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Software Engineering Support of the Third Round of Scientific Grand Challenge Investigations: Earth System Modeling Software Framework Survey

By Bryan Talbot

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.One of the most significant challenges in large-scale climate modeling, as well as in high-performance computing in other scientific fields, is that of effectively integrating many software models from multiple contributors. A software framework facilitates the integration task, both in the development and runtime stages of the simulation. Effective software frameworks reduce the programming burden for the investigators, freeing them to focus more on the science and less on the parallel communication implementation. while maintaining high performance across numerous supercomputer and workstation architectures. This document surveys numerous software frameworks for potential use in Earth science modeling. Several frameworks are evaluated in depth, including Parallel Object-Oriented Methods and Applications (POOMA), Cactus (from the relativistic physics community), Overture, Goddard Earth Modeling System (GEMS), the National Center for Atmospheric Research Flux Coupler, and UCLA/UCB Distributed Data Broker (DDB). Frameworks evaluated in less detail include ROOT, Parallel Application Workspace (PAWS), and Advanced Large-Scale Integrated Computational Environment (ALICE). A host of other frameworks and related tools are referenced in this context.

Reviews

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