SPEC CPU®2017 Integer Speed Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)
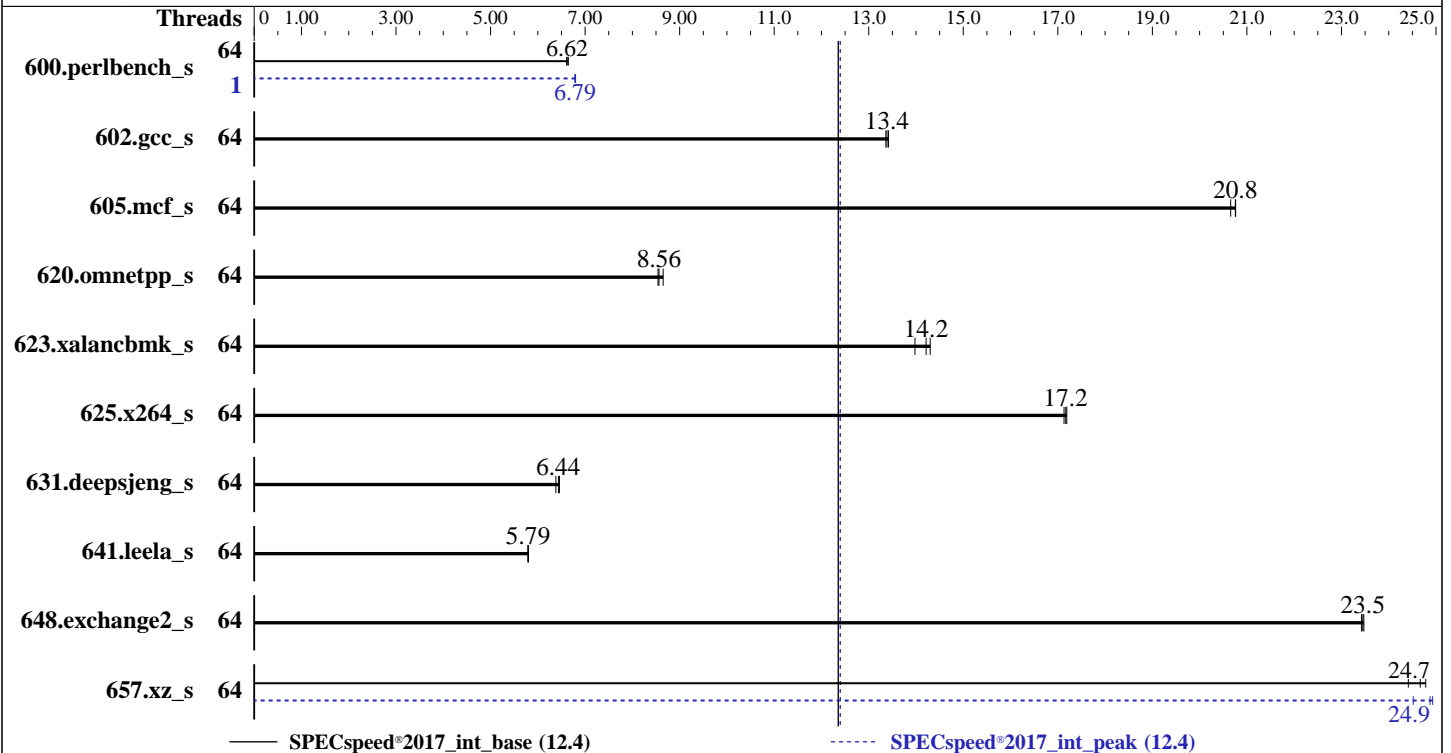
ProLiant DL365 Gen10 Plus
(2.60 GHz, AMD EPYC 7513)

$SPECspeed®2017\_int\_base = 12.4$

$SPECspeed®2017\_int\_peak = 12.4$

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

Threads — scale 0 to 25.0

- 600.perlbench_s — 64 threads: 6.62; 1 thread: 6.79
- 602.gcc_s — 64 threads: 13.4
- 605.mcf_s — 64 threads: 20.8
- 620.omnetpp_s — 64 threads: 8.56
- 623.xalancbmk_s — 64 threads: 14.2
- 625.x264_s — 64 threads: 17.2
- 631.deepsjeng_s — 64 threads: 6.44
- 641.leela_s — 64 threads: 5.79
- 648.exchange2_s — 64 threads: 23.5
- 657.xz_s — 64 threads: 24.7; 24.9

SPECspeed®2017_int_base (12.4)　　　　SPECspeed®2017_int_peak (12.4)

Hardware

CPU Name: AMD EPYC 7513
 Max MHz: 3650
 Nominal: 2600
Enabled: 64 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: 128 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 v2.42 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	64	269	6.61	267	6.65	**268**	**6.62**	1	262	6.78	**261**	**6.79**	261	6.80
602.gcc_s	64	297	13.4	**297**	**13.4**	298	13.4	64	297	13.4	**297**	**13.4**	298	13.4
605.mcf_s	64	229	20.7	**227**	**20.8**	227	20.8	64	229	20.7	**227**	**20.8**	227	20.8
620.omnetpp_s	64	**190**	**8.56**	189	8.65	191	8.54	64	**190**	**8.56**	189	8.65	191	8.54
623.xalancbmk_s	64	**99.7**	**14.2**	99.1	14.3	101	14.0	64	**99.7**	**14.2**	99.1	14.3	101	14.0
625.x264_s	64	**103**	**17.2**	103	17.2	103	17.1	64	**103**	**17.2**	103	17.2	103	17.1
631.deepsjeng_s	64	222	6.46	225	6.38	**223**	**6.44**	64	222	6.46	225	6.38	**223**	**6.44**
641.leela_s	64	294	5.80	**294**	**5.79**	295	5.79	64	294	5.80	**294**	**5.79**	295	5.79
648.exchange2_s	64	125	23.5	**125**	**23.5**	126	23.4	64	125	23.5	**125**	**23.5**	126	23.4
657.xz_s	64	**251**	**24.7**	253	24.4	249	24.8	64	248	24.9	**249**	**24.9**	252	24.5
SPECspeed®2017_int_base =		**12.4**												
SPECspeed®2017_int_peak =		**12.4**												

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 = "0-63"
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 = "64"

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 = "0-63"
```

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 Aug 16 13:17:56 EDT 2021
Submission: cpu2017-20210816-28734.sub
```

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CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2021

Hardware Availability: Mar-2021

Software Availability: Mar-2021

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 17:26:30 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 7513 32-Core Processor
       2  "physical id"s (chips)
       64 "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 : 32
       siblings  : 32
       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
       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

 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):                 64
    On-line CPU(s) list:    0-63
    Thread(s) per core:     1
    Core(s) per socket:     32
    Socket(s):              2
    NUMA node(s):           8
    Vendor ID:              AuthenticAMD
    CPU family:             25
```

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Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

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SPECspeed®2017_int_base = 12.4

ProLiant DL365 Gen10 Plus
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SPECspeed®2017_int_peak = 12.4

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

Platform Notes (Continued)

```
        Model:                        1
        Model name:                   AMD EPYC 7513 32-Core Processor
        Stepping:                     1
        Frequency boost:              enabled
        CPU MHz:                      1795.616
        CPU max MHz:                  2600.0000
        CPU min MHz:                  1500.0000
        BogoMIPS:                     5190.14
        Virtualization:               AMD-V
        L1d cache:                    2 MiB
        L1i cache:                    2 MiB
        L2 cache:                     32 MiB
        L3 cache:                     256 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
        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

     /proc/cpuinfo cache data
```

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CPU2017 License: 3
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Tested by: HPE

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

Platform Notes (Continued)

```
     cache size : 512 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
   available: 8 nodes (0-7)
   node 0 cpus: 0 1 2 3 4 5 6 7
   node 0 size: 257799 MB
   node 0 free: 257600 MB
   node 1 cpus: 8 9 10 11 12 13 14 15
   node 1 size: 258021 MB
   node 1 free: 257845 MB
   node 2 cpus: 16 17 18 19 20 21 22 23
   node 2 size: 258046 MB
   node 2 free: 257868 MB
   node 3 cpus: 24 25 26 27 28 29 30 31
   node 3 size: 245935 MB
   node 3 free: 245774 MB
   node 4 cpus: 32 33 34 35 36 37 38 39
   node 4 size: 258046 MB
   node 4 free: 257761 MB
   node 5 cpus: 40 41 42 43 44 45 46 47
   node 5 size: 258046 MB
   node 5 free: 257780 MB
   node 6 cpus: 48 49 50 51 52 53 54 55
   node 6 size: 258046 MB
   node 6 free: 257832 MB
   node 7 cpus: 56 57 58 59 60 61 62 63
   node 7 size: 258043 MB
   node 7 free: 257901 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  11  11  11  32  32  32  32
     1:  11  10  11  11  32  32  32  32
     2:  11  11  10  11  32  32  32  32
     3:  11  11  11  10  32  32  32  32
     4:  32  32  32  32  10  11  11  11
     5:  32  32  32  32  11  10  11  11
     6:  32  32  32  32  11  11  10  11
     7:  32  32  32  32  11  11  11  10

 From /proc/meminfo
    MemTotal:       2101230984 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

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

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Platform Notes (Continued)

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

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Platform Notes (Continued)

```
   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 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
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
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`

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`

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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 -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
-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
```

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ProLiant DL365 Gen10 Plus
(2.60 GHz, AMD EPYC 7513)

SPECspeed®2017_int_base = 12.4

SPECspeed®2017_int_peak = 12.4

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

Base Other Flags (Continued)

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

Fortran benchmarks:
```
-Wno-return-type
```

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
-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
```

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SPEC CPU®2017 Integer Speed Result

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Peak Optimization Flags (Continued)

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:

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/HPE-Platform-Flags-AMD-V1.2-EPYC-revQ.html
http://www.spec.org/cpu2017/flags/aocc300-flags-A1.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-revQ.xml
http://www.spec.org/cpu2017/flags/aocc300-flags-A1.xml

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CPU2017 License:	3	**Test Date:**	Jun-2021
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Tested by:	HPE	**Software Availability:**	Mar-2021

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