# SPEC® CPU2017 Floating Point Rate Result

## ASUSTeK Computer Inc.

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

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>9016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor</td>
<td>ASUSTeK Computer Inc.</td>
</tr>
<tr>
<td>Tested by</td>
<td>ASUSTeK Computer Inc.</td>
</tr>
<tr>
<td>Test Date</td>
<td>Jan-2019</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Sep-2018</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Nov-2018</td>
</tr>
</tbody>
</table>

## SPECrate2017_fp_base = 38.9

## SPECrate2017_fp_peak = 39.5

### 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
- **Cache L2:** 256 KB I+D on chip per core
- **Cache L3:** 12 MB I+D on chip per chip
- **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

## Copies

<table>
<thead>
<tr>
<th>Test</th>
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<th>SPECrate2017_fp_base</th>
<th>SPECrate2017_fp_peak</th>
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<td>503.bwaves_r</td>
<td>12</td>
<td>37.8</td>
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<tr>
<td>507.cactuBSSN_r</td>
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<td>554.roms_r</td>
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**Note:** All tests were conducted in a single-threaded environment. The results are reported in SPECrate2017_fp_base and SPECrate2017_fp_peak.
SPEC CPU2017 Floating Point Rate Result

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

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SPECrate2017_fp_base = 38.9
SPECrate2017_fp_peak = 39.5

Results Table

<table>
<thead>
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</table>

SPECrate2017_fp_base = 38.9
SPECrate2017_fp_peak = 39.5

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_2019u1/lib/ia32:/spec2017_2019u1/lib/intel64:
/spec2017_2019u1/je5.0.1-32:/spec2017_2019u1/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)
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_2019u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd8f2999c33d61f64985e45859ea9
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

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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 cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pbebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pdid ssse4_1 ssse4_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  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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CPU2017 License: 9016
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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="cpe:/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.
==============================================================================

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 CC  519.lbm_r(peak)
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Hardware Availability: Sep-2018
Software Availability: Nov-2018

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.

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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.

==============================================================================
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
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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

(Continued on next page)
## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

- `xCORE-AVX2` -ipo -03 -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 -03`
- `no-prec-div -qopt-prefetch -ffinite-math-only`
- `qopt-mem-layout-trans=3`

- `538.imagick_r: -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch`
- `ffinite-math-only -qopt-mem-layout-trans=3`

(Continued on next page)
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

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

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<th>Jan-2019</th>
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The flags files that were used to format this result can be browsed at:
- [Intel-ic18.0-official-linux64.2017-12-21.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:
- [ASUSTeKPlatform-Settings-p11-V2.0-revA.xml](http://www.spec.org/cpu2017/flags/ASUSTeKPlatform-Settings-p11-V2.0-revA.xml)
- [Intel-ic18.0-official-linux64.2017-12-21.xml](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml)

### SPECrate2017_fp_base = 38.9

### SPECrate2017_fp_peak = 39.5

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2019-01-15 05:20:50-0500.
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