

Multi-ClientGame System

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TCP Socket Connection



1 Latency Concerns
Minimizing delays for smooth gameplay.

2 Scalability Issues
Handling many concurrent players efficiently.

Problem Description

- TCP-based Client-Server Quiz Application with multithreading for handling multiple clients.
- User authentication, timed quiz rounds, and real-time feedback and scoring provided to each client.
- Scoring includes penalties for incorrect or missed answers, with final scores sent to clients.
- Extra Buzzer Round Quiz
- Alternating Quiz With Option To Challenge

System Architecture

Client-Side

Handles user interface and input.

Server-Side

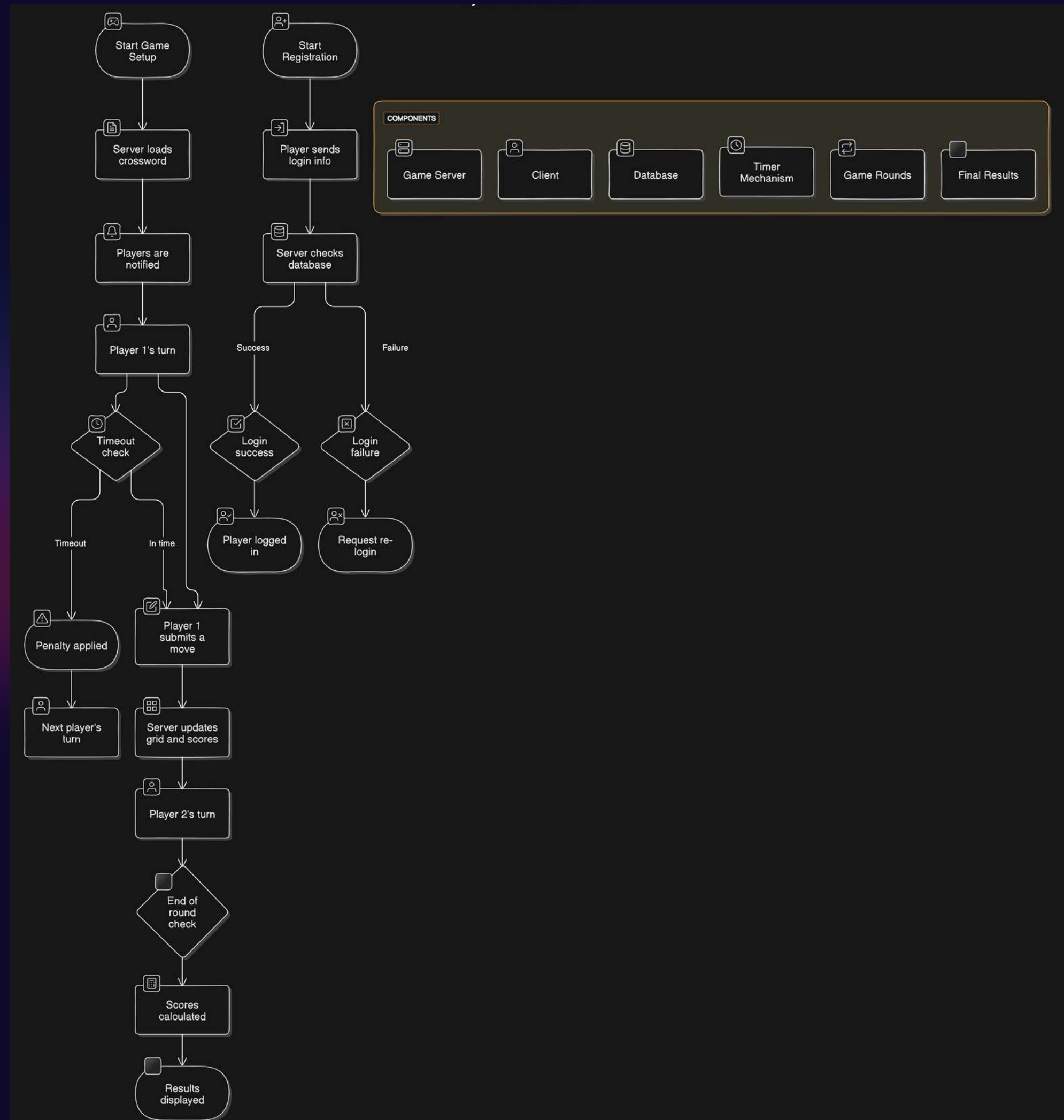
Game logic, networking, and data management.

Database

Persistent storage for player data.

Game Server

Manages game state and player interactions.



Client-Server Relationship

1

Client Request

Player sends input to the server.

2

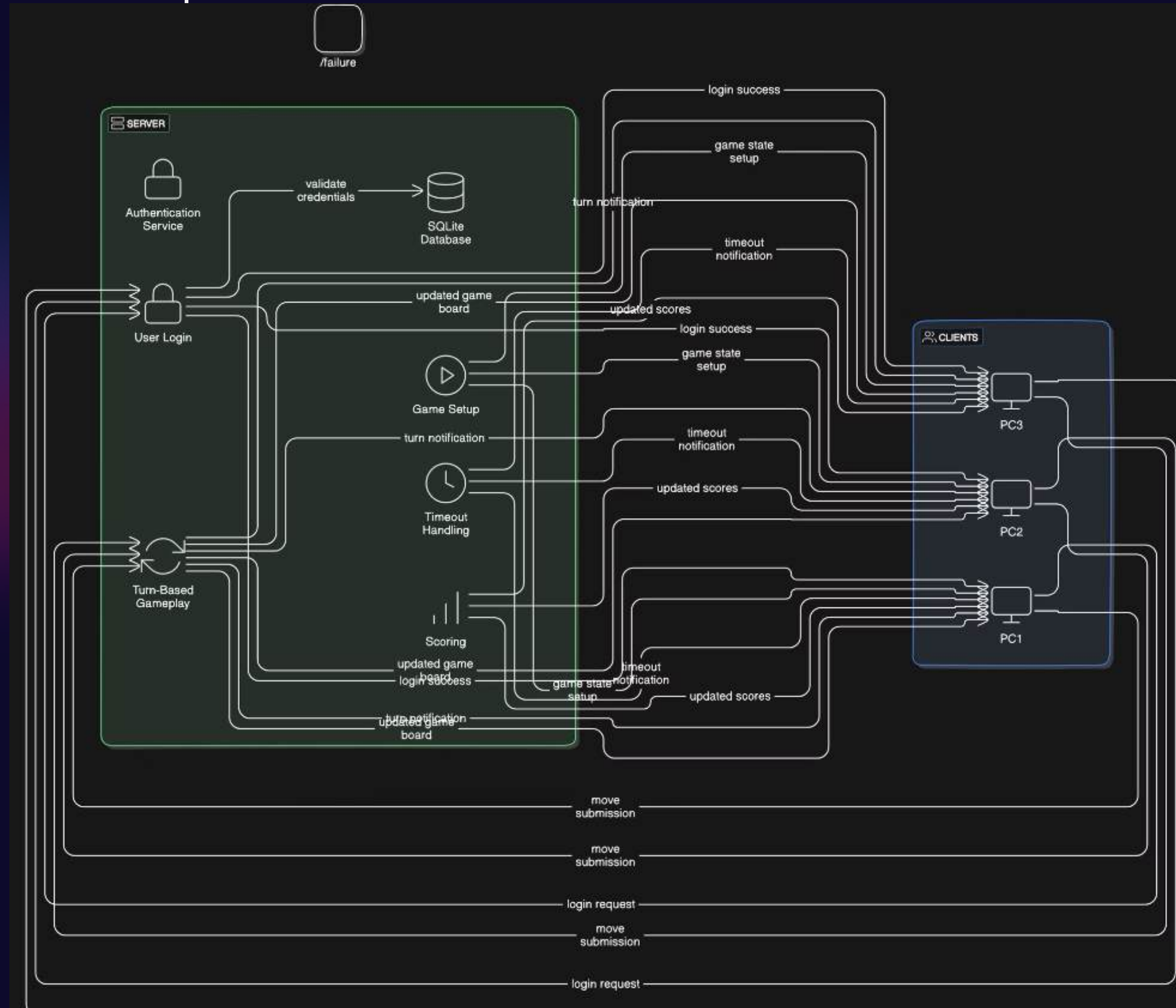
Server Processing

Server updates game state.

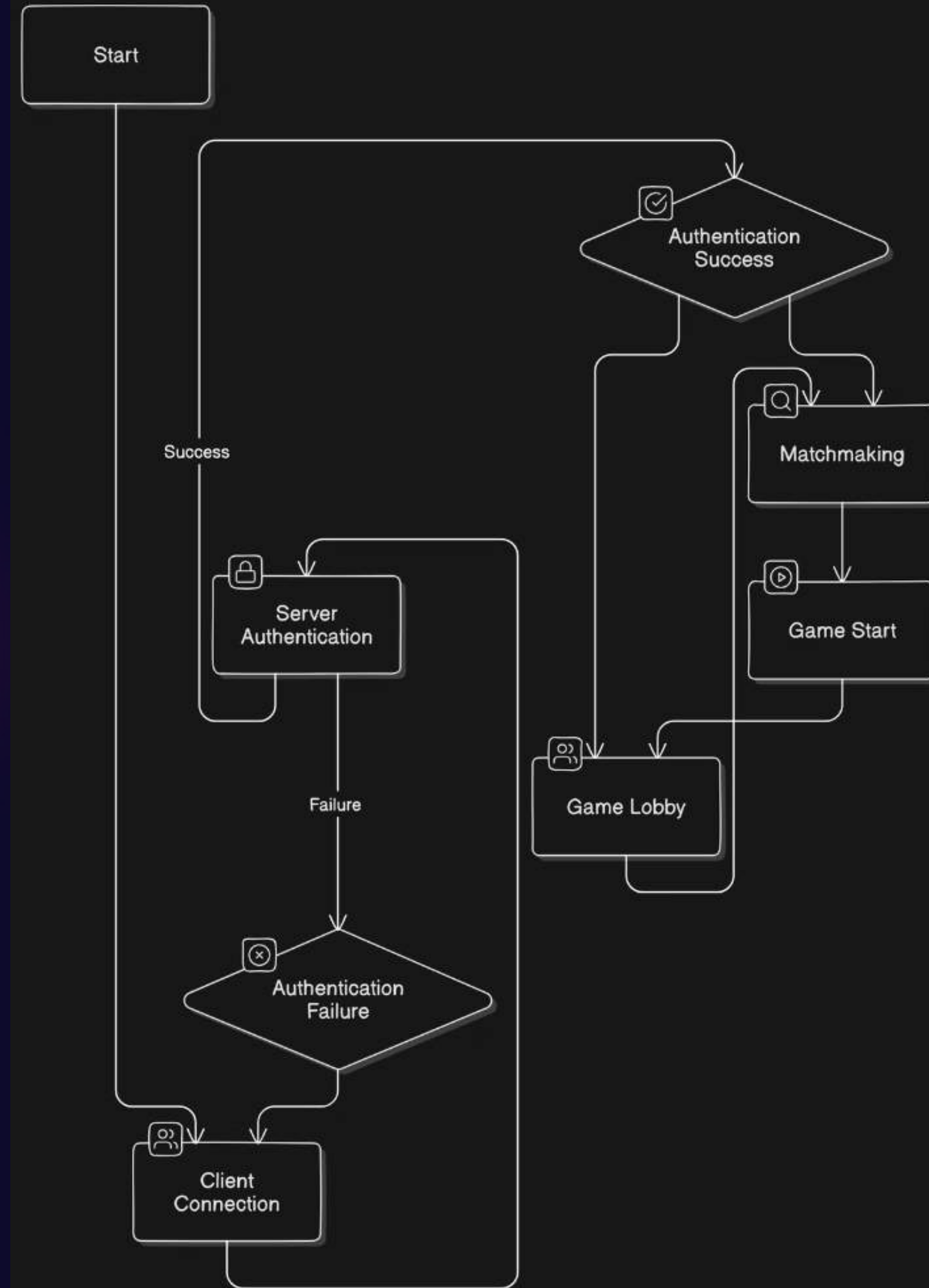
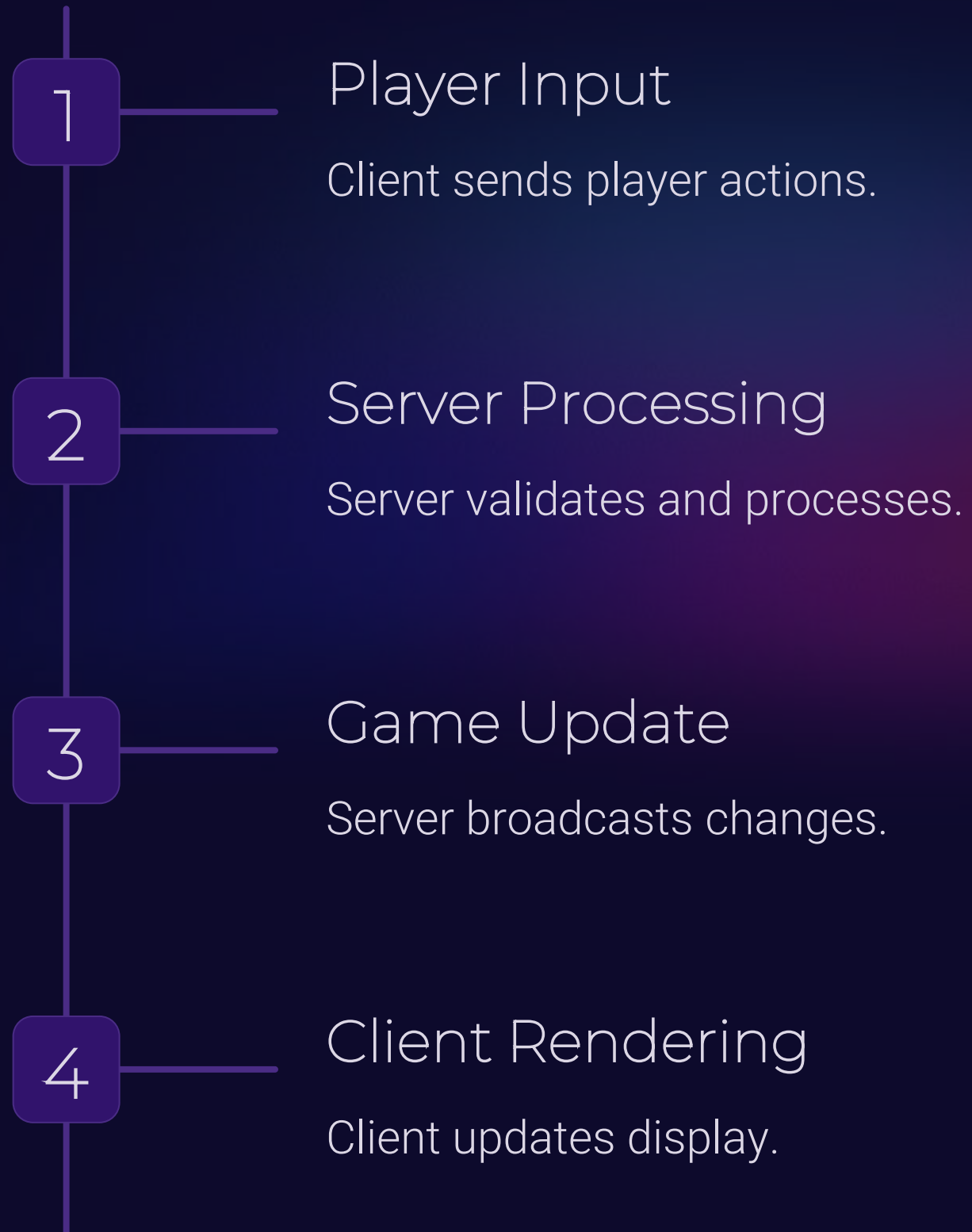
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Server Response

Server sends updates to the client.



Component Flowchart



Server Functionality

1

Connection Management

Handles client connections and disconnections.

2

Game Logic

Implements game rules and updates the game state.

3

Data Persistence

Saves and loads game data to the database.

4

Quiz with alternation, challenges, and session management

Two players alternate answers on separate client instances.

5

Extra Buzzer Round Quiz

Quiz server with Buzzer round: rewards the fastest correct answer.

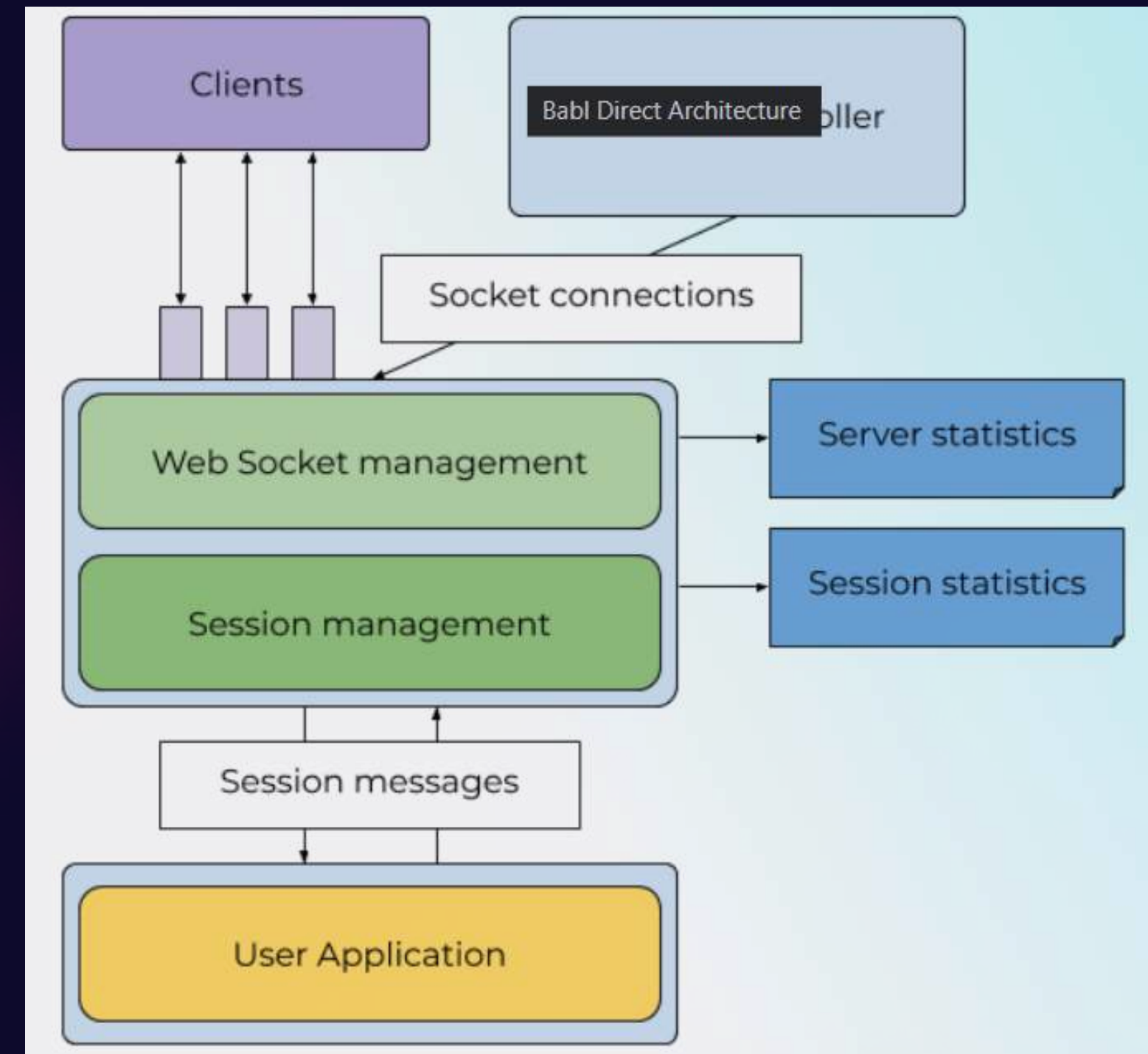
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Scoring Scheme

1. Correct Answer : 10 points
2. Incorrect Answer
 - Normal : 0 points
 - Challenge : -10 points

Networking Sockets

TCP	Connection-oriented, reliable
Sockets	Endpoint for network communication
Ports	Unique identifiers for applications



IMPLEMENTATION CHANGES



Debugging

Identifying and fixing errors.



Security

Protecting against vulnerabilities.



Optimization

Improving performance and scalability.

Identify the Error

Fix & Validate



Find the Error Location

Analyze the Error

Prove the Analysis

Cover Lateral Damage

Conclusion

- TCP Multi-Client Game System enables real-time, reliable multiplayer gameplay using TCP socket programming.
- Multi-threaded server architecture efficiently handles multiple clients, ensuring smooth gameplay and data integrity.
- Provides a scalable and secure multiplayer environment with potential for future scalability and security enhancements.

THANK YOU

