ARGONNE
ATPESC2023
EXTREME-SCALE COMPUTING

Performance Tools and Debuggers:

Introduction

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Outline

- What is your favorite debugger?
  - printf ?
  - You can have a better debugger on HPC environments
- How do you measure performance of your application on HPC?
  - Wall time (e.g., `$time ./a.out`)?
  - Flop-rate, bandwidth?
  - How to identify performance bottlenecks?
  - Leading profiling tools can help you optimize your code on HPC
- Seven powerful HPC tools in this track
  - Hardware vendor tools
    - Intel VTune and Advisor
    - NVIDIA Nsight System & Nsight Compute
    - AMD ROCm tools: ROC profiler & debugger
  - Cross-platform tools
    - Linaro Forge: DDT(debugger) & MAP(profiler)
    - Perforce TotalView(debugger)
  - Open source community tools
    - HPCToolkit
    - TAU

Team for Tools Track

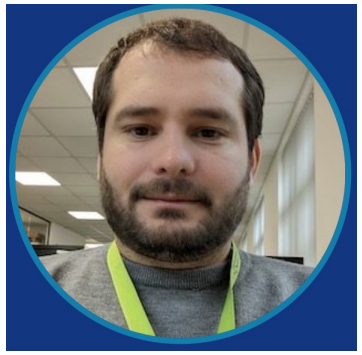
JaeHyuk Kwack
(Argonne)

Scott Parker
(Argonne)

Xiao Zhu
(Intel)

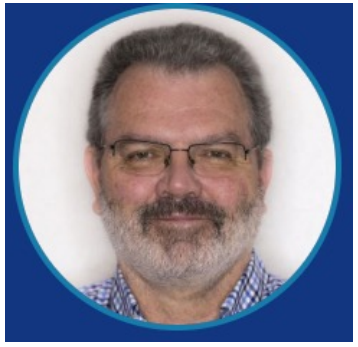
Kris Keipert
(NVIDIA)

Suyash Tandon
(AMD)



Rudy Shand
(Linaro)

Bill Burns
(PERFORCE)



John Mellor-Crummey
(Rice Univ.)

Sameer Shande
(Univ. of Oregon / Paratools)

Argonne NATIONAL LABORATORY

ECP EXASCALE COMPUTING PROJECT

Agenda

Track 6 – Performance Tools and Debuggers

8:30AM	Introduction of Tools Track	JaeHyuk Kwack, ANL Scott Parker, ANL
8:40AM	NVIDIA	Kris Keipert, NVIDIA
9:20AM	Intel	Xiao Zhu, Intel
10:00AM	*Break*	
10:30AM	AMD	Suyash Tandon, AMD
11:10AM	Parallel Sessions:	
	• Main room: Hands-on (Intel, AMD)	Xiao Zhu, Intel Suyash Tandon, AMD
	• Breakout room: Hands-on (NVIDIA)	Kris Keipert, NVIDIA

Hardware vendor tool sessions

12:30PM	*Lunch*	
1:30PM	Linaro Tools	Rudy Shand, Linaro
2:10PM	TotalView	Bill Burns, Perforce Software
2:50PM	Parallel Sessions:	
	• Main room: Hands-on (TotalView)	Bill Burns, Perforce Software
	• Breakout room: Hands-on (Linaro Tools)	Rudy Shand, Linaro
3:50PM	*Break*	

Cross-platform tool sessions

Open source community tool sessions

4:10PM	HPCToolkit	John Mellor-Crummey, Rice U.
4:50PM	Tau	Sameer Shende, Paratools/U Oregon
5:30PM	Parallel Sessions:	
	• Main room: Hands-on (Tau)	Sameer Shende, Paratools/U Oregon
	• Breakout room: Hands-on (HPCToolkit)	John Mellor-Crummey, Rice U.
6:30PM	Dinner	
7:30PM	*After-dinner talk:* 50 Years of Supercomputing – A Perspective	David Barkai
8:30PM	Hands-on (NVIDIA, Intel, AMD, Linaro, TotalView, HPCToolkit, Tau)	Xiao Zhu, Intel Suyash Tandon, AMD Rudy Shand, Linaro Bill Burns, Perforce Software John Mellor-Crummey, Rice U. Sameer Shende, Paratools/U Oregon
9:30PM	*Adjourn*	

Systems for Hands-on

- ALCF system reservation for today
  - Polaris: 85 nodes 7:30AM-9:30PM (-q ATPESC -A ATPESC2023)
  - Theta: 512 nodes 7:30AM-9:30PM (-q ATPESC2023 -A ATPESC2023)
  - ThetaGPU: 2 nodes (16 gpus) 7:30AM-midnight (-q single-gpu -A ATPESC2023)
    18 nodes (full-node) 8:30AM-midnight (-q training-gpu -A ATPESC2023)
- NERSC Perlmutter: 40 GPU nodes 7:30AM-midnight (-q atpesc_aug9 -A train5)
- OLCF ASCENT: no reservation, but usable with the default queue (with -P trn021)
- Intel DevCloud for Intel GPUs
- AMD Accelerator Cloud (AAC) for AMD GPUs

Thanks and Enjoy!