

Panel:
Does Architecture Matter for
Petaflops?

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What are the dominant challenges to Pflops Architecture?

- All the usual things
 - pflops, power, complexity, cost, reliability
 - latency, bandwidth, efficiency, generality, programmability
- Return to single node (highly parallel) systems
- data structure driven in-situ processing and control-flow
- dynamic fine/medium grain allocation, scheduling, synchronization
- runtime driven locality management

New approaches required for Effective Pflops?

- New relationship between processor and memory
- Change optimality metric from per processor flops to time to execution of application
- expensive processors high utilization
- cheap processors high availability
- Memory drives processors and understands structures and closures

Will mainstream do it?

- I don't know!
- Will conventional mass market systems demand these capabilities?
- Mass-storage I/O infrastructure will be the same
- Commonality required at some level of programming language API

Practical business model for Custom Pflops Architecture?

- You don't launch airplanes off a ChrisCraft
- You don't fly Cessna's to Saturn
- Peak of the Pyramid market is different from that of Rice-Crispies and Honda Accords
- Right systems for the right job
- Nimitz-ASCI business model