Cisco Systems
Cisco UCS C220 M7 (Intel Xeon Silver 4410Y, 2.00GHz)

SPECrater®2017_int_base = 218
SPECrater®2017_int_peak = 224

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

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<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base (218)</th>
<th>SPECrate®2017_int_peak (224)</th>
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<td>505.mcf_r</td>
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<td>520.omnetpp_r</td>
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<tr>
<td>523.xalancbmk_r</td>
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<td>525.x264_r</td>
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<tr>
<td>548.exchange2_r</td>
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</tr>
<tr>
<td>557.xz_r</td>
<td>48</td>
<td>435</td>
</tr>
</tbody>
</table>

Hardware
CPU Name: Intel Xeon Silver 4410Y
Max MHz: 3900
Nominal: 2000
Enabled: 24 cores, 2 chips, 2 threads/core
Orderable: 1,2 Chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 30 MB I+D on chip per chip
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R, running at 4000)
Storage: 1 x 960 GB M.2 SSD SATA
Other: None

Software
OS: SUSE Linux Enterprise Server 15 SP4
5.14.21-150400.22-default
Compiler: C/C++; Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version 4.3.1b released Mar-2023
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS set to prefer performance at the cost of additional power usage
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Ratio</th>
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<td>557.xz_r</td>
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<td>528</td>
<td>98.1</td>
<td>528</td>
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<td>524</td>
<td>98.8</td>
<td>528</td>
<td>98.1</td>
<td>528</td>
<td>98.2</td>
</tr>
</tbody>
</table>

### Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
MALLOC_CONF = "retain:true"
Cisco Systems
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General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Red Hat Enterprise Linux 8.4
Transparent Huge Pages enabled by default
Filesystem page cache synced and cleared with:
sync; echo 3>/proc/sys/vm/drop_caches
runcpu command invoked through numaclt i.e.:
umactl --interleave=all runcpu <etc>
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, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

BIOS Settings:
Adjacent Cache Line Prefetcher set to Enabled
DCU streamer Prefetch set to Enabled
Enhanced CPU Performance set to Auto
LLC Dead Line set to Disabled
ADDCS Sparing set to Disabled
Processor C6 Report set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Wed Aug 23 02:49:47 2023

SUT (System Under Test) info as seen by some common utilities.

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10. who -r
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12. Services, from systemctl list-unit-files
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SPEC CPU®2017 Integer Rate Result

Platform Notes (Continued)

22. BIOS

1. uname -a
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux

2. w
02:49:47 up 12 min, 1 user, load average: 0.00, 0.10, 0.16
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 02:49 11.00s 1.22s 0.16s -bash

3. Username
From environment variable $USER: root

4. ulimit -a
core file size (blocks, -c) unlimited
data seg size (kbytes, -d) unlimited
file size (blocks, -f) unlimited
file system limit (-l) 4126995
max locked memory (kbytes, -l) 64
max memory size (kbytes, -m) unlimited
open files (-n) 1024
pipe size (512 bytes, -p) 8
POSIX message queues (bytes, -q) 819200
real-time priority (-r) 0
stack size (kbytes, -s) unlimited
cpu time (seconds, -t) unlimited
max user processes (-u) 4126995
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

5. sysinfo process ancestry
/user/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
-runcpu --action=build --action validate --define default-platform-flags --define numcopies=48 -c
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --reportable --iterations 3 --define smt-on --define
cores=24 --define physicallfirst --define invoke_with_interleave --define drop_caches --tune all -- all
intrate
runcpu --action build --action validate --define default-platform-flags --define numcopies=48 --configfile
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --reportable --iterations 3 --define smt-on --define
cores=24 --define physicallfirst --define invoke_with_interleave --define drop_caches --tune all
--output_format all --nopower --runmode rate --tune base:peak --size refrate intrate --nopreenv
--note-preenv --logfile $SPEC/tmp/CPU2017.051/templogs/preenv.intrate.051.0.log --lognum 051.0
--from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

6. /proc/cpuinfo
model name : Intel(R) Xeon(R) Silver 4410Y
vendor_id : GenuineIntel

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Tested by: Cisco Systems
Test Date: Aug-2023
Hardware Availability: Feb-2023
Software Availability: Dec-2022

**Platform Notes (Continued)**

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</thead>
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</tr>
<tr>
<td>model</td>
</tr>
<tr>
<td>stepping</td>
</tr>
<tr>
<td>microcode</td>
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<tr>
<td>bugs</td>
</tr>
<tr>
<td>cpu cores</td>
</tr>
<tr>
<td>siblings</td>
</tr>
<tr>
<td>2 physical ids (chips)</td>
</tr>
<tr>
<td>48 processors (hardware threads)</td>
</tr>
<tr>
<td>physical id 0: core ids 0-11</td>
</tr>
<tr>
<td>physical id 1: core ids 0-11</td>
</tr>
<tr>
<td>physical id 0: apicids 0-23</td>
</tr>
<tr>
<td>physical id 1: apicids 128-151</td>
</tr>
<tr>
<td>Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.</td>
</tr>
</tbody>
</table>

7. lscpu

From lscpu from util-linux 2.37.2:

```
Architecture:                    x86_64
CPU op-mode(s):                  32-bit, 64-bit
Address sizes:                   46 bits physical, 57 bits virtual
Byte Order:                      Little Endian
CPU(s):                          48
On-line CPU(s) list:             0-47
Vendor ID:                       GenuineIntel
Model name:                      Intel(R) Xeon(R) Silver 4410Y
CPU family:                      6
Model:                           143
Thread(s) per core:              2
Core(s) per socket:              12
Socket(s):                       2
Stepping:                        8
CPU max MHz:                     3900.0000
CPU min MHz:                     800.0000
BogoMIPS:                        4000.00
Flags:                           fpu vme de pse tsc msr pae mca cmov pat pse36
                                 cli flush dt s acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                                 lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                                 nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
data_cpl smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 mce
                                 mmx fdxsr sse2 sse3 fma sse4 1 12 mmxext aes f16c rdrand lahf_lm abm
                                 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3 invpcid_single
                                 intel_pppin cdp_l2 sbd bmb ibs Ibpb stibp ibs Enhancement fsgsbase
                                 tsc_adjust bmi1 hle avx2 smep erms invpcid rtm cqm rdt_a avx2f
                                 avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd
                                 sha_ni avx512bw avx512vl xsaveopt xsavec xsavec xsavec xsavec xsavec
cqm_llc
cqm_occup_llc cqm_mbb_total cqm_mbb_local split_lock_detect avx_vnni
                                 avx512 bv16 wbnoinvd dtherm idaarat pln pts hwp hwp_act_window hwp_erp
                                 hwp_pkg_req avx512vmbi uimp pku ospe waitpkg avx512_vmbi gfn vaes
                                 vpclmulqdq avx512_vnni avx512_bitalg tme avx512 vpopcntdq ia57 rdpid
                                 bus_lock_detect cldemote movdiri movdirp64b enqcmd rmg pdm cl_clear serialize
                                 tsxidtrk pconfi arch lbr avx512_fp16 amx_tile flush_lid arch_capabilities

L1d cache:                       1.1 MiB (24 instances)
L1i cache:                       768 KiB (24 instances)
L2 cache:                        48 MiB (24 instances)
L3 cache:                        60 MiB (2 instances)
NUMA node(s):                    4
NUMA node0 CPU(s):               0-29
```
```
(Continued on next page)
```
Platform Notes (Continued)

NUMA node1 CPU(s):  6-11,30-35
NUMA node2 CPU(s):  12-17,36-41
NUMA node3 CPU(s):  18-23,42-47
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/swapsgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tx async abort: Not affected

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE  LEVEL  SETS PHY-LINE COHERENCY-SIZE
L1d  48K  1.1M  12 Data    1  64   1  64
L1i  32K  768K  8 Instruction 1  64  1  64
L2   2M   48M  16 Unified   2 2048 1  64
L3   30M  60M  15 Unified   3 32768 1  64

---------------------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 4 nodes (0-3)
   node 0 cpus: 0-5,24-29
   node 0 size: 257658 MB
   node 0 free: 253962 MB
   node 1 cpus: 6-11,30-35
   node 1 size: 258044 MB
   node 1 free: 254681 MB
   node 2 cpus: 12-17,36-41
   node 2 size: 258044 MB
   node 2 free: 257702 MB
   node 3 cpus: 18-23,42-47
   node 3 size: 258024 MB
   node 3 free: 257708 MB
   node distances:
      node   0   1   2   3
      0: 10  12  21  21
      1: 12  10  21  21
      2: 21  21  10  12
      3: 21  21  12  10

---------------------------------------------------------------------------
9. /proc/meminfo
   MemTotal: 1056535260 kB

---------------------------------------------------------------------------
10. who -r
    run-level 3 Aug 23 02:37

---------------------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
    Default Target  Status
    multi-user       running

---------------------------------------------------------------------------
12. Services, from systemctl list-unit-files
    STATE UNIT FILES
    enabled YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ haveged irqbalance

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Test Date: Aug-2023
Hardware Availability: Feb-2023
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Platform Notes (Continued)

issue-generator kbdsettings lvm2-monitor nscd postfix purge-kernels rollback rsyslog
smartd sshd wicked wickeddd-auto4 wickeddd-dhcpc4 wickeddd-dhcpc6 wickeddd-nanny
systemd-remount-fs
autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
chronydt console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
firewalld gpm grub2-once haveged-switch-root ipmi ipmievd issue-add-ssh-keys kexec-load
ksm kvm_stat lvm2-monitor man-db-create multipathd nfs nfs-blkmap rdisc rpmbind rpmconfigcheck
rsyncd serial-getty enabled-runtime systemd-remount-fs
rsyncd南宋 systemctl reboot rsyslog

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=77a2740b-b14c-4767-8283-c21dd185e97d
splash=silent
mitigations=auto
security=apparmor

------------------------------------------------------------
14. cpupower frequency-info
analyzing CPU 0:
current policy: frequency should be within 800 MHz and 3.90 GHz.
The governor "performance" may decide which speed to use
within this range.
boost state support:
  Supported: yes
  Active: yes

------------------------------------------------------------
15. sysctl
kernel.numa_balancing 1
kernel.randomize_va_space 2
vm.compaction_proactiveness 20
vm.dirty_background_bytes 0
vm.dirty_background_ratio 10
vm.dirty_ratio 20
vm.dirty_writeback_centisecs 500
vm.dirtytime_expire_centisecs 43200
vm.extfrag_threshold 500
vm.min_unmapped_ratio 1
vm.nr_hugepages 0
vm.nr_hugepages_mempolicy 0
vm.nr_overcommit_hugepages 0
vm.swappiness 1
vm.watermark_boost_factor 15000
vm.watermark_scale_factor 10
vm.zone_reclaim_mode 0

------------------------------------------------------------
16. /sys/kernel/mm/transparent_hugepage
defrag [always] defer defer*madvise madvise never
enabled [always] madvise never
hpage_pmd_size 2097152
shmem_enabled always within_size advise [never] deny force

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Platform Notes (Continued)

17. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs 60000
   defrag 1
   max_ptes_none 511
   max_ptes_shared 256
   max_ptes_swap 64
   pages_to_scan 4096
   scan_sleep_millisecs 10000

18. OS release
From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP4

19. Disk information
SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 btrfs 892G 13G 879G 2% /home

20. /sys/devices/virtual/dmi/id
Vendor: Cisco Systems Inc
Product: UCS-C220-M7S
Serial: WZP27020928

21. dmidecode
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 M321R8GA0BB0-CQKD G 64 GB 2 rank 4800, configured at 4000

22. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: Cisco Systems, Inc.
BIOS Version: C220M7.4.3.1b.0.0308232129
BIOS Date: 03/08/2023
BIOS Revision: 5.29

Compiler Version Notes

C | 502.gcc_r(peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201

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Test Date: Aug-2023
Hardware Availability: Feb-2023
Tested by: Cisco Systems
Software Availability: Dec-2022

Compiler Version Notes (Continued)
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---------------------------------------------
C       | 502.gcc_r(peak)
---------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

---------------------------------------------
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)
---------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

---------------------------------------------
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
541.leela_r(base, peak)
---------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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---------------------------------------------
Fortran | 548.exchange2_r(base, peak)
---------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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Base Compiler Invocation
C benchmarks:
icx
C++ benchmarks:
icpx
Fortran benchmarks:
ifx

Base Portability Flags
500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64

(Continued on next page)
Cisco Systems
Cisco UCS C220 M7 (Intel Xeon Silver 4410Y, 2.00GHz)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 218
SPECrate®2017_int_peak = 224

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

Test Date: Aug-2023
Hardware Availability: Feb-2023
Software Availability: Dec-2022

Base Portability Flags (Continued)

520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
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:
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx
SPEC CPU®2017 Integer Rate Result

Cisco Systems
Cisco UCS C220 M7 (Intel Xeon Silver 4410Y, 2.00GHz)

| SPECrate®2017_int_base = 218 |
| SPECrate®2017_int_peak = 224 |

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Test Date: Aug-2023
Tested by: Cisco Systems
Hardware Availability: Feb-2023
Software Availability: Dec-2022

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
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: -w -std=c11 -m64 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/ia32_lin
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

557.xz_r: basepeak = yes

C++ benchmarks:

(Continued on next page)
### Cisco Systems
Cisco UCS C220 M7 (Intel Xeon Silver 4410Y, 2.00GHz)

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### SPECrate®2017 Integer Rate Result

- **SPECrate®2017_int_base = 218**
- **SPECrate®2017_int_peak = 224**

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<th>Test Date:</th>
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<tr>
<td>Software Availability:</td>
<td>Dec-2022</td>
</tr>
</tbody>
</table>

#### Peak Optimization Flags (Continued)

520.omnetpp_r: basepeak = yes
523.xalancbmk_r: basepeak = yes
531.deepsjeng_r: basepeak = yes
541.leela_r: basepeak = yes

Fortran benchmarks:
548.exchange2_r: basepeak = yes

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

- [http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html)

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

- [http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml)

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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