

GCC/OpenACC Status

Siemens Embedded Platform Solutions

Sourcery Tools Group

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GCC and OpenACC

- **GCC maintainerships**
 - 2nd OpenACC maintainer named – Tobias Burnus
 - Co-maintainer with Thomas Schwinge
 - Enables continuous integration with mainline during GCC development cycle
- **GCC 10 – Current Release Series - Improvements**
 - Merging of development branch patches to mainline
 - Backlog still exists, but >100 patches merged during GCC 10 development cycle
 - Unification of Source Code for OpenACC targets (ie. AMD, NVIDIA, etc.)
- **GCC 11 Initiatives:**
 - Kernels performance improvements (Phase II)
 - Automatic annotation of loops with OpenACC directives
 - Support for AMD offload debugging
 - Ongoing incorporation of OpenACC Support into GCC mainline
 - Performance improvements for SPEC ACCEL 1.3 Benchmarks
- **GCC 12 Timeframe:**
 - Implementation of future OpenACC specification
 - Support for unified, pinned memory, shared memory
 - Support for multicore as an offloadable device

GCC and OpenACC

- **Resources for OpenACC 2.6 Support in GCC**

- Downloadable free AMD Toolchain:
 - Mentor website: <https://www.mentor.com/embedded-software/toolchain-services/codebench-lite-downloads>
 - OpenACC.org: <https://www.openacc.org/tools>
- NVIDIA support: Build from source: <https://gcc.gnu.org/wiki/OpenACC>

- **GCC Releases**

- **GCC 10: Current release series**
 - OpenACC 2.6 Support
 - Kernels Conversion Support – Phase I
 - Recognizes kernels regions as parallel regions
 - Loops can be manually annotated
- **Og10 Development Branch**
 - Early access to GCC 11 features
- **GCC 11: Next release due Spring 2021**
 - Kernels region performance improvements
 - AMD GCN performance improvements
 - AMD support for offload debugging



OpenACC
More Science, Less Programming

GCC and OpenACC Next Steps

- **Performance**
 - Continuation of kernels performance initiatives
 - Performance evaluation and improvements
- **Accessibility**
 - Continuous integration of development activities into mainline branch
- **Portability**
 - Development of new OpenACC functionality
 - Adherence to specification clarifications
 - Common code base for multiple hardware platforms