Geophysical Research Abstracts
Vol. 15, EGU2013-11193, 2013
EGU General Assembly 2013

EarthServer - 3D Visualization on the Web

Sebastian Wagner, Pasquale Herzig, Ulrich Bockholt, Yvonne Jung, and Johannes Behr
Fraunhofer IGD, Germany (sebastian.wagner@igd.fraunhofer.de)

EarthServer (www.earthserver.eu), funded by the European Commission under its Seventh Framework Program, is a project to enable the management, access and exploration of massive, multi-dimensional datasets using Open GeoSpatial Consortium (OGC) query and processing language standards like WCS 2.0 and WCPS. To this end, a server/client architecture designed to handle Petabyte/Exabyte volumes of multi-dimensional data is being developed and deployed. As an important part of the EarthServer project, six Lighthouse Applications, major scientific data exploitation initiatives, are being established to make cross-domain, Earth Sciences related data repositories available in an open and unified manner, as service endpoints based on solutions and infrastructure developed within the project. Clients technology developed and deployed in EarthServer ranges from mobile and web clients to immersive virtual reality systems, all designed to interact with a physically and logically distributed server infrastructure using exclusively OGC standards.

In this contribution, we would like to present our work on a web-based 3D visualization and interaction client for Earth Sciences data using only technology found in standard web browsers without requiring the user to install plugins or addons. Additionally, we are able to run the earth data visualization client on a wide range of different platforms with very different soft- and hardware requirements such as smart phones (e.g. iOS, Android), different desktop systems etc. High-quality, hardware-accelerated visualization of 3D and 4D content in standard web browsers can be realized now and we believe it will become more and more common to use this fast, lightweight and ubiquitous platform to provide insights into big datasets without requiring the user to set up a specialized client first. With that in mind, we will also point out some of the limitations we encountered using current web technologies. Underlying the EarthServer web client and on top of HTML5, WebGL and JavaScript we have developed the X3DOM framework (www.x3dom.org), which makes possible to embed declarative X3D scenegraphs, an ISO standard XML-based file format for representing 3D computer graphics, directly within HTML, thus enabling developers to rapidly design 3D content that blends seamlessly into HTML interfaces using Javascript. This approach (commonly referred to as a polyfill layer) is used to mimic native web browser support for declarative 3D content and is an important component in our web client architecture.