Extending the MPI Backend of X10 by Elasticity

Marco Bungart and Claudia Fohry
Research Group Programming Languages / Methodologies
University of Kassel, Germany
{marco.bungart|fohry}@uni-kassel.de

Overview

- Elastic X10 allows dynamic addition of places
- We implemented elasticity in MPI backend
- Switched on via environment variables: X10_ELASTIC=1 and X10_JOIN_EXISTING=<hostname>[::<port>]
- Initial connection establishment through network socket
- Before replacement of MPI_COMM_WORLD, finish all communication (silent state)
- MPI connection establishment via MPI_Comm_accept and MPI_Comm_connect
- MPI_Intercomm_merge and MPI_Group help to construct new MPI_COMM_WORLD

MPI Backend of X10

- Implemented with Open MPI ULFM, thus MPI_THREAD_SERIALIZED
- Ranking must include all processes, including failed ones
- We use MPI_Isend

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References