



# SPEC CPU®2017 Integer Speed Result

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## Hewlett Packard Enterprise

(Test Sponsor: HPE)

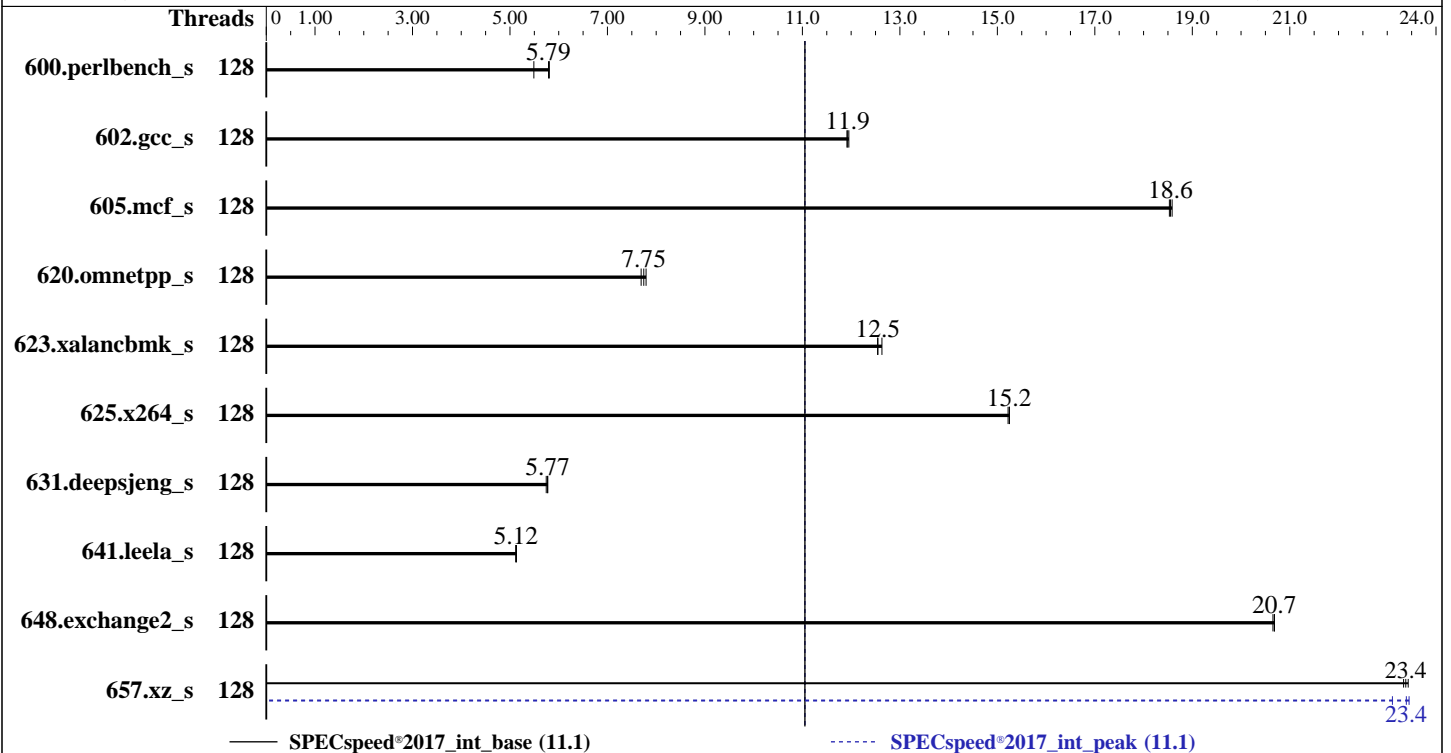
ProLiant DL365 Gen10 Plus  
(2.45 GHz, AMD EPYC 7763)

SPECspeed®2017\_int\_base = 11.1

SPECspeed®2017\_int\_peak = 11.1

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

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



### Hardware

CPU Name: AMD EPYC 7763  
Max MHz: 3500  
Nominal: 2450  
Enabled: 128 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 / 8 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



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## Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	128	306	5.81	323	5.49	<b>307</b>	<b>5.79</b>	128	306	5.81	323	5.49	<b>307</b>	<b>5.79</b>
602.gcc_s	128	333	12.0	<b>334</b>	<b>11.9</b>	334	11.9	128	333	12.0	<b>334</b>	<b>11.9</b>	334	11.9
605.mcf_s	128	<b>254</b>	<b>18.6</b>	255	18.5	254	18.6	128	<b>254</b>	<b>18.6</b>	255	18.5	254	18.6
620.omnetpp_s	128	212	7.69	<b>211</b>	<b>7.75</b>	209	7.79	128	212	7.69	<b>211</b>	<b>7.75</b>	209	7.79
623.xalancbmk_s	128	113	12.5	<b>113</b>	<b>12.5</b>	112	12.6	128	113	12.5	<b>113</b>	<b>12.5</b>	112	12.6
625.x264_s	128	116	15.2	116	15.2	<b>116</b>	<b>15.2</b>	128	116	15.2	116	15.2	<b>116</b>	<b>15.2</b>
631.deepsjeng_s	128	<b>248</b>	<b>5.77</b>	249	5.74	248	5.77	128	<b>248</b>	<b>5.77</b>	249	5.74	248	5.77
641.leela_s	128	333	5.12	332	5.13	<b>333</b>	<b>5.12</b>	128	333	5.12	332	5.13	<b>333</b>	<b>5.12</b>
648.exchange2_s	128	142	20.7	142	20.7	<b>142</b>	<b>20.7</b>	128	142	20.7	142	20.7	<b>142</b>	<b>20.7</b>
657.xz_s	128	264	23.4	265	23.3	<b>264</b>	<b>23.4</b>	128	<b>264</b>	<b>23.4</b>	264	23.4	268	23.1

SPECspeed®2017\_int\_base = **11.1**

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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.

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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 = "0-127"

LD\_LIBRARY\_PATH =

"/home/cpu2017n/amd\_speed\_aocc300\_milan\_B\_lib/64:/home/cpu2017n/amd\_spe  
d\_aocc300\_milan\_B\_lib/32:"

MALLOC\_CONF = "retain:true"

OMP\_DYNAMIC = "false"

OMP\_SCHEDULE = "static"

OMP\_STACKSIZE = "128M"

OMP\_THREAD\_LIMIT = "128"

Environment variables set by runcpu during the 657.xz\_s peak run:

GOMP\_CPU\_AFFINITY = "0-127"

## 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

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## Platform Notes (Continued)

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 18:00:05 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 7763 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 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): 128  
On-line CPU(s) list: 0-127  
Thread(s) per core: 1  
Core(s) per socket: 64  
Socket(s): 2  
NUMA node(s): 16  
Vendor ID: AuthenticAMD  
CPU family: 25  
Model: 1  
Model name: AMD EPYC 7763 64-Core Processor  
Stepping: 1

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## Platform Notes (Continued)

```

Frequency boost:          enabled
CPU MHz:                  1796.525
CPU max MHz:              2450.0000
CPU min MHz:              1500.0000
BogoMIPS:                 4891.30
Virtualization:          AMD-V
L1d cache:                4 MiB
L1i cache:                4 MiB
L2 cache:                 64 MiB
L3 cache:                 512 MiB
NUMA node0 CPU(s):       0-7
NUMA node1 CPU(s):       8-15
NUMA node2 CPU(s):       16-23
NUMA node3 CPU(s):       24-31
NUMA node4 CPU(s):       32-39
NUMA node5 CPU(s):       40-47
NUMA node6 CPU(s):       48-55
NUMA node7 CPU(s):       56-63
NUMA node8 CPU(s):       64-71
NUMA node9 CPU(s):       72-79
NUMA node10 CPU(s):      80-87
NUMA node11 CPU(s):      88-95
NUMA node12 CPU(s):      96-103
NUMA node13 CPU(s):      104-111
NUMA node14 CPU(s):      112-119
NUMA node15 CPU(s):      120-127
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
aperfmpperf 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
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 cqm rdt_a rdseed adx smap
clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc

```

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## Platform Notes (Continued)

cqm\_mbm\_total cqm\_mbm\_local clzero irperf xsaveerptr wbnoinvd arat npt lbrv 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
```

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 7  
node 0 size: 128776 MB  
node 0 free: 128624 MB  
node 1 cpus: 8 9 10 11 12 13 14 15  
node 1 size: 129022 MB  
node 1 free: 128797 MB  
node 2 cpus: 16 17 18 19 20 21 22 23  
node 2 size: 129022 MB  
node 2 free: 128778 MB  
node 3 cpus: 24 25 26 27 28 29 30 31  
node 3 size: 129022 MB  
node 3 free: 128869 MB  
node 4 cpus: 32 33 34 35 36 37 38 39  
node 4 size: 129022 MB  
node 4 free: 128905 MB  
node 5 cpus: 40 41 42 43 44 45 46 47  
node 5 size: 129022 MB  
node 5 free: 128910 MB  
node 6 cpus: 48 49 50 51 52 53 54 55  
node 6 size: 129022 MB  
node 6 free: 128917 MB  
node 7 cpus: 56 57 58 59 60 61 62 63  
node 7 size: 116909 MB  
node 7 free: 116801 MB  
node 8 cpus: 64 65 66 67 68 69 70 71  
node 8 size: 129022 MB  
node 8 free: 128893 MB  
node 9 cpus: 72 73 74 75 76 77 78 79  
node 9 size: 129022 MB  
node 9 free: 128870 MB  
node 10 cpus: 80 81 82 83 84 85 86 87  
node 10 size: 129022 MB  
node 10 free: 128928 MB  
node 11 cpus: 88 89 90 91 92 93 94 95  
node 11 size: 129022 MB  
node 11 free: 128915 MB  
node 12 cpus: 96 97 98 99 100 101 102 103
```

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## Platform Notes (Continued)

```

node 12 size: 128997 MB
node 12 free: 128878 MB
node 13 cpus: 104 105 106 107 108 109 110 111
node 13 size: 129022 MB
node 13 free: 128910 MB
node 14 cpus: 112 113 114 115 116 117 118 119
node 14 size: 129022 MB
node 14 free: 128895 MB
node 15 cpus: 120 121 122 123 124 125 126 127
node 15 size: 129016 MB
node 15 free: 128907 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  11  32  32  32  32  32  32  32  32
  1:  11  10  11  11  11  11  11  11  32  32  32  32  32  32  32  32
  2:  11  11  10  11  11  11  11  11  32  32  32  32  32  32  32  32
  3:  11  11  11  10  11  11  11  11  32  32  32  32  32  32  32  32
  4:  11  11  11  11  10  11  11  11  32  32  32  32  32  32  32  32
  5:  11  11  11  11  11  10  11  11  32  32  32  32  32  32  32  32
  6:  11  11  11  11  11  11  10  11  32  32  32  32  32  32  32  32
  7:  11  11  11  11  11  11  11  10  32  32  32  32  32  32  32  32
  8:  32  32  32  32  32  32  32  32  10  11  11  11  11  11  11  11
  9:  32  32  32  32  32  32  32  32  11  10  11  11  11  11  11  11
10:  32  32  32  32  32  32  32  32  11  11  10  11  11  11  11  11
11:  32  32  32  32  32  32  32  32  11  11  11  10  11  11  11  11
12:  32  32  32  32  32  32  32  32  11  11  11  11  10  11  11  11
13:  32  32  32  32  32  32  32  32  11  11  11  11  11  10  11  11
14:  32  32  32  32  32  32  32  32  11  11  11  11  11  11  10  11
15:  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  10

```

From /proc/meminfo

```

MemTotal:      2101212488 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:

```

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## Platform Notes (Continued)

```
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/swaps 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 frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

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## Platform Notes (Continued)

### 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.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  
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**Tested by:** HPE

**Test Date:** Mar-2021  
**Hardware Availability:** Jun-2021  
**Software Availability:** Mar-2021

## 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
-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
```

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# SPEC CPU®2017 Integer Speed Result

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**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant DL365 Gen10 Plus**  
(2.45 GHz, AMD EPYC 7763)

SPECspeed®2017\_int\_base = 11.1

SPECspeed®2017\_int\_peak = 11.1

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

**Test Date:** Mar-2021  
**Hardware Availability:** Jun-2021  
**Software Availability:** Mar-2021

## Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-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-vectorize-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
```

## Peak Compiler Invocation

C benchmarks:

```
clang
```

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# SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017\_int\_peak = 11.1

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

**Test Date:** Mar-2021  
**Hardware Availability:** Jun-2021  
**Software Availability:** Mar-2021

## Peak Compiler Invocation (Continued)

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: -m64 -mno-adx -mno-sse4a -Wl,-allow-multiple-definition  
-Wl,-mllvm -Wl,-enable-licm-vrp  
-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  
-fstruct-layout=5 -mllvm -unroll-threshold=50  
-fremap-arrays -flv-function-specialization  
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist  
-mllvm -global-vectorize-slp=true  
-mllvm -function-specialize -mllvm -enable-licm-vrp  
-mllvm -reduce-array-computations=3 -DSPEC\_OPENMP -fopenmp  
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

C++ benchmarks:

620.omnetpp\_s: basepeak = yes

623.xalancbmk\_s: basepeak = yes

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SPECspeed®2017\_int\_peak = 11.1

**CPU2017 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Mar-2021

**Hardware Availability:** Jun-2021

**Software Availability:** Mar-2021

## Peak Optimization Flags (Continued)

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/aocc300-flags-A1.html>

<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/aocc300-flags-A1.xml>

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revP.xml>

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