

# Chapter 16

## Language Bindings

### 16.1 C++

#### 16.1.1 Overview

The C++ language bindings have been deprecated. **A compliant MPI implementation providing C++ language bindings must provide the entire set defined in this document.** **ticket279.**

There are some issues specific to C++ that must be considered in the design of an interface that go beyond the simple description of language bindings. In particular, in C++, we must be concerned with the design of objects and their interfaces, rather than just the design of a language-specific functional interface to MPI. Fortunately, the design of MPI was based on the notion of objects, so a natural set of classes is already part of MPI.

MPI-2 includes C++ bindings as part of its function specifications. In some cases, MPI-2 provides new names for the C bindings of MPI-1 functions. In this case, the C++ binding matches the new C name — there is no binding for the deprecated name.

#### 16.1.2 Design

The C++ language interface for MPI is designed according to the following criteria:

1. The C++ language interface consists of a small set of classes with a lightweight functional interface to MPI. The classes are based upon the fundamental MPI object types (e.g., communicator, group, etc.).
2. The MPI C++ language bindings provide a semantically correct interface to MPI.
3. To the greatest extent possible, the C++ bindings for MPI functions are member functions of MPI classes.

*Rationale.* Providing a lightweight set of MPI objects that correspond to the basic MPI types is the best fit to MPI's implicit object-based design; methods can be supplied for these objects to realize MPI functionality. The existing C bindings can be used in C++ programs, but much of the expressive power of the C++ language is forfeited. On the other hand, while a comprehensive class library would make user programming more elegant, such a library it is not suitable as a language binding for MPI since a binding must provide a direct and unambiguous mapping to the specified functionality of MPI. (*End of rationale.*)