**SPEC CPU®2017 Integer Speed Result**

Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL325 Gen10 Plus v2  
(2.30 GHz, AMD EPYC 7643)

**SPECspeed®2017_int_base = 12.1**  
**SPECspeed®2017_int_peak = 12.1**

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (12.1)</th>
<th>SPECspeed®2017_int_peak (12.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** AMD EPYC 7643
- **Max MHz:** 3600
- **Nominal:** 2300
- **Enabled:** 48 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, 32 MB shared / 6 cores
- **Other:** None
- **Memory:** 1 TB (8 x 128 GB 4Rx4 PC4-3200AA-L)
- **Storage:** 1 x 800 GB SAS SSD, RAID 0

### Software

- **OS:** Ubuntu 20.04.1 LTS (x86_64)
- **Kernel:** 5.4.0-54-generic
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC
- **Parallel:** Yes
- **Firmware:** HPE BIOS Version A43 v2.42 04/15/2021 released Apr-2021
- **File System:** ext4
- **System State:** Run level 5 (multi-user, GUI disabled)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 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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SPECspeed®2017_int_base = 12.1  
SPECspeed®2017_int_peak = 12.1  

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>48</td>
<td>274</td>
<td>6.49</td>
<td>275</td>
<td>6.45</td>
<td>273</td>
<td>6.51</td>
<td>1</td>
<td>261</td>
<td>6.79</td>
<td>264</td>
<td>6.72</td>
<td>261</td>
<td>6.81</td>
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<tr>
<td>605.mcf_s</td>
<td>48</td>
<td>232</td>
<td>20.3</td>
<td>232</td>
<td>20.4</td>
<td>232</td>
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<td>48</td>
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<td>20.3</td>
<td>232</td>
<td>20.4</td>
<td>232</td>
<td>20.4</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>48</td>
<td>193</td>
<td>8.43</td>
<td>195</td>
<td>8.38</td>
<td>190</td>
<td>8.60</td>
<td>48</td>
<td>193</td>
<td>8.43</td>
<td>195</td>
<td>8.38</td>
<td>190</td>
<td>8.60</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>48</td>
<td>102</td>
<td>13.9</td>
<td>103</td>
<td>13.8</td>
<td>102</td>
<td>14.0</td>
<td>48</td>
<td>102</td>
<td>13.9</td>
<td>103</td>
<td>13.8</td>
<td>102</td>
<td>14.0</td>
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<tr>
<td>625.x264_s</td>
<td>48</td>
<td>105</td>
<td>16.8</td>
<td>106</td>
<td>16.6</td>
<td>105</td>
<td>16.7</td>
<td>48</td>
<td>105</td>
<td>16.8</td>
<td>106</td>
<td>16.6</td>
<td>105</td>
<td>16.7</td>
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<tr>
<td>641.leela_s</td>
<td>48</td>
<td>309</td>
<td>5.53</td>
<td>308</td>
<td>5.53</td>
<td>308</td>
<td>5.53</td>
<td>1</td>
<td>309</td>
<td>5.52</td>
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<td>5.54</td>
<td>308</td>
<td>5.53</td>
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<tr>
<td>648.exchange2_s</td>
<td>48</td>
<td>129</td>
<td>22.9</td>
<td>128</td>
<td>22.9</td>
<td>128</td>
<td>22.9</td>
<td>48</td>
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<td>657.xz_s</td>
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<td>24.2</td>
<td>255</td>
<td>24.2</td>
<td>254</td>
<td>24.3</td>
<td>48</td>
<td>255</td>
<td>24.2</td>
<td>255</td>
<td>24.2</td>
<td>254</td>
<td>24.3</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 limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit
runcpu command invoked through numacl i.e.: numacl --interleave=all runcpu <etc>
'echo 8 > /proc/sys/vm/dirty_ratio' run as root to limit dirty cache to 8% of memory.
'echo 1 > /proc/sys/vm/swappiness' run as root to limit swap usage to minimum necessary.
'echo 1 > /proc/sys/vm/zone_reclaim_mode' run as root to free node-local memory and avoid remote memory usage.
'sync; echo 3 > /proc/sys/vm/drop_caches' run as root to reset filesystem caches.
'sysctl -w kernel.randomize_va_space=0' run as root to disable address space layout randomization (ASLR) to reduce run-to-run variability.

The real test date is Apr-2021. The clock was mistakenly set to 2020 before the benchmark was run.

(Continued on next page)
**Hewlett Packard Enterprise**

(2.30 GHz, AMD EPYC 7643)

**SPECspeed®2017_int_base = 12.1**

**SPECspeed®2017_int_peak = 12.1**

---

**Operating System Notes (Continued)**

To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s,
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

---

**Environment Variables Notes**

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

GOMP_CPU_AFFINITY = "0-47"

LD_LIBRARY_PATH =
"/cpu2017/amd_speed_aocc300_milan_B_lib/64;/cpu2017/amd_speed_aocc300_milan_B_lib/32:" 

MALLOC_CONF = "retain:true"

OMP_DYNAMIC = "false"

OMP_SCHEDULE = "static"

OMP_STACKSIZE = "128M"

OMP_THREAD_LIMIT = "48"

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

GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 641.leela_s peak run:

GOMP_CPU_AFFINITY = "0"

---

**General Notes**

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 512GiB Memory using OpenSUSE 15.2

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 v4.8.2 in RHEL 7.4 (No options specified)

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: Wed May 12 19:01:22 EDT 2021

(Continued on next page)
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<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1</td>
<td>12.1</td>
</tr>
</tbody>
</table>

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

**General Notes (Continued)**

Submission: cpu2017-20210512-26342.sub

**Platform Notes**

BIOS Configuration
- Workload Profile set to General Throughput Compute
- AMD SMT Option set to Disabled
- Determinism Control set to Manual
  - Performance Determinism set to Power Deterministic
- Last-Level Cache (LLC) as NUMA Node set to Enabled
- Memory PStates set to Disabled
- Data Fabric C-State Enable set to Force Enabled
- Thermal Configuration set to Maximum Cooling
- Workload Profile set to Custom
  - Infinity Fabric Power Management set to Disabled
  - Infinity Fabric Performance State set to P0
- L1 HW Prefetcher set to Disabled

Sysinfo program /cpu2017/bin/sysinfo  
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c  
running on dl325gen10plus Wed Apr 1 12:25:20 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 7643 48-Core Processor  
1 "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 : 48
siblings : 48

  
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29 32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61

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): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 48

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

<table>
<thead>
<tr>
<th>Socket(s):</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMA node(s):</td>
<td>8</td>
</tr>
<tr>
<td>Vendor ID:</td>
<td>AuthenticAMD</td>
</tr>
<tr>
<td>CPU family:</td>
<td>25</td>
</tr>
<tr>
<td>Model:</td>
<td>1</td>
</tr>
<tr>
<td>Model name:</td>
<td>AMD EPYC 7643 48-Core Processor</td>
</tr>
<tr>
<td>Stepping:</td>
<td>1</td>
</tr>
<tr>
<td>Frequency boost:</td>
<td>enabled</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2222.579</td>
</tr>
<tr>
<td>CPU max MHz:</td>
<td>2300.0000</td>
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<tr>
<td>CPU min MHz:</td>
<td>1500.0000</td>
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<tr>
<td>BogoMIPS:</td>
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<tr>
<td>Virtualization:</td>
<td>AMD-V</td>
</tr>
<tr>
<td>L1d cache:</td>
<td>1.5 MiB</td>
</tr>
<tr>
<td>L1i cache:</td>
<td>1.5 MiB</td>
</tr>
<tr>
<td>L2 cache:</td>
<td>24 MiB</td>
</tr>
<tr>
<td>L3 cache:</td>
<td>256 MiB</td>
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<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-5</td>
</tr>
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<td>NUMA node1 CPU(s):</td>
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<td>NUMA node2 CPU(s):</td>
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<td>NUMA node3 CPU(s):</td>
<td>18-23</td>
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<td>NUMA node4 CPU(s):</td>
<td>24-29</td>
</tr>
<tr>
<td>NUMA node5 CPU(s):</td>
<td>30-35</td>
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<tr>
<td>NUMA node6 CPU(s):</td>
<td>36-41</td>
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<tr>
<td>NUMA node7 CPU(s):</td>
<td>42-47</td>
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<tr>
<td>Vulnerability Itlb multihit:</td>
<td>Not affected</td>
</tr>
<tr>
<td>Vulnerability L1tf:</td>
<td>Not affected</td>
</tr>
<tr>
<td>Vulnerability Mds:</td>
<td>Not affected</td>
</tr>
<tr>
<td>Vulnerability Meltdown:</td>
<td>Not affected</td>
</tr>
<tr>
<td>Vulnerability Spec store bypass:</td>
<td>Mitigation; Speculative Store Bypass disabled via prctl and seccomp</td>
</tr>
<tr>
<td>Vulnerability Spectre v1:</td>
<td>Mitigation; usercopy/swapgs barriers and __user pointer sanitation</td>
</tr>
<tr>
<td>Vulnerability Spectre v2:</td>
<td>Mitigation; Full AMD retpoline, IBPB conditional, IBRS_FW, STIBP disabled, RSB filling</td>
</tr>
<tr>
<td>Vulnerability Srbds:</td>
<td>Not affected</td>
</tr>
<tr>
<td>Vulnerability Tsx async abort:</td>
<td>Not affected</td>
</tr>
<tr>
<td>Flags:</td>
<td>fpu vme de pse tsc msr pae mce cx8 apic sep mtrr</td>
</tr>
<tr>
<td></td>
<td>pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt</td>
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<td>pdcp1gb rdtsscp lm constant_tsc rep_good nopt nonstop_tsc cpuid extd_apicid</td>
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<td>aperfmpref perfmpref pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes</td>
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<td>xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a</td>
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<tr>
<td></td>
<td>misalignsse 3dnowprefetch osvw ibs kinit wdt tce topoext perfctr_core perfctr_nb</td>
</tr>
<tr>
<td></td>
<td>bext perfctr_11c mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bm11 avx2 smep bmi2 invpcid cmqm rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsavec cmqm_llc cmqm_occup_llc</td>
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<tr>
<td></td>
<td>cmqm_mbb_total cmqm_mbb_local clzero irperf xsaveerptr wbnoinvd arat npt lbrv svm_lock</td>
</tr>
</tbody>
</table>

(Continued on next page)
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SPECspeed®2017_int_peak = 12.1

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

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

node 0 cpus: 0 1 2 3 4 5
node 0 size: 128775 MB
node 0 free: 128615 MB
node 1 cpus: 6 7 8 9 10 11
node 1 size: 129022 MB
node 1 free: 128833 MB
node 2 cpus: 12 13 14 15 16 17
node 2 size: 129022 MB
node 2 free: 128836 MB
node 3 cpus: 18 19 20 21 22 23
node 3 size: 129022 MB
node 3 free: 128901 MB
node 4 cpus: 24 25 26 27 28 29
node 4 size: 129022 MB
node 4 free: 128897 MB
node 5 cpus: 30 31 32 33 34 35
node 5 size: 129022 MB
node 5 free: 128917 MB
node 6 cpus: 36 37 38 39 40 41
node 6 size: 128998 MB
node 6 free: 128576 MB
node 7 cpus: 42 43 44 45 46 47
node 7 size: 116908 MB
node 7 free: 116737 MB
node distances:

...
Platform Notes (Continued)

Hugepagesize: 2048 kB

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

/usr/bin/lsb_release -d
   Ubuntu 20.04.1 LTS

From /etc/*release* /etc/*version*
   debian_version: bullseye/sid
   os-release:
      NAME="Ubuntu"
      VERSION="20.04.1 LTS (Focal Fossa)"
      ID=ubuntu
      ID_LIKE=debian
      PRETTY_NAME="Ubuntu 20.04.1 LTS"
      VERSION_ID="20.04"
      HOME_URL="https://www.ubuntu.com/"
      SUPPORT_URL="https://help.ubuntu.com/"

uname -a:
   Linux dl325gen10plus 5.4.0-54-generic #60-Ubuntu SMP Fri Nov 6 10:37:59 UTC 2020
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2018-3639 (Speculative Store Bypass): Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: disabled, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 5 Apr 1 12:23

SPEC is set to: /cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 ext4 733G 24G 672G 4% /
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Test Date: Apr-2021
Hardware Availability: Jun-2021
Software Availability: Mar-2021

Platform Notes (Continued)

From /sys/devices/virtual/dmi/id
Vendor:         HPE
Product:        ProLiant DL325 Gen10 Plus
Product Family: ProLiant
Serial:         CN79290FKQ

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 Samsung M386AAG40AM3-CWE 128 GB 4 rank 3200
8x UNKNOWN NOT AVAILABLE

BIOS:
BIOS Vendor:       HPE
BIOS Version:      A43
BIOS Date:         04/15/2021
BIOS Revision:     2.42
Firmware Revision: 2.40

(End of data from sysinfo program)

Compiler Version Notes

== C ==
600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

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

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

(Continued on next page)
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**Tested by:** HPE  
**Test Date:** Apr-2021  
**Hardware Availability:** Jun-2021  
**Software Availability:** Mar-2021

---

### Compiler Version Notes (Continued)

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

---

**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:**
  ```
  -m64 -mno-adx -mno-sse4a -Wl,-allow-multiple-definition  
  -Wl,-mllvm -Wl,-enable-licm-vrp -Wl,-mllvm -Wl,-region-vectorize
  ```

(Continued on next page)
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(Test Sponsor: HPE)
ProLiant DL325 Gen10 Plus v2
(2.30 GHz, AMD EPYC 7643)

SPECspeed®2017_int_base = 12.1
SPECspeed®2017_int_peak = 12.1

Base Optimization Flags (Continued):

C benchmarks (continued):
- -Wl,-mlllvm -Wl,-function-specialize
- -Wl,-mlllvm -Wl,-align-all-noallthru-blocks=6
- -Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
- -fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
- -mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000
- -fremap-arrays -mlllvm -function-specialize -flv-function-specialization
- -mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true
- -mlllvm -enable-lcm-vrp -mlllvm -reduce-array-computations=3 -z mulefs
- -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
- -lflang -lflangrti

C++ benchmarks:
- -m64 -std=c++98 -mno-adx -mno-sse4a
- -Wl,-mlllvm -Wl,-do-block-reorder=aggressive
- -Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-function-specialize
- -Wl,-mlllvm -Wl,-align-all-noallthru-blocks=6
- -Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
- -fveclib=AMDLIBM -ffast-math -flto -mlllvm -enable-partial-unswitch
- -mlllvm -unroll-threshold=100 -finline-aggressive
- -flv-function-specialization -mlllvm -loop-unswitch-threshold=200000
- -mlllvm -reroll-loops -mlllvm -aggressive-loop-unswitch
- -mlllvm -extra-vectorizer-passes -mlllvm -reduce-array-computations=3
- -mlllvm -global-vectorize-slp=true -mlllvm -convert-pow-exp-to-int=false
- -z mulefs -mlllvm -do-block-reorder=aggressive
- -fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP
- -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
- -lflangrti

Fortran benchmarks:
- -m64 -mno-adx -mno-sse4a -Wl,-mlllvm -Wl,-inline-recursion=4
- -Wl,-mlllvm -Wl,-isr-in-nested-loop -Wl,-mlllvm -Wl,-enable-iv-split
- -Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-function-specialize
- -Wl,-mlllvm -Wl,-align-all-noallthru-blocks=6
- -Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
- -fveclib=AMDLIBM -ffast-math -flto -z mulefs
- -mlllvm -unroll-aggressive -mlllvm -unroll-threshold=150 -DSPEC_OPENMP
- -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
- -lflangrti

Base Other Flags

C benchmarks:
- -Wno-unused-command-line-argument -Wno-return-type

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## Base Other Flags (Continued)

C++ benchmarks:
- `-Wno-unused-command-line-argument` `-Wno-return-type`

Fortran benchmarks:
- `-Wno-return-type`

## Peak Compiler Invocation

C benchmarks:
- `clang`

C++ benchmarks:
- `clang++`

Fortran benchmarks:
- `flang`

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:
- `600.perlbench_s` `-m64` `-mno-adx` `-mno-sse4a` `-Wl,-allow-multiple-definition`
- `-Wl,-mlllvm -Wl,-enable-licm-vrp`
- `-Wl,-mlllvm -Wl,-function-specialize`
- `-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3 -Ofast`
- `-march=znver3` `-fveclib=AMDLIBM` `-ffast-math` `-flto`
- `-fstruct-layout=5` `-mlllvm -unroll-threshold=50`
- `-ffreemap-arrays` `-ffunction-specialization`
- `-mlllvm -inline-threshold=1000 -mlllvm -enable-gvn-hoist`
- `-mlllvm -global-vectorize-slp=true`
- `-mlllvm -function-specialize` `-mlllvm -enable-licm-vrp`
- `-mlllvm -reduce-array-computations=3` `-DSPEC_OPENMP -fopenmp`
- `-fopenmp=libomp` `-lomp` `-lamdlibm` `-ljemalloc -lflang`

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### Peak Optimization Flags (Continued)

602.gcc_s: basepeak = yes
605.mcf_s: basepeak = yes
625.x264_s: basepeak = yes
657.xz_s: basepeak = yes

C++ benchmarks:
620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
641.leela_s: -m64 -std=c++98 -mno-adx -mno-sse4a
        -Wl,-mllvm -Wl,-do-block-reorder=aggressive
        -Wl,-mllvm -Wl,-function-specialize
        -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
        -Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
        -march=znver3 -fveclib=AMDLIBM -ffast-math -flto
        -finline-aggressive -mllvm -unroll-threshold=100
        -flv-function-specialization -mllvm -enable-licm-vrp
        -mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
        -mllvm -reduce-array-computations=3
        -mllvm -global-vectorize-slp=true
        -mllvm -do-block-reorder=aggressive
        -fvirtual-function-elimination -fvisibility=hidden
        -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamlibm
        -ljemalloc -lflang

Fortran benchmarks:
648.exchange2_s: basepeak = yes

### Peak Other Flags

C benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

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(2.30 GHz, AMD EPYC 7643)

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Test Sponsor: HPE
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Test Date: Apr-2021
Hardware Availability: Jun-2021
Software Availability: Mar-2021

Peak Other Flags (Continued)

C++ benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

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-revP.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-revP.xml

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