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Assignment 1.

Advanced Devops Lab.

(04/05)

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(a) Use S3 bucket and host Video Streaming.

To use Amazon S3 bucket for video streaming, we need to use S3 buckets as a container and CloudFront as a Content Delivery Network (CDN).

Step 1: Setup Amazon S3 bucket.

① Search for S3 on the services section. Click on it then click on create bucket. This will direct you to the bucket creation page. Give a name to your bucket.

Maintaining the other options as default click on Create bucket further.

2) Now bucket is created. Now you need to add video in this bucket. For this click on the name of the bucket, this will redirect you to the Objects screen which shows the objects of your bucket. Click Upload.

Select add files. Add mp4 file as we are hosting video.

After selecting click on upload. Then uploading will start

### Step: CloudFront Setup.

① Search for CloudFront on the services tab and open it in new tab.

② On the left pane, under security you will find origin access. Click on it, then click on identities. Click on create origin access identity.

Give identity a name & click create. Now go back to Distributions on the left pane click on Create a CloudFront distribution. Here in the origin field select S3 bucket where the video is uploaded. Under Origin Access, select legacy access identities. Here under origin access identities select the identity that you have created. Under bucket policy select Yes, update bucket policy.

In Default Cache behavior, under viewer, select Redirect HTTP to HTTPS making the hosting secure. Under Web Application Firewall select Enable security protection to provide a layer of security. Click Distribution. Once distribution is deployed, copy domain name (go to S3 bucket click on Name, find key, copy).

Last: Combine Domain name of distribution and key to make final link of video streamed. <domain>/key> //

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Q.2

Discuss BMW and hotstar Case Studies using AWS.

BMW:

Case Study overview: BMW has utilized AWS to enhance its digital transformation strategy focusing on data management, connectivity and innovation in the automotive sector.

key Aspects:

1. Data Management

i) Cloud Storage: BMW migrated its data to AWS, enabling secure and scalable storage solutions for vast amounts of data generated by vehicles.

ii) Data Analytics: AWS provides tools like Amazon Redshift and AWS glue, which help BMW analyse data for insights on vehicle performance, customer preferences, and manufacturing processes.

2. Connected Cars.

i) IoT Integration: Using AWS IoT services, BMW connects its vehicles to the cloud, allowing real-time data collection and analysis. This improves features like predictive maintenance and enhances user experience through over-the-air updates.

3. Scalability & Flexibility.

. Global Infrastructure: AWS's global reach allows BMW to deploy applications

in various regions, optimizing performance and ensuring compliance with local regulations.

• Rapid Development: The flexibility of AWS services supports BMW's rapid development cycles, enabling faster innovation in vehicle technology.

### Hotstar and AWS

Case Study Overview: Hotstar is one of India's leading streaming platforms that has heavily relied on AWS to scale its operations and manage peak traffic efficiently.

#### Key Aspects:

① Scalability: Dynamic Resource Management  
Hotstar leverages AWS's auto-scaling capabilities to handle traffic spikes during major events. This ensures a seamless streaming experience for millions of users simultaneously.

#### ② Content Delivery:

Amazon CloudFront: Hotstar uses AWS Cloudfront for content delivery, ensuring low latency and high transfer speeds. This is crucial for a smooth viewing experience especially for live broadcasts.

### 3. Data Analytics:

Use Insights: With AWS analytics tools, Hotstar collects and analyzes viewer data to understand preferences and improve content recommendations, enhancing user engagement.

### Security and Compliance:

Data Protection: AWS provides robust security features that help Hotstar protect sensitive user data and comply with regulatory requirements, ensuring a secure streaming environment.

### Conclusion:

Both BMW and Hotstar exemplify how AWS can transform business operations through cloud adoption. BMW focuses on connectivity and data driven insights in the automotive industry, while Hotstar emphasizes scalability and content delivery in the streaming space. Their success stories highlight AWS's versatility and capability to meet diverse industry needs.

Q.3) Why Kubernetes - Advantages and Disadvantages of Kubernetes. Explain how adidas uses Kubernetes.

→ Why Kubernetes?

Kubernetes is an open-source container orchestration platform designed to automate deploying, scaling and managing containerized applications. It helps teams manage complex applications more efficiently and reliably.

Advantages of Kubernetes

1) Scalability.

→ Kubernetes allows for easy scaling of applications up or down based on demand, automatically managing the load.

2) High Availability.

→ It provides built-in mechanisms for load balancing and self healing, ensuring that applications remain available and resilient.

3) Portability.

Kubernetes can run on any cloud provider or on-premises, allowing for the flexibility and easier migration of applications across environments.

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#### 4) Efficient Resource Utilization

- Kubernetes optimizes resource usage by automatically scheduling containers based on resource requirements and constraints.

#### 5) Declarative Configuration.

- Users can define the desired state of their applications in configuration files, and Kubernetes manages the current state to match it.

#### 6) Extensibility:

- Kubernetes supports a wide range of plugins and tools, allowing teams to extend its capabilities as needed.

### Disadvantages of Kubernetes

#### 1. Complexity

- The learning curve can be steep due to its architecture and various components, making it challenging for new users.

#### 2. Overhead.

- Running Kubernetes introduces some operational overhead, which may not be justified for small applications or simple architectures.

3) Management: Managing a Kubernetes cluster requires significant expertise, which can lead to increased operational costs.

#### 4) Security Concerns:

As with any complex system, security configurations can be intricate, requiring careful management to prevent vulnerabilities.

#### 5) Resource Requirements:

Kubernetes can consume more resources compared to simpler solutions, which may not be suitable for all environments.

### Adidas and Kubernetes

~~Case Study Overview:~~ Adidas has embraced ~~Kubernetes~~ to enhance its digital transformation focusing on improving its e-commerce platform and accelerating the deployment of applications.

#### Key Uses of Kubernetes at Adidas:

##### 1) Improved Scalability:

Adidas uses Kubernetes to manage its online shopping platform, allowing it to handle fluctuating traffic, especially during sales and promotional events.

(2) Continuous Deployment: By leveraging Kubernetes, Adidas can adopt a DevOps approach enabling continuous integration and continuous deployment (CI/CD) practices. This allows for faster rollouts of new features and updates.

### (3) Microservices Architecture.

Adidas has adopted a microservices architecture, and Kubernetes helps manage these services efficiently. It allows teams to develop, test and deploy services independently.

### (4) Global Reach.

With Kubernetes, Adidas can deploy applications across multiple cloud regions, ensuring low latency and better user experience for customers around the globe.

### (5) Operational Efficiency.

Kubernetes helps Adidas automate many operational tasks, such as load balancing and resource allocation, leading to improved efficiency and reduced manual intervention.

Q.1) What is Nagios?

Nagios is an open source monitoring tool used to oversee IT infrastructure, including servers, applications and network devices. It alerts users about potential issues to maintain system health and performance.

Key features:

- Host & Service Monitoring: Continuously check the availability and performance of systems.
- Alerting: Sends notifications via email or SMS for any detected problems.
- Customizable: Supports custom plugins for tailored monitoring.
- Web Interface: Offers a user friendly dashboard for status and logs.
- Extensible: Can be developed with community developed plugins.

Use of Nagios in E-Services.

- 1) Availability Monitoring: Ensures services are accessible.
- 2) Performance Monitoring: Tracks response times and resource usage to optimize application performance.
- 3) Infrastructure Monitoring, Application Monitoring, Alert Management, Capacity Planning, Compliance Reporting.

Conclusion: Nagios is essential for e-service providers, ensuring reliability, optimizing performance and enhancing customer satisfaction through proactive monitoring and alerting.