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Visualization Tools

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Data Analysis on Ranger
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Visualization applications

- Support for many input formats
  - Some may be better than others for certain tasks
- Aim for realtime point and click image manipulation
  - Data exploration
- Pipeline of data refinement or visualization operations
- Lots of tweakable parameters
- Parallel rendering (more on this later)
- Ease of use and suitability for certain tasks can vary
  - Definitely not one-size-fits-all

EnVision

- An easy-to-use web-based tool for remote scientific visualization
- Available through the Longhorn Vis Portal
- Developed at TACC
  - Funded in part by TeraGrid and the DoD PET program
  - Development team: Greg Johnson, Steve Mock, Brandt Westing, Matthew Hanlon

EnVision

- Simplified set of visualization operations and configuration params
- Slick and seamless web-based UI
- Very easy to use
- Perfect for initial/rough exploration of a new dataset
- Image snaphots

ParaView

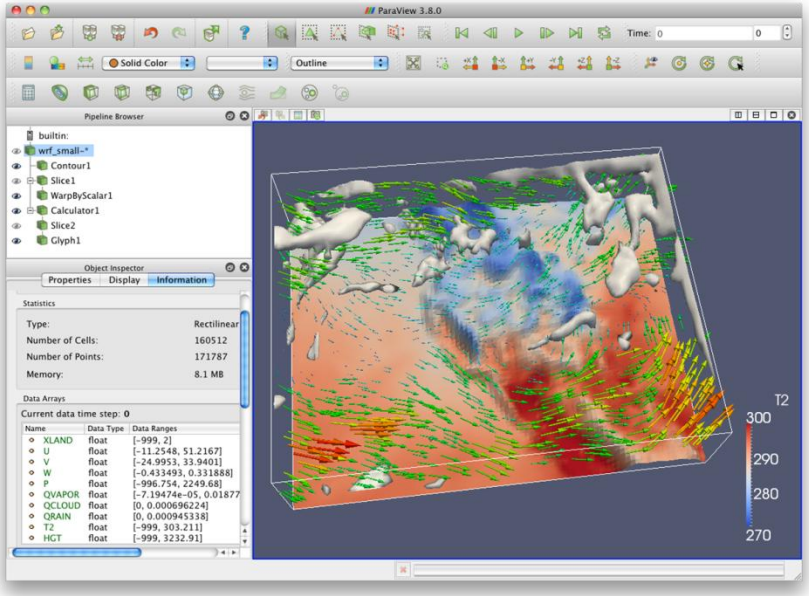
- http://www.paraview.org/
- Open-source, multi-platform parallel data analysis and visualization application
- Mature, feature-rich interface
- Good for general-purpose, rapid visualization
- Built upon the Visualization ToolKit (VTK) library
- Primary contributors:
  - Kitware, Inc.
  - Sandia National Laboratory
  - Los Alamos National Laboratory
  - Army Research Laboratory

ParaView

- Supports derived variables
  - New scalar / vector variables that are functions of existing variables in your data set
- Scriptable via Python
- Saves animations
- Can run in parallel / distributed mode for large data visualization

ParaView

- All processing operations (filters) produce data sets
- Can further process the result of every operation to build complex visualizations
  - e.g. can extract a cutting plane, and apply glyphs (i.e. vector arrows) to the result
    - Gives a plane of glyphs through your 3D volume

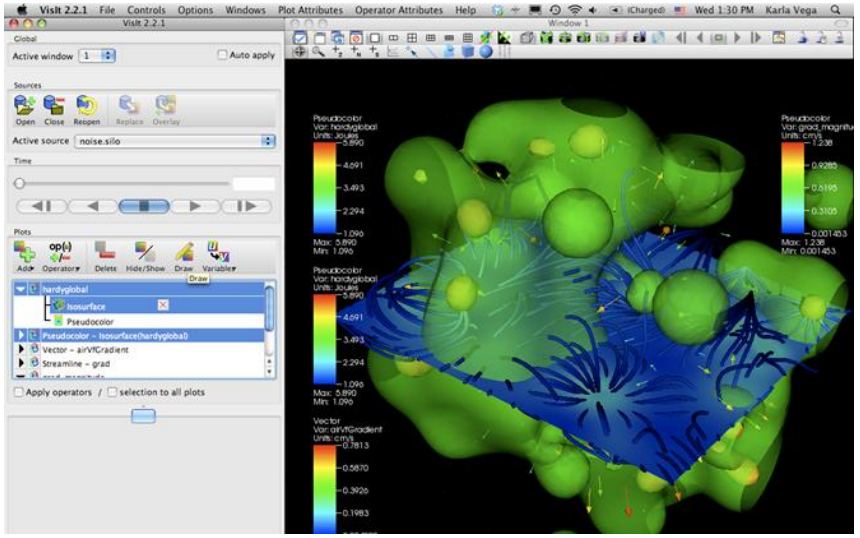


VisIt

- https://wci.llnl.gov/codes/visit/
- Open Source, Multiplatform, interactive parallel visualization and graphical analysis tool
- Developed by the Department of Energy (DOE) Advanced Simulation and Computing Initiative (ASCI)
- Although VisIt was developed for visualizing terascale data, it is also well suited typical desktop simulations

VisIt

- VisIt's visualization capabilities are grouped into two categories:
  - Plots are used to visualize data and include boundary, contour, label, mesh, pseudocolor,
  - Operators consist of operations that can be performed on the data prior to visualization. (Examples include slice, isosurface, threshold among others)



Lots of others

- EnSight
- Amira
  - Used extensively in life science and biomedical domains
- Aviso
  - Materials science, geoscience, environment
- Drishti
  - Tomography, electron microscopy