



SPEC CPU®2017 Integer Speed Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant Compute DL380 Gen12

(2.20 Ghz, Intel Xeon 6505P)

SPECspeed®2017_int_base = 14.3

SPECspeed®2017_int_peak = 14.6

CPU2017 License: 3

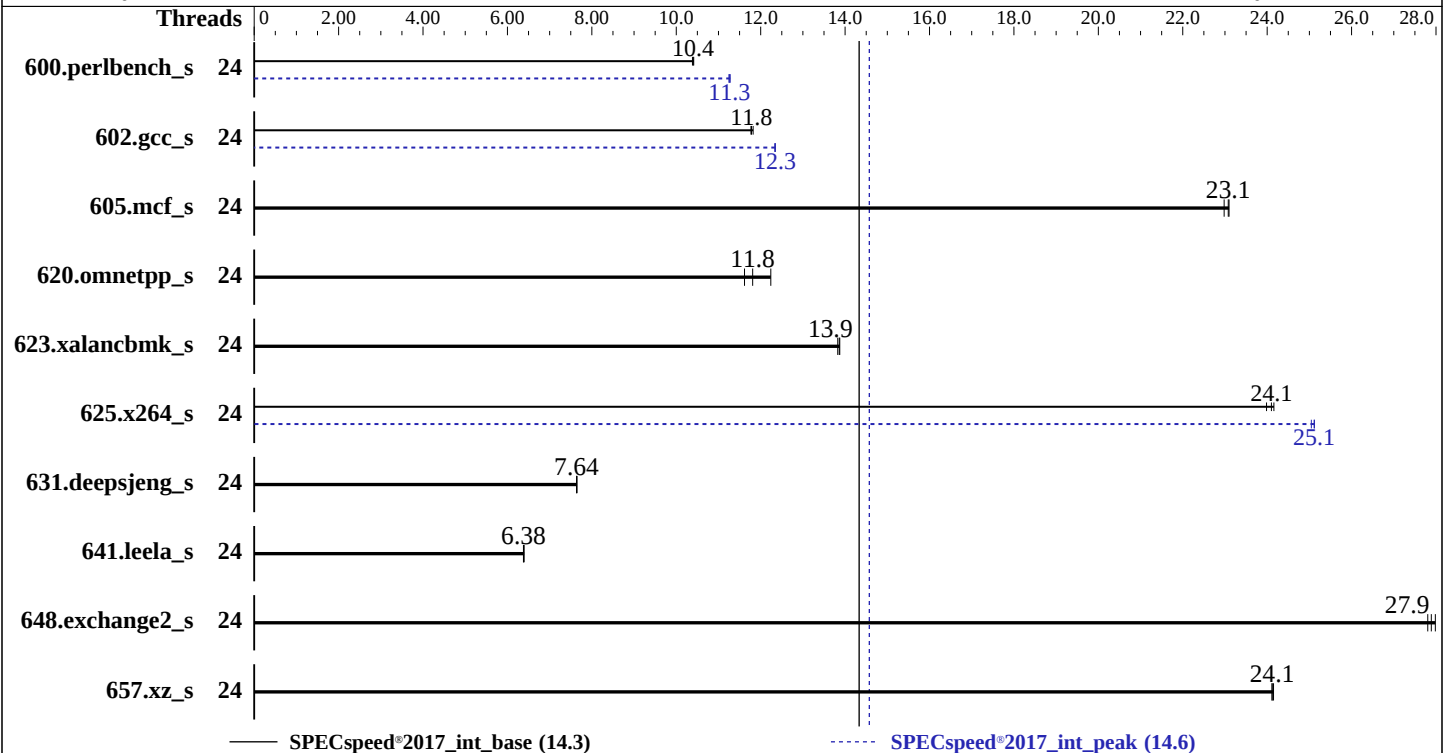
Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2025

Hardware Availability: Mar-2025

Software Availability: Jun-2024



Hardware

CPU Name: Intel Xeon 6505P
Max MHz: 4100
Nominal: 2200
Enabled: 24 cores, 2 chips
Orderable: 1, 2 Chips
Cache L1: 64 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 48 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-6400B-R)
Storage: 1 x 3.2 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: btrfs
System State: Run level 5 (multi-user graphical)
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	24	<u>171</u>	<u>10.4</u>	171	10.4	170	10.4	24	158	11.2	157	11.3	<u>158</u>	<u>11.3</u>
602.gcc_s	24	337	11.8	<u>338</u>	<u>11.8</u>	338	11.8	24	<u>323</u>	<u>12.3</u>	323	12.3	323	12.3
605.mcf_s	24	204	23.1	<u>205</u>	<u>23.1</u>	205	23.0	24	204	23.1	<u>205</u>	<u>23.1</u>	205	23.0
620.omnetpp_s	24	133	12.2	140	11.6	<u>138</u>	<u>11.8</u>	24	133	12.2	140	11.6	<u>138</u>	<u>11.8</u>
623.xalanchmk_s	24	<u>102</u>	<u>13.9</u>	102	13.8	102	13.9	24	<u>102</u>	<u>13.9</u>	102	13.8	102	13.9
625.x264_s	24	<u>73.2</u>	<u>24.1</u>	73.0	24.2	73.5	24.0	24	70.4	25.0	<u>70.2</u>	<u>25.1</u>	70.2	25.1
631.deepsjeng_s	24	<u>188</u>	<u>7.64</u>	187	7.65	188	7.64	24	<u>188</u>	<u>7.64</u>	187	7.65	188	7.64
641.leela_s	24	267	6.40	267	6.38	<u>267</u>	<u>6.38</u>	24	267	6.40	267	6.38	<u>267</u>	<u>6.38</u>
648.exchange2_s	24	105	28.0	<u>105</u>	<u>27.9</u>	106	27.8	24	105	28.0	<u>105</u>	<u>27.9</u>	106	27.8
657.xz_s	24	256	24.2	<u>256</u>	<u>24.1</u>	256	24.1	24	256	24.2	<u>256</u>	<u>24.1</u>	256	24.1

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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"
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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
tuned-adm profile was stopped using "systemctl stop tuned"

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
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
Intel Hyper-Threading set to Disabled
Enhanced Processor Performance Profile set to Aggressive
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
Last Level Cache (LLC) Prefetch set to Enabled
XPT Prefetch set to Disabled
Intel UPI Prefetch set to Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Apr 29 03:42:18 2025

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

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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. 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 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
x86_64 x86_64 x86_64 GNU/Linux
-
2. w
03:42:18 up 3 min, 4 users, load average: 0.02, 0.03, 0.00
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
-
3. Username
From environment variable \$USER: root
-
4. ulimit -a

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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) 2062963
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) 2062963
virtual memory     (kbytes, -v) unlimited
file locks         (-x) unlimited
```

5. sysinfo process ancestry

```
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@notty
bash -c cd $SPEC/ && $SPEC/intspeed_spr_smtoff.sh
runcpu --nobuild --action validate --define default-platform-flags -c
ic2024.1-lin-sapphirerapids-speed-20240308.cfg --define cores=24 --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=24 --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/CPU2017.001/templogs/preenv.intspeed.001.0.log
--lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
```

6. /proc/cpuinfo

```
model name      : Intel(R) Xeon(R) 6505P
vendor_id       : GenuineIntel
cpu family      : 6
model           : 173
stepping        : 1
microcode       : 0x1000380
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
cpu cores       : 12
siblings        : 12
2 physical ids (chips)
24 processors (hardware threads)
physical id 0:  core ids 0-11
physical id 1:  core ids 0-11
physical id 0:  apicids 0,2,4,6,8,10,12,14,16,18,20,22
physical id 1:  apicids 128,130,132,134,136,138,140,142,144,146,148,150
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
```

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Platform Notes (Continued)

CPU op-mode(s): 32-bit, 64-bit
Address sizes: 46 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 24
On-line CPU(s) list: 0-23
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation
Model name: Intel(R) Xeon(R) 6505P
BIOS Model name: Intel(R) Xeon(R) 6505P CPU @ 2.2GHz
BIOS CPU family: 179
CPU family: 6
Model: 173
Thread(s) per core: 1
Core(s) per socket: 12
Socket(s): 2
Stepping: 1
BogoMIPS: 4400.00
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 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 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: 1.1 MiB (24 instances)
L1i cache: 1.5 MiB (24 instances)
L2 cache: 48 MiB (24 instances)
L3 cache: 96 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-11
NUMA node1 CPU(s): 12-23
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 Not affected; BHI BHI_DIS_S
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

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Platform Notes (Continued)

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	1.1M	12	Data	1	64	1	64
L1i	64K	1.5M	16	Instruction	1	64	1	64
L2	2M	48M	16	Unified	2	2048	1	64
L3	48M	96M	16	Unified	3	49152	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: 0-11

node 0 size: 257735 MB

node 0 free: 256309 MB

node 1 cpus: 12-23

node 1 size: 258035 MB

node 1 free: 256949 MB

node distances:

node 0 1

0: 10 21

1: 21 10

9. /proc/meminfo

MemTotal: 528149900 kB

10. who -r

run-level 5 Apr 29 03:39

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

Default Target Status

graphical running

12. Services, from systemctl list-unit-files

STATE UNIT FILES

enabled ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd
bluetooth cron display-manager getty@ irqbalance issue-generator kbdsettings klog
lvm2-monitor nsd postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked
wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant

enabled-runtime systemd-remount-fs

disabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon autofs
autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates
chrony-wait chronyd console-getty cups cups-browsed debug-shell dnsmasq ebttables
exchange-bmc-os-info firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmiev
issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb openvpn@
ostree-remount rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@
smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures
systemd-confext systemd-network-generator systemd-sysextd systemd-time-wait-sync
systemd-timesyncd tuned udisks2 update-system-flatpaks upower vncserver@ wpa_supplicant@

indirect pcsd saned@ systemd-userdbd wickedd

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

BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default

root=UUID=f6b0717c-45db-4fdb-bacc-150fc0536ac9

splash=silent

mitigations=auto

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Platform Notes (Continued)

quiet
security=apparmor

14. cpupower frequency-info
analyzing CPU 5:
Unable to determine current policy
boost state support:
Supported: yes
Active: yes

15. tuned-adm active
It seems that tuned daemon is not running, preset profile is not activated.
Preset profile: balanced

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 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

17. /sys/kernel/mm/transparent_hugepage
defrag always defer defer+madvice [madvice] never
enabled [always] madvice 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 SP6

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Platform Notes (Continued)

20. Disk information

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda2	btrfs	445G	224G	219G	51%	/home

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

Vendor: HPE
Product: HPE ProLiant Compute DL380 Gen12
Product Family: ProLiant
Serial: CNXD1M02CK

22. 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:

16x Micron MTC20F2085S1RC64BD2 QSFF 32 GB 2 rank 6400

23. 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: 1.10

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.
=====



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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

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



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SPECspeed®2017_int_base = 14.3

SPECspeed®2017_int_peak = 14.6

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Apr-2025

Hardware Availability: Mar-2025

Software Availability: Jun-2024

Peak Compiler Invocation

C benchmarks:

icx

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.profdata(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.profdata(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

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

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Peak Optimization Flags (Continued)

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

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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