7-1 PROJECT TWO

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SOUTHERN NEW HAMPSHIRE UNIVERSITY

CS470-H7426: FULL STACK DEVELOPMENT 2

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Presentation Link:

https://youtu.be/C14w_XdPLZQ

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Welcome to my CS470 Project Conference Presentation on Cloud Development.

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Hello, my name is Justin Haby, and I am a Full Stack Developer for the company known as QnA. I am here today to illustrate cloud computing concepts such as containerization and the serverless cloud concept and even outline the pros and cons of some of the methods. Throughout this presentation, my overall objective is to articulate the intricacies of cloud development to both technical and non-technical audiences.

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There are two typical migration models: Lift and Shift (Rehost) and Rearchitect (Refactor)

Rehost / lift and shift - in this method apps get to the cloud as they are
Rearchitect / Refactor – in this method apps undergoes changes in code and structure before getting to the cloud
Tools necessary for containerization are docker and Kubernetes.

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When juggling between multiple services and containers, things can become challenging. Docker compose solves this problem since it is a tool which can run multiple services and containers.
Docker is a widely used container tool that developers and operation teams use to create and automate deploying applications in lightweight containers on VMs. This is done to ensure that applications work efficiently in multiple environments. (Simpl!learn 2022)

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The servers are used, but the vendor charges only as per the usage, not the number of servers or a fixed basis.
S3 stands for simple storage service, it is cloud based and it is a storage solution
Compared to local storage: it is more secure, more available and it possesses more sophisticated disaster recovery capabilities.

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The advantages of using a serverless API include: no need for server management, one is charged only for the space used, scalability and quick app deployment.

Lambda API logic refers to a mapped path and a HTTP method combination to a lambda function used in the cloud. To make this happen, browser API scripts are produced.

To connect the frontend and the backend, the backend developers expose their services via REST APIs and the frontend teams connect to these APIs via their web or mobile applications therefore linking the frontend and the backend

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MongoDB is an open-source product, whereas DynamoDB is a service provided by Amazon via Amazon Web Services (AWS).
MongoDB stores its information in a JSON-like format. The main stored objects are called documents, which are grouped into collections. In MongoDB, you don't need to create a collection before inserting new documents, making it fast to use. (Panoply 2022)

In the case of DynamoDB, its databases are structured similarly to relational databases; you have tables that contain items that, in turn, have attributes. Although not every item in a table must have the same number of attributes. With this to use a table, you must first create it and define a primary key. (Panoply 2022)

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Elasticity refers to the ability of the cloud to expand or shrink based on the requirements of the end user's organizations
Pay-for-use model is a model that charges as per the number of resources utilized on the cloud.

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One way to prevent unauthorized access to your cloud application is to use a security group. "A security group is a collection of firewall rules that allow or deny traffic to your cloud application. You can create a security group and add rules that allow traffic from specific IP addresses or networks." You can also create rules that deny traffic from specific IP addresses or networks.

Another way to prevent unauthorized access to your cloud application is to use a VPN. A VPN is a private network that encrypts your data as it travels over the public internet. VPNs can be used to connect your cloud application to your on-premises network. This allows you to keep your data private and secure.

"Finally, you can use Identity and Access Management (IAM) to control who has access to your cloud application. IAM allows you to create users and groups." You can then assign permissions to those users and groups. This allows you to control who can access your cloud application and what they can do.

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Policies are the permissions that you set for each role. For example, you could create a policy that allows full access to an Amazon S3 bucket, and then attach that policy to a role. Any user who assumes that role would then have full access to the bucket.

The relationship between roles and policies is an important one in securing your cloud application. Roles are essentially like users; in that they have a set of permissions that determine what they are able to do. Policies, on the other hand, are the permissions that you set for each role. "So, for example, you could create a policy that allows full access to an Amazon S3 bucket, and then attach that policy to a role." Any user who assumes that role would then have full access to the bucket.

This relationship is important because it allows you to granularly control access to your cloud resources. By creating different roles with different policies attached, you can ensure that only the right people have access to the resources they need. This is a key part of security in the cloud, as it helps to prevent unauthorized access and data leaks

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How can you secure the connection between Lambda and Gateway?

A lambda authorizer can secure the connection between Lambda and Gateway, a secrets manager for Lambda and the database and encryption for S3 Bucket.

Lambda and the database

Amazon S3 can send an event to a Lambda function when an object is created or deleted. You configure notification settings on a bucket, and grant Amazon S3 permission to invoke a function on the function's resource-based permissions policy. (AWS 2022)

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In conclusion, there are two main methods for migrating a full stack app to the cloud rehosting and rearchitecting.

The concept of serverless cloud computing is an idea that has the potential to disrupt traditional cloud computing principles and makes the use of the cloud more flexible and attractive to customers.

Security in the cloud is essential as one must secure lambda and gateway connections using a lambda authorizer, lambda and database connection using a secrets manager, and S3 bucket using encryption techniques.

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