## SPEC CPU®2017 Integer Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL385 Gen10 Plus  
(2.25 GHz, AMD EPYC 7742)

### SPECspeed®2017_int_base = 8.76

### SPECspeed®2017_int_peak = 8.94

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Apr-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Dec-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Aug-2019</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (8.76)</th>
<th>SPECspeed®2017_int_peak (8.94)</th>
</tr>
</thead>
<tbody>
<tr>
<td>128</td>
<td>4.77</td>
<td>14.7</td>
</tr>
<tr>
<td>1</td>
<td>5.01</td>
<td>15.6</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>OS:</th>
<th>SUSE Linux Enterprise Server 15 (x86_64) SP1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kernel 4.12.14-195-default</td>
</tr>
</tbody>
</table>

### CPU Name: AMD EPYC 7742

<table>
<thead>
<tr>
<th>Max MHz:</th>
<th>3400</th>
</tr>
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<tbody>
<tr>
<td>Nominal:</td>
<td>2250</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Enabled:</th>
<th>128 cores, 2 chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orderable:</td>
<td>1, 2 chips</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cache L1:</th>
<th>32 KB I + 32 KB D on chip per core</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2:</td>
<td>512 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>256 MB I+D on chip per chip, 16 MB shared / 4 cores</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other:</th>
<th>None</th>
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</thead>
<tbody>
<tr>
<td>Memory:</td>
<td>1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 800 GB SAS SSD, RAID 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other:</th>
<th>None</th>
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</thead>
<tbody>
<tr>
<td>Power Management:</td>
<td>BIOS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>

### Compiler:

C/C++/Fortran: Version 2.0.0 of AOCC

### Parallel:

Yes

### Firmware:

HPE BIOS Version A42 04/02/2020 released Apr-2020

### 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
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL385 Gen10 Plus
(2.25 GHz, AMD EPYC 7742)

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

SPECspeed®2017_int_base = 8.76
SPECspeed®2017_int_peak = 8.94

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>128</td>
<td>372</td>
<td></td>
<td>372</td>
<td>4.77</td>
<td>369</td>
<td>4.81</td>
<td>1</td>
<td>354</td>
<td>5.01</td>
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<td>5.02</td>
<td>354</td>
<td>5.01</td>
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<tr>
<td>605.mcf_s</td>
<td>128</td>
<td>317</td>
<td>14.9</td>
<td>320</td>
<td>14.7</td>
<td>320</td>
<td>14.7</td>
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<td>15.6</td>
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<td>15.6</td>
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<td>15.6</td>
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<tr>
<td>620.omnetpp_s</td>
<td>128</td>
<td>321</td>
<td>5.08</td>
<td>322</td>
<td>5.06</td>
<td>325</td>
<td>5.01</td>
<td>128</td>
<td>321</td>
<td>5.08</td>
<td>322</td>
<td>5.06</td>
<td>325</td>
<td>5.01</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>128</td>
<td>142</td>
<td>12.5</td>
<td>141</td>
<td>12.5</td>
<td>142</td>
<td>12.4</td>
<td>1</td>
<td>139</td>
<td>12.7</td>
<td>138</td>
<td>12.8</td>
<td>139</td>
<td>12.7</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>128</td>
<td>296</td>
<td>4.85</td>
<td>296</td>
<td>4.85</td>
<td>296</td>
<td>4.85</td>
<td>1</td>
<td>290</td>
<td>4.94</td>
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<td>4.94</td>
<td>290</td>
<td>4.94</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>128</td>
<td>408</td>
<td>4.18</td>
<td>414</td>
<td>4.12</td>
<td>415</td>
<td>4.11</td>
<td>128</td>
<td>408</td>
<td>4.18</td>
<td>414</td>
<td>4.12</td>
<td>415</td>
<td>4.11</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>128</td>
<td>182</td>
<td>16.2</td>
<td>181</td>
<td>16.2</td>
<td>182</td>
<td>16.2</td>
<td>1</td>
<td>182</td>
<td>16.2</td>
<td>181</td>
<td>16.3</td>
<td>181</td>
<td>16.2</td>
</tr>
<tr>
<td>657.xz_s</td>
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<td>295</td>
<td>20.9</td>
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<td>20.9</td>
<td>296</td>
<td>20.9</td>
<td>128</td>
<td>295</td>
<td>20.9</td>
<td>295</td>
<td>20.9</td>
<td>296</td>
<td>20.9</td>
</tr>
</tbody>
</table>

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)
# SPEC CPU®2017 Integer Speed Result

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<th>Test Date: Apr-2020</th>
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<td>Hardware Availability: Dec-2019</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Aug-2019</td>
</tr>
</tbody>
</table>

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:
- **GOMP_CPU_AFFINITY = "0-127"**
- **LD_LIBRARY_PATH** = 
  - "/home/cpu2017-bbn/amd_speed_aocc200_rome_C_lib/64;/home/cpu2017-bbn/amd_speed_aocc200_rome_C_lib/32;"
- **MALLOCONF = "retain:true"**
- **OMP_DYNAMIC = "false"**
- **OMP_SCHEDULE = "static"**
- **OMP_STACKSIZE = "128M"**
- **OMP_THREADLIMIT = "128"**

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 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"**

Environment variables set by runcpu during the 648.exchange2_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 5.2.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.2.0/jemalloc-5.2.0.tar.bz2

Platform Notes

BIOS Configuration
Thermal Configuration set to Maximum Cooling
AMD SMT Option set to Disabled
Determinism Control set to Manual
Performance Determinism set to Power Deterministic
Minimum Processor Idle Power Core C-State set to C6 State
Memory Patrol Scrubbing set to Disabled
NUMA memory domains per socket set to Four memory domains per socket
C-State Efficiency mode set to Disabled

Sysinfo program /home/cpu2017-bbn/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1be6e46a485a001
running on linux-30t0 Thu Feb 14 19:52:18 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 7742 64-Core Processor
  2  "physical id"s (chips)
  128 "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
53 54 55 56 57 58 59 60 61 62 63
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 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63

From Iscpu:
Architecture:      x86_64
CPU op-mode(s):    32-bit, 64-bit
Byte Order:        Little Endian
Address sizes:     48 bits physical, 48 bits virtual
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL385 Gen10 Plus
(2.25 GHz, AMD EPYC 7742)

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

SPECspeed®2017_int_base = 8.76
SPECspeed®2017_int_peak = 8.94

Platform Notes (Continued)

CPU(s): 128
On-line CPU(s) list: 0-127
Thread(s) per core: 1
Core(s) per socket: 64
Socket(s): 2
NUMA node(s): 8
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7742 64-Core Processor
Stepping: 0
CPU MHz: 2250.000
CPU max MHz: 2250.0000
CPU min MHz: 1500.0000
BogoMIPS: 4491.81
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
NUMA node4 CPU(s): 64-79
NUMA node5 CPU(s): 80-95
NUMA node6 CPU(s): 96-111
NUMA node7 CPU(s): 112-127

Flags: fpu vme de pse tsc msr pae 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 bptext perfctr_l2 mwaitx cpb cat_l3 cdp_l3 hw_pstate ssbd ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 cmq rdt_a rdsseed adx clflushopt clwb sha Ni xsaveopt xsavec xgetbv1 xsave xsaves cmq_llc cmq_occup_llc cmq_mbb_total cmq_mbb_local clzero irperf xsaverptr arat npt lbv svm_lock nrip_save tsc-scale vmcb_clean flushbyasid decodeassist paralalloc pfthreshold avic v_msave_vmload vgif umip rdpid overflow_recov succor smca

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 8 nodes (0-7)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

(Continued on next page)
### Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Node</th>
<th>Size (MB)</th>
<th>Free (MB)</th>
<th>CPU (IDs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>128709</td>
<td>128406</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>129019</td>
<td>128790</td>
<td>1-12</td>
</tr>
<tr>
<td>2</td>
<td>129019</td>
<td>128790</td>
<td>13-24</td>
</tr>
<tr>
<td>3</td>
<td>129007</td>
<td>128822</td>
<td>25-35</td>
</tr>
<tr>
<td>4</td>
<td>129019</td>
<td>128737</td>
<td>36-47</td>
</tr>
<tr>
<td>5</td>
<td>129019</td>
<td>128801</td>
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</tr>
<tr>
<td>7</td>
<td>129019</td>
<td>128698</td>
<td>80-91</td>
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</table>

**Node Distances:**

<table>
<thead>
<tr>
<th>Node 0</th>
<th>Node 1</th>
<th>Node 2</th>
<th>Node 3</th>
<th>Node 4</th>
<th>Node 5</th>
<th>Node 6</th>
<th>Node 7</th>
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<tbody>
<tr>
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<td>32</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>

From `/proc/meminfo`

- MemTotal: 1056568632 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

- NAME="SLES"
- VERSION="15-SP1"
- VERSION_ID="15.1"
- PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
- ID="sles"
- ID_LIKE="suse"
Platform Notes (Continued)

    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:15:spl"

    uname -a:
    Linux linux-30t0 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: disabled, RSB
                                                 filling

    run-level 3 Feb 14 19:51

SPEC is set to: /home/cpu2017-bbn
    Filesystem     Type     Size  Used  Avail  Use%  Mounted on
    /dev/sdc2      btrfs     743G  26G   716G   4%  /home

From /sys/devices/virtual/dmi/id
    BIOS:     HPE A42 04/02/2020
    Vendor:   HPE
    Product:  ProLiant DL385 Gen10 Plus
    Product Family: ProLiant
    Serial:   CN79340HC5

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 Micron 36ASF8G72PZ-3G2B2 64 GB 2 rank 3200
    16x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)

Compiler Version Notes

================================================================================
C     | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base,

(Continued on next page)
Compiler Version Notes (Continued)

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

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InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

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SPECPower CPU®2017 Integer Speed Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL385 Gen10 Plus
(2.25 GHz, AMD EPYC 7742)

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

SPECspeed®2017_int_base = 8.76
SPECspeed®2017_int_peak = 8.94

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

Compiler Version Notes (Continued)

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
AOCC_2_0_0-Build#191) (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
657.xz_s: -DSPEC_LP64
## Base Optimization Flags

**C benchmarks:**
- `-flto -Wl,-mlllvm -Wl,-function-specialize`
- `-Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
- `-march=znver2 -fstruct-layout=3 -mlllvm -unroll-threshold=50`
- `-fremap-arrays -mlllvm -function-specialize -mlllvm -enable-gvn-hoist`
- `-mlllvm -reduce-array-computations=3 -mlllvm -global-vectorize-slp`
- `-mlllvm -vector-library=LIBMVEC -mlllvm -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,-mlllvm -Wl,-function-specialize`
- `-Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3`
- `-Wl,-mlllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2`
- `-mlllvm -loop-unswitch-threshold=200000 -mlllvm -vector-library=LIBMVEC`
- `-mlllvm -unroll-threshold=100 -flv-function-specialization`
- `-ml llvm -enable-partial-unswitch -z muldefs -DSPEC_OPENMP -fopenmp`
- `-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`

**Fortran benchmarks:**
- `-flto -Wl,-mlllvm -Wl,-function-specialize`
- `-Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3 -ffast-math`
- `-Wl,-mlllvm -Wl,-inline-recursion=4 -Wl,-mlllvm -Wl,-lsr-in-nested-loop`
- `-Wl,-mlllvm -Wl,-enable-iv-split -O3 -march=znver2 -funroll-loops`
- `-Mrecursive -mlllvm -vector-library=LIBMVEC -z muldefs`
- `-mlllvm -disable-indvar-simplify -mlllvm -unroll-aggressive`
- `-mlllvm -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`

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SPECspeed®2017_int_base = 8.76
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</tr>
</tbody>
</table>

**Base Other Flags (Continued)**

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
-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`

(Continued on next page)
600.perlbench_s (continued):
-mlirv -unroll-threshold=50 -fremap-arrays
-mlirv -vector-library=LIBMVEC
-mlirv -reduce-array-computations=3
-mlirv -global-vectorize-slp -mlirv -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,-mlirv -Wl,-function-specialize
-Wl,-mlirv -Wl,-region-vectorize
-Wl,-mlirv -Wl,-vector-library=LIBMVEC
-Wl,-mlirv -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mlirv -vectorize-memory-aggressively
-mlirv -function-specialize -mlirv -enable-gvn-hoist
-mlirv -unroll-threshold=50 -fremap-arrays
-mlirv -vector-library=LIBMVEC
-mlirv -reduce-array-computations=3
-mlirv -global-vectorize-slp -mlirv -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,-mlirv -Wl,-function-specialize
-Wl,-mlirv -Wl,-region-vectorize
-Wl,-mlirv -Wl,-vector-library=LIBMVEC
-Wl,-mlirv -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mlirv -vectorize-memory-aggressively
-mlirv -function-specialize -mlirv -enable-gvn-hoist
-mlirv -unroll-threshold=50 -fremap-arrays
-mlirv -vector-library=LIBMVEC
-mlirv -reduce-array-computations=3
-mlirv -global-vectorize-slp -mlirv -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:

(Continued on next page)
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Peak Optimization Flags (Continued)

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: -m32 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-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=10000 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc

631.deepsjeng_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-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=10000 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-lmvec -lamdlibm -ljemalloc -lflang

641.leela_s: basepeak = yes

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-lv-split -O3 -march=znver2 -funroll-loops
-Mrecursive -mllvm -vector-library=LIBMVEC
-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
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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/HPE-Platform-Flags-AMD-V1.2-EPYC-revH.html

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

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