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?
Petaflop!!

- 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!

Alexander Graham Bell, 1877

“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
- Scalable MPI collectives
- Scalable job launch
- Small MPI memory footprint

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.