Online Game Server Framework for Creating Platformer Games

Kholid Fathoni 1), Rizky Yuniar Hakkun 1), Nana Ramadijanti 2), Achmad Basuki 1), Ruben Trisanjaya 2)

1) Department of Game Technology
2) Department of Informatic Engineering
Politeknik Elektronika Negeri Surabaya, Indonesia
kholid@pens.ac.id, rizky@pens.ac.id, nana@pens.ac.id, basuki@pens.ac.id, trisanjaya@gmail.com

Abstract - Game technology has become increasingly more popular in today’s society. Both adults and children love to play games as entertainment and exercise. But sometimes individuals cannot play the characters and scenarios according to their wishes, so the games that are played still depend on the scenarios created by the game maker. These issues encourage game authors to create a game server framework that helps players to create the desired game. In this paper we choose platformer game as research case study. There are several stages in the development of online gaming server framework. First, some 2D models are created that will be selected by the user as characters. Then, a program is created to build interaction between users with the game. Next, the framework is setup for placement of 2D / character models and programs. Then the framework is placed on the web server so that it can be accessed online. The application test shows the game goes well and gives satisfaction to its users.

Keywords - Online Games, Server Framework, Creating Platformer Games

I. INTRODUCTION

The definition and explanation of the term “Plateformer” are given in https://www.lifewire.com/what-is-a-platform-game-812371, which states “A platformer is a video game in which the game-play revolves heavily around players controlling a character who runs and jumps onto platforms, floors, ledges, stairs or other objects depicted on a single or scrolling (horizontal or vertical) game screen. It is frequently classified as a sub-genre of action games. The first platform games were developed in the early 1980s making it one of the earliest video game genres to exist, but the term platform game or platformer wasn't used until a number of years later to describe the games. Many game historians and fans consider the 1980 release of Space Panic to be the first true platform game while others consider then 1981 release of Nintendo's Donkey Kong to be the first. While it's debated which game actually started the platform genre, it's clear that early classics such as Donkey Kong, Space Panic, and Mario Bros were very influential and all had a hand in shaping the genre.”

Video games represent a multibillion-dollar industry and a major source of entertainment for children and adolescents. Games have large number of users. A national study of media use found that 52% of 2- to 7-year-olds and 82% of 8- to 18-year-olds live in homes with at least 1 video game console. Children and adolescents who play video games on any given day spend more than an hour playing them[1]. Other studies document similar usage patterns and further observe that parents are less likely to supervise video games than other entertainment media[2]. Unfortunately, little information exists about the ratings and genres of video games played by children of different ages, sex, family income level, and ethnicity. Consequently, the number and characteristics of children who play T-rated video games remain uncertain, although T-rated video games remain popular, comprising 28% of computer and video sales in 2002[3]. Many users play games because they like to be immersed in a fantasy enviroment [4]. This shows that the number of game users is huge and can not be underestimated. With standard games, users must follow and use the features provided. Users are not facilitated to expand and explore features in the game so it can create boredom. Therefore the user must be assisted in order to choose the desired features so that it can play with more comfortable. An example is a player can upload the assets he wants like as: design drawings, background, logic characters, background music and other complementary. In the platformer game, players are given the freedom to upload main characters, coin, environment, obstacles and so on. So far there are several applications that facilitate users to build their own game. Examples of game servers that provide services are kii and parse. For the category of its free feature is too restricted, so we as a game developer can not then develop our game online. Though the game is created with the server can make the value of the game becomes better. So that one user with another can interact with each other.

Our project reported here builds a game server framework that can be used by everyone to create their own game online. So that users can interact and play games that have been created by other users. We develop an application server game framework to facilitate users to build their own game. We limit our work to game platformer only.
II. RELATED WORKS

Many people believe that making a game is difficult, starting from the design of the image, background, character logic, music background and other features in the game that will be created. But at this time the users do not need to make the game themselves from scratch but can take advantage of existing applications. There are several game applications that can create their own games without the need for programming skills such as Gametracer and Sketch Nation Studio.

A. Gametracer

Game Tracer is a game maker application with 3D graphics, which has graphic advantages, but has a lack of customization and features that can be selected by the user. For example, the limitation is that users cannot use the characters or models that they make themselves [5].

B. Sketch Nation Studio

This application uses sketch or scribble of the user himself as the main object of the game maker, starting from the character to the background, the user is free to be creative. Users can draw directly various objects via iDevice or draw first on paper and then photograph. With this application, users can create games like doodle jump, and jetpack joyride easily. This application only runs on the iDevice platform and runs offline [6].

In this research project, the authors build a game maker application that is different from existing applications with several criteria:
1. server-based so that it can be accessed online and multi-user.
2. it allows users to create and upload self-made characters.
3. it is intended for the platformer game genre.

III. RESEARCH METHOD

A. Behaviour of User
In the game design stage, the author designs the flow of making games of platformer: making 2D asset, running mechanic, collider on obstacles and coins, preparing variables that will be sent his data to the server. Asset design is an important part in making a game, this is because the good quality or not a quality game of the asset is very influential. These assets include: GUI and gameplay.

Player has some actions like as: register account, request newest game list, create game, edit game, play game, update highest time and score and update session, shown in figure 3.

B. Architecture of Game Server

Building a game server requires a complete component that includes the platform, web server, database, service, game engine and the application itself. Web server is used for applications to be accessed online. Database is used to store game and user data. Game engine is used as a foothold of game applications to run on the server. The architecture of the game server system is shown in Figure 4.

C. Flowchart of the System

The flowchart of system is shown in Figure 5. The diagram shows the flow of the system, from the server flowing to the web server, then to the game engine / game maker and finally accepted by the user / player. Web servers use the PHP programming language, while game engines and game makers use unity programming.

D. Database Design

The game server requires a database because it involves a lot of users as well as games. In general, the database requires 2 tables only the game and the user, shown in figure 6.

In Game table has primary key idGame which definitely different and also do auto increment so that we can detect the most recent game made. The idUser column signifies the owner of the game, so each game must have its own owner. The name column makes the naming of the game, as per the user's wish. And lastly HP's column to accommodate the amount of Health Points that the game owner wants when running the game. HP's value is limited to five, so it does not damage the aesthetics of games and will offer challenges to the game.

E. Assets of Game Application

A platformer game is a subgenre of action game that the player controls a character or avatar to jump between suspended platforms and avoid obstacles. Environments often feature uneven terrain requiring jumping and climbing in order to traverse them. The player often has some control over the height and distance of jumps to avoid letting their character fall to their death or miss necessary jumps [7].

Platformer game needs game structure, character behavior design and assets. Assets are components of a game that cannot be ignored. Assets are the most easily understood form of visualization by players. The main asset
of this game consists of background, icon city, road, obstacle down / up, coin satay and playable character. Images and forms of assets in this game are adjusted to the local culture in the city of Surabaya, East Java, Indonesia including characters, backgrounds, coin / satay coin and others. Satay is a typical food in the city of Surabaya. Detailed assets are shown in table I.

TABLE I. DESIGN OF ASSETS ON GAME

<table>
<thead>
<tr>
<th>Name</th>
<th>2D Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Background</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>Background icon</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>Road</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>Top Obstacles</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>Bottom Obstacle</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>Satay Coin</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>Player</td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
</tbody>
</table>

The main background and icon background describes the city of Surabaya which has a fish and crocodile icon as the historical value of the city. The lower and upper obstacles should be avoided by the player to keep alive and running. While the satay coin must be taken by the player to get points as much as possible. Obstacles and satay coins remain fixed in this game. Asset player depicts players with custom-themed clothing Surabaya city. All visualization of this asset is made to introduce the culture and characteristics of the city of Surabaya.

IV. RESULTS AND DISCUSSION

On these results and trials of the application, we analyze: i) user interface, ii) portability in different Operating System, and iii) User Opinion as will be explained below.

TABLE II INTERFACES OF GAME APPLICATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Interface</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The initial view to start opens the app</td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td>2</td>
<td>Page to view the status of last game</td>
<td><img src="image9.png" alt="Image" /></td>
</tr>
<tr>
<td>3</td>
<td>Page to view state of Running Game</td>
<td><img src="image10.png" alt="Image" /></td>
</tr>
<tr>
<td>4</td>
<td>Page to edit game</td>
<td><img src="image11.png" alt="Image" /></td>
</tr>
<tr>
<td>5</td>
<td>Page to upload assets.</td>
<td><img src="image12.png" alt="Image" /></td>
</tr>
<tr>
<td>6</td>
<td>View of playing game.</td>
<td><img src="image13.png" alt="Image" /></td>
</tr>
</tbody>
</table>
A. Interface of the Game Server

In general, all the features of the game server application are running well from creating users, creating games, editing games, uploading assets and others, in detail shown the table II.

B. Portability of the Game Server

All the features of the system have been tested in some Operating Systems. Game server features are menus such as Splash Screen, Create New User, Login, Upload Obstacles, Upload Road, Upload Coin, Upload Background, Create Game, Edit Game, and Running Game. All menus have been tested and they can run well on some OS: Ms Windows 7, Ms Windows 8, and Debian.

C. User Analysis

The author also conducted a trial to 20 users to find out how their opinion of the game server applications that have been played. Approximately 85% of respondents expressed interest in game server applications that have been made. While only 15% are not interested in this game server. This is clearly visualized in Figure 7.

Viewed from the aspect of benefits for users, 35% of respondents stated that this game server is very useful for users for learning how to create and to play a game. 50% of respondents stated that the game server is quite useful. And only 15% of respondents said they were not useful. This is shown in Figure 8.

V. CONCLUSION

From the test run of this application can be drawn some conclusions as follows:

- The application of this game has a value or uniqueness that is different from other games, because in addition to online, this application can also invite and teach how to make games
- This application also uses a simple server concept so that the process done to get the output is not so long.
- This application can run in some Operating Systems
- This application is interesting and giving benefits to users.

REFERENCES