SPEC® CPU2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

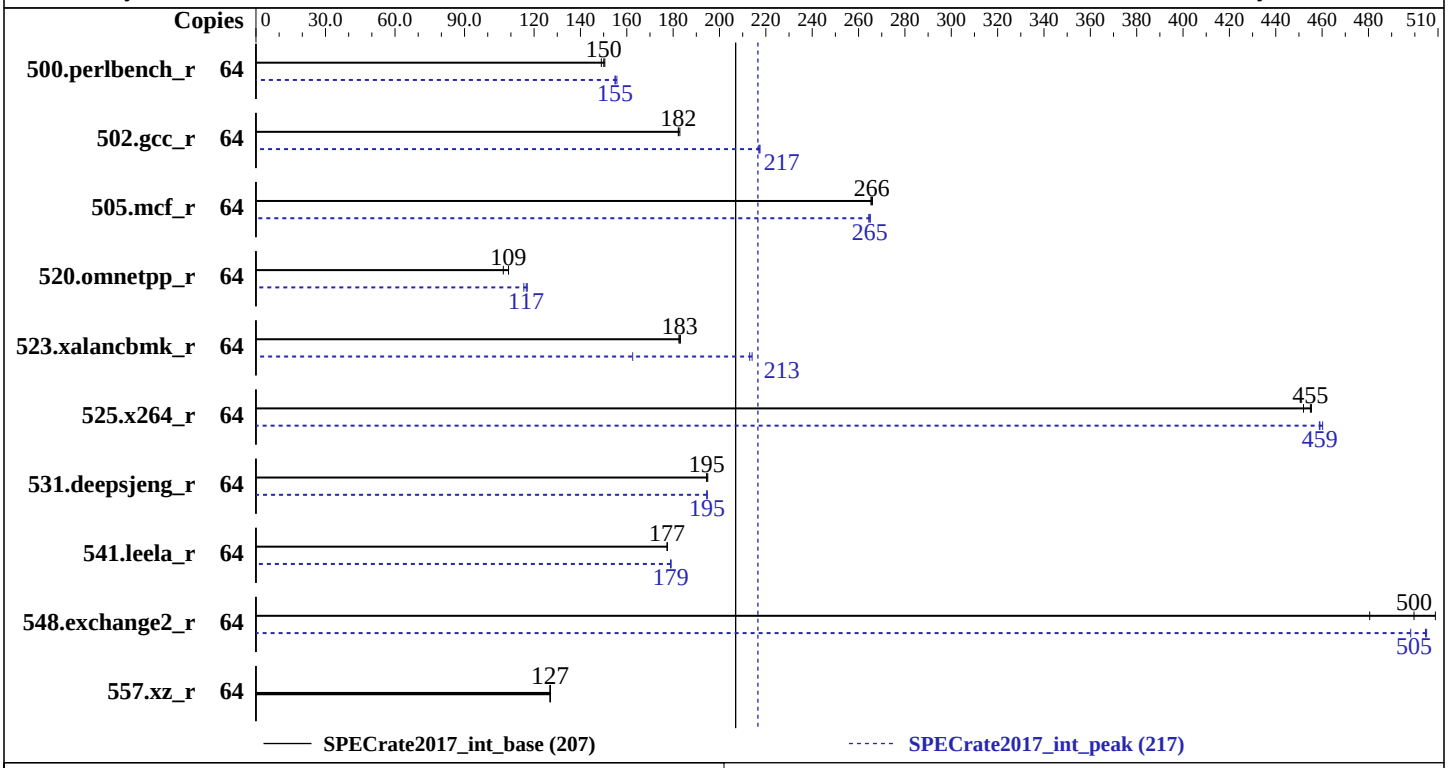
ProLiant DL385 Gen10
(3.10 GHz, AMD EPYC 7371)

SPECrate2017_int_base = 207

SPECrate2017_int_peak = 217

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

Test Date: Jul-2017
Hardware Availability: Feb-2019
Software Availability: Dec-2018



Hardware

CPU Name:	AMD EPYC 7371
Max MHz.:	3800
Nominal:	3100
Enabled:	32 cores, 2 chips, 2 threads/core
Orderable:	1, 2 chip(s)
Cache L1:	64 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, 8 MB shared / 2 cores
Other:	None
Memory:	1 TB (16 x 64 GB 4Rx4 PC4-2666V-L)
Storage:	1 x 400 GB SAS SSD RAID 0
Other:	None

Software

OS:	SUSE linux Enterprise Server 12 (x86_64) SP3 Kernel 4.4.132-94.33-default
Compiler:	C/C++: Version 1.3.0 of AOCC Fortran: Version 4.8.2 of GCC
Parallel:	No
Firmware:	HPE BIOS Version A40 10/02/2018 released Oct-2018
File System:	btrfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other:	jemalloc memory allocator library V5.1.0

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	64	**679**	**150**	677	151	684	149	64	**657**	**155**	658	155	654	156
502.gcc_r	64	495	183	497	182	**497**	**182**	64	417	217	418	217	**417**	**217**
505.mcf_r	64	390	265	**389**	**266**	389	266	64	**391**	**265**	391	264	390	265
520.omnetpp_r	64	**771**	**109**	787	107	771	109	64	726	116	**720**	**117**	717	117
523.xalancbmk_r	64	**370**	**183**	369	183	370	182	64	**317**	**213**	316	214	416	163
525.x264_r	64	248	452	246	455	**246**	**455**	64	**244**	**459**	244	459	243	460
531.deepsjeng_r	64	377	194	376	195	**377**	**195**	64	377	195	**377**	**195**	377	195
541.leela_r	64	**597**	**177**	597	177	597	177	64	592	179	592	179	**592**	**179**
548.exchange2_r	64	**336**	**500**	330	509	349	481	64	337	498	332	505	**332**	**505**
557.xz_r	64	**545**	**127**	545	127	544	127	64	**545**	**127**	545	127	544	127

SPECrate2017_int_base = 207

SPECrate2017_int_peak = 217

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/

The AOCC Gold Linker plugin was installed and used for the link stage.

The AOCC Fortran Plugin version 1.3.0 was used to leverage AOCC optimizers
with gfortran. It is available here:
http://developer.amd.com/amd-aocc/

jemalloc: configured and built with GCC v4.8.5 in RHEL v7.2 under default conditions.

jemalloc uses environment variable MALLOC_CONF with values narenas and lg_chunk:
  narenas: sets the maximum number of arenas to use for automatic multiplexing of
           threads and arenas.
  lg_chunk: set the virtual memory chunk size (log base 2). For example,
            lg_chunk:21 sets the default chunk size to 2^21 = 2MiB.
```

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

runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <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 were enabled for this run (OS default)
```

General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/amd1812na_rate_revA_lib/64;/home/cpu2017/amd1812na_rate_revA_lib/32:"

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using RHEL 7.4

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 v7.2 under default conditions.
jemalloc: sources available from jemalloc.net or
https://github.com/jemalloc/jemalloc/releases
jemalloc uses environment variable MALLOC_CONF
with values narenas and lg_chunk:
narenas: sets the maximum number of arenas to use
for automatic multiplexing
of threads and arenas.
lg_chunk: set the virtual memory chunk size (log
base 2). For example,
lg_chunk:21 sets the default chunk size to 2^21 =
2MiB.
```

Platform Notes

```
BIOS Configuration:
 Thermal Configuration set to Maximum Cooling
 Performance Determinism set to Power Deterministic
 Memory Patrol Scrubbing set to Disabled
 Workload Profile set to General Throughput Compute
 Processor Power and Utilization Monitoring set to Disabled
 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-lk9d Wed Jul 19 08:59:12 2017

 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 7371 16-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 : 16
       siblings  : 32
       physical 0: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29
       physical 1: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                64
      On-line CPU(s) list:   0-63
      Thread(s) per core:    2
      Core(s) per socket:    16
      Socket(s):             2
      NUMA node(s):          8
      Vendor ID:             AuthenticAMD
      CPU family:            23
      Model:                 1
      Model name:            AMD EPYC 7371 16-Core Processor
      Stepping:              2
      CPU MHz:               3100.000
      CPU max MHz:           3100.0000
      CPU min MHz:           2500.0000
      BogoMIPS:              6188.54
      Virtualization:        AMD-V
      L1d cache:             32K
      L1i cache:             64K
```

(Continued on next page)

Platform Notes (Continued)

```
      L2 cache:              512K
      L3 cache:              8192K
      NUMA node0 CPU(s):     0-3,32-35
      NUMA node1 CPU(s):     4-7,36-39
      NUMA node2 CPU(s):     8-11,40-43
      NUMA node3 CPU(s):     12-15,44-47
      NUMA node4 CPU(s):     16-19,48-51
      NUMA node5 CPU(s):     20-23,52-55
      NUMA node6 CPU(s):     24-27,56-59
      NUMA node7 CPU(s):     28-31,60-63
      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 extd_apicid amd_dcm aperfmperf eagerfpu pni
      pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c
      rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
      osvw skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx arat cpb
      hw_pstate ssbd retpoline retpoline_amd npt lbrv svm_lock nrip_save tsc_scale
      vmcb_clean flushbyasid decodeassists pausefilter pfthreshold vmmcall avic fsgsbase
      bmi1 avx2 smep bmi2 rdseed adx smap clflushopt sha_ni xsaveopt xsavec xgetbv1 clzero
      irperf ibpb 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 3 32 33 34 35
    node 0 size: 128840 MB
    node 0 free: 128683 MB
    node 1 cpus: 4 5 6 7 36 37 38 39
    node 1 size: 129022 MB
    node 1 free: 128850 MB
    node 2 cpus: 8 9 10 11 40 41 42 43
    node 2 size: 129022 MB
    node 2 free: 128842 MB
    node 3 cpus: 12 13 14 15 44 45 46 47
    node 3 size: 129022 MB
    node 3 free: 128875 MB
    node 4 cpus: 16 17 18 19 48 49 50 51
    node 4 size: 129022 MB
    node 4 free: 128885 MB
    node 5 cpus: 20 21 22 23 52 53 54 55
    node 5 size: 129022 MB
    node 5 free: 128885 MB
    node 6 cpus: 24 25 26 27 56 57 58 59
    node 6 size: 129022 MB
```

(Continued on next page)

Platform Notes (Continued)

```
   node 6 free: 128882 MB
   node 7 cpus: 28 29 30 31 60 61 62 63
   node 7 size: 116925 MB
   node 7 free: 116782 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  16  16  16  32  32  32  32
     1:  16  10  16  16  32  32  32  32
     2:  16  16  10  16  32  32  32  32
     3:  16  16  16  10  32  32  32  32
     4:  32  32  32  32  10  16  16  16
     5:  32  32  32  32  16  10  16  16
     6:  32  32  32  32  16  16  10  16
     7:  32  32  32  32  16  16  16  10

  From /proc/meminfo
     MemTotal:       1044375828 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  /usr/bin/lsb_release -d
     SUSE Linux Enterprise Server 12 SP3

  From /etc/*release* /etc/*version*
     SuSE-release:
        SUSE Linux Enterprise Server 12 (x86_64)
        VERSION = 12
        PATCHLEVEL = 3
        # This file is deprecated and will be removed in a future service pack or release.
        # Please check /etc/os-release for details about this release.
     os-release:
        NAME="SLES"
        VERSION="12-SP3"
        VERSION_ID="12.3"
        PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
        ID="sles"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12:sp3"

  uname -a:
     Linux linux-lk9d 4.4.132-94.33-default #1 SMP Tue May 29 20:09:56 UTC 2018 (76aae3b)
     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
```

(Continued on next page)

Platform Notes (Continued)

```
 CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline + IBPB

 run-level 3 Jul 19 08:58

 SPEC is set to: /home/cpu2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   331G  4.4G  326G   2% /home

 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 HPE A40 10/02/2018
   Memory:
    16x UNKNOWN NOT AVAILABLE
    16x UNKNOWN NOT AVAILABLE 64 GB 4 rank 2666

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CC  502.gcc_r(peak)
------------------------------------------------------------------------------
AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
  AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aocc1.3.0/AOCC-1.3.0-Compiler/bin
------------------------------------------------------------------------------

==============================================================================
 CXXC 523.xalancbmk_r(peak)
------------------------------------------------------------------------------
AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
  AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aocc1.3.0/AOCC-1.3.0-Compiler/bin
------------------------------------------------------------------------------

==============================================================================
 CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
     525.x264_r(base) 557.xz_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
```

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Compiler Version Notes (Continued)

```
  AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aocc1.3.0/AOCC-1.3.0-Compiler/bin
------------------------------------------------------------------------------

==============================================================================
 CXXC 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base,
      peak) 541.leela_r(base)
------------------------------------------------------------------------------
AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
  AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aocc1.3.0/AOCC-1.3.0-Compiler/bin
------------------------------------------------------------------------------

==============================================================================
CC   500.perlbench_r(peak) 525.x264_r(peak)
------------------------------------------------------------------------------
AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
  AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aocc1.3.0/AOCC-1.3.0-Compiler/bin
------------------------------------------------------------------------------

==============================================================================
CXXC 541.leela_r(peak)
------------------------------------------------------------------------------
AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
  AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aocc1.3.0/AOCC-1.3.0-Compiler/bin
------------------------------------------------------------------------------

==============================================================================
 FC  548.exchange2_r(base, peak)
------------------------------------------------------------------------------
GNU Fortran (GCC) 4.8.2
Copyright (C) 2013 Free Software Foundation, Inc.
GNU Fortran comes with NO WARRANTY, to the extent permitted by law.
You may redistribute copies of GNU Fortran
under the terms of the GNU General Public License.
For more information about these matters, see the file named COPYING
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
clang gfortran

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

500.perlbench_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -O3 -ffast-math
-march=znver1 -mno-avx2 -fstruct-layout=3
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -inline-threshold=1000 -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -function-specialize
-z muldefs -lamdlibm -lpthread -ldl -ljemalloc

502.gcc_r: Same as 500.perlbench_r

505.mcf_r: Same as 500.perlbench_r

525.x264_r: Same as 500.perlbench_r

557.xz_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -O3 -ffast-math

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Base Optimization Flags (Continued)

557.xz_r (continued):
-march=znver1 -mno-avx2 -fstruct-layout=3
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -inline-threshold=1000 -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -function-specialize
-z muldefs -lpthread -ldl -ljemalloc

C++ benchmarks:
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -O3 -march=znver1
-mllvm -unroll-threshold=100 -finline-aggressive -fremap-arrays
-mllvm -inline-threshold=1000 -mllvm -enable-vectorize-compares=false
-z muldefs -lpthread -ldl -ljemalloc

Fortran benchmarks:
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -Wl,-mllvm -Wl,-merge-constant
-Wl,-mllvm -Wl,-unroll-aggressive -Wl,-mllvm -Wl,-unroll-threshold=150
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -O3 -mavx -madx
-funroll-loops -ffast-math -frepack-arrays -z muldefs
-fplugin=dragonegg.so -specs=integrated-as.specs
-fplugin-arg-dragonegg-llvm-option=-disable-indvar-simplify
-fplugin-arg-dragonegg-llvm-option=-unroll-aggressive
-fplugin-arg-dragonegg-llvm-option=-unroll-threshold:150 -lpthread -ldl
-ljemalloc -lgfortran -lamdlibm

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
clang gfortran

Peak Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64

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Peak Portability Flags (Continued)

502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -D_FILE_OFFSET_BITS=64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver1
-fstruct-layout=3 -mllvm -vectorize-memory-aggressively
-mno-avx2 -mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -lpthread -ldl -ljemalloc

502.gcc_r: -m32 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -Ofast
-march=znver1 -fstruct-layout=3
-mllvm -vectorize-memory-aggressively -mno-avx2
-mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -fgnu89-inline -lpthread
-ldl -ljemalloc

505.mcf_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -Ofast
-march=znver1 -fstruct-layout=3
-mllvm -vectorize-memory-aggressively -mno-avx2
-mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -lpthread -ldl -ljemalloc

525.x264_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver1
-mno-avx2 -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -unroll-threshold=50 -fremap-arrays

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Peak Optimization Flags (Continued)

525.x264_r (continued):
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-flv-function-specialization -lamdlibm -ljemalloc
-lpthread -ldl

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -Ofast
-march=znver1 -finline-aggressive
-mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -lpthread -ldl -ljemalloc

523.xalancbmk_r: -m32 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -Ofast
-march=znver1 -finline-aggressive
-mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -lpthread -ldl -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver1
-mllvm -unroll-count=8 -mllvm -unroll-threshold=100
-lpthread -ldl -ljemalloc

Fortran benchmarks:
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -Wl,-mllvm -Wl,-merge-constant
-Wl,-mllvm -Wl,-unroll-aggressive -Wl,-mllvm -Wl,-unroll-threshold=150
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-enable-vectorize-compares -O3 -mavx -madx
-funroll-loops -ffast-math -frepack-arrays -fplugin=dragonegg.so
-specs=integrated-as.specs
-fplugin-arg-dragonegg-llvm-option=-disable-indvar-simplify
-fplugin-arg-dragonegg-llvm-option=-unroll-aggressive
-fplugin-arg-dragonegg-llvm-option=-unroll-threshold:150 -lpthread -ldl
-ljemalloc -lgfortran -lamdlibm

Peak Other Flags

C benchmarks:

502.gcc_r: `-L/root/work/lib/jemalloc510/lib32`

C++ benchmarks:

523.xalancbmk_r: `-L/root/work/lib/jemalloc510/lib32`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/aocc130-flags-revA2.html`
`http://www.spec.org/cpu2017/flags/gcc.2017-11-20.html`
`http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revD.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc130-flags-revA2.xml`
`http://www.spec.org/cpu2017/flags/gcc.2017-11-20.xml`
`http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revD.xml`

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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