e-Viz – An Advanced Environment for Enabling Visual Supercomputing

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Universities of Manchester and Leeds

The e-Viz Project

Challenge

To deliver an advanced infrastructure that enables complex visualization tasks to be carried out seamlessly in Grid and High Performance Computing environments.

The Project

e-Viz is a collaborative research project funded by EPSRC and the e-Science programme, involving Bangor, Leeds, Manchester and Swansea. Its main aim is to develop a conceptual framework for HPV automatically. It will develop a prototype software system, together with a collection of conceptual models, interaction protocols and algorithms, for automated HPV management. The work will be integrated with existing Grid middleware.

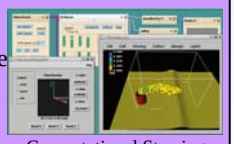
What is HPV?

HPV (High Performance Visualization) is the delivery of visualization services, using state-of-the-art algorithms and high performance computing, graphics and network resources.

Application Abstraction Adaptation

Applications

Typical applications include



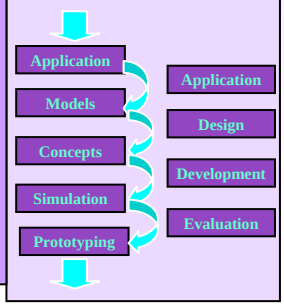
Computational Steering

Medical Visualization

Mobile Visualization

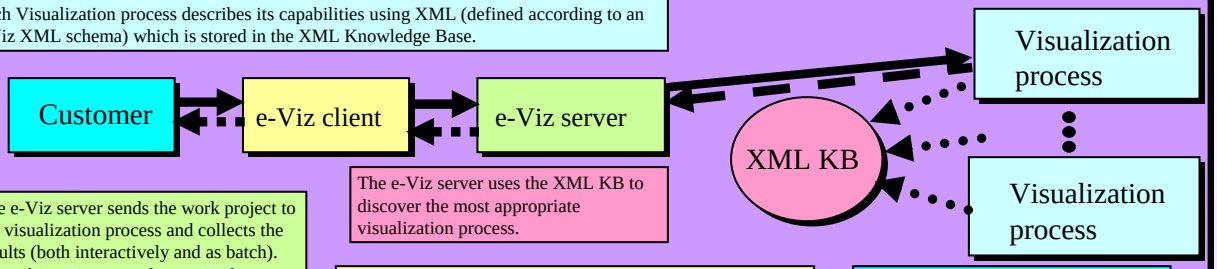
Abstraction

simuVS is a simulation environment, where models and protocols will be implemented to simulate a variety of HPV environments and applications, and is used to verify abstract HPV models, and evaluate various management algorithms and strategies in a "controlled" environment. It thus offers a "conceptual testbed" for each component in the development of e-Viz.



Adaptation

Each Visualization process describes its capabilities using XML (defined according to an e-Viz XML schema) which is stored in the XML Knowledge Base.



The e-Viz server sends the work project to the visualization process and collects the results (both interactively and as batch). Several iterations may be required to achieve the solution – e.g. isosurface followed by visualization.

The e-Viz server uses the XML KB to discover the most appropriate visualization process.

The e-Viz client sends a Visualization request to the server, receives results, and displays visual feedback. The display may consist of interactive visual data, or final results.

The customer may use the client to interact, steer or manage the visualization processes.

Graphics Technologies

Rendering Strategies

Cluster Rendering

An increase in performance can be gained by parallelising rendering – we are exploiting Chromium to enable cluster visualization and tiled displays.

Remote Rendering

Remote Rendering exploits powerful OpenGL hardware on a server delivering frames over the network to the client display. We are developing portable remote rendering software

Further information at: http://www.eviz.org
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