DCF255-Group Assignment

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**Introduction**

Amazon is one of the most powerful companies in the world. It offers a variety of services and products, and one of them is cloud service. Since its first establish in 2006, Amazon cloud service has brought back huge profit for Amazon and its one of the best-selling service Amazon has. Its cloud infrastructure offers a combination of hardware and software along with computing power, scalability, security, reliability, affordable price and much more. In this article, we will understand why AWS is so popular and is chosen over other cloud provider, how VPC plays a major part in AWS cloud, Security Groups with NACLs and EC2.

Nowadays, most companies and businesses are using the cloud service as per their convenience. There are several tech giants providing the cloud services to the users in the best way possible with variety of affordable options available. Some of the examples are Google Cloud Services, AWS (Amazon Web Services), Microsoft Azure, IBM cloud computing. There are several reasons like, why many companies prefer AWS over any other cloud service. The first and most important reason is its uniform geographical distribution of servers and having a greater number of servers around the globe as compared to any other cloud computing service. This also reduces the latency problem to maximum extent, which is faced by the user due to the long distance between server and client. Consequently, improvisation in the client’s performance can be observed. Secondly, it gives a large variety in the affordable option of services according to the need of the client. For example, if any organization wants to access multiple resources from the service, it can access the core service of AWS, while if any organization only wants to access the only blockchain section of the service, they can use it with lesser price than the organization using the core services. Moreover, Amazon understands the market need and increases the low-cost options according to the need of market in current situation. So, as a result, small businesses can use this highly featured Amazon’s services efficiently without purchasing the high-priced technology. In addition to that, AWS provides the highest security possible, as it is monitored and maintained continuously at its data centers across the world. Also, there are very low chances that the amazon web services are not available or are under maintenance, which adds to another reason to use AWS over any other cloud service provider. Last but not the least, Amazon makes the deals with a lot of third party to make the AWS a better IaaS, PaaS, AND SaaS platform day by day. Considering all the above points, one can easily conclude that AWS (Amazon Web Service) is the best option among all the other cloud computing services.

• Virtual Private Cloud is a private computing power dedicated to a user, which can be a person or a whole enterprise.

• It functions like a data center, but it brings much more benefits to the customer

• A good example to virtual private cloud is like a reserved room in a big conference building. People who rent that room can do anything they want in the room with being noticed or interfered by the people outside.

• Cost

• A VPC is like a private cloud or data center. However, it’s virtual, which means it’s controlled and managed by another Company, in this article, it’s Amazon.

• If the company wants a private cloud for themselves, they have two options: build their own machine and install their own hardware, which is very expensive, or they can ask Amazon to provide them everything they need with a cheaper price.

• Saving more space

• As AWS provides VPC to customers through the internet, companies don’t have to worry about space needed to place the hardware

• Security: AWS provides top security to make sure the customer’s data don’t get interfered.

• Scalability: As the customers just need to pay for resource they use, they just need to pay more to get more resource at ease without thinking about installation

• With the advantages of using VPC and being a popular brand. AWS is used by 80% of the Fortune 500 companies

• Every company can have one or more VPC and they can all connect, communicate with each other which create a huge network environment in the world.

Security groups are what we call the safeguards in the AWS that controls the incoming and outgoing traffic from EC2 instance depending upon a pre-defined set of rules. The major key point of the security groups is that they work at the instance level of the Virtual Private Cloud. And because of this, the security groups can be enforced on multiple instances, whereas an instance can also relate to multiple security groups. The security groups are automatically created when AWS creates Virtual Private Cloud. Moreover, while the rules of the security groups can be updated, the security groups cannot be permanently eradicated.

NACLs are the same as security groups in a way that both control the incoming and outgoing traffic depending on the pre-defined set of rules, but the difference comes from the fact that NACLs work on the subnet instead of the EC2 instance. Therefore, NACLs usually relate to network-level security. As NACLs work at the subnet level of the Virtual Private Cloud, a single NACL can be associated with multiple subnets, however, a subnet can only have one single NACL related to it. Same as the security groups, NACLs are automatically created when AWS creates Virtual Private Cloud and while rules governing NACLs can be updated, NACLs individually cannot be deleted.

While a cloud network can be secured just by using NACL or a security group, it is recommended that both are used to create the most protection. The main job of both is to act as a virtual firewall that filters out the incoming and outgoing traffic. In the could network, NACLs filter out the traffic first and after that, it is filtered by the security groups. They both work at different levels, NACL at the subnet level and security groups at the instance level, so they do complement each other. However, security groups are considered as required for instance protection as each EC2 instance must have at least one security group associated with it. Whereas the NACL is referred to as more of a side option for instance protection.

Security groups work based on the rules they are set up with, so the more strict the rules are, the more the EC2 instances be secured. On contrary, NACLs are processed on individual bases as each of its rule are given a number and AWS started in ascending order as soon as the traffic matches any of those rules, it is allowed to pass, whereas if it doesn’t next rule is applied.

The best way to secure the cloud network is by NACLs as are the first level of protection and then having security groups defined to increase the security.

Diagram

Description automatically generated

Photo retrieved from: <https://www.javatpoint.com/aws-nacl-vs-security-group>.

Amazon Elastic computing cloud(EC2) is a part of Amazon Web services(AWS) which allows the users to access the virtual computers of in which they can run their own applications. It offers the broadest and deepest computing platform which has over 500 choices of the newest launched processor, storage capacity type, and the type of various operating systems. It is basically a virtual machine which is designed to handle the variety of workloads. It has a huge scalable computing technology, and this will allow the organizations to develop their product and they can deploy easily because the amazon cloud is faster, and they have a huge variety of cloud networks which can deploy the organization product to any part of the world.

* Main Features of Amazon EC2

1. Amazon offers very reliable environment where it does the service level agreement with the client of the availability of their EC2 model in the region selected by the client.
2. Amazon cloud is very secure and vast network of resources. So, it protects the data, and it makes the stored data secure.
3. The EC2 model offered by amazon is cheaper compared to other various because it uses the special price model which charges the company only for the resources they use.

Amazon uses the special software for the deployment of the applications in the amazon EC2 instances. This software is known as Code Deploy it is a deployment service which works automatically in deploying the application content that runs on a server and it can also deploy new features. It helps in avoiding the downtime during the deployment of the newer versions. Hence, the application deployment using the Amazon EC2 model is easy to adopt because companies can easily reuse the code and it gives the ability to the companies to stop the latest version and revert it back to the previous versions in case it there is any errors in the system.

**Diagram

Description automatically generated**

*Photo retrieved from:* [*https://www.tutorialspoint.com/amazon\_web\_services/amazon\_web\_services\_basic\_architecture.htm*](https://www.tutorialspoint.com/amazon_web_services/amazon_web_services_basic_architecture.htm)

[](https://www.youtube.com/embed/TsRBftzZsQo?feature=oembed)

*Source:* [*https://www.youtube.com/watch?v=TsRBftzZsQo*](https://www.youtube.com/watch?v=TsRBftzZsQo)

**Conclusion**

In conclusion, several reasons like better quality in cheaper price, variety of option, its infrastructure, flexibility, security, and availability are because of which, it is considered the best option over the other cloud services providers. In addition, the best feature different from others is ‘pay as you go’ pricing, which keeps it demand high in the market. AWS Is expanding day by day and helping the most people out there in the best way possible, overtaking the market of cloud computing.

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