SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

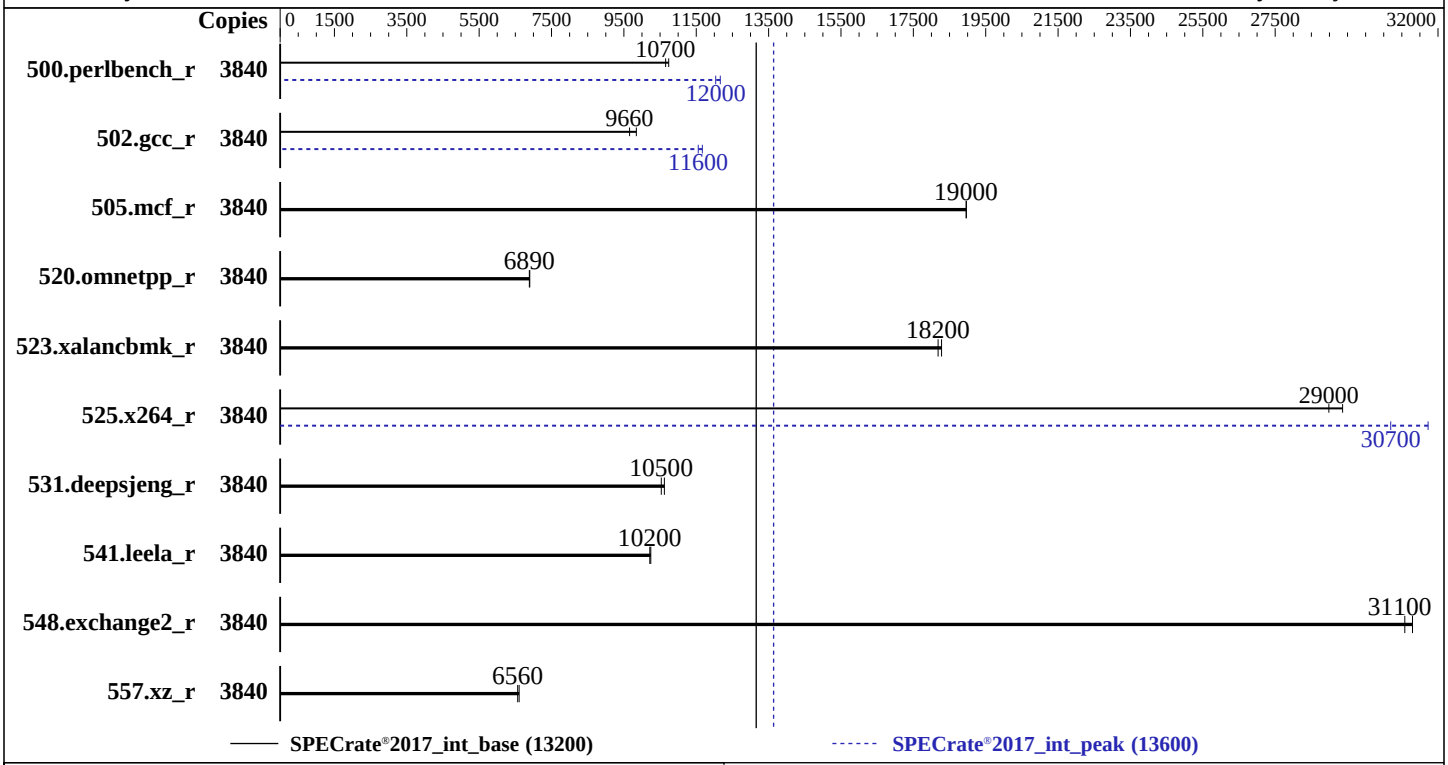
HPE Compute Scale-up Server 3200
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 13200

SPECrate®2017_int_peak = 13600

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

Test Date: May-2026
Hardware Availability: Dec-2023
Software Availability: May-2026



Hardware

CPU Name:	Intel Xeon Platinum 8490H
Max MHz:	3500
Nominal:	1900
Enabled:	1920 cores, 32 chips, 2 threads/core
Orderable:	4, 8, 16, 32 chip(s)
Cache L1:	32 KB I + 48 KB D on chip per core
L2:	2 MB I+D on chip per core
L3:	112.5 MB I+D on chip per chip
Other:	None
Memory:	32 TB (512 x 64 GB 2Rx4 PC5-4800B-R, running at 4400)
Storage:	1 x 14 TB NVMe SSD
Other:	CPU Cooling: Air

Software

OS:	SUSE Linux Enterprise Server 15 SP7 Kernel 6.4.0-150700.53.52-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; C: Version 2024.2.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
Parallel:	No
Firmware:	HPE Firmware Bundle Version 1.76.15 04/27/2026 released Apr-2026
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-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
500.perlbench_r	3840	569	10700	**574**	**10700**			3840	503	12200	**508**	**12000**		
502.gcc_r	3840	552	9840	**563**	**9660**			3840	**471**	**11600**	466	11700		
505.mcf_r	3840	327	19000	**327**	**19000**			3840	327	19000	**327**	**19000**		
520.omnetpp_r	3840	**732**	**6890**	730	6900			3840	**732**	**6890**	730	6900		
523.xalancbmk_r	3840	222	18300	**223**	**18200**			3840	222	18300	**223**	**18200**		
525.x264_r	3840	**232**	**29000**	229	29400			3840	**219**	**30700**	212	31700		
531.deepsjeng_r	3840	414	10600	**418**	**10500**			3840	414	10600	**418**	**10500**		
541.leela_r	3840	**622**	**10200**	621	10200			3840	**622**	**10200**	621	10200		
548.exchange2_r	3840	**324**	**31100**	321	31300			3840	**324**	**31100**	321	31300		
557.xz_r	3840	**632**	**6560**	628	6600			3840	**632**	**6560**	628	6600		

SPECrate®2017_int_base = **13200**

SPECrate®2017_int_peak = **13600**

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/lib/ia32:/home/cpu2017/je5.0.1-32"
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)
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
```

(Continued on next page)

General Notes (Continued)

```
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: Parameters are selected in the order shown below
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) Prefetch set to Enabled
 Last Level Cache (LLC) Dead Line Allocation set to Disabled
 Enhanced Processor Performance Profile set to Aggressive
 Memory Patrol Scrubbing set to Disabled
 Page Policy set to Open Adaptive

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on sph-679 Tue May 26 12:49:39 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.192.gc89ea566d9)
 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 sph-679 6.4.0-150700.53.52-default #1 SMP PREEMPT_DYNAMIC Fri May 15 16:13:26 UTC 2026 (51e3e5d)
   x86_64 x86_64 x86_64 GNU/Linux
```

(Continued on next page)

Platform Notes (Continued)

```
------------------------------------------------------------
2. w
   12:49:40 up  1:56,  1 user,  load average: 1.31, 0.99, 0.95
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  test     ttyS0    -                12:48   27.00s  0.12s 19.70s login -- test
  test     pts/0    -                12:48   27.00s  2.83s  0.06s 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) 130058719
  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) 130058719
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize=39
 login -- test
 -bash
 sudo su
 sudo su
 su
 bash
 bash
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=3840 -c
   ic2025.2-lin-graniterapids-rate-20250605.cfg --define smt-on --define cores=1920 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak -o all intrate -n 2
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=3840 --configfile
   ic2025.2-lin-graniterapids-rate-20250605.cfg --define smt-on --define cores=1920 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --iterations 2
   --nopower --runmode rate --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.002/templogs/preenv.intrate.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : Intel(R) Xeon(R) Platinum 8490H
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 143
    stepping        : 6
    microcode       : 0x2b000670
```

(Continued on next page)

Platform Notes (Continued)

```
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb bhi vmscape
cpu cores       : 60
siblings        : 120
32 physical ids (chips)
3840 processors (hardware threads)
physical id 0: core ids 0-59
physical id 1: core ids 0-59
physical id 2: core ids 0-59
physical id 3: core ids 0-59
physical id 4: core ids 0-59
physical id 5: core ids 0-59
physical id 6: core ids 0-59
physical id 7: core ids 0-59
physical id 8: core ids 0-59
physical id 9: core ids 0-59
physical id 10: core ids 0-59
physical id 11: core ids 0-59
physical id 12: core ids 0-59
physical id 13: core ids 0-59
physical id 14: core ids 0-59
physical id 15: core ids 0-59
physical id 16: core ids 0-59
physical id 17: core ids 0-59
physical id 18: core ids 0-59
physical id 19: core ids 0-59
physical id 20: core ids 0-59
physical id 21: core ids 0-59
physical id 22: core ids 0-59
physical id 23: core ids 0-59
physical id 24: core ids 0-59
physical id 25: core ids 0-59
physical id 26: core ids 0-59
physical id 27: core ids 0-59
physical id 28: core ids 0-59
physical id 29: core ids 0-59
physical id 30: core ids 0-59
physical id 31: core ids 0-59
physical id 0: apicids 0-119
physical id 1: apicids 128-247
physical id 2: apicids 256-375
physical id 3: apicids 384-503
physical id 4: apicids 512-631
physical id 5: apicids 640-759
physical id 6: apicids 768-887
physical id 7: apicids 896-1015
physical id 8: apicids 1024-1143
physical id 9: apicids 1152-1271
physical id 10: apicids 1280-1399
physical id 11: apicids 1408-1527
physical id 12: apicids 1536-1655
physical id 13: apicids 1664-1783
physical id 14: apicids 1792-1911
physical id 15: apicids 1920-2039
physical id 16: apicids 2048-2167
physical id 17: apicids 2176-2295
physical id 18: apicids 2304-2423
physical id 19: apicids 2432-2551
physical id 20: apicids 2560-2679
physical id 21: apicids 2688-2807
physical id 22: apicids 2816-2935
```

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Platform Notes (Continued)

```
     physical id 23: apicids 2944-3063
     physical id 24: apicids 3072-3191
     physical id 25: apicids 3200-3319
     physical id 26: apicids 3328-3447
     physical id 27: apicids 3456-3575
     physical id 28: apicids 3584-3703
     physical id 29: apicids 3712-3831
     physical id 30: apicids 3840-3959
     physical id 31: apicids 3968-4087
   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):                               3840
   On-line CPU(s) list:                  0-3839
   Vendor ID:                            GenuineIntel
   Model name:                           Intel(R) Xeon(R) Platinum 8490H
   CPU family:                           6
   Model:                                143
   Thread(s) per core:                   2
   Core(s) per socket:                   60
   Socket(s):                            32
   Stepping:                             6
   CPU(s) scaling MHz:                   23%
   CPU max MHz:                          3500.0000
   CPU min MHz:                          800.0000
   BogoMIPS:                             3799.98
   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_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:                            90 MiB (1920 instances)
   L1i cache:                            60 MiB (1920 instances)
   L2 cache:                             3.8 GiB (1920 instances)
   L3 cache:                             3.5 GiB (32 instances)
   NUMA node(s):                         32
   NUMA node0 CPU(s):                    0-59,1920-1979
```

(Continued on next page)

Platform Notes (Continued)

```
   NUMA node1 CPU(s):                    60-119,1980-2039
   NUMA node2 CPU(s):                    120-179,2040-2099
   NUMA node3 CPU(s):                    180-239,2100-2159
   NUMA node4 CPU(s):                    240-299,2160-2219
   NUMA node5 CPU(s):                    300-359,2220-2279
   NUMA node6 CPU(s):                    360-419,2280-2339
   NUMA node7 CPU(s):                    420-479,2340-2399
   NUMA node8 CPU(s):                    480-539,2400-2459
   NUMA node9 CPU(s):                    540-599,2460-2519
   NUMA node10 CPU(s):                   600-659,2520-2579
   NUMA node11 CPU(s):                   660-719,2580-2639
   NUMA node12 CPU(s):                   720-779,2640-2699
   NUMA node13 CPU(s):                   780-839,2700-2759
   NUMA node14 CPU(s):                   840-899,2760-2819
   NUMA node15 CPU(s):                   900-959,2820-2879
   NUMA node16 CPU(s):                   960-1019,2880-2939
   NUMA node17 CPU(s):                   1020-1079,2940-2999
   NUMA node18 CPU(s):                   1080-1139,3000-3059
   NUMA node19 CPU(s):                   1140-1199,3060-3119
   NUMA node20 CPU(s):                   1200-1259,3120-3179
   NUMA node21 CPU(s):                   1260-1319,3180-3239
   NUMA node22 CPU(s):                   1320-1379,3240-3299
   NUMA node23 CPU(s):                   1380-1439,3300-3359
   NUMA node24 CPU(s):                   1440-1499,3360-3419
   NUMA node25 CPU(s):                   1500-1559,3420-3479
   NUMA node26 CPU(s):                   1560-1619,3480-3539
   NUMA node27 CPU(s):                   1620-1679,3540-3599
   NUMA node28 CPU(s):                   1680-1739,3600-3659
   NUMA node29 CPU(s):                   1740-1799,3660-3719
   NUMA node30 CPU(s):                   1800-1859,3720-3779
   NUMA node31 CPU(s):                   1860-1919,3780-3839
   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 SW sequence; 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      90M   12 Data            1     64        1             64
      L1i       32K      60M    8 Instruction     1     64        1             64
      L2         2M     3.8G   16 Unified         2   2048        1             64
      L3     112.5M     3.5G   15 Unified         3 122880        1             64

 ------------------------------------------------------------
 8. numactl --hardware
```

(Continued on next page)

Platform Notes (Continued)

```
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 32 nodes (0-31)
  node 0 cpus: 0-59,1920-1979
  node 0 size: 1015077 MB
  node 0 free: 1012709 MB
  node 1 cpus: 60-119,1980-2039
  node 1 size: 1016219 MB
  node 1 free: 1014637 MB
  node 2 cpus: 120-179,2040-2099
  node 2 size: 1016219 MB
  node 2 free: 1015120 MB
  node 3 cpus: 180-239,2100-2159
  node 3 size: 1016219 MB
  node 3 free: 1015074 MB
  node 4 cpus: 240-299,2160-2219
  node 4 size: 1016219 MB
  node 4 free: 1015532 MB
  node 5 cpus: 300-359,2220-2279
  node 5 size: 1016219 MB
  node 5 free: 1015627 MB
  node 6 cpus: 360-419,2280-2339
  node 6 size: 1016219 MB
  node 6 free: 1015630 MB
  node 7 cpus: 420-479,2340-2399
  node 7 size: 1016219 MB
  node 7 free: 1015602 MB
  node 8 cpus: 480-539,2400-2459
  node 8 size: 1016219 MB
  node 8 free: 1014979 MB
  node 9 cpus: 540-599,2460-2519
  node 9 size: 1016219 MB
  node 9 free: 1015094 MB
  node 10 cpus: 600-659,2520-2579
  node 10 size: 1016219 MB
  node 10 free: 1014715 MB
  node 11 cpus: 660-719,2580-2639
  node 11 size: 1016219 MB
  node 11 free: 1015069 MB
  node 12 cpus: 720-779,2640-2699
  node 12 size: 1016219 MB
  node 12 free: 1015648 MB
  node 13 cpus: 780-839,2700-2759
  node 13 size: 1016219 MB
  node 13 free: 1015643 MB
  node 14 cpus: 840-899,2760-2819
  node 14 size: 1016219 MB
  node 14 free: 1015623 MB
  node 15 cpus: 900-959,2820-2879
  node 15 size: 1016219 MB
  node 15 free: 1015626 MB
  node 16 cpus: 960-1019,2880-2939
  node 16 size: 1016219 MB
  node 16 free: 1015620 MB
  node 17 cpus: 1020-1079,2940-2999
  node 17 size: 1016219 MB
  node 17 free: 1015604 MB
  node 18 cpus: 1080-1139,3000-3059
  node 18 size: 1016219 MB
  node 18 free: 1015646 MB
  node 19 cpus: 1140-1199,3060-3119
```

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Platform Notes (Continued)

```
node 19 size: 1016219 MB
node 19 free: 1015650 MB
node 20 cpus: 1200-1259,3120-3179
node 20 size: 1016219 MB
node 20 free: 1015537 MB
node 21 cpus: 1260-1319,3180-3239
node 21 size: 1016219 MB
node 21 free: 1015222 MB
node 22 cpus: 1320-1379,3240-3299
node 22 size: 1016181 MB
node 22 free: 1015475 MB
node 23 cpus: 1380-1439,3300-3359
node 23 size: 1016219 MB
node 23 free: 1015206 MB
node 24 cpus: 1440-1499,3360-3419
node 24 size: 1016219 MB
node 24 free: 1015641 MB
node 25 cpus: 1500-1559,3420-3479
node 25 size: 1016219 MB
node 25 free: 1015647 MB
node 26 cpus: 1560-1619,3480-3539
node 26 size: 1016219 MB
node 26 free: 1015652 MB
node 27 cpus: 1620-1679,3540-3599
node 27 size: 1016219 MB
node 27 free: 1015663 MB
node 28 cpus: 1680-1739,3600-3659
node 28 size: 1016219 MB
node 28 free: 1015587 MB
node 29 cpus: 1740-1799,3660-3719
node 29 size: 1016219 MB
node 29 free: 1015509 MB
node 30 cpus: 1800-1859,3720-3779
node 30 size: 1016219 MB
node 30 free: 1015585 MB
node 31 cpus: 1860-1919,3780-3839
node 31 size: 1013084 MB
node 31 free: 1012423 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  16  16  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  40  40  40  40
  1:  16  10  18  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  40  40  40  40
  2:  16  18  10  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  40  40  40  40
  3:  18  16  16  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  40  40  40  40
  4:  40  40  40  40  10  16  16  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
  5:  40  40  40  40  16  10  18  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:  40  40  40  40  16  18  10  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
  7:  40  40  40  40  18  16  16  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  16  16  18  40  40  40  40  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  16  10  18  16  40  40  40  40  40  40  40  40  40  40  40  40  40
```

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Platform Notes (Continued)

```
     40  40  40  40  40  40  40
    10:  40  40  40  40  40  40  40  40  40  16  18  10  16  40  40  40  40  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  40  18  16  16  10  40  40  40  40  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  40  40  40  40  40  10  16  16  18  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  40  40  40  40  40  40  16  10  18  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  40  40  40  40  40  40  16  18  10  16  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  40  40  40  40  40  40  18  16  16  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  40  40  10  16  16  18  40  40  40  40  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  40  40  16  10  18  16  40  40  40  40  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  40  40  16  18  10  16  40  40  40  40  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  40  40  18  16  16  10  40  40  40  40  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  40  40  40  40  40  40  10  16  16  18  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  40  40  40  40  40  40  16  10  18  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  40  40  40  40  40  40  16  18  10  16  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  40  40  40  40  40  40  18  16  16  10  40
    40  40  40  40  40  40  40
    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  40  40  10
    16  16  18  40  40  40  40
    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  40  40  16
    10  18  16  40  40  40  40
    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  40  40  16
    18  10  16  40  40  40  40
    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  40  40  18
    16  16  10  40  40  40  40
    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  40  40  40
    40  40  40  10  16  16  18
    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  40  40  40
    40  40  40  16  10  18  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  40  40  40
    40  40  40  16  18  10  16
    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  40  40  40
    40  40  40  18  16  16  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       33295066728 kB

------------------------------------------------------------
10. who -r
  run-level 3 May 26 11:04

------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.27+suse.192.gc89ea566d9)
  Default Target  Status
  multi-user      running

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

(Continued on next page)

Platform Notes (Continued)

```
 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
                     fancontrol firewalld fsidd gpm grub2-once haveged ipmi ipmievd irqbalance iscsi-init
                     iscsid issue-add-ssh-keys kexec-load lm_sensors 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-6.4.0-150700.53.52-default
   root=UUID=847ccf34-c09b-47dc-9cbd-431ae28cb064
   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
   pci=norom
   crashkernel=3G,high
   watchdog_thresh=60
   workqueue.watchdog_thresh=120

 ------------------------------------------------------------
 14. cpupower frequency-info
   analyzing CPU 2043:
     current policy: frequency should be within 800 MHz and 3.50 GHz.
                     The governor "performance" may decide which speed to use
                     within this range.
     boost state support:
       Supported: yes
       Active: yes

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

(Continued on next page)

Platform Notes (Continued)

```
------------------------------------------------------------
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 2.6.0, Build 757.1570.260501T0100.a.sles15sp7hpe-260501T0100

------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda2      xfs    14T  1.4T   13T  10% /

------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:          HPE
    Product:         Compute Scale-up Server 3200
    Product Family: 1590PID03030201
    Serial:          5UF2432328-000

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

(Continued on next page)

Platform Notes (Continued)

```
 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:
     32x Hynix HMCG94AEBRA102N 64 GB 2 rank 4800, configured at 4400
     34x Hynix HMCG94AEBRA103N 64 GB 2 rank 4800, configured at 4400
     34x Hynix HMCG94AEBRA109N 64 GB 2 rank 4800, configured at 4400
     32x Hynix HMCG94AEBRA123N 64 GB 2 rank 4800, configured at 4400
     49x Hynix HMCG94MEBRA109N 64 GB 2 rank 4800, configured at 4400
     18x Hynix HMCG94MEBRA121N 64 GB 2 rank 4800, configured at 4400
     4x Hynix HMCG94MEBRA123N 64 GB 2 rank 4800, configured at 4400
     128x Micron MTC40F2046S1RC48BA1 64 GB 2 rank 4800, configured at 4400
     112x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800, configured at 4400
     69x Samsung M321R8GA0BB0-CQKMG 64 GB 2 rank 4800, configured at 4400


 ------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       HPE
    BIOS Version:      Bundle:1.76.15-20260429_074928 SFW:009.056.003.000.2604270453
    BIOS Date:         04/27/2026
```

Compiler Version Notes

```
==============================================================================================================
C       | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.2.1 Build 20240711
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
        | 557.xz_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       | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2024.2.1 Build 20240711
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
        | 557.xz_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++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
```

(Continued on next page)

Compiler Version Notes (Continued)

```
        | 541.leela_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.
------------------------------------------------------------------------------------------------------------------------

========================================================================================================================
Fortran | 548.exchange2_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.
------------------------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xgraniterapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/intel-compilers/compiler/2025.2/lib -lqkmalloc

(Continued on next page)

Base Optimization Flags (Continued)

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xgraniterapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-fdelayed-template-parsing
-L/home/specdev/intel-compilers/compiler/2025.2/lib -lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xgraniterapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/home/specdev/intel-compilers/compiler/2025.2/lib -lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icx

502.gcc_r: icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: `-w -std=c11 -m64 -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 -fno-strict-overflow -fno-strict-aliasing -L/home/specdev/intel-compilers/compiler/2025.2/lib -lqkmalloc`

502.gcc_r: `-m32 -L/home/specdev/intel-compilers/compiler/2024.2/lib32 -std=gnu89 -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 -L/usr/local/jemalloc32-5.0.1/lib -ljemalloc`

505.mcf_r: `basepeak = yes`

525.x264_r: `-w -std=c11 -m64 -Wl,-z,muldefs -xgraniterapids -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fno-alias -L/home/specdev/intel-compilers/compiler/2025.2/lib -lqkmalloc`

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `basepeak = yes`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

Fortran benchmarks:

548.exchange2_r: `basepeak = yes`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic2025-official-linux64.html
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-CSS-GNR-rev1.3.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2025-official-linux64.xml
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-CSS-GNR-rev1.3.xml

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