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34

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Advance Devops Assignment 1

Q.1 Use S3 bucket and host video streaming

Ans.

1. Create an S3 bucket
   i) Login to the AWS console
   ii) Navigate to Amazon S3, click Create Bucket and set a unique name
   iii) Configure permissions for public access if necessary
2. Upload Video Files
   i) Go to your bucket and upload video files (eg. MP4)
   ii) Set public access permissions for the uploaded files
3. Generate Pre-signed URLs
   i) If you want to restrict access, generate pre-signed URLs using the AWS CLI or SDK for limited-time access
4. Set up a CloudFront for streaming
   • Create a CloudFront Distribution with your S3 bucket as the origin
   • Use the CloudFront domain to improve video distribution and delivery performance
5. Configure Video Player
   • Embed the video using an HTML5 video player or Javascript player:

```
<video width = "600" controls>
  <source src = "https://your-bucket-name.s3.amazonaws.com/your-video.mp4"
   type = "video/mp4">
</video>
```

6. Monitor and Optimize
   • Use CloudWatch to monitor S3 and CloudFront performance.
   • Compress video files or convert them to HLS for better streaming
7. Security
   • Use CloudFront Signed URLs or Signed Cookies for access control.
   • Enable HTTPS and encryption for secure delivery.

8- Manage Costs
- Track storage and delivery costs in the AWS Billing Dashboard

Q.2) Discuss BMW and Hotstar case studies using AWS

Ans. BMW case study

1. Data collection and management: BMW collects vast amount of data from millions of connected cars, leveraging AWS IoT to manage and analyze the data effectively.
2. Real-Time Data Processing: BMW uses AWS services like Amazon Kinesis to process real-time telemetry data, providing instant insights for services like navigation, traffic alerts and remote diagnostics
3. Scalability: AWS scalable cloud infrastructure allows BMW to handle the growing data volumes from its global fleet of connected vehicles without compromising performance
4. Machine Learning and AI: BMW utilizes AWS's machine learning services, including Amazon sagemaker for predictive analytics and personalized driving experience, optimizing vehicle performance based on user behaviour.
5. Security Compliance: AWS offers end-to-end encryption, protecting sensitive vehicle and driver data, ensuring compliance with global data protection regulations.
6. Innovation in Autonomous Driving: BMW leverages AWS's high performance computing (HPC) and data analytics capabilities to drive innovations in autonomous driving technologies.

- Disney+ Hotstar case study

1. High Scalability During Peak Events: AWS allows Disney+ Hotstar to scale on demand, handling upto 25 million concurrent viewers during live events like the Indian Premier League (IPL).
2. Content Delivery Network (CDN): AWS CloudFront ensures that Hotstar's video content is delivered with low latency and minimal buffering,

enhancing user experience globally.
3. Cost Efficiency: AWS pay-as-you-go pricing model helps Disney+ Hotstar reduce infrastructure costs, scaling resources only when needed during peak viewing times
4. Global Reach with Edge Locations: With AWS's network of edge locations, Hotstar ensures fast and reliable content delivery to viewers, regardless of their geographic locations.
5. Live Streaming and VOD: AWS enables seamless streaming of both live events and video-on-demand (VOD) content, delivery of high-quality video to millions of users on various data
6. Real Time Data Analytics: Hotstar uses AWS analytics such as Amazon Kinesis and Amazon Cloudwatch to monitor viewer engagement and platforms performance in real-time, enabling quick optimizations.

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

Ans. Kubernetes is open source platform designed to automate deployment, scaling and management of containerized applications.
Advantages of Kubernetes:
1. Portability: Applications can be moved easily between different environments (development, testing, production) without major changes
2. Scalability: Kubernetes can automatically scale applications up or down based on traffic and demand.
3. Reliability: It features self-healing capabilities, meaning it can restart failed containers and balance workloads to ensure high availability.
4. Self-healing: kubernetes health of containers and automatically restarts, replace containers if they fail
5. Efficiency: It optimizes resource usage by running multiple containers on

on a single host, improving overall efficiency.

Disadvantages of Kubernetes

1. Complexity: It can be calculated and complicated to set up and manage, especially for those new to container technology
2. Steep Learning Curve: Requires time and knowledge to fully understand and utilize its features
3. Resource Intensive: It may require more computing resources than simpler solutions, which can increase costs
4. Management Overhead: Requires ongoing management and maintenance, which can add to operational workload.

- How Adidas Uses Kubernetes

Adidas has adopted Kubernetes to enhance its IT infrastructure and improve its ability to respond to market needs. Here's how they benefit from Kubernetes

1. Faster Application Development: Kubernetes streamlines the deployment process, allowing Adidas to bring new products and features to market quickly.
2. Operational Efficiency: It automates many manual tasks, reducing the amount of time and effort required to manage applications and increasing reliability.
3. Scalability for Demand: During peak sales periods, Kubernetes helps Adidas scale its applications to handle increased customer traffic smoothly.
4. Encouraging Innovation: With a flexible platform, Adidas can experiment with new technologies and business ideas without significant risk.

Specific Use case at Adidas:

- Microservices Architecture: Adidas breaks down application into smaller, independent services that can be deployed and managed individually.
- Continuous Delivery: Kubernetes supports a continuous delivery pipeline, making it easier to build, test and deploy applications quickly.

Q.4. What are Nagios and explain how Nagios are used in E-services

Ans. Nagios is an open-source monitoring platform/ designed to oversee system, networks and infrastructure. It helps organization identify and resolve IT infrastructure problems before they impact critical business processes.

Nagios used in E-services:
Publicly available services such as HTTP, FTP, SMTP, etc. These services are network accessible services like web services, email servers while private services need intermediary agents for monitoring
Nagios used plugins to monitors E-services many of which came pre-installed and additional plugins can be found online or developed by users. To monitor a service, a host must first be defined in Nagios configuration files. Once host is defined services like HTTP, FTP or SSH can be monitored by associating them with specific plugins. Nagios provide alert if services failed to respond within defined time frames or if errors are detected.
When issues arise, Nagios integrates with incident management tools to streamline the process of resolving problems. This helps team quickly address and fix issues, minimize downtime.
Nagios can monitor the performance of applications from the user's perspective ensuring that response times are fast and services are running smoothly.

By implementing Nagios, e-services can maintain high availability, enhance reliability and ensure a positive experience for users. This monitoring capability is crucial in today's digital landscape, where any downtime can lead to lost revenue and customer dissatisfaction.