



Experiencing Virtual World Using Three-Dimension Internet Technology

Mousumi Dutta¹, Dr. Divya TL²

P.G. Student, Department of Master of Computer Applications, Rashtreeya Vidyalaya College of Engineering®,

Mysore Rd, Bengaluru, India¹

Assistant Professor, Department of Master of Computer Applications, Rashtreeya Vidyalaya College of Engineering®

College, Mysore Rd, Bengaluru, India²

ABSTRACT: The topic 3D Internet is one of the most important technologies world is looking forward to. Another name of 3D internet is virtual world. The 3D internet is the set of 3D virtual and mixed reality worlds in the internet. 3D internet is a combination of two powerful forces, and those two forces are internet and 3D graphics. 3D graphics can be used in any form like image, animation etc. In 3D internet we can interact more with the virtual reality. It results in an interactive, Realtime 3D graphics which is delivered over the world. Now the question is why there is a need of 3D internet. Until recently, there were two problems: slow computers and slow connections. If we want to download any 3D content it took a long time to download that. Even after downloading it ran very slowly and the quality of graphics was poor. 3D internet can be implemented using VRML-virtual reality modelling language. It provides a format which is platform independent and supported by most common 3D packages. It can also be implemented using WebGL (web graphics library) is a JavaScript library which provides 2D and 3D graphics with any compatible web browser, artificial intelligence. It can also be accomplished by using eyewear i.e. google glass or by using sensors. The outcome of 3D internet will be it will change the way we perceive internet of today. It includes the popular forms of live entertainment. It will be helpful for ecommerce such as 3d shopping which will provide a realistic view to an individual. It will made gaming more interesting and provides easy social interactions. using 3D, products can be visualized in a better way.

KEYWORDS: virtual world,Teleporting, visual experience,3D models,WebGL

I. INTRODUCTION

Internet is not a new word in today's world. Everyone is familiar with Internet. So, 3D internet is just an enhancement in the current existing 2D Internet, or we can say that it is the next generation after the current 2D internet. One of the most frequently asked question related to 3D internet is why do we need it? So, the answer is very simple that it will provide a real-life experience to the users and users will feel more interesting to use it when compared to 2D internet. The reason behind implementing the 3D internet is there are some problems which are facing by the people using 2D internet i.e., slow connections and slow computers. If a person wants to download some large data, it took a lot of time to download that content. Let us consider an example to get better view of 3D internet. If a person wants to visualise geographic scene in 3D then the most software did not have the capability of loading large-scale urban 3D models, and some problem may occur when browsing these large scenes. Users need a long time to download these city scenes, the model data of the whole scene cannot be called into the system memory at any single given moment, and the GPU cannot render in real-time. So, 3D internet solves the transmission bottleneck caused by network bandwidth. The websites which are present on the internet are in the form of 2D which contains only the written matter and images. So, to compete with this existing technology, it is necessary to upgrade where this written matter and images will be replaced with the 3D models which facilitate user a real-life experience.

3D internet is a combination of two powerful forces and those two forces are internet and 3D graphics. It is also known as virtual world. Like 2D internet only, it will also use browsers, search engines, servers but when compared to 2D, it will make world more social. The main feature of 3D internet is it will give services a shape using 3D graphics and will give users a shape using avatars. People are using internet to interact with each other. But the main reason behind the 3D internet is to get the sight of the next generation internet and to know its power i.e. what are the other things that can happen which all are not possible using 2D internet. As we know that the internet came into existence from the world wide web, there are many versions of web like web1.0, web 2.0. So, we can say that 3D internet is the next generation after the current 2D internet. The topic 3D Internet in Web 3.0 is one of the most important technologies for



which the world is looking forward. The internet which we are using currently completely lacks 3D experience. When we are talking about internet, everyone is using it in the form of 2D rather than 3D, hence this concept i.e. 3D Internet helps in achieving that. It is a virtual world where user can experience the real-world scenarios. It helps in converging physical and virtual world. It has flexible architecture, open protocols, intelligent and distributed system. It provides 3D map of every internet hub in the world. 3D Internet will use the same basic technology and components as that of a 2D internet, and it will interact with the same search engines and servers. Aside from the use of 3D computer graphics, the important difference lies in a much more social experience compared to the 2D Internet of today. The advantage of using 3D internet will be movies cannot be pirated which will be a big gain for movie industry. People will not lose money through illegal downloads from internet. Another advantage is it will lead to increase in the demand of 3D television.

II. RELATED WORK

In [1] author discusses about the need of 3D internet i.e., why 3d internet is required when there already exists 2D internet. It also includes what exactly is 3D internet, what comes under 3D internet and how it works. The author also discusses about the applications where 3D internet can be used. 3D internet can be useful for education for creating virtual classrooms, live sport entertainment where people can get the real-life experience, if they want, they can focus on their favorite player and many more. In [2] it includes the evolution of internet i.e., web 1.0 which contains only static web pages, web 2.0 where people could upload their contents as well. Web 3.0 is yet not fully developed. with the complete development of web 3.0, it will provide a real-life scenario. As we have different tools and technologies which can be used for development of 3D internet. WebGL stands for web graphics language [4]. It is a tool which render 3D images. It uses html5 <canvas> tag to render the image [5].

There are different hardware and software approaches which can be used to render the 3D images. Hardware approaches which can be used are google glasses which is just like normal lens over a 3D glass, shutter glasses which can be achieved by blocking the view of one eye at a time and repeating this at a very fast rate. etc and software approaches can be virtual reality modelling language (VRML) technology, WebGL etc.

III. PROPOSED TECHNOLOGY

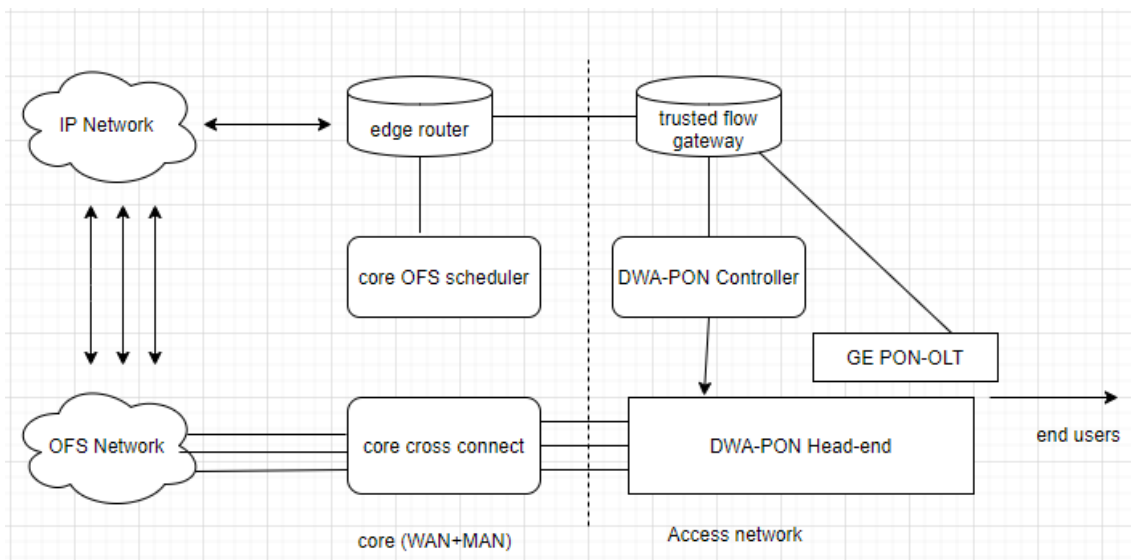


Fig 1. Overview of 3D internet working

The above block diagram tells the working of a 3D internet.

- It is divided into two parts: core network and access network.
- The core network consists of WAN (wide area network) and MAN (metropolitan area network)
- When a node is connected to two or more networks, it is known as router. A router is used to connect any number of LANs and use a standard protocol to move packets efficiently from source to destination. It works like a switch for sending messages from one network to another.
- It includes OLT which stands for optical online transmission to allow for computer connections.



- GE-EPON stands for Gigabyte Ethernet passive Optical Network which allows computer network to connect over telecommunication line.
- OFS network is an optical connectivity feedback network which interacts with the internet protocol network.
- The DWA- PON stands for Dynamic wavelength allocation Network-Passive optical Network Controller which is used for faster access across network.

IV. IMPLEMENTATION USING WEBGL

WebGL stands for web graphics language. The code of WebGL is a combination of JavaScript and OpenGL shader language. It can be run without JVM. WebGL code uses the tag of HTML5 such as <canvas> which can be used to draw graphs, create animations etc. WebGL (Web Graphics Library) is the new standard for 3D graphics on the Web, designed for generating an image for 2D graphics and interactive 3D graphics. The WebGL is currently supported by many web browsers including Apple (Safari), Google (Chrome), Mozilla (Firefox), and Opera (Opera). In order to display and animate the 3D content in the canvas, WebGL 'scene' involves mainly the three elements namely: renderer, lights and cameras. The WebGL technology has been used in various web-based simulation applications for scientific visualization, education, entertainment and gaming purposes. The structure of WebGL is shown below.

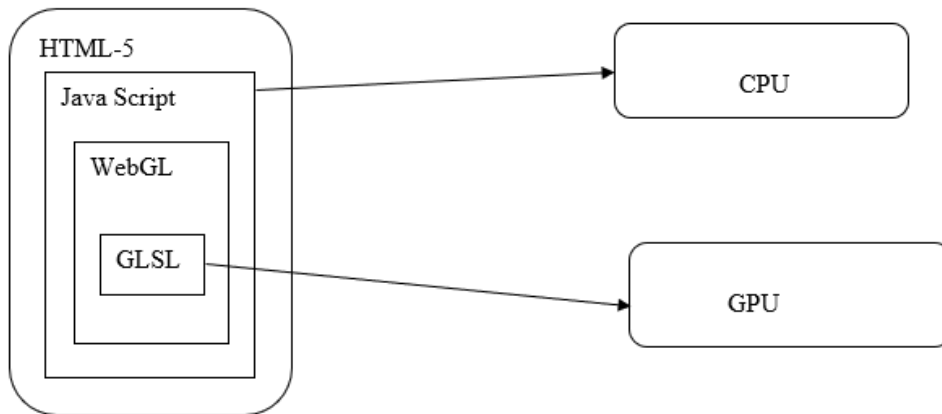


Fig2: Structure of WebGL

In the above diagram Java script is needed to communicate with CPU (central processing unit) and OpenGL shader language is needed to communicate with GPU (graphics processing unit). Following is a syntax which shows the declaration of canvas:

```

<body>
<canvas id="glCanvas" width="640" height="480"></canvas>
</body>
  
```

To implement the 3D models using WebGL, it is necessary to understand how it can be represented. A model is made of a mesh of triangles where each triangle is represented by three vertices. There are three properties attached to vertices i.e., vertex position, vertex normal and texture coordinates. After getting this, it is necessary to load the model which requires some code.

V.RESULTS

Internet speed is one of the most significant implications that are being faced by the 2D Internet. There are many countries in the world which does not have the required internet speeds that are needed for the implementation of the 3D internet. With the implementation of 3G, it will provide higher transmission rates i.e., minimum of 2Mbits/sec, maximum of 14.4Mbits/sec for stationary users and 348 Kbits/sec in a moving vehicle.

VI.CONCLUSION

Internet revolution is taking place rapidly. 3D internet is basically related to virtual world. We can see that 3D



Internet is the future as it will surely change the way we perceive the internet today. The advantages and applications exceed the cost associated with the implementation. The need of an intelligent Internet can surely be fulfilled by 3D Internet. Businessmen and interested investors are aware of the true potential of the user friendly, interactive, productive and addictive market side of it. There are many obstacles like Internet bandwidth, hardware, cost factors and lack of research which makes it difficult to implement. In today's world there is always a need to encourage the capabilities of an individual with the help of a technology.

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