



# **MPI-3 subsetting**

MPI-3 subsetting WG

*Alexander Supalov, Intel Corporation*

*April 28, 2008*

# Contents

Motivation and goals

Progress report

Discussion points

Call to action

Certain product names and references may be trade marks and registered trademarks of 3<sup>rd</sup> party entities.

# Motivation & Goals

- Customers drift away from the MPI
  - Complaints about MPI inadequacy and complexity
  - Complexity is going to grow in MPI-3
  - Growing complexity may lead to lower performance
- Subsetting aims at countering this thru
  - Modularization to better fit different application areas
  - Identification of the MPI core and other subsets
  - Performance optimization for certain module combinations

# Progress Report

- Started the subset proposal

<http://svn.mpi-forum.org/trac/mpi-forum-web/wiki/Subsets>

- Identified two kinds of subsets
  - Routine subsets, e.g. dynamic process management, file I/O, etc.
  - Feature subsets, e.g., heterogeneity support, etc.
  - Added laundry lists for predefined subsets of both kinds
- Defined three subset definition/selection moments
  - Compile time (Rainer's proposal)
  - Link time (basically dlopen of modules at MPI\_Init time)
  - Runtime
    - Jeff: ~MPI\_Init (argc, argv, hints\_in[, hints\_out]), plus queries, etc.
    - Dick: ~MPI\_Init (argc, argv, required, provided, assertions)

# Discussion Points

- Need several predefined subsets? E.g.:
  - MPI-1, MPI-2
  - Dynamic process support, file I/O, one-sided ops, communicator & group management, non-blocking communication
  - Heterogeneity, derived datatypes, MPI\_ANY\_SOURCE, message tagging
- Need way for the user to define their subsets?
- Need hierarchy of subsets (Ron) and/or set ops to combine subsets?
- Point of subset application
  - The whole job and/or
  - Communicators (Tony), possibly windows and files?
- Optional subsets and compatibility
- Subsets in the emerging MPI-3 proposals
  - Non-blocking collectives, fault tolerance, cache coherent RMA, ABI?

# Call to action

- Join the discussion list

<http://lists.mpi-forum.org/mailman/listinfo.cgi/mpi3-subsetting>

- Contribute to the subset proposal

<http://svn.mpi-forum.org/trac/mpi-forum-web/wiki/Subsets>

- Think subsetting when introducing new features

