A List of MPJ Express Methods

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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](http://www.hpjava.org/reports/mpiJava-spec/mpiJava-spec/mpiJava-spec.html).

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
7. **MPI Environmental Routines**

|  |  |  |
| --- | --- | --- |
| **Type** | **Classes** | **Methods** |
| Initialization | MPI | Init |
| Finalization | MPI | Finalize |
| Communicator | MPI | COMM\_WORLD |
| Accessors | MPI | [Get\_processor\_name](file:///C:\Documents%20and%20Settings\Aamir%20Shafi\My%20Documents\Downloads\javadocs\mpi\MPI.html#Get_processor_name()), [Wtime](file:///C:\Documents%20and%20Settings\Aamir%20Shafi\My%20Documents\Downloads\javadocs\mpi\MPI.html#Wtime()), [Wtick](file:///C:\Documents%20and%20Settings\Aamir%20Shafi\My%20Documents\Downloads\javadocs\mpi\MPI.html#Wtick()) |
| [Comm](file:///C:\Documents%20and%20Settings\Aamir%20Shafi\My%20Documents\Downloads\javadocs\mpi\Comm.html) | Rank, Size |

1. **Point to Point Communications**

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| --- | --- | --- |
| **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 |

1. **Collective Communication Routines**

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| --- | --- | --- |
| **Type** | **Classes** | **Methods** |
| Misc operations | Intracomm | Barrier, Bcast, Gather, Gatherv, Scatter, Scatterv, Allgather, Allgatherv, AlltoAll, AlltoAllv, Reduce, Allreduce, Reduce\_Scatter, Scan |

1. **Group Communications**

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| **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 |

1. **Intercommunications**

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| **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 |

1. **Process Topologies**

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| --- | --- | --- |
| **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 |