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THE POTENTIAL ROLE OF THE OPTIPUTER IN THE EARTHSCOPE PROJECT

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The OptIPuter (<http://www.optiputer.net>) uses **O**ptical networking, **I**nternet **P**rotocol, **c**omputer storage, processing and visualization technologies to create a distributed computing infrastructure where the central architectural element is optical networking and not the computers. This allows for very fast access to remote datasets and geographically distributed locations of large-scale parallel computers. This could be the framework for Earthscope projects so that scientists can access data on multiple machines at multiple locations. During the first year of this project, the 9-node OptIPuter Visualization Cluster was set up at IGPP/SIO. This system is a version of the Geowall 2 system i.e. it is a scalable resolution, cluster driven, tiled LCD panel display system (<http://www.evl.uic.edu/cavern/optiputer>). Each node is a dual Intel Xeon 2.4 GHz machine running Red Hat Linux 7.3, equipped with 2GB memory and a NVIDIA Quadro FX 2000 graphics card. The system has 2 IBM T221, 22.2" LCD displays – each supporting a resolution of up to 9.2 million pixels (3840 x 2400). Four nodes, resulting in eight tiled images over the two screens, drive each display and the ninth node is the master node. Currently the cluster supports gigabit bandwidth. This cluster is used for: (1) High resolution 2D imagery viewing using JUXTAVIEW (<http://www.evl.uic.edu/cavern/optiputer/juxtaview.html>) (2) Volume Visualization using VOL-A-TILE (<http://www.evl.uic.edu/cavern/optiputer/volatile.html>), a volume rendering tool for large-scale, time-varying seismic datasets for tiled displays. (3) Interactive 3D visualizations created using the Fledermaus package (<http://www.ivs.unb.ca>) and distributed online (<http://www.siovizcenter.ucsd.edu/>). These visualizations are a combination of digital elevation models, seismic profiles, seismic telemetry paths, bathymetry and other geo-referenced datasets.

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