SPEC CPU®2017 Integer Rate Result

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Dell Inc.

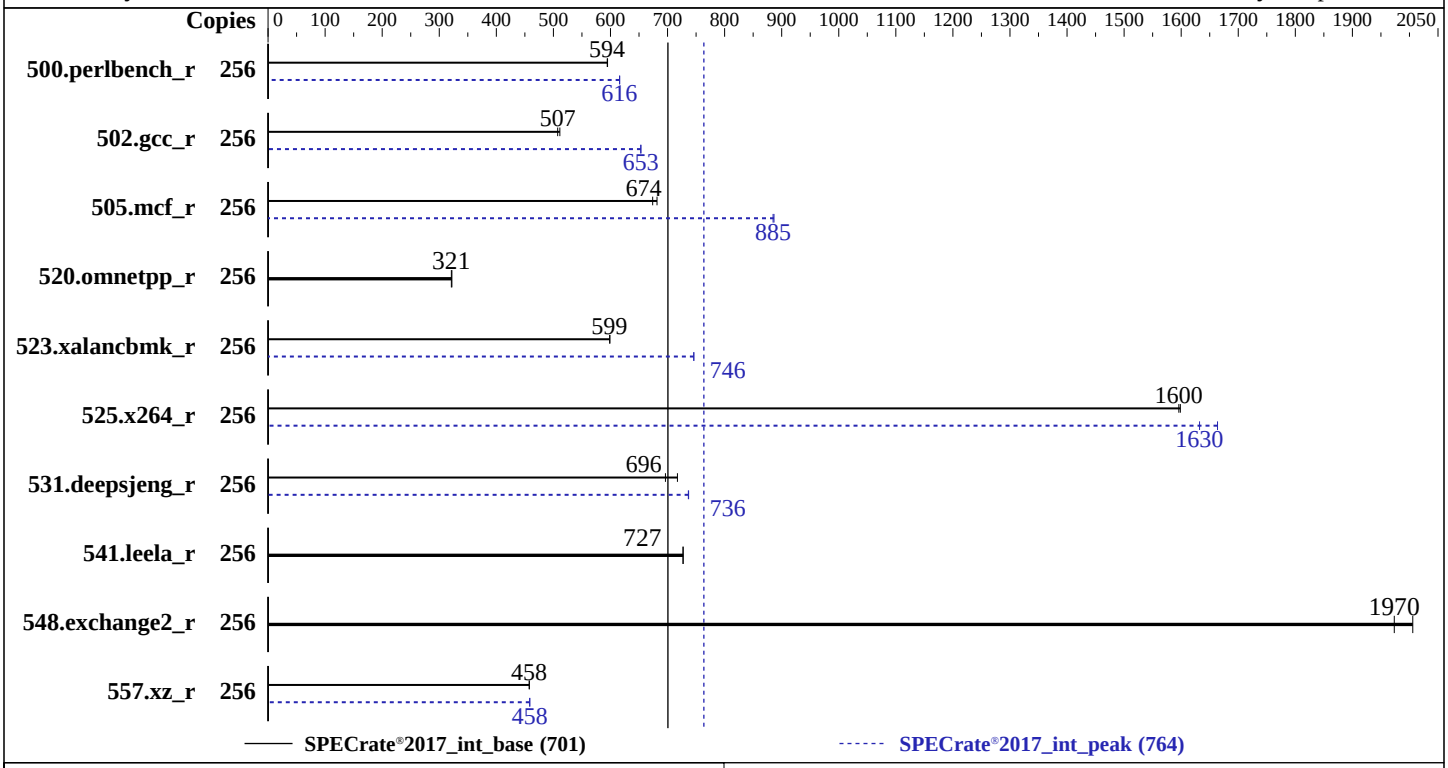
PowerEdge R7525 (AMD EPYC 7H12, 2.60 GHz)

SPECrate®2017_int_base = 701

SPECrate®2017_int_peak = 764

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

Test Date: Jul-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020



Hardware

CPU Name:	AMD EPYC 7H12
Max MHz:	3300
Nominal:	2600
Enabled:	128 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
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, 16 MB shared / 4 cores
Other:	None
Memory:	512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 3200)
Storage:	1 x 1.92 TB SATA SSD
Other:	None

Software

OS:	Red Hat Enterprise Linux 8.2 kernel 4.18.0-193.el8.x86_64
Compiler:	C/C++/Fortran: Version 2.0.0 of AOCC
Parallel:	No
Firmware:	Version 1.4.8 released May-2020
File System:	tmpfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other:	jemalloc: jemalloc memory allocator library v5.2.0
Power Management:	BIOS set to prefer performance at the cost of additional power usage.

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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	256	685	595	**686**	**594**			256	**662**	**616**	661	616		
502.gcc_r	256	709	511	**714**	**507**			256	555	653	**555**	**653**		
505.mcf_r	256	607	682	**614**	**674**			256	**468**	**885**	467	887		
520.omnetpp_r	256	1043	322	**1046**	**321**			256	1043	322	**1046**	**321**		
523.xalancbmk_r	256	**452**	**599**	451	599			256	**362**	**746**	362	746		
525.x264_r	256	**281**	**1600**	280	1600			256	**275**	**1630**	269	1660		
531.deepsjeng_r	256	409	717	**421**	**696**			256	398	737	**398**	**736**		
541.leela_r	256	**583**	**727**	583	727			256	**583**	**727**	583	727		
548.exchange2_r	256	334	2010	**340**	**1970**			256	334	2010	**340**	**1970**		
557.xz_r	256	604	458	**604**	**458**			256	**603**	**458**	603	459		

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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)

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
"/mnt/ramdisk/cpu2017-1.1.0/amd_rate_aocc200_rome_C_lib/64;/mnt/ramdisk/
cpu2017-1.1.0/amd_rate_aocc200_rome_C_lib/32:"
MALLOC_CONF = "retain:true"

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) is mitigated in the system as tested and documented.
Benchmark run from a 225 GB ramdisk created with the cmd; "mount -t tmpfs -o size=225G tmpfs /mnt/ramdisk"
jemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto
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:
L2 Stream HW Prefetcher Disabled
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
Memory Interleaving set to Disabled
ApbDis set to Disabled

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Platform Notes (Continued)

```
 DLWM set to Unforced

Sysinfo program /mnt/ramdisk/cpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on localhost.localdomain Thu Jul  2 10:55:32 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 7H12 64-Core Processor
      2  "physical id"s (chips)
      256 "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 : 64
      siblings  : 128
      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 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
      53 54 55 56 57 58 59 60 61 62 63
      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 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
      53 54 55 56 57 58 59 60 61 62 63

From lscpu:
     Architecture:        x86_64
     CPU op-mode(s):      32-bit, 64-bit
     Byte Order:          Little Endian
     CPU(s):              256
     On-line CPU(s) list: 0-255
     Thread(s) per core:  2
     Core(s) per socket:  64
     Socket(s):           2
     NUMA node(s):        32
     Vendor ID:           AuthenticAMD
     CPU family:          23
     Model:               49
     Model name:          AMD EPYC 7H12 64-Core Processor
     Stepping:            0
     CPU MHz:             3133.533
     BogoMIPS:            5190.17
     Virtualization:      AMD-V
     L1d cache:           32K
     L1i cache:           32K
     L2 cache:            512K
     L3 cache:            16384K
```

(Continued on next page)

Platform Notes (Continued)

```
      NUMA node0 CPU(s):   0-3,128-131
      NUMA node1 CPU(s):   4-7,132-135
      NUMA node2 CPU(s):   8-11,136-139
      NUMA node3 CPU(s):   12-15,140-143
      NUMA node4 CPU(s):   16-19,144-147
      NUMA node5 CPU(s):   20-23,148-151
      NUMA node6 CPU(s):   24-27,152-155
      NUMA node7 CPU(s):   28-31,156-159
      NUMA node8 CPU(s):   32-35,160-163
      NUMA node9 CPU(s):   36-39,164-167
      NUMA node10 CPU(s):  40-43,168-171
      NUMA node11 CPU(s):  44-47,172-175
      NUMA node12 CPU(s):  48-51,176-179
      NUMA node13 CPU(s):  52-55,180-183
      NUMA node14 CPU(s):  56-59,184-187
      NUMA node15 CPU(s):  60-63,188-191
      NUMA node16 CPU(s):  64-67,192-195
      NUMA node17 CPU(s):  68-71,196-199
      NUMA node18 CPU(s):  72-75,200-203
      NUMA node19 CPU(s):  76-79,204-207
      NUMA node20 CPU(s):  80-83,208-211
      NUMA node21 CPU(s):  84-87,212-215
      NUMA node22 CPU(s):  88-91,216-219
      NUMA node23 CPU(s):  92-95,220-223
      NUMA node24 CPU(s):  96-99,224-227
      NUMA node25 CPU(s):  100-103,228-231
      NUMA node26 CPU(s):  104-107,232-235
      NUMA node27 CPU(s):  108-111,236-239
      NUMA node28 CPU(s):  112-115,240-243
      NUMA node29 CPU(s):  116-119,244-247
      NUMA node30 CPU(s):  120-123,248-251
      NUMA node31 CPU(s):  124-127,252-255
      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 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_llc mwaitx cpb
     cat_l3 cdp_l3 hw_pstate sme ssbd mba 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
     wbnoinvd 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
```

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Platform Notes (Continued)

```
From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 32 nodes (0-31)
  node 0 cpus: 0 1 2 3 128 129 130 131
  node 0 size: 15546 MB
  node 0 free: 15454 MB
  node 1 cpus: 4 5 6 7 132 133 134 135
  node 1 size: 16125 MB
  node 1 free: 16032 MB
  node 2 cpus: 8 9 10 11 136 137 138 139
  node 2 size: 16126 MB
  node 2 free: 16061 MB
  node 3 cpus: 12 13 14 15 140 141 142 143
  node 3 size: 16123 MB
  node 3 free: 16061 MB
  node 4 cpus: 16 17 18 19 144 145 146 147
  node 4 size: 16126 MB
  node 4 free: 16057 MB
  node 5 cpus: 20 21 22 23 148 149 150 151
  node 5 size: 16125 MB
  node 5 free: 16086 MB
  node 6 cpus: 24 25 26 27 152 153 154 155
  node 6 size: 16126 MB
  node 6 free: 16087 MB
  node 7 cpus: 28 29 30 31 156 157 158 159
  node 7 size: 16123 MB
  node 7 free: 16077 MB
  node 8 cpus: 32 33 34 35 160 161 162 163
  node 8 size: 16126 MB
  node 8 free: 16073 MB
  node 9 cpus: 36 37 38 39 164 165 166 167
  node 9 size: 16125 MB
  node 9 free: 16080 MB
  node 10 cpus: 40 41 42 43 168 169 170 171
  node 10 size: 16126 MB
  node 10 free: 16016 MB
  node 11 cpus: 44 45 46 47 172 173 174 175
  node 11 size: 16123 MB
  node 11 free: 16078 MB
  node 12 cpus: 48 49 50 51 176 177 178 179
  node 12 size: 16126 MB
  node 12 free: 16029 MB
  node 13 cpus: 52 53 54 55 180 181 182 183
  node 13 size: 16125 MB
  node 13 free: 16061 MB
  node 14 cpus: 56 57 58 59 184 185 186 187
```

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Platform Notes (Continued)

```
node 14 size: 16126 MB
node 14 free: 16081 MB
node 15 cpus: 60 61 62 63 188 189 190 191
node 15 size: 16111 MB
node 15 free: 16066 MB
node 16 cpus: 64 65 66 67 192 193 194 195
node 16 size: 16126 MB
node 16 free: 16076 MB
node 17 cpus: 68 69 70 71 196 197 198 199
node 17 size: 16125 MB
node 17 free: 16087 MB
node 18 cpus: 72 73 74 75 200 201 202 203
node 18 size: 16126 MB
node 18 free: 16088 MB
node 19 cpus: 76 77 78 79 204 205 206 207
node 19 size: 16123 MB
node 19 free: 16084 MB
node 20 cpus: 80 81 82 83 208 209 210 211
node 20 size: 16126 MB
node 20 free: 15935 MB
node 21 cpus: 84 85 86 87 212 213 214 215
node 21 size: 16125 MB
node 21 free: 15973 MB
node 22 cpus: 88 89 90 91 216 217 218 219
node 22 size: 16126 MB
node 22 free: 16003 MB
node 23 cpus: 92 93 94 95 220 221 222 223
node 23 size: 16123 MB
node 23 free: 16004 MB
node 24 cpus: 96 97 98 99 224 225 226 227
node 24 size: 16126 MB
node 24 free: 16011 MB
node 25 cpus: 100 101 102 103 228 229 230 231
node 25 size: 16125 MB
node 25 free: 16070 MB
node 26 cpus: 104 105 106 107 232 233 234 235
node 26 size: 16126 MB
node 26 free: 16040 MB
node 27 cpus: 108 109 110 111 236 237 238 239
node 27 size: 16097 MB
node 27 free: 16009 MB
node 28 cpus: 112 113 114 115 240 241 242 243
node 28 size: 16126 MB
node 28 free: 11536 MB
node 29 cpus: 116 117 118 119 244 245 246 247
node 29 size: 16125 MB
node 29 free: 16090 MB
```

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Platform Notes (Continued)

```
node 30 cpus: 120 121 122 123 248 249 250 251
node 30 size: 16126 MB
node 30 free: 16084 MB
node 31 cpus: 124 125 126 127 252 253 254 255
node 31 size: 16122 MB
node 31 free: 16048 MB
node distances:
node   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
  0:  10  11  11  11  12  12  12  12  12  12  12  12  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  1:  11  10  11  11  12  12  12  12  12  12  12  12  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  2:  11  11  10  11  12  12  12  12  12  12  12  12  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  3:  11  11  11  10  12  12  12  12  12  12  12  12  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  4:  12  12  12  12  10  11  11  11  12  12  12  12  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  5:  12  12  12  12  11  10  11  11  12  12  12  12  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  6:  12  12  12  12  11  11  10  11  12  12  12  12  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  7:  12  12  12  12  11  11  11  10  12  12  12  12  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  8:  12  12  12  12  12  12  12  12  10  11  11  11  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
  9:  12  12  12  12  12  12  12  12  11  10  11  11  12  12  12  12  32  32  32  32
  32  32  32  32  32  32  32  32  32  32  32  32
 10:  12  12  12  12  12  12  12  12  11  11  10  11  12  12  12  12  32  32  32  32
 32  32  32  32  32  32  32  32  32  32  32  32
 11:  12  12  12  12  12  12  12  12  11  11  11  10  12  12  12  12  32  32  32  32
 32  32  32  32  32  32  32  32  32  32  32  32
 12:  12  12  12  12  12  12  12  12  12  12  12  12  12  10  11  11  32  32  32  32
 32  32  32  32  32  32  32  32  32  32  32  32
 13:  12  12  12  12  12  12  12  12  12  12  12  12  12  11  10  11  32  32  32  32
 32  32  32  32  32  32  32  32  32  32  32  32
 14:  12  12  12  12  12  12  12  12  12  12  12  12  12  11  11  10  32  32  32  32
 32  32  32  32  32  32  32  32  32  32  32  32
 15:  12  12  12  12  12  12  12  12  12  12  12  12  12  11  11  11  10  32  32  32
 32  32  32  32  32  32  32  32  32  32  32  32
 16:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  10  11  11
 12  12  12  12  12  12  12  12  12  12  12  12
 17:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  10  11
 12  12  12  12  12  12  12  12  12  12  12  12
 18:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  10
 12  12  12  12  12  12  12  12  12  12  12  12
```


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Platform Notes (Continued)

```
    19:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  10
    12  12  12  12  12  12  12  12  12  12  12  12
    20:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    10  11  11  11  12  12  12  12  12  12  12  12
    21:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    11  10  11  11  12  12  12  12  12  12  12  12
    22:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    11  11  10  11  12  12  12  12  12  12  12  12
    23:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    11  11  11  10  12  12  12  12  12  12  12  12
    24:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    12  12  12  12  10  11  11  11  12  12  12  12
    25:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    12  12  12  12  11  10  11  11  12  12  12  12
    26:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    12  12  12  12  11  11  10  11  12  12  12  12
    27:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    12  12  12  12  11  11  11  10  12  12  12  12
    28:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    12  12  12  12  12  12  12  12  10  11  11  11
    29:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    12  12  12  12  12  12  12  12  11  10  11  11
    30:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    12  12  12  12  12  12  12  12  11  11  10  11
    31:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
    12  12  12  12  12  12  12  12  11  11  11  10

  From /proc/meminfo
     MemTotal:       527766616 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  From /etc/*release* /etc/*version*
     os-release:
        NAME="Red Hat Enterprise Linux"
        VERSION="8.2 (Ootpa)"
        ID="rhel"
        ID_LIKE="fedora"
        VERSION_ID="8.2"
        PLATFORM_ID="platform:el8"
        PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
        ANSI_COLOR="0;31"
     redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
     system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
     system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

  uname -a:
```

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Platform Notes (Continued)

```
   Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
   x86_64 x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 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: conditional, RSB
                                           filling
 tsx_async_abort:                          Not affected

 run-level 3 Jul 2 05:45 last=5

 SPEC is set to: /mnt/ramdisk/cpu2017-1.1.0
    Filesystem     Type   Size  Used Avail Use% Mounted on
    tmpfs          tmpfs  225G  4.4G  221G   2% /mnt/ramdisk

 From /sys/devices/virtual/dmi/id
     BIOS:    Dell Inc. 1.4.8 05/06/2020
     Vendor:  Dell Inc.
     Product: PowerEdge R7525
     Product Family: PowerEdge
     Serial:  48LN333

 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 802C80B3802C 36ASF4G72PZ-3G2E7 32 GB 2 rank 3200
     1x 802C8632802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
     5x 802C869D802C 36ASF4G72PZ-3G2E7 32 GB 2 rank 3200
     2x 80AD863280AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
     16x Not Specified Not Specified

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 502.gcc_r(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
------------------------------------------------------------------------------

==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
        | 525.x264_r(base, peak) 557.xz_r(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       | 502.gcc_r(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
------------------------------------------------------------------------------

==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
        | 525.x264_r(base, peak) 557.xz_r(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++     | 523.xalancbmk_r(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)
```

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Compiler Version Notes (Continued)

```
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
        | 531.deepsjeng_r(base, peak) 541.leela_r(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++     | 523.xalancbmk_r(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
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
        | 531.deepsjeng_r(base, peak) 541.leela_r(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 | 548.exchange2_r(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
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

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:
-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 -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

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-mllvm -enable-partial-unswitch -z muldefs -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 -lmvec -lamdlibm -ljemalloc -lflang

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Peak Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
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,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC -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 -lmvec -lamdlibm -ljemalloc -lflang`

502.gcc_r: `-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 -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 -fgnu89-inline -ljemalloc`

505.mcf_r: `-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 -lmvec -lamdlibm -ljemalloc -lflang`

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Peak Optimization Flags (Continued)

525.x264_r: `Same as 500.perlbench_r`

557.xz_r: `Same as 505.mcf_r`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `-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 -ljemalloc`

531.deepsjeng_r: `-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 -lmvec -lamdlibm -ljemalloc -lflang`

541.leela_r: `basepeak = yes`

Fortran benchmarks:

548.exchange2_r: `basepeak = yes`

Peak Other Flags

C benchmarks:

502.gcc_r: `-L/sppo/dev/cpu2017/v110/amd_rate_aocc200_rome_C_lib/32`

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Peak Other Flags (Continued)

C++ benchmarks:

523.xalancbmk_r: `-L/sppo/dev/cpu2017/v110/amd_rate_aocc200_rome_C_lib/32`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/aocc200-flags-C4.html`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE11.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc200-flags-C4.xml`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE11.xml`

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