



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

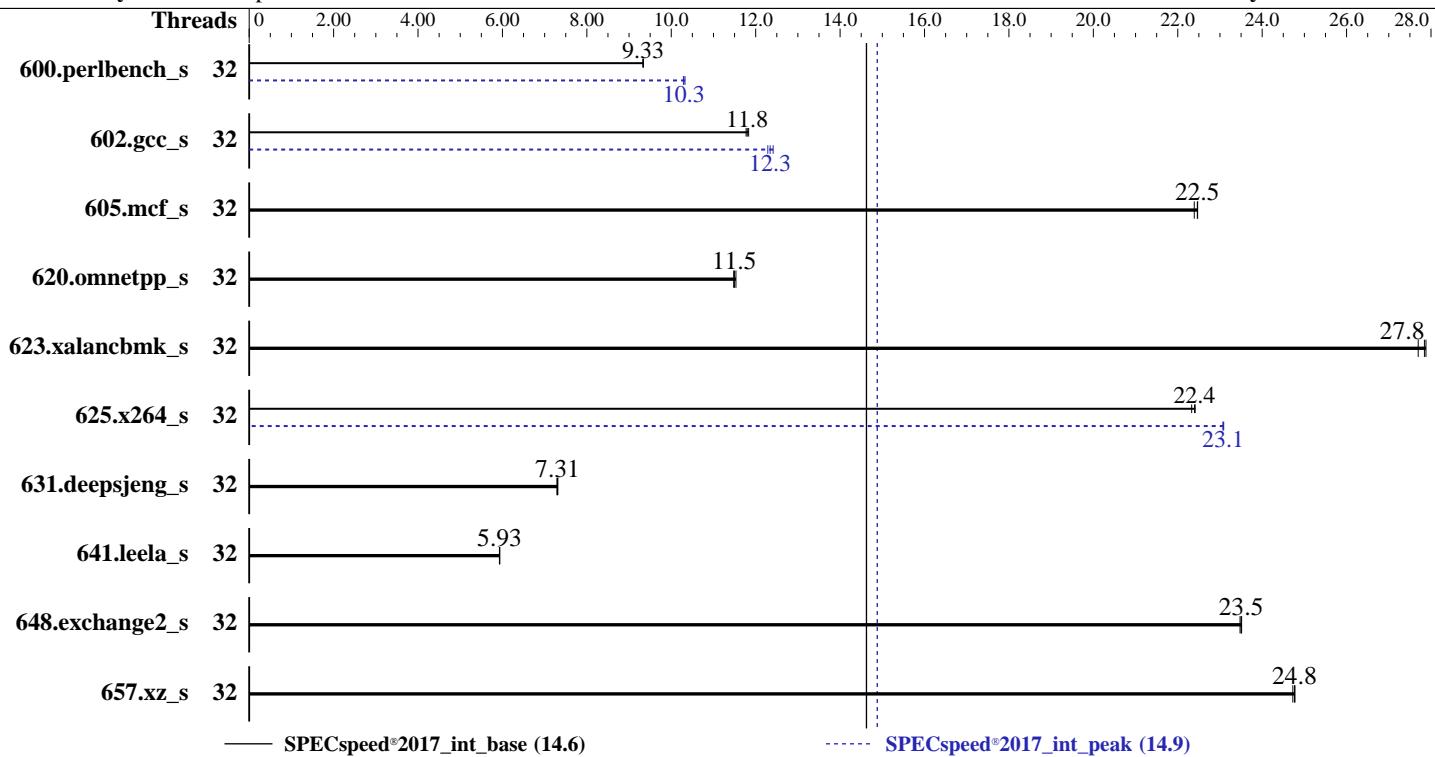
**SPECSspeed®2017\_int\_base = 14.6**

**SPECSspeed®2017\_int\_peak = 14.9**

**Test Date:** Dec-2022

**Hardware Availability:** Jan-2023

**Software Availability:** Jun-2022



### Hardware

CPU Name: Intel Xeon Platinum 8444H  
Max MHz: 4000  
Nominal: 2900  
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: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)  
Storage: 1 x 1.92 TB NVMe SSD  
Other: None

### Software

OS: SUSE Linux Enterprise High Performance Computing 15 SP4  
Compiler: 5.14.21-150400.22-default  
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 1.0b released Dec-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.



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

**SPECspeed®2017\_int\_base = 14.6**

**SPECspeed®2017\_int\_peak = 14.9**

CPU2017 License: 001176

Test Date: Dec-2022

Test Sponsor: Supermicro

Hardware Availability: Jan-2023

Tested by: Supermicro

Software Availability: Jun-2022

## Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	32	<b>190</b>	<b>9.33</b>	190	9.33	190	9.34	32	173	10.3	172	10.3	<b>172</b>	<b>10.3</b>
602.gcc_s	32	<b>337</b>	<b>11.8</b>	337	11.8	338	11.8	32	<b>323</b>	<b>12.3</b>	324	12.3	321	12.4
605.mcf_s	32	210	22.5	211	22.4	<b>210</b>	<b>22.5</b>	32	210	22.5	211	22.4	<b>210</b>	<b>22.5</b>
620.omnetpp_s	32	142	11.5	<b>142</b>	<b>11.5</b>	141	11.5	32	142	11.5	<b>142</b>	<b>11.5</b>	141	11.5
623.xalancbmk_s	32	50.8	27.9	51.2	27.7	<b>50.9</b>	<b>27.8</b>	32	50.8	27.9	51.2	27.7	<b>50.9</b>	<b>27.8</b>
625.x264_s	32	79.0	22.3	<b>78.8</b>	<b>22.4</b>	78.7	22.4	32	76.5	23.1	76.4	23.1	<b>76.4</b>	<b>23.1</b>
631.deepsjeng_s	32	196	7.31	197	7.29	<b>196</b>	<b>7.31</b>	32	196	7.31	197	7.29	<b>196</b>	<b>7.31</b>
641.leela_s	32	287	5.94	288	5.93	<b>288</b>	<b>5.93</b>	32	287	5.94	288	5.93	<b>288</b>	<b>5.93</b>
648.exchange2_s	32	125	23.5	125	23.5	<b>125</b>	<b>23.5</b>	32	125	23.5	125	23.5	<b>125</b>	<b>23.5</b>
657.xz_s	32	<b>250</b>	<b>24.8</b>	250	24.8	250	24.7	32	<b>250</b>	<b>24.8</b>	250	24.8	250	24.7
<b>SPECspeed®2017_int_base = 14.6</b>														
<b>SPECspeed®2017_int_peak = 14.9</b>														

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.xalancbmk\_r / 623.xalancbmk\_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](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)



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

SPECspeed®2017\_int\_base = 14.6

SPECspeed®2017\_int\_peak = 14.9

Test Date: Dec-2022

Hardware Availability: Jan-2023

Software Availability: Jun-2022

## 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.

jemalloc, a general purpose malloc implementation

built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  
sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

## Platform Notes

### BIOS Settings:

Hyper-Threading [ALL] = Disable

Power Technology = Custom

Power Performance Tuning = BIOS Controls EPPB

ENERGY\_PERF\_BIAS\_CFG mode = Performance

Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6622 of 2021-04-07 982a6lec0915b55891ef0e16acafc64d  
running on 165-76 Thu Dec 1 16:00:20 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) Platinum 8444H  
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) Platinum 8444H  
CPU family: 6  
Model: 143  
Thread(s) per core: 1  
Core(s) per socket: 16  
Socket(s): 2  
Stepping: 6  
Frequency boost: enabled  
CPU max MHz: 2901.0000  
CPU min MHz: 800.0000  
BogoMIPS: 5800.00

(Continued on next page)



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

SPECspeed®2017\_int\_base = 14.6

SPECspeed®2017\_int\_peak = 14.9

Test Date: Dec-2022

Hardware Availability: Jan-2023

Software Availability: Jun-2022

## Platform Notes (Continued)

```
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mttr
      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 aperfmpf perf 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_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1
      hle avx2 smep bmi2 erms invpcid rtm cqmq rdt_a avx512f avx512dq rdseed adx smap
      avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt
      xsavec xgetbv1 xsaves cqmq_llc cqmq_occup_llc cqmq_mbm_total cqmq_mbm_local
      split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts avx512vbmi
      umip pkru ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
      tme avx512_vpocntdq la57 rdpid bus_lock_detect cldemote movdir64b enqcmd
      fsrm md_clear serialize tsxldtrk pconfig arch_lbr avx512_fp16 amx_tile flush_lll
      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/swapgs 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

/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: 515625 MB
node 0 free: 513666 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 515751 MB
node 1 free: 515001 MB
node distances:
node 0 1
 0: 10 21
 1: 21 10
```

(Continued on next page)



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

SPECspeed®2017\_int\_base = 14.6

SPECspeed®2017\_int\_peak = 14.9

CPU2017 License: 001176

Test Date: Dec-2022

Test Sponsor: Supermicro

Hardware Availability: Jan-2023

Tested by: Supermicro

Software Availability: Jun-2022

## Platform Notes (Continued)

```
From /proc/meminfo
MemTotal:      1056130100 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="SLE_HPC"
  VERSION="15-SP4"
  VERSION_ID="15.4"
  PRETTY_NAME="SUSE Linux Enterprise High Performance Computing 15 SP4"
  ID="sle_hpc"
  ID_LIKE="suse"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sle_hpc:15:sp4"

uname -a:
Linux 165-76 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/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 Dec 1 15:55

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p4 xfs 738G 139G 600G 19% /home

```
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:
11x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800
5x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800

(Continued on next page)



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

SPECspeed®2017\_int\_base = 14.6

SPECspeed®2017\_int\_peak = 14.9

Test Date: Dec-2022

Hardware Availability: Jan-2023

Software Availability: Jun-2022

## Platform Notes (Continued)

BIOS:

BIOS Vendor: American Megatrends International, LLC.  
BIOS Version: 1.0b  
BIOS Date: 11/30/2022  
BIOS Revision: 5.29

(End of data from sysinfo program)

## Compiler Version Notes

=====

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.

=====

=====

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.

=====

=====

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.

=====

## Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

## Base Portability Flags

600.perlbench\_s: -DSPEC\_LP64 -DSPEC\_LINUX\_X64

602.gcc\_s: -DSPEC\_LP64

(Continued on next page)



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

SPECspeed®2017\_int\_base = 14.6

SPECspeed®2017\_int\_peak = 14.9

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Dec-2022

Hardware Availability: Jan-2023

Software Availability: Jun-2022

## Base Portability Flags (Continued)

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 -futto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fopenmp
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

C++ benchmarks:

```
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -futto
-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 -futto
-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



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

SPECspeed®2017\_int\_base = 14.6

SPECspeed®2017\_int\_peak = 14.9

Test Date: Dec-2022

Hardware Availability: Jan-2023

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 -DSPEC_OPENMP
-fno-strict-overflow -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 -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
```

```
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 -DSPEC_OPENMP
-fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

```
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
```



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Supermicro

SuperServer SYS-221H-TN24R  
(X13DEM , Intel Xeon Platinum 8444H)

SPECspeed®2017\_int\_base = 14.6

SPECspeed®2017\_int\_peak = 14.9

**CPU2017 License:** 001176

**Test Date:** Dec-2022

**Test Sponsor:** Supermicro

**Hardware Availability:** Jan-2023

**Tested by:** Supermicro

**Software Availability:** Jun-2022

The flags files that were used to format this result can be browsed at

[http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64\\_revA.2023-01-10.html](http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.2023-01-10.html)  
<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SPR-revC.html>

You can also download the XML flags sources by saving the following links:

[http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64\\_revA.2023-01-10.xml](http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.2023-01-10.xml)

<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SPR-revC.xml>

SPEC CPU and SPECspeed are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEC CPU®2017 v1.1.8 on 2022-12-01 19:00:19-0500.

Report generated on 2024-01-29 17:17:05 by CPU2017 PDF formatter v6716.

Originally published on 2023-01-13.