Subject: Relax unnecessary restrictions on VALUE
From: Van Snyder

1 Number

TBD

2 Title

Relax unnecessary restrictions on VALUE.

3 Submitted By

J3

4 Status

For consideration.

5 Basic Functionality

Allow POINTER, ALLOCATABLE, VOLATILE and DIMENSION attributes for dummy data arguments with the VALUE attribute. Allow the VALUE attribute for dummy procedure pointers. Beyond that, this is a two-level proposal.

5.1 Level 1

Require arrays to have bounds given by initialization expressions.

5.2 Level 2

Remove requirement that length type parameters be initialization expressions. Allow any kind of array other than assumed size.

6 Rationale

6.1 Level 1

There doesn't seem to be any good reason to prohibit the POINTER, ALLOCATABLE, VOLATILE and DIMENSION attributes to attach to an entity that has the VALUE attribute. Since derived-type objects with the VALUE attribute can have array components, the prohibition against DIMENSION seems to be pointless. Since the ASYNCHRONOUS attribute is permitted, the prohibition against the VOLATILE attribute seems to be pointless. The effect of VALUE on the POINTER or ALLOCATABLE attribute is obvious, and that could be useful.

6.2 Level 2

The present requirement for length type parameter values to be specified by initialization expressions, and the above-proposed requirement for array bounds to be initialization expressions, don't seem to be technically necessary. After all, processors know how to do automatic objects. The only new frill for VALUE would be the copy. Processors already know how to do a copy — for passing a pointer or assumed-shape actual argument to an explicit-shape or assumed-size dummy argument.

7 Estimated Impact

Small for the standard, probably small for processors as well. Level 2 may actually be easier for processors, by not imposing unique restrictions against situations that may be easer to allow than to check for and prohibit.

8 Detailed Specification

Details given in **Basic Functionality** because the **Rationale** wouldn't have made sense without the details.

Proposed edits are presented to give an idea of the scope of the effect on the standard.

8.1 Same for both Level 1 and Level 2

[Replace C527:] 73:19-21

C527 (R501) If the VALUE attribute is specified, the INTENT(INOUT) or INTENT (OUT) attribute shall not be specified. [PARAMETER is already prohibited for dummy arguments by C514, so there's no need to repeat it here.]

[Replace C529:] 73:24

C529 (R501) If the VALUE attribute is specified for a dummy procedure, the POINTER attribute shall also be specified.

[Insert "but does not have either the POINTER or ALLOCATABLE attribute" after "VALUE attribute".] 269:25

If the dummy argument has the VALUE and POINTER attributes it is a new entity that initially has the same association status, length parameter values, and array bounds as if the corresponding actual argument were assigned to it by pointer assignment (7.4.2). Subsequent changes to the pointer association status of the dummy argument do not affect the association status of the corresponding actual argument. 269:27+ New ¶'s

If the dummy argument has the VALUE and ALLOCATABLE attributes, it is a new entity that is initially unallocated. If the corresponding actual argument is allocated, the dummy argument is allocated with the same bounds and the same values for assumed and deferred length parameters as the actual argument. It then becomes defined as if the actual argument were assigned to it by intrinsic assignment (7.4.1.3). Subsequent changes to the value, definition status or allocation status of the dummy argument do not affect the value, definition status or allocation status of the corresponding actual argument.

If the dummy procedure has the VALUE and POINTER attributes, it is a new entity that initially has the same association status as the corresponding actual argument. Subsequent changes to the pointer association status of the dummy argument do not affect the corresponding actual argument. 272:1+ New ¶

8.2 Unique for Level 1

[Replace C528:] 73:22-23

C528 (R501) If the VALUE attribute is specified for a dummy array that does not have the POINTER or ALLOCATABLE attribute, the length type parameter values shall be omitted or specified by initialization expressions and if it is an array it shall have explicit shape with bounds given by initialization expressions.

8.3 Unique for Level 2

[Replace C528:] 73:22-23

C528 (R501) The VALUE attribute shall not be specified for an assumed-size array.

[Replace "is that" by ", assumed length parameters, and bounds are those".] 269:26

[Insert "does not have the VALUE attribute but" after "argument" twice.] 271:7,9

9 History