For a generalized request, the operation associated with the request is performed by the application; therefore, the application must notify MPI when the operation completes. This is done by making a call to MPI_GREQUEST_COMPLETE. MPI maintains the "completion" status of generalized requests. Any other request state has to be maintained by the user.

A new generalized request is started with

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MPI_GREQUEST_START(query_fn, free_fn, cancel_fn, extra_state, request)

```
8
9
       IN
                 query_fn
                                             callback function invoked when request status is queried
10
                                             (function)
11
                 free_fn
       IN
                                             callback function invoked when request is freed (func-
12
                                             tion)
13
       IN
                 cancel_fn
                                             callback function invoked when request is cancelled
14
                                             (function)
15
16
       IN
                 extra_state
                                             extra state
17
       OUT
                                             generalized request (handle)
                 request
18
19
     int MPI_Grequest_start(MPI_Grequest_query_function *query_fn,
20
                    MPI_Grequest_free_function *free_fn,
21
                    MPI_Grequest_cancel_function *cancel_fn, void *extra_state,
22
                    MPI_Request *request)
23
24
     MPI_GREQUEST_START(QUERY_FN, FREE_FN, CANCEL_FN, EXTRA_STATE, REQUEST,
25
                     IERROR)
26
          INTEGER REQUEST, IERROR
27
          EXTERNAL QUERY_FN, FREE_FN, CANCEL_FN
28
          INTEGER (KIND=MPI_ADDRESS_KIND) EXTRA_STATE
29
     static MPI::Grequest
30
                    MPI::Grequest::Start(const MPI::Grequest::Query_function*
31
                     query_fn, const MPI::Grequest::Free_function* free_fn,
32
                     const MPI::Grequest::Cancel_function* cancel_fn,
33
                     void *extra_state)
34
35
```

Advice to users. Note that a generalized request belongs, in C++, to the class MPI::Grequest, which is a derived class of MPI::Request. It is of the same type as regular requests, in C and Fortran. (End of advice to users.)

The call starts a generalized request and returns a handle to it in request.

The syntax and meaning of the callback functions are listed below. All callback functions are passed the extra_state argument that was associated with the request by the starting call MPI_GREQUEST_START. This can be used to maintain user-defined state for the request.

In C, the query function is

```
typedef int MPI_Grequest_query_function(void *extra_state,
             MPI_Status *status);
```