Epsylon Sp. z o.o. Sp. Komandytowa

Epsilon 205 TE1 (Intel Xeon Silver 4208, 2.10 GHz)

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

Test Date: Oct-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

500.perlbench_r 32
502.gcc_r 32
505.mcf_r 32
520.omnetpp_r 32
523.xalancbmk_r 32
525.x264_r 32
531.deepsjeng_r 32
541.leela_r 32
548.exchange2_r 32
557.xz_r 32

SPECrate®2017_int_base = 81.3
SPECrate®2017_int_peak = 84.2

CPU Name: Intel Xeon Silver 4208
Max MHz: 3200
Nominal: 2100
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 (12 x 32 GB 2Rx4 PC4-2933V-R, running at 2400)
Storage: 1 x 960 GB SSD SATA III
Other: None

OS: Red Hat Enterprise Linux Server release 7.4 (Maipo)
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 BIOS 3.1 released Apr-2019
File System: ext4
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: --
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 205 TE1 (Intel Xeon Silver 4208, 2.10 GHz)

SPEC CPU®2017 Integer Rate Result

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**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>Benchmark Base</td>
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<tr>
<td>perlbench_r</td>
<td>32</td>
<td>814</td>
<td>62.6</td>
<td>812</td>
<td>62.7</td>
<td>811</td>
<td>62.8</td>
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<td>gcc_r</td>
<td>32</td>
<td>653</td>
<td>69.4</td>
<td>651</td>
<td>69.6</td>
<td>647</td>
<td>70.1</td>
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<td>mcf_r</td>
<td>32</td>
<td>451</td>
<td>115</td>
<td>32</td>
<td>585</td>
<td>77.4</td>
<td>710</td>
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<td>omnetpp_r</td>
<td>32</td>
<td>725</td>
<td>57.9</td>
<td>722</td>
<td>58.1</td>
<td>722</td>
<td>58.2</td>
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<tr>
<td>xalancbmk_r</td>
<td>32</td>
<td>338</td>
<td>99.9</td>
<td>337</td>
<td>100</td>
<td>336</td>
<td>101</td>
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<tr>
<td>x264_r</td>
<td>32</td>
<td>385</td>
<td>146</td>
<td>386</td>
<td>145</td>
<td>385</td>
<td>146</td>
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<tr>
<td>deepsjeng_r</td>
<td>32</td>
<td>563</td>
<td>65.1</td>
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<td>65.2</td>
<td>562</td>
<td>65.3</td>
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<td>leela_r</td>
<td>32</td>
<td>861</td>
<td>61.5</td>
<td>862</td>
<td>61.5</td>
<td>862</td>
<td>61.5</td>
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<tr>
<td>exchange2_r</td>
<td>32</td>
<td>588</td>
<td>143</td>
<td>589</td>
<td>142</td>
<td>588</td>
<td>143</td>
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<tr>
<td>xz_r</td>
<td>32</td>
<td>661</td>
<td>52.3</td>
<td>660</td>
<td>52.3</td>
<td>657</td>
<td>52.6</td>
</tr>
</tbody>
</table>

**Results**

- **SPECrate®2017_int_base = 81.3**
- **SPECrate®2017_int_peak = 84.2**

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 = "/cpu2017.1.5/lib/ia32:/cpu2017.1.5/lib/intel64:/cpu2017.1.5/je5.0.1-32:/cpu2017.1.5/je5.0.1-64"
```

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5

NA: 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)
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SPEC CPU® 2017 Integer Rate Result

SPECratenew_int_base = 81.3
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General Notes (Continued)

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

jemalloc:
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

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 /cpu2017.1.5/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on SUT Wed Oct  9 14:15:16 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 4208 CPU @ 2.10GHz
    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:

(Continued on next page)
## Platform Notes (Continued)

- **Architecture:** x86_64
- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **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 4208 CPU @ 2.10GHz
- **Stepping:** 7
- **CPU MHz:** 2101.000
- **CPU max MHz:** 2101.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4200.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 11264K
- **NUMA node0 CPU(s):** 0-7,16-23
- **NUMA node1 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 pdelgb rdtsscp lm constant_tsc 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 xtrm pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_13 cdp_13 invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vnumi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ersed psvc rdmsk rdt_a avx512f avx512dq rdsdisp adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaveopt xgetbv1 cqm _llc cqm_occupte _llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts

```bash
/proc/cpuinfo cache data
cache size : 11264 KB
```

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

```bash
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: 195229 MB
node 0 free: 190349 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
```

(Continued on next page)
## Platform Notes (Continued)

node 1 free: 191817 MB
node distances:
  node 0  1
  0: 10 21
  1: 21 10

From /proc/meminfo
MemTotal: 394638188 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
    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

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Oct 9 14:14

SPEC is set to: /cpu2017.1.5

Filesystem Type  Size  Used Avail Use% Mounted on
/dev/sda1  ext4   825G  124G  660G  16% /

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. 3.1 04/30/2019
Memory:

(Continued on next page)
## Platform Notes (Continued)

12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)

## Compiler Version Notes

<table>
<thead>
<tr>
<th>C</th>
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*eterio 205 TE1 (Intel Xeon Silver 4208, 2.10 GHz)*

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**Base Compiler Invocation**

- C benchmarks:
  - icc -m64 -std=c11

- C++ benchmarks:
  - icpc -m64

- Fortran benchmarks:
  - ifort -m64

**Compiler Version Notes (Continued)**

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C++

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Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
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C++

| 523.xalancbmk_r(peak) |

Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.1.144 Build 20181018
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C++

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Fortran

| 548.exchange2_r(base, peak) |

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---
SPEC CPU®2017 Integer Rate Result

Epsylon Sp. z o.o. Sp. Komandytowa

eterio 205 TE1 (Intel Xeon Silver 4208, 2.10 GHz)

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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:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-1qkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-1qkmalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-1qkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64 -std=c11


C++ benchmarks (except as noted below):
icpc -m64

(Continued on next page)
<table>
<thead>
<tr>
<th>Peak Compiler Invocation (Continued)</th>
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<tr>
<td>Fortran benchmarks:</td>
</tr>
<tr>
<td></td>
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<tr>
<td>ifort -m64</td>
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<tr>
<td>500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64</td>
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<tr>
<td>502.gcc_r: -D_FILE_OFFSET_BITS=64</td>
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<td>505.mcf_r: -DSPEC_LP64</td>
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<tr>
<td>500.perlbench_r: -Wl,-z,muldefs</td>
</tr>
<tr>
<td>-prof-gen(pass 1) -prof-use(pass 2) -ipo</td>
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<td>-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4</td>
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<tr>
<td>-fno-strict-overflow</td>
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<td>-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lqkmalloc</td>
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<td>-L/usr/local/lgplv5.0.1-32/lib -ljemalloc</td>
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</table>

### Peak Optimization Flags (Continued)

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:

-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

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:

http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-08-06.xml


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

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