20 Years of MPICH

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Prehistory

- Rusty Lusk, Ross Overbeek, Ralph Butler at Argonne develop p4 system for portable parallel programming (1984ff)
- Bill Gropp at Yale develops ntools, combining math and communication libraries
  - Joined Argonne in 1990, split math part off into PETSc, kept portable communication library as Chameleon
- MPI prehistory: April 1992: Ken Kennedy organizes workshop on a standard API for message passing
  - Community agreement to get together at SC'92 in Minneapolis.

The Founding Moment

- SC'92, almost exactly 20 years ago, a group gathers in Minneapolis to organize what became the MPI Forum.
- It is very cold (-20)
- Jack Dongarra chairs the meeting, and various people volunteer to lead various parts, which became chapters of MPI.
- Bill and Rusty volunteer to do a reference implementation, building on both p4 and Chameleon.
- Bill has his first single-malt scotch and pronounces it good.

MPICH1

- Our reference implementation tracked the specification as it evolved, with a new release every six weeks, often undoing things that were done in the previous cycle.
- To keep it open source, we had to copyright it. To copyright it, it had to have a name, which we had given no thought to.
- In the Argonne lawyers office, with no time to think, we picked the name MPICH (the CH is for Chameleon, symbolizing adaptability and portability, and for Bill's library)
- It is pronounced "em-pee-eye-see-aitch", not "empitch", but even we have given up by now.
- The effort was worth it:
  - testing the spec as it developed improved the spec
  - the idea of subsetting was rendered irrelevant as it was shown that the whole thing could be implemented quickly
  - When the spec was finished, the implementation was ready to go
    - (compare with HPF)
- The architecture encouraged vendors to adopt our upper layers and optimize lower layers, so they embraced it.
- Linux clusters abounded with MPICH and OpenMPI (and LAM)

MPICH2

- The MPI-2 spec, started in ‘95 and released in ’97, was much more difficult to implement, and we did not track the development
- After the spec was released, we decided to do a completely implementation from scratch (mkdir).
  - new architecture, all new code, implementation of lessons learned in MPICH1
  - but same layered approach
- MPICH2 became a major research vehicle for research in parallel computing implementation, while the MPI standard remained relatively static for 10 years.
- Also the foundation of most MPI implementations distributed by vendors (more on this later in this BOF).
- We are planning to continue to develop this code rather than replace it.

The Future: MPICH

- Announcements coming at this BOF:
  - small name change to MPICH2 for the future
  - status of our MPI-3 implementation