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Abstract

A networked FPS game that must synchronize two clients with minimal latency whist having some game features such as buffs and debuffs.

Network game programming   
cgp503

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# Introduction / Game Idea:

A simple arena shooter that is in first person, it’s a one vs one game mode. Both players get one simple AR rifle that will be full auto, the weapons will be simple recasting weapons. They will both start with limited ammo.

Around the arena there will be items the players can pick up. One will give ammo; one will heal; the third one will give double damage, and the fourth gives another gas grenade. A maximum of 4 items must be present and between 6 to 12 spawn points.

The arena will be asymmetrical.

The players will have 2 hitboxes, one for the head that will kill the player instantly and the other one is the body and will deal damage from the attack like normal. (normal weapon damage unless there is a buff).

The players will also get a set amount of gas grenades, if any of the players enters the gas, they will get limited vision for a period and audio making it harder to hear. (like a concussion grenade).

Particles and SFX should be included.

This is a round system

Best of 5 round system. (rainbow six siege quick match), first to 3 wins. A timer of 5 minutes (300 seconds) is set per round. If the timer runs out the health of both are compared and the one with the most health wins. In case of a draw, no one gets a point (point as in round).

# Game Actions:

## Main Menu:

* Load to UI.
* Lobby menu
  + List all open games
  + Click to join games
  + Favourite lobbies
  + Direct connection
* Settings
  + Audio
  + Sensitivity
* Quit Game

## In Game Menu:

* Tab menu
  + Kick player for host only.
  + List kills and deaths, maybe KD too and score?
  + Player names
* “Pause” menu (“you can’t pause a multiplayer game”)
  + Close menu aka resume.
  + Settings?
    - Audio
    - Sensitivity
  + Leave match
  + Quit
* Hud
  + Cross hair
  + Ammo counter and grenade counter
  + Health bar
  + Timer displayed
  + Points displayed
  + Current round displayed

## In Game Actions:

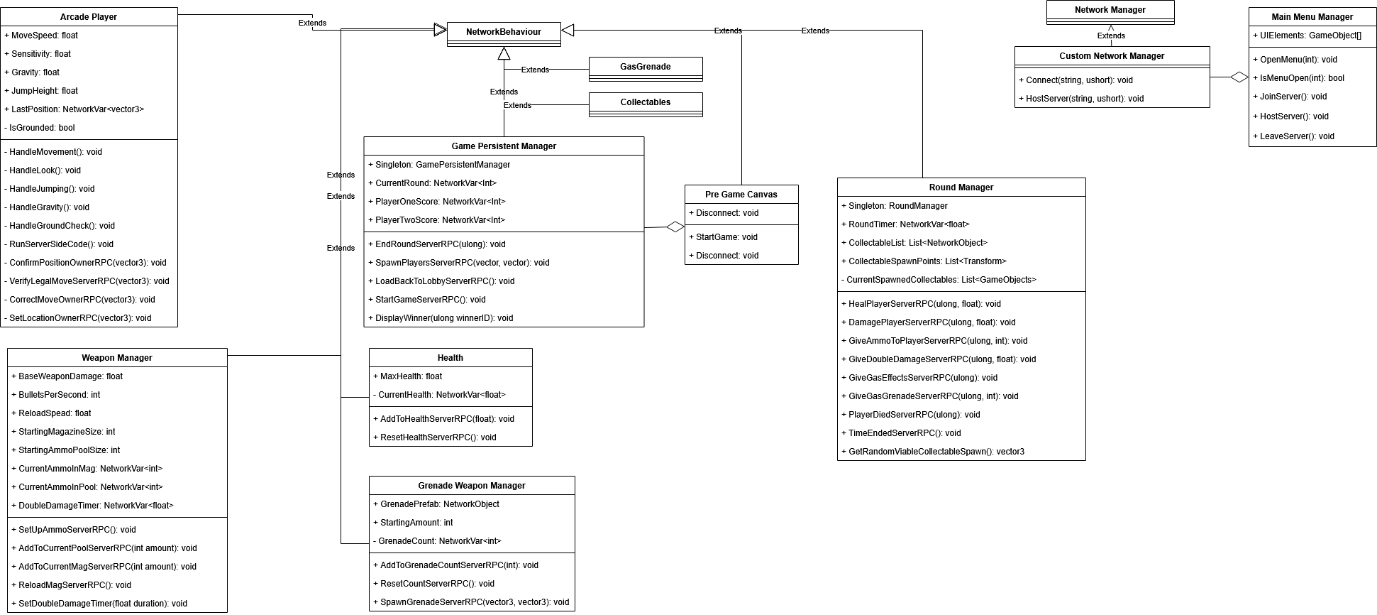
* Shoot (recast hit)
  + Detect hitbox, deal expected damage.
* Take damage
* Collect buff
  + Heal player
  + Grant double damage.
  + Give ammo
* Throw physics grenade. (server owned, need to be syncs to all clients accurately). (R6 ragdoll moments)
  + Gas cloud. Deals damage to everyone, can just be server owned environmental hazard.
* Handle player death.
* Round system.

# Flow charts and UML:

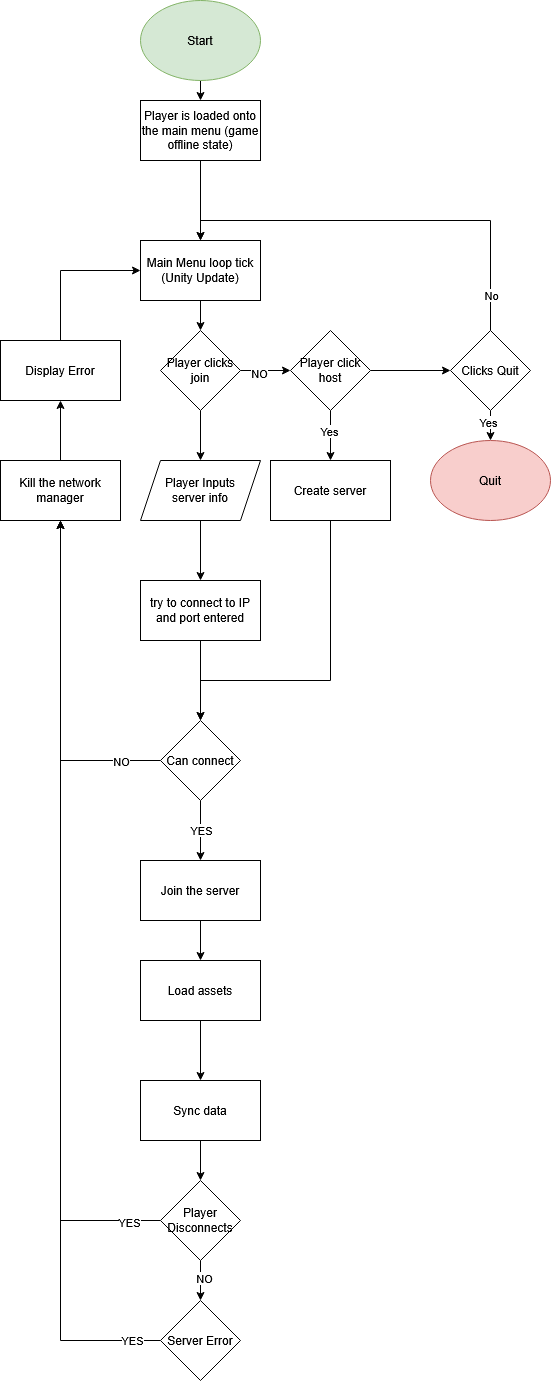
<https://viewer.diagrams.net/?tags=%7B%7D&lightbox=1&highlight=0000ff&edit=_blank&layers=1&nav=1&title=Networking%20Flow%20and%20UML.drawio&dark=auto#Uhttps%3A%2F%2Fdrive.google.com%2Fuc%3Fid%3D1696fGM5Qh_1YszE9zf2ONVLErNG_NzK_%26export%3Ddownload>

A link to the diagrams above.

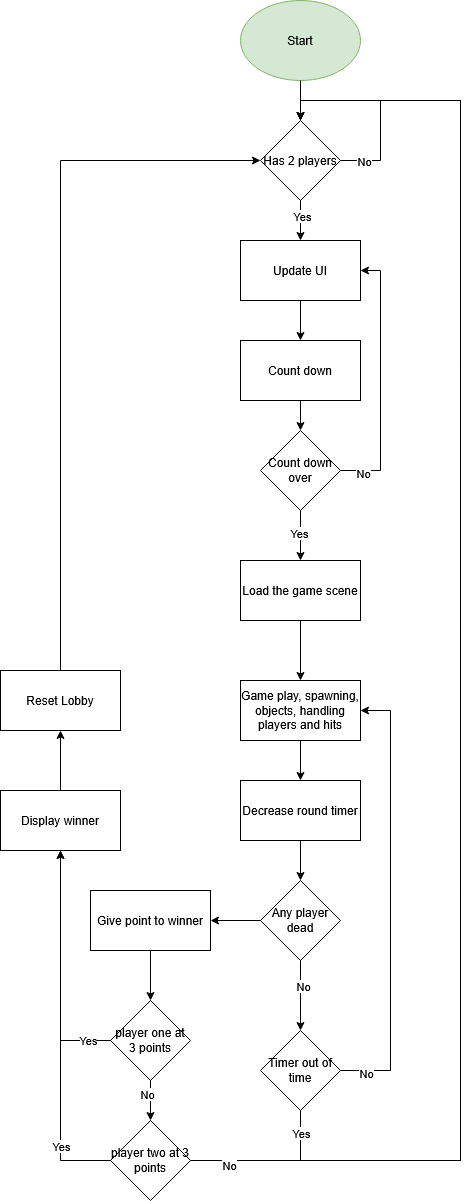
## UML diagram:



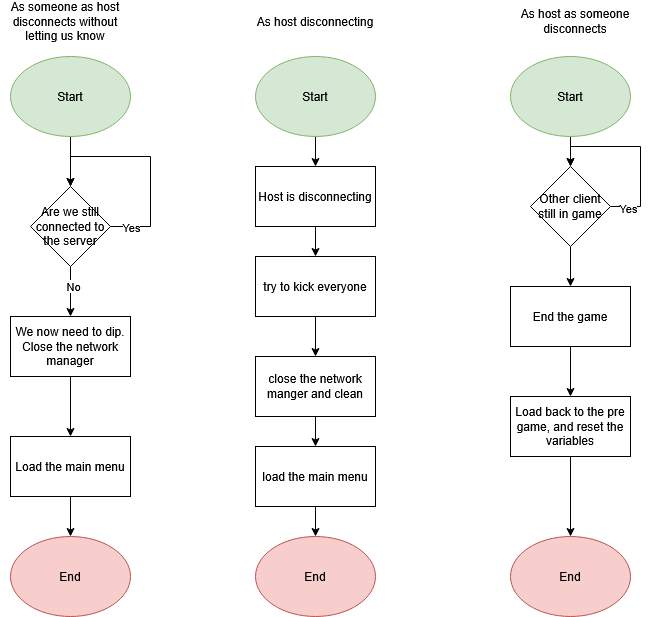
## Flow of main menu:



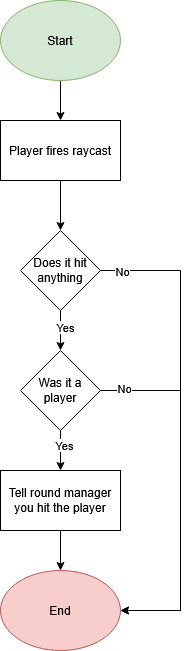
## Flow of pregame and game:



## Flow of disconnect handling:



## Flow of hit reg:



# Refs:

<https://en.wikipedia.org/wiki/Local_area_network>

<https://docs.unity.com/ugs/en-us/manual/lobby/manual/unity-lobby-service>