# SPEC CPU®2017 Floating Point Speed Result

<table>
<thead>
<tr>
<th>Supermicro</th>
<th>SPECspeed®2017_fp_base = 127</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuperServer 2029U-TR4 (X11DPU, Intel Xeon Gold 5218R)</td>
<td>SPECspeed®2017_fp_peak = 128</td>
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### Threads

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<tr>
<th>Benchmark</th>
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<td>40</td>
<td>489</td>
<td>486</td>
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<tr>
<td>607.cactusBSSN_s</td>
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<tr>
<td>619.lbm_s</td>
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<td>654.roms_s</td>
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### Hardware

- **CPU Name:** Intel Xeon Gold 5218R
- **Max MHz:** 4000
- **Nominal:** 2100
- **Enabled:** 40 cores, 2 chips
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 1 MB I+D on chip per core
- **Cache L3:** 27.5 MB I+D on chip per chip
- **Other:** None
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)
- **Storage:** 1 x 200 GB SATA III SSD
- **Other:** None
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

### Software

- **OS:** Red Hat Enterprise Linux release 8.1
- **Kernel:** 4.18.0-147.el8.x86_64
- **Compiler:** C/C++: Version 19.0.5.281 of Intel C/C++ Compiler for Linux;
  Fortran: Version 19.0.5.281 of Intel Fortran Compiler for Linux
- **Parallel:** Yes
- **Firmware:** Version 3.3 released Feb-2020
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
## SPEC CPU®2017 Floating Point Speed Result

**Supermicro**  
SuperServer 2029U-TR4  
(X11DPU, Intel Xeon Gold 5218R)

**SPECspeed®2017_fp_base** = 127  
**SPECspeed®2017_fp_peak** = 128

### Results Table

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</table>

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

### 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:

- `KMP_AFFINITY = "granularity=fine,compact"
- `LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64"
- `OMP_STACKSIZE = "192M"

### General Notes

Binaries compiled on a system with 1x Intel Core i9-9900K CPU + 64GB RAM  
memory using Redhat Enterprise Linux 8.0  
Transparent Huge Pages enabled by default  
Prior to runcpu invocation  
Files system page cache synced and cleared with:  
```
sync; echo 3>/proc/sys/vm/drop_caches
```

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) 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.
Supermicro
SuperServer 2029U-TR4
(X11DPU , Intel Xeon Gold 5218R)

SPECspeed®2017_fp_base = 127
SPECspeed®2017_fp_peak = 128

CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Apr-2020
Tested by: Supermicro
Hardware Availability: Feb-2020
Software Availability: Nov-2019

Platform Notes

BIOS Settings:
Hyper-Threading = Disable
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Performance
Stale AtoS = Disable
Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbl6e46a485a0011
running on RHEL81-01 Mon Apr 27 15:30:08 2020

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) Gold 5218R CPU @ 2.10GHz
    2 "physical id"s (chips)
    40 "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 : 20
    siblings : 20
    physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 40
  On-line CPU(s) list: 0-39
  Thread(s) per core: 1
  Core(s) per socket: 20
  Socket(s): 2
  NUMA node(s): 2
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 85
  Model name: Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz
  Stepping: 7
  CPU MHz: 2661.597
  CPU max MHz: 4000.0000
  CPU min MHz: 800.0000
  BogoMIPS: 4200.00
  Virtualization: VT-x

(Continued on next page)
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SuperServer 2029U-TR4
(X11DPU, Intel Xeon Gold 5218R)

Platform Notes (Continued)

L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0-19
NUMA node1 CPU(s): 20-39
Flags: fpu vme de pse tsc msr pae mca 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
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrp pdcm puid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm ablahm 3nowprefetch cpuid_fault epb cat_13 cdp_13
invpces_single intel_pnpn ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmi
flexpriority ept vpid fsgsbase tsc_adjust bmul hle avx2 smep bmi2 erms invpces cld
arch_capabilities

/proc/cpuinfo cache data
  cache size : 28160 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 2 nodes (0-1)
  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: 385653 MB
  node 0 free: 384804 MB
  node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
  node 1 size: 387041 MB
  node 1 free: 379489 MB
  node distances:
    node 0 1
      0: 10 21
      1: 21 10

From /proc/meminfo
  MemTotal: 791239664 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME=Red Hat Enterprise Linux
    VERSION="8.1 (Ootpa)"
    ID=rhel
    ID_LIKE=fedora

(Continued on next page)
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SuperServer 2029U-TR4
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Platform Notes (Continued)

VERSION_ID="8.1"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:ga

uname -a:
Linux RHEL81-01 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019 x86_64
x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swappgs barriers and __user pointer sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Apr 27 10:41

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 185G 19G 167G 10% /

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 3.3 02/21/2020
Vendor: Supermicro
Product: Super Server
Serial: 0123456789

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:
24x SK Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933

(End of data from sysinfo program)
Supermicro
SuperServer 2029U-TR4 (X11DPU, Intel Xeon Gold 5218R)

Supermicro

Spec 2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

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Compiler Version Notes

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<tr>
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Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-m64 -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
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Hardware Availability: Feb-2020
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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
- `m64 -std=c11 -xCORE-AVX512 -iipo -O3 -no-prec-div -qopt-prefetch`  
- `ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP`  
- `n ostandard-realloc-lhs`

Peak Compiler Invocation

C benchmarks:  
`icc`

Fortran benchmarks:  
`ifort`

Benchmarks using both Fortran and C:  
`ifort icc`

Benchmarks using Fortran, C, and C++:  
`icpc icc ifort`

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: `basepeak = yes`  
638.imagick_s: `basepeak = yes`

644.nab_s: `-m64 -std=c11 -xCORE-AVX512 -iipo -O3 -no-prec-div`  
-`qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4`  
-`qopenmp -DSPEC_OPENMP`

Fortran benchmarks:

603.bwaves_s: `-m64 -prof-gen(pass 1) -prof-use(pass 2)`  
-`DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -O2 -xCORE-AVX512`  
-`qopt-prefetch -iipo -O3 -ffinite-math-only -no-prec-div`

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

603.bwaves_s (continued):
- qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -std=c11 -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-prefetch -ipo -O3 -ffinite-math-only
-no-prec-div -qopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

627.cam4_s: basepeak = yes

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revF.html

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-revF.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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