



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

CPU2017 License: 9081

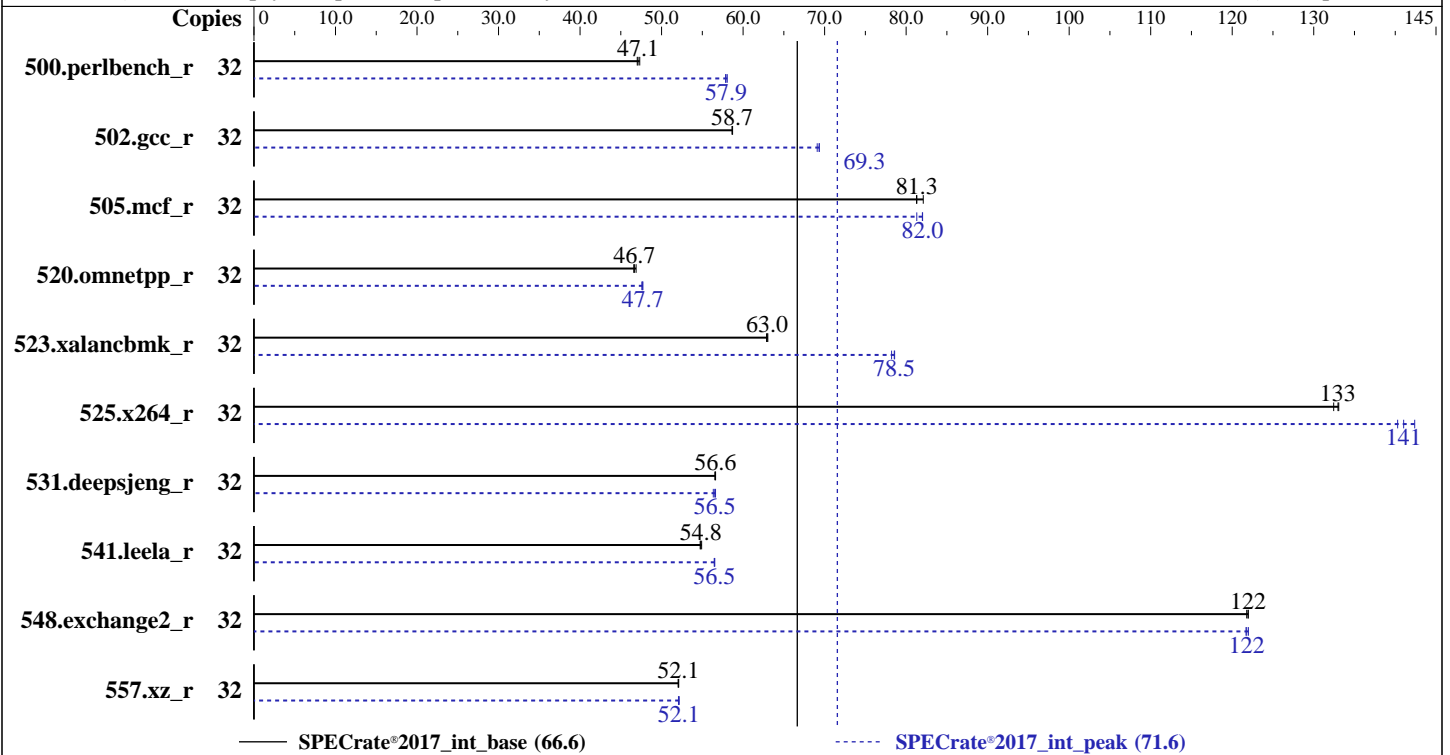
Test Sponsor: Epsilon Sp. z o.o. Sp. Komandytowa

Tested by: Epsilon Sp. z o.o. Sp. Komandytowa

Test Date: Oct-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2018



## Hardware

CPU Name: Intel Xeon E5-2620 v4  
 Max MHz: 3000  
 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: 256 KB I+D on chip per core  
 L3: 20 MB I+D on chip per chip  
 Other: None  
 Memory: 512 GB (16 x 32 GB 2Rx4 PC4-2666V-R, running at 2133)  
 Storage: 2 x 480 GB SSD configured as RAID1 volume  
 Other: None

## Software

OS: CentOS Linux release 7.5.1804 (Core)  
 3.10.0-862.14.4.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 BIOS 4E4C206G released Oct-2018  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other: jemalloc memory allocator library V5.0.1  
 Power Management: --



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

CPU2017 License: 9081

Test Sponsor: Epsilon Sp. z o.o. Sp. Komandytowa

Tested by: Epsilon Sp. z o.o. Sp. Komandytowa

Test Date: Oct-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2018

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	32	1084	47.0	<b><u>1081</u></b>	<b><u>47.1</u></b>	1076	47.3	32	881	57.9	877	58.1	<b><u>880</u></b>	<b><u>57.9</u></b>
502.gcc_r	32	772	58.7	772	58.7	<b><u>772</u></b>	<b><u>58.7</u></b>	32	656	69.1	653	69.3	<b><u>653</u></b>	<b><u>69.3</u></b>
505.mcf_r	32	<b><u>636</u></b>	<b><u>81.3</u></b>	630	82.1	636	81.3	32	630	82.0	<b><u>631</u></b>	<b><u>82.0</u></b>	636	81.3
520.omnetpp_r	32	901	46.6	896	46.9	<b><u>900</u></b>	<b><u>46.7</u></b>	32	880	47.7	<b><u>880</u></b>	<b><u>47.7</u></b>	882	47.6
523.xalancbmk_r	32	<b><u>537</u></b>	<b><u>63.0</u></b>	537	62.9	536	63.0	32	430	78.6	<b><u>430</u></b>	<b><u>78.5</u></b>	432	78.2
525.x264_r	32	421	133	<b><u>421</u></b>	<b><u>133</u></b>	423	132	32	399	140	<b><u>397</u></b>	<b><u>141</u></b>	394	142
531.deepsjeng_r	32	649	56.5	<b><u>648</u></b>	<b><u>56.6</u></b>	648	56.6	32	651	56.3	<b><u>649</u></b>	<b><u>56.5</u></b>	648	56.6
541.leela_r	32	965	54.9	968	54.7	<b><u>967</u></b>	<b><u>54.8</u></b>	32	<b><u>938</u></b>	<b><u>56.5</u></b>	938	56.5	937	56.5
548.exchange2_r	32	687	122	688	122	<b><u>688</u></b>	<b><u>122</u></b>	32	<b><u>688</u></b>	<b><u>122</u></b>	687	122	689	122
557.xz_r	32	664	52.0	663	52.1	<b><u>664</u></b>	<b><u>52.1</u></b>	32	<b><u>663</u></b>	<b><u>52.1</u></b>	664	52.1	663	52.2

SPECrate®2017\_int\_base = **66.6**

SPECrate®2017\_int\_peak = **71.6**

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 = "/cpu2017.1.0/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 CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

**CPU2017 License:** 9081

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

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

**Test Date:** Oct-2018

**Hardware Availability:** Sep-2017

**Software Availability:** Sep-2018

## General Notes (Continued)

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

jemalloc:  
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 Default + NUMA = Enabled

Sysinfo program /cpu2017.1.0/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f  
running on SUT Wed Oct 31 10:58:14 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) CPU E5-2620 v4 @ 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:  
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: 79

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

CPU2017 License: 9081

Test Sponsor: Epsilon Sp. z o.o. Sp. Komandytowa

Tested by: Epsilon Sp. z o.o. Sp. Komandytowa

Test Date: Oct-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2018

## Platform Notes (Continued)

```

Model name: Intel(R) Xeon(R) CPU E5-2620 v4 @ 2.10GHz
Stepping: 1
CPU MHz: 1199.707
CPU max MHz: 3000.0000
CPU min MHz: 1200.0000
BogoMIPS: 4190.41
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 20480K
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 rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf
eagerfpu pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg 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 epb cat_l3 cdp_l3 intel_ppin intel_pt ssbd ibrs
ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2
smep bmi2 erms invpcid rtm cqm rdt_a rdseed adx smap xsaveopt cqm_llc cqm_occup_llc
cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts spec_ctrl intel_stibp flush_lld

```

```

/proc/cpuinfo cache data
cache size : 20480 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: 262037 MB
node 0 free: 255992 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 262144 MB
node 1 free: 256268 MB
node distances:
node  0  1
  0:  10  21
  1:  21  10

```

```

From /proc/meminfo
MemTotal: 528089208 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

```

```

From /etc/*release* /etc/*version*
centos-release: CentOS Linux release 7.5.1804 (Core)

```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

CPU2017 License: 9081

Test Sponsor: Epsilon Sp. z o.o. Sp. Komandytowa

Tested by: Epsilon Sp. z o.o. Sp. Komandytowa

Test Date: Oct-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2018

## Platform Notes (Continued)

centos-release-upstream: Derived from Red Hat Enterprise Linux 7.5 (Source)

os-release:

NAME="CentOS Linux"

VERSION="7 (Core)"

ID="centos"

ID\_LIKE="rhel fedora"

VERSION\_ID="7"

PRETTY\_NAME="CentOS Linux 7 (Core)"

ANSI\_COLOR="0;31"

CPE\_NAME="cpe:/o:centos:centos:7"

redhat-release: CentOS Linux release 7.5.1804 (Core)

system-release: CentOS Linux release 7.5.1804 (Core)

system-release-cpe: cpe:/o:centos:centos:7

uname -a:

Linux SUT 3.10.0-862.14.4.el7.x86\_64 #1 SMP Wed Sep 26 15:12:11 UTC 2018 x86\_64 x86\_64 x86\_64 GNU/Linux

run-level 3 Oct 31 10:56

SPEC is set to: /cpu2017.1.0

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/centos-root	xfs	450G	18G	433G	4%	/

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. 4E4C206G 10/15/2018

Memory:

16x Samsung M393A4K40CB2-CTD 32 GB 2 rank 2667, configured at 2133

(End of data from sysinfo program)

## Compiler Version Notes

```
=====
C      | 500.perlbench_r(base, peak) 502.gcc_r(base, peak) 505.mcf_r(base,
      | peak) 525.x264_r(base, peak) 557.xz_r(base, peak)
=====
```

icc (ICC) 18.0.0 20170811

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

```
=====
C++   | 520.omnetpp_r(base, peak) 523.xalanbmk_r(base, peak)
=====
```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

CPU2017 License: 9081

Test Sponsor: Epsilon Sp. z o.o. Sp. Komandytowa

Tested by: Epsilon Sp. z o.o. Sp. Komandytowa

Test Date: Oct-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2018

## Compiler Version Notes (Continued)

| 531.deepsjeng\_r(base, peak) 541.leela\_r(base, peak)

icpc (ICC) 18.0.0 20170811

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

=====  
Fortran | 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:

icc

C++ benchmarks:

icpc

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:

-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

CPU2017 License: 9081

Test Sponsor: Epsilon Sp. z o.o. Sp. Komandytowa

Tested by: Epsilon Sp. z o.o. Sp. Komandytowa

Test Date: Oct-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2018

## Base Optimization Flags (Continued)

C benchmarks (continued):

`-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

C++ benchmarks:

`-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`

`-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

Fortran benchmarks:

`-Wl,-z,muldefs -xCORE-AVX2 -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`

Fortran benchmarks:

`-m64`

## Peak Compiler Invocation

C benchmarks:

`icc`

C++ benchmarks:

`icpc`

Fortran benchmarks:

`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`

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

CPU2017 License: 9081

Test Sponsor: Epsilon Sp. z o.o. Sp. Komandytowa

Tested by: Epsilon Sp. z o.o. Sp. Komandytowa

Test Date: Oct-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2018

## Peak Portability Flags (Continued)

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: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX2 -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  
-w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3  
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf\_r: -w1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib  
-ljemalloc

525.x264\_r: -w1,-z,muldefs -xCORE-AVX2 -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: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3  
-L/usr/local/je5.0.1-64/lib -ljemalloc

523.xalancbmk\_r: -L/opt/intel/compilers\_and\_libraries\_2018/linux/lib/ia32  
-w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3  
-L/usr/local/je5.0.1-32/lib -ljemalloc

(Continued on next page)





# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Epsilon Sp. z o.o. Sp. Komandytowa  
eterio 220 RF0 Type3 (Intel Xeon E5-2620 v4, 2.10 GHz)

SPECrate®2017\_int\_base = 66.6

SPECrate®2017\_int\_peak = 71.6

CPU2017 License: 9081

Test Sponsor: Epsilon Sp. z o.o. Sp. Komandytowa

Tested by: Epsilon Sp. z o.o. Sp. Komandytowa

Test Date: Oct-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2018

## Peak Optimization Flags (Continued)

531.deepsjeng\_r: Same as 520.omnetpp\_r

541.leela\_r: Same as 520.omnetpp\_r

Fortran benchmarks:

```
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

## 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

Fortran benchmarks:

```
-m64
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.html>

<http://www.spec.org/cpu2017/flags/Epsilon-Platform-Flags-RevA-Mar-2018-For-Supermicro-Platform.2018-11-20.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.xml>

<http://www.spec.org/cpu2017/flags/Epsilon-Platform-Flags-RevA-Mar-2018-For-Supermicro-Platform.2018-11-20.xml>

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEC CPU®2017 v1.0.2 on 2018-10-31 10:58:13-0400.

Report generated on 2021-03-29 17:34:51 by CPU2017 PDF formatter v6442.

Originally published on 2018-11-27.