

Challenge Intelligent scheduling of an abstract visualization task

The Project

The e-Viz project is developing a user-centred framework for High Performance Visualization (HPV) using a Grid infrastructure that will provide reliability, adaptability, transparency and pervasiveness. One aim is to determine if the Grid analogy of an electrical power grid is appropriate when constructing a visualization Grid, as well as identifying the issues involved in implementing such a system.

e-Viz Features

- Remote Rendering
 - visualize on remote HPV machines
- Migrateable Visualization
 - switch freely between servers at runtime
 - fault tolerance
- Autonomic computing for visualization
 - scalable autonomic infrastructure
- Heterogeneous Architecture
 - supports a range of visualization applications: interactive, batch rendering, mission critical, ...
 - Linux & Win32 clients (Mac support planned)
- Computational Steering for Visualization
 - steer any part of the visualization pipeline, including the frame rate

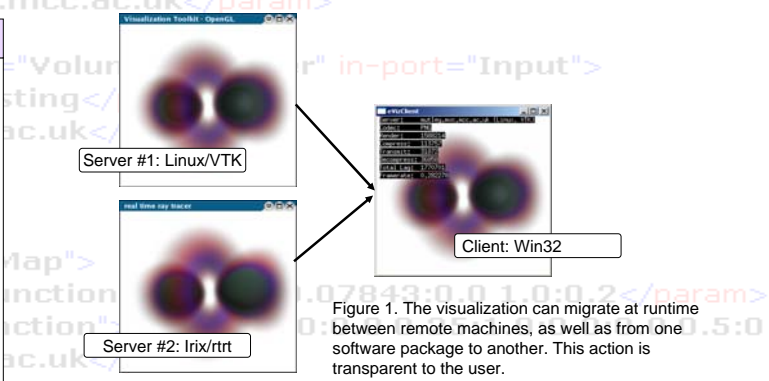


Figure 1. The visualization can migrate at runtime between remote machines, as well as from one software package to another. This action is transparent to the user.

Architectural Overview of an e-Viz Session

1. Client starts an e-Viz session, and describes data to broker
2. Broker queries database for an appropriate visualization pipeline
3. Database returns a suitable pipeline to the broker
4. Broker locates the data and visualization software
5. Data and software is transferred to the target HPV machine(s), job is staged
6. HPV machine(s) inform the broker when they are ready to begin
7. Broker informs client of which HPV machine(s) to connect to
8. Client connects to HPV machine(s), starts sending control data
9. HPV machine(s) respond to control data, and return output visualization stream
10. Client reports metadata (framerate, network lag, user metrics) to the broker
11. Broker stores metadata to influence decision making in future e-Viz sessions

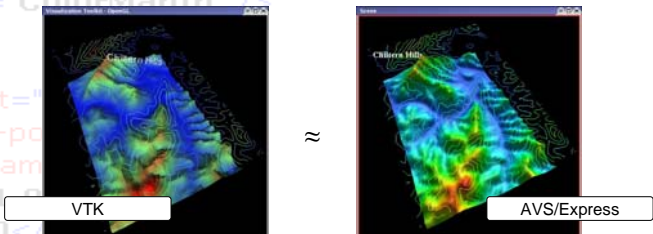


Figure 2. Comparative visualizations of the same data in different software packages have been made in order to test the feasibility of having an abstract visualization description language.

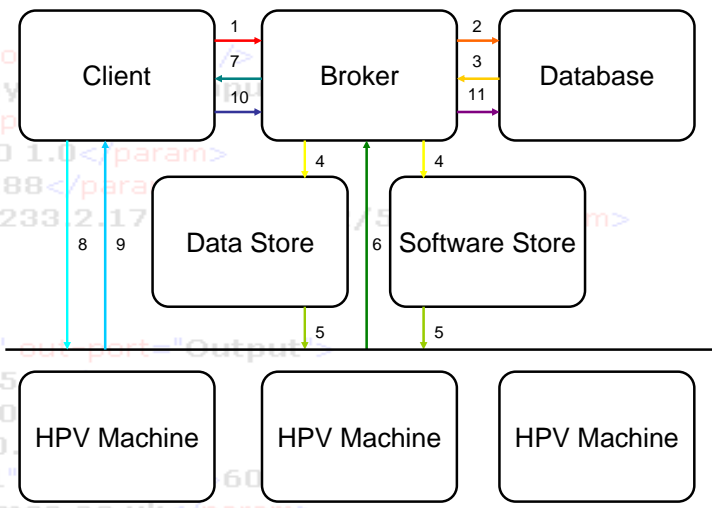


Figure 3. Architecture of the e-Viz System, and associated data flow in the setup of an e-Viz session.