## SPEC® CPU2017 Floating Point Rate Result

**ASUSTeK Computer Inc.**

ASUS RS300-E10(P11C-C/4L) Server System
(3.50 GHz, Intel Xeon E-2146G)

### SPECrate2017_fp_base = 38.3

### SPECrate2017_fp_peak = 38.8

### Hardware

<table>
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<th>Copies</th>
<th>SPECrate2017_fp_base (38.3)</th>
<th>SPECrate2017_fp_peak (38.8)</th>
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<td>507.cactuBSSN_r</td>
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### 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 Build:** 20181018 for Linux;
- **Fortran:** Version 19.0.1.144 of Intel Fortran
- **Compiler Build:** 20181018 for Linux
- **Parallel:** No
- **Firmware:** Version 0502 released Nov-2018
- **File System:** btrfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None

### CPU2017 License: 9016

- **Test Sponsor:** ASUSTeK Computer Inc.
- **Test Date:** May-2019
- **Hardware Availability:** Dec-2018
- **Software Availability:** Nov-2018

### Hardware Specifications

- **CPU Name:** Intel Xeon E-2146G
- **Max MHz.:** 4500
- **Nominal:** 3500
- **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
- **Other:** None
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
- **Storage:** 1 x 500 GB SATA HDD, 7200RPM
- **Other:** None
ASUSTeK Computer Inc.

ASUS RS300-E10(P11C-C/4L) Server System
(3.50 GHz, Intel Xeon E-2146G)

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Results Table

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

Submit Notes
The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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_new/lib/ia32:/spec2017_new/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-7900X 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)
ASUSTeK Computer Inc.

ASUS RS300-E10(P11C-C/4L) Server System (3.50 GHz, Intel Xeon E-2146G)

SPECrate2017_fp_base = 38.3
SPECrate2017_fp_peak = 38.8

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Test Date: May-2019
Hardware Availability: Dec-2018
Tested by: ASUSTeK Computer Inc.
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
AES = Disabled
Race to Halt (RTH) = Disabled
Sysinfo program /spec2017_new/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-pmm5 Sat May 11 12:44:03 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-2146G CPU @ 3.50GHz
  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-2146G CPU @ 3.50GHz
Stepping: 10
CPU MHz: 4348.600
CPU max MHz: 4500.0000
CPU min MHz: 800.0000
BogoMIPS: 7007.98

(Continued on next page)
Platform Notes (Continued)

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 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 aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrrchip pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invd淑单行单fl 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 erts invd淑单行单fl pln pts dtherm

From /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: 64313 MB
node 0 free: 57276 MB
node distances:
node 0
0: 10

From /proc/meminfo
MemTotal: 65857384 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"
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"

(Continued on next page)
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Software Availability: Nov-2018
Test Date: May-2019

Platform Notes (Continued)

```
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 May 10 18:12
SPEC is set to: /spec2017_new
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda2  btrfs 445G 134G 310G  31% /

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. 0502 11/15/2018
  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)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

==============================================================================
CC  519.lbm_r(peak)
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```

(Continued on next page)
Compiler Version Notes (Continued)

==============================================================================
CXXC 508.namd_r(base) 510.parest_r(base, peak)
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Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
   Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

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CXXC 508.namd_r(peak)
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CC   511.povray_r(base) 526.blender_r(base, peak)
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------------------------------------------------------------------------------

==============================================================================
FC  507.cactuBSSN_r(base, peak)
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Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
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Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
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------------------------------------------------------------------------------

(Continued on next page)
## Compiler Version Notes (Continued)

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

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)
64, Version 19.0.1.144 Build 20181018
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| Test Sponsor: ASUSTeK Computer Inc. | Hardware Availability: Dec-2018 |
| Tested by: ASUSTeK Computer Inc. | Software Availability: Nov-2018 |

## 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
```

**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.ibm_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 -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4
```

**C++ benchmarks:**

```
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
```

(Continued on next page)
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SPEC CPU2017 Floating Point Rate Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

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C++ benchmarks (continued):
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

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
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Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2019
Hardware Availability: Dec-2018
Software Availability: Nov-2018

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=4

538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

544.nab_r: Same as 538.imagick_r

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=4

510.parest_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

Fortran benchmarks:
503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -auto
-nostandard-realloc-lhs -align array32byte

549.fotonik3d_r: Same as 503.bwaves_r

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=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS300-E10(P11C-C/4L) Server System
(3.50 GHz, Intel Xeon E-2146G)

SPECrate2017_fp_base = 38.3
SPECrate2017_fp_peak = 38.8

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
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Peak Optimization Flags (Continued):

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=4

526.blender_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

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

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

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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 2019-05-11 00:44:03-0400.
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