### SPEC CPU®2017 Integer Speed Result

Supermicro
SuperServer SYS-741GE-TNRT (X13DEG-QT, Intel Xeon Gold 6444Y)

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Supermicro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>Supermicro</td>
</tr>
<tr>
<td>CPU2017 License:</td>
<td>001176</td>
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<tr>
<td>Test Date:</td>
<td>Dec-2022</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jan-2023</td>
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<td>Software Availability:</td>
<td>Jun-2022</td>
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<tr>
<td>SPECspeed®2017_int_base</td>
<td>15.1</td>
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<tr>
<td>SPECspeed®2017_int_peak</td>
<td>15.4</td>
</tr>
<tr>
<td>SPECspeed 2017_int_base</td>
<td>15.1</td>
</tr>
<tr>
<td>SPECspeed 2017_int_peak</td>
<td>15.4</td>
</tr>
</tbody>
</table>

<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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</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>32</td>
<td>10.7</td>
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<td>gcc_s</td>
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<td>12.3</td>
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<td>mcf_s</td>
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<tr>
<td>omnetpp_s</td>
<td>32</td>
<td>23.2</td>
<td></td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>32</td>
<td>28.5</td>
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<td>x264_s</td>
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<td>deepsjeng_s</td>
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<td>leela_s</td>
<td>32</td>
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<tr>
<td>exchange2_s</td>
<td>32</td>
<td>23.5</td>
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</tr>
<tr>
<td>xz_s</td>
<td>32</td>
<td>26.4</td>
<td></td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Gold 6444Y
- **Max MHz:** 4000
- **Nominal:** 3600
- **Enabled:** 32 cores, 2 chips
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 48 KB D on chip per core
- **L2:** 2 MB I+D on chip per core
- **L3:** 45 MB I+D on chip per chip
- **Other:** None
- **Memory:** 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)
- **Storage:** 1 x 240 GB NVMe SSD
- **Other:** None

#### Software

- **OS:** SUSE Linux Enterprise Server 15 SP4
- **Kernel:** 5.14.21-150400.22-default
- **Compiler:** C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
  Fortran: Version 2022.1 of Intel Fortran Compiler for Linux;
- **Parallel:** Yes
- **Firmware:** Version 1.0 released Nov-2022
- **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.
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SuperServer SYS-741GE-TNRT
(X13DEG-QT, Intel Xeon Gold 6444Y)

SPECspeed®2017_int_base = 15.1
SPECspeed®2017_int_peak = 15.4

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>Base</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
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<td><strong>10.7</strong></td>
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<td>328</td>
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<td><strong>12.3</strong></td>
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<td></td>
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<td><strong>313</strong></td>
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<td>306</td>
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<td>605.mcf_s</td>
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<td>49.8</td>
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<td>29.0</td>
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<td>620.omnetpp_s</td>
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<td>22.6</td>
<td><strong>77.6</strong></td>
<td>22.7</td>
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<td><strong>234</strong></td>
<td>26.4</td>
<td><strong>234</strong></td>
<td>26.4</td>
</tr>
</tbody>
</table>

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

Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancmk_r / 623.xalancmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

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 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation

(Continued on next page)
**Supermicro**

SuperServer SYS-741GE-TNRT
(X13DEG-QT, Intel Xeon Gold 6444Y)

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**SPECspeed®2017_int_base = 15.1**

**SPECspeed®2017_int_peak = 15.4**

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**CPU2017 License:** 001176

**Test Sponsor:** Supermicro

**Tested by:** Supermicro

---

**General Notes (Continued)**

Filesystem page cache synced and cleared with:

sync; echo 3 > /proc/sys/vm/drop_caches

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.


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**Platform Notes**

**BIOS Settings:**

Power Technology = Custom

Power Performance Tuning = BIOS Controls EPB

ENERGY_PERF_BIAS_CFG mode = Performance

DCU Streamer Prefetcher = Disable

Hyper-Threading [ALL] = Disable

LLC Dead Line Alloc = Disable

KTI Prefetch = Enable

Stale AtoS = Disable

Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost Fri Dec 2 01:05:28 2022

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 6444Y
  2 "physical id"s (chips)
  32 "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 : 16
  siblings : 16
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

From lscpu from util-linux 2.37.2:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 46 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) Gold 6444Y
CPU family: 6
Model: 143
Thread(s) per core: 1
Core(s) per socket: 16
Socket(s): 2
```

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(Continued on next page)
Platform Notes (Continued)

Stepping: 7
Frequency boost: enabled
CPU max MHz: 3601.0000
CPU min MHz: 800.0000
BogoMIPS: 7200.00
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 pdemul pdcm pclid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebpf cat_l3 cat_l2 invpcid_single invpd l2lb safl ma ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 3dnowprefetch bmi1 bmi2 avx512_ifma clflushopt clwb intel_pt intel_pms achecker arch_capabilities

Virtualization: VT-x
L1d cache: 1.5 MiB (32 instances)
L1i cache: 1 MiB (32 instances)
L2 cache: 64 MiB (32 instances)
L3 cache: 90 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d 48K 1.5M 12 Data 1 64 1 64
L1i 32K 1M 8 Instruction 1 64 1 64
L2 2M 64M 16 Unified 2 2048 1 64
L3 45M 90M 15 Unified 3 49152 1 64

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
node 0 size: 257644 MB
node 0 free: 256964 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 258023 MB

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SPEC CPU®2017 Integer Speed Result

Supermicro
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(X13DEG-QT , Intel Xeon Gold 6444Y)

SPECspeed®2017_int_base = 15.1
SPECspeed®2017_int_peak = 15.4

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

Test Date: Dec-2022
Hardware Availability: Jan-2023
Software Availability: Jun-2022

Platform Notes (Continued)

node 1 free: 257400 MB
node distances:
node  0  1
0:  10  21
1:  21  10

From /proc/meminfo
MemTotal: 528044660 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15-SP4"
VERSION_ID="15.4"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp4"

uname -a:
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222) 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/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): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Dec 2 01:03

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p2 xfs 236G 189G 48G 81% /

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

(Continued on next page)
### Supermicro

SuperServer SYS-741GE-TNRT (X13DEG-QT, Intel Xeon Gold 6444Y)

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

---

**Platform Notes (Continued)**

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 Micron Technology MTC20F2085S1RC48BA1 32 GB 2 rank 4800

**BIOS:**  
- **BIOS Vendor:** American Megatrends International, LLC.  
- **BIOS Version:** 1.0  
- **BIOS Date:** 11/16/2022  
- **BIOS Revision:** 5.29

(End of data from sysinfo program)

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**Compiler Version Notes**

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**C**
- 600.perlbench_s(base, peak) 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 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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**C++**
- 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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**Fortran**
- 648.exchange2_s(base, peak)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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**Base Compiler Invocation**

**C benchmarks:**
- icx

**C++ benchmarks:**
- icpx

**Fortran benchmarks:**
- ifx
Supermicro
SuperServer SYS-741GE-TNRT (X13DEG-QT, Intel Xeon Gold 6444Y)

SPECspeed®2017_int_base = 15.1
SPECspeed®2017_int_peak = 15.4

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

Test Date: Dec-2022
Hardware Availability: Jan-2023
Software Availability: Jun-2022

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 -std=c11 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-m64 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
-m64 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Peak Compiler Invocation
C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx
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Test Date: Dec-2022
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Software Availability: Jun-2022

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
             -fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3
             -ffast-math -flto -mfpmath=sse -funroll-loops
             -qopt-mem-layout-trans=4 -fiopenmp -D SPEC_OPENMP
             -fno-strict-overflow -L/usr/local/jemalloc64-5.0.1/lib
             -ljemalloc

600.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
             -fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3
             -ffast-math -flto -mfpmath=sse -funroll-loops
             -qopt-mem-layout-trans=4 -fiopenmp -D SPEC_OPENMP
             -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

605.mcf_s: basepeak = yes

625.x264_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3
             -ffast-math -flto -mfpmath=sse -funroll-loops
             -qopt-mem-layout-trans=4 -fiopenmp -D SPEC_OPENMP
             -fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes
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(X13DEG-QT, Intel Xeon Gold 6444Y)

SPECspeed®2017_int_base = 15.1
SPECspeed®2017_int_peak = 15.4

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/Supermicro-Platform-Settings-V1.2-SPR-revC.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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