**Supermicro**

SuperStorage 5029P-E1CTR12L (X11SPH-nCTF, Intel Xeon Silver 4114)

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base = 46.9</th>
<th>SPECrate2017_fp_peak = 47.2</th>
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<tbody>
<tr>
<td><strong>CPU2017 License:</strong> 001176</td>
<td><strong>Test Date:</strong> Jun-2018</td>
</tr>
<tr>
<td><strong>Test Sponsor:</strong> Supermicro</td>
<td><strong>Hardware Availability:</strong> Jul-2017</td>
</tr>
<tr>
<td><strong>Tested by:</strong> Supermicro</td>
<td><strong>Software Availability:</strong> Mar-2018</td>
</tr>
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<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
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<tbody>
<tr>
<td>CPU Name: Intel Xeon Silver 4114</td>
<td>OS: SUSE Linux Enterprise Server 12 SP3 (x86_64)</td>
</tr>
<tr>
<td>Max MHz.: 3000</td>
<td>Kernel 4.4.114-94.11-default</td>
</tr>
<tr>
<td>Nominal: 2200</td>
<td>Compiler: C/C++: Version 18.0.2.199 of Intel C/C++</td>
</tr>
<tr>
<td>Enabled: 10 cores, 1 chip, 2 threads/core</td>
<td>Compiler for Linux;</td>
</tr>
<tr>
<td>Orderable: 1 chip</td>
<td>Fortran: Version 18.0.2.199 of Intel Fortran</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>Compiler for Linux</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td>Parallel: No</td>
</tr>
<tr>
<td>L3: 13.75 MB I+D on chip per chip</td>
<td>Firmware: Supermicro BIOS version 2.1 released Jun-2018</td>
</tr>
<tr>
<td>Other: None</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>Memory: 192 GB (6 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Storage: 1 x 2 TB NVMe SSD</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Other: None</td>
<td>Peak Pointers: 64-bit</td>
</tr>
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## SPEC CPU2017 Floating Point Rate Result

**Supermicro**  
SuperStorage 5029P-E1CTR12L (X11SPH-nCTF, Intel Xeon Silver 4114)  

**SPECrate2017_fp_base =** 46.9  
**SPECrate2017_fp_peak =** 47.2

---

### Results Table

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<td>1341</td>
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<td>1382</td>
<td>23.0</td>
</tr>
</tbody>
</table>

**SPECrate2017_fp_base =** 46.9  
**SPECrate2017_fp_peak =** 47.2

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
```

runcpu command invoked through numactl i.e.:
```
numactl --interleave=all runcpu <etc>
```

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
General Notes (Continued)

is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (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

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
- SNC = Enable
- XPT Prefetch = Enable
- Stale AtoS = Enable
- LLC dead line alloc = Disable
- IMC Interleaving = 1-way Interleave
- SDDC Plus One = Disable
- ADDDC Sparing = Disable
- Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bce091c0f
running on linux-liai Fri Jun 22 04:16:20 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 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

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

**Supermicro**

SuperStorage 5029P-E1CTR12L (X11SPH-nCTF, Intel Xeon Silver 4114)

**SPECrate2017_fp_base** = 46.9  
**SPECrate2017_fp_peak** = 47.2

<table>
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<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
<td>CPU2017 License</td>
<td>001176</td>
</tr>
<tr>
<td>Test Sponsor</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Tested by</td>
<td>Supermicro</td>
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<tr>
<td>Hardware Availability</td>
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<tr>
<td>Test Date</td>
<td>Jun-2018</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

- Thread(s) per core: 2
- Core(s) per socket: 10
- Socket(s): 1
- NUMA node(s): 1
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
- Stepping: 4
- CPU MHz: 2199.986
- BogoMIPS: 4399.97
- 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 mca cmov pat pse36 clflush dts acp lmsic 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 aperfmpref eagerfpu nni 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 3nowprefetch ida arat epb invpcid_single pln pts dtherm hwp_epp intel_pt rsb_cntxsw spec_ctrl retpoline kaiser tpr_shadow vmmi flexpriority etp vpd fsbgbase tsc_adjust bmi1 hle avx2 smep bmi2 ews invpcid rtm cqm mxav xav512f avx512dq rseed adx smap ciflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xgetbv1 cqm_11c cqm_occup_11c 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: 192824 MB
- node 0 free: 176425 MB
- node distances:
- node 0: 0
- 0: 10

From /proc/meminfo
- MemTotal: 197452140 KB
- HugePages_Total: 0
- Hugepagesize: 2048 KB

/usr/bin/lsb_release -d

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

Supermicro
SuperStorage 5029P-E1CTR12L (X11SPH-nCTF, Intel Xeon Silver 4114)

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Test Date: Jun-2018
Tested by: Supermicro
Hardware Availability: Jul-2017
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Platform Notes (Continued)

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

uname -a:
Linux linux-liai 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 Jun 21 16:57

SPEC is set to: /home/cpu2017
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p4 xfs   1.8T   57G  1.8T   4% /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 06/11/2018
Memory:
2x NO DIMM NO DIMM
6x Samsung M393A4K40CB2-CTD 32 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  519.lbm_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)
Supermicro
SuperStorage 5029P-E1CTR12L (X11SPH-nCTF, Intel Xeon Silver 4114)

SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

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CPU2017 License: 001176
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Tested by: Supermicro
Test Date: Jun-2018
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Compiler Version Notes (Continued)

---------------------------------------------------------------------
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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.
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CXXC 508.namd_r(peak)
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Supermicro
SuperStorage 5029P-E1CTR12L (X11SPH-nCTF , Intel Xeon Silver 4114)

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

Compiler Version Notes (Continued)

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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FC  503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)
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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
SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro
SuperStorage 5029P-E1CTR12L (X11SPH-nCTF, Intel Xeon Silver 4114)

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CPU2017 License: 001176
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Tested by: Supermicro
Software Availability: Mar-2018

Base Compiler Invocation (Continued)

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

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.ibm_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)
Supermicro
SuperStorage 5029P-E1CTR12L (X11SPH-nCTF, Intel Xeon Silver 4114)

<table>
<thead>
<tr>
<th>SPEC CPU2017 Floating Point Rate Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_base = 46.9</td>
</tr>
<tr>
<td>SPECrate2017_fp_peak = 47.2</td>
</tr>
</tbody>
</table>

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

### 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)

519.1bm_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

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

549.fotonik3d_r: Same as 503.bwaves_r

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

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

Supermicro
SuperStorage 5029P-E1CTR12L (X11SPH-nCTF, Intel Xeon Silver 4114)

 SPECrate2017_fp_base = 46.9
 SPECrate2017_fp_peak = 47.2

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

Peak Optimization Flags (Continued)

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

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