SPEC CPU®2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

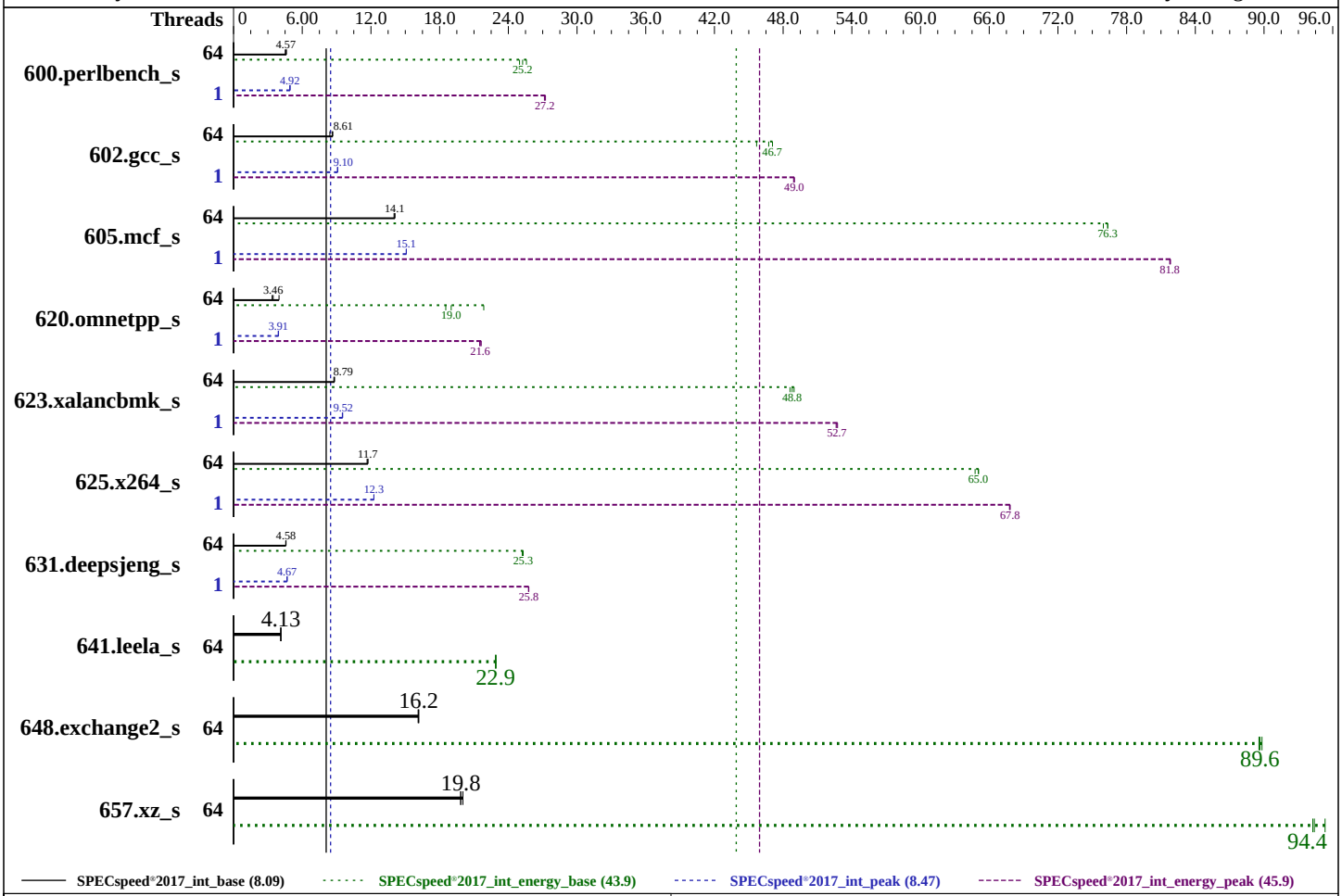
(Test Sponsor: HPE)

ProLiant DL325 Gen10
(2.00 GHz, AMD EPYC 7702P)

SPECspeed®2017_int_base =	8.09
SPECspeed®2017_int_energy_base =	43.9
SPECspeed®2017_int_peak =	8.47
SPECspeed®2017_int_energy_peak =	45.9

CPU2017 License: 003
Test Sponsor: HPE
Tested by: HPE

Test Date: Aug-2019
Hardware Availability: Oct-2019
Software Availability: Aug-2019



Hardware

CPU Name:	AMD EPYC 7702P
Max MHz:	3350
Nominal:	2000
Enabled:	64 cores, 1 chip
Orderable:	1 chip
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	512 KB I+D on chip per core
L3:	256 MB I+D on chip per chip, 16 MB shared / 4 cores
Other:	None
Memory:	256 GB (8 x 32 GB 2Rx4 PC4-2933Y-L)
Storage:	1 x HPE 480 GB SATA 6G SSD
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 (x86_64) SP1 Kernel 4.12.14-195-default
Compiler:	C/C++/Fortran: Version 2.0.0 of AOCC
Parallel:	Yes
Firmware:	HPE BIOS Version A41 07/20/2019 released Aug-2019
File System:	btrfs
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:	Disabled

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Test Date: Aug-2019
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Software Availability: Aug-2019

Power

Max. Power (W): 368.6
Idle Power (W): 189.94
Min. Temperature (C): 20.44
Elevation (m): 132
Line Standard: 208 V / 60 Hz / 1 phase / 2 wires
Provisioning: Line-powered

Power Settings

Management FW: Version 1.43 of iLO5 released May 23 2019
Memory Mode: Normal

Power-Relevant Hardware

Power Supply: 1 x 800 W (non-redundant)
Details: HPE 800W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit (865438-B21)
Backplane: 8 SFF NVMe with optional optical drive
Other Storage: Embedded SATA Controller
Storage Model #s: P05976-B21
NICs Installed: 1 x HPE Ethernet 4-port 331i Adapter @ 1 Gb
NICs Enabled (FW/OS): 4 / 4
NICs Connected/Speed: 2 @ 1 Gb
Other HW Model #s: 7 x High Performance fans

Power Analyzer

Power Analyzer: 10.216.1.15:8888
Hardware Vendor: Yokogawa
Model: YokogawaWT210
Serial Number: 91K308562
Input Connection: GPIB via NI GIPB-USB-HS
Metrology Institute: NIST
Calibration By: TRANSCAT
Calibration Label: 5-E553M-20-1
Calibration Date: 21-May-2019
PTDaemon™ Version: 1.9.1 (a2d19f26; 2019-07-17)
Setup Description: SUT Power Supply 1 via neoXt NXB 20815
Current Ranges Used: 1A, 2A
Voltage Range Used: 300V

Temperature Meter

Temperature Meter: 10.216.1.15:8889
Hardware Vendor: Digi International Inc.
Model: DigiWATCHPORT_H
Serial Number: V45297862
Input Connection: USB
PTDaemon Version: 1.9.1 (a2d19f26; 2019-07-17)
Setup Description: 5 mm in front of SUT main intake

Base Results Table

Benchmark	Threads	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
600.perlbench_s	64	393	4.51	77.1	25.0	196	204	384	4.62	75.3	25.6	196	204	**389**	**4.57**	**76.3**	**25.2**	**196**	**203**
602.gcc_s	64	459	8.67	92.0	47.1	200	222	**462**	**8.61**	**92.6**	**46.7**	**200**	**223**	473	8.41	94.7	45.7	200	223
605.mcf_s	64	**335**	**14.1**	**67.5**	**76.3**	**201**	**226**	335	14.1	67.5	76.4	201	227	337	14.0	67.8	76.0	201	227
620.omnetpp_s	64	**471**	**3.46**	**93.4**	**19.0**	**198**	**200**	411	3.97	81.2	21.9	198	199	484	3.37	95.7	18.5	198	199
623.xalancbmk_s	64	161	8.82	31.4	49.0	196	197	**161**	**8.79**	**31.5**	**48.8**	**196**	**197**	162	8.76	31.7	48.6	196	198
625.x264_s	64	151	11.7	29.6	64.8	196	197	**150**	**11.7**	**29.5**	**65.0**	**196**	**198**	150	11.7	29.5	65.1	196	197
631.deepsjeng_s	64	314	4.56	61.8	25.2	196	214	313	4.58	61.6	25.3	197	212	**313**	**4.58**	**61.6**	**25.3**	**197**	**215**
641.leela_s	64	413	4.13	80.6	22.9	195	196	413	4.13	80.7	22.9	195	197	**413**	**4.13**	**80.7**	**22.9**	**195**	**197**
648.exchange2_s	64	182	16.2	35.6	89.8	196	197	182	16.1	35.7	89.6	196	197	**182**	**16.2**	**35.7**	**89.6**	**196**	**197**
657.xz_s	64	309	20.0	70.6	95.3	229	369	**311**	**19.8**	**71.3**	**94.4**	**229**	**367**	312	19.8	71.4	94.3	229	367

SPECspeed®2017_int_base = 8.09

SPECspeed®2017_int_energy_base = 43.9

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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ProLiant DL325 Gen10 (2.00 GHz, AMD EPYC 7702P)

SPECspeed®2017_int_base = 8.09

SPECspeed®2017_int_energy_base = 43.9

SPECspeed®2017_int_peak = 8.47

SPECspeed®2017_int_energy_peak = 45.9

CPU2017 License: 003
Test Sponsor: HPE
Tested by: HPE

Test Date: Aug-2019
Hardware Availability: Oct-2019
Software Availability: Aug-2019

Peak Results Table

Benchmark	Threads	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
600.perlbench_s	1	361	4.91	70.9	27.1	196	204	**361**	**4.92**	**70.8**	**27.2**	**196**	**205**	360	4.93	70.7	27.2	196	204
602.gcc_s	1	**438**	**9.10**	**88.4**	**49.0**	**202**	**223**	438	9.08	88.5	48.9	202	223	438	9.10	88.4	49.0	202	223
605.mcf_s	1	313	15.1	63.0	81.8	201	226	313	15.1	62.9	81.8	201	225	**313**	**15.1**	**63.0**	**81.8**	**201**	**225**
620.omnetpp_s	1	417	3.91	82.6	21.5	198	199	415	3.93	82.0	21.6	198	198	**417**	**3.91**	**82.3**	**21.6**	**198**	**199**
623.xalancbmk_s	1	149	9.53	29.2	52.8	196	197	149	9.50	29.2	52.6	196	197	**149**	**9.52**	**29.2**	**52.7**	**196**	**197**
625.x264_s	1	144	12.3	28.3	67.8	197	198	144	12.3	28.3	67.8	197	198	**144**	**12.3**	**28.3**	**67.8**	**197**	**198**
631.deepsjeng_s	1	306	4.68	60.4	25.8	197	220	307	4.67	60.5	25.8	197	216	**307**	**4.67**	**60.4**	**25.8**	**197**	**222**
641.leela_s	64	413	4.13	80.6	22.9	195	196	413	4.13	80.7	22.9	195	197	**413**	**4.13**	**80.7**	**22.9**	**195**	**197**
648.exchange2_s	64	182	16.2	35.6	89.8	196	197	182	16.1	35.7	89.6	196	197	**182**	**16.2**	**35.7**	**89.6**	**196**	**197**
657.xz_s	64	309	20.0	70.6	95.3	229	369	**311**	**19.8**	**71.3**	**94.4**	**229**	**367**	312	19.8	71.4	94.3	229	367

SPECspeed®2017_int_peak = 8.47

SPECspeed®2017_int_energy_peak = 45.9

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 = "0-63"
LD_LIBRARY_PATH =
     "/cpu2017/amd_speed_aocc200_rome_C_lib/64;/cpu2017/amd_speed_aocc200_rom
     e_C_lib/32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "64"

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.
```

(Continued on next page)

General Notes (Continued)

```
jemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2


Submitted_by: "Bucek, James" <james.bucek@hpe.com>
Submitted: Tue Sep 17 00:02:18 EDT 2019
Submission: cpu2017-20190903-17799.sub

Submitted_by: "Bucek, James" <james.bucek@hpe.com>
Submitted: Tue Sep 17 09:00:11 EDT 2019
Submission: cpu2017-20190903-17799.sub
```

Platform Notes

```
BIOS Configuration:
 AMD SMT Option set to Disabled
 Thermal Configuration set to Maximum Cooling
 Determinism Control set to Manual
 Performance Determinism set to Power Deterministic
 Memory Patrol Scrubbing set to Disabled
 NUMA memory domains per socket set to Four memory domains per socket
 Workload Profile set to General Peak Frequency Compute
 Minimum Processor Idle Power Core C-State set to C6 State

 Sysinfo program /cpu2017/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on dl325gen10 Sat Aug 31 14:01:49 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 7702P 64-Core Processor
       1  "physical id"s (chips)
       64 "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 : 64
       siblings  : 64
       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 48 49 50 51 52
```

(Continued on next page)

Platform Notes (Continued)

```
       53 54 55 56 57 58 59 60 61 62 63

 From lscpu:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
      Address sizes:       48 bits physical, 48 bits virtual
      CPU(s):              64
      On-line CPU(s) list: 0-63
      Thread(s) per core:  1
      Core(s) per socket:  64
      Socket(s):           1
      NUMA node(s):        4
      Vendor ID:           AuthenticAMD
      CPU family:          23
      Model:               49
      Model name:          AMD EPYC 7702P 64-Core Processor
      Stepping:            0
      CPU MHz:             2000.000
      CPU max MHz:         2000.0000
      CPU min MHz:         1500.0000
      BogoMIPS:            3992.33
      Virtualization:      AMD-V
      L1d cache:           32K
      L1i cache:           32K
      L2 cache:            512K
      L3 cache:            16384K
      NUMA node0 CPU(s):   0-15
      NUMA node1 CPU(s):   16-31
      NUMA node2 CPU(s):   32-47
      NUMA node3 CPU(s):   48-63
      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 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_l2 mwaitx cpb
     cat_l3 cdp_l3 hw_pstate ssbd 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
```

(Continued on next page)

Platform Notes (Continued)

```
From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 4 nodes (0-3)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  node 0 size: 64290 MB
  node 0 free: 64038 MB
  node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
  node 1 size: 64507 MB
  node 1 free: 64350 MB
  node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
  node 2 size: 64507 MB
  node 2 free: 64245 MB
  node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
  node 3 size: 64465 MB
  node 3 free: 64353 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

From /proc/meminfo
   MemTotal:       263958144 kB
   HugePages_Total:       0
   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 dl325gen10 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:
```

(Continued on next page)

Platform Notes (Continued)

```
 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 Aug 31 13:56

 SPEC is set to: /cpu2017
    Filesystem     Type   Size  Used Avail Use% Mounted on
    /dev/sda2      btrfs   40G   11G   29G  28% /

 From /sys/devices/virtual/dmi/id
     BIOS:    HPE A41 07/20/2019
     Vendor:  HPE
     Product: ProLiant DL325 Gen10
     Product Family: ProLiant
     Serial:  CN781302PS

 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:
     8x UNKNOWN NOT AVAILABLE
     8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2933

 (End of data from sysinfo program)
```

Power Settings Notes

```
PTDaemon to measure power and temperature was run on a ProLiant DL360 Gen9 as a controller
with 2x Intel Xeon E5-2660 v3 CPU and 128 GB of memory using Windows Server 2012 R2.
Power management in the OS was disabled by setting Linux CPU governor to performance for all cores:
 cpupower frequency-set -r -g performance
Power management in the BIOS was default except for any settings mentioned in BIOS Configuration.
No power management settings were set in the management firmware.
The optional optical drive was not installed.
The system was configured with 7 HPE Small Form Factor Hard Drive Blanks (666987-B21), 8 DIMM blanks
2 high performance heatsinks and baffles that fit over the high performance
```

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Power Settings Notes (Continued)

```
heatsinks in order to produce correct airflow and cooling.
The run was started and observed through the management firmware.
The Embedded SATA controller was the HPE Smart Array S100i SR Gen10 SW RAID.
```

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
```

(Continued on next page)

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`

(Continued on next page)

Base Portability Flags (Continued)

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:
-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

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-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

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Peak Portability Flags (Continued)

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
-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

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Peak Optimization Flags (Continued)

605.mcf_s (continued):
-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

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

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Peak Optimization Flags (Continued)

623.xalancbmk_s (continued):
`-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`

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-C1-HPE.html`
`http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revF.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc200-flags-C1-HPE.xml`
`http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revF.xml`

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