




## Breakout #2 Summary

# Collab and Funding Models (1 / 2)

- Outline of what a plan would include, and possible outcomes
- Identify R&D models that enable laboratories, universities, and vendors to co-develop coordinated open source HPC software
- What is the value proposition for each international member?
- Examine funding and governance models that support international development
  - ▣ How are priorities set?
- How does the IESP fit into other international activities?
- What are the scientific grand challenges this project will address?
- Acceptance tests and support models that can be embraced by both vendors and the open source community
- Who assumes risk for hitting R&D targets? How do we handle failures?
- Educational Outreach

# Possible Models (2/2)

## (from loose to tight collaboration)



- Identify needs, focus Int'l R&D attention on missing components
- Coordinate features, delivery schedule, interoperability, and improvements across international R&D teams
- IESP community recommends funding for key areas
- Provide forums for vendors and community to work together on roadmaps
- Fund R&D and subsequent deployment of key components
- Fund collaborative relationship with vendors and co-develop components
- Test, integrate, and support internationally developed software components
- Build integrated software that can pass acceptance tests on extreme platforms

# Breakout 2:

- Science Driven
  - ▣ Clear benefit to global challenges (Int'l science drivers that are shared)
  - ▣ Organizational involvement (advisory committee?)
  - ▣ Is there an existing (mirroring) effort on CompSci?
  - ▣ Are there
- We must clearly articulate why participating is advantageous to each country (agency)
  - ▣ What is the value proposition
- How do we participate and collaborate with the existing computer science and platform R&D efforts?
- Discussing nomenclature: “System Software”
  - ▣ Operating System → math libraries, tools, etc
  - ▣ The components that are required for almost all apps

# Breakout 2: Vendors

- What collaboration models work best for delivering a supported system?
  - We reviewed basic acceptance test and deployment plans
  - Union of the needs of the first 3 customers defines the initial software stack
  - For basic low-level software components (OS, networking, filesystems) local expertise and support is mandatory
  - For other components (mpi, math libs, etc) grabbing the current version and porting can work
  - Leverage with Open Source groups is key to providing good support, otherwise vendors provide best effort
  - The Linux model works well
  - We need to develop a sustainable transfer and support plan.

# Breakout 2: Where to Invest



- Not all issues are HPC
  - ▣ Multicore programming model?
  - ▣ Parallel I/O?
  - ▣ Compilers?
- What flavor of HPC? We must be clear
  - ▣ Not Cloud? Not Grid?
- Where can we have the greatest impact?
- Our plan needs to clearly articulate where we are investing and why

# Breakout 2: Collab Models



- Discussion of models that have worked
- HPC Europe Taskforce
- Distributed software development is difficult, but successful models exist
  - ▣ Functional decomposition?
- DARPA HPCS experiences:
  - ▣ Down-selecting is ok, but transferring responsibility to vendors probably not applicable here
- Lead agency or team required to force it to happen
- Multi-agency support is very valuable

# Breakout 2:



- Quality Assurance: Our plan must include how the software will be tested and deployed
- Verification and Validation discussion.
  - ▣ What parts are are IESP goals, and what is the responsibility of the application teams?



## Breakout 2: Revolutionary / Evolutionary



- Clearly define impact timeline
- They are not mutually exclusive