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Subject : AdDevOps Topic : Assignment 1 Page No.: 1 Date :

1 Use S3 bucket and host video streaming

-> Steps the host video on AWS S3 bucket

1) Download any specific /sample video from internet

2) Now break the whole video into smaller segment sothat it can be easily transmitted over network

3) To make smaller chunks we would ffmpeg tool, the general syntax is ffmpeg -i <video_name> -profile : v baseline -level 3.0 -start_number 0 -his time 3.5 -hls_list_size 0 -f hls output m348.

4) Ensure you download the ffmpeg before executing above command

5) After that create a new S3 bucket, name it and allow public access

6) Now, change the bucket policy sothat anyone can access bucket object

7) We also need to setup Cops policy sothat any ~~one~~ can ~~access~~ endpoint can request for resources of bucket

8) After setting up all necessary configuration, we need the upload video segments that we had created previously

9) Create a new folder name 'his' inside bucket and upload all the video segments in it.

10) Now we should create a simple HTML document that would be hosted on S3 bucket sothat video can be played

11) The HTML file would contain the link of the main playlist of the video segments

12) Open the link provided inside object properties

13) The video will start streaming

2. Discuss BMW and HotStar case studies using AWS

→ BMW Group leverages AWS to power its Connected Drive services and streamline its production processes. Here's how BMW uses AWS:

- Connected Car Platform: BMW uses AWS to enabl its ConnectedDrive platform, which provides in car services like real-time traffic information, weather updates and entertainment services. This platform is supported by Amazon EC2 and Amazon S3 to store and process the massive amounts of data generated by vehicles
- Data Analytics and Machine Leaning: AWS services like Amazon S3, AWS Lambda and Amazon SageMaker allow BMW to collect analyze and process data from millions of connected vehicles in real time. This data includes performance metrics, maintenance data and user behavior, which help BMW improve vehicle performance predict maintenance and offer personalized customer experience
- Global Scalability: AWS enables BMW to scale its infrastructure globally supporting millions of vehicles across different regions. AWS scalability ensures reliable performance even during periods of high demand.
- Development and Innovation: Using AWS, BMW can rapidly develop and deploy new features. AWS managed services allow BMW to reduce development time and operational costs while increasing efficiency in software delivery.

2. Hotstar, one of India's largest streaming platforms relies heavily on AWS to manage traffic spikes and delivers content to millions of viewer especially during live events like cricket matches.

- Handling Massive Scale: During popular live events like the IPL, Hotstar has experienced over 25 millions concurrent viewers. To handle this scale, Hotstar use AWS services like Amazon CloudFront, Elastic Load Balancing and Amazon EC2 to distribute content efficiently and ensure low-latency video delivery.
- Elasticity and Scalability: Hotstar can dynamically scale its infrastructure up and down based on traffic demands. AWS auto-scaling ensures that Hotstar can handle massive traffic spikes during major events while keeping cost low during off-peak times
- High-Quality Streaming: Hotstar leverages AWS Elemental Media Services to encode and deliver high-quality video content across multiple devices. AWS global network ensures that video streams are delivery with minimal buffering and delay even in high traffic situations
- Cost Optimization: By using AWS pay-as-you-go model Hotstar only pays for the ~~r~~ resources it uses. This enable the platform to manage its infrastructure cost effectively especially during high traffic events

Conclusion

Both BMW and Hotstar have successfully leveraged AWS. scalable secure and cost-effective cloud infrastructure to improve their business operations. BMW uses AWS to enhance vehicle connectivity and streamline operation while Hotstar relies on AWS to deliver live streaming services to millions of users, particularly during large-scale events

3 Why Kubernetes and advantages and disadvantage of Kubernates. Explain How adidas uses Kubernete

-> Kubernetes is an open-source container orchestration platform designed to automate the deployment, scaling and operation of containerized applications. Contain allow for the packaging of application and their dependencies into a single light weight unit, but managing a large number of containers can be comple

Advantages of Kubernetes.

1. Automated Deployment and Scaling: Kubernetes automates the deployment of containers across a cluster of machines. It also automatically adjust the number of containers based on traffic and usage

2. Self-Healing: Kubernetes automatically replaces or restart containers that fail, reschedules containers when nodes go down and kills containers that don't respond to health checks

3. Service Discovery and Load Balancing: It provides built-in service discovery and load balancing to distribut traffic across containers, ensuring high availability and balanced workloads

4. Portability: Kubernetes supports multiple cloud environments and on-premise deployments, offering flexibility for hybrid and multi-cloud strategies

Disadvantages of Kubernetes

1. Complexity: Setting up and managing Kubernetes can be complex, especially for small teams or business without much experience with container orchestratio

2. Steep Learning Curve: Kubernetes has a steep learning curve, particularly with understanding its architecture and operational concepts like pods, services, namespaces and volumes.

3. Operational Overhead: While Kubernetes simplifies container management, it adds operation overhead, requiring teams to maintain not just the application but the Kubernetes infrastructure.

4. Security Complexity: Managing security in a Kubernetes environment can be challenging. Ensuring proper role-based access control (RBAC), securing API endpoints and managing vulnerabilities in containers require specialized knowledge

Adidas adopted kubernetes to modernize its e-commerce platform and scale its global operation effectively.

1. Global Scalability: Adidas operates a large-scale e-commerce platform that serves customers world wide. Using Kubernetes, Adidas can manage micro services across multiple regions ~~r~~ ensuring availability and consistent performance across different market.

2. Microservices Architecture: Adidas transitioned to a microservices architecture, which splits the monolithic application into smaller independently deployable services

3. CI/CD Pipeline Integration: Adidas uses Kubernetes to support its continuous integration and continuous delivery (CI/CD) pipelines, allowing faster deploymen of new features and updates. This reduce time to market and allows Adidas to respond quickly to customer demands

4. Cloud-Agnostic Deployment: Kubernetes offers Adidas flexibility in deploying their application across multiple cloud providers. This helps Adidas avoid vendor lock in and choose the best environment for specific workloads.

Adidas uses Kubernetes to manage a global microservices-based architecture, allowing it to scale efficiently maintain a high performance ecommerce platform and delivery a seamless experience to its customers worldwide.

4 What are Nagios and explain how Nagios are used in E-Services

-> Nagios is an open source monitoring tool used for IT infrastructure monitoring ensuring systems, networks and applications are running properly It ~~hetp~~ helps detect and resolve IT infrastructure issues before processes

How Nagios is Used in E-Services

1. Service Uptime Monitoring

- E-commerce platforms or banking websites need to ensure that key services like webservers, databases and payment gateways are always online. Nagios monitor these services for uptime and performance.

If a service goes down, Nagios sends alerts to the IT team to resolve the issue quickly

•Example: Monitoring HTTP(S) services ensuring the website is always accessible, or monitoring database services (MYSQL, MongoDB) for availability and performa

2. Performance Monitoring: For e-services, performan is critical. Nagios monitors the performance of web servers application servers and databases ensurin response times are within acceptable ranges. This helps identify performance bottlenecks before they affect users.

Example: Monitoring CPU memory and disk usage on servers hosting e-services to ensure resources are not exhausted which could lead to slow page load ti or service outages

3. Security Monitoring: In e-services, security is paramount. Nagios can monitor log files, firewalls and intrusion detection systems (IDS) to detect security breaches or anomalies. ~~AH~~ Alerts are sent out when suspicious activity is detected

Example: Monitoring login attempts and detecting potential brute-force attacks on a website or serv

4. Alerting and Notifications: For e-services rapid response to issues is critical. Nagios sends out real time alerts (via email, SMS or integration with thir party tools like Slack) to the appropriate IT personne or teams. This helps in reducing downtime as team a alerted instantly when an issue arises.

Example: If a web service or database is down, the operations team gets an instant notification allowin for quick resolution before users are affected