



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECspeed®2017_int_base = 8.54

PowerEdge R7515 (AMD EPYC 7402P, 2.80GHz)

SPECspeed®2017_int_peak = 8.89

CPU2017 License: 55

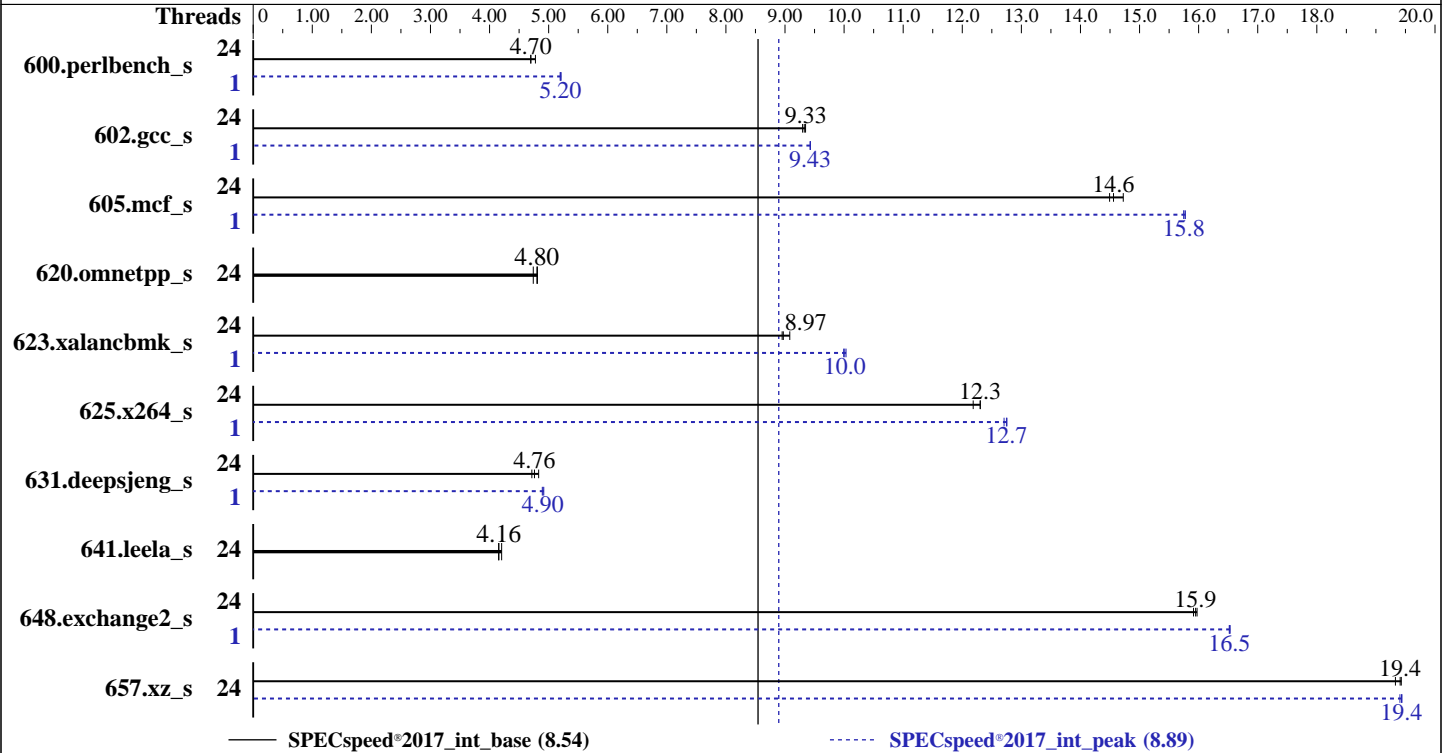
Test Date: Aug-2019

Test Sponsor: Dell Inc.

Hardware Availability: Sep-2019

Tested by: Dell Inc.

Software Availability: Aug-2019



Hardware

CPU Name: AMD EPYC 7402P
 Max MHz: 3350
 Nominal: 2800
 Enabled: 24 cores, 1 chip, 2 threads/core
 Orderable: 1 chip
 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, 16 MB shared / 3 cores
 Other: None
 Memory: 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R, running at 3200)
 Storage: 1 x 960 GB SAS SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP1
 kernel 4.12.14-195-default
 Compiler: C/C++/Fortran: Version 2.0.0 of AOCC
 Parallel: Yes
 Firmware: Version 1.0.1 released Aug-2019
 File System: xfs
 System State: Run level 5 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit
 Other: jemalloc: jemalloc memory allocator library version 5.2.0
 Power Management: --



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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	24	372	4.78	<u>378</u>	<u>4.70</u>	378	4.70	1	342	5.20	<u>341</u>	<u>5.20</u>	341	5.21
602.gcc_s	24	<u>427</u>	<u>9.33</u>	426	9.35	428	9.30	1	422	9.43	<u>422</u>	<u>9.43</u>	422	9.43
605.mcf_s	24	326	14.5	321	14.7	<u>324</u>	<u>14.6</u>	1	<u>300</u>	<u>15.8</u>	300	15.7	299	15.8
620.omnetpp_s	24	344	4.74	<u>340</u>	<u>4.80</u>	339	4.81	24	344	4.74	<u>340</u>	<u>4.80</u>	339	4.81
623.xalancbmk_s	24	158	8.95	156	9.08	<u>158</u>	<u>8.97</u>	1	<u>142</u>	<u>10.0</u>	142	9.99	141	10.0
625.x264_s	24	145	12.2	<u>143</u>	<u>12.3</u>	143	12.3	1	139	12.7	<u>138</u>	<u>12.7</u>	138	12.8
631.deepsjeng_s	24	<u>301</u>	<u>4.76</u>	304	4.72	297	4.83	1	<u>292</u>	<u>4.90</u>	293	4.89	291	4.92
641.leela_s	24	406	4.20	<u>410</u>	<u>4.16</u>	411	4.15	24	406	4.20	<u>410</u>	<u>4.16</u>	411	4.15
648.exchange2_s	24	<u>184</u>	<u>15.9</u>	185	15.9	184	16.0	1	<u>178</u>	<u>16.5</u>	178	16.5	178	16.5
657.xz_s	24	320	19.3	<u>318</u>	<u>19.4</u>	318	19.4	24	<u>318</u>	<u>19.4</u>	319	19.4	318	19.4

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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>

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runcpu

dirty_ratio, swappiness, zone_reclaim_mode and drop_caches were
all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

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Operating System Notes (Continued)

Transparent huge pages set to 'always' for this run (OS default)

General Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-47"
LD_LIBRARY_PATH = "/root/cpu2017-1.0.5/amd_speed_aocc200_rome_A_lib/64:/root/cpu2017-1.0.5/amd_speed_aocc200_rome_A_lib/32:"
MALLOCONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "48"

Binaries were compiled on a system with 2p AMD EPYC 7601 CPU + 512GB Memory using Fedora 26

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 9.1.0 in Ubuntu 19.04
with flags: -O3 -march=znver2 -lto. jemalloc 5.2.0 is available here:
<https://github.com/jemalloc/jemalloc/releases/download/5.2.0/jemalloc-5.2.0.tar.bz2>

Platform Notes

BIOS settings:
NUMA Nodes Per Socket set to 4
CCX as NUMA Domain set to Enabled
System Profile set to Custom
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost Enabled
Cstates set to Enabled
Memory Patrol Scrub Disabled
Memory Refresh Rate set to 1x
PCI ASPM L1 Link Power Management Disabled
Determinism Slider set to Power Determinism
Efficiency Optimized Mode Disabled
Sysinfo program /root/cpu2017-1.0.5/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-g3ob Tue Aug 20 15:04:26 2019

SUT (System Under Test) info as seen by some common utilities.

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Platform Notes (Continued)

For more information on this section, see <https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

model name : AMD EPYC 7402P 24-Core Processor

1 "physical id"s (chips)

48 "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 : 24

siblings : 48

physical 0: cores 0 1 2 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30

From lscpu:

Architecture: x86_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

Address sizes: 43 bits physical, 48 bits virtual

CPU(s): 48

On-line CPU(s) list: 0-47

Thread(s) per core: 2

Core(s) per socket: 24

Socket(s): 1

NUMA node(s): 8

Vendor ID: AuthenticAMD

CPU family: 23

Model: 49

Model name: AMD EPYC 7402P 24-Core Processor

Stepping: 0

CPU MHz: 2794.922

BogoMIPS: 5589.84

Virtualization: AMD-V

L1d cache: 32K

L1i cache: 32K

L2 cache: 512K

L3 cache: 16384K

NUMA node0 CPU(s): 0-2,24-26

NUMA node1 CPU(s): 3-5,27-29

NUMA node2 CPU(s): 6-8,30-32

NUMA node3 CPU(s): 9-11,33-35

NUMA node4 CPU(s): 12-14,36-38

NUMA node5 CPU(s): 15-17,39-41

NUMA node6 CPU(s): 18-20,42-44

NUMA node7 CPU(s): 21-23,45-47

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 xtopology nonstop_tsc cpuid extd_apicid aperfmperf pni

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Platform Notes (Continued)

```
pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx fl6c
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_l2 mwaitx cpb
cat_l3 cdp_l3 hw_pstate sme ssbd sev ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep
bmi2 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 arat npt
lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
pfthreshold avic v_vmsave_vmload vgif umip 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: 8 nodes (0-7)
node 0 cpus: 0 1 2 24 25 26
node 0 size: 31820 MB
node 0 free: 31462 MB
node 1 cpus: 3 4 5 27 28 29
node 1 size: 32224 MB
node 1 free: 32124 MB
node 2 cpus: 6 7 8 30 31 32
node 2 size: 32254 MB
node 2 free: 32140 MB
node 3 cpus: 9 10 11 33 34 35
node 3 size: 32254 MB
node 3 free: 32118 MB
node 4 cpus: 12 13 14 36 37 38
node 4 size: 32254 MB
node 4 free: 32053 MB
node 5 cpus: 15 16 17 39 40 41
node 5 size: 32254 MB
node 5 free: 31876 MB
node 6 cpus: 18 19 20 42 43 44
node 6 size: 32254 MB
node 6 free: 32102 MB
node 7 cpus: 21 22 23 45 46 47
node 7 size: 32241 MB
node 7 free: 32095 MB
node distances:
node  0  1  2  3  4  5  6  7
 0:  10 11 12 12 12 12 12 12
 1:  11 10 12 12 12 12 12 12
 2:  12 12 10 11 12 12 12 12
 3:  12 12 11 10 12 12 12 12
 4:  12 12 12 12 10 11 12 12
 5:  12 12 12 12 11 10 12 12
```

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Platform Notes (Continued)

```

6:  12  12  12  12  12  12  12  10  11
7:  12  12  12  12  12  12  12  11  10

```

From /proc/meminfo

```

MemTotal:      263740424 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

From /etc/*release* /etc/*version*

```

os-release:
NAME="SLES"
VERSION="15-SP1"
VERSION_ID="15.1"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp1"

```

uname -a:

```

Linux linux-g3ob 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
x86_64 x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

```

CVE-2017-5754 (Meltdown):          Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional,
IBRS_FW, STIBP: conditional, RSB filling

```

run-level 5 Aug 20 22:56

SPEC is set to: /root/cpu2017-1.0.5

```

Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda2       xfs       440G      97G  344G  22% /

```

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.

BIOS Dell Inc. 1.0.1 08/19/2019

Memory:

```

5x 80AD80B380AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
1x 80AD863280AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
2x 80AD869D80AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
8x Not Specified Not Specified

```

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Platform Notes (Continued)

(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)  
-----
```

```
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins  
AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin  
-----
```

```
=====  
C++   | 623.xalanbmk_s(peak)  
-----
```

```
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins  
AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)  
Target: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin  
-----
```

```
=====  
C++   | 620.omnetpp_s(base, peak) 623.xalanbmk_s(base)  
      | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)  
-----
```

```
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins  
AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin  
-----
```

```
=====  
C++   | 623.xalanbmk_s(peak)  
-----
```

```
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins  
AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)  
Target: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin  
-----
```

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Compiler Version Notes (Continued)

```

=====
C++      | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base)
         | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
=====

```

```

AOCCLLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCCLLVM.2.0.0.B179.2019_06_12) (based on LLVM AOCCLLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
=====

```

```

=====
Fortran  | 648.exchange2_s(base, peak)
=====

```

```

AOCCLLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCCLLVM.2.0.0.B179.2019_06_12) (based on LLVM AOCCLLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/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

```

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Base Portability Flags (Continued)

657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-freemap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang
```

C++ benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-partial-unswitch -z muldefs -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang
```

Fortran benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -ffast-math
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver2 -funroll-loops
-Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs
-mllvm -disable-indvar-simplify -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang
```



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Base Other Flags

C benchmarks:

-Wno-return-type

C++ benchmarks:

-Wno-return-type

Fortran benchmarks:

-Wno-return-type

Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Peak 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 -D_FILE_OFFSET_BITS=64
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
```

Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
```

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Hardware Availability: Sep-2019

Software Availability: Aug-2019

Peak Optimization Flags (Continued)

600.perlbench_s (continued):

```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver2
-mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang
```

602.gcc_s: -flto -Wl,-mllvm -Wl,-function-specialize

```
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -z muldefs -DSPEC_OPENMP
-fopenmp -DUSE_OPENMP -fgnu89-inline -fopenmp=libomp
-lomp -lpthread -ldl -ljemalloc
```

605.mcf_s: -flto -Wl,-mllvm -Wl,-function-specialize

```
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang
```

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SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017_int_base = 8.54

PowerEdge R7515 (AMD EPYC 7402P, 2.80GHz)

SPECspeed®2017_int_peak = 8.89

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Aug-2019

Hardware Availability: Sep-2019

Software Availability: Aug-2019

Peak Optimization Flags (Continued)

625.x264_s: Same as 600.perlbench_s

```

657.xz_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-lmvec -lamdlibm -ljemalloc -lflang

```

C++ benchmarks:

620.omnetpp_s: basepeak = yes

```

623.xalancbmk_s: -m32 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc

```

```

631.deepsjeng_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-lmvec -lamdlibm -ljemalloc -lflang

```

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Peak Optimization Flags (Continued)

641.leela_s: basepeak = yes

Fortran benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -ffast-math
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver2 -funroll-loops
-Mrecursive -mllvm -vector-library=LIBMVEC
-mllvm -disable-indvar-simplify -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang
```

Peak Other Flags

C benchmarks:

-Wno-return-type

C++ benchmarks (except as noted below):

-Wno-return-type

623.xalancbmk_s: -Wno-return-type

-L/sppo/dev/cpu2017/amd_speed_aocc200_rome/amd_speed_aocc200_rome_A_lib/32

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/aocc200-flags-B1-speed-Dell.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE5.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/aocc200-flags-B1-speed-Dell.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE5.xml>



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