

Charter to Working Groups

1, 2, 3

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Systems Productivity

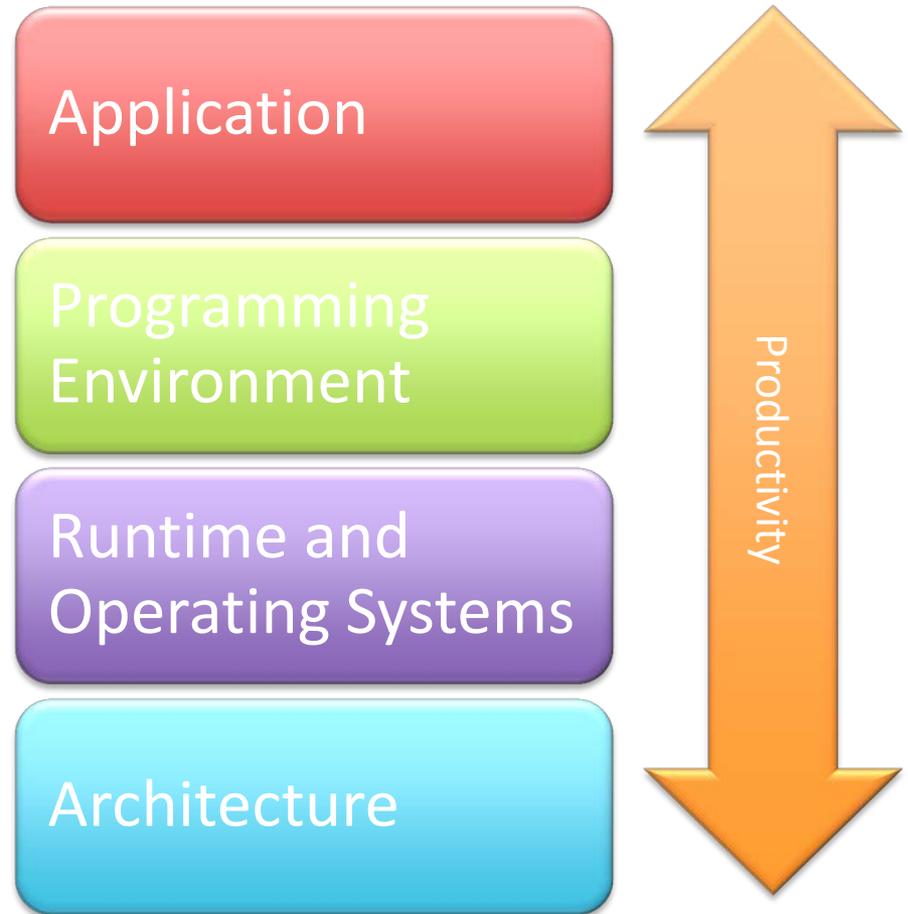
- Hardware/software vertical stack that together makes up the operational system
- Complements prior meetings on software engineering and application computation
- Goals
 - Understand the role and relationship of each system component layer to overall productivity
 - How the layers interrelate to mutually support productivity
 - Determine research directions and risks that will advance exascale productivity

Working Groups

- (1) Parallel Programming Environments
 - Laura Carrington, John Mellor-Crummey
 - Bethesda Room
 - Programming model
 - API
 - Performance and debugging tools
- (2) System Software
 - Pavan Balarji, Anthony Danalis
 - Frederick Room
 - Runtime system
 - Operating system
- (3) Hardware Technologies and Parallel Architecture
 - Lenny Oliker, Darren Kerbyson
 - Salon E Room
 - Component devices
 - Global system architecture
 - Node and core architecture

Day 1 Working Group Charge

- What design choices in your functional area (e.g., RTS, PE, OS, HW) impact productivity?
 - Provide examples
 - Prioritize your factors (top 5)
 - Prioritize your risks looking forward to Exascale
- How do the added priorities of Power and Resilience impact Productivity for your functional area?
- How do other functional areas intersect and impact your functional area in your ability to provide a productive system?
- What research directions may advance productivity in your area?



Design Choices in XYZ Functional Area that Impact Productivity

- Heterogeneous ISA
 - GPUs, Xeon Phi,
- Task binding to physical resources
- ...

Risks for productivity moving toward Exascale

Risk	Probability	Impact	Overall
Low application portability due to heterogeneous architectures	High	High	High
Increasingly complex applications to mitigate/compensate for unreliable hardware	High	Med	Med
Lack of performance portability	High	High	High
...			

Rules of Engagement

- List assumptions
- But don't reinvent the other system component layers
- Timeframes
 - Near term – actions to be performed on Petascale systems
 - Long term – potential full redesign of systems
- Outcome
 - How each area can contribute to productivity
 - How each area supports others in achieving productivity
 - Possible program tasks – things to be done
 - Deliverables
 - Compare and contrast with other programs
 - Annotations
 - Relevant issues we forgot to ask about

Go Be Productive

