

# MIDTERM PROJECT REPORT

## ENPM809J- Cloud Security

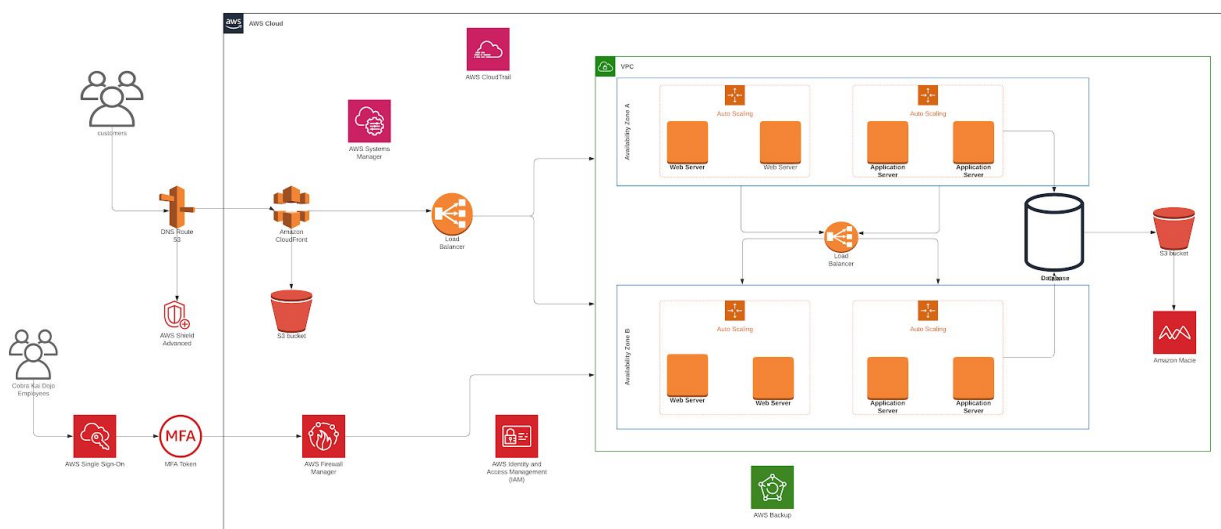
### Mrugandha Namjoshi

## COBRA KAI

With the high growing demand of Cobra Kai application there is a major need to make the application more secure and sturdy. Currently, the website is not very resilient to threats because it is handled on a single server, to make it more flexible, migrating the website to cloud can be very advantageous as it can help in reducing IT costs, and enabling benefits like application scalability and many more.

Among all the available cloud providers, I would propose hosting the application on Amazon Web Services (AWS). AWS is designed to allow application providers and vendors to quickly and securely host applications. It's an easy to use, flexible, cost-effective, reliable, secure and highly scalable platform.

This is a high-level representation of how the Cobra Kai application will look after migrating it to AWS.



- **Patching Strategy-**

Addressing the issues like patching, we can make use of AWS System Manager that will help in providing a unified user interface, so that we can view the operational data from the multiple AWS services. System manager can help in grouping resources like the EC2 instance and the S3 buckets, therefore here in the case of occurrence of malfunctioning in the availability zone A and B, Amazon S3 buckets will have the backup data.

- **DDoS Attack Prevention-**

In the case of any DDoS attacks by the rivals, AWS shield advanced will help our application to withstand that attack. AWS shield advanced provides customized detection based on the traffic patterns in our protected elastic IP address. AWS Shield Advanced accompanies DDoS cost insurance, to protect against scaling charges coming about because of DDoS-related utilization spikes.. It is integrated with AWS WAF, that is a web-application firewall.

- **Slow streaming, Downloads and order processing -**

In the event of slow streaming and downloading of data and videos, Amazon CloudFront, a fast Content Delivery Network (CDN) service, helps in securely delivering data, videos and applications and APIs to customers globally with low latency and high transfer speed. Customers will have easy access to the data without any interruptions. AWS CloudFront works smoothly with other services like Amazon S3 and Elastic Load Balancing.

- **Account Permission-**

Currently every user group has the ability to run the privileged commands on the web server if they want to, but that is highly insecure and thus we should have a good account permission strategy. Use of AWS Identity & Access Management (IAM) will allow us to manage access to AWS services and resources securely. Using IAM, we can create and manage several user groups and according to their different user roles, they will be given access to various services in AWS.

- **Backup Strategy-**

In case of break-down in the VPC(Virtual Private Cloud), AWS Backup service will be used. AWS Backup, is a fully managed backup service that makes it easy to centralize and automate the backup of data across AWS services. It helps in automating the backup process and saves time and money.

- **Personal Information-**

In order to keep the sensitive information of the users safe, Amazon Macie service is used. It used machine Learning and pattern learning to discover and protect the user data. Amazon Macie is linked to the S3 buckets, where it applies techniques to these buckets in order to identify and alert about any sensitive data, such as personally identifiable information (PII)

Other services mentioned in the architecture are,

- **Single Sign-on** - Single sign-on is a confirmation plot that permits a client to sign in with a solitary ID and secret key
- **Multi-factor Authentication** - AWS Multi-Factor Authentication (MFA) is a straightforward best practice that includes an additional layer of insurance on head of your client name and secret phrase.
- **AWS CloutTrail** - AWS CloudTrail is a help that empowers administration, consistence, operational reviewing, and danger inspecting of your AWS account.
- **Elastic Load Balancing** - Elastic Load Balancing automatically distributes incoming application traffic across multiple targets, such as Amazon Elastic Compute Cloud (Amazon EC2) instances, containers, and IP addresses, and multiple Availability Zones, which minimizes the risk of overloading a single resource.