



# SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## ASUSTeK Computer Inc.

ASUS RS300-E10(P11C-C/4L) Server System  
(3.70 GHz, Intel Xeon E-2176G)

SPECrate2017\_fp\_base = 38.9

SPECrate2017\_fp\_peak = 39.5

CPU2017 License: 9016

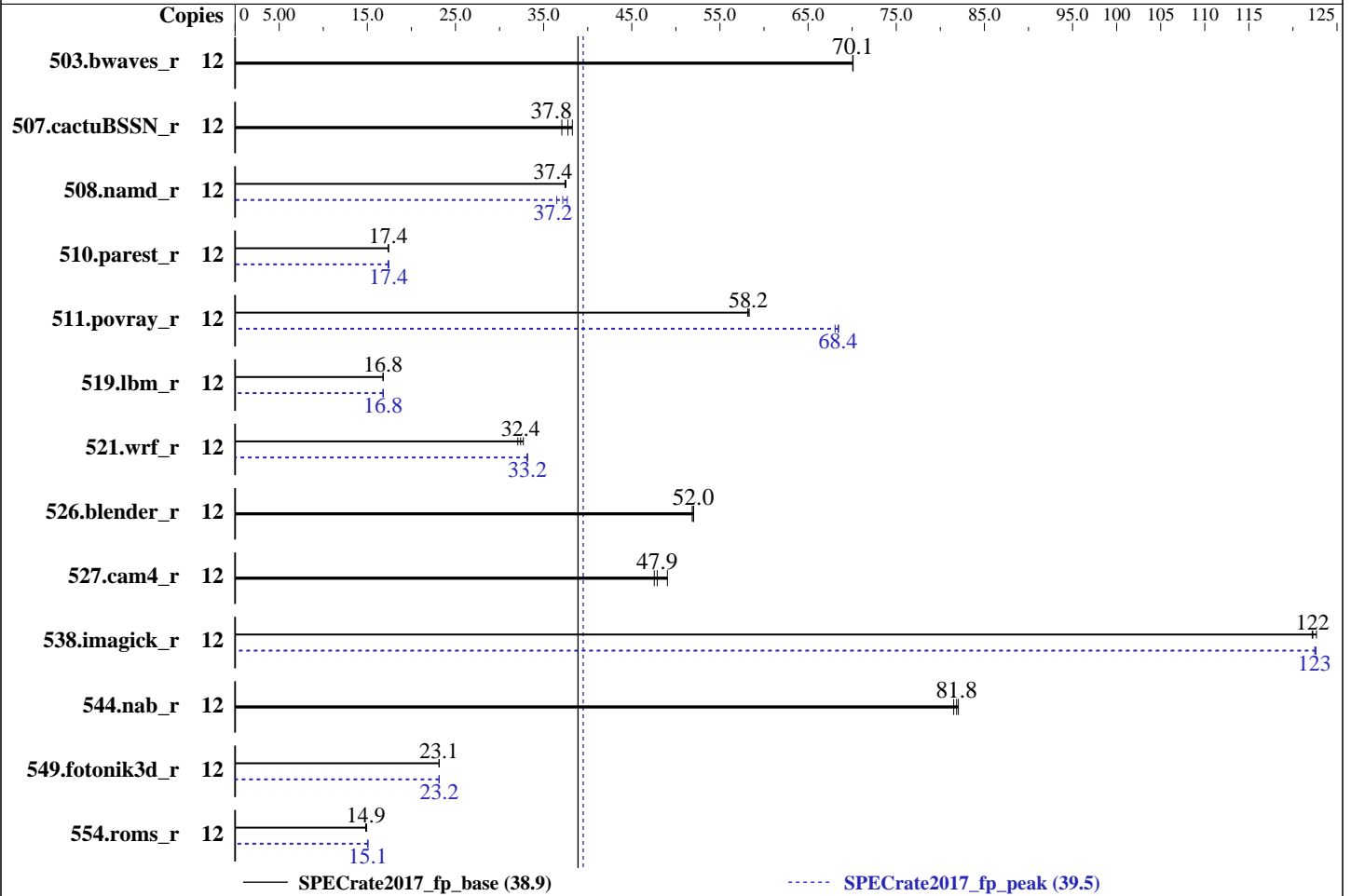
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Jan-2019

Hardware Availability: Sep-2018

Software Availability: Nov-2018



### Hardware

CPU Name: Intel Xeon E-2176G  
 Max MHz.: 4700  
 Nominal: 3700  
 Enabled: 6 cores, 1 chip, 2 threads/core  
 Orderable: 1 chip  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 256 KB I+D on chip per core  
 L3: 12 MB I+D on chip per chip  
 Other: None  
 Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)  
 Storage: 1 x 500 GB SATA HDD, 7200RPM  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 12 (x86\_64) SP3  
 Kernel 4.4.120-94.17-default  
 Compiler: C/C++: Version 19.0.1.144 of Intel C/C++  
 Compiler for Linux;  
 Fortran: Version 19.0.1.144 of Intel Fortran  
 Compiler for Linux  
 Parallel: No  
 Firmware: Version 0303 released Aug-2018  
 File System: btrfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: None



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## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	12	1716	70.1	<b><u>1717</u></b>	<b><u>70.1</u></b>	1717	70.1	12	1716	70.1	<b><u>1717</u></b>	<b><u>70.1</u></b>	1717	70.1
507.cactuBSSN_r	12	410	37.1	<b><u>402</u></b>	<b><u>37.8</u></b>	397	38.3	12	410	37.1	<b><u>402</u></b>	<b><u>37.8</u></b>	397	38.3
508.namd_r	12	304	37.5	305	37.4	<b><u>305</u></b>	<b><u>37.4</u></b>	12	<b><u>307</u></b>	<b><u>37.2</u></b>	312	36.5	302	37.7
510.parest_r	12	<b><u>1805</u></b>	<b><u>17.4</u></b>	1804	17.4	1807	17.4	12	1802	17.4	1808	17.4	<b><u>1803</u></b>	<b><u>17.4</u></b>
511.povray_r	12	480	58.3	<b><u>481</u></b>	<b><u>58.2</u></b>	482	58.1	12	<b><u>410</u></b>	<b><u>68.4</u></b>	412	68.1	409	68.5
519.lbm_r	12	<b><u>753</u></b>	<b><u>16.8</u></b>	753	16.8	753	16.8	12	753	16.8	<b><u>753</u></b>	<b><u>16.8</u></b>	753	16.8
521.wrf_r	12	822	32.7	<b><u>830</u></b>	<b><u>32.4</u></b>	838	32.1	12	<b><u>811</u></b>	<b><u>33.2</u></b>	812	33.1	810	33.2
526.blender_r	12	351	52.0	<b><u>352</u></b>	<b><u>52.0</u></b>	352	51.9	12	351	52.0	<b><u>352</u></b>	<b><u>52.0</u></b>	352	51.9
527.cam4_r	12	428	49.0	<b><u>438</u></b>	<b><u>47.9</u></b>	441	47.6	12	428	49.0	<b><u>438</u></b>	<b><u>47.9</u></b>	441	47.6
538.imagick_r	12	243	123	<b><u>244</u></b>	<b><u>122</u></b>	244	122	12	244	122	243	123	<b><u>244</u></b>	<b><u>123</u></b>
544.nab_r	12	<b><u>247</u></b>	<b><u>81.8</u></b>	246	82.0	248	81.5	12	<b><u>247</u></b>	<b><u>81.8</u></b>	246	82.0	248	81.5
549.fotonik3d_r	12	2019	23.2	<b><u>2020</u></b>	<b><u>23.1</u></b>	2021	23.1	12	2020	23.2	<b><u>2020</u></b>	<b><u>23.2</u></b>	2021	23.1
554.roms_r	12	1278	14.9	<b><u>1284</u></b>	<b><u>14.9</u></b>	1286	14.8	12	1266	15.1	<b><u>1266</u></b>	<b><u>15.1</u></b>	1268	15.0

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

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

## General Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = "/spec2017_2019ul/lib/ia32:/spec2017_2019ul/lib/intel64:/spec2017_2019ul/je5.0.1-32:/spec2017_2019ul/je5.0.1-64"
```

Binaries compiled on a system with 1x Intel Core i7-6700K CPU + 32GB RAM

memory using Redhat Enterprise Linux 7.5

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

```
sync; echo 3> /proc/sys/vm/drop_caches
```

Yes: 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.

(Continued on next page)



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**CPU2017 License:** 9016

**Test Sponsor:** ASUSTeK Computer Inc.

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**Test Date:** Jan-2019

**Hardware Availability:** Sep-2018

**Software Availability:** Nov-2018

### General Notes (Continued)

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 Configuration:

VT-d = Disabled

Software Guard Extensions (SGX) = Disabled

AES = Disabled

Hardware Prefetcher = Disabled

Adjacent Cache Line Prefetch = Disabled

Race to Halt (RTH) = Disabled

    Sysinfo program /spec2017\_2019ul/bin/sysinfo

    Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9

    running on linux-pmm5 Tue Jan 15 18:20:50 2019

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 : Intel(R) Xeon(R) E-2176G CPU @ 3.70GHz

        1 "physical id"s (chips)

        12 "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 : 6

        siblings : 12

        physical 0: cores 0 1 2 3 4 5

From lscpu:

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 12

On-line CPU(s) list: 0-11

Thread(s) per core: 2

Core(s) per socket: 6

Socket(s): 1

NUMA node(s): 1

Vendor ID: GenuineIntel

CPU family: 6

Model: 158

Model name: Intel(R) Xeon(R) E-2176G CPU @ 3.70GHz

Stepping: 10

CPU MHz: 4606.560

(Continued on next page)



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### Platform Notes (Continued)

```

CPU max MHz:      4700.0000
CPU min MHz:      800.0000
BogoMIPS:         7391.48
Virtualization:   VT-x
L1d cache:        32K
L1i cache:        32K
L2 cache:         256K
L3 cache:         12288K
NUMA node0 CPU(s): 0-11

```

```

Flags:             fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts dtherm
hwp hwp_notify hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl stibp retpoline
kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xgetbv1

```

```

/proc/cpuinfo cache data
cache size : 12288 KB

```

```

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

```

```

available: 1 nodes (0)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11
node 0 size: 64314 MB
node 0 free: 63783 MB
node distances:
node    0
0:     10

```

```

From /proc/meminfo

```

```

MemTotal:      65858104 kB
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"

```

(Continued on next page)



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### Platform Notes (Continued)

```
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="/o:suse:sles:12:sp3"
```

uname -a:

```
Linux linux-pmm5 4.4.120-94.17-default #1 SMP Wed Mar 14 17:23:00 UTC 2018 (cf3a7bb)
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

```
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB
```

run-level 3 Jan 15 18:15

SPEC is set to: /spec2017\_2019u1

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 445G 116G 329G 27% /
```

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. 0303 08/07/2018

Memory:

4x Samsung M391A2K43BB1-CTD 16 GB 2 rank 2667, configured at 2666

(End of data from sysinfo program)

### Compiler Version Notes

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

-----  
icc (ICC) 19.0.1.144 20181018

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
-----

=====  
CC 519.lbm\_r(peak)

-----  
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### Compiler Version Notes (Continued)

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

icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
=====

=====  
CXXC 508.namd\_r(peak)  
=====

icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
=====

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

icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
icc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
=====

=====  
CC 511.povray\_r(peak)  
=====

icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
icc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
=====

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

icpc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
icc (ICC) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
ifort (IFORT) 19.0.1.144 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
=====

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

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### Compiler Version Notes (Continued)

```
-----
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----
```

```
=====
FC 554.roms_r(peak)
-----
```

```
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----
```

```
=====
CC 521.wrf_r(base) 527.cam4_r(base, peak)
-----
```

```
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----
```

```
=====
CC 521.wrf_r(peak)
-----
```

```
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----
```

### Base Compiler Invocation

C benchmarks:

```
icc -m64 -std=c11
```

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```

Benchmarks using both Fortran and C:

```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using both C and C++:

```
icpc -m64 icc -m64 -std=c11
```

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## Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:

```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

## 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_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
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:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Benchmarks using both C and C++:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

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## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

## Peak Compiler Invocation

C benchmarks:

```
icc -m64 -std=c11
```

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```

Benchmarks using both Fortran and C:

```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using both C and C++:

```
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

```
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3
```

```
538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3
```

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## Peak Optimization Flags (Continued)

544.nab\_r: basepeak = yes

C++ benchmarks:

508.namd\_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

510.parest\_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:

503.bwaves\_r: basepeak = yes

549.fotonik3d\_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3 -auto  
-nostandard-realloc-lhs

554.roms\_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

521.wrf\_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

527.cam4\_r: basepeak = yes

Benchmarks using both C and C++:

511.povray\_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

526.blender\_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN\_r: basepeak = yes



# SPEC CPU2017 Floating Point Rate Result

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**ASUSTeK Computer Inc.**

ASUS RS300-E10(P11C-C/4L) Server System  
(3.70 GHz, Intel Xeon E-2176G)

SPECrate2017\_fp\_base = 38.9

SPECrate2017\_fp\_peak = 39.5

**CPU2017 License:** 9016

**Test Sponsor:** ASUSTeK Computer Inc.

**Tested by:** ASUSTeK Computer Inc.

**Test Date:** Jan-2019

**Hardware Availability:** Sep-2018

**Software Availability:** Nov-2018

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

<http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-p11-V2.0-revA.html>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.html>

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

<http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-p11-V2.0-revA.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml>

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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 v1.0.5 on 2019-01-15 05:20:50-0500.

Report generated on 2019-04-16 17:15:19 by CPU2017 PDF formatter v6067.

Originally published on 2019-04-16.