## SPEC CPU®2017 Integer Rate Result

**Supermicro**  
SuperServer 5019C-L  
(X11SCL-IF, Intel Xeon E-2226G)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
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<th>SPECrate®2017_int_peak</th>
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<td>xz_r</td>
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### Hardware
- **CPU Name:** Intel Xeon E-2226G  
  - **Max MHz:** 4700  
  - **Nominal:** 3400  
  - **Enabled:** 6 cores, 1 chip  
  - **Orderable:** 1 chip  
  - **Cache L1:** 32 KB I + 32 KB D on chip per core  
  - **L2:** 256 KB I+D on chip per core  
  - **L3:** 12 MB I+D on chip per chip  
  - **Other:** None  
- **Memory:** 64 GB (2 x 32 GB 2Rx8 PC4-2666V-E)  
- **Storage:** 1 x 4 TB SATA III 7200 RPM  
- **Other:** None

### Software
- **OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64)  
  - **Kernel:** 4.12.14-94.41-default  
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler for Linux  
- **Parallel:** No  
- **Firmware:** Version 1.0b released May-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:** --
SPEC CPU®2017 Integer Rate Result

Supermicro
SuperServer 5019C-L
(X11SCL-IF, Intel Xeon E-2226G)

SPECRate®2017_int_base = 40.5
SPECRate®2017_int_peak = 41.9

Results Table

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<td>20.9</td>
<td>310</td>
<td>20.9</td>
<td>310</td>
</tr>
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</table>

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

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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"

General Notes

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

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.


Platform Notes

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbble6e46a485a0011
running on linux-cq1s Thu Oct 31 17:24:10 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) E-2226G CPU @ 3.40GHz
  1 "physical id"s (chips)
  6 "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 : 6
  siblings : 6
  physical 0: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 6
On-line CPU(s) list: 0-5
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2226G CPU @ 3.40GHz
Stepping: 10

(Continued on next page)
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Platform Notes (Continued)

CPU MHz: 3400.000
CPU max MHz: 4700.0000
CPU min MHz: 800.0000
BogoMIPS: 6816.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-5
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single pti ssbd ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp flush_l1d

/proc/cpuinfo cache data
  cache size : 12288 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 1 nodes (0)
  node 0 cpus: 0 1 2 3 4 5
  node 0 size: 64048 MB
  node 0 free: 63507 MB
  node distances:
    node 0
      0: 10

From /proc/meminfo
  MemTotal: 65585588 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
  SUSE Linux Enterprise Server 12 SP4

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 4

(Continued on next page)
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Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Oct-2019
Hardware Availability: May-2019
Software Availability: May-2019

Platform Notes (Continued)

# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

os-release:
  NAME="SLES"
  VERSION="12-SP4"
  VERSION_ID="12.4"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:
  x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Mitigation: PTE Inversion; VMX: conditional
  cache flushes, SMT disabled
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled
  via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted
  Speculation, IBPB, IBRS_FW

run-level 3 Oct 31 17:22

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda4      xfs  3.6T  130G  3.5T   4% /home

From /sys/devices/virtual/dmi/id
  BIOS: American Megatrends Inc. 1.0b 05/24/2019
  Vendor: Supermicro
  Product: Super Server
  Serial: 0123456789

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:
    2x Samsung M391A4G43MB1-CTD 32 GB 2 rank 2667

(End of data from sysinfo program)
Supermicro
SuperServer 5019C-L
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CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Oct-2019
Hardware Availability: May-2019

Tested by: Supermicro
Software Availability: May-2019

Compiler Version Notes

==============================================================================
| C | 502.gcc_r(peak) 
|---------------
| Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version 
| 19.0.4.227 Build 20190416 
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved. 
|-----------------------------------------------

==============================================================================
| C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 
| | 525.x264_r(base, peak) 557.xz_r(base, peak) 
| 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. 
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| | 525.x264_r(base, peak) 557.xz_r(base, peak) 
| 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++ | 523.xalancbmk_r(peak) 
|---------------
| Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 
| 19.0.4.227 Build 20190416 
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved. 
|-----------------------------------------------

==============================================================================
| 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, 

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Tested by: Supermicro
Hardware Availability: May-2019
Software Availability: May-2019

Compiler Version Notes (Continued)

Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------

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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------

Fortran | 548.exchange2_r(base, peak)

Intel(R) Fortran 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.

------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64

(Continued on next page)
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**Base Portability Flags (Continued)**

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

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -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

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -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

**Peak Compiler Invocation**

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


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

523.xalancbmk_r: icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin

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

Fortran benchmarks:

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-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4  
-fno-strict-overflow  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc

502.gcc_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4  
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -fno-alias  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64 -lqkmalloc

557.xz_r: -Wl,-z,muldefs -xCORE-AVX2 -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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<th>Software Availability</th>
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<tr>
<td>Supermicro</td>
<td>May-2019</td>
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</tbody>
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## Peak Optimization Flags (Continued)

**C++ benchmarks:**

- **520.omnetpp_r:**  
  -Wl,-z,muldefs -xCORE-AVX2 -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

- **523.xalancbmk_r:**  
  -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
  -xCORE-AVX2 -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:**

- **548.exchange2_r:** basepeak = yes

---

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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