SPEC CPU®2017 Integer Rate Result

Supermicro
SuperServer SYS-620C-TN12R
(X12DDW-A6 , Intel Xeon Platinum 8380)

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

SPECrate®2017_int_base = 557
SPECrate®2017_int_peak = Not Run

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

Copies (557)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base (557)</th>
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<tbody>
<tr>
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<tr>
<td>502.gcc_r 160</td>
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<td>505.mcf_r 160</td>
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<tr>
<td>520.omnetpp_r 160</td>
</tr>
<tr>
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<td>525.x264_r 160</td>
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<td>531.deepsjeng_r 160</td>
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<tr>
<td>541.leela_r 160</td>
</tr>
<tr>
<td>548.exchange2_r 160</td>
</tr>
<tr>
<td>557.xz_r 160</td>
</tr>
</tbody>
</table>

Software

OS: Red Hat Enterprise Linux 8.3
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 May-2021
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS set to prefer performance at the cost of additional power usage.

Hardware

CPU Name: Intel Xeon Platinum 8380
Max MHz: 3400
Nominal: 2300
Enabled: 80 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: 60 MB I+D on chip per chip
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 2 TB SATA III SSD
Other: None
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### Results Table

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<tr>
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**SPECrate®2017_int_base** = **557**  
**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:

- `LD_LIBRARY_PATH` = 
  ```
  "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
  ```
  - `MALLOCONF` = "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 982a61ec0915b55891ef0e16acaf6d4  
running on localhost.localdomain Thu May 20 19:18:46 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 8380 CPU @ 2.30GHz  
  2 "physical id"s (chips)  
  160 "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 : 40  
    siblings : 80  
    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 38 39  
    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 38 39

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):              160

(Continued on next page)
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SPECrate®2017_int_peak = Not Run

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

SPECrates:
- SPECrate®2017_int_base = 557
- SPECrate®2017_int_peak = Not Run

Platform Notes (Continued)

On-line CPU(s) list: 0-159
Thread(s) per core: 2
Core(s) per socket: 40
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
Stepping: 6
CPU MHz: 3000.133
CPU max MHz: 3400.000
CPU min MHz: 800.000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 61440K
NUMA node0 CPU(s): 0-19,80-99
NUMA node1 CPU(s): 20-39,100-119
NUMA node2 CPU(s): 40-59,120-139
NUMA node3 CPU(s): 60-79,140-159
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrn pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed
adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
avx512bw avx512vl xsaveopt xsavec xmovd xsave xsaveopt xsaves cqm_llc cqm_occup_llc
qm_mbm_total qm_mbm_local split_lock_detect wbnoiwvd dtherm ida arat pni avx512vbmi umip pkv
ospek avx512_vbmi2 gfnl vaes vpclmulqdq avx512_vnni avx512_vbitalg 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: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 80 81 82 83 84 85 86 87
88 89 90 91 92 93 94 95 96 97 98 99
node 0 size: 249937 MB
node 0 free: 256554 MB

(Continued on next page)
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| Test Date:       | May-2021 |
| Test Sponsor:    | Supermicro |
| Hardware Availability: | Apr-2021 |
| Software Availability: | Apr-2021 |

---

**Platform Notes (Continued)**

```
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 100 101 102
  103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119
node 1 size: 250708 MB
node 1 free: 257379 MB
node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 120 121 122
  123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
node 2 size: 251150 MB
node 2 free: 257622 MB
node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 140 141 142
  143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159
node 3 size: 250734 MB
node 3 free: 257558 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: 1056159732 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="8.3 (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 localhost.localdomain 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
```

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

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):** Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2018-3639 (Speculative Store Bypass):** Mitigation: usercopy/swapgs barriers and __user pointer sanitization
- **CVE-2017-5753 (Spectre variant 1):** Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- **CVE-2017-5715 (Spectre variant 2):** Not affected
- **CVE-2020-0543 (Special Register Buffer Data Sampling):** Not affected
- **CVE-2019-11135 (TSX Asynchronous Abort):** Not affected

**SPEC is set to: /home/cpu2017**

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/rhel-home</td>
<td>xfs</td>
<td>1.7T</td>
<td>210G</td>
<td>1.5T</td>
<td>13%</td>
<td>/home</td>
</tr>
</tbody>
</table>

**From /sys/devices/virtual/dmi/id**
- **Vendor:** Supermicro
- **Product:** Super Server
- **Product Family:** Family
- **Serial:** 0123456789

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:**
- 16x SK Hynix HMAA8GR7AJR4N-XN 64 GB 2 rank 3200

**BIOS:**
- **BIOS Vendor:** American Megatrends International, LLC.
- **BIOS Version:** 1.1
- **BIOS Date:** 05/10/2021
- **BIOS Revision:** 5.22

(End of data from sysinfo program)
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Compiler Version Notes
==============================================================================
| C     | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) |
|       | 525.x264_r(base) 557.xz_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.

==============================================================================
| 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.

==============================================================================
| 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

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### Base Portability Flags (Continued)

- 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

### 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:

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

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