

Assignment - I

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Q1 Discuss BMW and hat stan case studies using AWS

BMW (case study (AWS))

BMW leveraged AWS to create a global platform for managing millions of connected cars. Key AWS solution included

- AWS IoT to enable real-time communication between vehicles and cloud applications.
- Amazon EC2 & Lambda for scalable and on-demand computing power to process vehicle data in real-time.
- AWS S3 & RDS for secure and scalable data storage.
- Amazon SageMaker to develop machine learning models for predictive maintenance and personalized services.

Outcome:

BMW efficiently managed data from over 10 million connected vehicles worldwide, enhanced the customer driving experience through real-time insights, and streamlined its operations by reducing complexity and costs.

Hotstar (case study (AWS))

Hotstar utilized AWS to scale its infrastructure to handle massive spikes in traffic, especially during live events like IPL. Key AWS services used

- Amazon CloudFront for delivering content globally with minimum latency.

I - Examples

- EC2 Auto-Scaling to adjust infrastructure dynamically based on traffic demand.
- Use Amazon S3 for storing vast amounts of video content.
- AWS Lambda for handling event-driven tasks without server management.
- Amazon DynamoDB to manage real-time user interactions. Data.

During the 2019 IPL final, Hotstar supported over 25 million concurrent viewers without service disruption, delivering a seamless viewing experience and optimizing infrastructure costs.

Q: Why Kubernetes and its advantages and disadvantages of Kubernetes? Explain how it uses Kubernetes.

→ Kubernetes is an open-source platform that automates the deployment, scaling, and management of containerized applications. It's widely used to manage microservices-based architectures in modern cloud environments.

Advantages of Kubernetes:

- 1) Scalability :- Automatically scales applications based on demand.
- 2) High Availability :- Provides self-healing and automatic failover for resilient operations.
- 3) Efficient Resource Management : Optimizes resource usage and reduces cost.
- 4) Portability : Work across on-premises, cloud or hybrid environments.
- 5) Rolling updates :- Enables seamless, zero-downtime application updates.

Disadvantages of Kubernetes :-

- ① Complexity : Steep learning curve for beginners.
- ② Overhead : Requires significant resources, making it costly for small setups.
- ③ Requires Expertise : DevOps expertise is needed for effective management.
- ④ Networking challenges : Managing large-scale networking can be complicated.

How Adidas uses Kubernetes

Adidas uses Kubernetes to modernize its infrastructure and support its e-commerce operations. Kubernetes allows Adidas to:

- Scale microservices automatically during traffic spikes.
- Integrate seamlessly with their CI/CD pipelines for faster deployments.
- Optimize resource usage, ensuring high availability and cost efficiency.

Outcome:

Adidas handles global traffic spikes effectively, ensuring a reliable, responsive platform during events like product launches, improving overall customer experience.

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

→ Nagios is an open-source monitoring tool used to track the health of IT infrastructure including servers, networks and applications. It provides real-time alerts, allowing administrators to detect and resolve issues quickly.

How Nagios is used in E-services.

In e-services, Nagios monitors key components like web servers, databases and APIs to ensure high availability and performances.

- Detects outages or slowdowns and sends real-time alerts.
- Tracks performance metrics like CPU, memory and network usage.
- Helps maintain system security by monitoring logs and potential threats.
- Scales to monitor large, distributed systems.

For example, in an e-commerce platform, Nagios monitors website uptime, payment systems, and databases, ensuring seamless customer experience with minimal downtime.

Q1] Use S3 bucket and host Video streaming. guide me with this.

→ Hosting video streaming using Amazon S3 involves a few steps to ensure videos are stored securely, accessible to users, and can be streamed efficiently. Below is a step-by-step guide to hosting video streaming on S3.

1] Create an S3 Bucket.

- Sign in to AWS Management Console and open the S3 service.
- Click on Create Bucket configuration.
- Bucket Name: Choose a unique name (e.g. my-video-streaming-bucket).

- Region : Select the appropriate AWS region.
- Object Ownership : Select "ACLs disabled" and keep bucket ownership to yourself.
- Public Access : Uncheck "Block all public access" if you want the video to be publicly accessible. Otherwise, you can set access permissions for specific users.
- Create Bucket
- Upload Videos to S3
- After creating the bucket, upload your video files by clicking on Upload.
- Use proper folder structures, e.g. /videos/m to organize your media files.

3) Set object Permissions

- To allow public streaming, you need to make the video files publicly accessible:
- Go to the permissions tab of each video file
- In the Bucket Policy, you can grant public read access to your video files using the following policy.

```
"Version": "2012-10-17",  
"Statement": [
```

```
    {"Effect": "allow",  
     "Principal": "*"  
     "Action": "S3:GetObject";}
```

"Resource": "arn:aws:s3:::my-video-streaming-bucket/videos/*"

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- Replace my-video-streaming-bucket with your bucket name and /videos/* to apply to all video files inside the folder

5] Embed Videos on website.

- Use the public URLs of your video files to embed the video on your website or application

<video width = "600" controls>

<source src = "https://d1234.cloudfront.net/videos/simple.mp4" type = "video/mp4">

Your browser does not support the video tag

</video>

