# SPEC CPU®2017 Floating Point Rate Result

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## Hewlett Packard Enterprise

(Test Sponsor: HPE)

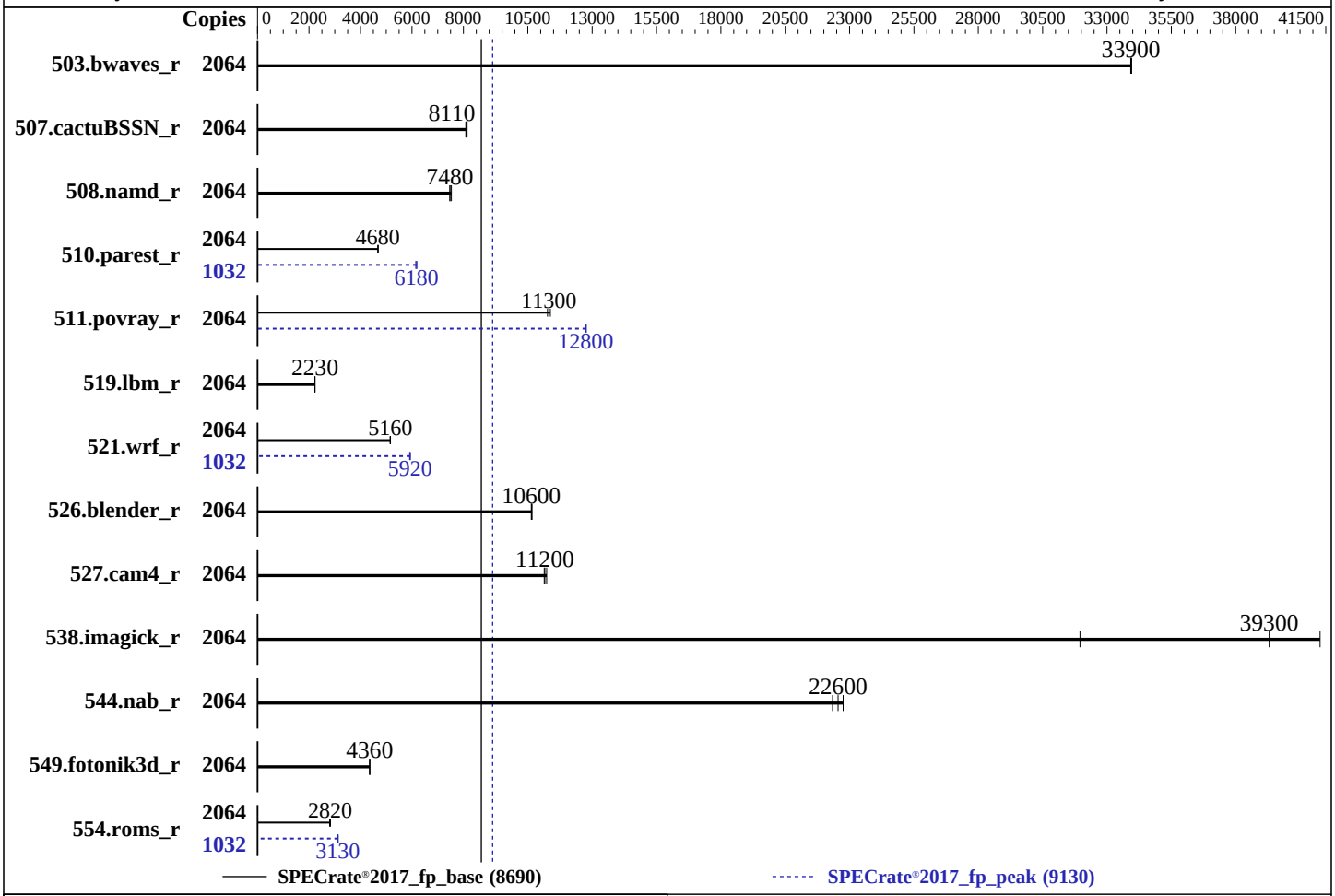
HPE Compute Scale-up Server 3250
(2.00 GHz, Intel Xeon 6788P)

**SPECrate®2017_fp_base = 8690**

**SPECrate®2017_fp_peak = 9130**

**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: | 1032 cores, 12 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: | 6 TB (96 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<br>Kernel 6.4.0-150700.53.31-default |
| Compiler: | C/C++: Version 2025.2 of Intel oneAPI DPC++/C++ Compiler for Linux;<br>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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**CPU2017 License:** 3
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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 | 2064 | 610 | 34000 | 610 | 33900 | **610** | **33900** | 2064 | 610 | 34000 | 610 | 33900 | **610** | **33900** |
| 507.cactuBSSN_r | 2064 | 321 | 8140 | **322** | **8110** | 323 | 8090 | 2064 | 321 | 8140 | **322** | **8110** | 323 | 8090 |
| 508.namd_r | 2064 | **262** | **7480** | 262 | 7470 | 260 | 7530 | 2064 | **262** | **7480** | 262 | 7470 | 260 | 7530 |
| 510.parest_r | 2064 | **1154** | **4680** | 1153 | 4680 | 1155 | 4680 | 1032 | 439 | 6150 | **437** | **6180** | 437 | 6180 |
| 511.povray_r | 2064 | 428 | 11300 | **426** | **11300** | 424 | 11400 | 2064 | 377 | 12800 | 378 | 12700 | **378** | **12800** |
| 519.lbm_r | 2064 | **975** | **2230** | 975 | 2230 | 977 | 2230 | 2064 | **975** | **2230** | 975 | 2230 | 977 | 2230 |
| 521.wrf_r | 2064 | 895 | 5160 | **896** | **5160** | 898 | 5150 | 1032 | 391 | 5910 | **390** | **5920** | 389 | 5940 |
| 526.blender_r | 2064 | 296 | 10600 | **295** | **10600** | 295 | 10700 | 2064 | 296 | 10600 | **295** | **10600** | 295 | 10700 |
| 527.cam4_r | 2064 | 321 | 11200 | 324 | 11100 | **323** | **11200** | 2064 | 321 | 11200 | 324 | 11100 | **323** | **11200** |
| 538.imagick_r | 2064 | 124 | 41300 | **131** | **39300** | 161 | 32000 | 2064 | 124 | 41300 | **131** | **39300** | 161 | 32000 |
| 544.nab_r | 2064 | 156 | 22300 | **154** | **22600** | 153 | 22700 | 2064 | 156 | 22300 | **154** | **22600** | 153 | 22700 |
| 549.fotonik3d_r | 2064 | **1847** | **4360** | 1847 | 4360 | 1844 | 4360 | 2064 | **1847** | **4360** | 1847 | 4360 | 1844 | 4360 |
| 554.roms_r | 2064 | 1170 | 2800 | 1158 | 2830 | **1164** | **2820** | 1032 | **524** | **3130** | 524 | 3130 | 525 | 3120 |

**SPECrate®2017_fp_base = 8690**

**SPECrate®2017_fp_peak = 9130**

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 Fri Feb 27 14:23:47 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)
```

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## Platform Notes (Continued)

```
  x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   14:23:48 up 13 min,  2 users,  load average: 0.57, 3.16, 2.82
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  test     ttyS0    -                14:17   37.00s  0.11s  0.06s login -- test
  test     pts/0    -                14:17   37.00s  1.99s  0.05s 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) 24376413
  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) 24376413
  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=2064 -c
   ic2025.2-lin-graniterapids-rate-20250605.cfg --define smt-on --define cores=1032 --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=2064 --configfile
   ic2025.2-lin-graniterapids-rate-20250605.cfg --define smt-on --define cores=1032 --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
     12 physical ids (chips)
     2064 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 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
   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):                               2064
   On-line CPU(s) list:                  0-2063
   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):                            12
   Stepping:                             1
   CPU(s) scaling MHz:                   21%
   CPU max MHz:                          3800.0000
   CPU min MHz:                          800.0000
   BogoMIPS:                             3999.52
   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
```

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## Platform Notes (Continued)

```
                                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:                    48.4 MiB (1032 instances)
  L1i cache:                    64.5 MiB (1032 instances)
  L2 cache:                     2 GiB (1032 instances)
  L3 cache:                     3.9 GiB (12 instances)
  NUMA node(s):                 24
  NUMA node0 CPU(s):            0-42,1032-1074
  NUMA node1 CPU(s):            43-85,1075-1117
  NUMA node2 CPU(s):            86-128,1118-1160
  NUMA node3 CPU(s):            129-171,1161-1203
  NUMA node4 CPU(s):            172-214,1204-1246
  NUMA node5 CPU(s):            215-257,1247-1289
  NUMA node6 CPU(s):            258-300,1290-1332
  NUMA node7 CPU(s):            301-343,1333-1375
  NUMA node8 CPU(s):            344-386,1376-1418
  NUMA node9 CPU(s):            387-429,1419-1461
  NUMA node10 CPU(s):           430-472,1462-1504
  NUMA node11 CPU(s):           473-515,1505-1547
  NUMA node12 CPU(s):           516-558,1548-1590
  NUMA node13 CPU(s):           559-601,1591-1633
  NUMA node14 CPU(s):           602-644,1634-1676
  NUMA node15 CPU(s):           645-687,1677-1719
  NUMA node16 CPU(s):           688-730,1720-1762
  NUMA node17 CPU(s):           731-773,1763-1805
  NUMA node18 CPU(s):           774-816,1806-1848
  NUMA node19 CPU(s):           817-859,1849-1891
  NUMA node20 CPU(s):           860-902,1892-1934
  NUMA node21 CPU(s):           903-945,1935-1977
  NUMA node22 CPU(s):           946-988,1978-2020
  NUMA node23 CPU(s):           989-1031,2021-2063
  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;
```

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## Platform Notes (Continued)

```
                                       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    48.4M   12 Data            1     64        1             64
     L1i       64K    64.5M   16 Instruction     1     64        1             64
     L2         2M       2G   16 Unified         2   2048        1             64
     L3       336M     3.9G   16 Unified         3 344064        1             64

------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 24 nodes (0-23)
  node 0 cpus: 0-42,1032-1074
  node 0 size: 256719 MB
  node 0 free: 255803 MB
  node 1 cpus: 43-85,1075-1117
  node 1 size: 250007 MB
  node 1 free: 249535 MB
  node 2 cpus: 86-128,1118-1160
  node 2 size: 258025 MB
  node 2 free: 257579 MB
  node 3 cpus: 129-171,1161-1203
  node 3 size: 250023 MB
  node 3 free: 249577 MB
  node 4 cpus: 172-214,1204-1246
  node 4 size: 258025 MB
  node 4 free: 257483 MB
  node 5 cpus: 215-257,1247-1289
  node 5 size: 250023 MB
  node 5 free: 249670 MB
  node 6 cpus: 258-300,1290-1332
  node 6 size: 258025 MB
  node 6 free: 257617 MB
  node 7 cpus: 301-343,1333-1375
  node 7 size: 250023 MB
  node 7 free: 249365 MB
  node 8 cpus: 344-386,1376-1418
  node 8 size: 258025 MB
  node 8 free: 257725 MB
  node 9 cpus: 387-429,1419-1461
  node 9 size: 250023 MB
  node 9 free: 249740 MB
  node 10 cpus: 430-472,1462-1504
  node 10 size: 258025 MB
  node 10 free: 257726 MB
  node 11 cpus: 473-515,1505-1547
  node 11 size: 250023 MB
  node 11 free: 249741 MB
  node 12 cpus: 516-558,1548-1590
  node 12 size: 257986 MB
  node 12 free: 257689 MB
  node 13 cpus: 559-601,1591-1633
  node 13 size: 250023 MB
  node 13 free: 249733 MB
  node 14 cpus: 602-644,1634-1676
```

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## Platform Notes (Continued)

```
   node 14 size: 258025 MB
   node 14 free: 257723 MB
   node 15 cpus: 645-687,1677-1719
   node 15 size: 250023 MB
   node 15 free: 249735 MB
   node 16 cpus: 688-730,1720-1762
   node 16 size: 258025 MB
   node 16 free: 257410 MB
   node 17 cpus: 731-773,1763-1805
   node 17 size: 250023 MB
   node 17 free: 249414 MB
   node 18 cpus: 774-816,1806-1848
   node 18 size: 258025 MB
   node 18 free: 257462 MB
   node 19 cpus: 817-859,1849-1891
   node 19 size: 250023 MB
   node 19 free: 249448 MB
   node 20 cpus: 860-902,1892-1934
   node 20 size: 258025 MB
   node 20 free: 257330 MB
   node 21 cpus: 903-945,1935-1977
   node 21 size: 250023 MB
   node 21 free: 249546 MB
   node 22 cpus: 946-988,1978-2020
   node 22 size: 258025 MB
   node 22 free: 257364 MB
   node 23 cpus: 989-1031,2021-2063
   node 23 size: 248943 MB
   node 23 free: 248049 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
     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
     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
     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
     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
     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
     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
     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
     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
     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
     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
    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
    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
    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
    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
    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
    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
    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
    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
    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
    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
    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
    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
    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
    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

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       6240399640 kB
```

(Continued on next page)

## Platform Notes (Continued)

```
------------------------------------------------------------
10. who -r
  run-level 3 Feb 27 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
  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 879:
    current policy: frequency should be within 800 MHz and 3.80 GHz.
                    The governor "performance" may decide which speed to use
```

**(Continued on next page)**

## Platform Notes (Continued)

```
                  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

------------------------------------------------------------
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   37G  1.5T   3% /
```

**(Continued on next page)**

## Platform Notes (Continued)

```
------------------------------------------------------------
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
    50x 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
Copyright (C) 1985-2025 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
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
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.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
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
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.
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.
```

**(Continued on next page)**

## Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------------------------------------
==============================================================================================================
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

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

**(Continued on next page)**

## Base Portability Flags (Continued)

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

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

**(Continued on next page)**

## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
`-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:

**(Continued on next page)**

## Peak Optimization Flags (Continued)

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

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


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