SPEC CPU®2017 Integer Speed Result

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Dell Inc.

PowerEdge C6615 (AMD EPYC 8324P 32-Core Processor)

$SPECspeed®2017\_int\_base = 10.9$

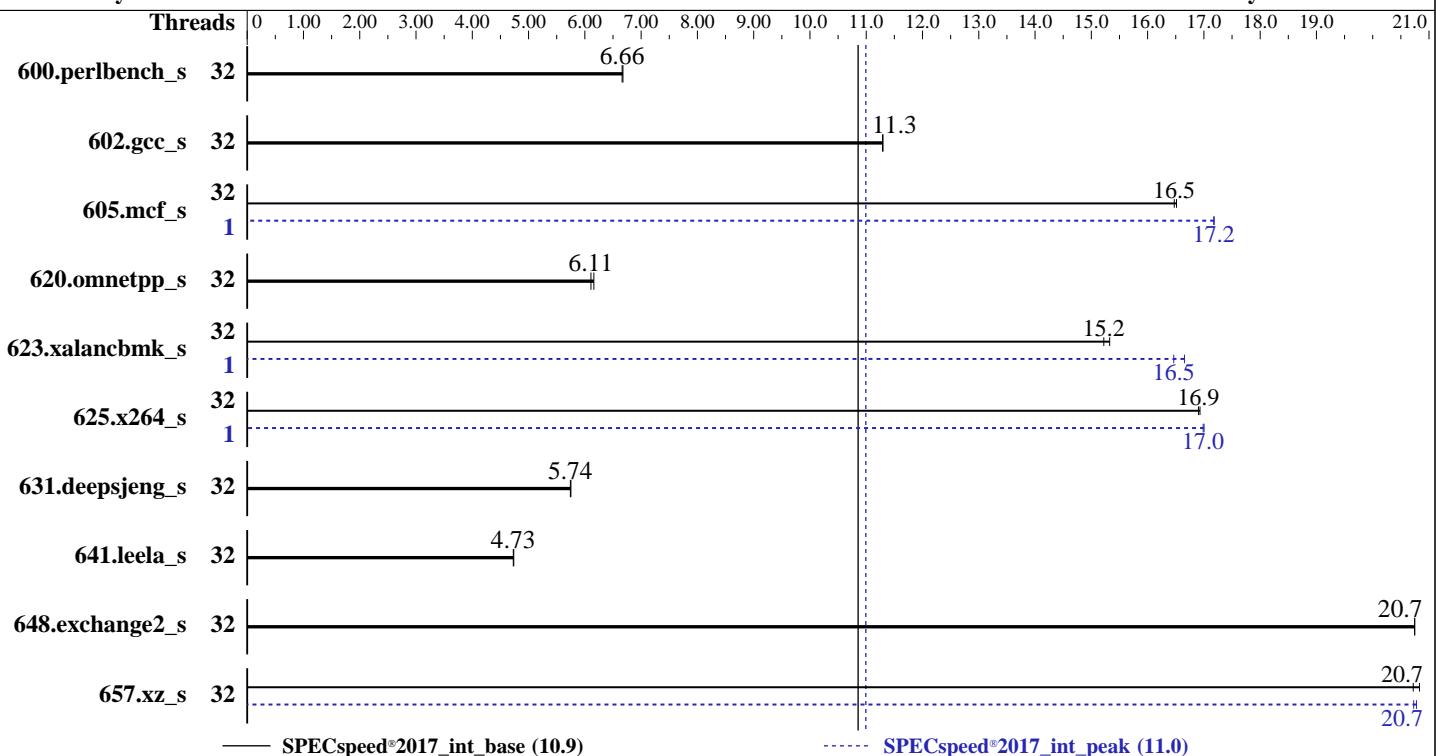$SPECspeed®2017\_int\_peak = 11.0$

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

Test Date: Aug-2023
Hardware Availability: Sep-2023
Software Availability: Nov-2022

Threads

Benchmark	Threads	Value
600.perlbench_s	32	6.66
602.gcc_s	32	11.3
605.mcf_s	32	16.5
605.mcf_s	1	17.2
620.omnetpp_s	32	6.11
623.xalancbmk_s	32	15.2
623.xalancbmk_s	1	16.5
625.x264_s	32	16.9
625.x264_s	1	17.0
631.deepsjeng_s	32	5.74
641.leela_s	32	4.73
648.exchange2_s	32	20.7
657.xz_s	32	20.7
657.xz_s	1	20.7

SPECspeed®2017_int_base (10.9)   SPECspeed®2017_int_peak (11.0)

Hardware

CPU Name: AMD EPYC 8324P
Max MHz: 3000
Nominal: 2650
Enabled: 32 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 128 MB I+D on chip per chip, 16 MB shared / 4 cores
Other: None
Memory: 192 GB (6 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 40 GB on tmpfs
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4 5.14.21-150400.22-default
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: Yes
Firmware: Version 1.0.2 released Jul-2023
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
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						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	32	266	6.68	**266**	**6.66**			32	266	6.68	**266**	**6.66**		
602.gcc_s	32	352	11.3	**353**	**11.3**			32	352	11.3	**353**	**11.3**		
605.mcf_s	32	286	16.5	**287**	**16.5**			1	275	17.2	**275**	**17.2**		
620.omnetpp_s	32	**267**	**6.11**	265	6.16			32	**267**	**6.11**	265	6.16		
623.xalancbmk_s	32	92.5	15.3	**93.1**	**15.2**			1	85.1	16.7	**86.1**	**16.5**		
625.x264_s	32	104	16.9	**104**	**16.9**			1	104	17.0	**104**	**17.0**		
631.deepsjeng_s	32	249	5.75	**250**	**5.74**			32	249	5.75	**250**	**5.74**		
641.leela_s	32	360	4.74	**361**	**4.73**			32	360	4.74	**361**	**4.73**		
648.exchange2_s	32	**142**	**20.7**	142	20.7			32	**142**	**20.7**	142	20.7		
657.xz_s	32	**298**	**20.7**	297	20.8			32	**298**	**20.7**	298	20.8		
SPECspeed®2017_int_base =		**10.9**												
SPECspeed®2017_int_peak =		**11.0**												

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.
```

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

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-31"
LD_LIBRARY_PATH = "/mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1/amd_speed_aocc400_znver4_A_lib/lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "32"

Environment variables set by runcpu during the 605.mcf_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-31"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "8"
```

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.


 Benchmark run from a 40 GB ramdisk created with the cmd: "mount -t tmpfs -o size=40G tmpfs /mnt/ramdisk"
```

Platform Notes

```
 BIOS settings:
            DRAM Refresh Delay : Performance
        DIMM Self Healing on
   Uncorrectable Memory Error : Disabled
            Logical Processor : Disabled
   Virtualization Technology : Disabled
          NUMA Nodes per Socket : 4
     L3 Cache as NUMA Domain : Enabled

               System Profile : Custom
                     C-States : Disabled
         Memory Patrol Scrub : Disabled
         PCI ASPM L1 Link
            Power Management : Disabled
         Determinism Slider : Power Determinism
     Algorithm Performance
       Boost Disable (ApbDis) : Enabled
```

(Continued on next page)

Dell Inc.

SPECspeed®2017_int_base = 10.9

PowerEdge C6615 (AMD EPYC 8324P 32-Core Processor)

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Platform Notes (Continued)

```
Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Wed Aug 16 03:41:51 2023

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 249 (249.11+suse.124.g2bc0b2c447)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent_hugepage
19. /sys/kernel/mm/transparent_hugepage/khugepaged
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS
-----------------------------------------------------------


-----------------------------------------------------------
1. uname -a
  Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
  x86_64 x86_64 x86_64 GNU/Linux


-----------------------------------------------------------
2. w
   03:41:51 up 4 min,  1 user,  load average: 0.60, 0.85, 0.43
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                03:40   39.00s  1.84s  0.32s /bin/bash ./amd_speed_aocc400_znver4_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) 771059
  max locked memory       (kbytes, -l) 2097152
  max memory size         (kbytes, -m) unlimited
```

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Platform Notes (Continued)

```
   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) 771059
   virtual memory      (kbytes, -v) unlimited
   file locks                  (-x) unlimited


   --------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd linux --switched-root --system --deserialize 30
 login -- root
 -bash
 /bin/bash ./DELL_speed.sh
 /bin/bash ./dell-run-main.sh speed
 /bin/bash ./dell-run-main.sh speed
 /bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProcD=1
   --define DL-BIOS-VirtD=1 --define DL-VERS=v4.6 --output_format html,pdf,txt
 python3 ./run_amd_speed_aocc400_znver4_A1.py
 /bin/bash ./amd_speed_aocc400_znver4_A1.sh
 runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
   DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProcD=1 --define DL-BIOS-VirtD=1 --define DL-VERS=v4.6
   --output_format html,pdf,txt intspeed
 runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
   DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProcD=1 --define DL-BIOS-VirtD=1 --define DL-VERS=v4.6
   --output_format html,pdf,txt --nopower --runmode speed --tune base:peak --size test:train:refspeed
   intspeed --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.001/templogs/preenv.intspeed.001.0.log
   --lognum 001.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1


   --------------------------------------------------------------
6. /proc/cpuinfo
     model name        : AMD EPYC 8324P 32-Core Processor
     vendor_id         : AuthenticAMD
     cpu family        : 25
     model             : 160
     stepping          : 2
     microcode         : 0xaa00212
     bugs              : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
     TLB size          : 3584 4K pages
     cpu cores         : 32
     siblings          : 32
     1 physical ids (chips)
     32 processors (hardware threads)
     physical id 0: core ids 0-3,16-19,32-35,48-51,64-67,80-83,96-99,112-115
     physical id 0: apicids 0-3,16-19,32-35,48-51,64-67,80-83,96-99,112-115
   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:                 52 bits physical, 57 bits virtual
   Byte Order:                    Little Endian
```

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Platform Notes (Continued)

```
  CPU(s):                         32
  On-line CPU(s) list:            0-31
  Vendor ID:                      AuthenticAMD
  Model name:                     AMD EPYC 8324P 32-Core Processor
  CPU family:                     25
  Model:                          160
  Thread(s) per core:             1
  Core(s) per socket:             32
  Socket(s):                      1
  Stepping:                       2
  Frequency boost:                enabled
  CPU max MHz:                    3001.9529
  CPU min MHz:                    1500.0000
  BogoMIPS:                       5292.15
  Flags:                          fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                                  clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
                                  constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf rapl
                                  pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe
                                  popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy
                                  abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
                                  perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3
                                  invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1
                                  avx2 smep bmi2 erms invpcid cqm rdt_a avx512f 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 arat npt lbrv
                                  svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
                                  pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
                                  umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                  avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
  Virtualization:                 AMD-V
  L1d cache:                      1 MiB (32 instances)
  L1i cache:                      1 MiB (32 instances)
  L2 cache:                       32 MiB (32 instances)
  L3 cache:                       128 MiB (8 instances)
  NUMA node(s):                   1
  NUMA node0 CPU(s):              0-31
  Vulnerability Itlb multihit:    Not affected
  Vulnerability L1tf:             Not affected
  Vulnerability Mds:              Not affected
  Vulnerability Meltdown:         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 disabled, RSB
                                  filling
  Vulnerability Srbds:            Not affected
  Vulnerability Tsx async abort:  Not affected

 From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL  SETS PHY-LINE COHERENCY-SIZE
     L1d       32K       1M   8 Data            1    64    1            64
     L1i       32K       1M   8 Instruction     1    64    1            64
     L2         1M      32M   8 Unified         2  2048    1            64
     L3        16M     128M  16 Unified         3 16384    1            64


    -----------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 1 nodes (0)
   node 0 cpus: 0-31
```

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Platform Notes (Continued)

```
  node 0 size: 192788 MB
  node 0 free: 188590 MB
  node distances:
  node   0
    0:  10


   ----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       197415760 kB


   ----------------------------------------------------------
10. who -r
   run-level 3 Aug 16 03:39


   ----------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
   Default Target  Status
   multi-user      degraded


   ----------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
     UNIT          LOAD   ACTIVE SUB    DESCRIPTION
   * nscd.service loaded failed failed Name Service Cache Daemon


   ----------------------------------------------------------
13. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager firewalld getty@
                   haveged irqbalance issue-generator kbdsettings klog lvm2-monitor nscd
                   nvmefc-boot-connections postfix purge-kernels rollback rsyslog smartd sshd tuned wicked
                   wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
   enabled-runtime systemd-remount-fs
   disabled        autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                   chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info gpm
                   grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd issue-add-ssh-keys
                   kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nvmf-autoconnect rdisc rpcbind
                   rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd
                   systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                   systemd-time-wait-sync systemd-timesyncd
   indirect        wickedd


   ----------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=3a4101f7-871d-4ae3-b0d4-fea810a0dbbf
   linux
   splash=silent
   mitigations=auto
   quiet
   security=apparmor


   ----------------------------------------------------------
15. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 1.50 GHz and 2.65 GHz.
                     The governor "performance" may decide which speed to use
                     within this range.
     boost state support:
       Supported: yes
       Active: yes
```

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Platform Notes (Continued)

```
    ----------------------------------------------------------
    16. tuned-adm active
      Current active profile: throughput-performance


    ----------------------------------------------------------
    17. sysctl
      kernel.numa_balancing               0
      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


    ----------------------------------------------------------
    18. /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


    ----------------------------------------------------------
    19. /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


    ----------------------------------------------------------
    20. OS release
      From /etc/*-release /etc/*-version
      os-release SUSE Linux Enterprise Server 15 SP4


    ----------------------------------------------------------
    21. Disk information
    SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1
      Filesystem      Type   Size  Used Avail Use% Mounted on
      tmpfs           tmpfs   40G  3.5G   37G   9% /mnt/ramdisk


    ----------------------------------------------------------
    22. /sys/devices/virtual/dmi/id
        Vendor:         Dell Inc.
        Product:        PowerEdge C6615
        Product Family: PowerEdge
```

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SPECspeed®2017_int_base = 10.9

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CPU2017 License:	6573	**Test Date:**	Aug-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Sep-2023
Tested by:	Dell Inc.	**Software Availability:**	Nov-2022

Platform Notes (Continued)

```
     Serial:        SC665C5

  ------------------------------------------------------------
  23. dmidecode
    Additional information from dmidecode 3.2 follows.  WARNING: Use caution when you interpret this section.
    The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
    determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
    "DMTF SMBIOS" standard.
    Memory:
      4x 80AD000080AD HMCG88MEBRA107N 32 GB 2 rank 4800
      2x 80AD000080AD HMCG88MEBRA113N 32 GB 2 rank 4800


  ------------------------------------------------------------
  24. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       Dell Inc.
    BIOS Version:      1.0.2
    BIOS Date:         07/26/2023
    BIOS Revision:     1.0
```

Compiler Version Notes

```
==============================================================================
C        | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak)
         | 657.xz_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C++      | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak)
         | 641.leela_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
Fortran | 648.exchange2_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:

clang

(Continued on next page)

Dell Inc.

PowerEdge C6615 (AMD EPYC 8324P 32-Core Processor)

SPECspeed®2017_int_base = 10.9

SPECspeed®2017_int_peak = 11.0

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

Test Date: Aug-2023
Hardware Availability: Sep-2023
Software Availability: Nov-2022

Base Compiler Invocation (Continued)

C++ benchmarks:
`clang++`

Fortran benchmarks:
`flang`

Base Portability Flags

600.perlbench_s: `-DSPEC_LINUX_X64 -DSPEC_LP64`
602.gcc_s: `-DSPEC_LP64`
605.mcf_s: `-DSPEC_LP64`
620.omnetpp_s: `-DSPEC_LP64`
623.xalancbmk_s: `-DSPEC_LINUX -DSPEC_LP64`
625.x264_s: `-DSPEC_LP64`
631.deepsjeng_s: `-DSPEC_LP64`
641.leela_s: `-DSPEC_LP64`
648.exchange2_s: `-DSPEC_LP64`
657.xz_s: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lflang
-lamdalloc
```

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

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Dell Inc.

PowerEdge C6615 (AMD EPYC 8324P 32-Core Processor)

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SPECspeed®2017_int_peak = 11.0

CPU2017 License: 6573		**Test Date:**	Aug-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Sep-2023
Tested by:	Dell Inc.	**Software Availability:**	Nov-2022

Base Optimization Flags (Continued)

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 -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -mllvm -optimize-strided-mem-cost
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc
```

Base Other Flags

C benchmarks:
```
-Wno-return-type -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

```
Same as Base Portability Flags
```

SPEC CPU®2017 Integer Speed Result

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Dell Inc.

PowerEdge C6615 (AMD EPYC 8324P 32-Core Processor)

SPECspeed®2017_int_base = 10.9

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CPU2017 License: 6573
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Tested by: Dell Inc.

Test Date: Aug-2023
Hardware Availability: Sep-2023
Software Availability: Nov-2022

Peak Optimization Flags

C benchmarks:

600.perlbench_s: basepeak = yes

602.gcc_s: basepeak = yes

```
605.mcf_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

625.x264_s: Same as 605.mcf_s

657.xz_s: Same as 605.mcf_s

C++ benchmarks:

620.omnetpp_s: basepeak = yes

```
623.xalancbmk_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang
```

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes

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

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6615 (AMD EPYC 8324P 32-Core Processor)

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SPECspeed®2017_int_peak = 11.0

CPU2017 License: 6573		**Test Date:**	Aug-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Sep-2023
Tested by:	Dell Inc.	**Software Availability:**	Nov-2022

Peak Other Flags

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

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/aocc400-flags.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.html
```

You can also download the XML flags sources by saving the following links:
```
http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.xml
```

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

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