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Subject Name & Code: Cloud Computing

Title of Assignment: Assignment 6: Case study on Amazon EC2 / Microsoft Azure.

Date of Performance: 5/12/2022	Date of Submission: 6/12/2022

Aim: Case study on Amazon EC2 / Microsoft Azure.

Problem Statement: Case study on Amazon EC2 / Microsoft Azure.

Background Information:

Amazon Elastic Compute Cloud (Amazon EC2)

- Amazon EC2 is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computing easier for developers.
- Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction.
- Amazon EC2 reduces the time required to obtain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change.
- Amazon EC2 changes the economics of computing by allowing you to pay only for capacity that you actually use.
- Amazon EC2 provides developers the tools to build failure resilient applications and isolate themselves from common failure scenarios.

1. **Elastic Compute Units:** The Elastic Compute Unit (ECU) was introduced by Amazon EC2 as an abstraction of computer resources. One EC2 Compute Unit provides the equivalent CPU capacity of a 1.0-1.2 GHz 2007 Opteron or 2007 Xeon processor.

2. **Amazon EC2 Instances Types:**
   › Standard
   › Micro
   › High-memory
   › High CPU
   › Cluster Compute
   › Cluster GPU

3. **EC2 Storage Types:**
   › Elastic Block Storage (EBS): Is persistent, network-based storage, which can attached to running instances or also used as a persistent boot medium.
   › Instance storage: It is the local storage, which is a non-persistent and data will be lost after an instance terminates.

4. **Elastic IP Addresses:** Amazon's Elastic IP Address feature is similar to static IP address in traditional data centres, with one key difference. A user can programmatically map an Elastic IP Address to any VM instance without a network admin help and without having to wait for DNS to propagate the new binding. It exists until it is explicitly removed. It remains associated with the account, even while it is associated with no instance.

5. **Amazon CloudWatch:** It is a web service that provides monitoring for AWS cloud resources and applications, starting with Amazon EC2. It provides you with visibility into resource utilization, operational performance, and overall demand patterns—including metrics such as CPU utilization, disk reads and writes, and network traffic. You can get statistics, view graphs, and set alarms for your metric data. Amazon CloudWatch will begin aggregating and storing monitoring data that can be accessed using web service APIs or Command Line Tools.

6. **Automated Scaling:** Auto Scaling allows you to automatically scale your Amazon EC2 capacity up or down according to conditions you define. With Auto Scaling, you can ensure that the number of Amazon EC2 instances you're using scales up seamlessly during demand spikes to maintain performance, and scales down automatically during demand lulls to minimize costs.

Comparison between AWS & AZURE:

The basis of comparison	AWS	AZURE
Compute	AWS uses Elastic Compute Cloud (EC2) as a primary solution for scalable computing and for management of software container with Docker or Kubernetes it uses ECS (EC2 Container service) and uses EC2 container registry.	For computing purpose Azure uses virtual machines and to scale for large extent uses virtual machine scale sets and for software management, in Docker container it uses Container Service (AKS) and uses Container Registry for Docker container registry.
Storage	Storage is next to the main service for the cloud provider. AWS uses S3 (Simple storage service) which is longest running than Azure. It offers Archive storage by a Glacier, data archive and S3 Infrequent access (IA)	Azure uses Storage Block blob for storage which are comprised of blocks and uploads large blobs efficiently. It uses Storage cool and storage archive for archiving data.
Networking	AWS uses a virtual private cloud for networking and uses an API gateway for cross-premises connectivity. AWS uses Elastic load balancing for load balance during networking.	Azure uses a virtual network for networking or content delivery and uses a VPN gateway for cross-premises connectivity.

Deploying Apps	AWS also offers similar solutions with Elastic Beanstalk, Batch, Lambda, container service etc. But it doesn't have many features on app hosting side.	Azure has multiple app deployment tools such as cloud services, container service, functions, batch, app services etc.
Database	Almost all cloud providers provide an ability to implement a database in both SQL and NoSQL solutions. AWS uses a relational database as a service by using RDS, for NoSQL it uses Dynamo DB and caching it uses Elastic Cache.	Azure uses SQL database, MySQL, and PostgreSQL for the relational database, it uses Cosmos DB for NoSQL solutions and Redis Cache for caching purpose.
Open-source Developers	AWS is excellent for open-source developers as it welcomes Linux users and offers several integrations for different open-source applications.	Azure provides the facility for enterprise users so that they can use current active directory account to sign on the Azure cloud platform and runs .net framework on Windows, Linux, and MacOS.

GitHub Repo Link:
https://github.com/Vidhyapati/CCA-Assignments

Conclusion:
AWS EC2 users can configure their own VMS or pre-configured images whereas Azure users need to choose the virtual hard disk to create a VM which is pre-configured by the third party and need to specify the number of cores and memory required.