

In situ code coupling and analysis – an essential capability for advanced large scale simulations

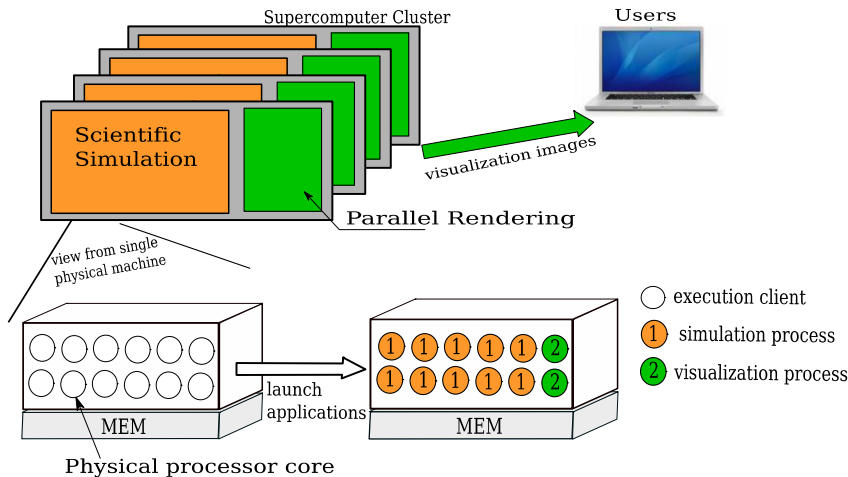
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Objectives

- Provide tools for online and In-situ data analytics
 - E.g. visualization, feature tracking
- Enable integrated and coupled multi-physics simulation
 - E.g. integrated climate modeling, fusion simulation, subsurface modeling, material science workflows

Impact

- Enable in-situ execution of coupled scientific workflow
- Enabled coupled simulation / data analytics / data processing workflow composed as a DAG of tasks
- The DataSpaces tool was used for shared space programming abstraction to coordinate data sharing for in-memory code coupling



In-situ execution of simulation and visualization processes on a multi-core platform

Accomplishments

Two workflow scenarios evaluated on Cray XT5

- Significant saving in the amount of data transferred over the network by co-locating data producers and consumers on the same processor
- Data transfer time (and energy) decreased as much of the coupled data is retrieved directly from on-processor shared memory

F. Zhang, C. Docan, M. Parashar, S. Klasky, N. Podhorszki, H. Abbasi: *Enabling In-situ Execution of Coupled Scientific Workflow on Multi-core Platform. IPDPS'2012*