CSE 546 - Cloud Computing
Project-1 : Individual Contribution Portfolio Report

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Individual Contribution

Setting up Infrastructure

To establish the Lambda function, several prerequisites needed to be configured. Initially, I created a new IAM Policy named "S3-DYNAMODB-CLOUDWATCHLOGS-ACCESS-FOR-LAMDA-FUNCTION-PROJECT2." This policy was defined to grant the necessary permissions for accessing CloudWatch Logs, DynamoDB, and S3 buckets. Subsequently, I proceeded to create a new IAM Role, denoted as "CSE546PROJECT2ROLE," to which I attached the previously mentioned IAM Policy. With these access permissions in place, my next task involved constructing an Elastic Container Registry Image.

To achieve this, I installed Docker Desktop for Windows and initiated a new session within the Docker Desktop environment. Subsequently, I accessed the command prompt and crafted the Elastic Container Registry Image. Upon completing this step, I proceeded to create the Lambda Function, which I named "AWSLAMDAFUNCTIONPROJECT2CSE546." During the Lambda Function setup, I associated it with the newly established IAM Role tailored for this specific project.

To finalize the infrastructure setup, I made some minor adjustments to the Lambda Function. Specifically, I increased the allocated memory size from the default 128 MB to 512 MB and extended the timeout duration from the default 3 seconds to 5 minutes. Lastly, I configured the Lambda function to trigger whenever any "create event" occurred within the specified input S3 bucket, which we named "cc-input-546" and specified to capture "ALL CREATE EVENTS."

Code Development

My specific role involved handling the extraction of new events triggered when a fresh file is uploaded into the S3 bucket. My primary objective was to identify and extract newly uploaded videos from the input S3 bucket, saving them to a local directory named "videos." Subsequently, I executed a process to remove the event, effectively deleting the recently uploaded video from the input S3 bucket. Following the successful implementation of this task, I proceeded to develop a function responsible for extracting images from the previously extracted video. The implementation of this function was straightforward, thanks to the sample command provided by our professor in the project description.

Lessons Learned

The second project, which involved building an elastic application using Platform as a Service (PaaS) on AWS Lambda, provided valuable insights and lessons that have significantly enriched our cloud computing and PaaS programming expertise. Throughout the project, we encountered several key takeaways that have enhanced our understanding of cloud-based applications, scalability, and serverless computing.

First and foremost, we learned the immense potential of PaaS in simplifying application development in the cloud. AWS Lambda, as a leading function-based serverless computing service, allowed us to focus on code development without worrying about infrastructure management. This newfound ease of development empowered us to build a more sophisticated application compared to our previous project, Group Project 1. It underscored the importance of using cloud-based tools and services to streamline development and maximize efficiency.

The project also exposed us to the practical challenges and complexities of building a smart classroom assistant. Implementing video processing, face recognition, and database integration required a deeper understanding of various technologies. We learned how to leverage Python libraries like face_recognition and integrate them seamlessly within the Lambda function, enhancing our programming skills and adaptability.

In summary, Project 2 provided a rich learning experience. It showcased the benefits of PaaS in cloud development, expanded our technical toolkit, and underscored the importance of scalability in cloud applications. Building a smart classroom assistant application on AWS Lambda not only equipped us with practical skills but also instilled a sense of innovation and enthusiasm for future cloud-based projects. The lessons learned from this project will undoubtedly serve as a solid foundation for tackling more complex and innovative cloud computing challenges in our educational and professional journey.

References

- Group Project 2: PaaS - Canvas Project Description
- face-recognition 1.3.0
- Cse546-project-lambda-Neha-code-repository