Shravani Patil
D15A - 38

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27/09/24 Advance Devops - Assignment no: 01

Q.1. Use S3 bucket and host video streaming

→ Amazon S3 bucket with Amazon cloudfront is used to host on demand videos (video content is stored on server eg movies can watch any time) Eg Amazon cloudfront is web service that speeds up distribution of static & dynamic web content to users. cloudfront delivers contents through worldwide network of data centers called edge collections cloudfront used the cache for the latest lowest latency. If content is already in edge collection it will deliver immediately otherwise it will retrieve from the origin (S3 bucket). In our case, media package HTTP server.

steps for host video streaming using S3 bucket:-

i. Create an S3 bucket
ii. Upload a video to the S3 bucket.
iii. Create a cloudfront origin access identity.
iv. Create a cloudfront distribution
v. Access the the video through cloudfront distribution
vi. Configure your cloudfront distribution to use your custom domain name.

vii. Access S3 video through cloudfront distribution with the custom domain name.

viii. Optional - view data requests received by your cloudfront distribution.

ix. clean up.

Q.4. What is Nagios? explain how nagios is used in E-services?

→ Nagios is an open source monitoring platform/ tool designed to oversee systems, networks & infrastructure. It helps organisation identify and resolve IT infrastructure problems before they impact critical business processes.

Nagios uses in e-services:

→ They are publically available services such as HTTP, STP, SMTP etc. These services are network accessible. Services like web services, email services while private services need intermediary agents for monitoring.
Nagios used plugins to monitor e-services many of which come pre-installed & additional plugins can be fetched, found online or developed by users. To monitor a service, a host must first be defined in Nagios configuration. Nagios provide alert if services failed to respond...

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

→ Overview:

BMW is a leading automotive manufacturer known for its luxury vehicles, while Hotstar is a popular streaming platform in India, offering a variety of content, including movies, TV shows and live sports. Both companies have utilised AWS to drive the innovation, improve customer experience & optimise 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 analyse vast amounts data from their connected cars. The data includes

- vehicle performance data: Monitoring engine performance, fuel efficiency & maintenance needs.
- Driver behaviour: Understanding how drivers interact with their vehicles which can lead to personalised services and safety features.

Benefits:

- Predictive Maintainence: AWS enables BMW to use machine learning algorithms to predict when a vehicle needs servicing, reducing downtime & improving customer features.
- Enhanced Customer insights: By analyzing driven patterns, BMW can tailor marketing strategies & develop features that resonate with these customers.

2. Scalability & cost management
BMW utilizes AWS's scalable infrastructure to handle varying workloads, especially during product launches or events.
- Cost efficiency - BMW can scale resources up or down based on demand, ensuring they only pay for what they use.
- Global reach - AWS's global infrastructure allows BMW to deploy applications closer to their customers, reducing latency & improving service delivery.

Hotstar use of AWS

1. Content Delivery & streaming services

Hotstar relies heavily on AWS to manage its massive content library & deliver high

deliver high quality streaming experiences to millions of users

- AWS cloudfront - Hotstar uses AWS's content delivery Network (CDN) to deliver content quickly eg efficiently, ensuring minimal buffering eg downtime during peak times such as major sports events.

Benefits:

- Scalability: During events like IPL, when there is a massive traffic, AWS allows Hotstar to scale resources dynamically to handle these spikes without compromising performance.
- Global Content Reach: AWS enables Hotstar to distribute content across multiple regions, ensuring that users worldwide can access their services seamlessly.

Q: Data Analytics for User Engagement
Hotstar leverages AWS data analytics tools to gather insights about user behaviour, content preferences eg viewing patterns.

- AWS redshift eg Athena - These services help Hotstar analyse large datasets to improve content recommendations eg user engagement strategies.

Benefits:

- Personalised content Recommendations: By analysing viewing habits can suggest relevant content to users, enhancing their viewing experience.
- Targeted Advertising: Insights gathered from user data enable platform to serve more targeted ads, increasing ads revenue & improving user satisfaction

Challenges & solutions:

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

1. Data security & compliance - protecting user data & adhering to regulations is paramount especially in the automotive & streaming industries.
   - Solutions - Both companies utilise AWS robust security features like encryption, identity & access management (IAM) & compliance certifications
2. Cost Management - As the usage scales, managing cost can become challenging.
   Solutions: Implementing AWS cost explorer & using AWS Budgets helps both companies

monitor & optimize their cloud expenditure.

Conclusion..

Therefore, By leveraging AWS's scalability, data analytics & global infrastructure both companies are well structured to meet the evolving need of their customers and stay ahead of the competition.

Q.3. Why Kubernetes and advantages & disadvantages of Kubernetes. Explain how adidas uses Kubernetes.

→ What is 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 & micro services architecture.

Advantages:

i. Automated Deployment & scaling: facilitates easy deployment and scaling of app^ns based on demand.

ii. self Healing: Automatically restarts or replaces failed containers.

iii. Load balancing - distributes traffic across containers for optimal resource use.

Disadvantages:

i. Complexity - steep learning curve & operational challenges, especially for beginners.
ii. Resource overhead - can require significant computational resources.
iii. Network challenges - configuring networking can be complex.
iv. Frequent updates - rapid evolution can lead to compatibility issues.

How Adidas uses Kubernetes

i. Microservices Architecture:
Adidas has adopted a microservices architecture to enable agility & faster delivery of features. Kubernetes allows Adidas to manage these microservices effectively.

ii. Scalability & Performance:
During high traffic events, Adidas can use Kubernetes to scale its applications automatically based on user demand. For example, during Black Friday sales, Kubernetes can help ensure that the e-commerce platform remains responsive, handling large volumes of simultaneous transactions without downtime.