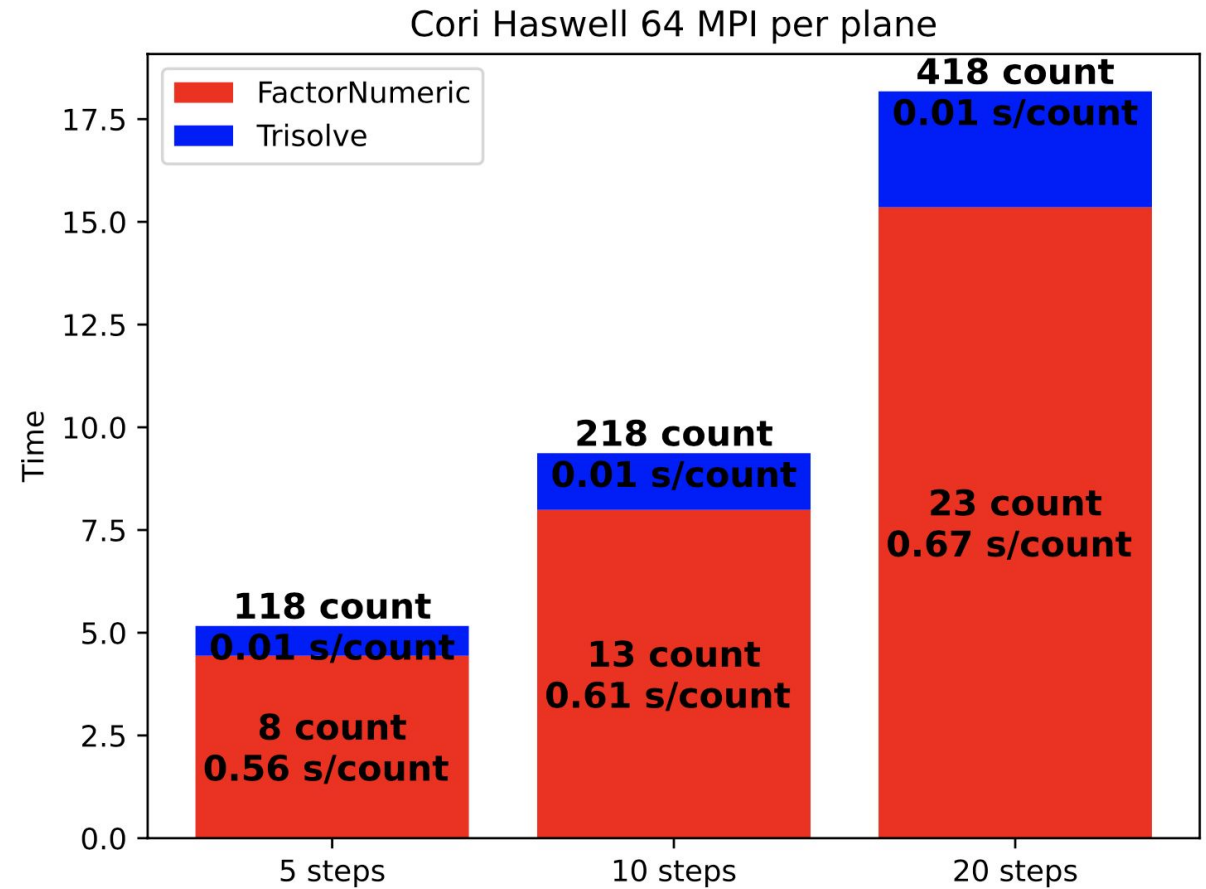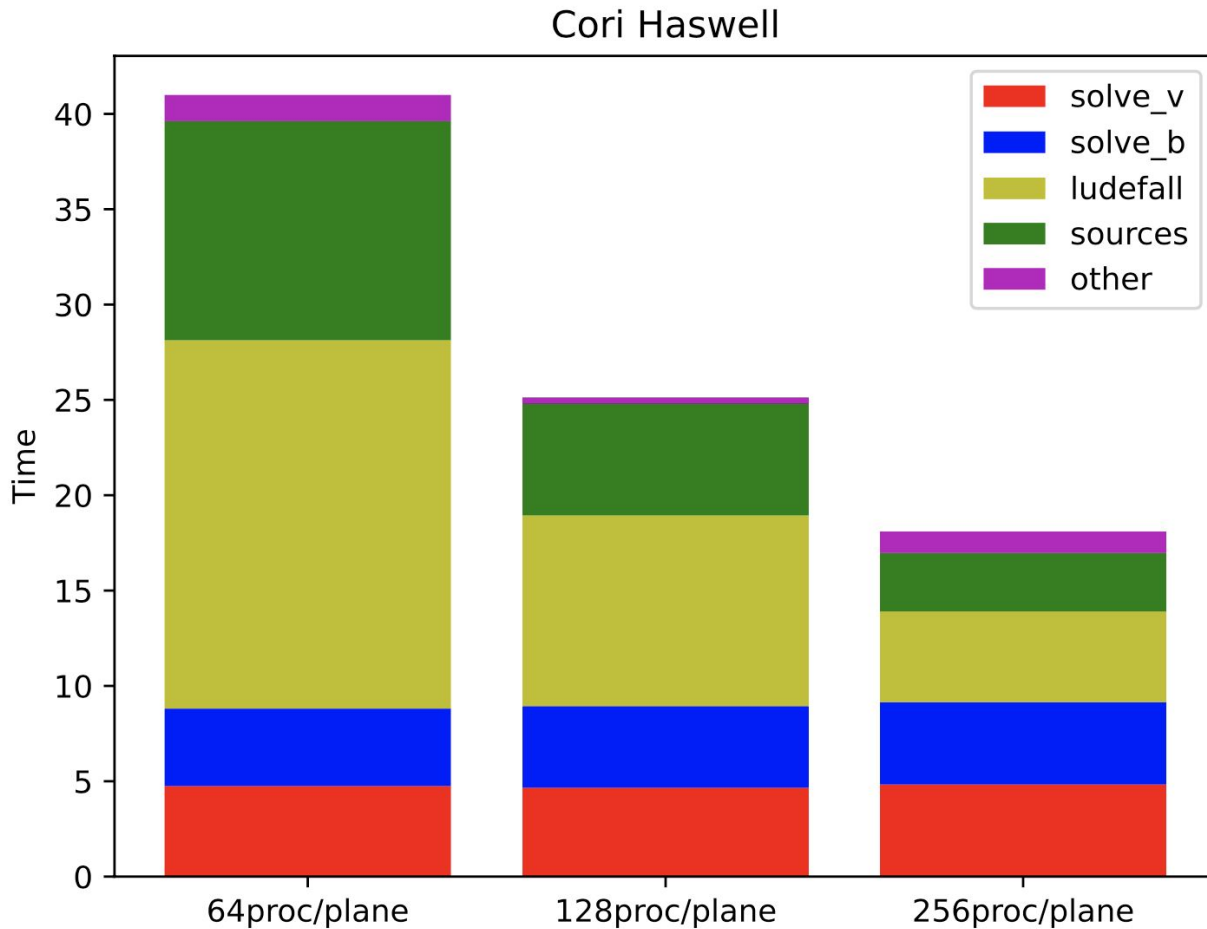# LBL Updates

October, 2022

Topics

- Scaling Experiments on Cori Haswell
- One-sided Communication for Solvers
- Q&A

Scaling Experiments on Cori Haswell

- issues on perlmutter CPU, profiling on Cori Haswell as the touch base
- case: Run05 2planes
- non-scaling solve time due to insufficient computation

Issues on Perlmutter CPU

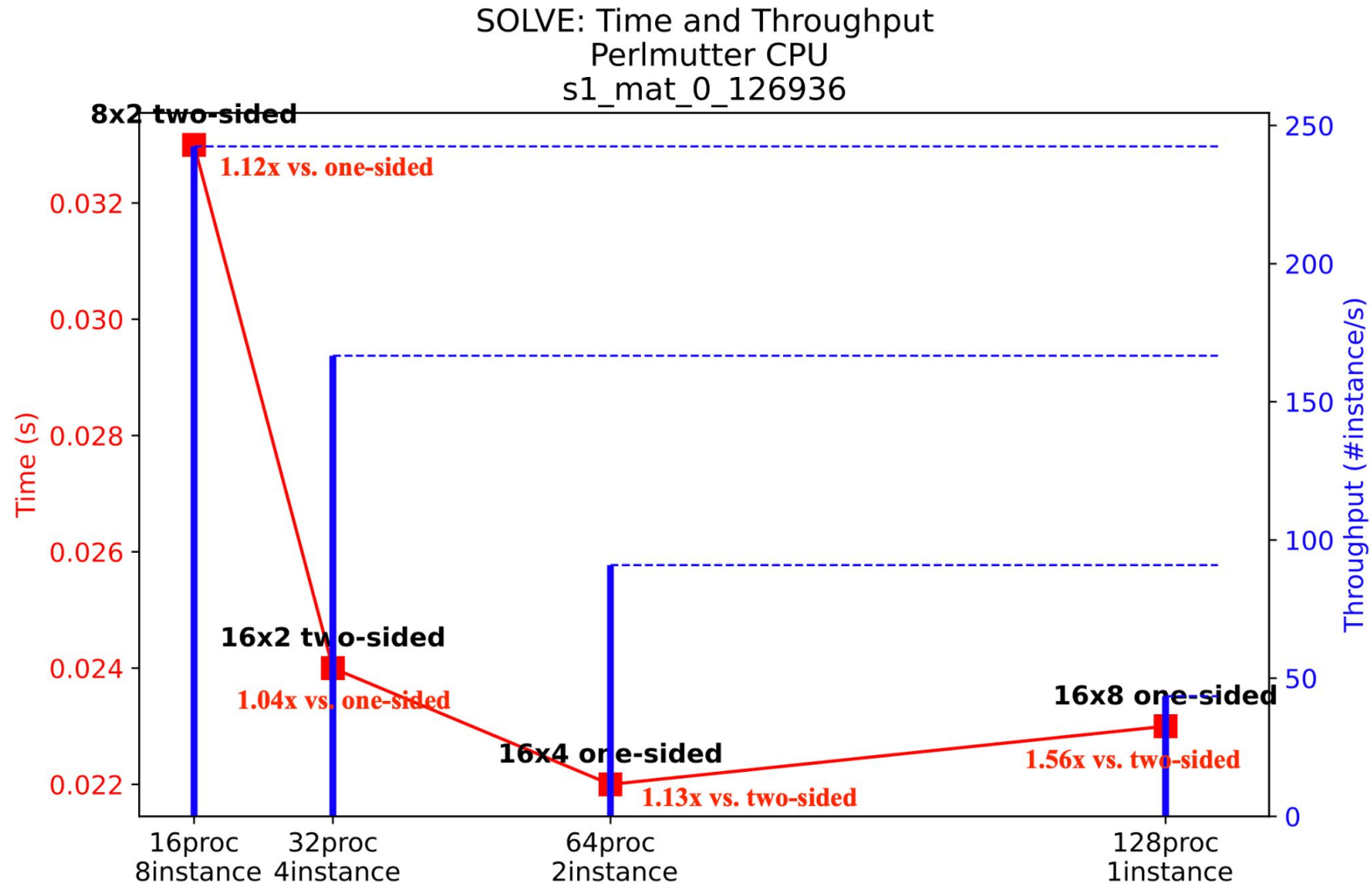|	petsc	scorec	unstructured	M3dc1 run
PrgEnv-aocc	compiled ok	compiled ok	compiled ok	Very beginning: seg 0, mem 3: remap(0x20492000,0x1000,0x1000,0x3,0x14886494c000) failed, error 14.
PrgEnv-gnu	compiled ok	compiled ok	compiled ok	*Time integration: Crank-Nicholson.* *Generating newvar matrices* *[9]PETSC ERROR: PetscAbortErrorHandler: setupParaMat() at /global/cfs/cdirs/m2956/nanding/myprojects/M3D/202209/M3DC1/m3dc1_scorec/src/m3dc1_matrix.cc:551* *To prevent termination, change the error handler using PetscPushErrorHandler()*
PrgEnv-nvidia *Jin succeed	compiled ok	jin's scorec /global/homes/j/jinchen/project/PETSC/core-dev/perlmuttercpu-*	perlmuttercpu-nvidia Compiled ok perlmuttercpu-nvidia2&3 /usr/bin/ld: /global/homes/j/jinchen/project/M3DC1/gitrepo/M3DC1/m3dc1_scorec/src/m3dc1_matrix.cc:392: undefined reference to `PetscMPIErrorString'	perlmuttercpu-nvidia Run failed *version <= SMB_VERSION failed at /global/homes/j/jinchen/project/PETSC/core-dev/mds/mds_smb.c + 125

Scaling Experiments on Cori Haswell

- To proceed the profiling on Perlmutter
  - point to Jin's petsc build? -> Jin build petsc in a shared project folder
  - point to Jin's scorec build?
  - LBL build unstructured …

- differences with standalone
- appropriate problem size

	Matrix size	m3dc1 case
s1_mat_0_126936	126,936 x 126,936	Run05??
s1_mat_0_253872	253,872 x 253,872	?
s1_mat_0_507744	-	?

One-sided Communication for Solvers

- Standard one-sided MPI can provide 1.4x bandwidth than standard two-sided MPI over SS11
- New one-sided communication solve achieves up to 1.56x speedup using one Perlmutter CPU node (128 processes)

SOLVE: Time and Throughput
Perlmutter CPU
s1_mat_0_126936

Q&A / Feedback