



# SPEC CPU®2017 Integer Speed Result

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## Hewlett Packard Enterprise

(Test Sponsor: HPE)

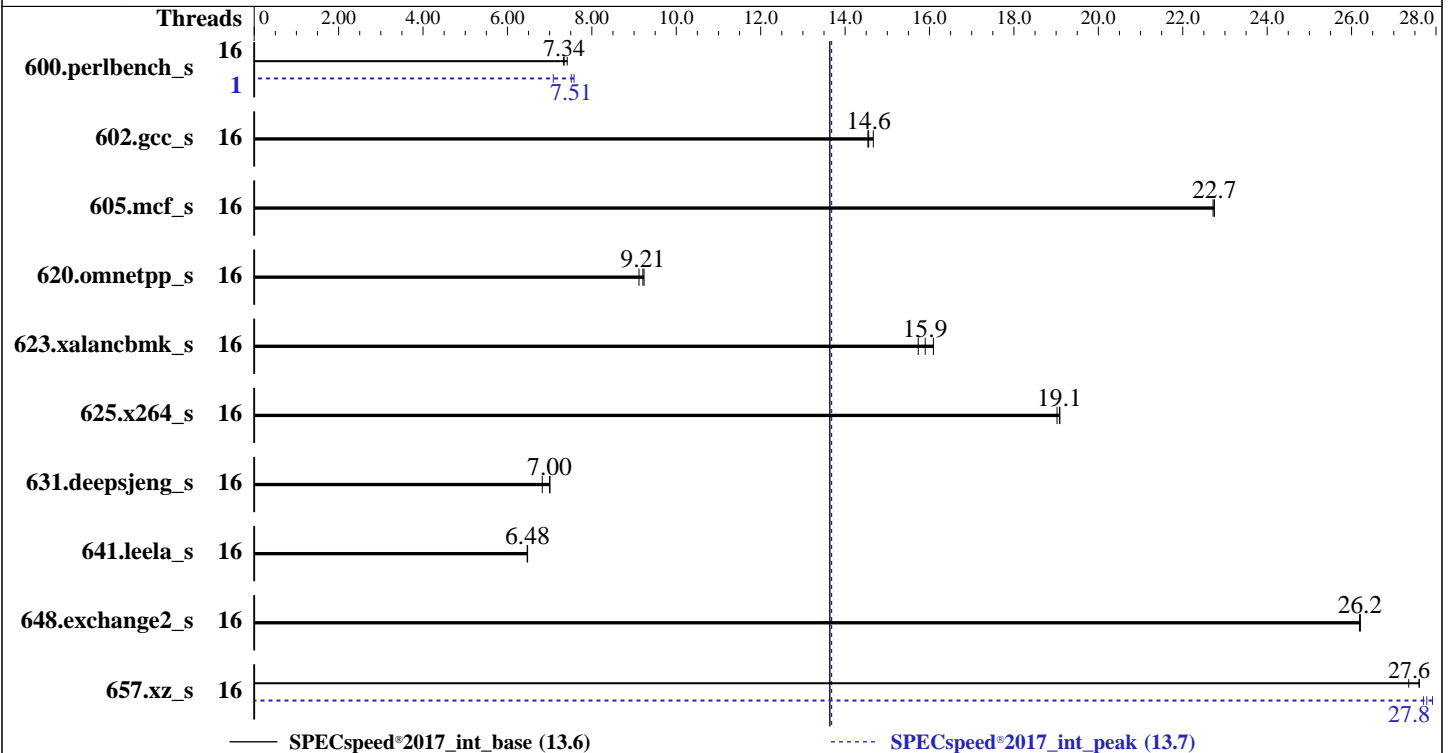
ProLiant DL365 Gen10 Plus  
(3.70 GHz, AMD EPYC 72F3)

SPECspeed®2017\_int\_base = 13.6

SPECspeed®2017\_int\_peak = 13.7

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

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



### Hardware

CPU Name: AMD EPYC 72F3  
Max MHz: 4100  
Nominal: 3700  
Enabled: 16 cores, 2 chips  
Orderable: 1,2 chip(s)  
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 per core  
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 v2.42 04/29/2021 released Apr-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	16	242	7.33	<b><u>242</u></b>	<b><u>7.34</u></b>	239	7.42	1	234	7.58	250	7.09	<b><u>236</u></b>	<b><u>7.51</u></b>
602.gcc_s	16	274	14.5	<b><u>274</u></b>	<b><u>14.6</u></b>	271	14.7	16	274	14.5	<b><u>274</u></b>	<b><u>14.6</u></b>	271	14.7
605.mcf_s	16	208	22.7	208	22.7	<b><u>208</u></b>	<b><u>22.7</u></b>	16	208	22.7	208	22.7	<b><u>208</u></b>	<b><u>22.7</u></b>
620.omnetpp_s	16	177	9.24	<b><u>177</u></b>	<b><u>9.21</u></b>	179	9.12	16	177	9.24	<b><u>177</u></b>	<b><u>9.21</u></b>	179	9.12
623.xalancbmk_s	16	<b><u>89.1</u></b>	<b><u>15.9</u></b>	88.1	16.1	90.1	15.7	16	<b><u>89.1</u></b>	<b><u>15.9</u></b>	88.1	16.1	90.1	15.7
625.x264_s	16	92.4	19.1	92.7	19.0	<b><u>92.4</u></b>	<b><u>19.1</u></b>	16	92.4	19.1	92.7	19.0	<b><u>92.4</u></b>	<b><u>19.1</u></b>
631.deepsjeng_s	16	204	7.01	<b><u>205</u></b>	<b><u>7.00</u></b>	210	6.83	16	204	7.01	<b><u>205</u></b>	<b><u>7.00</u></b>	210	6.83
641.leela_s	16	264	6.47	263	6.48	<b><u>263</u></b>	<b><u>6.48</u></b>	16	264	6.47	263	6.48	<b><u>263</u></b>	<b><u>6.48</u></b>
648.exchange2_s	16	112	26.2	<b><u>112</u></b>	<b><u>26.2</u></b>	112	26.2	16	112	26.2	<b><u>112</u></b>	<b><u>26.2</u></b>	112	26.2
657.xz_s	16	226	27.4	<b><u>224</u></b>	<b><u>27.6</u></b>	224	27.6	16	<b><u>223</u></b>	<b><u>27.8</u></b>	221	27.9	223	27.7

SPECspeed®2017\_int\_base = **13.6**

SPECspeed®2017\_int\_peak = **13.7**

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 = "0-15"  
LD\_LIBRARY\_PATH =  
"/home/SPEC\_CPU2017/amd\_speed\_aocc300\_milan\_B\_lib/64:/home/SPEC\_CPU2017/  
amd\_speed\_aocc300\_milan\_B\_lib/32:"  
MALLOC\_CONF = "retain:true"  
OMP\_DYNAMIC = "false"  
OMP\_SCHEDULE = "static"  
OMP\_STACKSIZE = "128M"  
OMP\_THREAD\_LIMIT = "16"

Environment variables set by runcpu during the 600.perlbench\_s peak run:  
GOMP\_CPU\_AFFINITY = "0"

Environment variables set by runcpu during the 657.xz\_s peak run:  
GOMP\_CPU\_AFFINITY = "0-15"

## 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>

Submitted\_by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>  
Submitted: Mon Jun 7 11:50:18 EDT 2021  
Submission: cpu2017-20210607-26880.sub



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## 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  
 Infinity Fabric Power Management set to Disabled  
 Infinity Fabric Performance State set to P0  
 Workload Profile set to Custom  
 Power Regulator set to OS Control Mode

sysinfo program /home/SPEC\_CPU2017/bin/sysinfo  
 Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c  
 running on admin Wed Apr 1 17:27:06 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 72F3 8-Core Processor  
 2 "physical id"s (chips)  
 16 "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 : 8  
 siblings : 8  
 physical 0: cores 0 1 2 3 4 5 6 7  
 physical 1: cores 0 1 2 3 4 5 6 7

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): 16  
 On-line CPU(s) list: 0-15  
 Thread(s) per core: 1  
 Core(s) per socket: 8  
 Socket(s): 2  
 NUMA node(s): 16  
 Vendor ID: AuthenticAMD  
 CPU family: 25  
 Model: 1  
 Model name: AMD EPYC 72F3 8-Core Processor

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## Platform Notes (Continued)

```

Stepping: 1
Frequency boost: enabled
CPU MHz: 1793.015
CPU max MHz: 3700.0000
CPU min MHz: 1500.0000
BogoMIPS: 7386.04
Virtualization: AMD-V
L1d cache: 512 KiB
L1i cache: 512 KiB
L2 cache: 8 MiB
L3 cache: 512 MiB
NUMA node0 CPU(s): 0
NUMA node1 CPU(s): 1
NUMA node2 CPU(s): 2
NUMA node3 CPU(s): 3
NUMA node4 CPU(s): 4
NUMA node5 CPU(s): 5
NUMA node6 CPU(s): 6
NUMA node7 CPU(s): 7
NUMA node8 CPU(s): 8
NUMA node9 CPU(s): 9
NUMA node10 CPU(s): 10
NUMA node11 CPU(s): 11
NUMA node12 CPU(s): 12
NUMA node13 CPU(s): 13
NUMA node14 CPU(s): 14
NUMA node15 CPU(s): 15
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 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

```

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## Platform Notes (Continued)

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

```
/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
node 0 size: 128776 MB
node 0 free: 128683 MB
node 1 cpus: 1
node 1 size: 129023 MB
node 1 free: 128968 MB
node 2 cpus: 2
node 2 size: 128999 MB
node 2 free: 128934 MB
node 3 cpus: 3
node 3 size: 129023 MB
node 3 free: 128971 MB
node 4 cpus: 4
node 4 size: 129023 MB
node 4 free: 128961 MB
node 5 cpus: 5
node 5 size: 129023 MB
node 5 free: 128970 MB
node 6 cpus: 6
node 6 size: 129023 MB
node 6 free: 128964 MB
node 7 cpus: 7
node 7 size: 116910 MB
node 7 free: 116842 MB
node 8 cpus: 8
node 8 size: 129023 MB
node 8 free: 128967 MB
node 9 cpus: 9
node 9 size: 129023 MB
node 9 free: 128973 MB
node 10 cpus: 10
node 10 size: 129023 MB
node 10 free: 128976 MB
node 11 cpus: 11
node 11 size: 129023 MB
node 11 free: 128963 MB
```

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## Platform Notes (Continued)

```

node 12 cpus: 12
node 12 size: 129023 MB
node 12 free: 128955 MB
node 13 cpus: 13
node 13 size: 129023 MB
node 13 free: 128779 MB
node 14 cpus: 14
node 14 size: 129023 MB
node 14 free: 128964 MB
node 15 cpus: 15
node 15 size: 129019 MB
node 15 free: 128967 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 32 10 11 11 11 11 11 11
  9:  32 32 32 32 32 32 32 32 32 11 10 11 11 11 11 11
10:  32 32 32 32 32 32 32 32 32 11 11 10 11 11 11 11
11:  32 32 32 32 32 32 32 32 32 11 11 11 10 11 11 11
12:  32 32 32 32 32 32 32 32 32 11 11 11 11 10 11 11
13:  32 32 32 32 32 32 32 32 32 11 11 11 11 11 10 11
14:  32 32 32 32 32 32 32 32 32 11 11 11 11 11 11 10
15:  32 32 32 32 32 32 32 32 32 11 11 11 11 11 11 10

```

```

From /proc/meminfo
MemTotal:      2101236412 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

```

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## 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/swappgs 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/SPEC_CPU2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/ubun--vg-ubuntu--lv ext4  196G   43G  144G  23% /
```

```
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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## Platform Notes (Continued)

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

Memory:

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

BIOS:

BIOS Vendor: HPE  
BIOS Version: A42  
BIOS Date: 04/29/2021  
BIOS Revision: 2.42  
Firmware Revision: 2.42

(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

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## Compiler Version Notes (Continued)

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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

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# SPEC CPU®2017 Integer Speed Result

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**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant DL365 Gen10 Plus**  
(3.70 GHz, AMD EPYC 72F3)

SPECspeed®2017\_int\_base = 13.6

SPECspeed®2017\_int\_peak = 13.7

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

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

## 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-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
```



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## 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,-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
-freemap-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
```

602.gcc\_s: basepeak = yes

605.mcf\_s: basepeak = yes

625.x264\_s: basepeak = yes

657.xz\_s: Same as 600.perlbench\_s

C++ benchmarks:

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CPU2017 License: 3

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Tested by: HPE

Test Date: May-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

## Peak Optimization Flags (Continued)

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

## 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-revQ.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-revQ.xml>

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