The Path to MPI 4.1

(note: these slides are working notes from the meeting and hence cover the discussion, but are by no means clean presentation slides)

https://mpi-forum.org/

Chapter Committees

Chapter	Chair	Members
Front Matter	Bill Gropp	Rolf Rabenseifner, Martin Schulz
Introduction	Bill Gropp	Rolf Rabenseifner, Martin Schulz
MPI Terms and Conventions	Claudia Blaas-Schenner	Rolf Rabenseifner, Bill Gropp, Tony Skjellum, Puri Bangalore, Guillaume Mercier, Dan Holmes, Julien Jaeger
Point to Point Communcation	Dan Holmes	Ken Raffenetti, Ryan Grant, Bill Gropp, Brian Smith
Partitioned Communication	Ryan Grant	Tony Skjellum, Puri Bangalore, Dan Holmes, Matthew Dosanjh
Datatypes	George Bosilca	Bill Gropp, Martin Ruefenacht, Dan Holmes
Collective Communication	Tony Skjellum	Torsten Höfler, Brian Smith, Wesley Bland, Martin Schulz, Julien Jaeger
Groups, Contexts, Communicators, Caching	Guillaume Mercier	Bill Gropp, Tony Skjellum, Pavan Balaji
Process Topologies	Rolf Rabenseifner	Guillaume Mercier, Claudia Blaas-Schenner, Torsten Höfler, Tony Skjellum, Mahdieh Ghazimirsaeed, Christoph Niethammer
MPI Environmental Management	George Bosilca	Ken Raffenetti, Wesley Bland, Thomas Naughton
The Info Object	Martin Schulz	Ryan Grant, Guillaume Mercier, Wesley Bland
Process Creation and Mangement	Howard Pritchard	Ken Raffenetti, Dan Holmes, Martin Schulz, Thomas Naughton
One-Sided Communication	Bill Gropp	Pavan Balaji, Joseph Schuchart, Nathan Hjelm, Artem Polyakov
External Interfaces	Martin Schulz	Pavan Balaji, Brian Smith, Tony Skjellum
I/O	Tony Skjellum	Quincey Koziol, Shinji Sumimoto
Tool Support	Marc-Andre Hermanns	Martin Schulz, Kathryn Mohror
Deprecated Functions	Rolf Rabenseifner	Martin Schulz, Wesley Bland
Removed Interfaces	Rolf Rabenseifner	Martin Schulz, Wesley Bland
Backward Incompatibilities	Wesley Bland	Martin Schulz
Language Bindings	Puri Bangalore	Tony Skjellum, Rolf Rabenseifner
Language Bindings Summary	Rolf Rabenseifner	Puri Bangalore, Tony Skjellum, Hubert Ritzdorf
Change-Log	Rolf Rabenseifner	Marc-Andre Hermanns, Hubert Ritzdorf

Gating Issues for MPI 4.1 by Working Group

Collectives, Context, ~~Topology~~, Communicators, Groups, ADD PERSISTENCE ADD PARTITIONED
- Torsten Hoefler, Andrew Lumsdaine and Anthony Skjellum

Fault Tolerance
- Wesley Bland, Aurélien Bouteiller

HW and Virt. Topologies
- Guillaume Mercier

Hybrid and Accelerator Programming
- Jim Dinan

Language Bindungs
- Martin Ruefenacht

~~**Persistence**~~
~~- Anthony Skjellum~~

Point to Point Communication ON HOLD
- Rich Graham and Dan Holmes

Remote Memory Access
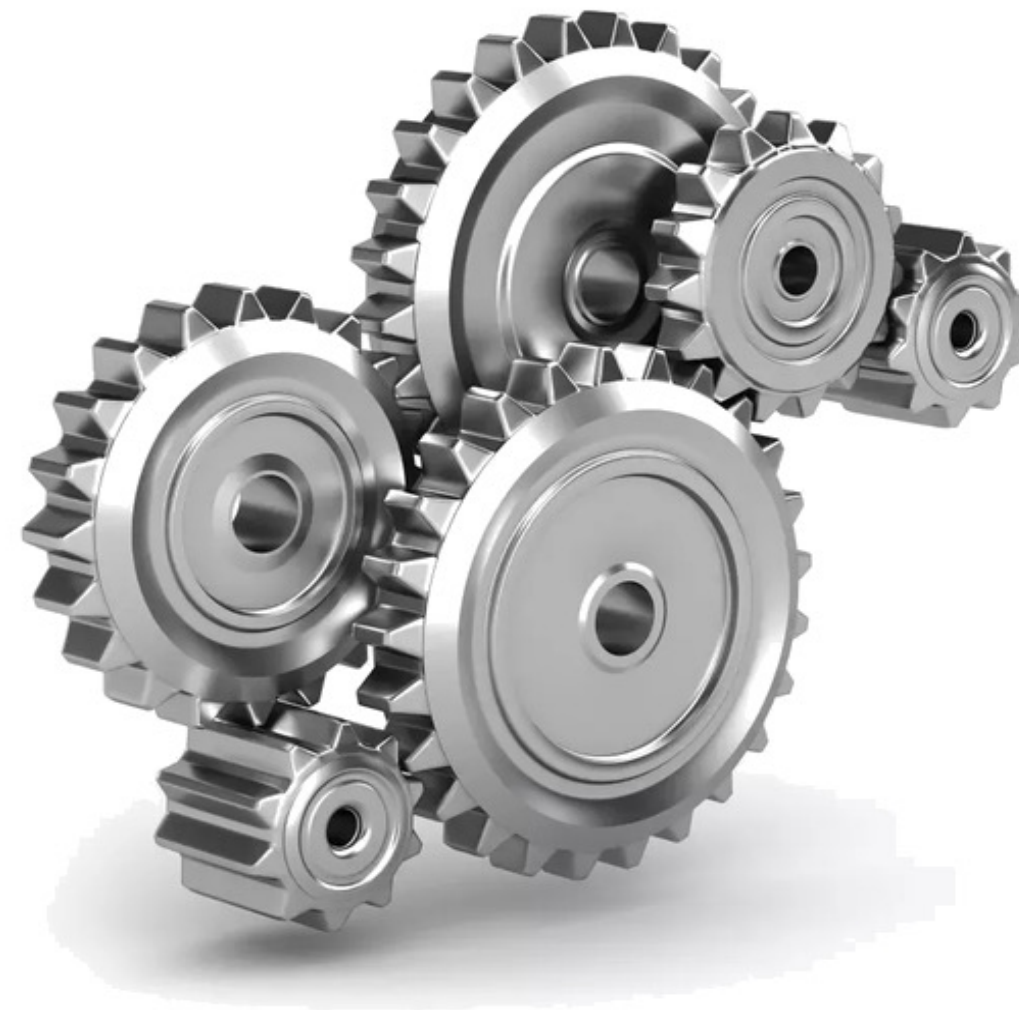- Bill Gropp, Rajeev Thakur and Joseph Schuchart

Semantic Terms
- Rolf Rabenseifner and Purushotham Bangalore

Sessions
- Dan Holmes, Howard Pritchard

Tools
- Marc-Andre Hermanns

Gating Issues for MPI 4.1 by Working Group

Collective Context, Topology, Communicators, Groups, Persistence, Partitioned

- Torsten Hoefler, Andrew Lumsdaine and Anthony Skjellum

Nothing new in the pipeline
Readings/tickets in motion

Virtual topologies may want to move to HW Topologies
-> issues see there

Parrived any/some
            reading today, in progress

Partitioned collectives -> 5.0

Gating Issues for MPI 4.1 by Working Group

Error Handling and Fault Tolerance

~~Wesley Bland,~~ Aurélien Bouteiller, Ignacio Laguna

Clarifications Sessions/Errors
Errorhandler free / removing error classes
→ Read and in progress

ULFM slice 1 / 2 for MPI 5.0, ReInit as well

Gating Issues for MPI 4.1 by Working Group

HW and Virt, Topologies

• Guillaume Mercier

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Query for HW Names

-> still need to find the right interface

#457 semantics in virtual topologies

-> still pending, plenary in December 2022?

Pset guided splitting

-> may be stretch, could also be MPI 5.0

Gating Issues for MPI 4.1 by Working Group

Hybrid and Accelerator Programming
- Jim Dinan

Accelerator Info
-> read today

MPI Buf Prepare
-> with persistance, one outstanding item (need special request)?
-> goal is to conclude by Dec 2022 (in combination)
-> discussion later today and needs some changes to terms (Dan)

Accelerator bindings for partitioned
-> treated as side document on same timeline, merge perhaps in 5.0
      Should align timeline with main standard version 4.1
      Needs reading/discussions and all text – early next year??? Or Dec?
-> side document should be referenced in main standard (reading in December 2022)

Possibly side document on cont. To experiment with new features
      May need slight adjustment to rules –> Dec 2022

Camp A vs. B / logically concurrent (vs. C and D)
      should be resolved, but unclear when we can do that? Or side step?
      unlcear if this can make it into 4.1?
      WG will make proposal on how/if to handle that in 4.1 by Dec 22
      Virtual Meeting with strong call for participation by whole forum

Gating Issues for MPI 4.1 by Working Group

Persistence
- Anthony Skjellum

- MOVED

Gating Issues for MPI 4.1 by Working Group

Point to Point Communication

- Rich Graham and Dan Holmes

- ON HOLD

Gating Issues for MPI 4.1 by Working Group

Remote Memory Access

- Bill Gropp, Rajeev Thakur and Joseph Schuchart

Semantic Terms fixes for RMA chapter
       first readings this meeting, on schedule
       incl. Fixes to assertions for shmem (as stop gap at least)
       WG will discuss and present solution in Dec.

Fix for better atomic ops
       exact items to be done
       (info key, MPI_PROD dep., …)
       reading in Dec, VM to present ideas before

Extension of win shared query
       read in first version this time, in progress

Better RMA in 5.0

Gating Issues for MPI 4.1 by Working Group

Semantic Terms
- Rolf Rabenseifner and Purushotham Bangalore

Holistic definition of progress incl. Get status
    Joint WG meeting Tools/RMA/Terms
    then VM to discuss
    proposal to read in Dec.

Integration of the table
    Need ticket/proposal for Dec
    Need RMA involvement (dep. On ticket in RMA group)
        Open questions
    Need VM as well (perhaps)

New version of the state diagrams with enabled
    may not be gating, but nice to have
    Discussion at VM before Dec.

Get rid of word „task" -> part of VM

Gating Issues for MPI 4.1 by Working Group

Sessions

- Dan Holmes, Howard Pritchard

Language binding 535
MPI last used code (read)
Def. Of MPI_GROUP_NULL 534
Buffer attached in the session model
        open and tbd.
        need ticket/proposal by Dec.

Gating Issues for MPI 4.1 by Working Group

Tools
- Marc-Andre Hermanns

Some nice to have, not gating
- 520: compound data types, may be in 4.1 but could slip, not gating

Cleanup tickets
- 160: clarification on binds in MPI_T, in progress
- 542: Correct usage of return codes, in progress (work on feedback pending)
- 414: overflow behavior
- 385: MPI_T vs. error classes (needs WG discussions still)
  once discussion done, text should be easy
- 584: rename profiling interface to capture better semantics
  open the door for QMPI
- 443: list entries in MPI_T IN vs. INOUT (may need terms update)

- Should all be read in Dec 22

All WG/CC Issues

Index Semantics #237

Primary Index #239

Mark erroneous examples #244

Shorten Example Names #239

Add example titles #228

MPI Process / Rank cleanup (one issue per chapter)

Issues on the Board

Active ToDo Items: 70

- Which ones should we still do / can we still do for MPI 4.1?

- Who will do them?

In Progress: 48

- What is still missing?

Had Reading: 7

- Seems under control

A Possible Timeline

Last readings March 2023

Vote 1 June 2023   **Vote 1: April 2023**

Vote 2 Sept 2023   **Vote 2: June 2023**

Ratification Meeting 1 December 2023   **Ratification: Sep 2023**

Ratification Meeting 2 March 2024   **Ratification: Oct 23**

New Standard by ISC 24   **New standard: SC 23**

A Possible Timeline

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Virtual Meetings

5.10.	cancel	~~Pbuf_prepared~~
12.10.	New state diagram	
19.10.	Rules/Sides and 4.1 Board	~~ULFM slice 2~~
26.10.	PBUF_prepared	~~FT integration discussion~~
2.11.	Progress	
9.11.	Procedures table / A2	~~MPI 4.1 Board (half)~~
16.11.	-> SC 22	~~Virtual meeting rules discussion (half)~~
23.11.	cancel	~~Side document (half)~~
	(before Thanksgiving??)	
30.11.	FT (ULFM + Int.)	~~Logical concurrency (-> WG)~~
7.12.	-> Meeting	

~~Progress~~
~~Semantic of procedures table~~
~~New state diagram~~

Support for better RMA atomics (half)
get rid of "task" (half)