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EXP-010..
Adv Devops

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Assignment - 1

Q1 USE S3 BUCKET & HOST VIDEO STREAMING

→ Step to host video on AWS S3 bucket.

- ① Download any sample video from internet
- ② Now break the whole video into smaller segments so that it can be easily transmitted over network.
- ③ To make smaller chunks we would use ff mpeg tool, the general syntax is ff mpeg -i <video> -profile = v baseline -level 3.0 -start-number 0 -hs-time 3.5 -hls-list-size 0 -f m3u8 -m 348.
- ④ Ensure you download the ff mpeg before executing above command.
- ⑤ After that create a new S3 bucket, name & now public access.
- ⑥ Now, change bucket policy so that anyone can access bucket object.
- ⑦ We also need to setup CORS policy so that any endpoint can request for resources of bucket.
- ⑧ After setting up all necessary configuration we need to upload video segments that we had created previously.
- ⑨ Now we would create a simple HTML document that would be hosted on S3 bucket so that video can be played.

- ① The HTML file would contain the link of main playlist of video segments.
- ② open the link provided inside properties
- ③ The video will start streaming.

Q2) Discuss BMW & hotstar case studies using AWS?

→ BMW uses AWS to power its connected car services, enabling real-time analysis & secure processing of vehicle data from millions of cars worldwide with AWS's scalable cloud infrastructure, BMW can provide features like remote software update, predictive maintenance & realtime driver assistance. Key services include Amazon S3 for storing large volumes of vehicle telemetry data, Amazon EC2 for processing this data, Amazon EC2 for processing this data & Cloud Front for distributing content globally. This setup allows BMW to scale its services across regions & comply with varying regulatory standard for data security & privacy. AWS flexibility also helps BMW enhances user experiences by offering faster updates & better connectivity.

* HOTSTAR

- Hotstar relies on AWS to handle surges in viewership, especially during live events like the Indian Premier League (IPL). During these events, Hotstar records millions of concurrent viewers, which requires a highly scalable & reliable infrastructure. Using AWS auto scaling, Hotstar dynamically adjusts its resources to accommodate real-time spikes in traffic, while Amazon CloudFront ensures low latency content delivery. AWS services like EC2, Elastic Load Balancing & S3 enable Hotstar to manage huge amounts of data & provide uninterrupted streaming. This scalable architecture helps optimize costs during off-peak times ensuring smooth streaming during high demand events.

Q3 Why Kubernetes & advantage & disadvantage of Kubernetes. Explain how Adidas uses Kubernetes.

→ **Kubernetes Overview:** Kubernetes is an open source platform designed to automate deploying, scaling & managing containerized applications. It helps in orchestrating containers (such as Docker containers) across a cluster of machines,

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making it easier to manage application that require high availability, scalability & resistance.

* Advantages:

- 1) Automated Scaling: Kubernetes can automatically turn your application up or down based on traffic & load.
- 2) Self healing: It restart failed containers, replaces unresponsive container & kills containers efficiently on nodes.
- 3) Efficient Resource management: Kubernetes helps optimize resource utilization by packing containers efficiently on nodes.
- 4) Rolling update & rollback: Kubernetes allows smooth deployment of updates without downtime. In case of an issue, it can roll back to the previous version.

* Disadvantage:

- 1) Complexity: setting up & managing Kubernetes can be complex, especially for beginner or small teams.
- 2) Learning curve: The platform has a steep learning curve, requiring knowledge of networking, security & infrastructure.
- 3) Resource intensive: Running Kubernetes requires substantial infrastructure resources which can be costly for small app.

Adidas, like many large-scale companies, leverages Kubernetes to enhance the scalability & resilience of its infrastructure. Adidas adopted Kubernetes to accelerate its digital transformation, particularly to handle traffic spikes during product launches & events, ensuring a seamless experience for users. By containerizing their time to services & running them on Kubernetes, Adidas improved their time to market for new features & updates, optimized resource utilization & enabled continuous delivery & integration (CDI) pipelines.

Benefits of Using Kubernetes:

- **Scalability:** Adidas can handle millions of users accessing their platform during peak times without disruptions.
- **Improved Agility:** Kubernetes allows the company to quickly develop, test & deploy, test & deploy new services.
- **Cost Optimization:** The efficient use of cloud resources through Kubernetes help reduce operational costs.

Q4) What are Nagios & explain how Nagios used in E-services?

→ Nagios is an open source continuous monitoring tool which monitors network, application & services.

It can find & repair problems detected in infrastructure & stop future issues before they affect that end users. It gives the complete status of your IT infrastructure & its performance.

Benefits of Nagios:

- It helps in getting rid of periodic testing
- It detects split-second failures when the worst strap is still in the "intermittent" stage
- It reduces maintenance cost without sacrificing performance.
- It provides timely notification to management of control & breakdown.

* How Nagios is used in E-Services.

In the context of E-Services, which refers to services provided electronically Nagios plays critical role in ensuring the availability & performance of these services.

▷ monitoring uptime of Services:

- E-Services like online transactions, user portals or data processing need application need to be available 24/7. Nagios continuously checks the availability of these services & generated alerts if they go down, helping to minimize downtime.

2) Performance monitoring:-

- Nagios can monitor the performance metrics of servers hosting e-services, such as CPU usage, memory consumption, disk space & network bandwidth. This helps in identifying performance bottlenecks that could affect user experience.

3) Database monitoring:

E-Services rely on database to store & retrieve data. Nagios can monitor database health, query execution times & availability to ensure seamless operations.

4) Security monitoring:

Nagios can integrate with security plugins to monitor potential vulnerabilities or security breaches, ensuring the integrity & safety of e-services platforms.

5) Custom Alerts for Critical application:

- E-Services platform often have mission-critical application that requires immediate attention. If an issue arises, Nagios allows custom configuration for these applications, ensuring rapid response & issues resolutions.

By providing real-time monitoring & alerting, Nagios

ensures that e-Services remain operational, secure & performant, helping to improve user satisfaction & business continuity.