### Dell Inc.

PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base = 220</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak = 226</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Mar-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Mar-2021

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (220)</th>
<th>SPECspeed®2017_fp_peak (226)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>619.ibm_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>621.wrf_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>627.cam4_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>628.pop2_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>638.imagick_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>644.nab_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>654.roms_s 64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** AMD EPYC 75F3  
- **Max MHz:** 4000  
- **Nominal:** 2950  
- **Enabled:** 64 cores, 2 chips  
- **Orderable:** 1.2 chips  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **Cache L2:** 512 KB I+D on chip per core  
- **Cache L3:** 256 MB I+D on chip per chip, 32 MB shared / 4 cores  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
- **Storage:** 252 GB on tmpfs  
- **Other:** None

#### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC  
- **Parallel:** Yes  
- **Firmware:** Version 2.1.4 released Feb-2021  
- **File System:** tmpfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc: jemalloc memory allocator library v5.1.0  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.
Dell Inc.
PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)

CPU2017 License: 55
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Test Date: Mar-2021
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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>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>64</td>
<td>81.2</td>
<td>727</td>
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<td>81.2</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>361</td>
<td>46.0</td>
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<tr>
<td>619.lbm_s</td>
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<td>111</td>
<td>41.8</td>
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<td>111</td>
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<td>621.wrf_s</td>
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<td>71.3</td>
<td>185</td>
<td>73.5</td>
<td>180</td>
<td>71.3</td>
<td>185</td>
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<td>627.cam4_s</td>
<td>64</td>
<td>53.7</td>
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<td>53.4</td>
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<td>165</td>
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<tr>
<td>628.pop2_s</td>
<td>64</td>
<td>172</td>
<td>68.9</td>
<td>173</td>
<td>68.6</td>
<td>172</td>
<td>68.9</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>64</td>
<td>44.5</td>
<td>324</td>
<td>44.4</td>
<td>325</td>
<td>44.5</td>
<td>324</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>64</td>
<td>38.3</td>
<td>456</td>
<td>38.3</td>
<td>456</td>
<td>38.3</td>
<td>456</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
<td>77.5</td>
<td>118</td>
<td>77.5</td>
<td>118</td>
<td>77.5</td>
<td>118</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>64</td>
<td>59.9</td>
<td>263</td>
<td>59.2</td>
<td>266</td>
<td>59.9</td>
<td>263</td>
</tr>
</tbody>
</table>

SPECspeed®2017_fp_base = 220
SPECspeed®2017_fp_peak = 226

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
	numactl --interleave=all runcpu <etc>

'echo 8 > /proc/sys/vm/dirty_ratio' run as root to limit dirty cache to 8% of memory.
'echo 1 > /proc/sys/vm/swappiness' run as root to limit swap usage to minimum necessary.
'echo 1 > /proc/sys/vm/zone_reclaim_mode' run as root to free node-local memory and avoid remote memory usage.
'sync; echo 3 > /proc/sys/vm/drop_caches' run as root to reset filesystem caches.
'sysctl -w kernel.randomize_va_space=0' run as root to disable address space layout randomization (ASLR) to reduce run-to-run variability.

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

Dell Inc.
PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)

SPECspeed®2017_fp_base = 220
SPECspeed®2017_fp_peak = 226

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

Operating System Notes (Continued)

To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s,
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH =
    "/dev/shm/cpu2017-1.1.5/amd_speed_aocc300_milan_B_lib/64;/dev/shm/cpu201
    7-1.1.5/amd_speed_aocc300_milan_B_lib/32;"
MALLOCP_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "64"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0 32 1 33 2 34 3 35 4 36 5 37 6 38 7 39 8 40 9 41 10 42
11 43 12 44 13 45 14 46 15 47 16 48 17 49 18 50 19 51 20 52 21 53 22 54
23 55 24 56 25 57 26 58 27 59 28 60 29 61 30 62 31 63"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-63"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using openSUSE 15.2

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 v4.8.2 in RHEL 7.4 (No options specified)
Dell Inc.

PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_peak</th>
<th>226</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_base</td>
<td>220</td>
</tr>
</tbody>
</table>

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

Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

General Notes (Continued)

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

<table>
<thead>
<tr>
<th>BIOS settings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical processor</td>
</tr>
<tr>
<td>L3 Cache as NUMA Domain</td>
</tr>
<tr>
<td>Virtualization Technology</td>
</tr>
<tr>
<td>DRAM Refresh Delay</td>
</tr>
<tr>
<td>System Profile</td>
</tr>
<tr>
<td>CPU Power Management</td>
</tr>
<tr>
<td>Memory Patrol Scrub</td>
</tr>
<tr>
<td>PCI ASPM L1 Link</td>
</tr>
<tr>
<td>Power Management</td>
</tr>
</tbody>
</table>

Sysinfo program /dev/shm/cpu2017-1.1.5/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeea89d4b38e2f1c
running on rhel-8-3-amd Mon Mar 1 22:37:47 2021

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 75F3 32-Core Processor
2 "physical id"s (chips)
64 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 32
siblings : 32
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
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

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 1
Core(s) per socket: 32

(Continued on next page)
Dell Inc.  PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)

SPECspeed®2017_fp_base = 220
SPECspeed®2017_fp_peak = 226

Platform Notes (Continued)

Socket(s): 2
NUMA node(s): 16
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 75F3 32-Core Processor
Stepping: 1
CPU MHz: 1911.646
BogoMIPS: 5888.80
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-3
NUMA node1 CPU(s): 4-7
NUMA node2 CPU(s): 8-11
NUMA node3 CPU(s): 12-15
NUMA node4 CPU(s): 16-19
NUMA node5 CPU(s): 20-23
NUMA node6 CPU(s): 24-27
NUMA node7 CPU(s): 28-31
NUMA node8 CPU(s): 32-35
NUMA node9 CPU(s): 36-39
NUMA node10 CPU(s): 40-43
NUMA node11 CPU(s): 44-47
NUMA node12 CPU(s): 48-51
NUMA node13 CPU(s): 52-55
NUMA node14 CPU(s): 56-59
NUMA node15 CPU(s): 60-63
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtsscp lm
constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmpref perf pni pclmulqdq
monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c
rdseed rdrand lahf_lm cmp_legacy svm extapic cmp_legacy abm sse4a misalignsse 3dnowprefetch
osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb
cat_l3 cdp_l3 invpcid_single hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall
fsgsbase bmi1 avx2 smep bmi2 invvpclmulqdq cqm rdt_a rdseed adx smap clflushopt clwb
sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqmOccurs llc cqm_mbm_total
cqm_mbm_local clzero irperf xsaveerptr wboneinvd amd_ppin arat npt lbv svm_lock
nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pffthresd
v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_recover succor smca

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
Dell Inc.

PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)

SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

SPECspeed®2017_fp_base = 220
SPECspeed®2017_fp_peak = 226

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

Test Date: Mar-2021
Hardware Availability: Apr-2021
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Platform Notes (Continued)

physical chip.
  available: 16 nodes (0-15)
  node 0 cpus: 0 1 2 3
  node 0 size: 31817 MB
  node 0 free: 31650 MB
  node 1 cpus: 4 5 6 7
  node 1 size: 32246 MB
  node 1 free: 32179 MB
  node 2 cpus: 8 9 10 11
  node 2 size: 32250 MB
  node 2 free: 32200 MB
  node 3 cpus: 12 13 14 15
  node 3 size: 32250 MB
  node 3 free: 32148 MB
  node 4 cpus: 16 17 18 19
  node 4 size: 32252 MB
  node 4 free: 32205 MB
  node 5 cpus: 20 21 22 23
  node 5 size: 32254 MB
  node 5 free: 32191 MB
  node 6 cpus: 24 25 26 27
  node 6 size: 32250 MB
  node 6 free: 32175 MB
  node 7 cpus: 28 29 30 31
  node 7 size: 32195 MB
  node 7 free: 32001 MB
  node 8 cpus: 32 33 34 35
  node 8 size: 32252 MB
  node 8 free: 32193 MB
  node 9 cpus: 36 37 38 39
  node 9 size: 32252 MB
  node 9 free: 32195 MB
  node 10 cpus: 40 41 42 43
  node 10 size: 32254 MB
  node 10 free: 26349 MB
  node 11 cpus: 44 45 46 47
  node 11 size: 32252 MB
  node 11 free: 32217 MB
  node 12 cpus: 48 49 50 51
  node 12 size: 32252 MB
  node 12 free: 32214 MB
  node 13 cpus: 52 53 54 55
  node 13 size: 32254 MB
  node 13 free: 32214 MB
  node 14 cpus: 56 57 58 59
  node 14 size: 32254 MB
  node 14 free: 32223 MB

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

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SPECspeed®2017_fp_base = 220  

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Tested by: Dell Inc.  

Test Date: Mar-2021  
Hardware Availability: Apr-2021  
Software Availability: Mar-2021  

Platform Notes (Continued)  

node 15 cpus: 60 61 62 63  
node 15 size: 32250 MB  
node 15 free: 32216 MB  

node distances:  

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
</table>

From /proc/meminfo  

MemTotal: 527955012 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB  

/sbin/tuned-adm active  
Current active profile: throughput-performance  

From /etc/*release* /etc/*version*  

os-release:  
NAME="Red Hat Enterprise Linux"  
VERSION="8.3 (Ootpa)"  
ID="rhel"  
ID_LIKE="fedora"  
VERSION_ID="8.3"  
PLATFORM_ID="platform:el8"  
PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"  
ANSI_COLOR="0;31"  
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)  
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)  
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga  

uname -a:  

Linux rhel-8-3-amd 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020 x86_64  
x86_64 x86_64 GNU/Linux  

(Continued on next page)
Dell Inc.  
PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)  

Platform Notes (Continued)

Kernel self-reported vulnerability status:

<table>
<thead>
<tr>
<th>Vulnerability</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVE-2018-12207 (iTLB Multihit)</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3620 (L1 Terminal Fault)</td>
<td>Not affected</td>
</tr>
<tr>
<td>Microarchitectural Data Sampling</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2017-5754 (Meltdown)</td>
<td>Mitigation: Speculative Store</td>
</tr>
<tr>
<td>CVE-2018-3639 (Speculative Store Bypass)</td>
<td>Bypass disabled via prctl and</td>
</tr>
<tr>
<td></td>
<td>seccomp</td>
</tr>
<tr>
<td>CVE-2017-5753 (Spectre variant 1)</td>
<td>Mitigation: usercopy/swapgs</td>
</tr>
<tr>
<td></td>
<td>barriers and __user pointer</td>
</tr>
<tr>
<td></td>
<td>sanitization</td>
</tr>
<tr>
<td>CVE-2017-5715 (Spectre variant 2)</td>
<td>Mitigation: Full AMD retpoline,</td>
</tr>
<tr>
<td></td>
<td>IBPB: conditional, IBRS_FW, STIBP:</td>
</tr>
<tr>
<td></td>
<td>disabled, RSB filling</td>
</tr>
<tr>
<td>CVE-2020-0543 (Special Register Buffer Data Sampling):</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2019-11135 (TSX Asynchronous Abort):</td>
<td>Not affected</td>
</tr>
</tbody>
</table>

run-level 3 Nov 25 14:54

SPEC is set to: /dev/shm/cpu2017-1.1.5

<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>tmpfs</td>
<td>tmpfs</td>
<td>252G</td>
<td>5.7G</td>
<td>247G</td>
<td>3%</td>
<td>/dev/shm</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

Vendor: Dell Inc.
Product: PowerEdge C6525
Product Family: PowerEdge

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 80AD863280AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
8x 80AD863280AD HMAA4GR7A JR8N-XN 32 GB 2 rank 3200

BIOS:

<table>
<thead>
<tr>
<th>BIOS Vendor</th>
<th>BIOS Version</th>
<th>BIOS Date</th>
<th>BIOS Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Inc.</td>
<td>2.1.4</td>
<td>02/17/2021</td>
<td>2.1</td>
</tr>
</tbody>
</table>

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

### C

<table>
<thead>
<tr>
<th>Source Code</th>
<th>Performance Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>619.lbm_s(base, peak)</td>
<td>638.imagick_s(base, peak)</td>
</tr>
<tr>
<td>644.nab_s(base, peak)</td>
<td></td>
</tr>
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</table>

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

### C++, C, Fortran

<table>
<thead>
<tr>
<th>Source Code</th>
<th>Performance Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>607.cactuBSSN_s(base, peak)</td>
<td></td>
</tr>
</tbody>
</table>

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

### Fortran

<table>
<thead>
<tr>
<th>Source Code</th>
<th>Performance Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s(base, peak)</td>
<td>649.fotonik3d_s(base, peak)</td>
</tr>
<tr>
<td>654.roms_s(base, peak)</td>
<td></td>
</tr>
</tbody>
</table>

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

### Fortran, C

<table>
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<tbody>
<tr>
<td>621.wrf_s(base, peak)</td>
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<tr>
<td>628.pop2_s(base, peak)</td>
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AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

(Continued on next page)
Dell Inc. PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor) Dell Inc.

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>220</th>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>226</td>
</tr>
</tbody>
</table>

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test Date: Mar-2021  
Hardware Availability: Apr-2021  
Software Availability: Mar-2021

Compiler Version Notes (Continued)

LLVM Mirror.Version.12.0.0
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Base Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Base Portability Flags

603.bwaves_s: -DSPEC_LP64  
607.cactuBSSN_s: -DSPEC_LP64  
619.lbm_s: -DSPEC_LP64  
621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64  
627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64  
628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64  
638.imagick_s: -DSPEC_LP64  
644.nab_s: -DSPEC_LP64  
649.fotonik3d_s: -DSPEC_LP64  
654.roms_s: -DSPEC_LP64
SPEC CPU®2017 Floating Point Speed Result

Dell Inc. PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)

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</table>

CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

Base Optimization Flags

C benchmarks:
- -m64 -mno-adx -mno-sse4a -Wl, -mllvm -Wl, -region-vectorize
- -Wl, -mllvm -Wl, -function-specialize
- -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6
- -Wl, -mllvm -Wl, -reduce-array-computations=3 -O3 -march=znver3
- -fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
- -mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
- -fremap-arrays -mllvm -function-specialize -flv-function-specialization
- -mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
- -mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
- -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
- -lflang -lflangrti

Fortran benchmarks:
- -m64 -mno-adx -mno-sse4a -Wl, -mllvm -Wl, -enable-X86-prefetching
- -Wl, -mllvm -Wl, -enable-licm-vrp -Wl, -mllvm -Wl, -region-vectorize
- -Wl, -mllvm -Wl, -function-specialize
- -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6
- -Wl, -mllvm -Wl, -reduce-array-computations=3 -Hz,1,0x1 -O3
- -march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
- -mllvm -fuse-tile-inner-loop -funroll-loops
- -mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
- -mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
- -mllvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
- -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti

Benchmarks using both Fortran and C:
- -m64 -mno-adx -mno-sse4a -Wl, -mllvm -Wl, -enable-X86-prefetching
- -Wl, -mllvm -Wl, -enable-licm-vrp -Wl, -mllvm -Wl, -region-vectorize
- -Wl, -mllvm -Wl, -function-specialize
- -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6
- -Wl, -mllvm -Wl, -reduce-array-computations=3 -O3 -march=znver3
- -fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
- -mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
- -fremap-arrays -mllvm -function-specialize -flv-function-specialization
- -mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
- -mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -Hz,1,0x1
- -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
- -mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs
- -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
- -lflang -lflangrti

Benchmarks using Fortran, C, and C++:
- -m64 -mno-adx -mno-sse4a -std=c++98
- -Wl, -mllvm -Wl, -x86-use-vzeroupper=false
- -Wl, -mllvm -Wl, -region-vectorize -Wl, -mllvm -Wl, -function-specialize

(Continued on next page)
Dell Inc.

PowerEdge C6525 (AMD EPYC 75F3 32-Core Processor)

| SPECspeed®2017_fp_base = 220 |
| SPECspeed®2017_fp Peak = 226 |

| CPU2017 License: 55 | Test Date: Mar-2021 |
| Test Sponsor: Dell Inc. | Hardware Availability: Apr-2021 |
| Tested by: Dell Inc. | Software Availability: Mar-2021 |

**Base Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++ (continued):
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3`
- `-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5`
- `-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000`
- `-fremap-arrays -mllvm -function-specialize -flv-function-specialization`
- `-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true`
- `-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3`
- `-mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100`
- `-finline-aggressive -mllvm -loop-unswitch-threshold=200000`
- `-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch`
- `-mllvm -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false`
- `-Hz,1,0x1 -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops`
- `-mllvm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp`
- `-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti`

**Base Other Flags**

C benchmarks:
- `-Wno-unused-command-line-argument -Wno-return-type`

Fortran benchmarks:
- `-Wno-unused-command-line-argument -Wno-return-type`

Benchmarks using both Fortran and C:
- `-Wno-unused-command-line-argument -Wno-return-type`

Benchmarks using Fortran, C, and C++:
- `-Wno-unused-command-line-argument -Wno-return-type`

**Peak Compiler Invocation**

C benchmarks:
- `clang`

Fortran benchmarks:
- `flang`

Benchmarks using both Fortran and C:
- `flang clang`

(Continued on next page)
Peak Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: basepeak = yes

Fortran benchmarks:
603.bwaves_s: basepeak = yes
649.fotonik3d_s: basepeak = yes
654.roms_s: -m64 -mno-adx -mno-sse4a
   -W1,-mlllvm -W1,-enable-X86-prefetching
   -W1,-mlllvm -W1,-enable-licm-vrp
   -W1,-mlllvm -W1,-function-specialize
   -W1,-mlllvm -W1,-align-all-nofallthru-blocks=6
   -W1,-mlllvm -W1,-reduce-array-computations=3 -Ofast
   -march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
   -mlllvm -reduce-array-computations=3
   -mlllvm -global-vectorize-slp=true -mlllvm -enable-licm-vrp
   -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
   -ljemalloc -lflang

Benchmarks using both Fortran and C:
621.wrf_s: -m64 -mno-adx -mno-sse4a
   -W1,-mlllvm -W1,-enable-X86-prefetching
   -W1,-mlllvm -W1,-enable-licm-vrp
   -W1,-mlllvm -W1,-function-specialize
   -W1,-mlllvm -W1,-align-all-nofallthru-blocks=6

(Continued on next page)
621.wrf_s (continued):
- W1, -mlir -W1, -reduce-array-computations=3 -Ofast
- march=znver3 -fveclib=AMDLIBM -ffast-math -flto
- fstruct-layout=5 -mlir -unroll-threshold=50
- fremap-arrays -flv-function-specialization
- mlir -inline-threshold=1000 -mlir -enable-gvn-hoist
- mlir -global-vectorize-slp=true
- mlir -function-specialize -mlir -enable-licm-vrp
- mlir -reduce-array-computations=3 -Hz,1,0x1 -O3
- Mrecursive -mlir -fuse-tile-inner-loop -funroll-loops
- mlir -extra-vectorizer-passes -mlir -lsr-in-nested-loop
- DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
- ljemalloc -lflang

627.cam4_s: -m64 -mno-adx -mno-sse4a
- W1, -mlir -W1, -enable-X86-prefetching
- W1, -mlir -W1, -enable-licm-vrp
- W1, -mlir -W1, -function-specialize
- W1, -mlir -W1, -align-all-nofallthru-blocks=6
- W1, -mlir -W1, -reduce-array-computations=3 -Ofast
- march=znver3 -fveclib=AMDLIBM -ffast-math -flto
- fstruct-layout=5 -mlir -unroll-threshold=50
- fremap-arrays -flv-function-specialization
- mlir -inline-threshold=1000 -mlir -enable-gvn-hoist
- mlir -global-vectorize-slp=true
- mlir -function-specialize -mlir -enable-licm-vrp
- mlir -reduce-array-computations=3 -Mrecursive
- DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
- ljemalloc -lflang

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactusBSSN_s: basepeak = yes

Peak Other Flags

C benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

Fortran benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

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

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument  -Wno-return-type

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument  -Wno-return-type

The flags files that were used to format this result can be browsed at

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