



# SPEC CPU®2017 Integer Speed Result

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## Hewlett Packard Enterprise

(Test Sponsor: HPE)

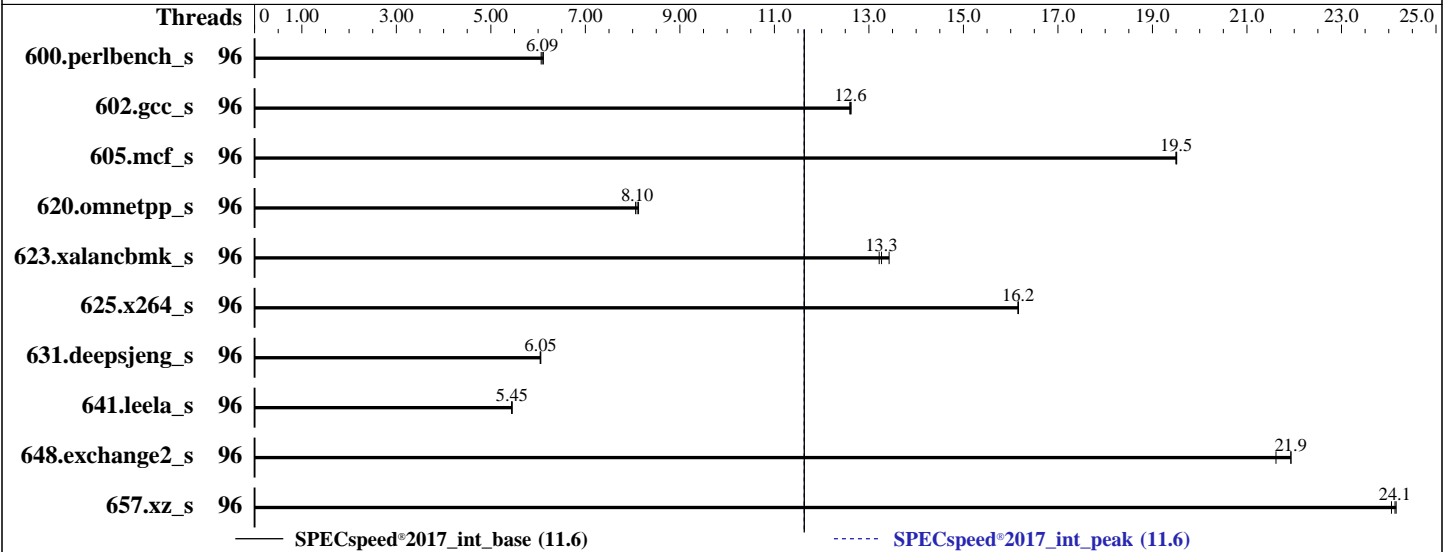
ProLiant DL365 Gen10 Plus  
(2.30 GHz, AMD EPYC 7643)

SPECspeed®2017\_int\_base = 11.6

SPECspeed®2017\_int\_peak = 11.6

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

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



### Hardware

CPU Name: AMD EPYC 7643  
 Max MHz: 3600  
 Nominal: 2300  
 Enabled: 96 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 / 6 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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## Results Table

| Benchmark       | Base    |            |             |            |             |            |             | Peak    |            |             |            |             |            |             |
|-----------------|---------|------------|-------------|------------|-------------|------------|-------------|---------|------------|-------------|------------|-------------|------------|-------------|
|                 | Threads | Seconds    | Ratio       | Seconds    | Ratio       | Seconds    | Ratio       | Threads | Seconds    | Ratio       | Seconds    | Ratio       | Seconds    | Ratio       |
| 600.perlbench_s | 96      | <b>292</b> | <b>6.09</b> | 290        | 6.11        | 293        | 6.06        | 96      | <b>292</b> | <b>6.09</b> | 290        | 6.11        | 293        | 6.06        |
| 602.gcc_s       | 96      | 316        | 12.6        | <b>316</b> | <b>12.6</b> | 315        | 12.6        | 96      | 316        | 12.6        | <b>316</b> | <b>12.6</b> | 315        | 12.6        |
| 605.mcf_s       | 96      | 242        | 19.5        | <b>242</b> | <b>19.5</b> | 242        | 19.5        | 96      | 242        | 19.5        | <b>242</b> | <b>19.5</b> | 242        | 19.5        |
| 620.omnetpp_s   | 96      | 202        | 8.06        | <b>201</b> | <b>8.10</b> | 201        | 8.13        | 96      | 202        | 8.06        | <b>201</b> | <b>8.10</b> | 201        | 8.13        |
| 623.xalancbmk_s | 96      | 106        | 13.4        | 107        | 13.2        | <b>107</b> | <b>13.3</b> | 96      | 106        | 13.4        | 107        | 13.2        | <b>107</b> | <b>13.3</b> |
| 625.x264_s      | 96      | 109        | 16.2        | 109        | 16.2        | <b>109</b> | <b>16.2</b> | 96      | 109        | 16.2        | 109        | 16.2        | <b>109</b> | <b>16.2</b> |
| 631.deepsjeng_s | 96      | 237        | 6.06        | <b>237</b> | <b>6.05</b> | 237        | 6.04        | 96      | 237        | 6.06        | <b>237</b> | <b>6.05</b> | 237        | 6.04        |
| 641.leela_s     | 96      | 313        | 5.45        | 314        | 5.44        | <b>313</b> | <b>5.45</b> | 96      | 313        | 5.45        | 314        | 5.44        | <b>313</b> | <b>5.45</b> |
| 648.exchange2_s | 96      | 136        | 21.6        | 134        | 21.9        | <b>134</b> | <b>21.9</b> | 96      | 136        | 21.6        | 134        | 21.9        | <b>134</b> | <b>21.9</b> |
| 657.xz_s        | 96      | <b>256</b> | <b>24.1</b> | 257        | 24.1        | 256        | 24.2        | 96      | <b>256</b> | <b>24.1</b> | 257        | 24.1        | 256        | 24.2        |

SPECspeed®2017\_int\_base = **11.6**

SPECspeed®2017\_int\_peak = **11.6**

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 = "0-95"  
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 = "96"
```

## 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

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## Platform Notes (Continued)

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 17:30:52 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 7643 48-Core Processor  
2 "physical id"s (chips)  
96 "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  
physical 1: 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): 96  
On-line CPU(s) list: 0-95  
Thread(s) per core: 1  
Core(s) per socket: 48  
Socket(s): 2  
NUMA node(s): 16  
Vendor ID: AuthenticAMD  
CPU family: 25  
Model: 1  
Model name: AMD EPYC 7643 48-Core Processor  
Stepping: 1  
Frequency boost: enabled  
CPU MHz: 1661.112  
CPU max MHz: 2300.0000  
CPU min MHz: 1500.0000

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## Platform Notes (Continued)

```

BogoMIPS:                4591.69
Virtualization:          AMD-V
L1d cache:               3 MiB
L1i cache:               3 MiB
L2 cache:                48 MiB
L3 cache:                512 MiB
NUMA node0 CPU(s):      0-5
NUMA node1 CPU(s):      6-11
NUMA node2 CPU(s):      12-17
NUMA node3 CPU(s):      18-23
NUMA node4 CPU(s):      24-29
NUMA node5 CPU(s):      30-35
NUMA node6 CPU(s):      36-41
NUMA node7 CPU(s):      42-47
NUMA node8 CPU(s):      48-53
NUMA node9 CPU(s):      54-59
NUMA node10 CPU(s):     60-65
NUMA node11 CPU(s):     66-71
NUMA node12 CPU(s):     72-77
NUMA node13 CPU(s):     78-83
NUMA node14 CPU(s):     84-89
NUMA node15 CPU(s):     90-95
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 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 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

```

(Continued on next page)



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## Platform Notes (Continued)

```
/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
node 0 size: 128776 MB
node 0 free: 128670 MB
node 1 cpus: 6 7 8 9 10 11
node 1 size: 129022 MB
node 1 free: 128905 MB
node 2 cpus: 12 13 14 15 16 17
node 2 size: 129022 MB
node 2 free: 128925 MB
node 3 cpus: 18 19 20 21 22 23
node 3 size: 129022 MB
node 3 free: 128932 MB
node 4 cpus: 24 25 26 27 28 29
node 4 size: 129022 MB
node 4 free: 128935 MB
node 5 cpus: 30 31 32 33 34 35
node 5 size: 129022 MB
node 5 free: 128941 MB
node 6 cpus: 36 37 38 39 40 41
node 6 size: 129022 MB
node 6 free: 128920 MB
node 7 cpus: 42 43 44 45 46 47
node 7 size: 116909 MB
node 7 free: 116826 MB
node 8 cpus: 48 49 50 51 52 53
node 8 size: 129022 MB
node 8 free: 128809 MB
node 9 cpus: 54 55 56 57 58 59
node 9 size: 129022 MB
node 9 free: 128864 MB
node 10 cpus: 60 61 62 63 64 65
node 10 size: 129022 MB
node 10 free: 128914 MB
node 11 cpus: 66 67 68 69 70 71
node 11 size: 129022 MB
node 11 free: 128907 MB
node 12 cpus: 72 73 74 75 76 77
node 12 size: 128998 MB
node 12 free: 128885 MB
node 13 cpus: 78 79 80 81 82 83
node 13 size: 129022 MB
```

(Continued on next page)



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## Platform Notes (Continued)

```

node 13 free: 128856 MB
node 14 cpus: 84 85 86 87 88 89
node 14 size: 129022 MB
node 14 free: 128863 MB
node 15 cpus: 90 91 92 93 94 95
node 15 size: 129017 MB
node 15 free: 128928 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:      2101219408 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

```

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```
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.

Memory:

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

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## Platform Notes (Continued)

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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## 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**  
(2.30 GHz, AMD EPYC 7643)

SPECspeed®2017\_int\_base = 11.6

SPECspeed®2017\_int\_peak = 11.6

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

**Test Date:** Apr-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
```

(Continued on next page)



# SPEC CPU<sup>®</sup>2017 Integer Speed Result

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SPECspeed<sup>®</sup>2017\_int\_base = 11.6

SPECspeed<sup>®</sup>2017\_int\_peak = 11.6

**CPU2017 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Apr-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: basepeak = yes

C++ benchmarks:

620.omnetpp\_s: basepeak = yes

623.xalancbmk\_s: basepeak = yes

631.deepsjeng\_s: basepeak = yes

641.leela\_s: basepeak = yes

Fortran benchmarks:

648.exchange2\_s: basepeak = yes



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SPECspeed®2017\_int\_peak = 11.6

**CPU2017 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Apr-2021

**Hardware Availability:** Jun-2021

**Software Availability:** Mar-2021

## 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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