**SPEC CPU®2017 Integer Rate Result**

Dell Inc.

**PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 437</th>
<th>SPECrate®2017_int_peak = 466</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_int_base</th>
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<td>perlbench_r</td>
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<td>gcc_r</td>
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<td>mcf_r</td>
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<td>omnetpp_r</td>
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<td>xalancbmk_r</td>
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<td>x264_r</td>
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<td>xz_r</td>
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**Hardware**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>AMD EPYC 7532</td>
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<tr>
<td>Max MHz</td>
<td>3300</td>
</tr>
<tr>
<td>Nominal</td>
<td>2400</td>
</tr>
<tr>
<td>Enabled</td>
<td>64 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
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<tr>
<td>L2</td>
<td>512 KB I+D on chip per core</td>
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<tr>
<td>L3</td>
<td>256 MB I+D on chip per chip, 16 MB shared / 2 cores</td>
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<tr>
<td>Other</td>
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<tr>
<td>Memory</td>
<td>512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)</td>
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<tr>
<td>Storage</td>
<td>1 x 800 GB SATA SSD</td>
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<tr>
<td>Other</td>
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</table>

**Software**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
</table>
| OS | SUSE Linux Enterprise Server 15 SP1  
kernel 4.12.14-195-default |
| Compiler | C/C++/Fortran: Version 2.0.0 of AOCC |
| Parallel | No |
| Firmware | Version 1.2.6 released Nov-2019 |
| 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 |
Dell Inc.

PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)

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

SPECrare®2017_int_base = 437
SPECrare®2017_int_peak = 466

Results Table

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</table>

SPECrare®2017_int_base = 437
SPECrare®2017_int_peak = 466

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).

(Continued on next page)
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Dell Inc. PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)

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

Test Date: Dec-2019
Hardware Availability: Feb-2020
Software Availability: Aug-2019

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.

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:
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

Sysinfo program /mnt/ramdisk/cpu2017-1.1.0/bin/sysinfo

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

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**Dell Inc.**

PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)

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**Platform Notes (Continued)**

Rev: r6365 of 2019-08-21 295195f888a3d7ed1b1e6e46a485a0011
running on linux-g3ob Mon Dec 2 14:02:30 2019

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 7532 32-Core Processor
2 "physical id"s (chips)
128 "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 : 32
siblings : 64
physical 0: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45
48 49 52 53 56 57 60 61
physical 1: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45
48 49 52 53 56 57 60 61
```

From lscpu:

```
Architecture:        x86_64
CPU op-mode(s):      32-bit, 64-bit
Byte Order:          Little Endian
Address sizes:       43 bits physical, 48 bits virtual
CPU(s):              128
On-line CPU(s) list: 0-127
Thread(s) per core:  2
Core(s) per socket:  32
Socket(s):           2
NUMA node(s):        32
Vendor ID:           AuthenticAMD
CPU family:          23
Model:               49
Model name:          AMD EPYC 7532 32-Core Processor
Stepping:            0
CPU MHz:             2395.376
BogoMIPS:            4790.75
Virtualization:      AMD-V
L1d cache:           32K
L1i cache:           32K
L2 cache:            512K
L3 cache:            16384K
NUMA node0 CPU(s):   0,1,64,65
NUMA node1 CPU(s):   2,3,66,67
NUMA node2 CPU(s):   4,5,68,69
NUMA node3 CPU(s):   6,7,70,71
```

(Continued on next page)
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SPECrate®2017_int_base = 437

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NUMA node4 CPU(s): 8, 9, 72, 73
NUMA node5 CPU(s): 10, 11, 74, 75
NUMA node6 CPU(s): 12, 13, 76, 77
NUMA node7 CPU(s): 14, 15, 78, 79
NUMA node8 CPU(s): 16, 17, 80, 81
NUMA node9 CPU(s): 18, 19, 82, 83
NUMA node10 CPU(s): 20, 21, 84, 85
NUMA node11 CPU(s): 22, 23, 86, 87
NUMA node12 CPU(s): 24, 25, 88, 89
NUMA node13 CPU(s): 26, 27, 90, 91
NUMA node14 CPU(s): 28, 29, 92, 93
NUMA node15 CPU(s): 30, 31, 94, 95
NUMA node16 CPU(s): 32, 33, 96, 97
NUMA node17 CPU(s): 34, 35, 98, 99
NUMA node18 CPU(s): 36, 37, 100, 101
NUMA node19 CPU(s): 38, 39, 102, 103
NUMA node20 CPU(s): 40, 41, 104, 105
NUMA node21 CPU(s): 42, 43, 106, 107
NUMA node22 CPU(s): 44, 45, 108, 109
NUMA node23 CPU(s): 46, 47, 110, 111
NUMA node24 CPU(s): 48, 49, 112, 113
NUMA node25 CPU(s): 50, 51, 114, 115
NUMA node26 CPU(s): 52, 53, 116, 117
NUMA node27 CPU(s): 54, 55, 118, 119
NUMA node28 CPU(s): 56, 57, 120, 121
NUMA node29 CPU(s): 58, 59, 122, 123
NUMA node30 CPU(s): 60, 61, 124, 125
NUMA node31 CPU(s): 62, 63, 126, 127

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov prof pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm constant_tsc rep_good nopl xtopology nonstop_tsc cpuid extd_apicid aperfmperf pni 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 ibr skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx cpb cat_l3 cdp_13 hw_pstate sme ssbd sev ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsavec xsaveopt xsaveopt xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local czero irperf xsaverptr arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassist pausefilter pfthreshold avic v_msave_vmload vgpf umip rdpid overflow_recov succor smca

/proc/cpuinfo cache data
cache size : 512 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 32 nodes (0-31)
node 0 cpus: 0 1 64 65

(Continued on next page)
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Platform Notes (Continued)

node 0 size: 15676 MB
node 0 free: 15612 MB
node 1 cpus: 2 3 66 67
node 1 size: 16127 MB
node 1 free: 16083 MB
node 2 cpus: 4 5 68 69
node 2 size: 16127 MB
node 2 free: 16057 MB
node 3 cpus: 6 7 70 71
node 3 size: 16126 MB
node 3 free: 16085 MB
node 4 cpus: 8 9 72 73
node 4 size: 16127 MB
node 4 free: 16066 MB
node 5 cpus: 10 11 74 75
node 5 size: 16127 MB
node 5 free: 16071 MB
node 6 cpus: 12 13 76 77
node 6 size: 16127 MB
node 6 free: 16072 MB
node 7 cpus: 14 15 78 79
node 7 size: 16126 MB
node 7 free: 16074 MB
node 8 cpus: 16 17 80 81
node 8 size: 16127 MB
node 8 free: 16091 MB
node 9 cpus: 18 19 82 83
node 9 size: 16097 MB
node 9 free: 16060 MB
node 10 cpus: 20 21 84 85
node 10 size: 16127 MB
node 10 free: 16090 MB
node 11 cpus: 22 23 86 87
node 11 size: 16126 MB
node 11 free: 16087 MB
node 12 cpus: 24 25 88 89
node 12 size: 16127 MB
node 12 free: 16020 MB
node 13 cpus: 26 27 90 91
node 13 size: 16127 MB
node 13 free: 16076 MB
node 14 cpus: 28 29 92 93
node 14 size: 16127 MB
node 14 free: 16084 MB
node 15 cpus: 30 31 94 95
node 15 size: 16114 MB
node 15 free: 11918 MB

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

<table>
<thead>
<tr>
<th>Node</th>
<th>CPUs</th>
<th>Size</th>
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SPEC CPU®2017 Integer Rate Result

Dell Inc.
PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)

SPECrate®2017_int_base = 437
SPECrate®2017_int_peak = 466

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

Test Date: Dec-2019
Hardware Availability: Feb-2020
Software Availability: Aug-2019

Platform Notes (Continued)

From /proc/meminfo
MemTotal: 527939392 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"

cve-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected

(Continued on next page)
Dell Inc.

PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)

SPECRate®2017_int_base = 437
SPECRate®2017_int_peak = 466

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

Test Date: Dec-2019
Hardware Availability: Feb-2020
Software Availability: Aug-2019

Platform Notes (Continued)

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

run-level 3 Dec 2 07:57 last=5

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.0
Filesystem     Type   Size  Used Avail Use% Mounted on
tmpfs          tmpfs  140G  4.0G  137G   3% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
BIOS:    Dell Inc. 1.2.6 11/21/2019
Vendor:  Dell Inc.
Product: PowerEdge R7525
Product Family: PowerEdge
Serial:  1234567

Memory:
3x 802C80B3802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
1x 802C80B3802C 36ASF4G72PZ-3G2E7 32 GB 2 rank 3200
2x 80C8632802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
1x 80C869D802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
9x 80AD863280AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
16x Not Specified Not Specified

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

(Continued on next page)
Dell Inc.

PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)

**SPEC CPU®2017 Integer Rate Result**

**SPECrate®2017_int_base = 437**

**SPECrate®2017_int_peak = 466**

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

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**Compiler Version Notes (Continued)**

```plaintext
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  
```

---

```plaintext
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  
```

---

```plaintext
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  
```

---

```plaintext
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  
```

---

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

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++
**SPEC CPU®2017 Integer Rate Result**

Dell Inc.  
PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: Dec-2019</th>
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</thead>
<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability: Feb-2020</td>
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<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Aug-2019</td>
</tr>
</tbody>
</table>

**SPECrate®2017_int_base = 437**  
**SPECrate®2017_int_peak = 466**

---

**Base Compiler Invocation (Continued)**

Fortran benchmarks:

flang

---

**Base Portability Flags**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>-DSPEC_LINUX_X64 -DSPEC_LP64</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>-DSPEC_LINUX -DSPEC_LP64</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>557.xz_r</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 -lmvec -lamdlibm -ljemalloc -lflang`

**C++ benchmarks:**

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

**Fortran benchmarks:**

- `flto`  
- `-Wl,-mllvm -Wl,-function-specialize`  
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC`
SPEC CPU®2017 Integer Rate Result

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-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 -lament -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

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

500.perlbench_r (continued):
  -fprofile-instr-generate(pass 1)
  -fprofile-instr-use(pass 2) -Ofast -march=znver2
  -mno-sse4a -fstruct-layout=5
  -mlirvm -vectorize-memory-aggressively
  -mlirvm -function-specialize -mlirvm -enable-gvn-hoist
  -mlirvm -unroll-threshold=50 -fremap-arrays
  -mlirvm -vector-library=LIBMVEC
  -mlirvm -reduce-array-computations=3
  -mlirvm -global-vectorize-slp -mlirvm -inline-threshold=1000
  -flv-function-specialization -lmvec -lamdlibm -ljemalloc
  -lflang

502.gcc_r: -m32 -flto -Wl,-mlirvm -Wl,-function-specialize
  -Wl,-mlirvm -Wl,-region-vectorize
  -Wl,-mlirvm -Wl,-vector-library=LIBMVEC
  -Wl,-mlirvm -Wl,-reduce-array-computations=3 -Ofast
  -march=znver2 -mno-sse4a -fstruct-layout=5
  -mlirvm -vectorize-memory-aggressively
  -mlirvm -function-specialize -mlirvm -enable-gvn-hoist
  -mlirvm -unroll-threshold=50 -fremap-arrays
  -mlirvm -vector-library=LIBMVEC
  -mlirvm -reduce-array-computations=3
  -mlirvm -global-vectorize-slp -mlirvm -inline-threshold=1000
  -flv-function-specialization -fgnu89-inline -ljemalloc

505.mcf_r: -flto -Wl,-mlirvm -Wl,-function-specialize
  -Wl,-mlirvm -Wl,-region-vectorize
  -Wl,-mlirvm -Wl,-vector-library=LIBMVEC
  -Wl,-mlirvm -Wl,-reduce-array-computations=3 -Ofast
  -march=znver2 -mno-sse4a -fstruct-layout=5
  -mlirvm -vectorize-memory-aggressively
  -mlirvm -function-specialize -mlirvm -enable-gvn-hoist
  -mlirvm -unroll-threshold=50 -fremap-arrays
  -mlirvm -vector-library=LIBMVEC
  -mlirvm -reduce-array-computations=3
  -mlirvm -global-vectorize-slp -mlirvm -inline-threshold=1000
  -flv-function-specialization -lmvec -lamdlibm -ljemalloc
  -lflang

525.x264_r: Same as 500.perlbench_r

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

(Continued on next page)
Dell Inc.
PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)

SPEC CPU®2017 Integer Rate Result
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Peak Optimization Flags (Continued)

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
-flang

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

C++ benchmarks:

523.xalancbmk_r: -L/sppo/dev/cpu2017/v110/amd_rate_aocc200_rome_C_lib/32
### Dell Inc.

**PowerEdge R7525 (AMD EPYC 7532, 2.40 GHz)**

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


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