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

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

SPECspeed®2017_fp_base = 237
SPECspeed®2017_fp_peak = Not Run

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

Threads

<table>
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<tr>
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<tr>
<td>603.bwaves_s</td>
<td>76</td>
<td>302</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>76</td>
<td>148</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>76</td>
<td>224</td>
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<tr>
<td>621.wrf_s</td>
<td>76</td>
<td>183</td>
</tr>
<tr>
<td>627.cam4_s</td>
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<td>102</td>
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<tr>
<td>628.pop2_s</td>
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<tr>
<td>638.imagick_s</td>
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<td>510</td>
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<tr>
<td>644.nab_s</td>
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<td>120</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>260</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>76</td>
<td>-</td>
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</table>

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 chip
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: Red Hat Enterprise Linux 8.2
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 1.1 released Apr-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**

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

**SPECspeed®2017_fp_base =** 237

**SPECspeed®2017_fp_peak =** Not Run

---

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

**Test Date:** May-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Apr-2021

---

### Results Table

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<td>713</td>
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<td>638.imagick_s</td>
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<td>54.7</td>
<td>264</td>
<td><strong>54.7</strong></td>
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<tr>
<td>644.nab_s</td>
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<td>60.8</td>
<td>259</td>
<td>59.6</td>
<td>264</td>
</tr>
</tbody>
</table>

---

**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"
- MALLOC_CONF = "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

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

SPECspeed®2017_fp_base = 237
SPECspeed®2017_fp_peak = Not Run

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

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

General Notes (Continued)

built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

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

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0eac6256d
running on localhost.localdomain Mon May 24 12:13:56 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 from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
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

(Continued on next page)
## Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Model:</th>
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<tbody>
<tr>
<td>Model name:</td>
<td>Intel(R) Xeon(R) Platinum 8368Q CPU @ 2.60GHz</td>
</tr>
<tr>
<td>Stepping:</td>
<td>6</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>3412.763</td>
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<td>CPU max MHz:</td>
<td>3700.0000</td>
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<td>CPU min MHz:</td>
<td>800.0000</td>
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<td>BogoMIPS:</td>
<td>5200.00</td>
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<td>Virtualization:</td>
<td>VT-x</td>
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<tr>
<td>L1d cache:</td>
<td>48K</td>
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<td>L1i cache:</td>
<td>32K</td>
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<td>L2 cache:</td>
<td>1280K</td>
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<td>L3 cache:</td>
<td>58368K</td>
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<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-37</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>38-75</td>
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</table>

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 art 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 3nowprefetch cpuid_fault epb cat_13 invpcid_single ssbd mba ibrs ibpb ibrs_enabled tpr_shadow vmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local wbnoinvd dtherm ida arat pln pts avx512vbmni umip pku ospke avx512_vbmi2 gfnl vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpbigcntdq la57 rdrpid 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.

<table>
<thead>
<tr>
<th>available:</th>
<th>2 nodes (0-1)</th>
</tr>
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<tbody>
<tr>
<td>node 0 cpus:</td>
<td>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</td>
</tr>
<tr>
<td>node 0 size:</td>
<td>1031232 MB</td>
</tr>
<tr>
<td>node 0 free:</td>
<td>1029713 MB</td>
</tr>
<tr>
<td>node 1 cpus:</td>
<td>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</td>
</tr>
<tr>
<td>node 1 size:</td>
<td>1032180 MB</td>
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<tr>
<td>node 1 free:</td>
<td>1027791 MB</td>
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<tr>
<td>node distances:</td>
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<tr>
<td>node 0 1</td>
<td></td>
</tr>
<tr>
<td>0: 10 20</td>
<td></td>
</tr>
<tr>
<td>1: 20 10</td>
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</table>
Supermicro
SuperServer SYS-420GP-TNR
(X12DPG-OA6, Intel Xeon Platinum 8368Q)

SPECspeed\textsuperscript{\textregistered}2017\_fp\_base = 237
SPECspeed\textsuperscript{\textregistered}2017\_fp\_peak = Not Run

Platform Notes (Continued)

From /proc/meminfo
   MemTotal: 2112934700 kB
   HugePages_Total: 0
   Hugepagesize: 2048 kB

/sbin/tuned-adm active
   Current active profile: throughput-performance

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release*/etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.2 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.2"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
   system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

uname -a:
   Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
   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
   Mitigation: usercopy/swaps barriers and __user pointer sanitation
CVE-2017-5753 (Spectre variant 1):
   Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling):
   No status reported
CVE-2019-11135 (TSX Asynchronous Abort):
   Not affected

run-level 3 May 24 11:38
## Platform Notes (Continued)

SPEC is set to: /home/cpu2017

From /sys/devices/virtual/dmi/id

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

Additional information from dmidecode 3.2 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:
32x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

BIOS:
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 1.1
BIOS Date: 04/15/2021
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

(Continued on next page)
## Supermicro

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

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<th>CPU2017 License</th>
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<tbody>
<tr>
<td>Test Sponsor</td>
<td>Supermicro</td>
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<tr>
<td>SPECspeed®2017_fp_base</td>
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Test Date: May-2021  
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### 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.

Fortran, C  
| 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)  
|---------------------------------------------------------------|

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Intel (R) Fortran Intel (R) 64 Compiler Classic for applications running on  
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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`

(Continued on next page)
**SPEC CPU® 2017 Floating Point Speed Result**

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

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**CPU2017 License:** 001176
**Test Sponsor:** Supermicro
**Test Date:** May-2021
**Tested by:** Supermicro
**Hardware Availability:** Apr-2021

**Software Availability:** Apr-2021

---

**Base Portability Flags (Continued)**

- 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
- -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

---

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:

| SPECsmoot®2017_fp_base = 237 |
| SPECspeak®2017_fp_peak = Not Run |

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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 v1.1.8 on 2021-05-24 12:13:56-0400.
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