CSCI 265 Requirements and specifications

Team name: We Be Daves

Project/product name: See a Neevle, Hear a Neevle

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1. Known issues/omissions

The actual text for the help screens has yet to be determined. This will be rectified as part of the development of the user guide/manual in phase 3. Similarly, the glossary terms and text have not yet been identified, but will be

completed during phase 3 (as most of the terms to appear in the glossary will also appear in the game guidance, and similar language is desirable in the two locations).

There is an error in the placement of the Gamma gate in Puzzle Zone 2B: a fix has been noted in the zone 2B discussion but has yet to be applied to the zone map.

2. Game Overview

See a Neevle, Hear a Neevle (SaNHaN hereafter) is a team multiplayer puzzle/combat game, played on a top-down 2D map. Players on a team have to cooperate to survive and move on, as the makeup of each being means they are unable to sense certain other things, effectively meaning each player has some things they cannot see and some things they cannot hear. The game is best suited for teams that either communicate/cooperate very well or teams that have a sense of humour when things go hideously wrong.

The premise of the game is that players are inhabitants of the planet Neevle, where all life forms are energy based. There are three core forms of energy, Gamma, Zeta, and Theta *(those names are tentative and likely to change before release)* and life forms of each core type are unable to see beings of one other type and unable to hear beings of one other type. *(Gamma cannot see Zeta or hear Theta, Zeta cannot see Theta or hear Gamma, Theta cannot see Gamma or hear Zeta)*.

Players on each team are evenly divided across the three core energy forms, thus each player is unable to see/hear certain players on their own team and unable to see/hear certain enemies. This means players on a team need to coordinate with each other to survive/overcome opponents. Similarly, puzzles (involving gates, switches, locks, etc) revolve around specific energy bases, meaning players need to coorinate to solve puzzles that permit moving deeper into the game world.

To summarize the impact:

- you can see and hear anyone (friend or enemy) who is of the same energy base but you cannot hurt them (and they can see/hear you but not hurt you)
- if you can see anybody else then you will not be able to hear them, while they can hear you but not see you (and it'll hurt if you bump into each other)
- if you can hear anybody else then you will not be able to see them, while they can see you but not hear you (and it'll hurt if you bump into each other)

The objective is to either become the first team to reach **THE GREAT CORE**, an energy source granting virtually limitless power to the first team to reach it. Alternatively, a team can win by eliminating all other teams in the game, giving teams the choice to win by success in combat or by evading combat and rapidly solving puzzles to leave your opposition behind.

3. Target audience and motivation

The game is intended as a relatively light-hearted top-down 2D team game, with a heavy emphasis on team coordination and a mix of combat and puzzle solving elements. It is expected to appeal to groups who either cooperate effectively or who can find the humour in watching their friends perish to things they can't see coming. *(We all have friends like that, you know who you are!)*

Everyone on our team is an avid game player and we have all followed discussions/videos discussing the design strengths/weaknesses of our favourite games, but none of us has yet attempted actually designing or building an actual game. We're all looking forward to the project as a way of learning more about the ins and outs of game development from an applied perspective.

Targeting a multiplayer game right out of the gate adds a big extra layer of challenge, so we'll be keeping many of the other game aspects simple (relatively simple puzzle/combat rules, maps, and story progression). We still hope the basic nature of the game will render it fun for casual players.

The game controls are currently expressed in keyboard form, but console or touch-screen versions and controls might be considered as a long term stretch goal.

4. Game flow, objectives, and plot-line

The game is won or lost as a team: a team wins the game by being either the last surviving team or by being the first team to solve the puzzles and reach **THE GREAT CORE** on the map.

Teams begin the game in isolated sections of a shared map, and must solve puzzles and survive combat with other teams and creatures while traversing the map in search of **THE GREAT CORE**.

Some portions of the map are designated combat zones: all teams can reach these zones. Other portions of the map are puzzle zones, keyed differently for each team.

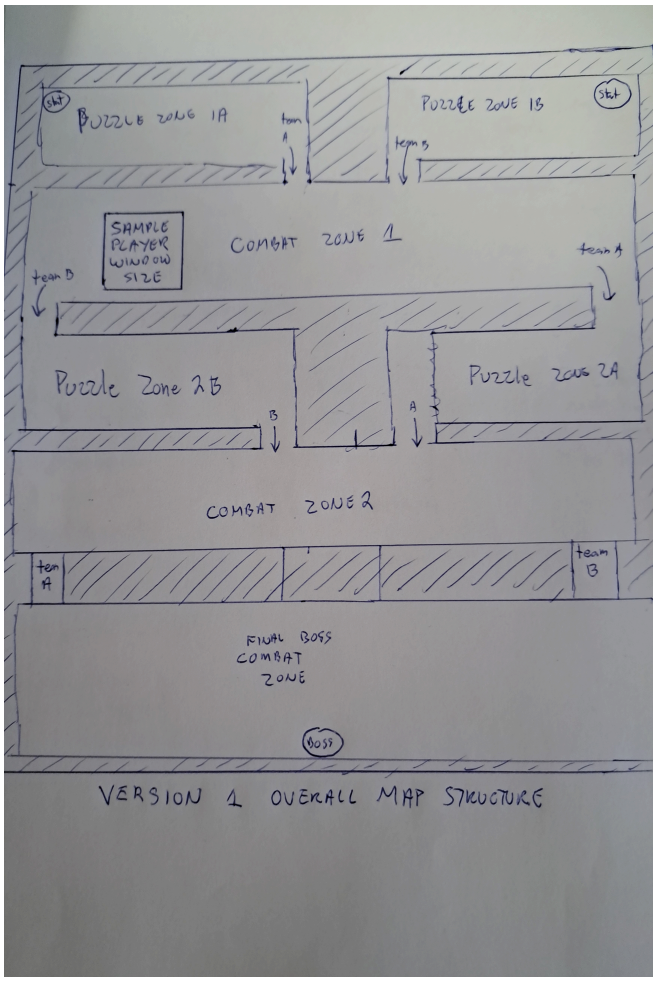
While a choice of maps and support for multiple teams are seen as secondary and stretch goals for the project, the initial version of the game supports just a single map and two teams of three players each. This preliminary map is sketched and described below, with seven key areas:

- Puzzle zones 1A and 1B: in these sections teams A and B are isolated from one another and have a set of introductory puzzles to solve and creatures to deal with before entering combat area 1.
- Combat zone 1: both teams and a number of hostile creatures have access to this section. Teams can either attempt to run through to puzzle zone 2 while minimizing combat, or they can attempt to eliminate or weaken hostile teams and creatures. Only team A can enter puzzle zone 2A, while only team B can enter puzzle zone 2B.
- Puzzle zones 2A and 2B: similar to the previous puzzle zone, but the puzzles themselves are of a different nature.
- Combat zone 2: similar to combat zone 1, but only one team can exit the 'other side' to encounter the final boss. (Note: this could create a situation where one team dashes through but then loses to the final boss while the slower team is now stuck in combat zone 2. A high priority secondary goal may be to resolve this so the slower team can advance to the final boss if the first team perishes: effectively only one team 'at a time' can be in the final boss zone.).
- Final zone: a combat zone for one team (or one team at a time) to fight the final boss.

Note that the left side of the map is a mirror image of the right side (to ensure fairness for the two teams).

At any point in time a player can only see their immediate surroundings, usually a portion of the zone they are currently located in (and thus just a very tiny portion of the overall map). In the initial version there is no planned support for the player to be able to zoom in/out, but a limited ability to do so might be considered as a stretch goal. The overall map and configuration of the zones within it is shown below, while the individual zones are shown and discussed in detail in the Game Map section near the end of this document.

Initial sketch of overall map



5. Key features, with detailed requirements for each

As mentioned earlier, the game will consist of opposing teams of players working their way through a map, fighting opposing teams (and some other hostile inhabitants) and solving puzzles in the hopes of being the first to reach **THE GREAT CORE**. With that in mind, some of the key features/aspects of the game are broken down below.

Teams

- initially SaNHaN will target two teams of three players each
- one player will host the game, the other five players joining as clients
  - the host chooses any shared game settings such as map, friendly fire, and whether or not to apply the rules regarding what players can/cannot see/hear
  - as a stretch goal, each player will have some configurable settings unique for them (choices of control types, audio controls, and display settings)
- for the initial version, players will need to know the connection information for the host whose game they wish to know (IP and port?), while a more flexible system of joining/matching players with hosts will be considered a stretch goal
- each team has one slot for each of the three core energy types: Gamma, Theta, Zeta
- each team will have a unique symbol to represent its players, and each energy base is assigned a specific colour, thus the symbol+colour tells you which team a player is on and what energy type they are
- the six players are randomly assigned to teams and slots, secondary goals will be to fill empty player slots with NPCs and to allow the players or host to assign teams and slots, while a stretch goal will be to support more than two teams and more than three players per team

Preliminary versions of the various game menus, navigation sequence, and the player view of the map can be seen in the Game Interface section later in this document.

Energy levels, combat, and healing

Energy in the game equates roughly to health in other games: you expend energy during combat and replenish energy over time. The key facets of energy in the game are as follows:

- each being in the game has a current and maximum energy level (somewhat akin to health), a resistance level (higher resistance reduces the damage taken from attacks), a replenishment level (how many seconds it takes them to regain one unit of energy), and an attack efficiency level (how much damage they deliver on others)
- energy is expended in combat by taking damage (really an energy drain) or firing projectiles (see below)
- energy naturally replenishes over time, but can also be replenished by item pickups during the game
- all beings have a critical energy level of 2, at or below this level they cannot take any action until their energy replenishes above the critical level
- if a beings energy level reaches zero they dissipate: for player characters this means they can no longer participate in the game (but can continue to watch if desired)
- whenever two beings of different energy bases come in contact they will both experience an energy drain, hand to hand combat thus amounts to running into another being and hoping they take drain faster than you do or that you have enough energy to outlast them
- players can also use the space bar to periodically fire energy projectiles that drain beings of other energy bases (projectiles travel in the direction the player is facing, and stop when they hit something of a different energy base)
- when setting up the game, the host has the option of turning off friendly fire (so you can't accidentally clobber or shoot an ally)

Each player will be able to see their own current energy and maximum energy level as a partially-filled bar near the bottom of their map.

The specific values to be used for energy levels, damage, drain rates, and impact of items will undoubtedly need to be adjusted quite a bit during playtesting, but the preliminary chosen values are as follows:

- each player starts with 10/10 as their current/maximum energy level, 1 as initial resistance rating, 12 as initial replenishment rating, and 1 as the initial attack rating
- different upgrades can increase the maximum energy level up to 30, the resistance and attack ratings up to 3, and reduce the replenishment time down as low as 4
- items scattered throughout the map zones can instantly replenish energy levels by 1, 5, or 10 units (up to the player's maximum) by moving over them
- the energy drain from firing projectiles is 6 divided by the attack rating (6 for level 1 attack, 3 for level 2 attack, 2 for level 3 attack)
- the energy drain from being struck by a projectile is 12 divided by the resistance level (12 for level 1, 6 for level 2, 4 for level 3)
- projectiles are fired using the spacebar, and travel in the direction the player is facing at the time the projectile is fired
- contact with a conflicting energy source (creature or item) has a base energy drain of 1 unit per second, multiplied by the attack rating of the attacker and divided by the resistance rating of the attackee. Thus an attack level of 2 and resistance level of 3 would result in 2/3 of a unit of energy being drained each second, an attack level of 3 and resistance level of 1 would result in 3 units drained per second, etc.

Maps and movement

The two teams are traversing a large map, moving from zone to zone within it. Some of the zones are open to both teams, while others have their access restricted to a single team. (In such cases the zones for the two teams are mirror images of each other.) The key details with respect to the overall map and movement within it are outlined below.

- there is a single large map with numerous walls, items, obstacles, traps, puzzles, creatures, etc
- each team starts in an isolated section of the map, getting practice with some puzzle solving before reaching a common area with a mix of puzzles and team-v-team combat
- stretch goals include having multiple maps for the host to choose from when setting up a game and/or having procedurally-generated maps
- players move around the map using WASD controls, with the player facing the direction of the most recent movement (up/down/left/right)
- the section of the map the player sees at any one point is roughly 1/16 of the total game map (roughly one quarter of the width of the total map and one quarter of the height of the total map)
- with respect to scale and movement speeds: travelling in an unobstructed straight line the player would traverse the entire height or width of the map in 20 seconds
- projectiles have unlimited range and travel at twice the speed of players
- creature speeds will be set individually (see the creatures section later in this document)

Sounds and hearing

As some beings cannot see certain others but **can** hear them, sound is a crucial game element. Ultimately the goal would be to have high quality directional headphone sound, but this is regarded as well outside the scope of what our team can tackle this semester. Our alternative for the initial version is to display sounds in a subtitle field, with the specific details outlined below.

- When a sound is made that the game judges to be audible to a player, the sound text is displayed in the subtitle field onscreen and a circle is generated on the map indicating the general area the sound came from.
- The circle is smaller when the source of the sound is closer (giving the player a clearer idea of where the sound is coming from) and is larger when the source is further away.
- A later enhancement might be to allow different sound volumes, e.g. a player could yell, talk, or whisper, letting players attempt to communicate without being overhead by enemies or alerting possibly hostile creatures.
- Players 'speak' by hitting the k key, typing in their message, then hitting return/enter. The game may also judge they have made sounds at specific points (crashing into things, walking on squeaky floors, etc).
- Specific kinds of sounds will be represented with pre-determined text (bump, sizzle, crash, etc).
- everyone in the same zone on the map sees the typed message
- The circle size and proximity is based on closeness relative to the overall size of the map, with three distinct circle sizes:
    - if you are within 1/8 of the width of the overall map then the circle size is 1/16th the size of the map,
    - if you are within 1/16th then the size is 1/32nd,
    - if you are within 1/32nd then the size is 1/64th,
    - if you are in the same zone as the sound source but not within 1/8th of the overall map width then the sound text is displayed but no circle is shown,
    - no sounds are shown if you and the source are in different zones.
- Sound text is displayed for three seconds then vanishes (constant sounds are replenished after the three seconds).
- Distance and circle placement/sizes are determined at the time the sound begins or is replenished.

Puzzles

Throughout the game there will be a variety of traps, triggers, gates, switches, pads, etc that the team must avoid or pass through to reach the next map area. Overall thoughts on the nature of puzzles within the game are discussed below, then we describe the specific puzzles that will be implemented for version 1 of the game.

- Puzzles may consist of multiple components (e.g. several switches that must be flipped to open a gate), each of which is keyed to a specific energy type.
- Some components might only be detectable by sound, some are visible but make no sound, and the usual energy-base rules apply (which energy types can see/hear which others)
- *puzzle example:*
  - a long wall contains a gap that the players must go through
  - an energy gate bars the gap and two energy pads are nearby, all three items are of different energy types
  - two players must stand on the pads while the third opens the gate, but they all must be on/at whichever item is invisible to them (i.e. the other two players must talk them into the correct position)
  - *(of course, a similar puzzle might appear later where players must be on/at the one that **is** visible to them or they get zapped, or another puzzle might be sound-based rather than visible...)*
- There could be long winding pathways the players have to traverse with sections that are invisible to certain energy bases.
- There could be gates to shortcuts to bypass certain areas/obstacles, where a neutral guardian provides the first person to arrive with a password to get through the gate. That person can tell the password to others on their team, but might risk being overheard by the opposition. (Or possibly a stronger enemy could spare them from destruction in return for the password?)
- There could be gates or passages that cycle through the energy types, you can only go through while its current energy type aligns with your own.
- There could be friendly creatures that guide you to passageways or valuable items (or unfriendly ones that are actually guiding you to a trap).

Puzzles to be implemented for version 1

For version 1 of the game, a series of simple gate-based puzzles will be implemented in zones 1A/1B, while maze and npc-based puzzles will be implemented in zones 2A/2B.

The zone 1A/1B puzzles are as follows:

- The players will proceed down a corridor from the starting location and encounter a sequence of three locked gates, each of a different energy type (Gamma, then Theta, then Zeta). Each gate can only opened by the approach of the player with the matching energy type: anyone else takes damage (using the usual contact damage rules). Each gate is worth 10xp when opened. Players approaching a gate of a different energy type will 'hear' a buzzing sound shortly before taking damage (to serve as a warning/hint).
- The players will then encounter another sequence of locked gates (again Gamma, then Theta, then Zeta) but in this case the gates can only be unlocked by the approach of the person the respective gate is invisible to. This will require guidance from the teammate who can see the gate, possibly relayed through the person the approachee can hear. (Again the warning buzz will sound for players of the incorrect type.) Each gate is worth 25xp when opened.
- Finally, the exit from the zone is controlled by a set of 3 pads, one of each energy type. These gates are randomly keyed to the three different energy types, and all three players must approach the correct pads simultaneously (using the warning buzz for guidance).

The zone 2A/2B puzzles are as follows:

- This zone consists of a maze which the players can randomly find their way through, but there is also a set of 3 friendly NPC creatures at the start of the zone who can act as guides. Each player follows the creature of their own energy type, and will be guided through a shortcut accessible only by their energy type. Reaching the exit point from puzzle zone 2 (whether guided or by navigating the maze) is worth 75xp. The maze portion will also contain some hostile creatures, discussed below.

Levelling up

As the players progress through the map, the opponents will become more challenging. A leveling system provides the player with the chance to decide which attributes of their character they wish to improve. Details of the leveling system are described below.

- Players gradually accrue experience as they solve puzzles and succeed in combat. Each puzzle and hostile creature will have an associated experience level: solving the puzzle or defeating the creature results in the assigned increase in experience. (The puzzles and creatures of this document contain tables of the relevant experience rewards.)
- For version 1 of the game, all players on a team advance equally in experience. This may be altered in future version.
- Each time players reach set experience thresholds they are able to improve their ability in one of several areas:
  - increasing their maximum energy level,
  - decreasing the time it takes them to replenish energy,
  - increasing the amount of energy they drain from an opponent in combat,
  - improving their resistance to energy damage.
- The players are given the opportunity to pick which attribute(s) to improve at the point where they transition to the next zone on the overall map.
- Improving from level 1 to level 2 in an attribute costs 100 experience points, while improving from level 2 to level 3 costs 250 experience points.

Items

Items can help or hinder players, and will be scattered around the map at preset points. Each item is energy-based, so only visible/audible to players of the appropriate energy bases. Overall details on items are provided first, followed by discussion of the specific items to be implemented in version 1 of the game.

- Common items restore a portion of a player's current energy level for players of the same energy type (in increments of 1, 3, 5, or 10 units, with larger valued items more rare than lower valued items). These items drain energy from players of a different energy base.
- Some rarer items might increase a player's experience level by 10, 25, or 50 points.
- Trapped items might be disguised to look like restorative items but actually drain energy (again in increments of 1, 3, 5, or 10 points).
- Lore markers might provide backstory for the planet and its inhabitants (possible experience benefits?).

Version 1 items

- Following the first set of puzzles in Zones 1A/1B there will be one 1-point restorative item of each energy base, followed a little further along with one 3-point item of each base. (The 1-pointers give players a low-risk chance to learn what happens if you pick up the right/wrong base.)
- Following the second set of puzzles in Zones 1A/1B there will be two of each 3-point restorative item.
- Each 'side' of combat zone 1 will contain two 1-point restoratives for each base, two 3-point, and one 5-point.
- Similarly, each side of combat zone 1 will contain two 10xp items and one 25xp item.

- Each 'side' of combat zone 2 will contain two 3-point restoratives for each base, two 5-point, and one 10-point.
- Similarly, each side of combat zone 2 will contain two 25xp items and one 50xp item.
- Lore markers are regarded as a stretch goal for version 1.
- **THE GREAT CORE** will appear as an item in the final boss zone.

Creatures

A variety of NPC creatures will populate the world, starting at fixed points when teams first enter a zone. Some of these creatures may remain stationary until a player approaches them, while others will begin randomly wandering. These creatures (as with everything else) are of one of the three energy types, following the same see/hear rules as player characgters. Creatures will have different levels of hostility, intelligence, current and maximum energy.

Version 1 creatures

- Puzzle zones 1A/1B will each contain three 'Radiant Mounds', one of each energy base. These have the same stats as a starting player, but are completely stationary. They each fire one projectile per second in a fixed rotation: N, E, S, w. They are worth 25xp if destroyed by the players.
- Each side of combat zone 1 will similarly contain three radiant mounds (one of each base).
- Puzzle zones 2A/2B will each contain three 'Radiant Drifts', one of each energy base. These have level 2 stats in each category, and move at the same speed as a player. They do not fire projectiles, but will pursue the nearest player and will inflict contact damage whenever possible. They are worth 50xp if destroyed by the players.
- Each side of combat zone 2 will similarly contain three radiant drifts (one of each base).
- The final boss zone will have **THE GREAT CORE** guarded on both sides by six radiant mounds, six radiant drifts, and the 'Energy Tzar'. The energy tzar has stats equivalent to a level 3 character, but has no energy drain for firing projectiles. The energy tzar fires one projectile in each direction (NESW) each second, and moves the same as a radiant drift. The energy tzar is worth 100xp, though the player won't have a chance to spend it before the game ends.

6. Game interface, screens, and menus

The images shown for the interfaces, screens, and menus are not intended to be taken as exact literal images of the final game appearance, rather they reflect the required on-screen elements for each component, and the approximate visual appearance and location for each.

Screen and menu navigation

The discussions below list the collection of available screens a player might navigate through during a typical game, with short descriptions for each.

- Main menu: the game startup screen
- Host game screen: the options/information the host must provide to begin a game
- Join game screen: the options/information players must provide to join a hosted game
- Main gameplay screen: the window the players see during most of the actual game action
- Help screen: provides the player with a variety of topics to investigate further
- Options screen: most options are set by the host prior to starting the game. In game this provides the player with information on the settings currently in use.
- Game-over screen: summarizes the results for the player and their team after the game ends
- Connection-lost screen: provides the player with options if they have lost their game connection

Main menu

This is the game startup screen, and provides the user with links to the following key screens:

- Host
- Join
- Options
- Help
- Exit

Host game screen

This gets the player to enter the options/information necessary to host a game. Once the settings are determined and the host selects 'Begin' the game will wait for five players to join then will take all six players to their gameplay window. The relevant settings are as follows:

- Select username
- Select IP
- Select Port
- Help
- Back
- Begin (wait for players)

Join game screen

This gets the player to enter the options/information players necessary to join a hosted game. The relevant settings are as follows:

- Select username
- Enter host's IP
- Enter host's Port
- Back
- Begin (waits for connection and other players)

Help screen

This lets the player select from a variety of key topics for detailed help information. The specific areas are as follows:

- Game overview
- Hosting/joining
- Combat and movement
- Experience and upgrades
- Creature catalogue
- Items
- Puzzles
- About us
- Back

KNOWN OMISSION: At the moment the detailed text for the help topics has yet to be developed. This information will be decided in the upcoming phase 3 as part of the user guide/manual development.

Options screen

This is the screen seen by the host when they select the game options. It can also be viewed (but the options cannot be changed) by players during the game. The specific options are as follows:

- friendly fire (on/off, default on): determines if players can shoot/damage each other
- see all/hear all (on/off, default off): determines if players can see and hear everyone (instead of the usual energy-based seeing/hearing rules)
- show player names (on/off, default off): should player's usernames be superimposed on their symbol in-game (this may become a secondary goal)
- Help (takes to help screen)
- Back (takes back to the previous screen)
- Exit game

Game-over screen

This screen summarizes the results for the player and their team after the game ends, showing the following:

- whether the player's team won or lost
- whether or not the player survived
- the attribute levels and XP levels of each player on each team
- the map zone the player was in at the end of the game

Connection-lost screen

This screen simply tells the player that their connection has been lost and gives them the option of returning to the main menu or exiting the game.

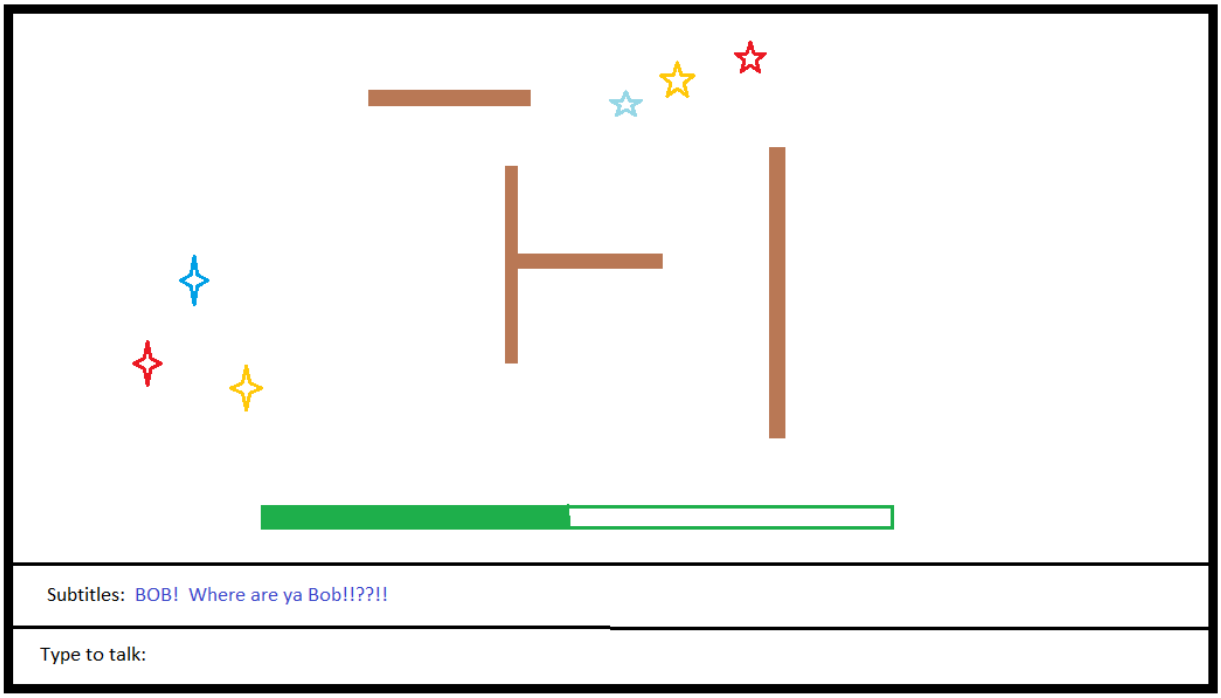
Main gameplay screen

This is the window the players see during most of the actual game action, centred on their character within the overall game map (and showing roughly 1/64th of that overall map). The key elements shown are as follows:

- the player's view of the map takes up the bulk of the screen, as can be seen in the image below
- the player's current/maximum energy bar is shown just below the map (the green portion reflects their current energy, and turns red if their energy drops to the critical level)
- the subtitles section below the health bar provides the text display of any sounds audible to the player
- the player types K to talk, types what they wish to say, and hits enter (the text appears in the text screen segment at the bottom of the window)

The player uses WASD to move around the map, and the spacebar to fire a projectile in the direction they are currently facing. Hitting ESC during gameplay brings up the Options menu, but *does not* pause the game!

A preliminary representation of the main game screen is shown in the image below.



Game map

As shown in the Game Overview section earlier in this document, there is a single large map that is segregated into sections or zones by long walls containing a single gate/gap to the next section. Within each zone there may be creatures, traps, puzzles and items (some common to all sections, some unique to that particular section).

In the default map (the only map for version 1), the teams start in separate sections while they master the puzzle solving techniques and basic game mechanics. Once they get through the opening segment they will enter a shared section where team-vs-team combat is an option.

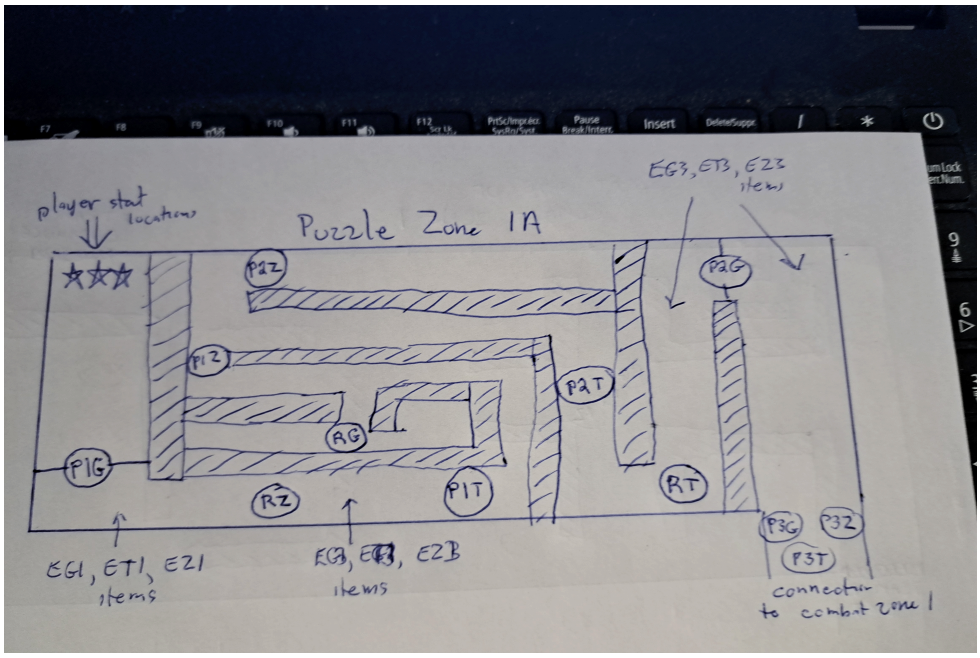
There are seven zones in the initial map, each of which is shown and discussed in detail below.

The specific puzzles are discussed in the 'version 1 puzzles' section above, the items in the 'version 1 items' section above, and the creatures in the 'version 1 creatures' section above.

Puzzle Zones 1A and 1B

Puzzle zones 1A and 1B are the starting areas for the two teams, and both teams will exit into combat zone 1 once they finish their respective puzzle zone. The specific maps, items, and creatures are described later in the document, but the map and content are as follows:

- Zone 1A shown, zone 1B is a mirror image
- the first trio of puzzles are marked P1G, P1T, P1Z (g,t,z denotes energy type)
- the second trio of puzzles are marked P2G, P2T, P2Z
- the exit puzzle pads are marked P3G, P3T, P3Z
- the radiant mounds are marked RG, RT, RZ
- the energy restoration items are marked EG1, EG3, ET1, ET3, etc
- the experience items are marked XP10, XP25, etc

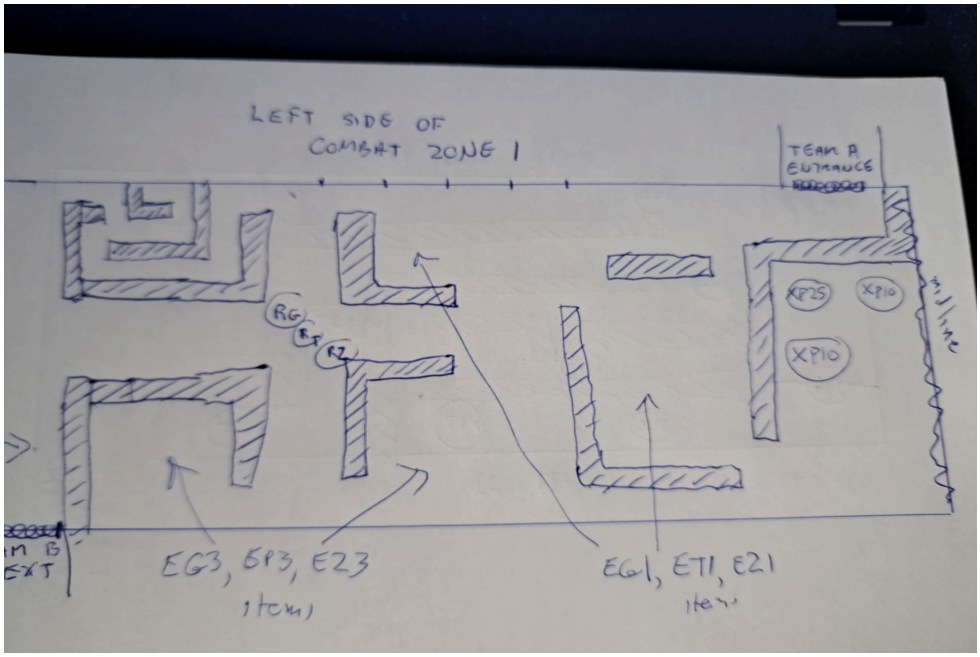


Combat Zone 1

Combat zone 1 is entered by each team once they exit their first puzzle zone, and teams will exit this combat zone into their respective second puzzle zone.

The map of the left side (1A) of the zone is depicted below, the right side is a mirror image.

Creatures and items are marked as per puzzle zones 1A/1B.



Puzzle Zones 2A and 2B

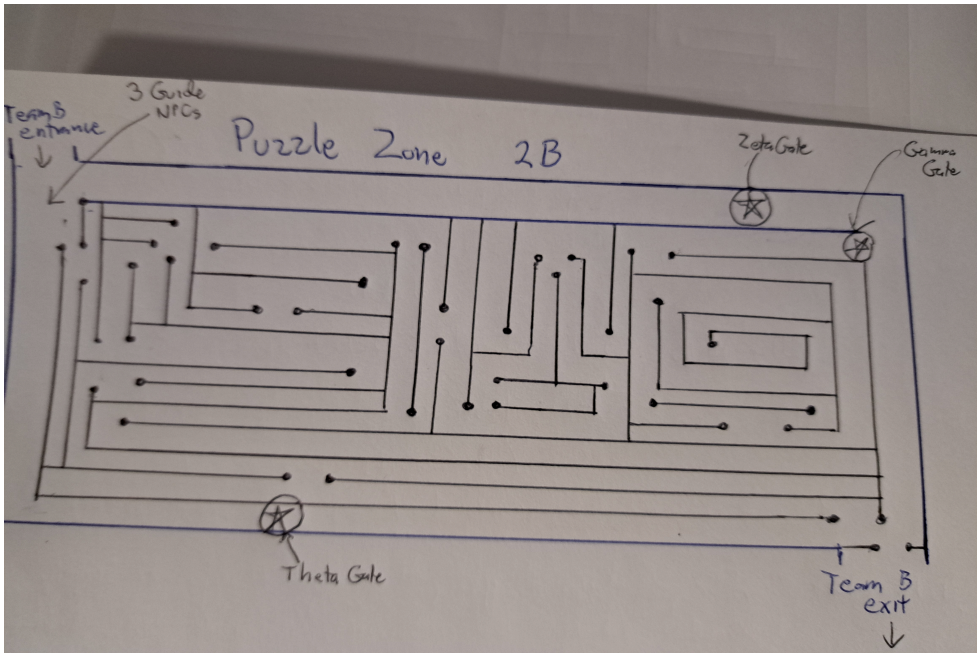
Both teams will enter their second respective puzzle zone if/when they survive combat zone 1, and teams will enter combat zone 2 when they leave their puzzle zone 2.

A sketch of the left half of the map (zone 2B) is shown, zone 2A is a mirror image.

The map legend is similar to that of puzzle zone 1, but this time three radiant drifts will be randomly generated within the maze portion (in mirrored positions for the other team).

The location of the three puzzle gates (shortcuts) are marked on the map below.

- There is an error in the placement of the Gamma gate in Puzzle Zone 2B (it should be in the western inside wall in the lower left corner of the map, allowing entry to the passageway immediately above the hall to the Theta shortcut).



Combat Zone 2

Teams reach combat zone 2 upon leaving their puzzle zone 2.

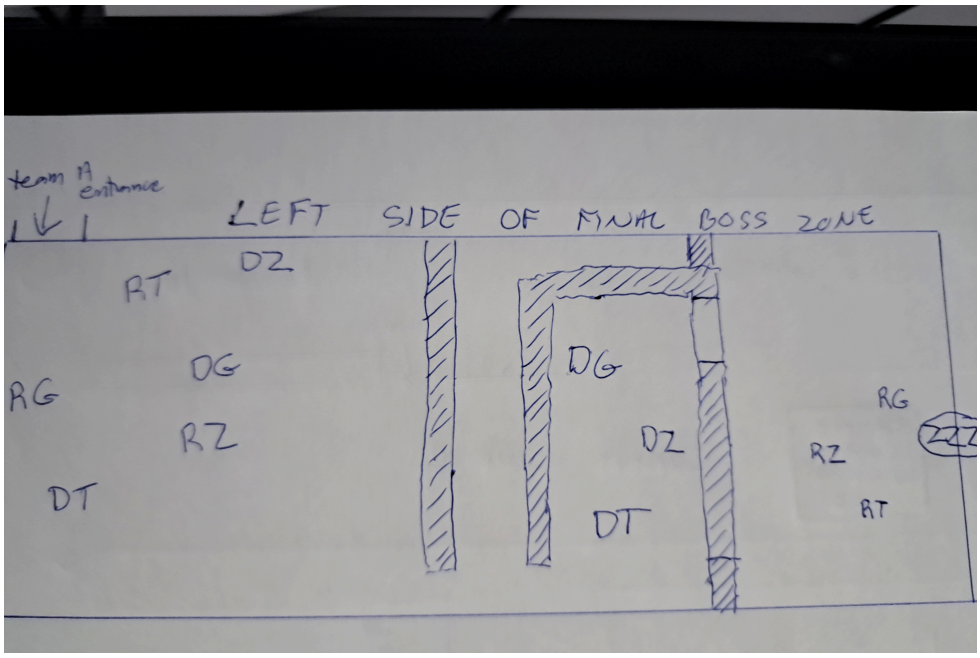
The combat zone 2 maps are identical to the combat zone 1's except that the items have been scaled up one level (e.g. EG1->EG3, XP10->XP25, etc) and the Radiant Mounds are replaced with Radiant Drifts.

Final Boss Zone

The final boss zone is entered by whichever team first makes it through combat zone 2 (possibly the only team to survive this far).

The sketch below outlines the left/centre of the zone, while the right size is a mirror image of the left side.

The map legend is as per earlier zones, with the addition of ZZZ to denote the energy tsar.



7. Feature prioritization

As this is our first attempt at game design and development (and a multiplayer game at that!) there is a great deal of uncertainty around what we'll be able to successfully complete.

As a result, we have identified a core set of features we absolutely want to complete, a secondary set that we certainly hope to complete, and a set of stretch goals we can work on if/when everything else is finished.

Core aspects

The following must all be implemented for us to regard the project as a success:

- support for six human players divided into two teams, where the host provides the players with the necessary information to connect to them (IP and port?)
- the fixed version 1 map with its listed traps, obstacles, creatures, items, and puzzles
- the combat and energy-recovery system as described in the key features section
- the experience and leveling system described for version 1
- if the host drops then the game ends, if another player drops they are 'dead'
- players are randomly assigned to the teams/energy slots

Secondary features

The following are features we hope to implement, but on an "as time permits" basis:

- a wider variety of maps to select from, with differences in size and difficulty
- a wider variety of puzzles, traps, items, and creatures
- configuration options to turn on/off friendly fire and turn on/off energy based hearing and visibility
- a mechanism for the host to automatically communicate the necessary connection information
- options for the host to impose some form of throttling on update rates to deal with potential networking issues
- filling empty player slots with AI (allowing the game to be played with 1-6 players)
- either the host or the joining player can pick their team/energy slots (first come first served?)

Stretch goals

The following features are not expected to make it into our initial version of the game, but would be nice to add if things proceed smoothly and ahead of schedule:

- procedurally generated maps
- support for more than two teams and more than two players per team
- allow hosting to switch to another player if the host drops and allow an AI to take over if client player drops
- good AI control of NPCs
- allow the host or joining players to supply avatars/map images
- add more variety/depth to the combat system

8. Non-functional requirements

As this is a multiplayer game, there are some network-related requirements:

- The implementation of the networking/multiplayer components must not render either the host or the clients vulnerable to any security threats (beyond those already inherent in their system). Satisfying this will require the team to investigate the options for establishing multiplayer connections and the security risks and avoidance techniques for each.
- The implementation of the networking/multiplayer components must not generate an unreasonable level of load on either the client or host network *("unreasonable" is yet to be quantified: the team is investigating how to express loads and what could be considered unreasonable)*
- Ideally the implementation would be capable of preventing or detecting network-based 'cheats' by the host, client, or third parties. This will require investigation of likely cheating techniques for a game of this nature, and may become a secondary or stretch goal.

Modifiability is going to be a crucial aspect of the design and implementation for this project to be successful. Many of the numeric values and calculations are simply preliminary guesses, including (but not limited to) things such as:

- player and creature attributes for current/maximum energy levels, replenishment rates, attack and resistance levels
- calculation formulae for energy drains due to combat and projectiles
- experience levels and upgrade costs and benefits
- map layouts (including puzzle and item placement) It is highly likely that playtesting will show the need to tweak many of these values and calculations, perhaps repeatedly. As such it is crucial that the design, implementation, and documentation all be carried out in a way that enables easy changes to these values.

9. Glossary

Define any product-specific terms and any terms that are unlikely to be known to the 'average' reader (e.g. a random second-year CS student).

Known omission: - the actual glossary content is yet to be determined.