MPI: A Message-Passing Interface Standard

Version 3.1

Message Passing Interface Forum

September 21, 2012

Annex A.3.4 :
Callbacks without
- BIND(C)
- any INTENT(...)

#345

```
    TYPE(MPI_Datatype), INTENT(IN) ::  sendtype, recvtype
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror
```

A.3.4 Groups, Contexts, Communicators, and Caching Fortran 2008 Bindings

```
MPI_Comm_compare(comm1, comm2, result, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm1, comm2
    INTEGER, INTENT(OUT) ::  result
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_create(comm, group, newcomm, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Group), INTENT(IN) ::  group
    TYPE(MPI_Comm), INTENT(OUT) ::  newcomm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_create_group(comm, group, tag, newcomm, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Group), INTENT(IN) ::  group
    INTEGER, INTENT(IN) ::  tag
    TYPE(MPI_Comm), INTENT(OUT) ::  newcomm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_create_keyval(comm_copy_attr_fn, comm_delete_attr_fn, comm_keyval,
            extra_state, ierror)
    PROCEDURE(MPI_Comm_copy_attr_function) ::  comm_copy_attr_fn
    PROCEDURE(MPI_Comm_delete_attr_function) ::  comm_delete_attr_fn
    INTEGER, INTENT(OUT) ::  comm_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND), INTENT(IN) ::  extra_state
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_delete_attr(comm, comm_keyval, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, INTENT(IN) ::  comm_keyval
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_dup(comm, newcomm, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Comm), INTENT(OUT) ::  newcomm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_COMM_DUP_FN(oldcomm, comm_keyval, extra_state, attribute_val_in,
            attribute_val_out, flag, ierror)
    TYPE(MPI_Comm) ::  oldcomm
    INTEGER ::  comm_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  extra_state, attribute_val_in
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  attribute_val_out
    LOGICAL ::  flag
    INTEGER ::  ierror
```

```
MPI_Comm_dup_with_info(comm, info, newcomm, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Info), INTENT(IN) ::  info
    TYPE(MPI_Comm), INTENT(OUT) ::  newcomm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_free(comm, ierror)
    TYPE(MPI_Comm), INTENT(INOUT) ::  comm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_free_keyval(comm_keyval, ierror)
    INTEGER, INTENT(INOUT) ::  comm_keyval
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_get_attr(comm, comm_keyval, attribute_val, flag, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, INTENT(IN) ::  comm_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND), INTENT(OUT) ::  attribute_val
    LOGICAL, INTENT(OUT) ::  flag
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_get_info(comm, info_used, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Info), INTENT(OUT) ::  info_used
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_get_name(comm, comm_name, resultlen, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    CHARACTER(LEN=MPI_MAX_OBJECT_NAME), INTENT(OUT) ::  comm_name
    INTEGER, INTENT(OUT) ::  resultlen
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_group(comm, group, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Group), INTENT(OUT) ::  group
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_idup(comm, newcomm, request, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Comm), INTENT(OUT), ASYNCHRONOUS ::  newcomm
    TYPE(MPI_Request), INTENT(OUT) ::  request
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_COMM_NULL_COPY_FN(oldcomm, comm_keyval, extra_state, attribute_val_in,
            attribute_val_out, flag, ierror)
    TYPE(MPI_Comm) ::  oldcomm
    INTEGER ::  comm_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  extra_state, attribute_val_in
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  attribute_val_out
    LOGICAL ::  flag
    INTEGER ::  ierror

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MPI_COMM_NULL_DELETE_FN(comm, comm_keyval, attribute_val, extra_state,
            ierror)
    TYPE(MPI_Comm) ::  comm
    INTEGER ::  comm_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  attribute_val, extra_state
    INTEGER ::  ierror

MPI_Comm_rank(comm, rank, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, INTENT(OUT) ::  rank
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_remote_group(comm, group, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Group), INTENT(OUT) ::  group
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_remote_size(comm, size, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, INTENT(OUT) ::  size
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_set_attr(comm, comm_keyval, attribute_val, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, INTENT(IN) ::  comm_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND), INTENT(IN) ::  attribute_val
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_set_info(comm, info, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    TYPE(MPI_Info), INTENT(IN) ::  info
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_set_name(comm, comm_name, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    CHARACTER(LEN=*), INTENT(IN) ::  comm_name
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_size(comm, size, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, INTENT(OUT) ::  size
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_split(comm, color, key, newcomm, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, INTENT(IN) ::  color, key
    TYPE(MPI_Comm), INTENT(OUT) ::  newcomm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_split_type(comm, split_type, key, info, newcomm, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    INTEGER, INTENT(IN) ::  split_type, key
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    TYPE(MPI_Info), INTENT(IN) ::  info
    TYPE(MPI_Comm), INTENT(OUT) ::  newcomm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Comm_test_inter(comm, flag, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  comm
    LOGICAL, INTENT(OUT) ::  flag
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_compare(group1, group2, result, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group1, group2
    INTEGER, INTENT(OUT) ::  result
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_difference(group1, group2, newgroup, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group1, group2
    TYPE(MPI_Group), INTENT(OUT) ::  newgroup
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_excl(group, n, ranks, newgroup, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group
    INTEGER, INTENT(IN) ::  n, ranks(n)
    TYPE(MPI_Group), INTENT(OUT) ::  newgroup
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_free(group, ierror)
    TYPE(MPI_Group), INTENT(INOUT) ::  group
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_incl(group, n, ranks, newgroup, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group
    INTEGER, INTENT(IN) ::  n, ranks(n)
    TYPE(MPI_Group), INTENT(OUT) ::  newgroup
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_intersection(group1, group2, newgroup, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group1, group2
    TYPE(MPI_Group), INTENT(OUT) ::  newgroup
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_range_excl(group, n, ranges, newgroup, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group
    INTEGER, INTENT(IN) ::  n, ranges(3,n)
    TYPE(MPI_Group), INTENT(OUT) ::  newgroup
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_range_incl(group, n, ranges, newgroup, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group
    INTEGER, INTENT(IN) ::  n, ranges(3,n)
    TYPE(MPI_Group), INTENT(OUT) ::  newgroup
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror
```

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MPI_Group_rank(group, rank, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group
    INTEGER, INTENT(OUT) ::  rank
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_size(group, size, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group
    INTEGER, INTENT(OUT) ::  size
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_translate_ranks(group1, n, ranks1, group2, ranks2, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group1, group2
    INTEGER, INTENT(IN) ::  n, ranks1(n)
    INTEGER, INTENT(OUT) ::  ranks2(n)
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Group_union(group1, group2, newgroup, ierror)
    TYPE(MPI_Group), INTENT(IN) ::  group1, group2
    TYPE(MPI_Group), INTENT(OUT) ::  newgroup
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Intercomm_create(local_comm, local_leader, peer_comm, remote_leader,
            tag, newintercomm, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  local_comm, peer_comm
    INTEGER, INTENT(IN) ::  local_leader, remote_leader, tag
    TYPE(MPI_Comm), INTENT(OUT) ::  newintercomm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Intercomm_merge(intercomm, high, newintracomm, ierror)
    TYPE(MPI_Comm), INTENT(IN) ::  intercomm
    LOGICAL, INTENT(IN) ::  high
    TYPE(MPI_Comm), INTENT(OUT) ::  newintracomm
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Type_create_keyval(type_copy_attr_fn, type_delete_attr_fn, type_keyval,
            extra_state, ierror)
    PROCEDURE(MPI_Type_copy_attr_function) ::  type_copy_attr_fn
    PROCEDURE(MPI_Type_delete_attr_function) ::  type_delete_attr_fn
    INTEGER, INTENT(OUT) ::  type_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND), INTENT(IN) ::  extra_state
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Type_delete_attr(datatype, type_keyval, ierror)
    TYPE(MPI_Datatype), INTENT(IN) ::  datatype
    INTEGER, INTENT(IN) ::  type_keyval
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_TYPE_DUP_FN(oldtype, type_keyval, extra_state, attribute_val_in,
            attribute_val_out, flag, ierror)
    TYPE(MPI_Datatype) ::  oldtype
    INTEGER ::  type_keyval
```

```
    INTEGER(KIND=MPI_ADDRESS_KIND) :: extra_state, attribute_val_in
    INTEGER(KIND=MPI_ADDRESS_KIND) :: attribute_val_out
    LOGICAL :: flag
    INTEGER :: ierror

MPI_Type_free_keyval(type_keyval, ierror)
    INTEGER, INTENT(INOUT) :: type_keyval
    INTEGER, OPTIONAL, INTENT(OUT) :: ierror

MPI_Type_get_attr(datatype, type_keyval, attribute_val, flag, ierror)
    TYPE(MPI_Datatype), INTENT(IN) :: datatype
    INTEGER, INTENT(IN) :: type_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND), INTENT(OUT) :: attribute_val
    LOGICAL, INTENT(OUT) :: flag
    INTEGER, OPTIONAL, INTENT(OUT) :: ierror

MPI_Type_get_name(datatype, type_name, resultlen, ierror)
    TYPE(MPI_Datatype), INTENT(IN) :: datatype
    CHARACTER(LEN=MPI_MAX_OBJECT_NAME), INTENT(OUT) :: type_name
    INTEGER, INTENT(OUT) :: resultlen
    INTEGER, OPTIONAL, INTENT(OUT) :: ierror

MPI_TYPE_NULL_COPY_FN(oldtype, type_keyval, extra_state, attribute_val_in,
            attribute_val_out, flag, ierror)
    TYPE(MPI_Datatype) :: oldtype
    INTEGER :: type_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND) :: extra_state, attribute_val_in
    INTEGER(KIND=MPI_ADDRESS_KIND) :: attribute_val_out
    LOGICAL :: flag
    INTEGER :: ierror

MPI_TYPE_NULL_DELETE_FN(datatype, type_keyval, attribute_val, extra_state,
            ierror)
    TYPE(MPI_Datatype) :: datatype
    INTEGER :: type_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND) :: attribute_val, extra_state
    INTEGER, INTENT(OUT) :: ierror

MPI_Type_set_attr(datatype, type_keyval, attribute_val, ierror)
    TYPE(MPI_Datatype), INTENT(IN) :: datatype
    INTEGER, INTENT(IN) :: type_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND), INTENT(IN) :: attribute_val
    INTEGER, OPTIONAL, INTENT(OUT) :: ierror

MPI_Type_set_name(datatype, type_name, ierror)
    TYPE(MPI_Datatype), INTENT(IN) :: datatype
    CHARACTER(LEN=*), INTENT(IN) :: type_name
    INTEGER, OPTIONAL, INTENT(OUT) :: ierror

MPI_Win_create_keyval(win_copy_attr_fn, win_delete_attr_fn, win_keyval,
            extra_state, ierror)
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```
    PROCEDURE(MPI_Win_copy_attr_function) ::  win_copy_attr_fn
    PROCEDURE(MPI_Win_delete_attr_function) ::  win_delete_attr_fn
    INTEGER, INTENT(OUT) ::  win_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND), INTENT(IN) ::  extra_state
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Win_delete_attr(win, win_keyval, ierror)
    TYPE(MPI_Win), INTENT(IN) ::  win
    INTEGER, INTENT(IN) ::  win_keyval
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_WIN_DUP_FN(oldwin, win_keyval, extra_state, attribute_val_in,
            attribute_val_out, flag, ierror)
    TYPE(MPI_Win) ::  oldwin
    INTEGER ::  win_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  extra_state, attribute_val_in
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  attribute_val_out
    LOGICAL ::  flag
    INTEGER ::  ierror

MPI_Win_free_keyval(win_keyval, ierror)
    INTEGER, INTENT(INOUT) ::  win_keyval
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Win_get_attr(win, win_keyval, attribute_val, flag, ierror)
    TYPE(MPI_Win), INTENT(IN) ::  win
    INTEGER, INTENT(IN) ::  win_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND), INTENT(OUT) ::  attribute_val
    LOGICAL, INTENT(OUT) ::  flag
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_Win_get_name(win, win_name, resultlen, ierror)
    TYPE(MPI_Win), INTENT(IN) ::  win
    CHARACTER(LEN=MPI_MAX_OBJECT_NAME), INTENT(OUT) ::  win_name
    INTEGER, INTENT(OUT) ::  resultlen
    INTEGER, OPTIONAL, INTENT(OUT) ::  ierror

MPI_WIN_NULL_COPY_FN(oldwin, win_keyval, extra_state, attribute_val_in,
            attribute_val_out, flag, ierror)
    TYPE(MPI_Win) ::  oldwin
    INTEGER ::  win_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  extra_state, attribute_val_in
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  attribute_val_out
    LOGICAL ::  flag
    INTEGER ::  ierror

MPI_WIN_NULL_DELETE_FN(win, win_keyval, attribute_val, extra_state, ierror)
    TYPE(MPI_Win) ::  win
    INTEGER ::  win_keyval
    INTEGER(KIND=MPI_ADDRESS_KIND) ::  attribute_val, extra_state
    INTEGER ::  ierror
```