**SPEC CPU®2017 Integer Speed Result**

**Lenovo Global Technology**

ThinkSystem SR665  
2.00 GHz, AMD EPYC 7662

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>8.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>8.99</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** Jun-2020  
**Hardware Availability:** Jun-2020  
**Software Availability:** Nov-2019

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (8.75)</th>
<th>SPECspeed®2017_int_peak (8.99)</th>
</tr>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>1</td>
<td>5.63</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>128</td>
<td>5.05</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>625.x264_s</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>128</td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>AMD EPYC 7662</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz:</td>
<td>3300</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2000</td>
</tr>
<tr>
<td>Enabled:</td>
<td>128 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>
</tr>
<tr>
<td>L2: 512 KB I+D on chip per core</td>
<td></td>
</tr>
<tr>
<td>L3: 256 MB I+D on chip per chip, 16 MB shared / 4 cores</td>
<td></td>
</tr>
<tr>
<td>Other: None</td>
<td></td>
</tr>
<tr>
<td>Memory: 1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R)</td>
<td></td>
</tr>
<tr>
<td>Storage: 1 x 960 GB SATA SSD</td>
<td></td>
</tr>
<tr>
<td>Other: None</td>
<td></td>
</tr>
</tbody>
</table>

**Software**

<table>
<thead>
<tr>
<th>OS:</th>
<th>Red Hat Enterprise Linux 8.1 (Ootpa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernel:</td>
<td>4.18.0-147.el8.x86_64</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++/Fortran: Version 2.0.0 of AOCC</td>
</tr>
<tr>
<td>Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware:</td>
<td>Lenovo BIOS Version D8E105P 1.00 released May-2020</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other:</td>
<td>jemalloc: jemalloc memory allocator library v5.1.0</td>
</tr>
<tr>
<td>Power Management:</td>
<td>BIOS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>
Lenovo Global Technology
ThinkSystem SR665
2.00 GHz, AMD EPYC 7662

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>128</td>
<td>373</td>
<td>4.76</td>
<td>379</td>
<td>4.68</td>
<td>373</td>
<td>4.76</td>
<td>1</td>
<td>353</td>
<td>5.03</td>
<td>356</td>
<td>4.98</td>
<td>352</td>
<td>5.04</td>
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<tr>
<td>605.mcf_s</td>
<td>128</td>
<td>317</td>
<td>14.9</td>
<td>318</td>
<td>14.8</td>
<td>318</td>
<td>14.9</td>
<td>128</td>
<td>323</td>
<td>5.05</td>
<td>323</td>
<td>5.05</td>
<td>323</td>
<td>5.05</td>
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<tr>
<td>620.omnetpp_s</td>
<td>128</td>
<td>153</td>
<td>12.3</td>
<td>155</td>
<td>12.2</td>
<td>155</td>
<td>12.2</td>
<td>128</td>
<td>144</td>
<td>12.3</td>
<td>144</td>
<td>12.2</td>
<td>144</td>
<td>12.2</td>
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<tr>
<td>623.xalanchmk_s</td>
<td>128</td>
<td>144</td>
<td>16.3</td>
<td>144</td>
<td>16.3</td>
<td>144</td>
<td>16.3</td>
<td>128</td>
<td>144</td>
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<td>144</td>
<td>16.3</td>
<td>144</td>
<td>16.3</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>128</td>
<td>298</td>
<td>4.82</td>
<td>299</td>
<td>4.80</td>
<td>306</td>
<td>4.68</td>
<td>1</td>
<td>292</td>
<td>4.91</td>
<td>292</td>
<td>4.90</td>
<td>292</td>
<td>4.91</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>128</td>
<td>323</td>
<td>4.16</td>
<td>310</td>
<td>4.16</td>
<td>410</td>
<td>4.16</td>
<td>128</td>
<td>323</td>
<td>4.16</td>
<td>410</td>
<td>4.16</td>
<td>410</td>
<td>4.16</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base = 8.75**
**SPECspeed®2017_int_peak = 8.99**

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).

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:
GOMP_CPU_AFFINITY = "0-255"
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.0-amd-rome-aocc200-C1/amd_speed_aocc200_rome_C_lib/64
;/home/cpu2017-1.1.0-amd-rome-aocc200-C1/amd_speed_aocc200_rome_C_lib/32
;"
MALLOCONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREADLIMIT = "256"

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

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

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

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

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

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

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using Fedora 26

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4) is mitigated in the system as tested and documented.

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

jemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

### Platform Notes

BIOS settings:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
NUMA nodes per socket set to NPS4

Sysinfo program /home/cpu2017-1.1.0-amd-rome-aocc200-C1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on localhost.localdomain Mon Jun  8 00:27:04 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 7662 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):          8
Vendor ID:             AuthenticAMD
CPU family:            23
```

(Continued on next page)
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ThinkSystem SR665 2.00 GHz, AMD EPYC 7662

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**Hardware Availability:** Jun-2020  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Nov-2019

---

### Platform Notes (Continued)

```
Model:               49  
Model name:          AMD EPYC 7662 64-Core Processor  
Stepping:            0  
CPU MHz:             3228.567  
CPU max MHz:         2000.0000  
CPU min MHz:         1500.0000  
BogoMIPS:            3992.60  
Virtualization:      AMD-V  
L1d cache:           32K  
L1i cache:           32K  
L2 cache:            512K  
L3 cache:            16384K  
NUMA node0 CPU(s):   0-15,128-143  
NUMA node1 CPU(s):   16-31,144-159  
NUMA node2 CPU(s):   32-47,160-175  
NUMA node3 CPU(s):   48-63,176-191  
NUMA node4 CPU(s):   64-79,192-207  
NUMA node5 CPU(s):   80-95,208-223  
NUMA node6 CPU(s):   96-111,224-239  
NUMA node7 CPU(s):   112-127,240-255  
Flags:               fpu vme de pse tsc msr pae mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtsscp lm constant_tsc rep_good nopl xtopology svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw lfskinit 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 bml1 avx2 smep bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsaves xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr wbnoinvd arat npt lbiv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic v_vmsave_vmload vgif umip rpdpid overflow_recov succor smca
```

```
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 4 5 6 7 8 9 10 11 12 13 14 15 128 129 130 131 132 133 134 135 136
  137 138 139 140 141 142 143
  node 0 size: 128822 MB
  node 0 free: 128545 MB
  node 1 cpus:  16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 144 145 146 147 148 149
  150 151 152 153 154 155 156 157 158 159
  node 1 size: 129015 MB
  node 1 free: 128724 MB
```

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

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ThinkSystem SR665
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SPECspeed®2017_int_base = 8.75
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Platform Notes (Continued)

node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175
node 2 size: 129015 MB
node 2 free: 128826 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191
node 3 size: 129003 MB
node 3 free: 128805 MB
node 4 cpus: 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207
node 4 size: 129015 MB
node 4 free: 128831 MB
node 5 cpus: 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223
node 5 size: 128990 MB
node 5 free: 128793 MB
node 6 size: 128560 MB
node 6 free: 128560 MB
node 7 cpus: 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255
node 7 size: 129014 MB
node 7 free: 128830 MB
node distances:
node 0 1 2 3 4 5 6 7
0: 10 12 12 12 32 32 32 32
1: 12 10 12 12 32 32 32 32
2: 12 12 10 12 32 32 32 32
3: 12 12 12 10 32 32 32 32
4: 32 32 32 32 10 12 12 12
5: 32 32 32 32 12 10 12 12
6: 32 32 32 32 12 12 10 12
7: 32 32 32 32 12 12 12 10

From /proc/meminfo
MemTotal: 1056659244 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os_release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.1 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.1"

(Continued on next page)
### Lenovo Global Technology

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</tr>
</tbody>
</table>

### Platform Notes (Continued)

```plaintext
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:ga
```

```plaintext
uname -a:
Linux localhost.localdomain 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

- **CVE-2018-3620 (L1 Terminal Fault):** Not affected
- **Microarchitectural Data Sampling:** Not affected
- **CVE-2017-5754 (Meltdown):** Not affected
- **CVE-2018-3639 (Speculative Store Bypass):** Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2017-5753 (Spectre variant 1):** Mitigation: usercopyswapgs barriers and __user pointer sanitization
- **CVE-2017-5715 (Spectre variant 2):** Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling

```plaintext
run-level 3 Jun 8 00:06
```

### Filesystem

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sdb2</td>
<td>xfs</td>
<td>838G</td>
<td>38G</td>
<td>800G</td>
<td>5%</td>
<td>/home</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

- **BIOS:** Lenovo D8E105P-1.00 05/08/2020
- **Vendor:** Lenovo
- **Product:** ThinkSystem SR665 MB
- **Product Family:** ThinkSystem
- **Serial:** 1234567890

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:**

- 32x Samsung M393A4G43AB3-CWE 32 kB 2 rank 3200

(End of data from sysinfo program)
**Compiler Version Notes**

---

**C**

- 600.perlbench_s(base, peak)
- 602.gcc_s(base, peak)
- 605.mcf_s(base, peak)
- 625.x264_s(base, peak)
- 657.xz_s(base, peak)

---

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

---

**C++**

- 623.xalancbmk_s(peak)

---

AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
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---

**C++**

- 620.omnetpp_s(base, peak)
- 623.xalancbmk_s(base)
- 631.deepsjeng_s(base, peak)
- 641.leela_s(base, peak)

---

AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
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**C++**

- 623.xalancbmk_s(peak)

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

---

**C++**

- 620.omnetpp_s(base, peak)
- 623.xalancbmk_s(base)
- 631.deepsjeng_s(base, peak)
- 641.leela_s(base, peak)

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

---

**C++**

- 623.xalancbmk_s(peak)

---

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

---

**C++**

- 620.omnetpp_s(base, peak)
- 623.xalancbmk_s(base)
- 631.deepsjeng_s(base, peak)
- 641.leela_s(base, peak)

---

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

---

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)
Lenovo Global Technology
ThinkSystem SR665
2.00 GHz, AMD EPYC 7662

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

SPECspeed®2017_int_base = 8.75
SPECspeed®2017_int_peak = 8.99

Test Date: Jun-2020
Hardware Availability: Jun-2020
Software Availability: Nov-2019

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

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Base Portability Flags

600.perlbench_s: -DSPEC_LINUX_X64 -DSPEC_LP64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LINUX -DSPEC_LP64
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

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 Optimization Flags

**C benchmarks:**
- `-flto -Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
- `-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50`
- `-fremap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist`
- `-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp`
- `-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000`
- `-flv-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp`
- `-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`

**C++ benchmarks:**
- `-flto -Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3`
- `-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2`
- `-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC`
- `-mllvm -unroll-threshold=100 -flv-function-specialization`
- `-mllvm -enable-partial-unswitch -z muldefs -DSPEC_OPENMP -fopenmp`
- `-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -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,-isr-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 -DSPEC_OPENMP -fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`

## Base Other Flags

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

**C++ benchmarks:**
- `-Wno-return-type`
Lenovo Global Technology
ThinkSystem SR665
2.00 GHz, AMD EPYC 7662

SPECspeed®2017_int_base = 8.75
SPECspeed®2017_int_peak = 8.99

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Jun-2020
Hardware Availability: Jun-2020
Software Availability: Nov-2019

Base Other Flags (Continued)

Fortran benchmarks:
-Wno-return-type

Peak Compiler Invocation

C benchmarks:
clang
C++ benchmarks:
clang++

Fortran benchmarks:
flang

Peak Portability Flags

600.perlbench_s: -DSPEC_LINUX_X64 -DSPEC_LP64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LINUX -D_FILE_OFFSET_BITS=64
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:
600.perlbench_s: -flto -Wl,-mllvm -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
-mmss-se4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist

(Continued on next page)
Lenovo Global Technology
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Test Date: Jun-2020
Hardware Availability: Jun-2020
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Peak Optimization Flags (Continued)

600.perlbench_s (continued):
-mlir -unroll-threshold=50 -fremap-arrays
-mlir -vector-library=LIBMVEC
-mlir -reduce-array-computations=3
-mlir -global-vectorize-slp -mlir -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang

602gcc_s: basepeak = yes

605.mcf_s: -flto -Wl,-mlir -Wl,-function-specialize
-Wl,-mlir -Wl,-region-vectorize
-Wl,-mlir -Wl,-vector-library=LIBMVEC
-Wl,-mlir -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mlir -vectorize-memory-aggressively
-mlir -function-specialize -mlir -enable-gvn-hoist
-mlir -unroll-threshold=50 -fremap-arrays
-mlir -vector-library=LIBMVEC
-mlir -reduce-array-computations=3
-mlir -global-vectorize-slp -mlir -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang

625.x264_s: Same as 600.perlbench_s

657.zx_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: -m32 -flto -Wl,-mlir -Wl,-function-specialize
-Wl,-mlir -Wl,-region-vectorize
-Wl,-mlir -Wl,-vector-library=LIBMVEC
-Wl,-mlir -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mlir -unroll-threshold=100
-mlir -enable-partial-unswitch
-mlir -loop-unswitch-threshold=200000
-mlir -vector-library=LIBMVEC
-mlir -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc (Continued on next page)
Lenovo Global Technology

ThinkSystem SR665
2.00 GHz, AMD EPYC 7662

**SPEC CPU®2017 Integer Speed Result**

<table>
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<tr>
<th>SPECspeed®2017_int_base</th>
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<td>SPECspeed®2017_int_peak</td>
<td>8.99</td>
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</tbody>
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

<table>
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</tr>
<tr>
<td>Software Availability</td>
<td>Nov-2019</td>
</tr>
</tbody>
</table>

**Peak Optimization Flags (Continued)**

631.deepsjeng_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-lmvec -lamdlibm -ljemalloc -lflang

641.leela_s: basepeak = yes

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
-mllvm -disable-indvar-simplify -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang

**Peak Other Flags**

C benchmarks:
-Wno-return-type

C++ benchmarks (except as noted below):
-Wno-return-type

623.xalancbmk_s: -Wno-return-type
-L/sppo/dev/cpu2017/v110/amd_speed_aocc200_rome_C_lib/32

Fortran benchmarks:
-Wno-return-type
SPEC CPU®2017 Integer Speed Result

Lenovo Global Technology
ThinkSystem SR665
2.00 GHz, AMD EPYC 7662

SPECspeed®2017_int_base = 8.75
SPECspeed®2017_int_peak = 8.99

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Test Sponsor: Lenovo Global Technology
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The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome2P-K.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome2P-K.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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