

CMSC 498W Lecture 11
“Distributed Virtual Worlds”
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The Endless Forest [1] is described by its creators as a “multiplayer online game and social screensaver”. Although it is an MMO (Massively Multiplayer Online) game, it runs on only a single server. The game is implemented as a Windows screensaver. Development of the game was funded by several artistic cultural institutions, including [Musée d'Art Moderne Grand-Duc Jean](#), which also hosts the server. The gameplay is very abstract and artistic- for example, players may not chat directly with each other, but must attempt to communicate through deer-gestures.

“Distributed” in this context could be thought of as simply meaning “networked”- there is a client and a server in different locations. There may also be multiple clients or multiple servers all comprising the same virtual world.

Sometimes it would be desirable for clients on different servers to not interact- for example, there could be servers for different languages, player skill levels, gameplay styles (such as Role Play, Player Vs. Player), etc.. However, in other cases it would be desirable for these clients to interact, for example if the multiple servers were being used only for performance reasons. A server or group of servers on which clients can interact, and which thus comprise the same virtual world, is sometimes called a “shard”.

MMORPGs (Massively Multiplayer Online Role Playing Games) have existed for decades (since the 70s), starting as text-based and eventually evolving to virtual-reality graphics. At what point they would be considered “virtual worlds” is debatable, though they could technically be considered so as long as the server maintains some world state.

A more modern example, World of Warcraft [6], was released in 2004 and holds the Guinness World Record for “Most popular MMORPG”. It has grossed over \$10 Billion [7]. It consists of multiple servers, or shards, which it calls “realms”. These allow various combinations of language, role-play dialog, and player-vs-player combat.

“Mirror worlds” are recreations of real locations in a virtual world. Google Earth [2] is one example of this, particularly when using its 3D building models. Other examples are flight simulators, such as Microsoft Flight Simulator [3] (first released in 1982), or trucking simulators, such as American Truck Simulator [4]. Mirror worlds could also be used for non-entertainment applications such as disaster-response training or planning military operations. In fact, Lockheed Martin actually has a product called Mirror World [5], based on “video game technology”, for military Command and Control.

Outerra [8] is a “3D planetary engine for seamless planet rendering from space down to the surface”. It “can use arbitrary resolution of elevation data, refining it to centimeter resolution using fractal algorithms”. The planet Earth has been implemented using Google Maps data, and Mars is planned as well.

The virtual world in The Matrix could be considered a prime example of a fictional mirror world, as well as a distributed virtual world.

[1] <http://tale-of-tales.com/TheEndlessForest/home.html>

[2] <http://www.google.com/earth/>

[3] <http://www.fsxinsider.com/>

- [4] <http://americantrucksimulator.com/>
- [5] <http://www.lockheedmartin.com/us/products/mirror-world.html>
- [6] <http://us.battle.net/wow/en/>
- [7] <http://www.businessinsider.com/here-are-the-top-10-highest-grossing-video-games-of-all-time-2012-6?op=1>
- [8] <http://www.outerra.com/index.html>