## SPEC CPU®2017 Integer Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL365 Gen10 Plus  
(2.0 GHz, AMD EPYC 7663)

**SPECspeed®2017_int_base = 11.7**  
**SPECspeed®2017_int_peak = 11.7**

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Mar-2021</th>
<th>Hardware Availability:</th>
<th>Apr-2021</th>
<th>Software Availability:</th>
<th>Mar-2021</th>
</tr>
</thead>
</table>

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base (11.7)</th>
<th>SPECspeed®2017_int_peak (11.7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>112</td>
<td>6.14</td>
<td></td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>112</td>
<td>12.6</td>
<td></td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>112</td>
<td>19.5</td>
<td></td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>112</td>
<td>8.03</td>
<td></td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>112</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>625.x264_s</td>
<td>112</td>
<td>16.1</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>112</td>
<td>6.08</td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>112</td>
<td>5.44</td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>112</td>
<td>21.9</td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>112</td>
<td>24.3</td>
<td></td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** AMD EPYC 7663  
- **Max MHz:** 3500  
- **Nominal:** 2000  
- **Enabled:** 112 cores, 2 chips  
- **Orderable:** 1,2 chips  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **Cache L2:** 512 KB I+D on chip per core  
- **Cache L3:** 256 MB I+D on chip per core, 32 MB shared / 7 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 and OS set to prefer performance at the cost of additional power usage
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<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>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>112</td>
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<td>6.14</td>
<td>287</td>
<td>6.18</td>
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<td>6.13</td>
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<tr>
<td>602.gcc_s</td>
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<td>315</td>
<td>12.6</td>
<td>316</td>
<td>12.6</td>
<td>316</td>
<td>12.6</td>
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<tr>
<td>605.mcf_s</td>
<td>112</td>
<td>242</td>
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<tr>
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<td>112</td>
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<td>8.03</td>
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<td>8.06</td>
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<td>623.xalanchmk_s</td>
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<td>13.3</td>
<td>106</td>
<td>13.3</td>
<td>105</td>
<td>13.5</td>
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<tr>
<td>625.x264_s</td>
<td>112</td>
<td>109</td>
<td>16.1</td>
<td>110</td>
<td>16.1</td>
<td>109</td>
<td>16.2</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>112</td>
<td>236</td>
<td>6.08</td>
<td>237</td>
<td>6.06</td>
<td>235</td>
<td>6.09</td>
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<tr>
<td>641.leela_s</td>
<td>112</td>
<td>314</td>
<td>5.44</td>
<td>314</td>
<td>5.43</td>
<td>313</td>
<td>5.45</td>
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<td>134</td>
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<td>21.9</td>
<td>134</td>
<td>21.9</td>
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<tr>
<td>657.xz_s</td>
<td>112</td>
<td>254</td>
<td>24.3</td>
<td>253</td>
<td>24.4</td>
<td>259</td>
<td>23.9</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>

'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.

(Continued on next page)
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Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root to enable
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 = "0-111"
LD_LIBRARY_PATH =
"/home/cpu2017n/amd_speed_aocc300_milan_B_lib/64;/home/cpu2017n/amd_spee
d_aocc300_milan_B_lib/32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "112"

Environment variables set by runcpu during the 620.omnetpp_s peak run:
GOMP_CPU_AFFINITY = "0"

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

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE
Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

Platform Notes (Continued)

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
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 18:15:52 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 7663 56-Core Processor
  2 "physical id"s (chips)
  112 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
corpus from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores: 56
siblings: 56
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
  28 29 30 32 33 34 35 36 37 38 40 41 42 43 44 45 46 48 49 50 51 52 53 54 56 57 58 59
  60 61 62
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
  28 29 30 32 33 34 35 36 37 38 40 41 42 43 44 45 46 48 49 50 51 52 53 54 56 57 58 59
  60 61 62

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): 112
On-line CPU(s) list: 0-111
Thread(s) per core: 1
Core(s) per socket: 56
Socket(s): 2
NUMA node(s): 16
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7663 56-Core Processor

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

- **Stepping:** 1  
- **Frequency boost:** enabled  
- **CPU MHz:** 1728.597  
- **CPU max MHz:** 2000.0000  
- **CPU min MHz:** 1500.0000  
- **BogoMIPS:** 3992.29  
- **Virtualization:** AMD-V  
- **L1d cache:** 3.5 MiB  
- **L1i cache:** 3.5 MiB  
- **L2 cache:** 56 MiB  
- **L3 cache:** 512 MiB  

### NUMA node0 CPU(s):  
- 0-6  

### NUMA node1 CPU(s):  
- 7-13  

### NUMA node2 CPU(s):  
- 14-20  

### NUMA node3 CPU(s):  
- 21-27  

### NUMA node4 CPU(s):  
- 28-34  

### NUMA node5 CPU(s):  
- 35-41  

### NUMA node6 CPU(s):  
- 42-48  

### NUMA node7 CPU(s):  
- 49-55  

### NUMA node8 CPU(s):  
- 56-62  

### NUMA node9 CPU(s):  
- 63-69  

### NUMA node10 CPU(s):  
- 70-76  

### NUMA node11 CPU(s):  
- 77-83  

### NUMA node12 CPU(s):  
- 84-90  

### NUMA node13 CPU(s):  
- 91-97  

### NUMA node14 CPU(s):  
- 98-104  

### NUMA node15 CPU(s):  
- 105-111  

- **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 ptrct and seccomp  
- **Vulnerability Spectre v1:** Mitigation; usercopy/swapgs barriers and __user pointer sanitization  
- **Vulnerability Spectre v2:** Mitigation; Full AMD retpoline, IBFB 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 pdelbg rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic 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 bpsxt perfctr_l1d mwaimtx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 invpcid cqm rdt_a rdseed adx smap  

(Continued on next page)
Platform Notes (Continued)

clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsavees cqm_llc cqm_occup_llc
cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr wmbninvd arat npt lbrv svm_lock
nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pfthreshold
v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_recov succor smca

/proc/cpuinfo cache data
cache size : 512 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 4 5 6
node 0 size: 128776 MB
node 0 free: 128644 MB
node 1 cpus: 7 8 9 10 11 12 13
node 1 size: 129022 MB
node 1 free: 128894 MB
node 2 cpus: 14 15 16 17 18 19 20
node 2 size: 129022 MB
node 2 free: 128889 MB
node 3 cpus: 21 22 23 24 25 26 27
node 3 size: 129022 MB
node 3 free: 128824 MB
node 4 cpus: 28 29 30 31 32 33 34
node 4 size: 129022 MB
node 4 free: 128826 MB
node 5 cpus: 35 36 37 38 39 40 41
node 5 size: 129022 MB
node 5 free: 128888 MB
node 6 cpus: 42 43 44 45 46 47 48
node 6 size: 129022 MB
node 6 free: 128911 MB
node 7 cpus: 49 50 51 52 53 54 55
node 7 size: 116909 MB
node 7 free: 116815 MB
node 8 cpus: 56 57 58 59 60 61 62
node 8 size: 129022 MB
node 8 free: 128922 MB
node 9 cpus: 63 64 65 66 67 68 69
node 9 size: 128998 MB
node 9 free: 128901 MB
node 10 cpus: 70 71 72 73 74 75 76
node 10 size: 129022 MB
node 10 free: 128911 MB
node 11 cpus: 77 78 79 80 81 82 83
node 11 size: 129022 MB
node 11 free: 128924 MB

(Continued on next page)
Platform Notes (Continued)

node 12 cpus: 84 85 86 87 88 89 90
node 12 size: 129022 MB
node 12 free: 128928 MB
node 13 cpus: 91 92 93 94 95 96 97
node 13 size: 129022 MB
node 13 free: 128935 MB
node 14 cpus: 98 99 100 101 102 103 104
node 14 size: 129022 MB
node 14 free: 128891 MB
node 15 cpus: 105 106 107 108 109 110 111
node 15 size: 129017 MB
node 15 free: 128893 MB

node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
0:  10  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
1:  11  10  11  11  11  11  11  32  32  32  32  32  32  32  32  32
5:  11  11  11  11  11  10  11  32  32  32  32  32  32  32  32  32
From /proc/meminfo
MemTotal:    2101215940 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

(Continued on next page)
Platform Notes (Continued)

```
    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 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, IBPB: 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
```

(Continued on next page)
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Hewlett Packard Enterprise
(2.0 GHz, AMD EPYC 7663)

Platform Notes (Continued)

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
  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.xalanchbmk_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

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Base Portability Flags

600.perlbmk_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,-mlllvm -Wl,-enable-lcvm-vrp -Wl,-mlllvm -Wl,-region-vectorize
-Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-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-lcvm-vrp -mlllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-llangc -llangrti

(Continued on next page)
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SPECspeed®2017_int_base = 11.7
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Base Optimization Flags (Continued)

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
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3
-mllvm -global-vectorizer-slp=true -mllvm -convert-pow-exp-to-int=false
-z muldefs -mllvm -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,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
-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 -z muldefs
-mllvm -unroll-aggressive -mllvm -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

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

Fortran benchmarks:
-Wno-return-type
SPEC CPU®2017 Integer Speed Result
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Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.0 GHz, AMD EPYC 7663)

| SPECspeed®2017_int_base = 11.7 |
| SPECspeed®2017_int_peak = 11.7 |

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

Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

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: basepeak = yes
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: -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

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

## Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.0 GHz, AMD EPYC 7663)

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<tr>
<th>SPECspeed®2017_int_base = 11.7</th>
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</tr>
</tbody>
</table>

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

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### Peak Optimization Flags (Continued)

620.omnetpp_s (continued):
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm  
-ljemalloc -lflang

623.xalancbmk_s:basepeak = yes

631.deepsjeng_s:basepeak = yes

641.leela_s:basepeak = yes

Fortran benchmarks:

648.exchange2_s:basepeak = yes

### Peak 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

---

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

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