

Rules and Regulations of the 5th Annual XSEDE Boot Camp Hybrid Challenge



NEWER AND IMPROVED!

General Rules

- 3 Weeks (July 1st)
- 4 Nodes of Bridges
- Use any combination of MPI, OpenACC and OpenMP
- How fast can you run a 10K x 10K Laplace code to convergence?

Some Specifics

- Can't change kernel (Must retain two core loops source)
- Can change number of PEs (Does not have to be 4)
- 1 Source File
- 1 Combined Environment/Compile/Run SLURM script (batch isn't that bad). Compilation included. No *interact*.
- Mail to urbanic@psc.edu by deadline
 - Mail a ping earlier if you want to be informed of any developments

Rules For Lawyers

- No libraries
- Don't mess with timer placement
- ?

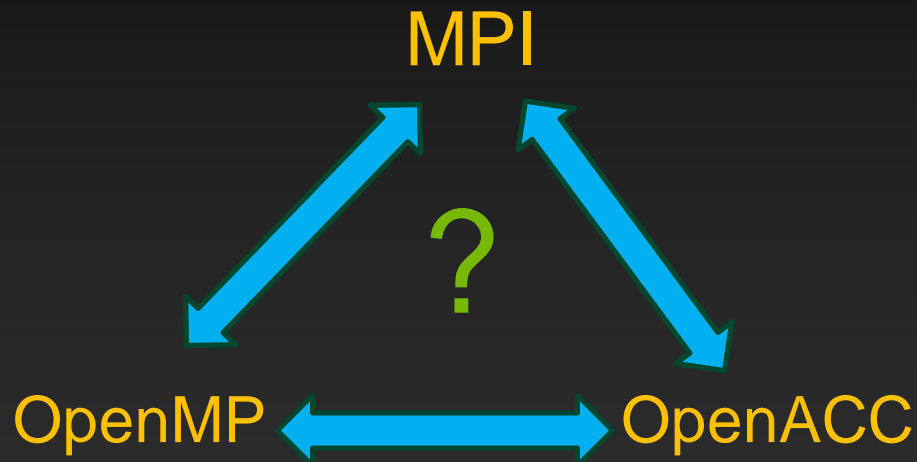
Reality Checks

- Serial code converges at 3578 time steps. Yours should too.
- As we know, this is not enough to verify correctness. You should find point [7500][9950] in C and (9950,7500) in Fortran converges to $17 (\pm 1)$ degrees.
- As discussed, the 10K result differs from the 1K result.*
 - Plugging in Gauss-Seidel or Successive Over Relaxation (SOR) would be easy and interesting. But, not for our contest.

<http://www.cs.berkeley.edu/~demmel/cs267/lecture24/lecture24.html> is a brief analysis of these issues.

Suggested Things to Explore

- **Compiler flags**
 - -fast
- **Compiler**
 - module swap
 - Intel, PGI, GNU
- **More efficient MPI commands**
 - One example already given
- **MPI Environment Variables**
 - man mpi



Decision

- On July 2nd we will take the top self-reported speeds and run them in an interactive session:
 - *sbatch hybrid.job*
 - *Your batch job should include all parameters to*
 - *Run on some set of 4 nodes*
 - *Load any modules required*
 - *Compile itself*
 - *Set any environment variables*
- Timings not within 10% of self-reported time will be disqualified
- Codes should print out “test point” at [7500][9950] for C, (9950,7500) for Fortran at conclusion of run.
- Best of three runs for each finalist will determine winner
- **Titan V to the winner (and maybe a trophy)!**

