

Using the Network Engine

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Game Design 2

1. Objectives (Outcomes)

- A. Be capable of starting a server.
- B. Be capable of connecting multiple clients.
- C. Capable of synchronizing a variable.
- D. Capable of having the user set a value remotely and having it synchronized on all clients.
- E. Be able to spawn objects (They do not have to move)
- F. Be able to destroy objects

2. Equipment

- A. A laptop that can run Unity 2018.3 or better.

3. Lab Preparation

- A. Ensure you have the network engine functioning

4. Lab Instruction

- A. Connection and Disconnection
 - a. Create a network manager object that will contain the network core
 - b. Create a different empty object that will act as the menu.
 - i. (Remember we do not want to modify the network core for each type of game we play).
 - c. You will need two network prefabs
 - i. The network manager player (described below)
 - ii. The sphere spawn (described below)
 - d. The menu object will have a canvas object that will allow the user to Start Server or Start Client by calling the appropriate function on the network manager.
 - e. The Menu object will also have a disconnect button that will call LeaveGame on the network manager.
 - f. Set this up (create empty prefabs) and make sure you can connect 2 or more clients to a server. (this can be done on the local host)
- B. The network player manager
 - a. Here you will have an empty object that represents the player when they first connect
 - b. The object will have a canvas that will list out all of the active players by searching for all other network player managers that were spawned on the client. (Thus the server does not need to provide this information)
 - i. The canvas will ONLY appear on the local player it belongs to.
 - c. The network player manager will have one public variables score.
 - d. On the server side, create a co-routine that will fire once every second and increase the score.
 - e. On slowUpdate for the server, if the score is different than it was the previous slow update send the new score to all the clients
 - f. On the client side Handle message, update the score variable to the new value.

- g. On the client SlowUpdate portion update the canvas to reflect everyone newest score (known to that client).
 - i. In other words look for all network player managers, and find their current score on the local game.
- h. Run these two or more clients on one server and ensure that the score variable are accurate for both the client and server. (A couple of ms delay between the server and the client is acceptable).
- C. Creating/Destroying an object
 - a. Create a sphere with a new network component script.
 - b. This sphere will have a canvas IN WORLD SPACE attached to it with a button that says destroy me.
 - i. In the network script IF and ONLY IF the client who requested the sphere to be created presses the button, then a command will be sent to the server requesting it to be destroyed
 - ii. Note all players can click the button, but only the sphere's owner can destroy it.
 - c. In the network player manager add a button called "Create Sphere".
 - i. If the local player presses this button, send a command to the server requesting a sphere to be created at a random coordinate (as long as it is visible by the camera).
 - d. Make sure you create a sphere on all clients and the server
 - e. Test this with multiple clients on one server. Make sure you cannot destroy someone else's sphere.
 - f. Make sure you can destroy your sphere when you press the button on it.

5. Lab Rubric

	Perfect	Logic issues	Incomplete
You can create an application where multiple clients can connect to one server.	10	5	0
You created a network player manager where the scores from yours and all the other network player managers were displayed and synchronized.	20	10	0
You can create your sphere	5	3	0
Only you can destroy your sphere	5	3	0
Total	/30		

6. Lab Report Requirements

There is no report necessary, however, I want each of you to post three questions on the discussion forum that you have regarding this assignment. Then I want you to try to answer the other students questions.