OpenMP 5.2 is Here!

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OpenMP Roadmap

- OpenMP has a well-defined roadmap:
  - 5-year cadence for major releases
  - One minor release in between
  - OpenMP 5.2 was added as a second minor release before OpenMP version 6.0
  - (At least) one Technical Report (TR) with feature previews in every year

* Numbers assigned to TRs may change if additional TRs are released.
Modifications to the OpenMP specification follow a (strict) process:

- **Proposal**
- **Impl. in LaTeX**
- **1st vote**
- **2nd vote**
- **Verify**
- **Merge to main**

Release process for specifications:

- **Draft**
- **Editing**
- **Comment Draft**
- **Quality Control**
- **Final Draft**
- **ARB Approval**
OpenMP 5.2 was released earlier this month

- OpenMP ARB adopted on November 11, 2021
- Large portions of specification now generated from JSON-based database
  - Section headers and directive and clause format
  - Cross references, index entries, hyperlinks and many other document details
  - Long-term plan will capture sufficient information in database to generate much more, including grammar, quick reference guide, and header and runtime library routine stub files

- Improves specification of OpenMP syntax
  - Ensuring syntax of directives and clauses is well-specified and consistent
  - Ensuring restrictions are consistent and not just implied by syntax
  - Deprecating one-off syntax choices, many other inconsistencies (12 new deprecation entries)
  - Makes C++ attribute syntax a first-class citizen

- Many other minor improvements
- ~125 passed issues
A deeper dive into OpenMP 5.2 changes

- Defined directive, clause and modifier properties to consolidate common restrictions
- Defined common base-language code associations to consolidate syntax specification
- Replaced deprecated Fortran use of `allocate` directive with allocators construct
- Replaced deprecated use of `depend` clause on ordered construct with `doacross`
- Replaced deprecated use of `to` clause on declare target directives with `enter` clause
- Replaced deprecated use of `default` clause on metadirectives with otherwise clause
- Allowed use of iterators and present for map clauses on declare mapper
- Updated default map types on target enter data and target exit data
- Allowed `allocate` and `firstprivate` clauses on scope construct
- Updated syntax of `linear` clause to be more consistent with other clauses
- Extended set of directives allowed in a Fortran pure procedure
- Allowed clauses that can appear on corresponding end directive to appear on directive
- Reserved `omp`, `ompx` and `omx` directive sentinels, `omp_` and `ompx_` prefixes
- Deprecated minus (−) reduction operator
OpenMP 6.0 will be released in November 2023

- Removal of features that were deprecated in 5.0, 5.1 or 5.2
- Further adoption of the database-specification approach
- Dependences and affinity for the `taskloop` construct
- Task-only or free-agent threads
- Spawning tasks for other teams (event-driven parallelism and more)
- Continued improvements to device support
  - True support for using multiple devices
  - Extensions of deep copy support (serialize/deserialize functions)
- More support for memory affinity and complex hierarchies
- Deeper support for descriptive and prescriptive control
- Support for pipelining, other computation/data associations; data-flow?
- 161 issues already created for/deferred to 6.0
Help Us Shape the Future of OpenMP

- OpenMP continues to grow
  - 33 members currently
- You can contribute to our annual releases
- Attend IWOMP, become a cOMPunity member
- OpenMP membership types now include less expensive memberships
  - Please let us know if you would be interested