

ASRC Exascale Tools Workshop

Oct 13- Oct 14 Annapolis, MD

Workshop Committee:

John Mellor-Crummey, Barton Miller, Jeff Hollingsworth, Dan Quinlan, Martin Schulz, Paul Hovland, Jeff Vetter, David Skinner, John Daly

ASCR POC:

Sonia R. Sachs

Workshop Goals Summary:

1. *Define objective criteria for assessing tools for Exascale application development (debugging, correctness, and performance) along a wide spectrum of challenges, namely power, locality, resilience, etc.)*
2. *Identify tools requirements and interfaces for hardware and system stack, particularly compilers and runtime systems and metrics for success. Identify integrated systems solutions rather than ad-hoc tools solutions*
3. *Prioritize challenges for Exascale tools, both generally and specifically to each tool category*
4. *Prioritize options addressing the identified challenges*
5. *Lay out a roadmap, with options, timeline, and rough cost estimates for needed Exascale research in the different tools category*
6. *Generate a report that summarizes the workshop discussions and provides recommendations on the programming directions for ASCR*

Workshop Agenda:

October 13:

- **3:00-3:10 p.m.** **Welcome and Introduction** (Sonia Sachs)
- **3:10-4:50 p.m.** **Background and user's perspective Session**
 - **Moderator:** Jeffrey Vetter
 - **Summary:** Richard Vuduc
 - **Martin Schultz**, "Activities in the ASC Working Group Exascale Tools"
 - **John Mellor-Crummey**, "Exascale Software Center (RIP) Tools Perspective"
 - **David Skinner**, "Application Performance Tools at NERSC"
 - **Richard Graham**, "Oak Ridge Leadership Computing Facility Tool Needs Perspective"
 - **Scott Parker**, "Tools on the Blue Gene P & Q"
- **4:50-6:30 p.m.** **Break**
- **6:30-7:30 p.m.** **Working Dinner + Key note address (Jeff Vetter)**
- **7:30-7:50 p.m.** **Background and user's perspective Session**
 - **David Montoya**, NNSA User's Perspective
- **7:50-9:00 p.m.** **Performance Analysis Tools Working Session**
 - **Moderator:** Robert Ross
 - **Summary:** Curtis Janssen

- **Panelists:** John Mellor-Crummey, Alan Malony, Jeff Hollingsworth, Ramesh Peri, David Skinner, Donald Becker, Todd Gamlin, Phillip Roth

October 14:

- **7:00-8:00 a.m.** **Breakfast**
- **8:00-8:10 a.m.** **Introduction** (Sonia Sachs)
- **8:10-10:30 a.m.** **Performance Analysis Tools Working Session (Continuation)**
- **10:30-10:45 a.m.** **Break**
- **10:45-11:00 a.m.** **Summary of Performance Analysis Tools Working Session**
- **11:00-12:00 a.m.** **Debugging and Correctness Tools Working Session**
 - **Moderator:** Jeff Hollingsworth
 - **Summary:** Martin Schulz
 - **Panelists:** John Delsignore, Ramesh Peri, Sen Koushik, Costin Iancu, Stephen Siegel, Dan Quinlan, Donald Becker
- **12:00-1:00 p.m.** **Working Lunch + keynote speech (Sen Koushik)**
- **1:00-2:30 p.m.** **Debugging and Correctness Tools Working Session (Continuation)**
- **2:30-3:30 p.m.** **Cross-Cutting Issues Working Session**
 - **Moderator:** Dan Quinlan
 - **Summary:** Dave Montoya
 - **Panelists:** Paul Hovland, Leonid Oliker, Richard Graham, Nathan Tallent, Martin Schulz, James Brandt, Curtis Janssen
- **3:30-3:45 p.m.** **Break**
- **3:45-4:15 p.m.** **Summary of Debugging and Correctness Tools and Cross-Cutting Issues Working Session**
- **4:15-5:30 p.m.** **Committee Members only: create report outline**

Format of the Working Sessions:

The sessions will be organized as panel discussions, with the **moderator** offering an initial strawman position including:

- a list of challenges,
- a list of approaches,
- a list of compiler, runtime, and hardware support needs, and
- a list of deliverables for the session. A prioritized list of challenges and approaches should be part of the deliverables of each session.

The panels will have 5-6 questions. All panelists answer one question, then the question is open to the audience before moving to the next question. At the end of the session, panelists present their vision.