Supermicro
SuperServer 5019P-MT (X11SPI-TF, Intel Xeon Silver 4112)

SPECrate2017_int_base = 21.9
SPECrate2017_int_peak = 23.1

Hardware
CPU Name: Intel Xeon Silver 4112
Max MHz.: 3000
Nominal: 2600
Enabled: 4 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 8.25 MB I+D on chip per chip
Other: None
Memory: 192 GB (6 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)
Storage: 1 x 200 GB SATA III SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 12 SP3 (x86_64)
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 2.1 released Jun-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>
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<td>520.omnetpp_r</td>
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<td>541.leela_r</td>
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<td><strong>18.1</strong></td>
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<tr>
<td>548.exchange2_r</td>
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<td><strong>40.8</strong></td>
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<td>557.xz_r</td>
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<td><strong>567</strong></td>
<td><strong>15.2</strong></td>
<td>567</td>
<td>15.2</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base = 21.9**

**SPECrate2017_int_peak = 23.1**

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.
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

BIOS Settings:
LLC prefetch = Enable
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Maximum Performance
Hardware P-state = Out of Band Mode
XPT Prefetch = Enable
Stale AtoS = Enable
LLC dead line alloc = Disable
Patrol Scrub = Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-cyyj Sun Oct  7 07:07:02 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) Silver 4112 CPU @ 2.60GHz
  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 1 2 4 5

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

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro
SuperServer 5019P-MT (X11SPI-TF, Intel Xeon Silver 4112)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>21.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>23.1</td>
</tr>
</tbody>
</table>

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro
Test Date: Oct-2018
Hardware Availability: Jul-2017
Software Availability: Mar-2018

Platform Notes (Continued)

Model: 85
Model name: Intel(R) Xeon(R) Silver 4112 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 2600.003
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
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 dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good ntopology nonstop_tsc
aperfmperf eagerfpu pni pclmulqdq dtes64 monitor 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 ida arat epb invpcl single pln pts
dtherm hwlp_epp intel_pt rsb_ctxsw spec_ctrl rtbshadow vnmi flexpriority ept vpid fsdise base tsc_adjust bni hle avx2 smep bmi2 erms invpcid rtm
cqm mpux avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
gxsaveopt xsaves xcxsave xgetbv1 cqm_llc cqm_occup_llc pku ospke

From /proc/cpuinfo cache data
cache size : 8448 KB

Warning: a numactl 'node' might or might not correspond to a physical chip.

From /proc/meminfo
MemTotal: 196689748 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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.
Supermicro
SuperServer 5019P-MT (X11SPI-TF, Intel Xeon Silver 4142)

SPEC CPU2017 Integer Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECrate2017_int_base = 21.9
SPECrate2017_int_peak = 23.1

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

Platform Notes (Continued)

```
os-release:
    NAME="SLES"
    VERSION="12-SP3"
    VERSION_ID="12.3"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp3"
```

```
uname -a:
    Linux linux-cyyj 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
```

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: Barriers
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

```
run-level 3 Oct 7 06:51
SPEC is set to: /home/cpu2017
```

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   145G   45G  100G  31% /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. 2.1 06/14/2018
Memory:
    2x NO DIMM NO DIMM
    6x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2400
```

(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.
```

(Continued on next page)
### Compiler Version Notes (Continued)

<table>
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<tr>
<th>CC</th>
<th>500.perlb benchmark r(peak)</th>
<th>502.gcc_r(peak)</th>
<th>505.mcf_r(peak)</th>
<th>525.x264_r(peak)</th>
<th>557.xz_r(peak)</th>
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</thead>
<tbody>
<tr>
<td>icc  (ICC)</td>
<td>18.0.2 20180210</td>
<td>Copyright (C) 1985-2018 Intel Corporation. All rights reserved.</td>
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<table>
<thead>
<tr>
<th>CXXC</th>
<th>520.omnetpp_r(base)</th>
<th>523.xalancbmk_r(base)</th>
<th>531.deepsjeng_r(base)</th>
<th>541.leela_r(base)</th>
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</thead>
<tbody>
<tr>
<td>icpc (ICC)</td>
<td>18.0.2 20180210</td>
<td>Copyright (C) 1985-2018 Intel Corporation. All rights reserved.</td>
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<table>
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<th>548.exchange2_r(base)</th>
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<tbody>
<tr>
<td>ifort (IFORT)</td>
<td>18.0.2 20180210</td>
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<tr>
<td>ifort (IFORT)</td>
<td>18.0.2 20180210</td>
</tr>
</tbody>
</table>

### Base Compiler Invocation

**C benchmarks:**
```bash
icc -m64 -std=c11
```

**C++ benchmarks:**
```bash
icpc -m64
```
**SPEC CPU2017 Integer Rate Result**

**Supermicro**
SuperServer 5019P-MT (X11SPi-TF, Intel Xeon Silver 4112)  
SPECrate\text{2017\_int\_peak} = 23.1  
SPECrate\text{2017\_int\_base} = 21.9

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>Test Date</th>
<th>Test Sponsor</th>
<th>Hardware Availability</th>
<th>Tested by</th>
<th>Software Availability</th>
</tr>
</thead>
</table>

**Base Compiler Invocation (Continued)**

Fortran benchmarks:  
ifort -m64

**Base Portability Flags**

- 500.perlbcmr_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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:  
-W1, -z, muldefs -xCORE\_AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:  
-W1, -z, muldefs -xCORE\_AVX512 -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

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

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
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-AVX512 -03 -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-AVX512 -03 -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-AVX512 -03 -no-prec-div -qopt-mem-layout-trans=3
-fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: basepeak = yes

(Continued on next page)
Supermicro
SuperServer 5019P-MT (X11SPi-TF, Intel Xeon Silver 4112)

SPECrate2017_int_base = 21.9
SPECrate2017_int_peak = 23.1

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

Peak Optimization Flags (Continued)

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-64/lib -ljemalloc

541.leela_r: Same as 531.deepsjeng_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:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SKL-revD.xml

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