A List of MPJ Express Methods

Aamir Shafi, Kamran Hamid

aamir.shafi@seecs.edu.pk, kamran.hamid@seecs.edu.pk

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The main purpose of this document is to help MPJ Express application developers map specific MPI-level functionality to exact classes and methods in javadocs provided with the software. This document will help application developers find answers to questions like:

- Where can I find point-to-point methods in the MPJ Express software?
- What are the arguments to the Gather() method?
- How will my application call a specific collective method?
- What are the API differences between mpiJava (the software) and MPJ Express?

The purpose of this document is not to elaborate the API of MPJ Express software. For more details on the MPJ Express API, see the mpiJava 1.2 API reference paper.

The document provides mapping for the following MPI-level features:

1. MPI Environmental Routines
2. Point to Point Communications
3. Collective Communication Routines
4. Group Communications
5. Intercommunicator
6. Process Topologies

1. MPI Environmental Routines

Type	Classes	Methods
Initialization	MPI	Init
Finalization	MPI	Finalize
Communicator	MPI	COMM_WORLD
Accessors	MPI	Get_processor_name, Wtime, Wtick
	Comm	Rank, Size

2. Point to Point Communications

Type	Classes	Methods
Blocking operations	Comm	Send, Recv, Sendrecv, Probe, Bsend, Ssend, Rsend, Irsend, Ibsend
Non-Blocking operations	Comm	Isend, Irecv, Sendrecv_replace, Iprobe
	Request	Wait, Waitall, Waitany, Test, Waitsome, Cancel
Persistent communication requests	Comm	Send_init, Bsend_init, Ssend_init, Rsend_init
Null processes	MPI	NULL_PROCESS
Derived Datatypes	MPI	MPI.BYTE, MPI.CHAR, MPI.SHORT, MPI.BOOLEAN, MPI.INT, MPI.LONG, MPI.FLOAT, MPI.DOUBLE, MPI.OBJECT, MPI.LB, MPI.UB, MPI.PACKED
Buffer operations	MPI	Pack, Unpack, Buffer_attach, Buffer_detach

3. Collective Communication Routines

Type	Classes	Methods
Misc operations	Intracomm	Barrier, Bcast, Gather, Gatherv, Scatter, Scatterv, Allgather, Allgatherv, AlltoAll, AlltoAllv, Reduce, Allreduce, Reduce_Scatter, Scan

4. Group Communications

Type	Classes	Methods
Group accessors	Group	Size, Rank, Translate_ranks, compare
Group constructors	Group	Union, Intersection, Difference, Incl, Excl, Range_incl, Range_excl, Split
Empty Group	MPI	GROUP_EMPTY
Group Destructors	Group	Free

5. Intercommunications

Type	Classes	Methods
Inter-communicator accessors	Intercomm	Test_Inter, Remote_size, Remote_group,
Inter-communicator operation	Comm	Create_intercomm
	Intracomm	Clone
	Intercomm,	Merge
Caching	Comm	Attr_get

6. Process Topologies

Type	Classes	Methods
Cartesian constructors	Cartcomm	Create_cart
Cartesian convenience function	Cartcomm	Dims_create
Graph Constructor	Graphcomm	Create_graph
Topology inquiry functions	Cartcomm	Topo_test, Get , Rank , Coords
	Graphcomm	Get , Neighbors
Cartesian shift coordinates	Cartcomm	Shift
Partitioning of Cartesian structures	Cartcomm	Sub
Low level topology functions	Cartcomm	Map
	Graphcomm	Map