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