**SPEC® CPU2017 Floating Point Speed Result**

Supermicro
SuperServer 2029TP-HTR
(X11DPT-PS, Intel Xeon Gold 6230)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>001176</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Supermicro</td>
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<td>Tested by:</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Mar-2019</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jul-2017</td>
</tr>
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<td>Nov-2018</td>
</tr>
<tr>
<td>Threads</td>
<td>126</td>
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<td>40 112</td>
<td>126</td>
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<td>644.nab_s</td>
<td>40 205</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>40 80.4</td>
<td></td>
<td>80.5</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>40 124</td>
<td></td>
<td>125</td>
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</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6230
- **Max MHz.:** 3900
- **Nominal:** 2100
- **Enabled:** 40 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:** 27.5 MB I+D on chip per chip
- **Other:** None
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 480 GB SATA 3 SSD
- **Other:** None

**Software**

- **OS:** Red Hat Enterprise Linux Server release 7.6 (Maipo)
- **Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++
  Compiler Build 20181018 for Linux;
  Fortran: Version 19.0.1.144 of Intel Fortran
  Compiler Build 20181018 for Linux
- **Parallel:** Yes
- **Firmware:** version 3.0a released Jan-2019
- **File System:** xfs
- **System State:** Run level 3 (Multi-user mode with networking)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
## SPEC CPU2017 Floating Point Speed Result

**Supermicro**  
SuperServer 2029TP-HTR  
(X11DPT-PS, Intel Xeon Gold 6230)

| Benchmark     | Threads | Base       | Peak      | Base       | Peak      | Base       | Peak       | Base       | Peak       | Base       | Peak       | Base       | Peak       |
|---------------|---------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
|               |         | Seconds    | Ratio     | Seconds    | Ratio     | Seconds    | Ratio     | Seconds    | Ratio     | Seconds    | Ratio     | Seconds    | Ratio     |
| 603.bwaves_s  | 40      | 118        | 500       | 119        | 495       | 119        | 498       | 119        | 496       | 118        | 499       | 118        | 500       |
| 607.cactuBSSN_s | 40    | 114        | 146       | 115        | 145       | 114        | 146       | 115        | 145       | 115        | 145       | 115        | 145       |
| 619.lbm_s     | 40      | 54.7       | 95.7      | 54.9       | 95.4      | 54.7       | 95.8      | 54.7       | 95.4      | 54.6       | 96.0      | 54.8       | 95.6      |
| 621.wrf_s     | 40      | 121        | 109       | 122        | 109       | 121        | 110       | 114        | 116       | 114        | 116       | 114        | 116       |
| 627.cam4_s    | 40      | 101        | 87.8      | 101        | 87.9      | 101        | 87.9      | 101        | 87.9      | 101        | 87.9      | 101        | 87.9      |
| 628.pop2_s    | 40      | 188        | 63.2      | 183        | 65.0      | 183        | 65.0      | 180        | 65.9      | 180        | 65.8      | 182        | 65.1      |
| 638.imagick_s | 40      | 128        | 113       | 140        | 103       | 128        | 112       | 128        | 112       | 140        | 103       | 133        | 108       |
| 644.nab_s     | 40      | 85.0       | 205       | 85.2       | 205       | 85.1       | 205       | 85.2       | 205       | 85.1       | 205       | 85.1       | 205       |
| 649.fotonik3d_s | 40  | 113        | 80.7      | 113        | 80.4      | 114        | 79.9      | 113        | 80.5      | 113        | 80.4      | 113        | 80.6      |
| 654.roms_s    | 40      | 127        | 124       | 127        | 124       | 127        | 124       | 126        | 125       | 127        | 124       | 125        | 126       |

**SPECspeed2017_fp_base = 126**  
**SPECspeed2017_fp_peak = 126**

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"

### General Notes

Environment variables set by runcpu before the start of the run:
- KMP_AFFINITY = "granularity=fine,compact"
- LD_LIBRARY_PATH = "/home/lib/ia32:/home/lib/intel64"
- OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i9-7900X 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) 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.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4) is mitigated in the system as tested and documented.
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**SPECspeed2017_fp_base = 126**

**SPECspeed2017_fp_peak = 126**

**Platform Notes**

BIOS Settings:
- Hyper-Threading = Disabled
- SNC = Disabled
- IMC Interleaving = Auto
- Monitor/Mwait = Disabled
- ENERGY_PERF_BIAS_CFG mode = Extreme Performance
- Hardware Pstate = Out of band mode
- Stale Atos = Disabled
- Patrol Scrub = Disabled

Sysinfo program /home/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f6d4985e45859ea9
running on localhost.localdomain Thu Mar 14 03:53:55 2019

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 6230 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 6230 CPU @ 2.10GHz
- Stepping: 6
- CPU MHz: 2100.000
- BogoMIPS: 4200.00
- Virtualization: VT-x
- L1d cache: 32K

(Continued on next page)
Supermicro
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SPECspeed2017_fp_base = 126
SPECspeed2017_fp_peak = 126

Platform Notes (Continued)

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 lbx fpmt st smm vm xse "TP

/cproc/cpuinfo cache data

cache size: 28160 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

From /proc/meminfo
MemTotal: 394821680 KB
HugePages_Total: 0
Hugepagesize: 2048 KB

From /etc/*release*/etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.6 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.6"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

(Continued on next page)
Supermicro
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SPECspeed2017_fp_base = 126
SPECspeed2017_fp_peak = 126

Platform Notes (Continued)

CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS

run-level 3 Mar 13 21:51

SPEC is set to: /home

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda5 xfs 392G 11G 382G 3% /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. 3.0a 01/12/2019
Memory:
12x Micron Technology 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933, configured at 2934
4x NO DIMM NO DIMM

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
FC  607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

(Continued on next page)
Compiler Version Notes (Continued)

FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base, peak)

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 603.bwaves_s(peak) 649.fotonik3d_s(peak)

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
Intel (R) C Intel (R) 64 Compiler for applications running on Intel (R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CC 621.wrf_s(peak) 628.pop2_s(peak)

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
Intel (R) C Intel (R) 64 Compiler for applications running on Intel (R) 64,
Version 19.0.1.144 Build 20181018
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Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

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Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

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

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

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs
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Peak Compiler Invocation

C benchmarks:
  icc -m64 -std=c11

Fortran benchmarks:
  ifort -m64

Benchmarks using both Fortran and C:
  ifort -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:
  -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
  603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
  -DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3
  -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4
  -qopenmp -nostandard-realloc-lhs
  649.fotonik3d_s: Same as 603.bwaves_s
  654.roms_s: -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:
  621.wrf_s: -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

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**Tested by:** Supermicro  
**Test Date:** Mar-2019  
**Hardware Availability:** Jul-2017  
**Software Availability:** Nov-2018

### Peak Optimization Flags (Continued)

- **627.cam4_s:** `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`  
  `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`  
  `-DSPEC_OPENMP -nostandard-realloc-lhs`

- **628.pop2_s:** Same as 621.wrf_s

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

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

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-revB.html](http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revB.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-revB.xml](http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revB.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 2019-03-14 03:53:55-0400.