Supermicro
SuperServer SYS-420GP-TNR
(X12DPG-OA6, Intel Xeon Platinum 8368Q)

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

Hardware
CPU Name: Intel Xeon Platinum 8368Q
Max MHz: 3700
Nominal: 2600
Enabled: 76 cores, 2 chips
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: 57 MB I+D on chip per core
Other: None
Memory: 2 TB (32 x 64 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 2 TB SATA III SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 15 SP2
Kernel: 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
Parallel: Yes
Firmware: Version 1.0 released Mar-2021
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS set to prefer performance at the cost of additional power usage.

SPEC CPU®2017 Floating Point Speed Result

Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Apr-2021

SPECspeed®2017_fp_base = 230
SPECspeed®2017_fp_peak = Not Run

Threads
0 30.0 70.0 110.0 150.0 190.0 230.0 270.0 310.0 350.0 390.0 430.0 470.0 510.0 550.0 590.0 630.0 670.0 710.0

603.bwaves_s 76
607.cactuBSSN_s 76
619.lbm_s 76
621.wrf_s 76
627.cam4_s 76
628.pop2_s 76
638.imagick_s 76
644.nab_s 76
649.fotonik3d_s 76
654.roms_s 76

SPECspeed®2017_fp_base (230)

---
SPEC CPU®2017 Floating Point Speed Result

Supermicro
SuperServer SYS-420GP-TNR
(X12DPG-OA6 , Intel Xeon Platinum 8368Q)

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>76</td>
<td>82.9</td>
<td>711</td>
<td>83.0</td>
<td>711</td>
<td>83.7</td>
<td>705</td>
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<td>607.cactuBSSN_s</td>
<td>76</td>
<td>56.8</td>
<td>294</td>
<td>55.6</td>
<td>300</td>
<td>57.2</td>
<td>292</td>
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<tr>
<td>619.lbm_s</td>
<td>76</td>
<td>36.2</td>
<td>145</td>
<td>37.1</td>
<td>141</td>
<td>35.7</td>
<td>147</td>
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<tr>
<td>621.wrf_s</td>
<td>76</td>
<td>60.5</td>
<td>219</td>
<td>60.5</td>
<td>219</td>
<td>60.6</td>
<td>218</td>
</tr>
<tr>
<td>627.cam4_s</td>
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<td>48.7</td>
<td>182</td>
<td>48.8</td>
<td>182</td>
<td>49.0</td>
<td>181</td>
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<tr>
<td>628.pop2_s</td>
<td>76</td>
<td>118</td>
<td>100</td>
<td>120</td>
<td>99.0</td>
<td>117</td>
<td>101</td>
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<tr>
<td>638.imagick_s</td>
<td>76</td>
<td>56.5</td>
<td>255</td>
<td>55.5</td>
<td>262</td>
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<td>262</td>
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<tr>
<td>644.nab_s</td>
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<td>503</td>
<td>34.9</td>
<td>501</td>
<td>34.8</td>
<td>501</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>76</td>
<td>75.9</td>
<td>120</td>
<td>78.3</td>
<td>116</td>
<td>76.7</td>
<td>119</td>
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<tr>
<td>654.roms_s</td>
<td>76</td>
<td>70.6</td>
<td>223</td>
<td>70.0</td>
<td>225</td>
<td>72.3</td>
<td>218</td>
</tr>
</tbody>
</table>

SPECspeed®2017_fp_base = 230
SPECspeed®2017_fp_peak = Not Run

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:/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
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.
jemalloc, a general purpose malloc implementation built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

(Continued on next page)
**Supermicro**

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**SPECspeed®2017_fp_base** = 230

**SPECspeed®2017_fp_peak** = Not Run

---

**CPU2017 License:** 001176  
**Test Date:** Mar-2021  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro

**Hardware Availability:** Apr-2021  
**Software Availability:** Apr-2021

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**General Notes (Continued)**


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**Platform Notes**

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

Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c  
running on localhost Mon Mar 29 17:53:21 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 8368Q CPU @ 2.60GHz
  2 "physical id"s (chips)
  76 "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 : 38
  siblings : 38
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
  25 26 27 28 29 30 31 32 33 34 35 36 37
physical 1: 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
  25 26 27 28 29 30 31 32 33 34 35 36 37
```

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): 76
On-line CPU(s) list: 0-75
Thread(s) per core: 1
Core(s) per socket: 38
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
```
**SPEC CPU®2017 Floating Point Speed Result**

**Supermicro**

SuperServer SYS-420GP-TNR
(X12DPG-OA6, Intel Xeon Platinum 8368Q)

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

**SPECspeed®2017_fp_base = 230**

**SPECspeed®2017_fp_peak = Not Run**

---

### Platform Notes (Continued)

- **Model:** 106
- **Model name:** Intel(R) Xeon(R) Platinum 8368Q CPU @ 2.60GHz
- **Stepping:** 6
- **CPU MHz:** 800.684
- **CPU max MHz:** 3700.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 5200.00
- **Virtualization:** VT-x
- **L1d cache:** 48K
- **L1i cache:** 32K
- **L2 cache:** 1280K
- **L3 cache:** 58368K
- **NUMA node0 CPU(s):** 0-37
- **NUMA node1 CPU(s):** 38-75

**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 art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref pi 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 ebpx cat_13 invpcid_single ssbd
mca ibrs ibpb ibrs_enhanced tpr_shadow vmi flexpriority ept vpid ept_ad
fsgsbase tsc_adjust bni hle avx2 smep bmi2 erts invpcid rtm cmq rdt_a avx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
avx512bw avx512v1 xsaveopt xsavec xgetbv1 xsaveavc cmq_l1c cmq_occup_l1c cmq_mbmr_total
cmq_mbmr_local wbnoinvd dtherm ida arat pln pt avx512vbm1 umip pku ospke
avx512_vbmi2 gfni vaes vclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq
la57 rdpid md_clear pconfig flush_l1d arch_capabilities

/proc/cpuinfo cache data

```
cache size : 58368 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 20 21 22 23 24 25 26 27
28 29 30 31 32 33 34 35 36 37
node 0 size: 1031738 MB
node 0 free: 1031208 MB
node 1 cpus: 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62
63 64 65 66 67 68 69 70 71 72 73 74 75
node 1 size: 1032178 MB
node 1 free: 1031434 MB
node distances:
node 0 1
0: 10 20
1: 20 10
```

(Continued on next page)
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SPECspeed®2017_fp_base = 230
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Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Apr-2021

Platform Notes (Continued)

From /proc/meminfo
MemTotal: 2113450740 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has ondemand

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles: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

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
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/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):
Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3
Mar 29 17:52

SPEC is set to: /home/cpu2017
Filesystem Type  Size Used Avail Use% Mounted on
/dev/sda3 xfs 1.7T 108G 1.6T 7% /home

(Continued on next page)
Supermicro
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SPECspeed®2017_fp_base = 230
SPECspeed®2017_fp_peak = Not Run

Platform Notes (Continued)

Vendor: Supermicro
Product: X12DPG-OA6
Product Family: SMC X12
Serial: 123456789

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 SM BIOS" standard.

Memory:
32x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

BIOS:
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 1.0
BIOS Date: 03/23/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C               |  619.lbm_s(base)  638.imagick_s(base)  644.nab_s(base)
------------------------------------------------------------------------------
Intel(R) C 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.
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran |  607.cactuBSSN_s(base)
==============================================================================
Intel(R) C++ 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) C 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) 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.

==============================================================================
Fortran         |  603.bwaves_s(base)  649.fotonik3d_s(base)  654.roms_s(base)
(Continued on next page)
Supermicro
SuperServer SYS-420GP-TNR
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\[ \text{SPECspeed}^{2017\_fp\_base} = 230 \]
\[ \text{SPECspeed}^{2017\_fp\_peak} = \text{Not Run} \]

**Compiler Version Notes (Continued)**

---

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.
---

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

(Continued on next page)
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Base Portability Flags (Continued)

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
-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
-llib -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
-llib -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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/Intel-ic2021-official-linux64_revA.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 CPU®2017 v1.1.5 on 2021-03-29 05:53:21-0400.
Report generated on 2021-04-14 14:17:24 by CPU2017 PDF formatter v6442.