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

SPEC CPU®2017 Floating Point Speed Result

SPECspeed®2017_fp_base = 263
SPECspeed®2017_fp_peak = 263

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

Threads

<table>
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<th>Spec ID</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<tr>
<td>619.ibm_s</td>
<td>32</td>
</tr>
<tr>
<td>621.wrf_s</td>
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<tr>
<td>627.cam4_s</td>
<td>32</td>
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<tr>
<td>628.pop2_s</td>
<td>32</td>
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<tr>
<td>638.imagick_s</td>
<td>32</td>
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<tr>
<td>644.nab_s</td>
<td>32</td>
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<tr>
<td>649.fotonik3d_s</td>
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<tr>
<td>654.roms_s</td>
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</tr>
</tbody>
</table>

SPECspeed®2017_fp_base (263) SPECspeed®2017_fp_peak (263)

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 core
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.

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

Tested by: Supermicro
Hardware Availability: Jan-2023
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Supermicro
SuperServer SYS-741GE-TNRT (X13DEG-QT, Intel Xeon Gold 6444Y)

SPECspeed®2017_fp_base = 263
SPECspeed®2017_fp_peak = 263

Results Table

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<td>50.9</td>
<td>309</td>
</tr>
</tbody>
</table>

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 rncpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
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 rncpu invocation
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-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

jemalloc, a general purpose malloc implementation

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

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
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 982a61ec0915b55891ef0e16acaf6d4
running on localhost Fri Dec 2 04:16:32 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
SPEC CPU®2017 Floating Point Speed Result

Supermicro
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CPU2017 License: 001176
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Test Date: Dec-2022
Hardware Availability: Jan-2023
Software Availability: Jun-2022

Platform Notes (Continued)

Thread(s) per core: 1
Core(s) per socket: 16
Socket(s): 2
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
pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx
smx est tm2 ssse3 sdbg fma cx16 xtpr 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_13 cat_12 cdp_13 invpcid_single cdp_12 ssbd mba ibrs ibpb stibp
ibrs_enabled tpr_shadow vnumi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bm1
hle avx2 smep bmi2 erms invpcid rtm cmq rdt_a avx512f avx512dq rdseed adx smap
avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt
xsavexc xgetbv1 xsaves cmq_llc cmq_occmap_llc cmq_mbb_total cmq_mbb_local
split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida arat p1n pts avx512vbmi
umip pku ospke waitpkg avx512_vbmi2 gfn vaes vpcmtdq avx512_vnni avx512_bitalg
tme avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri movdir64b enqcmd
fsrm md_clear serialize txsl1dtrk pconfig arch_lbr avx512_fp16 amx_tile flush_l1d
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/swapsgs barriers and __user
pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB
filling
Vulnerability Srbds: Not affected
Vulnerability Tx async abort: Not affected

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE

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

<table>
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<td>Supermicro</td>
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**Platform Notes (Continued)**

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<td>L1d</td>
<td>48K</td>
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<td>L3</td>
<td>45M</td>
<td>90M</td>
<td>15 Unified</td>
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</tbody>
</table>

/proc/cpuinfo cache data

cache size : 46080 KB

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: 257120 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
node 1 free: 250919 MB
node distances:

node 0 1
0: 10 21
1: 21 10

From /proc/meminfo

MemTotal: 528044660 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

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:

(Continued on next page)
Supermicro
SuperServer SYS-741GE-TNRT
(X13DEQ-QT, Intel Xeon Gold 6444Y)

**Platform Notes (Continued)**

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 sanitation
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 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)

**Compiler Version Notes**

C | 619.lbm_s(base, peak) 638.imagick_s(base, peak)

(Continued on next page)
Supermicro
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SPECspeed®2017_fp_base = 263
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Compiler Version Notes (Continued)

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</tr>
<tr>
<td>Copyright (C) 1985-2022 Intel Corporation. All rights reserved.</td>
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C++, C, Fortran | 607.cactuBSSN_s(base, peak) |
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Fortran, C | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak) |
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Base Compiler Invocation

C benchmarks:
icx

(Continued on next page)
Supermicro
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Base Compiler Invocation (Continued)

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifx

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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

Benchmarks using both Fortran and C:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte -auto

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -gopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Peak Compiler Invocation

C benchmarks:
icx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: basepeak = yes

Fortran benchmarks:

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

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

Peak Optimization Flags (Continued)

603.bwaves_s: -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc

649.fotonik3d_s: basepeak = yes
654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes
627.cam4_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

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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