



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2025 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant Compute DL340 Gen12

(2.50 GHz, Intel Xeon 6730P)

SPECspeed®2017_int_base = 13.7

SPECspeed®2017_int_peak = 14.0

CPU2017 License: 3

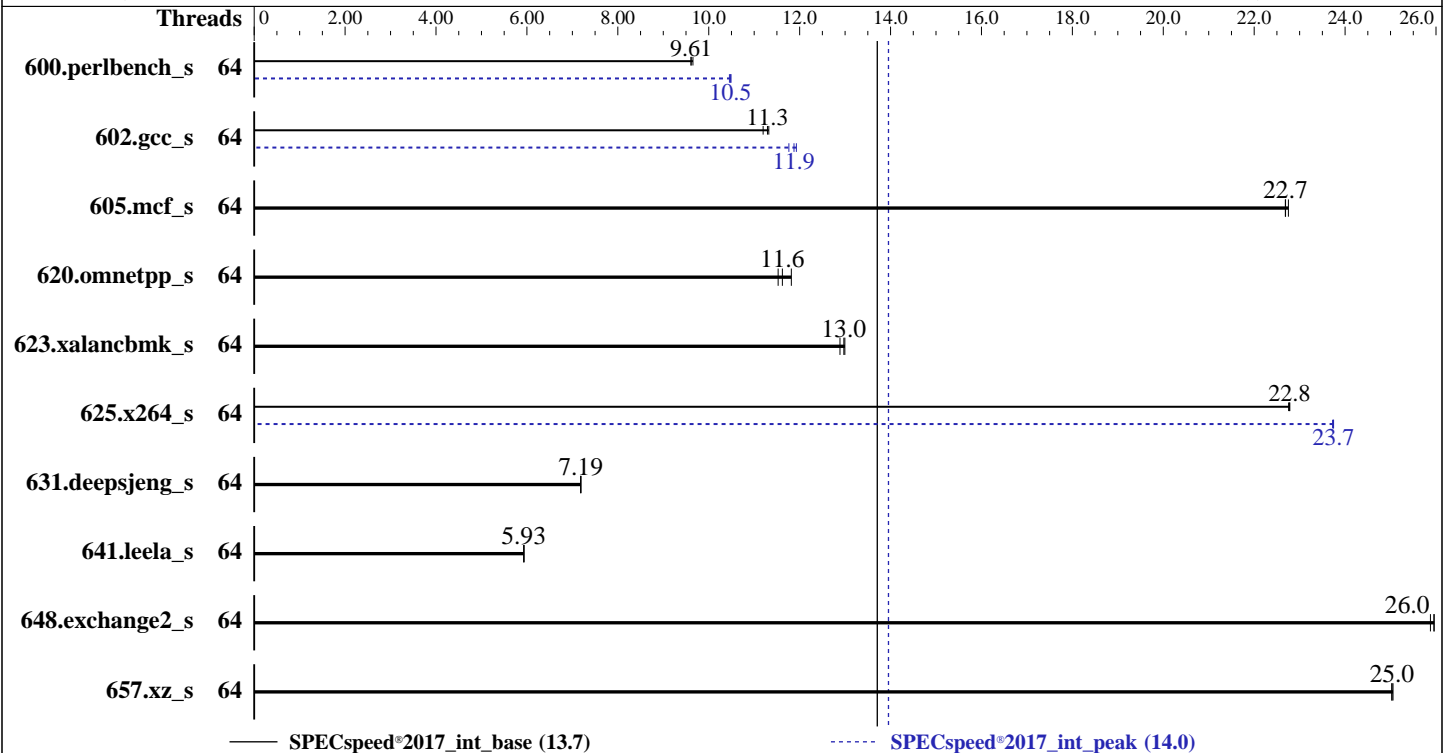
Test Sponsor: HPE

Tested by: HPE

Test Date: Mar-2025

Hardware Availability: Mar-2025

Software Availability: Jun-2024



Hardware

CPU Name: Intel Xeon 6730P
 Max MHz: 3800
 Nominal: 2500
 Enabled: 32 cores, 1 chip, 2 threads/core
 Orderable: 1 Chip
 Cache L1: 64 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 288 MB I+D on chip per chip
 Other: None
 Memory: 256 GB (8 x 32 GB 2Rx8 PC5-6400B-R)
 Storage: 1 x 1.2 TB NVMe SSD
 Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6
 Kernel 6.4.0-150600.21-default
 Compiler: C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;
 Parallel: Yes
 Firmware: HPE BIOS Version v1.20 02/14/2025 released Feb-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 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
600.perlbench_s	64	184	9.65	185	9.61	185	9.61	64	170	10.5	169	10.5	169	10.5
602.gcc_s	64	356	11.2	352	11.3	353	11.3	64	334	11.9	335	11.9	339	11.8
605.mcf_s	64	207	22.8	208	22.7	208	22.7	64	207	22.8	208	22.7	208	22.7
620.omnetpp_s	64	141	11.5	140	11.6	138	11.8	64	141	11.5	140	11.6	138	11.8
623.xalancbmk_s	64	109	13.0	110	12.9	109	13.0	64	109	13.0	110	12.9	109	13.0
625.x264_s	64	77.4	22.8	77.5	22.8	77.4	22.8	64	74.3	23.7	74.4	23.7	74.3	23.7
631.deepsjeng_s	64	199	7.19	199	7.18	199	7.19	64	199	7.19	199	7.18	199	7.19
641.leela_s	64	288	5.93	287	5.93	288	5.93	64	288	5.93	287	5.93	288	5.93
648.exchange2_s	64	114	25.9	113	26.0	113	26.0	64	114	25.9	113	26.0	113	26.0
657.xz_s	64	247	25.1	247	25.0	247	25.0	64	247	25.1	247	25.0	247	25.0

SPECspeed®2017_int_base = **13.7**

SPECspeed®2017_int_peak = **14.0**

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"
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
```

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"
MALLOCONF = "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
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
```



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Platform Notes

BIOS Configuration:

Workload Profile set to General Peak Frequency Compute
 Memory Patrol Scrubbing set to Disabled
 Thermal Configuration set to Maximum Cooling
 Enhanced Processor Performance Profile set to Aggressive
 Sub-NUMA Clustering (SNC) set to Enabled
 Last Level Cache (LLC) Prefetch set to Enabled
 Minimum Processor Idle Power Core C-State set to C6 as ACPI C3 State
 Workload Profile set to Custom
 Minimum Processor Idle Power Package C-State set to No Package State

Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Thu Mar 27 10:48:29 2025

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

Table of contents

1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS

```
1. uname -a
Linux localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
10:48:29 up 0 min, 3 users, load average: 0.08, 0.03, 0.01
USER      TTY      FROM          LOGIN@      IDLE        JCPU       PCPU       WHAT
```

```
3. Username
From environment variable $USER: root
```

```
4. ulimit -a
```

(Continued on next page)



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Platform Notes (Continued)

```

core file size      (blocks, -c) unlimited
data seg size      (kbytes, -d) unlimited
scheduling priority (-e) 0
file size          (blocks, -f) unlimited
pending signals    (-i) 1030690
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) 1030690
virtual memory    (kbytes, -v) unlimited
file locks        (-x) unlimited

```

```

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize=31
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@notty
bash -c cd $SPEC/ && $SPEC/intspeedsprof.sh
runcpu --nobuild --action validate --define default-platform-flags -c
  ic2024.1-lin-sapphirerapids-speed-20240308.cfg --define cores=64 --tune base,peak -o all --define
  intspeedaffinity --define drop_caches intspeed
runcpu --nobuild --action validate --define default-platform-flags --configfile
  ic2024.1-lin-sapphirerapids-speed-20240308.cfg --define cores=64 --tune base,peak --output_format all
  --define intspeedaffinity --define drop_caches --nopower --runmode speed --tune base:peak --size refspeed
  intspeed --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.003/templogs/preenv.intspeed.003.0.log
  --lognum 003.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

```

```

-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) 6730P
vendor_id      : GenuineIntel
cpu family     : 6
model          : 173
stepping       : 1
microcode      : 0x1000380
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
cpu cores      : 32
siblings       : 64
1 physical ids (chips)
64 processors (hardware threads)
physical id 0: core ids 0-15,64-79
physical id 0: apicids 0-31,128-159
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 2.39.3:
Architecture:      x86_64
CPU op-mode(s):    32-bit, 64-bit
Address sizes:     46 bits physical, 57 bits virtual

```

(Continued on next page)



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Platform Notes (Continued)

```

Byte Order:                Little Endian
CPU(s):                    64
On-line CPU(s) list:      0-63
Vendor ID:                 GenuineIntel
BIOS Vendor ID:          Intel(R) Corporation
Model name:               Intel(R) Xeon(R) 6730P
BIOS Model name:         Intel(R) Xeon(R) 6730P  CPU @ 2.5GHz
BIOS CPU family:         179
CPU family:               6
Model:                    173
Thread(s) per core:      2
Core(s) per socket:      32
Socket(s):                1
Stepping:                 1
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 bmil hle avx2 smep bmi2 erms invpcid
                          rtm 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_lld arch_capabilities

Virtualization:           VT-x
L1d cache:                1.5 MiB (32 instances)
L1i cache:                2 MiB (32 instances)
L2 cache:                 64 MiB (32 instances)
L3 cache:                 288 MiB (1 instance)
NUMA node(s):            2
NUMA node0 CPU(s):       0-15,32-47
NUMA node1 CPU(s):       16-31,48-63
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit: Not affected
Vulnerability Lltf:      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/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling;
                          PBRSE-eIBRS Not affected; 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

(Continued on next page)



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Platform Notes (Continued)

L1d	48K	1.5M	12 Data	1	64	1	64
L1i	64K	2M	16 Instruction	1	64	1	64
L2	2M	64M	16 Unified	2	2048	1	64
L3	288M	288M	16 Unified	3	294912	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: 0-15,32-47
node 0 size: 128704 MB
node 0 free: 127811 MB
node 1 cpus: 16-31,48-63
node 1 size: 128993 MB
node 1 free: 128516 MB
node distances:
node 0 1
  0: 10 12
  1: 12 10

```

9. /proc/meminfo

MemTotal: 263882220 kB

10. who -r

run-level 3 Mar 27 10:48

11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)

```

Default Target Status
multi-user      running

```

12. Services, from systemctl list-unit-files

```

STATE UNIT FILES
enabled apparmor auditd cron getty@ irqbalance issue-generator kbdsettings nvme-fc-boot-connections
nvme-f-autoconnect postfix purge-kernels rollback sshd systemd-pstore wicked wickedd-auto4
wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime systemd-remount-fs
disabled boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell grub2-once
haveged hwloc-dump-hwdata issue-add-ssh-keys kexec-load rpmconfigcheck serial-getty@
systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-sysext
systemd-time-wait-sync systemd-timesyncd
indirect systemd-userdbd wickedd

```

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

```

BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=eab0ed4d-682e-4710-8733-c28bac484a35
splash=silent
resume=/dev/disk/by-uuid/aed0eb8-1155-47a5-869c-f7c223bb00af
mitigations=auto
quiet
security=apparmor

```

14. cpupower frequency-info

```

analyzing CPU 39:
Unable to determine current policy

```

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Platform Notes (Continued)

boost state support:

Supported: yes

Active: yes

15. 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	20
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	60
vm.watermark_boost_factor	15000
vm.watermark_scale_factor	10
vm.zone_reclaim_mode	0

16. /sys/kernel/mm/transparent_hugepage

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

17. /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

18. OS release

From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP6

19. Disk information

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/nvme0n1p3	xfs	1.2T	141G	1.1T	12%	/home

20. /sys/devices/virtual/dmi/id

Vendor:	HPE
Product:	HPE ProLiant Compute DL340 Gen12
Product Family:	ProLiant
Serial:	C2X2NWW69B

(Continued on next page)



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Platform Notes (Continued)

21. dmidecode

Additional information from dmidecode 3.4 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:

8x Micron MTC20F2085S1RC64BD2 QSFF 32 GB 2 rank 6400

22. BIOS

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

BIOS Vendor: HPE
BIOS Version: 1.20
BIOS Date: 02/14/2025
BIOS Revision: 1.20
Firmware Revision: 1.11

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 2024.1.0 Build 20240308
Copyright (C) 1985-2024 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 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

Fortran | 648.exchange2_s(base, peak)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

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Base Compiler Invocation (Continued)

Fortran benchmarks:

ifx

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:

```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -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:

```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -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

(Continued on next page)



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Peak Compiler Invocation (Continued)

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```

600.perlbench_s: -w -m64 -std=c11 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profddata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast(pass 1) -xCORE-AVX512 -O3 -ffast-math
-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: -w -m64 -std=c11 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profddata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast(pass 1) -xCORE-AVX512 -O3 -ffast-math
-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: -w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -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:

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant Compute DL340 Gen12

(2.50 GHz, Intel Xeon 6730P)

SPECspeed®2017_int_base = 13.7

SPECspeed®2017_int_peak = 14.0

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Mar-2025

Hardware Availability: Mar-2025

Software Availability: Jun-2024

Peak Optimization Flags (Continued)

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/HPE-Platform-Flags-Intel-GNR-rev1.1.html>

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.html>

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-GNR-rev1.1.xml>

<http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml>

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Tested with SPEC CPU®2017 v1.1.9 on 2025-03-27 10:48:28-0400.

Report generated on 2025-04-22 18:12:30 by CPU2017 PDF formatter v6716.

Originally published on 2025-04-22.