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

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) 3.10.0-693.21.1.el7.x86_64
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 225 RE1 (Intel Xeon Silver 4208, 2.10 GHz)

SPECrate®2017_int_base = 81.4
SPECrate®2017_int_peak = 84.3

Results Table

<table>
<thead>
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<td>560</td>
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<td>557.xz</td>
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<td>660</td>
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<td>657</td>
<td>52.6</td>
</tr>
</tbody>
</table>

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)
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 9bcde8f2999c33d61f64985e45859ea9
running on SUT Fri Oct  4 15:37:38 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:
Epsylon Sp. z o.o. Sp. Komandytowa

cterio 225 RE1 (Intel Xeon Silver 4208, 2.10 GHz)

SPECrate®2017_int_base = 81.4
SPECrate®2017_int_peak = 84.3

CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Test Date: Oct-2019
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa
Hardware Availability: Apr-2019
Software Availability: Nov-2018

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: 2100.000
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 pdpe1gb rdtps
lem constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmpref eagerfpf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma
cx16 xtrp pdcm pcid dca ssse4_1 ssse4_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 vmi flexpriority ept vpid fsxgsbase
tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmq mpx rdt_a avx512f avx512dq
rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xgetbv1
cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_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: 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: 195230 MB
  node 0 free: 190424 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: 191746 MB
  node distances:

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

```
node  0  1  
0:  10  21
1:  21  10
```

From `/proc/meminfo`
- MemTotal: 394638492 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"
  - 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)

```
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 4 15:37
```

SPEC is set to: `/cpu2017.1.5`
- Filesystem     Type  Size  Used Avail Use% Mounted on
- /dev/sda1      ext4  825G   99G  685G  13% /

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:
  - 12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2400
## SPEC CPU®2017 Integer Rate Result

**Epsilon Sp. z o.o. Sp. Komandytowa**

Epsylon 225 RE1 (Intel Xeon Silver 4208, 2.10 GHz)

| SPECrate®2017_int_base = 81.4 |
| SPECrate®2017_int_peak = 84.3 |

- **CPU2017 License:** 9081
- **Test Sponsor:** Epsilon Sp. z o.o. Sp. Komandytowa
- **Test Date:** Oct-2019
- **Hardware Availability:** Apr-2019
- **Tested by:** Epsilon Sp. z o.o. Sp. Komandytowa
- **Software Availability:** Nov-2018

### Platform Notes (Continued)

(End of data from sysinfo program)

### Compiler Version Notes

<table>
<thead>
<tr>
<th>Language</th>
<th>Notes</th>
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<tbody>
<tr>
<td>C</td>
<td>502.gcc_r(peak)</td>
</tr>
<tr>
<td></td>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.1.144 Build 20181018 Copyright (C) 1985-2018 Intel Corporation. All rights reserved.</td>
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<td>500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak)</td>
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</tr>
<tr>
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<td>523.xalancbmk_r(peak)</td>
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**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

---

### Compiler Version Notes (Continued)

```plaintext
C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)  
    | 531.deepsjeng_r(base, peak) 541.leela_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.
```

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

```plaintext
C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)  
    | 531.deepsjeng_r(base, peak) 541.leela_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.
```

```plaintext
Fortran | 548.exchange2_r(base, peak)

Intel(R) Fortran 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.
```

---

### Base Compiler Invocation

**C benchmarks:**  
```bash
icc -m64 -std=c11
```

**C++ benchmarks:**  
```bash
icpc -m64
```

**Fortran benchmarks:**  
```bash
ifort -m64
```
SPEC CPU®2017 Integer Rate Result

Epsylon Sp. z o.o. Sp. Komandytowa
eterio 225 RE1 (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

SPECrate®2017_int_base = 81.4
SPECrate®2017_int_peak = 84.3

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
-lqkmalloc

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
-lqkmalloc

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

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)
### SPEC CPU®2017 Integer Rate Result

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

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**CPU2017 License:** 9081

**Test Date:** Oct-2019

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

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

**Hardware Availability:** Apr-2019

**Software Availability:** Nov-2018

### Peak Compiler Invocation (Continued)

523.xalancbmk_r: icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/ia32_lin

Fortran benchmarks:

```fortran
ifort -m64
```

### 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=4
- fno-strict-overflow
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
- lqkmalloc

502.gcc_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

505.mcf_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

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=4 -fno-alias
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
- lqkmalloc

(Continued on next page)
## SPEC CPU®2017 Integer Rate Result

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

**eterio 225 RE1 (Intel Xeon Silver 4208, 2.10 GHz)**

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</tr>
<tr>
<td>Software Availability:</td>
<td>Nov-2018</td>
</tr>
</tbody>
</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:


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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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