SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.15 GHz, AMD EPYC 9565)

$SPECrate®2017\_int\_base = 1740$

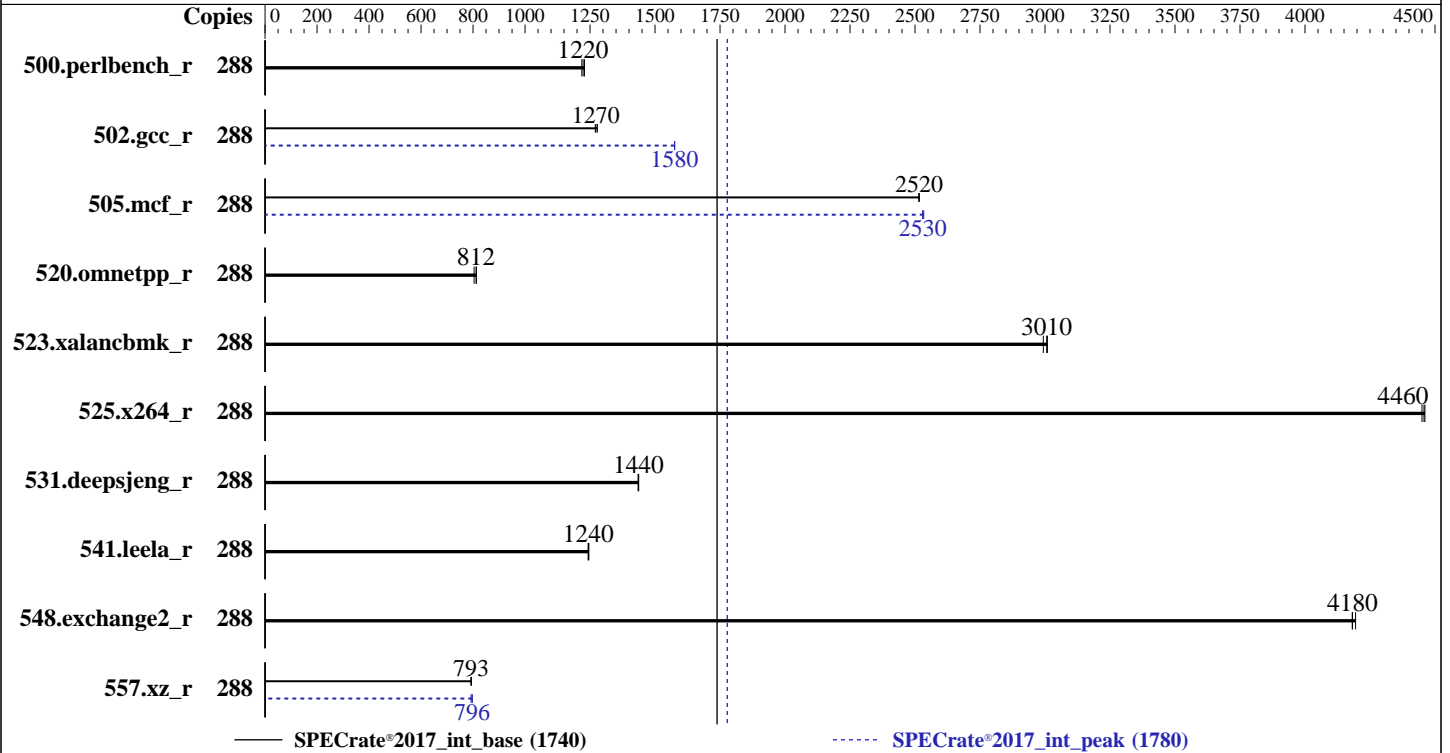$SPECrate®2017\_int\_peak = 1780$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Benchmark	Copies	Base	Peak
500.perlbench_r	288	1220	
502.gcc_r	288	1270	1580
505.mcf_r	288	2520	2530
520.omnetpp_r	288	812	
523.xalancbmk_r	288	3010	
525.x264_r	288	4460	
531.deepsjeng_r	288	1440	
541.leela_r	288	1240	
548.exchange2_r	288	4180	
557.xz_r	288	793	796

SPECrate®2017_int_base (1740)   SPECrate®2017_int_peak (1780)

Hardware

CPU Name: AMD EPYC 9565

 Max MHz: 4300

 Nominal: 3150

Enabled: 144 cores, 2 chips, 2 threads/core

Orderable: 1,2 chips

Cache L1: 32 KB I + 48 KB D on chip per core

 L2: 1 MB I+D on chip per core

 L3: 384 MB I+D on chip per chip,
32 MB shared / 6 cores

 Other: None

Memory: 768 GB (24 x 32 GB 2Rx8 PC5-6400B-R,
running at 6000)

Storage: 1 x 480 GB SATA SSD

Other: CPU Cooling: DLC

Software

OS: SUSE Linux Enterprise Server 15 SP6
Kernel 6.4.0-150600.21-default

Compiler: C/C++/Fortran: Version 5.0.0 of AOCC

Parallel: No

Firmware: HPE BIOS Version v2.20 10/31/2024 released
Oct-2024

File System: btrfs

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

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CPU2017 License: 3	**Test Date:** Nov-2024
Test Sponsor: HPE	**Hardware Availability:** Jan-2025
Tested by: HPE	**Software Availability:** Oct-2024

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	288	**375**	**1220**	373	1230	376	1220	288	**375**	**1220**	373	1230	376	1220
502.gcc_r	288	321	1270	319	1280	**320**	**1270**	288	**259**	**1580**	259	1570	259	1580
505.mcf_r	288	**185**	**2520**	185	2520	185	2520	288	184	2530	**184**	**2530**	184	2530
520.omnetpp_r	288	470	804	465	813	**466**	**812**	288	470	804	465	813	**466**	**812**
523.xalancbmk_r	288	**101**	**3010**	102	2990	101	3010	288	**101**	**3010**	102	2990	101	3010
525.x264_r	288	113	4460	**113**	**4460**	113	4450	288	113	4460	**113**	**4460**	113	4450
531.deepsjeng_r	288	230	1440	**230**	**1440**	230	1430	288	230	1440	**230**	**1440**	230	1430
541.leela_r	288	**383**	**1240**	383	1250	384	1240	288	**383**	**1240**	383	1250	384	1240
548.exchange2_r	288	180	4190	**180**	**4180**	180	4180	288	180	4190	**180**	**4180**	180	4180
557.xz_r	288	**392**	**793**	393	792	392	794	288	390	797	393	792	**391**	**796**
SPECrate®2017_int_base =		**1740**												
SPECrate®2017_int_peak =		**1780**												

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.

To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/cpu2017/amd_rate_aocc500_znver5_A_lib/lib:/home/cpu2017/amd_rate_aocc500_znver5_A_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
 Memory Patrol Scrubbing set to Disabled
 ACPI CST C2 Latency set to 18 microseconds
 Thermal Configuration set to Maximum Cooling
 NUMA memory domains per socket set to Four memory domains per socket
 Workload Profile set to Custom
  Power Regulator set to OS Control Mode
 The reference code/AGESA version used in this ROM is version Turin-PI 1.0.0.2

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Tue Nov 26 15:40:43 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
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
 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
```

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Platform Notes (Continued)

```
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
    --------------------------------------------------------------


    --------------------------------------------------------------
 1. uname -a
   Linux localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
   x86_64 x86_64 x86_64 GNU/Linux


    --------------------------------------------------------------
 2. w
    15:40:43 up 9 min,  3 users,  load average: 0.28, 1.61, 1.89
   USER     TTY       FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     pts/0     10.30.195.96     15:40   19.00s  0.91s  0.10s /bin/bash ./amd_rate_aocc500_znver5_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) 3093899
   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) 3093899
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited


    --------------------------------------------------------------
 5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize=42
   sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
   sshd: root [priv]
   sshd: root@pts/0
   -bash
   python3 ./run_intrate.py
   /bin/bash ./amd_rate_aocc500_znver5_A1.sh
   runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 intrate
   runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
     --runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
     $SPEC/tmp/CPU2017.009/templogs/preenv.intrate.009.0.log --lognum 009.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/cpu2017


    --------------------------------------------------------------
 6. /proc/cpuinfo
```

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Platform Notes (Continued)

```
      model name      : AMD EPYC 9565 72-Core Processor
      vendor_id       : AuthenticAMD
      cpu family      : 26
      model           : 2
      stepping        : 1
      microcode       : 0xb00211a
      bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
      TLB size        : 192 4K pages
      cpu cores       : 72
      siblings        : 144
      2 physical ids (chips)
      288 processors (hardware threads)
      physical id 0: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61,64-69,72-77,80-85,88-93
      physical id 1: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61,64-69,72-77,80-85,88-93
      physical id 0: apicids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123,128-139,144-155,160-171,176-187
      physical id 1: apicids
      256-267,272-283,288-299,304-315,320-331,336-347,352-363,368-379,384-395,400-411,416-427,432-443
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.


  ------------------------------------------------------------
  7. lscpu

  From lscpu from util-linux 2.39.3:
    Architecture:                    x86_64
    CPU op-mode(s):                  32-bit, 64-bit
    Address sizes:                   52 bits physical, 57 bits virtual
    Byte Order:                      Little Endian
    CPU(s):                          288
    On-line CPU(s) list:             0-287
    Vendor ID:                       AuthenticAMD
    BIOS Vendor ID:                  Advanced Micro Devices, Inc.
    Model name:                      AMD EPYC 9565 72-Core Processor
    BIOS Model name:                 AMD EPYC 9565 72-Core Processor          CPU @ 3.1GHz
    BIOS CPU family:                 107
    CPU family:                      26
    Model:                           2
    Thread(s) per core:              2
    Core(s) per socket:              72
    Socket(s):                       2
    Stepping:                        1
    Frequency boost:                 enabled
    CPU(s) scaling MHz:              100%
    CPU max MHz:                     3150.0000
    CPU min MHz:                     1500.0000
    BogoMIPS:                        6290.67
    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 amd_lbr_v2 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 hw_pstate ssbd mba perfmon_v2
                                     ibrs ibpb stibp ibrs_enhanced vmmcall fsgsbase tsc_adjust 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 user_shstk avx_vnni avx512_bf16 clzero irperf
                                     xsaveerptr rdpru wbnoinvd amd_ppin cppc arat npt lbrv svm_lock
```

(Continued on next page)

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Platform Notes (Continued)

```
                        nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
                        pfthreshold avic v_vmsave_vmload vgif x2avic v_spec_ctrl vnmi
                        avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
                        avx512_vnni avx512_bitalg avx512_vpopcntdq la57 rdpid bus_lock_detect
                        movdiri movdir64b overflow_recov succor smca fsrm avx512_vp2intersect
                        flush_l1d debug_swap
    Virtualization:                AMD-V
    L1d cache:                     6.8 MiB (144 instances)
    L1i cache:                     4.5 MiB (144 instances)
    L2 cache:                      144 MiB (144 instances)
    L3 cache:                      768 MiB (24 instances)
    NUMA node(s):                  8
    NUMA node0 CPU(s):             0-17,144-161
    NUMA node1 CPU(s):             18-35,162-179
    NUMA node2 CPU(s):             36-53,180-197
    NUMA node3 CPU(s):             54-71,198-215
    NUMA node4 CPU(s):             72-89,216-233
    NUMA node5 CPU(s):             90-107,234-251
    NUMA node6 CPU(s):             108-125,252-269
    NUMA node7 CPU(s):             126-143,270-287
    Vulnerability Gather data sampling:  Not affected
    Vulnerability Itlb multihit:       Not affected
    Vulnerability L1tf:                Not affected
    Vulnerability Mds:                 Not affected
    Vulnerability Meltdown:            Not affected
    Vulnerability Mmio stale data:     Not affected
    Vulnerability Reg file data sampling: Not affected
    Vulnerability Retbleed:            Not affected
    Vulnerability Spec rstack overflow:  Not affected
    Vulnerability Spec store bypass:   Mitigation; Speculative Store Bypass disabled via prctl
    Vulnerability Spectre v1:          Mitigation; usercopy/swapgs barriers and __user pointer sanitization
    Vulnerability Spectre v2:          Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
                                       always-on; RSB filling; PBRSB-eIBRS Not affected; BHI 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     48K     6.8M   12 Data              1    64       1         64
      L1i     32K     4.5M    8 Instruction       1    64       1         64
      L2       1M     144M   16 Unified           2  1024       1         64
      L3      32M     768M   16 Unified           3 32768       1         64


  -----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0-17,144-161
    node 0 size: 96379 MB
    node 0 free: 95555 MB
    node 1 cpus: 18-35,162-179
    node 1 size: 96758 MB
    node 1 free: 96345 MB
    node 2 cpus: 36-53,180-197
    node 2 size: 96719 MB
    node 2 free: 96349 MB
    node 3 cpus: 54-71,198-215
    node 3 size: 96758 MB
    node 3 free: 96337 MB
    node 4 cpus: 72-89,216-233
```

(Continued on next page)

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Platform Notes (Continued)

```
   node 4 size: 96758 MB
   node 4 free: 96407 MB
   node 5 cpus: 90-107,234-251
   node 5 size: 96758 MB
   node 5 free: 96434 MB
   node 6 cpus: 108-125,252-269
   node 6 size: 96758 MB
   node 6 free: 96367 MB
   node 7 cpus: 126-143,270-287
   node 7 size: 96613 MB
   node 7 free: 96031 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  12  12  12  32  32  32  32
     1:  12  10  12  12  32  32  32  32
     2:  12  12  10  12  32  32  32  32
     3:  12  12  12  10  32  32  32  32
     4:  32  32  32  32  10  12  12  12
     5:  32  32  32  32  12  10  12  12
     6:  32  32  32  32  12  12  10  12
     7:  32  32  32  32  12  12  12  10


   ----------------------------------------------------------
 9. /proc/meminfo
    MemTotal:       792069424 kB


   ----------------------------------------------------------
10. who -r
   run-level 5 Nov 26 15:31


   ----------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
   Default Target  Status
   graphical       running


   ----------------------------------------------------------
12. Services, from systemctl list-unit-files
    STATE            UNIT FILES
    enabled          ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd
                     bluetooth cron display-manager getty@ irqbalance issue-generator kbdsettings klog
                     lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore wicked
                     wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant
    enabled-runtime  systemd-remount-fs
    disabled         NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon autofs
                     autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates
                     chrony-wait chronyd console-getty cups cups-browsed debug-shell dnsmasq ebtables
                     exchange-bmc-os-info firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd
                     issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb openvpn@
                     ostree-remount rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@
                     smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd systemd-boot-check-no-failures
                     systemd-confext systemd-network-generator systemd-sysext systemd-time-wait-sync
                     systemd-timesyncd tuned udisks2 update-system-flatpaks upower vncserver@ wpa_supplicant@
    indirect         pcscd saned@ systemd-userdbd wickedd


   ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
    root=UUID=c70d6b0a-e893-482b-b564-48624143e39e
    splash=silent
    mitigations=auto
```

(Continued on next page)

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Platform Notes (Continued)

```
  quiet
  security=apparmor


  ---------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 13:
    current policy: frequency should be within 1.50 GHz and 3.15 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes


  ---------------------------------------------------------
15. tuned-adm active
  No current active profile.


  ---------------------------------------------------------
16. sysctl
  kernel.numa_balancing            1
  kernel.randomize_va_space        0
  vm.compaction_proactiveness     20
  vm.dirty_background_bytes        0
  vm.dirty_background_ratio       10
  vm.dirty_bytes                   0
  vm.dirty_expire_centisecs     3000
  vm.dirty_ratio                   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_shared          256
  max_ptes_swap             64
  pages_to_scan           4096
  scan_sleep_millisecs   10000


  ---------------------------------------------------------
19. OS release
  From /etc/*-release /etc/*-version
  os-release SUSE Linux Enterprise Server 15 SP6
```

(Continued on next page)

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(3.15 GHz, AMD EPYC 9565)

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$SPECrate^{®}2017\_int\_peak = 1780$

CPU2017 License: 3		**Test Date:**	Nov-2024
Test Sponsor:	HPE	**Hardware Availability:**	Jan-2025
Tested by:	HPE	**Software Availability:**	Oct-2024

Platform Notes (Continued)

```
    ----------------------------------------------------------
    20. Disk information
    SPEC is set to: /home/cpu2017
      Filesystem     Type   Size  Used Avail Use% Mounted on
      /dev/sda3      btrfs  407G   23G  383G   6% /home


    ----------------------------------------------------------
    21. /sys/devices/virtual/dmi/id
        Vendor:         HPE
        Product:        ProLiant DL385 Gen11
        Product Family: ProLiant
        Serial:         DL385G11-006


    ----------------------------------------------------------
    22. dmidecode
      Additional information from dmidecode 3.4 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 Hynix HMCG88AHBRA471N 32 GB 2 rank 6400, configured at 6000


    ----------------------------------------------------------
    23. BIOS
    (This section combines info from /sys/devices and dmidecode.)
        BIOS Vendor:       HPE
        BIOS Version:      2.20
        BIOS Date:         10/31/2024
        BIOS Revision:     2.20
        Firmware Revision: 1.63
```

Compiler Version Notes

```
==============================================================================================================
C      | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
C      | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: i386-unknown-linux-gnu
```

(Continued on next page)

SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(3.15 GHz, AMD EPYC 9565)

SPECrate®2017_int_base = 1740

SPECrate®2017_int_peak = 1780

Compiler Version Notes (Continued)

```
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
--------------------------------------------------------------------------------------


==================================================================================
Fortran | 548.exchange2_r(base, peak)
--------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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`

(Continued on next page)

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SPECrate®2017_int_peak = 1780

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

Test Date: Nov-2024
Hardware Availability: Jan-2025
Software Availability: Oct-2024

Base Portability Flags (Continued)

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 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-Wl,-mllvm -Wl,-extra-inliner -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc-ext -ldl
```

C++ benchmarks:
```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang -lamdalloc-ext
-ldl
```

Fortran benchmarks:
```
-m64 -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=znver5
-fveclib=AMDLIBM -ffast-math -flto
-fepilog-vectorization-of-inductions -mllvm -optimize-strided-mem-cost
-floop-transform -mllvm -unroll-aggressive -mllvm -unroll-threshold=500
-lamdlibm -lflang -lamdalloc -ldl
```

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

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(3.15 GHz, AMD EPYC 9565)

SPECrate®2017_int_base = 1740

SPECrate®2017_int_peak = 1780

CPU2017 License: 3		**Test Date:**	Nov-2024
Test Sponsor:	HPE	**Hardware Availability:**	Jan-2025
Tested by:	HPE	**Software Availability:**	Oct-2024

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)

SPEC CPU®2017 Integer Rate Result

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SPECrate®2017_int_base = 1740

ProLiant DL385 Gen11
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SPECrate®2017_int_peak = 1780

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

Test Date: Nov-2024
Hardware Availability: Jan-2025
Software Availability: Oct-2024

Peak Optimization Flags (Continued)

502.gcc_r: -m32 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand
-fenable-aggressive-gather -Wl,-mllvm -Wl,-extra-inliner
-z muldefs -Ofast -march=znver5 -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 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lflang -lamdalloc-ext -ldl

525.x264_r: basepeak = yes

557.xz_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand
-fenable-aggressive-gather -Wl,-mllvm -Wl,-extra-inliner
-Ofast -march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lflang -lamdalloc-ext -ldl

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: basepeak = yes

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

Fortran benchmarks:

548.exchange2_r: basepeak = yes

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Test Date: Nov-2024
Hardware Availability: Jan-2025
Software Availability: Oct-2024

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/v119/aocc5/1316/amd_rate_aocc500_znver5_A_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-Turin-rev1.0.html`
`http://www.spec.org/cpu2017/flags/aocc500-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-Turin-rev1.0.xml`
`http://www.spec.org/cpu2017/flags/aocc500-flags.xml`

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

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