SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)
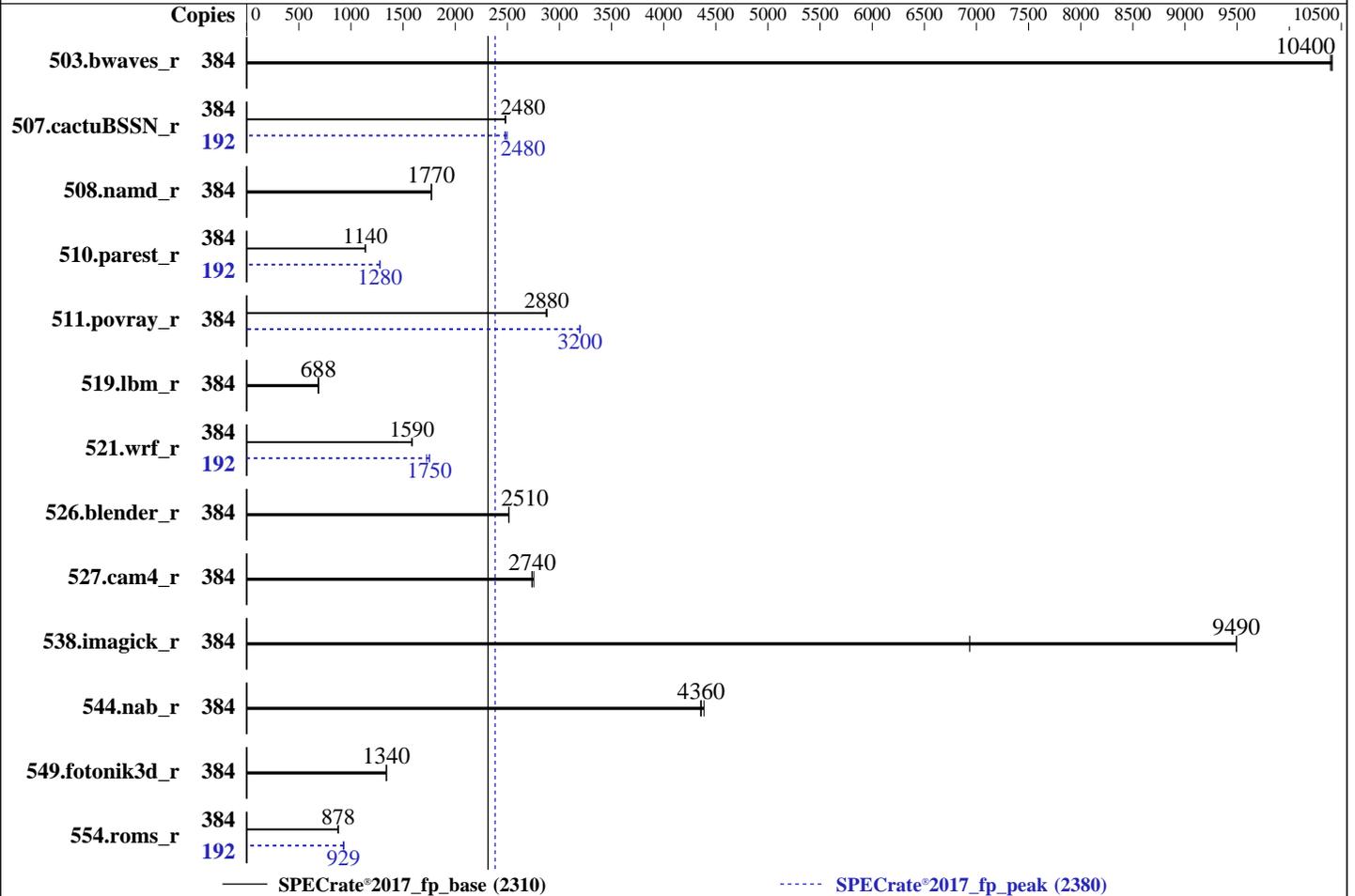
ProLiant Compute DL580 Gen12
(2.50 Ghz, Intel Xeon 6748P)

$SPECrate^{®}2017\_fp\_base = 2310$

$SPECrate^{®}2017\_fp\_peak = 2380$

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

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

Copies

Benchmark	Copies	Value
503.bwaves_r	384	10400
507.cactuBSSN_r	384	2480
507.cactuBSSN_r	192	2480
508.namd_r	384	1770
510.parest_r	384	1140
510.parest_r	192	1280
511.povray_r	384	2880
511.povray_r	384	3200
519.lbm_r	384	688
521.wrf_r	384	1590
521.wrf_r	192	1750
526.blender_r	384	2510
527.cam4_r	384	2740
538.imagick_r	384	9490
544.nab_r	384	4360
549.fotonik3d_r	384	1340
554.roms_r	384	878
554.roms_r	192	929

SPECrate®2017_fp_base (2310)   SPECrate®2017_fp_peak (2380)

Hardware

CPU Name: Intel Xeon 6748P
 Max MHz: 4100
 Nominal: 2500
Enabled: 192 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: 192 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

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

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Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
503.bwaves_r	384	**370**	**10400**	370	10400	370	10400	384	**370**	**10400**	370	10400	370	10400
507.cactuBSSN_r	384	196	2480	**196**	**2480**	196	2480	192	98.2	2480	**97.9**	**2480**	97.3	2500
508.namd_r	384	**206**	**1770**	206	1770	206	1770	384	**206**	**1770**	206	1770	206	1770
510.parest_r	384	883	1140	882	1140	**882**	**1140**	192	393	1280	**393**	**1280**	393	1280
511.povray_r	384	311	2880	312	2870	**311**	**2880**	384	281	3190	**281**	**3200**	280	3200
519.lbm_r	384	**589**	**688**	589	688	589	688	384	**589**	**688**	589	688	589	688
521.wrf_r	384	542	1590	543	1580	**542**	**1590**	192	**245**	**1750**	245	1750	249	1730
526.blender_r	384	233	2510	**233**	**2510**	232	2520	384	233	2510	**233**	**2510**	232	2520
527.cam4_r	384	244	2750	246	2730	**245**	**2740**	384	244	2750	246	2730	**245**	**2740**
538.imagick_r	384	138	6940	101	9490	**101**	**9490**	384	138	6940	101	9490	**101**	**9490**
544.nab_r	384	148	4350	**148**	**4360**	147	4390	384	148	4350	**148**	**4360**	147	4390
549.fotonik3d_r	384	**1117**	**1340**	1119	1340	1116	1340	384	**1117**	**1340**	1119	1340	1116	1340
554.roms_r	384	695	878	696	877	**695**	**878**	192	**329**	**929**	329	929	328	931

SPECrate®2017_fp_base =	**2310**
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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 set to virtual-host using "tuned-adm profile virtual-host"
```

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.
```

(Continued on next page)

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General Notes (Continued)

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 Peak Frequency 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 Fri Aug 22 14:36:18 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)
    x86_64 x86_64 x86_64 GNU/Linux

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Platform Notes (Continued)

```
        ----------------------------------------------------------
        2. w
          14:36:18 up 22:47,  3 users,  load average: 265.58, 361.04, 376.54
          USER     TTY        FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
          root     :                           Thu15  ?xdm?  59:01   0.01s gdm-session-worker [pam/gdm-password]
          root     seat0      login-           Thu15   0.00s  0.00s  0.00s /usr/lib/gdm/gdm-x-session
          --register-session --run-script gnome
          root     :1                          Thu15  ?xdm?  59:01   0.00s /usr/lib/gdm/gdm-x-session
          --register-session --run-script gnome
          benchmar pts/3     :pts/9:S.0         Thu16   5:13m  0.95s  0.06s 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) 8254663
          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) 8254663
          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=384 -c
           6748P-avx512-rate-20240308.cfg --define smt-on --define cores=192 --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=384 --configfile
           6748P-avx512-rate-20240308.cfg --define smt-on --define cores=192 --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/CPU2017.004/templogs/preenv.fprate.004.0.log --lognum 004.0 --from_runcpu 2
         specperl $SPEC/bin/sysinfo
         $SPEC = /home/cpu2017

        ----------------------------------------------------------
        6. /proc/cpuinfo
            model name        : Intel(R) Xeon(R) 6748P
```

(Continued on next page)

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Platform Notes (Continued)

```
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 173
    stepping        : 1
    microcode       : 0x10003c2
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs bhi
    cpu cores       : 48
    siblings        : 96
    4 physical ids (chips)
    384 processors (hardware threads)
    physical id 0: core ids 0-47
    physical id 1: core ids 0-47
    physical id 2: core ids 0-47
    physical id 3: core ids 0-47
    physical id 0: apicids 0-95
    physical id 1: apicids 128-223
    physical id 2: apicids 256-351
    physical id 3: apicids 384-479
  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):                   384
  On-line CPU(s) list:      0-383
  Vendor ID:                GenuineIntel
  Model name:               Intel(R) Xeon(R) 6748P
  CPU family:               6
  Model:                    173
  Thread(s) per core:       2
  Core(s) per socket:       48
  Socket(s):                4
  Stepping:                 1
  BogoMIPS:                 5000.00
  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
```

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Platform Notes (Continued)

```
  Virtualization:                       VT-x
  L1d cache:                            9 MiB (192 instances)
  L1i cache:                            12 MiB (192 instances)
  L2 cache:                             384 MiB (192 instances)
  L3 cache:                             768 MiB (4 instances)
  NUMA node(s):                         4
  NUMA node0 CPU(s):                    0-47,192-239
  NUMA node1 CPU(s):                    48-95,240-287
  NUMA node2 CPU(s):                    96-143,288-335
  NUMA node3 CPU(s):                    144-191,336-383
  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       9M   12 Data            1      64       1             64
      L1i       64K      12M   16 Instruction     1      64       1             64
      L2         2M     384M   16 Unified         2    2048       1             64
      L3       192M     768M   16 Unified         3  196608       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: 0-47,192-239
    node 0 size: 515606 MB
    node 0 free: 473112 MB
    node 1 cpus: 48-95,240-287
    node 1 size: 516032 MB
    node 1 free: 468845 MB
    node 2 cpus: 96-143,288-335
    node 2 size: 516070 MB
    node 2 free: 477035 MB
    node 3 cpus: 144-191,336-383
    node 3 size: 515988 MB
    node 3 free: 471252 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
```

(Continued on next page)

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Platform Notes (Continued)

```
    MemTotal:       2113227456 kB


   ----------------------------------------------------------
   10. who -r
     run-level 5 Aug 21 15:50


   ----------------------------------------------------------
   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 300:
       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
```

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Platform Notes (Continued)

```
   vm.dirty_background_bytes            0
   vm.dirty_background_ratio            5
   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                       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  315G  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
```

(Continued on next page)

Hewlett Packard Enterprise

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ProLiant Compute DL580 Gen12
(2.50 Ghz, Intel Xeon 6748P)

SPECrate®2017_fp_base = 2310

SPECrate®2017_fp_peak = 2380

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Aug-2025

Hardware Availability: Jul-2025

Software Availability: Jul-2025

Platform Notes (Continued)

```
    5x Micron MTC40F2046S1RC64BD2 MWFF 64 GB 2 rank 6400
    23x Micron MTC40F2046S1RC64BD2 QSFF 64 GB 2 rank 6400


  ------------------------------------------------------------
  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
Copyright (C) 1985-2024 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 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.
------------------------------------------------------------------------------


==============================================================================
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
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------------------------------------------------------------------------------


==============================================================================
Fortran, C     | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
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ProLiant Compute DL580 Gen12
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SPECrate®2017_fp_peak = 2380

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)

```
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
Copyright (C) 1985-2024 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`
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`

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Hardware Availability: Jul-2025
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Base Optimization Flags

C benchmarks:
```
-w -std=c11 -m64 -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
```

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)

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ProLiant Compute DL580 Gen12
(2.50 Ghz, Intel Xeon 6748P)

SPECrate®2017_fp_base = 2310

SPECrate®2017_fp_peak = 2380

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: `-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math`
`-flto -mfpmath=sse -funroll-loops`

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$SPECrate^{®}2017\_fp\_base = 2310$

ProLiant Compute DL580 Gen12
(2.50 Ghz, Intel Xeon 6748P)

$SPECrate^{®}2017\_fp\_peak = 2380$

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

Peak Optimization Flags (Continued)

554.roms_r (continued):
```
-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 -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
```

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

---

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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$SPECrate®2017\_fp\_peak = 2380$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Aug-2025

Hardware Availability: Jul-2025

Software Availability: Jul-2025

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

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