# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R7615 (AMD EPYC 9274F 24-Core Processor)

$SPECspeed®2017\_int\_base = 15.9$

$SPECspeed®2017\_int\_peak = 16.1$

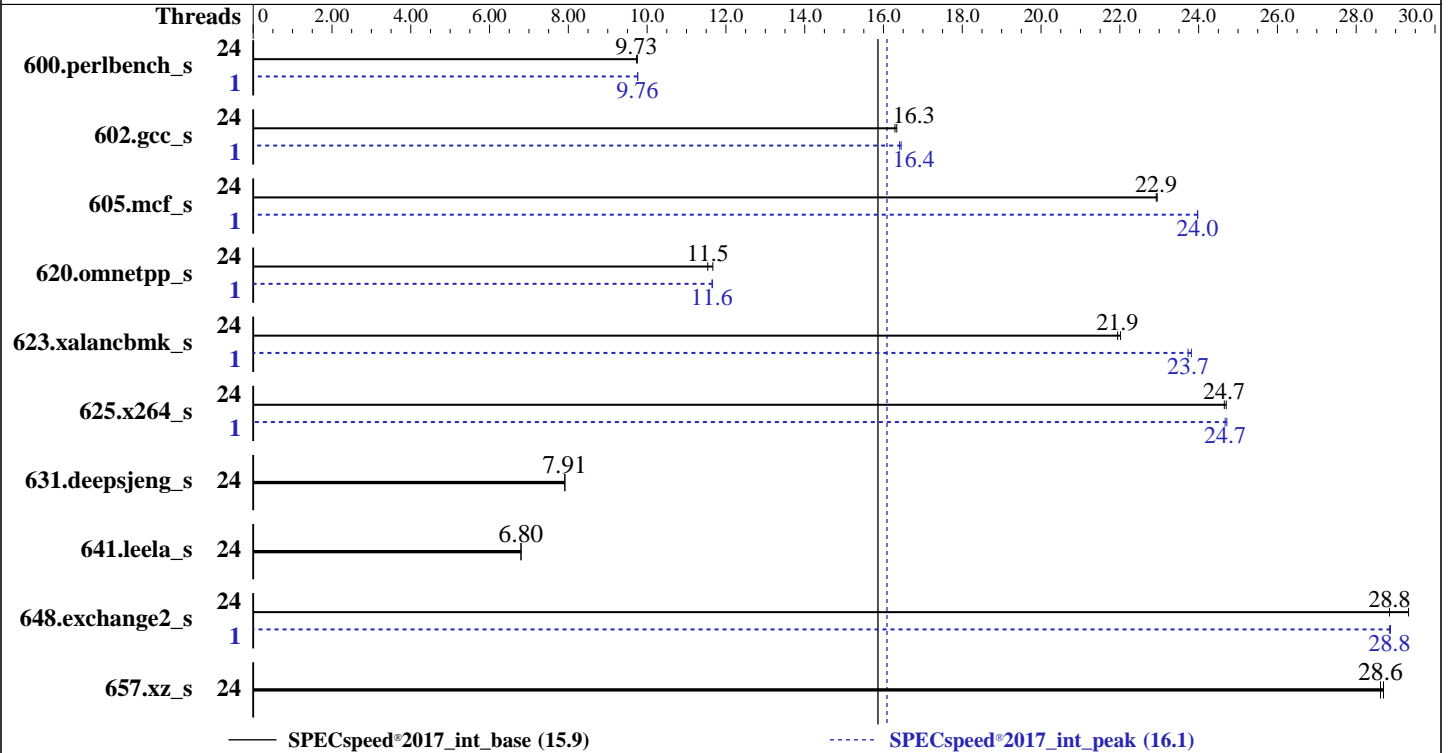**CPU2017 License:** 6573
**Test Sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test Date:** Mar-2023
**Hardware Availability:** Mar-2023
**Software Availability:** Nov-2022

Threads

| Benchmark | 24 | 1 |
|-----------|-----|-----|
| 600.perlbench_s | 9.73 | 9.76 |
| 602.gcc_s | 16.3 | 16.4 |
| 605.mcf_s | 22.9 | 24.0 |
| 620.omnetpp_s | 11.5 | 11.6 |
| 623.xalancbmk_s | 21.9 | 23.7 |
| 625.x264_s | 24.7 | 24.7 |
| 631.deepsjeng_s | 7.91 | |
| 641.leela_s | 6.80 | |
| 648.exchange2_s | 28.8 | 28.8 |
| 657.xz_s | 28.6 | |

SPECspeed®2017_int_base (15.9)       SPECspeed®2017_int_peak (16.1)

## Hardware

CPU Name: AMD EPYC 9274F
  Max MHz: 4300
  Nominal: 4050
Enabled: 24 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: 256 MB I+D on chip per chip, 32 MB shared / 3
      cores
  Other: None
Memory: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 125 GB on tmpfs
Other: None

## Software

OS: Ubuntu 22.04.1 LTS
    5.15.0-46-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: Yes
Firmware: Version 1.1.0 released Nov-2022
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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| | | |
|---|---|---|
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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 | 24 | 182 | 9.75 | **182** | **9.73** | | | 1 | **182** | **9.76** | 182 | 9.76 | | |
| 602.gcc_s | 24 | **244** | **16.3** | 244 | 16.3 | | | 1 | 242 | 16.4 | **243** | **16.4** | | |
| 605.mcf_s | 24 | **206** | **22.9** | 206 | 22.9 | | | 1 | **197** | **24.0** | 197 | 24.0 | | |
| 620.omnetpp_s | 24 | **141** | **11.5** | 140 | 11.7 | | | 1 | **140** | **11.6** | 140 | 11.7 | | |
| 623.xalancbmk_s | 24 | 64.4 | 22.0 | **64.6** | **21.9** | | | 1 | 59.5 | 23.8 | **59.7** | **23.7** | | |
| 625.x264_s | 24 | 71.4 | 24.7 | **71.6** | **24.7** | | | 1 | **71.5** | **24.7** | 71.4 | 24.7 | | |
| 631.deepsjeng_s | 24 | **181** | **7.91** | 181 | 7.91 | | | 24 | **181** | **7.91** | 181 | 7.91 | | |
| 641.leela_s | 24 | **251** | **6.80** | 251 | 6.80 | | | 24 | **251** | **6.80** | 251 | 6.80 | | |
| 648.exchange2_s | 24 | 100 | 29.3 | **102** | **28.8** | | | 1 | 102 | 28.9 | **102** | **28.8** | | |
| 657.xz_s | 24 | **216** | **28.6** | 215 | 28.7 | | | 24 | **216** | **28.6** | 215 | 28.7 | | |
| **SPECspeed®2017_int_base =** | | **15.9** | | | | | | | | | | | | |
| **SPECspeed®2017_int_peak =** | | **16.1** | | | | | | | | | | | | |

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:
GOMP_CPU_AFFINITY = "0-23"
LD_LIBRARY_PATH = "/mnt/ramdisk/cpu2017-1.1.9-aocc400-B1e/amd_speed_aocc400_genoa_B_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 = "24"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 602.gcc_s peak run:
GOMP_CPU_AFFINITY = "15"

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

Environment variables set by runcpu during the 620.omnetpp_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 648.exchange2_s peak run:
GOMP_CPU_AFFINITY = "15"
```

## 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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G 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
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
              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

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc400-B1e/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on amd-sut Mon Mar 20 15:14:43 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 (249.11-0ubuntu3.4)
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 amd-sut 5.15.0-46-generic #49-Ubuntu SMP Thu Aug 4 18:03:25 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   15:14:43 up 8 min,  1 user,  load average: 0.06, 0.04, 0.01
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                15:12   24.00s  1.41s  0.27s /bin/bash ./amd_speed_aocc400_genoa_B1.sh

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

------------------------------------------------------------
4. ulimit -a
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
  time(seconds)         unlimited
  file(blocks)          unlimited
  data(kbytes)          unlimited
  stack(kbytes)         unlimited
  coredump(blocks)      0
  memory(kbytes)        unlimited
  locked memory(kbytes) 2097152
  process               3093987
  nofiles               1024
  vmemory(kbytes)       unlimited
  locks                 unlimited
  rtprio                0


    -----------------------------------------------------------
  5. sysinfo process ancestry
   /sbin/init
   /bin/login -p --
   -bash
   /bin/bash ./DELL_speed.sh
   /bin/bash ./dell-run-main.sh speed
   /bin/bash ./dell-run-main.sh speed
   /bin/bash ./dell-run-specspeed.sh --output_format csv,html,pdf,txt -define
     Dell-BIOS-inc=Dell-BIOS_EPYC-4.inc --define Dell-BIOS-LogProcD=1
   python3 ./run_amd_speed_aocc400_genoa_B1.py
   /bin/bash ./amd_speed_aocc400_genoa_B1.sh
   runcpu --config amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 2 --output_format
     csv,html,pdf,txt -define Dell-BIOS-inc=Dell-BIOS_EPYC-4.inc --define Dell-BIOS-LogProcD=1 intspeed
   runcpu --configfile amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 2 --output_format
     csv,html,pdf,txt --define Dell-BIOS-inc=Dell-BIOS_EPYC-4.inc --define Dell-BIOS-LogProcD=1 --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-B1e


    -----------------------------------------------------------
  6. /proc/cpuinfo
      model name      : AMD EPYC 9274F 24-Core Processor
      vendor_id       : AuthenticAMD
      cpu family      : 25
      model           : 17
      stepping        : 1
      microcode       : 0xa101111
      bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
      TLB size        : 3584 4K pages
      cpu cores       : 24
      siblings        : 24
      1 physical ids (chips)
      24 processors (hardware threads)
      physical id 0: core ids 0-2,16-18,32-34,48-50,64-66,80-82,96-98,112-114
      physical id 0: apicids 0-2,16-18,32-34,48-50,64-66,80-82,96-98,112-114
   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
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
        Byte Order:                     Little Endian
        CPU(s):                         24
        On-line CPU(s) list:            0-23
        Vendor ID:                      AuthenticAMD
        Model name:                     AMD EPYC 9274F 24-Core Processor
        CPU family:                     25
        Model:                          17
        Thread(s) per core:             1
        Core(s) per socket:             24
        Socket(s):                      1
        Stepping:                       1
        Frequency boost:                enabled
        CPU max MHz:                    4304.0000
        CPU min MHz:                    400.0000
        BogoMIPS:                       8102.75
        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 cppc arat npt
                                        lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
                                        pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
                                        umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                        avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
        Virtualization:                 AMD-V
        L1d cache:                      768 KiB (24 instances)
        L1i cache:                      768 KiB (24 instances)
        L2 cache:                       24 MiB (24 instances)
        L3 cache:                       256 MiB (8 instances)
        NUMA node(s):                   4
        NUMA node0 CPU(s):              0-2,12-14
        NUMA node1 CPU(s):              6-8,18-20
        NUMA node2 CPU(s):              9-11,21-23
        NUMA node3 CPU(s):              3-5,15-17
        Vulnerability Itlb multihit:    Not affected
        Vulnerability L1tf:             Not affected
        Vulnerability Mds:              Not affected
        Vulnerability Meltdown:         Not affected
        Vulnerability Mmio stale data:  Not affected
        Vulnerability Retbleed:         Not affected
        Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
        Vulnerability Spectre v1:       Mitigation; usercopy/swapgs barriers and __user pointer sanitization
        Vulnerability Spectre v2:       Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP 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     768K    8 Data           1     64      1           64
         L1i       32K     768K    8 Instruction    1     64      1           64
         L2         1M      24M    8 Unified        2   2048      1           64
         L3        32M     256M   16 Unified        3  32768      1           64
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
        ----------------------------------------------------------
        8. numactl --hardware
        NOTE: a numactl 'node' might or might not correspond to a physical chip.
          available: 4 nodes (0-3)
          node 0 cpus: 0-2,12-14
          node 0 size: 193079 MB
          node 0 free: 192568 MB
          node 1 cpus: 6-8,18-20
          node 1 size: 193533 MB
          node 1 free: 191439 MB
          node 2 cpus: 9-11,21-23
          node 2 size: 193533 MB
          node 2 free: 193248 MB
          node 3 cpus: 3-5,15-17
          node 3 size: 193461 MB
          node 3 free: 191361 MB
          node distances:
          node   0   1   2   3
            0:  10  12  12  12
            1:  12  10  12  12
            2:  12  12  10  12
            3:  12  12  12  10


        ----------------------------------------------------------
        9. /proc/meminfo
           MemTotal:       792174784 kB


        ----------------------------------------------------------
        10. who -r
          run-level 3 Mar 20 15:08


        ----------------------------------------------------------
        11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.4)
          Default Target  Status
          multi-user      degraded


        ----------------------------------------------------------
        12. Failed units, from systemctl list-units --state=failed
            UNIT                              LOAD   ACTIVE SUB    DESCRIPTION
          * systemd-networkd-wait-online.service loaded failed failed Wait for Network to be Configured


        ----------------------------------------------------------
        13. Services, from systemctl list-unit-files
          STATE            UNIT FILES
          enabled          blk-availability console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager
                           grub-common grub-initrd-fallback irqbalance keyboard-setup lm-sensors 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 vgauth wpa_supplicant
          enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-networkd-wait-online systemd-remount-fs
          disabled         ModemManager apparmor console-getty debug-shell iscsid lvm2-monitor lxd-agent multipathd
                           nftables rsync serial-getty@ systemd-boot-check-no-failures systemd-network-generator
                           systemd-sysext systemd-time-wait-sync ufw upower wpa_supplicant-nl80211@
                           wpa_supplicant-wired@ wpa_supplicant@
          generated        apport
          indirect         uuidd
          masked           NetworkManager NetworkManager-dispatcher NetworkManager-wait-online cryptdisks
                           cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo x11-common
```

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## Platform Notes (Continued)

```
  ----------------------------------------------------------------
  14. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.15.0-46-generic
    root=UUID=593ab29a-c8fe-4d75-821a-b60d5c945311
    ro

  ----------------------------------------------------------------
  15. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 400 MHz and 4.30 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
        Supported: yes
        Active: yes
        Boost States: 0
        Total States: 3
        Pstate-P0:  4050MHz

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

  ----------------------------------------------------------------
  17. sysctl
    kernel.numa_balancing              1
    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

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

**(Continued on next page)**

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## Platform Notes (Continued)

```
  scan_sleep_millisecs    10000


  -------------------------------------------------------------
  20. OS release
    From /etc/*-release /etc/*-version
    os-release Ubuntu 22.04.1 LTS


  -------------------------------------------------------------
  21. Disk information
  SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc400-B1e
    Filesystem      Type   Size  Used Avail Use% Mounted on
    tmpfs           tmpfs  125G  3.5G  122G   3% /mnt/ramdisk


  -------------------------------------------------------------
  22. /sys/devices/virtual/dmi/id
      Vendor:         Dell Inc.
      Product:        PowerEdge R7615
      Product Family: PowerEdge
      Serial:         RDB5009


  -------------------------------------------------------------
  23. 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.
    Memory:
      12x 80AD000080AD HMCG94MEBRA109N 64 GB 2 rank 4800



  -------------------------------------------------------------
  24. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:      Dell Inc.
    BIOS Version:     1.1.0
    BIOS Date:        11/25/2022
    BIOS Revision:    1.1
```

## 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#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
C++      | 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#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------------------------------
```

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# SPEC CPU®2017 Integer Speed Result

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## Dell Inc.

PowerEdge R7615 (AMD EPYC 9274F 24-Core Processor)

SPECspeed®2017_int_base = 15.9

SPECspeed®2017_int_peak = 16.1

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

**Test Date:** Mar-2023
**Hardware Availability:** Mar-2023
**Software Availability:** Nov-2022

## Compiler Version Notes (Continued)

```
==============================================================================================
Fortran | 648.exchange2_s(base, peak)
----------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
----------------------------------------------------------------------------------------------
```

## Base Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

## Base Portability Flags

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
```

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Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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# Base Optimization Flags (Continued)

C benchmarks (continued):
```
-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
```

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++
```

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## Dell Inc.

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**Software Availability:** Nov-2022

## Peak Compiler Invocation (Continued)

Fortran benchmarks:
```
flang
```

## Peak Portability Flags

```
Same as Base Portability Flags
```

## Peak Optimization Flags

C benchmarks:

```
600.perlbench_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
```

```
602.gcc_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -z muldefs -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
```

```
605.mcf_s: Same as 600.perlbench_s
```

```
625.x264_s: Same as 600.perlbench_s
```

```
657.xz_s: basepeak = yes
```

C++ benchmarks:

```
620.omnetpp_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
```

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## Dell Inc.

PowerEdge R7615 (AMD EPYC 9274F 24-Core Processor)

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SPECspeed®2017_int_peak = 16.1

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**Software Availability:** Nov-2022

# Peak Optimization Flags (Continued)

620.omnetpp_s (continued):
```
-flto -finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang
```

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:
```
-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 -lamdalloc -lflang
```

# 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-v1.0.html

# SPEC CPU®2017 Integer Speed Result

## Dell Inc.

PowerEdge R7615 (AMD EPYC 9274F 24-Core Processor)

$SPECspeed®2017\_int\_base = 15.9$

$SPECspeed®2017\_int\_peak = 16.1$

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

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-v1.0.xml

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

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