

# Gateway and Protocol for Modern Cyberspace (online id web-0029)

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## 1. Introduction

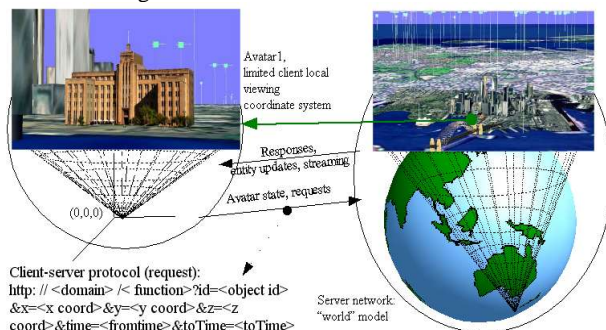
There is a vast quantity of 3D information in the world, too large to fit on any one computer. It needs a distributed, interactive web3D visualization system: a *cyberspace*. Web3d has also suffered from cross platform portability problems and client side restrictions. We look at how one might create a common, believable cyberspace using current technology and outline the cyberspace protocol (CP) it will require. One that makes web3D relatively cross platform and not overly sensitive to client limitations.

## 2. A Realistic Cyberspace

Cyberspace has long been conceived by academics and industry as it was painted by science fiction writers, particularly William Gibson who coined the term. *Cyberspace: First Steps* [Benedikt 1991] scientifically laid down what cyberspace would be like and how it may be built. They viewed cyberspace as emerging, even imminent, "the door to cyberspace is open" pp 18. The book envisions close interfacing with body and clothing [Benedikt pp 312, 324] and having a fluid space of abstract constructs for objects and data. In recent times the film *The Matrix* has continued the science fiction theme with fully realistic input (*sensreal*) to the senses. Even with current technology *sensereal* Virtual Reality (VR) is beyond us.

We define cyberspace as simply a 3D interactive extension to the web, immersive like a good online 3D game but not *sensereal*. Cyberspace client and distributed server programs must come without encumbrances (costly licenses or royalties) and run on enough hardware platforms in order to be available and easily accessible to the general public.

Many elements for cyberspace are laid down by Crosby Fitch's series of articles [Fitch 2000b]. Fitch describes the technology and design for a highly scalable distributed internet gaming system, however it can be applied to web3d visualization in general. Pesce et al [Pesce et al 1994] proposed a client-server CP which required new protocol support and modified DNS resolution to support its multiple domain field. We retain the ideas behind this CP but use single domain http request and URL encoding with "form" parameters. The generalized http format is shown in the figure.



"function" describes an operation on an object like create, get, add, delete or replace. The x,y,z coordinates can be in any

coordinate system that suits the application, but we restrict ourselves initially to Cartesian. This can be implemented in VRML using createVrmlFromURL function in a script node, as in the following fragment:

```
url "javascript: function create (v){
  if(v==true) {
    Browser.createVrmlFromURL(http://a.b.c:8080/web-
  enabler/webobject?function=create&type=box&ont=0",
  self, 'isAdded');
  }
}
```

Similarly, X3D has the createX3dFromURL function. Thus platform portability is possible across all web3D browsers that implement the URL based create function. It is not constrained to special implementations, such as those supporting java in the script node. Further, complicated or demanding functionality can be implemented on the server(s) freeing the application from the constraints of limited clients. This includes navigating visual spaces too large to fit on the client.

This protocol is being implemented in the planet-earth system [Thorne and Weiley 2003] which is an online virtual earth gateway. Scalability of the virtual pace will be handled by the CPs as described in [Fitch 2000a, Fitch 2000b]. These allow a server to delegate responsibility to other servers as the overall load increases while still maintaining control.

## 3. Conclusion

We have reviewed early ideas about cyberspace and proposed a practical implementation. The CP presented will allow the client-server interaction conceived by Pesce et al to be realised in a widely portable way using current technology. In addition we propose using server and client side protocols as described by Fitch.

We propose therefore that planet-earth be the gateway to a modern-day cyberspace for the masses. This is a cyberspace that is believable and useful for a range of common activities whether they be work or entertainment.

## References

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