An Open Extensible Application Generation Tool for Simple Rapid Deployment of Multi-Scale Scientific Codes

A new framework for rapid generation of scientific applications running on a variety of systems including science gateways has recently been developed. This framework builds a user interface and back end code for a variety of target environments on a collection of executable modules. Current targets include a PHP web based science gateway and a C++/Qt GUI based application. The method for execution of the modules has limited framework restrictions, primarily the requirement of wrapping the application to accept JSON formatted input and output. Initial implementations currently support direct execution on a user's workstation, a web server, or a compute resource accessible from the web server. To support a diversity of queue managed compute resources, a Google Summer of Code project was completed last summer to integrate the Apache Airavata middleware as an additional execution model within the framework. Currently in beta testing, executables being used by international testers include serial, threaded, MPI parallel, CUDA and combinations. This ongoing project is a product of an international NSF and EPSRC (UK) grant focused on the small angle scattering community (http://ccpsas.org).