

The next standard – Fortran 2018

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Big themes for Fortran 2018

The next standard incorporates two so-called technical reports from Fortran 2008:

- Further enhancement of the interaction with C
- Additional parallel features

Besides these major themes, changes are made to support the new IEEE arithmetic standard.

The remaining changes are related to deficiencies and discrepancies.

More information: <https://wg5-fortran.org/f2018.html>

Dealing with arrays:

- Assumed-shape arrays can now be passed to C – standardised array descriptors on the C side
- Array sections and array subscripts – via compatibility routines
- Allocation and deallocation – in C via compatibility routines
- Assumed rank and assumed type – relaxation of the rank and type constraints (compare to C's `void *` variables)

The functionality of co-arrays is extended:

- Images can be grouped in *teams* – teams can execute independently from each other
- Failure of images can be detected via `stat =` keywords in various image control statements
- The introduction of *events* to enhance the possibilities of synchronising actions
- A family of collective functions has been added: `co_sum()` and the like, to gather information over images.

Besides the two big themes the changes are numerous but limited, a few items:

- New functions to support the new IEEE arithmetic standard
- Routines will be recursive by default – use `non_recursive` to avoid that
- Locality clauses in `do concurrent` refine the control over the variables in such loops – compare to *OpenMP* clauses
- Via an extension to the `implicit none` statement you can now require external routines to have an explicit interface information over images.