## SPEC CPU®2017 Integer Rate Result

**Supermicro**

SuperStorage 6029P-E1CR24H  
(X11DSC+, Intel Xeon Gold 6242R)

### CPU2017 License: 001176  
Test Sponsor: Supermicro  
Tested by: Supermicro  

<table>
<thead>
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<th>Test Date: Aug-2020</th>
<th>Hardware Availability: Feb-2020</th>
<th>Software Availability: Apr-2020</th>
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</thead>
</table>

**SPECrate®2017_int_base = 293**  
**SPECrate®2017_int_peak = 304**

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Gold 6242R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz:</td>
<td>4100</td>
</tr>
<tr>
<td>Nominal:</td>
<td>3100</td>
</tr>
<tr>
<td>Enabled:</td>
<td>40 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>35.75 MB I+D on chip per chip</td>
</tr>
</tbody>
</table>

**Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)  
**Storage:** 1 x 200 GB SATA III SSD  
**Other:** None

### Software

<table>
<thead>
<tr>
<th>OS:</th>
<th>Red Hat Enterprise Linux release 8.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernel:</td>
<td>4.18.0-147.el8.x86_64</td>
</tr>
</tbody>
</table>

**Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux;  
Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux

**Firmware:** Version 3.2 released Oct-2019  
**File System:** xfs  
**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:** BIOS set to prefer performance at the cost of additional power usage

### SPECrate®2017_int_base (293)  
### SPECrate®2017_int_peak (304)

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<td>505.mcf_r</td>
<td>80</td>
<td>285</td>
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<tr>
<td>520.omnetpp_r</td>
<td>80</td>
<td>494</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>80</td>
<td>393</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>80</td>
<td>607</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
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<td>234</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>80</td>
<td>220</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>80</td>
<td>559</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>80</td>
<td>172</td>
</tr>
</tbody>
</table>

**Power Management:** BIOS set to prefer performance at the cost of additional power usage.
**SPEC CPU®2017 Integer Rate Result**

Copyright 2017-2020 Standard Performance Evaluation Corporation

### Supermicro

SuperStorage 6029P-E1CR24H  
(X11DSC+, Intel Xeon Gold 6242R)

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<th>Seconds</th>
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<td>374</td>
<td>561</td>
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<tr>
<td>557.xz_r</td>
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<td>503</td>
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<td>491</td>
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</tbody>
</table>

- **SPECrate®2017_int_base** = 293
- **SPECrate®2017_int_peak** = 304

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux. The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux.

### 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"

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = 
  "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"

MALLOC_CONF = "retain:true"
```
Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6242R)

SPEC CPU®2017 Integer Rate Result

SPECrate®2017_int_base = 293
SPECrate®2017_int_peak = 304

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

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.
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
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Maximum Performance
SNC = Enable
Stale AtoS = Disable
IMC Interleaving = 1-way Interleave
Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on RHEL81-01 Fri Aug 14 23:10:15 2020

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) Gold 6242R CPU @ 3.10GHz
2 "physical id"s (chips)
80 "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 : 20
siblings : 40

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

**Supermicro**

**SuperStorage 6029P-E1CR24H**

(X11DSC+, Intel Xeon Gold 6242R)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_peak</th>
<th>304</th>
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<tbody>
<tr>
<td>SPECrate®2017_int_base</td>
<td>293</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 001176  
**Test Date:** Aug-2020  
**Test Sponsor:** Supermicro  
**Hardware Availability:** Feb-2020  
**Tested by:** Supermicro  
**Software Availability:** Apr-2020

---

#### Platform Notes (Continued)

```
physical 0: cores 0 1 2 3 5 6 8 10 12 13 16 17 18 19 20 21 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 21 28 29
```

From `lscpu`:

- **Architecture:** x86_64
- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **CPU(s):** 80
- **On-line CPU(s) list:** 0-79
- **Thread(s) per core:** 2
- **Core(s) per socket:** 20
- **Socket(s):** 2
- **NUMA node(s):** 4
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Gold 6242R CPU @ 3.10GHz
- **Stepping:** 7
- **CPU MHz:** 3800.078
- **CPU max MHz:** 4100.0000
- **CPU min MHz:** 1200.0000
- **BogoMIPS:** 6200.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 36608K
- **NUMA node0 CPU(s):** 0-3,6,7,10-12,16,40-43,46,47,50-52,56
- **NUMA node1 CPU(s):** 4,5,8,9,13-15,17-19,44,45,48,49,53-55,57-59
- **NUMA node2 CPU(s):** 20-23,27-29,33-35,60-63,67-69,73-75
- **NUMA node3 CPU(s):** 24-26,30-32,36-39,64-66,70-72,76-79
- **Flags:** fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
- **cache size:** 36608 KB

From `numactl --hardware` WARNING: a numactl 'node' might or might not correspond to a

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

physical chip.

<table>
<thead>
<tr>
<th>Node</th>
<th>CPUs</th>
<th>Size</th>
<th>Free</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 1 2 3 6 7 10 11 12 16 40 41 42 43 46 47 50 51 52 56</td>
<td>95349 MB</td>
<td>95137 MB</td>
</tr>
<tr>
<td>1</td>
<td>4 5 8 9 13 14 15 17 18 19 44 45 48 49 53 54 55 57 58 59</td>
<td>96763 MB</td>
<td>96590 MB</td>
</tr>
<tr>
<td>2</td>
<td>20 21 22 23 27 28 29 33 34 35 60 61 62 63 67 68 69 73 74 75</td>
<td>96763 MB</td>
<td>96254 MB</td>
</tr>
<tr>
<td>3</td>
<td>24 25 26 30 31 32 36 37 38 39 64 65 66 70 71 72 76 77 78 79</td>
<td>96738 MB</td>
<td>96523 MB</td>
</tr>
</tbody>
</table>

node distances:

- 0: 10 11 21 21
- 1: 11 10 21 21
- 2: 21 21 10 11
- 3: 21 21 11 10

From /proc/meminfo

- MemTotal: 394869796 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

- os-release:
  - NAME="Red Hat Enterprise Linux"
  - VERSION="8.1 (Ootpa)"
  - ID="rhel"
  - ID_LIKE="fedora"
  - VERSION_ID="8.1"
  - PLATFORM_ID="platform:el8"
  - PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
  - ANSI_COLOR="0;31"

- redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
- system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
- system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:ga

uname -a:

```
Linux RHEL81-01 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019 x86_64
x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

- CVE-2018-3620 (L1 Terminal Fault): Not affected

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

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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro
Test Date: Aug-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Platform Notes (Continued)

- Microarchitectural Data Sampling: Not affected
- CVE-2017-5754 (Meltdown): Not affected
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapgs barriers and __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Aug 14 22:57

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 185G 25G 160G 14% /

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 3.2 10/18/2019
Vendor: pm_2019-10-08_18:11:34
Product: ppm_2019-10-08_18:11:37
Serial: ps_2019-10-08_18:11:38

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.
Memory:
12x NO DIMM NO DIMM
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from syssinfo program)

Compiler Version Notes

==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
          | 525.x264_r(base, peak) 557.xz_r(base)
------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1

(Continued on next page)
Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6242R)

**SPEC CPU®2017 Integer Rate Result**

**Compiler Version Notes (Continued)**

NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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<table>
<thead>
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<th>C</th>
<th>500.perlbench_r(peak) 557.xz_r(peak)</th>
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</table>
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
<table>
<thead>
<tr>
<th>C</th>
<th>502.gcc_r(peak)</th>
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Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen
Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
| C   | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
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<tr>
<td></td>
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Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
<table>
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(Continued on next page)
Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6242R)

SPECrates®
SPECrates®

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Aug-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Compiler Version Notes (Continued)

<table>
<thead>
<tr>
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C | 500.perlbench_r(peak) 557.xz_r(peak) |
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<tbody>
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<tr>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) |
<table>
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Fortran | 548.exchange2_r(base, peak) |
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<th></th>
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<tr>
<td>Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)</td>
</tr>
<tr>
<td>64, Version 19.1.1.217 Build 20200306</td>
</tr>
<tr>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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</tbody>
</table>

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
# SPEC CPU®2017 Integer Rate Result

**Supermicro**  
SuperStorage 6029P-E1CR24H  
(X11DSC+, Intel Xeon Gold 6242R)  

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<table>
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<tr>
<td>Test Sponsor</td>
<td>Supermicro</td>
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<tr>
<td>Tested by</td>
<td>Supermicro</td>
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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:**
- `-m64 -qnextgen -std=c11`
- `-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs`
- `-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops`
- `-fuse-ld=gold -qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**C++ benchmarks:**
- `-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
- `-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse`
- `-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**Fortran benchmarks:**
- `-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs`
- `-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4`
- `-nostandard-realloc-lhs -align array32byte -auto`
- `-mbranches-within-32B-boundaries`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

## Peak Compiler Invocation

**C benchmarks:**
- `icc`

(Continued on next page)
Peak Compiler Invocation (Continued)

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
520.omnetpp_r: -DSPEC_LP64
523.xalanchbk_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

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/ia32_lin
-std=gnu89
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qnextgen -fuse-ld=gold
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc32-5.0.1/lib
-ljemalloc

505.mcf_r: basepeak = yes
SPEC CPU®2017 Integer Rate Result

Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+ , Intel Xeon Gold 6242R)

SPECrate®2017_int_base = 293
SPECrate®2017_int_peak = 304

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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Aug-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Peak Optimization Flags (Continued)

525.x264_r: -m64 -qnextgen -std=c11
-W1,-plugin-opt=-x86-branches-within-32B-boundaries
-W1,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math
-fuse-ld=gold -qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

557.xz_r: -W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:

520.omnetpp_r: basepeak = yes
523.xalancbmk_r: basepeak = yes
531.deepsjeng_r: basepeak = yes
541.leela_r: basepeak = yes

Fortran benchmarks:

548.exchange2_r: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revG.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revG.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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