

Project 2

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<https://youtu.be/avAZuXqdUak>

Slide#1- Title

Hello, my name is Miguel Gonzalez. The purpose of this presentation is to articulate the intricacies of cloud development to both technical and nontechnical audiences

Slide#2 Overview

I will be discussing Containerization and Orchestration, benefits of the serverless cloud, cloud-based development principles, how to successfully migrate an application from Docker instance to Amazon's AWS environment, and how to properly secure the application once it is on the cloud.

Slide #3 Containerization

It is important to know the difference between containerization and virtualization. Virtualization enables you to run multiple operating systems on the hardware of a single physical server. A lot more resources are needed and moving VMs between public clouds, private clouds and traditional data centers can be challenging. Containers are more lightweight than VM's and require less resources to deploy, run and manage. containerization enables you to deploy multiple applications using the same operating system on a single virtual machine or server.

Slide#4 Orchestration

The tools necessary for containerization are Container tools, such as Docker compose, which is an open-source containerization engine. Docker Compose allows you to host multiple isolated environments on one host. Running everything on a single piece of hardware lets you save a lot of resources. Useful for development, testing, and staging environments.

Slide #5 Serverless cloud S3

Serverless allows developers to build and run the application while the providers of these servers manage them. This allows for greater scalability, more flexibility, and a quicker release time. Talking about flexibility, the pay-as-you-go model, which is common in serverless providers, allows developers to avoid the traditional way of paying, which was paying a specific amount of data all at once. This helps keep overhead costs down and increase storage as the need grows. Amazon's S3 storage is great for this and is highly secure encrypting data using AES-256, a strong and widely accepted block cipher that is also a federal government standard.

Slide#6 Serverless cloud Api & Lambda

The advantages of using serverless Api are no server management is necessary, developers are only charged for the space they use, there is a decrease in latency, allows for quick deployment and is highly scalable. With Lambda, you can run code for any type of application or backend service. All you need to do is supply your code in one of the languages that Lambda supports. To invoke Lambda functions you use Lambda Api or it can run functions when events are triggered from other AWS services S3 resources or data stored using DynamoDB. (Hendrix, 1983)

Slide#7 Database

Storing data using the most beneficial database is crucial for any application. The main ones are MongoDB and Amazon's DynamoDB. The main differences are MongoDB is cloud-agnostic and can be deployed on any major cloud provider with guaranteed availability and scalability while conforming to all the compliance and security standards. (14 & Wickramasinghe, 2021) Its core components are collections, documents, and fields. DynamoDB is a proprietary NoSQL database by Amazon and the core components are table, item, and attribute. Within the application we performed the CRUD queries, which are creating an item, reading an item, updating an item, and deleting an item. The Json test events we used allowed us to verify the application was performing as intended.

Slide#8 Development Principles

Cloud Elasticity is often associated with horizontal scaling architecture, and it is associated with public cloud provider resources that are billed on a pay-as-you-go basis. (2022) This helps keep costs down, allows organizations to meet demand if demand goes up and allows for actual consumption of cloud services.

Slide#9 Securing Cloud app

Securing and keeping an application secure is top of mind in any organization, so following the principle of least privilege is crucial. To follow this an organization should only allow users access to information they need, this helps prevent unauthorized access to resources. IAM provides the ability to regulate access to an AWS resource, check who accessed information with AWS CloudTrail, and the ability to integrate identity tech such as Microsoft's Active Directory. IAM works based on concepts consisting of users, groups, roles, and policies. A user is a specific individual, a group is a collection of users, policies define access to a resource, and roles are a collection of policies. To secure the connection between Lambda and Gateway by Lambda authorizer function. To secure Lambda and database as well as S3 buckets, policies can be used to allow users levels of information authorized to them.

Slide#10 Conclusion

Three main points that I believe are key to any application are having a secure serverless environment like AWS to help manage and secure an application. The benefits of a pay-as-you-go model allow you to pay only what you use, with the benefit of quickly scaling up and increasing usage when demand increases. Properly securing an application is the most important aspect and should have the highest priority.