SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant Compute DL580 Gen12
(2.90 Ghz, Intel Xeon 6738P)

$SPECrate^{®}2017\_fp\_base = 1850$
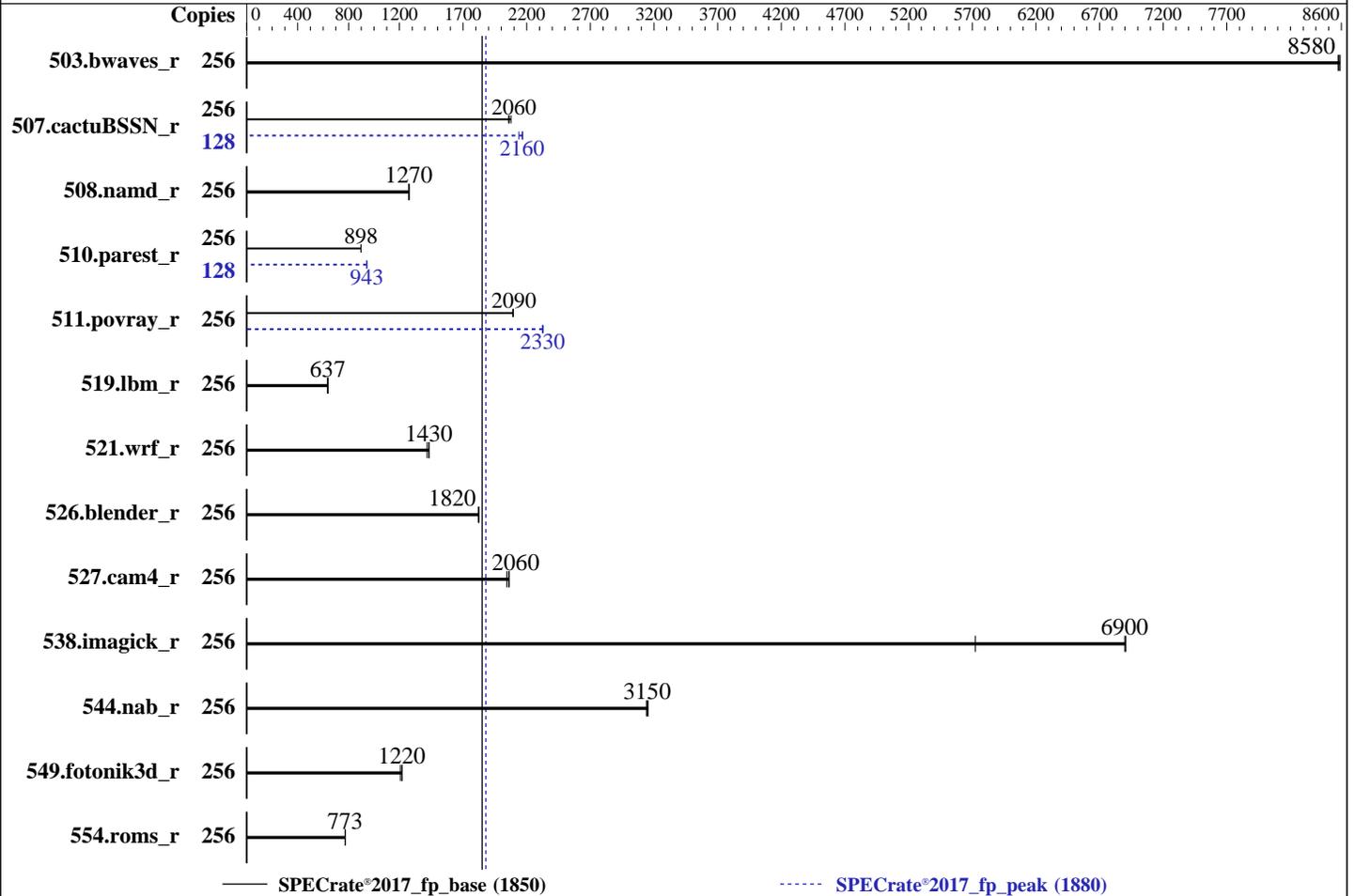
$SPECrate^{®}2017\_fp\_peak = 1880$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Aug-2025

Hardware Availability: Jul-2025

Software Availability: Jul-2025

Benchmark	Copies	Result
503.bwaves_r	256	8580
507.cactuBSSN_r	256	2060
507.cactuBSSN_r	128	2160
508.namd_r	256	1270
510.parest_r	256	898
510.parest_r	128	943
511.povray_r	256	2090
511.povray_r	256	2330
519.lbm_r	256	637
521.wrf_r	256	1430
526.blender_r	256	1820
527.cam4_r	256	2060
538.imagick_r	256	6900
544.nab_r	256	3150
549.fotonik3d_r	256	1220
554.roms_r	256	773

SPECrate®2017_fp_base (1850)   SPECrate®2017_fp_peak (1880)

Hardware

CPU Name: Intel Xeon 6738P

 Max MHz: 4200

 Nominal: 2900

Enabled: 128 cores, 4 chips, 2 threads/core

Orderable: 1,2,4 Chips

Cache L1: 64 KB I + 48 KB D on chip per core

 L2: 2 MB I+D on chip per core

 L3: 144 MB I+D on chip per chip

 Other: None

Memory: 2 TB (32 x 64 GB 2Rx4 PC5-6400B-R)

Storage: 1 x 1.8 TB NVMe SSD

Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6
Kernel 6.4.0-150600.23.60-default

Compiler: C/C++: Version 2024.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2024.1 of Intel Fortran Compiler for Linux;

Parallel: No

Firmware: HPE BIOS Version v1.43 07/09/2025 released Jul-2025

File System: btrfs

System State: Run level 5 (multi-user graphical)

Base Pointers: 64-bit

Peak Pointers: 64-bit

Other: jemalloc memory allocator V5.0.1

Power Management: BIOS set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	256	**299**	**8580**	299	8570	299	8590	256	**299**	**8580**	299	8570	299	8590
507.cactuBSSN_r	256	158	2060	**157**	**2060**	156	2080	128	**74.9**	**2160**	74.7	2170	75.8	2140
508.namd_r	256	191	1270	**191**	**1270**	191	1280	256	191	1270	**191**	**1270**	191	1280
510.parest_r	256	746	897	746	898	**746**	**898**	128	355	943	**355**	**943**	355	943
511.povray_r	256	286	2090	285	2090	**286**	**2090**	256	257	2330	257	2320	**257**	**2330**
519.lbm_r	256	424	637	**424**	**637**	424	637	256	424	637	**424**	**637**	424	637
521.wrf_r	256	405	1420	400	1430	**401**	**1430**	256	405	1420	400	1430	**401**	**1430**
526.blender_r	256	214	1820	214	1830	**214**	**1820**	256	214	1820	214	1830	**214**	**1820**
527.cam4_r	256	**218**	**2060**	217	2060	219	2040	256	**218**	**2060**	217	2060	219	2040
538.imagick_r	256	**92.3**	**6900**	111	5720	92.2	6910	256	**92.3**	**6900**	111	5720	92.2	6910
544.nab_r	256	137	3150	137	3140	**137**	**3150**	256	137	3150	137	3140	**137**	**3150**
549.fotonik3d_r	256	826	1210	**819**	**1220**	817	1220	256	826	1210	**819**	**1220**	817	1220
554.roms_r	256	**526**	**773**	525	774	526	773	256	**526**	**773**	525	774	526	773
SPECrate®2017_fp_base =				**1850**										
SPECrate®2017_fp_peak =				**1880**										

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>
tuned-adm profile was stopped using "systemctl stop tuned"
```

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)
```

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General Notes (Continued)

```
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
 jemalloc, a general purpose malloc implementation
 built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS Configurations : Parameters are selected in the order shown below
Workload Profile set to General Throughput Compute
Enhanced Processor Performance Profile set to Aggressive
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
Last Level Cache (LLC) Prefetch set to Enabled
XPT Prefetch set to Disabled
Intel UPI Prefetch set to Disabled
Workload Profile set to Custom
  Collaborative Power Control set to Enabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Mon Aug 25 22:26:08 2025

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

 -----------------------------------------------------------
 Table of contents
 -----------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 254 (254.27+suse.167.g130293e510)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
 -----------------------------------------------------------


 -----------------------------------------------------------
  1. uname -a
    Linux localhost 6.4.0-150600.23.60-default #1 SMP PREEMPT_DYNAMIC Tue Jul  1 14:43:49 UTC 2025 (6f98261)
```

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Platform Notes (Continued)

```
  x86_64 x86_64 x86_64 GNU/Linux


  --------------------------------------------------------
  2. w
    22:26:08 up 11:27,  2 users,  load average: 196.76, 247.00, 254.93
    USER      TTY       FROM              LOGIN@   IDLE   JCPU   PCPU WHAT
    benchmar pts/6   :pts/4:S.0        13:38    8:47m  0.88s  0.03s sudo su


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


  --------------------------------------------------------
  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) 8255057
    max locked memory       (kbytes, -l) 8192
    max memory size         (kbytes, -m) unlimited
    open files                      (-n) 1024
    pipe size            (512 bytes, -p) 8
    POSIX message queues     (bytes, -q) 819200
    real-time priority              (-r) 0
    stack size              (kbytes, -s) unlimited
    cpu time               (seconds, -t) unlimited
    max user processes              (-u) 8255057
    virtual memory          (kbytes, -v) unlimited
    file locks                      (-x) unlimited


  --------------------------------------------------------
  5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize=42
  SCREEN -S cpu2017
  /bin/bash
  sudo su
  sudo su
  su
   bash
   bash
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=256 -c
     6738P-avx512-rate-20240308.cfg --define smt-on --define cores=128 --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=256 --configfile
     6738P-avx512-rate-20240308.cfg --define smt-on --define cores=128 --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/CPU2017.008/templogs/preenv.fprate.008.0.log --lognum 008.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
  $SPEC = /home/cpu2017


  --------------------------------------------------------
  6. /proc/cpuinfo
     model name      : Intel(R) Xeon(R) 6738P
     vendor_id       : GenuineIntel
     cpu family      : 6
     model           : 173
     stepping        : 1
```

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Platform Notes (Continued)

```
       microcode       : 0x10003c2
       bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
       cpu cores       : 32
       siblings        : 64
       4 physical ids (chips)
       256 processors (hardware threads)
       physical id 0: core ids 0-31
       physical id 1: core ids 0-31
       physical id 2: core ids 0-31
       physical id 3: core ids 0-31
       physical id 0: apicids 0-63
       physical id 1: apicids 128-191
       physical id 2: apicids 256-319
       physical id 3: apicids 384-447
   Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
   virtualized systems.  Use the above data carefully.


   ------------------------------------------------------------
   7. lscpu

   From lscpu from util-linux 2.39.3:
     Architecture:           x86_64
     CPU op-mode(s):         32-bit, 64-bit
     Address sizes:          46 bits physical, 57 bits virtual
     Byte Order:             Little Endian
     CPU(s):                 256
     On-line CPU(s) list:    0-255
     Vendor ID:              GenuineIntel
     Model name:             Intel(R) Xeon(R) 6738P
     CPU family:             6
     Model:                  173
     Thread(s) per core:     2
     Core(s) per socket:     32
     Socket(s):              4
     Stepping:               1
     BogoMIPS:               5800.00
     Flags:                  fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat
                             pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx
                             pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good
                             nopl xtopology nonstop_tsc cpuid aperfmperf tsc_known_freq pni
                             pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma
                             cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
                             tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm
                             3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3 intel_ppin
                             cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
                             flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep
                             bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                             avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw
                             avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
                             cqm_mbm_total cqm_mbm_local split_lock_detect user_shstk avx_vnni
                             avx512_bf16 wbnoinvd dtherm ida arat pln pts vnmi avx512vbmi umip
                             pku ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
                             avx512_bitalg tme avx512_vpopcntdq la57 rdpid bus_lock_detect
                             cldemote movdiri movdir64b enqcmd fsrm md_clear serialize tsxldtrk
                             pconfig arch_lbr ibt amx_bf16 avx512_fp16 amx_tile amx_int8
                             flush_l1d arch_capabilities
     Virtualization:         VT-x
     L1d cache:              6 MiB (128 instances)
     L1i cache:              8 MiB (128 instances)
     L2 cache:               256 MiB (128 instances)
```

(Continued on next page)

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Platform Notes (Continued)

```
    L3 cache:                        576 MiB (4 instances)
    NUMA node(s):                    4
    NUMA node0 CPU(s):               0-31,128-159
    NUMA node1 CPU(s):               32-63,160-191
    NUMA node2 CPU(s):               64-95,192-223
    NUMA node3 CPU(s):               96-127,224-255
    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 Tsx async abort:   Not affected

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL   SETS PHY-LINE COHERENCY-SIZE
      L1d      48K       6M  12 Data            1     64       1             64
      L1i      64K       8M  16 Instruction    1     64       1             64
      L2        2M     256M  16 Unified         2   2048       1             64
      L3      144M     576M  16 Unified         3 147456       1             64


  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 4 nodes (0-3)
    node 0 cpus: 0-31,128-159
    node 0 size: 515679 MB
    node 0 free: 479720 MB
    node 1 cpus: 32-63,160-191
    node 1 size: 516078 MB
    node 1 free: 488165 MB
    node 2 cpus: 64-95,192-223
    node 2 size: 516078 MB
    node 2 free: 486231 MB
    node 3 cpus: 96-127,224-255
    node 3 size: 515960 MB
    node 3 free: 484227 MB
    node distances:
    node   0   1   2   3
      0:  10  21  21  21
      1:  21  10  21  21
      2:  21  21  10  21
      3:  21  21  21  10


  ------------------------------------------------------------
  9. /proc/meminfo
     MemTotal:       2113328440 kB


  ------------------------------------------------------------
  10. who -r
```

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Platform Notes (Continued)

```
  run-level 5 Aug 25 10:59


  ----------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.27+suse.167.g130293e510)
  Default Target  Status
  graphical       running


  ----------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd
                   bluetooth chronyd cron display-manager getty@ irqbalance iscsi issue-generator kbdsettings
                   klog lvm2-monitor nscd nvmefc-boot-connections nvmf-autoconnect postfix purge-kernels
                   rollback rsyslog smartd sshd systemd-pstore virtqemud wicked wickedd-auto4 wickedd-dhcp4
                   wickedd-dhcp6 wickedd-nanny wpa_supplicant
  enabled-runtime  systemd-remount-fs
  disabled         NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon autofs
                   autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates
                   chrony-wait console-getty cups cups-browsed debug-shell dmraid-activation dnsmasq ebtables
                   exchange-bmc-os-info firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd
                   iscsi-init iscsid issue-add-ssh-keys kexec-load ksm kvm_stat libvirt-guests lunmask
                   man-db-create multipathd nfs nfs-blkmap nfs-server nfsserver nmb openvpn@ ostree-remount
                   rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd
                   snmptrapd speech-dispatcherd systemd-boot-check-no-failures systemd-confext
                   systemd-network-generator systemd-nspawn@ systemd-sysext systemd-time-wait-sync
                   systemd-timesyncd tcsd tuned udisks2 update-system-flatpaks upower virtinterfaced
                   virtlockd virtlogd virtnetworkd virtnodedevd virtnwfilterd virtsecretd virtstoraged
                   vncserver@ wpa_supplicant@
  indirect         pcscd saned@ systemd-userdbd tftp wickedd

  ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.23.60-default
  root=UUID=31ddc59e-f5ed-47da-8154-f16fa2fc98b8
  splash=silent
  mitigations=auto
  quiet
  security=apparmor

  ----------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 41:
    Unable to determine current policy
    boost state support:
      Supported: yes
      Active: yes

  ----------------------------------------------------------
15. tuned-adm active
  Current active profile: virtual-host

  ----------------------------------------------------------
16. sysctl
  kernel.numa_balancing          1
  kernel.randomize_va_space      2
  vm.compaction_proactiveness    20
  vm.dirty_background_bytes      0
  vm.dirty_background_ratio      5
  vm.dirty_bytes                 0
  vm.dirty_expire_centisecs      3000
```

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Platform Notes (Continued)

```
   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                     10
   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 SP6


   -------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
   Filesystem      Type   Size  Used Avail Use% Mounted on
   /dev/nvme1n1p3 btrfs  1.8T  316G  1.5T  18% /home


   -------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
     Vendor:         HPE
     Product:        HPE ProLiant Compute DL580 Gen12
     Product Family: ProLiant
     Serial:         SANJACSCM


   -------------------------------------------------------------
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:
     4x Hynix HMCG94AHBRA480N 64 GB 2 rank 6400
     5x Micron MTC40F2046S1RC64BD2 MWFF 64 GB 2 rank 6400
     23x Micron MTC40F2046S1RC64BD2 QSFF 64 GB 2 rank 6400
```

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Tested by: HPE

Test Date: Aug-2025
Hardware Availability: Jul-2025
Software Availability: Jul-2025

Platform Notes (Continued)

```
       ---------------------------------------------------------------
    23. BIOS
    (This section combines info from /sys/devices and dmidecode.)
       BIOS Vendor:      HPE
       BIOS Version:     1.43
       BIOS Date:        07/09/2025
       BIOS Revision:    1.43
       Firmware Revision: 1.17
```

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


==============================================================================
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 2024.1.0 Build 20240308
Copyright (C) 1985-2024 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 2024.1.0 Build 20240308
Copyright (C) 1985-2024 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.1.0 Build 20240308
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```

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SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant Compute DL580 Gen12
(2.90 Ghz, Intel Xeon 6738P)

SPECrate®2017_fp_base = 1850

SPECrate®2017_fp_peak = 1880

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

Test Date: Aug-2025
Hardware Availability: Jul-2025
Software Availability: Jul-2025

Compiler Version Notes (Continued)

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`
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 -xCORE-AVX512 -Ofast -ffast-math`

(Continued on next page)

Hewlett Packard Enterprise
(Test Sponsor: HPE)

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SPECrate®2017_fp_peak = 1880

CPU2017 License: 3		**Test Date:**	Aug-2025
Test Sponsor:	HPE	**Hardware Availability:**	Jul-2025
Tested by:	HPE	**Software Availability:**	Jul-2025

Base Optimization Flags (Continued)

C benchmarks (continued):
```
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -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 -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -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 -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:
```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -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
```

(Continued on next page)

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant Compute DL580 Gen12
(2.90 Ghz, Intel Xeon 6738P)

SPECrate®2017_fp_base = 1850

SPECrate®2017_fp_peak = 1880

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

Test Date: Aug-2025
Hardware Availability: Jul-2025
Software Availability: Jul-2025

Peak Compiler Invocation (Continued)

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 -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

Fortran benchmarks:

503.bwaves_r: `basepeak = yes`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `basepeak = yes`

Benchmarks using both Fortran and C:

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise
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SPECrate®2017_fp_base = 1850

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CPU2017 License: 3
Test Sponsor: HPE
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Test Date: Aug-2025
Hardware Availability: Jul-2025
Software Availability: Jul-2025

Peak Optimization Flags (Continued)

521.wrf_r: `basepeak = yes`

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`
`-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

526.blender_r: `basepeak = yes`

Benchmarks using Fortran, C, and C++:
`-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -Wno-implicit-int -nostandard-realloc-lhs`
`-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-GNR-rev1.3.html
http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.html

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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-GNR-rev1.3.xml
http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml

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

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