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SCHOOL COMPUTING AND IMFORMATICS TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

MASTER OF SCIENCE IN COMPUTER SCIENCE

MCS 7101

CLOUD TECHNOLOGIES AND ARCHITECTURES

AMAZON S3 & EC2 ASSIGNMENT

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Qtn. Review the Amazon S3 Service and EC2. What are the differences, and capabilities? What are the challenges. What are the strengths and shortcomings?

Amazon S3 service, which is Amazon Simple Storage Service is an object storage service that provides scalable and durable storage for various types of data, that is, files, documents, images, backups and more.

It stores its data in buckets which are containers where the objects are stored. The Objects are the actual content stored in the bucket.

Amazon EC2, which is Amazon Elastic Compute Cloud provides virtual servers in the cloud, known as instances, which allow users to run applications and perform computing tasks on scalable resources.

Amazon EC2 instances can be customized with difference configurations such as CPU, memory, storage and networking options.

Both Amazon S3 services and Amazon EC2 are services provided by Amazon Web Services.

Capabilities of Amazon S3

1. Amazon S3 has different storage classes for example Standard, Glacier which can meet different storage needs and budgets for users.
2. Amazon S3 can highly integrate with other Amazon web services like Amazon EC2, making it easy to use.
3. It is optimized for fast data access, offering high performance, low latency, and high throughput.
4. Amazon EC2 stores data across multiple availability zones, ensuring both high availability and durability.

Capabilities of Amazon EC2

1. Amazon EC2 allows you to scale computing capacity up or down as needed, without requiring any modifications to the underlying infrastructure.
2. Amazon EC2 is easy to integrate with other Amazon Web Services such Amazon S3.
3. Amazon EC2 lets you select your preferred operating system, whether it's Linux, Windows, or other platforms.

4. It provides multiple management options, such as a web-based console, command-line interface, and APIs, enabling users to easily manage their instances.

Differences between Amazon S3 service and Amazon EC2

1. Amazon EC2 is an Instructure as a Service (IaaS) while Amazon S3 is Storage as a Service (SaaS).

2. Amazon EC2 is commonly used for running web servers, application servers, databases, batch processing tasks, and other computing workloads that require flexible and scalable compute resources whereas Amazon S3 is ideal for storing and serving large volumes of static content, backups, media files, data archives, and content distribution. It is often used in conjunction with other AWS services to store and deliver data efficiently.

3. Amazon EC2 pricing depends on the selected instance type, the number of instances, and the hours of usage Amazon S3 charges are based on the volume of data stored, the number of requests for data retrieval or storage, and any associated data transfer costs.

4. Amazon EC2 can be scaled up or down depending on the computing needs while Amazon S3 can automatically scale to accommodate any amount of data or traffic.

Shortcomings of Amazon S3.

5. **Latency:** While designed for high availability, S3 can experience latency issues for certain types of workloads or large numbers of requests.

6. **Cost Complexity:** Costs can become complex to manage with varying storage classes, request types, and data transfer fees, potentially leading to unexpected expenses.

7. **Data Consistency:** Although S3 provides strong read-after-write consistency, eventual consistency might apply in some cases, which could impact data retrieval for recent updates.

8. **Limited to Object Storage:** S3 is designed specifically for object storage, which might not be ideal for applications needing file system capabilities or block storage.

Shortcomings of Amazon EC2

Cost Management: Can become expensive if not properly managed, especially with on-demand pricing; costs can quickly escalate with high instance usage and additional services.

Complexity: The range of instance types, storage options, and configuration settings can be overwhelming for new users and may require significant management and optimization efforts.

Resource Management: Instances require manual management of scaling and load balancing unless integrated with additional services like Auto Scaling or Elastic Load Balancing.

Security Configuration: Users need to carefully configure security settings, such as firewall rules and access controls, to prevent potential vulnerabilities.