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Adv. DevOps Assignment 1

Q1. Use S3 Bucket to Host Video Streaming.

Amazon S3 is a scalable object storage service from AWS and can be used to host video files for streaming. To stream videos using S3, you can follow these steps:

1. Upload Videos to S3 Bucket:
   upload your video files to an S3 bucket.
   Set permissions for the bucket or specific video files to ensure they are publicly accessible (for public streaming).

2. Use AWS CloudFront:
   AWS CloudFront (CDN service) can be used to distribute the video content globally with low latency and higher transfer speeds.
   You can create a CloudFront distribution that points to your S3 bucket and delivers video content efficiently.

3. Use HIS (HTTP Live Streaming):
   Convert your video files into a streaming format such as HIS, which breaks the video into small chunks and allows adaptive bitrate streaming.
   Store these chunks in the S3 bucket and serve them via CloudFront for optimized streaming experiences.

4. Link Video in a Player:
   Embed a video player in your website or application that points to CloudFront distribution or S3. URL.

Benefits:
1. Scalability   3. Low Latency.
2. Security

Q2 BMW and Hotstar Case Studies Using Aws

1. BMW Case Study with AWS: BMW uses AWS to build and scale its data platform to support next-gen automotive technologies and digital services.
- Cloud-native Data Platform: BMW uses AWS S3, Redshift and Athena for storing, processing and analyzing vast amounts of vechile data.
- Connected Cars: AWS IOT services enable real-time data collection from vehicles, providing insights for both consumers and manufactures.
- Scalability and flexibility: By using AWS, BMW can scale its infrastructure dynamically based on demand.
- AI and ML: BMW utilizes Aws SageMaker for advanced ML workloads, like predictive maintenance and autonomous driving features.

2. Hotstar Case Study with Aws: Hotstar (now Disney + Hotstar) a leading OTT platform, relies on Aws to stream content to millions of concurrent users.
- Scalable Streaming: Hotstar leverages Amazon EC2, Aws Lambda and Auto Scaling to handle unpredictable spikes in traffic, especially during popular sports events (like IPL).
- Storage and Content Delivery: Amazon S3 is used for storing video content, while CloudFront ensures low-latency video delivery to users globally.
- Data Analytics: Hotstar uses AWS EMR and Redshift for real-time analytics to deliver personalized content and targeted ads.

- High Availability: AW's global infrastructure allows Hotstar to ensure high availability and smooth streaming during high demand events.

Q3. Why Kubernetes? Advantages and Disadvantages of Kubernetes and How Adidas uses it.

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Kubernetes is an open source container orchestration platform that automates the deployment, scaling and management of containerized applications.

Advantages of Kubernetes:
- Scalability: Automatically scales applications up or down based on traffic on demand.
- High Availability: Distributes workloads across multiple nodes, ensuring services remain available even if individual nodes fail.
- Self-Healing: Kubernetes can restart failed containers replace them and reschedule workloads automatically.
- Portability: Since Kubernetes abstracts the underlying infrastructure, applications can be deployed across different cloud platforms.
- Resource Efficiency: Optimizes the utilization of resources by allocating them dynamically.

Disadvantages of Kubernetes:
- Complexity: Kubernetes has a steep learning curve, especially for teams new to containerization.
- Overhead: Running Kubernetes clusters can introduce

computational and operational overhead.
- Cost: Managing and maintaining a kubernetes environment can be resource-intensive potentially leading to increased cloud costs.

How Adidas Uses Kubernetes:
Adidas leverages kubernetes for cloud-native microservice architecture. They migrated from monolithic applications to microservices to improve agility and speed of delivery.
- Dynamic Scaling: Kubernetes help Adidas auto-scale applications based on traffic, particularly during high demand times like product launches.
- Faster Deployments: Kubernetes allowed Adidas to streamline their CI/CD pipelines, reducing deployment times.
- Resilience: Adidas leverages kubernetes self healing features to minize downtime and improve fault tolerance across services.

Q4. What is Nagios and How is it Used in E-Services?

Nagios is an open source monitoring tool used to monitor the performance of IT infrastructure including servers, applications, networks and services.

How Nagios is Used in E-Services:
1. Monitoring System Health.
Nagios monitors the health of server resources (CPU,

disk usage, memory) and services (web servers, databases) in e-services, providing alerts when performance issues arise.

2. Real time Alerting.
Nagios generates real time alerts (email, SMS, etc) when services or hardware resources reach a critical state, allowing for quick resolution.

3. Event Log Monitoring.
For e-services, Nagios can analyze system logs, detecting anomalies or errors and notifying administrators about potential security or performance issues.

4. Service Availability
E-services rely on Nagios to ensure that critical services (eg. payment gateways, web servers) are up and running 24/7. Nagios tracks uptime and service availability, helping maintain high availability for users.

5. Plugins:
Nagios uses a wide range of plugins that allow it to monitor various aspects of infrastructure including protocols, databases and even cloud services.

6. Reporting and Trends:
Nagios provides detailed reports and trends on historical performance of systems, helping teams to forecast potential issues or plan resource scaling.