SPEC CPU®2017 Integer Speed Result

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Dell Inc.

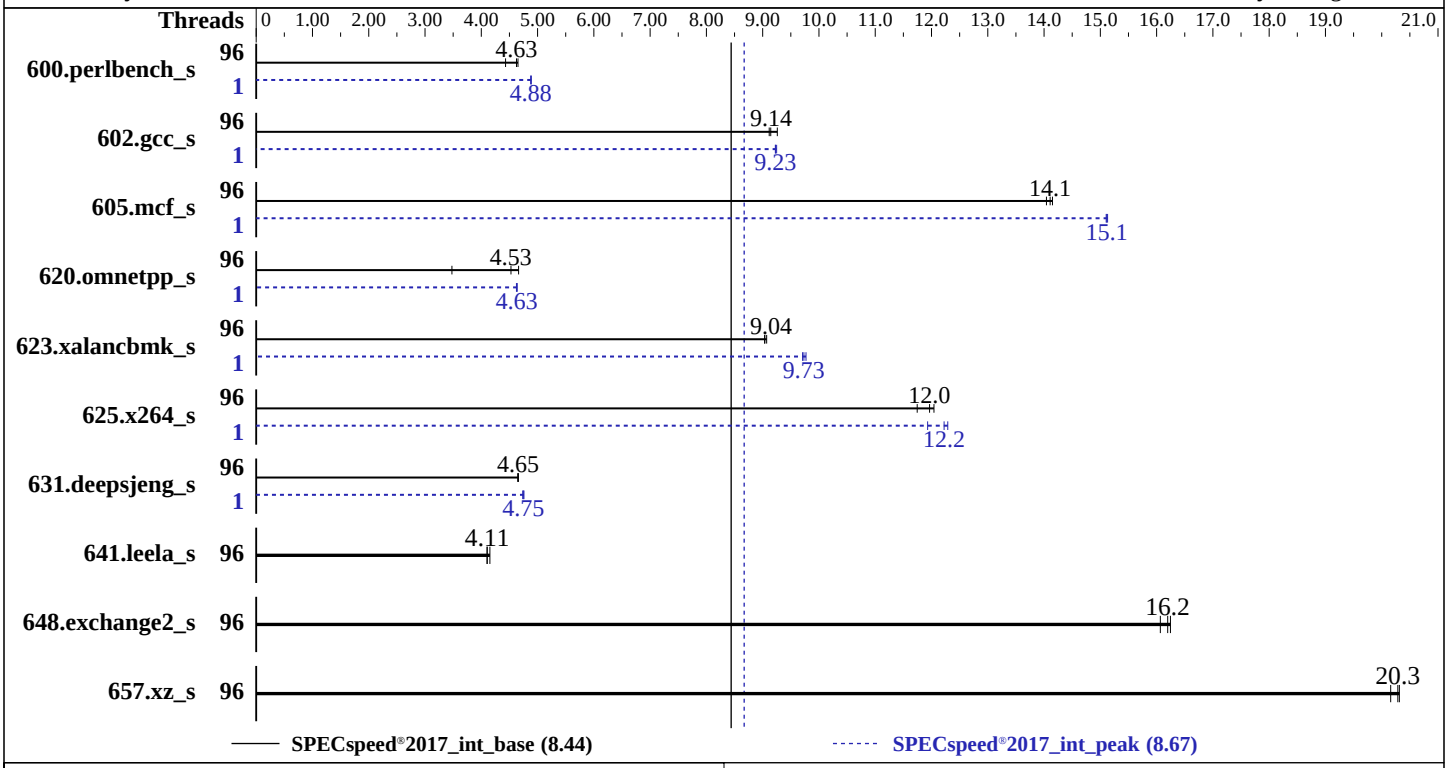
PowerEdge C6525 (AMD EPYC 7552, 2.20 GHz)

SPECspeed®2017_int_base = 8.44

SPECspeed®2017_int_peak = 8.67

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Feb-2020
Software Availability: Aug-2019



Hardware

CPU Name:	AMD EPYC 7552
Max MHz:	3300
Nominal:	2200
Enabled:	96 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	512 KB I+D on chip per core
L3:	192 MB I+D on chip per chip, 16 MB shared / 4 cores
Other:	None
Memory:	512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)
Storage:	1 x 480 GB SATA SSD
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 SP1 kernel 4.12.14-195-default
Compiler:	C/C++/Fortran: Version 2.0.0 of AOCC
Parallel:	Yes
Firmware:	Version 1.2.2 released Nov-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 v5.1.0
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	96	**384**	**4.63**	382	4.65	401	4.43	1	363	4.89	364	4.88	**364**	**4.88**
602.gcc_s	96	**436**	**9.14**	430	9.26	437	9.12	1	**432**	**9.23**	432	9.23	431	9.25
605.mcf_s	96	**335**	**14.1**	336	14.0	334	14.1	1	312	15.1	313	15.1	**312**	**15.1**
620.omnetpp_s	96	469	3.48	**360**	**4.53**	350	4.66	1	353	4.62	**352**	**4.63**	352	4.64
623.xalancbmk_s	96	**157**	**9.04**	156	9.07	157	9.04	1	146	9.71	**146**	**9.73**	145	9.77
625.x264_s	96	146	12.0	150	11.7	**147**	**12.0**	1	148	11.9	**144**	**12.2**	144	12.3
631.deepsjeng_s	96	308	4.65	**308**	**4.65**	308	4.66	1	**302**	**4.75**	303	4.74	301	4.76
641.leela_s	96	411	4.15	416	4.10	**416**	**4.11**	96	411	4.15	416	4.10	**416**	**4.11**
648.exchange2_s	96	**182**	**16.2**	183	16.1	181	16.2	96	**182**	**16.2**	183	16.1	181	16.2
657.xz_s	96	**305**	**20.3**	304	20.3	307	20.2	96	**305**	**20.3**	304	20.3	307	20.2

SPECspeed®2017_int_base = 8.44

SPECspeed®2017_int_peak = 8.67

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)
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-191"
LD_LIBRARY_PATH =
     "/root/cpu2017-1.0.5/cpu2017-1.1.0/amd_speed_aocc200_rome_C_lib/64;/root
     /cpu2017-1.0.5/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 = "192"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 602.gcc_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.xalancbmk_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"
```

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 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2
```

Platform Notes

```
 BIOS settings:
  NUMA Nodes Per Socket set to 1
  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

 Sysinfo program /root/cpu2017-1.0.5/cpu2017-1.1.0/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on linux-g3ob Sat Dec 14 08:30:05 2019

 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 7552 48-Core Processor
       2  "physical id"s (chips)
       192 "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  : 96
       physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
       physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47

 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
```

(Continued on next page)

Platform Notes (Continued)

```
CPU(s):              192
On-line CPU(s) list: 0-191
Thread(s) per core:  2
Core(s) per socket:  48
Socket(s):           2
NUMA node(s):        24
Vendor ID:           AuthenticAMD
CPU family:          23
Model:               49
Model name:          AMD EPYC 7552 48-Core Processor
Stepping:            0
CPU MHz:             2195.741
BogoMIPS:            4391.48
Virtualization:      AMD-V
L1d cache:           32K
L1i cache:           32K
L2 cache:            512K
L3 cache:            16384K
NUMA node0 CPU(s):   0-3,96-99
NUMA node1 CPU(s):   4-7,100-103
NUMA node2 CPU(s):   8-11,104-107
NUMA node3 CPU(s):   12-15,108-111
NUMA node4 CPU(s):   16-19,112-115
NUMA node5 CPU(s):   20-23,116-119
NUMA node6 CPU(s):   24-27,120-123
NUMA node7 CPU(s):   28-31,124-127
NUMA node8 CPU(s):   32-35,128-131
NUMA node9 CPU(s):   36-39,132-135
NUMA node10 CPU(s):  40-43,136-139
NUMA node11 CPU(s):  44-47,140-143
NUMA node12 CPU(s):  48-51,144-147
NUMA node13 CPU(s):  52-55,148-151
NUMA node14 CPU(s):  56-59,152-155
NUMA node15 CPU(s):  60-63,156-159
NUMA node16 CPU(s):  64-67,160-163
NUMA node17 CPU(s):  68-71,164-167
NUMA node18 CPU(s):  72-75,168-171
NUMA node19 CPU(s):  76-79,172-175
NUMA node20 CPU(s):  80-83,176-179
NUMA node21 CPU(s):  84-87,180-183
NUMA node22 CPU(s):  88-91,184-187
NUMA node23 CPU(s):  92-95,188-191
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 xtopology nonstop_tsc cpuid extd_apicid aperfmperf pni
pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx
f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse
```

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Platform Notes (Continued)

```
      3dnowprefetch osvw 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 2 3 96 97 98 99
   node 0 size: 21051 MB
   node 0 free: 20919 MB
   node 1 cpus: 4 5 6 7 100 101 102 103
   node 1 size: 21501 MB
   node 1 free: 21363 MB
   node 2 cpus: 8 9 10 11 104 105 106 107
   node 2 size: 21502 MB
   node 2 free: 21387 MB
   node 3 cpus: 12 13 14 15 108 109 110 111
   node 3 size: 21501 MB
   node 3 free: 21357 MB
   node 4 cpus: 16 17 18 19 112 113 114 115
   node 4 size: 21501 MB
   node 4 free: 21388 MB
   node 5 cpus: 20 21 22 23 116 117 118 119
   node 5 size: 21503 MB
   node 5 free: 21020 MB
   node 6 cpus: 24 25 26 27 120 121 122 123
   node 6 size: 21501 MB
   node 6 free: 21241 MB
   node 7 cpus: 28 29 30 31 124 125 126 127
   node 7 size: 21501 MB
   node 7 free: 21393 MB
   node 8 cpus: 32 33 34 35 128 129 130 131
   node 8 size: 21503 MB
   node 8 free: 21395 MB
   node 9 cpus: 36 37 38 39 132 133 134 135
   node 9 size: 21501 MB
   node 9 free: 21392 MB
   node 10 cpus: 40 41 42 43 136 137 138 139
   node 10 size: 21501 MB
   node 10 free: 21390 MB
```

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Platform Notes (Continued)

```
   node 11 cpus: 44 45 46 47 140 141 142 143
   node 11 size: 21490 MB
   node 11 free: 21383 MB
   node 12 cpus: 48 49 50 51 144 145 146 147
   node 12 size: 21472 MB
   node 12 free: 21372 MB
   node 13 cpus: 52 53 54 55 148 149 150 151
   node 13 size: 21501 MB
   node 13 free: 21401 MB
   node 14 cpus: 56 57 58 59 152 153 154 155
   node 14 size: 21502 MB
   node 14 free: 21401 MB
   node 15 cpus: 60 61 62 63 156 157 158 159
   node 15 size: 21501 MB
   node 15 free: 21401 MB
   node 16 cpus: 64 65 66 67 160 161 162 163
   node 16 size: 21501 MB
   node 16 free: 21395 MB
   node 17 cpus: 68 69 70 71 164 165 166 167
   node 17 size: 21503 MB
   node 17 free: 21404 MB
   node 18 cpus: 72 73 74 75 168 169 170 171
   node 18 size: 21501 MB
   node 18 free: 21399 MB
   node 19 cpus: 76 77 78 79 172 173 174 175
   node 19 size: 21501 MB
   node 19 free: 21401 MB
   node 20 cpus: 80 81 82 83 176 177 178 179
   node 20 size: 21503 MB
   node 20 free: 21402 MB
   node 21 cpus: 84 85 86 87 180 181 182 183
   node 21 size: 21501 MB
   node 21 free: 21401 MB
   node 22 cpus: 88 89 90 91 184 185 186 187
   node 22 size: 21501 MB
   node 22 free: 21400 MB
   node 23 cpus: 92 93 94 95 188 189 190 191
   node 23 size: 21501 MB
   node 23 free: 21400 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  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  32
     2:  11  11  10  11  11  11  12  12  12  12  12  12  32  32  32  32  32  32  32  32
```


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Platform Notes (Continued)

```
      32  32  32  32
      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  10  11  11  11  11  11  12  12
     12  12  12  12
     13:  32  32  32  32  32  32  32  32  32  32  32  32  11  10  11  11  11  11  12  12
     12  12  12  12
     14:  32  32  32  32  32  32  32  32  32  32  32  32  11  11  10  11  11  11  12  12
     12  12  12  12
     15:  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  10  11  11  12  12
     12  12  12  12
     16:  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  10  11  12  12
     12  12  12  12
     17:  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  10  12  12
     12  12  12  12
     18:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  10  11
     11  11  11  11
     19:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  10
     11  11  11  11
     20:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  11
     10  11  11  11
     21:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  11
     11  10  11  11
     22:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  11
     11  11  10  11
     23:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  11
     11  11  11  10

  From /proc/meminfo
     MemTotal:       527930332 kB
     HugePages_Total:       0
```


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Platform Notes (Continued)

```
    Hugepagesize:       2048 kB

 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 linux-g3ob 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
    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: conditional, RSB
                                           filling

 run-level 3 Dec 13 09:58

 SPEC is set to: /root/cpu2017-1.0.5/cpu2017-1.1.0
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda2      xfs   440G   23G  418G   6% /

 From /sys/devices/virtual/dmi/id
     BIOS:    Dell Inc. 1.2.2 11/13/2019
     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:
     5x 802C80B3802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
```

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Platform Notes (Continued)

```
     1x 802C8632802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
     5x 802C869D802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
     5x 80AD863280AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200

  (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.xalancbmk_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.xalancbmk_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.xalancbmk_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
```


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Compiler Version Notes (Continued)

```
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_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
------------------------------------------------------------------------------

==============================================================================
Fortran | 648.exchange2_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
------------------------------------------------------------------------------
```

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

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Base Portability Flags (Continued)

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:
-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
-fremap-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
-DUSE_OPENMP -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
-DUSE_OPENMP -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 -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang

Base Other Flags

C benchmarks:
`-Wno-return-type`

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

Fortran benchmarks:
`-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.gcc_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`

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Peak Optimization Flags (Continued)

600.perlbench_s (continued):
-Wl,-mllvm -Wl,-reduce-array-computations=3
-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
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang

602.gcc_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 -z muldefs -DSPEC_OPENMP
-fopenmp -DUSE_OPENMP -fgnu89-inline -fopenmp=libomp
-lomp -lpthread -ldl -ljemalloc

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
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang

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Peak Optimization Flags (Continued)

625.x264_s: `Same as 600.perlbench_s`

657.xz_s: `basepeak = yes`

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
-DUSE_OPENMP -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
-DUSE_OPENMP -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`

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Peak Other Flags (Continued)

C++ benchmarks (except as noted below):
`-Wno-return-type`

623.xalancbmk_s: `-Wno-return-type`
`-L/sppo/dev/cpu2017/v110/amd_speed_aocc200_rome_C_lib/32`

Fortran benchmarks:
`-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-speed-Dell.html`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE7.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc200-flags-B1-speed-Dell.xml`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE7.xml`

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