## SPEC CPU®2017 Integer Rate Result

### Supermicro
SuperServer 2029TP-HC1R (X11DPT-PS, Intel Xeon Gold 5218R)

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base =</th>
<th>SPECrate®2017_int_peak =</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>204</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

| CPU2017 License: 001176 | Test Date: Feb-2020 |
| Test Sponsor: Supermicro | Hardware Availability: Feb-2020 |
| Tested by: Supermicro | Software Availability: May-2019 |

### Hardware

<table>
<thead>
<tr>
<th>CPU Name: Intel Xeon Gold 5218R</th>
<th>OS: Red Hat Enterprise Linux Server release 7.6 (Maipo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz: 4000</td>
<td>3.10.0-957.el7.x86_64</td>
</tr>
<tr>
<td>Nominal: 2100</td>
<td>Compiler: version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux</td>
</tr>
<tr>
<td>Enabled: 40 cores, 2 chips, 2 threads/core</td>
<td>Parallel: No</td>
</tr>
<tr>
<td>Orderable: 1.2 chips</td>
<td>Firmware: version 3.2 released Oct-2019</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>L3: 27.5 MB I+D on chip per chip</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Other: None</td>
<td>Peak Pointers: Not Applicable</td>
</tr>
<tr>
<td>Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2933V-R, running at 2666)</td>
<td>Other: None</td>
</tr>
<tr>
<td>Storage: 2 x 480 GB SAS SSD, RAID 1</td>
<td>Power Management: BIOS set to max performance at the cost of additional power usage</td>
</tr>
<tr>
<td>Other: None</td>
<td></td>
</tr>
</tbody>
</table>

### Software

| Compiler: C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux |
|---------------------------------|--------------------------------------------------|
| Parallel: No                   | Firmware: version 3.2 released Oct-2019 |
| File System: xfs                | System State: Run level 3 (multi-user) |
| Base Pointers: 64-bit           | Peak Pointers: Not Applicable |
| Other: None                     | Other: None |
| Power Management: BIOS set to max performance at the cost of additional power usage |
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SPEC CPU®2017 Integer Rate Result
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SPECrate®2017_int_base = 204
SPECrate®2017_int_peak = Not Run

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>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500.perlbench_r</td>
<td>80</td>
<td>853</td>
<td>149</td>
<td>855</td>
<td>149</td>
<td>864</td>
<td>147</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>80</td>
<td>662</td>
<td>171</td>
<td>659</td>
<td>172</td>
<td>668</td>
<td>170</td>
</tr>
<tr>
<td>505.mcf_r</td>
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<td>505</td>
<td>256</td>
<td>503</td>
<td>257</td>
<td>505</td>
<td>256</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>80</td>
<td>757</td>
<td>139</td>
<td>759</td>
<td>138</td>
<td>757</td>
<td>139</td>
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<tr>
<td>523.xalancbmk_r</td>
<td>80</td>
<td>377</td>
<td>224</td>
<td>377</td>
<td>224</td>
<td>376</td>
<td>225</td>
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<tr>
<td>525.x264_r</td>
<td>80</td>
<td>327</td>
<td>428</td>
<td>329</td>
<td>426</td>
<td>330</td>
<td>425</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>80</td>
<td>541</td>
<td>170</td>
<td>552</td>
<td>166</td>
<td>557</td>
<td>165</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>80</td>
<td>826</td>
<td>160</td>
<td>815</td>
<td>163</td>
<td>826</td>
<td>160</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>80</td>
<td>526</td>
<td>398</td>
<td>528</td>
<td>397</td>
<td>526</td>
<td>398</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>80</td>
<td>648</td>
<td>133</td>
<td>645</td>
<td>134</td>
<td>644</td>
<td>134</td>
</tr>
</tbody>
</table>

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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"

Environment Variables Notes

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

LD_LIBRARY_PATH =
"/home/speccpu-1.1.0/lib/intel64:/home/speccpu-1.1.0/lib/ia32:/home/speccpu-1.1.0/je5.0.1-32"

General Notes

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)

(Continued on next page)
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SPECrate®2017_int_base = 204
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CPU2017 License: 001176
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Tested by: Supermicro

Test Date: Feb-2020
Hardware Availability: Feb-2020
Software Availability: May-2019

General Notes (Continued)

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

Platform Notes

BIOS Settings:
Monitor/Mwait = Disable
Intel Virtualization Technology = Disable
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Maximum Performance
Enhanced Halt Stat (C1E) = Disable
SNC = Enable
Stale Atos = Enable
LLC Dead Line Alloc = Disable
IMC Interleaving = 1-way Interleave
ADDDC Sparing = Disable
Patrol Scrub = Disable

Sysinfo program /home/spec/cpu2017/Docs/config.html#sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbble6e46a485a0011
running on 200-131.pnet Wed Feb 12 11:36:11 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 5218R CPU @ 2.10GHz
  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
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit

(Continued on next page)
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Platform Notes (Continued)

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 5218R 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: 28160K
NUMA node0 CPU(s): 0-2,5,6,10-12,15,16,40-42,45,46,50-52,55,56
NUMA node1 CPU(s): 3,4,7-9,13,14,17-19,43,44,47-49,53,54,57-59
NUMA node2 CPU(s): 20-22,25,26,30-32,35,36,60-62,65,66,70-72,75,76
NUMA node3 CPU(s): 23,24,27-29,33,34,37-39,63,64,67-69,73,74,77-79
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
aperfmpref eagerfpu pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movpd popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 intel_pni intel_pt ssbd
mba ibrs ibpb stibp ibrsenhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase
tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq
rdseed adx smap clflushopt clwb avx512cd avx512bw avx512v1 xsaveopt xsavec xgetbv1
cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pku ospke
avx512_vnni spec_ctrl intel_stibp flush_l1d arch_capabilities

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 5 6 10 11 12 15 16 40 41 42 45 46 50 51 52 55 56
node 0 size: 96932 MB
node 0 free: 94436 MB
node 1 cpus: 3 4 7 8 9 13 14 17 18 19 43 44 47 48 49 53 54 57 58 59
node 1 size: 98304 MB
node 1 free: 95888 MB

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

- **node 2**: cpus: 20 21 22 25 26 30 31 32 35 36 60 61 62 65 66 70 71 72 75 76  
  size: 98304 MB  
  free: 95950 MB  
- **node 3**: cpus: 23 24 27 28 29 33 34 37 38 39 63 64 67 68 69 73 74 77 78 79  
  size: 98304 MB  
  free: 95937 MB  
- **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: 394826148 kB  
- HugePages_Total: 0  
- Hugepagesize: 2048 kB

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

- os-release:
  - NAME="Red Hat Enterprise Linux Server"  
  - VERSION="7.6 (Maipo)"  
  - ID="rhel"  
  - ID_LIKE="fedora"  
  - VARIANT="Server"  
  - VARIANT_ID="server"  
  - VERSION_ID="7.6"  
  - PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"

- redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)  
- system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)  

- uname -a:  
  Linux 200-131.pnet 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018 x86_64  
  x86_64 x86_64 GNU/Linux

**Kernel self-reported vulnerability status:**

- **CVE-2018-3620 (L1 Terminal Fault)**: Not affected  
- **Microarchitectural Data Sampling**: No status reported  
- **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: Load fences, __user pointer sanitization  
- **CVE-2017-5715 (Spectre variant 2)**: Mitigation: Enhanced IBRS

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Platform Notes (Continued)

run-level 3 Feb 12 11:35

SPEC is set to: /home/speccpu-1.1.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 380G 24G 356G 7% /home

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 3.2 10/30/2019
Vendor: Supermicro1
Product: 12345678
Serial: 87654321

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:
4x NO DIMM NO DIMM
12x SK Hynix HMA84GR7JJR4N-WM 32 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)

Compiler Version Notes

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

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

============================================================================================================
C++ | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
============================================================================================================

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

============================================================================================================
Fortran | 548.exchange2_r(base)
============================================================================================================

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)

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Compiler Version Notes (Continued)

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Compiler Invocation

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=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

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Base Optimization Flags (Continued)

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_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

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-revF.2020-01-09.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revF.2020-01-09.xml

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

Tested with SPEC CPU®2017 v1.1.0 on 2020-02-12 14:36:11-0500.
Report generated on 2020-03-17 16:14:14 by CPU2017 PDF formatter v6255.
Originally published on 2020-03-17.