

Subject: Protected types
From: Van Snyder
Reference: 03-258r1, section 2.2.7

1 **Number**

2 TBD

3 **Title**

4 Protected types.

5 **Submitted By**

6 J3

7 **Status**

8 For consideration.

9 **Basic Functionality**

10 Provide an attribute for types that has the effect of applying the PROTECTED attribute to every object
11 of its type.

12 **Rationale**

13 Fortran 2003 has protected variables, but if they have the target attribute, their values aren't protected.
14 A PROTECTED attribute should be provided for types, to indicate that objects of such types cannot
15 be allocated or deallocated, or their values or pointer association status changed, except by procedures
16 within the module where they are declared or the type is defined. This would allow one to have a local
17 pointer step through a linked list of protected objects in a different module without being able to change
18 them.

19 Protected types could also be used to allow a pure procedure to associate a pointer with a global variable,
20 with the proviso that a pointer of protected type cannot be used in a variable-definition context within
21 a pure procedure.

22 **Estimated Impact**

23 Trivial to minor.

24 **Detailed Specification**

25 Add a PROTECTED attribute for types. Specify that

- 26 • Nonpointer nonallocatable variables of the type can be changed only within the module where the
27 type is defined or one of its submodules, or within the scoping unit where the variable is declared
28 or one that accesses that scoping unit by host association. Dummy argument declarations don't
29 count.
- 30 • A target of a pointer of the type can allocated, deallocated, or its value changed by way of the
31 pointer, only within the module where the type is defined or one of its submodules. The association
32 status can be changed within the module where the type is defined or one of its submodules, or
33 within the scoping unit where the pointer is declared or one that accesses that scoping unit by
34 host association.

- 1 • The association status of a pointer of the type can be changed within a pure procedure if it's
2 declared there or if the procedure is defined in the module where the type is defined or one of its
3 submodules, but it cannot be allocated or deallocated, nor can it appear in a variable-definition
4 context, within a pure procedure.

- 5 • An allocatable variable of the type can be allocated or deallocated, or its value changed, only
6 within the module where the type is defined or one of its submodules, or within the scoping unit
7 where the variable is declared or one that accesses that scoping unit by host association. Dummy
8 argument declarations don't count.

9 **History**