SOFT4221 Cloud Solutions: Amazon Web Services

Final Homework

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1. How can LimonAkademi handle incoming attacks?

To protect against incoming attacks, LimonAkademi should implement a combination of AWS Shield and AWS WAF (Web Application Firewall).

- **AWS Shield**: This service provides protection against Distributed Denial of Service (DDoS) attacks. It's integrated with Amazon CloudFront and automatically provides baseline protection against the most common attacks without any additional charges.
- **AWS WAF**: This service allows you to monitor HTTP and HTTPS requests forwarded to an Amazon CloudFront distribution, Amazon API Gateway REST API, or an Application Load Balancer. It helps in controlling access to content by blocking harmful traffic based on IP addresses, HTTP headers, HTTP body, or URI strings.

2. How can LimonAkademi handle high traffic without experiencing downtime?

To handle high traffic and avoid downtime, LimonAkademi should use Auto Scaling, Elastic Load Balancing (ELB), and potentially Amazon RDS Multi-AZ deployments.

- **Auto Scaling**: Automatically adjusts the number of Amazon EC2 instances in your infrastructure to handle the load effectively. It ensures that the number of instances increases during demand spikes to maintain performance and decreases during demand lulls to minimize costs.
- **Elastic Load Balancing (ELB)**: Distributes incoming application traffic across multiple targets, such as Amazon EC2 instances, containers, and IP addresses. It can handle the varying load of your application traffic in a single Availability Zone or across multiple Availability Zones.
- **Amazon RDS Multi-AZ Deployments**: For database scalability and high availability, using a Multi-AZ deployment can ensure that database operations continue without interruption during maintenance events and DB instance failures.

3. Where should LimonAkademi store the information of registered students, and what approach can be taken in case of a downtime?

For storing registered students' information, Amazon RDS (Relational Database Service) should be used. In case of downtime:

- **Amazon RDS**: Provides a managed relational database service with several options such as MySQL, PostgreSQL, Oracle, etc. It handles routine database tasks such as patching, backup, recovery, and scaling.
- **Multi-AZ Deployment for RDS**: In case of a downtime, Multi-AZ deployment for RDS ensures high availability. If the primary DB instance becomes unavailable, RDS automatically fails over to the standby so that database operations can resume quickly without administrative intervention.

4. How can LimonAkademi reduce latency while delivering static content worldwide?

To reduce latency in delivering static content worldwide, Amazon CloudFront should be utilized.

- **Amazon CloudFront**: A content delivery network (CDN) service that securely delivers data, videos, applications, and APIs to customers globally with low latency and high transfer speeds. It caches content in edge locations worldwide, so the content is closer to users, reducing latency.

5. How can the LimonAkademi Administrator and Developer teams solve the authorization problem?

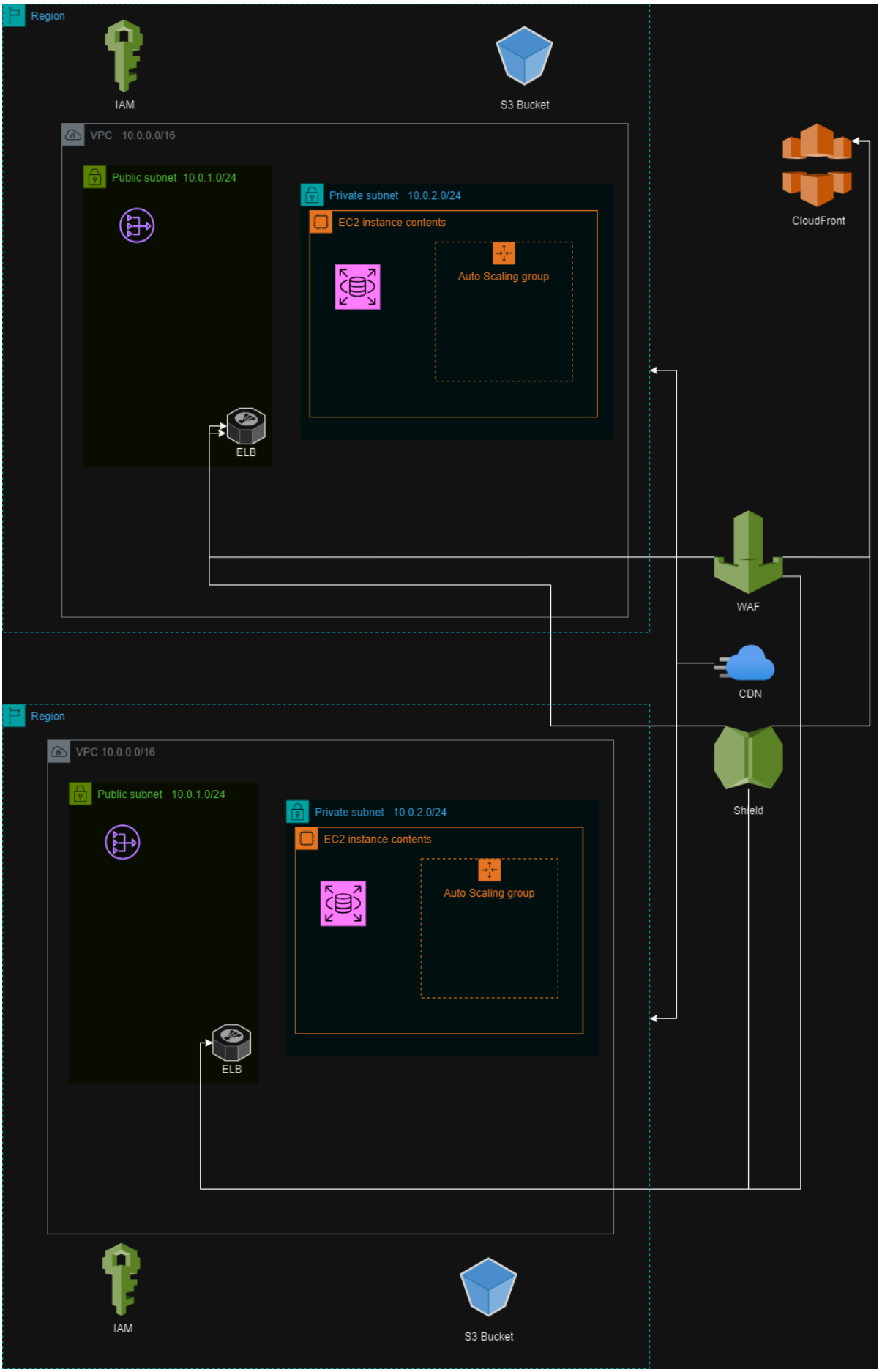
To solve the authorization problem for the Administrator and Developer teams, AWS Identity and Access Management (IAM) should be used.

- **AWS IAM**: Allows the creation of multiple users and groups with specific permissions and roles. For LimonAkademi, distinct IAM roles and policies can be created for the Administrator and Developer teams. Each role will have specific permissions that align with the team's responsibilities, ensuring secure access control.

6. How can LimonAkademi optimize costs for outdated static content?

To optimize costs for outdated static content, Amazon S3 with Intelligent-Tiering is the recommended solution.

- **Amazon S3 with Intelligent-Tiering**: This storage class automatically moves data to the most cost-effective access tier based on how frequently it is accessed. It's ideal for data with unknown or changing access patterns. For outdated content that is accessed less frequently, this can lead to significant cost savings.


Region
IAM
S3 Bucket
VPC 10.0.0.0/16
Public subnet 10.0.1.0/24
Private subnet 10.0.2.0/24
EC2 instance contents
Auto Scaling group
CloudFront
ELB
WAF
CDN
Shield
Region
VPC 10.0.0.0/16
Public subnet 10.0.1.0/24
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