International Journal of Advance Research in Science and Engineering
Vol. No.5, Issue No. 02, February 2016
www.ijarse.com
IJARSE
ISSN 2319 - 8354

3D INTERNET: TOWARDS A NEW DIMENSION

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ABSTRACT

The internet that we see today has evolved from read only web to the read write web to the read write execute web that has taken the World Wide Web to a new dimension that is 3d internet. It is evolving to become the de-facto cyber space or virtual environment facilitating communication, business, and entertainment on a global level. In this paper we are going to implement 3D internet against the 2D technology and the present 3D methodologies. Our goal in this paper is getting a glimpse of the next generation internet and its seamless power. We will be discussing the intermediate steps that lead to the evolution of this virtual world, its architecture, technologies evolving from it that have taken interactivity to a new level.

Keywords: 3D media future internet, social virtual world, second life

I. INTRODUCTION

The topic 3D Internet in Web 3.0 is one of the most important technologies world is looking forward to. Generally, we do our things manually in the daily life, which can be said to be in the form of 3D. But when it comes to internet we are actually using it in the form of 2D rather than 3D, hence this concept i.e. 3D Internet helps in achieving that.3D Internet, also known as virtual worlds, is a powerful new way for you to reach consumers, customers, co-workers, partners, and students. It combines the immediacy of television, the versatile content of the Web, and the relationship-building strengths of social networking sites like Face book Second Life is one such resource which is implementing the concept of the 3D Internet in its applications. And this application has been a great success in the United States and is expected to affect internet usage in a drastic way. 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. Future Media Internet has been designed to overcome current limitations and address emerging trends including: network architecture, content and service delivery across heterogeneous networks, diffusion of heterogeneous nodes and devices, mass digitisation, new forms of (3D) user centric/user generated content provisioning, emergence of software as a service and interaction with improved security, trustworthiness and privacy.It is an interactive virtual environment for services, interaction and communication. The internet is evolving to become the de facto cyber space or virtual environment facilitating communication, business and entertainment on global business. Today over 1 billion of users access the internet on regular basis, more than 100 million users have downloaded at least 1 file and over 47 million of them do so regularly. A typical 2D website is an extremely abstract entity and consists of nothing but bunch of document and pictures. In the near future these numbers are expected to exponentially rise. In this evolving environment, machine to machine communication, rich 3D content as well as community networks and the use of peer-to –peer overlays are expected to generate new models of interaction

and cooperation.The paper is structured as follows: after an introduction about the 3d internet the next section deals with the evolution of 3d internet, its underlying architecture how it developed gradually from web 1.0, web 2.0 and web 3.0;next section is about how to implement 3D internet which is through virtual platforms , an introduction to VRML technology ; Networking and Distributed Computing ; next section is about the technologies based on 3d internet i.e. Google glass , 3d mouse , vision station , virtual shopping etc. The next section is about the architecture of 3D internet, then the challenges faced by 3D internet and how to resolve the issues and finally the paper concludes with remarks.

II. EVOLUTION OF 3D INTERNET

The 3D internet has not just emerged suddenly instead it has been transformed from different stages of web.

2.1 Web 1.0

It is the initial face of World Wide Web. It is the information published on the web in a static manner. It could be considered as the read only web. In other words, the early web allowed us to search for information and read it. There was very little in the way of user interaction or content contribution. However, this is exactly what most website owners wanted. Their goal for a website was to establish an online presence and make their information available to anyone at any time. The first shopping cart applications, which most e-commerce website owners use in some shape or form, basically fall under the category of Web 1.0. The overall goal was to present products to potential customers, much as a catalogue or a brochure does

2.2 Web 2.0 – The writing and participating web

The lacks of active interaction of common users with the web lead to the birth of Web 2.0. The year 1999 marked the beginning of a Read-Write-Publish era with notable contributions from Live Journal (Launched in April, 1999) and Blogger (Launched in August, 1999). Now even a non-technical user can actively interact & contribute to the web using different blog platforms. The Web 2.0 or the "read-write" web has the ability to contribute content and interact with other web users. This interaction and contribution has dramatically changed the landscape of the web. It has even more potential that we have yet to see. The Web 2.0 appears to be a welcome response to a web users demand to be more involved in what information is available to them.

2.3 Web 3.0 – The semantic executing web

The Web 3.0 would be a "read-write-execute" web. The two things that form the basis of the Web 3.0 — semantic mark-up and web services. Semantic mark-up refers to thecommunication gap between human web users and computerized applications. One of the largest organizational challenges of presenting information on the web was that web applications weren't able to provide context to data While this is still evolving, this notion of formatting data to be understood by software agents leads to the "execute" portion of our definition, and provides a way to discuss web service.

A web service is a software system designed to support computer-to-computer interaction over the Internet... Currently, thousands of web services are available. However, in the context of Web 3.0, they take centre stage. By combining a semantic mark-up and web services, the Web 3.0 promises the potential for applications that can speak to each other directly, and for broader searches for information through simpler interfaces.

III. ARCHITECTURE OF 3D INTERNET

The philosophies of the 3Dimensional Internet shared by its forerunner includes open and reliable architecture, open proprieties, simple to operate at the network core, higher levels of intellect at the edges, and scattered application. User surfs the 3Dimension net and uses teleports to move between independent worlds or services. Web place in contradiction of the 2Dimensional Internet we have www, Websites and Sub domains.

3.1 World servers

It provides the user or administrator formed, fixed and active contented which makes unambiguous website place (3Dimensional atmosphere) that has imagining, physics related machine, avatar's information funding, and hypermedia, providing many other features to the client and server sequencers. The worldwide servers have an imperative task of harmonizing actuality with the users that are connected, starting to communicate within themselves, which ensures space in consistency in realistic machines. These are also used to give various other services such as mails, immediate memorandum, uploading, downloading fast and more.

3.2 Avatar/ID servers

Computer-generated individuality running systems encompassing identity and avatar material as well as account of enumerated employers these all provide an environment in which the information of the world servers and the individual servers are having privacy and security.

3.3 Universal Location Server

The systems which are used for virtual management that are same as the (DNS),these DNS are used to provide the information regarding virtual geography The (ULS) can also facilitate as a distributor of id servers and the user.

3.4Client

Programs running on the user system like a browser which needs a caching, network and a3 dimensional functions to run in the system. There are some additional software's which are needed to support 3dimensional functions such as editing software's and placing websites in client system. It is expected that discovery of new tool and software development kits will overcome this problem.

IV. IMPLEMENTATION

3D internet can be implemented using available virtual platform such as second life, cannot in fact be considered a teaching platform, although it provides a good foundation for one**.** Second Life (SL) evolved as an idea by founder and former Linden Lab CEO, Philip Rosedale (aka Philip Linden). He envisioned a vast green, continuous landscape, distributed across multiple servers — and went on to build it. While he dreamed of virtual worlds since his childhood, in 1994, Rosedale first thought of connecting computers via the Internet and creating a virtual world. Lindenwold was renamed into Second Life: a 3D virtual world with user generated content, where users could interact with each other in real time.

It can also be implemented by using artificial intelligence which is the field that studies the synthesis and analysis of computational agents that act intelligently. It can also be accomplished by using eyewear i.e. google glass or by using sensors or holographic image projection i.e. our hologram technology pushes boundaries and expectations, and provides that extra wow factor to captivate your audiences. With our groundbreaking 3D holographic projection technique, your event will never be forgotten.

Working with us and our unique technology we will bring your vision to life. MDH will help you create a stunning experience for your audiences.

4.1 Implementation using VRML Technology

4.1.1 Introduction to VRML

VRML is the Virtual Reality Modelling Language, a system for describing 3D scenes on the Web. Using text files in a similar format to the HTML which you have been studying, VRML allows a browser to produce the illusion of a three dimensional environment .The very first thing you need is a VRML browser, to view your worlds, as well as other peoples. The most popular one is Cosmo Player from Cosmo Software (Win95/NT). The next thing you need to do is create your own worlds. There are two ways of doing this. First, you could use one of the many VRML authoring tools, which are like 3D modellers in which you can build your world. The other way is to code it by hand. All you need for this is a text editor, such as notepad or word pad. Simply type in the code as shown, and save it as filename.wrl. You can then load this into your browser and take a look!

4.2.2 File structure of VRML technology

VRML files contain:

The file header

- Comments - notes to yourself
- Nodes - nuggets of scene information
- Fields - node attributes you can change
- Values - attribute values

4.2.3 Simple code in VRML technology

VRML for coordinating nodes – The transformation

A simple text language for describing 3-D shapes and interactive environments

```
#VRML V2.0 utf8
#A Cylinder
Shape {
appearanceAppearance
{
geometry Cylinder
{
Height 2.0
radius 1.5
}
}
```

}

4.3 Networking and Distributed Computing

The conventional web caching approaches will not be adequate for the needs of the 3D Internet environment consisting of 3D worlds, which may be hosted on different servers. One challenge stems from the fact that avatars contain significantly more information about the user who is visiting a 3D world than cookies do about a 2D web site visitor. For instance, avatars contain information about appearance (e.g. height, clothing) and behaviour (e.g. visible, open for conversation). As avatars move between worlds, caching will be needed in server-to-server interactions to enable fast and responsive transition between worlds. This will be intensified by avatars carrying objects (e.g. a bicycle) or virtual companions (e.g. a virtual dog) with them, which will require the transfer of large volumes of information in a short time when changing world. Another challenge is related to the fact that some virtual objects or companions are essentially not static documents but running programs. They have code that defines how they react to certain inputs, and they have a partly autonomous behaviour. Thus, when an avatar and its companions move to a world, the world server (or servers) needs to execute the corresponding code. This raises a number of interesting research problems: how can we safely run potentially entrusted code (for instance, when the virtual companions are user-generated and custom built)? How will the economics of such transactions be handled? How can we move running code between different world servers without fatally disrupting its execution? Platforms will be needed that allow the dynamic deployment of potentially entrusted computation at globally dispersed servers, in a fast, secure and accountable manner.

4.3.1 Latency Minimization

As the 3D Internet will increase the reliance on graphics and interactivity, it will be crucial that the latency that clients observe when interacting with servers is minimized. It has been known from existing implementations such as SL that high latency incurs low responsiveness and reduced user satisfaction. Therefore, the network has to be designed intelligently to overcome these challenges. We propose a hybrid peer-to-peer (P2P) approach to reduce server load and ensure scalability of the 3D Internet infrastructure. It consists of three types of communications: client to server (C2S), server to server (S2S) and client to client (C2C) each with different latency and band- width requirements. C2S communications (see Figure 1 red lines) are bandwidth limited, frequently updated, and synchronous. Location and activity data as well as use of in-world services will spend substantial amount of re- sources both at the client and world servers. The avatar/ID server-client C2S communications (dash-dotted gray lines) are less frequent and asynchronous. As an optimization, some portion of this communications can be pushed to the backbone by facilitating S2S links between ID and world servers (solid gray lines) triggered by clients and through intelligent caching. Additional S2S communications will also take place on the backbones. The S2S in the case of universe location servers (dotted gray lines) are expected to be relatively low load. Improving server independent C2C (P2P) communication is one of the main solutions to the scalability problems. One example is the information about avatars in the same space, which can be communicated more efficiently if exchanged directly between the avatars ‘hosts, instead of through a central server. When the user moves around other avatars can send their information as well as of others within the range in a P2P fashion as depicted in Figure 2. For ex- ample, the avatars in circle L1 can send information about the ones in L2 and they in turn about L3 as a dynamic intelligent caching scheme.

V. TECHNOLOGIES PROVIDED BY 3D INTERNET

5.1 Google Glass

It is a headset, or optical head-mounted display, that is worn like a pair of eyeglasses. It was developedwith the mission of producing a ubiquitous computer.[1] Google Glass displayed information in a smart phone-like hands-free format. Wearers communicated with the Internet via natural language voice commands. Google started selling a prototype of Google Glass to qualified "Glass Explorers" in the US on April 15, 2013, for a limited period for $1,500, before it became available to the public on May 15, 2014, for the same price. The headset has received massive criticism and legislative action due to privacy and safety concerns.

5.2 Vision Station

The 2.0 meter VisionStation is designed to deliver the maximum in single user immersive viewing. The Vision station's ultra wide 180 degree field of view (FOV), great sense of immersion and ease of use make for a terrific, low cost alternative to large, unwieldy multi-projector systems.

The VisionStation is designed to be deployable- one person working alone can set up the VisionStation in less than fifteen minutes. With a range of projectors available, the VisionStation is the perfect solution for many different project challenges. VisionStation are affordable, low maintenance and easy to use. The standard VisionStation can be used for reviewing buildings, automotives and aerospace designs or as a low cost driving simulator. The modular components can be integrated into military simulations solutions such as part task trainers, cockpit, procedural trainers, mission rehearsal systems, and UAV operator consoles. The VisionStation is 2.0 meters and has 1920 by 1080 resolution.

5.3 3D Mouse

It is an input device that allows you to move 3D objects on your screen in an easier and more intuitive way than with a 2D mouse. The reason for this is that a 3D controller provides access to three dimensions of motion control*:* right-left, back-forward, up-down.

Furthermore the Space Controller allows the rotation around eachaxis so that you have six degreesof freedomunder your control. The Space Controller is the ideal input device for CAD construction as well as camera movement in GoogleEarthTM. The heart of the Space Controller is its cap. You can move and rotate it for a few millimetres and the object on the screen will move in the same direction. As soon as you release the cap it will slide back to its central position and the object on the screen will stop its movement. This process is completely intuitive and actually needs almost no familiarization.

5.4 Virtual shopping

fter 3 years of intense research, 3D store can now be easily managed by the shop owner and represents an absolute innovation in the international web market. The system builds upon an earlier Esimple technology, Virtuymall, the first Virtual Mall in the world.

Main Characteristics:

1. Avatar navigation
2. Live interaction with other connected users

3. Product details and free purchase from directly inside the 3D environment
4. An advanced editor lets shop owners place objects and furniture inside the 3D store
5. Access to statistics and visitor information
6. Personalized 3D shop assistants to assist clients and make the purchase process faster
7. Presence of avatar bots
8. Constant interaction with the database system and continuous refreshing of prices and object details.

VI. CHALLENGES TO 3D INTERNET

6.1 Platform Performance

FP is intensively client/server, Const. bandwidth and Low latency. Thus, the link has to be premeditated competently to overwhelm these trials of low dormancy due to high graphic software. The use of PC with 20X GPU and 3XCPU can increase the performance.

6.2 User Created Contents

(UCC): Portability over world is to Easy-to-use tools, Realistic rendering. This is online content that has to be created by an Internet user. Tools are must to be provided to create this content. They must produce tools for content creation and enhancement free. Site like one of the YouTube allows its user to distribute their material in different ways that were impossible previous decade. Some virtual sites give users chance to modify individual oriented data and might stop the amount that can be environmentally directed. Each world would have a value associated with single style of data.

6.3 Simulation services

Dense avatar measures, diverse client styles, Unified graphics or physics. Simulation service can be carried out on server side or client side. Tools and models must be accepted on.

6.4 The management of multilevel identities

Identity managing is basic so that while on numerous virtual world the individual has the similar identity and can be verified. In this concept, conditions and aspect of self are incrementally externalized as divided into both 2Dimensional and 3Dimensional digital personalities reflecting any number of combinations of now malleable aspects of race, sex, dob, body type, personality and physique.

6.5 Monetizing of virtual assets:

Each virtual world now has their own money system. Second life renders Dollar. In the same way that web application like e-Bay and Amazon net has their own currency system, services. The ogoglio used services won't be a slightly bounded as the Second Life's grid, so there is not going to be a one company which can control a payment or exchange.

6.6. Applicable rules or privatization of "digital avatars"

One of the main values of most popular in the report based around the effects of technology and modern society is security. Private things is seen as a basic human right in all western democratic countries, and is often argued to be a essential condition for using of other human rights. Many of them relate controls to be private: The

individual control over who have access to the personal live and info. Control across interactions with others, Control across handling one personal information, against surviving and observing, and a physical control over one personal world. A main characteristic of Second Life's is anonym, which enable user to distinguish their online, in the world identity (their avatars) from their offline identity. Many user states that they are feeling like their Second Life identities are not identical, and even significant different from their "real life" identities. In this aspect Second Life differ from social network which needs user to login and use their general names and identifications.

6.7. Speed

The connection speed in internet is one of the meant glitches which are often confronted by the 3Dimensional net technology. Many republics all around the earth are trying to meet the demand of the net rapidity speed, which are needed for 3Dimensional net. With their introduction of 3rd Generation, 4th Generation etc., there is an increase in speed measured always 3-G is the 3rd generalization of telecommunication typical and for mobile schmoozing. 3rd Cohort influences are wide arena mobile network that emerged to provide good net access speed and video telephony technology. The expectations from the 3rdGenerationis that it will deliver high broadcast speed, the smallest rate of 2Megabit/seconds and all of 14.4Megebit/seconds for motionless consumers , whereas 348 Kilobit/seconds for a car, which is in motion. Thus, with announcing of 3rd Generation technology, the speed rate operations included with the 3Dimensional net will be suppressed earlier.

6.8 Visualization and Interfaces

First access to 3Dimensoinal net is the problem of visualization and interfacing. Devices that can be used to perform such an aim includes PET's, basically known as cell phones and PARTS'. PET's are able of creating holographic imagery, and permissive the visualization of 3Dimensional images and videos. PARTS's make up an advanced versions of today's multimedia vision glass, making it to view 3Dimensional imagery and even involving them in the practical world.

VII. CONCLUSION

Thus, in this paper we have provided with an overview of concept of 3D internet i.e. also known as virtual worlds, is a powerful new way for you to reach consumers, business customers, co-workers, partners, and students. It combines the immediacy of television, the versatile content of the Web, and the relationship-building strengths of social networking sites like Face book. We have discussed the motivation behind it and specific research directions in the fields of networking, security, distributed computing, and machine learning. Thus 3D internet is a step ahead to future which could serve for not only as metaverse but will change the way we perceive internet of today. In today's ever expanding and demanding world there is always need as well as scope to enhance the capability of an individual with the help of the technology. We are give a load of possibilities in the field of computer science to develop it into the life which could not be imagined by any human.

Thus a lot of research is going on and a lot is yet to be done in the field of 3D internet.

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