

APS Scientific Computation Seminar Series

Speakers: Tekin Bicer and Raj Kettimuthu
Mathematics and Computer Science Division
Argonne National Laboratory

Title: Rapid Development and Parallelization of Tomographic
Reconstruction Codes at the APS

Date: Monday, September 21, 2015

Time: 1:00 p.m.

Location: 431/C010

Hosts: Nicholas Schwarz and Brian Toby

Abstract:

New technological advancements in scientific instruments, such as detectors and light sources, enable scientists to design complex experimental setups and perform rapid data acquisition. However, analysis of this collected data is a challenging task. First, the implementation of data analysis/reconstruction code is not a trivial process. Second, analysis of the collected data is a highly compute-intensive operation and requires efficient utilization of large-scale high-end computing systems, which might not be available locally. In this talk, we propose a high performance reduction-based computing middleware that eases the implementation of parallel image reconstruction and analysis algorithms for tomography. The proposed middleware provides an API where different (iterative) algorithms can be plugged-in. We will also introduce our workflow management system, which can run codes that are implemented with our middleware on geographically distributed resources.