Q1] 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: Set up 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. Here, give a name to your bucket. It is better to block all public access so that unauthorized people do not use the video. Maintaining the other options as default, click on Create default bucket.

2) The bucket has been created. Now we need to add our video in this bucket. For that click on the name of the bucket, this will redirect you to the Objects screen which shows the objects of your bucket. Click on Upload. Here, selects add files (you can also drag and drop your file). An mp4 extension file is needed as we need to host a video. Once selected, click on upload. This will start the uploading process.

Step 2: Setup CloudFront

1) As the video is being uploaded. Search for CloudFront on the services tab and open it in a new tab.

2) On the left pane, under security, you will find origin access. Click on it, then click on Identities (legacy). Click on Create origin access identity. Give the identity a name and click on Create. Now, go back to Distributors on the left pane and click on Create a CloudFront distribution.

3] Here, in the origin Field, select the S3 bucket where the vide 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 behaviour, 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. Keep remaining options as default and click on Create Distribution.

Step 3: Accessing the hosted Video
1] Once the distribution is deployed, copy the domain name of your distribution.
2] Now, go to the S3 bucket and click on its name. Click on the name of the video you have uploaded. There you will find a Key, copy that.
3] Combine the Domain name of the distribution and the Key of the video to make your final link of the video that is streamed.
<domain name of distribution> / <key of video>

02] Discuss BMW and Hot Star case studies using AWS

→ i.] BMW Group Case Study with AWs

Overview: BMW Group, one of the world's leading premium automobile manufacturers, uses AWS to drive innovation and efficiency in its IT infrastructure. The Company leverages AWS services to build a serverless and highly scalable platform, which supports its connected Car architecture and provides a seamless digital experience to customers.

Challenges:- BMW faced challenges in managing a global network of data centres that required significant maintainance and operational overhead. The need to analyze vast amounts of data generated by connected cars and deliver updates to millions of vehicles worldwide made scalability and real-time processing Crucial.

Solutions with AWS:-

• Connected Car Platform: BMW built its Connected Car Plat-form on AWs using services like Amazon S3, Amazon EC2, and AWS Lambda. This platform Collects and processes terabytes of vehicle sensor data, enabling real-time analytics and enhancing predictive maintainance, navigation, and in-Car infotainment.

• Data Storage and Analytics: BMW uses Amazon S3 for scalable data storage and Amazon Redshift for data analysis.

• Machine Learning: Used Amazon SageMaker to build

models for improved safety and services.

Hotstar Case Study with AWS

Overview: Hotstar, one of India's longest streaming platforms, uses AWS to manage traffic peaks during high-profile live events.

Challenges:- Hotstar needed to handle unpredictable traffic spikes, especially during events like IPL, with millions of concurrent viewers.

AWS Solutions:-

· Scalable Architecture:- Hotstar implemented AWS Services like Amazon EC2 Auto Scaling, Amazon CloudFront, and Amazon S3 to manage traffic peaks effectively. This setup allowed Hotstar to scale dynamically and handle over 25 million concurrent viewers during IPL.

· Serverless Architecture: AWS Lambda and Amazon DynamoDB were used to build serverless components, reducing the operational overhead and ensuring that the infrastructure scaled automatically with the traffic.

· Content Delivery: Hotstar leverages Amazon CloudFront, a global content delivery network (CDN), to distribute video content to users worldwide with low latency and high transfer speeds.

[Q3] Why Kubernetes and advantages and disadvantages of Kubernetes. Explian How adidas uses Kubernetes.

→ Kubernetes, an open-source container orchestration platform, is designed to automate the deployment, scaling and management of containerized applications. It helps businesses manage complex applications by ensuring high availability, efficient resource utilization and seamless scaling.

Advantages of Kubernetes

1. **Scalability**: Automatically scales applications based on demand, ensuring optimal performance during traffic spikes.

2) **Portability**: Works aceross different enviornment (on-premises, cloud, hybrid), making it easy to move applications.

3) **High availability**: Offers load balancing, automatic failover, and self-healing, ensuring applications stay online.

4) **Resource Efficiency**: Efficientetly manages resource allocation, reducing infrastructure costs.

Disadvantages of Kubernetes:-

1] **Complexity**:- Kubernetes has a steep learning curve and requires expertise to manage efficiently.

2) **Resource Intensive**: Requires significant resources for setup and maintainance, especialy for smaller applications.

3) **Security Challenges**: Misconfigurations can lead to security vulnerabilities, requiring diligent management.

- How Adidas Use Kubernetes

Adidas, a global sportswear company, leverages Kubernetes to enhance its digital presence and delivers Seamless experiences to Customers.

Scalable E-commerce Platform:- Adidas uses Kubernetes to manage its e-commerce website, which experiences high-traffic during product launches and promotions. Kubernetes ensures the platform scales automatically, handling traffic surges efficiently.

Faster Deployment:- Kubernetes allows Adidas to deploy new features and updates quickly across its digital platforms, reducing time-to-market and enabling Continuous innovation.

Global Reach: With Kubernetes, Adidas maintains a Consistent application environment across different regions, ensuring a unified experience for customers worldwide.

Q4 What are Nagius and explain how Nagios are used in E-Services?

→ Nagios is an open-source monitoring tool used to track the health, performance, and availability of IT infrastructure, including servers, networks, and applications. It provides real-time alerts and helps detect issues early to prevent downtime.

How Nagios is used in E-Services

1] Website Monitoring! Tracks uptime and response times, ensuring e-service websites stay available and responsive.

2] Application Monitoring:- Monitors e-service applications and databases, identifying issues like slow queries or errors.

3] Network Monitoring:- Keeps an eye on network devices and traffic, ensuring smooth data flow and preventing bottlenecks.

4] Resource Monitoring: Checks server resource usage (CPU, memory, disk space) to maintain optimal performance.

5] Security Monitoring!- Detects potential security threats by monitoring log files and network activity.

Benefits in E-Services.

• Proactive Alerts: Detects issues before they impact users.

• Reduced Downtime! Ensures quick resolution of problems.

• Centralized Monitoring! offers a single platform monitor all e-service components.

Nagios helps e-services maintain high availability, performance, and security by providing timely insights and alerts.

Security Monitoring:

Nagios helps monitor security aspects of e-services by tracking log files, firewall activity, and network traffic. It detects suspicious behavior, unauthorized access attempts, or unusual patterns that could indicate security breaches. For example, if there's an unexpected spike in login attempts or data transfer, Nagios will alert administrators to investigate.