## SPEC CPU®2017 Floating Point Rate Result

### Supermicro

SuperServer SYS-620U-TNR  
(X12DPU-6, Intel Xeon Gold 6348)

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

Software Availability: Dec-2020

**Test Date:** Jul-2021

Hardware Availability: Apr-2021

**Tested by:** Supermicro

### SPECrate®2017 fp_base = 404  
**SPECrate®2017 fp_peak = 422**

### Hardware

| Software | CPU Name: Intel Xeon Gold 6348  
| Max MHz: 3500  
| Nominal: 2600  
| Enabled: 56 cores, 2 chips, 2 threads/core  
| 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: 42 MB I+D on chip per core  
| Other: None  
| Memory: 1 TB  
| (16 x 64 GB 2Rx4 PC4-3200AA-R)  
| Storage: 1 x 800 GB SATA III SSD  
| Other: None  

### Software

| OS: Red Hat Enterprise Linux release 8.3 (Ootpa)  
| 4.18.0-240.el8.x86_64  
| 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: No  
| Firmware: Version 1.1 released Apr-2021  
| 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 and OS set to prefer performance at the cost of additional power usage. |
# SPEC CPU®2017 Floating Point Rate Result

**Supermicro**  
SuperServer SYS-620U-TNR  
(X12DPU-6 , Intel Xeon Gold 6348)

---

**SPECrate®2017_fp_base = 404**

**SPECrate®2017_fp_peak = 422**

---

## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>112</td>
<td>1543</td>
<td>728</td>
<td>1543</td>
<td>728</td>
<td>1542</td>
<td>728</td>
<td>56</td>
<td>771</td>
<td>729</td>
<td>771</td>
<td>728</td>
<td>771</td>
<td>729</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>112</td>
<td>253</td>
<td>561</td>
<td>254</td>
<td>558</td>
<td>253</td>
<td>561</td>
<td>112</td>
<td>253</td>
<td>561</td>
<td>254</td>
<td>558</td>
<td>253</td>
<td>561</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>112</td>
<td>316</td>
<td>337</td>
<td>316</td>
<td>337</td>
<td>316</td>
<td>337</td>
<td>112</td>
<td>316</td>
<td>337</td>
<td>316</td>
<td>337</td>
<td>316</td>
<td>337</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>112</td>
<td>1431</td>
<td>205</td>
<td>1424</td>
<td>206</td>
<td>1425</td>
<td>206</td>
<td>56</td>
<td>569</td>
<td>258</td>
<td>568</td>
<td>258</td>
<td>568</td>
<td>258</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>112</td>
<td>529</td>
<td>495</td>
<td>529</td>
<td>494</td>
<td>529</td>
<td>494</td>
<td>112</td>
<td>461</td>
<td>568</td>
<td>462</td>
<td>566</td>
<td>462</td>
<td>566</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>112</td>
<td>443</td>
<td>267</td>
<td>443</td>
<td>267</td>
<td>443</td>
<td>267</td>
<td>112</td>
<td>443</td>
<td>267</td>
<td>443</td>
<td>267</td>
<td>443</td>
<td>267</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>112</td>
<td>741</td>
<td>338</td>
<td>742</td>
<td>338</td>
<td>742</td>
<td>338</td>
<td>56</td>
<td>371</td>
<td>338</td>
<td>369</td>
<td>340</td>
<td>368</td>
<td>341</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>112</td>
<td>381</td>
<td>447</td>
<td>381</td>
<td>448</td>
<td>380</td>
<td>449</td>
<td>112</td>
<td>381</td>
<td>447</td>
<td>381</td>
<td>448</td>
<td>380</td>
<td>449</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>112</td>
<td>445</td>
<td>440</td>
<td>446</td>
<td>439</td>
<td>447</td>
<td>438</td>
<td>112</td>
<td>445</td>
<td>440</td>
<td>446</td>
<td>439</td>
<td>447</td>
<td>438</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>112</td>
<td>242</td>
<td>1150</td>
<td>240</td>
<td>1160</td>
<td>241</td>
<td>1160</td>
<td>112</td>
<td>242</td>
<td>1150</td>
<td>240</td>
<td>1160</td>
<td>241</td>
<td>1160</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>112</td>
<td>249</td>
<td>758</td>
<td>249</td>
<td>757</td>
<td>251</td>
<td>752</td>
<td>112</td>
<td>244</td>
<td>773</td>
<td>245</td>
<td>770</td>
<td>244</td>
<td>773</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>112</td>
<td>1926</td>
<td>227</td>
<td>1927</td>
<td>227</td>
<td>1926</td>
<td>227</td>
<td>112</td>
<td>1926</td>
<td>227</td>
<td>1927</td>
<td>227</td>
<td>1926</td>
<td>227</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>112</td>
<td>1141</td>
<td>156</td>
<td>1144</td>
<td>156</td>
<td>1144</td>
<td>156</td>
<td>56</td>
<td>475</td>
<td>187</td>
<td>473</td>
<td>188</td>
<td>475</td>
<td>188</td>
</tr>
</tbody>
</table>

---

**SPECrate®2017_fp_base = 404**  
**SPECrate®2017_fp_peak = 422**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## 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:

LD_LIBRARY_PATH =  
"/root/cpu2017-1.1.7/lib/intel64:/root/cpu2017-1.1.7/je5.0.1-64"

MALLOC_CONF = "retain:true"

## General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1

Transparent Huge Pages enabled by default

Prior to runcpu invocation

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

Supermicro
SuperServer SYS-620U-TNR (X12DPU-6 , Intel Xeon Gold 6348)

SPECrates®2017_fp_base = 404
SPECrates®2017_fp_peak = 422

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>001176</th>
<th>Test Date:</th>
<th>Jul-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Supermicro</td>
<td>Hardware Availability:</td>
<td>Apr-2021</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Supermicro</td>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

**General Notes (Continued)**

Filesystem page cache synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
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-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) 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

**Platform Notes**

BIOS Settings:
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Extreme Performance
SNC (Sub NUMA) = Enable
KTI Prefetch = Enable
LLC Dead Line Alloc = Disable

Sysinfo program /root/cpu2017-1.1.7/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on 182-104.hnet Thu Jul 22 23:26:09 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) Gold 6348 CPU @ 2.60GHz
   2 "physical id"s (chips)
   112 "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 : 28
siblings : 56
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
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

From lscpu:
(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6, Intel Xeon Gold 6348)

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

SPECrate®2017_fp_base = 404
SPECrate®2017_fp_peak = 422

Test Date: Jul-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Platform Notes (Continued)

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 112
On-line CPU(s) list: 0-111
Thread(s) per core: 2
Core(s) per socket: 28
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 6348 CPU @ 2.60GHz
Stepping: 6
CPU MHz: 3400.000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 43008K
NUMA node0 CPU(s): 0-13, 56-69
NUMA node1 CPU(s): 14-27, 70-83
NUMA node2 CPU(s): 28-41, 84-97
NUMA node3 CPU(s): 42-55, 98-111
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
xtrr 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 invpcid_single
intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmi flexpriority ept
vpid ept_ad fsgsbase tsc_adjust bm11 hle avx2 smep bmi2 erms invpcid cm qd t_a
avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsave avx512c cqm mob cm qd mb ltotal
cqm_mb_local split_lock_detect wbnoinvd dtherm ida arat pti avx512vbmi umip pku
ospke avx512_vbmi2 gfi vaes vpmulqdq avx512_vni avx512_bitalg tme
avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities

/proc/cpuinfo cache data
cache size: 43008 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 15 56 57 58 59 60 61 62 63 64 65 66 67
node 0 size: 250922 MB

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

Copyright 2017-2021 Standard Performance Evaluation Corporation

Supermicro
SuperServer SYS-620U-TNR (X12DPU-6, Intel Xeon Gold 6348)

SPECrate®2017_fp_base = 404
SPECrate®2017_fp_peak = 422

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

Test Date: Jul-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Platform Notes (Continued)

node 0 free: 243758 MB
node 1 cpus: 14 15 16 17 18 19 20 21 22 23 24 25 26 27 70 71 72 73 74 75 76 77 78 79 80 81 82 83
node 1 size: 251507 MB
node 1 free: 246549 MB
node 2 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 84 85 86 87 88 89 90 91 92 93 94 95 96 97
node 2 size: 251645 MB
node 2 free: 246232 MB
node 3 cpus: 42 43 44 45 46 47 48 49 50 51 52 53 54 55 98 99 100 101 102 103 104 105 106 107 108 109 110 111
node 3 size: 253124 MB
node 3 free: 246537 MB
node distances:
node 0 1 2 3
0: 10 11 20 20
1: 11 10 20 20
2: 20 20 10 11
3: 20 20 11 10

From /proc/meminfo
MemTotal: 1056434632 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
/sbin/tuned-adm active
Current active profile: throughput-performance

From /etc/*release* /etc/*version*

os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.3 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.3"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
Linux 182-104.hnet 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020 x86_64
x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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

**Supermicro**

SuperServer SYS-620U-TNR  
(X12DPU-6 , Intel Xeon Gold 6348)

---

**SPECrate®2017_fp_base = 404**

**SPECrate®2017_fp_peak = 422**

---

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>001176</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Tested by</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Test Date</td>
<td>Jul-2021</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Apr-2021</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

---

**Platform Notes (Continued)**

- **CVE-2018-12207 (iTLB Multihit):** Not affected
- **CVE-2018-3620 (L1 Terminal Fault):** Not affected
- **Microarchitectural Data Sampling:** Not affected
- **CVE-2017-5754 (Meltdown):** Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2018-3639 (Speculative Store Bypass):** 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** 3 Jul 22 16:24
- **SPEC is set to:** /root/cpu2017-1.1.7
- **Filesystem**  
  - **/dev/sda4**  
  - **xfs**  
  - **739G 196G 544G 27% /**

---

**From /sys/devices/virtual/dmi/id**

- **Vendor:** Supermicro
- **Product:** SYS-620U-TNR
- **Product Family:** Ultra
- **Serial:** 0123456789

---

**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:**
- 16x NO DIMM NO DIMM
- 16x SK Hynix HMAA8GR7CJR4N-XN 64 GB 2 rank 3200

**BIOS:**
- **BIOS Vendor:** American Megatrends International, LLC.
- **BIOS Version:** 1.1
- **BIOS Date:** 04/21/2021
- **BIOS Revision:** 5.22

---

(End of data from sysinfo program)
Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6, Intel Xeon Gold 6348)

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

Test Date: Jul-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

SPECrate®2017_fp_base = 404
SPECrate®2017_fp_peak = 422

Compiler Version Notes

C
519.lbm_r(base, peak) 538.imagick_r(base, peak)
544.nab_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C++
508.namd_r(base, peak) 510.parest_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C++, C
511.povray_r(peak)

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
511.povray_r(base) 526.blender_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C++, C
511.povray_r(peak)

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.

Continued on next page
Compiler Version Notes (Continued)

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

--------------------------------------------------------------------------------
C++, C          | 511.povray_r(base) 526.blender_r(base, peak)
--------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
--------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
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          | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
                  | 554.roms_r(base, peak)
--------------------------------------------------------------------------------
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       | 521.wrf_r(peak)
--------------------------------------------------------------------------------
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.
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.

(Continued on next page)
Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6 , Intel Xeon Gold 6348)

SPECrates®
SPECrates®
SPECrate®2017_fp_base = 404
SPECrate®2017_fp_peak = 422

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

Test Date: Jul-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Compiler Version Notes (Continued)

Fortran, C | 521.wrf_r(base) 527.cam4_r(base, peak)
-------------------------------------------------------------------------------------------------------------------
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.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------------------------------------------

Fortran, C | 521.wrf_r(peak)
-------------------------------------------------------------------------------------------------------------------
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.
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.
-------------------------------------------------------------------------------------------------------------------

Fortran, C | 521.wrf_r(base) 527.cam4_r(base, peak)
-------------------------------------------------------------------------------------------------------------------
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.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

(Continued on next page)
Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6, Intel Xeon Gold 6348)

SPECrate®2017_fp_base = 404
SPECrate®2017_fp_peak = 422

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

Test Date: Jul-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifort

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6, Intel Xeon Gold 6348)

SPECrate\textsuperscript{\textregistered}2017\textunderscore fp\textunderscore peak = 422
SPECrate\textsuperscript{\textregistered}2017\textunderscore fp\textunderscore base = 404

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

Test Date: Jul-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-\texttt{-qopt-multiple-gather-scatter-by-shuffles -qopt-mem-layout-trans=4}
-\texttt{-nostandard-realloc-lhs -align array32byte -auto}
-\texttt{-mbranches\textendash within-32B-boundaries -ljemalloc}
-\texttt{-L/usr/local/jemalloc64-5.0.1/lib}

Benchmarks using both Fortran and C:
-\texttt{-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math}
-\texttt{-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo}
-\texttt{-no-prec-div -qopt-prefetch -ffinite-math-only}
-\texttt{-qopt-multiple-gather-scatter-by-shuffles}
-\texttt{-mbranches\textendash within-32B-boundaries -nostandard-realloc-lhs}
-\texttt{-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib}

Benchmarks using both C and C++:
-\texttt{-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math}
-\texttt{-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4}
-\texttt{-mbranches\textendash within-32B-boundaries -ljemalloc}
-\texttt{-L/usr/local/jemalloc64-5.0.1/lib}

Benchmarks using Fortran, C, and C++:
-\texttt{-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math}
-\texttt{-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3}
-\texttt{-no-prec-div -qopt-prefetch -ffinite-math-only}
-\texttt{-qopt-multiple-gather-scatter-by-shuffles}
-\texttt{-mbranches\textendash within-32B-boundaries -nostandard-realloc-lhs}
-\texttt{-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib}

Peak Compiler Invocation

C benchmarks:
\texttt{icx}

C++ benchmarks:
\texttt{icpx}

Fortran benchmarks:
\texttt{ifort}

Benchmarks using both Fortran and C:
\texttt{521.wrf_r:ifort icc}

(Continued on next page)
Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6 , Intel Xeon Gold 6348)

SPECrate®2017_fp_base = 404
SPECrate®2017_fp_peak = 422

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

Test Date: Jul-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Peak Compiler Invocation (Continued)

527.cam4_r: ifort icx

Benchmarks using both C and C++:

511.povray_r: icpc icc
526.blender_r: icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifort

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes
538.imagick_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

Fortran benchmarks:

503.bwaves_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -ipo -no-prec-div -qopt-prefetch -ffinite-math-only

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

503.bwaves_r (continued):
-`qopt-multiple-gather-scatter-by-shuffles`
-`qopt-mem-layout-trans=4 -nostandard-realloc-lhs`
-`align array32byte -auto -mbranches-within-32B-boundaries`
-`-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

549.fotonik3d_r: basepeak = yes

554.roms_r: Same as 503.bwaves_r

Benchmarks using both Fortran and C:

521.wrf_r: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3`
-`ipo -no-prec-div -qopt-prefetch -ffinite-math-only`
-`qopt-multiple-gather-scatter-by-shuffles`
-`qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
-`nostandard-realloc-lhs -align array32byte -auto`
-`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3`
-`ipo -no-prec-div -qopt-prefetch -ffinite-math-only`
-`qopt-multiple-gather-scatter-by-shuffles`
-`qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
-`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

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
<table>
<thead>
<tr>
<th><strong>Supermicro</strong></th>
<th><strong>SPECratenew</strong>2017_fp_base = 404</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuperServer SYS-620U-TNR (X12DPU-6, Intel Xeon Gold 6348)</td>
<td>SPECratenew2017_fp_peak = 422</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th><strong>Test Date:</strong></th>
<th>Jul-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware Availability:</strong></td>
<td>Apr-2021</td>
</tr>
<tr>
<td><strong>Software Availability:</strong></td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

SPEC CPU and SPECratenew are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®v2017 v1.1.7 on 2021-07-23 02:26:08-0400.
Originally published on 2021-08-17.