### SPEC CPU®2017 Floating Point Rate Result

**Supermicro**

SuperServer SYS-620P-TRT  
(X12DPi-NT6, Intel Xeon Platinum 8380)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
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<tbody>
<tr>
<td>503.bwaves_r</td>
<td>160</td>
<td>634</td>
<td>Not Run</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>160</td>
<td>407</td>
<td></td>
</tr>
<tr>
<td>508.namd_r</td>
<td>160</td>
<td>213</td>
<td></td>
</tr>
<tr>
<td>510.parest_r</td>
<td>160</td>
<td>692</td>
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</tr>
<tr>
<td>511.povray_r</td>
<td>160</td>
<td>271</td>
<td></td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>160</td>
<td>348</td>
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</tr>
<tr>
<td>521.wrf_r</td>
<td>160</td>
<td>549</td>
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<tr>
<td>526.blender_r</td>
<td>160</td>
<td>528</td>
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</tr>
<tr>
<td>527.cam4_r</td>
<td>160</td>
<td>1390</td>
<td></td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>160</td>
<td>927</td>
<td></td>
</tr>
<tr>
<td>544.nab_r</td>
<td>160</td>
<td>229</td>
<td></td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>160</td>
<td>160</td>
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</tr>
<tr>
<td>554.roms_r</td>
<td>160</td>
<td>160</td>
<td></td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Platinum 8380  
  - **Max MHz:** 3400  
  - **Nominal:** 2300  
  - **Enabled:** 80 cores, 2 chips, 2 threads/core  
  - **Orderable:** 1,2 chips  
  - **Cache L1:** 32 KB I + 48 KB D on chip per core  
  - **L2:** 1.25 MB I+D on chip per core  
  - **L3:** 60 MB I+D on chip per chip  
  - **Other:** None  
- **Memory:** 1 TB (16 x 64 GB 2Rx4 PC4-3200V-R)  
  - **Storage:** 2 TB SATA HDD, 7200 RPM  
  - **Other:** None

#### Software

- **OS:** SUSE Linux Enterprise High Performance Computing 15 SP2  
  - 5.3.18-22-default  
- **Compiler:**  
  - C/C++: Version 2021.1 of Intel oneAPI DPC++/C++  
  - Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler  
  - Classic Build 20201112 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler  
  - Classic Build 20201112 for Linux  
- **Firmware:** version 1.1 released Apr-2021  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Power Management:** BIOS set to max performance at the cost of additional power usage.
### 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>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>730</td>
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<td>229</td>
<td>2722</td>
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<td>1593</td>
<td>160</td>
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<td></td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Submit Notes

The `numactl` mechanism was used to bind copies to processors. The config file option 'submit' was used to generate `numactl` 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"

### Environment Variables Notes

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

```
LD_LIBRARY_PATH = "/home/lib/intel64:/home/je5.0.1-64"
MALLOC_CONF = "retain:true"
```

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7940X CPU + 64GB RAM memory using openSUSE Leap 15.2

NA: 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)
SPEC CPU®2017 Floating Point Rate Result

Supermicro
SuperServer SYS-620P-TRT (X12DPi-NT6, Intel Xeon Platinum 8380)

| SPECrate®2017_fp_base = 450 |
| SPECrate®2017_fp_peak = Not Run |

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

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.
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>
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:
Monitor/Mwait = Disable
Intel Virtualization Technology = Disable
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Maximum Performance
Enhanced Halt Stat (C1E) = Disable
SNC = Enable
Stale Atos = Enable
LLC Dead Line Alloc = Disable
IMC Interleaving = 1-way Interleave
ADDDC Sparing = Disable
Patrol Scrub = Disable

Sysinfo program /home/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost Wed May 19 17:21:40 2021

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) Platinum 8380 CPU @ 2.30GHz
  2 "physical id"s (chips)
  160 "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 : 40
  siblings : 80
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

(Continued on next page)
Platform Notes (Continued)

From lscpu:

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 52 bits physical, 57 bits virtual
CPU(s): 160
On-line CPU(s) list: 0-159
Thread(s) per core: 2
Core(s) per socket: 40
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
Stepping: 6
CPU MHz: 800.007
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 61440K
NUMA node0 CPU(s): 0-19, 80-99
NUMA node1 CPU(s): 20-39, 100-119
NUMA node2 CPU(s): 40-59, 120-139
NUMA node3 CPU(s): 60-79, 140-159
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf 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 pse36 clflush dts tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_13 invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xsavec xckiants xsaveprec xa xsave npgode cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local wbnoinvd dtherm ida arat pln pts hwp_epp avx512vbm1 umip pku ospke avx512_vbmi2 gfn vaes vpcmfragdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfug flush_lld arch_capabilities

/proc/cpuinfo cache data
    cache size: 61440 KB

(Continued on next page)


### Platform Notes (Continued)

From `numactl --hardware`:

```
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 80 81 82 83 84 85 86 87
88 89 90 91 92 93 94 95 96 97 98 99
node 0 size: 257556 MB
node 0 free: 246945 MB
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 100 101 102
103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119
node 1 size: 258004 MB
node 1 free: 249808 MB
node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 120 121 122
123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
node 2 size: 258038 MB
node 2 free: 250075 MB
node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 140 141 142
143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159
node 3 size: 257755 MB
node 3 free: 249478 MB
node distances:
node 0  1  2  3
 0: 10 11 20 20
 1: 11 10 20 20
 2: 20 20 10 11
 3: 20 20 11 10
```

From `/proc/meminfo`:

```
MemTotal:       1056107724 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

From `/etc/*release*`:

```
os-release:
NAME="SLE_HPC"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise High Performance Computing 15 SP2"
ID=sle_hpc
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sle_hpc:15:sp2"
```

`uname -a`:

```
Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) x86_64
x86_64 x86_64 GNU/Linux
```

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

Kernel self-reported vulnerability status:

<table>
<thead>
<tr>
<th>Vulnerability</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVE-2018-12207 (iTLB Multihit):</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3620 (L1 Terminal Fault):</td>
<td>Not affected</td>
</tr>
<tr>
<td>Microarchitectural Data Sampling:</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2017-5754 (Meltdown):</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3639 (Speculative Store Bypass):</td>
<td>Mitigation: Speculative Store Bypass disabled via prctl and seccomp</td>
</tr>
<tr>
<td>CVE-2017-5753 (Spectre variant 1):</td>
<td>Mitigation: usercopy/swapgs barriers and __user pointer sanitization</td>
</tr>
<tr>
<td>CVE-2017-5715 (Spectre variant 2):</td>
<td>Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling</td>
</tr>
<tr>
<td>CVE-2020-0543 (Special Register Buffer Data Sampling):</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2019-11135 (TSX Asynchronous Abort):</td>
<td>Not affected</td>
</tr>
</tbody>
</table>

run-level 3 May 18 22:50

SPEC is set to: /home

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda3</td>
<td>xfs</td>
<td>815G</td>
<td>91G</td>
<td>725G</td>
<td>12%</td>
<td>/home</td>
</tr>
</tbody>
</table>

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.

Memory:
- 16x Micron 36ASF8G72PZ-3G2E1 64 GB 2 rank 3200
- 2x NO DIMM NO DIMM

BIOS:
- BIOS Vendor: American Megatrends International, LLC.
- BIOS Version: 1.1
- BIOS Date: 04/21/2021
- BIOS Revision: 5.22

(End of data from sysinfo program)
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**Supermicro**

SuperServer SYS-620P-TRT
(X12DPI-NT6, Intel Xeon Platinum 8380)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>001176</th>
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</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Supermicro</td>
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<tr>
<td>Tested by:</td>
<td>Supermicro</td>
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</tbody>
</table>

**SPECratio®2017_fp_base = 450**

**SPECratio®2017_fp_peak = Not Run**

---

### Compiler Version Notes

```
<table>
<thead>
<tr>
<th>C</th>
<th>519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113</td>
<td></td>
</tr>
<tr>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
<td></td>
</tr>
</tbody>
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```

```
<table>
<thead>
<tr>
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<th>508.namd_r(base) 510.parest_r(base)</th>
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<tbody>
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```
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<tr>
<th>C++, C</th>
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</tr>
<tr>
<td>Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000</td>
<td></td>
</tr>
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SuperServer SYS-620P-TRT
(X12DPi-NT6, Intel Xeon Platinum 8380)

SPECraten2017_fp_base = 450
SPECraten2017_fp_peak = Not Run

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

Test Date: May-2021
Hardware Availability: May-2021
Software Availability: May-2021

Compiler Version Notes (Continued)

------------------------------------------------------------------------------
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifort

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

(Continued on next page)
Supermicro
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SPECrate®2017_fp_base = 450
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: May-2021
Hardware Availability: May-2021
Software Availability: May-2021

Base Portability Flags (Continued)

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:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both C and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math

(Continued on next page)
**SPEC CPU®2017 Floating Point Rate Result**

**Supermicro**
SuperServer SYS-620P-TRT (X12DPi-NT6, Intel Xeon Platinum 8380)

| SPECrate®2017_fp_base = 450 |
| SPECrate®2017_fp_peak = Not Run |

| CPU2017 License: 001176 | Test Date: May-2021 |
| Test Sponsor: Supermicro | Hardware Availability: May-2021 |
| Tested by: Supermicro | Software Availability: May-2021 |

**Base Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++ (continued):
- `f20 -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3`  
- `no-prec-div -qopt-prefetch -ffinite-math-only`  
- `qopt-multiple-gather-scatter-by-shuffles`  
- `mbranches-within-32B-boundaries -nostandard-realloc-lhs`  
- `align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`  

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/Supermicro-Platform-Settings-V1.2-CLX-revH.xml](http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revH.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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