# Tanks 2-D

Requirements

1. **Introduction and Context**

Group 5 is creating a distributed turn-based tanks game based on the many flash-based tanks games available to play online. It will be based on the Unity game engine with a server to organize and start games, along with multiple game servers to run each individual game. Another system will be used to track players specific statistics based on all previous games, and record these statistics in a database.

1. **Actors and their Goals**

The actors in our system are the players. Each player's goal is to open the game, find a lobby, and when ready start a game wherein the game server takes over the game instance. At any point, they may view their statistics or search the statistics of another player.

1. **Functional Requirements**

When starting the game, a player will be taken to a main screen before joining the main lobby.

A player must be able to see multiple game lobbies, and join one.

A player must be able to search statistics of any player and receive accurate records.

In a game, a player must be able to control their tank's position and attack including weapon, angle, and distance.

A player must be able to leave a game at any point, and the opponent will be notified of the departure and his own victory.

A player who quits the application will automatically leave any lobby or game and all connection attempts will stop.

A message queue will be enabled to ensure that each client is given messages in order while the message communicator attempts to resolve any out of order errors.

Messages will be check summed and will be used to verify their correctness. The communication manager will attempt to fix errors by requesting the message sent again.

The communication manager will request that all messages send will be acknowledged. If not, the communicator will send the message again.

The communicator will keep track of the number of tries for a message to be acknowledged. If more that three attempts are unsuccessful, the connection will be assumed to be down.

The client and server will perform a key handshake by encrypting AES keys using an RSA public key.

The server will encrypt all messages after the handshake is complete.

1. **Non-functional Requirements**

This system will be coded in C# and created in Unity.

It will connect to the internet and allow players to play from any location with internet.

We will host the main lobby/match creation on a Windows Server Virtual Machine on AWS.

We will host the statistics and score database on a Windows Server Virtual Machine on AWS.

We will host matches on real-time spin-up servers on a Windows Server Virtual Machine on AWS.

1. **Future Features**

Features that may be added if the project goes faster than expected:

* A friends list including who is currently online, and an option to create a game with them.
* Team matches consisting of four, six, or any number of players.
* Different game modes such as king of the hill or bounty hunter (kill a npc tank to win)
* Chat for various game lobbies
* A player disconnected by internet interruption can rejoin a game without conceding the match.
* Each player could be able to purchase some different kinds of weapons.
* Various tanks with weaknesses and strengths
* The ability for players to have stored login information and stats
* The ability to log in and out of the system