Dell Inc.

PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)

SPECspeed®2017_int_base = 8.09  
SPECspeed®2017_int_peak = 8.35

Threads

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Threads</th>
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<th>SPECspeed®2017_int_peak</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
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<td>4.83</td>
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<td>605.mcf_s</td>
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<tr>
<td>620.omnetpp_s</td>
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<td>625.x264_s</td>
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<tr>
<td>631.deepsjeng_s</td>
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<td>5.03</td>
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<td>641.leela_s</td>
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<td>648.exchange2_s</td>
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<tr>
<td>657.xz_s</td>
<td>16</td>
<td>4.03</td>
<td>5.03</td>
</tr>
</tbody>
</table>

---

**Hardware**

- CPU Name: AMD EPYC 7282
- Max MHz: 3200
- Nominal: 2800
- Enabled: 16 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: 64 MB I+D on chip per chip, 16 MB shared / 4 cores
- Other: None
- Memory: 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)
- Storage: 1 x 960 GB SATA SSD
- Other: None

**Software**

- OS: SUSE Linux Enterprise Server 15 SP1
- Compiler: C/C++/Fortran: Version 2.0.0 of AOCC
- Parallel: Yes
- Firmware: Version 1.3.0 released Jan-2020
- File System: xfs
- System State: Run level 3 (multi-user)
- Base Pointers: 64-bit
- Peak Pointers: 32/64-bit
- Other: jemalloc: jemalloc memory allocator library v5.1.0
- Power Management: BIOS set to prefer performance at the cost of additional power usage.
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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</tbody>
</table>

**Specspeed\textsuperscript{2017\textunderscore int\_base} = 8.09**  
**Specspeed\textsuperscript{2017\textunderscore int\_peak} = 8.35**

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.  
'nnumactl' 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 -1 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numacli 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).

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

PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)

SPECspeed®2017_int_base = 8.09
SPECspeed®2017_int_peak = 8.35

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-31"
LD_LIBRARY_PATH = "/root/cpu2017-1.1.0/amd_speed_aocc200_rome_C_lib/64;/root/cpu2017-1.1.0/amd_speed_aocc200_rome_C_lib/32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "32"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 602.gcc_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 605.mcf_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 620.omnetpp_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "0"
OMP_STACKSIZE = "128M"

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 631.deepsjeng_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 648.exchange2_s peak run:
GOMP_CPU_AFFINITY = "0"

General Notes

Binaries were compiled on a system with 2x 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)

(Continued on next page)
**SPEC CPU®2017 Integer Speed Result**

Dell Inc.

PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)  

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.09</td>
<td>8.35</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Test Date:** Jan-2020  
**Tested by:** Dell Inc.  
**Hardware Availability:** Apr-2020  
**Software Availability:** Aug-2019

---

### General Notes (Continued)

is mitigated in the system as tested and documented.

jemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto
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 settings:
- NUMA Nodes Per Socket set to 1
- 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
- Memory Interleaving set to Disabled
- Memory Freq set to 3200
- Fan Speed = Maximum

Sysinfo program /root/cpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbe6e46a485a0011
running on linux-g3ob Mon Jan 27 08:54:06 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 7282 16-Core Processor
  1 "physical id"s (chips)
  32 "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 : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

From lscpu:

```
Architecture: x86_64
```

(Continued on next page)
### Platform Notes (Continued)

| CPU op-mode(s): | 32-bit, 64-bit |
| Byte Order: | Little Endian |
| Address sizes: | 43 bits physical, 48 bits virtual |
| CPU(s): | 32 |
| On-line CPU(s) list: | 0-31 |
| Thread(s) per core: | 2 |
| Core(s) per socket: | 16 |
| Socket(s): | 1 |
| NUMA node(s): | 4 |
| Vendor ID: | AuthenticAMD |
| CPU family: | 23 |
| Model: | 49 |
| Model name: | AMD EPYC 7282 16-Core Processor |
| Stepping: | 0 |
| CPU MHz: | 2794.628 |
| BogoMIPS: | 5589.25 |
| Virtualization: | AMD-V |
| L1d cache: | 32K |
| L1i cache: | 32K |
| L2 cache: | 512K |
| L3 cache: | 16384K |
| NUMA node0 CPU(s): | 0-3,16-19 |
| NUMA node1 CPU(s): | 4-7,20-23 |
| NUMA node2 CPU(s): | 8-11,24-27 |
| NUMA node3 CPU(s): | 12-15,28-31 |
| 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 xtopology nonstop_tsc cpuid extd_apicid aperfmperpni pclmulqdq monitor ssse3 fma cx16 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_l2 mwaitx cpb cat_l3 cdp_l3 hw_pstate sme ssbd sev ibr bpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsavees cqm_llc cqm_occu_llc cqm_mbm_total cqm_mbm_local clzero irperfv xsaveerptr arat npt ibrv svm_lock nrrip_save tsc_scale vmcb_clean flushbyasync decodeassist pausefilter pfthreshold avic v_vmsave_vmload vgif umip rdpid overflow_recover 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: | 4 nodes (0-3) |
| node 0 cpus: | 0 1 2 3 16 17 18 19 |
| node 0 size: | 63932 MB |
| node 0 free: | 63764 MB |

(Continued on next page)
Dell Inc. PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECspeed®2017_int_base = 8.09
SPECspeed®2017_int_peak = 8.35

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Jan-2020
Hardware Availability: Apr-2020
Software Availability: Aug-2019

Platform Notes (Continued)

node 1 cpus: 4 5 6 7 20 21 22 23
node 1 size: 64509 MB
node 1 free: 64291 MB
node 2 cpus: 8 9 10 11 24 25 26 27
node 2 size: 64509 MB
node 2 free: 64350 MB
node 3 cpus: 12 13 14 15 28 29 30 31
node 3 size: 64468 MB
node 3 free: 64273 MB
node distances:
node 0 1 2 3
0: 10 11 11 11
1: 11 10 11 11
2: 11 11 10 11
3: 11 11 11 10

From /proc/meminfo
MemTotal: 263598296 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-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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling

(Continued on next page)
SPEC CPU®2017 Integer Speed Result

Dell Inc.

PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)

SPECspeed®2017_int_base = 8.09
SPECspeed®2017_int_peak = 8.35

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Platform Notes (Continued)

run-level 3 Jan 26 09:51 last=5

SPEC is set to: /root/cpu2017-1.1.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 440G 36G 404G 9% /

From /sys/devices/virtual/dmi/id
BIOS: Dell Inc. 1.3.0 01/14/2020
Vendor: Dell Inc.
Product: PowerEdge R7515
Product Family: PowerEdge
Serial: 5MGPH13

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:
8x 80AD80B380AD HMA84GR7CJR4N~XN 32 GB 2 rank 3200
8x Not Specified Not Specified

(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.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
   AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

C++ | 623.xalancbmk_s(peak)

AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
   AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: i386-unknown-linux-gnu
Thread model: posix
 InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

(Continued on next page)
Compiler Version Notes (Continued)

```
C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base)
   | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
   ------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
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C++     | 623.xalancbmk_s(peak)
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AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
   AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base)
   | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
   ------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
   AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

Fortran | 648.exchange2_s(base, peak)
   ------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
   AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
```
## SPEC CPU® 2017 Integer Speed Result

### Dell Inc.

**PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)**

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<td>8.09</td>
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</table>

### CPU2017 License: 55

<table>
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<th>Test Sponsor:</th>
<th>Tested by:</th>
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<tbody>
<tr>
<td>Dell Inc.</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

**Test Date:** Jan-2020  
**Hardware Availability:** Apr-2020  
**Software Availability:** Aug-2019

### Base Compiler Invocation

#### C benchmarks:
- clang

#### C++ benchmarks:
- clang++

#### Fortran benchmarks:
- flang

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>-DSPEC_LINUX_X64 -DSPEC_LP64</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>-DSPEC_LINUX -DSPEC_LP64</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

### 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
- -fremap-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
- -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

(Continued on next page)
SPEC CPU®2017 Integer Speed Result

Dell Inc.

PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)

SPECspeed®2017_int_base = 8.09
SPECspeed®2017_int_peak = 8.35

Base Optimization Flags (Continued)

C++ benchmarks (continued):
-mlir -unroll-threshold=100 -flv-function-specialization
-mlir -enable-partial-unswitch -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-llflang

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

Base Other Flags

C benchmarks:
-#no-return-type

C++ benchmarks:
-#no-return-type

Fortran benchmarks:
-#no-return-type

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang
Dell Inc.

PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)

SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017_int_base = 8.09
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Jan-2020
Hardware Availability: Apr-2020
Software Availability: Aug-2019

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 -W1,-function-specialize
-W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-vector-library=LIBMVEC
-W1,-mllvm -W1,-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
-lmvec -landlibm -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc -lflang

602.gcc_s: -flto -Wl,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-vector-library=LIBMVEC
-W1,-mllvm -W1,-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 -z muldefs

(Continued on next page)
Peak Optimization Flags (Continued)

602.gcc_s (continued):
-fopenmp -fgnu99-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
-lmvec -ldl -ljemalloc -lomp -lpthread -ldl
-m32

657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_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
-lmvec -ljemalloc -lomp -lpthread -ldl -lmvec -ldl

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

(Continued on next page)
**PEC CPU®2017 Integer Speed Result**

**Dell Inc.**

PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)

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### Peak Optimization Flags (Continued)

623.xalancbmk_s (continued):
- `mllvm -vector-library=LIBMVEC`
- `mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp`
- `fopenmp=libomp -lomp -lpthread -ldl -ljemalloc`

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: `basepeak = yes`

**Fortran benchmarks:**
- `-ffast-math`
- `-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-lv-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 -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/v110/amd_speed_aocc200_rome_C_lib/32`

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

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The flags files that were used to format this result can be browsed at:


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

Dell Inc.

PowerEdge R7515 (AMD EPYC 7282, 2.80 GHz)

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Tested with SPEC CPU\textsuperscript{®}2017 v1.1.0 on 2020-01-27 09:54:06-0500.
Originally published on 2020-04-14.