## SPEC CPU®2017 Integer Rate Result

### CPU2017 License: 001176

**Test Sponsor:** Supermicro  
**Tested by:** Supermicro  
**Test Date:** May-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Apr-2021

### 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  
**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:** Not Applicable  
**Power Management:** BIOS set to prefer performance at the cost of additional power usage.

### Hardware

**CPU Name:** Intel Xeon Platinum 8368Q  
**Max MHz:** 3700  
**Nominal:** 2600  
**Enabled:** 76 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:** 57 MB I+D on chip per chip  
**Other:** None  
**Memory:** 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)  
**Storage:** 1 x 512 GB PCIE M.2 SSD  
**Other:** None

### SPECrate®2017_int_base = 573

**SPECrate®2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base (573)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>500.perlbench_r</strong> 152</td>
</tr>
<tr>
<td>502.gcc_r 152</td>
</tr>
<tr>
<td>505.mcf_r 152</td>
</tr>
<tr>
<td>520.omnetpp_r 152</td>
</tr>
<tr>
<td>523.xalancbmk_r 152</td>
</tr>
<tr>
<td>525.x264_r 152</td>
</tr>
<tr>
<td>531.deepsjeng_r 152</td>
</tr>
<tr>
<td>541.leela_r 152</td>
</tr>
<tr>
<td>548.exchange2_r 152</td>
</tr>
<tr>
<td>557.xz_r 152</td>
</tr>
</tbody>
</table>

### Copies

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base (573)</th>
</tr>
</thead>
<tbody>
<tr>
<td>413</td>
</tr>
<tr>
<td>421</td>
</tr>
<tr>
<td>890</td>
</tr>
<tr>
<td>299</td>
</tr>
<tr>
<td>706</td>
</tr>
<tr>
<td>1240</td>
</tr>
<tr>
<td>477</td>
</tr>
<tr>
<td>478</td>
</tr>
<tr>
<td>1300</td>
</tr>
<tr>
<td>319</td>
</tr>
</tbody>
</table>
# SPEC CPU®2017 Integer Rate Result

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

---

**SPECrate®2017_int_base =** 573  
**SPECrate®2017_int_peak = Not Run**

---

### 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>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>152</td>
<td>585</td>
<td>413</td>
<td>586</td>
<td>413</td>
<td>589</td>
<td>411</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>152</td>
<td>511</td>
<td>421</td>
<td>511</td>
<td>422</td>
<td>513</td>
<td>420</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>152</td>
<td>276</td>
<td>889</td>
<td>276</td>
<td>890</td>
<td>275</td>
<td>893</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>152</td>
<td>668</td>
<td>299</td>
<td>666</td>
<td>299</td>
<td>668</td>
<td>299</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>152</td>
<td>227</td>
<td>708</td>
<td>228</td>
<td>705</td>
<td>227</td>
<td>706</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>152</td>
<td>215</td>
<td>1240</td>
<td>215</td>
<td>1240</td>
<td>214</td>
<td>1240</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>152</td>
<td>366</td>
<td>476</td>
<td>365</td>
<td>477</td>
<td>364</td>
<td>479</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>152</td>
<td>527</td>
<td>478</td>
<td>526</td>
<td>478</td>
<td>527</td>
<td>477</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>152</td>
<td>307</td>
<td>1300</td>
<td>307</td>
<td>1300</td>
<td>307</td>
<td>1300</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>152</td>
<td>517</td>
<td>318</td>
<td>514</td>
<td>319</td>
<td>514</td>
<td>319</td>
</tr>
</tbody>
</table>

**SPECrate®2017_int_base =** 573  
**SPECrate®2017_int_peak = Not Run**

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:

```bash
LD_LIBRARY_PATH = "'/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
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  
Filesystem page cache synced and cleared with:  
```
sync; echo 3> /proc/sys/vm/drop_caches
```

(Continued on next page)
**General Notes (Continued)**

`runcpu` command invoked through `numactl` i.e.:
```
numactl --interleave=all runcpu <etc>
```

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.

### Platform Notes

**BIOS Settings:**
- Power Technology = Custom
- Power Performance Tuning = BIOS Controls EPB
- ENERGY_PERF_BIAS_CFG mode = Extreme Performance
- DCU Streamer Prefetcher = Disable
- SNC = Enable
- Patrol Scrub = Disable

Sysinfo program `/home/cpu2017/bin/sysinfo`
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca6c4d running on localhost.localdomain Sun May 23 01:20:35 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)
  152 "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 : 76
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): 152
```

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

Copyright 2017-2021 Standard Performance Evaluation Corporation

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

SPECrate®2017_int_base = 573
SPECrate®2017_int_peak = Not Run

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

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

Platform Notes (Continued)

On-line CPU(s) list: 0-151
Thread(s) per core: 2
Core(s) per socket: 38
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8368Q CPU @ 2.60GHz
Stepping: 6
CPU MHz: 3300.037
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, 76-113
NUMA node1 CPU(s): 38-75, 114-151
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
aperfperf zpt pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrpr 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 stibp ibrs_enhanced tpr_shadow vnumi flexpriority ept vpid fsgsbase
tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmqm rdt_a avx512f avx512dq
rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw
avx512vl xsaveopt xsave xsetbv xsaves cmqm_llc cmqm_occup llc cmqm_mbmt total
cmqm_1mb_local wmoinvd dtherm ida arat pln pts avx512vbmi umip pku ospke
avx512_vbmi2 gfi vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq
la57 rdpid md_clear pconfig flush_l1d arch_capabilities

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 38 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94
95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113
node 0 size: 515412 MB
node 0 free: 497286 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

(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

**Supermicro**

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

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>573</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

<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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>May-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Apr-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Apr-2021</td>
</tr>
</tbody>
</table>

## Platform Notes (Continued)

```
63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147
148 149 150 151
node 1 size: 516047 MB
node 1 free: 499974 MB
node distances:
node 0 1
 0: 10 20
 1: 20 10
```

From `/proc/meminfo`

```
MemTotal:       1056215032 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*`

```
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
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
```

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

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

CPU2017 Integer Rate Result

SPECrater®2017_int_base = 573
SPECrater®2017_int_peak = Not Run

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

Platform Notes (Continued)

CVE-2017-5753 (Spectre variant 1):
Mitigation: usercopy/swapgs 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):
No status reported

CVE-2019-11135 (TSX Asynchronous Abort):
Not affected

run-level 3 May 22 14:28
SPECrater is set to: /home/cpu2017

spec

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 Hynix HMA84GR7DJR4N-XN 32 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

==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>525.x264_r(base) 557.xz_r(base)</td>
</tr>
</tbody>
</table>
==============================================================================

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.

(Continued on next page)
### SPEC CPU®2017 Integer Rate Result

#### Supermicro

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

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

**SPECrate®2017_int_base = 573**  
**SPECrate®2017_int_peak = Not Run**

---

### Compiler Version Notes (Continued)

```plaintext
C++                   | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
----------------------|-----------------------------------------------------------------------------------------------
```

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.

```plaintext
Fortran                | 548.exchange2_r(base)
-----------------------|-----------------------------------------------------------------------------------------------
```

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:**  
icx

**C++ benchmarks:**  
icpx

**Fortran benchmarks:**  
ifort

---

### Base Portability Flags

```
500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64  
502.gcc_r: -DSPEC_LP64  
505.mcf_r: -DSPEC_LP64  
520.omnetpp_r: -DSPEC_LP64  
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX  
525.x264_r: -DSPEC_LP64  
531.deepsjeng_r: -DSPEC_LP64  
541.leela_r: -DSPEC_LP64  
548.exchange2_r: -DSPEC_LP64  
557.xz_r: -DSPEC_LP64
```
## SPEC CPU®2017 Integer Rate Result

### Supermicro

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

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>573</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

<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>May-2021</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Apr-2021</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Apr-2021</td>
</tr>
</tbody>
</table>

### Base Optimization Flags

#### C benchmarks:
- `-w` `-std=c11` `-m64` `-Wl,-z,muldefs` `-xCORE-AVX512` `-O3` `-ffast-math`
- `-flto` `-mfpmath=sse` `-funroll-loops` `-qopt-mem-layout-trans=4`
- `-mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

#### C++ benchmarks:
- `-w` `-m64` `-Wl,-z,muldefs` `-xCORE-AVX512` `-O3` `-ffast-math` `-flto`
- `-mfpmath=sse` `-funroll-loops` `-qopt-mem-layout-trans=4`
- `-mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

#### Fortran benchmarks:
- `-w` `-m64` `-Wl,-z,muldefs` `-xCORE-AVX512` `-O3` `-ipo` `-no-prec-div`
- `-qopt-mem-layout-trans=4` `-nostandard-realloc-lhs` `-align array32byte`
- `-auto` `-mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

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:


SPEC CPU and SPECrate 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®2017 v1.1.8 on 2021-05-22 13:20:34-0400.
Originally published on 2021-06-09.