



# SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

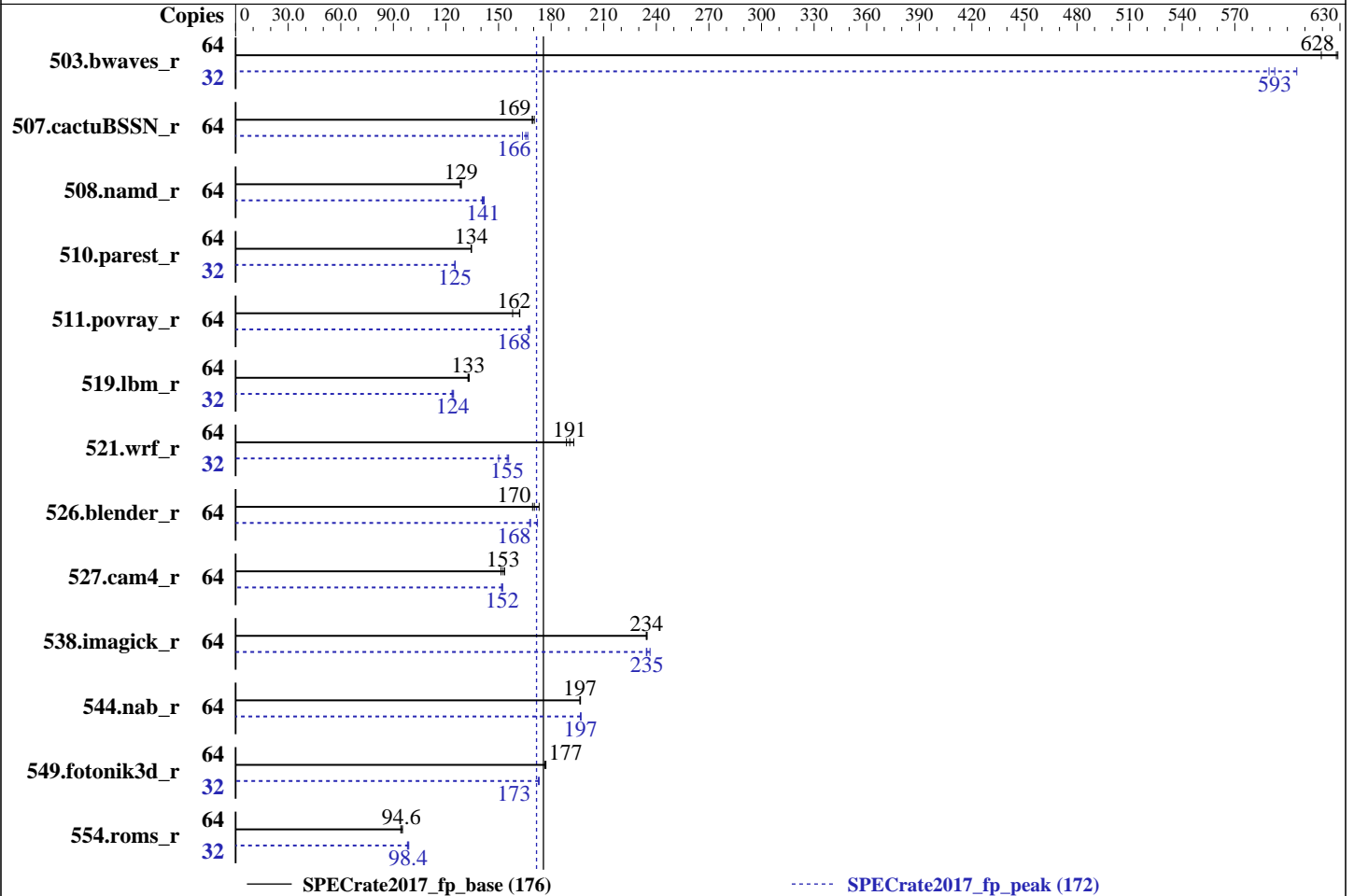
A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

CPU2017 License: 001176  
Test Sponsor: Supermicro  
Tested by: Supermicro

Test Date: May-2018  
Hardware Availability: Jun-2017  
Software Availability: Feb-2018



### Hardware

CPU Name: AMD EPYC 7281  
 Max MHz.: 2700  
 Nominal: 2100  
 Enabled: 32 cores, 2 chips, 2 threads/core  
 Orderable: 1,2 chips  
 Cache L1: 64 KB I + 32 KB D on chip per core  
 L2: 512 KB I+D on chip per core  
 L3: 32 MB I+D on chip per chip, 4 MB shared / 2 cores  
 Other: None  
 Memory: 1 TB (16 x 64 GB 4Rx4 PC4-2666V-L)  
 Storage: 1 x 500 GB SATAIII, 7200 RPM  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 12 SP3 (x86\_64)  
 kernel 4.4.114-94.11-default  
 Compiler: C/C++: Version 1.0.0 of AOCC  
 Fortran: Version 4.8.2 of GCC  
 Parallel: No  
 Firmware: Supermicro BIOS version 1.1 released Feb-2018  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: jemalloc general purpose malloc implementation V4.5.0



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

CPU2017 License: 001176  
Test Sponsor: Supermicro  
Tested by: Supermicro

Test Date: May-2018  
Hardware Availability: Jun-2017  
Software Availability: Feb-2018

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	64	1036	619	1021	629	<b>1022</b>	<b>628</b>	32	544	590	530	605	<b>541</b>	<b>593</b>
507.cactuBSSN_r	64	<b>479</b>	<b>169</b>	476	170	479	169	64	<b>489</b>	<b>166</b>	486	167	495	164
508.namd_r	64	<b>473</b>	<b>129</b>	472	129	474	128	64	<b>430</b>	<b>141</b>	429	142	432	141
510.parest_r	64	1246	134	1244	135	<b>1246</b>	<b>134</b>	32	669	125	669	125	<b>669</b>	<b>125</b>
511.povray_r	64	946	158	922	162	<b>923</b>	<b>162</b>	64	895	167	<b>892</b>	<b>168</b>	891	168
519.lbm_r	64	<b>508</b>	<b>133</b>	506	133	509	133	32	273	123	<b>272</b>	<b>124</b>	271	124
521.wrf_r	64	760	189	743	193	<b>752</b>	<b>191</b>	32	<b>463</b>	<b>155</b>	460	156	478	150
526.blender_r	64	575	169	<b>572</b>	<b>170</b>	563	173	64	<b>579</b>	<b>168</b>	581	168	566	172
527.cam4_r	64	739	151	<b>733</b>	<b>153</b>	729	153	64	738	152	<b>736</b>	<b>152</b>	735	152
538.imagick_r	64	678	235	<b>679</b>	<b>234</b>	679	234	64	<b>678</b>	<b>235</b>	673	236	679	234
544.nab_r	64	548	196	<b>548</b>	<b>197</b>	547	197	64	547	197	<b>547</b>	<b>197</b>	547	197
549.fotonik3d_r	64	1409	177	1414	176	<b>1410</b>	<b>177</b>	32	721	173	721	173	<b>721</b>	<b>173</b>
554.roms_r	64	1079	94.2	<b>1075</b>	<b>94.6</b>	1068	95.2	32	515	98.8	519	98.0	<b>517</b>	<b>98.4</b>

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The config file option 'submit' was used.  
'numactl' was used to bind copies to the cores.  
See the configuration file for details.

## Operating System Notes

'ulimit -s unlimited' was used to set environment stack size  
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runspec command invoked through numactl i.e.:  
numactl --interleave=all runspec <etc>

Set dirty\_ratio=8 to limit dirty cache to 8% of memory  
Set swappiness=1 to swap only if necessary  
Set zone\_reclaim\_mode=1 to free local node memory and avoid remote memory  
sync then drop\_caches=3 to reset caches before invoking runcpu

dirty\_ratio, swappiness, zone\_reclaim\_mode and drop\_caches were  
all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages were enabled for this run (OS default)

Huge pages were not configured for this run.



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

## General Notes

Environment variables set by runcpu before the start of the run:  
LD\_LIBRARY\_PATH = "/home/cpu2017/amd1704-rate-libs-revC/64;/home/cpu2017/amd1704-rate-libs-revC/32:"  
MALLOCONF = "lg\_chunk:28"

The AMD64 AOCC Compiler Suite is available at  
<http://developer.amd.com/amd-aocc/>

The AOCC Gold Linker plugin was installed and used for the link stage.

The AOCC Fortran Plugin version 1.0 was used to leverage AOCC optimizers with gfortran. It is available here:  
<http://developer.amd.com/amd-aocc/>

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using RHEL 7.4

jemalloc, a general purpose malloc implementation, was obtained at  
<https://github.com/jemalloc/jemalloc/releases/download/4.5.0/jemalloc-4.5.0.tar.bz2>  
jemalloc was built with GCC v4.8.5 in RHEL v7.2 under default conditions.  
jemalloc uses environment variable MALLOCONF with values narenas and lg\_chunk:  
narenas: sets the maximum number of arenas to use for automatic multiplexing of threads and arenas.  
lg\_chunk: set the virtual memory chunk size (log base 2). For example,  
lg\_chunk:21 sets the default chunk size to 2<sup>21</sup> = 2MiB.

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.  
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.  
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

## Platform Notes

BIOS Settings:  
Determinism Slider = Power  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f  
running on linux-769d Wed May 16 01:32:51 2018

SUT (System Under Test) info as seen by some common utilities.  
For more information on this section, see  
<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo  
model name : AMD EPYC 7281 16-Core Processor  
2 "physical id"s (chips)

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

### Platform Notes (Continued)

64 "processors"  
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

```
cpu cores : 16
siblings  : 32
physical 0: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29
physical 1: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                64
On-line CPU(s) list:   0-63
Thread(s) per core:    2
Core(s) per socket:    16
Socket(s):              2
NUMA node(s):          8
Vendor ID:              AuthenticAMD
CPU family:             23
Model:                 1
Model name:             AMD EPYC 7281 16-Core Processor
Stepping:               2
CPU MHz:               2100.000
CPU max MHz:           2100.0000
CPU min MHz:           1200.0000
BogoMIPS:              4199.69
Virtualization:        AMD-V
L1d cache:             32K
L1i cache:             64K
L2 cache:              512K
L3 cache:              4096K
NUMA node0 CPU(s):     0-3,32-35
NUMA node1 CPU(s):     4-7,36-39
NUMA node2 CPU(s):     8-11,40-43
NUMA node3 CPU(s):     12-15,44-47
NUMA node4 CPU(s):     16-19,48-51
NUMA node5 CPU(s):     20-23,52-55
NUMA node6 CPU(s):     24-27,56-59
NUMA node7 CPU(s):     28-31,60-63
```

```
Flags:                  fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
constant_tsc rep_good nopl nonstop_tsc extd_apicid amd_dcm aperfmperf eagerfpu pni
pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c
rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
osvw skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx arat cpb
hw_pstate retpoline retpoline_amd npt lbrv svm_lock nrip_save tsc_scale vmcb_clean
```

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

### Platform Notes (Continued)

flushbyasid decodeassists pausefilter pfthreshold vmmcall avic fsgsbase bmil avx2  
smep bmi2 rdseed adx smap clflushopt sha\_ni xsaveopt xsavec xgetbv1 clzero irperf  
ibpb overflow\_recov succor smca

```
/proc/cpuinfo cache data
cache size : 512 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 8 nodes (0-7)
node 0 cpus: 0 1 2 3 32 33 34 35
node 0 size: 128846 MB
node 0 free: 128682 MB
node 1 cpus: 4 5 6 7 36 37 38 39
node 1 size: 129021 MB
node 1 free: 128868 MB
node 2 cpus: 8 9 10 11 40 41 42 43
node 2 size: 129021 MB
node 2 free: 128873 MB
node 3 cpus: 12 13 14 15 44 45 46 47
node 3 size: 129021 MB
node 3 free: 128884 MB
node 4 cpus: 16 17 18 19 48 49 50 51
node 4 size: 129021 MB
node 4 free: 128897 MB
node 5 cpus: 20 21 22 23 52 53 54 55
node 5 size: 129021 MB
node 5 free: 128902 MB
node 6 cpus: 24 25 26 27 56 57 58 59
node 6 size: 129021 MB
node 6 free: 128904 MB
node 7 cpus: 28 29 30 31 60 61 62 63
node 7 size: 129019 MB
node 7 free: 128900 MB
```

```
node distances:
node  0  1  2  3  4  5  6  7
0:  10 16 16 16 32 32 32 32
1:  16 10 16 16 32 32 32 32
2:  16 16 10 16 32 32 32 32
3:  16 16 16 10 32 32 32 32
4:  32 32 32 32 10 16 16 16
5:  32 32 32 32 16 10 16 16
6:  32 32 32 32 16 16 10 16
7:  32 32 32 32 16 16 16 10
```

```
From /proc/meminfo
MemTotal: 1056761176 kB
```

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

### Platform Notes (Continued)

HugePages\_Total: 0  
Hugepagesize: 2048 kB

From /etc/\*release\* /etc/\*version\*

SuSE-release:

SUSE Linux Enterprise Server 12 (x86\_64)  
VERSION = 12  
PATCHLEVEL = 3

# This file is deprecated and will be removed in a future service pack or release.  
# Please check /etc/os-release for details about this release.

os-release:

NAME="SLES"  
VERSION="12-SP3"  
VERSION\_ID="12.3"  
PRETTY\_NAME="SUSE Linux Enterprise Server 12 SP3"  
ID="sles"  
ANSI\_COLOR="0;32"  
CPE\_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:

Linux linux-769d 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)  
x86\_64 x86\_64 x86\_64 GNU/Linux

run-level 3 May 15 14:51

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda4	xfs	422G	25G	397G	6%	/home

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS American Megatrends Inc. 1.1 02/07/2018

Memory:

16x NO DIMM NO DIMM  
16x Samsung M386A8K40BM2-CTD 64 GB 4 rank 2667

(End of data from sysinfo program)

### Compiler Version Notes

=====  
CC 519.lbm\_r(base, peak) 538.imagick\_r(base, peak) 544.nab\_r(base, peak)  
=====

AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

### Compiler Version Notes (Continued)

AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin

=====  
CXXC 508.namd\_r(base, peak) 510.parest\_r(base, peak)

=====  
AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin

=====  
CC 511.povray\_r(base, peak) 526.blender\_r(base, peak)

=====  
AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin  
AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin

=====  
FC 507.cactuBSSN\_r(base, peak)

=====  
AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin  
AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin  
GNU Fortran (GCC) 4.8.2  
Copyright (C) 2013 Free Software Foundation, Inc.  
GNU Fortran comes with NO WARRANTY, to the extent permitted by law.

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

### Compiler Version Notes (Continued)

You may redistribute copies of GNU Fortran under the terms of the GNU General Public License. For more information about these matters, see the file named COPYING

FC 503.bwaves\_r(base, peak) 549.fotonik3d\_r(base, peak) 554.roms\_r(base, peak)

GNU Fortran (GCC) 4.8.2  
Copyright (C) 2013 Free Software Foundation, Inc.  
GNU Fortran comes with NO WARRANTY, to the extent permitted by law.  
You may redistribute copies of GNU Fortran under the terms of the GNU General Public License. For more information about these matters, see the file named COPYING

CC 521.wrf\_r(base, peak) 527.cam4\_r(base, peak)

GNU Fortran (GCC) 4.8.2  
Copyright (C) 2013 Free Software Foundation, Inc.  
GNU Fortran comes with NO WARRANTY, to the extent permitted by law.  
You may redistribute copies of GNU Fortran under the terms of the GNU General Public License. For more information about these matters, see the file named COPYING  
AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin

### Base Compiler Invocation

C benchmarks:  
clang

C++ benchmarks:  
clang++

Fortran benchmarks:  
clang gfortran

Benchmarks using both Fortran and C:  
clang gfortran

(Continued on next page)





# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

## Base Compiler Invocation (Continued)

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang gfortran

## Base Portability Flags

503.bwaves\_r: -DSPEC\_LP64  
507.cactuBSSN\_r: -DSPEC\_LP64  
508.namd\_r: -DSPEC\_LP64  
510.parest\_r: -DSPEC\_LP64  
511.povray\_r: -DSPEC\_LP64  
519.lbm\_r: -DSPEC\_LP64  
521.wrf\_r: -DSPEC\_CASE\_FLAG -fconvert=big-endian -DSPEC\_LP64  
526.blender\_r: -funsigned-char -D\_\_BOOL\_DEFINED -DSPEC\_LP64  
527.cam4\_r: -DSPEC\_CASE\_FLAG -DSPEC\_LP64  
538.imagick\_r: -DSPEC\_LP64  
544.nab\_r: -DSPEC\_LP64  
549.fotonik3d\_r: -DSPEC\_LP64  
554.roms\_r: -DSPEC\_LP64

## Base Optimization Flags

C benchmarks:

-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop  
-disable-vect-cmp -O3 -ffast-math -march=znver1 -fstruct-layout=2  
-mllvm -unroll-threshold=100 -fremap-arrays -mno-avx2  
-inline-threshold=1000 -z muldefs -ljemalloc

C++ benchmarks:

-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop  
-disable-vect-cmp -O3 -march=znver1 -mllvm -unroll-threshold=100  
-finline-aggressive -fremap-arrays -inline-threshold=1000 -z muldefs  
-ljemalloc

Fortran benchmarks:

-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop  
-disable-vect-cmp -O3(gfortran) -O3(clang) -mavx -madox  
-funroll-loops -ffast-math -z muldefs -fplugin=dragonegg.so

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

## Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-fplugin-arg-dragonegg-llvm-option=" -disable-vect-cmp" -ljemalloc  
-lgfortran -lamdlibm
```

Benchmarks using both Fortran and C:

```
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop  
-disable-vect-cmp -O3(clang) -ffast-math -march=znver1  
-fstruct-layout=2 -mllvm -unroll-threshold=100 -fremap-arrays  
-mno-avx2 -inline-threshold=1000 -O3(gfortran) -mavx -madox  
-funroll-loops -z muldefs -fplugin=dragonegg.so  
-fplugin-arg-dragonegg-llvm-option=" -disable-vect-cmp" -ljemalloc  
-lgfortran -lamdlibm
```

Benchmarks using both C and C++:

```
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop  
-disable-vect-cmp -O3 -ffast-math -march=znver1 -fstruct-layout=2  
-mllvm -unroll-threshold=100 -fremap-arrays -mno-avx2  
-inline-threshold=1000 -finline-aggressive -z muldefs -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop  
-disable-vect-cmp -O3(clang) -ffast-math -march=znver1  
-fstruct-layout=2 -mllvm -unroll-threshold=100 -fremap-arrays  
-mno-avx2 -inline-threshold=1000 -finline-aggressive -O3(gfortran)  
-mavx -madox -funroll-loops -z muldefs -fplugin=dragonegg.so  
-fplugin-arg-dragonegg-llvm-option=" -disable-vect-cmp" -ljemalloc
```

## Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

clang gfortran

Benchmarks using both Fortran and C:

clang gfortran

Benchmarks using both C and C++:

clang++ clang

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

## Peak Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:  
clang++ clang gfortran

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

```
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast  
-march=znver1 -fstruct-layout=3 -mllvm -vectorize-memory-aggressively  
-mno-avx2 -unroll-threshold=100 -fremap-arrays -inline-threshold=1000  
-ljemalloc
```

C++ benchmarks:

```
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast  
-march=znver1 -finline-aggressive -mllvm -unroll-threshold=100  
-fremap-arrays -inline-threshold=1000 -ljemalloc
```

Fortran benchmarks:

```
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop  
-O3(gfortran) -O3(clang) -mavx2 -madox -funroll-loops -ffast-math  
-fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option="  
-inline-threshold:1000" -ljemalloc -lgfortran -lamdlibm
```

Benchmarks using both Fortran and C:

```
521.wrf_r: -flto -Wl, -plugin-opt= -merge-constant  
-lsr-in-nested-loop -O3(clang) -mavx -ffast-math  
-O3(gfortran) -funroll-loops -fplugin=dragonegg.so  
-fplugin-arg-dragonegg-llvm-option="  
-inline-threshold:1000" -ljemalloc -lgfortran -lamdlibm
```

```
527.cam4_r: -flto -Wl, -plugin-opt= -merge-constant  
-lsr-in-nested-loop -Ofast -march=znver1  
-fstruct-layout=3 -mllvm -vectorize-memory-aggressively  
-mno-avx2 -unroll-threshold=100 -fremap-arrays  
-inline-threshold=1000 -O3(gfortran) -O3(clang) -mavx2  
-madox -funroll-loops -ffast-math -fplugin=dragonegg.so  
-fplugin-arg-dragonegg-llvm-option="  
-inline-threshold:1000" -ljemalloc -lgfortran -lamdlibm
```

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Supermicro

A+ Server 2023US-TR4  
(H11DSU-iN , AMD EPYC 7281)

SPECrate2017\_fp\_base = 176

SPECrate2017\_fp\_peak = 172

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Test Date:** May-2018  
**Hardware Availability:** Jun-2017  
**Software Availability:** Feb-2018

## Peak Optimization Flags (Continued)

Benchmarks using both C and C++:

```
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast  
-march=znver1 -fstruct-layout=3 -mllvm -vectorize-memory-aggressively  
-mno-avx2 -unroll-threshold=100 -fremap-arrays -inline-threshold=1000  
-finline-aggressive -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast  
-march=znver1 -fstruct-layout=3 -mllvm -vectorize-memory-aggressively  
-mno-avx2 -unroll-threshold=100 -fremap-arrays -inline-threshold=1000  
-finline-aggressive -O3 -mavx2 -madx -funroll-loops -ffast-math  
-fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option="  
-inline-threshold:1000" -ljemalloc
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/gcc.2018-02-16.html>  
<http://www.spec.org/cpu2017/flags/aoccl100-flags-revC-I.2018-02-16.html>  
<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Naples-revD.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/gcc.2018-02-16.xml>  
<http://www.spec.org/cpu2017/flags/aoccl100-flags-revC-I.2018-02-16.xml>  
<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Naples-revD.xml>

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEC CPU2017 v1.0.2 on 2018-05-15 13:32:50-0400.  
Report generated on 2019-02-21 15:45:12 by CPU2017 PDF formatter v6067.  
Originally published on 2018-06-12.