

Collectives Working Group Report

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Redesign the collective interface to the changed environment in HPC. Use gained experience to improve or correct current interface.

The approach

- 1 discuss
- 2 design
- 3 implement
- 4 propose

Were are we?

- stage 1/2/3
- everything in this talk is preliminary and open for discussion

February Telecon

- 8 participants/7 institutions
- discussed group focus
- defined first opinions
- formed subgroups

Current Items

- new collectives
- non-blocking interface
- persistent interface
- sparse/topological collectives
- modularity/subsetting

New collective operations

MPI_Reduce_scatter_block()

- regular, non-vector variant of MPI_Reduce_scatter()
- new MPI operations
- maybe MPI-2.2?

???

- new proposals welcome

Non-blocking and Persistent Interface

MPI_I<coll> for all

- very close to the original proposal for MPI-2 (see early mailinglist discussions)
- multiple outstanding requests
- but no matching between blocking non-blocking
- limited cancel/free functionality
- reference implementation available as open-source (LibNBC)

MPI_<coll>_init() for all

- cf. persistent send/recv
- might have performance benefits
- might also bloat interface

Sparse/Topological Collectives

- no consensus yet - two proposals under consideration -

1: MPI_<coll>_sparse(..., MPI_Group group)

- allows arbitrary processes to communicate
- arbitrary collectives
- might be hard to implement/optimize
- might bloat interface

2: Topological Collectives

- defined on cartesian/graph communicators
- graph communicator enables arbitrary processes to communicate (i.e., parse Alltoally)
- implemented in open-source implementation (LibNBC)
- used in a real-world application (with arbitrary graphs)
- only 2/3 functions added to interface



Interaction with other Groups

Graph Topologies

- current interface is not scalable
- collaborate with existing group
- - or - make it topic of the group

Modularize collective Interface

- blocking collectives
- non-blocking collectives
- topological collectives

Coordination with Subsetting Group

- Torsten participates in subsetting discussions
- try to collaborate

More Information:

- Mailinglist
- Wiki
- Teleconferences (announced on ML)
- LibNBC (<http://www.unixer.de/NBC>)