

Reasons and Experience for Needing Visualizations of Complex Remote Data Sources

Providing Research Infrastructure & Support

Visualization Services
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Schedule

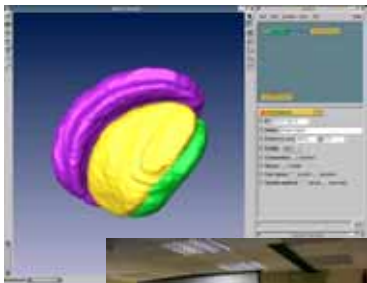
- The Complex of Data
 - Need a definition of complexity?
- People want to Collaborate
 - Need a definition of remote visualization?

1. Examples of complex data – across sites

2. Solution from e-Science

- Computational Steering

Brain imaging across continents



Amira Access Grid Broadcast Module - includes stereoscopic projection (Robert Frank)

StereoBodies - Stereoscopic Choreography



Memetic TimeLine Synchronisation

Compendium Mind-Mapper Tool

Morphologies



University of Bedfordshire – Stereoscopic playback – 2007

eDance Project



A ground-breaking project on dance choreography is being funded by the joint AHRC/EPSRC/JISC

Links with Access Grid (Videoconferencing)

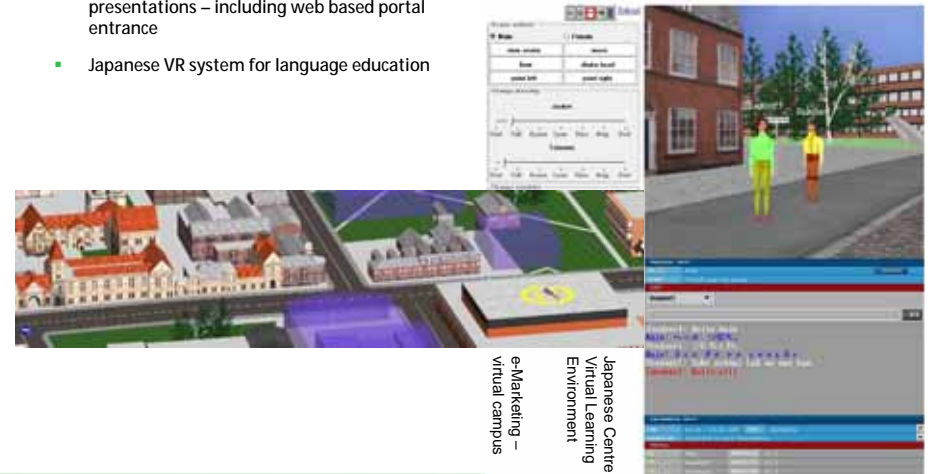
New Access Grid codecs plus remote and fully recorded presentations



photo by Carl Bentley 2004; SC Global

Web based VR environments Couple of the Virtual Spaces

- Lightweight framework for web based presentations – including web based portal entrance
- Japanese VR system for language education



Japanese Centre Virtual Learning Environment
eMarketing – virtual campus



Manchester Services

A multitude range of users have included:

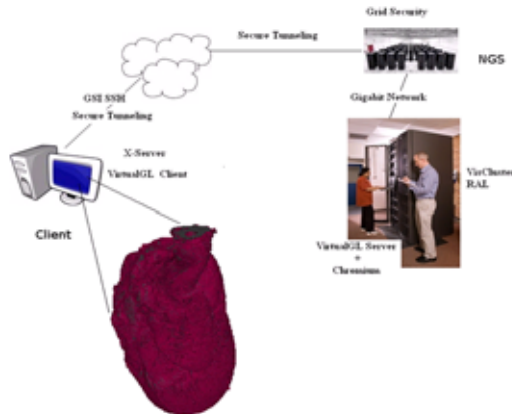
1. Palaeontologists collaborating with Earth scientists to carry out virtual field trips.
2. Stereoscopic dance performance and capture within theatrical spaces.
3. Presentations of research in remote conferences and meetings.
4. etc...



Reasons for Remote Visualization

- Data is Remote
 - Computational Remote Sources
- Confidential Data
 - IPR Issues
- Data is too Large to Move
 - Size/distance measurements.
- Convenience for User
 - Internet café syndrome

Remote Rendering on a Visualization Cluster using VirtualGL and Chromium

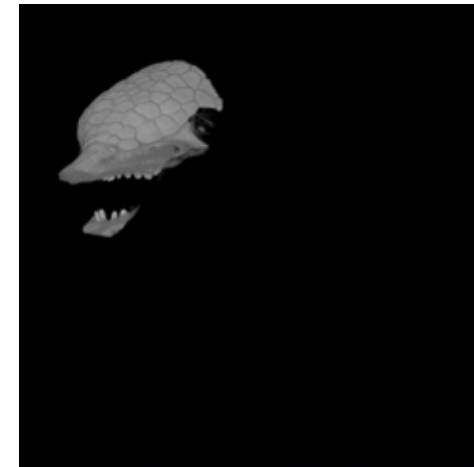


1. Data is considered confidential after computation
2. Video and Images are not considered confidential

Srikanth Nagella, Lakshmi Sastry and Ronald Fowler
RAL

Parallel Modules – remotely viewed from AVS/Express

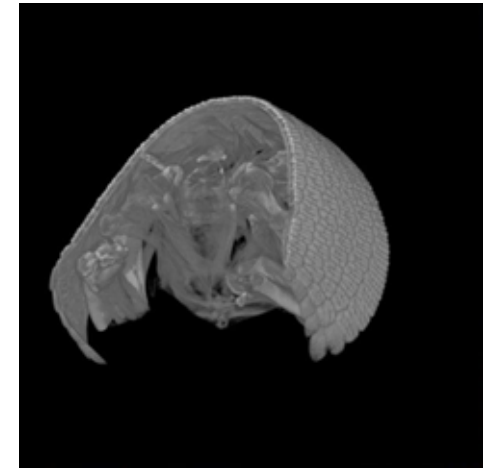
Data is too large to transfer so ... split data to remote locations



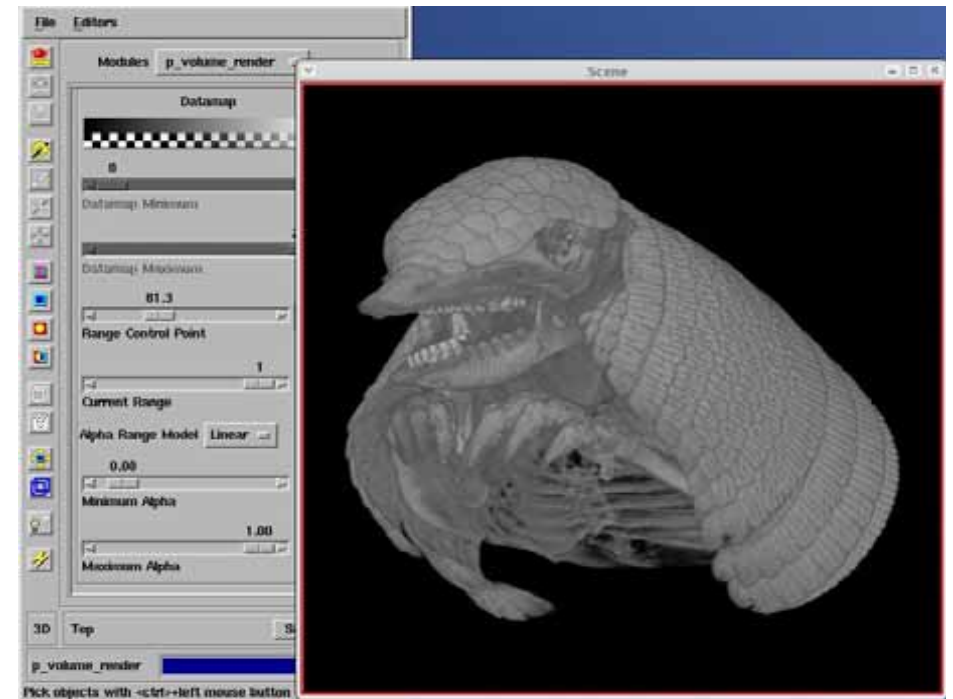
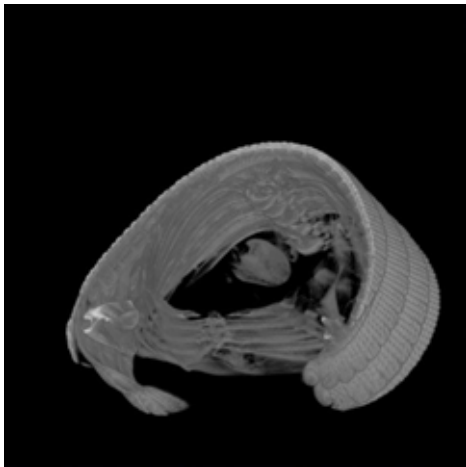
Parallel Modules – remotely viewed from AVS/Express

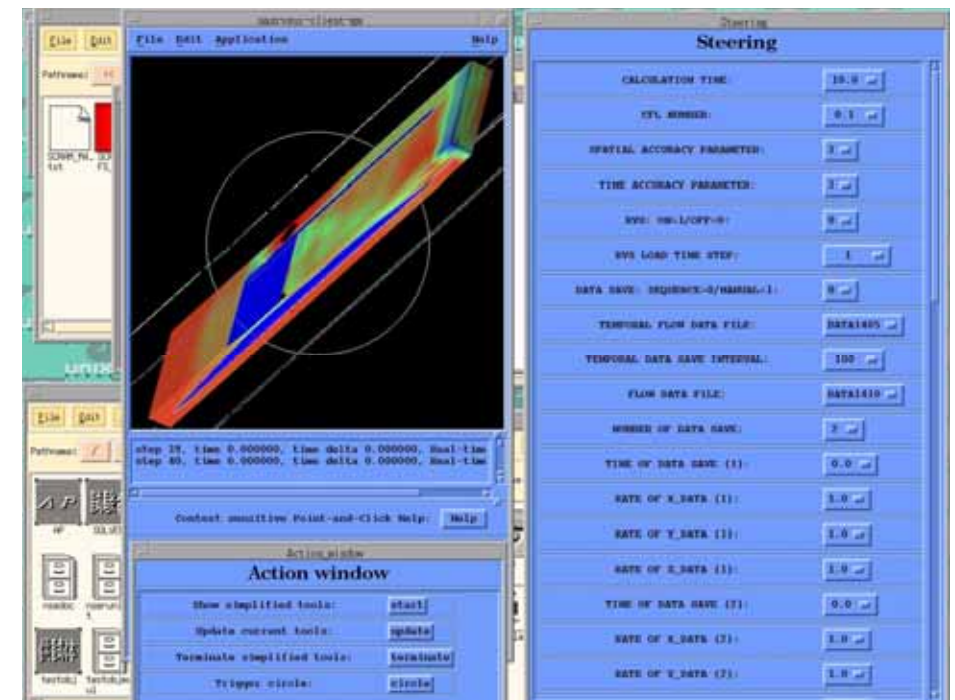
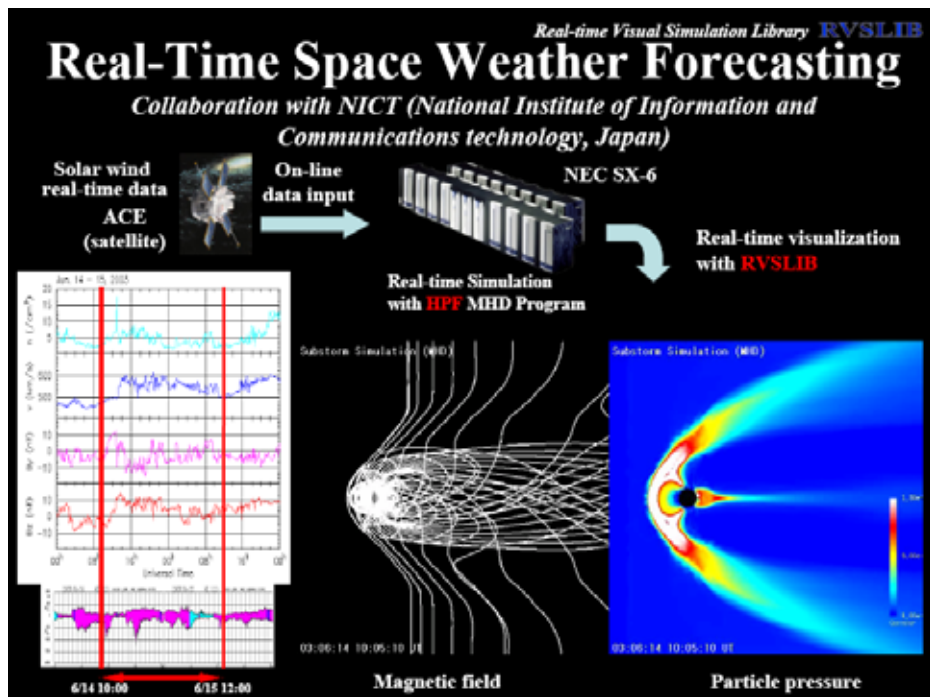


Parallel Modules – remotely viewed from AVS/Express



Parallel Modules – remotely viewed from AVS/Express





RVSLIB: Real-time Simulation and Visualization Library

- Live link

<http://www2.nict.go.jp/y/y223/simulation/realtime/index.html>

- Information

http://www.nec.co.jp/APSOFT/SX/rvslib_e/index.html

Thanks to: Arihiro Yoshida - NEC



RealityGrid – Computational Steering

E-Science Project; EPSRC Platform Grant

- Thanks to Robert Haines - Research Computing Services
- rhaines@manchester.ac.uk

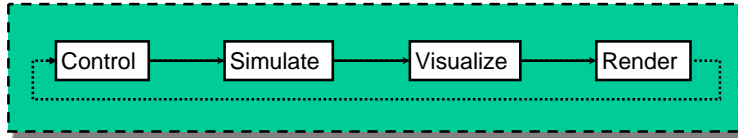


- Web

- www.realitygrid.org
- www.rcs.manchester.ac.uk/research/realitygrid

What is Computational Steering?

- "Closure of the loop" between simulation and user



- Monitoring a running simulation
 - Pause, resume or stop simulation if needs be
- Altering parameters in a running simulation
 - Receive feedback on the changes
- Restarting a simulation from a known or saved point

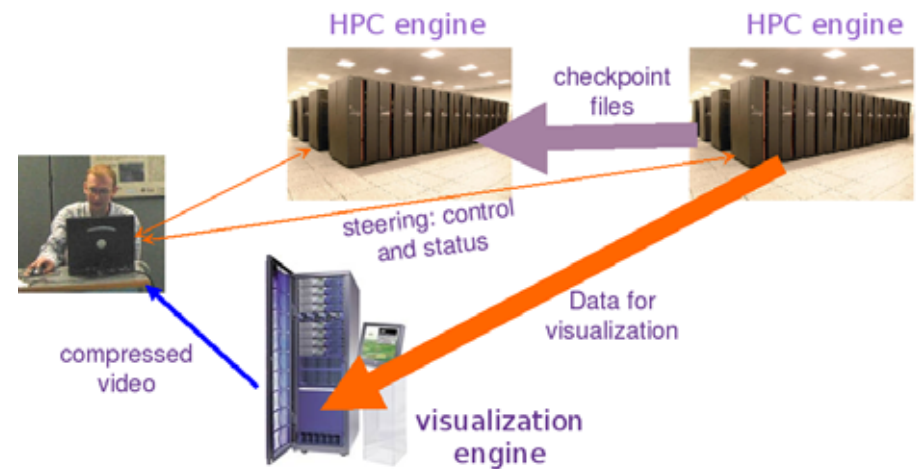
What is NOT Computational Steering?

- Running large parameter sweeps with lots of individual runs
 - ...unless you are able to guide

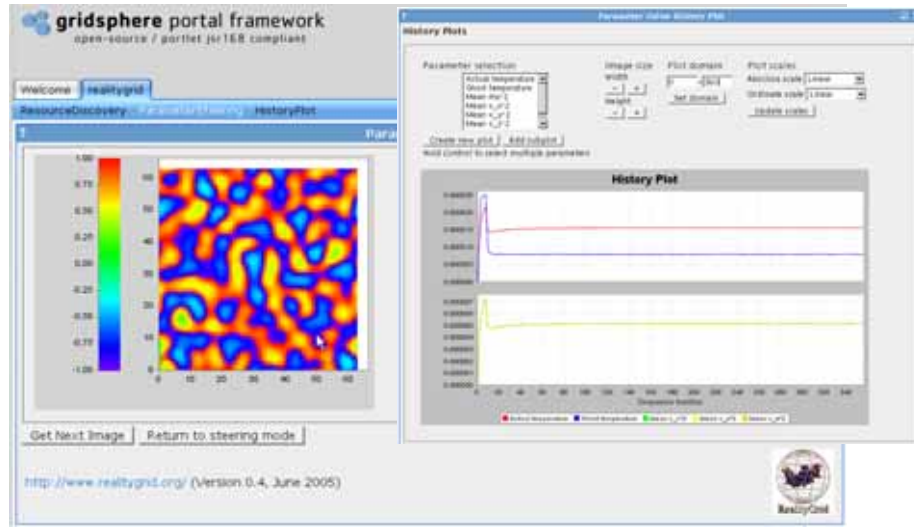
Why use Computational Steering?

- Improves efficiency
 - Kill "bad" jobs early - save CPU cycles
 - Recover seemingly stalled or "stuck" simulations
 - Less runs == less storage space for results
- Can easily conduct "what-if" experiments
- Gives the scientist more understanding of the system
 - Watch a simulation evolve over its run time.
 - PhD students using a steered code in Loughborough learned how to use it more efficiently in 6 weeks as opposed to 6 months for the same code without steering!

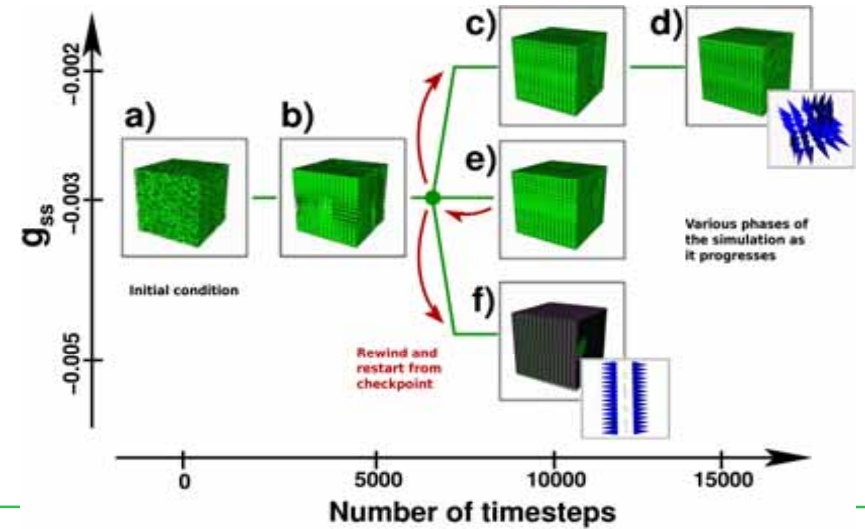
A Computational Steering Workflow



Steering Clients



Checkpoint and Restart Workflow



Interaction for the Health Protection Agency



Questions/Comments

Think Big and Think Collaborative. If you don't someone else will.
**"If you want to go fast, travel alone;
 if you want to go far, travel together."**

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