



```

    *newtype)
int MPI_Type_vector (int count, int
    blocklength, int stride, MPI_Datatype
    oldtype, MPI_Datatype *newtype)
int MPI_Type_indexed (int count, int
    blocklength_array[], int displ_array[],
    MPI_Datatype oldtype, MPI_Datatype
    *newtype)
int MPI_Type_create_struct (int count, int
    blocklength_array[], MPI_Aint
    displ_array[], MPI_Datatype
    oldtype_array[], MPI_Datatype *newtype)
int MPI_Type_create_subarray (int ndims, int
    size_array[], int subsize_array[], int
    start_array[], int order, MPI_Datatype
    oldtype, MPI_Datatype *newtype)
int MPI_Get_address (void *location, MPI_Aint
    *address)
int MPI_Type_size (MPI_Datatype *datatype,
    int *size)
int MPI_Type_get_extent (MPI_Datatype
    datatype, MPI_Aint *lb, MPI_Aint *extent)
int MPI_Pack (void *inbuf, int incount,
    MPI_Datatype datatype, void *outbuf, int
    outcount, int *position, MPI_Comm comm)
int MPI_Unpack (void *inbuf, int insize, int
    *position, void *outbuf, int outcount,
    MPI_Datatype datatype, MPI_Comm comm)
int MPI_Pack_size (int incount, MPI_Datatype
    datatype, MPI_Comm comm, int *size)

```

*Related:* MPI\_Type\_create\_hvector,  
 MPI\_Type\_create\_hindexed,  
 MPI\_Type\_create\_indexed\_block,  
 MPI\_Type\_create\_darray,  
 MPI\_Type\_create\_resized,  
 MPI\_Type\_get\_true\_extent, MPI\_Type\_dup,  
 MPI\_Pack\_external, MPI\_Unpack\_external,  
 MPI\_Pack\_external\_size

## Groups and Communicators:

```

int MPI_Group_size (MPI_Group group, int
    *size)
int MPI_Group_rank (MPI_Group group, int
    *rank)
int MPI_Comm_group (MPI_Comm comm, MPI_Group
    *group)

```

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int MPI_Group_translate_ranks (MPI_Group
    group1, int n, int rank1_array[],
    MPI_Group group2, int rank2_array[])
int MPI_Group_compare (MPI_Group group1,
    MPI_Group group2, int *result)
    MPI_IDENT, MPI_COMGRUENT, MPI_SIMILAR,
    MPI_UNEQUAL
int MPI_Group_union (MPI_Group group1,
    MPI_Group group2, MPI_Group *newgroup)
Related: MPI_Group_intersection,
    MPI_Group_difference
int MPI_Group_incl (MPI_Group group, int n,
    int rank_array[], MPI_Group *newgroup)
Related: MPI_Group_excl
int MPI_Comm_create (MPI_Comm comm, MPI_Group
    group, MPI_Comm *newcomm)
int MPI_Comm_compare (MPI_Comm comm1,
    MPI_Comm comm2, int *result)
    MPI_IDENT, MPI_COMGRUENT, MPI_SIMILAR,
    MPI_UNEQUAL
int MPI_Comm_dup (MPI_Comm comm, MPI_Comm
    *newcomm)
int MPI_Comm_split (MPI_Comm comm, int color,
    int key, MPI_Comm *newcomm)
int MPI_Comm_free (MPI_Comm *comm)

```

## Topologies:

```

int MPI_Dims_create (int nnodes, int ndims,
    int *dims)
int MPI_Cart_create (MPI_Comm comm_old, int
    ndims, int dims_array[], int
    periods_array[], int reorder, MPI_Comm
    *comm_cart)
int MPI_Cart_shift (MPI_Comm comm, int
    direction, int disp, int *rank_source,
    int *rank_dest)
int MPI_Cartdim_get (MPI_Comm comm, int
    *ndim)
int MPI_Cart_get (MPI_Comm comm, int naxdim,
    int *dims, int *periods, int *coords)
int MPI_Cart_rank (MPI_Comm comm, int
    coords_array[], int *rank)
int MPI_Cart_coords (MPI_Comm comm, int rank,
    int maxdims, int *coords)

```

```

int MPI_Cart_sub (MPI_Comm comm_old, int
    remain_dims_array[], MPI_Comm *comm_new)
int MPI_Cart_map (MPI_Comm comm_old, int
    ndims, int dims_array[], int
    periods_array[], int *new_rank)
int MPI_Graph_create (MPI_Comm comm_old, int
    nnodes, int index_array[], int
    edges_array[], int reorder, MPI_Comm
    *comm_graph)
int MPI_Graph_neighbors_count (MPI_Comm comm,
    int rank, int *nneighbors)
int MPI_Graph_neighbors (MPI_Comm comm, int
    rank, int maxneighbors, int *neighbors)
int MPI_Graphdims_get (MPI_Comm comm, int
    *nnodes, int *nedges)
int MPI_Graph_get (MPI_Comm comm, int
    maxindex, int maxedges, int *index, int
    *edges)
int MPI_Graph_map (MPI_Comm comm_old, int
    nnodes, int index_array[], int
    edges_array[], int *new_rank)
int MPI_Topo_test (MPI_Comm comm, int
    *topo_type)

```

## Wildcards:

MPI\_ANY\_TAG, MPI\_ANY\_SOURCE

## Basic Datatypes:

MPI\_CHAR, MPI\_SHORT, MPI\_INT, MPI\_LONG,  
 MPI\_UNSIGNED\_CHAR, MPI\_UNSIGNED\_SHORT,  
 MPI\_UNSIGNED, MPI\_UNSIGNED\_LONG MPI\_FLOAT,  
 MPI\_DOUBLE, MPI\_LONG\_DOUBLE, MPI\_BYTE,  
 MPI\_PACKED

## Predefined Groups and Communicators:

MPI\_GROUP\_EMPTY, MPI\_GROUP\_NULL,  
 MPI\_COMM\_WORLD, MPI\_COMM\_SELF, MPI\_COMM\_NULL

## Reduction Operations:

MPI\_MAX, MPI\_MIN, MPI\_SUM, MPI\_PROD,  
 MPI\_BAND, MPI\_BOR, MPI\_BXOR, MPI\_LAND,  
 MPI\_LOR, MPI\_LXOR

## Status Object:

status.MPI\_SOURCE, status.MPI\_TAG,  
 status.MPI\_ERROR