Networking & Database Implementation Plan

Online Multiplayer Board Game Platform (OMG)

Overview

This implementation plan outlines the steps required to fully integrate the networking and database components of the OMG project. The plan follows a structured approach, ensuring that each component is developed, tested, and integrated on time.

- **Iteration 2 Deadline: March 21, 2025**
- **Iteration 3 Deadline: April 4, 2025**
- **Development Start Date: March 5, 2025**

Implementation Timeline

Phase 1: Core Infrastructure Setup (March 5 – March 12)

Objective: Establish the foundational components for networking and database interactions.

March 5 – March 7:

- Set up the **PostgreSQL database** and define the **schema** (tables for players, match history, and leaderboards).
- Implement the **database connection system** to facilitate communication between the server and the database.

March 8 – March 9:

- Implement **user authentication**, including registration, login, and session management.
- Ensure that all passwords are securely hashed before storage in the database.

March 10 – March 12:

- Set up the **networking system** using WebSockets to manage real-time communication between players and the server.

- Develop a basic **server capable of handling multiple connections** and relaying messages between clients.

Deliverable: A functioning **server with authentication and database integration**, capable of handling user logins and maintaining session states.

Phase 2: Game Session Management & Core Communication (March 13 – March 18)

Objective: Implement the server's ability to create and manage game sessions, ensuring smooth communication between players.

March 13 – March 14:

- Develop the **game session management system** to handle matchmaking and track active sessions.
- Define a **structured message format** for communication between the server and clients.

March 15 – March 16:

- Implement **game state synchronization**, ensuring that all players receive consistent updates.
- Develop a mechanism to **validate player moves before updating the game state**.

March 17 – March 18:

- Implement **player reconnection handling**, ensuring that players can rejoin a game if they disconnect.
- Conduct **initial integration testing** to ensure that sessions are properly managed.

Deliverable: A functioning **game session system** where multiple players can join, interact, and receive real-time updates.

Phase 3: Database Integration for Match History & Leaderboards (March 19 – March 21)

Objective: Enable permanent storage of match data and retrieval of player statistics.

March 19 – March 20:

- Implement **match history storage**, recording completed games and player performance data in the database.

- Enable players to **view past matches** by retrieving stored data.

March 21:

- Implement **leaderboard functionality**, dynamically ranking players based on their match history.
- Optimize database queries for efficient retrieval of player statistics.

Deliverable: A fully integrated **match history and leaderboard system**, capable of storing and displaying player records.

Phase 4: Testing, Security, and Iteration 2 Submission (March 22 – March 26)

Objective: Finalize all components for Iteration 2, ensuring system stability and reliability.

March 22 – March 23:

- Conduct **end-to-end testing** for authentication, game sessions, and database interactions.
- Debug any outstanding issues in game state updates and player synchronization.

March 24 – March 25:

- Implement **basic security measures**, including input validation and ensuring proper handling of user authentication.
- Verify that **session management and player reconnections** work correctly.

March 26:

- Final debugging and documentation updates.
- Submit **Iteration 2 deliverables**, including code, documentation, and diagrams.

Phase 5: Refinements & Final Submission (March 27 – April 4)

Objective: Address any remaining issues, complete final integration, and prepare for submission.

March 27 – March 30:

- Ensure that all required functionality is implemented and working as expected.
- Refine code structure for better maintainability.

March 31 – April 2:

- Conduct final **system-wide testing** to confirm stability.
- Complete documentation, including architecture diagrams and implementation notes.

April 3:

- Final debugging and last-minute fixes.

April 4:

- Submit **final deliverables**, including the fully implemented networking and database systems, supporting documentation, and test results.

Summary of Key Deliverables & Deadlines

Phase	Date Range	Key Deliverables
Core Infrastructure Setup	March 5 – March 12	Database setup, authentication system, basic networking
Game Session Management	March 13 – March 18	Matchmaking, game state synchronization, move validation
Database Integration	March 19 – March 21	Match history storage, leaderboards
Testing & Security	March 22 – March 26	Iteration 2 submission
Final Refinements	March 27 – April 3	Bug fixes, testing, documentation completion
Final Submission	April 4	Fully implemented networking and database system