

WG5 Procedures for the Future Development of Urgent New Features in Fortran by means of Type 2 Technical Reports

Summary

Urgent user requirements for separable facilities in the Fortran Standard may be met by the timely production of ISO Technical Reports of Type 2. These will act as the standards equivalent of beta-testing for software. The main development of revisions and additions to the Standard will proceed in the normal manner, as described in the WG5 Strategic Plan (Standing Document 4).

The syntax and semantics described in the Technical Reports will be incorporated unchanged into the succeeding revision of the appropriate Part of the Standard unless any major disadvantages are identified, in which case every reasonable effort will be made to minimise the impact of such integration changes on existing commercial implementations.

1. Background

There are two conflicting problems associated with adding new features to Fortran when there is perceived to be an urgent market requirement for these features:

- Vendors wish to extend their compilers in order to satisfy the demands being expressed by their customers (and potential customers);
- Vendors are unwilling to add new features to their compilers in advance of the final standardisation of such features for fear that the standardised version may differ from that already implemented.

WG5 uses Type 2 Technical Reports to resolve this conflict and, in addition, to enable major new features to undergo a form of "beta test" in advance of formal standardisation. It is WG5's declared intention that the syntax and semantics described in such a report would, wherever possible, be incorporated unaltered in the next revision of the appropriate Part of the International Standard for Fortran. Where it is felt to be necessary to make changes to the syntax and/or semantics during such integration, every reasonable effort will be made to minimise the impact of such integration changes on existing commercial implementations of the features concerned.

This approach is intended to enable major new features to be developed more quickly than would otherwise be the case, and will allow for experience with such features (similar to the "beta testing" of software) before they are finally incorporated in the Standard, while providing a reasonable guarantee that implementations of the features described in the TR(s) will not be wasted effort.

A Type 2 Technical Report is defined in the JTC1 Directives as being for use when "the subject in question is still under technical development or where for any other reason there is the possibility of an agreement [on publication as an International Standard] at some time in the future." (15.2.2) Furthermore, there is a requirement that, prior to the third year after publication, a recommendation be made to JTC1 "stating whether the TR should be

- converted to an IS without change;
- revised and published as an IS;
- confirmed for continuation as a TR;
- revised for publication as a revision to the TR;
- withdrawn." (15.4.1.2)

Such a TR is, therefore, appropriate for items which are not yet ready to be standardised but which, it is expected, will be so ready within three years.

With this use of TRs, the process of revising the Fortran Standard may be summarised as follows:

- The base Fortran language Standard (IS 1539-1), and all other Parts of the Fortran Standard (IS 1539-2, etc), will be developed and revised by the method described in the Strategic Plan, whereby WG5 determines the requirements and delegates the production of a draft document to a Development Body;
- where a single feature is deemed to satisfy certain criteria, as described in section 2 of this paper, WG5 will request SC22 to subdivide the main Fortran project, which relates to the base Fortran Standard, in order to allow for the production of a Type 2 Technical Report specifying the syntax and semantics of this new feature according to the principles described below, and will establish a (small) development body to produce a draft PDTR within a defined period; it is expected that this body will work primarily by electronic means, consulting others within the Fortran community to whatever degree it feels to be necessary and appropriate;
- the syntax and semantics described in any such Technical Reports will be incorporated in the next revision of the appropriate Part of the Standard exactly as described in the TR, unless experience in the

implementation and use of the feature has identified errors which need to be corrected, or changes are required in order to achieve proper integration, in which case every reasonable effort will be made to minimise the impact of such integration changes on existing commercial implementations of the features concerned.

2. The criteria for selecting a feature for definition in a Type 2 Technical Report

The major criteria which must be satisfied before WG5 will consider developing a Technical Report for a new language feature are as follows:

- there must be a reasonable consensus that there is a significant demand for the feature from the Fortran user community;
- there must be no alternative method of achieving the desired result by use of existing features of the language which is acceptable to the major part of the identified user community demanding the feature;
- the feature must be important enough to the identified user community for a significant proportion to seriously consider converting their programs to another language if the feature is not available within a significantly shorter timescale than would be the case if it was only added at the next revision of the Fortran Standard.

In addition, WG5 must be confident that

- a draft PDTR can be produced within eighteen months of approval of the relevant New Work Item;
- the Technical Report can be published at least two years before the anticipated publication date of the next full revision of the Standard;
- the addition of the syntax and semantics that are used in the proposed Technical Report to compilers will have sufficiently small impact on the overall compiler maintenance process to make it probable that a significant number of compilers will incorporate the feature described in the Technical Report.

3. The content of a new feature Technical Report

Every Type 2 Technical Report developed under this process will commence with a statement along the following lines:

It is the intention of ISO/IEC JTC1/SC22/WG5 that the semantics and syntax described in this Technical Report shall be incorporated in the next revision of IS 1539-1 (Fortran) [*or such other Part of the Fortran Standard as is appropriate*] exactly as they are specified here unless experience in the implementation and use of this feature has identified any errors which need to be corrected, or changes are required in order to achieve proper integration, in which case every reasonable effort will be made to minimise the impact of such integration changes on existing commercial implementations.

The Technical Report will contain the following three main sections:

- an explanation of why it was felt necessary to define the feature which is the subject of the Report in advance of the next revision of the Standard;
- a full description of the syntax and semantics of the new feature;
- a complete set of edits to the appropriate Part of the current Fortran Standard which would be necessary to incorporate the feature in the Standard.

4. The membership of the Development Bodies and their relationship to the Primary Development Body

Since one of the primary criteria for the adoption of the Technical Report route is that there must be a demonstrable demand for the feature from the Fortran user community, it is anticipated that the particular user community will already have one or more representatives amongst the membership of WG5, and that one of these individuals, who will, by definition, have a strong personal interest in the success of the project, will be nominated as the Project Editor for the proposed Technical Report.

The Editor will be assisted by a (small) number of individuals having a particular interest and/or expertise in the relevant area of the language, who will, together, form the Development Body for the Technical Report.

In general, it is expected that such a Development Body will always have at least one member from the Primary Development Body in order that the Development Body can have an effective, albeit informal, means of interaction with the body which will, in due course, be responsible for determining the technical acceptability of the syntax and semantics defined in the TR, as required by section 3.5 of the Strategic Plan. Although the Development Body will report

directly to WG5, it is clearly highly desirable that it should take full advantage of the expertise within the Primary Development Body.

Similarly, if it is anticipated that the feature described in the TR will, at least initially, be incorporated in a part of the Fortran Standard which is the responsibility of some Development Body other than the Primary Development Body, then that Development Body should also, normally, be represented on the Development Body for the TR.