# SPEC CPU®2017 Integer Speed Result

**Supermicro**  
SYS-620U-TNR  
(X12DPU-6, Intel Xeon Platinum 8380)

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: SUSE Linux Enterprise Server 15 SP2 5.3.18-22-default</td>
<td>CPU Name: Intel Xeon Platinum 8380 Max MHz: 3400 Nominal: 2300</td>
</tr>
<tr>
<td>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;</td>
<td>Enabled: 80 cores, 2 chips Orderable: 1.2 Chips</td>
</tr>
<tr>
<td>Parallel: Yes</td>
<td>Cache L1: 32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>Firmware: Version 1.0b released Apr-2021 tested as Mar-2021</td>
<td>L2: 1.25 MB I+D on chip per core</td>
</tr>
<tr>
<td>File System: xfs</td>
<td>L3: 60 MB I+D on chip per chip</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Other: None</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)</td>
</tr>
<tr>
<td>Peak Pointers: 64-bit</td>
<td>Storage: 1 x 400 GB NVMe SSD</td>
</tr>
<tr>
<td>Other: jemalloc memory allocator V5.0.1</td>
<td>Other: None</td>
</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage.</td>
<td></td>
</tr>
</tbody>
</table>

## SPECspeed®2017_int_base = 11.7

## SPECspeed®2017_int_peak = 11.9

### Test Details
- **CPU2017 License:** 001176
- **Test Sponsor:** Supermicro
- **Test Date:** Mar-2021
- **Hardware Availability:** Apr-2021
- **Tested by:** Supermicro
- **Software Availability:** Dec-2020

### Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
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<tbody>
<tr>
<td>perlbench_s</td>
<td>8.04</td>
<td>10.9</td>
</tr>
<tr>
<td>gcc_s</td>
<td>11.3</td>
<td>19.8</td>
</tr>
<tr>
<td>mcf_s</td>
<td>11.1</td>
<td>16.8</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>13.3</td>
<td>17.5</td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>5.80</td>
<td>18.6</td>
</tr>
<tr>
<td>x264_s</td>
<td>4.74</td>
<td>24.3</td>
</tr>
</tbody>
</table>

**Threads**

<table>
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<tr>
<th>Benchmark</th>
<th>SPECspeed®2017_int_base (11.7)</th>
<th>SPECspeed®2017_int_peak (11.9)</th>
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<tr>
<td>perlbench_s</td>
<td>8.04</td>
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</tr>
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<td>11.3</td>
<td>19.8</td>
</tr>
<tr>
<td>mcf_s</td>
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<td>16.8</td>
</tr>
<tr>
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<td>13.3</td>
<td>17.5</td>
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<td>4.74</td>
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Results Table

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<tr>
<th>Benchmark</th>
<th>Base Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Threads</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>80</td>
<td>252</td>
<td>7.04</td>
<td>80</td>
<td>220</td>
<td>8.06</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>80</td>
<td>366</td>
<td>10.9</td>
<td>80</td>
<td>353</td>
<td>11.3</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>80</td>
<td>241</td>
<td>19.6</td>
<td>80</td>
<td>241</td>
<td>19.8</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>80</td>
<td>146</td>
<td>11.2</td>
<td>80</td>
<td>146</td>
<td>11.2</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>80</td>
<td>107</td>
<td>13.3</td>
<td>80</td>
<td>107</td>
<td>13.3</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>80</td>
<td>105</td>
<td>16.8</td>
<td>80</td>
<td>101</td>
<td>17.5</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>80</td>
<td>247</td>
<td>5.79</td>
<td>80</td>
<td>247</td>
<td>5.79</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>80</td>
<td>358</td>
<td>4.77</td>
<td>80</td>
<td>358</td>
<td>4.77</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>80</td>
<td>158</td>
<td>18.6</td>
<td>80</td>
<td>158</td>
<td>18.6</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>80</td>
<td>253</td>
<td>24.4</td>
<td>80</td>
<td>253</td>
<td>24.4</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 11.7
SPECspeed®2017_int_peak = 11.9

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,scatter"
LD_LIBRARY_PATH = "/root/cpu2017-1.1.5/lib/intel64:/root/cpu2017-1.1.5/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

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.

(Continued on next page)
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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

General Notes (Continued)
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 = Performance
SNC (Sub NUMA) = Disable
KTI Prefetch = Enable
Hyper-Threading = Disable

Sysinfo program /root/cpu2017-1.1.5/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on 148-253 Fri Mar 26 10:49:12 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)
  80 "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 : 40
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:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 57 bits virtual
CPU(s): 80
On-line CPU(s) list: 0-79
Thread(s) per core: 1
Core(s) per socket: 40
Socket(s): 2
NUMA node(s): 2

(Continued on next page)
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Specspeed®2017_int_base = 11.7
Specspeed®2017_int_peak = 11.9

Platform Notes (Continued)

Vendor ID:           GenuineIntel
CPU family:          6
Model:               106
Model name:          Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
Stepping:            6
CPU MHz:             802.335
CPU max MHz:         3400.0000
CPU min MHz:         800.0000
BogoMIPS:            4600.00
Virtualization:      VT-x
L1d cache:           48K
L1i cache:           32K
L2 cache:            1280K
L3 cache:            61440K
NUMA node0 CPU(s):   0–39
NUMA node1 CPU(s):   40–79
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 aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_13 invvpcid_single ssd
b mba ibrs ibpb stibp ibd Enhanced_tpr_shadow vmx flexpriority ept vpid ept_ad
fgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdtd_a avx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni
avx512bw avx512vl xsavesopt xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total
cqm_mbb_local wbnoinvd dtherm ida arat pni pts avx512vbmi unip pku ospke
avx512_vbmi2 gfnl vaes vpcmldqavx512_vnni avx512_bitalg tme avx512_vpopcntdq
la57 rdfid 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 39
node 0 size: 257587 MB
node 0 free: 256731 MB
node 1 cpus: 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 76 77 78 79
node 1 size: 258001 MB
node 1 free: 257481 MB
node distances:
node 0 1
0: 10 20

(Continued on next page)
Platform Notes (Continued)

1:  20  10

From /proc/meminfo
MemTotal:       527962824 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

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

From /etc/*release* /etc/*version*
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 148-253 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 25 11:27

SPEC is set to: /root/cpu2017-1.1.5

Filesystem  Type      Size  Used Avail Use% Mounted on
/dev/nvme0n1p2 xfs 372G   66G  306G  18%  /
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Test Sponsor: Supermicro
Tested by: Supermicro

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

Platform Notes (Continued)

From /sys/devices/virtual/dmi/id
Vendor: Supermicro
Product: Super Server
Product Family: Family
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 HMA84GR7DJR4N-XN 32 GB 2 rank 3200

BIOS:
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 1.0b
BIOS Date: 03/19/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C       | 600.perlbench_s(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       | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)
625.x264_s(base, peak) 657.xz_s(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       | 600.perlbench_s(peak)
==============================================================================
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)

(Continued on next page)
### Supermicro

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#### Compiler Version Notes (Continued)

64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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<thead>
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<th>C</th>
<th>600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak)</th>
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
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<tr>
<th>C++</th>
<th>620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)</th>
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</table>

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<table>
<thead>
<tr>
<th>Fortran</th>
<th>648.exchange2_s(base, peak)</th>
</tr>
</thead>
</table>

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on  
Intel(R) 64, Version 2021.1 Build 20201112_000000  
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#### Base Compiler Invocation

**C benchmarks:**
- icx

**C++ benchmarks:**
- icpx

**Fortran benchmarks:**
- ifort
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Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-DSPEC_OPENMP -std=c11 -m64 -fopenmp -Wl,-z,muldefs -xCORE-AVX512
-O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-DSPEC_OPENMP -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/
-1qkmalloc

Fortran benchmarks:
-m64 -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries

Peak Compiler Invocation

C benchmarks (except as noted below):
icx

600.perlbench_s: icc

C++ benchmarks:
icpx

(Continued on next page)
Peak Compiler Invocation (Continued)

Fortran benchmarks:
ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

- 600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
- -xCORE-AVX512 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=4 -fno-strict-overflow
- -mbranches-within-32B-boundaries
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- 602.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
- -fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
- -Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
- -mbranches-within-32B-boundaries
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- 605.mcf_s: basepeak = yes

- 625.x264_s: -DSPEC_OPENMP -fiopenmp -std=c11 -m64 -Wl,-z,muldefs
- -xCORE-AVX512 -flto -O3 -ffast-math
- -qopt-mem-layout-trans=4 -fno-alias
- -mbranches-within-32B-boundaries
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- 657.xz_s: basepeak = yes

C++ benchmarks:

- 620.omnetpp_s: basepeak = yes

(Continued on next page)
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SPECspeed\textsuperscript{®}2017\textsubscript{int\_base} = 11.7
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Test Date: Mar-2021
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Peak Optimization Flags (Continued)

641.leela\_s: basepeak = yes

Fortran benchmarks:
648.exchange2\_s: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revH.html

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
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revH.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\textsuperscript{®}2017 v1.1.5 on 2021-03-26 13:49:11-0400.
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