

Ad-Devops Assignment-1

04/05

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).

St:- Set up Amazon S3 bucket.

- 1) search for S3 on the services section. Click on it, then 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 bucket.

- 2) The bucket has been created. Now we need to add our video in the 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.

Then select add files (you can also drag and drop your file). An mp4 extension file is needed as we need to host a video. And the Upload

set up CloudFront

- 1) As the video is being uploaded. Search for CloudFront on the services tab & 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.
- Now, go back to Distribution on the left pane & click on create.

a CloudFront distribution.

- 3) Here, in the origin field, select the S3 bucket where video is uploaded. Under Origin access, select access identities. Here, under Origin access identities, select the identity that you have created. Under bucket, select Yes, update bucket policy.

Step 3: Accessing the hosted video

- 1) Once the distribution is deployed, copy the domain 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. 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>~~

Q2] Discuss BMW and Hotstar case studies using AWS.

→ BMW: Overview: BMW uses Amazon Web Services (AWS) to build and scale its connected car platform, providing services like real-time traffic updates, remote vehicle diagnostics. AWS enables BMW to handle billions of data requests daily from over 20 million connected vehicles, leveraging tools like Amazon Elastic Kubernetes Service (EKS) for scalability and Amazon S3 for data storage. Amazon EMR is used for real-time data analysis.

BMW case study using AWS:

Overview:

BMW utilizes Amazon Web Services (AWS) to power its Connected Car platform, delivering a suite of digital services such as real-time traffic updates, remote ^{vehicle} control, & diagnostic capabilities.

Key points:

1 Scalability:

- BMW leverages AWS's data services, such as
- BMW uses Amazon Elastic Kubernetes Service (EKS) to manage and scale its microservices-based architecture which powers the connected car platform.

2 Data Analytics:

- BMW leverages AWS's data services such as Amazon S3 for storage, Amazon EMR for big data processing, and Amazon Athena for querying, to analyze enormous amounts of vehicle & user data.

3 Security:

- Security is paramount in BMW's architecture, especially when dealing with sensitive vehicle and user data.
- AWS Identity & Access Management (IAM) & AWS Key Management Service (KMS) are employed to securely manage access controls & encryption.

4 Supply chain Transparency (ProChain Platform):

- To improve traceability & transparency in its supply chain, BMW has built the ProChain platform on Amazon EKS & blockchain technology.

5. Cost Optimization:

- BMW uses Amazon EC2 Auto scaling to adjust compute capacity based on real-time demand, preventing over provisioning & reducing operational costs.

6. Employee Upskilling & Innovation:

- AWS plays a pivotal role in training BMW's workforce. BMW aims to upskill 5,000 engineers & certify 2,000 employees in cloud service like machine learning & data analytics.

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Through AWS, BMW accelerates the development of electric and autonomous vehicles & enhance digital automotive services, aligning with its long-term strategy of connected, efficient, & sustainable automotive.

Hotstar:

Overview: Disney+ Hotstar is a popular Indian subscription streaming service owned by Star India, a subsidiary

The Walt Disney Company India. It offers two paid plans: VIP, offering on-demand content & sports, and Premium, featuring international content from platforms like HBO & Showtime.

Services for Hotstar AWS used are explained

1. Amazon Route 53

The name itself suggests that at port no. 53, the AWS provides the DNS services to its application. It easily and efficiently connects the EC2 instances or Amazon S3 bucket, & it also provides the routing information to the other side of the infrastructure. This makes AWS more user friendly.

2. Amazon EC2

Provide Scalability & reliability to computing capacity in the AWS cloud which makes less to hardware & more to developing & deploying applications on the cloud.

3. Amazon CloudFront

Low latency & high transfer speed of 5700 Gbps for botnet is somehow possible through cloudfront as it provides content delivery Network Services (CDN).

4. Amazon S3

Storing the data & fetching them as per need is the advantage of the AWS services.

Q3) What is Kubernetes & advantages & disadvantages of Kubernetes. Explain How adidas uses Kubernetes.
→ Kubernetes is an open-source container orchestration platform that automates the deployment, scaling, & management of containerized applications. It is designed to manage large clusters of containers efficiently.

Key features:

1. Automation: Automates deployment, scaling and operation of application containers across clusters of hosts.
2. Portability: Works across on-premise, hybrid or cloud environments, ensuring flexibility in infrastructure choices.
3. Self-Healing: Detects & replaces failed containers, & reschedules them automatically.
4. Service Discovery: Facilitates easy discovery of services within a cluster without hard-coding network settings.

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Load Balancing: Automatically distributes network traffic across the different containers.

Advantages:

1. Scalability: Easily scales applications horizontally based on real-time demand.
2. Portability: Allows applications to be moved seamlessly between environments (e.g., from testing to production).
3. Resilience: Offers self-healing capabilities, replacing failed containers without downtime.

Disadvantages of Kubernetes:

1. Complexity: Kubernetes has a steep learning curve & is difficult to set up and manage, especially for beginners.
2. Overhead: Can introduce overhead in terms of computing operational costs, requiring more resources for orchestration.
3. Security Management: While powerful, Kubernetes requires strong expertise to ensure proper security configurations.

Adidas

In recent years, the Adidas team was happy with its software choices from a technology perspective - but accessing all the tools was a problem.

Challenge: In recent years, the Adidas team was happy with its software choices from a technology perspective - but accessing all of the tools was a problem.

Solution: To improve the process, "we started from the developer point of view," & looked for ways to shorten the time it took to get a project up & running.

running and into the adidas infrastructure, Sany Senior Director of platform Engineering Fernando Corripio. They found the solution with containerization, agile development, continuous delivery, & a cloud native platform that includes Kubernetes & Prometheus.

• Kubernetes, an open-source container orchestration platform, has provided several benefits to Adidas:

→ Scalability & flexibility: Kubernetes enables Adidas to scale its applications & services dynamically to meet fluctuating demand. During high-traffic events like product releases or major sports events, the platform automatically allocates additional resources to ensure smooth operations.

→ Faster Development & Deployment: Kubernetes simplifies the deployment & management of containerized applications. This allows Adidas to develop & release new features & updates more rapidly.

→ High Availability & Reliability: Kubernetes ensures high availability by automatically distributing workloads across multiple container nodes. This means Adidas can provide uninterrupted online shopping experiences to customers worldwide.

→ Resource Efficiency: With Kubernetes, Adidas can optimize resource utilization. Containers share the underlying infrastructure efficiently, reducing waste & resource

→ CI/CD: Kubernetes integrates seamlessly with CI/CD. Adidas can automate the testing & deployment of code, ensuring that new features & updates are delivered to users quickly & reliably.

Impact: Just six months after the project began, the Adidas e-commerce site was running on Kubernetes. Load time for the e-commerce site was reduced by 50%. Releases went from every 4-6 weeks to 3-4 times a day.

Conclusion: Kubernetes is a powerful & flexible platform for container orchestration that can simplify the management, & scaling of your applications while enhancing their reliability & resource efficiency. Its extensive ecosystem & active community make it a compelling choice for modern application deployment management.

Q 4) What are Nagios & explain how Nagios works in IT-services?

→ Nagios is an open-source monitoring system that enables organizations to monitor their IT infrastructure, including servers, network devices, & applications. It helps ensure systems are running smoothly by providing real-time monitoring, alerting & reporting capabilities.

* How Nagios is used in IT-services

1. Infrastructure Monitoring: Nagios continuously monitors servers, databases & network devices in an enterprise environment to ensure they are operational. This involves checking the availability of web servers, databases, etc.

and other critical components.

2. **Performance Monitoring:** It tracks various performance metrics such as CPU load, memory usage, disk space, & network traffic.
 3. **Alerting & Notifications:** Nagios can send alerts via email, SMS, or other communication methods when it detects issues.
 4. **Service Monitoring:** It monitors specific e-services such as web applications, APIs, and email servers to ensure they are functioning correctly.
 5. **Log Monitoring:** Nagios can analyze log files for error messages or anomalies, providing insights into potential issues within the e-services.
 6. **Integration with Other tools:** Nagios can be integrated with other monitoring and management tools, allowing for comprehensive oversight of the IT environment and enabling more sophisticated alerting & reporting mechanisms.
 7. **Customizable Dashboards:** It provides dashboards that give a visual overview of the monitored infrastructure, helping teams to quickly assess the health of their e-services.
- By using Nagios, e-service provider can ensure high availability & performance of their applications, enhancing user satisfaction & trust in their services.

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