04/05/2023 LARA

Get AWS accounts via TU Delft. We can continue to use these reusable accounts which will be available for every few days.

If we train a model, we have to download the zip files and all the archives otherwise we will lose it.

It would be better to not use this for testing… Hard for them to reimburse if it is above 500.

Plan for today:

Go through 2 different workshops:

1. classic 3 tier application - introduces you to a lot of networking things in AWS

Security in the cloud:

* AWS is responsible for the security of the cloud
* Customers are responsible for their security in the cloud
* Our workloads reside in a single region
* in order to make it highly available => select 2 availability zones
* if you create a DynamoDB table, you have to select a region
* local zones → extensions of regions and availability zones in metropolitan areas
* AWS wavelength → ultra low latency, we only have wavelength in the US. (out of scope for us)
* what region are we operating in? We can use Ireland but for our accounts unsure where we are deployed, Ireland moving forward
* there are differences between regions, some services may not be available in all regions
* some regions are bigger than others, not all regions are equal
* ireland is one of the oldest regions, the first that operated in EU, one of the largest

Some of the core services:

* In the console you can see that there are different categories, services are clustered in different areas. Portfolio services for each of these workloads for customers. There are a lot of capabilities across all of that.

Pillars of AWS Well-Architected

* Operational Excellence
  + covers the part around operations, having a good view of monitoring and logging, solid way to handle incidents
* Security
  + how strong your authentication is
* Reliability
  + If a region goes down, what happens to your service? if an availability zone goes down what happens to your service? architect in a way where even when something unexpected occurs, your services are operational
* Performance Efficiency
  + have your application run at the same agreed upon level, customers shouldn’t be waiting longer
* Cost optimization
* Sustainability

When we create a workload, we need to go through all of the pillars above.

The application we create has to be well-architected.

Lambda operates by default in multiple availability zones. You don’t have to think about the reliability there too much.

**Compute in AWS**

Amazon EC2 - VMs

Elastic Beanstalk - deploys some foundational things for you, everything you might need for web application you can deploy with this, a more managed way to deploy basic architectures.

Auto Scaling - helps with performance efficiency

AWS Fargate - serverless containers on AWS, without having to assign EC2 instances - can use in our app but we probably will not need the containers

Amazon EKS - takes care of the control plane

Amazon ECS - another service for containers, it takes care of the orchestration as well, orchestrator is the service itself, does not have CPU or memory

AWS Batch - a way to run huge batch jobs, big pre processing jobs

Recommended services to be used in our application:

* 2nd lab is close to what we will be creating

AWS Graviton Processor

**Storage**

Amazon EBS (file system storage you have on your laptop), follows the protocol of a filesystem.

There are different versions of it, like the general purpose one is the one we will need. These are also the services that will reside in multiple availability zones. Amazon S3 is a block file system that can be used to store files + for static website hosting (in a whole region).

**Databases**

There are different options, we will see the relational and key-value store.

**Security**

The most important part of the AWS is identity and access management.

A VPC is a logically isolated section of AWS cloud. You are in a region and then you create your VPC within the region.

AWS CloudFront → content delivery network, operates with regional classes. Works as a content delivery network. Works with S3, content delivered faster to users.