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Assignment 1 Ad Devops

Q1) Use S3 bucket and host Video Streaming

To use Amazon S3 bucket and host video streaming follow below steps:

(i) Create an S3 bucket

- Create new S3 bucket with/without public access.

(ii) Upload video files.

- upload video files
- Set appropriate permission

(iii) Set Bucket Policy for Public access.

- Navigate to permission of your bucket.
- Edit the Bucket Policy to allow public access

Example:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Sid": "PublicReadGetObject",
            "Effect": "Allow",
            "Principal": "*",
            "Action": "s3:GetObject",
            "Resource": "arn:aws:s3:::bucket-name/*"
        }
    ]
}
```

(iv) ~~Generate~~ Use Cloudfront for Streaming Optimization

- Create a Cloudfront distribution
- Choose your S3 bucket as origin
- Set the distribution behavior to streaming

(v) Integrate into your frontend

- add src = "https://bucket-name.s3.amazonaws.com/video-file.mp4"

Q 2. Discuss BMW and Hot Star case studies using AWS.

Ans → BMW case study using AWS:
BMW uses AWS for building connected car services and improving customer experience. AWS enables BMW to collect, store & analyze massive volumes of data generated by their vehicles, providing real time data processing capabilities.
Key uses:-

- ConnectedDrive Platform: S3, DynamoDB, Amazon Kinesis for storage & processing real time data.
- Data Lakes: It uses S3 bucket to build data lake for storing sensor data
- AI/ML for autonomous driving - It uses Amazon SageMaker to develop models for autonomous driving.
- Scalability & Global Reach: BMW ensures services by AWS scaling feature.

→ Hotstar Case Study Using AWS:
It uses AWS to scale dynamically and ensure smooth streaming during high-traffic events like the Indian Premier League (IPL) cricket matches. AWS helps hotstar in:

- Auto-Scaling: During major events, Hotstar needs to handle million of concurrent users. AWS EC2 auto scaling automatically adjusts computing power based on demand.
- Content Delivery: AWS cloudfront can be used for video content delivery
- Serverless Computing: Hotstar uses AWS Lambda for event-driven processing of live streams & monitoring.
- Cost-effectiveness: By AWS, Hotstar pays only for the resources they use.

Q3 Why Kubernetes and its advantages and disadvantages
Ans Why kubernetes:
Kubernetes (k8s) is an open source platform designed to automate deploying, scaling, and operating containerized application. It is widely adopted due to its orchestration capabilities, enabling businesses to manage large-scale, distributed systems efficiently.
Advantages of kubernetes:
1 Scalability: k8s enables horizontal scaling of applications based on real-time traffic, ensuring consistent performance even during traffic hours.
2. Fault Tolerance: It offers automated failure and recovery. Can distribute workload to other nodes if a nodes fails.
3. Container Orchestration: It manages complex containerized application across

multiple hosts, including deployments, Scaling and resource optimization.
4. Portability: K8's works across various cloud providers making applications highly portable.
5. Self-healing: K8's automatically restart, failed containers, kill containers that dont respond to health checks

Disadvantages of K8's.

1. Complex setup: K8S has a steep learning curve, requires specialized skills.
2. Resource intensive: Requires significant hardware resources.
3. Management overhead: Managing K8S clusters across environments can be time consuming, requiring additional tools and management efforts.
4. Security configuration: K8s requires careful security configuration - Misconfigurations may expose sensitive data or allow unauthorized access.

How Adidas uses kubernetes

Adidas uses kubernetes to modernize its infrastructure and manage its high traffic e-commerce platform. Key uses include:

- Microservice Architecture: Adidas runs its e-commerce microservice on kubernetes clusters, enabling seamless scaling and deployment of individual services
- CI/CD Pipeline: Kubernetes allows Adidas

to implement continuous integration and delivery pipelines, reducing the time needed to release new features.
- Auto Scaling: Adidas can handle traffic spikes during sales events and new product launches by leveraging kubernetes auto-scaling.
- Multi-Cloud Strategy: Adidas uses Kubernetes for a multi cloud architecture, running workloads across different cloud providers to ensure high availability and fault tolerance.

What is Nagios and how it is used in E-services?

What is Nagios?

Nagios is an open source monitoring system used to monitor network services, applications, servers and IT infrastructure. It provids real-time alerts and notifications when issues like services outages or performance degradation occur. Nagios is used to identifying and resolving problems in complex IT environments before they affect end users.

Features of Nagios

- Real time monitoring: Nagios monitors servers network devices and services like HTTP SMTP
- Alerts and Notification: It sends alerts via mail or SMS when there is an issue, helping IT teams resolve problems before they escalate

Performance graphing: Nagios provide historical data and performance graphs, enabling organization to track trends and detect bottlenecks.
Extensibility: Nagios supports plugins and custom scripts, making it adaptable for specific monitoring needs.

How Nagios is used in E-Services:-
In the context of e-services (such as web service, e-commerce platform, or SaaS applications) Nagios is used for:-

1. Server health monitoring: Nagios monitors CPU loads, disk usage, memory consumption and network traffic for web servers and application servers.
2. Uptime monitoring: Nagios checks for availability of essential services like HTTP, MySQL & APIs ensuring uninterrupted access to e-services.
3. Database monitoring: It monitors database performance for services relying on databases.
4. Incident Response: When an issue arises Nagios send alerts to the support team, reducing downtime.
5. Proactive Problem detection: By monitoring the underlying infrastructure & service performance, Nagios helps detect problems before they impact users, improving the quality of e-services.

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