SPEC CPU®2017 Floating Point Rate Result

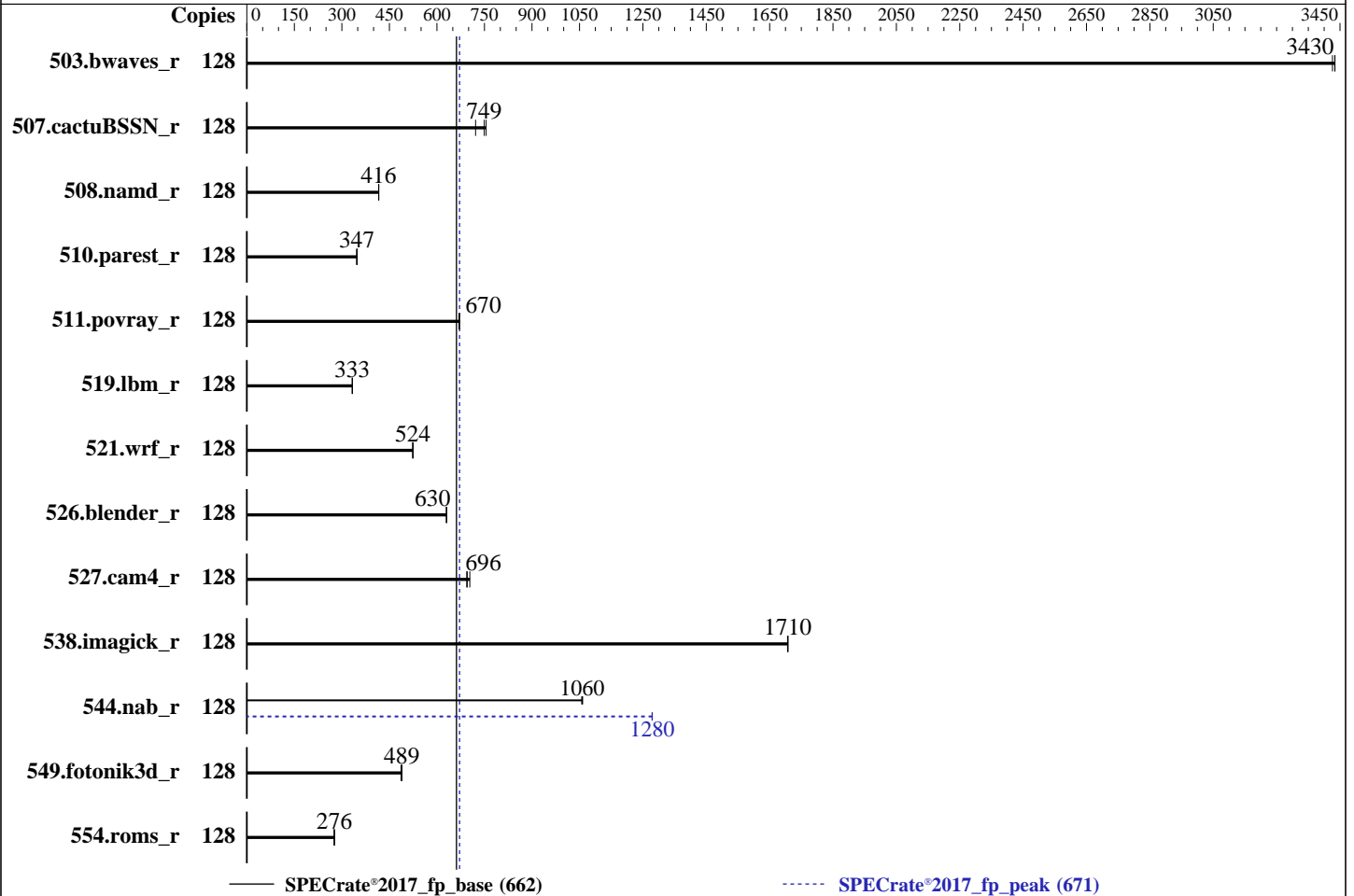## Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

SPECrate®2017_fp_base = 662

SPECrate®2017_fp_peak = 671

CPU2017 License: 3   **Test Date:** Feb-2023
Test Sponsor: HPE   **Hardware Availability:** Jan-2023
Tested by: HPE   **Software Availability:** May-2022

Benchmark	Copies	Result
503.bwaves_r	128	3430
507.cactuBSSN_r	128	749
508.namd_r	128	416
510.parest_r	128	347
511.povray_r	128	670
519.lbm_r	128	333
521.wrf_r	128	524
526.blender_r	128	630
527.cam4_r	128	696
538.imagick_r	128	1710
544.nab_r	128	1060 (base), 1280 (peak)
549.fotonik3d_r	128	489
554.roms_r	128	276

Copies scale: 0 150 300 450 600 750 900 1050 1250 1450 1650 1850 2050 2250 2450 2650 2850 3050 3450

——— SPECrate®2017_fp_base (662)   - - - - SPECrate®2017_fp_peak (671)

Hardware

CPU Name: Intel Xeon Gold 6454S
 Max MHz: 3400
 Nominal: 2200
Enabled: 64 cores, 2 chips, 2 threads/core
Orderable: 1, 2 chip(s)
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 60 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 960 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
Kernel 5.14.0-70.13.1.el9_0.x86_64
Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++
Compiler for Linux;
Fortran: Version 2022.1 of Intel Fortran Compiler
for Linux;
Parallel: No
Firmware: HPE BIOS Version v1.22 01/18/2023 released
Jan-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at
the cost of additional power usage

SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

SPECrate®2017_fp_base = 662

SPECrate®2017_fp_peak = 671

CPU2017 License: 3	**Test Date:** Feb-2023
Test Sponsor: HPE	**Hardware Availability:** Jan-2023
Tested by: HPE	**Software Availability:** May-2022

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	128	374	3430	**374**	**3430**	375	3430	128	374	3430	**374**	**3430**	375	3430
507.cactuBSSN_r	128	215	755	**216**	**749**	224	722	128	215	755	**216**	**749**	224	722
508.namd_r	128	292	416	292	416	**292**	**416**	128	292	416	292	416	**292**	**416**
510.parest_r	128	**964**	**347**	966	347	962	348	128	**964**	**347**	966	347	962	348
511.povray_r	128	446	669	**446**	**670**	445	672	128	446	669	**446**	**670**	445	672
519.lbm_r	128	**405**	**333**	405	333	405	333	128	**405**	**333**	405	333	405	333
521.wrf_r	128	**547**	**524**	548	524	547	524	128	**547**	**524**	548	524	547	524
526.blender_r	128	309	630	**309**	**630**	309	630	128	309	630	**309**	**630**	309	630
527.cam4_r	128	323	694	**322**	**696**	318	704	128	323	694	**322**	**696**	318	704
538.imagick_r	128	186	1710	**186**	**1710**	187	1710	128	186	1710	**186**	**1710**	187	1710
544.nab_r	128	203	1060	**204**	**1060**	204	1060	128	168	1280	168	1280	**168**	**1280**
549.fotonik3d_r	128	1019	489	1025	487	**1019**	**489**	128	1019	489	1025	487	**1019**	**489**
554.roms_r	128	737	276	**736**	**276**	736	276	128	737	276	**736**	**276**	736	276

SPECrate®2017_fp_base =	**662**
SPECrate®2017_fp_peak =	**671**

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>
    IRQ balance service was stopped using "systemctl stop irqbalance.service"
    tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"

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

(Continued on next page)

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

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

$SPECrate®2017\_fp\_base = 662$

$SPECrate®2017\_fp\_peak = 671$

CPU2017 License: 3		**Test Date:**	Feb-2023
Test Sponsor:	HPE	**Hardware Availability:**	Jan-2023
Tested by:	HPE	**Software Availability:**	May-2022

General Notes (Continued)

```
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
 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

```
The system ROM used for this result contains Intel microcode version 0x2b000161 for
the Intel Xeon Gold 6454S processor.
BIOS Configuration:
 Workload Profile set to General Throughput Compute
 Thermal Configuration set to Maximum Cooling
 Enhanced Processor Performance Profile set to Aggressive
 Last Level Cache (LLC) Dead Line Allocation set to Disabled
 Memory Patrol Scrubbing set to Disabled
 Workload Profile set to Custom
  DCU Stream Prefetcher set to Disabled
  Adjacent Sector Prefetch set to Disabled
  Minimum Processor Idle Power Package C-State set to No Package State
The reported date by sysinfo is incorrect due to computer clock being not set correctly.
The correct test date is: Feb-2023.

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Tue Jul  5 05:47:28 2022

 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 250 (250-6.el9_0)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
 16. /sys/kernel/mm/transparent_hugepage
 17. /sys/kernel/mm/transparent_hugepage/khugepaged
 18. OS release
 19. Disk information
 20. /sys/devices/virtual/dmi/id
 21. dmidecode
 22. BIOS
 -----------------------------------------------------------
```

(Continued on next page)

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

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

$SPECrate®2017\_fp\_base = 662$

$SPECrate®2017\_fp\_peak = 671$

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

Test Date: Feb-2023
Hardware Availability: Jan-2023
Software Availability: May-2022

Platform Notes (Continued)

```
        --------------------------------------------------------
        1. uname -a
          Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14 12:42:38 EDT 2022 x86_64
          x86_64 x86_64 GNU/Linux

        --------------------------------------------------------
        2. w
           05:47:28 up 14 min,  0 users,  load average: 0.15, 0.03, 0.01
          USER      TTY        LOGIN@   IDLE   JCPU   PCPU WHAT

        --------------------------------------------------------
        3. Username
          From environment variable $USER:  root

        --------------------------------------------------------
        4. ulimit -a
          real-time non-blocking time  (microseconds, -R) unlimited
          core file size              (blocks, -c) 0
          data seg size               (kbytes, -d) unlimited
          scheduling priority              (-e) 0
          file size                   (blocks, -f) unlimited
          pending signals                  (-i) 4127158
          max locked memory           (kbytes, -l) 64
          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) 4127158
          virtual memory              (kbytes, -v) unlimited
          file locks                       (-x) unlimited

        --------------------------------------------------------
        5. sysinfo process ancestry
         /usr/lib/systemd/systemd --switched-root --system --deserialize 28
         sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
         sshd: root [priv]
         sshd: root@notty
         bash -c cd $SPEC/ && $SPEC/fprate.sh
         runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
           ic2022.1-lin-core-avx512-rate-20220316.cfg --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=128 --configfile
           ic2022.1-lin-core-avx512-rate-20220316.cfg --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/CPU2017.001/templogs/preenv.fprate.001.0.log --lognum 001.0 --from_runcpu 2
         specperl $SPEC/bin/sysinfo
        $SPEC = /home/cpu2017

        --------------------------------------------------------
        6. /proc/cpuinfo
            model name     : Intel(R) Xeon(R) Gold 6454S
            vendor_id      : GenuineIntel
            cpu family     : 6
            model          : 143
            stepping       : 8
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

$SPECrate®2017\_fp\_base = 662$

$SPECrate®2017\_fp\_peak = 671$

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

Test Date: Feb-2023
Hardware Availability: Jan-2023
Software Availability: May-2022

Platform Notes (Continued)

```
      microcode       : 0x2b000161
      bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
      cpu cores       : 32
      siblings        : 64
      2 physical ids (chips)
      128 processors (hardware threads)
      physical id 0: core ids 0-31
      physical id 1: core ids 0-31
      physical id 0: apicids 0-63
      physical id 1: apicids 128-191
  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 2.37.4:
    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):                  128
    On-line CPU(s) list:     0-127
    Vendor ID:               GenuineIntel
    BIOS Vendor ID:          Intel(R) Corporation
    Model name:              Intel(R) Xeon(R) Gold 6454S
    BIOS Model name:         Intel(R) Xeon(R) Gold 6454S
    CPU family:              6
    Model:                   143
    Thread(s) per core:      2
    Core(s) per socket:      32
    Socket(s):               2
    Stepping:                8
    BogoMIPS:                4400.00
    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
                             invpcid_single cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
                             vnmi 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 avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts
                             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 avx512_fp16 amx_tile flush_l1d arch_capabilities
    Virtualization:          VT-x
    L1d cache:               3 MiB (64 instances)
    L1i cache:               2 MiB (64 instances)
    L2 cache:                128 MiB (64 instances)
    L3 cache:                120 MiB (2 instances)
    NUMA node(s):            8
    NUMA node0 CPU(s):       0-7,64-71
    NUMA node1 CPU(s):       8-15,72-79
    NUMA node2 CPU(s):       16-23,80-87
```

(Continued on next page)

Page 5   Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

$SPECrate®2017\_fp\_base = 662$

$SPECrate®2017\_fp\_peak = 671$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Feb-2023

Hardware Availability: Jan-2023

Software Availability: May-2022

Platform Notes (Continued)

```
  NUMA node3 CPU(s):          24-31,88-95
  NUMA node4 CPU(s):          32-39,96-103
  NUMA node5 CPU(s):          40-47,104-111
  NUMA node6 CPU(s):          48-55,112-119
  NUMA node7 CPU(s):          56-63,120-127
  Vulnerability Itlb multihit:    Not affected
  Vulnerability L1tf:             Not affected
  Vulnerability Mds:              Not affected
  Vulnerability Meltdown:         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 IBRS, IBPB conditional, RSB filling
  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       3M  12 Data            1    64        1             64
    L1i       32K       2M   8 Instruction     1    64        1             64
    L2         2M     128M  16 Unified         2  2048        1             64
    L3        60M     120M  15 Unified         3 65536        1             64

    ------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 8 nodes (0-7)
  node 0 cpus: 0-7,64-71
  node 0 size: 128733 MB
  node 0 free: 128186 MB
  node 1 cpus: 8-15,72-79
  node 1 size: 129020 MB
  node 1 free: 128416 MB
  node 2 cpus: 16-23,80-87
  node 2 size: 129020 MB
  node 2 free: 128686 MB
  node 3 cpus: 24-31,88-95
  node 3 size: 129020 MB
  node 3 free: 128649 MB
  node 4 cpus: 32-39,96-103
  node 4 size: 129020 MB
  node 4 free: 128698 MB
  node 5 cpus: 40-47,104-111
  node 5 size: 128984 MB
  node 5 free: 128668 MB
  node 6 cpus: 48-55,112-119
  node 6 size: 129020 MB
  node 6 free: 128721 MB
  node 7 cpus: 56-63,120-127
  node 7 size: 129009 MB
  node 7 free: 128714 MB
  node distances:
  node   0   1   2   3   4   5   6   7
    0:  10  20  30  30  30  30  30  30
    1:  20  10  30  30  30  30  30  30
    2:  30  30  10  20  30  30  30  30
    3:  30  30  20  10  30  30  30  30
    4:  30  30  30  30  10  20  30  30
    5:  30  30  30  30  20  10  30  30
    6:  30  30  30  30  30  30  10  20
    7:  30  30  30  30  30  30  20  10
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

$SPECrate^{®}2017\_fp\_base = 662$

$SPECrate^{®}2017\_fp\_peak = 671$

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

Test Date: Feb-2023
Hardware Availability: Jan-2023
Software Availability: May-2022

Platform Notes (Continued)

```
   ----------------------------------------------------------
   9. /proc/meminfo
      MemTotal:       1056593204 kB


   ----------------------------------------------------------
   10. who -r
     run-level 3 Jul 5 05:32


   ----------------------------------------------------------
   11. Systemd service manager version: systemd 250 (250-6.el9_0)
     Default Target  Status
     multi-user      running


   ----------------------------------------------------------
   12. Services, from systemctl list-unit-files
     STATE            UNIT FILES
     enabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
                      dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode
                      nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd
                      systemd-network-generator udisks2
     enabled-runtime  systemd-remount-fs
     disabled         blk-availability chrony-wait console-getty cpupower debug-shell kvm_stat
                      man-db-restart-cache-update nftables rdisc rhsm rhsm-facts rpmdb-rebuild serial-getty@
                      sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext
     indirect         sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo


   ----------------------------------------------------------
   13. Linux kernel boot-time arguments, from /proc/cmdline
      BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
      root=/dev/mapper/rhel-root
      ro
      resume=/dev/mapper/rhel-swap
      rd.lvm.lv=rhel/root
      rd.lvm.lv=rhel/swap


   ----------------------------------------------------------
   14. cpupower frequency-info
      analyzing CPU 0:
        Unable to determine current policy
        boost state support:
          Supported: yes
          Active: yes


   ----------------------------------------------------------
   15. sysctl
     kernel.numa_balancing            1
     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
```

(Continued on next page)

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

$SPECrate^{®}2017\_fp\_base = 662$

$SPECrate^{®}2017\_fp\_peak = 671$

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

Test Date: Feb-2023
Hardware Availability: Jan-2023
Software Availability: May-2022

Platform Notes (Continued)

```
   vm.nr_overcommit_hugepages           0
   vm.swappiness                       60
   vm.watermark_boost_factor        15000
   vm.watermark_scale_factor           10
   vm.zone_reclaim_mode                 0


   --------------------------------------------------------------
16. /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


   --------------------------------------------------------------
17. /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


   --------------------------------------------------------------
18. OS release
   From /etc/*-release /etc/*-version
   os-release      Red Hat Enterprise Linux 9.0 (Plow)
   redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
   system-release Red Hat Enterprise Linux release 9.0 (Plow)


   --------------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   819G  143G  676G  18% /home


   --------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
   Vendor:          HPE
   Product:         ProLiant DL360 Gen11
   Product Family: ProLiant
   Serial:          CNX20800PZ


   --------------------------------------------------------------
21. dmidecode
   Additional information from dmidecode 3.3 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:
     16x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800



   --------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:     HPE
   BIOS Version:    1.22
   BIOS Date:       01/18/2023
   BIOS Revision:   1.22
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

$SPECrate^{®}2017\_fp\_base = 662$

$SPECrate^{®}2017\_fp\_peak = 671$

CPU2017 License: 3	**Test Date:** Feb-2023
Test Sponsor: HPE	**Hardware Availability:** Jan-2023
Tested by: HPE	**Software Availability:** May-2022

Platform Notes (Continued)

```
     Firmware Revision: 1.10
```

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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 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 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

SPECrate®2017_fp_base = 662

SPECrate®2017_fp_peak = 671

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

Test Date: Feb-2023
Hardware Availability: Jan-2023
Software Availability: May-2022

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

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

SPECrate®2017_fp_base = 662

SPECrate®2017_fp_peak = 671

CPU2017 License: 3		**Test Date:**	Feb-2023
Test Sponsor:	HPE	**Hardware Availability:**	Jan-2023
Tested by:	HPE	**Software Availability:**	May-2022

Base Optimization Flags (Continued)

C++ benchmarks:
```
-w -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
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both C and C++:
```
-w -m64 -std=c11 -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
```

Benchmarks using Fortran, C, and C++:
```
-w -m64 -std=c11 -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
```

Peak Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

Benchmarks using both Fortran and C:
```
ifx icx
```

Benchmarks using both C and C++:
```
icpx icx
```

(Continued on next page)

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

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

SPECrate®2017_fp_base = 662

SPECrate®2017_fp_peak = 671

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

Test Date: Feb-2023
Hardware Availability: Jan-2023
Software Availability: May-2022

Peak Compiler Invocation (Continued)

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: `-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -qopt-zmm-usage=high -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib`

C++ benchmarks:

508.namd_r: `basepeak = yes`

510.parest_r: `basepeak = yes`

Fortran benchmarks:

503.bwaves_r: `basepeak = yes`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `basepeak = yes`

Benchmarks using both Fortran and C:

521.wrf_r: `basepeak = yes`

527.cam4_r: `basepeak = yes`

(Continued on next page)

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL360 Gen11
(2.20 GHz, Intel Xeon Gold 6454S)

SPECrate®2017_fp_base = 662

SPECrate®2017_fp_peak = 671

CPU2017 License:	3	**Test Date:**	Feb-2023
Test Sponsor:	HPE	**Hardware Availability:**	Jan-2023
Tested by:	HPE	**Software Availability:**	May-2022

Peak Optimization Flags (Continued)

Benchmarks using both C and C++:

511.povray_r: `basepeak = yes`

526.blender_r: `basepeak = yes`

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: `basepeak = yes`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.2.html
http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.html

---

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.2.xml
http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.xml

---

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

Tested with SPEC CPU®2017 v1.1.9 on 2022-07-04 20:17:27-0400.
Report generated on 2023-05-23 19:05:50 by CPU2017 PDF formatter v6716.
Originally published on 2023-05-23.