SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise

(Test Sponsor: HPE)

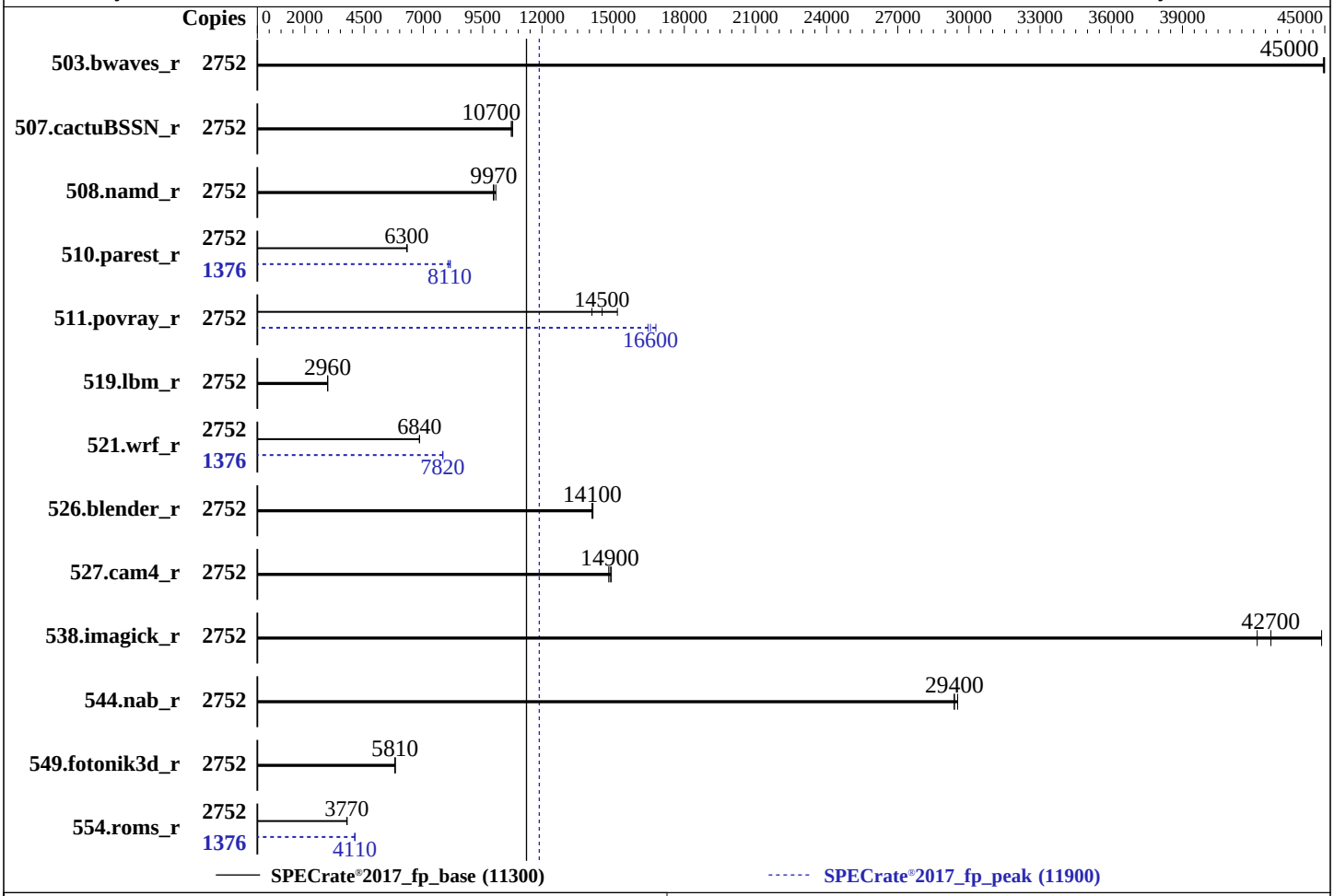
HPE Compute Scale-up Server 3250
(2.00 GHz, Intel Xeon 6788P)

SPECrate®2017_fp_base = 11300

SPECrate®2017_fp_peak = 11900

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Feb-2026
Hardware Availability: Apr-2026
Software Availability: Feb-2026



Hardware

CPU Name:	Intel Xeon 6788P
Max MHz:	3800
Nominal:	2000
Enabled:	1376 cores, 16 chips, 2 threads/core
Orderable:	4, 8, 12, 16 chip(s)
Cache L1:	64 KB I + 48 KB D on chip per core
L2:	2 MB I+D on chip per core
L3:	336 MB I+D on chip per chip
Other:	None
Memory:	8 TB (128 x 64 GB 2Rx4 PC5-6400B-R)
Storage:	1 x 1.5 TB NVMe SSD
Other:	CPU Cooling: Air

Software

OS:	SUSE Linux Enterprise Server 15 SP7 Kernel 6.4.0-150700.53.31-default
Compiler:	C/C++: Version 2025.2 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2025.2 of Intel Fortran Compiler for Linux;
Parallel:	No
Firmware:	HPE Firmware Bundle Version 1.0.308 01/21/2026 released Jan-2026
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						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	2752	614	44900	613	45000	**614**	**45000**	2752	614	44900	613	45000	**614**	**45000**
507.cactuBSSN_r	2752	**324**	**10700**	324	10800	326	10700	2752	**324**	**10700**	324	10800	326	10700
508.namd_r	2752	260	10100	**262**	**9970**	263	9950	2752	260	10100	**262**	**9970**	263	9950
510.parest_r	2752	1143	6300	**1142**	**6300**	1139	6320	1376	**444**	**8110**	448	8040	442	8140
511.povray_r	2752	456	14100	**442**	**14500**	423	15200	2752	**388**	**16600**	382	16800	390	16500
519.lbm_r	2752	**979**	**2960**	978	2970	979	2960	2752	**979**	**2960**	978	2970	979	2960
521.wrf_r	2752	902	6830	901	6840	**902**	**6840**	1376	395	7810	394	7820	**394**	**7820**
526.blender_r	2752	**297**	**14100**	297	14100	296	14100	2752	**297**	**14100**	297	14100	296	14100
527.cam4_r	2752	325	14800	**324**	**14900**	322	14900	2752	325	14800	**324**	**14900**	322	14900
538.imagick_r	2752	162	42200	153	44900	**160**	**42700**	2752	162	42200	153	44900	**160**	**42700**
544.nab_r	2752	**158**	**29400**	157	29500	158	29400	2752	**158**	**29400**	157	29500	158	29400
549.fotonik3d_r	2752	1850	5800	1843	5820	**1847**	**5810**	2752	1850	5800	1843	5820	**1847**	**5810**
554.roms_r	2752	**1159**	**3770**	1154	3790	1160	3770	1376	**532**	**4110**	532	4110	531	4120

SPECrate®2017_fp_base = 11300

SPECrate®2017_fp_peak = 11900

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

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>
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
```

General Notes

```
 Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
 memory using Red Hat Enterprise Linux 8.4
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)
```

(Continued on next page)

General Notes (Continued)

```
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:
 Workload Profile set to Custom
 Energy/Performance Bias set to Maximum Performance
 Energy Efficient Turbo set to Disabled
 Advanced Memory Protection set to Advanced ECC Support
 SR-IOV set to Disabled
 Intel Virtualization Technology (Intel VT, VT-x) set to Disabled
 Adjacent Sector Prefetch set to Disabled
 DCU Stream Prefetcher set to Disabled
 Last Level Cache (LLC) Dead Line Allocation set to Disabled
 Enhanced Processor Performance Profile set to Aggressive
 Memory Patrol Scrubbing set to Disabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on gnh-108 Thu Feb 26 21:58:41 2026

 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 (254.27+suse.179.g75eab961ea)
 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 gnh-108 6.4.0-150700.53.31-default #1 SMP PREEMPT_DYNAMIC Tue Feb  3 14:18:17 UTC 2026 (73f3a11)
```

(Continued on next page)

Platform Notes (Continued)

```
  x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   21:58:42 up  7:51,  2 users,  load average: 1.06, 0.85, 0.92
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  test     ttyS0    -                14:19    1:14   0.28s  0.06s login -- test
  test     pts/0    -                14:20    1:14   2.66s  0.26s sudo su

------------------------------------------------------------
3. Username
  From environment variable $USER:  root
  From the command 'logname':       test

------------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) 0
  data seg size           (kbytes, -d) unlimited
  scheduling priority             (-e) 0
  file size               (blocks, -f) unlimited
  pending signals                 (-i) 32505174
  max locked memory       (kbytes, -l) 8192
  max memory size         (kbytes, -m) unlimited
  open files                      (-n) 40000
  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) 32505174
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize=38
 login -- test
 -bash
 sudo su
 sudo su
 su
 bash
 /bin/bash ./fprate_reportable.sh fprate.sh
 /bin/bash ./fprate_reportable.sh fprate.sh
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=2752 -c
   ic2025.2-lin-graniterapids-rate-20250605.cfg --define smt-on --define cores=1376 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=2752 --configfile
   ic2025.2-lin-graniterapids-rate-20250605.cfg --define smt-on --define cores=1376 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
   --runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.fprate.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) 6788P
    vendor_id       : GenuineIntel
    cpu family      : 6
```

(Continued on next page)

Platform Notes (Continued)

```
     model           : 173
     stepping        : 1
     microcode       : 0x1000405
     bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi vmscape
     cpu cores       : 86
     siblings        : 172
     16 physical ids (chips)
     2752 processors (hardware threads)
     physical id 0: core ids 0-42,64-106
     physical id 1: core ids 0-42,64-106
     physical id 2: core ids 0-42,64-106
     physical id 3: core ids 0-42,64-106
     physical id 4: core ids 0-42,64-106
     physical id 5: core ids 0-42,64-106
     physical id 6: core ids 0-42,64-106
     physical id 7: core ids 0-42,64-106
     physical id 8: core ids 0-42,64-106
     physical id 9: core ids 0-42,64-106
     physical id 10: core ids 0-42,64-106
     physical id 11: core ids 0-42,64-106
     physical id 12: core ids 0-42,64-106
     physical id 13: core ids 0-42,64-106
     physical id 14: core ids 0-42,64-106
     physical id 15: core ids 0-42,64-106
     physical id 0: apicids 0-85,128-213
     physical id 1: apicids 256-341,384-469
     physical id 2: apicids 512-597,640-725
     physical id 3: apicids 768-853,896-981
     physical id 4: apicids 1024-1109,1152-1237
     physical id 5: apicids 1280-1365,1408-1493
     physical id 6: apicids 1536-1621,1664-1749
     physical id 7: apicids 1792-1877,1920-2005
     physical id 8: apicids 2048-2133,2176-2261
     physical id 9: apicids 2304-2389,2432-2517
     physical id 10: apicids 2560-2645,2688-2773
     physical id 11: apicids 2816-2901,2944-3029
     physical id 12: apicids 3072-3157,3200-3285
     physical id 13: apicids 3328-3413,3456-3541
     physical id 14: apicids 3584-3669,3712-3797
     physical id 15: apicids 3840-3925,3968-4053
   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:                           52 bits physical, 57 bits virtual
   Byte Order:                              Little Endian
   CPU(s):                                  2752
   On-line CPU(s) list:                     0-2751
   Vendor ID:                               GenuineIntel
   Model name:                              Intel(R) Xeon(R) 6788P
   CPU family:                              6
   Model:                                   173
   Thread(s) per core:                      2
   Core(s) per socket:                      86
   Socket(s):                               16
```

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Platform Notes (Continued)

```
Stepping:                             1
CPU(s) scaling MHz:                   21%
CPU max MHz:                          3800.0000
CPU min MHz:                          800.0000
BogoMIPS:                             3999.54
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 arch_perfmon pebs bts rep_good nopl
                                      xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtes64
                                      monitor ds_cpl 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 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 hwp hwp_act_window hwp_epp
                                      hwp_pkg_req 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
                                      ibpb_exit_to_user
L1d cache:                            64.5 MiB (1376 instances)
L1i cache:                            86 MiB (1376 instances)
L2 cache:                             2.7 GiB (1376 instances)
L3 cache:                             5.3 GiB (16 instances)
NUMA node(s):                         32
NUMA node0 CPU(s):                    0-42,1376-1418
NUMA node1 CPU(s):                    43-85,1419-1461
NUMA node2 CPU(s):                    86-128,1462-1504
NUMA node3 CPU(s):                    129-171,1505-1547
NUMA node4 CPU(s):                    172-214,1548-1590
NUMA node5 CPU(s):                    215-257,1591-1633
NUMA node6 CPU(s):                    258-300,1634-1676
NUMA node7 CPU(s):                    301-343,1677-1719
NUMA node8 CPU(s):                    344-386,1720-1762
NUMA node9 CPU(s):                    387-429,1763-1805
NUMA node10 CPU(s):                   430-472,1806-1848
NUMA node11 CPU(s):                   473-515,1849-1891
NUMA node12 CPU(s):                   516-558,1892-1934
NUMA node13 CPU(s):                   559-601,1935-1977
NUMA node14 CPU(s):                   602-644,1978-2020
NUMA node15 CPU(s):                   645-687,2021-2063
NUMA node16 CPU(s):                   688-730,2064-2106
NUMA node17 CPU(s):                   731-773,2107-2149
NUMA node18 CPU(s):                   774-816,2150-2192
NUMA node19 CPU(s):                   817-859,2193-2235
NUMA node20 CPU(s):                   860-902,2236-2278
NUMA node21 CPU(s):                   903-945,2279-2321
NUMA node22 CPU(s):                   946-988,2322-2364
NUMA node23 CPU(s):                   989-1031,2365-2407
NUMA node24 CPU(s):                   1032-1074,2408-2450
NUMA node25 CPU(s):                   1075-1117,2451-2493
NUMA node26 CPU(s):                   1118-1160,2494-2536
NUMA node27 CPU(s):                   1161-1203,2537-2579
NUMA node28 CPU(s):                   1204-1246,2580-2622
NUMA node29 CPU(s):                   1247-1289,2623-2665
```

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Platform Notes (Continued)

```
  NUMA node30 CPU(s):                   1290-1332,2666-2708
  NUMA node31 CPU(s):                   1333-1375,2709-2751
  Vulnerability Gather data sampling:   Not affected
  Vulnerability Indirect target selection: 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;
                                        PBRSB-eIBRS Not affected; BHI BHI_DIS_S
  Vulnerability Srbds:                  Not affected
  Vulnerability Tsa:                    Not affected
  Vulnerability Tsx async abort:        Not affected
  Vulnerability Vmscape:                Mitigation; IBPB before exit to userspace

From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL   SETS PHY-LINE COHERENCY-SIZE
     L1d       48K    64.5M   12 Data            1     64        1             64
     L1i       64K      86M   16 Instruction     1     64        1             64
     L2         2M     2.7G   16 Unified         2   2048        1             64
     L3       336M     5.3G   16 Unified         3 344064        1             64

------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 32 nodes (0-31)
  node 0 cpus: 0-42,1376-1418
  node 0 size: 256719 MB
  node 0 free: 255785 MB
  node 1 cpus: 43-85,1419-1461
  node 1 size: 250007 MB
  node 1 free: 249544 MB
  node 2 cpus: 86-128,1462-1504
  node 2 size: 258025 MB
  node 2 free: 257650 MB
  node 3 cpus: 129-171,1505-1547
  node 3 size: 250023 MB
  node 3 free: 249596 MB
  node 4 cpus: 172-214,1548-1590
  node 4 size: 258025 MB
  node 4 free: 257607 MB
  node 5 cpus: 215-257,1591-1633
  node 5 size: 250023 MB
  node 5 free: 249650 MB
  node 6 cpus: 258-300,1634-1676
  node 6 size: 258025 MB
  node 6 free: 257627 MB
  node 7 cpus: 301-343,1677-1719
  node 7 size: 250023 MB
  node 7 free: 249506 MB
  node 8 cpus: 344-386,1720-1762
  node 8 size: 258025 MB
  node 8 free: 257639 MB
```

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Platform Notes (Continued)

```
node 9 cpus: 387-429,1763-1805
node 9 size: 250023 MB
node 9 free: 249385 MB
node 10 cpus: 430-472,1806-1848
node 10 size: 258025 MB
node 10 free: 257694 MB
node 11 cpus: 473-515,1849-1891
node 11 size: 250023 MB
node 11 free: 249541 MB
node 12 cpus: 516-558,1892-1934
node 12 size: 258025 MB
node 12 free: 257656 MB
node 13 cpus: 559-601,1935-1977
node 13 size: 250023 MB
node 13 free: 249689 MB
node 14 cpus: 602-644,1978-2020
node 14 size: 258025 MB
node 14 free: 257627 MB
node 15 cpus: 645-687,2021-2063
node 15 size: 250023 MB
node 15 free: 249537 MB
node 16 cpus: 688-730,2064-2106
node 16 size: 258025 MB
node 16 free: 257412 MB
node 17 cpus: 731-773,2107-2149
node 17 size: 250023 MB
node 17 free: 249334 MB
node 18 cpus: 774-816,2150-2192
node 18 size: 257986 MB
node 18 free: 253743 MB
node 19 cpus: 817-859,2193-2235
node 19 size: 250023 MB
node 19 free: 232326 MB
node 20 cpus: 860-902,2236-2278
node 20 size: 258025 MB
node 20 free: 257613 MB
node 21 cpus: 903-945,2279-2321
node 21 size: 250023 MB
node 21 free: 249507 MB
node 22 cpus: 946-988,2322-2364
node 22 size: 258025 MB
node 22 free: 257445 MB
node 23 cpus: 989-1031,2365-2407
node 23 size: 250023 MB
node 23 free: 240636 MB
node 24 cpus: 1032-1074,2408-2450
node 24 size: 258025 MB
node 24 free: 257534 MB
node 25 cpus: 1075-1117,2451-2493
node 25 size: 250023 MB
node 25 free: 249567 MB
node 26 cpus: 1118-1160,2494-2536
node 26 size: 258025 MB
node 26 free: 257516 MB
node 27 cpus: 1161-1203,2537-2579
node 27 size: 250023 MB
node 27 free: 249598 MB
node 28 cpus: 1204-1246,2580-2622
node 28 size: 258025 MB
node 28 free: 257551 MB
```

(Continued on next page)

Platform Notes (Continued)

```
node 29 cpus: 1247-1289,2623-2665
node 29 size: 250023 MB
node 29 free: 249509 MB
node 30 cpus: 1290-1332,2666-2708
node 30 size: 258025 MB
node 30 free: 257512 MB
node 31 cpus: 1333-1375,2709-2751
node 31 size: 248941 MB
node 31 free: 248420 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24
25  26  27  28  29  30  31
  0:  10  12  16  16  16  16  18  18  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  1:  12  10  16  16  16  16  18  18  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  2:  16  16  10  12  18  18  16  16  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  3:  16  16  12  10  18  18  16  16  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  4:  16  16  18  18  10  12  16  16  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  5:  16  16  18  18  12  10  16  16  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  6:  18  18  16  16  16  16  10  12  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  7:  18  18  16  16  16  16  12  10  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  8:  40  40  40  40  40  40  40  40  10  12  16  16  16  16  18  18  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
  9:  40  40  40  40  40  40  40  40  12  10  16  16  16  16  18  18  40  40  40  40  40  40  40  40  40
  40  40  40  40  40  40  40
 10:  40  40  40  40  40  40  40  40  16  16  10  12  18  18  16  16  40  40  40  40  40  40  40  40  40
 40  40  40  40  40  40  40
 11:  40  40  40  40  40  40  40  40  16  16  12  10  18  18  16  16  40  40  40  40  40  40  40  40  40
 40  40  40  40  40  40  40
 12:  40  40  40  40  40  40  40  40  16  16  18  18  10  12  16  16  40  40  40  40  40  40  40  40  40
 40  40  40  40  40  40  40
 13:  40  40  40  40  40  40  40  40  16  16  18  18  12  10  16  16  40  40  40  40  40  40  40  40  40
 40  40  40  40  40  40  40
 14:  40  40  40  40  40  40  40  40  18  18  16  16  16  16  10  12  40  40  40  40  40  40  40  40  40
 40  40  40  40  40  40  40
 15:  40  40  40  40  40  40  40  40  18  18  16  16  16  16  12  10  40  40  40  40  40  40  40  40  40
 40  40  40  40  40  40  40
 16:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  10  12  16  16  16  16  18  18  40
 40  40  40  40  40  40  40
 17:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  12  10  16  16  16  16  18  18  40
 40  40  40  40  40  40  40
 18:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  16  16  10  12  18  18  16  16  40
 40  40  40  40  40  40  40
 19:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  16  16  12  10  18  18  16  16  40
 40  40  40  40  40  40  40
 20:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  16  16  18  18  10  12  16  16  40
 40  40  40  40  40  40  40
 21:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  16  16  18  18  12  10  16  16  40
 40  40  40  40  40  40  40
 22:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  18  18  16  16  16  16  10  12  40
 40  40  40  40  40  40  40
 23:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  18  18  16  16  16  16  12  10  40
 40  40  40  40  40  40  40
```

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Platform Notes (Continued)

```
   24:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  10
   12  16  16  16  16  18  18
   25:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  12
   10  16  16  16  16  18  18
   26:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  16
   16  10  12  18  18  16  16
   27:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  16
   16  12  10  18  18  16  16
   28:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  16
   16  18  18  10  12  16  16
   29:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  16
   16  18  18  12  10  16  16
   30:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  18
   18  16  16  16  16  10  12
   31:  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  40  18
   18  16  16  16  16  12  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       8321362372 kB

------------------------------------------------------------
10. who -r
  run-level 3 Feb 26 14:17

------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.27+suse.179.g75eab961ea)
  Default Target  Status
  multi-user      running

------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd bluetooth chronyd
                   cpuset_cpunodemap cpuset_memory_spread cron dcd dcdchkgracefulshutdown dcdshutdown
                   display-manager getty@ hpe-auto-config hpe_irqbalance iscsi issue-generator kbdsettings
                   kdump kdump-early kdump-notify klog lvm2-monitor nscd postfix purge-kernels rollback
                   rsyslog smartd sshd systemd-pstore vgauthd vmblock-fuse vmtoolsd vsftpd wicked
                   wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
  enabled-runtime  systemd-fsck-root systemd-remount-fs
  disabled         accounts-daemon amavis apache2 apache2@ autofs autoyast-initscripts blk-availability
                   bluetooth-mesh boot-sysctl ca-certificates certmonger chrony-wait clamd clamonacc
                   console-getty cups cups-browsed cxl-monitor debug-shell ebtables exchange-bmc-os-info
                   firewalld fsidd gpm grub2-once haveged ipmi ipmievd irqbalance iscsi-init iscsid
                   issue-add-ssh-keys kexec-load lunmask man-db-create mariadb mariadb@ multipathd named
                   ndctl-monitor nfs nfs-blkmap nfs-server nfsserver nmb ostree-remount ostree-state-overlay@
                   rpcbind rpmconfigcheck rsyncd rtkit-daemon samba-bgqd smartd_generate_opts smb snmpd
                   snmptrapd spamd spampd speech-dispatcherd srp_daemon srp_daemon_port@ sysstat
                   sysstat_collect sysstat_summary systemd-boot-check-no-failures systemd-confext
                   systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd tuned
                   udisks2 update-system-flatpaks upower vncserver@ winbind wsdd ypbind
  indirect         serial-getty@ systemd-userdbd tftp wickedd

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-6.4.0-150700.53.31-default
  root=UUID=8f7dbb2d-77d8-40d9-b606-6b60ffd4e6ad
  rd.auto=1
  console=ttyS0,115200n8
  selinux=0
```

(Continued on next page)

Platform Notes (Continued)

```
  security=
  splash=silent
  mitigations=auto
  console=ttyS0,115200
  udev.children-max=512
  nmi_watchdog=0
  uv_nmi.action=kdump
  add_efi_memmap
  tsc=nowatchdog
  earlyprintk=ttyS0,115200
  log_buf_len=8M
  numa_balancing=disable
  crashkernel=1G,high
  watchdog_thresh=60
  workqueue.watchdog_thresh=120

------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 939:
    current policy: frequency should be within 800 MHz and 3.80 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes

------------------------------------------------------------
15. tuned-adm active
  No current active profile.

------------------------------------------------------------
16. sysctl
  kernel.numa_balancing               0
  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+madvise [madvise] never
  enabled         [always] madvise never
  hpage_pmd_size  2097152
  shmem_enabled   always within_size advise [never] deny force

------------------------------------------------------------
```

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Platform Notes (Continued)

```
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
  hpe-foundation-release HPE Foundation Software 2.5.9, Build 757.1570.260209T0200.a.sles15sp7hpe-260209T0200

------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/nvme1n1p2 xfs   1.5T   40G  1.5T   3% /

------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         HPE
    Product:        Compute Scale-up Server 3250
    Product Family: 1590PID03030202
    Serial:         5UFD3H1626-000

------------------------------------------------------------
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:
    46x Samsung M321R8GA0EB2-CCPKC 64 GB 2 rank 6400
    82x Samsung M321R8GA0EB2-CCPWC 64 GB 2 rank 6400


------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       HPE
   BIOS Version:      Bundle:1.0.308-20260123_101935 SFW:010.001.004.000.2601210240
   BIOS Date:         01/21/2026
```

Compiler Version Notes

```
==============================================================================================================
C               | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++             | 508.namd_r(base, peak) 510.parest_r(base, peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
```

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Compiler Version Notes (Continued)

```
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------------------------------------------------------------------------------------------------------------------------

==============================================================================================================================
C++, C          | 511.povray_r(base, peak) 526.blender_r(base, peak)
------------------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
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------------------------------------------------------------------------------------------------------------------------

==============================================================================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------------------------

==============================================================================================================================
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
------------------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------------------------

==============================================================================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2025.2.0 Build 20250605
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Benchmarks using both Fortran and C:
`ifx icx`

(Continued on next page)

Base Compiler Invocation (Continued)

Benchmarks using both C and C++:
icpx icx

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

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

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

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xgraniterapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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

(Continued on next page)

Base Optimization Flags (Continued)

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

Benchmarks using both C and C++:
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xgraniterapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xgraniterapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using both C and C++:
icpx icx

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_r: basepeak = yes

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -std=c++14 -m64 -Wl,-z,muldefs -xgraniterapids
-Ofast -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: -w -m64 -Wl,-z,muldefs -xgraniterapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:

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

527.cam4_r: basepeak = yes

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Peak Optimization Flags (Continued)

Benchmarks using both C and C++:

511.povray_r: `-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs`
`-fprofile-generate`(pass 1)
`-fprofile-use=default.profdata`(pass 2) `-xCORE-AVX2`(pass 1)
`-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse`
`-funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int`
`-mprefer-vector-width=512 -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

526.blender_r: `basepeak = yes`

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: `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-CSS-GNR-rev1.3.html`
`http://www.spec.org/cpu2017/flags/Intel-ic2025-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-CSS-GNR-rev1.3.xml`
`http://www.spec.org/cpu2017/flags/Intel-ic2025-official-linux64.xml`

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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