SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R7625 (AMD EPYC 9474F 48-Core Processor)

$SPECspeed^{®}2017\_int\_base = 15.3$

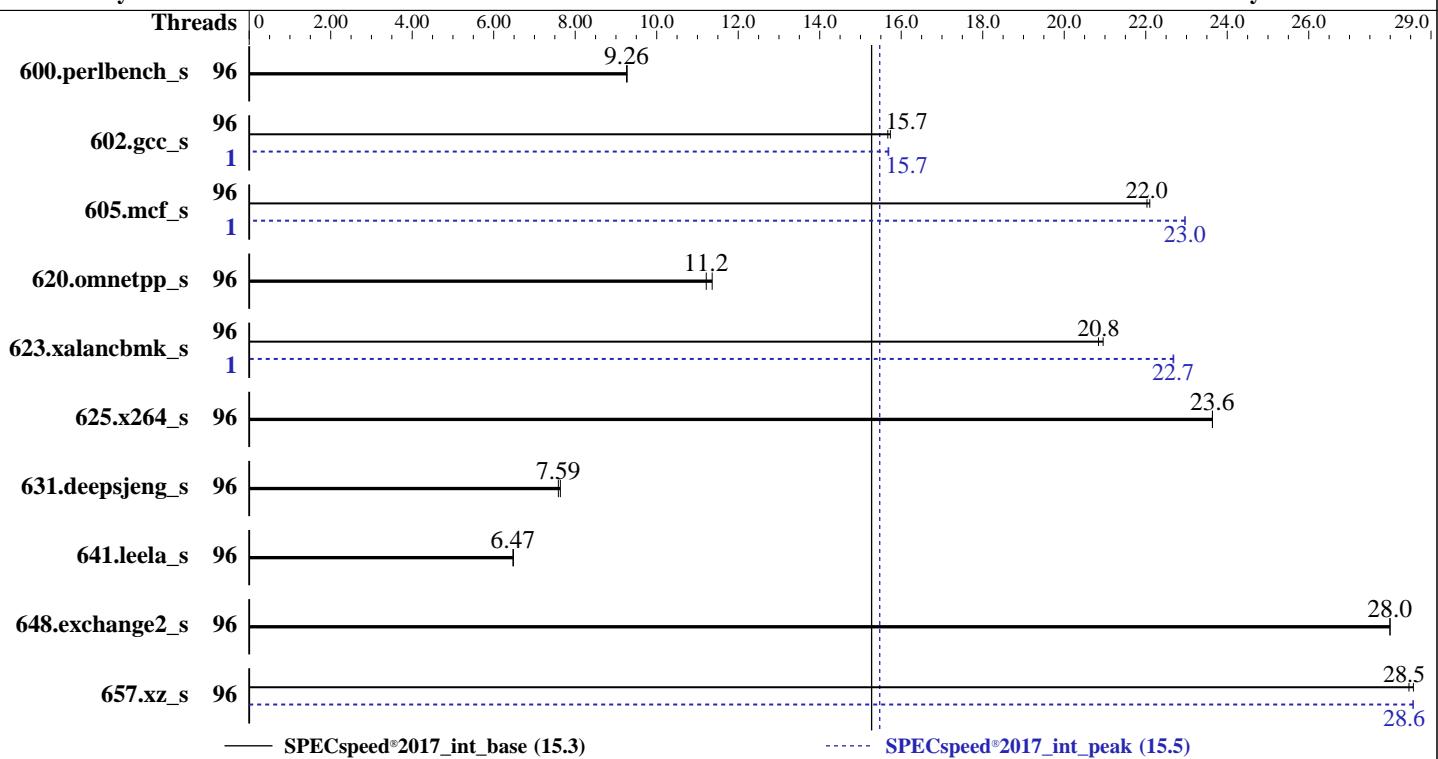$SPECspeed^{®}2017\_int\_peak = 15.5$

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

Test Date: Nov-2022
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Threads

- 600.perlbench_s 96 — 9.26
- 602.gcc_s 96 — 15.7 / 1 — 15.7
- 605.mcf_s 96 — 22.0 / 1 — 23.0
- 620.omnetpp_s 96 — 11.2
- 623.xalancbmk_s 96 — 20.8 / 1 — 22.7
- 625.x264_s 96 — 23.6
- 631.deepsjeng_s 96 — 7.59
- 641.leela_s 96 — 6.47
- 648.exchange2_s 96 — 28.0
- 657.xz_s 96 — 28.5 / 28.6

———— SPECspeed®2017_int_base (15.3)   - - - - SPECspeed®2017_int_peak (15.5)

Hardware

CPU Name: AMD EPYC 9474F
 Max MHz: 4100
 Nominal: 3600
Enabled: 96 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 256 MB I+D on chip per chip, 32 MB shared / 6 cores
 Other: None
Memory: 1536 GB (24 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 1.0.2 released Oct-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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CPU2017 License: 6573	**Test Date:**	Nov-2022
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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	96	**192**	**9.26**	191	9.27			96	**192**	**9.26**	191	9.27		
602.gcc_s	96	253	15.7	**254**	**15.7**			1	254	15.7	**254**	**15.7**		
605.mcf_s	96	214	22.1	**214**	**22.0**			1	**206**	**23.0**	206	23.0		
620.omnetpp_s	96	144	11.4	**145**	**11.2**			96	144	11.4	**145**	**11.2**		
623.xalancbmk_s	96	67.6	21.0	**68.0**	**20.8**			1	**62.5**	**22.7**	62.5	22.7		
625.x264_s	96	74.6	23.6	**74.6**	**23.6**			96	74.6	23.6	**74.6**	**23.6**		
631.deepsjeng_s	96	188	7.64	**189**	**7.59**			96	188	7.64	**189**	**7.59**		
641.leela_s	96	**264**	**6.47**	263	6.48			96	**264**	**6.47**	263	6.48		
648.exchange2_s	96	**105**	**28.0**	105	28.0			96	**105**	**28.0**	105	28.0		
657.xz_s	96	216	28.6	**217**	**28.5**			96	216	28.6	**216**	**28.6**		
SPECspeed®2017_int_base =		15.3												
SPECspeed®2017_int_peak =		15.5												

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.
```

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Operating System Notes (Continued)

```
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.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-95"
LD_LIBRARY_PATH =
      "/mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b/amd_speed_aocc400_genoa_B_lib/li
      b:"
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 = "96"

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 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-95"
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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"
```

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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

 Sysinfo program /mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on amd-sut Wed Nov  2 22:35:32 2022

 SUT (System Under Test) info as seen by some common utilities.
 For more information on this section, see
    https://www.spec.org/cpu2017/Docs/config.html#sysinfo

 From /proc/cpuinfo
    model name : AMD EPYC 9474F 48-Core Processor
       2  "physical id"s (chips)
       96 "processors"
    cores, siblings (Caution: counting these is hw and system dependent. The following
    excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
       cpu cores : 48
       siblings  : 48
       physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
       32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61
       physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
       32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61

 From lscpu from util-linux 2.37.2:
       Architecture:                x86_64
       CPU op-mode(s):              32-bit, 64-bit
       Address sizes:               52 bits physical, 57 bits virtual
       Byte Order:                  Little Endian
       CPU(s):                      96
       On-line CPU(s) list:         0-95
```

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

Platform Notes (Continued)

```
Vendor ID:                     AuthenticAMD
Model name:                    AMD EPYC 9474F 48-Core Processor
CPU family:                    25
Model:                         17
Thread(s) per core:            1
Core(s) per socket:            48
Socket(s):                     2
Stepping:                      1
Frequency boost:               enabled
CPU max MHz:                   4114.0000
CPU min MHz:                   400.0000
BogoMIPS:                      7202.10
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:                     3 MiB (96 instances)
L1i cache:                     3 MiB (96 instances)
L2 cache:                      96 MiB (96 instances)
L3 cache:                      512 MiB (16 instances)
NUMA node(s):                  16
NUMA node0 CPU(s):             0-5
NUMA node1 CPU(s):             24-29
NUMA node2 CPU(s):             12-17
NUMA node3 CPU(s):             36-41
NUMA node4 CPU(s):             18-23
NUMA node5 CPU(s):             42-47
NUMA node6 CPU(s):             6-11
NUMA node7 CPU(s):             30-35
NUMA node8 CPU(s):             48-53
NUMA node9 CPU(s):             72-77
NUMA node10 CPU(s):            60-65
NUMA node11 CPU(s):            84-89
NUMA node12 CPU(s):            66-71
NUMA node13 CPU(s):            90-95
```

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Platform Notes (Continued)

```
        NUMA node14 CPU(s):             54-59
        NUMA node15 CPU(s):             78-83
        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       3M    8 Data            1     64        1             64
        L1i        32K       3M    8 Instruction     1     64        1             64
        L2          1M      96M    8 Unified         2   2048        1             64
        L3         32M     512M   16 Unified         3  32768        1             64

  /proc/cpuinfo cache data
     cache size : 1024 KB

  From numactl --hardware
  WARNING: a numactl 'node' might or might not correspond to a physical chip.
     available: 16 nodes (0-15)
     node 0 cpus: 0 1 2 3 4 5
     node 0 size: 96312 MB
     node 0 free: 96179 MB
     node 1 cpus: 24 25 26 27 28 29
     node 1 size: 96765 MB
     node 1 free: 96672 MB
     node 2 cpus: 12 13 14 15 16 17
     node 2 size: 96766 MB
     node 2 free: 96653 MB
     node 3 cpus: 36 37 38 39 40 41
     node 3 size: 96765 MB
     node 3 free: 96658 MB
     node 4 cpus: 18 19 20 21 22 23
     node 4 size: 96730 MB
     node 4 free: 96626 MB
     node 5 cpus: 42 43 44 45 46 47
     node 5 size: 96765 MB
```

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Platform Notes (Continued)

```
node 5 free: 96664 MB
node 6 cpus: 6 7 8 9 10 11
node 6 size: 96766 MB
node 6 free: 96667 MB
node 7 cpus: 30 31 32 33 34 35
node 7 size: 96749 MB
node 7 free: 96652 MB
node 8 cpus: 48 49 50 51 52 53
node 8 size: 96766 MB
node 8 free: 96595 MB
node 9 cpus: 72 73 74 75 76 77
node 9 size: 96765 MB
node 9 free: 96538 MB
node 10 cpus: 60 61 62 63 64 65
node 10 size: 96766 MB
node 10 free: 96468 MB
node 11 cpus: 84 85 86 87 88 89
node 11 size: 96765 MB
node 11 free: 96495 MB
node 12 cpus: 66 67 68 69 70 71
node 12 size: 96766 MB
node 12 free: 96587 MB
node 13 cpus: 90 91 92 93 94 95
node 13 size: 96765 MB
node 13 free: 96555 MB
node 14 cpus: 54 55 56 57 58 59
node 14 size: 96766 MB
node 14 free: 93005 MB
node 15 cpus: 78 79 80 81 82 83
node 15 size: 96739 MB
node 15 free: 96491 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
  0:  10  11  12  12  12  12  12  12  32  32  32  32  32  32  32  32
  1:  11  10  12  12  12  12  12  12  32  32  32  32  32  32  32  32
  2:  12  12  10  11  12  12  12  12  32  32  32  32  32  32  32  32
  3:  12  12  11  10  12  12  12  12  32  32  32  32  32  32  32  32
  4:  12  12  12  12  10  11  12  12  32  32  32  32  32  32  32  32
  5:  12  12  12  12  11  10  12  12  32  32  32  32  32  32  32  32
  6:  12  12  12  12  12  12  10  11  32  32  32  32  32  32  32  32
  7:  12  12  12  12  12  12  11  10  32  32  32  32  32  32  32  32
  8:  32  32  32  32  32  32  32  32  10  11  12  12  12  12  12  12
  9:  32  32  32  32  32  32  32  32  11  10  12  12  12  12  12  12
 10:  32  32  32  32  32  32  32  32  12  12  10  11  12  12  12  12
 11:  32  32  32  32  32  32  32  32  12  12  11  10  12  12  12  12
 12:  32  32  32  32  32  32  32  32  12  12  12  12  10  11  12  12
 13:  32  32  32  32  32  32  32  32  12  12  12  12  11  10  12  12
```

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Platform Notes (Continued)

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

 From /proc/meminfo
    MemTotal:        1584868716 kB
    HugePages_Total:          0
    Hugepagesize:          2048 kB

 /sbin/tuned-adm active
     Current active profile: latency-performance

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

 /usr/bin/lsb_release -d
    Ubuntu 22.04.1 LTS

 From /etc/*release* /etc/*version*
    debian_version: bookworm/sid
    os-release:
        PRETTY_NAME="Ubuntu 22.04.1 LTS"
        NAME="Ubuntu"
        VERSION_ID="22.04"
        VERSION="22.04.1 LTS (Jammy Jellyfish)"
        VERSION_CODENAME=jammy
        ID=ubuntu
        ID_LIKE=debian
        HOME_URL="https://www.ubuntu.com/"

 uname -a:
    Linux 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

 Kernel self-reported vulnerability status:

 CVE-2018-12207 (iTLB Multihit):           Not affected
 CVE-2018-3620 (L1 Terminal Fault):        Not affected
 Microarchitectural Data Sampling:         Not affected
 CVE-2017-5754 (Meltdown):                 Not affected
 mmio_stale_data:                          Not affected
 retbleed:                                 Not affected
 CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store
                                           Bypass disabled via prctl and
                                           seccomp
 CVE-2017-5753 (Spectre variant 1):        Mitigation: usercopy/swapgs
                                           barriers and __user pointer
                                           sanitization
```

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Platform Notes (Continued)

```
CVE-2017-5715 (Spectre variant 2):                   Mitigation: Retpolines, IBPB:
                                                     conditional, IBRS_FW, STIBP:
                                                     disabled, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort):             Not affected


run-level 3 Nov 2 22:32


SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b
   Filesystem      Type   Size  Used Avail Use% Mounted on
   tmpfs           tmpfs  125G  3.4G  122G   3% /mnt/ramdisk


From /sys/devices/virtual/dmi/id
   Vendor:         Dell Inc.
   Product:        PowerEdge R7625
   Product Family: PowerEdge
   Serial:         BRZ5015


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:
    1x 802C0000802C MTC40F2046S1RC48BA1 64 GB 2 rank 4800
    23x 80AD000080AD HMCG94MEBRA109N 64 GB 2 rank 4800


BIOS:
   BIOS Vendor:       Dell Inc.
   BIOS Version:      1.0.2
   BIOS Date:         10/17/2022
   BIOS Revision:     1.0


(End of data from sysinfo program)
```

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

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Compiler Version Notes (Continued)

```
==============================================================================
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
------------------------------------------------------------------------------


==============================================================================
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
```

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Dell Inc.

PowerEdge R7625 (AMD EPYC 9474F 48-Core Processor)

SPECspeed®2017_int_base = 15.3

SPECspeed®2017_int_peak = 15.5

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

Test Date: Nov-2022
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Base Portability Flags (Continued)

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
```

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
```

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Hardware Availability: Feb-2023
Software Availability: Nov-2022

Base Other Flags (Continued)

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

Peak Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

600.perlbench_s: basepeak = yes

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: `-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`

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Dell Inc.

PowerEdge R7625 (AMD EPYC 9474F 48-Core Processor)

SPECspeed®2017_int_base = 15.3

SPECspeed®2017_int_peak = 15.5

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

Test Date: Nov-2022
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Peak Optimization Flags (Continued)

605.mcf_s (continued):
```
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

625.x264_s: basepeak = yes

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

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`

SPEC CPU®2017 Integer Speed Result

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PowerEdge R7625 (AMD EPYC 9474F 48-Core Processor)

$SPECspeed®2017\_int\_base = 15.3$

$SPECspeed®2017\_int\_peak = 15.5$

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

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

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

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