## SPEC CPU®2017 Integer Rate Result

### Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7413 24-Core Processor)

| Test Sponsor: | Cisco Systems |
| Test Date:    | Sep-2021 |
| Hardware Availability: | Jun-2021 |
| Software Availability: | Jun-2021 |

### SPECrate®2017_int_base = 433
### SPECrate®2017_int_peak = 447

### CPU2017 License: 9019

### CPU Name:
AMD EPYC 7413

### Max MHz:
3600

### Nominal:
2650

### Enabled:
48 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:
128 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 1.6 TB NVMe SSD

### Other:
None

### 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:
No

### 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:
32/64-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

---

### TEST RESULTS

<table>
<thead>
<tr>
<th>Test</th>
<th>Copies</th>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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<tbody>
<tr>
<td>perlbench_r</td>
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<td>311</td>
<td>445</td>
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<tr>
<td>gcc_r</td>
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<td>367</td>
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<td>mcf_r</td>
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<td>omnetpp_r</td>
<td>96</td>
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<td>525</td>
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<tr>
<td>xalancbmk_r</td>
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<td>378</td>
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<td>x264_r</td>
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<tr>
<td>xz_r</td>
<td>96</td>
<td>253</td>
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</tr>
</tbody>
</table>

---

### Software

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---

### Huawei Technologies
Huawei Mate 40 Pro (Liquid Cooling System)
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7413 24-Core Processor)

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

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<td>253</td>
<td>411</td>
<td>253</td>
</tr>
</tbody>
</table>

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 numacl1 i.e.: numacl1 --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)
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Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root for peak
integer runs and all FP runs to enable Transparent Hugepages (THP).

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
    " /home/cpu2017/amd_rate_aocc300_milan_B_lib/lib;/home/cpu2017/amd_rate_a
occ300_milan_B_lib/lib32:"
MALLOC_CONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:never"

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 NPS4
ACPI SRAT L3 Cache As NUMA Domain set to Enabled
DRAM Scrub Time set to Disabled
Determinism Slider set to Power
Memory Interleaving set to Auto
APBDIS set to 1

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca664

(Continued on next page)
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Platform Notes (Continued)

running on localhost Sun Sep 12 17:10:32 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 7413 24-Core Processor
 2 "physical id"s (chips)
96 "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 : 24
siblings  : 48
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
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

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):                          96
On-line CPU(s) list:             0-95
Thread(s) per core:              2
Core(s) per socket:              24
Socket(s):                       2
NUMA node(s):                    8
Vendor ID:                       AuthenticAMD
CPU family:                      25
Model:                           1
Model name:                      AMD EPYC 7413 24-Core Processor
Stepping:                        1
Frequency boost:                 enabled
CPU MHz:                         1497.201
CPU max MHz:                     2650.0000
CPU min MHz:                     1500.0000
BogoMIPS:                        5290.53
Virtualization:                  AMD-V
L1d cache:                       1.5 MiB
L1i cache:                       1.5 MiB
L2 cache:                        24 MiB
L3 cache:                        256 MiB
NUMA node0 CPU(s):               0-5,48-53
NUMA node1 CPU(s):               6-11,54-59
NUMA node2 CPU(s):               12-17,60-65
NUMA node3 CPU(s):               18-23,66-71

(Continued on next page)
Platform Notes (Continued)

NUMA node4 CPU(s): 24-29,72-77
NUMA node5 CPU(s): 30-35,78-83
NUMA node6 CPU(s): 36-41,84-89
NUMA node7 CPU(s): 42-47,90-95
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
prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user
pointer sanitation
Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBPB conditional,
IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr
pg e mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt
pdpeslgb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
aperfmpref pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes
xsave avx f16c rdape lahf_lmx cmp_legacy svm extapic cr8_legacy abm sse4a
misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext perfctmr_core perfctmr_nb
bpext perfctmr_l1l2 mwaitx cpb cat_l3 cdpl_l3 invpcid_single hw_pstate ssbd mba ibrs
ibpb stibp vmmcall fsqbtai bml1 avx2 smep bmi2 invpcid qm rdt_a rdseed adx map
clflushopt clwb sha_ni xsaveopt xsaves xgetb1 xsave xsaveopt xsaves xsavee xsaves
qm_llc qm_occup_llc
qm_mbb_total qm_mbb_local clzero irperf xsavepr wbnoiwv amd_psep arat npt lbiv
svm_lock nip_nve tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
pftreshold v_vmsave_vmload vgif umip pkup ospke vaes vpcmlmulqdq rdpid overflow_recov
succor smca

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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<tr>
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<td>1.5M</td>
<td>8</td>
<td>Data</td>
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<td>1</td>
<td>64</td>
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<tr>
<td>L1i</td>
<td>32K</td>
<td>1.5M</td>
<td>8</td>
<td>Instruction</td>
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<td>64</td>
</tr>
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<td>512K</td>
<td>24M</td>
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<td>2</td>
<td>1024</td>
<td>1</td>
<td>64</td>
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<tr>
<td>L3</td>
<td>32M</td>
<td>256M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
<td>32768</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

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 48 49 50 51 52 53
  node 0 size: 257857 MB
  node 0 free: 257598 MB
  node 1 cpus: 6 7 8 9 10 11 14 15 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
  node 1 size: 257857 MB
  node 1 free: 257598 MB
## Platform Notes (Continued)

node 1 size: 258043 MB  
node 1 free: 257780 MB  
node 2 cpus: 12 13 14 15 16 17 60 61 62 63 64 65  
node 2 size: 258043 MB  
node 2 free: 257711 MB  
node 3 cpus: 18 19 20 21 22 23 66 67 68 69 70 71  
node 3 size: 257997 MB  
node 3 free: 257758 MB  
node 4 cpus: 24 25 26 27 28 29 72 73 74 75 76 77  
node 4 size: 258043 MB  
node 4 free: 257749 MB  
node 5 cpus: 30 31 32 33 34 35 78 79 80 81 82 83  
node 5 size: 258043 MB  
node 5 free: 257726 MB  
node 6 cpus: 36 37 38 39 40 41 84 85 86 87 88 89  
node 6 size: 258043 MB  
node 6 free: 257803 MB  
node 7 cpus: 42 43 44 45 46 47 90 91 92 93 94 95  
node 7 size: 258042 MB  
node 7 free: 257572 MB  
node distances:

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<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<td>10</td>
</tr>
</tbody>
</table>

From /proc/meminfo

- MemTotal: 2113656188 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

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

- os-release:
  - NAME="SLES"
  - VERSION="15-SP3"
  - VERSION_ID="15.3"
  - PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
  - ID="sles"
  - ID_LIKE="suse"

(Continued on next page)
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**SPECrate®2017_int_base = 433**  
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### Platform Notes (Continued)

```
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 swapping barriers and __user pointer sanitization
- **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

```
run-level 3 Sep 12 17:08
SPEC is set to: /home/cpu2017
```

```
From /sys/devices/virtual/dmi/id
Vendor: Cisco Systems Inc
Product: UCSC-C225-M6N
Serial: WZP25230TMY
```

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:** C225M6.4.2.1c.0.0806211349
- **BIOS Date:** 08/06/2021

(Continued on next page)
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Platform Notes (Continued)

BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

==============================================================================
C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
   525.x264_r(base, peak) 557.xz_r(base, peak)
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 | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

==============================================================================
C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
   525.x264_r(base, peak) 557.xz_r(base, peak)
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

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Cisco UCS C225 M6 (AMD EPYC 7413 24-Core Processor)

SPEC CPU®2017 Integer Rate Result
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Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7413 24-Core Processor)

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

SPECrate®2017_int_base = 433
SPECrate®2017_int_peak = 447

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

Compiler Version Notes (Continued)

==============================================================================
C++   | 523.xalancbmk_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

==============================================================================
C++   | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(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++   | 523.xalancbmk_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

==============================================================================
C++   | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(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++   | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(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

Fortran | 548.exchange2_r(base, peak)

(Continued on next page)
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Test Date: Sep-2021
Tested by: Cisco Systems
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Software Availability: Jun-2021

Compiler Version Notes (Continued)

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

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -W1,-allow-multiple-definition -W1,-mlllvm -W1,-enable-licm-vrp
-flto -W1,-mlllvm -W1,-region-vectorize
-W1,-mlllvm -W1,-function-specialize
-W1,-mlllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mlllvm -W1,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -fstruct-layout=5
-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000

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**Base Optimization Flags (Continued)**

C benchmarks (continued):

- `fremap-arrays` - `mllvm -function-specialize` - `flv-function-specialization`
- `mllvm -enable-gvn-hoist` - `mllvm -global-vectorize-slp=true`
- `mllvm -enable-lcm-vrp` - `mllvm -reduce-array-computations=3` - `z` muldefs
- `lدمlibm` - `ljemalloc` - `lflang` - `lflangrti`

C++ benchmarks:

- `-m64` - `-std=c++98` - `-Wl,-mllvm -Wl,-do-block-reorder=aggressive` - `-flto`
- `-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` - `-ffast-math`
- `-march=znver3` - `-fveclib=AMDLIBM` - `-mllvm -enable-partial-unswitch`
- `-mllvm -unroll-threshold=100` - `-finline-aggressive`
- `-flv-function-specialization` - `-mllvm -loop-unswitch-threshold=200000`
- `-mllvm -reroil-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` - `-lدمlibm`
- `-ljemalloc` - `-lflang` - `-lflangrti`

Fortran benchmarks:

- `-m64` - `-Wl,-mllvm -Wl,-inline-recursion=4`
- `-Wl,-mllvm -Wl,-lsr-in-nested-loop` - `-Wl,-mllvm -Wl,-enable-iv-split`
- `-flto` - `-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` - `-ffast-math`
- `-march=znver3` - `-fveclib=AMDLIBM` - `-z` muldefs - `-mllvm -unroll-aggressive`
- `-mllvm -unroll-threshold=500` - `-lدمlibm` - `-ljemalloc` - `-lflang` - `-lflangrti`

**Base Other Flags**

C benchmarks:

- `-Wno-unused-command-line-argument`

C++ benchmarks:

- `-Wno-unused-command-line-argument`
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7413 24-Core Processor)

SPECrate®2017_int_base = 433
SPECrate®2017_int_peak = 447

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

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 -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver3
-fvcclib=AMDLIBM -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-fly-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=false
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -llamdlibm -ljemalloc

502.gcc_r: -m32 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto

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Cisco UCS C225 M6 (AMD EPYC 7413 24-Core Processor)  

SPEC CPU®2017 Integer Rate Result

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Tested by: Cisco Systems

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

Peak Optimization Flags (Continued)

502.gcc_r (continued):
-WL,-mlirvm -Wl,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -fstruct-layout=7
-mlirvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mlirvm -inline-threshold=1000
-mlirvm -enable-gvn-hoist -mlirvm -global-vectorize-slp=true
-mlirvm -function-specialize -mlirvm -enable-licm-vrp
-mlirvm -reduce-array-computations=3 -fgnu89-inline
-ljemalloc
505.mcf_r: basepeak = yes
525.x264_r: basepeak = yes
557.xz_r: basepeak = yes

C++ benchmarks:
520.omnetpp_r: -m64 -std=c++98
-WL,-mlirvm -Wl,-do-block-reorder=aggressive -flto
-WL,-mlirvm -Wl,-function-specialize
-WL,-mlirvm -Wl,-align-all-nofallthru-blocks=6
-WL,-mlirvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -finline-aggressive
-mlirvm -unroll-threshold=100 -flv-function-specialization
-mlirvm -enable-licm-vrp -mlirvm -reroll-loops
-mlirvm -aggressive-loop-unswith
-mlirvm -reduce-array-computations=3
-mlirvm -global-vectorize-slp=true
-mlirvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvvisibility=hidden
-lamdlibm -ljemalloc
523.xalancbmk_r: -m32 -Wl,-mlirvm -Wl,-do-block-reorder=aggressive -flto
-WL,-mlirvm -Wl,-function-specialize
-WL,-mlirvm -Wl,-align-all-nofallthru-blocks=6
-WL,-mlirvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -finline-aggressive
-mlirvm -unroll-threshold=100 -flv-function-specialization
-mlirvm -enable-licm-vrp -mlirvm -reroll-loops
-mlirvm -aggressive-loop-unswith
-mlirvm -reduce-array-computations=3
-mlirvm -global-vectorize-slp=true
-mlirvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvvisibility=hidden
-ljemalloc

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Peak Optimization Flags (Continued)

531.deepsjeng_r: Same as 520.omnetpp_r
541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:
548.exchange2_r: basepeak = yes

Peak Other Flags

C benchmarks (except as noted below):
-Wno-unused-command-line-argument
502.gcc_r -L/usr/lib -Wno-unused-command-line-argument
-L/sppo/bin/cpu2017v115aocc3/amd_rate_aocc300_milan_A_lib/32

C++ benchmarks (except as noted below):
-Wno-unused-command-line-argument
523.xalancbmk_r -L/usr/lib -Wno-unused-command-line-argument
-L/sppo/bin/cpu2017v115aocc3/amd_rate_aocc300_milan_A_lib/32

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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