# SPEC® CPU2017 Floating Point Rate Result

**Epsylon Sp. z o.o. Sp. Komandytowa**

**eterio 225 RE1 (Intel Xeon Silver 4114, 2.20 GHz)**

**SPECrate\textsubscript{2017\_fp\_peak} = 52.9**

**SPECrate\textsubscript{2017\_fp\_base} = 52.2**

| Test Date: | Mar-2019 |
| Test Sponsor: | Epsylon Sp. z o.o. Sp. Komandytowa |
| Test Date: | Mar-2019 |
| Software Availability: | Mar-2018 |
| CPU2017 License: | 9081 |
| Hardware Availability: | Sep-2017 |
| Tested by: | Epsylon Sp. z o.o. Sp. Komandytowa |
| | Epsylon Sp. z o.o. Sp. Komandytowa |

## Hardware

<table>
<thead>
<tr>
<th>SPECrate\textsubscript{2017_fp_base} (52.2)</th>
<th>SPECrate\textsubscript{2017_fp_peak} (52.9)</th>
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<tbody>
<tr>
<td><strong>503.bwaves_r</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>507.caCTuBSSN_r</strong></td>
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<td><strong>519.lbm_r</strong></td>
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<td>20</td>
</tr>
<tr>
<td><strong>549.fotonik3d_r</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>554.roms_r</strong></td>
<td>20</td>
</tr>
</tbody>
</table>

### Software

- **OS:** Red Hat Enterprise Linux Server release 7.4 (Maipo)
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux;
  Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
- **Firmware:** Version BIOS 3.0a released Jan-2019
- **File System:** ext4
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
Epsylon Sp. z o.o. Sp. Komandytowa

CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Base</th>
<th>Peak</th>
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<tbody>
<tr>
<td></td>
<td>Copies</td>
<td>Seconds</td>
<td>Ratio</td>
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<tr>
<td>503.bwaves_r</td>
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<td>1134</td>
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<tr>
<td>507.cactuBSSN_r</td>
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<tr>
<td>508.namd_r</td>
<td>20</td>
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<tr>
<td>510.parest_r</td>
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<td>1443</td>
<td>1445</td>
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<tr>
<td>511.povray_r</td>
<td>20</td>
<td>829</td>
<td>829</td>
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<tr>
<td>519.lbm_r</td>
<td>20</td>
<td>541</td>
<td>539</td>
</tr>
<tr>
<td>521.wrf_r</td>
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<td>694</td>
<td>692</td>
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<td>526.blender_r</td>
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<tr>
<td>527.cam4_r</td>
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<td>782</td>
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<td>538.imagick_r</td>
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<td>537</td>
<td>537</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
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<td>1554</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>20</td>
<td>1010</td>
<td>1013</td>
</tr>
</tbody>
</table>

SPECrate2017_fp_base = 52.2
SPECrate2017_fp_peak = 52.9

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 = "/cpu2017.1.0/lib/intel64:/cpu2017.1.0/je5.0.1-32:/cpu2017.1.0/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32 GB RAM
memory using Redhat Enterprise Linux 7.4

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.
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.

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SPEC CPU2017 Floating Point Rate Result

Epsylon Sp. z o.o. Sp. Komandytowa
eterio 225 RE1 (Intel Xeon Silver 4114, 2.20 GHz)

<table>
<thead>
<tr>
<th>SPECrate2017_fp_peak</th>
<th>52.9</th>
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<tbody>
<tr>
<td>SPECrate2017_fp_base</td>
<td>52.2</td>
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CPU2017 License: 9081
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Test Date: Mar-2019
Hardware Availability: Sep-2017
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa
Software Availability: Mar-2018

General Notes (Continued)

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

Platform Notes

BIOS Settings:
Power Technology = Custom
Turbo Mode = Enable
Enhanced Halt State (C1E) = Disable
CPU C6 report = Disabled
Package C State = No limit
Software Controlled T-States = Disable
Hyper-Threading (All) = Enable
Enforce POR = Disable
Memory Frequency = 2400
Patrol Scrub = Disabled
IMC Interleaving = Auto
SNC = Disabled

Sysinfo program /cpu2017.1.0/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on SUT Fri Mar 1 23:08:55 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) Silver 4114 CPU @ 2.20GHz
  1 "physical id"s (chips)
  20 "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 : 10
  siblings : 20
  physical 0: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 20
  On-line CPU(s) list: 0-19

(Continued on next page)
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**Software Availability:** Mar-2018

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**Platform Notes (Continued)**

- Thread(s) per core: 2
- Core(s) per socket: 10
- Socket(s): 1
- NUMA node(s): 1
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
- Stepping: 4
- CPU MHz: 2201.000
- CPU max MHz: 2201.0000
- CPU min MHz: 800.0000
- BogoMIPS: 4400.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 14080K
- NUMA node 0 CPU(s): 0-19
- 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 fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epccat_13 cpuid_13 invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occu llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts

/proc/cpuinfo cache data

- cache size : 14080 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 12 13 14 15 16 17 18 19
- node 0 size: 195231 MB
- node 0 free: 190022 MB
- node distances:
  - node 0
  - 0: 10

From /proc/meminfo

- MemTotal: 196471408 KB
- HugePages_Total: 0
- Hugepagesize: 2048 KB

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**CPU2017 License:** 9081

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**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa

**Test Date:** Mar-2019

**Hardware Availability:** Sep-2017

**Software Availability:** Mar-2018

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**Platform Notes (Continued)**

```bash
From /etc/*release* /etc/*version*
os-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.4 (Maipo)"
  ID="rhel"
  ID_LIKE="fedora"
  VARIANT="Server"
  VARIANT_ID="server"
  VERSION_ID="7.4"
  PRETTY_NAME="Red Hat Enterprise Linux"
redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

uname -a:
  Linux SUT 3.10.0-693.21.1.el7.x86_64 #1 SMP Fri Feb 23 18:54:16 UTC 2018 x86_64 x86_64
  x86_64 GNU/Linux
run-level 3 Mar 1 12:32

SPEC is set to: /cpu2017.1.0
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda1      ext4  825G   89G  695G 12% /
```

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. 3.0a 01/12/2019

**Memory:**
  6x NO DIMM NO DIMM
  6x Samsung M393A4K40CB2-CTD 32 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

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**Compiler Version Notes**

```bash
==============================================================================
  CC  519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base)
==============================================================================
  icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
```

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### Epsylon Sp. z o.o. Sp. Komandytowa

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**Software Availability:** Mar-2018

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#### Compiler Version Notes (Continued)

**CC** 519.lbm_r(peak) 544.nab_r(peak)

`icc (ICC) 18.0.0 20170811`  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

---

**CXXC** 508.namd_r(base) 510.parest_r(base)

`icpc (ICC) 18.0.0 20170811`  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

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**CXXC** 508.namd_r(peak) 510.parest_r(peak)

`icpc (ICC) 18.0.0 20170811`  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

---

**CC** 511.povray_r(base) 526.blender_r(base)

`icpc (ICC) 18.0.0 20170811`  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
`icc (ICC) 18.0.0 20170811`  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

---

**CC** 511.povray_r(peak) 526.blender_r(peak)

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Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
`icc (ICC) 18.0.0 20170811`  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

---

**FC** 507.cactuBSSN_r(base)

`icpc (ICC) 18.0.0 20170811`  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
`icc (ICC) 18.0.0 20170811`  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
`ifort (IFORT) 18.0.0 20170811`  
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**Hardware Availability:** Sep-2017  
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### Compiler Version Notes (Continued)

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**FC**  507.cactusBSSN_r(peak)  
**icpc (ICC) 18.0.0 20170811**  
**Copyright (C) 1985-2017 Intel Corporation. All rights reserved.**  
**icc (ICC) 18.0.0 20170811**  
**Copyright (C) 1985-2017 Intel Corporation. All rights reserved.**  
**ifort (IFORT) 18.0.0 20170811**  
**Copyright (C) 1985-2017 Intel Corporation. All rights reserved.**

---

**FC**  503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)  
**ifort (IFORT) 18.0.0 20170811**  
**Copyright (C) 1985-2017 Intel Corporation. All rights reserved.**

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**FC**  554.roms_r(peak)  
**ifort (IFORT) 18.0.0 20170811**  
**Copyright (C) 1985-2017 Intel Corporation. All rights reserved.**

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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

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-AVX512 -ipo -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-align array32byte

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Benchmarks using both Fortran and C:
-m64 -std=c11

Benchmarks using both C and C++:
-m64 -std=c11

Benchmarks using Fortran, C, and C++:
-m64 -std=c11
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Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

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-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3

538.imagick_r: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3

544.nab_r: Same as 519.lbm_r

C++ benchmarks:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:

(Continued on next page)
Peak Optimization Flags (Continued)

503.bwaves_r: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -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-AVX512
-O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Peak Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Benchmarks using both Fortran and C:
-m64 -std=c11

Benchmarks using both C and C++:
-m64 -std=c11

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa

eterio 225 RE1 (Intel Xeon Silver 4114, 2.20 GHz)

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<th>SPECrate2017_fp_base = 52.2</th>
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CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa

Test Date: Mar-2019
Hardware Availability: Sep-2017
Software Availability: Mar-2018

Peak Other Flags (Continued)

Benchmarks using Fortran, C, and C++:
-m64 -std=c11

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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Tested with SPEC CPU2017 v1.0.2 on 2019-03-01 17:08:54-0500.
Report generated on 2019-03-19 14:58:54 by CPU2017 PDF formatter v6067.
Originally published on 2019-03-19.