Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6226R)

SPECSpeed\textsuperscript{®}2017\_fp\_base = 127
SPECSpeed\textsuperscript{®}2017\_fp\_peak = 129

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

Threads

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<th>Benchmark</th>
<th>Threads</th>
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<th>SPECspeed\textsuperscript{®}2017_fp_peak</th>
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<tr>
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<tr>
<td>654.roms_s</td>
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SPECSpeed\textsuperscript{®}2017\_fp_base (127)
SPECSpeed\textsuperscript{®}2017\_fp_peak (129)

Hardware
CPU Name: Intel Xeon Gold 6226R
Max MHz: 3900
Nominal: 2900
Enabled: 32 cores, 2 chips
Orderable: 1.2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 22 MB I+D on chip per core
Other: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)
Storage: 1 x 200 GB SATA III SSD
Other: None

Software
OS: Red Hat Enterprise Linux release 8.1
Kernel 4.18.0-147.el8.x86_64
Compiler: C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux;
Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux
Parallel: Yes
Firmware: Version 3.2 released Oct-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS set to prefer performance at the cost of additional power usage.
Results Table

<table>
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<tr>
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<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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</table>

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux and the correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux.

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:/home/cpu2017/je5.0.1-64"
MALLOCONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0
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

(Continued on next page)
General Notes (Continued)

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.


Platform Notes

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

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7eddb1e6e46a485a0011
running on RHEL81-01 Sat Aug 8 04:44:09 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 6226R CPU @ 2.90GHz
  2 "physical id"s (chips)
  32 "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 : 16
  siblings : 16
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 32
  On-line CPU(s) list: 0-31
  Thread(s) per core: 1

(Continued on next page)
Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6226R)

SPECspeed®2017_fp_base = 127
SPECspeed®2017_fp_peak = 129

Platform Notes (Continued)

Core(s) per socket:  16
Socket(s):           2
NUMA node(s):        2
Vendor ID:           GenuineIntel
CPU family:          6
Model:               85
Model name:          Intel(R) Xeon(R) Gold 6226R CPU @ 2.90GHz
Stepping:            7
CPU MHz:             3029.149
CPU max MHz:         3900.0000
CPU min MHz:         1200.0000
BogoMIPS:            5800.00
Virtualization:      VT-x
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            22528K
NUMA node0 CPU(s):   0-15
NUMA node1 CPU(s):   16-31
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 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 tsc_deadline_timer aes
                     xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
                     invpcid_single intel_pnin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
                     vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid
                     rtm cmq mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt
                     avx512cd avx512bw avx512vl xsaveopt xsaveprec xsaves xsavec xsaveopt cqm_llc
                     cqm_occ山水q cqm_mbmlocal dtherm ida arat pln pts pkup ospke avx512_vnni
                     md_clear flush_l1d
                     arch_capabilities

/proc/cpuinfo cache data
  cache size : 22528 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
  node 0 size: 192092 MB
  node 0 free: 187341 MB
  node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
  node 1 size: 193532 MB
  node 1 free: 190480 MB
  node distances:
    node 0 1
    0: 10 21
Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6226R)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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<tr>
<td>SPECspeed®2017_fp_peak</td>
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</table>

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

Test Date: Aug-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Platform Notes (Continued)

From /proc/meminfo
MemTotal: 394879892 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
NAME="Red Hat Enterprise Linux"
VERSION="8.1 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
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 RHEL8-1-01 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/swapgs barriers and __user pointer sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Aug 8 00:14

SPEC is set to: /home/cpu2017

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 3.2 10/18/2019
Vendor: pm_2019-10-08_18:11:34
Product: ppm_2019-10-08_18:11:37

(Continued on next page)
Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6226R)

SPECspeed®2017_fp_base = 127
SPECspeed®2017_fp_peak = 129

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

Platform Notes (Continued)

Serial: ps_2019-10-08_18:11:38

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:
  12x NO DIMM NO DIMM
  12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

====================================================================================================
C               | 619.lbm_s(base, peak) 638.imagick_s(base, peak) | 644.nab_s(base, peak)
<table>
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<tr>
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<tbody>
<tr>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
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<tr>
<td>Version 19.1.1.217 Build 20200306</td>
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<td>C++, C, Fortran</td>
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<td>Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
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SPEC CPU®2017 Floating Point Speed Result

Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6226R)

SPECspeed®2017_fp_base = 127
SPECspeed®2017_fp_peak = 129

Compiler Version Notes (Continued)

Fortran, C

| 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak) |

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
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
Supermicro
SuperStorage 6029P-E1CR24H
(X11DSC+, Intel Xeon Gold 6226R)

SPECspeed®2017_fp_base = 127
SPECspeed®2017_fp_peak = 129

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
-mbranches-within-32B-boundaries

Fortran benchmarks:
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs
-mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc

Benchmarks using both Fortran and C:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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
**Supermicro**

SuperStorage 6029P-E1CR24H  
(X11DSC+, Intel Xeon Gold 6226R)

---

**SPECspeed®2017_fp_base = 127**

**SPECspeed®2017_fp_peak = 129**

---

### Peak Optimization Flags

**C benchmarks:**

619.lbm_s: basepeak = yes

638.imagick_s: basepeak = yes

--  
644.nab_s: -m64 -Wl,-z,muldefs -xcORE-AVX512 -ipo -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
--  

**Fortran benchmarks:**

603.bwaves_s: -m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xcORE-AVX512
-O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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 -Wl,-z,muldefs -prof-gen(pass 1)
-prof-use(pass 2) -ipo -xcORE-AVX512 -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

627.cam4_s: basepeak = yes

628.pop2_s: basepeak = yes

**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-revG.html
# SPEC CPU®2017 Floating Point Speed Result

## Supermicro

**SuperStorage 6029P-E1CR24H (X11DSC+, Intel Xeon Gold 6226R)**

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<th>CPU2017 License</th>
<th>Test Date</th>
<th>Hardware Availability</th>
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<th>Test Sponsor</th>
<th>Tested by</th>
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<td>Supermicro</td>
</tr>
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</table>

**SPECspeed®2017_fp_base = 127**

**SPECspeed®2017_fp_peak = 129**

You can also download the XML flags sources by saving the following links:


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