

Update on Trilinos Performance Testing

Trilinos Users Group Meeting

October 27, 2022

Trilinos Performance Dashboard

- Purpose
 - Automated plotting of Trilinos solver and kernel performance over time
- Developed by Geoff Danielson, Brian Kelley, and Elliott Ridgway
- Tests Trilinos `develop` VOTD
- Tpetra team reviews dashboard at its weekly Tuesday meeting

Trilinos Performance Dashboard

- Platforms

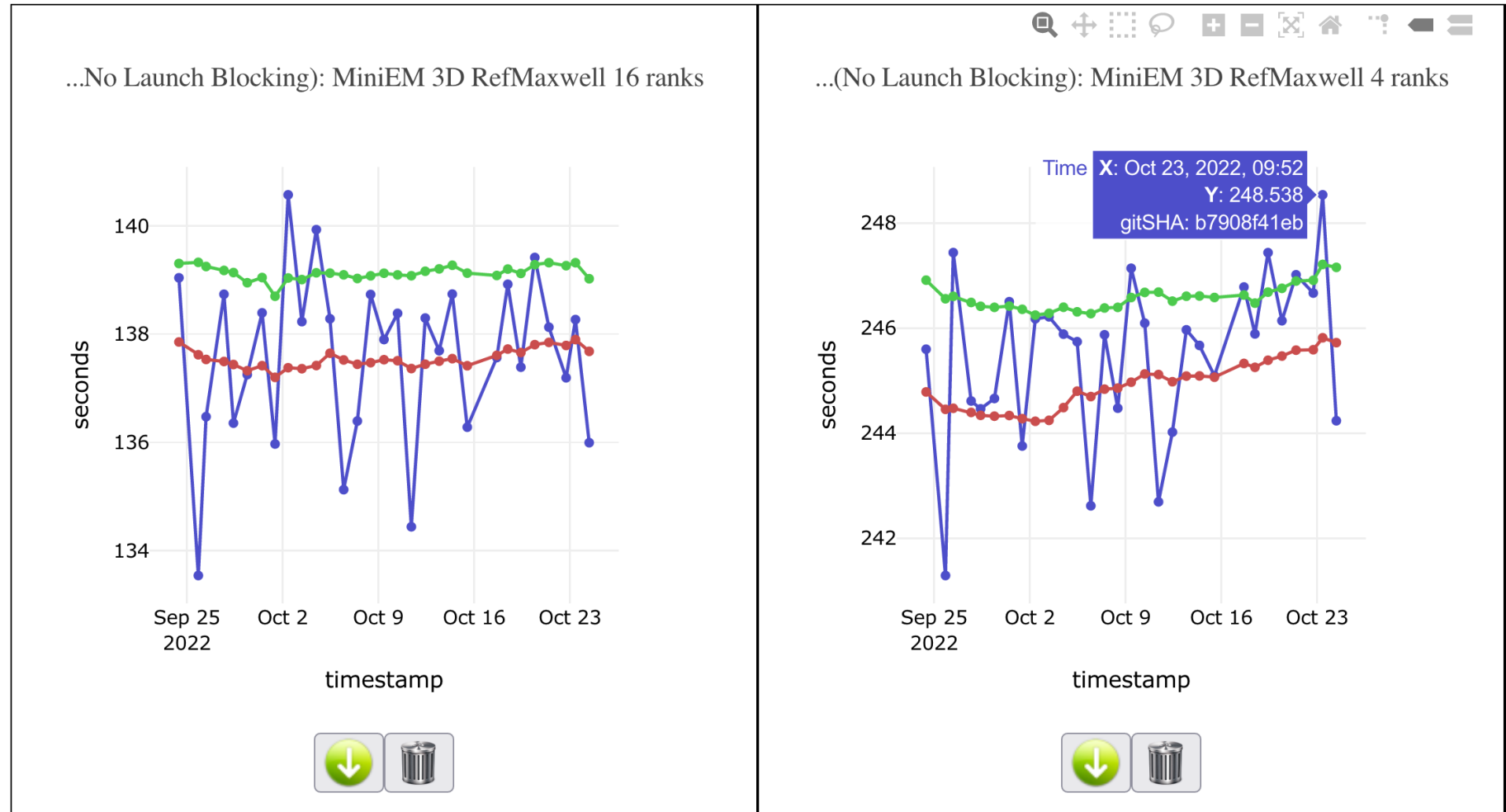
- Intel CPUs
- ARM
- NVIDIA and AMD GPUs

- Algorithms

- Belos (CG)
- Tpetra (FE assembly, SpMV, SpGEMM)
- MueLu (SA AMG setup and solve)
- Panzer MiniEM (Maxwell solver)
- Ifpack2 (ILU)
 - Application matrices important to Sierra/Aria

Trilinos Performance Dashboard

- <https://jenkins-son.sandia.gov>

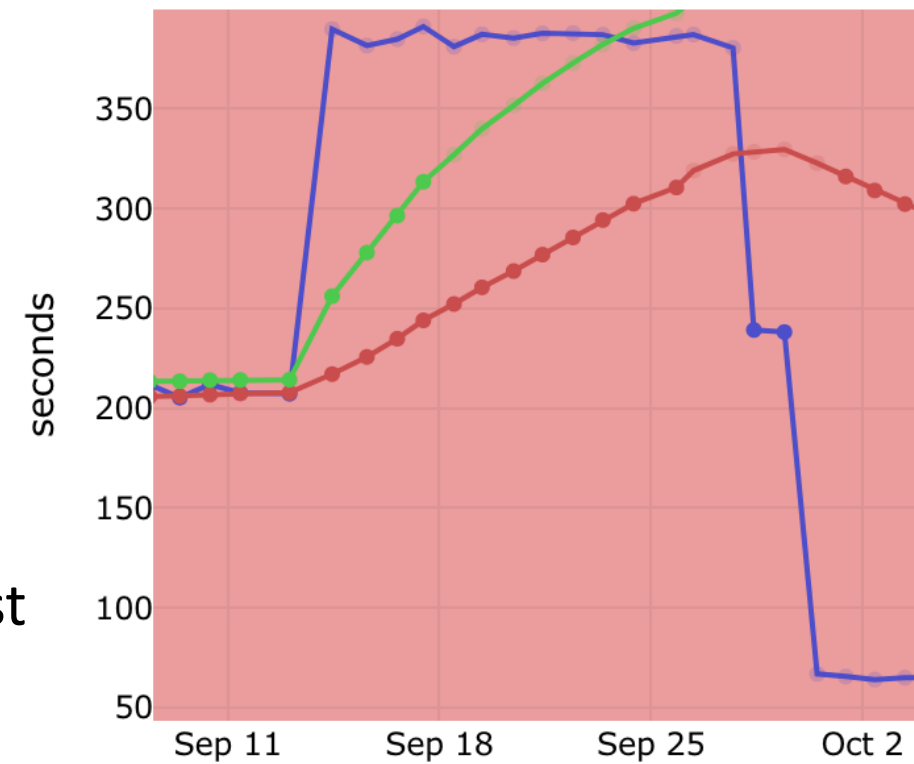


Trilinos Performance Dashboard

- Jenkins for automation
- Uses Watchr library for plotting
 - <https://github.com/sandialabs/watchr-core>
- Runs tests in Cmake PERFORMANCE testing group

A Success Story

- Sept. 14 (Wedn.) regression introduced to Aria test
 - Sept. 20 (Tues.) issue noticed at weekly meeting
 - Sept. 28 (Wedn.) PR merged and regression fixed
 - Sept. 30 (Friday) 2nd PR yields 2x improvement
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- Issue fixed before downstream appl was impacted
 - Fixing this led to discovery of further 2x optimization



Future Plans

- Include more application matrices
 - Xyce
 - Sierra SD
 - Open to other apps!
- Incorporate automated regression detection
 - Assessing work done by J. Watkins et al. (see his 2021 TUG talk, “Automated Performance Testing and Tuning”)