



HPC Center Software  
Development, Engineering, and Sustainability  
*DOE Workshop on Best Practices*



# HPC Software Layers

## Breakout Session 2: Library

### Development of Sustainable Software Libraries

Ken Alvin, SNL  
Tony Drummond, LBNL

Session Co-Chair  
Session Co-Chair



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# Members

- Ken Alvin
- Brett Bode
- Shreyas Cholia
- Tony Drummond
- Andrew Hanushevsky
- Lie-Quan Lee
- Rusty Lusk
- Rebecca Springmeyer
- Daniela Ushizima
- Mary Zosel



# Cross-cutting Questions

- Best practices
  - Automated, integrated build and testing process is key for quality library support
  - Other issues discussed (standards, SQ processes)
- Key challenges
  - Interoperability between existing and emerging programming paradigms (e.g. comm libs, languages, etc)
  - Sustaining resources for maintenance and support
- New technologies
  - Libraries to insulate applications from new languages and lower-level libraries needed to take advantage of emerging hardware
  - Other code re-use opportunities



# Proposed Findings

- The automated, integrated build and testing process is key for quality library support. This is currently done independently by different groups resulting in duplication of efforts. Is the timing right for a cooperative effort?
- There is a need for interoperability between libraries that support existing and emerging programming paradigms.
- There are opportunity for new libraries to shield applications from new languages and lower level libraries that are needed to take advantage of emerging hardware
- Research software that becomes part of the the scientific computing infrastructure requires integrated support and maintenance. This is difficult to reconcile with funding program priorities



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# Testing Application vs Libraries

- Scalability
- Validation
- Performance
- Software Dependencies