



SPEC CPU®2017 Floating Point Speed Result

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Supermicro

Mainstream SuperServer SYS-221P-C9R
(X13DEI , Intel Xeon Gold 6548Y+)

SPECspeed®2017_fp_base = 354

SPECspeed®2017_fp_peak = 354

CPU2017 License: 6569

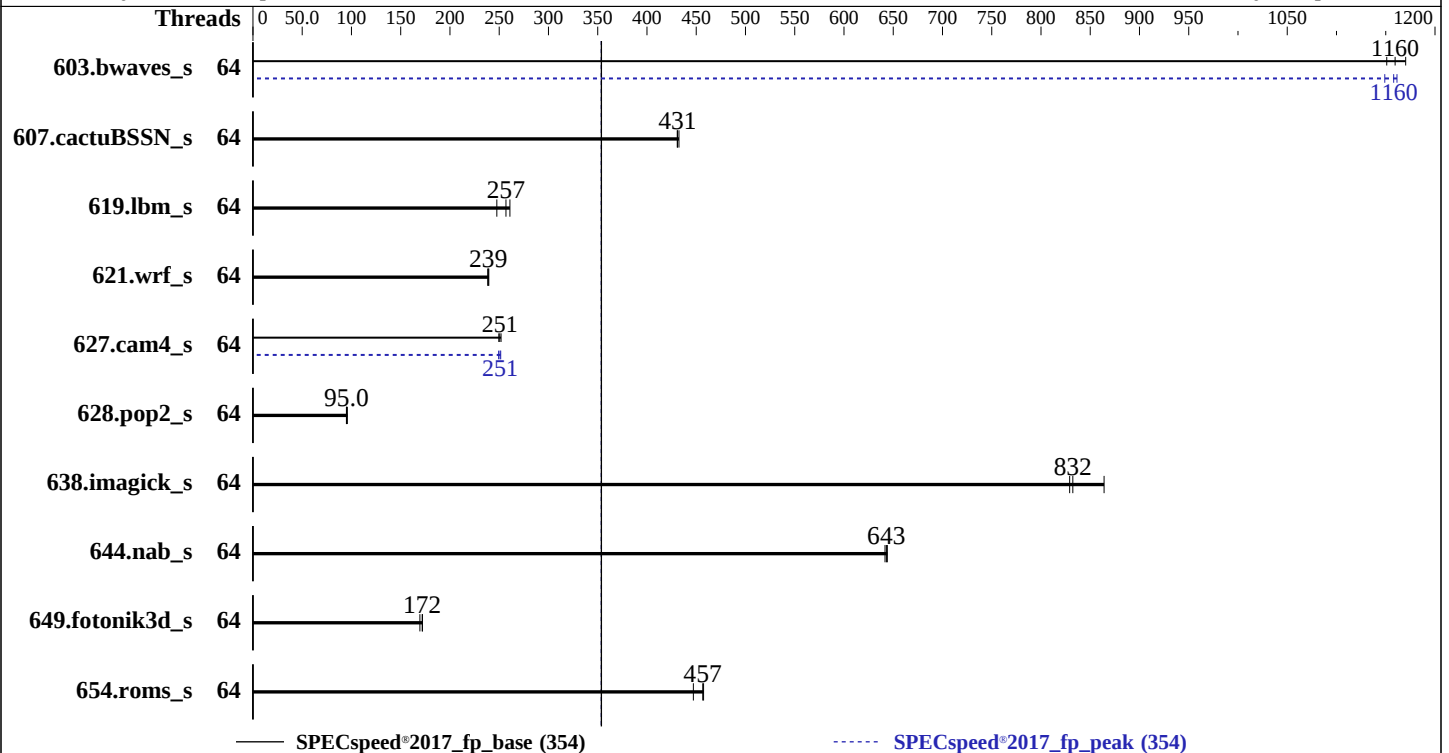
Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Jul-2026

Hardware Availability: Dec-2023

Software Availability: Apr-2026



Hardware

CPU Name: Intel Xeon Gold 6548Y+
Max MHz: 4100
Nominal: 2500
Enabled: 64 cores, 2 chips, 2 threads/core
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: 60 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC5-5600B-R, running at 5200)
Storage: 1 x 1.92 TB NVMe SSD
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP7
Kernel 6.4.0-150700.51-default
Compiler: C/C++: Version 2026.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2026.0 of Intel Fortran Compiler for Linux;
Parallel: Yes
Firmware: Version 2.8 released Oct-2025
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 and OS set to prefer performance at the cost of additional power usage.



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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	64	51.3	1150	<u>50.9</u>	<u>1160</u>	50.4	1170	64	51.3	1150	<u>50.9</u>	<u>1160</u>	50.8	1160
607.cactuBSSN_s	64	<u>38.7</u>	<u>431</u>	38.5	432	38.7	431	64	<u>38.7</u>	<u>431</u>	38.5	432	38.7	431
619.lbm_s	64	20.1	261	21.2	248	<u>20.4</u>	<u>257</u>	64	20.1	261	21.2	248	<u>20.4</u>	<u>257</u>
621.wrf_s	64	55.2	239	55.5	238	<u>55.4</u>	<u>239</u>	64	55.2	239	55.5	238	<u>55.4</u>	<u>239</u>
627.cam4_s	64	35.5	250	<u>35.4</u>	<u>251</u>	35.2	252	64	35.2	252	35.5	249	<u>35.3</u>	<u>251</u>
628.pop2_s	64	<u>125</u>	<u>95.0</u>	125	94.9	124	95.9	64	<u>125</u>	<u>95.0</u>	125	94.9	124	95.9
638.imagick_s	64	<u>17.3</u>	<u>832</u>	16.7	864	17.4	829	64	<u>17.3</u>	<u>832</u>	16.7	864	17.4	829
644.nab_s	64	27.1	644	<u>27.2</u>	<u>643</u>	27.2	642	64	27.1	644	<u>27.2</u>	<u>643</u>	27.2	642
649.fotonik3d_s	64	<u>53.1</u>	<u>172</u>	53.0	172	53.8	169	64	<u>53.1</u>	<u>172</u>	53.0	172	53.8	169
654.roms_s	64	<u>34.5</u>	<u>457</u>	35.2	447	34.4	457	64	<u>34.5</u>	<u>457</u>	35.2	447	34.4	457

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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,compact,1,0"

LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64"

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

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 Configuration:

Power Performance Tuning = BIOS Controls EPB

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Platform Notes (Continued)

ENERGY_PERF_BIAS_CFG mode = Performance

LLC Dead Line Alloc = Disable

KTI Prefetch = Enable

Stale AtoS = Disable

Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Fri Jul 24 20:29:17 2026

SUT (System Under Test) info as seen by some common utilities.

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4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
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9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 254 (254.24+suse.148.g83b9060b6e)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

1. uname -a
Linux localhost 6.4.0-150700.51-default #1 SMP PREEMPT_DYNAMIC Wed Apr 30 21:35:43 UTC 2025 (6930611)
x86_64 x86_64 x86_64 GNU/Linux

2. w
20:29:17 up 3:10, 1 user, load average: 6.65, 5.55, 3.40
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 17:19 3:07m 0.80s 0.00s -bash

3. Username
From environment variable \$USER: root

4. ulimit -a
core file size (blocks, -c) unlimited
data seg size (kbytes, -d) unlimited
scheduling priority (-e) 0

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Platform Notes (Continued)

file size	(blocks, -f)	unlimited
pending signals	(-i)	2062324
max locked memory	(kbytes, -l)	8192
max memory size	(kbytes, -m)	unlimited
open files	(-n)	1024
pipe size	(512 bytes, -p)	8
POSIX message queues	(bytes, -q)	819200
real-time priority	(-r)	0
stack size	(kbytes, -s)	unlimited
cpu time	(seconds, -t)	unlimited
max user processes	(-u)	2062324
virtual memory	(kbytes, -v)	unlimited
file locks	(-x)	unlimited

5. sysinfo process ancestry

```
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
login -- root
-bash
-bash
runcpu --nobuild --action validate --define default-platform-flags -c
ic2026.0-lin-sapphirerapids-speed-20260429.cfg --define cores=64 --tune base,peak -o all --define smt-on
--define drop_caches fpspeed
runcpu --nobuild --action validate --define default-platform-flags --configfile
ic2026.0-lin-sapphirerapids-speed-20260429.cfg --define cores=64 --tune base,peak --output_format all
--define smt-on --define drop_caches --nopower --runmode speed --tune base:peak --size refspeak fpspeed
--nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.006/temlogs/preenv.fpspeed.006.0.log --lognum 006.0
--from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
```

6. /proc/cpuinfo

```
model name      : INTEL(R) XEON(R) GOLD 6548Y+
vendor_id       : GenuineIntel
cpu family      : 6
model           : 207
stepping        : 2
microcode       : 0x210002c0
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb bhi
cpu cores       : 32
siblings        : 64
2 physical ids (chips)
128 processors (hardware threads)
physical id 0:  core ids 0-31
physical id 1:  core ids 0-31
physical id 0:  apicids 0-63
physical id 1:  apicids 128-191
```

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

7. lscpu

From lscpu from util-linux 2.40.4:

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):	128

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Platform Notes (Continued)

On-line CPU(s) list: 0-127
Vendor ID: GenuineIntel
Model name: INTEL(R) XEON(R) GOLD 6548Y+
CPU family: 6
Model: 207
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 2
Stepping: 2
Frequency boost: enabled
CPU(s) scaling MHz: 107%
CPU max MHz: 2501.0000
CPU min MHz: 800.0000
BogoMIPS: 5000.00
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_l3 cat_l2 cdp_l3 intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local split_lock_detect user_shstk avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts hfi vnmi avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri movdir64b enqcmd fsrm md_clear serialize tsxldtrk pconfig arch_lbr ibt amx_bf16 avx512_fp16 amx_tile amx_int8 flush_l1d arch_capabilities
Virtualization: VT-x
L1d cache: 3 MiB (64 instances)
L1i cache: 2 MiB (64 instances)
L2 cache: 128 MiB (64 instances)
L3 cache: 120 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-31,64-95
NUMA node1 CPU(s): 32-63,96-127
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Reg file data sampling: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec rstack overflow: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling; PBRSE-eIBRS SW sequence; BHI BHI_DIS_S
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	3M	12	Data	1	64	1	64

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Platform Notes (Continued)

L1i	32K	2M	8 Instruction	1	64	1	64
L2	2M	128M	16 Unified	2	2048	1	64
L3	60M	120M	15 Unified	3	65536	1	64

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

```
available: 2 nodes (0-1)
node 0 cpus: 0-31,64-95
node 0 size: 257656 MB
node 0 free: 255623 MB
node 1 cpus: 32-63,96-127
node 1 size: 257952 MB
node 1 free: 250837 MB
node distances:
node  0  1
  0:  10  21
  1:  21  10
```

9. /proc/meminfo

MemTotal: 527983268 kB

10. who -r

run-level 3 Jul 24 17:19

11. Systemd service manager version: systemd 254 (254.24+suse.148.g83b9060b6e)

Default Target	Status
multi-user	running

12. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager getty@ irqbalance issue-generator kbdsettings klog lvm2-monitor nscd nvme-fc-boot-connections nvmmf-autoconnect postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore tuned wickedd wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime	systemd-remount-fs
disabled	autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info firewallld fsidd gpm grub2-once haveged ipmi ipmievd issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap rpcbind rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-sysexit systemd-time-wait-sync systemd-timesyncd udisks2 vncserver@
indirect	systemd-userdbd wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline

```
BOOT_IMAGE=/boot/vmlinuz-6.4.0-150700.51-default
root=UUID=8358bf61-4d6f-4acc-bfdf-cfc5aa7f96be
splash=silent
mitigations=auto
quiet
security=apparmor
```

14. cpupower frequency-info

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Platform Notes (Continued)

analyzing CPU 5:

current policy: frequency should be within 800 MHz and 2.50 GHz.
The governor "performance" may decide which speed to use within this range.

boost state support:

Supported: yes

Active: yes

15. tuned-adm active

Current active profile: throughput-performance

16. sysctl

kernel.numa_balancing	1
kernel.randomize_va_space	2
vm.compaction_proactiveness	20
vm.dirty_background_bytes	0
vm.dirty_background_ratio	10
vm.dirty_bytes	0
vm.dirty_expire_centisecs	3000
vm.dirty_ratio	40
vm.dirty_writeback_centisecs	500
vm.dirtytime_expire_seconds	43200
vm.extfrag_threshold	500
vm.min_unmapped_ratio	1
vm.nr_hugepages	0
vm.nr_hugepages_mempolicy	0
vm.nr_overcommit_hugepages	0
vm.swappiness	10
vm.watermark_boost_factor	15000
vm.watermark_scale_factor	10
vm.zone_reclaim_mode	0

17. /sys/kernel/mm/transparent_hugepage

defrag	always	defer	defer+madvise	[madvise]	never
enabled	[always]	madvise	never		
hpage_pmd_size	2097152				
shmem_enabled	always	within_size	advise	[never]	deny force

18. /sys/kernel/mm/transparent_hugepage/khugepaged

alloc_sleep_millisecs	60000
defrag	1
max_ptes_none	511
max_ptes_shared	256
max_ptes_swap	64
pages_to_scan	4096
scan_sleep_millisecs	10000

19. OS release

From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP7

20. Disk information

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
------------	------	------	------	-------	------	------------

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Platform Notes (Continued)

/dev/nvme0n1p2 xfs 1.8T 191G 1.6T 11% /

21. /sys/devices/virtual/dmi/id

Vendor: Supermicro
Product: SYS-741P-TRT
Product Family: Family
Serial: A945221X7416000

22. dmidecode

Additional information from dmidecode 3.6 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 Samsung M321R4GA3PB0-CWMKJ 32 GB 2 rank 5600, configured at 5200

23. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 2.8
BIOS Date: 10/08/2025
BIOS Revision: 5.32

Compiler Version Notes

C | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.

C++, C, Fortran | 607.cactuBSSN_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2026.0.0 Build 20260331
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2026.0.0 Build 20260331
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.

Fortran | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2026.0.0 Build 20260331
Copyright (C) 1985-2026 Intel Corporation. All rights reserved.

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

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:

-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:

-w -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xsapphirerapids -Ofast

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):

-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:

-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:

-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -Wno-implicit-int
-mprefer-vector-width=512 -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



SPEC CPU®2017 Floating Point Speed Result

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Supermicro

Mainstream SuperServer SYS-221P-C9R
(X13DEI , Intel Xeon Gold 6548Y+)

SPECspeed®2017_fp_base = 354

SPECspeed®2017_fp_peak = 354

CPU2017 License: 6569

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Jul-2026

Hardware Availability: Dec-2023

Software Availability: Apr-2026

Peak Optimization Flags

C benchmarks:

619.lbm_s: basepeak = yes

638.imagick_s: basepeak = yes

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: -w -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xsapphirerapids
-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: -w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-Wno-implicit-int -mprefer-vector-width=512
-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

<http://www.spec.org/cpu2017/flags/Intel-ic2026-official-linux64.html>

<http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-EMR-revG.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic2026-official-linux64.xml>

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



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