### Cisco Systems

Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
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**CPU2017 License:** 9019  
**Test Date:** Sep-2021  
**Test Sponsor:** Cisco Systems  
**Hardware Availability:** Jun-2021  
**Tested by:** Cisco Systems  
**Software Availability:** Jun-2021

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**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tr>
<td>600.perlbench_s</td>
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<tr>
<td>602.gcc_s</td>
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<td>605.mcf_s</td>
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<td>620.omnetpp_s</td>
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<td>623.xalancbmk_s</td>
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<td>625.x264_s</td>
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<td>631.deepsjeng_s</td>
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<td>641.leela_s</td>
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<tr>
<td>648.exchange2_s</td>
<td>96</td>
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<td>23.0</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Hardware**

- **CPU Name:** AMD EPYC 7643
- **Max MHz:** 3600
- **Nominal:** 2300
- **Enabled:** 96 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, 32 MB shared / 6 cores
- **Other:** None
- **Memory:** 2 TB (16 x 128 GB 4Rx4 PC4-3200V-L)
- **Storage:** 1 x 960 GB M.2 SSD SATA
- **Other:** None

---

**Software**

- **OS:** SUSE Linux Enterprise Server 15 SP3 (x86_64)  
  kernel version 5.3.18-57-default
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC
- **Parallel:** Yes
- **Firmware:** Version C225M6.4.2.1c released Sep-2021
- **File System:** xfs
- **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
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

SPEC CPU®2017 Integer Speed Result

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems

Test Date: Sep-2021
Hardware Availability: Jun-2021
Software Availability: Jun-2021

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>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
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<td>247</td>
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<tr>
<td>625.x264_s</td>
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<td>244</td>
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<td>96</td>
<td>244</td>
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<td>25.5</td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 12.3
SPECspeed®2017_int_peak = 12.4

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 limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit
runcpu command invoked through numacl i.e.:
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.
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root for peak

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Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

SPECspeed®2017_int_base = 12.3
SPECspeed®2017_int_peak = 12.4

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-191"
LD_LIBRARY_PATH = "/home/cpu2017/amd_speed_aocc300_milan_B_lib/lib;/home/cpu2017/amd_speed_aocc300_milan_B_lib/lib32;"
MALLOCCONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "192"

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

Environment variables set by runcpu during the 602.gcc_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 620.omnetpp_s peak run:
GOMP_CPU_AFFINITY = "0"

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

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 641.leela_s peak run:
GOMP_CPU_AFFINITY = "0"

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

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Operating System Notes (Continued)

integer runs and all FP runs to enable Transparent Hugepages (THP).
'cpupower -f frequency-set -g performance' run as root to set the scaling governor to performance.
SPEC CPU®2017 Integer Speed Result

Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

| SPECspeed®2017_int_base = 12.3 | SPECspeed®2017_int_peak = 12.4 |

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems

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.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
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 Configuration
SMT Mode set to Auto
NUMA nodes per socket set to NPS1
ACPI SRAT L3 Cache As NUMA Domain set to Enabled
DRAM Scrub Time set to Disabled
Determinism Slider set to Power
L1 Stream HW Prefetcher set to Enabled
APBDIS set to 1

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost Tue Sep 21 19:43:24 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 7643 48-Core Processor
   2 "physical id"s (chips)
    192 "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 : 48
siblings : 96
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61

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Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

**SPEC CPU®2017 Integer Speed Result**

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<th>Software Availability</th>
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<tbody>
<tr>
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<td>Cisco Systems</td>
<td>Jun-2021</td>
<td>Jun-2021</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base = 12.3**

**SPECspeed®2017_int_peak = 12.4**

**Platform Notes (Continued)**

From lscpu from util-linux 2.36.2:

- **Architecture:** x86_64
- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **Address sizes:** 48 bits physical, 48 bits virtual
- **CPU(s):** 192
- **On-line CPU(s) list:** 0–191
- **Thread(s) per core:** 2
- **Core(s) per socket:** 48
- **Socket(s):** 2
- **NUMA node(s):** 16
- **Vendor ID:** AuthenticAMD
- **CPU family:** 25
- **Model:** 1
- **Model name:** AMD EPYC 7643 48-Core Processor
- **Stepping:** 1
- **Frequency boost:** enabled
- **CPU MHz:** 1716.658
- **CPU max MHz:** 2300.0000
- **CPU min MHz:** 1500.0000
- **BogoMIPS:** 4591.25
- **Virtualization:** AMD-V
- **L1d cache:** 3 MiB
- **L1i cache:** 3 MiB
- **L2 cache:** 48 MiB
- **L3 cache:** 512 MiB
- **NUMA node0 CPU(s):** 0–5, 96–101
- **NUMA node1 CPU(s):** 6–11, 102–107
- **NUMA node2 CPU(s):** 12–17, 108–113
- **NUMA node3 CPU(s):** 18–23, 114–119
- **NUMA node4 CPU(s):** 24–29, 120–125
- **NUMA node5 CPU(s):** 30–35, 126–131
- **NUMA node6 CPU(s):** 36–41, 132–137
- **NUMA node7 CPU(s):** 42–47, 138–143
- **NUMA node8 CPU(s):** 48–53, 144–149
- **NUMA node9 CPU(s):** 54–59, 150–155
- **NUMA node10 CPU(s):** 60–65, 156–161
- **NUMA node11 CPU(s):** 66–71, 162–167
- **NUMA node12 CPU(s):** 72–77, 168–173
- **NUMA node13 CPU(s):** 78–83, 174–179
- **NUMA node14 CPU(s):** 84–89, 180–185
- **NUMA node15 CPU(s):** 90–95, 186–191

- **Vulnerability Itlb multihit:** Not affected
- **Vulnerability L1tf:** Not affected
- **Vulnerability Mds:** Not affected
- **Vulnerability Meltdown:** Not affected
- **Vulnerability Spec store bypass:** Mitigation; Speculative Store Bypass disabled via

(Continued on next page)
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

| SPECspeed®2017_int_base = 12.3 |
| SPECspeed®2017_int_peak = 12.4 |

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Platform Notes (Continued)

prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBPB conditional, IBS_FW, STIBP always-on, RSB filling
Vulnerability Srbd: Not affected
Vulnerability Tsx async abort: Not affected
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr
pgm mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt
pdelpgb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
aperfmonperf pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes
xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a
misalignsse 3nowprefetch osuw ibs kninit wdt tce topoext perfctr_core perfctr_nb
bpxext perfctr_llc mwaitx cpb cat_l3 cd p_l3 invpcid_single hw pstate ssbd mba ibrs
ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 erms invpcid cmp rdtd a rdseed adx
smap clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
cqm_mbb_total cqm_mbb_local clzero irperf xsaverptr wbnoinvvd amd_pin arat npt lbv
svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
pfthreshold v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_recover
sccor smca fsrm

From lscpu --cache:
<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
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<tbody>
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<td>L1d</td>
<td>32K</td>
<td>3M</td>
<td>8 Data</td>
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<td>1</td>
<td>64</td>
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<tr>
<td>L1i</td>
<td>32K</td>
<td>3M</td>
<td>8 Instruction</td>
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<tr>
<td>L3</td>
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<td>512M</td>
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<td>32768</td>
<td>1</td>
<td>64</td>
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</tr>
</tbody>
</table>

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 4 5 96 97 98 99 100 101
node 0 size: 128836 MB
node 0 free: 128554 MB
node 1 cpus: 6 7 8 9 10 11 102 103 104 105 106 107
node 1 size: 129020 MB
node 1 free: 128684 MB
node 2 cpus: 12 13 14 15 16 17 108 109 110 111 112 113
node 2 size: 129020 MB
node 2 free: 128874 MB
node 3 cpus: 18 19 20 21 22 23 114 115 116 117 118 119
node 3 size: 129020 MB
node 3 free: 128882 MB
node 4 cpus: 24 25 26 27 28 29 120 121 122 123 124 125

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SPECspeed®2017_int_base = 12.3
SPECspeed®2017_int_peak = 12.4

Platform Notes (Continued)

node 4 size: 129020 MB
node 4 free: 128770 MB
node 5 cpus: 30 31 32 33 34 35 126 127 128 129 130 131
node 5 size: 128986 MB
node 5 free: 128863 MB
node 6 cpus: 36 37 38 39 40 41 132 133 134 135 136 137
node 6 size: 129020 MB
node 6 free: 128878 MB
node 7 cpus: 42 43 44 45 46 47 138 139 140 141 142 143
node 7 size: 116908 MB
node 7 free: 116779 MB
node 8 cpus: 48 49 50 51 52 53 144 145 146 147 148 149
node 8 size: 129020 MB
node 8 free: 128597 MB
node 9 cpus: 54 55 56 57 58 59 150 151 152 153 154 155
node 9 size: 129020 MB
node 9 free: 128876 MB
node 10 cpus: 60 61 62 63 64 65 156 157 158 159 160 161
node 10 size: 129020 MB
node 10 free: 128869 MB
node 11 cpus: 66 67 68 69 70 71 162 163 164 165 166 167
node 11 size: 129020 MB
node 11 free: 12889 MB
node 12 cpus: 72 73 74 75 76 77 168 169 170 171 172 173
node 12 size: 129020 MB
node 12 free: 128896 MB
node 13 cpus: 78 79 80 81 82 83 174 175 176 177 178 179
node 13 size: 129020 MB
node 13 free: 128893 MB
node 14 cpus: 84 85 86 87 88 89 180 181 182 183 184 185
node 14 size: 129020 MB
node 14 free: 128896 MB
node 15 cpus: 90 91 92 93 94 95 186 187 188 189 190 191
node 15 size: 129015 MB
node 15 free: 128891 MB
node distances:

(Continued on next page)
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SPECspeed®2017_int_base = 12.3
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Platform Notes (Continued)


From /proc/meminfo
MemTotal: 2101245552 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release*, /etc/*version*
NAME="SLES"
VERSION="15-SP3"
VERSION_ID="15.3"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp3"

uname -a:
Linux localhost 5.3.18-57-default #1 SMP Wed Apr 28 10:54:41 UTC 2021 (ba3c2e9) x86_64
x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2018-3639 (Speculative Store Bypass): Mitigation: usercopy/swaps barriers and __user pointer sanitation
CVE-2017-5753 (Spectre variant 1): Mitigation: Full AMD retpoline, IBFB: conditional, IBRS_FW, STIBP: always-on, RSB filling
CVE-2017-5715 (Spectre variant 2): Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected
Platform Notes (Continued)

run-level 3 Sep 21 15:06

SPEC is set to: /home/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdc3 xfs 557G 11G 546G 2% /

From /sys/devices/virtual/dmi/id
Vendor: Cisco Systems Inc
Product: UCSC-C225-M6S
Serial: WZP252309U3

Additional information from dmidecode 3.2 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:
16x 0xCE00 M386AAG40AM3-CWE 128 GB 4 rank 3200

BIOS:
BIOS Vendor: Cisco Systems, Inc.
BIOS Version: C22SM6.4.2.1c.0.0806211349
BIOS Date: 08/06/2021
BIOS Revision: 5.22

(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)
==============================================================================
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++ | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
==============================================================================
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

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### Compiler Version Notes (Continued)

Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

---

**Fortran | 648.exchange2_s(base, peak)***

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

**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
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

SPEC CPU®2017 Integer Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECspeed®2017_int_base = 12.3
SPECspeed®2017_int_peak = 12.4

CPU2017 License: 9019
Test Date: Sep-2021
Test Sponsor: Cisco Systems
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Software Availability: Jun-2021

Base Optimization Flags

C benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-lcim-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
-freemap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-lcim-vrp -mllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-llflang -llflangrti

C++ benchmarks:
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-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 -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -convert-pow-exp-to-int=false
-z muldefs -mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP
-fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc -llflang
-llflangrti

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-lv-split
-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 -z muldefs
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -DSPEC_OPENMP
-fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc -llflang
-llflangrti
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

SPECspeed®2017_int_base = 12.3
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CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems

Test Date: Sep-2021
Hardware Availability: Jun-2021
Software Availability: Jun-2021

Base Other Flags

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

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

Fortran benchmarks:
-Wno-return-type

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-allow-multiple-definition
-Wl,-mlllvm -Wl,-enable-licm-vrp -Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -Ofast -march=znver3
-ftveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlllvm -unroll-threshold=50 -fremap-arrays -flv-function-specialization
-mlllvm -inline-threshold=1000 -mlllvm -enable-gvn-hoist
-mlllvm -global-vectorize-slp=true -mlllvm -function-specialize
-mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-llflang

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

**Cisco Systems**
Cisco UCS C225 M6 (AMD EPYC 7643 48-Core Processor)

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**Cisco Systems**

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## Peak Optimization Flags (Continued)

### C++ benchmarks:
- `-m64 -std=c++98 -mno-adx -mno-sse4a`
- `-Wl,-mlllvm -Wl,-do-block-reorder=aggressive`
- `-Wl,-mlllvm -Wl,-function-specialize`
- `-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3 -Ofast -fno-march=znver3`
- `-fveclib=AMDLIBM -ffast-math -flto -finline-aggressive`
- `-mlllvm -unroll-threshold=100 -flv-function-specialization`
- `-mlllvm -enable-licm-vrp -mlllvm -reroll-loops`
- `-mlllvm -aggressive-loop-unswitch -mlllvm -reduce-array-computations=3`
- `-mlllvm -global-vectorize-slp=true -mlllvm -do-block-reorder=aggressive`
- `-fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP`
- `-fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang`

### Fortran benchmarks:
- `-m64 -mno-adx -mno-sse4a -Wl,-mlllvm -Wl,-inline-recursion=4`
- `-Wl,-mlllvm -Wl,-lsr-in-nested-loop -Wl,-mlllvm -Wl,-enable-iv-split`
- `-Wl,-mlllvm -Wl,-function-specialize`
- `-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -fno-march=znver3`
- `-fveclib=AMDLIBM -ffast-math -flto -mlllvm -unroll-aggressive`
- `-mlllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -fopenmp=libomp`
- `-lomp -lamdlibm -ljemalloc -lflang`

---

## Peak Other Flags

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

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

### Fortran benchmarks:
- `-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:

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