IESP Breakout Group 4

Funding agency representatives
Group Members

- Rob Pennington  NSF
- Jos Engelen  NWO
- Patrick Aerts  NWO
- Peter Michielse  NWO
- Kyriakos Baxevanidis  EC
- Michael Ball  BBSRC
- Bertrand Braunschweig  ANR-France
- David Dean  ORNL/DOE
- Leonardo Flores  EC
- Kostas Glinos  EC
- Ian Halliday  UK
- Bill Harrod  DARPA
- Barb Helland  DOESC
- Fred Johnson  DOE
- Emma Jones  EPSRC
- Alain Lichnewsky  GENCI
- Jane Nicholson  EPSRC
- Ed Seidel  NSF
- Akiyuki Seki  MEXT-Japan
- Toshikazu Takeda  RIKEN
- Michael Wilson  STFC
Governance (1)

• Developing a governance, management and organizational structure for IESP
• Exploring ways for funding agencies to coordinate their support of IESP-related R&D so that they complement each other
• Exploring how laboratories, universities and vendors can work together on coordinated HPC software
• Creating a plan for working closely with HW vendors and applications teams to co-design future architectures
Governance (2)

- Why bother? Business case
- Lifetime – scope – is it a project or a program?
  - Might be a project that evolves? IESP is a facet.
  - End time strategy
- Will there really be a big jump? What is the big difference? Number of threads exceed personal capacity to deal with complexity.
  - Business case/justification, extension of commercial efforts
  - Cost of not doing the software
  - Problem definition and process (R&D or development?)
Governance (3)

• Governance for a large investment
• Loose, joint, coordinated, legal framework
• Alignment or misalignment of interests
  – Commitments and benefits
• Business case to be defined for each funding agency
  – Use of the systems by applications scientists
  – Technology development
  – Workforce development
Governance (4)

• Coordinated calls for proposals
• G8 HORCS is an experiment to be tracked
  – Researchers getting the funding at the same time
  – Will not produce specific deliverables/software
• Delivery of resultant software critical
• Investments in grids – resultant software are not interoperable
• Clear, concise and well-defined roadmap
• International Linear Collider is non-legal entity
Governance (5)

• Generate a roadmap, split it up and fund it separately
• Common roadmap, competing funding – result not productive
  – Now in an uncoordinated environment
• Risk mitigation strategy for the entire international community
• Co-design is necessary this time, etc.
Initial Thoughts on Governance (1)

• International software roadmap group funded by government funding agencies
  – Periodic (semi-annual/annual) updates
  – Contingency planning
  – Clear definition and identification of open source components
  – Open source development project

• Deliverables funded by agency

• International coordination/monitoring team funded by gov’t funding agencies
  – Keep up to date on the status of the software efforts
  – Provide non-binding information to the funding agencies and to the software roadmap group

• Software roadmap group keeps up with the international coordination team
Initial Thoughts on Governance (2)

• Vendor interactions for co-design?
  – Software/hardware
  – TBD
• Testing resources (cases and platforms) need to be identified and organized
  • TBD
• Need funding agencies to have effective coordination
  • Separately funded efforts that are coordinated
  • Demonstrable commitments to the project
Open Source

• Gov’t funding
• Reproducible results, need access to the details, modulo some practical limits
• Time phase to address vendor sensitivity?
  – Details of hw architecture
  – Compilers, network protocols
  – Low levels of the control system
  – Different levels of open openness
• Which open source license?
• Separation of hardware and software efforts for funding
• Roadmap: Exascale only software, Critical path software
  – Roadmappers define open, vendors raise an exception for discussion
• Software lifecycle costs for community software
Open Source

• Which open source license?
  – Non-viral license

• Pedigree and certificates of originality
  – Do the contributors have the right to contribute?
  – Who has the right to change the code?
  – Lessons learned from Linux community
IP

• Software IP
  – Not locked up with a specific vendor
  – Identified early

• Restrictions might be different with specific ministries or funding programs

• Pre-commercial procurement method

• Begin the IP working group asap
  – Suggest a template
Co-Design

• Business case
• Apps <-> Software <-> Hardware
• Openness increases risk for vendors
  – Too many people can result in non-patentable technologies
• Process to match apps requirements to the sw and hw
• Responsibility for SW roadmap group
• Support for simulators and models, performance models
• Possibly design study to be funded for HW/SW
Governance Model

• Development and testing on intermediate platforms on the way to exascale systems
  – Timeline is already under pressure due to DOE early systems in ~2015
• Test and integration – function and platform
• Exascale Test and Monitor facility
  – Patches and regression testing
  – Change management
  – 1:1 of software org staff might be doing test and integration vs developing software
  – What are the funding agencies supporting now with large scale projects?
Governance Model - Timelines

• 2020 – One or more exascale systems in production
• 2018 - initial delivery, full, integrated stack
• 2015 – early technology deliveries,
  – mini-exascale ~200 PF, minimum software stack
  – 6 months ahead start final integration of all components
• 2012 budgets
• 2010, Software roadmap outline to feed into solicitations
  – Funding agency coordination or clearinghouse
  – DOE NNSA (with Office of Science) to begin this fall, lead on
    funding, conservative choices, minimal research, basis for others
    to build on
  – Software support models definition