## CPU2017 Floating Point Rate Result

### Copyright 2017-2018 Standard Performance Evaluation Corporation

**Supermicro**

**SuperServer 5019P-MT (X11SPi-TF, Intel Xeon Silver 4114T)**

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Supermicro</th>
</tr>
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<tbody>
<tr>
<td>Test Date:</td>
<td>Oct-2018</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jul-2017</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2018</td>
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**SPECrate2017_fp_base = 50.1**

**SPECrate2017_fp_peak = 51.6**

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<tr>
<th>Specified Application</th>
<th>SPECrate2017_fp_base</th>
<th>SPECrate2017_fp_peak</th>
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<tr>
<td>503.bwaves_r</td>
<td>51.6</td>
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<tr>
<td>507.cactuBSSN_r</td>
<td>50.1</td>
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<td>519.blm_r</td>
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<td>521.wrf_r</td>
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<td>526.blender_r</td>
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<td>549.fotonik3d_r</td>
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</tr>
<tr>
<td>554.roms_r</td>
<td>50.1</td>
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</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Silver 4114T
- **Max MHz.:** 3000
- **Nominal:** 2200
- **Enabled:** 10 cores, 1 chip, 2 threads/core
- **Orderable:** 1 chip
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 1 MB I+D on chip per core
- **Cache L3:** 13.75 MB I+D on chip per core
- **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:** 64-bit
- **Other:** None
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Supermicro
SuperServer 5019P-MT (X11SPI-TF, Intel Xeon Silver 4114T)

SPECrate2017_fp_base = 50.1
SPECrate2017_fp_peak = 51.6

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<td>527.cam4_r</td>
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</tbody>
</table>

SPECrate2017_fp_base = 50.1
SPECrate2017_fp_peak = 51.6

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/jen5.0.1-32:/home/cpu2017/jen5.0.1-64"

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)

(Continued on next page)
Supermicro
SuperServer 5019P-MT (X11SPi-TF, Intel Xeon Silver 4114T)

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

Test Date: Oct-2018
Hardware Availability: Jul-2017
Software Availability: Mar-2018

General Notes (Continued)
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

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 Thu Oct 25 02:40:48 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 4114T CPU @ 2.20GHz
1 "physical id"s (chips)
20 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 20
On-line CPU(s) list: 0-19
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6

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

- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Silver 4114T CPU @ 2.20GHz
- **Stepping:** 4
- **CPU MHz:** 2200.001
- **BogoMIPS:** 4400.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 14080K
- **NUMA node0 CPU(s):** 0-19
- **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 xtopology 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 hwp_epp intel_pt rsb_ctxsw spec_ctrl retspec_shadow vmm vsx priority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 2ms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaves opt xsaveopt xsave cqm_llc cqm occupancy llc pkup ospe

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 8 9 10 11 12 13 14 15 16 17 18 19
- **node 0 size:** 192078 MB
- **node 0 free:** 175853 MB
- **node distances:**

From /proc/meminfo

```
MemTotal: 196688068 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

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

```
SUSE-release:
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.

(Continued on next page)
## SPEC CPU2017 Floating Point Rate Result

### Platform Notes (Continued)

```bash
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 24 15:15

SPEC is set to: /home/cpu2017
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda3      xfs   145G   66G   79G  46% /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 519.llm_r(base) 538.imagick_r(base, peak) 544.nab_r(base, peak)
```

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

---

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

CC  519.lbm_r(peak)
-----------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

-----------------------------------------------
CXXC 508.namd_r(base) 510.parest_r(base, peak)
-----------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

-----------------------------------------------
CXXC 508.namd_r(peak)
-----------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

-----------------------------------------------
CC  511.povray_r(base) 526.blender_r(base, peak)
-----------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.
iccc (ICC) 18.0.2 20180210
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

-----------------------------------------------
FC  507.cactuBSSN_r(base, peak)
-----------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.
iccc (ICC) 18.0.2 20180210
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

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**Supermicro**  
SuperServer 5019P-MT (X11SPI-TF, Intel Xeon Silver 4114T)  

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<thead>
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<th>001176</th>
<th>Test Date:</th>
<th>Oct-2018</th>
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<td>Hardware Availability:</td>
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<td>Supermicro</td>
<td>Software Availability:</td>
<td>Mar-2018</td>
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**SPECrate2017_fp_base** = 50.1  
**SPECrate2017_fp_peak** = 51.6

### Compiler Version Notes (Continued)

```plaintext
---
FC 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)
```

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

```plaintext
---
FC 554.roms_r(peak)
```

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

```plaintext
---
CC 521.wrf_r(base) 527.cam4_r(base)
```

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

```plaintext
---
CC 521.wrf_r(peak) 527.cam4_r(peak)
```

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

(Continued on next page)
Supermicro
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CPU2017 License: 001176
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Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.roms_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

 Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

(Continued on next page)
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| CPU2017 License | 001176 | Test Date: | Oct-2018 |
| Test Sponsor    | Supermicro | Hardware Availability: | Jul-2017 |
| Tested by       | Supermicro | Software Availability: | Mar-2018 |

| SPECrate2017_fp_base | 50.1 |
| SPECrate2017_fp_peak | 51.6 |

**Base Optimization Flags (Continued)**

Benchmarks using both C and C++:
- `xCORE-AVX2`
- `-ipo`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`
- `-qopt-mem-layout-trans=3`

Benchmarks using Fortran, C, and C++:
- `xCORE-AVX2`
- `-ipo`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`
- `-qopt-mem-layout-trans=3`
- `-auto`
- `-nostandard-realloc-lhs`

### Peak Compiler Invocation

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

**C++ benchmarks:**
```
icpc -m64
```

**Fortran benchmarks:**
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using both C and C++:
```
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

**C benchmarks:**
```
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
```

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

519.lbm_r (continued):
-qopt-mem-layout-trans=3

538.imagick_r -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

544.nab_r: Same as 538.imagick_r

C++ benchmarks:

508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

510.parest_r -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -auto
-nostandard-realloc-lhs

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both C and C++:

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

526.blender_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
### SPEC CPU2017 Floating Point Rate Result

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SuperServer 5019P-MT (X11SPI-TF, Intel Xeon Silver 4114T)  

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

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.  

Tested with SPEC CPU2017 v1.0.5 on 2018-10-24 14:40:47-0400.  