

OpenMP[®]

SC24 Booth Talk Series



OpenMP Validation and Verification Testsuite

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OpenMP Validation and Verification Testsuite

(Formerly known as SOLLVE V&V)

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Project Website - <https://crpl.cis.udel.edu/ompv/>



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OpenMP V&V Contributors List

- Outside the project contributors
 - AMD
 - Tobias Schuele (Siemens) for his feedback and engagement with the tests
- Former project members
 - Felipe Cabarcas, Nolan Baker, Michael Carr, Nikhil Rao, Jaydon Reap, Kristina Holsapple, Joshua Hoke Davis, Thomas Huber, Jose M. Monsalve

OpenMP V&V Objectives

- Tests implementations of new features introduced in OpenMP 4.5+
- Checks conformance to the specification
 - Peer reviewed, publicly available
- Highlights ambiguities in the OpenMP specification
- Reports status of implementations on primary supercomputing target platforms
 - Help application and compiler developers
- Exemplifies the use of the new features in OpenMP
- Abstracts application kernels as tests

Latest OpenMP Specification: 6.0 (TR13)

- Released August 2024
 - Around 63 additions (new features, deprecated features, behavior changes)
 - Some of these modifications to the specification are implemented in open source compilers
 - GCC status <https://gcc.gnu.org/wiki/openmp>
 - LLVM status <https://clang.llvm.org/docs/OpenMPSupport.html>
 - Leads to writing tests from scratch, with no compilers to test with
- 6.0 specification is scheduled to be released on November 2024

OpenMP V&V Testsuite repository

- Clone the repo https://github.com/OpenMP-Validation-and-Verification/OpenMP_VV
- Setup your environment (install or 'module load' your compilers)
- Use our make commands to compile and run a single test or the whole suite
 - Running a single test:
`make CC=clang CXX=clang++ FC=flang-new OMP_VERSION=6.0 SOURCES=test_name.ext all`
 - Running the entire suite:
`make CC=clang CXX=clang++ FC=flang-new OMP_VERSION=6.0 all`
or using multiple threads
`make -jobs=N CC=clang CXX=clang++ FC=flang-new OMP_VERSION=6.0 all`

Tests and Coverage

Number of Tests				
	C	C++	Fortran	Total
4.5	134	14	104	252
5.0	193	20	128	341
5.1	99	2	28	129
5.2	16	8	5	29
6.0	9	0	1	10
Total	451	44	266	761

Approximated coverage of requested features			
	C	C++	Fortran
4.5	100%	100%	100%
5.0	90%	100%	90%
5.1	88%	100%	50%
5.2	86%	100%	25%
6.0	18%	0%	2%

- The testsuite not only contains tests for the new features of each specification, but also common usage scenarios.
- We have given priority to requested features over complete coverage.

Systems and Compilers Regularly tested

<i>System</i>	<i>Perlmutter</i>	<i>Frontier</i>	<i>Sunspot</i>
<i>Location</i>	<i>NERSC</i>	<i>ORNL</i>	<i>ANL</i>
<i>CPU / GPU</i>	<i>AMD / NVIDIA</i>	<i>AMD / AMD</i>	<i>Intel / Intel</i>
GNU (gcc/gfortan)	YES	NO	NO
LLVM (clang/flang-new)	YES	YES	NO
AMD ROCM (amdclang/amdflang)	NO	YES	NO
HPE/Cray (cce)	YES	YES	NO
IBM (xlc, xlf)	NO	NO	NO
NVIDIA (nvc, nvfortran)	NO	YES	NO
INTEL (icpx, ifx)	NO	NO	YES



RESULTS

These results were last reviewed October 22, 2024

Compilers tested on respective systems:
Frontier - CPU: **AMD EPYC 7A53**, GPU: **AMD MI250X** - CCE (17.0.3), AMDCLANG (17.0.0), LLVM (20.0.0), GNU (13.2.0)
Perlmutter - CPU: **AMD Milan EPYC**, GPU: **NVIDIA A100** - CCE (17.0.3), NVHPC (24.9), LLVM (20.0.0), GNU (14.1.0)
Sunspot - CPU: **Intel Xeon Sapphire**, GPU: **Intel Ponte Vecchio Max 1550** - INTEL Compiler (18.0.0)

Filter results

Search Results:

Compilers

- CC 17.0.3
- ftn Cray Fortran : 17.0.0
- cc 17.0.3

test_target_assumed_array_size.c

Path: tests/6.0/target/test_target_assumed_array_size.c

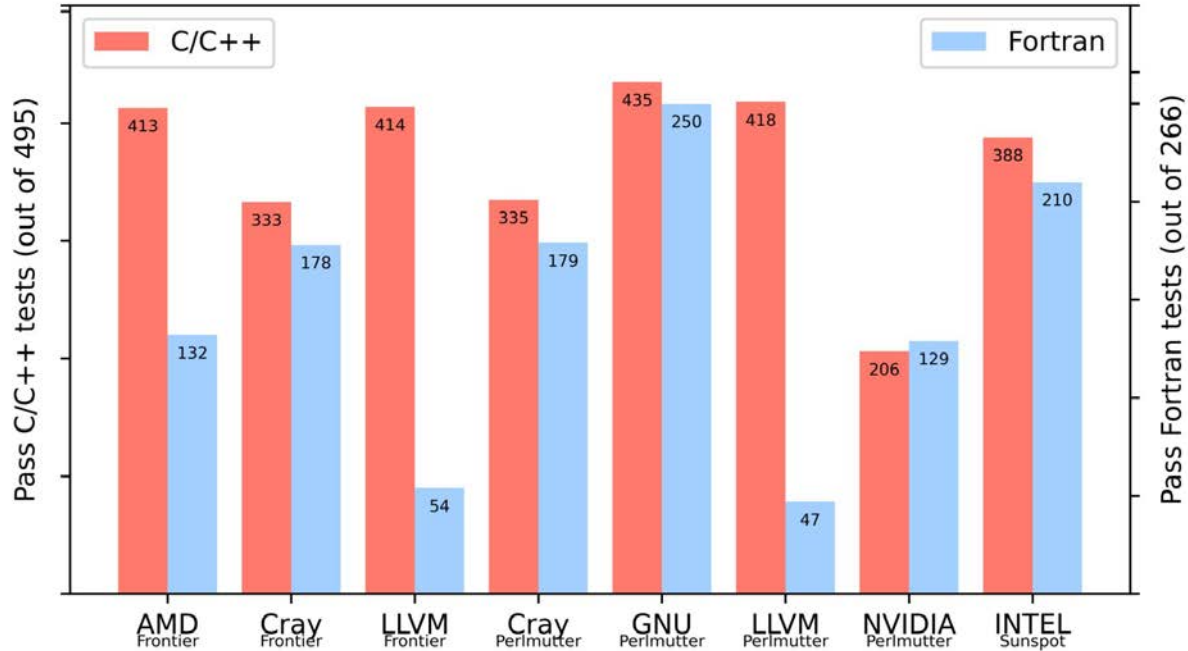
Compiler: clang 20.0.0git

[Source code](#)

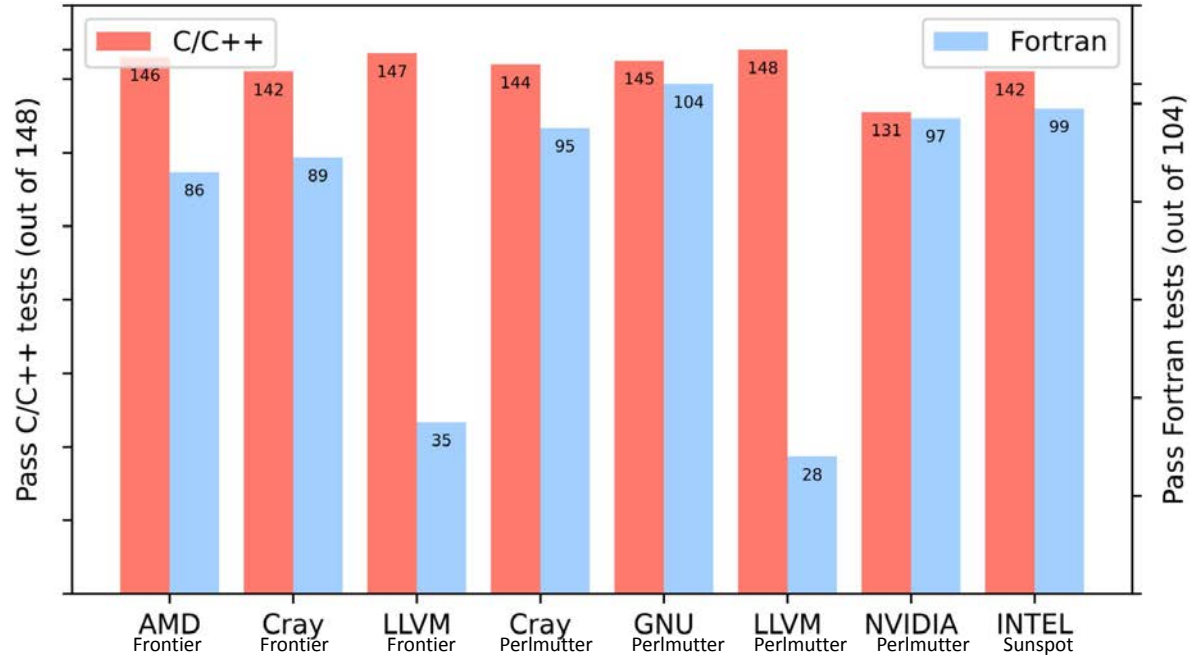
Compiler result = FAIL

Runtime result =

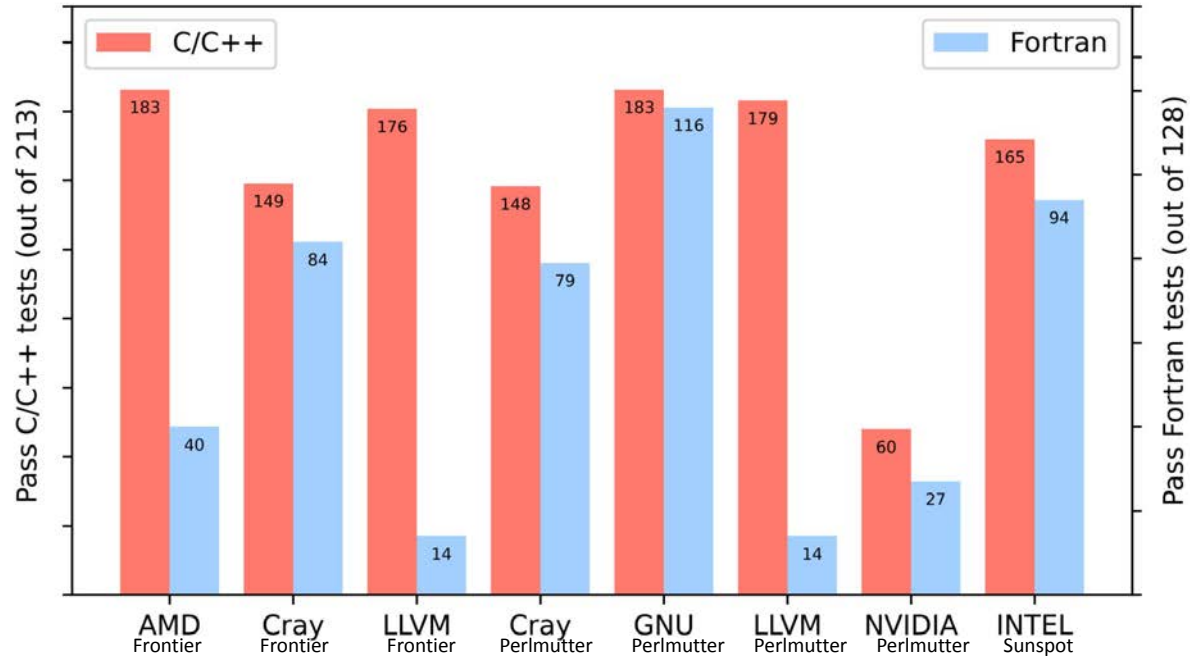
Overall Results



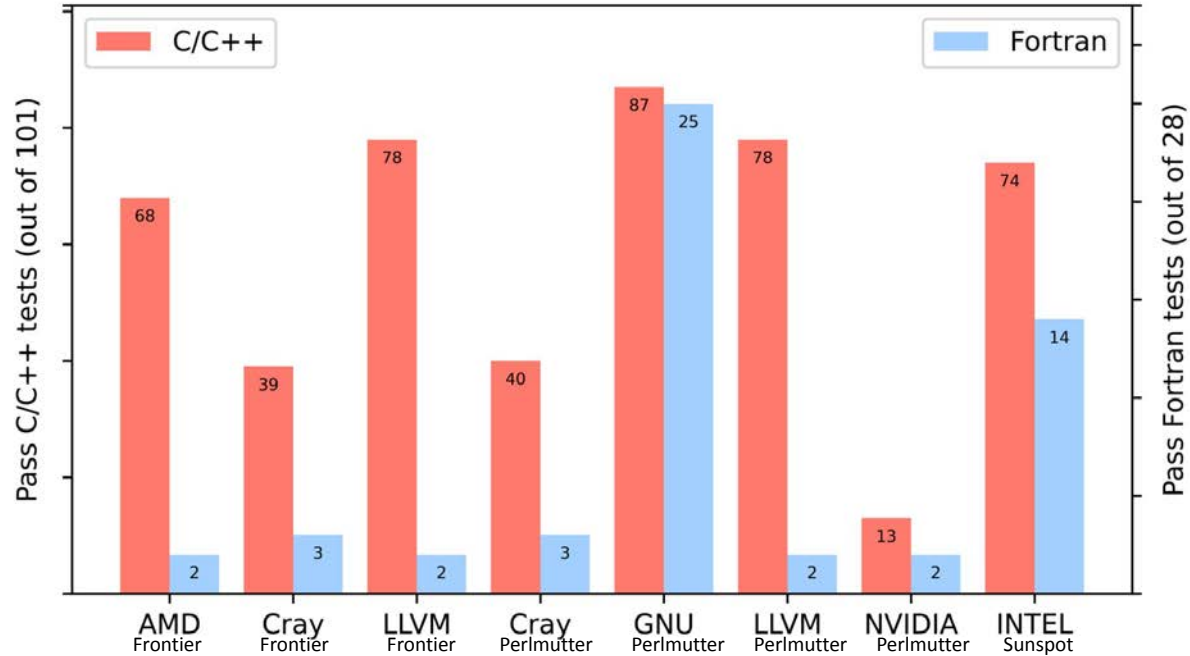
Results OpenMP 4.5



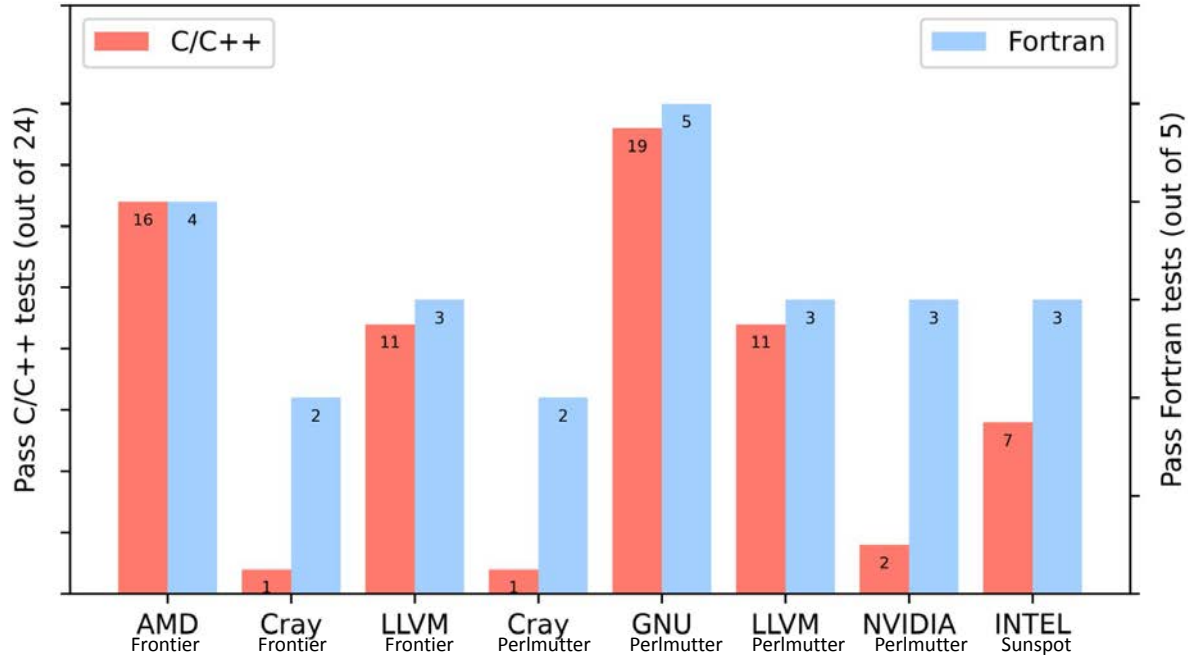
Results OpenMP 5.0



Results OpenMP 5.1



Results OpenMP 5.2



Beyond V&V testsuite

The screenshot shows the GitLab Pipelines interface for the project 'LLVM OpenMP Offloading'. The page displays a list of pipeline runs, all of which are in a 'Passed' state. The table below summarizes the visible pipeline runs:

Status	Pipeline	Created by	Stages
Passed 00:08:42 35 minutes ago	Removed Failure for Cleanup #20475 main -> 1270b5a0 scheduled latest		4 green checkmarks
Passed 00:19:57 1 hour ago	Removed Failure for Cleanup #20474 main -> 1270b5a0 scheduled latest		4 green checkmarks
Passed 00:19:38 2 hours ago	Removed Failure for Cleanup #20473 main -> 1270b5a0 scheduled latest		4 green checkmarks
Passed 00:17:51 3 hours ago	Removed Failure for Cleanup #20472 main -> 1270b5a0 scheduled latest		4 green checkmarks
Passed 00:13:44 4 hours ago	Removed Failure for Cleanup #20471 main -> 1270b5a0 scheduled latest		4 green checkmarks
Passed 00:09:19 5 hours ago	Removed Failure for Cleanup #20470 main -> 1270b5a0 scheduled latest		4 green checkmarks

https://github.com/OpenMP-Validation-and-Verification/OpenMP_VV

Project Website - <https://crpl.cis.udel.edu/ompvv/>

OpenMP-Validation-and-Verification / OpenMP_VV

Code Issues 22 Pull requests 4 Actions Wiki Security 2 Insights

OpenMP_VV Public

Edit Pins Watch 14 Fork 19 Starred 54

master 423 Branches Tags

Go to file Add file Code

andrewkallai and Andrew Kallai Adding initial test file which requires revisions for comm... d9fcb8c - last week 1,658 Commits

.github	Update test-request.md	last year
ompvv	Fix fixed-form Fortran quote and line-length issues	10 months ago
sys	Adding changes to prevent race condition with temporary lo...	3 months ago
template	Remove shared env macro from target and target data tests ...	4 years ago
tests	Adding initial test file which requires revisions for comments...	last week
.gitignore	Update gitignore to correctly ignore recent report online tag...	3 years ago
LICENSE	Correct LICENSE name (#173)	4 years ago
Makefile	Adding changes to prevent race condition with temporary lo...	3 months ago
README.md	Update README.md (#822)	6 months ago

README License

About

OpenMP Offloading Validation & Verification Suite; Official repository. We have migrated from bitbucket!! For documentation, results, publication and presentations, please check out our website ->

crpl.cis.udel.edu/ompvvsolve/

testing validation openmp

verification compilers testing-framework

openmp-offloading openmp-target

Readme

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54 stars

14 watching

19 forks

Recent repositories

The OpenMP logo features the text "OpenMP" in a white, sans-serif font. The "O" is significantly larger than the other letters. A horizontal line is positioned below the "O" and "P". A registered trademark symbol (®) is located to the right of the "P".

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