Parallel Distributed-Memory Visualization with ParaView

Introduction

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Outline

• Introduction
• Basic Usage
• Cluster Processing Large Models
• Configuring ParaView for Vis Clusters
• Python Scripting
What is ParaView?

• An open-source, scalable, multi-platform visualization application.
• Support for distributed computation models to process large data sets.
• An open, flexible, and intuitive user interface.
• An extensible, modular architecture based on open standards.
• Commercial maintenance and support.
Current ParaView Usage

• Used by academic, government, and commercial institutions worldwide.
  – Downloaded ~3K times/month.
• Used for all ranges of data size.
• Current landmarks of SNL usage:
  – 6 billion structured cells.
  – Billions of AMR cells.
  – 250 million unstructured cells.
ParaView Development

• Started in 2000 as collaborative effort between Los Alamos National Laboratories and Kitware Inc. (lead by James Ahrens).
  – ParaView 0.6 released October 2002.

• September 2005: collaborative effort between Sandia National Laboratories, Kitware Inc. and CSimSoft to rewrite user interface to be more user friendly and develop quantitative analysis framework.
Current Funding

- Army SBIR
- ERDC Contract
- US NSF SBIR
- Other contributors
  - Swiss National Supercomputing Centre
- Support Contracts
  - Electricity de France
  - Mirarco
  - Oil Industry
Basics of Visualization
Data Types

Uniform Rectilinear (Image Data)
Non-Uniform Rectilinear (Rectilinear Data)
Curvilinear (Structured Data)
Polygonal (Poly Data)
Unstructured Grid

Multi-block
Hierarchical Adaptive Mesh Refinement (AMR)
Hierarchical Uniform AMR
Octree
More Information

• Online Help
• The ParaView Guide

• The ParaView web page
  – www.paraview.org

• ParaView mailing list
  – paraview@paraview.org