

1 Main idea

Battle490

An **AR turn-based strategy game** that can be played on a table or street or any kind of surface that can be used to set up the AR game field.

The main idea for the game is the player will have the ability **to control multiple characters** (called “toon”) from their own team and **destroy the enemy’s Supercomputer** (after collecting enough points (490 points) in the duration of the game) to win the game. Also, player will have to **work on a strategy to protect their own Supercomputer** with the toons in their disposal.

At the start of the game, player will initially have only 5 toons in their team. As the battle goes on, player can navigate their toons and interact with items on the field for the possibility to spawn more toons into their team, increasing their total score, or got penalized by collecting a random bomb disguised as collectable items.

2 Characters (“toons”)

2.1 General idea

There are 3 types of toons that a player can get their hands on. By rank (1 being the most powerful), they are:

1. CPU
2. RAM
3. Hard Disk

Each of these types of toons can be commanded around on the field by each player. Each toon has their own **HP (health points)** - depleting one's HP will destroy the toon. For each player's turn, **they can give 2 commands to each of the toons** that they have. Commands that player can give to their toons includes

1. Move
 1. When a toon has been selected and commanded to move, a square box will be available for player to see. Player are free to move that selected toon, if it is within that square box area.
2. Attack
 1. Similar to Move command, a square box area will be visible when the player have selected this command, albeit a bit smaller area than that of Move command. The selected toon can only attack one enemy toon that also inside that square area.
3. Disassemble
 1. This can only be used when there's a desktop nearby to spawn more characters into their team.

2.2 Design

In order for player to have easier time recognizing the type of each toons, all playable toons will be **designed based on their type** which are

1. CPU
2. RAM
3. Hard Disk

2.3 Type

1. There are 3 types of character, namely CPU, RAM, and Hard Disk
 - a. At the start of the game, each player will have 5 initial toons – 1 CPU, 1 RAM, and 3 Hard Disk.
 - b. Any of the toon can go and spawn more toon for their team (by interacting with desktop scattered around the playing field), but the newly spawned toon can only be the toon of a lower level. CPU have the possibility of spawning either a new RAM or Hard Disk, while both RAM and Hard Disk can only spawn a new Hard Disk toon.
2. Each type has **fighting advantage and disadvantage** against the other type. This mechanism is simply according to the level of the particular toon types.
 1. A toon can attack and destroy an enemy's toon of lower level
 2. A toon will also have a chance to do some damage to an enemy's toon of the same level
 3. A toon cannot give any damage to an enemy's toon of higher level

3 Playing field

3.1 Mechanics

The playing field will be **grid-based**, with each toon can choose to which grid they want to move to.

There will be several items that will be scattered around across the whole map.

1. Desktop - can be disassembled by the character so that player can spawn more characters into their team.
2. Collectables - the character can collect these items and gain one of these
 1. Increase in the player's total score
 2. Random chances of the collectables being a bomb which decreases some of the player's total score and damaging the toons that collected it

Player's and enemy's Supercomputer will be placed at the far end of the opposite side of the map and cannot be move around. These Supercomputer can only be attacked once player have reached the total score of 490.

4 Gameplay

4.1 Game modes

This is a multiplayer game.

4.2 Starting the game

At the start, player can choose their team color (Team Red, Team Blue, Team Green and Team Black).

The toons color will be the same as which team color the player had chosen. Each player will be given 5 toons at the start of the game, which consists of 1 CPU, 1 RAM, and 3 Hard Disk.

4.3 Game mechanics

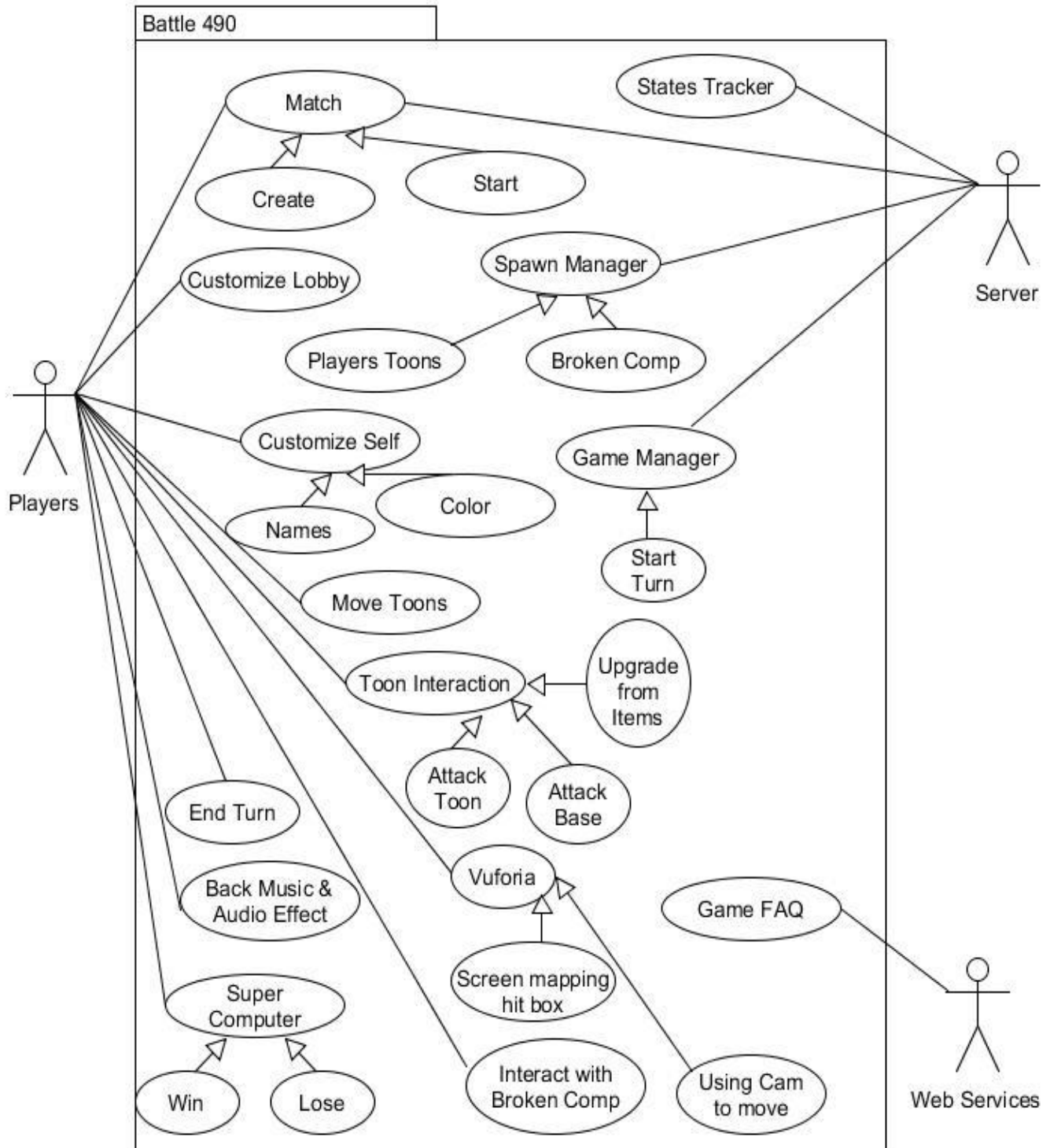
1. In each player's turn, all the toons can be given up to 2 different commands (i.e. no command can be selected twice per turn)
2. Spawning new character
 - a. The player can spawn new toon by directing one of their already acquired toon to collect a desktop scattered around the playing field.
 - b. The new toon will then be spawned out of that desktop **but will only be activated for player to command starting on the player's next turn.**
 - c. New toon can only be of the lower level than the toon that spawned it (or the same level if the spawner is of type Hard Disk).
3. Increasing player's total score
 - a. Each player need to be over the total of 490 points first before they can launch any attack on their opponent's Supercomputer.

- b. For players to increase their score, there's all sorts of collectables item scattered around the playing field for the whole duration of the game that they can command their toons to go and collect.
 - c. But, hiding in those collectables items too is something that we call "**bomb**" that can decrease both the **player's total score** and the **health points of the toon** that collected it. For every single collectable item that got spawned into the playing field, there's a **20% chance** of it being a bomb.
 - d. The collectable items are:
 - i. Laptop
 - ii. LCD monitor
 - iii. Keyboard
 - iv. Mouse
 - e. Each of the items carries a random score ranging from 10, 20, 30, 40 or 50 points. The same goes to the bomb too where it can deduct both the score and the toon's health points by 10, 20, 30, 40 or 50 points.
4. Moving the toon around
- a. As explained in 2.1.1.1, when a toon has been selected and commanded to move, a square box will be available for player to see. Player are free to move that selected toon, if it is within that square box area.
5. Attacking another toon
- a. As explained in 2.1.1.2, similar to Move command, a square box area will be visible when the player have selected this command, albeit a bit smaller area than that of Move command. The selected toon can only attack one enemy toon that also inside that square area.

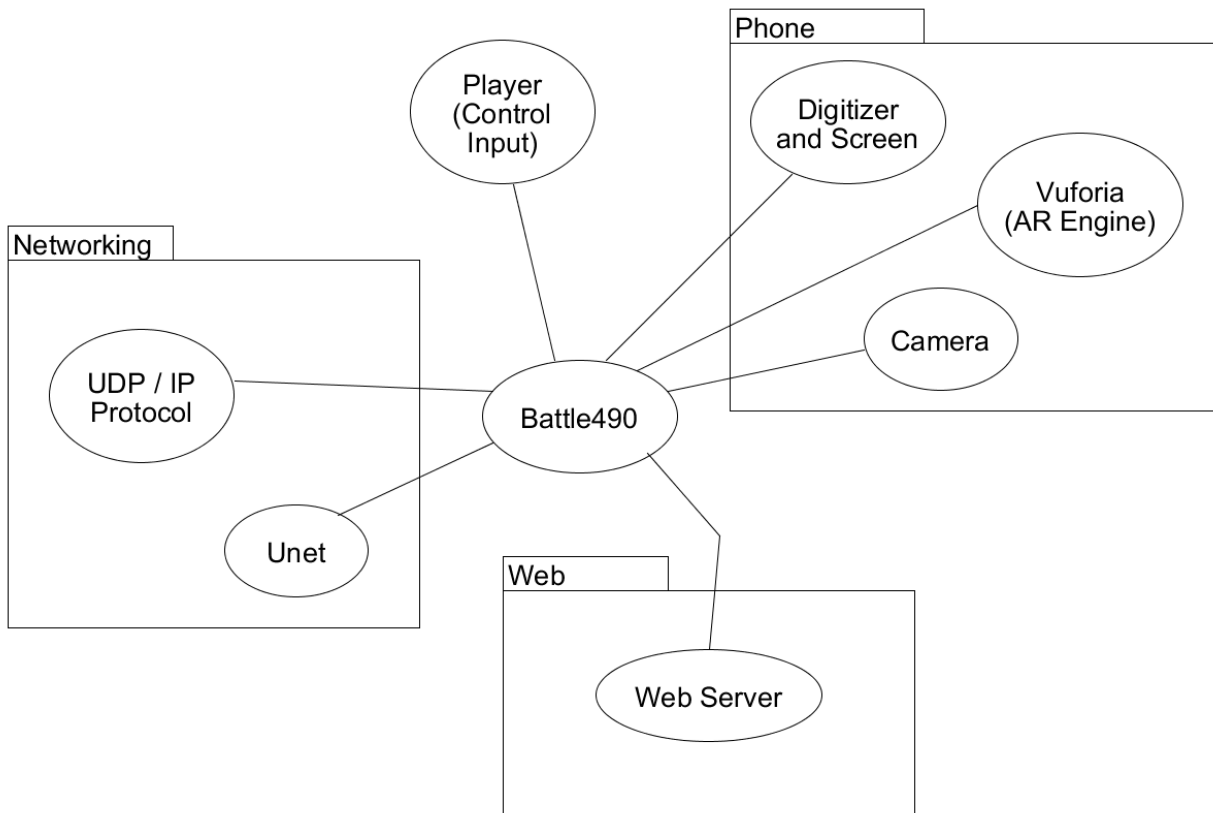
- b. Not every toon can attack any toon and deal damage to them.
 - i. Toon of type CPU has the highest rank so they can deal damages to any other type of toon.
 - ii. Toon of type RAM is the second highest rank, they can only deal damage to same type toon or lower (Hard Disk).
 - iii. Toon of type Hard Disk are the lowest ranked toons, so they can only deal damages to other toon of the same type only.
 - c. Every attack will give 50 HP damages, but there's a random chance that the attack could be so powerful it can destroy the enemy in one blow.
6. Attacking the enemy's Supercomputer
- a. The opponent's Supercomputer can only be attacked and destroyed once player have collected more than 490 points.
 - b. They can keep track of their scores so far in the game via the on-screen scoreboard.
When the player had reached 490 points, the text "MAX!" then should be visible in the player's scoreboard to indicate that they can now allowed to attack their opponent's Supercomputer.

5 UML Diagrams

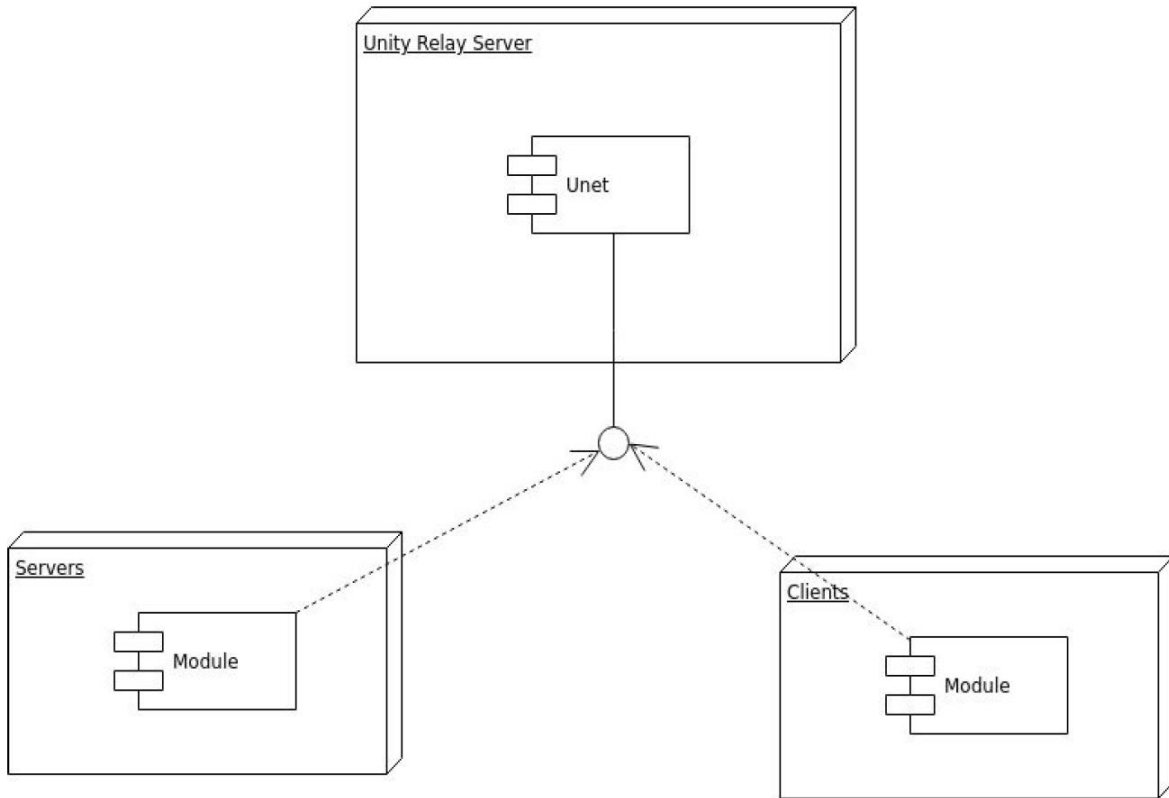
1. Use Cases Diagram



2. Context Model Diagram



3. Multiplayer Client implementation



We are using Client and Server Model with a little twist in between by letting Unet handles all the protocols and using its relay server as firewall punch through so that we do not have to actually do port forward and set up the server.

6 Ideas Currently on Hold or Cancelled

1	<p>SP (skill points) (on character's stats) - depleting the SP will result in the toons cannot use their Special Attack anymore.</p> <p><i>Cancelled: Toons won't have SP anymore since we revised and changed the attack mechanism from the initial plan.</i></p>
2	<p>Defend (on character's commands) - Ability to boost up a character's defensive ability slightly for a short time period.</p>
3	<p>Hide (on character's commands) - This move is used to hide the character into that desktop/laptop and disabled the enemy's ability to see them on the field.</p>
4	<p>Each toons that the player have could be assigned one of these three types.</p> <ol style="list-style-type: none">1. Data2. Antivirus3. Virus <p>Each type has their own Special Attack.</p> <ol style="list-style-type: none">1. Data - Overload2. Antivirus - Quarantine3. Virus - Infect
5	<p>Game modes: The game can be played in one of these 3 modes</p>

	<ol style="list-style-type: none">1. Player vs AI (Single-player mode)2. Player vs Player (Multiplayer 1v1)3. Group Battle (Multiplayer 2v2)
6	<p>Combining characters (on Game Mechanics)</p> <ol style="list-style-type: none">1. 2 characters of the same type can be combined together. The benefits of combining characters are:<ol style="list-style-type: none">1. Increase in HP and SP2. Increase in Normal Attack and Special Attack power3. Increase in Defensive power4. Increase in movement range2. The 2 characters that have been combined together will act just the same as normal 1 character (i.e. combined character could only be commanded twice per turn, the same as normal 1 character).
7	<p>Map Design</p> <p>The maps will be designed based on the theme “computer lab”.</p>
8	<p>Map Obstacles</p> <p>Other than interactable items above, the maps also will feature some obstacles that the characters need to navigate around it in order not to inflict damages towards themselves. The obstacles include:</p>

	<ol style="list-style-type: none">1. Water
--	--

2. Holes