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DISA '41'
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Advance Devops

ASSIGNMENT NO: 1

Q1] Use S3 bucket and host video streaming

Ans: Steps to host video streaming on S3 bucket

Prerequisites:

Before you start to host video streaming through S3 bucket, you must register and configure a custom domain (for example, example.com) with Route 53 so that you can configure your cloudfront to use a custom domain name later. Without a custom domain name, your S3 video is publicly and hosted through Cloudfront at a URL that looks similar to the following https://cloudfront distribution domain name/path to an S3 video

- Step 1: Create Bucket

Sign in to Aws console and open Amazon S3 console. Then Select Bucket → Create Bucket > Enter Bucket name > Select Region → Block Public Access settings for this Bucket → Remaining setting Defaults → Then choose Create Bucket.

Step 2: Upload a video to the S3 bucket

- Now, in buckets list, choose the name of the bucket that you created in step 1 to upload your file to
- On the objects tab for your bucket, choose Upload
- Then on upload page, unde Files and folders, choose Add files
- Then select a file to upload, and then choose Open for example, you can upload a video file named
- Choose upload

Then open cloudfront and follow next steps.

Step 3: Create a cloudfront origin access identity

- Sign in to AWS and open the cloudfront console
- Select security section and choose Origin access
- Now under Identities tab, choose origin access identit
- Enter name and choose create

Step 4: Create a cloudfront distribution

a) Create a cloudfront distribution

- choose Distribution → create distribution
- choose the domain name → starts the name of S3 bucket you created
- for origin access, select legacy access identities
- Under Orgin access identity → origin access identity
- Under Bucket policy, choose Yes update the bucket policy → select Default cache behavior → Viwer protocal policy → Redirect HTTP to HTTPS
- Keep the remaining setting to Default.
- Now, choose Create distribution

b) Review the bucket policy.

Step 5: Access the video through the cloudfront distribution

- Go to Distribution in the left panel
- find the distribution by matching the S3 origin name and then copy the Domain Name and now Open a new tab and paste the copied Domai name
- Now, Return the previous tab, open the S3 conso and select the bucket created in step1 and then choose the video object uploaded in step2 and the copy the key from The Object overview.

- In the new tab, append / and paste the key to the domain Name
- Your video is now accessible via Cloudfront

Step 6: Configure your cloudfront distribution to use your custom domain name

a) Request an SSL certificate
b) Add the alternate DNS to your Cloudfront.
c) Create a DNS record to route traffic from your alternate domain name to your cloudfront distribution's Domain name.
d) Check whether IPV6 is enabled for your distribution and create another DNS record if needed

Step 7: Access the S3 video through the Cloudfront distribution with the custom domain name

- Select Distribution → Find distribution by matching S3 origin name → Copy the alternate domain name → Past the domain name.
- Open S3 → find path to your S3video → Return to the tab with domain, add /<s3video path>
- Access your video at https://Cloudfront_domain/S3_video_path.

Step 8: View data about requests received by your Cloudfront distribution (Optional)

Now, your video streaming is live through S3 bucket.

Q2] Discuss BMW and Hot Star case studies using AWS

Ans:
- The BMW Group whose headquater is in Munich, Germany, is a Global manufacturer of premium automobiles and motorcycles.
- The company needed to scale its data lake to support the growing demands of internal and external stakeholders. As data wasn't easily accesible..:
- The BMW Group's innovation was slowed down by their own IT infrastructure and the long lead times required to support new initiative. The BMW needed to develop a solution agile enough to both support the data needs of all the various internal buisness units and allow this company to move quicky to address the array of emerging use cases its customers demand.
- The BMW Group re-architected its on-premises data lake to the AWS Cloud, creating a Cloud Data Hub (CDH) that integrates anonymized data from vechile sensors and other sources.
- Using AWS services like Amazon S3, Athena, Kinesis Data Firehose, and Glue, BMW streamlined data management and enabled scalable, agile operations for data engineers. The setup also allowed teams to maintain their own DevOps processes, fostering innovation. A modern web portal was implemented to help users discover and query trusted datasets, facilitating new insights.

- The company uses this data to monitor ~~vechle~~ vehicle health indicators such as check control error to identify potential issues across vechicle lines
- This enable the BMW Groups to leverage fleet data ingested, collected and refined from the CDH to better resolve issues, even before they impact customers.

HOTSTAR

- Hotstar is an indian subscription video on-demand streaming service owned by and operated by Star India, a subsidiary of The Walt Disney Company India.
- In 2019, During ICC world cup Semi-final between India and New-Zealand, Hotstar sets a new record of 25.3 million viewers. So, on the game day, the first spike witnessed was from 1.5M to 15m, as India started batting. Then, in between it was usual (10-12m) then Dhoni came to bat, and again sudden spike was noticed in traffic, taking it to 25.3m viewers. But then Dhoni got out, and suddenly there was drastic viewers drop to 4.1M viewers.
- The very first challenge was handling 25.3m viewers. Secondly, when users dropped off the match some of them exited from the app entirely and others returned to the homepage and started exploring other content. That leads to an increase in load on homepage services.
- Hotstar does not use traditional autoscaling from

Aws because there were a lot of challenges like
- Insufficient capacity errors.
- Step size, Autoscaling groups.
- They built their own scaling strategy. and At the Back end side, Hotstar uses Amazon Route 53 and Amazon CloudFront are services for the Hotstar streaming video

Q3] Why kubernetes and advantages and disadvantages of kubernetes. Explain how adidas uses kubernets?

Ans. Imagine you have a bunch of different programs running on your computer. They need to work together and sometimes you want to run more copies of a program when things are busy. This can be hard to do manually, thats where kubernets comes in

Advantages of kubernets

- Scalability - kubernets allows developers to easily scale their application up or down as demand fluctuates
- Resource efficiency
kubernets helps optimize the use of resources by scheduling containers to run on the most appropriate node based on their resource requirement.
- High availability
kubernetes provides mechanisms for ensuring that application are alway available.
- Other advantages are Portability, Self healing,

service discovery and load balacing, Extensi

Disadvantages of kubernetes.

- Complexity:
  kubernets can be complex to set up and manage.
- Learning curve
  Developers and operations teams need to learn how to use kubernets effectively
- Performance overhead
  kubernets introduces some overhead in terms of CPU and memory usage, which can impact application performance.
- Some other disadvantages are Security, Dependency on external services, lack of maturity Complexity of networking.

Case Study: Adidas.

- Adidas is a globally renowned sportswear and athletic footwear company headquartered in Germany
- In recent years, the adidas team was happy with the software choices from a technology perspective. But accessing all of the tools was a problem. for example, just to get a developer VM, you had to send a request, give the purpose, who's responsible, internal cost center and so on. So the best case is you got your machine in half an hour and the worst case in half week or sometimes even a week was a challenge faced by the adidas.
- They found the solution with containerization,

agile development, continuous delivery, and a cloud native platform that includes kubernetes and Prometheus.

- Just six months after the project began, 100% of the adidas e-commerce site was running on kubernetes. load time for the e-commerce site was reduced by Half Release went from every 4-6 weeks to 3-4 times a day. with 4000 pods, 200 nodes, and 80,000 builds per month, adidas is now running 40% of its most critical, impactful systems on its cloud native platform.

Q4] what are Nagios and explain how Nagios are used in E-services.

Ans. • Nagios is a powerful monitoring system that enables organizations to identify and resolve IT infrastructure problems before they affect critical business processes.

- E-services S.R.L is an innovative energy company offering solutions in monitoring, VOIP, call centers and IT solutions. E-services S.R.L. chose to partner with Nagios and become the officid representative of Nagios XI in Paraguay.
- To set up a monitoring system across Paraguay one would have to carefully consider monitoring band width, setting up different levels of support for hosts that are only being watched, a high availability system with a failover system,

an a system that can be accessed from afar.

- Nagios provided E-services and ANDE with real-time solution including:
  - A centralized monitoring system for their entire infrastructure, easing the sysAdmin workload
  - Helpful and intutive statics that simplify decision making and aid troubleshooting
  - Easy-to-understand graphics and displays
  - Excellent availability, thanks to the mirrored servers with the failover system.