Open MPI: Open Source + Innovation + Community = Petaflop

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Aside: MPI-2.1 and MPI-3.0

• MPI-2.1 is complete
  - Merged MPI-1 and MPI-2 documents (yay!)
  - $22 printed books (586 pages!), HLRS booth #1353
• The MPI Forum needs your help!
  - What do you want to see in MPI-3.0?
  - What do you not want to see in MPI-3.0?
• Los Alamos Road Runner
• #1 on Nov. 2008 Top500
  ▪ 1.1 petaflops
• Powered by Open MPI
  ▪ Significant community achievement
Open MPI Is…

• Evolution of several prior MPI implementations
• Open source project and community
  ▪ Production quality
  ▪ Vendor-friendly
  ▪ Research- and academic-friendly
• All of MPI-1 and MPI-2
Why Does Open MPI Exist?

- Maximize all MPI expertise, including:
  - Research / academia
  - Vendors
  - Customers, enterprise
- Utilize years of MPI research and experience
- The sum is greater than the parts
15 Members, 9 Contributors, 2 Partners
Why Open Source?

- Open source HPC is good for everyone
  - Room for research / new ideas
  - Open information transfer
  - Feed them back into production / commodity products
- Shorten the cycle from research to commodity
- Researchers have ideas; industry has production capability
  - There are smart people in both!
“Great discoveries and improvements invariably involve the cooperation of many minds.”
How Does It Work?

• It’s all about the collaboration
  ▪ Communicate, communicate, communicate
  ▪ Developers scattered across three continents

• Our greatest development tool:
Give To Get

• Nightly community regression testing
  ▪ 300-500k tests per night
  ▪ Web-based analysis tools
• Strive for consensus
  ▪ But realize it isn’t always possible (or necessary)
• Perform “community service”
  ▪ Example: Fortran API maintenance
…But How Does That Equal a Petaflop?

- OpenFabrics performance
- Robustness through QA
- Ease of deployment
- High quality error reporting (MTBF!)
- Optimized Fortran API
- Scalable connectivity scheme
- Small MPI memory footprint
- Scalable job launch
- Scalable MPI collectives
- Scalable connectivity scheme
Community Makes It Possible
Come Join Us!

“Open source is decided by those who show up”

http://www.open-mpi.org/

welcome to the human network.