## SPEC CPU®2017 Integer Rate Result

**Cisco Systems**

Cisco UCS C225 M6 (AMD EPYC 7543 32-Core)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 280</th>
<th>SPECrate®2017_int_peak = 290</th>
</tr>
</thead>
</table>

**CPU2017 License:** 9019

**Test Sponsor:** Cisco Systems

**Test Date:** Oct-2021

**Tested by:** Cisco Systems

**Hardware Availability:** Jun-2021

**Software Availability:** Jun-2021

**Tested by:** Cisco Systems

### Copies

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Value</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>64</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>64</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>64</td>
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</tr>
<tr>
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<td>64</td>
</tr>
<tr>
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<td>64</td>
</tr>
<tr>
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</tr>
<tr>
<td>548.exchange2_r</td>
<td>64</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>64</td>
</tr>
</tbody>
</table>

### 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:** No
- **Firmware:** Version 4.2.1c released Aug-2021
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 32/64-bit
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage

### Hardware

- **CPU Name:** AMD EPYC 7543
- **Max MHz:** 3700
- **Nominal:** 2800
- **Enabled:** 32 cores, 1 chip, 2 threads/core
- **Orderable:** 1 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 / 4 cores
- **Other:** None
- **Memory:** 1 TB (8 x 128 GB 4Rx4 PC4-3200AA-L)
- **Storage:** 1 x 960 GB M.2 SSD SATA
- **Other:** None

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Page 1  Standard Performance Evaluation Corporation (info@spec.org)  https://www.spec.org/
Cisco Systems

Cisco UCS C225 M6 (AMD EPYC 7543 32-Core)

<table>
<thead>
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<td>196</td>
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<td>301</td>
<td>244</td>
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<td>168</td>
<td>412</td>
<td>168</td>
<td>412</td>
<td>168</td>
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</table>

**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 numactl 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.

(Continued on next page)
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7543 32-Core)

SPECrater®2017_int_base = 280
SPECrater®2017_int_peak = 290

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

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

Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root for peak
test 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_aoc300_milan_B_lib/lib;/home/cpu2017/amd_rate_a
coc300_milan_B_lib/lib32:""
MALLOCONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOCONF = "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
APB DIS set to 1

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aaca64d
running on localhost Fri Oct 29 09:35:07 2021

(Continued on next page)
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Platform Notes (Continued)

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 7543 32-Core Processor
  1 "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: 64
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

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): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 1
NUMA node(s): 8
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7543 32-Core Processor
Stepping: 1
Frequency boost: enabled
CPU MHz: 1496.668
CPU max MHz: 2800.0000
CPU min MHz: 1500.0000
BogoMIPS: 5589.37
Virtualization: AMD-V
L1d cache: 1 MiB
L1i cache: 1 MiB
L2 cache: 16 MiB
L3 cache: 256 MiB
NUMA node0 CPU(s): 0-3, 32-35
NUMA node1 CPU(s): 4-7, 36-39
NUMA node2 CPU(s): 8-11, 40-43
NUMA node3 CPU(s): 12-15, 44-47
NUMA node4 CPU(s): 16-19, 48-51
NUMA node5 CPU(s): 20-23, 52-55

(Continued on next page)
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Platform Notes (Continued)

- NUMA node6 CPU(s): 24–27, 56–59
- NUMA node7 CPU(s): 28–31, 60–63
- 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 sanitization
- Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBP 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 pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq monitor sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs kinfComb tce topoext perfctr_core perfctr_nb bpxext perfctr_llc mwaitx cpb cat_l3 cdq_l3 invpdqcd_single hw_pstate ssbd ibs ibp sb ibsp stibp vmbmac fsgsbase bmi1 avx2 smep bmi2 invpcid cqm rdt_a rdsed adx smap clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occ_map cqm_mbm_total cqm_mbm_local clzero irperf xsaverpr wbnoinvd amd_ppin arat npt lbiv svvm_lock nrip_safe tsc_scale vmcb_clean flushbyasid decodeassist pausetime pfthreshold v_vmsave_vmload vgif umip pku ospke vaes vpcmvlqmdq rdpid overflow_recov succor smca

From lscpu --cache:

```markdown
<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>
</tr>
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<tbody>
<tr>
<td>L1d</td>
<td>32K</td>
<td>1M</td>
<td>8</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
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<td>L1i</td>
<td>32K</td>
<td>1M</td>
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<td>Instruction</td>
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<td>L2</td>
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<td>16M</td>
<td>8</td>
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<td>2</td>
<td>1024</td>
<td>1</td>
<td>64</td>
</tr>
<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

```plaintext
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 32 33 34 35
done 0 size: 128838 MB
node 0 free: 128573 MB
node 1 cpus: 4 5 6 7 36 37 38 39
node 1 size: 129019 MB
node 1 free: 128842 MB
```

(Continued on next page)
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7543 32-Core)

SPEC CPU®2017 Integer Rate Result

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CPU2017 License: 9019
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Platform Notes (Continued)

node 2 cpus: 8 9 10 11 40 41 42 43
node 2 size: 129021 MB
node 2 free: 128806 MB
node 3 cpus: 12 13 14 15 44 45 46 47
node 3 size: 129019 MB
node 3 free: 128801 MB
node 4 cpus: 16 17 18 19 48 49 50 51
node 4 size: 129021 MB
node 4 free: 128801 MB
node 5 cpus: 20 21 22 23 52 53 54 55
node 5 size: 129019 MB
node 5 free: 128829 MB
node 6 cpus: 24 25 26 27 56 57 58 59
node 6 size: 129021 MB
node 6 free: 128844 MB
node 7 cpus: 28 29 30 31 60 61 62 63
node 7 size: 128974 MB
node 7 free: 128812 MB
node distances:
0: 10 11 12 12 12 12 12 12
1: 11 10 12 12 12 12 12 12
2: 12 12 10 11 12 12 12 12
3: 12 12 11 10 12 12 12 12
4: 12 12 12 12 10 11 12 12
5: 12 12 12 12 11 10 12 12
6: 12 12 12 12 12 12 12 12
7: 12 12 12 12 12 12 12 12

From /proc/meminfo
MemTotal: 1056703280 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"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp3"

(Continued on next page)
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CPU2017 License: 9019
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Platform Notes (Continued)

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 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 Oct 29 09:33

SPEC is set to: /home/cpu2017

From /sys/devices/virtual/dmi/id
Vendor: Cisco Systems, Inc
Product: UCSC-C225-M6N
Serial: WZP25230TMR

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:
   8x 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
   BIOS Revision: 5.22

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

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

**********************************************************************************
Fortran | 548.exchange2_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)
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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

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 -Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-enable-lcm-vrp
-fflto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallback-thru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=zynver3 -fveclib=AMDLIBM -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

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Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7543 32-Core)

SPECrater®2017_int_base = 280
SPECrater®2017_int_peak = 290

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

Base Optimization Flags (Continued)

C benchmarks (continued):
-mllvm -enable-llicm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-la ndlibm -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 -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 -la ndlibm
-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 -la ndlibm -ljemalloc -lflang -lflangrti

Base Other Flags

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

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

Peak Compiler Invocation

clang

(Continued on next page)
Cisco Systems
Cisco UCS C225 M6 (AMD EPYC 7543 32-Core)

SPEC CPU®2017 Integer Rate Result

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Cisco UCS C225 M6 (AMD EPYC 7543 32-Core) SPECrate®2017_int_base = 280
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Peak Compiler Invocation (Continued)

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
- W1,-mllvm -Wl,-enable-licm-vrp -fto
- W1,-mllvm -Wl,-function-specialize
- W1,-mllvm -Wl,-align-all-nofallthru-blocks=6
- W1,-mllvm -Wl,-reduce-array-computations=3
- fprofile-instr-generate(pass 1)
- fprofile-instr-use(pass 2) -Ofast -march=znver3
- fveclib=AMDLIBM -fstruct-layout=7
- mllvm -unroll-threshold=50 -fremap-arrays
- flv-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 -lamdlibm -ljemalloc

502.gcc_r: -m32 -Wl,-allow-multiple-definition
- Wl,-mllvm -Wl,-enable-licm-vrp -fto
- Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
- fveclib=AMDLIBM -fstruct-layout=7
- mllvm -unroll-threshold=50 -fremap-arrays
(Continued on next page)
## Cisco Systems

- **CPU2017 License**: 9019
- **Test Sponsor**: Cisco Systems
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### SPECrate\textsuperscript{\textregistered}2017 Integer Rate Result

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<td>290</td>
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### Peak Optimization Flags (Continued)

502.gcc\textsubscript{r} (continued):
- \texttt{-flv-function-specialization -mllvm -inline-threshold=1000}
- \texttt{-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true}
- \texttt{-mllvm -function-specialize -mllvm -enable-licm-vrp}
- \texttt{-mllvm -reduce-array-computations=3 -fgnu89-inline}
- \texttt{-ljemalloc}

505.mcf\textsubscript{r}:
- \texttt{-m64 -Wl,-allow-multiple-definition}
- \texttt{-Wl,-mllvm -Wl,-enable-licm-vrp -flto}
- \texttt{-Wl,-mllvm -Wl,-function-specialize}
- \texttt{-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6}
- \texttt{-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast}
- \texttt{-march=znver3 -fveclib=AMDLIBM -fstruct-layout=7}
- \texttt{-mllvm -unroll-threshold=50 -fremap-arrays}
- \texttt{-flv-function-specialization -mllvm -inline-threshold=1000}
- \texttt{-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true}
- \texttt{-mllvm -function-specialize -mllvm -enable-licm-vrp}
- \texttt{-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc}

525.x264\textsubscript{r}:
- \texttt{basepeak = yes}

557.xz\textsubscript{r}:
- Same as 505.mcf\textsubscript{r}

### C++ benchmarks:

520.omnetpp\textsubscript{r}:
- \texttt{-m64 -std=c++98}
- \texttt{-Wl,-mllvm -Wl,-do-block-reorder=aggressive -flto}
- \texttt{-Wl,-mllvm -Wl,-function-specialize}
- \texttt{-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6}
- \texttt{-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast}
- \texttt{-march=znver3 -fveclib=AMDLIBM -finline-aggressive}
- \texttt{-mllvm -unroll-threshold=100 -flv-function-specialization}
- \texttt{-mllvm -enable-licm-vrp -mllvm -reroll-loops}
- \texttt{-mllvm -aggressive-loop-unswitch}
- \texttt{-mllvm -reduce-array-computations=3}
- \texttt{-mllvm -global-vectorize-slp=true}
- \texttt{-mllvm -do-block-reorder=aggressive}
- \texttt{-fvirtual-function-elimination -fvisibility=hidden}
- \texttt{-lamdlibm -ljemalloc}

523.xalancbmk\textsubscript{r}:
- \texttt{-m32 -Wl,-mllvm -Wl,-do-block-reorder=aggressive -flto}
- \texttt{-Wl,-mllvm -Wl,-function-specialize}
- \texttt{-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6}
- \texttt{-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast}
- \texttt{-march=znver3 -fveclib=AMDLIBM -finline-aggressive}
- \texttt{-mllvm -unroll-threshold=100 -flv-function-specialization}

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## Cisco Systems

**Cisco UCS C225 M6 (AMD EPYC 7543 32-Core)**

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

### Peak Optimization Flags (Continued)

523.xalancbmk_r (continued):
- `mllvm -enable-lcm-vrp -mllvm -reroll-loops`
- `mllvm -aggressive-loop-unswitch`
- `mllvm -reduce-array-computations=3`
- `mllvm -global-vectorize-slp=true`
- `mllvm -do-block-reorder=aggressive`
- `-fvirtual-function-elimination -fvisibility=hidden`
- `-ljemalloc`

531.deepsjeng_r: basepeak = yes

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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