SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

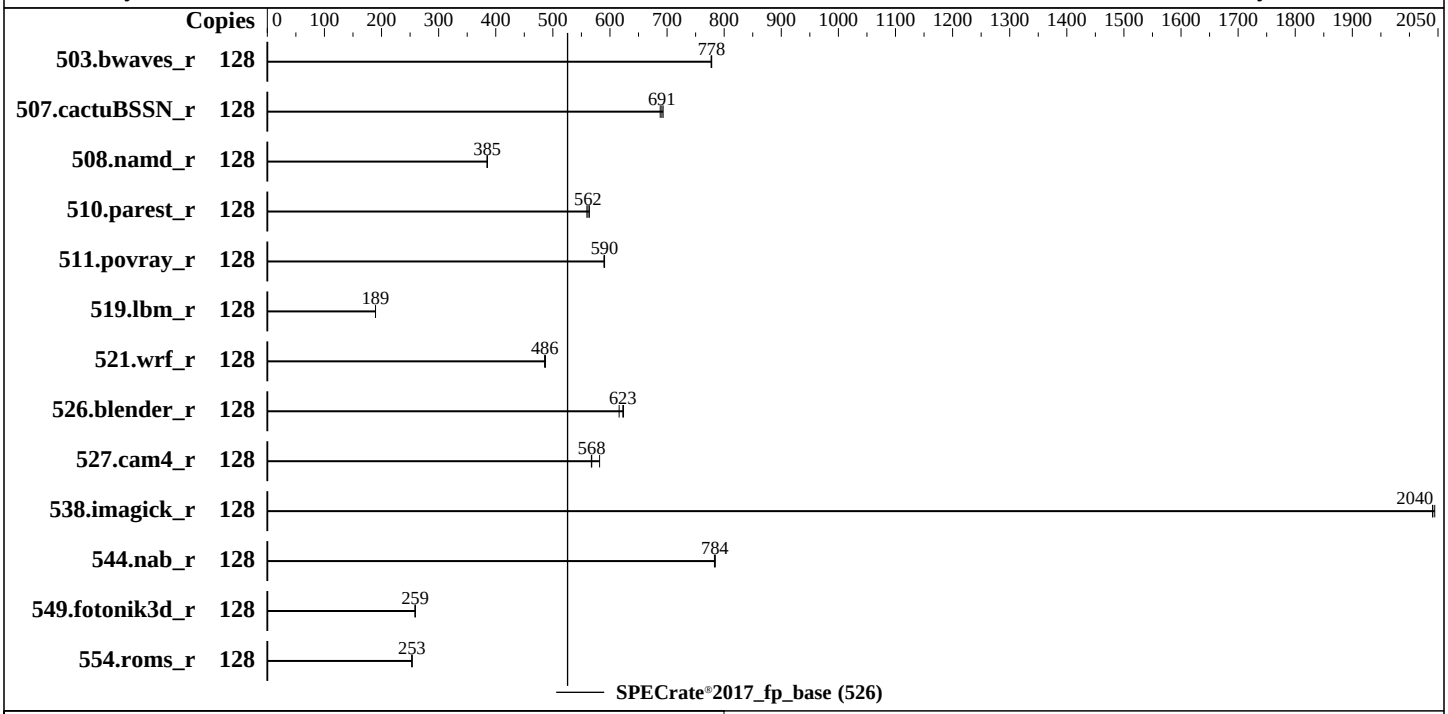
ProLiant XL225n Gen10 Plus
(2.80 GHz, AMD EPYC 7543)

SPECrate®2017_fp_base = 526

SPECrate®2017_fp_peak = Not Run

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

Test Date: May-2024
Hardware Availability: Mar-2021
Software Availability: Nov-2022



Hardware

CPU Name:	AMD EPYC 7543
Max MHz:	3700
Nominal:	2800
Enabled:	64 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	512 KB I+D on chip per core
L3:	256 MB I+D on chip per chip, 32 MB shared / 4 cores
Other:	None
Memory:	2 TB (16 x 128 GB 4Rx4 PC4-3200V-L)
Storage:	1 x 1.6 TB NVMe SSD
Other:	CPU Cooling: Air

Software

OS:	SUSE Linux Enterprise Server 15 SP2 Kernel 5.3.18-22-default
Compiler:	C/C++/Fortran: Version 3.2.0 of AOCC
Parallel:	No
Firmware:	HPE BIOS Version v2.80 07/31/2023 released Jul-2023
File System:	btrfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	jemalloc: jemalloc memory allocator library v5.1.0
Power Management:	BIOS and OS set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	128	1652	777	1649	778	**1650**	**778**							
507.cactuBSSN_r	128	236	688	234	693	**235**	**691**							
508.namd_r	128	316	385	**316**	**385**	316	385							
510.parest_r	128	594	564	**596**	**562**	598	560							
511.povray_r	128	506	591	**506**	**590**	507	589							
519.lbm_r	128	**712**	**189**	712	189	712	189							
521.wrf_r	128	**590**	**486**	590	486	589	487							
526.blender_r	128	316	616	**313**	**623**	313	624							
527.cam4_r	128	395	567	385	582	**394**	**568**							
538.imagick_r	128	156	2040	**156**	**2040**	156	2040							
544.nab_r	128	275	784	**275**	**784**	275	783							
549.fotonik3d_r	128	1925	259	1927	259	**1927**	**259**							
554.roms_r	128	803	253	804	253	**803**	**253**							

SPECrate®2017_fp_base = 526

SPECrate®2017_fp_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

```
The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/
```

Submit Notes

```
The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.
```

Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.
tuned-adm profile was set to throughput-performance using "tuned-adm profile throughput-performance"
To enable Transparent Hugepages (THP) for all allocations,
```

(Continued on next page)

Operating System Notes (Continued)

```
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/cpu2017/amd_rate_aocc320_milanx_A_lib/lib;/home/cpu2017/amd_rate_aocc320_milanx_A_lib/lib32:"
MALLOC_CONF = "retain:true"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using OpenSUSE 15.2

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: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2
```

Platform Notes

```
BIOS Configuration
 Workload Profile set to General Throughput Compute
 Determinism Control set to Manual
 Performance Determinism set to Power Deterministic
 Last-Level Cache (LLC) as NUMA Node set to Enabled
 NUMA memory domains per socket set to Four memory domains per socket
 Infinity Fabric Power Management set to Disabled
 Infinity Fabric Performance State set to P0
 Data Fabric C-State Enable set to Force Enabled
 Thermal Configuration set to Maximum Cooling
 Workload Profile set to Custom
  L1 HW Prefetcher set to Disabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Fri May  3 10:43:19 2024

 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
```

(Continued on next page)

Platform Notes (Continued)

```
 6. /proc/cpuinfo
 7. lscpu
 8. numactl --hardware
 9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 234
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. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS
------------------------------------------------------------

------------------------------------------------------------
1. uname -a
  Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) x86_64 x86_64 x86_64
  GNU/Linux

------------------------------------------------------------
2. w
   10:43:19 up 6 min,  2 users,  load average: 0.11, 1.04, 0.75
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                10:38    4:36   0.18s  0.18s -bash
  root     pts/0    172.17.1.13      10:38   13.00s  1.28s  0.12s /bin/bash ./amd_rate_aocc320_milanx_A1.sh

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

------------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) unlimited
  data seg size           (kbytes, -d) unlimited
  scheduling priority             (-e) 0
  file size               (blocks, -f) unlimited
  pending signals                 (-i) 8255827
  max locked memory       (kbytes, -l) 2097152
  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) 8255827
  virtual memory          (kbytes, -v) unlimited
  file locks                      (-x) unlimited

------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 24
 /usr/sbin/sshd -D
```

(Continued on next page)

Platform Notes (Continued)

```
 sshd: root@pts/0
 -bash
 python3 ./run_fprate.py
 /bin/bash ./amd_rate_aocc320_milanx_A1.sh
 runcpu --config amd_rate_aocc320_milanx_A1.cfg --tune base --reportable --iterations 3 fprate
 runcpu --configfile amd_rate_aocc320_milanx_A1.cfg --tune base --reportable --iterations 3 --nopower
   --runmode rate --tune base --size test:train:refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 7543 32-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 25
    model           : 1
    stepping        : 1
    microcode       : 0xa0011d1
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size        : 2560 4K pages
    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 64-127
  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 2.33.1:
  Architecture:        x86_64
  CPU op-mode(s):      32-bit, 64-bit
  Byte Order:          Little Endian
  Address sizes:       48 bits physical, 48 bits virtual
  CPU(s):              128
  On-line CPU(s) list: 0-127
  Thread(s) per core:  2
  Core(s) per socket:  32
  Socket(s):           2
  NUMA node(s):        16
  Vendor ID:           AuthenticAMD
  CPU family:          25
  Model:               1
  Model name:          AMD EPYC 7543 32-Core Processor
  Stepping:            1
  CPU MHz:             1796.107
  BogoMIPS:            5589.57
  Virtualization:      AMD-V
  L1d cache:           32K
  L1i cache:           32K
  L2 cache:            512K
  L3 cache:            32768K
  NUMA node0 CPU(s):   0-3,64-67
  NUMA node1 CPU(s):   4-7,68-71
```

(Continued on next page)

Platform Notes (Continued)

```
  NUMA node2 CPU(s):   8-11,72-75
  NUMA node3 CPU(s):   12-15,76-79
  NUMA node4 CPU(s):   16-19,80-83
  NUMA node5 CPU(s):   20-23,84-87
  NUMA node6 CPU(s):   24-27,88-91
  NUMA node7 CPU(s):   28-31,92-95
  NUMA node8 CPU(s):   32-35,96-99
  NUMA node9 CPU(s):   36-39,100-103
  NUMA node10 CPU(s):  40-43,104-107
  NUMA node11 CPU(s):  44-47,108-111
  NUMA node12 CPU(s):  48-51,112-115
  NUMA node13 CPU(s):  52-55,116-119
  NUMA node14 CPU(s):  56-59,120-123
  NUMA node15 CPU(s):  60-63,124-127
  Flags:               fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx
                       fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm constant_tsc rep_good
                       nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq monitor ssse3 fma cx16
                       pcid sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm
                       extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
                       perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single
                       hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 erms invpcid
                       cqm rdt_a rdseed adx smap clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves
                       cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr wbnoinvd
                       arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
                       pausefilter pfthreshold v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid
                       overflow_recov succor smca

------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 16 nodes (0-15)
  node 0 cpus: 0-3,64-67
  node 0 size: 128710 MB
  node 0 free: 128559 MB
  node 1 cpus: 4-7,68-71
  node 1 size: 129019 MB
  node 1 free: 128923 MB
  node 2 cpus: 8-11,72-75
  node 2 size: 129021 MB
  node 2 free: 128529 MB
  node 3 cpus: 12-15,76-79
  node 3 size: 129019 MB
  node 3 free: 128860 MB
  node 4 cpus: 16-19,80-83
  node 4 size: 129021 MB
  node 4 free: 128904 MB
  node 5 cpus: 20-23,84-87
  node 5 size: 129019 MB
  node 5 free: 128935 MB
  node 6 cpus: 24-27,88-91
  node 6 size: 129021 MB
  node 6 free: 128929 MB
  node 7 cpus: 28-31,92-95
  node 7 size: 129007 MB
  node 7 free: 128860 MB
  node 8 cpus: 32-35,96-99
  node 8 size: 128988 MB
  node 8 free: 128908 MB
  node 9 cpus: 36-39,100-103
  node 9 size: 129019 MB
```

(Continued on next page)

Platform Notes (Continued)

```
  node 9 free: 128952 MB
  node 10 cpus: 40-43,104-107
  node 10 size: 129021 MB
  node 10 free: 128939 MB
  node 11 cpus: 44-47,108-111
  node 11 size: 129019 MB
  node 11 free: 128935 MB
  node 12 cpus: 48-51,112-115
  node 12 size: 129021 MB
  node 12 free: 128948 MB
  node 13 cpus: 52-55,116-119
  node 13 size: 129019 MB
  node 13 free: 128955 MB
  node 14 cpus: 56-59,120-123
  node 14 size: 129021 MB
  node 14 free: 128953 MB
  node 15 cpus: 60-63,124-127
  node 15 size: 129019 MB
  node 15 free: 128951 MB
  node distances:
  node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
    0:  10  11  12  12  12  12  12  12  32  32  32  32  32  32  32  32
    1:  11  10  12  12  12  12  12  12  32  32  32  32  32  32  32  32
    2:  12  12  10  11  12  12  12  12  32  32  32  32  32  32  32  32
    3:  12  12  11  10  12  12  12  12  32  32  32  32  32  32  32  32
    4:  12  12  12  12  10  11  12  12  32  32  32  32  32  32  32  32
    5:  12  12  12  12  11  10  12  12  32  32  32  32  32  32  32  32
    6:  12  12  12  12  12  12  10  11  32  32  32  32  32  32  32  32
    7:  12  12  12  12  12  12  11  10  32  32  32  32  32  32  32  32
    8:  32  32  32  32  32  32  32  32  10  11  12  12  12  12  12  12
    9:  32  32  32  32  32  32  32  32  11  10  12  12  12  12  12  12
   10:  32  32  32  32  32  32  32  32  12  12  10  11  12  12  12  12
   11:  32  32  32  32  32  32  32  32  12  12  11  10  12  12  12  12
   12:  32  32  32  32  32  32  32  32  12  12  12  12  10  11  12  12
   13:  32  32  32  32  32  32  32  32  12  12  12  12  11  10  12  12
   14:  32  32  32  32  32  32  32  32  12  12  12  12  12  12  10  11
   15:  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       2113510088 kB

------------------------------------------------------------
10. who -r
  run-level 3 May 3 10:37

------------------------------------------------------------
11. Systemd service manager version: systemd 234
  Default Target  Status
  multi-user      running

------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE     UNIT FILES
  enabled   auditd autovt@ btrfsmaintenance-refresh cron getty@ haveged irqbalance issue-generator
            kbdsettings network postfix purge-kernels rollback sshd wicked wickedd-auto4 wickedd-dhcp4
            wickedd-dhcp6 wickedd-nanny
  disabled  ca-certificates chrony-wait chronyd console-getty debug-shell grub2-once issue-add-ssh-keys
            kexec-load raw rpmconfigcheck serial-getty@ systemd-timesyncd tuned
  indirect  wickedd
```

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Platform Notes (Continued)

```
------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.3.18-22-default
  root=UUID=0646dc80-3a19-417a-b15c-ebccd13229db
  splash=silent
  resume=/dev/disk/by-uuid/629d39e5-f3ab-4af5-8260-2a80995bc14f
  mitigations=auto
  quiet

------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 0:
    Unable to determine current policy
    boost state support:
      Supported: yes
      Active: no

------------------------------------------------------------
15. tuned-adm active
  Current active profile: throughput-performance

------------------------------------------------------------
16. sysctl
  kernel.numa_balancing               1
  kernel.randomize_va_space           0
  vm.dirty_background_bytes           0
  vm.dirty_background_ratio          10
  vm.dirty_bytes                      0
  vm.dirty_expire_centisecs        3000
  vm.dirty_ratio                      8
  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                       1
  vm.watermark_boost_factor       15000
  vm.watermark_scale_factor          10
  vm.zone_reclaim_mode                1

------------------------------------------------------------
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_swap              64
  pages_to_scan            4096
  scan_sleep_millisecs    10000

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

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Platform Notes (Continued)

```
19. OS release
  From /etc/*-release /etc/*-version
  os-release SUSE Linux Enterprise Server 15 SP2

------------------------------------------------------------
20. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
  itlb_multihit        Not affected
  l1tf                 Not affected
  mds                  Not affected
  meltdown             Not affected
  spec_store_bypass    Mitigation: Speculative Store Bypass disabled via prctl and seccomp
  spectre_v1           Mitigation: usercopy/swapgs barriers and __user pointer sanitization
  spectre_v2           Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB
                       filling
  srbds                Not affected
  tsx_async_abort      Not affected
For more information, see the Linux documentation on hardware vulnerabilities, for example
     https://www.kernel.org/doc/html/latest/admin-guide/hw-vuln/index.html

------------------------------------------------------------
21. Disk information
SPEC is set to: /home/cpu2017
  Filesystem     Type   Size  Used Avail Use% Mounted on
  /dev/nvme0n1p5 btrfs  1.2T   18G  1.2T   2% /home

------------------------------------------------------------
22. /sys/devices/virtual/dmi/id
    Vendor:         HPE
    Product:        ProLiant XL225n Gen10 Plus
    Product Family: ProLiant
    Serial:         2M212001PN

------------------------------------------------------------
23. dmidecode
  Additional information from dmidecode 3.2 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 M386AAG40AM3-CWE 128 GB 4 rank 3200


------------------------------------------------------------
24. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       HPE
   BIOS Version:      A46
   BIOS Date:         07/31/2023
   BIOS Revision:     2.80
   Firmware Revision: 2.96
```

Compiler Version Notes

```
==============================================================================================================
C              | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
--------------------------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
```

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Compiler Version Notes (Continued)

```
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++             | 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
------------------------------------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
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Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------------------------------------------------

==============================================================================================================
Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
------------------------------------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------------------------------------------------

==============================================================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
```

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Compiler Version Notes (Continued)

```
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using both C and C++:
clang++ clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

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_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -D__BOOL_DEFINED -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
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:
```
-m64 -flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays
-mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -enable-loop-fusion -z muldefs -lamdlibm -ljemalloc -lflang
```

C++ benchmarks:
```
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -convert-pow-exp-to-int=false
-mllvm -enable-loop-fusion -z muldefs -lamdlibm -ljemalloc -lflang
```

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -Hz,1,0x1 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -enable-loop-fusion
-mllvm -enable-loopinterchange -mllvm -compute-interchange-order
-z muldefs -lamdlibm -ljemalloc -lflang
```

Benchmarks using both Fortran and C:
```
-m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -flto -Wl,-mllvm -Wl,-region-vectorize
```

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays
-mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -enable-loop-fusion -Hz,1,0x1 -Kieee -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
-mllvm -enable-loopinterchange -mllvm -compute-interchange-order
-z muldefs -lamdlibm -ljemalloc -lflang

Benchmarks using both C and C++:
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays
-mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -enable-loop-fusion -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -mllvm -extra-vectorizer-passes
-mllvm -convert-pow-exp-to-int=false -z muldefs -lamdlibm -ljemalloc
-lflang

Benchmarks using Fortran, C, and C++:
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays
-mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true

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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -enable-loop-fusion -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -mllvm -extra-vectorizer-passes
-mllvm -convert-pow-exp-to-int=false -Hz,1,0x1 -Kieee -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops -mllvm -lsr-in-nested-loop
-mllvm -enable-loopinterchange -mllvm -compute-interchange-order
-z muldefs -lamdlibm -ljemalloc -lflang

Base Other Flags

C benchmarks:
-Wno-unused-command-line-argument

C++ benchmarks:
-Wno-unused-command-line-argument

Fortran benchmarks:
-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument

Benchmarks using both C and C++:
-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/aocc320-flags-A1.html
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.3-EPYC-revS.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc320-flags-A1.xml
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.3-EPYC-revS.xml

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