Marissa Sihapanya

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CS-470 Final Reflection

https://www.youtube.com/watch?v=f49bCdXlaHY

This course has been extremely helpful in harnessing the skills I need in the professional world, allowing me to reach my goals. With the emergence of cloud technologies, it's important to be proficient in one of the Big Three, and this course has taught me proficiency with Amazon Web Services and software development on said platform. Learning how to deploy applications using AWS aligns directly with me being a versatile software engineer. It's no longer about knowing the on-premises frameworks, but rather keeping up with the cloud. Full Stack Development II also introduced me to industry best practices, helping me to design more scalable, reliable, and secure applications—the essentials to highly skilled software development roles.

My new familiarity with AWS adds to my adaptability in cloud-based development and management. Not only that, but my thorough knowledge of IAM implementation throughout the development cycle in AWS helps me develop secure applications. By being familiar with AWS, I am much more marketable since I know how to deploy and maintain applications to the cloud, while understanding permissions to uphold security so that the applications remain secure and non-exploitable. Also, the experience with AWS exposed me to understanding AWS's cost efficiency and optimization techniques. This means I am highly aware of how to efficiently use resources, which employers who are looking to reduce cloud expenses will find attractive.

As a software developer, I have honed several strengths throughout my coursework. I am a much stronger problem-solver. My mindset in problem-solving is sharp, and I can break down complex tasks into manageable pieces, resulting in modular, reusable solutions. Transitioning from on-premises containerized development in Full Stack I to cloud deployments in Full Stack II demonstrates my adaptability. I can pick up new tools, frameworks, and technologies quickly, while applying them to practical use cases. Familiarity with cloud development is also key to succeeding in fast-paced environments, which are common in many software development roles. With the final presentation in intention to communicating with both technical and non-technical audiences, I have harbored a strong communication skill to collaborate effectively with all stakeholders. This ensures a smooth development cycle for everyone involved. I'm prepared to assume many roles in a new job, but with the skills I've prepared, I anticipate any of the following: Back-end Engineer, Front-end Engineer, Full Stack Engineer, DevOps Engineer, and Cloud Software Developer.

Full Stack Development II has taught me that cloud services are key to creating scalable, flexible, and cost-effective applications. AWS has a large array of services for developing modern web applications. Understanding how to leverage services such as S3, Lambda, and DynamoDB is essential to creating reliable solutions for evolving and specific business needs in the world of software development. Microservices involve breaking down a large service into smaller services, and deploying each smaller service, ensuring that each service interacts with each

other for the highly available deployment of a full-stack application. Modularizing such services allows for better maintenance and improvements as time passes. In the professional world, different teams can be assigned to different microservices, driving efficiency in such a world. Serverless architecture, in our case AWS Lambda, can reduce management overhead on a professional team. Amazon handles the server and automatically scales resources for code execution based on resource usage. This is perfect for dynamic sizes of traffic throughout the life of an application.

AWS Auto Scaling provides a service that automatically scales applications dynamically based on demand, ensuring high availability. In the case of serverless applications like we worked on, AWS Lambda and API Gateway naturally scale based on usage. For error handling, AWS provides a service called CloudWatch that allows for alerting and monitoring for real-time issues in applications. By using CloudWatch, I would ensure that error handling is robust throughout AWS Lambda or microservices. The AWS ecosystem is large, and sections do not exist in isolation. For predicting cost, the AWS Cost Explorer is a perfect tool to predict and monitor costs. It would also be helpful to monitor historical usage data and use AI models to forecast future costs based on previous traffic data. The question of whether containers or serverless are more cost predictable depends on the scenario. Serverless is perfectly cost predictable for variable workloads, since developers pay for what they use. However, containers can be more efficient when traffic is predictable.

For deciding plans for expansion in the cloud environment for applications, there are several pros and cons that need to be considered for AWS. AWS has high elasticity, scaling up or down depending on the traffic that comes through. AWS also has availability zones with global reach. Also, the pay-as-you-go model reduces upfront costs, encouraging businesses to grow sustainably from the beginning and throughout the development of their business model. However, as scaling increases, AWS's pricing models can become more complex. This can be remedied with careful monitoring of costs and expenses, but great attention must be taken to address such complexities leading to overspending. Another daunting con is that completely relying on AWS causes complications if a business may need to diversify their cloud providers on their horizon.

For planning future growth, elasticity and pay-for-service play crucial roles. Elasticity allows applications to scale on demand and minimize costs during low traffic. Such flexibility is highly important for applications that have variable traffic. Pay-for-service ensures that developers and businesses are only paying for the resources that are used. This information is beneficial for budgeting as applications grow. With the combination of AWS's ecosystems, businesses are best equipped to tackle their usage of the ecosystem and how they may approach their growth while using the ecosystem.