SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

$SPECrate®2017\_int\_base = 436$

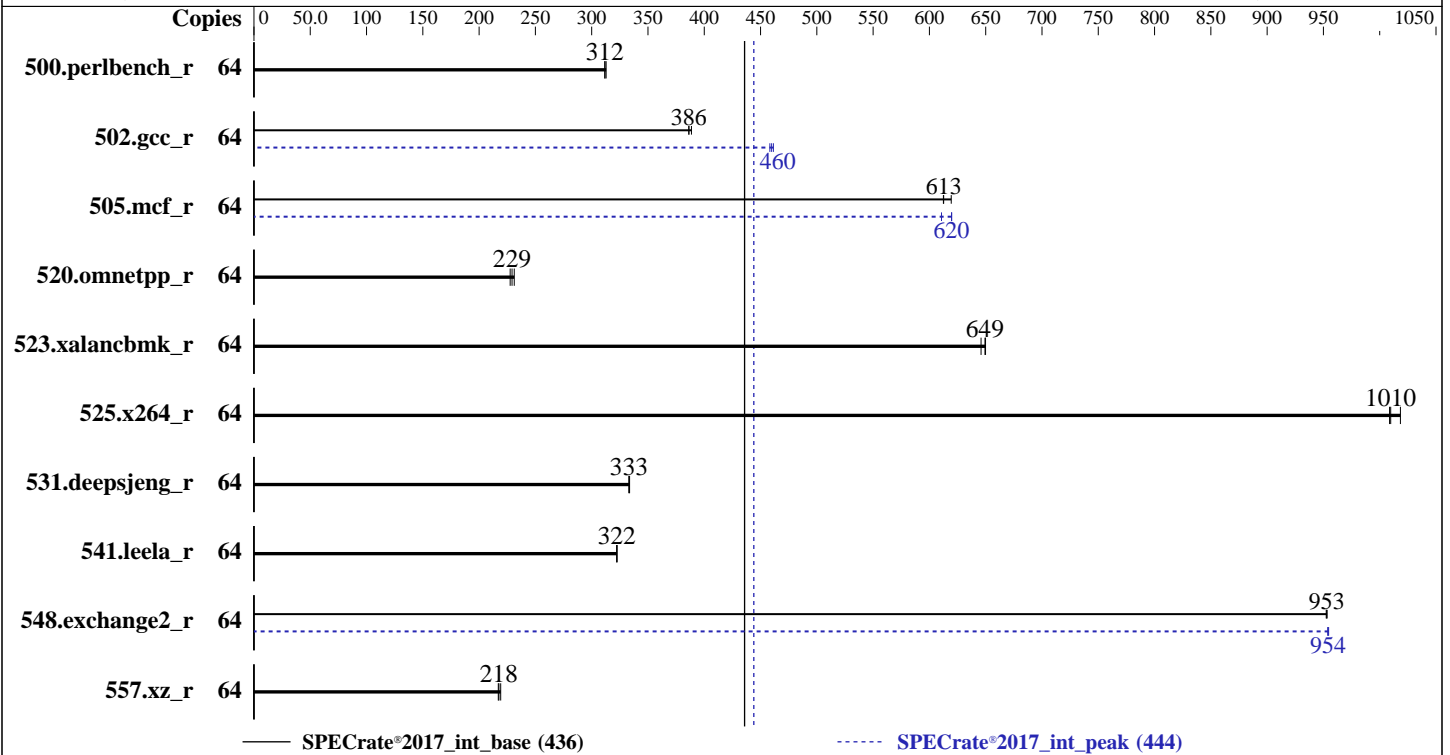$SPECrate®2017\_int\_peak = 444$

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

Copies		
500.perlbench_r	64	312
502.gcc_r	64	386 / 460
505.mcf_r	64	613 / 620
520.omnetpp_r	64	229
523.xalancbmk_r	64	649
525.x264_r	64	1010
531.deepsjeng_r	64	333
541.leela_r	64	322
548.exchange2_r	64	953 / 954
557.xz_r	64	218

——— SPECrate®2017_int_base (436)   - - - - SPECrate®2017_int_peak (444)

Hardware

CPU Name: AMD EPYC 9174F
  Max MHz: 4400
  Nominal: 4100
Enabled: 32 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
  L2: 1 MB I+D on chip per core
  L3: 256 MB I+D on chip per chip,
    32 MB shared / 2 cores
  Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 480 GB SATA SSD
Other: None

Software

OS: Ubuntu 22.04.1 LTS
  Kernel 5.15.0-56-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: HPE BIOS Version v1.12 11/24/2022 released Nov-2022
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Results Table

Benchmark	Base						Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	64	327	312	**327**	**312**	326	313	64	327	312	**327**	**312**	326	313
502.gcc_r	64	233	389	**235**	**386**	235	386	64	198	458	196	461	**197**	**460**
505.mcf_r	64	**169**	**613**	167	619	169	612	64	167	620	**167**	**620**	169	611
520.omnetpp_r	64	363	231	369	228	**366**	**229**	64	363	231	369	228	**366**	**229**
523.xalancbmk_r	64	104	650	105	646	**104**	**649**	64	104	650	105	646	**104**	**649**
525.x264_r	64	**111**	**1010**	111	1010	110	1020	64	**111**	**1010**	111	1010	110	1020
531.deepsjeng_r	64	220	333	**220**	**333**	220	334	64	220	333	**220**	**333**	220	334
541.leela_r	64	329	322	**329**	**322**	329	322	64	329	322	**329**	**322**	329	322
548.exchange2_r	64	**176**	**953**	176	953	176	952	64	176	955	**176**	**954**	176	954
557.xz_r	64	318	217	315	219	**318**	**218**	64	318	217	315	219	**318**	**218**

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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.
```

(Continued on next page)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

$SPECrate^{®}2017\_int\_base = 436$

$SPECrate^{®}2017\_int\_peak = 444$

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

Operating System Notes (Continued)

```
To enable Transparent Hugepages (THP) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'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_aocc400_genoa_B_lib/lib:/home/CPU2017/amd_rate_a
      occ400_genoa_B_lib/lib32:"
MALLOC_CONF = "retain:true"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

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.
```

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
 ACPI CST C2 Latency set to 18 microseconds
 Thermal Configuration set to Maximum Cooling
 Workload Profile set to Custom
  Power Regulator set to OS Control Mode


The system ROM used for this result contains microcode version 0xa10110e for the
AMD EPYC 9nn4X family of processors. The reference code/AGESA version used in this
ROM is version GenoaPI 1.0.0.1-L6
```

(Continued on next page)

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

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Platform Notes (Continued)

```
Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on admin1 Mon Jun 27 18:34:43 2022

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
   https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : AMD EPYC 9174F 16-Core Processor
      2  "physical id"s (chips)
      64 "processors"
   cores, siblings (Caution: counting these is hw and system dependent. The following
   excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
      cpu cores : 16
      siblings  : 32
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu from util-linux 2.37.2:
   Architecture:                 x86_64
   CPU op-mode(s):               32-bit, 64-bit
   Address sizes:                52 bits physical, 57 bits virtual
   Byte Order:                   Little Endian
   CPU(s):                       64
   On-line CPU(s) list:          0-63
   Vendor ID:                    AuthenticAMD
   Model name:                   AMD EPYC 9174F 16-Core Processor
   CPU family:                   25
   Model:                        17
   Thread(s) per core:           2
   Core(s) per socket:           16
   Socket(s):                    2
   Stepping:                     1
   Frequency boost:              enabled
   CPU max MHz:                  4409.0000
   CPU min MHz:                  400.0000
   BogoMIPS:                     8187.52
   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 rapl pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic 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 avx512f
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Platform Notes (Continued)

```
    avx512dq rdseed adx smap avx512ifma clflushopt clwb avx512cd sha_ni avx512bw
    avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
    cqm_mbm_local avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin cppc arat
    npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
    pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku
    ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq
    la57 rdpid overflow_recov succor smca fsrm flush_l1d
  Virtualization:                   AMD-V
  L1d cache:                        1 MiB (32 instances)
  L1i cache:                        1 MiB (32 instances)
  L2 cache:                         32 MiB (32 instances)
  L3 cache:                         512 MiB (16 instances)
  NUMA node(s):                     16
  NUMA node0 CPU(s):                0,1,32,33
  NUMA node1 CPU(s):                8,9,40,41
  NUMA node2 CPU(s):                4,5,36,37
  NUMA node3 CPU(s):                12,13,44,45
  NUMA node4 CPU(s):                6,7,38,39
  NUMA node5 CPU(s):                14,15,46,47
  NUMA node6 CPU(s):                2,3,34,35
  NUMA node7 CPU(s):                10,11,42,43
  NUMA node8 CPU(s):                16,17,48,49
  NUMA node9 CPU(s):                24,25,56,57
  NUMA node10 CPU(s):               20,21,52,53
  NUMA node11 CPU(s):               28,29,60,61
  NUMA node12 CPU(s):               22,23,54,55
  NUMA node13 CPU(s):               30,31,62,63
  NUMA node14 CPU(s):               18,19,50,51
  NUMA node15 CPU(s):               26,27,58,59
  Vulnerability Itlb multihit:      Not affected
  Vulnerability L1tf:               Not affected
  Vulnerability Mds:                Not affected
  Vulnerability Meltdown:           Not affected
  Vulnerability Mmio stale data:    Not affected
  Vulnerability Retbleed:           Not affected
  Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via
  prctl and seccomp
  Vulnerability Spectre v1:         Mitigation; usercopy/swapgs barriers and __user
  pointer sanitization
  Vulnerability Spectre v2:         Mitigation; Retpolines, IBPB conditional, IBRS_FW,
  STIBP always-on, RSB filling, PBRSB-eIBRS Not affected
  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       32K      1M    8 Data            1    64        1              64
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Test Date: Jan-2023
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Platform Notes (Continued)

```
     L1i         32K         1M    8 Instruction    1    64         1              64
     L2           1M        32M    8 Unified        2  2048         1              64
     L3          32M       512M   16 Unified        3 32768         1              64

  /proc/cpuinfo cache data
    cache size : 1024 KB

  From numactl --hardware
  WARNING: a numactl 'node' might or might not correspond to a physical chip.
    available: 16 nodes (0-15)
    node 0 cpus: 0 1 32 33
    node 0 size: 96456 MB
    node 0 free: 96266 MB
    node 1 cpus: 8 9 40 41
    node 1 size: 96766 MB
    node 1 free: 96665 MB
    node 2 cpus: 4 5 36 37
    node 2 size: 96766 MB
    node 2 free: 96612 MB
    node 3 cpus: 12 13 44 45
    node 3 size: 96766 MB
    node 3 free: 96634 MB
    node 4 cpus: 6 7 38 39
    node 4 size: 96766 MB
    node 4 free: 96616 MB
    node 5 cpus: 14 15 46 47
    node 5 size: 96766 MB
    node 5 free: 96639 MB
    node 6 cpus: 2 3 34 35
    node 6 size: 96766 MB
    node 6 free: 96673 MB
    node 7 cpus: 10 11 42 43
    node 7 size: 96731 MB
    node 7 free: 96581 MB
    node 8 cpus: 16 17 48 49
    node 8 size: 96766 MB
    node 8 free: 96616 MB
    node 9 cpus: 24 25 56 57
    node 9 size: 96766 MB
    node 9 free: 96655 MB
    node 10 cpus: 20 21 52 53
    node 10 size: 96766 MB
    node 10 free: 96593 MB
    node 11 cpus: 28 29 60 61
    node 11 size: 96766 MB
    node 11 free: 96619 MB
    node 12 cpus: 22 23 54 55
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Test Date: Jan-2023
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Platform Notes (Continued)

```
   node 12 size: 96766 MB
   node 12 free: 96618 MB
   node 13 cpus: 30 31 62 63
   node 13 size: 96766 MB
   node 13 free: 96625 MB
   node 14 cpus: 18 19 50 51
   node 14 size: 96766 MB
   node 14 free: 96579 MB
   node 15 cpus: 26 27 58 59
   node 15 size: 96719 MB
   node 15 free: 96582 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

 From /proc/meminfo
    MemTotal:       1585025480 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /sbin/tuned-adm active
     Current active profile: throughput-performance

 /sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
    performance

 /usr/bin/lsb_release -d
    Ubuntu 22.04.1 LTS

 From /etc/*release* /etc/*version*
    debian_version: bookworm/sid
    os-release:
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Test Date: Jan-2023
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Platform Notes (Continued)

```
        PRETTY_NAME="Ubuntu 22.04.1 LTS"
        NAME="Ubuntu"
        VERSION_ID="22.04"
        VERSION="22.04.1 LTS (Jammy Jellyfish)"
        VERSION_CODENAME=jammy
        ID=ubuntu
        ID_LIKE=debian
        HOME_URL="https://www.ubuntu.com/"

   uname -a:
      Linux admin1 5.15.0-56-generic #62-Ubuntu SMP Tue Nov 22 19:54:14 UTC 2022 x86_64
      x86_64 x86_64 GNU/Linux

   Kernel self-reported vulnerability status:

   CVE-2018-12207 (iTLB Multihit):                  Not affected
   CVE-2018-3620 (L1 Terminal Fault):               Not affected
   Microarchitectural Data Sampling:                Not affected
   CVE-2017-5754 (Meltdown):                        Not affected
   mmio_stale_data:                                 Not affected
   retbleed:                                        Not affected
   CVE-2018-3639 (Speculative Store Bypass):        Mitigation: Speculative Store
                                                    Bypass disabled via prctl and
                                                    seccomp
   CVE-2017-5753 (Spectre variant 1):               Mitigation: usercopy/swapgs
                                                    barriers and __user pointer
                                                    sanitization
   CVE-2017-5715 (Spectre variant 2):               Mitigation: Retpolines, IBPB:
                                                    conditional, IBRS_FW, STIBP:
                                                    always-on, RSB filling,
                                                    PBRSB-eIBRS: Not affected
   CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
   CVE-2019-11135 (TSX Asynchronous Abort):         Not affected

   run-level 5 Jun 27 18:30

   SPEC is set to: /home/CPU2017
      Filesystem                      Type  Size  Used Avail Use% Mounted on
      /dev/mapper/ubuntu--vg-ubuntu--lv ext4  437G   37G  381G   9% /

   From /sys/devices/virtual/dmi/id
       Vendor:          HPE
       Product:         ProLiant DL385 Gen11
       Product Family: ProLiant
       Serial:          DL385G11-008

    Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you
```

(Continued on next page)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

$SPECrate^{®}2017\_int\_base = 436$

$SPECrate^{®}2017\_int\_peak = 444$

Platform Notes (Continued)

```
  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:
      24x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800

  BIOS:
    BIOS Vendor:       HPE
    BIOS Version:      1.12
    BIOS Date:         11/24/2022
    BIOS Revision:     1.12
    Firmware Revision: 1.10

  (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C        | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
         | 525.x264_r(base, peak) 557.xz_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
C        | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Compiler Version Notes (Continued)

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

==========================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
         | 525.x264_r(base, peak) 557.xz_r(base, peak)
--------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------

==========================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)
         | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
--------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------

==========================================================================
Fortran | 548.exchange2_r(base, peak)
--------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

$SPECrate^{®}2017\_int\_base = 436$

$SPECrate^{®}2017\_int\_peak = 444$

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

Base Portability Flags

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

Base Optimization Flags

C benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc
```

C++ benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang
-lamdalloc-ext
```

Fortran benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc
```

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Base Other Flags

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

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

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

Peak Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

Peak Portability Flags

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

Peak Optimization Flags

C benchmarks:

500.perlbench_r: `basepeak = yes`

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Peak Optimization Flags (Continued)

502.gcc_r: `-m32 -flto -z muldefs -Ofast -march=znver4`
`-fveclib=AMDLIBM -ffast-math -fstruct-layout=7`
`-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline`
`-lamdalloc`

505.mcf_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math`
`-fstruct-layout=7 -mllvm -unroll-threshold=50`
`-fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lflang -lamdalloc`

525.x264_r: `basepeak = yes`

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `basepeak = yes`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

Fortran benchmarks:
`-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop`
`-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver4 -fveclib=AMDLIBM`
`-ffast-math -fepilog-vectorization-of-inductions`
`-mllvm -optimize-strided-mem-cost -floop-transform`
`-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm`
`-lflang -lamdalloc`

Peak Other Flags

C benchmarks (except as noted below):
`-Wno-unused-command-line-argument`

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(4.10 GHz, AMD EPYC 9174F)

SPECrate®2017_int_base = 436

SPECrate®2017_int_peak = 444

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

Test Date: Jan-2023
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Peak Other Flags (Continued)

502.gcc_r: `-L/usr/lib32 -Wno-unused-command-line-argument`
`-L/home/work/cpu2017/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_lib/lib32`

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

Fortran benchmarks:
`-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/HPE-Platform-Flags-AMD-Genoa-rev2.1.html`
`http://www.spec.org/cpu2017/flags/aocc400-flags.2023-02-15.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Genoa-rev2.1.xml`
`http://www.spec.org/cpu2017/flags/aocc400-flags.2023-02-15.xml`

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

Tested with SPEC CPU®2017 v1.1.8 on 2022-06-27 14:34:42-0400.
Report generated on 2023-02-15 10:31:20 by CPU2017 PDF formatter v6442.
Originally published on 2023-02-14.