Removing simple deficiencies in Fortran

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Revising the Fortran 2008 standard

It was decided in 2011 that the revision of the standard should consist of incorporation into the main standard of:

- agreed editorial improvements

- corrigenda

- Technical Specification on Further Interoperability with C

- Technical Specification on Additional Parallel Features

- removal of simple deficiencies in, and discrepancies between, existing facilities

Selecting deficiencies to address

The UK made 10 proposals; the US made 17

One item (update IEEE arithmetic conformance) was proposed by both groups

Fourteen of the 26 proposals were accepted (in whole or in part)

The remainder "will not be addressed in Fortran 2015, subject to WG5 review in 2014"

Voting procedure

The UK and US proposals were passed to a subgroup to make initial recommendations.

The items deemed to be less contentious were proposed in a block vote with members allowed to object. Items subject to objections were withdrawn and discussed and voted on separately, as were the more contentious items.

After further discussion in full committee, items were adopted or deleted until consensus had been reached.

Fuller details are in the minutes.

Approved changes to the standard - 1

UK-02 Specifiable default accessibility for USEd module's entities

If module B uses module A, the default accessibility for entities accessed from A is PUBLIC. It should be possible to specify the default, for example by permitting a module name to appear in a PUBLIC or PRIVATE statement.

UK-03 RECL= for unlimited records

If INQUIRE is used on a file with unlimited record length, the value returned by RECL is processor dependent. It should be defined. HUGE(0) is suggested.

Approved changes to the standard - 2

UK-04 Allow E0.d, ES0.d, EN0.d edit descriptors

It is anomalous that G0.m is allowed but E0.m is not. E, EN and ES should be added to the list of descriptors that can take a width of zero.

UK-05 Improve generic disambiguation rules

The current generic disambiguation rules for procedure interfaces fail because subroutines are not distinguishable from functions and the rules about "number of nonoptional arguments" apply only to dummy data objects, not to dummy procedures. A new constraint is needed.

UK-06 Remove restriction on ERROR STOP

There is no standard way to issue a diagnostic message from a PURE procedure. A program should be able to execute an error termination with a meaningful message. The restriction on the appearance of an ERROR STOP statement in a PURE procedure should be removed.

Approved changes to the standard - 3

UK-08 New reduction intrinsic REDUCE

It is anomalous that it is proposed to add CO_REDUCE in the TS on Additional Parallel Features when there is no corresponding generalized reduction function in the main language. Such a function should be added.

UK-09/US-14 Compatibility with ISO/IEC 60559:2011

Fortran 2008 makes many references to IEC 60559:1989, which has been superseded by IEC 60559:2011. The references should be reviewed for any necessary changes relative to IEC 60559:2011.

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Approved changes to the standard - 4

UK-10 New deletions and obsolescences

Delete:

- Arithmetic IF

- Shared DO termination and termination on a statement other than END DO or CONTINUE

Obsolesce:

- EQUIVALENCE

- COMMON

- Label on a block DO construct

- Specific names for intrinsic functions

- FORALL

Approved changes to the standard - 5

US-01 Allow G0.d

'.d' is required to be absent when the corresponding list item is not real or complex. It should be possible to make it optional and/or ignored.

US-03 Require diagnosability of nonstandard intrinsic modules et al

Since processors are required to have the ability to report the appearance of an intrinsic procedure not described in the standard, it would aid standards-conformance checking if they were also required to be able to report the use of non-standard intrinsic modules, of non-standard entities from standard intrinsic modules, and of non-standard use of standard intrinsic procedures.

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Approved changes to the standard - 6

US-04 Control of host association

Extend host association so as to be able to control both importation and hiding of a host entity. In particular, allow specification that an entity is host-associated; allow limiting host association to a specific list of names; prevent inadvertent "shadowing" of host names. Do not allow renaming.

US-05 Improve DIM= argument handling in intrinsics

Make more consistent the specification of DIM= arguments of several intrinsic procedures.

Approved changes to the standard - 7

US-08 Specify explicit specification of EXTERNAL attribute is required

There is no way to require explicit specification of the external attribute. Providing such a means would aid program checking.

US-12 Allow SIZE= with advancing input

When SIZE= is present in a formatted I/O statement, do not require ADVANCE= to appear.

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Items which missed the cut - 1

The following proposals will not be proceeded with, subject to possible review by WG5 in June 2014:

UK-01 Default KINDs for constants and intrinsics

Provide a mechanism for specifying the default kind parameter for the intrinsic types REAL and INTEGER. Decouple the concepts of "default kind" from those of "single precision" and "basic integer".

UK-04 (Further) FORMAT inconsistencies

Various extensions to exponent specifications for E and G formats.

UK-07 Numeric conversion check

New intrinsic functions to pre-determine whether type conversions between reals and integers of various KINDs would be achievable.

Items which missed the cut - 2

UK-10 New deletions and obsolescences (not accepted)

Obsolesce implicit interfaces to procedures

Un-obsolesce (restore to full language status) the CHARACTER* form of the CHARACTER statement.

US-02, US-06, US-07, US-09, US-10, US-11, US-13, US-15, US-16, and US-17

These cover such things as adding conditional expressions, moving intrinsic functions from part 2 (varying length strings) to part 1, adding a 'trim' effect to the A format, allowing concatenation of characters of different KINDs, allowing a dummy argument with VALUE to be VOLATILE, plus various shortcut facilities for writing statements.

Fuller details are in paper j3-244r1.

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References

UK proposals: ftp://ftp.nag.co.uk/sc22wg5/N1951-N2000/N1975.txt

US proposals: http://j3-fortran.org/doc/meeting/200/13-244r1.txt

List of accepted proposals: ftp://ftp.nag.co.uk/sc22wg5/N1951-N2000/N1982.txt

Minutes of WG5 meeting: ftp://ftp.nag.co.uk/sc22wg5/N1951-N2000/N1977.txt