastructure to handle these extreme spikes in traffic, ensuring smooth streaming without latency or downtime.

2) Content Delivery at Scale :

- AWS CloudFront, a content delivery network helps Hotstar deliver high quality video to users across different regions in India and around the world.

3) Live streaming and video processing :

- Hotstar uses AWS Elemental media services for video processing, encoding and live streaming. This helps them reduce latency and ensure the video quality is maintained even when millions of users are tuning in simultaneously.

4) Data Analytics and User Engagement :

Hotstar leverages AWS data analytics tools to analyze user behaviour and personalize content recommendations. By processing large volumes of user data, Hotstar can predict trends, optimize content delivery and increase user engagement.

BMW Group's Use of AWS

BMW, a global leader in the automotive industry, leverages AWS for a variety of critical workloads, including data analytics, machine learning and cloud infrastructure.

Q) Data-Driven Innovation?

BMW uses AWS to analyze vast amounts of data generated from connected vehicles, manufacturing processes and customer feedback. This data is processed and stored on AWS, allowing BMW to gain insights into customer preferences.

2) Connected Car Platforms :

BMW's connected car services are built on AWS, where they provide real-time vehicle data, offer in-car services, and enhance driving experiences with features like navigation, entertainment and remote services.

3) Machine Learning and AI :

BMW employs AWS's machine learning services to develop predictive maintenance models. By analyzing data from various sensors, BMW can predict failures and schedule maintenance, improving reliability.

- Q.3) Why Kubernetes and advantages and disadvantages of Kubernetes
Explain how Adidas uses Kubernetes.

→ Kubernetes is an open-source container orchestration platform designed to manage, scale and automate the deployment of containerized applications. It provides a powerful framework for running distributed systems resiliently, ensuring the applications are managed efficiently across multiple hosts and environments.

Advantages

- 1) Scalability - Easily scale applications based on demand.
- 2) Portability - Cloud-agnostic, run on any platform supporting containers.
- 3) Automated Deployment - Handles rolling updates and rollbacks.
- 4) Resource Optimization - Efficiently uses CPU and memory.
- 5) Extensibility: Large ecosystem of plugins and add-ons.

Disadvantages

- 1) Complexity - Steep learning curve, especially for beginners.
- 2) Resource Intensive - Requires significant CPU & memory.
- 3) Networking complexity - Challenging to configure services and network policies.
- 4) Operational overhead - Increased complexity in managing the orchestration itself.

How Adidas Uses Kubernetes

Adidas - the global sportswear brand, has adopted Kubernetes to modernize its digital platforms and scale its services more efficiently. Here's how Adidas benefits from Kubernetes:

1) microservices Architecture

- Adidas manages its microservices-based architecture. By containerizing their services, Adidas can deploy,

update and scale individual components of their applications independently.

2) Global Scalability

- Adidas Operates in many countries, with millions of customers using its e-commerce platform. Kubernetes' auto-scaling capabilities ensure that Adidas can manage peak traffic periods, such as during product launches or sale events, without compromising performance.

3) CI/CD pipelines

- This enables Adidas to automate deployments, run tests, and quickly roll out new features or fixes to production without significant manual intervention.

4) DevOps and Efficiency Gains :

- Adidas promotes a Devops culture where development teams are empowered to deploy their own services using Kubernetes. This results in faster development cycles, reduced dependencies on central IT and better resource management across teams.

Q.4

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

- Nagios is an open-source monitoring tool used for continuous monitoring of systems, networks and infrastructure. It alerts users when something goes wrong and informs them when the issue has been resolved. Nagios can monitor network services (like HTTP, SMTP, DNS), host resources and even custom application services. It helps organizations ensure that their IT infrastructure is running smoothly and any potential issues are identified early on.

Key Features

- 1) Monitoring - Monitoring network and host services and applications.
- 2) Custom Plugins - Allows the creation of custom scripts to extend monitoring capabilities.
- 3) Alerts - sends notifications (via email, SMS, etc) when problems arise and when they are resolved.
- 4) Web Interface - Provides a web-based dashboard for real-time monitoring and reporting.
- 5) Integration - Integrates with other systems and tools for comprehensive monitoring.

How Nagios is used in e-services.

- 1) Service Availability Monitoring
 - E-services rely heavily on continuous availability of their web servers, databases and application services. Nagios monitors these services to ensure they are up and running, notifying the team of any ^{down} time or degraded performance.
- 2) Resource Monitoring
 - E-services can ensure backend systems can handle user traffic and transactions without overloading by monitoring server resources like the CPU usage, disk space & bandwidth.
- 3) Transaction Monitoring
 - For payment-based services, Nagios can monitor the entire transaction workflow from user login to checkout. This helps detect and resolve issues in failed payments.
- 4) Downtime Reduction
 - By alerting administrators to issues in real time, Nagios helps reduce downtime & minimizes disruptions in e-services, ensuring high availability and reliability for users.