Epsylon Sp. z o.o. Sp. Komandytowa
eterio 115 RE1 (Intel Xeon Silver 4108, 1.80 GHz)

SPECrate2017_fp_peak = 36.9
SPECrate2017_fp_base = 36.4

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<th>510.parest_r</th>
<th>511.povray_r</th>
<th>519.lbm_r</th>
<th>521.wrf_r</th>
<th>526.blender_r</th>
<th>527.cam4_r</th>
<th>538.imagick_r</th>
<th>544.nab_r</th>
<th>549.fotonik3d_r</th>
<th>554.roms_r</th>
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</table>

**Hardware**

- **CPU Name**: Intel Xeon Silver 4108
- **Max MHz.**: 3000
- **Nominal**: 1800
- **Enabled**: 8 cores, 1 chip, 2 threads/core
- **Orderable**: 1 chip
- **Cache L1**: 32 KB I + 32 KB D on chip per core
- **L2**: 1 MB I+D on chip per core
- **L3**: 11 MB I+D on chip per chip
- **Memory**: 128 GB (8 x 16 GB 2Rx4 PC4-2666V-R, running at 2400)
- **Storage**: 1 x 960 GB SSD SATA III
- **Other**: None

**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
- **Parallel**: No
- **Firmware**: Version BIOS 2.0b released Feb-2018
- **File System**: ext4
- **System State**: Run level 3 (multi-user)
- **Base Pointers**: 64-bit
- **Peak Pointers**: 64-bit
- **Other**: None
**Results Table**

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</table>

**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/ia32:/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.

(Continued on next page)
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 = Auto
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 Tue Apr 24 05:46:46 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 : Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
 1 "physical id"s (chips)
 16 "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 : 8
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7

From lscpu:
Architecture:     x86_64
CPU op-mode(s):  32-bit, 64-bit
Byte Order:       Little Endian
CPU(s):           16
On-line CPU(s) list: 0-15
Epsylon Sp. z o.o. Sp. Komandytowa

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

**SPECrate2017_fp_base** = 36.4
**SPECrate2017_fp_peak** = 36.9

---

**Platform Notes (Continued)**

- Thread(s) per core: 2
- Core(s) per socket: 8
- Socket(s): 1
- NUMA node(s): 1
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
- Stepping: 4
- CPU MHz: 1801.000
- CPU max MHz: 1801.0000
- CPU min MHz: 800.0000
- BogoMIPS: 3600.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 11264K
- NUMA node0 CPU(s): 0-15
- 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 rdtsscp
  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 cat l3 invpcid_single
  intel_pt spec_ctrl ibpb_support tpr_shadow vmx flexpriority ept vpid fsgsbase
  tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid rtm cqm mpx rdt_a avx512f avx512dq
  rdseed adx smap cld flushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xgetbv1
  cqm_llc cqm_occupa llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts

/proc/cpuinfo cache data
  cache size: 11264 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
  node 0 size: 129708 MB
  node 0 free: 126082 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 130428632 KB
  HugePages_Total: 0
  Hugepagesize: 2048 KB

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

Epsylon Sp. z o.o. Sp. Komandytowa

ETERIO 115 RE1 (Intel Xeon Silver 4108, 1.80 GHz)

SPECraten2017_fp_base = 36.4
SPECraten2017_fp_peak = 36.9

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

Platform Notes (Continued)

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 Apr 23 17:37

SPEC is set to: /cpu2017.1.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda1 ext4 825G 79G 705G 11% /

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. 2.0b 02/26/2018
Memory:
8x Samsung M393A2G40EB2-CTD 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
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.

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

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 115 RE1 (Intel Xeon Silver 4108, 1.80 GHz)

**SPECrate2017_fp_base** = 36.4
**SPECrate2017_fp_peak** = 36.9

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

### Compiler Version Notes (Continued)

```
ic (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.
```

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

```
CC 511.povray_r(peak) 526.blender_r(peak)
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ic (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.
ic (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 115 RE1 (Intel Xeon Silver 4108, 1.80 GHz)

**SPECrater2017_fp_base = 36.4**

**SPECrater2017_fp_peak = 36.9**

---

**Compiler Version Notes (Continued)**

```plaintext
FC   507.cactuBSSN_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.

---

FC   554.roms_r(peak)

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

---

CC   521.wrf_r(base) 527.cam4_r(base)

ifort (IFORT) 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   521.wrf_r(peak) 527.cam4_r(peak)

ifort (IFORT) 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.
```

---

**CPU2017 License: 9081**

**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa

**Test Date:** Apr-2018

**Hardware Availability:** Sep-2017

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

**Software Availability:** Mar-2018
Epsilon Sp. z o.o. Sp. Komandytowa
eterio 115 RE1 (Intel Xeon Silver 4108, 1.80 GHz)

**SPECrate2017_fp_base** = 36.4
**SPECrate2017_fp_peak** = 36.9

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<td>Software Availability: Mar-2018</td>
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</table>

## 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_CASE_FLAG` `-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`

(Continued on next page)
### SPEC CPU2017 Floating Point Rate Result

Epsylon Sp. z o.o. Sp. Komandytowa

**eterio 115 RE1** (Intel Xeon Silver 4108, 1.80 GHz)

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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:** Apr-2018  
**Hardware Availability:** Sep-2017  
**Software Availability:** Mar-2018

### Base Optimization Flags (Continued)

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

Fortran benchmarks:
- `-xCORE-AVX512`  
- `-ipo`  
- `-03`  
- `-no-prec-div`  
- `-qopt-prefetch`

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

Fortran benchmarks:
- `-xCORE-AVX512`  
- `-ipo`  
- `-03`  
- `-no-prec-div`  
- `-qopt-prefetch`

### 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`
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 115 RE1 (Intel Xeon Silver 4108, 1.80 GHz)

**SPEC CPU2017 Floating Point Rate Result**

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>36.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
<td>36.9</td>
</tr>
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**CPU2017 License:** 9081  
**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa  
**Test Date:** Apr-2018  
**Hardware Availability:** Sep-2017  
**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa  
**Software Availability:** Mar-2018

---

**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

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**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)
Epsylon Sp. z o.o. Sp. Komandytowa  
eterio 115 RE1 (Intel Xeon Silver 4108, 1.80 GHz)  

**SPECrate2017_fp_base = 36.4**  
**SPECrate2017_fp_peak = 36.9**

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</tbody>
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## 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)
SPEC CPU2017 Floating Point Rate Result

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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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