SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)
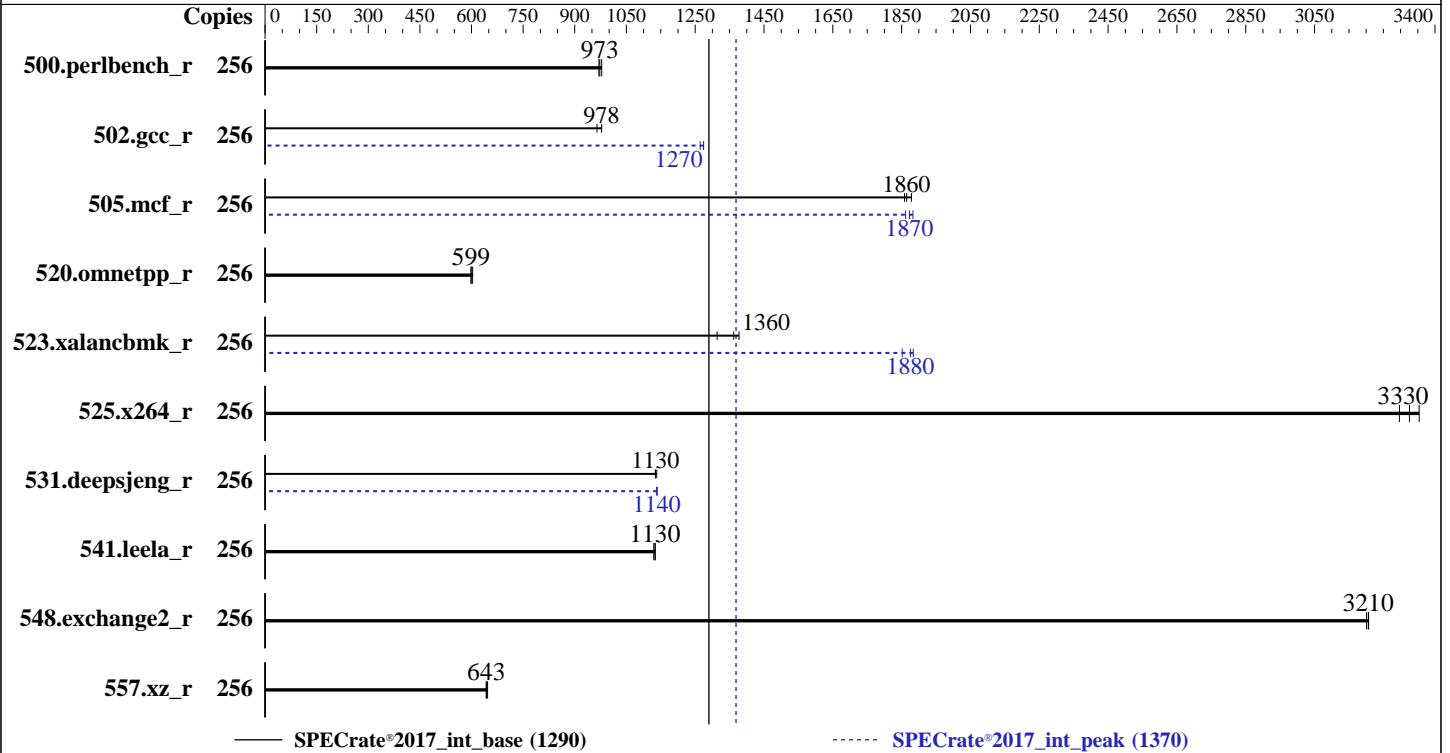
ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

$SPECrate®2017\_int\_base = 1290$

$SPECrate®2017\_int\_peak = 1370$

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

Benchmark	Copies	base	peak
500.perlbench_r	256	973	
502.gcc_r	256	978	1270
505.mcf_r	256	1860	1870
520.omnetpp_r	256	599	
523.xalancbmk_r	256	1360	1880
525.x264_r	256	3330	
531.deepsjeng_r	256	1130	1140
541.leela_r	256	1130	
548.exchange2_r	256	3210	
557.xz_r	256	643	

Copies scale: 0, 150, 300, 450, 600, 750, 900, 1050, 1250, 1450, 1650, 1850, 2050, 2250, 2450, 2650, 2850, 3050, 3400

SPECrate®2017_int_base (1290)   SPECrate®2017_int_peak (1370)

Hardware

CPU Name: AMD EPYC 9554
Max MHz: 3750
Nominal: 3100
Enabled: 128 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 / 8 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 5.15.0-43-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
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
500.perlbench_r	256	417	978	**419**	**973**	420	970	256	417	978	**419**	**973**	420	970
502.gcc_r	256	**371**	**978**	371	978	376	965	256	**284**	**1270**	284	1270	287	1260
505.mcf_r	256	220	1880	**222**	**1860**	223	1860	256	**221**	**1870**	220	1880	222	1860
520.omnetpp_r	256	561	599	557	603	**561**	**599**	256	561	599	557	603	**561**	**599**
523.xalancbmk_r	256	196	1380	**198**	**1360**	206	1310	256	146	1850	143	1880	**144**	**1880**
525.x264_r	256	**135**	**3330**	136	3300	134	3350	256	**135**	**3330**	136	3300	134	3350
531.deepsjeng_r	256	258	1140	259	1130	**259**	**1130**	256	258	1140	**258**	**1140**	257	1140
541.leela_r	256	**374**	**1130**	374	1130	375	1130	256	**374**	**1130**	374	1130	375	1130
548.exchange2_r	256	210	3200	209	3210	**209**	**3210**	256	210	3200	209	3210	**209**	**3210**
557.xz_r	256	428	647	430	643	**430**	**643**	256	428	647	430	643	**430**	**643**
SPECrate®2017_int_base =	**1290**													
SPECrate®2017_int_peak =	**1370**													

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
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Dec-2022

Hardware Availability: Dec-2022

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"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:never"
```

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
```

(Continued on next page)

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
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

Platform Notes (Continued)

```
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

 Sysinfo program /home/CPU2017/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on admin1 Tue Jun 28 13:57:31 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 9554 64-Core Processor
       2  "physical id"s (chips)
       256 "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 : 64
       siblings  : 128
       physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
       53 54 55 56 57 58 59 60 61 62 63
       physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
       53 54 55 56 57 58 59 60 61 62 63

 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):                   256
    On-line CPU(s) list:      0-255
    Vendor ID:                AuthenticAMD
    Model name:               AMD EPYC 9554 64-Core Processor
    CPU family:               25
    Model:                    17
    Thread(s) per core:       2
    Core(s) per socket:       64
    Socket(s):                2
    Stepping:                 1
    Frequency boost:          enabled
    CPU max MHz:              3764.0000
    CPU min MHz:              400.0000
    BogoMIPS:                 6190.80
    Flags:                    fpu vme de pse tsc msr pae mce cx8 apic sep mtrr
```

(Continued on next page)

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

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

Platform Notes (Continued)

```
     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
     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:                     4 MiB (128 instances)
   L1i cache:                     4 MiB (128 instances)
   L2 cache:                      128 MiB (128 instances)
   L3 cache:                      512 MiB (16 instances)
   NUMA node(s):                  16
   NUMA node0 CPU(s):             0-7,128-135
   NUMA node1 CPU(s):             32-39,160-167
   NUMA node2 CPU(s):             16-23,144-151
   NUMA node3 CPU(s):             48-55,176-183
   NUMA node4 CPU(s):             24-31,152-159
   NUMA node5 CPU(s):             56-63,184-191
   NUMA node6 CPU(s):             8-15,136-143
   NUMA node7 CPU(s):             40-47,168-175
   NUMA node8 CPU(s):             64-71,192-199
   NUMA node9 CPU(s):             96-103,224-231
   NUMA node10 CPU(s):            80-87,208-215
   NUMA node11 CPU(s):            112-119,240-247
   NUMA node12 CPU(s):            88-95,216-223
   NUMA node13 CPU(s):            120-127,248-255
   NUMA node14 CPU(s):            72-79,200-207
   NUMA node15 CPU(s):            104-111,232-239
   Vulnerability Itlb multihit:   Not affected
   Vulnerability L1tf:            Not affected
   Vulnerability Mds:             Not affected
   Vulnerability Meltdown:        Not affected
   Vulnerability Mmio stale data: 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
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

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

Platform Notes (Continued)

```
      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       4M   8 Data           1    64        1             64
      L1i        32K       4M   8 Instruction    1    64        1             64
      L2          1M     128M   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 2 3 4 5 6 7 128 129 130 131 132 133 134 135
    node 0 size: 96419 MB
    node 0 free: 95942 MB
    node 1 cpus: 32 33 34 35 36 37 38 39 160 161 162 163 164 165 166 167
    node 1 size: 96764 MB
    node 1 free: 96333 MB
    node 2 cpus: 16 17 18 19 20 21 22 23 144 145 146 147 148 149 150 151
    node 2 size: 96764 MB
    node 2 free: 96468 MB
    node 3 cpus: 48 49 50 51 52 53 54 55 176 177 178 179 180 181 182 183
    node 3 size: 96764 MB
    node 3 free: 96493 MB
    node 4 cpus: 24 25 26 27 28 29 30 31 152 153 154 155 156 157 158 159
    node 4 size: 96764 MB
    node 4 free: 96455 MB
    node 5 cpus: 56 57 58 59 60 61 62 63 184 185 186 187 188 189 190 191
    node 5 size: 96764 MB
    node 5 free: 96460 MB
    node 6 cpus: 8 9 10 11 12 13 14 15 136 137 138 139 140 141 142 143
    node 6 size: 96764 MB
    node 6 free: 96508 MB
    node 7 cpus: 40 41 42 43 44 45 46 47 168 169 170 171 172 173 174 175
    node 7 size: 96764 MB
    node 7 free: 96500 MB
    node 8 cpus: 64 65 66 67 68 69 70 71 192 193 194 195 196 197 198 199
    node 8 size: 96764 MB
    node 8 free: 96389 MB
    node 9 cpus: 96 97 98 99 100 101 102 103 224 225 226 227 228 229 230 231
    node 9 size: 96764 MB
    node 9 free: 96417 MB
    node 10 cpus: 80 81 82 83 84 85 86 87 208 209 210 211 212 213 214 215
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

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

Platform Notes (Continued)

```
    node 10 size: 96764 MB
    node 10 free: 96497 MB
    node 11 cpus: 112 113 114 115 116 117 118 119 240 241 242 243 244 245 246 247
    node 11 size: 96764 MB
    node 11 free: 96461 MB
    node 12 cpus: 88 89 90 91 92 93 94 95 216 217 218 219 220 221 222 223
    node 12 size: 96764 MB
    node 12 free: 96440 MB
    node 13 cpus: 120 121 122 123 124 125 126 127 248 249 250 251 252 253 254 255
    node 13 size: 96764 MB
    node 13 free: 96498 MB
    node 14 cpus: 72 73 74 75 76 77 78 79 200 201 202 203 204 205 206 207
    node 14 size: 96764 MB
    node 14 free: 96501 MB
    node 15 cpus: 104 105 106 107 108 109 110 111 232 233 234 235 236 237 238 239
    node 15 size: 96709 MB
    node 15 free: 96390 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:       1584974136 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

  /sbin/tuned-adm active
      Current active profile: balanced

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

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

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

Platform Notes (Continued)

```
/usr/bin/lsb_release -d
   Ubuntu 22.04.1 LTS

From /etc/*release* /etc/*version*
   debian_version: bookworm/sid
   os-release:
      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 5.15.0-43-generic #46-Ubuntu SMP Tue Jul 12 10:30:17 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
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
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   23G  396G   6% /

From /sys/devices/virtual/dmi/id
    Vendor:         HPE
    Product:        ProLiant DL385 Gen11
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

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

Platform Notes (Continued)

```
      Product Family: ProLiant
      Serial:         DL385G11-008

 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:
     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
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

Compiler Version Notes (Continued)

```
  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++      | 523.xalancbmk_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++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
         | 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
--------------------------------------------------------------------------


==============================================================================
C++      | 523.xalancbmk_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
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

Compiler Version Notes (Continued)

```
==============================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
         | 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
```

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
```

(Continued on next page)

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

Base Portability Flags (Continued)

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
```

Base Other Flags

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

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

(Continued on next page)

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

Base Other Flags (Continued)

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`

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`

(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
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

Peak Optimization Flags (Continued)

502.gcc_r (continued):
`-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: `-m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-do-block-reorder=aggressive`
`-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM`
`-ffast-math -finline-aggressive`
`-mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -zopt`
`-mllvm -do-block-reorder=aggressive`
`-fvirtual-function-elimination -fvisibility=hidden`
`-lamdalloc-ext`

531.deepsjeng_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -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 -lamdalloc-ext`

541.leela_r: basepeak = yes

Fortran benchmarks:

548.exchange2_r: basepeak = yes

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.10 GHz, AMD EPYC 9554)

SPECrate®2017_int_base = 1290

SPECrate®2017_int_peak = 1370

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

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

Peak Other Flags

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

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

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

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.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.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 2022-06-28 09:57:30-0400.
Report generated on 2023-02-01 18:23:00 by CPU2017 PDF formatter v6442.
Originally published on 2023-02-01.