Hosting A Dynamic Website Using AWS

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Article Info

ABSTRACT

This project is about Hosting a dynamic website using AWS EC2 and VPC is a reliable and scalable solution for businesses that need to serve content to a global audience. It enables the development of virtual machines that may be tailored to the particular requirements of the website. VPC provides a secure and isolated environment for the website to operate in, ensuring that sensitive data and applications are protected. By utilizing the flexibility and power of these two services, businesses can create a dynamic website that is highly available, scalable, and secure. This abstract will explore the benefits and best practices of hosting a dynamic website using AWS EC2 and VPC, including how to configure and manage the infrastructure, how to optimize for performance and cost, and how to ensure high availability and disaster recovery. For that we create a Free tier account in AWS. This has come up with a fantastic concept to openly offer their consumers a quick and straightforward way to host content using the AWS EC2 & VPC. I host a website related to car rental management system into Amazon EC2 & VPC and it gives an URL to access the webpage. It helps us to Access the remote server in that we need to host the website. I used XAMPP server in the instance. After hosting that ec2 will have a IP address with the IP address we can access the web page anywhere.

Keywords : AWS EC2 & VPC, Dynamic website, data centres, cloud servers, server-side, web- applications, Xampp Server.

I. INTRODUCTION

Dynamic Website:

A dynamic website is a website that displays different content and interacts with users based on their behaviour, preferences, and inputs. Unlike static websites, which display the same content to all visitors, dynamic websites use programming languages such as PHP, JavaScript, and others to generate content on the fly and provide a personalized user experience.

Dynamic websites can include features such as user logins, personalized content, interactive forms, real-time updates, and more. They often require a back-end database and server-side scripting to generate content and manage user interactions. The use of dynamic content allows websites to be more engaging, responsive, and tailored to individual users' needs, making them an ideal solution for businesses looking to provide a high-quality online experience.

II. LITERATURE REVIEW

Examining the literature on
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It emphasizes the importance of architectural considerations and design patterns tailored to dynamic web applications. Concepts like microservices, serverless computing, containerization (using services like Amazon ECS or AWS Fargate), and event-driven architectures are explored as ways to enhance flexibility, scalability, and maintainability.

Furthermore, the literature delves into deployment strategies, including continuous integration and continuous deployment (CI/CD) pipelines, blue-green deployments, and canary releases, to automate the deployment process and minimize downtime during updates or changes to the application.

III. METHODOLOGY

DESCRIPTION

Amazon Elastic Compute Cloud is a web service that provides resizable compute capacity in the cloud. It is one of the core components of Amazon Web Services and allows users to launch and manage virtual machines (instances) on demand.

EC2 instances can be configured with a variety of operating systems, applications, and software, making it a flexible solution for a variety of purposes. Users can also choose from a variety of A variety of instance types are available to meet different demands, including compute-optimized instances for high-performance computing, memory-optimized instances for in-memory databases, and storage-optimized instances for big data processing.

Creating and managing a personal virtual network within the AWS cloud is made possible via the web service known as Amazon Virtual Private Cloud (VPC). By configuring their own IP address range, subnets, routing tables, and security settings, users can create a safe and private environment. With this, users can launch instances and other resources in a private and controlled environment. They can also configure a variety of network connectivity options, including private connectivity between VPCs, direct connections to on-premises data centers, and VPN connections to remote networks.

VPC also provides a range of security features to protect resources within the virtual network, including security groups, network access control lists (ACLs), and encrypted communication options. Users can also configure VPC flow logs to record network activity for oversight and analysis.

Data processing and

The crucial roles in hosting a dynamic website using AWS. Before deploying the website, it's essential to ensure that the data to be displayed dynamically is processed efficiently. This involves organizing, cleaning, and structuring the data to meet the website's requirements. AWS provides many services for processing data, including Amazon RDS for databases, Amazon DynamoDB for NoSQL databases, and Amazon S3 for storage. Once the data is processed, preprocessing steps may include

optimizing images and files for web delivery, implementing caching mechanisms to improve website performance, and configuring content delivery networks (CDNs) to distribute content globally with low latency. AWS provides services like Amazon CloudFront for CDN delivery, AWS Lambda for serverless computing, and AWS Elastic Beanstalk for easy deployment and scaling of web applications.

Preprocessing Data

Furthermore, it offers tools for monitoring and analyzing website traffic, such as Amazon CloudWatch and Amazon Elasticsearch Service, enabling developers to gain insights into user behavior and performance metrics. By leveraging AWS's suite of services for data processing, preprocessing, and website hosting, developers can ensure a seamless and scalable experience for users accessing dynamic websites.

IV. EXPERIMENTAL SETUP

Creating Amazon Virtual Private Cloud (VPC)

To access the VPC dashboard, sign in to the AWS Management Console.
To initiate the VPC creation wizard, click "Create VPC".
Give your VPC a name and IPv4 CIDR block. The IP address range for your VPC is defined by the CIDR block.
Select if you want your VPC to support IPv6. For your VPC, decide whether to allow DNS resolution and DNS hostnames.
Click "Create" to create your VPC.
Once your VPC is created, you can create subnets, route tables, and security groups to configure your network.

Creating Subnets for this PC:

Click the "Subnets" link in the left navigation pane. Select "Create subnet" from the menu. Enter the following data in the "Create subnet" dialog:
Name tag: An acronym for your subnet's name
VPC: The VPC where you want to create the subnet Where you wish to establish the subnet is known as the "Availability Zone."
IPv4 CIDR block: The subnet's IP address range, represented in CIDR notation Note: The subnet's IP address range needs to be a subset of the VPC's IP address range. To construct the subnet, click the "Create" button. For every additional subnet you wish to create, follow steps 3 through 5 again. Once you have created your subnets, you can associate them with your EC2 instances, RDS instances, and other resources in your VPC. To do this, navigate to the "Instances" or "DB instances"

V. ANALYSIS
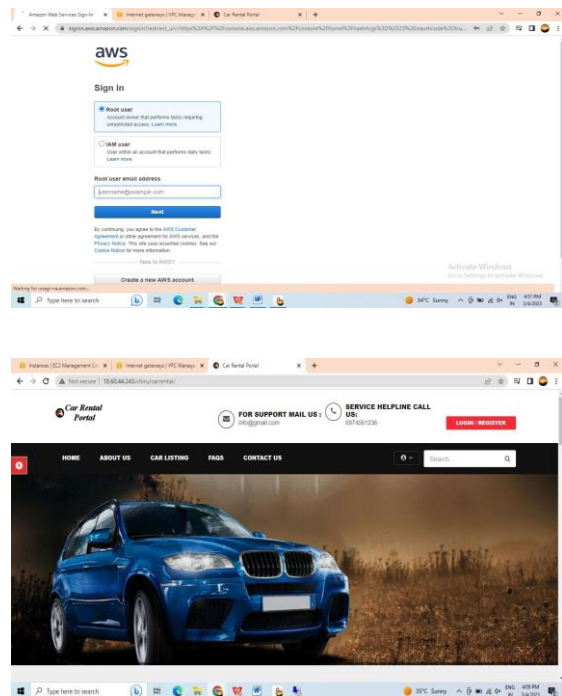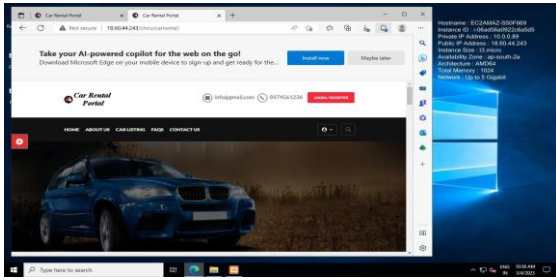
Here in the above picture in search bar there will be an IP address it is public IP address.

We can access it from out of the server also. Any can access the website with the Public IP address in mobiles pcs and anywhere we can access it. While accessing the website we need to put the EC2 in running mode that time we can access from anywhere.

So we need to keep it in running mode only. The ec2 will never end up until we terminate it. If is there any network issue that time we can't access the webpage.

VI. DISCUSSIONS

Interpretations of results

leveraging AWS's scalable infrastructure allows for effortless scaling of resources based on website traffic demands. This flexibility minimizes expenses during off-peak hours while guaranteeing high performance during those moments. Furthermore, AWS provides an extensive array of services specifically designed for hosting dynamic websites, including virtual server instances (VSEs) on Amazon EC2, managed databases (RDS) on Amazon RDS, and dynamic content storage on Amazon S3.

Furthermore, AWS's global network of data centers enables efficient content delivery worldwide, reducing latency and improving user experience. This global presence also enhances reliability and fault tolerance through redundancy and failover mechanisms. Security is another crucial aspect of hosting a dynamic website on AWS. AWS provides a robust set of security features, including network isolation, encryption at rest and in transit, DDoS protection, and identity and access management controls. Compliance certifications and adherence to industry best practices further ensure data protection and regulatory compliance.

Benefits and Drawbacks

Serverless architecture eliminates the need to maintain idle EC2 instances, resulting in cost savings by paying only for the actual compute resources consumed.

Pay-per-use pricing model of Lambda and API Gateway can be more cost-effective compared to traditional EC2 instances.

Scalability and Performance:

Serverless services like Lambda, DynamoDB, and API Gateway automatically scale in response to incoming traffic, ensuring optimal performance under varying workloads.

CloudFront CDN accelerates content delivery, lowering latency and improving user experience in various geographic locations.

Simplified Management:

Amazon Amplify provides a unified platform for managing the entire development lifecycle, including deployment, monitoring, and scaling, thereby simplifying the management overhead. Serverless architecture reduces operational complexity by offloading infrastructure management tasks to AWS, allowing developers to focus on application logic.

Drawbacks

Cost Complexity:

Managing multiple AWS services can lead to complexity in cost management. It's easy to overlook costs associated with data transfer, storage, and instance usage, which can add up quickly.

Maintenance Overhead:

Setting up and managing the infrastructure on AWS requires expertise in various areas such as networking, security, and scalability. Time-consuming routine maintenance chores include fixing security flaws, updating software, and performance optimization.

Security Risks:

Misconfigurations or vulnerabilities in AWS services can expose your website to security risks such as data breaches, unauthorized access, or denial-of-service attacks. It's crucial to stay updated on security best practices and regularly audit your infrastructure for potential vulnerabilities.

VII CONCLUSION

In conclusion, hosting a dynamic website using AWS EC2 and VPC provides numerous benefits for businesses. The scalability, security, customization, high availability, and cost-effectiveness of AWS infrastructure make it an ideal solution for hosting dynamic websites. While there may be some technical complexity and potential for cost overruns, the advantages typically outweigh the disadvantages when properly managed and optimized. Proper planning, management, and optimization are crucial to ensure that the website is secure, performance, and cost-effective. This includes implementing best practices for managing infrastructure, optimizing for cost and performance, and disaster recovery planning. Additionally, businesses must carefully consider their specific needs and resources before deciding to host their website on AWS.

Overall, hosting a dynamic website using AWS EC2 and VPC can help businesses create a robust and scalable web solution that meets their specific needs.

With the right tools, expertise, and planning, businesses can take advantage of AWS infrastructure to create a website that is secure, performance, and cost-effective.

VII. REFERENCES

[1]. Books and Publications: There are numerous books available that cover AWS services and their applications in hosting dynamic websites. Titles like "AWS Certified Solutions Architect Study Guide" by Ben Piper and "AWS for Developers For Dummies" by John Paul Mueller and Luca Massaron provide in-depth knowledge and practical advice for utilizing AWS services effectively.

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