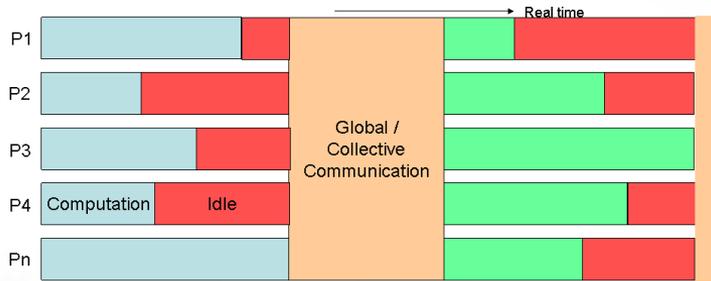


Asynchronous Speculative Methods for Scientific and Mathematical Computing

Modeling and Simulation Group

Computational Sciences & Engineering Division



Problem Statement:

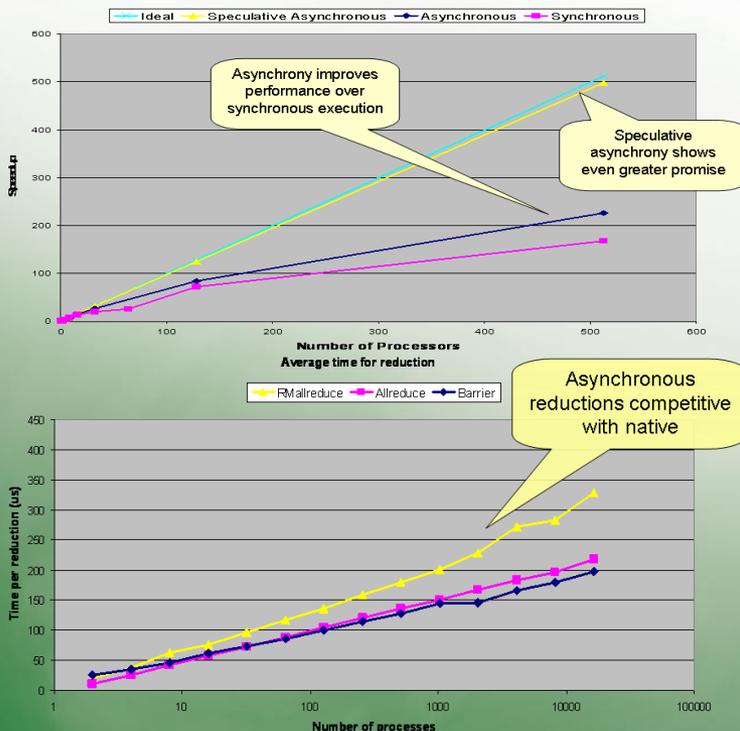
- Scalability is severely impaired with traditional approaches in supercomputing applications. To enable peta-scale computation, new technology is needed to relieve synchronization overheads. Moreover, the solution must be evolutionary to transparently port existing applications to peta-scale platforms.

Technical Approach:

- Global synchronization latencies are hidden to remove idle time via speculative execution. Rollback methods are used to recover from synchronization errors. A transparent speculative interface is added as backward-compatible extensions to Message Passing Interface standard.

Benefit:

- The utilization of large-scale parallel executions will be increased for peta-scale systems. The performance/price ratio is improved & turnaround time for simulations is greatly reduced for scientists using the large scale executions.



Point of Contact:

Kalyan S. Perumalla
(865) 241-1315
perumallaks@ornl.gov

