

Proving Viability

"How do I Measure the
Benefits of Remote
Visualization?"

The plan for today...

- Describe activities at the University of Utah that use or are related to the Access Grid.
- Present research done in remote visualization at the SCI Institute.
- Utilize the expertise in the audience to develop a strategy for extracting information from users.

Who is SCI?

- What do you guys do?
 - Visualization, Computational Steering, Imaging, Simulation, Haptics, VR, Pure Graphics, Computational Science...
 - Basically, cool stuff!
- What Fields do you serve?
 - Computer Science, Physics, Radiology, Cardiology, Chemical Engineering, Geophysics...

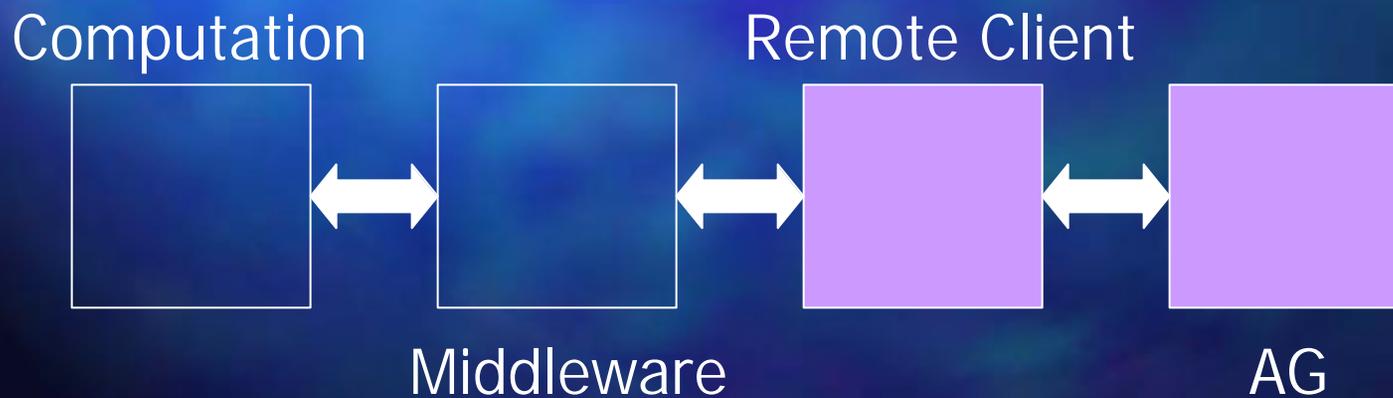
Why am I asking this?

- Remote Visualization needs to go from a research novelty to a real world toolset
- The Access Grid needs this this toolset
- I have people who will use a tool if they have "proof of viability"
- I have people who will use the AG if we have this piece

Define Remote Visualization

- Check the web...
- "Remote" is defined as not physically attached to the interconnect fabric of the computational resource.

<http://www-fp.mcs.anl.gov/fl/research/Proposals/avtc.html#remote>



Overview...

What We Have...

- Video
- Audio
- PowerPoint
- Streaming Frame Buffer

What we think we want...

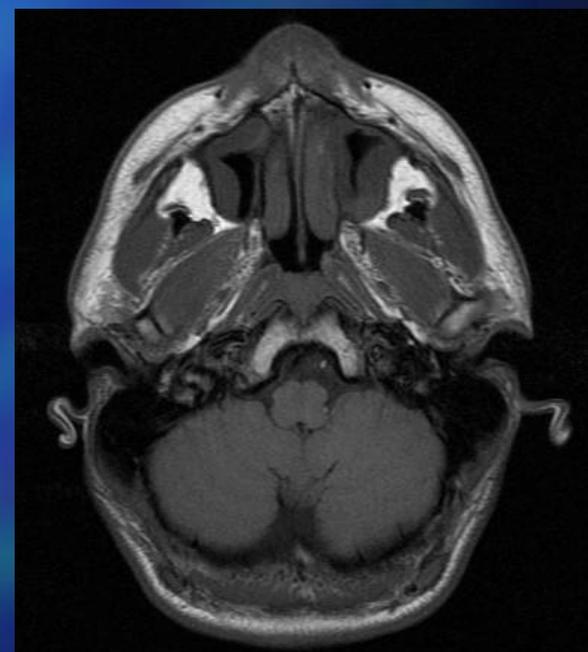
- Remote Visualization
 - It's a good idea
 - But who will use it?
- Shared Whiteboard
 - It's a necessity
 - But it's not part of the spec!
- Shared Paste Buffer?
 - It's a nice idea
 - But who's it good for?

What the Real Users Want!

- CAMT
 - Training
 - Collaboration
- Cardiology
 - Training
 - Collaboration
- CVRTI
 - Collaboration
- ASCI
 - Meetings
 - Seminars
- Little Rock
 - Visualization/Computation
- Graduate Students
 - Remote Committee Member Meeting
 - Collaboration

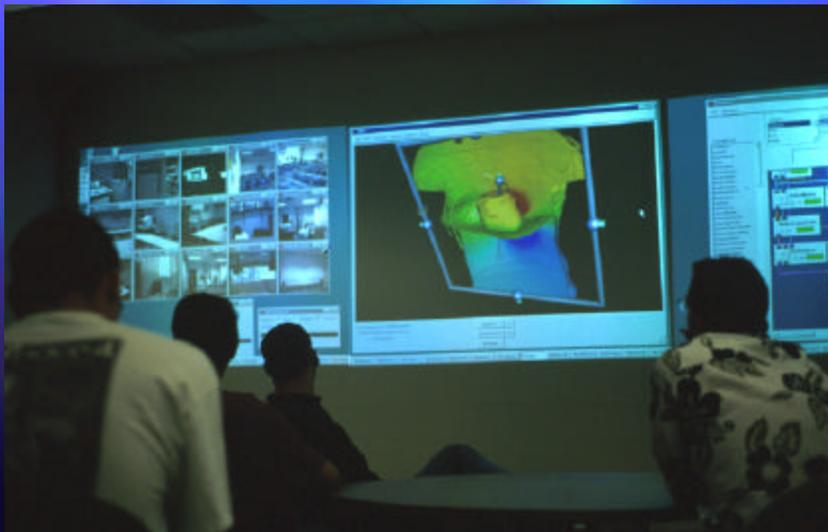
Case in Point: CAMT and Radiology

- Extract info from a PACs System
- Visualization
- Collaboration
- Annotation



Case in Point: CAMT and Radiology

Here's what we'd like to do:



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Remote Vis at SCI

a.k.a. Eric Luke's Masters
Thesis

a.k.a. Semotus Visum

Motivation

- Need to visualize datasets remotely
 - Cannot download entire dataset
- Utilize client and server resources
- Must be able to collaborate
- Remote control of computation
- Platform independence
 - Use of accepted standards
 - (Java, XML)

Previous Work

- Remote X Display
- Image Streaming
 - Compress images, dump to network
- Java Implementations
 - Remote Method Invocation (VisAD)
 - All local computation and rendering (Vizwiz)
 - Volume rendering using VRML
- Isosurface Extraction
 - Level of Detail control
 - Load division between client and server
 - View-dependent isosurface extraction

Proposed Work

- Client-server Architecture
- Multiple Viewing Methods
 - Image streaming, Geometry, Ztex
- XML-based Communication
- Collaboration
 - Image annotation, chat
 - Access Grid

Access Grid

- Provides videoconferencing infrastructure
 - Complements high-quality rendered images
- Soon to provide other collaborative tools
- Up and Coming Ubiquity! ;-)

Current Work

- Client has image-streaming implemented.
- No collaborative tools or control of computation.
- Server classes almost done.

Pitfalls? Oh yes...

Client Side

- Incompatible Java versions and extensions
- Without a JIT, it's too slow
- Conversion between datatypes

Server Side

- Serialization
- Threading
- Multi-user contention

Applications we're plugging in

- SCIRun
 - An uber-widget for Scientific Computing
 - www.sci.utah.edu
- RTRT
 - A real-time ray tracer
 - www.sci.utah.edu/~sparker/
- T-Rex
 - Some cool volume rendering software

Ok, What is the plan?

- Finding Collaborators to burn this in...
- Researching Researchers
- Looking for ways to make the AG SHINE.

What do we have?

- Users
- Application
- Collaborations

What do we need?

- Data collection
- Analysis
- Synthesis
- Publication
 - Why publish? Peer reviews grant you credibility in all communities!

People I'd really like to talk to!

Examples:

- Emilee Patrick

- Because she's got the psych background and does active research

- Evans Craig

- Because he's got field experience with distance education

Future Work

- It's time for a SIGGRAPH sketch or panel!
- A subset of AG folks to work on this as an active research area

Contact information

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