CS-470 Final Reflection

Youtube link to presentation: https://youtu.be/rWcVpSuI_2g

Joseph Kim

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The Full Stack Development II course has helped me become a more marketable candidate. I have learned about containers and its value proposition. The ability to "containerize" an applications code, libraries, and dependencies into a single executable called an image is extremely valuable. In addition, the course covered the concept of orchestration which abstracts away the complexities of running multiple containers. The course gave me practice using Docker to build and host containers for a simple app. In addition, a simple application was migrated to a serverless architecture paradigm using Amazon Web Services. I was able to AWS S3 to host the front-end logic for an app and then implement function as a service using AWS Lambda. AWS API Gateway was utilized to route request to the appropriate Lambda function. DynamoDB was employed to store relevant data and connected to the lambda functions.

I believe my strengths as a software developer is my attention to detail and my time management skills. This course required that I practice both in order to complete the assignments. The roles that I would like to assume follow closely to the skills of a frontend, backend, or full stack software engineer.

AWS's microservices and serverless tools can be used to efficiently manage and scale web applications. Errors can be gracefully handled and efficiently managed using Lambdas and Step Functions. Scaling can be addressed by utilizing AWS Auto Scaling. This service automatically adjusts capacity requirements based on the utilized EC2 and DynamoDB instances.

AWS provides the AWS Pricing Calculator which is a convenient tool to calculate or project costs based on specific use cases. This calculator provides a certain level of predictability in terms of cost when using a serverless architecture. However, auto scaling may need to be accounted for as costs can increase substantially based on utilization. Therefore, containers provide more cost predictability as they are hosted without autoscaling. A container's load will have to be adjusted manually for under or over utilization, which makes its cost more predictable.

When planning for expansion, several factors in the form of pros and cons should be considered. In the case that feasibility studies show that a large portion of the market share is favorable to the business, business expansion is sensible. In addition, if the cost studies show that additional expenses are outweighed by the potential income, then business expansion is sensible. This would ensure that expansion leads to additional revenue as well as higher retention of customer. By expanding a business, it can be assumed that issues associated with resources such as latency or bandwidth will be resolved. This in turn will ensure that customers remain happy and loyal. However, in the case that the cost to build out infrastructure and make additional hires is higher than the potential increase in revenue, then expanding the business is not sensible. Another portion that should be considered is the time to build said infrastructure and staff.

Elasticity and pay-for-service plays a large role when planning for future growth. Serverless elasticity is the ability for cloud service providers to dynamically adjust compute resources based on demand. Serverless pay-for-service model only charges for the resources (CPU, memory, and storage) used on a time period basis. These factors play a beneficial role in planning future growth by simplifying the complexities involved in the process. The decision to expand infrastructure to increase resource capacity is timely and costly. However, as serverless elasticity allows for users to easily increase or decrease resource capacity, this essentially nullifies this risk factor. In addition, the pay-for-service payment model allows expanding businesses to scale with more confidence. Cost of scaling is an

important factor for many businesses and the pay-for-service payment model ensures that a business will not overspend when expanding.