SPEC CPU®2017 Integer Rate Result

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Dell Inc.

PowerEdge R7525 (AMD EPYC 7643 48-Core Processor)

$SPECrate®2017\_int\_base = 641$

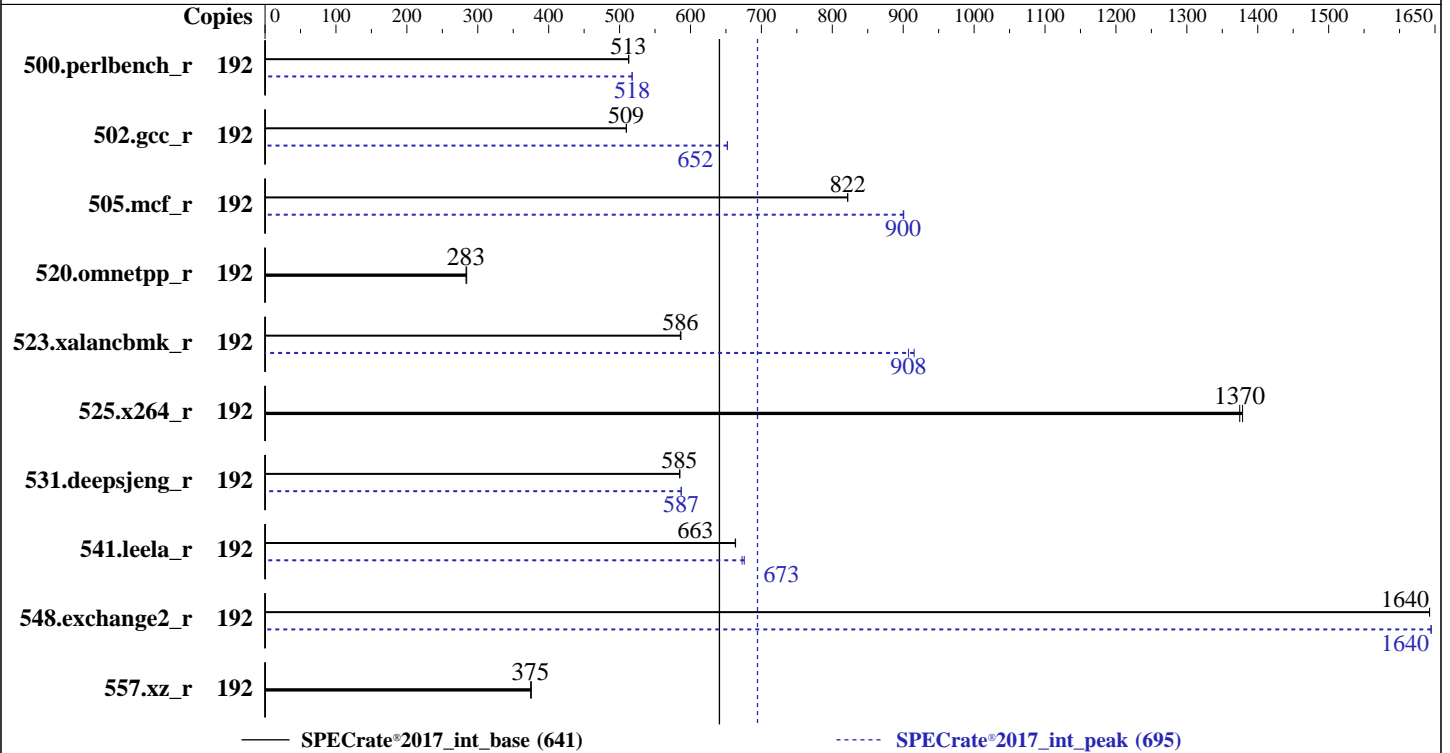$SPECrate®2017\_int\_peak = 695$

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Apr-2024

Hardware Availability: Jul-2021

Software Availability: Mar-2024

Copies

Benchmark	Copies	base	peak
500.perlbench_r	192	513	518
502.gcc_r	192	509	652
505.mcf_r	192	822	900
520.omnetpp_r	192	283	
523.xalancbmk_r	192	586	908
525.x264_r	192	1370	
531.deepsjeng_r	192	585	587
541.leela_r	192	663	673
548.exchange2_r	192	1640	1640
557.xz_r	192	375	

—— SPECrate®2017_int_base (641)　　----- SPECrate®2017_int_peak (695)

Hardware

CPU Name: AMD EPYC 7643
Max MHz: 3600
Nominal: 2300
Enabled: 96 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 512 KB I+D on chip per core
L3: 256 MB I+D on chip per chip, 32 MB shared / 6 cores
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)
Storage: 110 GB on tmpfs
Other: CPU Cooling: Air

Software

OS: Ubuntu 22.04.4 LTS
5.15.0-101-generic
Compiler: C/C++/Fortran: Version 3.2.0 of AOCC
Parallel: No
Firmware: Version 2.8.4 released Jun-2022
File System: tmpfs
System State: Run level 5 (graphical multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc: jemalloc memory allocator library v5.1.0
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	192	**596**	**513**	596	513			192	**591**	**518**	590	518		
502.gcc_r	192	**534**	**509**	533	510			192	417	652	**417**	**652**		
505.mcf_r	192	**378**	**822**	378	822			192	**345**	**900**	344	901		
520.omnetpp_r	192	886	284	**889**	**283**			192	886	284	**889**	**283**		
523.xalancbmk_r	192	**346**	**586**	346	587			192	221	915	**223**	**908**		
525.x264_r	192	244	1380	**245**	**1370**			192	244	1380	**245**	**1370**		
531.deepsjeng_r	192	**376**	**585**	376	585			192	375	587	**375**	**587**		
541.leela_r	192	**479**	**663**	479	664			192	**473**	**673**	470	676		
548.exchange2_r	192	**306**	**1640**	306	1640			192	**306**	**1640**	306	1640		
557.xz_r	192	**554**	**375**	552	376			192	**554**	**375**	552	376		
SPECrate®2017_int_base =	**641**													
SPECrate®2017_int_peak =	**695**													

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) 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.
```

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/mnt/ramdisk/cpu2017-1.1.9-aocc320-A1/amd_rate_aocc320_milanx_A_lib/lib/;/mnt/ramdisk/cpu2017-1.1.9-ao
     cc320-A1/amd_rate_aocc320_milanx_A_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 7742 CPU + 1TiB Memory using OpenSUSE 15.2

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.

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


 Benchmark run from a 110 GB ramdisk created with the cmd: "mount -t tmpfs -o size=110G tmpfs /mnt/ramdisk"
```

Platform Notes

```
 BIOS settings:
       DRAM Refresh Delay : Performance
        Memory Interleaving : Disabled
    DIMM Self Healing on
Uncorrectable Memory Error : Disabled

 Virtualization Technology : Disabled
     NUMA Nodes per Socket : 4
   L3 cache as NUMA Domain : Enabled

            System Profile : Custom
      CPU Power Management : Maximum Performance
       Memory Patrol Scrub : Disabled
        PCI ASPM L1 Link
          Power Management : Disabled

 Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc320-A1/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on spa-amd Thu Apr 11 15:03:39 2024

 SUT (System Under Test) info as seen by some common utilities.

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
   1. uname -a
   2. w
```

(Continued on next page)

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Platform Notes (Continued)

```
    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 249 (249.11-0ubuntu3.12)
   12. Services, from systemctl list-unit-files
   13. Linux kernel boot-time arguments, from /proc/cmdline
   14. cpupower frequency-info
   15. tuned-adm active
   16. sysctl
   17. /sys/kernel/mm/transparent_hugepage
   18. /sys/kernel/mm/transparent_hugepage/khugepaged
   19. OS release
   20. Disk information
   21. /sys/devices/virtual/dmi/id
   22. dmidecode
   23. BIOS
  -----------------------------------------------------------


  -----------------------------------------------------------
  1. uname -a
    Linux spa-amd 5.15.0-101-generic #111-Ubuntu SMP Tue Mar 5 20:16:58 UTC 2024 x86_64 x86_64 x86_64 GNU/Linux


  -----------------------------------------------------------
  2. w
     15:03:39 up 6 min,  2 users,  load average: 0.20, 0.10, 0.03
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root     tty1     -                25Nov61 31.00s  1.70s  0.33s /bin/bash ./amd_rate_aocc320_milanx_A1.sh
    root     tty2     -                15:03    3.00s  0.05s  0.00s -bash


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


  -----------------------------------------------------------
  4. ulimit -a
    time(seconds)        unlimited
    file(blocks)         unlimited
    data(kbytes)         unlimited
    stack(kbytes)        unlimited
    coredump(blocks)     0
    memory(kbytes)       unlimited
    locked memory(kbytes) 2097152
    process              4126068
    nofiles              1024
    vmemory(kbytes)      unlimited
    locks                unlimited
    rtprio               0


  -----------------------------------------------------------
  5. sysinfo process ancestry
   /sbin/init
   /bin/login -p --
   -bash
   /bin/bash ./DELL_rate.sh
   /bin/bash /home/DellFiles/bin/dell-run-main.sh rate
```

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Platform Notes (Continued)

```
 /bin/bash /home/DellFiles/bin/dell-run-main.sh rate
 /bin/bash /home/DellFiles/bin/AMD/dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_EPYC-3.inc --define
   DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.2 --output_format html,pdf,txt
 python3 ./run_amd_rate_aocc320_milanx_A1.py
 /bin/bash ./amd_rate_aocc320_milanx_A1.sh
 runcpu --config amd_rate_aocc320_milanx_A1.cfg --tune all --reportable --iterations 2 --define
   DL-BIOS-L3NUMA=1 --define DL-BIOS-NPS=4 --define DL-BIOSinc=Dell-BIOS_EPYC-3.inc --define
   DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.2 --output_format html,pdf,txt intrate
 runcpu --configfile amd_rate_aocc320_milanx_A1.cfg --tune all --reportable --iterations 2 --define
   DL-BIOS-L3NUMA=1 --define DL-BIOS-NPS=4 --define DL-BIOSinc=Dell-BIOS_EPYC-3.inc --define
   DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define DL-VERS=5.2 --output_format html,pdf,txt --nopower
   --runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc320-A1

 ----------------------------------------------------------
6. /proc/cpuinfo
     model name      : AMD EPYC 7643 48-Core Processor
     vendor_id       : AuthenticAMD
     cpu family      : 25
     model           : 1
     stepping        : 1
     microcode       : 0xa0011d1
     bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srso
     TLB size        : 2560 4K pages
     cpu cores       : 48
     siblings        : 96
     2 physical ids (chips)
     192 processors (hardware threads)
     physical id 0: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61
     physical id 1: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61
     physical id 0: apicids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123
     physical id 1: apicids 128-139,144-155,160-171,176-187,192-203,208-219,224-235,240-251
 Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
 virtualized systems.  Use the above data carefully.


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

From lscpu from util-linux 2.37.2:
  Architecture:               x86_64
  CPU op-mode(s):             32-bit, 64-bit
  Address sizes:              48 bits physical, 48 bits virtual
  Byte Order:                 Little Endian
  CPU(s):                     192
  On-line CPU(s) list:        0-191
  Vendor ID:                  AuthenticAMD
  Model name:                 AMD EPYC 7643 48-Core Processor
  CPU family:                 25
  Model:                      1
  Thread(s) per core:         2
  Core(s) per socket:         48
  Socket(s):                  2
  Stepping:                   1
  BogoMIPS:                   4591.53
  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
```

(Continued on next page)

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Platform Notes (Continued)

```
                      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 invpcid cqm rdt_a rdseed adx smap
                      clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc
                      cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr
                      rdpru wbnoinvd amd_ppin arat npt lbrv svm_lock nrip_save tsc_scale
                      vmcb_clean flushbyasid decodeassists pausefilter pfthreshold
                      v_vmsave_vmload vgif v_spec_ctrl umip pku ospke vaes vpclmulqdq rdpid
                      overflow_recov succor smca
  Virtualization:                     AMD-V
  L1d cache:                          3 MiB (96 instances)
  L1i cache:                          3 MiB (96 instances)
  L2 cache:                           48 MiB (96 instances)
  L3 cache:                           512 MiB (16 instances)
  NUMA node(s):                       16
  NUMA node0 CPU(s):                  0-5,96-101
  NUMA node1 CPU(s):                  6-11,102-107
  NUMA node2 CPU(s):                  12-17,108-113
  NUMA node3 CPU(s):                  18-23,114-119
  NUMA node4 CPU(s):                  24-29,120-125
  NUMA node5 CPU(s):                  30-35,126-131
  NUMA node6 CPU(s):                  36-41,132-137
  NUMA node7 CPU(s):                  42-47,138-143
  NUMA node8 CPU(s):                  48-53,144-149
  NUMA node9 CPU(s):                  54-59,150-155
  NUMA node10 CPU(s):                 60-65,156-161
  NUMA node11 CPU(s):                 66-71,162-167
  NUMA node12 CPU(s):                 72-77,168-173
  NUMA node13 CPU(s):                 78-83,174-179
  NUMA node14 CPU(s):                 84-89,180-185
  NUMA node15 CPU(s):                 90-95,186-191
  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 Retbleed:             Not affected
  Vulnerability Spec rstack overflow: Mitigation; safe RET
  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       3M     8 Data          1    64      1             64
      L1i      32K       3M     8 Instruction   1    64      1             64
      L2      512K      48M     8 Unified       2  1024      1             64
      L3       32M     512M    16 Unified       3 32768      1             64

  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 16 nodes (0-15)
    node 0 cpus: 0-5,96-101
```

(Continued on next page)

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Platform Notes (Continued)

```
    node 0 size: 64023 MB
    node 0 free: 63682 MB
    node 1 cpus: 6-11,102-107
    node 1 size: 64506 MB
    node 1 free: 64212 MB
    node 2 cpus: 12-17,108-113
    node 2 size: 64508 MB
    node 2 free: 60672 MB
    node 3 cpus: 18-23,114-119
    node 3 size: 64507 MB
    node 3 free: 63890 MB
    node 4 cpus: 24-29,120-125
    node 4 size: 64508 MB
    node 4 free: 64192 MB
    node 5 cpus: 30-35,126-131
    node 5 size: 64507 MB
    node 5 free: 64190 MB
    node 6 cpus: 36-41,132-137
    node 6 size: 64508 MB
    node 6 free: 64177 MB
    node 7 cpus: 42-47,138-143
    node 7 size: 64495 MB
    node 7 free: 64171 MB
    node 8 cpus: 48-53,144-149
    node 8 size: 64508 MB
    node 8 free: 64269 MB
    node 9 cpus: 54-59,150-155
    node 9 size: 64507 MB
    node 9 free: 64305 MB
    node 10 cpus: 60-65,156-161
    node 10 size: 64508 MB
    node 10 free: 64231 MB
    node 11 cpus: 66-71,162-167
    node 11 size: 64507 MB
    node 11 free: 64303 MB
    node 12 cpus: 72-77,168-173
    node 12 size: 64508 MB
    node 12 free: 64253 MB
    node 13 cpus: 78-83,174-179
    node 13 size: 64507 MB
    node 13 free: 64303 MB
    node 14 cpus: 84-89,180-185
    node 14 size: 64508 MB
    node 14 free: 64269 MB
    node 15 cpus: 90-95,186-191
    node 15 size: 64501 MB
    node 15 free: 64276 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
```

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Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Platform Notes (Continued)

```
    11:  32  32  32  32  32  32  32  32  12  12  11  10  12  12  12  12
    12:  32  32  32  32  32  32  32  32  12  12  12  12  10  11  12  12
    13:  32  32  32  32  32  32  32  32  12  12  12  12  11  10  12  12
    14:  32  32  32  32  32  32  32  32  12  12  12  12  12  12  10  11
    15:  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  10

  ------------------------------------------------------------
  9. /proc/meminfo
     MemTotal:       1056389564 kB


  ------------------------------------------------------------
  10. who -r
     run-level 5 Nov 25 17:46


  ------------------------------------------------------------
  11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.12)
     Default Target  Status
     graphical       running


  ------------------------------------------------------------
  12. Services, from systemctl list-unit-files
     STATE            UNIT FILES
     enabled          ModemManager apparmor blk-availability console-setup cron dmesg e2scrub_reap finalrd
                      getty@ gpu-manager grub-common grub-initrd-fallback irqbalance keyboard-setup lm-sensors
                      lvm2-monitor lxd-agent multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate
                      rsyslog secureboot-db setvtrgb ssh systemd-networkd systemd-pstore systemd-resolved
                      systemd-timesyncd thermald tuned ua-reboot-cmds ubuntu-advantage udisks2 ufw vgauth
     enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
     disabled         console-getty debug-shell iscsid nftables rsync serial-getty@
                      systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                      systemd-time-wait-sync upower
     generated        apport
     indirect         uuidd
     masked           cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
                      systemd-networkd-wait-online x11-common

  ------------------------------------------------------------
  13. Linux kernel boot-time arguments, from /proc/cmdline
     BOOT_IMAGE=/vmlinuz-5.15.0-101-generic
     root=/dev/mapper/ubuntu--vg-ubuntu--lv
     ro


  ------------------------------------------------------------
  14. cpupower frequency-info
     analyzing CPU 0:
       Unable to determine current policy
       boost state support:
         Supported: yes
         Active: yes
         Boost States: 0
         Total States: 3
         Pstate-P0:  2300MHz


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


  ------------------------------------------------------------
  16. sysctl
     kernel.numa_balancing              1
```

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Dell Inc.

PowerEdge R7525 (AMD EPYC 7643 48-Core Processor)

SPECrate®2017_int_base = 641

SPECrate®2017_int_peak = 695

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Apr-2024
Hardware Availability: Jul-2021
Software Availability: Mar-2024

Platform Notes (Continued)

```
   kernel.randomize_va_space          0
   vm.compaction_proactiveness       20
   vm.dirty_background_bytes          0
   vm.dirty_background_ratio          3
   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 Ubuntu 22.04.4 LTS


   ----------------------------------------------------------------
20. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc320-A1
   Filesystem      Type   Size  Used Avail Use% Mounted on
   tmpfs           tmpfs  110G  3.4G  107G   4% /mnt/ramdisk


   ----------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
   Vendor:         Dell Inc.
   Product:        PowerEdge R7525
   Product Family: PowerEdge
   Serial:         GK2D853


   ----------------------------------------------------------------
22. dmidecode
   Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
   determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
   "DMTF SMBIOS" standard.
```

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Dell Inc.

PowerEdge R7525 (AMD EPYC 7643 48-Core Processor)

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Platform Notes (Continued)

```
   Memory:
     16x 80AD869D80AD HMAA8GR7AJR4N-XN 64 GB 2 rank 3200
     16x Not Specified Not Specified


   --------------------------------------------------------------
   23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:        Dell Inc.
     BIOS Version:       2.8.4
     BIOS Date:          06/23/2022
     BIOS Revision:      2.8
```

Compiler Version Notes

```
==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/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 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------


==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/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 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------


==============================================================================
C++     | 523.xalancbmk_r(peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
```

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Dell Inc.

PowerEdge R7525 (AMD EPYC 7643 48-Core Processor)

SPECrate®2017_int_base = 641

SPECrate®2017_int_peak = 695

CPU2017 License: 6573		**Test Date:**	Apr-2024
Test Sponsor: Dell Inc.		**Hardware Availability:** Jul-2021
Tested by: Dell Inc.		**Software Availability:** Mar-2024

Compiler Version Notes (Continued)

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


==============================================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base,
        | peak)
----------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
----------------------------------------------------------------------------------------------


==============================================================================================
C++     | 523.xalancbmk_r(peak)
----------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
----------------------------------------------------------------------------------------------


==============================================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base,
        | peak)
----------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
----------------------------------------------------------------------------------------------


==============================================================================================
Fortran | 548.exchange2_r(base, peak)
----------------------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
----------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

SPEC CPU®2017 Integer Rate Result

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Dell Inc.

PowerEdge R7525 (AMD EPYC 7643 48-Core Processor)

$SPECrate®2017\_int\_base = 641$

$SPECrate®2017\_int\_peak = 695$

CPU2017 License: 6573		**Test Date:**	Apr-2024
Test Sponsor: Dell Inc.		**Hardware Availability:**	Jul-2021
Tested by: Dell Inc.		**Software Availability:**	Mar-2024

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 -Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-enable-licm-vrp
-flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays
-mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -enable-loop-fusion -z muldefs -lamdlibm -ljemalloc -lflang
```

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

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-inline-recursion=4
```

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Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

Dell Inc.

PowerEdge R7525 (AMD EPYC 7643 48-Core Processor)

SPECrate®2017_int_base = 641

SPECrate®2017_int_peak = 695

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
-flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -z muldefs -mllvm -unroll-aggressive
-mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang
```

Base Other Flags

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

C++ 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`

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Dell Inc.

PowerEdge R7525 (AMD EPYC 7643 48-Core Processor)

SPECrate®2017_int_base = 641

SPECrate®2017_int_peak = 695

Peak Portability Flags (Continued)

548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`

Peak Optimization Flags

C benchmarks:

```
500.perlbench_r: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=false
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

502.gcc_r: -m32 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -fgnu89-inline
-ljemalloc

505.mcf_r: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc
```

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Dell Inc.

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SPECrate®2017_int_peak = 695

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Apr-2024
Hardware Availability: Jul-2021
Software Availability: Mar-2024

Peak Optimization Flags (Continued)

525.x264_r: `basepeak = yes`

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `-m32 -Wl,-mllvm -Wl,-do-block-reorder=aggressive -flto`
`-Wl,-mllvm -Wl,-function-specialize`
`-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
`-march=znver3 -fveclib=AMDLIBM -ffast-math`
`-finline-aggressive -mllvm -unroll-threshold=100`
`-flv-function-specialization -mllvm -enable-licm-vrp`
`-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch`
`-mllvm -reduce-array-computations=3`
`-mllvm -global-vectorize-slp=true`
`-mllvm -do-block-reorder=aggressive`
`-fvirtual-function-elimination -fvisibility=hidden`
`-ljemalloc`

531.deepsjeng_r: `-m64 -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize`
`-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
`-march=znver3 -fveclib=AMDLIBM -ffast-math`
`-finline-aggressive -mllvm -unroll-threshold=100`
`-flv-function-specialization -mllvm -enable-licm-vrp`
`-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch`
`-mllvm -reduce-array-computations=3`
`-mllvm -global-vectorize-slp=true`
`-fvirtual-function-elimination -fvisibility=hidden`
`-lamdlibm -ljemalloc`

541.leela_r: `Same as 531.deepsjeng_r`

Fortran benchmarks:
`-m64 -Wl,-mllvm -Wl,-inline-recursion=4`
`-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split`
`-flto -Wl,-mllvm -Wl,-function-specialize`
`-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3`
`-fveclib=AMDLIBM -ffast-math -mllvm -unroll-aggressive`
`-mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang`

Dell Inc.

PowerEdge R7525 (AMD EPYC 7643 48-Core Processor)

$SPECrate®2017\_int\_base = 641$

$SPECrate®2017\_int\_peak = 695$

CPU2017 License: 6573		**Test Date:**	Apr-2024
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Jul-2021
Tested by:	Dell Inc.	**Software Availability:**	Mar-2024

Peak Other Flags

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

502.gcc_r: `-L/usr/lib -Wno-unused-command-line-argument`
`-L/sppo/bin/cpu2017v118-aocc3-milanX/amd_rate_aocc320_milanx_A_lib/lib32`

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

523.xalancbmk_r: `-L/usr/lib -Wno-unused-command-line-argument`
`-L/sppo/bin/cpu2017v118-aocc3-milanX/amd_rate_aocc320_milanx_A_lib/lib32`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/aocc320-flags-A1.html`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.2.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc320-flags-A1.xml`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.2.xml`

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

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