

MPI Reference

1 MPI functions

1. `int MPI_Send(const void *buf, int count, MPI_Datatype datatype, int dest, int tag, MPI_Comm comm)`
2. `int MPI_Recv(void *buf, int count, MPI_Datatype datatype, int source, int tag, MPI_Comm comm, MPI_Status *status)`
3. `int MPI_Init(int *argc, char ***argv)`
4. `int MPI_Comm_size(MPI_Comm comm, int *size)`
5. `int MPI_Comm_rank(MPI_Comm comm, int *rank)`
6. `int MPI_Finalize(void)`
7. `int MPI_Bcast(void *buffer, int count, MPI_Datatype datatype, int root, MPI_Comm comm)`
8. `int MPI_Reduce(const void *sendbuf, void *recvbuf, int count, MPI_Datatype datatype, MPI_Op op, int root, MPI_Comm comm)`
9. `int MPI_Get_count(const MPI_Status *status, MPI_Datatype datatype, int *count)`
10. `int MPI_Allreduce(const void *sendbuf, void *recvbuf, int count, MPI_Datatype datatype, MPI_Op op, MPI_Comm comm)`
11. `int MPI_Comm_group(MPI_Comm comm, MPI_Group *group)`
12. `int MPI_Group_excl(MPI_Group group, int n, const int ranks[], MPI_Group *newgroup)`
13. `int MPI_Group_free(MPI_Group *group)`
14. `int MPI_Comm_create(MPI_Comm comm, MPI_Group group, MPI_Comm *newcomm)`
15. `int MPI_Comm_free(MPI_Comm *comm)`
16. `int MPI_Comm_create_group(MPI_Comm comm, MPI_Group group, int tag, MPI_Comm * newcomm)`
17. `int MPI_Comm_split(MPI_Comm comm, int color, int key, MPI_Comm *newcomm)`
18. `int MPI_Cart_create(MPI_Comm comm_old, int ndims, const int dims[], const int periods[], int reorder, MPI_Comm *comm_cart)`

19. int MPI_Cart_shift(MPI_Comm comm, int direction, int disp, int *rank_source, int *rank_dest)
20. int MPI_Cart_get(MPI_Comm comm, int maxdims, int dims[], int periods[], int coords[])
21. int MPI_Cart_rank(MPI_Comm comm, const int coords[], int *rank)
22. int MPI_Cart_coords(MPI_Comm comm, int rank, int maxdims, int coords[])
23. int MPI_Sendrecv(const void *sendbuf, int sendcount, MPI_Datatype sendtype, int dest, int sendtag, void *recvbuf, int recvcount, MPI_Datatype recvtype, int source, int recvtag, MPI_Comm comm, MPI_Status *status)
24. int MPI_Buffer_attach(void *buffer, int size)
25. int MPI_Buffer_detach(void *buffer_addr, int *size)
26. int MPI_Bsend(const void *buf, int count, MPI_Datatype datatype, int dest, int tag, MPI_Comm comm)
27. int MPI_Ssend(const void *buf, int count, MPI_Datatype datatype, int dest, int tag, MPI_Comm comm)
28. int MPI_Rsend(const void *buf, int count, MPI_Datatype datatype, int dest, int tag, MPI_Comm comm)
29. int MPI_Isend(const void *buf, int count, MPI_Datatype datatype, int dest, int tag, MPI_Comm comm, MPI_Request *request)
30. int MPI_Irecv(void *buf, int count, MPI_Datatype datatype, int source, int tag, MPI_Comm comm, MPI_Request *request)
31. int MPI_Wait(MPI_Request *request, MPI_Status *status)
32. int MPI_Waitall(int count, MPI_Request array_of_requests[], MPI_Status array_of_statuses[])
33. int MPI_Waitany(int count, MPI_Request array_of_requests[], int *indx, MPI_Status *status)
34. int MPI_Waitsome(int incout, MPI_Request array_of_requests[], int *outcount, int array_of_indices[], MPI_Status array_of_statuses[])
35. int MPI_Test(MPI_Request *request, int *flag, MPI_Status *status)
36. int MPI_Testall(int count, MPI_Request array_of_requests[], int *flag, MPI_Status array_of_statuses[])
37. int MPI_Testany(int count, MPI_Request array_of_requests[], int *indx, int *flag, MPI_Status *status)
38. int MPI_Testsome(int incout, MPI_Request array_of_requests[], int *outcount, int array_of_indices[], MPI_Status array_of_statuses[])

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39. int MPI_Send_init(const void *buf, int count, MPI_Datatype datatype,
    int dest, int tag, MPI_Comm comm, MPI_Request *request)

40. int MPI_Recv_init(void *buf, int count, MPI_Datatype datatype,
    int source, int tag, MPI_Comm comm, MPI_Request *request)

41. int MPI_Start(MPI_Request *request)

42. int MPI_Startall(int count, MPI_Request array_of_requests[])

43. int MPI_Type_size(MPI_Datatype datatype, int *size)

44. int MPI_Type_get_extent(MPI_Datatype datatype, MPI_Aint *lb, MPI_Aint
    *extent)

45. int MPI_Type_contiguous(int count, MPI_Datatype oldtype, MPI_Datatype
    *newtype)

46. int MPI_Type_commit(MPI_Datatype *datatype)

47. int MPI_Type_free(MPI_Datatype *datatype)

48. int MPI_Type_vector(int count, int blocklength, int stride, MPI_Datatype
    oldtype, MPI_Datatype *newtype)

49. int MPI_Type_indexed(int count, const int *array_of_blocklengths,
    const int *array_of_displacements, MPI_Datatype oldtype, MPI_Datatype
    *newtype)

50. int MPI_Type_create_struct(int count, const int array_of_blocklengths[],
    const MPI_Aint array_of_displacements[], const MPI_Datatype array_of_types[],
    MPI_Datatype *newtype)

51. int MPI_Type_create_resized(MPI_Datatype oldtype, MPI_Aint lb, MPI_Aint
    extent, MPI_Datatype *newtype)

52. int MPI_Barrier( MPI_Comm comm )

53. int MPI_Gather(const void *sendbuf, int sendcount, MPI_Datatype
    sendtype, void *recvbuf, int recvcount, MPI_Datatype recvttype,
    int root, MPI_Comm comm)

54. int MPI_Gatherv(const void *sendbuf, int sendcount, MPI_Datatype
    sendtype, void *recvbuf, const int *recvcounts, const int *displs,
    MPI_Datatype recvttype, int root, MPI_Comm comm)

55. int MPI_Allgather(const void *sendbuf, int sendcount, MPI_Datatype
    sendtype, void *recvbuf, int recvcount, MPI_Datatype recvttype,
    MPI_Comm comm)

56. int MPI_Allgatherv(const void *sendbuf, int sendcount, MPI_Datatype
    sendtype, void *recvbuf, const int *recvcounts, const int *displs,
    MPI_Datatype recvttype, MPI_Comm comm)

57. int MPI_Scatter(const void *sendbuf, int sendcount, MPI_Datatype
    sendtype, void *recvbuf, int recvcount, MPI_Datatype recvttype,
    int root, MPI_Comm comm)

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58. int MPI_Scatterv(const void *sendbuf, const int *sendcounts, const
    int *displs, MPI_Datatype sendtype, void *recvbuf, int recvcount,
    MPI_Datatype recvtype, int root, MPI_Comm comm)

59. int MPI_Alltoall(const void *sendbuf, int sendcount, MPI_Datatype
    sendtype, void *recvbuf, int recvcount, MPI_Datatype recvtype,
    MPI_Comm comm)

60. int MPI_Alltoallv(const void *sendbuf, const int *sendcounts, const
    int *sdispls, MPI_Datatype sendtype, void *recvbuf, const int *recvcounts,
    const int *rdispls, MPI_Datatype recvtype, MPI_Comm comm)

61. int MPI_Alltoallw(const void *sendbuf, const int sendcounts[],
    const int sdispls[], const MPI_Datatype sendtypes[], void *recvbuf,
    const int recvcounts[], const int rdispls[], const MPI_Datatype
    recvtypes[], MPI_Comm comm)

62. int MPI_Reduce_scatter(const void *sendbuf, void *recvbuf, const
    int recvcounts[], MPI_Datatype datatype, MPI_Op op, MPI_Comm comm)

63. int MPI_Reduce_scatter_block(const void *sendbuf, void *recvbuf,
    int recvcount, MPI_Datatype datatype, MPI_Op op, MPI_Comm comm)

64. int MPI_Scan(const void *sendbuf, void *recvbuf, int count, MPI_Datatype
    datatype, MPI_Op op, MPI_Comm comm)

65. int MPI_Exscan(const void *sendbuf, void *recvbuf, int count, MPI_Datatype
    datatype, MPI_Op op, MPI_Comm comm)

66. int MPI_Op_create(MPI_User_function *user_fn, int commute, MPI_Op
    *op)

67. int MPI_Op_free(MPI_Op *op)

68. void MPI_User_function(void *invec, void *inoutvec, int *len, MPI_Datatype
    *datatype)

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2 MPI data types

1. MPI_CHAR
2. MPI_SHORT
3. MPI_INT
4. MPI_LONG
5. MPI_LONG_LONG_INT
6. MPI_UNSIGNED_CHAR
7. MPI_UNSIGNED_SHORT
8. MPI_UNSIGNED
9. MPI_UNSIGNED_LONG

- 10. MPI_UNSIGNED_LONG_LONG
- 11. MPI_FLOAT
- 12. MPI_DOUBLE
- 13. MPI_LONG_DOUBLE
- 14. MPI_BYTE
- 15. MPI_PACKED
- 16. MPI_FLOAT_INT
- 17. MPI_DOUBLE_INT
- 18. MPI_LONG_INT
- 19. MPI_2INT
- 20. MPI_SHORT_INT
- 21. MPI_LONG_DOUBLE_INT

3 MPI reduction operations

- 1. MPI_MAX
- 2. MPI_MIN
- 3. MPI_SUM
- 4. MPI_PROD
- 5. MPI_LAND
- 6. MPI_BAND
- 7. MPI_LOR
- 8. MPI_BOR
- 9. MPI_LXOR
- 10. MPI_BXOR
- 11. MPI_MAXLOC
- 12. MPI_MINLOC