**Supermicro**

SuperServer 6029U-TR4 (X11DPU, Intel Xeon Bronze 3204)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>43.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>43.7</td>
</tr>
</tbody>
</table>

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Apr-2019

Hardware Availability: Apr-2019

Software Availability: Nov-2018

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base (43.5)</th>
<th>SPECspeed2017_fp_peak (43.7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s 12 Threads</td>
<td>47.7</td>
<td>47.5</td>
</tr>
<tr>
<td>607.cactuBSSN_s 12 Threads</td>
<td>35.2</td>
<td>35.2</td>
</tr>
<tr>
<td>619.lbm_s 12 Threads</td>
<td>40.5</td>
<td>40.5</td>
</tr>
<tr>
<td>621.wrf_s 12 Threads</td>
<td>19.9</td>
<td>19.9</td>
</tr>
<tr>
<td>627.cam4_s 12 Threads</td>
<td>33.8</td>
<td>33.8</td>
</tr>
<tr>
<td>628.pop2_s 12 Threads</td>
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</tr>
<tr>
<td>638.imagick_s 12 Threads</td>
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</tr>
<tr>
<td>644.nab_s 12 Threads</td>
<td>46.0</td>
<td>46.0</td>
</tr>
<tr>
<td>649.fotonik3d_s 12 Threads</td>
<td>47.5</td>
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</tr>
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<td>654.roms_s 12 Threads</td>
<td>47.7</td>
<td>47.7</td>
</tr>
</tbody>
</table>

**Hardware**

CPU Name: Intel Xeon Bronze 3204

Max MHz.: 1900

Nominal: 1900

Enabled: 12 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: 8.25 MB I+D on chip per chip

Other: None

Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2133)

Storage: 1 x 200 GB SATA III SSD

Other: None

**Software**

OS: Red Hat Enterprise Linux Server 7.6 (Maipo)

Kernel 3.10.0-957.el7.x86_64

Compiler: C/C++: Version 19.0.1.144 of Intel C/C++ Compiler for Linux;

Fortran: Version 19.0.1.144 of Intel Fortran Compiler for Linux

Parallel: Yes

Firmware: Version 3.0b released Mar-2019

File System: xfs

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

Peak Pointers: 64-bit

Other: None
## SPEC CPU2017 Floating Point Speed Result

### Supermicro
SuperServer 6029U-TR4 (X11DPU , Intel Xeon Bronze 3204)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
<td>603.bwaves_s</td>
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<td>377</td>
<td>41.8</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 43.5
SPECspeed2017_fp_peak = 43.7

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/cpu2017/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.

### Platform Notes

BIOS Settings:
LLC prefetch = Disable
Platform Notes (Continued)

Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Performance
Hardware P-state = Out of Band Mode
XPT Prefetch = Disable
Stale Atos = Disable
LLCdead line alloc = Enable
SDDC Plus One = Disable
ADDDC Sparing = Disable
Patrol Scrub = Disable
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bced8f2999c33d61f64985e45859ea9
running on CPU2017-01 Fri Apr 26 05:11:49 2019

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) Bronze 3204 CPU @ 1.90GHz
  2 "physical id"s (chips)
  12 "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 : 6
  siblings : 6
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5

From lscpu:
  Architecture:       x86_64
  CPU op-mode(s):       32-bit, 64-bit
  Byte Order:           Little Endian
  CPU(s):               12
  On-line CPU(s) list:  0-11
  Thread(s) per core:   1
  Core(s) per socket:   6
  Socket(s):            2
  NUMA node(s):         2
  Vendor ID:            GenuineIntel
  CPU family:           6
  Model:                85
  Model name:           Intel(R) Xeon(R) Bronze 3204 CPU @ 1.90GHz
  Stepping:             6
  CPU MHz:              1900.000
  BogoMIPS:             3800.00
  Virtualization:       VT-x

(Continued on next page)
Supermicro
SuperServer 6029U-TR4 (X11DPU, Intel Xeon Bronze 3204)

SPECspeed2017_fp_base = 43.5
SPECspeed2017_fp_peak = 43.7

Platform Notes (Continued)

L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0-5
NUMA node1 CPU(s): 6-11

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 rdtsscp
lm constant_tsc arch_perfmon pebs bts rep_good nop1 xtopology nonstop_tsc
aperfmpref eagerfpu 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 epb cat_l3 dcp_l3 intel_pinn
intel_pt ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept
vpid fsgsbase tsc_adjust bni hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsaves xgetbv1 cmp_legacy cmp_occupy_llc cmp_mbm_total cmp_mbm_local dtherm arat pln pts
hwp_epp pku ospke avx512_vnni spec_ctrl intel_stibp flush_l1d arch_capabilities

/proc/cpuinfo cache data
  cache size : 8448 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
  node 0 size: 391838 MB
  node 0 free: 380955 MB
  node 1 cpus: 6 7 8 9 10 11
  node 1 size: 393216 MB
  node 1 free: 379514 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 791182372 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"

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

Supermicro
SuperServer 6029U-TR4 (X11DPU, Intel Xeon Bronze 3204)

SPECspeed2017_fp_base = 43.5
SPECspeed2017_fp_peak = 43.7

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

Platform Notes (Continued)

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 CPU2017-01 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:

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 Apr 25 19:48

SPEC is set to: /home/cpu2017
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/sdb2 xfs 185G 35G 151G 19% /

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. 3.0b 03/04/2019
    Memory:
        24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2133

(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)
==============================================================================

(Continued on next page)
Supermicro
SuperServer 6029U-TR4 (X11DPU, Intel Xeon Bronze 3204)

SPECspeed2017_fp_base = 43.5
SPECspeed2017_fp_peak = 43.7

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

Compiler Version Notes (Continued)

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.

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,
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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
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Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
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(Continued on next page)
Supermicro
SuperServer 6029U-TR4 (X11DPU, Intel Xeon Bronze 3204)  

SPECspeed2017_fp_peak = 43.7  
SPECspeed2017_fp_base = 43.5

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

Test Date: Apr-2019  
Hardware Availability: Apr-2019  
Software Availability: Nov-2018

Compiler Version Notes (Continued)

Base 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

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

(Continued on next page)
Supermicro
SuperServer 6029U-TR4 (X11DPU, Intel Xeon Bronze 3204)

SPECspeed2017_fp_base = 43.5
SPECspeed2017_fp_peak = 43.7

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

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

Base Optimization Flags (Continued)

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

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:

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

638.imagick_s: basepeak = yes

644.nab_s: Same as 619.lbm_s

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

Fortran benchmarks:

603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP 
-DSPEC_OPENMP -02 -xCORE-AVX512 -qopt-prefetch -ipo -O3 
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4 
-qopenmp -nostandard-realloc-lhs 

649.fotonik3d_s: basepeak = yes 

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: basepeak = yes 

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: -prof-gen(pass 1) -prof-use(pass 2) -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 

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-revC.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-revC.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 2019-04-25 17:11:48-0400.