Supermicro
SuperServer 5019C-M4L (X11SCL-LN4F, Intel Xeon E-2144G)

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

Test Date: Oct-2018
Hardware Availability: Nov-2018
Software Availability: Mar-2018

SPECrate2017_int_base = 30.1
SPECrate2017_int_peak = 32.2

CPU Name: Intel Xeon E-2144G
Max MHz.: 4500
Nominal: 3600
Enabled: 4 cores, 1 chip, 2 threads/core
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: 8 MB I+D on chip per chip
Other: None
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
Storage: 1 x 2 TB SATA III 7200 RPM
Other: None

OS: SUSE Linux Enterprise Server 12 SP3
Kernel 4.4.114-94.11-default
Compiler: C/C++: Version 18.0.2.199 of Intel C/C++
Compiler for Linux:
Fortran: Version 18.0.2.199 of Intel Fortran
Compiler for Linux:
Parallel: No
Firmware: Supermicro BIOS version 1.0 released Sep-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
**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>
<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>500.perlbench_r</td>
<td>8</td>
<td>514</td>
<td>24.8</td>
<td>512</td>
<td>24.9</td>
<td>517</td>
<td>24.6</td>
<td>8</td>
<td>426</td>
<td>29.9</td>
<td>425</td>
<td>29.9</td>
<td>426</td>
<td>29.9</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>8</td>
<td>401</td>
<td>28.3</td>
<td>400</td>
<td>28.3</td>
<td>401</td>
<td>28.3</td>
<td>8</td>
<td>330</td>
<td>34.4</td>
<td>329</td>
<td>34.4</td>
<td>329</td>
<td>34.4</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>8</td>
<td>349</td>
<td>37.0</td>
<td>358</td>
<td>36.1</td>
<td>363</td>
<td>35.6</td>
<td>8</td>
<td>349</td>
<td>37.0</td>
<td>358</td>
<td>36.1</td>
<td>363</td>
<td>35.6</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>8</td>
<td>618</td>
<td>17.0</td>
<td>619</td>
<td>17.0</td>
<td>622</td>
<td>16.9</td>
<td>8</td>
<td>618</td>
<td>17.0</td>
<td>619</td>
<td>17.0</td>
<td>622</td>
<td>16.9</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>8</td>
<td>292</td>
<td>28.9</td>
<td>292</td>
<td>28.9</td>
<td>292</td>
<td>28.9</td>
<td>8</td>
<td>299</td>
<td>36.8</td>
<td>230</td>
<td>36.7</td>
<td>232</td>
<td>36.4</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>8</td>
<td>221</td>
<td>63.3</td>
<td>220</td>
<td>63.7</td>
<td>214</td>
<td>65.5</td>
<td>8</td>
<td>209</td>
<td>67.1</td>
<td>208</td>
<td>67.3</td>
<td>209</td>
<td>67.1</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>8</td>
<td>327</td>
<td>28.0</td>
<td>331</td>
<td>27.7</td>
<td>334</td>
<td>27.5</td>
<td>8</td>
<td>327</td>
<td>28.0</td>
<td>331</td>
<td>27.7</td>
<td>334</td>
<td>27.5</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>8</td>
<td>528</td>
<td>25.1</td>
<td>528</td>
<td>25.1</td>
<td>528</td>
<td>25.1</td>
<td>8</td>
<td>528</td>
<td>25.1</td>
<td>528</td>
<td>25.1</td>
<td>528</td>
<td>25.1</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>8</td>
<td>356</td>
<td>58.8</td>
<td>356</td>
<td>58.8</td>
<td>356</td>
<td>58.9</td>
<td>8</td>
<td>356</td>
<td>58.8</td>
<td>356</td>
<td>58.8</td>
<td>356</td>
<td>58.9</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>8</td>
<td>422</td>
<td>20.5</td>
<td>461</td>
<td>18.8</td>
<td>463</td>
<td>18.7</td>
<td>8</td>
<td>422</td>
<td>20.5</td>
<td>461</td>
<td>18.8</td>
<td>463</td>
<td>18.7</td>
</tr>
</tbody>
</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"

**General Notes**

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

```
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32/:/home/cpu2017/lib/intel64/:/home/cpu2017/je5.0.1-32/:/home/cpu2017/je5.0.1-64"
```

Binaries compiled on a system with 1x Intel Core i7-6700K 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
```

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.

(Continued on next page)
General Notes (Continued)

jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on linux-9m9c Fri Oct 12 03:05:08 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) E-2144G CPU @ 3.60GHz
    1 "physical id"s (chips)
    8 "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 : 4
    siblings : 8
    physical 0: cores 0 1 2 3

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 8
  On-line CPU(s) list: 0-7
  Thread(s) per core: 2
  Core(s) per socket: 4
  Socket(s): 1
  NUMA node(s): 1
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 158
  Model name: Intel(R) Xeon(R) E-2144G CPU @ 3.60GHz
  Stepping: 10
  CPU MHz: 4080.837
  CPU max MHz: 4500.0000
  CPU min MHz: 800.0000
  BogoMIPS: 7200.00
  Virtualization: VT-x
  L1d cache: 32K
  L1i cache: 32K

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro
SuperServer 5019C-M4L (X11SCL-LN4F, Intel Xeon E-2144G)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.1</td>
<td>32.2</td>
</tr>
</tbody>
</table>

CPU2017 License: 001176
Test Date: Oct-2018
Test Sponsor: Supermicro
Hardware Availability: Nov-2018
Tested by: Supermicro
Software Availability: Mar-2018

Platform Notes (Continued)

L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-7
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dtsc 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
aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtrm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsse save avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single lpi nts
dtherm hwp_notif hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl retoline
kaiser tpr_shadow vnmi fsexploit ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
bmi2 erms invpcid rtm mpx rdseed adx xsave opt crflushopt xsavepref xsaveopt xgetbw

/proc/cpuinfo cache data
  cache size: 8192 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 6 7
  node 0 size: 64151 MB
  node 0 free: 63647 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 65690984 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
  SUSE Linux Enterprise Server 12 SP3

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 3
    # 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-SP3"
    VERSION_ID="12.3"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
    ID="sles"

(Continued on next page)
Supermicro
SuperServer 5019C-M4L (X11SCL-LN4F, Intel Xeon E-2144G)

<table>
<thead>
<tr>
<th>SPEC CPU2017 Integer Rate Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPECrate2017_int_base</strong> = 30.1</td>
</tr>
<tr>
<td><strong>SPECrate2017_int_peak</strong> = 32.2</td>
</tr>
</tbody>
</table>

CPU2017 License: 001176
Test Sponsor: Supermicro
Hardware Availability: Nov-2018
Test Date: Oct-2018
Software Availability: Mar-2018
Tested by: Supermicro

Platform Notes (Continued)

```
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
    Linux linux-9m9c 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)
x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Oct 12 03:02
SPEC is set to: /home/cpu2017
    Filesystem   Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   1.8T  123G  1.7T   7% /home

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. 1.0 09/19/2018
  Memory:
    4x Micron 18ADF2G72AZ-2G6H1R 16 GB 2 rank 2667

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
     557.xz_r(base)
==============================================================================
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
CC  500.perlbench_r(peak) 502.gcc_r(peak) 505.mcf_r(peak) 525.x264_r(peak)
     557.xz_r(peak)
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
     541.leela_r(base)
icpc (ICC) 18.0.2 20180210
(Continued on next page)
```
Compiler Version Notes (Continued)

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

==============================================================================
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
541.leela_r(peak)

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC 548.exchange2_r(base)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC 548.exchange2_r(peak)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 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.perlbuch_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

(Continued on next page)
## SPEC CPU2017 Integer Rate Result

**Supermicro**  
SuperServer 5019C-M4L (X11SCL-LN4F, Intel Xeon E-2144G)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>001176</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Oct-2018</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Nov-2018</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base** = 30.1  
**SPECrate2017_int_peak** = 32.2

---

### Base Portability Flags (Continued)

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=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  
-L/usr/local/je5.0.1-64/lib -ljemalloc

---

### Peak Compiler Invocation

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

502.gcc_r:icc -m32 -std=c11 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

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

523.xalancbmk_r:icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

**Fortran benchmarks:**  
ifort -m64

---

### Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64

(Continued on next page)
Peak Portability Flags (Continued)

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=3
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc

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=3
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

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=3
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes
Supermicro
SuperServer 5019C-M4L (X11SCL-LN4F, Intel Xeon E-2144G)

| SPECrate2017_int_base = 30.1 |
| SPECrate2017_int_peak = 32.2 |

CPU2017 License: 001176
Test Date: Oct-2018
Test Sponsor: Supermicro
Hardware Availability: Nov-2018
Tested by: Supermicro
Software Availability: Mar-2018

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:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml

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

SPEC is a registered trademark 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.