Subject: One more try at a READONLY attribute
From: Van Snyder
References: 00-169 00-192

1 Introduction

The people I work with, who pay the bill for me to participate in J3 meetings, have asked me again about a READONLY attribute for module variables. I mentioned that it had foundered on the name: "Hmmm, READONLY... does that mean it can only appear in a read statement?"

Several other names were suggested for the attribute: LIMITED, SEMIPRIVATE (with and without an underscore) and PROTECTED.

I'll use LIMITED here, because it's the shortest one. If the proposed specification is accepted, we can have a straw vote on the spelling.

I propose here that we add an attribute, however spelled, that a named variable cannot be changed, and the pointer association status of a pointer cannot be changed, in scoping units that access the variable by use association. By stretching our imaginations a little bit, we can put it under the aegis of work plan item R4, which I thought had been changed to be something like "Improving modules so that it's easier to use modules to implement new abstract data types efficiently," but the work plan (00-010) still says "Interval Arithmetic."

2 Specification

Add an attribute and statement that specifies that a named variable cannot be changed, and the pointer association status of a pointer cannot be changed, in scoping units that access the variable by use association.

3 Syntax

Except for spelling, the syntax is obvious: An attribute and statement, spelled with the same keyword. **Straw vote**: (1) LIMITED, (2) PROTECTED, (3) SEMIPRIVATE or SEMI_PRIVATE, (4) other (and another obvious straw vote if (3) wins).

4 Edits

Edits refer to 00-007r1. Page and line numbers are displayed in the margin. Absent other instructions, a page and line number or line number range implies all of the indicated text is to be replaced by immediately following text, while a page and line number followed by + indicates that immediately following text is to be inserted after the indicated line. Remarks for the editor are noted in the margin, or appear between [and] in the text.

or *limited-stmt*	10:49+
or LIMITED	42:27+
Constraint: If PRIVATE appears, LIMITED shall not appear.	42:30+

or LIMITED	42:40+
or LIMITED	64:1+
Constraint: The LIMITED attribute shall be specified only in the specification part of a module. Constraint: The LIMITED attribute shall be specified only for a named variable. Constraint: If the LIMITED attribute is specified, the EXTERNAL, INTRINSIC, PARAMETER, PRIVATE or PUBLIC attribute shall not be specified. Constraint: The LIMITED attribute shall not be specified for an object that is in a common block.	65:12+

5.1.2.9$\frac{1}{2}$ LIMITED attribute 76:21+

The **LIMITED attribute** specifies that a named variable or structure component shall not appear in a variable definition context (14.7.7) in any scoping unit that accesses it by use association. If it has the POINTER attribute its association status shall not be changed or become undefined in any scoping unit that accesses it by use association. A named variable with the LIMITED attribute may be referenced in a scoping unit that accesses it by use association, even if the default accessibility is PRIVATE. A structure component with the LIMITED attribute may be referenced in a scoping unit that accesses it by use association, even if the default accessibility for components of the type of the object is PRIVATE.

5.2.9$\frac{1}{2}$ LIMITED statement 82:23+

R533$\frac{1}{2}$ *limited-stmt* **is** LIMITED [::] *object-name-list*

The **LIMITED statement** specifies the LIMITED attribute for a list of objects.

[Editor: Insert ", a LIMITED statement" before "or" – but not if section 11.1.2 is deleted as recommended in 00-192.	237:44
[Editor: Insert ", the LIMITED statement (5.2.9$\frac{1}{2}$)" after "(5.2.3)".]	239:17
[Editor: Insert ", 5.1.2.9$\frac{1}{2}$" after "5.1.2.2", and replace "statement" by "and LIMITED statements".]	239:18
[Editor: Replace "or PRIVATE" by ", PRIVATE or LIMITED".]	240:40
[Editor: Before "If" insert "If the identifier appears in a LIMITED statement it causes the object accessible by use association to be a limited object of that module.]	241:3
[Editor: Replace "either a PUBLIC or PRIVATE" by "a PUBLIC, PRIVATE or LIMITED".]	241:4
[Editor: Replace "or PUBLIC" by ", PUBLIC or LIMITED" – but not if the "PRIVATE or PUBLIC" part is removed as advocated in 00-169.]	242:2