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

**CPU2017 Integer Rate Result**

**CPU Name:** Intel Xeon Silver 4109T

**Max MHz.:** 3000

**Nominal:** 2000

**Enabled:** 16 cores, 2 chips, 2 threads/core

**Orderable:** 1.2 chips

**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

**Other:** None

**Memory:** 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R, running at 2400)

**Storage:** 1 x 960 GB SSD SATA III

**Other:** None

**OS:** Red Hat Enterprise Linux Server release 7.4 (Maipo) 3.10.0-693.21.1.el7.x86_64

**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 BIOSR0013 released Mar-2018

**File System:** ext4

**System State:** Run level 3 (multi-user)

**Base Pointers:** 64-bit

**Peak Pointers:** 32/64-bit

**Other:** jemalloc memory allocator library V5.0.1

---

**SPECrate2017_int_base = 71.0**

**SPECrate2017_int_peak = 73.9**
**SPEC CPU2017 Integer Rate Result**

Epsylon Sp. z o.o. Sp. Komandytowa

Epsylon Sp. z o.o. Sp. Komandytowa

**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>957</td>
<td>53.2</td>
<td>966</td>
<td>52.7</td>
<td>966</td>
<td>52.7</td>
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<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>720</td>
<td>62.9</td>
<td>717</td>
<td>63.2</td>
<td>725</td>
<td>62.5</td>
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<tr>
<td>505.mcf_r</td>
<td>32</td>
<td>583</td>
<td>88.7</td>
<td>584</td>
<td>88.6</td>
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<tr>
<td>520.omnetpp_r</td>
<td>32</td>
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<td>49.5</td>
<td>855</td>
<td>49.1</td>
<td>856</td>
<td>49.0</td>
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<tr>
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<td>446</td>
<td>75.8</td>
<td>445</td>
<td>76.0</td>
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<td>75.9</td>
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<tr>
<td>525.x264_r</td>
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<td>424</td>
<td>132</td>
<td>422</td>
<td>133</td>
<td>419</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>632</td>
<td>58.0</td>
<td>633</td>
<td>58.0</td>
<td>631</td>
<td>58.1</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>32</td>
<td>949</td>
<td>55.8</td>
<td>952</td>
<td>55.7</td>
<td>954</td>
<td>55.6</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>648</td>
<td>129</td>
<td>648</td>
<td>129</td>
<td>647</td>
<td>130</td>
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<tr>
<td>557.xz_r</td>
<td>32</td>
<td>647</td>
<td>53.5</td>
<td>646</td>
<td>53.5</td>
<td>646</td>
<td>53.5</td>
</tr>
</tbody>
</table>

**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 = "/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.

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

(Continued on next page)
**SPEC CPU2017 Integer Rate Result**

Epsylon Sp. z o.o. Sp. Komandytowa

**SPECrate2017_int_base = 71.0**

**SPECrate2017_int_peak = 73.9**

<table>
<thead>
<tr>
<th>CPU2017 License: 9081</th>
<th>Test Date: Mar-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by: Epsylon Sp. z o.o. Sp. Komandytowa</td>
<td>Software Availability: Mar-2018</td>
</tr>
</tbody>
</table>

**General Notes (Continued)**

runcpu command invoked through numactl i.e.:

```
numactl --interleave=all runcpu <etc>
```

ejemalloc:
configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;
sources available via jemalloc.net or https://github.com/jemalloc/jemalloc/releases

**Platform Notes**

BIOS Settings:
Intel(R) Hyper-Threading Tech = Enabled
CPU Power and Performance Policy = Performance
Intel(R) Turbo Boost Technology = Enabled
C1E = Disabled
Processor C6 = Disabled
IMC Interleaving = Auto
Sub_NUMA Cluster = Disabled
Set FAN Profile = Performance
Patrol Scrub = Disabled

Sysinfo program /cpu2017.1.0/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on SUT Thu Mar 29 20:19:42 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 4109T CPU @ 2.00GHz
  2 "physical id"s (chips)
  32 "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
physical 1: 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

(Continued on next page)
**SPEC CPU2017 Integer Rate Result**

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

**Evelio 210 RA1 (Intel Xeon Silver 4109T, 2.00 GHz)**

<table>
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**CPU2017 License:** 9081

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

**Test Date:** Mar-2018

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

**Hardware Availability:** Sep-2017

**Software Availability:** Mar-2018

**Platform Notes (Continued)**

| CPU(s):                | 32   |
| On-line CPU(s) list:   | 0-31 |
| Thread(s) per core:    | 2    |
| Core(s) per socket:    | 8    |
| Socket(s):             | 2    |
| NUMA node(s):          | 2    |
| Vendor ID:             | GenuineIntel |
| CPU family:            | 6    |
| Model:                 | 85   |
| Model name:            | Intel(R) Xeon(R) Silver 4109T CPU @ 2.00GHz |
| Stepping:              | 4    |
| CPU MHz:               | 1192.656 |
| CPU max MHz:           | 3000.0000 |
| CPU min MHz:           | 800.0000 |
| BogoMIPS:              | 4000.00 |
| Virtualization:        | VT-x |
| L1d cache:             | 32K  |
| L1i cache:             | 32K  |
| L2 cache:              | 1024K|
| L3 cache:              | 11264K|
| NUMA node0 CPU(s):     | 0-7,16-23 |
| NUMA nodel CPU(s):     | 8-15,24-31 |
| 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 aperfmperf eagerfpu nni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma cx16 xptr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpb cat_13 cpd_13 invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vmmi flexpriority ept vpid fsgbased 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_occupp LLC cqm mbm total cqm mbm local dtm thermal ida arat pln pts hwp hwp act_window hwp epp hwp pkg req |

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

| available: 2 nodes (0-1) |
| node 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23 |
| node 0 size: 195276 MB |
| node 0 free: 190319 MB |
| node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31 |
| node 1 size: 196608 MB |
| node 1 free: 192027 MB |

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 210 RA1 (Intel Xeon Silver 4109T, 2.00 GHz)

SPECrate2017_int_base = 71.0
SPECrate2017_int_peak = 73.9

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

Platform Notes (Continued)

node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 394686428 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
os-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.4 (Maipo)"
  ID="rhel"
  IDLIKE="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 28 14:20
SPEC is set to: /cpu2017.1.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda1 ext4 825G 68G 716G 9% /

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 Intel Corporation SE5C620.86B.00.01.0013.030920180427 03/09/2018
  Memory:
    24x Samsung M393A2G40EB2-CTD 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)
# SPEC CPU2017 Integer Rate Result

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

**ETERIO 210 RA1 (Intel Xeon Silver 4109T, 2.00 GHz)**

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
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<tbody>
<tr>
<td>71.0</td>
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</table>

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

## Compiler Version Notes

<table>
<thead>
<tr>
<th>CC</th>
<th>500.perlbench_r(base)</th>
<th>502.gcc_r(base)</th>
<th>505.mcf_r(base, peak)</th>
<th>525.x264_r(base, peak)</th>
<th>557.xz_r(base, peak)</th>
</tr>
</thead>
</table>
|     | icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
| CC  | 500.perlbench_r(peak) | 502.gcc_r(peak) |
|     | icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
| CXXC | 520.omnetpp_r(base) | 523.xalancbmk_r(base) | 531.deepsjeng_r(base) | 541.leela_r(base) |
|     | icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
| CXXC | 520.omnetpp_r(peak) | 523.xalancbmk_r(peak) | 531.deepsjeng_r(peak) | 541.leela_r(peak) |
|     | icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
| FC  | 548.exchange2_r(base, peak) |
|     | ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |

## Base Compiler Invocation

**C benchmarks:**  
cc

**C++ benchmarks:**  
icpc

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 210 RA1 (Intel Xeon Silver 4109T, 2.00 GHz)

SPECrate2017_int_base = 71.0
SPECrate2017_int_peak = 73.9

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

Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-W1, -z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-W1, -z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-W1, -z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

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

Fortran benchmarks:
- \texttt{-m64}

### Peak Compiler Invocation

C benchmarks:
- \texttt{icc}

C++ benchmarks:
- \texttt{icpc}

Fortran benchmarks:
- \texttt{ifort}

### Peak Portability Flags

500.perlbench\_r: -DSPEC\_LP64 -DSPEC\_LINUX\_X64
502.gcc\_r: -D\_FILE\_OFFSET\_BITS=64
505.mcf\_r: -DSPEC\_LP64
520.omnetpp\_r: -DSPEC\_LP64
523.xalancbmk\_r: -D\_FILE\_OFFSET\_BITS=64 -DSPEC\_LINUX
525.x264\_r: -DSPEC\_LP64
531.deepsjeng\_r: -DSPEC\_LP64
541.leela\_r: -DSPEC\_LP64
548.exchange2\_r: -DSPEC\_LP64
557.xz\_r: -DSPEC\_LP64

### Peak Optimization Flags

C benchmarks:

500.perlbench\_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo 
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib 
-ljemalloc

502.gcc\_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo 
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 
-L/usr/local/je5.0.1-32/lib -ljemalloc

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 210 RA1 (Intel Xeon Silver 4109T, 2.00 GHz)

SPECrate2017_int_base = 71.0
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CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Test Date: Mar-2018
Hardware Availability: Sep-2017
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa
Software Availability: Mar-2018

Peak Optimization Flags (Continued)

505.mcf_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc
525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc
557.xz_r: Same as 505.mcf_r

C++ benchmarks:
520.omnetpp_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc
531.deepsjeng_r: Same as 520.omnetpp_r
541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:

Peak Other Flags

C benchmarks (except as noted below):
-m64 -std=c11
502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):
-m64
523.xalancbmk_r: -m32

(Continued on next page)
| Epsylon Sp. z o.o. Sp. Komandytowa eterio 210 RA1 (Intel Xeon Silver 4109T, 2.00 GHz) | SPECrate2017_int_base = 71.0 |
| SPECrate2017_int_peak = 73.9 |
| CPU2017 License: 9081 | Test Date: Mar-2018 |
| Tested by: Epsylon Sp. z o.o. Sp. Komandytowa | Software Availability: Mar-2018 |

**Peak Other Flags (Continued)**

- Fortran benchmarks: `-m64`

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 2018-03-29 14:19:41-0400.  
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