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ADVANCE DEVOPS ASSIG

Q1. Use S3 bucket and host video streaming

STEP 1: Create an S3 Bucket

1. Sign into AWS management console

2. Navigate to S3:

→ In AWS management console, Select S3

3. Create a Bucket

→ Click on Create Bucket

→ Enter a unique bucket name

STEP 2: Upload video to S3 Bucket

1. Open your Bucket by clicking on bucket name you created.

2. Upload files

→ Click on upload

→ Drag and drop your files

3. Set permissions

→ For public access under permissions, upload. Check grant public read access

STEP 3: Create a Cloud Front Distribution

1. Navigate to Cloud Front Forum from AWS Console

2. Click on Create distribution

choose web as delivery method.

Teacher's Sign.: _____

3. Configure the distribution

- Origin Domain: select your S3 bucket
- viewer protocol policy: choose redirect HTTP to HTTPS for secure access
- Cache Behaviour setting
- Click Create distribution

STEP 4: Configure Cloud Front for secure access

1. Create an origin access identity (OAI)
 - In CloudFront origin console, go to distribution setting
 - Under origins and origin group click edit
 - Create a new origin access Identity
2. Update S3 bucket policy
 - Go to your S3 bucket
 - Click on permission and then bucket policy
 - Add to policy to grant access to OAI

STEP 5: Access the video through CloudFront

1. Get the CloudFront URL
 - In CloudFront URL console: Go to distribution
 - Copy the domain name
2. Use the URL
 - Use this URL in your webpages to stream the video.

Q2 Discuss BMW and hotstar case studies using AWS

→ OVERVIEW: BMW is a leading automotive manufacturer known for its luxury vehicles while hotstar (now known Disney+ Hotstar) is a popular streaming platform in India, offering a variety of content including movies, TV shows and live sports. Both companies have utilized AWS to optimize their operations.

BMW's Use of AWS

1. Connected Vehicles and Data Analytics

BMW has been at the forefront of integrating technology into their vehicles. By leveraging AWS they can collect and analyze vast amount of data.

That data includes

- i) Vehicle Performance Data
- ii) Driver Behaviour

Benefits:

2. Predictive Maintenance: AWS enables BMW to use machine learning algorithms to predict when a vehicle needs servicing, reducing downtime.

2. Enhanced Customer Insights: By analyzing driving patterns, BMW can tailor marketing strategies and develop features that resonate with customer needs.

2. Scalability and Cost Management

BMW utilizes AWS's scalable infrastructure to handle varying workloads, especially during product launches or events.

Benefits:

1. Cost Efficiency: BMW can scale resources up or down based on demand, ensuring they only pay for what they use.
2. Global Reach: AWS's global infrastructure allows BMW to deploy applications closer to their customers, reducing latency and improving service delivery.

Hotsuy's Use of AWS

1. Content Delivery and Streaming Services

Hotsuy relies heavily on AWS to manage its massive content library and deliver high-quality streaming experience to users.

Benefits

1. Scalability: During events like IPL user traffic can spike drastically. AWS allows Hotstar to scale resources dynamically to handle these spikes without compromising performances.
 2. Global Content Reach: AWS enables Hotstar to distribute content across multiple regions ensuring that users worldwide can access their services seamlessly.
2. Data Analytics for User Engagement
Hotstar leverages AWS data analytics tools to gather insights about user behaviour, content preferences and viewing patterns.

Benefits:

1. Personalized Content Recommendation: By analyzing viewing habits, Hotstar can suggest relevant content to users, enhancing their viewing experience.
2. Targeted Advertising: Insights gathered from user data enables Hotstar to serve more targeted ads, increasing ad revenue and improving user satisfaction.

Challenges and Solutions:

While both BMW and Hotstar have seen significant benefits from using AWS, they also face challenges.

1. Data Security and Compliance: Protecting user data and adhering to regulations is paramount.

Solution: Both companies utilize AWS's robust security features such as encryption, identity and access management.

2. Cost Management: As usage scales, managing costs can become challenging.

Solution: Implementing AWS cost monitors and using AWS Budgets help both companies monitor and optimize their cloud expenditure.

Conclusion:

The integration of AWS into BMW and Hotstar's operations demonstrates how cloud computing can drive innovation, improve customer experiences and enhance operational efficiency.

Q3. Why Kubernetes and advantages and disadvantages of Kubernetes. Explain how adidus uses Kubernetes.

Kubernetes

KUBERNETES:

Kubernetes is an open-source container orchestration platform designed to automate the deployment, scaling and management of containerized applications. Originally developed by Google, it has become a standard for managing cloud-native applications.

ADVANTAGES:

1. Automated Deployment and Scaling: Facilitates easy deployment and scaling of applications based on demand.
2. Self-Healing: Automatically detects and replaces failed containers ensuring high availability.
3. Load Balancing: Distributes traffic across containers for optimal resource use.
4. Declarative Configuration: Allows users to define application status using YAML.

5. multi-cloud support - can run on various cloud platforms and on-premises

DISADVANTAGES

1. Complexity: Steep learning curve and operational challenges, especially for beginners
2. Resource Overhead: Can require significant computational resources
3. Networking Challenges: Configuring networking can be complex
4. Frequent Updates: Rapid evolution can lead to compatibility issues

USE OF KUBERNETES in Adidas

1. Microservice Architecture: Adidas has adopted a microservices architecture to enable agility and faster delivery of features. Kubernetes allows Adidas to manage these microservices. Each microservice can be developed, deployed and scaled independently.

2. Scalability and Performance:

During high-traffic events (like product launches or major sales), Adidas can use Kubernetes to scale its applications automatically based on user demand.

3. Continuous Deployment and Integration

Adidas employs CI/CD pipeline, and Kubernetes plays a crucial role in this process. By integrating Kubernetes with their CI/CD tools, Adidas can automate testing and deployment, ensuring the new features and updates.

4. DevOps and Collaboration

Kubernetes supports a DevOps culture at Adidas, allowing development and operations teams to work closely together.

5. Cost Management:

Kubernetes helps Adidas optimize resource usage, allowing them to allocate computing resources more efficiently. This can lead to significant cost savings, especially when operating in cloud environments where usage pricing is common.

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

→ **NAGIOS:**

Nagios is an open-source monitoring system that enables organizations to monitor their IT infrastructure, including servers, networks and applications. It provides real-time insights into the status of various components.

KEY FEATURES:

1. Host and Service Management:

Nagios monitors the availability and performance of hosts (servers, devices) and services (applications, processes).

2. Alerts and Notification:

Sends alerts via email or SMS when issues arise, ensuring prompt attention.

3. Customizable Dashboards: Offers visual dashboard to represent the health of IT resources at a glance.

4. Extensibility: Supports plugins that can extend its functionality, allowing monitoring of custom applications or services.

USE OF NAGIOS IN E-SERVICES

1. Infrastructure Monitoring:

E-service providers use Nagios to monitor servers and network devices, ensuring uptime and reliability.

2. Application Performance Monitoring:

Nagios can monitor the performance of web applications, databases and other services.

3. Proactive Issue Resolution:

By setting thresholds for various metrics, Nagios can alert administrators before issues become critical.

4. Capacity Planning:

Historical data collected by Nagios helps e-service providers understand usage patterns and plan for further growth. This is essential for scaling resources effectively as user demand increases.