Visualization Standards

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Outline

" Visualization Standards?

" An incomplete list and biased assessment of visualization options
  - IDL, AVS, OpenDX

" OpenDX Example

" Conclusions
Visualization Standards

" Need to have the ability to display 3D data in variety formats
  - Scalars - Isosurfaces, contour plots, volume rendering
  - Vectors - Field lines (streamlines), streaklines, hedgehogs (glyphs)

" Visualization standards not software packages
  - Everybody's got their favorite and you'll never please everyone

" Desirable features of package
  - Supports distributed (web) and local visualization on numerous platforms
  - Inexpensive or already in wide usage
IDL

- Widely used data visualization package
- Excellent for 1D and 2D data plots
- Not so good for 3D data
  - Cannot directly render 3D data on irregular grids
  - Manipulating 3D view is difficult
- Can be linked to web based visualization via perl scripts and cgi bin web pages
- Licenses are not cheap
AVS

- Not widely used data visualization package
- Excellent for rendering 2D & 3D data
  - Easily visualizes data from irregular grids
  - User interface to view manipulation is trivial
- 1D data plots are possible, but cumbersome
- Very expensive
- Direct web visualization not easily implemented
OpenDX

" Open Source Data visualization package based upon IBM's commercial Data Explorer visualization system

- Has a very active development community
- Open Source => Free :-)

" Excellent for rendering 2D & 3D data

- Easily visualizes data from irregular grids
- User interface to view manipulation is straightforward, but not as trivial as AVS
- Can visualize results from Composite Grid systems

" Translation of visual programs into web page is accomplished through implementation of DX in Java
OpenDX Example

" Visual program (net) setup to render parameters on contours in the magnetosphere and trace streamline through vector fields for simple IMF conditions (north,south,west)

" Network has been placed online as JavaDX web page for remote access

  kansas.dartmouth.edu/java/user/BasicLFMWeb.html
Conclusions

"Recommend development of OpenDX based visualization system

- No cost for users to install program on platforms ranging from almost UNIXes and Windows
  - Allows users to conduct more advanced investigations with local data and local rendering
- Web pages can allow sophisticated view manipulation and data investigation
- Goto www.opendx.org for more information