

NERSC / LBNL Visualization Group

Report on Graphics Packages

Stephen Lau, Nancy Johnston, Terry Ligoeki

graphics@nersc.gov

Report on Software Packages

- Action item from last ERSUG meeting (June 1996/Wash., D.C.)
- Members
 - Stephen Lau (NERSC/LBNL)
 - Steve Jardin (PPPL)
 - Judy Giarrusso (PPPL)
 - Jean-Noel Leboeuf (ORNL)
- Goals of Committee
 - Determine packages currently used
 - Determine packages currently available on new resources
 - Develop migration strategy and procedures

Chart of currently available packages

Package Name	Version
ATC GKS	4.1
AVS	5.3
AVS Express	--
IBM Data Explorer	2.0
Disspla	11.0
Gnuplot	3.5
Gplot	4.3b2
Graflib/grafcore	--
HDF/netCDF	4.0
Khoros	2.1.1
IDL	3.6
NCAR	3.2, 4.0.1
NCAR NCL	4.0.1
NCAR GUI	4.0.1
PV-WAVE	--
SDSC imtools	3.0
tv80gks	3.0
xv	2.21, 3.0

Availability on New Platforms

- Several packages have been ported to J90. Examples:
 - NCAR 3.2, 4.0.1
 - gnuplot

- Khoros
- Availability of packages on T3E has been dependent upon stability and availability of platform.
Examples:
 - netCDF (serial and parallel version)
 - OpenGL
- Continuing to port existing packages as resources and requirements permit

Software Recommendations

- We have three different recommendations/support levels for software packages:
 - **Recommended**
For software in this category, problems and questions will be given a high priority, local expertise is available, newer versions of the software will be installed, and training may be available. If it is externally supported, bug reports will be passed on to the author/vendor.
Recommended does not mean the software will be available on all systems. Lack of availability on a system could be due to cost of licenses, difficulty in porting the package, lack of vendor support for the system, or an appropriate computer environment for the software.
 - **Partially Recommended**
Software in this category is either frozen, has limited functionality, isn't a package we have expertise in, or is being dropped by vendor. Software may not be ported to new architectures or updated in the future. The software is available because of unique functionality, previous wide use, ease of use, or our familiarity with it. Software in this category may move to the "Not Recommended" category in the future.
 - **Not Recommended**
Software in this category is provided "as is". Bugs are not fixed, new versions are not installed, and questions may not be addresses. Also, if the software becomes inoperable because of a system change, it may be removed. We advise any software utilizing software packages in this category be ported to a Recommended package. Typically, there is a Recommended package which will provide the same capabilities as Not Recommended packages.
- Necessitated by certain factors
 - Availability of software
 - Age of software package
 - Amount of use
 - Limited resources
- Information available on our website:
http://vis.jbl.gov/software/support_levels.html

Software Documentation

- Documentation on available packages at our website:
<http://vis.jbl.gov/software.html>
- Website provides examples of usage of packages and how to access the packages on NERSC machines
- Our opinions and recommendations on packages
- "What's New" page for updates on changes (updates will also be announced through NERSC):
http://vis.jbl.gov/whats_new.html
- Provides links to vendor/author home pages (AVS, Khoros, NCAR, netCDF)

Collaborations

- **Work with researchers to develop new ways to visualize data**
- **Develop generic visualization technologies**
- **Generate useful and accurate visualizations of underlying data**
- **Contact us if you are interested in a collaboration**
- Lattice Gauge Theory
 - Ohio State University
 - QCD Simulation
 - Explored use of Internet technologies
 - Data generated on T3E
- Accelerator Research
 - Stanford Linear Accelerator (SLAC)
 - Visualization of electromagnetic vector fields inside the beamline
 - Still in planning stages
- Computational Fluid Dynamics
 - Center for Computational Sciences and Engineering
 - Extended work already in progress

- Demonstration at SC '96 in Pittsburgh, PA
- Two fluid simulations remotely controlled
- Use of haptic device
- Tokamak Physics
 - Princeton Plasma Physics Lab
 - Applying new visualization techniques to MHD simulations
 - Will be developing visualizations of pellet and two-fluid simulations
- Materials Science
 - Ames Lab
 - Part of Grand Challenge
 - Possible use of CAVE++ at Ames Lab

Future Directions

- Grand Challenge Projects
- Continuing to evaluate and explore new input devices
 - Haptic Device
 - Device demonstrated at SC '96
- Developing visualization software tools (Khoros)
- Exploring lower cost hardware platforms
 - Use of low cost Pentium-based platform for visualization
 - Ability to use stereoscopic display
 - Availability of visualization software packages: AVS, OpenGL

Demonstration

- Remotely controlling cameras at Advanced Light Source (ALS) Lab on LBNL campus
- Existing mechanism for controlling remote cameras via a 2-D interface
- Exploring mechanisms of controlling cameras via a 3-D interface
- Use of Internet technologies such as VRML, Java
- Available on low cost platforms
- Technology applicable to interactive information retrieval and data exploration

Conclusion

Mission

- Work closely with NERSC researchers
- Provide generic visualization tools for use in applications
- Maintain a variety of visualization software packages on different platforms
- Educate and consult with researchers about available visualization tools
- Investigate new techniques to visualize researcher data

How to Contact Us

- For information on collaborating with us and for further information about our group, contact us by email:
graphics@nersc.gov
- Visit our Website:
<http://www-vis.lbl.gov>
- For information regarding visualization software and general visualization assistance, contact User Services:
consult@nersc.gov

Who We Are

- Five member group at LBNL/NERSC:
 - Nancy Johnston (Group Leader)
 - Wes Bethel
 - Kevin Campbell
 - Stephen Lau
 - Terry Ligocki

- Combination of a pre-existing LBNL visualization group and the NERSC visualization group
- Group supports LBNL and NERSC users
- 2 FTE's supported by NERSC and one open position