## SPEC CPU®2017 Integer Speed Result

### Supermicro
SuperServer SYS-240P-TNRT
(X12QCH+, Intel Xeon Gold 6348H)

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

### Benchmark Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tr>
<td>600.perlbench_s</td>
<td>96</td>
<td>12.0</td>
<td>12.3</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>96</td>
<td>14.5</td>
<td>15.7</td>
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<tr>
<td>605.mcf_s</td>
<td>96</td>
<td>17.7</td>
<td>18.0</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>96</td>
<td>14.5</td>
<td>15.7</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>96</td>
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<td>18.0</td>
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<tr>
<td>625.x264_s</td>
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<td>15.7</td>
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<tr>
<td>631.deepsjeng_s</td>
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<tr>
<td>641.leela_s</td>
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<td>18.0</td>
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<tr>
<td>648.exchange2_s</td>
<td>96</td>
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<td>18.0</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>96</td>
<td>26.5</td>
<td>26.5</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base** = 12.0
**SPECspeed®2017_int_peak** = 12.3

### Hardware

- **CPU Name:** Intel Xeon Gold 6348H
- **Max MHz:** 4200
- **Nominal:** 2300
- **Enabled:** 96 cores, 4 chips
- **Orderable:** 1,2,4 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 1 MB I+D on chip per core
- **L3:** 33 MB I+D on chip per chip
- **Memory:** 1536 GB (48 x 32 GB 2Rx4 PC4-3200AA-R, running at 2933)
- **Storage:** 1 x 200 GB SATA III SSD
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux 8.2
- **Kernel:** 4.18.0-193.el8.x86_64
- **Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux;
  Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux
- **Parallel:** Yes
- **Firmware:** Version 1.0 released Sep-2020
- **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 set to prefer performance at the cost of additional power usage
Supermicro
SuperServer SYS-240P-TNRT
(X12QCH+ , Intel Xeon Gold 6348H)

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
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<td>150</td>
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</table>

Compiler Notes
The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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 = "/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
SPEC CPU®2017 Integer Speed Result

Supermicro
SuperServer SYS-240P-TNRT (X12QCH+, Intel Xeon Gold 6348H)

SPECspeed®2017_int_base = 12.0
SPECspeed®2017_int_peak = 12.3

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

Test Date: Oct-2020
Hardware Availability: Sep-2020
Software Availability: Apr-2020

General Notes (Continued)

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
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
Hyper-Threading = Disable
Stale AtoS = Disable
Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbble6e46a485a0011
running on X12QCH-01 Sat Oct 3 23:45:21 2020

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 6348H CPU @ 2.30GHz
 4 "physical id"s (chips)
 96 "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 : 24
  siblings : 24
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
  physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
  physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96

(Continued on next page)
Supermicro

SuperServer SYS-240P-TNRT
(X12QCH+, Intel Xeon Gold 6348H)

SPECspeed®2017_int_base = 12.0
SPECspeed®2017_int_peak = 12.3

Platform Notes (Continued)

On-line CPU(s) list: 0-95
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6348H CPU @ 2.30GHz
Stepping: 11
CPU MHz: 2416.011
CPU max MHz: 4200.0000
CPU min MHz: 1000.0000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 33792K
NUMA node0 CPU(s): 0-23
NUMA node1 CPU(s): 24-47
NUMA node2 CPU(s): 48-71
NUMA node3 CPU(s): 72-95
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
aperfmperf piplmulqdq 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_ll3 cdp_ll3
invpcid_single intel_pppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaves xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local avx512_bf16 dtherm ida arat pln pts pku ospke avx512_vnni md_clear
flush_lld arch_capabilities

/proc/cpuinfo cache data
cache size : 33792 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 14 15 16 17 18 19 20 21 22 23
node 0 size: 385606 MB
node 0 free: 384158 MB
node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
node 1 size: 387066 MB

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

Copyright 2017-2020 Standard Performance Evaluation Corporation

Supermicro
SuperServer SYS-240P-TNRT
(X12QCH+, Intel Xeon Gold 6348H)

SPECspeed®2017_int_base = 12.0
SPECspeed®2017_int_peak = 12.3

CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Oct-2020
Hardware Availability: Sep-2020
Tested by: Supermicro
Software Availability: Apr-2020

Platform Notes (Continued)

node 1 free: 386819 MB
node 2 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
node 2 size: 387038 MB
node 2 free: 386715 MB
node 3 cpus: 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
node 3 size: 387065 MB
node 3 free: 386845 MB
node distances:
  node 0 1 2 3
  0: 10 20 20 20
  1: 20 10 20 20
  2: 20 20 10 20
  3: 20 20 20 10

From /proc/meminfo
MemTotal: 1583900452 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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 X12QCH-01 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:

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/swapgs barriers and __user pointer sanitization

(Continued on next page)
Supermicro
SuperServer SYS-240P-TNRT
(X12QCH+ , Intel Xeon Gold 6348H)

SPECspeed®2017_int_base = 12.0
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CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Oct-2020
Tested by: Supermicro
Hardware Availability: Sep-2020
Software Availability: Apr-2020

Platform Notes (Continued)

CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
tsx_async_abort: Not affected

run-level 3 Oct 3 22:07

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 125G 111G 14G 89% /home

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends International, LLC. 1.0 09/02/2020
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:
48x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| 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) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
| C       | 600.perlbench_s(peak)                                         |
==============================================================================

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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

**Supermicro**  
SuperServer SYS-240P-TNRT  
(X12QCH+, Intel Xeon Gold 6348H)

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<td>Software Availability: Apr-2020</td>
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#### Compiler Version Notes (Continued)

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<th>Compiler</th>
<th>Benchmark(s)</th>
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<tr>
<td>C</td>
<td>600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak)</td>
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Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

<table>
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<th>Compiler</th>
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<td>C++</td>
<td>620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)</td>
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</table>

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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<th>Compiler</th>
<th>Benchmark(s)</th>
</tr>
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<tr>
<td>Fortran</td>
<td>648.exchange2_s(base, peak)</td>
</tr>
</tbody>
</table>

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---

### Base Compiler Invocation

- **C benchmarks:**  
  - icc

- **C++ benchmarks:**  
  - icpc

- **Fortran benchmarks:**  
  - ifort
Supermicro
SuperServer SYS-240P-TNRT
(X12QCH+ , Intel Xeon Gold 6348H)

SPECspeed®2017_int_base = 12.0
SPECspeed®2017_int_peak = 12.3

Test Date: Oct-2020
Hardware Availability: Sep-2020
Software Availability: Apr-2020

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:
-m64 -gqnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-m64 -gqnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
-O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-branches-within-32B-boundaries

Peak Compiler Invocation
C benchmarks:
icc

C++ benchmarks:
icpc

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

Fortran benchmarks:

- **ifort**

### Peak Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>-DSPEC_LP64 -DSPEC_LINUX_X64</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>-DSPEC_LP64(*) -DSPEC_LP64</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>-DSPEC_LP64 -DSPEC_LINUX</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

(*) Indicates a portability flag that was found in a non-portability variable.

### Peak Optimization Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>-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</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>-m64 -qnextgen -std=c11 -fuse-ld=gold -Wl, -plugin-opt=-x86-branches-within-32B-boundaries -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 -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>-m64 -qnextgen -std=c11 -Wl, -plugin-opt=-x86-branches-within-32B-boundaries -Wl, -z, muldefs -xCORE-AVX512 -flto -O3 -ffast-math -fuse-ld=gold -qopt-mem-layout-trans=4 -fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc</td>
</tr>
</tbody>
</table>

(Continued on next page)
Supermicro
SuperServer SYS-240P-TNRT
(X12QCH+ , Intel Xeon Gold 6348H)

SPECspeed®2017_int_base = 12.0
SPECspeed®2017_int_peak = 12.3

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

Test Date: Oct-2020
Hardware Availability: Sep-2020
Software Availability: Apr-2020

Peak Optimization Flags (Continued)

657.xz_s: basepeak = yes
C++ benchmarks:
620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
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-revG.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revG.xml

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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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