Collaviz®

Functional answer from the Collaviz project

Ian GRIMSTEAD, UNIVERSITY OF CARDIFF

& Laurent ANNE, DISTENE

Remote Visualization: Why?

- Why not just use your local machine?
  - If the datasets are small, that's great! But that's not the case anymore.
  - No additional hardware costs, very convenient
- What if you are running a large simulation?
  - Will it take too long to download the data?
  - Can you maintain an up-to-date local copy?
  - Can your local machine cope with the data?
  - Have you got software to display the data?
- If any of the above answers are "No!"…
  - You need remote visualization!

Remote Visualization: Advantages

- Now the “hard” work is carried out on appropriate hardware
  - Remote large compute cluster?
  - Or, data is sent to remote rendering cluster

- Only the required view is transmitted
  - Raw data remains on cluster
  - Latest view of data

Remote Collaboration: Why?

- How many people can share a device?
  - A monitor is good for (say) 5 people
  - Large display: 20?

- One issue is also mobility:
  - People do not like traveling to use a computer
  - A long walk? A bus ride away? No thank you…
- What if the other participants are far away?
  - Different city? Different country?
- You need to work collaboratively - remotely

Remote Collaboration: Advantages

- Multiple people can view and interact with the same dataset
  - Simultaneously
  - Enables discussion and evaluation
- Multiple people can use **different viewpoints**
  - Not possible when sharing a display
  - Experts with different specialties can view the data they need

Remote Visualization and Collaboration: Issues?

- This all sounds wonderful…
  - …are there any problems?
- Yes – standards
  - There are too many standards (!)
- Need a simple way of getting remote visualization to work
  - Networks constraints
  - Firewalls block traffic
  - Every site has different policies on traffic
  - Different client platforms required

Remote Visualization and Collaboration: Solutions

- Ideal approach: open standards to visualization
  - Web3D for data
    - Progressive encoding
    - Ontologies to describe content
  - Use web services to access remote services
    - Use http/https – passes through firewalls
- Any existing application can then be wrapped with a web service

Remote Visualization and Collaboration: Solutions

- Web3D + Web Services?
  - Cardiff carried out research into this area
- Resource Aware Visualization Environment
  - UDDI discovery of distributed servers
  - "Data service" hosted data
  - "Render service" rendered data remotely
  - Clients connect to direct to data service
  - Or via render service if client can't cope (mobile)
  - Import of data, then non-standard data flow to client

Resource-Aware Visualization Environment

Remote Visualization and Collaboration: Solutions

- Collaviz?
  - RAVE was limited to the “Render” aspect of the traditional Filter-Map-Render pipeline
  - Collaviz extends this to work with all aspects of the pipeline
  - Filter, Map, Render are web services
  - Remote data source is a web service
  - Also has support for streaming data

What is Collaviz?

- The Collaviz program begun in January 2009 to answer those questions
  - Community building approach
  - Started with a € 4M funding (€ 2M from ANR, half from other partners)
  - Open Source initiative: open to contributions…
- Prototypes and user return on experiments will be available in December 2011

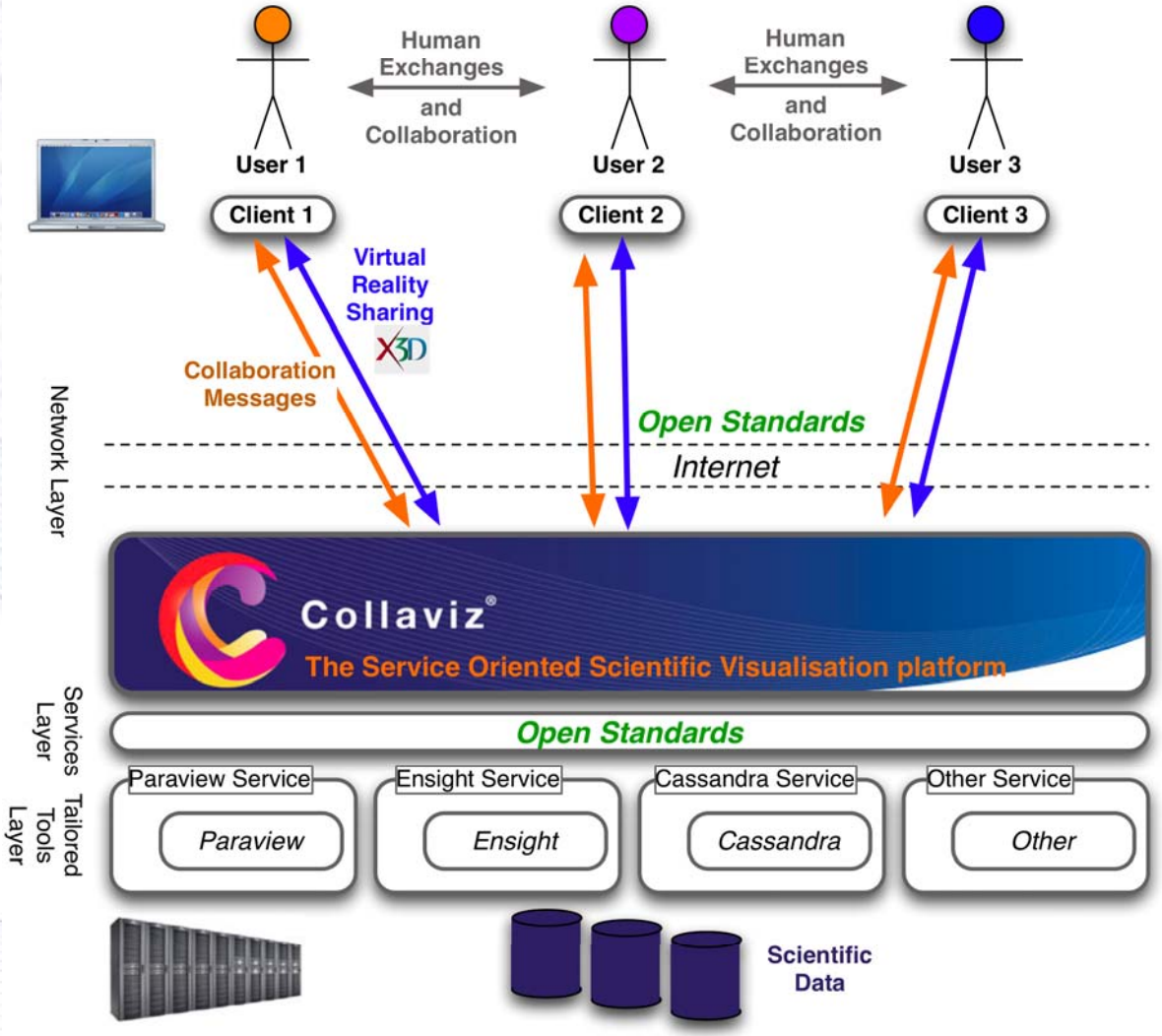
Collaviz: Advantages

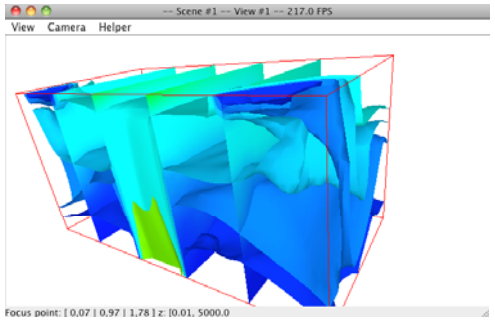
- Collaviz improves on existing techniques:
  - Full open pipeline to enable 3rd party services
  - Uses http/https to simplify remote access
  - Streaming support
  - Cross-platform support
  - Using existing standards
  - Synchronous & asynchronous collaboration
  - …
- The extensibility of Collaviz **will** make it survive after the end of the project

Collaviz technical answer

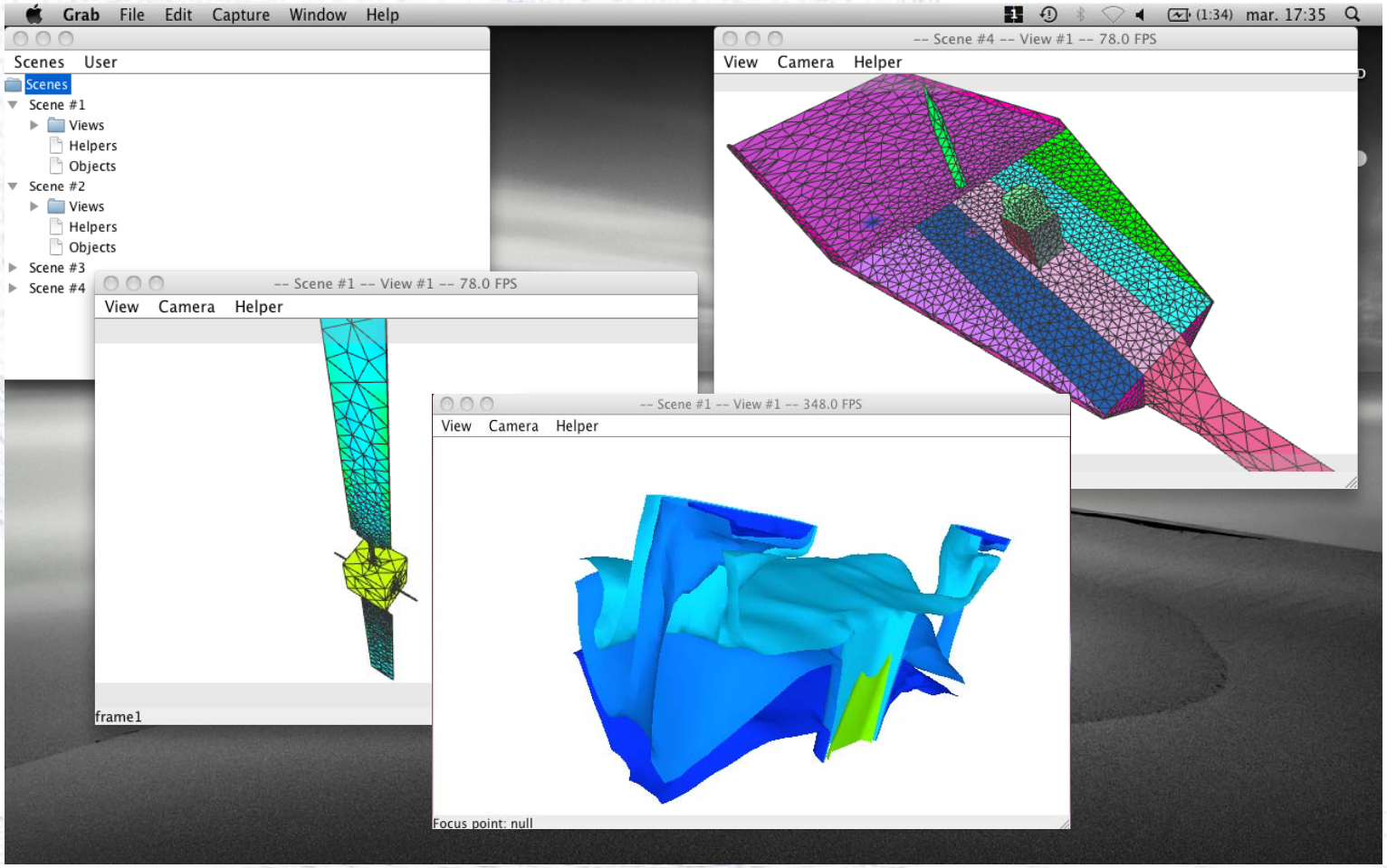
- Based on open standards:
  - Data formats, API, service container layer (e.g. web services), communication layer (SOAP…), virtual reality formats (e.g. X3D)
- Sharing the results as “virtual reality” scenes
  - Scientific datasets are processed on remote servers
  - 3D processing outputs are exported as X3D scenes
  - The X3D is shared by all clients
- Collaviz is not another post-processing engine. It’s a middleware layer to expose reference/legacy tools as services.
  - We provide a full set of capabilities through the network!

The open architecture





First views of Collaviz



We are currently building
an OPEN Community…

So join us!

Coordinator: alban.schmutz@oxalya.com