Journal of
•Virtual Worlds Research

Volume 1, Number 3. Culture of Virtual Worlds.

Editor-in-Chief's Corner

Interconnecting virtual worlds

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Abstract

The argument is put forward that current virtual worlds find themselves in a situation akin to that of BBS systems in the 1980s and 1990s vis-à-vis the Internet. A reflection from the technical viewpoint on the similarities between Web browsing and virtual world navigation is made and to conclude, the paper will offer a set of requirements for interconnection of virtual worlds and what that may achieve are made.

Keywords: virtual worlds; interconnecting; metaverse.

Interconnecting virtual worlds

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Imagine the world today if there was no import of products whatsoever. If each country not only happened to survive and evolve only with its internal resources, but in fact had no other option but to do so. We would be back in an extremely ancient era, when human populations seldom met each other and mostly thrived or vanished in isolation – if such a situation ever existed, since even in the most primitive times there has been constant flux of ideas, products, and genes.

But in current virtual worlds, this flux is quite limited. It takes place, but in a "stealth" format – people that use more than one virtual world end up spreading, reusing or reinventing ideas across the board, as the various supporting technologies allow them. What if the flux was more similar to the one that occurs in the physical world? If for example, while crossing a border, you kept your identity, persona, and possessions? And why stop at travelers and their possessions? When travelers cross borders, what they find is not a fishbowl environment and completely isolated: whole shipments of products, ideas, and money also cross borders. As we all know, the world and its people – we – are interconnected.

If the Web Were Like Virtual Worlds

Making an exercise in imagination, let's suppose that each web site, running on specific web server technology, was like current virtual worlds. One thing that would change is that I'd have to install a different browser for each server technology, of course. So even clicking on a link would only work within a web site or, at most, within web sites using the same server technology – and even this would include some issues, as I'll address later. If you were at the *Journal of Virtual Worlds Research* web site (which runs on Apache 2.0.61) and decided to click the authors login page, at auth.tdl.org (which runs on Apache 2.2.6), you might be able to use the same browser, but the following step, which takes place at www.tdl.org (running on Zope 2.10.5) would require a different browser.

The previous example is what the web is now: different web sites employ different technologies, even within the same organization. And the user simply accesses it all from a single application – the web browser. Obviously, different web browsers have different abilities. I collected the above server data in the Firefox browser, using the HttpFox plug-in, but I typically use Google's Chrome browser for regular surfing. If I was a blind user, I could be using a completely different browser, like WebbIE. Even PDA or cell phones have their own versions of browsers. So, not having a single browser and not being able to link between different-technology servers, would be a way to imagine the web more like virtual worlds are today.

But browsers are only part of the story. There is plenty running behind the scenes, between web servers and browsers (without the user's intervention). For instance, when opening a web page, every single element on it (e.g., the text, the style sheet defining the presentation, each image and multimedia element, the icon for the browser's address bar, and so forth) is a different request that the browser makes – each can be at a different server, and often are. Some

web servers may restrict access to pictures and some other files for inclusion in external pages, but most do not. This is what allows many web pages to aggregate information, and indeed is often encouraged by web 2.0 sites – for instance, at the web page for each YouTube video, a user is presented with the direct address to the video and even a ready-to-use piece of code for embedding the video in another web page. So, in order to imagine the web more like virtual worlds today, this would have to cease – or only work within same-technology servers.

And even further behind the scenes, plenty takes place between web servers. When one logs in at a web site, the server can check the credentials, but it can also simply forward the login request for validation at another server. There are several remote authentication technologies to make this a reality, and that is what allows one to move between some groups of sites (Google Mail and Google Reader, for instance) without having to re-authenticate. You have to trust those sites to do this, but trust is a human decision – the technology behind today's web allows this if humans so decide. And the content on a web page does not have to be requested by the browser from different sites: in fact, a web server can itself make that job and provide complex functionality. It can ask an analytics service to store and process visitor's data, ask a marketing service to provide adverts, mix it with its own content, get links and global menus from another server, and use still further services from other servers, resulting in the web as we see it today, rich and varied, with many suppliers and consumers not only of end-user products, but also of technological services and innovations.

So, imagine it like virtual worlds today. That would mean turning all this off and implementing services once for each server technology. Many services would end up implemented only for one of a few technologies.

Are Virtual Worlds in the BBS Age?

Some readers may have never used a Bulleting Board System (BBS) before. Basically, each BBS would be running on a server somewhere, typically providing access to files, discussion forums, mailboxes, and chat (Marx and Virnoche, 1997). Online games were also common. Users would use modems to dial-in the phone number of a specific BBS in order to access its services. In the BBS heyday, during the late 1970s and 1980s and even the early 1990s, a user would dial a BBS number, take part in its activities, then hang up and dial another, where other people, data, and activities could be found. Some commercial services like CompuServe or AOL were permanently available, while others were shoestring operations working on a personal computer at someone's home, only available to one caller at the time, and only when the system's operator was not using the line for telephone calls.

It was a fantastic age. Information was previously hard to get, but suddenly, one did not have to run from city to city, from library to library, from shop to shop, to find trivial or not-so-trivial documents or pictures. One did not have to live in a metropolis to have access to a wealth of viewpoints, know-how, or even jobs: all was reachable from a phone line. People were excited and involved, and companies reacted both with their own BBS and with a presence in the most successful commercial providers. It would be common to browse a magazine and find on adverts the name of CompuServe message boards that had been created by companies to provide online support for customers, for instance.

It was not unlike the way that we often see news in the media about companies developing their own virtual worlds or establishing a presence in *Second Life*. But, the BBS world was eventually succeeded by the web.

Can We Move on from Virtual Worlds and into the Metaverse?

From the above, we can think of several requirements of interconnection between virtual worlds that could lift them from the BBS age into the web age. I'll refer to this future age as the age of the Metaverse – not the single, contiguous world from *Snow Crash* but a plethora of interconnected worlds (Stephenson, 1992).

First, it should be possible for an identity to cross over from world to world. This means that some semblance of the avatar's name should be retained, even if that means that my own Andabata Mandelbrot in *Second Life* is only Andabata or External1234-andabatamandelbrot in some other world. And possibly an avatar's appearance could be defined in layers of complexity, so that some resemblance could be kept, even in quite different server technologies. For instance, perhaps my body shape and size could be lost when crossing from a high-detail world into a low-detail one, but could it be possible for my avatar's hair to still be sky blue? And kept barefooted? Obviously, when the server technology allows it, it should be possible to carry over the entire appearance. I do not mean to say that any of this should be mandatory – just that it should be possible.

Second, it should be possible for the virtual world client software to be somewhat independent of the virtual world. Perhaps this would involve installing "client plug-ins" for different virtual worlds or some other solution, but it definitely would require the development of a standard protocol for virtual world access. This would users to travel between worlds without changing client software and allow a variety of client software to be used for different purposes, like improved accessibility of plain business competition. This already is happening for virtual worlds based on the *Second Life* / OpenSimulator technology and also for virtual worlds based on OpenCroquet technology. But one cannot cross from an OpenCroquet-based world to *Second Life* (or vice-versa) without changing client software.

Thirdly, and possibly the most important, virtual world servers should be able to interact with other virtual world servers, so that true metaverse applications and solutions could be developed. For instance, if a user requests support at an automated helpdesk in a virtual world, the system behind that helpdesk should be able to contact a private enterprise virtual world and update a virtual management console. A student should be able to set up a virtual display on a school's private virtual world and use for that display images, sounds, texts, and virtual objects from public virtual spaces – and link them to their sources. Again, this does not have to be mandatory. Some virtual worlds, mainly games, simply cater for particular needs and have no need or wish to be part of the Metaverse. Other may wish to prevent all external access to its resources – but it should be possible to share if so desired.

Some authors refer to any virtual world as a metaverse. In that sense, each private intraweb is indeed a web – but there's also the world wide web. Shouldn't we create the Metaverse?

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