SPEC CPU®2017 Integer Rate Result

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Dell Inc.

PowerEdge R7525 (AMD EPYC 7H12, 2.60 GHz)

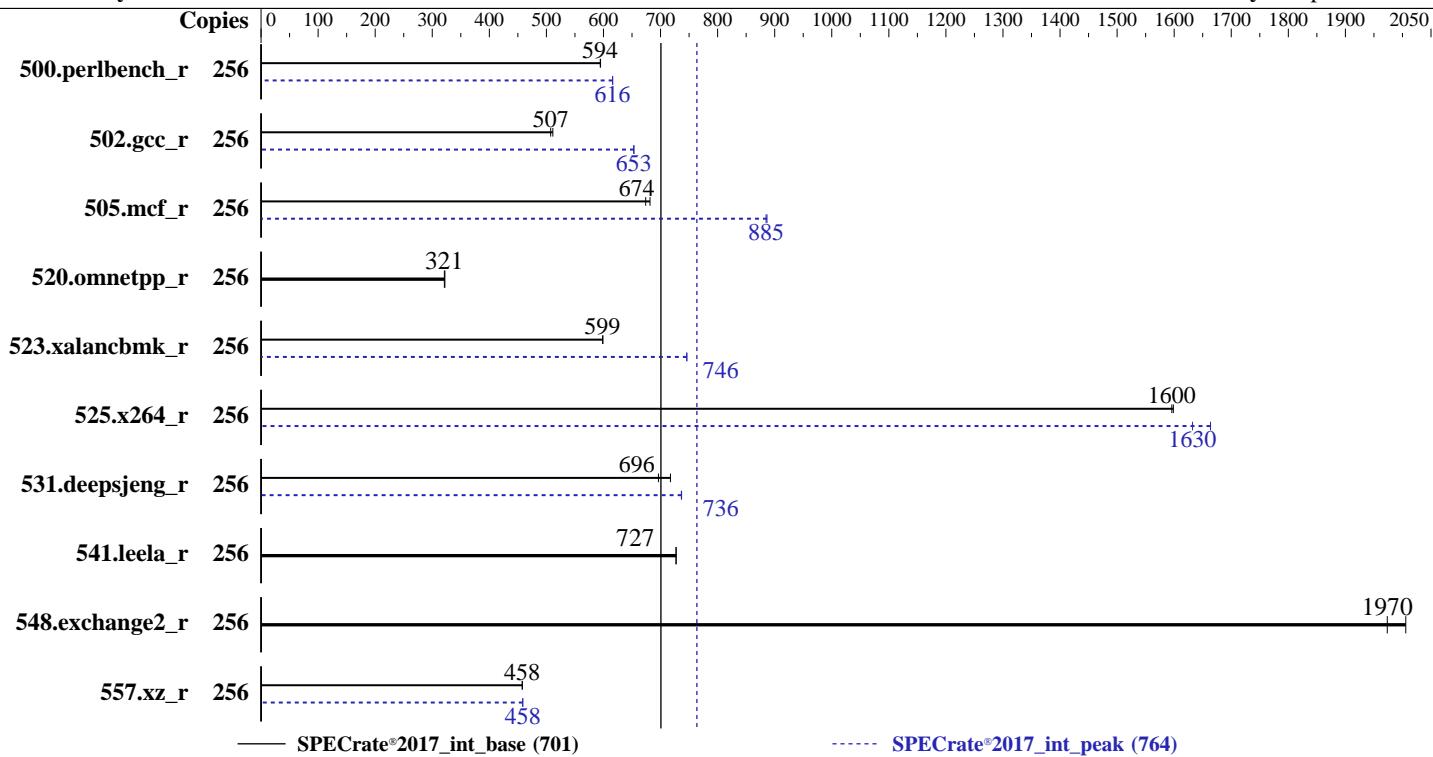$SPECrate^{®}2017\_int\_base = 701$

$SPECrate^{®}2017\_int\_peak = 764$

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

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

Benchmark	Copies	base	peak
500.perlbench_r	256	594	616
502.gcc_r	256	507	653
505.mcf_r	256	674	885
520.omnetpp_r	256	321	
523.xalancbmk_r	256	599	746
525.x264_r	256	1600	1630
531.deepsjeng_r	256	696	736
541.leela_r	256	727	
548.exchange2_r	256	1970	
557.xz_r	256	458	458

SPECrate®2017_int_base (701)　　　SPECrate®2017_int_peak (764)

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
```

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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  10  11  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  11  10  11  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  11  11  10  11  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  11  11  11  10  32  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  10  11  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  11  10  11  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  11  11  10  11
 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:
```

(Continued on next page)

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

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)
```

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

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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Dell Inc.

PowerEdge R7525 (AMD EPYC 7H12, 2.60 GHz)

SPECrate®2017_int_base = 701

SPECrate®2017_int_peak = 764

CPU2017 License: 55	**Test Date:** Jul-2020
Test Sponsor: Dell Inc.	**Hardware Availability:** Feb-2020
Tested by: Dell Inc.	**Software Availability:** Apr-2020

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

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

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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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

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`

SPEC CPU®2017 Integer Rate Result

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Dell Inc.

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

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

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
```

Dell Inc.

PowerEdge R7525 (AMD EPYC 7H12, 2.60 GHz)

SPECrate®2017_int_base = 701

SPECrate®2017_int_peak = 764

CPU2017 License: 55		**Test Date:**	Jul-2020
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Feb-2020
Tested by:	Dell Inc.	**Software Availability:**	Apr-2020

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`

(Continued on next page)

Dell Inc.

PowerEdge R7525 (AMD EPYC 7H12, 2.60 GHz)

SPECrate®2017_int_base = 701

SPECrate®2017_int_peak = 764

CPU2017 License: 55		**Test Date:**	Jul-2020
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Feb-2020
Tested by:	Dell Inc.	**Software Availability:**	Apr-2020

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`

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

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