## SPEC® CPU2017 Floating Point Rate Result

**Supermicro**

SuperStorage 5049P-E1CR45H (X11SPL-F, Intel Xeon Silver 4114)

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

### Hardware

- **CPU Name:** Intel Xeon Silver 4114  
- **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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**SPECrate2017_fp_base = 49.6**  
**SPECrate2017_fp_peak = 51.2**

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**Copies (51.2)**

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**SPECrate2017_fp_base (49.6)**

---

**SPECrate2017_fp_peak (51.2)**
SPEC CPU2017 Floating Point Rate Result

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Supermicro
SuperStorage 5049P-E1CR45H (X11SPL-F, Intel Xeon Silver 4114)

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

Results Table

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</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)

(Continued on next page)
Supermicro
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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 4114 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

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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
SDDC Plus One = Disable
ADDDC Sparing = Disable
Patrol Scrub = Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-52ma Tue Oct 9 02:42:40 2018

Test Sponsor: Supermicro
Test Date: Oct-2018
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Software Availability: Mar-2018

Tested by: Supermicro

(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

### Platform Notes (Continued)

- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
- **Stepping:** 4
- **CPU MHz:** 2200.010
- **BogoMIPS:** 4400.02
- **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 nopl nonstop_tsc aperf mp xsave lgDT xsaveopt xsavec x STREAM mmmtcpr m33 msa msc msr xsave peer_sma sse3 cx16 xtpr pdcm pcid sse4_1 mcm vt-d sc svm x2apic movbe popcnt tsc_deadline_timer aes xsave x salv f16c rdrand lahf_lm abm 3dmovdqa rbfcqf ndx 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 invpd_single pln pts dtherm hwlp epp intel_pt rsb c t xsw spec c trl ret poline kaiser tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  erms invpcid rtm cqm  mp x avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt x savec xgetbtn cqm llc cqm_occup llc pku ospke

```
/proc/cpuinfo cache data  
cache size : 14080 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 8 9 10 11 12 13 14 15 16 17 18 19
- **node 0 size:** 192078 MB
- **node 0 free:** 177766 MB
- **node distances:**
  - **node 0:** 10

From /proc/meminfo

- **MemTotal:** 196687880 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**

(Continued on next page)
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**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.

```plaintext
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"
```

```plaintext
uname -a:
Linux linux-52ma 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 8 15:25

SPEC is set to: /home/cpu2017

```plaintext
Filesystem   Type Size  Used Avail Use% Mounted on
/dev/sda4    xfs  145G  47G   98G  33% /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 06/15/2018
- 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**

```plaintext
CC  519.ibm_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)
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icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
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CXXC 508.namd_r(peak)
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icpc (ICC) 18.0.2 20180210
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CC  511.povray_r(base) 526.blender_r(base, peak)
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icc (ICC) 18.0.2 20180210
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Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

(Continued on next page)
### Base Compiler Invocation

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

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

Fortran benchmarks:
```bash
ifort -m64
```

(Continued on next page)
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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.cactusBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_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

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

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

Benchmarks using both C and C++:
-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

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:

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>519.lbm_r</td>
<td><code>prof-gen(pass 1)</code> -prof-use(pass 2)</td>
</tr>
<tr>
<td></td>
<td><code>-ipo</code> -xCORE-AVX2 -O3</td>
</tr>
<tr>
<td></td>
<td><code>-no-prec-div</code> -qopt-prefetch</td>
</tr>
<tr>
<td></td>
<td><code>-ffinite-math-only</code> -qopt-mem-layout-trans=3</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td><code>-xCORE-AVX2 -ipo -O3</code></td>
</tr>
<tr>
<td></td>
<td><code>-no-prec-div</code> -qopt-prefetch</td>
</tr>
<tr>
<td></td>
<td><code>-ffinite-math-only</code> -qopt-mem-layout-trans=3</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>Same as 538.imagick_r</td>
</tr>
</tbody>
</table>

**C++ benchmarks:**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>508.namd_r</td>
<td><code>prof-gen(pass 1)</code> -prof-use(pass 2)</td>
</tr>
<tr>
<td></td>
<td><code>-ipo</code> -xCORE-AVX2 -O3</td>
</tr>
<tr>
<td></td>
<td><code>-no-prec-div</code> -qopt-prefetch</td>
</tr>
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<tr>
<td></td>
<td><code>-auto</code> -nostandard-realloc-lhs</td>
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</table>

**Fortran benchmarks:**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td><code>basepeak = yes</code></td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td><code>-xCORE-AVX2 -ipo -O3</code></td>
</tr>
<tr>
<td></td>
<td><code>-no-prec-div</code> -qopt-prefetch</td>
</tr>
<tr>
<td></td>
<td><code>-ffinite-math-only</code> -qopt-mem-layout-trans=3 -auto</td>
</tr>
<tr>
<td></td>
<td><code>-nostandard-realloc-lhs</code></td>
</tr>
<tr>
<td>554.roms_r</td>
<td><code>prof-gen(pass 1)</code> -prof-use(pass 2)</td>
</tr>
<tr>
<td></td>
<td><code>-ipo</code> -xCORE-AVX2 -O3</td>
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**Benchmarks using both Fortran and C:**

<table>
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<tbody>
<tr>
<td><code>prof-gen(pass 1)</code> -prof-use(pass 2)</td>
</tr>
<tr>
<td><code>-ipo</code> -xCORE-AVX2 -O3</td>
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<td><code>-auto</code> -nostandard-realloc-lhs</td>
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**Benchmarks using both C and C++:**

<table>
<thead>
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<th>Flags</th>
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<tbody>
<tr>
<td><code>prof-gen(pass 1)</code> -prof-use(pass 2)</td>
</tr>
<tr>
<td><code>-ipo</code> -xCORE-AVX2 -O3</td>
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<tr>
<td><code>-no-prec-div</code> -qopt-prefetch</td>
</tr>
<tr>
<td><code>-ffinite-math-only</code> -qopt-mem-layout-trans=3</td>
</tr>
</tbody>
</table>

**Benchmarks using Fortran, C, and C++:**

<table>
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<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-xCORE-AVX2 -ipo -O3</code></td>
</tr>
<tr>
<td><code>-no-prec-div</code> -qopt-prefetch</td>
</tr>
<tr>
<td><code>-ffinite-math-only</code></td>
</tr>
</tbody>
</table>
# SPEC CPU2017 Floating Point Rate Result

**Supermicro**  
SuperStorage 5049P-E1CR45H (X11SPL-F, Intel Xeon Silver 4114)  

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>49.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
<td>51.2</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 |

## Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

```bash
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

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 2018-10-08 14:42:40-0400.  
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