Going International:
The New Zealand Virtual World Grid

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"The emergence of virtual, synthetic, and immersive worlds is a revolution, and it will likely arrive sooner than we can assimilate it." (Katz, 2008)

INTRODUCTION

Second Life[TM] [1], the well-known 3D virtual world created by Linden Labs, has enjoyed a centre stage position in the industry for many years. Within that commercial environment universities around the globe have poured tens of thousands of dollars into building their presence, simulations and virtual campuses. However, in October 2010 Linden Labs issued a notice to education institutions that the 50% discounts afforded to them would end by December 31 of that same year, effectively doubling the cost [2]. Within days the internet filled with angry posts from educators, developers and university administrators who all knew that shrinking budgets and grant-funded developments would preclude them from sustaining their current level of work.

During that same period the open source community was developing OpenSim [4], a platform which would replicate the Second Life environment, and many universities and commercial entities began to explore its potential.

OPENSIM

The OpenSimulator project, also known as OpenSim, is an open source project founded in January 2007 by Darren Guard [4]. The initial motivation for OpenSim was to develop a proof of concept server that could connect to the open source Second Life[TM] [2] client that was released in early 2007. This would allow users to install and run their own local virtual world server, providing them with full control over their own environment.

An OpenSim installation consists of the OpenSim server and a number of regions (or islands) that make up the virtual world environment. Users can create an avatar which exists within that OpenSim installation, and can interact with other avatars within the same OpenSim. One of the advantages of Second Life[TM] is that users are participating in a large worldwide virtual community, and so are able to interact with, and share resources with a large number of other users. With OpenSim enabling users to run their own virtual worlds, this advantage of Second Life[TM] was lost and it wasn't long before OpenSim users were looking for a way to connect their standalone worlds with one another. This was achieved through the introduction of the *hypergrid* to the OpenSimulator project.

HYPERGRID

The Hypergrid is a relatively recent addition to the OpenSim codebase that enables users to connect multiple OpenSim installations to each other and allow avatars to move seamlessly between the different OpenSim worlds. As in Second Life, users can teleport from one region to another within the virtual world. With hypergrid enabled, teleports can be made to allow users to move from a region within world A to a region within world B as if they were all part of one world.

TECHNICAL REQUIREMENTS FOR SETTING UP A GRID

Initially, to install and run an OpenSim server was a complicated process that involved editing a number of configuration files and the execution several servers processes. However, as the project matured the configuration has been simplified and currently requires the execution of only two processes to have a local OpenSim server running on a machine. There are also a number of preconfigured installations that are available to simplify the process further, such as the popular *Diva Distribution* [5].

OpenSim can run on common platforms such as Windows/Mac and other unix-like system such as Ubuntu, and can be run on popular database systems like MySQL and SQL Server Express. Running OpenSim does not require powerful hardware, often off-the-shelf desktop computers nowadays are sufficient. Server class systems are recommended for large number of concurrent users, large builds and extensive use of scripts. One major consideration of OpenSim is network bandwidth and latency. User experience highly depends on these factors as well as the user's physical location.

THE NEW ZEALAND VIRTUAL WORLD GRID

In 2007 as part of the Global Network Interconnectivity (GNI) Project at The University of Otago, an experimental OpenSim virtual world was set up in the Otago Next Generation Networks and Services (ONGENS) Test Bed Facility to explore the possibilities of Virtual Worlds and Web3.D technology [6]. The ONGENS Virtual World Grid was formed in conjunction with The University of Canterbury and with support from Telecom NZ. The Grid was set up with an education and research focus, and expanded rapidly as more researchers and educators became aware of the OpenSim project as a free alternative to Second Life™, and was soon hosting approximately 100 users from 14 educational institutions around New Zealand. As the OpenSimulator project developed and the codebase matured, interest in the ONGENS Virtual World Grid grew. It was subsequently decided that a national initiative was required and the experimental setup of ONGENS was no longer viable. This lead to the formation of the New Zealand Virtual World Grid (NZVWG) by The University of Otago, the University of Auckland and the University of Canterbury [7]. The objectives of the NZVWG were to:

- Undertake both experimental and routine use of virtual worlds in teaching and research;
- Develop engaging, interactive in-world content customised for NZ use; and
- Develop new context-specific plug-ins enabling interaction between the virtual and real (non-virtual) worlds.

INTERNATIONAL PARTICIPATION AND FUTURE WORK

In mid-2010 discussions began between the NZVWG and a wide range of international universities who were exploring OpenSim as an alternative to Second Life. Soon after, Montclair State University and Clemson University, both in the United States, worked with the New Zealand teams to successfully hyperlink their OpenSim installations with the NZVWG. Subsequently, an informal international group was formed to explore wider expansions of the grid, and at the Educause 2010 conference in Anaheim, U.S.A, the NZVWG was prominently featured.

At this writing the internet continues to be flooded with posts about the sudden changes in Second Life pricing, with many universities suggesting they will abandon or substantially lessen their investments in that platform and turn their attention to the OpenSim platform instead. This session will present the current states of the International Virtual World Grid developments for Tertiary Education institutions in Australasia, along with updates on progress to bring together the international community into an international virtual world grid.

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