SPEC CPU®2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.80 GHz, AMD EPYC 7543)

SPECspeed®2017_int_base = 12.5
SPECspeed®2017_int_peak = 12.5

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

Threads
600.perlbench_s 64
602.gcc_s 64
605.mcf_s 64
620.omnetpp_s 64
623.xalanbmk_s 64
625.x264_s 64
631.deepsjeng_s 64
641.leea_s 64
648.exchange2_s 64
657.xz_s 64

Hardware
CPU Name: AMD EPYC 7543
Max MHz: 3700
Nominal: 2800
Enabled: 64 cores, 2 chips
Orderable: 1, 2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 512 KB I+D on chip per core
L3: 256 MB I+D on chip per chip, 32 MB shared / 4 cores
Other: None
Memory: 2 TB (16 x 128 GB 4Rx4 PC4-3200AA-L)
Storage: 1 x 196 GB SATA SSD, RAID 0
Other: None

Software
OS: Ubuntu 20.04.1 LTS (x86_64)
Kernel: 5.4.0-56-generic
Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
Parallel: Yes
Firmware: HPE BIOS Version A42 v2.40 02/23/2021 released Feb-2021
File System: ext4
System State: Run level 5 (multi-user)
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

Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021
## 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>
</tr>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>64</td>
<td>269</td>
<td>6.60</td>
<td>270</td>
<td>6.57</td>
<td>269</td>
<td>6.59</td>
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<tr>
<td>602.gcc_s</td>
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<td>13.4</td>
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<td>605.mcf_s</td>
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<td>20.9</td>
<td>225</td>
<td>21.0</td>
<td>226</td>
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<td></td>
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<tr>
<td>620.omnetpp_s</td>
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<td>191</td>
<td>8.55</td>
<td>191</td>
<td>8.56</td>
<td>187</td>
<td>8.74</td>
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<tr>
<td>623.xalanchmk_s</td>
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<td>98.5</td>
<td>14.4</td>
<td>100</td>
<td>14.1</td>
<td>98.5</td>
<td>14.4</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>625.x264_s</td>
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<td>102</td>
<td>17.3</td>
<td>102</td>
<td>17.4</td>
<td>101</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>64</td>
<td>222</td>
<td>6.45</td>
<td>222</td>
<td>6.46</td>
<td>226</td>
<td>6.34</td>
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<td></td>
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<td></td>
<td></td>
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<td>641.leela_s</td>
<td>64</td>
<td>290</td>
<td>5.87</td>
<td>291</td>
<td>5.87</td>
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<td>5.88</td>
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<td>648.exchange2_s</td>
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<td>23.7</td>
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<td>124</td>
<td>23.7</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>64</td>
<td>237</td>
<td>26.1</td>
<td>238</td>
<td>26.0</td>
<td>237</td>
<td>26.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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.

### 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>

'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.
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root to enable

(Continued on next page)
## Operating System Notes (Continued)
Transparent Hugepages (THP) for this run.
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root for peak runs of 628.pop2_s and 638.imagick_s to enable THP only on request.

## Environment Variables Notes
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH = 
"/home/cpu2017n/amd_speed_aocc300_milan_B_lib/64;/home/cpu2017n/amd_speed_aocc300_milan_B_lib/32;"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "64"

## General Notes
Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB 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

## Platform Notes
BIOS Configuration
- Workload Profile set to General Peak Frequency 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
- NUMA memory domains per socket set to One memory domain per socket
- Thermal Configuration set to Maximum Cooling
- Workload Profile set to Custom
- Infinity Fabric Power Management set to Disabled

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

Infinity Fabric Performance State set to P0
Power Regulator set to OS Control Mode

Sysinfo program /home/cpu2017n/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on admin Wed Apr 1 17:26:11 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>model name</td>
<td>AMD EPYC 7543 32-Core Processor</td>
</tr>
<tr>
<td>physical id&quot;s (chips)</td>
<td>64</td>
</tr>
<tr>
<td>cores, siblings</td>
<td>[<a href="44x505">257x294</a>]</td>
</tr>
<tr>
<td>cpu cores</td>
<td>32</td>
</tr>
<tr>
<td>siblings</td>
<td>32</td>
</tr>
<tr>
<td>physical 0: cores</td>
<td>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</td>
</tr>
<tr>
<td>physical 1: cores</td>
<td>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</td>
</tr>
</tbody>
</table>

From lscpu:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture:</td>
<td>x86_64</td>
</tr>
<tr>
<td>CPU op-mode(s):</td>
<td>32-bit, 64-bit</td>
</tr>
<tr>
<td>Byte Order:</td>
<td>Little Endian</td>
</tr>
<tr>
<td>Address sizes:</td>
<td>48 bits physical, 48 bits virtual</td>
</tr>
<tr>
<td>CPU(s):</td>
<td>64</td>
</tr>
<tr>
<td>On-line CPU(s) list:</td>
<td>0-63</td>
</tr>
<tr>
<td>Thread(s) per core:</td>
<td>1</td>
</tr>
<tr>
<td>Core(s) per socket:</td>
<td>32</td>
</tr>
<tr>
<td>Socket(s):</td>
<td>2</td>
</tr>
<tr>
<td>NUMA node(s):</td>
<td>16</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 7543 32-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>1785.257</td>
</tr>
<tr>
<td>CPU max MHz:</td>
<td>2800.0000</td>
</tr>
<tr>
<td>CPU min MHz:</td>
<td>1500.0000</td>
</tr>
<tr>
<td>BogoMIPS:</td>
<td>5589.57</td>
</tr>
<tr>
<td>Virtualization:</td>
<td>AMD-V</td>
</tr>
<tr>
<td>L1d cache:</td>
<td>2 MiB</td>
</tr>
</tbody>
</table>
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Test Date: Mar-2021
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Software Availability: Mar-2021

Platform Notes (Continued)

L1i cache: 2 MiB
L2 cache: 32 MiB
L3 cache: 512 MiB
NUMA node0 CPU(s): 0-3
NUMA node1 CPU(s): 4-7
NUMA node2 CPU(s): 8-11
NUMA node3 CPU(s): 12-15
NUMA node4 CPU(s): 16-19
NUMA node5 CPU(s): 20-23
NUMA node6 CPU(s): 24-27
NUMA node7 CPU(s): 28-31
NUMA node8 CPU(s): 32-35
NUMA node9 CPU(s): 36-39
NUMA node10 CPU(s): 40-43
NUMA node11 CPU(s): 44-47
NUMA node12 CPU(s): 48-51
NUMA node13 CPU(s): 52-55
NUMA node14 CPU(s): 56-59
NUMA node15 CPU(s): 60-63

Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBPB conditional, IBRS_FW, STIBP disabled, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibr legacy tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 invpcid cmp rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occupp llc cqm_mbb_total cqm_mbb_local clzero iperf xsaveprtr wbinvd arat npt lbv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_recov succor smca

/proc/cpuinfo cache data
cache size : 512 KB

(Continued on next page)
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<table>
<thead>
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<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tbody>
<tr>
<td>12.5</td>
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</table>

**CPU2017 License:** 3  
**Test Date:** Mar-2021  
**Test Sponsor:** HPE  
**Hardware Availability:** Apr-2021  
**Tested by:** HPE  
**Software Availability:** Mar-2021

**Platform Notes (Continued)**

From numactl --hardware  
WARNING: a numactl 'node' might or might not correspond to a physical chip.  
available: 16 nodes (0-15)  
node 0 cpus: 0 1 2 3  
node 0 size: 128777 MB  
node 0 free: 128649 MB  
node 1 cpus: 4 5 6 7  
node 1 size: 129022 MB  
node 1 free: 128914 MB  
node 2 cpus: 8 9 10 11  
node 2 size: 129022 MB  
node 2 free: 128915 MB  
node 3 cpus: 12 13 14 15  
node 3 size: 129022 MB  
node 3 free: 128924 MB  
node 4 cpus: 16 17 18 19  
node 4 size: 129022 MB  
node 4 free: 128924 MB  
node 5 cpus: 20 21 22 23  
node 5 size: 129022 MB  
node 5 free: 128937 MB  
node 6 cpus: 24 25 26 27  
node 6 size: 129022 MB  
node 6 free: 128938 MB  
node 7 cpus: 28 29 30 31  
node 7 size: 116909 MB  
node 7 free: 116807 MB  
node 8 cpus: 32 33 34 35  
node 8 size: 129022 MB  
node 8 free: 128939 MB  
node 9 cpus: 36 37 38 39  
node 9 size: 129022 MB  
node 9 free: 128897 MB  
node 10 cpus: 40 41 42 43  
node 10 size: 129022 MB  
node 10 free: 128946 MB  
node 11 cpus: 44 45 46 47  
node 11 size: 129022 MB  
node 11 free: 128949 MB  
node 12 cpus: 48 49 50 51  
node 12 size: 129022 MB  
node 12 free: 128949 MB  
node 13 cpus: 52 53 54 55  
node 13 size: 129022 MB  
node 13 free: 128896 MB  
node 14 cpus: 56 57 58 59  
node 14 size: 129022 MB

(Continued on next page)
SPEC CPU® 2017 Integer Speed Result

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SPECspeed® 2017_int_base = 12.5
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<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>Test Date</th>
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<tbody>
<tr>
<td>3</td>
<td>Mar-2021</td>
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<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>Hardware Availability</th>
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<tbody>
<tr>
<td>HPE</td>
<td>Apr-2021</td>
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<th>Tested by</th>
<th>Software Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPE</td>
<td>Mar-2021</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

node 14 free: 128952 MB
node 15 cpus: 60 61 62 63
node 15 size: 128994 MB
node 15 free: 128824 MB

node distances:

node 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
0: 11 10 11 11 11 11 11 11 32 32 32 32 32 32 32 32
1: 11 11 10 11 11 11 11 32 32 32 32 32 32 32 32 32
2: 11 11 11 10 11 32 11 32 32 32 32 32 32 32 32 32
8: 32 32 32 32 32 32 32 32 10 11 11 11 32 32 32 32
10: 32 32 32 32 32 32 32 32 10 11 11 11 32 32 32 32
11: 32 32 32 32 32 32 32 32 10 11 11 11 32 32 32 32
12: 32 32 32 32 32 32 32 32 10 11 11 11 32 32 32 32
14: 32 32 32 32 32 32 32 32 10 11 11 11 32 32 32 32
15: 32 32 32 32 32 32 32 32 10 11 11 11 32 32 32 32

From /proc/meminfo
MemTotal: 2101226844 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
Current active profile: balanced

/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/"

(Continued on next page)
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Platform Notes (Continued)

uname -a:
    Linux admin 5.4.0-56-generic #62-Ubuntu SMP Mon Nov 23 19:20:19 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): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBFB: conditional, IBRS_FW, STIBP: disabled, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 5 Apr 1 17:24

SPEC is set to: /home/cpu2017n
  Filesystem          Type Size  Used Avail Use% Mounted on
  /dev/mapper/ubuntu--vg-ubuntu--lv ext4 196G  50G 137G  27% /

From /sys/devices/virtual/dmi/id
  Vendor: HPE
  Product: ProLiant DL365 Gen10 Plus
  Product Family: ProLiant
  Serial: CN70430NKR

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 UNKNOWN M386AAG40AM3-CWE 128 GB 4 rank 3200
    16x UNKNOWN NOT AVAILABLE

BIOS:
  BIOS Vendor: HPE
  BIOS Version: A42
**Platform Notes (Continued)**

- BIOS Date: 02/23/2021
- BIOS Revision: 2.40
- 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

---

Fortran | 648.exchange2_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

---

**Base Compiler Invocation**

C benchmarks:
clang

(Continued on next page)
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Base Compiler Invocation (Continued)

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.xalancbk_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-llvm-vrp -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -o3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti

C++ benchmarks:
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -o3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -mllvm -enable-partial-unswitch

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SPEC CPU®2017 Integer Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.80 GHz, AMD EPYC 7543)

SPECspeed®2017_int_base = 12.5
SPECspeed®2017_int_peak = 12.5

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

Base Optimization Flags (Continued)

C++ benchmarks (continued):
-mlir -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mlir -loop-unswitch-threshold=200000
-mlir -reroll-loops -mlir -aggressive-loop-unswitch
-mlir -extra-vectorizer-passes -mlir -reduce-array-computations=3
-mlir -global-vectorize-slp=true -mlir -convert-pow-exp-to-int=false
-z mulf -mlir -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP
-fopenmp -fopenmp=libomp -lomp -lamlibm -ljemalloc -lflang
-lflangi

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mlir -Wl,-inline-recursion=4
-Wl,-mlir -Wl,-lsr-in-nested-loop -Wl,-mlir -enable-iv-split
-Wl,-mlir -Wl,-region-vectorize -Wl,-mlir -Wl,-function-specialize
-Wl,-mlir -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlir -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -z mulf -mlir
-fmlir -unroll-aggressive -mlir -unroll-threshold=150 -DSPEC_OPENMP
-fopenmp -fopenmp=libomp -lomp -lamlibm -ljemalloc -lflang
-lflangi

Base Other Flags

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

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

Fortran benchmarks:
-Wno-return-type

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

(Continued on next page)
Wide or Narrow
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