CPR101-Activity 6

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# Part A: Client-Server Scenario Analysis (50%)

## Select a Scenario (15%):

Choose a real-world scenario where client-server architecture plays a significant role. Examples could include a healthcare information system, e-commerce platform, or an online banking service.

* Social Media Platform

## Client-Server Mapping (15%):

Identify the components in your chosen scenario that represent the client and those that represent the server. Create a clear mapping illustrating how they interact.

| CLIENT | SERVER |
| --- | --- |
| Thick Client: web interface | Server/Host |
| Client App/Smartphone App | App Server |
| Front-end | Back-end |

## System Requirements (20%):

Define the specific requirements for both the client and server components in the scenario. What functionalities should the client offer, and what services should the server provide?

| CLIENT | SERVER |
| --- | --- |
| Front-end requests/User interface | Back-end API, multi-user processing |
| Log-in with username/password | Authentication/Authorization system |
| User data management | Database/Encryption |
| Post content, view/engage with others' content | Database, real-time notifications, authorization system |

# Part B: Cloud Services Evaluation (50%)

## Cloud Service Selection (20%):

Research and select a cloud service provider (e.g., AWS, Azure, Google Cloud) that could host the server component of your scenario. Justify your choice based on factors like scalability, security, and cost.

I would use AWS to help facilitate the server components for the following reasons:

* **Elastic Scalability:** “AWS Auto Scaling monitors your applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost”
* **Security:** AWS offers a wide variety of security features and compliance certifications.
* **Global Infrastructure:** AWS operates data centers worldwide, allowing for fast speeds to users globally and ensuring a high rate of availability and reliability.
* **Managed Services:** AWS provides fully managed services like Amazon RDS, DynamoDB, and Lambda.

## Cloud Service Features (20%):

Describe the cloud services and features that your chosen provider offers to support your client-server scenario. Explain how these services can enhance the scalability, availability, or security of your system.

* **Amazon EC2:**
  + Scalability: Easily scale resources up or down to match demand.
  + Availability: Distribute instances across multiple geographical zones for more reliability and faster speeds.
* **Amazon RDS:**
  + Scalability: Automatically scale database capacity as data grows.
  + Availability: Offer multiple deployments and back-ups.
  + Security: full range of encryption options to satisfy company or governmental requirements.
* **Amazon S3:**
  + Scalability: Store and serve large volumes of user-generated content.
  + Availability: Replicate data across multiple geographical zones for high availability and faster speeds.
* **Amazon CloudFront:**
  + Scalability: Cache content at edge locations to reduce server load and improve scalability.
  + Availability: Provide DDoS protection and enhance reliability through distributed content delivery.

## Cost Analysis (10%):

Analyze the estimated costs associated with using the selected cloud services for one year. Include factors like data storage, data transfer, and compute resources. Provide a cost breakdown.

* I have high hopes for this social media site so I have allocated a minimum of 10 EC2 instances with a max of 100 for a peak rate of 8 hours daily. This ensures that if we get a lot of daily traffic, typically after regular work hours, our servers won’t get overloaded.
* I have also allocated a minimum of 1 RDS SQL database with a max capacity of 10 as data grows.
* Amazon S3 will take in 10 TB of storage a week and will be accessed daily.
* CloudFront will use dynamic scaling to determine the amount of data to cache at edge locations.

