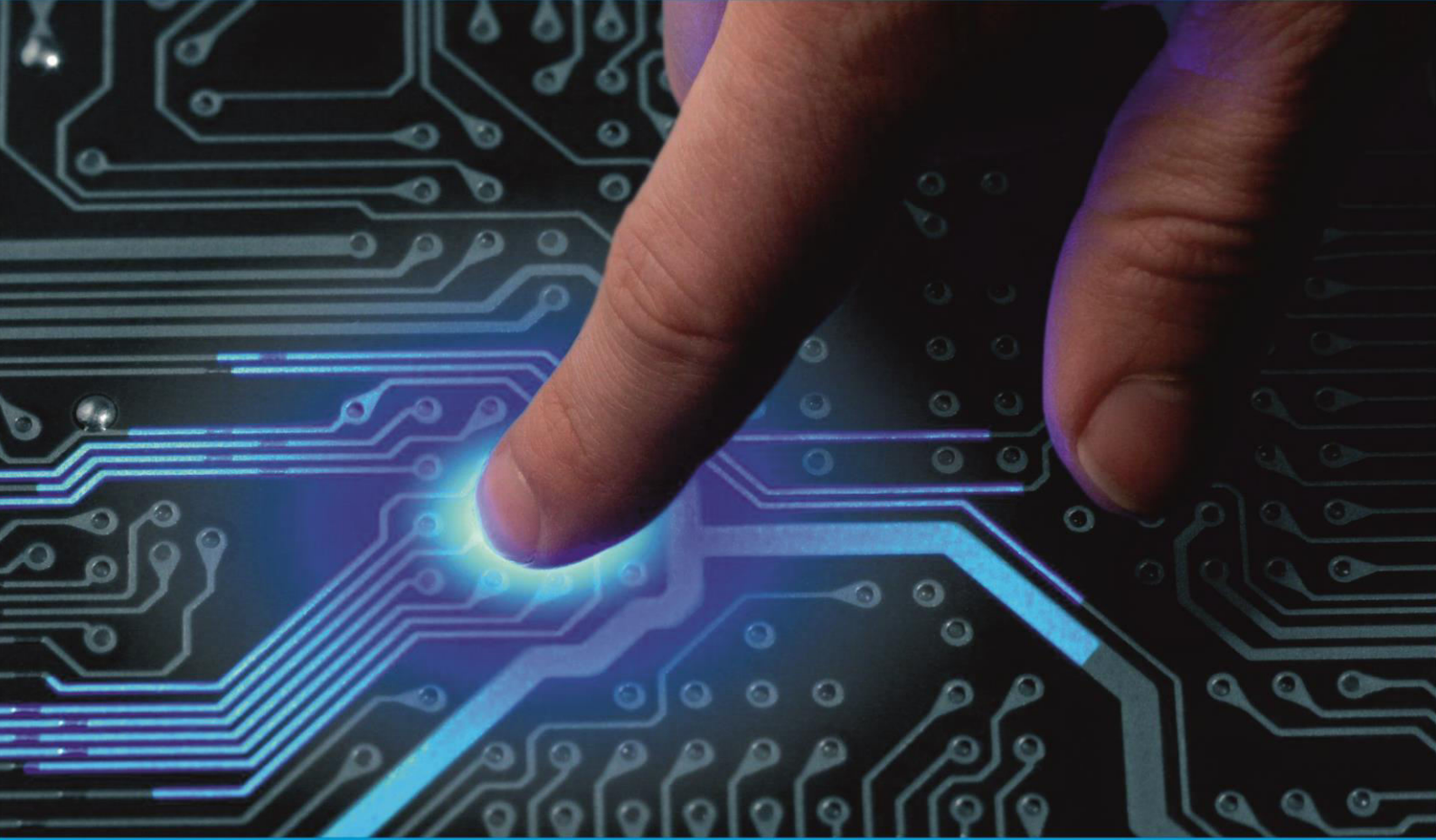




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# Multiplayer Third Person Shooting Hybrid Game Using Socket Programming and Unity 3D

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**ABSTRACT :** In this paper, we present a new immersive multiplayer third-person shooting (TPS) game. Our system provides both offline and online network support with custom server deployment tool suites. It lets the user to play across any console devices with different OS.

**KEYWORDS:** Third Person Shooter, Online and Offline Multiplayer Shooter, Hybrid gaming

## I. INTRODUCTION

PLAYING ONLINE GAMES on the Internet is an increasingly popular kind of mediated entertainment, but it has not yet led to a body of scientific research. Earlier studies primarily focused on role playing games (RPG) (clash of clans [super cell gaming]) with a graphical user interface and several thousands of users playing simultaneously online. 1-7A second type of-online games, the Third Person Shooter Games(TPSG) has to our knowledge not been covered in published research. This is surprising, because TPSG such as PUBG, FAU-G and Counter Strike are often the subject of public controversy as a result of the graphic violence they feature. This paper concentrates on how to sync game events with web browsers, android | ios apps and systemsoftwares.

## II. METHODS

Deciding to spend more time onserver programming to manage version across any os. Previously we used to do separate development for each devices which is too difficult to provide update. Considering that fact, we decided to reduce the different versions in backend part. Having a single server with n (arbitrary constant) load balancers provides a way to achieve hybrid gaming experience.

## III. RESULTS

Having single web-socket server will enable the user to synchronize their movements between clients from various devices. For role playing kind of games, a single http server is enough to handle the data sync, since the live transaction is not needed. Where as in shooting game, even a frame rate of monitor is important for a player to win the game session.

Considering that, we are using tcp/udp connection to give the best performance and security for the users to sync their movements without any network deviation. When a player creates a server entry and made it accesible via internet, they can share their key (server access key) for other players to connect to their device. The one who creates the server will own the session time and other configurable settings to the server and along with that the player can also act as a client. Security wise the machine should allow the server instance to establish socket connection between devices. Once the player shares the server key and if the instance is accesible via internet then he/she can make the server session as protected via custom security key which will be used to authenticate and login to the session ( to reduce the risk of brute force attack on server session, we decided to have another layer to make it more protected for the players). Where as in local network, we may not be able to provide these kind of securities since already we can restrict the number of game instances running on amachine.

Once the client connects to the server and if the player is authenticated, then their connection will be maintained unless the server/client closing their session.

## IV. NETWORKING ANDSECURITY

Once the player starts the server, a game instance will be triggered and will running their local machine with custom port specified( This functionality is limited to mobile applications and system softwares for security purposes). Once

the server instance is started, if the specified port is forwarded, then the server instance will be accessible via internet, else it will work only on the local network connection. Client movements like fire trigger, run, crouch, walk and aim will be transferred as commands to the server and in server side we'll be maintaining player data with location informations and inventory data. Once the server receives the command, the server will transfer the data commands to all the clients that is been connected to it. For each command, corresponding actions will be triggered for the user. If a player is not responding for more than specified ping seconds, then corresponding player will be automatically disconnected from the server for better playing experiences. To reduce the data consumption part, animations and environments are maintained in OBB file, so that even without internet, player can experience same level of gaming environment.

## V. HYBRID APP

Developers build hybrid apps using web technologies such as JavaScript, CSS and HTML. The code is then wrapped within a native application using open-source frameworks such as Ionic or React Native. This allows the app to run through each platform's embedded browser instead of the web browser, which means they can be installed on mobile devices and submitted to app stores for sale, just like regular native apps. Moreover, using plugins will enable them full access to the device's hardware and features, such as GPS, camera or address book. The wrapper solutions also provide a suite of UI components to create a native interface. So, even though they are developed with web technologies, hybrid apps have the look and feel of native apps, provide the same user experience and have the ability to work on different platforms.

## VI. ANIMATIONS AND ENVIRONMENT

Environment setup and environment objects will be loaded in OBB file during the time of installation. So when a player downloads the app, OBB file will be automatically created and will be wired up with the app. When a player creates the server session, by default it will pick the default environment and will load it on server session and player can choose other environments too within the specified time limit. It can be attained with the help of maintaining the available environment list in a separate folder structure and from there, app will render the list of environments. Environment will consist of destroyable or mutable objects like chair, doors etc., and also immutable objects like tree, sand and other physical objects. Each object will have its own characteristics and other properties like whether it should affect the gameplay or not. These things will be loaded as commands which will be obtained from DB config so that it can be updated without any harder pushes. The app will have its own consumer which will respond to the command received from server. It will activate the corresponding animation for the received command. Since we are executing the commands, it might reduce the data consumption level, but on the other hand it will increase the latency time which causes delay in execution of commands.

## VII. GAMEPLAY

The FPS Sample is a multiplayer only game. There is no single player mode and you cannot play the game without being connected to a server. It is a pretty traditional shooter game with two different characters: The Terraformer and The Robot. Each have their own weapon with a primary and secondary fire mode. There are two gamemodes:

Team deathmatch - Two teams fight for frags. Winner is team with most scores when time is up.

Assault mode - One team is attacking, another is defending. Attackers win by capturing all 3 bases before time runs out. Defenders win by preventing that.

Attackers can capture a base by having one or more players in the base. Defenders can take capture progress back by being in the base. Once a base is captured completely the battle proceeds to the next base. There are two levels in the game. The primary level is built for Assault mode. It is called Level\_01. The other level is mainly for testing purposes and is much smaller both in size and assets. It is called Level\_00.

## VIII. WORKFLOW

Working with a multiplayer game in Unity means you will be working a lot with the standalone player. To make a client and a server that talk over a network connection there has to be two processes. To make this workflow as frictionless as possible, we use asset bundles for all the content (levels and characters etc.). The only thing that goes into

the standalone player is the code and a single, very small, bootstrapper scene. Only if you have made changes to a level or a prefab do you have to rebuild the assetbundles. (And you can rebuild selectively -- to some degree.)The Project Tools window is used to make this workflow function in practice.

## IX. HUMANOID

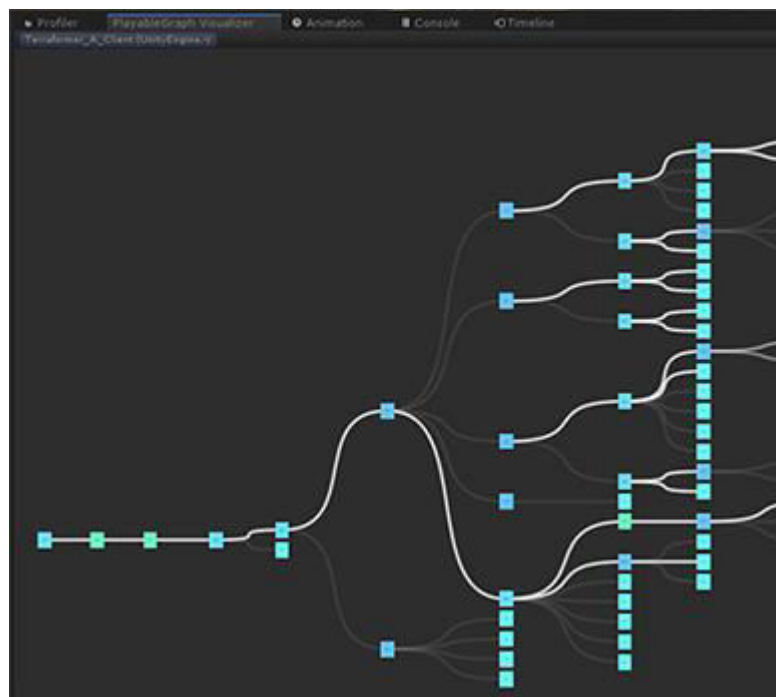
We use Humanoid for third person and Generic for first person. Using both allows us to demonstrate and exercise both pipelines. Humanoid provides re- targeting and built in IK solving, while Generic offers slightly better performance and more degrees of freedom in places like fingers.The use of translation driven squash and stretch (TranslateScale Component) allows for non-uniform scale to be used with Generic as well as with Humanoid/Re-targeting.

## X. THIRD PERSON SHOOTERANIMATION

Making network synchronised animation for a server authoritative multi player shooter, puts specific constraints on how we implement animation. We need to handle things like replication, rollback, prediction and lag compensation. For this reason we have chosen to use a custom Playable Graph for Third Person animation.

## XI. PLAYABLEGRAPH

The playable graph is the backend for animation features like TimeLine and the Animator Controller. When you use these a playable graph is created in the background. Playable graphs can also be constructed and managed through code using the Playable API, which is what we do.You can view Playable graphs using the Playable Graph Visualizer:



## XII.GAMECONTROLLER

Player can communicate with the server via different interfaces like joystick, touch, keyboard and mouse. Each will have its own command definition which supports single input devices for a device. To make it more easier, a VR gear will help the user to control their actions with physical moves. Study states that people won't prefer playing under sun light, hence they were tend to play indoor games. These kind of technology advancement will help the environment to have a healthy life by playing physically and mentally.



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