



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECspeed®2017_int_base = 9.41

PowerEdge C6525 (AMD EPYC 7F72, 3.20 GHz)

SPECspeed®2017_int_peak = 9.75

CPU2017 License: 55

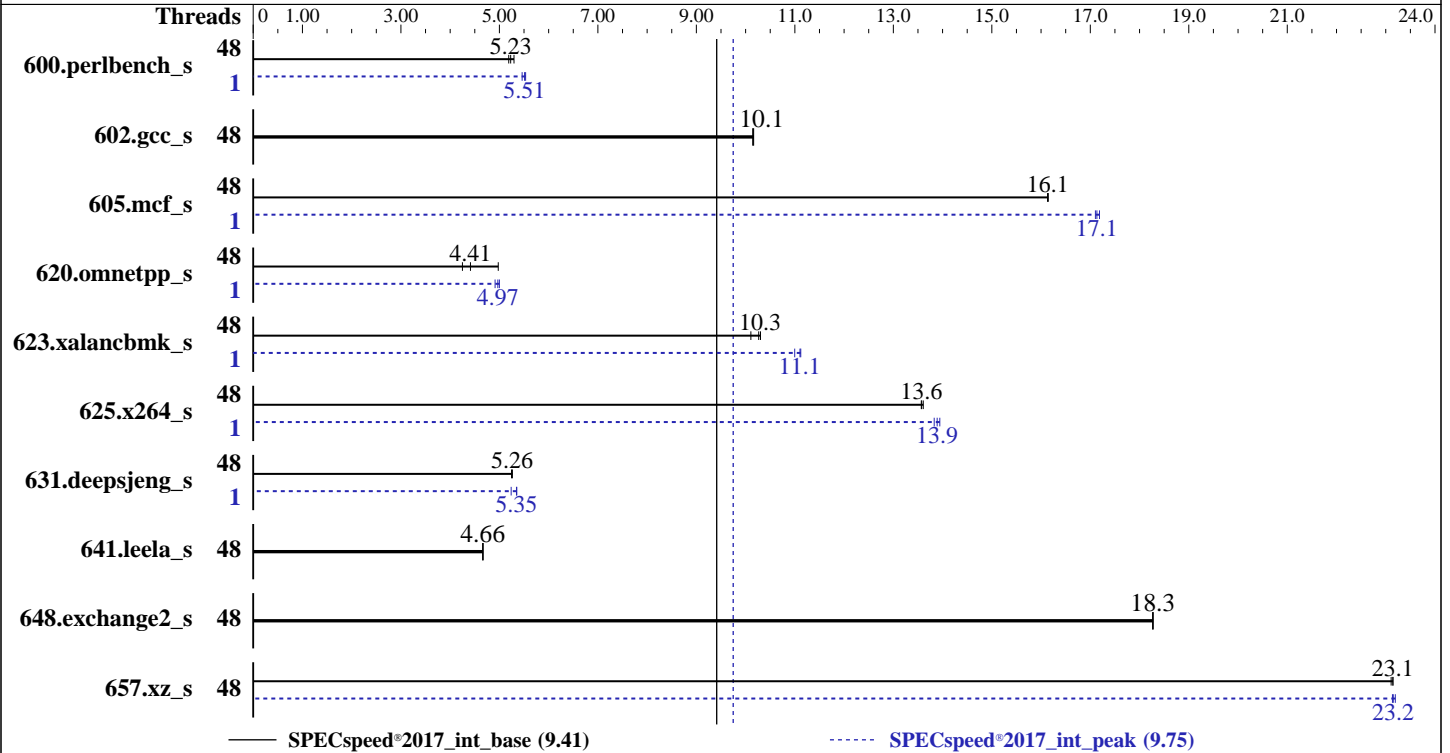
Test Date: Jan-2020

Test Sponsor: Dell Inc.

Hardware Availability: Apr-2020

Tested by: Dell Inc.

Software Availability: Aug-2019



Hardware

CPU Name: AMD EPYC 7F72
 Max MHz: 3700
 Nominal: 3200
 Enabled: 48 cores, 2 chips
 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: 192 MB I+D on chip per chip, 16 MB shared / 2 cores
 Other: None
 Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 3200)
 Storage: 1 x 480 GB SATA SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP1
 kernel 4.12.14-197.7-default
 Compiler: C/C++/Fortran: Version 2.0.0 of AOCC
 Parallel: Yes
 Firmware: Version 1.2.5 released Dec-2019
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit
 Other: jemalloc: jemalloc memory allocator library v5.2.0
 Power Management: BIOS 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	48	335	5.30	342	5.19	339	5.23	1	322	5.51	325	5.46	321	5.53
602.gcc_s	48	392	10.2	392	10.1	392	10.1	48	392	10.2	392	10.1	392	10.1
605.mcf_s	48	293	16.1	292	16.1	292	16.1	1	275	17.2	276	17.1	276	17.1
620.omnetpp_s	48	384	4.25	370	4.41	328	4.98	1	326	5.00	328	4.97	332	4.91
623.xalancbmk_s	48	138	10.3	138	10.3	140	10.1	1	129	11.0	127	11.1	128	11.1
625.x264_s	48	130	13.6	130	13.6	130	13.6	1	127	13.9	127	13.9	128	13.8
631.deepsjeng_s	48	272	5.26	273	5.25	273	5.26	1	274	5.24	268	5.35	268	5.35
641.leela_s	48	366	4.67	366	4.66	366	4.66	48	366	4.67	366	4.66	366	4.66
648.exchange2_s	48	161	18.3	161	18.3	161	18.3	48	161	18.3	161	18.3	161	18.3
657.xz_s	48	268	23.1	267	23.1	267	23.1	48	267	23.2	267	23.1	267	23.2

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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
'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>
```

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runcpu

dirty_ratio, swappiness, zone_reclaim_mode and drop_caches were
all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages set to 'always' for this run (OS default)



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Environment Variables Notes

Environment variables set by runcpu before the start of the run:

GOMP_CPU_AFFINITY = "0-95"

LD_LIBRARY_PATH =

"/root/cpu2017-1.1.0/amd_speed_aocc200_rome_C_lib/64;/root/cpu2017-1.1.0/amd_speed_aocc200_rome_C_lib/32:"

MALLOC_CONF = "retain:true"

OMP_DYNAMIC = "false"

OMP_SCHEDULE = "static"

OMP_STACKSIZE = "128M"

OMP_THREAD_LIMIT = "96"

Environment variables set by runcpu during the 600.perlbench_s peak run:

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 605.mcf_s peak run:

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 620.omnetpp_s peak run:

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 623.xalanbmk_s peak run:

GOMP_CPU_AFFINITY = "0"

OMP_STACKSIZE = "128M"

Environment variables set by runcpu during the 625.x264_s peak run:

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 631.deepsjeng_s peak run:

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 657.xz_s peak run:

GOMP_CPU_AFFINITY = "0-47"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using Fedora 26

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 v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto

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General Notes (Continued)

jemalloc 5.2.0 is available here:
<https://github.com/jemalloc/jemalloc/releases/download/5.2.0/jemalloc-5.2.0.tar.bz2>

Platform Notes

BIOS settings:

NUMA Nodes Per Socket set to 2
CCX as NUMA Domain set to Enabled
System Profile set to Custom
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost Enabled
Cstates set to Enabled
Memory Patrol Scrub Disabled
Memory Refresh Rate set to 1x
PCI ASPM L1 Link Power Management Disabled
Determinism Slider set to Power Determinism
Efficiency Optimized Mode Disabled
Memory Interleaving set to Disabled
Logical Processor Disabled

Sysinfo program /root/cpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on susel5-spl Wed Feb 5 04:58:26 2020

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 7F72 24-Core Processor
2 "physical id"s (chips)
48 "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 : 24
siblings : 24
physical 0: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45
physical 1: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 43 bits physical, 48 bits virtual

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Platform Notes (Continued)

```

CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 24
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7F72 24-Core Processor
Stepping: 0
CPU MHz: 3194.196
BogoMIPS: 6388.39
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0,1
NUMA node1 CPU(s): 2,3
NUMA node2 CPU(s): 4,5
NUMA node3 CPU(s): 6,7
NUMA node4 CPU(s): 8,9
NUMA node5 CPU(s): 10,11
NUMA node6 CPU(s): 12,13
NUMA node7 CPU(s): 14,15
NUMA node8 CPU(s): 16,17
NUMA node9 CPU(s): 18,19
NUMA node10 CPU(s): 20,21
NUMA node11 CPU(s): 22,23
NUMA node12 CPU(s): 24,25
NUMA node13 CPU(s): 26,27
NUMA node14 CPU(s): 28,29
NUMA node15 CPU(s): 30,31
NUMA node16 CPU(s): 32,33
NUMA node17 CPU(s): 34,35
NUMA node18 CPU(s): 36,37
NUMA node19 CPU(s): 38,39
NUMA node20 CPU(s): 40,41
NUMA node21 CPU(s): 42,43
NUMA node22 CPU(s): 44,45
NUMA node23 CPU(s): 46,47
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 pni pclmulqdq
monitor ssse3 fma cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave_2 avx f16c rdrand
lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw

```

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Platform Notes (Continued)

ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx cpb
cat_l3 cdp_l3 hw_pstate sme ssbd sev ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep
bmi2 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 arat npt
lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
pfthreshold avic v_vmsave_vmload vgif umip rdpid overflow_recov succor smca

```
/proc/cpuinfo cache data
cache size : 512 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 24 nodes (0-23)
node 0 cpus: 0 1
node 0 size: 21023 MB
node 0 free: 20971 MB
node 1 cpus: 2 3
node 1 size: 21502 MB
node 1 free: 21473 MB
node 2 cpus: 4 5
node 2 size: 21504 MB
node 2 free: 21436 MB
node 3 cpus: 6 7
node 3 size: 21502 MB
node 3 free: 21458 MB
node 4 cpus: 8 9
node 4 size: 21502 MB
node 4 free: 21418 MB
node 5 cpus: 10 11
node 5 size: 21503 MB
node 5 free: 21460 MB
node 6 cpus: 12 13
node 6 size: 21502 MB
node 6 free: 21426 MB
node 7 cpus: 14 15
node 7 size: 21502 MB
node 7 free: 21437 MB
node 8 cpus: 16 17
node 8 size: 21504 MB
node 8 free: 21464 MB
node 9 cpus: 18 19
node 9 size: 21502 MB
node 9 free: 21475 MB
node 10 cpus: 20 21
node 10 size: 21502 MB
node 10 free: 21464 MB
node 11 cpus: 22 23
```

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Platform Notes (Continued)

```

node 11 size: 21491 MB
node 11 free: 21470 MB
node 12 cpus: 24 25
node 12 size: 21502 MB
node 12 free: 21484 MB
node 13 cpus: 26 27
node 13 size: 21502 MB
node 13 free: 21480 MB
node 14 cpus: 28 29
node 14 size: 21504 MB
node 14 free: 21487 MB
node 15 cpus: 30 31
node 15 size: 21502 MB
node 15 free: 21485 MB
node 16 cpus: 32 33
node 16 size: 21502 MB
node 16 free: 21485 MB
node 17 cpus: 34 35
node 17 size: 21503 MB
node 17 free: 21484 MB
node 18 cpus: 36 37
node 18 size: 21502 MB
node 18 free: 21485 MB
node 19 cpus: 38 39
node 19 size: 21502 MB
node 19 free: 21484 MB
node 20 cpus: 40 41
node 20 size: 21504 MB
node 20 free: 21487 MB
node 21 cpus: 42 43
node 21 size: 21502 MB
node 21 free: 21485 MB
node 22 cpus: 44 45
node 22 size: 21502 MB
node 22 free: 21484 MB
node 23 cpus: 46 47
node 23 size: 21502 MB
node 23 free: 21482 MB
node distances:
node 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
20 21 22 23
0: 10 11 11 11 11 11 12 12 12 12 12 12 32 32 32 32 32 32 32
32 32 32 32
1: 11 10 11 11 11 11 12 12 12 12 12 12 32 32 32 32 32 32 32
32 32 32 32
2: 11 11 10 11 11 11 12 12 12 12 12 12 32 32 32 32 32 32 32
32 32 32 32

```

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Platform Notes (Continued)

3:	11	11	11	10	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
4:	11	11	11	11	10	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
5:	11	11	11	11	11	10	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
6:	12	12	12	12	12	12	10	11	11	11	11	11	32	32	32	32	32	32	32	32
32	32	32	32																	
7:	12	12	12	12	12	12	11	10	11	11	11	11	32	32	32	32	32	32	32	32
32	32	32	32																	
8:	12	12	12	12	12	12	11	11	10	11	11	11	32	32	32	32	32	32	32	32
32	32	32	32																	
9:	12	12	12	12	12	12	11	11	11	10	11	11	32	32	32	32	32	32	32	32
32	32	32	32																	
10:	12	12	12	12	12	12	11	11	11	11	10	11	32	32	32	32	32	32	32	32
32	32	32	32																	
11:	12	12	12	12	12	12	11	11	11	11	11	10	32	32	32	32	32	32	32	32
32	32	32	32																	
12:	32	32	32	32	32	32	32	32	32	32	32	32	32	10	11	11	11	11	11	12
12	12	12	12																	
13:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	10	11	11	11	11	12
12	12	12	12																	
14:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	10	11	11	11	12
12	12	12	12																	
15:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	11	10	11	11	12
12	12	12	12																	
16:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	11	11	10	11	12
12	12	12	12																	
17:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	11	11	11	10	12
12	12	12	12																	
18:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	10
11	11	11	11																	
19:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11
11	11	11	11																	
20:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11
10	11	11	11																	
21:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11
11	10	11	11																	
22:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11
11	11	10	11																	
23:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11
11	11	11	10																	

From /proc/meminfo
 MemTotal: 527958416 kB
 HugePages_Total: 0
 Hugepagesize: 2048 kB

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Platform Notes (Continued)

From /etc/*release* /etc/*version*

os-release:

```

NAME="SLES"
VERSION="15-SP1"
VERSION_ID="15.1"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp1"

```

uname -a:

```

Linux suse15-sp1 4.12.14-197.7-default #1 SMP Mon Jun 24 08:33:54 UTC 2019 (650fd32)
x86_64 x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

```

CVE-2018-3620 (L1 Terminal Fault):          Not affected
Microarchitectural Data Sampling:         Not affected
CVE-2017-5754 (Meltdown):                 Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled
via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):        Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):        Mitigation: Full AMD retpoline, IBPB:
conditional, IBRS_FW, STIBP: disabled, RSB
filling

```

run-level 3 Feb 5 04:35

SPEC is set to: /root/cpu2017-1.1.0

```

Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda2       xfs       444G      13G  432G   3% /

```

From /sys/devices/virtual/dmi/id

```

BIOS:          Dell Inc. 1.2.5 12/11/2019
Vendor:        Dell Inc.
Product:       PowerEdge C6525
Product Family: PowerEdge

```

Additional information from dmidecode 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:

16x 802C869D802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200

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Platform Notes (Continued)

(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)  
-----
```

```
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins  
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
-----
```

```
=====  
C++    | 623.xalanbmk_s(peak)  
-----
```

```
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins  
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)  
Target: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
-----
```

```
=====  
C++    | 620.omnetpp_s(base, peak) 623.xalanbmk_s(base)  
      | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)  
-----
```

```
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins  
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
-----
```

```
=====  
C++    | 623.xalanbmk_s(peak)  
-----
```

```
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins  
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)  
Target: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
-----
```

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SPEC CPU®2017 Integer Speed Result

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Dell Inc.

SPECspeed®2017_int_base = 9.41

PowerEdge C6525 (AMD EPYC 7F72, 3.20 GHz)

SPECspeed®2017_int_peak = 9.75

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Jan-2020

Hardware Availability: Apr-2020

Software Availability: Aug-2019

Compiler Version Notes (Continued)

```

=====
C++      | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base)
          | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
=====

```

```

AOCCLLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCCLLVM.2.0.0.B191.2019_07_19) (based on LLVM AOCCLLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
=====

```

```

=====
Fortran  | 648.exchange2_s(base, peak)
=====

```

```

AOCCLLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCCLLVM.2.0.0.B191.2019_07_19) (based on LLVM AOCCLLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/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

```

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Base Portability Flags (Continued)

657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-freemap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang
```

C++ benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-partial-unswitch -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang
```

Fortran benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -ffast-math
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver2 -funroll-loops
-Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs
-mllvm -disable-indvar-simplify -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -fopenmp=libomp
-lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang
```

Base Other Flags

C benchmarks:

```
-Wno-return-type -DUSE_OPENMP
```

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Base Other Flags (Continued)

C++ benchmarks:

-Wno-return-type -DUSE_OPENMP

Fortran benchmarks:

-DUSE_OPENMP -Wno-return-type

Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Peak Portability Flags

```

600.perlbench_s: -DSPEC_LINUX_X64 -DSPEC_LP64
602.gc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LINUX -D_FILE_OFFSET_BITS=64
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

```

Peak Optimization Flags

C benchmarks:

```

600.perlbench_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3

```

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Peak Optimization Flags (Continued)

600.perlbench_s (continued):

```
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver2
-mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-lmvec -lamdlibm -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc -lflang
```

602.gcc_s: basepeak = yes

```
605.mcf_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-lmvec -lamdlibm -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc -lflang
```

625.x264_s: Same as 600.perlbench_s

```
657.xz_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
```

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Peak Optimization Flags (Continued)

657.xz_s (continued):

-ljemalloc -lflang

C++ benchmarks:

```
620.omnetpp_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang
```

```
623.xalancbmk_s: -m32 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -ljemalloc
```

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes

Peak Other Flags

C benchmarks:

-Wno-return-type -DUSE_OPENMP

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Peak Other Flags (Continued)

C++ benchmarks (except as noted below):

-Wno-return-type -DUSE_OPENMP

623.xalancbmk_s: -Wno-return-type -DUSE_OPENMP

-L/sppo/dev/cpu2017/v110/amd_speed_aocc200_rome_C_lib/32

Fortran benchmarks:

-DUSE_OPENMP -Wno-return-type

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/aocc200-flags-B1.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE9.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/aocc200-flags-B1.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE9.xml>

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