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Large Scale Visualization with ParaView

Kenneth Moreland
Sandia National Laboratories
P.O. Box 5800 MS 1326
Albuquerque, New Mexico 87185-1326
kmorel@sandia.gov

W. Alan Scott
SAIC/Sandia National Laboratories
P.O. Box 5800 MS 0822
Albuquerque, New Mexico 87185-1326
wascott@sandia.gov

ABSTRACT

ParaView is a powerful open-source turnkey application for analyzing and visualizing large data sets in parallel. Designed to be configurable, extendible, and scalable, ParaView is built upon the Visualization Toolkit (VTK) to allow rapid deployment of visualization components. This tutorial presents the architecture of ParaView and the fundamentals of parallel visualization. Attendees will learn the basics of using ParaView for scientific visualization with hands-on lessons. The tutorial features detailed guidance in visualizing the massive simulations run on today's supercomputers and an introduction to scripting and extending ParaView. Attendees should bring laptops to install ParaView and follow along with the demonstrations.

Summary

This tutorial provides an introduction to using ParaView for parallel and distributed visualization of large scientific data sets. ParaView is designed from the ground up to run efficiently on large parallel distributed-memory cluster computers, and our current usage of ParaView has proven its success in this regard. In this tutorial we will dedicate time to focus on the features of performing large-scale parallel visualizations and scripting.

This tutorial has a wide appeal for all levels and types of attendees. Attendees familiar with visualization, graphics, or VTK will learn about the design and implementation of a successful end user application. Others will learn how to use ParaView to process their large data sets.

Beginners will benefit by learning how to configure and run ParaView and process their large data set in parallel. They will learn how the advanced processing modules operate internally. This understanding will allow them to select which visualization modules should be used for specific tasks.

Intermediate and advanced users will be given a guided tour on the inner workings of ParaView. Special attention is placed on establishing a proper platform and launching the application in a parallel environment. We also identify the pitfalls inherent in visualizing memory straining data. With an introduction to the Python scripting, we demonstrate how to customize and automate the ParaView application for domain-specific visualization solutions.

Detailed handouts (for many versions of ParaView) and example slides can be found at:

http://www.paraview.org/Wiki/The_ParaView_Tutorial

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