Cisco Systems

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

| SPECrate®2017_int_base = 284 |
| SPECrate®2017_int_peak = 294 |

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

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

| Copies | 0 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 | 300 | 330 | 360 | 390 | 420 | 450 | 480 | 510 | 540 | 570 | 600 | 630 | 660 |
|--------|---|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 500.perlbench_r | 64 | ![207](image) | | | | | | | | | | | | | | | | | | | | | | | | |
| 502.gcc_r | 64 | ![241](image) | | | | | | | | | | | | | | | | | | | | | | | | |
| 505.mcf_r | 64 | ![137](image) | | | | | | | | | | | | | | | | | | | | | | | | |
| 520.omnetpp_r | 64 | ![137](image) | | | | | | | | | | | | | | | | | | | | | | | | |
| 523.xalancbk_r | 64 | | | | | | | | | | | | | | | | | | | | | | | | |
| 525.x264_r | 64 | ![247](image) | | | | | | | | | | | | | | | | | | | | | | | | |
| 531.deepsjeng_r | 64 | ![247](image) | | | | | | | | | | | | | | | | | | | | | | | | |
| 541.leela_r | 64 | ![257](image) | | | | | | | | | | | | | | | | | | | | | | | | |
| 548.exchange2_r | 64 | ![257](image) | | | | | | | | | | | | | | | | | | | | | | | | |
| 557.xz_r | 64 | ![171](image) | | | | | | | | | | | | | | | | | | | | | | | | |

Hardware

CPU Name: AMD EPYC 7543P
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 PC4-3200V-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: 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
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
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Cisco UCS C225 M6 (AMD EPYC 7543P 32-Core)

SPECrate®2017_int_base = 284

SPECrate®2017_int_peak = 294

Results Table

<table>
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<td>515</td>
<td>198</td>
<td>547</td>
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<td>548.exchange2_r</td>
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<td>171</td>
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<td>171</td>
<td>405</td>
<td>171</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 numactl i.e.:
numactl --interleave=all runcpu <etc>

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

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

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2022 Standard Performance Evaluation Corporation

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

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

SPECrater®2017_int_base = 284
SPECrater®2017_int_peak = 294

Operating System Notes (Continued)

To enable Transparent Hugepages (THP) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
   "'/home/cpu2017/amd_rate_aoccs300_milan_b_lib/lib;/home/cpu2017/amd_rate_aoccs300_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
Memory Interleaving set to Auto

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

SPECrates®

SPECr®2017_int_base = 284
SPECr®2017_int_peak = 294

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

Platform Notes (Continued)

APBDIS set to 1

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aaca64d
running on localhost Fri Dec 10 02:20:54 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 7543P 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 7543P 32-Core Processor
Stepping: 1
Frequency boost: enabled
CPU MHz: 1460.501
CPU max MHz: 2800.0000
CPU min MHz: 1500.0000
BogoMIPS: 5589.38
Virtualization: AMD-V
L1d cache: 1 MiB
L1i cache: 1 MiB
L2 cache: 16 MiB
L3 cache: 256 MiB

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

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Tested by: Cisco Systems
Test Date: Dec-2021
Hardware Availability: Jun-2021
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SPECrate®2017_int_base = 284
SPECrate®2017_int_peak = 294

Platform Notes (Continued)

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
NUMA node6 CPU(s): 24-27, 56-59
NUMA node7 CPU(s): 28-31, 60-63
Vulnerability l1lb 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 sanctization
Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Txsm 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 aperfmpref pni pclmulqdq monitor ssse3 fma cx16 pclid 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 kntt wd tce topoext perfctr_core perfctr_nb bext perfctr_l1c mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmcctcall fsgsbase bml1 avx2 smep bmi2 invpcid cqg rdt_a rdseed adx clflushopt clwb sha ni xsaveopt xsaves xgetbv1 xsaves cqg_llc cqg_occu_llc cqg_mbb_total cqg_mbb_local nullzero irperf xsaverptr wboinvd amd_pmn arat npt lbv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter ptf threshold v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpmi overflow_recov succor smca

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d 32K 1M 8 Data 1 64 1 64
L1i 32K 1M 8 Instruction 1 64 1 64
L2 512K 16M 8 Unified 2 1024 1 64
L3 32M 256M 16 Unified 3 32768 1 64

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 8 nodes (0-7)

(Continued on next page)
Platform Notes (Continued)

node 0 cpus: 0 1 2 3 32 33 34 35
node 0 size: 128762 MB
node 0 free: 128381 MB
node 1 cpus: 4 5 6 7 36 37 38 39
node 1 size: 129019 MB
node 1 free: 128845 MB
node 2 cpus: 8 9 10 11 40 41 42 43
node 2 size: 129021 MB
node 2 free: 128608 MB
node 3 cpus: 12 13 14 15 44 45 46 47
node 3 size: 129019 MB
node 3 free: 128808 MB
node 4 cpus: 16 17 18 19 48 49 50 51
node 4 size: 129021 MB
node 4 free: 128799 MB
node 5 cpus: 20 21 22 23 52 53 54 55
node 5 size: 128985 MB
node 5 free: 128825 MB
node 6 cpus: 24 25 26 27 56 57 58 59
node 6 size: 129021 MB
node 6 free: 128713 MB
node 7 cpus: 28 29 30 31 60 61 62 63
node 7 size: 128781 MB
node 7 free: 128593 MB
node distances:
node   0   1   2   3   4   5   6   7
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  10  11
7:  12  12  12  12  12  12  11  10

From /proc/meminfo
MemTotal:       1056393504 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"

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

SPECrate®2017_int_base = 284
SPECrate®2017_int_peak = 294

CPU2017 License: 9019
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Tested by: Cisco Systems

Platform Notes (Continued)

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): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store
Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapsgs
barriers and __user pointer
sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline,
IBPF: conditional, IBRS_FW, STIBP:
always-on, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Sep 12 23:38

SPEC is set to: /home/cpu2017

From /sys/devices/virtual/dmi/id
Vendor: Cisco Systems Inc
Product: UCSC-C225-M6S
Serial: WZP25230TN2

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 SMI BIOS" standard.
Memory:
8x 0xCE00 M386AAG40AM3-CWE 128 GB 4 rank 3200

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

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

BIOS:
  BIOS Vendor: Cisco Systems, Inc.
  BIOS Version: C225M6.4.2.1c.0.0806211349
  BIOS Date: 08/06/2021
  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

(Continued on next page)
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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: i386-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

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

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CPU2017 License: 9019
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Compiler Version Notes (Continued)

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)
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-licm-vrp
-ffltc -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize

(Continued on next page)
### Cisco Systems

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

<table>
<thead>
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<th>Specification</th>
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#### SPEC CPU2017 Integer Rate Result

**SPECrate®2017_int_base = 284**

**SPECrate®2017_int_peak = 294**

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#### Base Optimization Flags (Continued)

**C benchmarks (continued):**
- `-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
- `-march=znver3 -fveclib=AMDLIBM -fstruct-layout=5`
- `-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000`
- `-fremap-arrays -mlllvm -function-specialize -f1v-function-specialization`
- `-mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true`
- `-mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3 -z muldefs`
- `-lamdlibm -ljemalloc -lflang -lflangrti`

**C++ benchmarks:**
- `-m64 -std=c++98 -Wl,-mlllvm -Wl,-do-block-reorder=aggressive -flto`
- `-Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-function-specialize`
- `-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
- `-march=znver3 -fveclib=AMDLIBM -mlllvm -enable-partial-unswitch`
- `-mlllvm -unroll-threshold=100 -finline-aggressive`
- `-f1v-function-specialization -mlllvm -loop-unswitch-threshold=200000`
- `-mlllvm -reroll-loops -mlllvm -aggressive-loop-unswitch`
- `-mlllvm -extra-vectorizer-passes -mlllvm -reduce-array-computations=3`
- `-mlllvm -global-vectorize-slp=true -mlllvm -convert-pow-exp-to-int=false`
- `-z muldefs -mlllvm -do-block-reorder=aggressive`
- `-fvirtual-function-elimination -fvisibility=hidden -lamdlibm`
- `-ljemalloc -lflang -lflangrti`

**Fortran benchmarks:**
- `-m64 -Wl,-mlllvm -Wl,-inline-recursion=4`
- `-Wl,-mlllvm -Wl,-lsr-in-nested-loop -Wl,-mlllvm -Wl,-enable-iv-split`
- `-flto -Wl,-mlllvm -Wl,-region-vectorize`
- `-Wl,-mlllvm -Wl,-function-specialize`
- `-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
- `-march=znver3 -fveclib=AMDLIBM -z muldefs -mlllvm -unroll-aggressive`
- `-mlllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lflangrti`

---

#### Base Other Flags

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

**C++ benchmarks:**
- `-Wno-unused-command-line-argument`
## SPEC CPU®2017 Integer Rate Result

**Copyright 2017-2022 Standard Performance Evaluation Corporation**

### Cisco Systems

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

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### SPECrate®2017_int_base = 284

**SPECrate®2017_int_peak = 294**

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#### Peak Compiler Invocation

**C benchmarks:**
- clang

**C++ benchmarks:**
- clang++

**Fortran benchmarks:**
- flang

---

#### Peak Portability Flags

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

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

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Peak Optimization Flags (Continued)

502.gcc_r (continued):
- Wl,-mllvm -Wl,—function-specialize -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=true
- mllvm -function-specialize -mllvm -enable-licm-vrp
- mllvm -reduce-array-computations=3 -fgnu89-inline
- ljemalloc

505.mcf_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 -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=true
- mllvm -function-specialize -mllvm -enable-licm-vrp
- mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

525.x264_r: basepeak = yes

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -m64 -std=c++98
- Wl,-mllvm -Wl,—do-block-reorder-aggressive -flto
- Wl,-mllvm -Wl,—function-specialize
- Wl,-mllvm -Wl,—align-all-nofallthru-blocks=6
- Wl,-mllvm -Wl,—reduce-array-computations=3 -Ofast
- march=znver3 —fveclib=AMDLIBM -finline-aggressive
- mllvm -unroll-threshold=100 -flv-function-specialization
- mllvm -enable-licm-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
- lamdlibm -ljemalloc

523.xalancbmk_r: -m32 -Wl,-mllvm -Wl,—do-block-reorder-aggressive -flto
- Wl,-mllvm -Wl,—function-specialize
- Wl,-mllvm -Wl,—align-all-nofallthru-blocks=6

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**Cisco Systems**

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

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**SPEC CPU®2017 Integer Rate Result**

**Cisco Systems**

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**SPECrate®2017_int_base = 284**

**SPECrate®2017_int_peak = 294**

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**Peak Optimization Flags (Continued)**

523.xalancbmk_r (continued):

- -Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
- -march=znver3 -fveclib=AMDLIBM -finline-aggressive
- -mllvm -unroll-threshold=100 -fllvm-function-specialization
- -mllvm -enable-licm-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:**

- -m64
- -Wl,-mllvm -Wl,-inline-recursion=4
- -Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
- -flto -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 -unroll-aggressive
- -mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lflangrti

---

**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

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


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

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