

Curating and Assessing Proxy Apps

Application Development
Co-Design

PI: David Richards (LLNL)
Team: Jeanine Cook (SNL), Hal Finkel (ANL), Christoph Junghans (LANL), Peter McCorquodale (LBNL)
Shirley Moore (ORNL)
Contributors: Omar Aaziz (SNL), Abhinav Bhatele (LLNL), Brian Homerding (ANL), Tanner Juedeman (SNL),
Tiffany Mintz (ORNL), Courtenay Vaughan (SNL)

MISSION: To curate a suite of proxy applications that are representative of the intended characteristics of their respective parent applications and easy to use and obtain. Characteristics include hardware bottlenecks (e.g., memory, computation, communication) and programming models.

Curation

- Improve quality of ECP proxies
- Maximize Benefit from their use
- ECP Proxy App Suite
 - Composed of Proxies Developed or Maintained by ECP Projects
 - Represent most important features and pain points of exascale applications
 - Held to a high set of standards with a focus on maximizing utility to all parties
 - Distributed via Spack and Proxy Apps Website
- Current Proxy Apps Suite
 - v1.0
 - Expected to be updated every 6 months

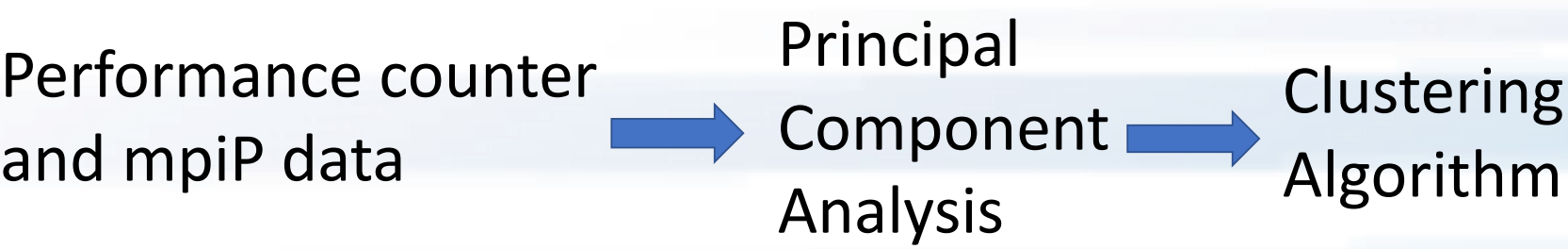


Quantitative Assessment

- Goal:** Understand how well proxies represent parent applications quantitatively at hardware level → future better proxies
- Representative problems/sizes
 - Detailed profiling
 - Quantitative characterization
 - Statistical proxy/parent app comparison

Profiling to (1) better understand proxy, (2) determine qualitative similarity to parent
Characterize to understand bottlenecks using hardware performance counters and mpiP

Statistical comparison to parent app to understand representativeness:



PathForward Engagement

Proxy App PathForward representatives

- AMD: Jeanine Cook, jeacock@sandia.gov
- Cray: Christoph Junghans, junghans@lanl.gov
- HPE: David Richards, richards12@llnl.gov
- IBM: Shirley Moore, mooresv@ornl.gov
- Intel: Hal Finkel, hfinkel@anl.gov
- Nvidia: Thomas Uram, turam@anl.gov

- Engagement process:** Work with vendors to provide appropriate proxy apps and input sets for evaluating work packages
- Vendor informs representative of requirements
 - Proxy app team determines if current proxy app suite can meet requirements
 - Recommend proxy app development or full app with specific input sets if necessary

