**AWS Assignment 4**

1. Explain the Snowball concept.

Ans: AWS Snowball is a service that provides secure, rugged devices, so we can bring AWS computing and storage capabilities to your edge environments, and transfer data into and out of AWS. Those rugged devices are commonly referred to as AWS Snowball or AWS Snowball Edge devices.

AWS Snowball is a suitcase-sized data migration and edge computing device that comes in two device options: Compute Optimized and Storage Optimized AWS Snowmobile is a shipping container moved with a tractor-trailer.

1. Make a distinction between NAT Gateways and NAT Instances.

Ans: A NAT Gateway is an AWS service that allows a private subnet to have access to the Internet, but prevents the Internet from initiating a connection directly to the instances. While the NAT Gateway is needed for private subnets to have Internet access, it is created in a public subnet.

A NAT (Network Address Translation) instance is, like a bastion host, an EC2 instance that lives in your public subnet. A NAT instance, however, allows your private instances outgoing connectivity to the internet while at the same time blocking inbound traffic from the internet.

1. Describe the essential components of Amazon Web Services (AWS).

Ans:

1. Simple Storage Service

Amazon AWS provides S3 or Simple Storage Service that can be used for sharing large files or small files to large audiences online. Depending on the web server type that you are using, you can quickly run out of resources as sharing huge volumes of data online is very expensive. AWS provides cloud storage for your use that offers scalability for file sharing.

2. Simple Email Service

When you want to send emails to thousands of customers, you can’t just use an email service like Outlook or Gmail. Even if somehow you manage to send out the emails, email providers like Yahoo and Gmail will treat them as spam messages. Simple Email Service of Amazon is able to handle such transactional emails at an affordable cost.

3. CloudFront

Web data is transferred from a central server to an edge server’s distributed network which is closer to the location of the end-user. This task is performed by the Content Delivery Network or CDN. This distributes the website traffic loads better, improving the load times and providing a better experience for the end-user. Large CDNs are expensive. Amazon’s CDN service, CloudFront manages to bring everything under a single room and with no limit to its scalability.

4. Website hosting

AWS offers the advantage of not worrying about exceeding the allocated usage of resources. Hosting a website on AWS might not be a one-click installation but its scalability makes it perfect for hosting different websites.

5. File sharing system

Normally, in a large company, one central drive is used by all the computers for storing and sharing files with other members of the team. AWS offers a file-sharing system that is best suited for an organization with employees around the world. Once you set everything up, it works on scale forever. You will never run out of drive space and you will have access to the files from anywhere in the world.

Here are some other advantages of incorporating AWS in your business:

It allows the organizations usage of familiar operating systems, architectures, databases, and programming models.

There are no long-term commitments or up-front payment. You only pay for what you use which makes it a very cost-effective service.

You don’t have to spend a single penny to run and maintain data centers

With AWS services, you can enjoy faster deployments.

Adding or removing capacity is very easy.

You can quickly get access to the cloud with limitless activity.

Compared to private servers, the cost of ownership is low.

AWS services have hybrid capabilities.

It offers centralized management and billing.

Deployment of applications in several regions across the world is possible with just a few clicks.

What are AWS Components

1. Data Management and Data Transfer

To run HPC applications in the AWS cloud, you need to move the required data into the cloud. There are several data transport solutions designed to securely transfer huge amounts of data. This overcomes issues like a long time for transfer, high network costs, and security concerns. Also, you can automate the movement of data between the AWS cloud and on-premises storage. There are options for establishing a private connection to the AWS from your premises. This increases bandwidth to provide more throughput, reduces the cost of the network, and provides a consistent network experience.

2. Compute & Networking

There are several compute instances types that can be customized according to your needs. It also handles monitoring your application and adjusting its capacity for maintaining a steady and predictable performance at an affordable cost. Also, setting up application scaling across multiple services for multiple resources takes a few minutes. Enhanced networking options from AWS allow achieving lower inter-instance latency and higher bandwidth.

3. Storage

When looking for an HPC solution, you need to consider the storage options and cost. There are several flexible blocks, object, and file storage options in AWS services that allow permanent and transient data storage. It allows allocating storage volumes according to the size you need. You can store and access and data type over the cloud without doing a data migration project. Also, with AWS services, you can transfer your workload to the cloud from on-premises.

4. Automation and Orchestration

For using the infrastructure efficiently, you need to automate scheduling submitted jobs and the job submission process. AWS services allow you to run thousands of batch computing jobs through the dynamic provision of the computer resources on the basis of the requirements.

5. Operations and Management

As a system administrator, you are responsible for avoiding cost overruns and monitoring the infrastructure. There are several management and monitoring services that allow you to optimize utilization of resources, monitor the application, get a complete view of operational health, and respond to the performance changes.

6. Visualization

With the AWS services, you can easily visualize the engineering simulations’ results without moving huge amounts of data. Now, you can access the interactive applications remotely over a standard network and deliver application sessions to any workstation.

7. Security and Compliance

For running applications on the cloud, you need to have an understanding of regulatory compliance and security management. There are several quick-launch templates and security related services offered by AWS that helps in protecting data and customer privacy by putting strong safeguards in the AWS infrastructure.

1. When should you utilize a spin-up server? Use examples to demonstrate your point.

Ans:

* Reduced capital and operating costs.
* Minimized or eliminated downtime.
* Increased IT productivity, efficiency, agility and responsiveness.
* Faster provisioning of applications and resources.

1. Explain the concept of outlier car scaling.