## SPEC CPU®2017 Floating Point Rate Result

### Cisco Systems

Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9019</th>
</tr>
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<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Cisco Systems</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Cisco Systems</td>
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<table>
<thead>
<tr>
<th>Software Availability:</th>
<th>Jun-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Platinum 8490H</td>
</tr>
<tr>
<td>Max MHz:</td>
<td>3500</td>
</tr>
<tr>
<td>Nominal:</td>
<td>1900</td>
</tr>
<tr>
<td>Enabled:</td>
<td>240 cores, 4 chips</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1,2,3,4 Chips</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>Cache L2:</td>
<td>2 MB I+D on chip per core</td>
</tr>
<tr>
<td>Cache L3:</td>
<td>112.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Memory:</td>
<td>2 TB (32 x 64 GB 2Rx4 PC5-4800B-R)</td>
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<tr>
<td>Storage:</td>
<td>1 x 1.6 TB NVMe SSD</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
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<table>
<thead>
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<th>Hardware Availability:</th>
<th>Dec-2022</th>
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<tbody>
<tr>
<td>OS:</td>
<td>SUSE Linux Enterprise Server 15 SP4 5.14.21-150400.22-default</td>
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<tr>
<td>Compiler:</td>
<td>C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;</td>
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<tr>
<td>Parallel:</td>
<td>No</td>
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<tr>
<td>Firmware:</td>
<td>Version 5.1.1b released Apr-2023</td>
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<tr>
<td>File System:</td>
<td>xfs</td>
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<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
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<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>Not Applicable</td>
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<tr>
<td>Other:</td>
<td>jemalloc memory allocator V5.0.1</td>
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<td>Power Management:</td>
<td>BIOS set to prefer performance at the cost of additional power usage</td>
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<tr>
<td>507.cactuBSSN_r</td>
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<tr>
<td>508.namd_r</td>
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<tr>
<td>510.parest_r</td>
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<td>511.povray_r</td>
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<tr>
<td>519.lbm_r</td>
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<tr>
<td>521.wrf_r</td>
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<tr>
<td>526.blender_r</td>
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<tr>
<td>527.cam4_r</td>
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<tr>
<td>538.imagick_r</td>
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<tr>
<td>544.nab_r</td>
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<tr>
<td>549.fotonik3d_r</td>
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<td>554.roms_r</td>
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<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>1850</th>
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<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
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<thead>
<tr>
<th>SPECrate®2017_fp_base (1850)</th>
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<tr>
<td>SPECrate®2017_fp_base</td>
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<tr>
<td>SPECrate®2017_fp_peak</td>
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**Test Date:** May-2023

**Hardware Availability:** Jun-2023

**Test Sponsor:** Cisco Systems

**Tested by:** Cisco Systems

**Software Availability:** Dec-2022

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**CPU2017 License:** 9019

**Test Date:** May-2023

**Hardware Availability:** Jun-2023

**Test Sponsor:** Cisco Systems

**Tested by:** Cisco Systems
Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

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

Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Results Table

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</tr>
</tbody>
</table>

SPECrate®2017_fp_base = 1850
SPECrate®2017_fp_peak = Not Run

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/je5.0.1-64"
MALLOC_CONF = "retain:true"

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
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3 > /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --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.

(Continued on next page)
Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

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

SPECrater®2017_fp_base = 1850
SPECrater®2017_fp_peak = Not Run

Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

General Notes (Continued)

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.


Platform Notes

BIOS Settings:
Intel HyperThreading set to Disabled
LLC Dead Line set to Disabled
Processor C6 Report set to Enabled
UPI Link Power Management Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c889b7ed5c36ae2c92cc097bec197
running on spec-srv Sun May 7 01:16:55 2023

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

Table of contents
------------------------------------------------------------------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
 12. Failed units, from systemctl list-units --state=failed
 13. Services, from systemctl list-unit-files
 14. Linux kernel boot-time arguments, from /proc/cmdline
 15. cpupower frequency-info
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
------------------------------------------------------------------------------------------------------------------------

1. uname -a
   Linux spec-srv 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
   01:16:55 up 5 min, 1 user, load average: 0.39, 2.80, 1.72

(Continued on next page)
Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

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

Platform Notes (Continued)

<table>
<thead>
<tr>
<th>USER</th>
<th>TTY</th>
<th>FROM</th>
<th>LOGIN@</th>
<th>IDLE</th>
<th>JCPU</th>
<th>PCPU</th>
<th>WHAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>root</td>
<td>tty1</td>
<td>-</td>
<td>01:16</td>
<td>15.00s</td>
<td>1.76s</td>
<td>0.46s</td>
<td>-bash</td>
</tr>
</tbody>
</table>

3. Username
From environment variable $USER: root

4. ulimit -a
   core file size (blocks, -c) unlimited
   data seg size (kbytes, -d) unlimited
   scheduling priority (-e) 0
   file size (blocks, -f) unlimited
   pending signals (-i) 8255440
   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) 8255440
   virtual memory (kbytes, -v) unlimited
   file locks (-x) unlimited

5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 30
   login -- root
   -bash
   runcpu --action=build --action validate --define default-platform-flags --define numcopies=240 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --reportable --iterations 3 --define amt-on --define cores=120 --define physicalfirst --define invoke_with_interleave --define drop_caches --tune base -o all fprate
   runcpu --action build --action validate --define default-platform-flags --define numcopies=240 --configfile ic2023.0-lin-sapphirerapids-rate-20221201.cfg --reportable --iterations 3 --define amt-on --define cores=120 --define physicalfirst --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode rate --tune base --size refrate fprate --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.051/templogs/preenv.fprate.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) Platinum 8490H
   vendor_id : GenuineIntel
   cpu family : 6
   model : 143
   stepping : 8
   microcode : 0x2b000461
   bugs : spectre_v1 spectre_v2 spec_store_bypass swapps
   cpu cores : 60
   siblings : 60
   4 physical ids (chips)
   240 processors (hardware threads)
   physical id 0: core ids 0-59
   physical id 1: core ids 0-59
   physical id 2: core ids 0-59

(Continued on next page)
Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

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

SPECrate\textsuperscript{®}2017\textsubscript{fp} peak = Not Run
SPECrate\textsuperscript{®}2017\textsubscript{fp} base = 1850

Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Platform Notes (Continued)

physical id 3: core ids 0-59
physical id 0: apicids
0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118
physical id 1: apicids
physical id 2: apicids

physical id 3: apicids

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

---

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): 240
On-line CPU(s) list: 0-239
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) Platinum 8490H
CPU family: 6
Model: 143
Thread(s) per core: 1
Core(s) per socket: 60
Socket(s): 4
Stepping: 8
CPU max MHz: 3500.000
CPU min MHz: 800.000
BogoMIPS: 3800.00

Flags:
   fpu vme de pse move cx8 apic sep mtrr pse36
   clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb
   rdtpsc lm constant_tsc art arch_perfmon pebs rep_good nopl xtopology
   nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64
   monitor ds_cpl vmx est tm2 ssbe3 sdbg fma cx16 xtrm pdcm pcid
   dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
   avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebpx cat_13
   cat_12 cdp_l3
   invvpicid_single intel_pmask cdp_l2 msa ibrs ibpb stibp ibrs_enhanced
   trp_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bm11
   hle
   avx2 smep bmi2 erms invpcid rdmsk cqm_rdt_a avx512f avx512d rdcnd adx
   smap
   avx512fma clflushopt clwb intel_pt avx512cd sha ni avx512bw
   avx512vl
   xsaveopt xsavec xедер vbv xsaves cqm llc cqm_occrr llc cqm_mmm_total
   cqm_mm_local split_lock_detect avx_vnni avx512_bf16
   vmbinning dtherm ida
   arat pln pts hwp hwp_act_window hwp_tsa hwp_tsa avx512bf16
   avx512d dse sse2 avx2 amx bmi2 erms invpcid rdmsk cqm_rdt_a
   avx512f avx512d rdseed adx smap
   avx512bf16 clflushopt clwb intel_pt avx512cd sha ni avx512bw
   avx512vl
   xsaveopt xsavec xедер vbv xsaves cqm llc cqm_occrr llc cqm_mmm_total
   cqm_mm_local split_lock_detect avx_vnni avx512_bf16
   vmbinning dtherm ida
   arat pln pts hwp hwp_act_window hwp_tsa hwp_tsa avx512bf16
   avx512d dse sse2 avx2 amx bmi2 erms invpcid rdmsk cqm_rdt_a
   avx512f avx512d rdseed adx smap

   Virtualization: VT-x
   L1d cache: 11.3 MiB (240 instances)

(Continued on next page)
Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)  

SPECrates®2017 fp_base = 1850
SPECrates®2017 fp_peak = Not Run

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

Platform Notes (Continued)

| L1d cache: | 7.5 MiB (240 instances) |
| L2 cache: | 480 MiB (240 instances) |
| L3 cache: | 450 MiB (4 instances) |
| NUMA node(s): | 16 |
| NUMA node0 CPU(s): | 0-14 |
| NUMA node1 CPU(s): | 15-29 |
| NUMA node2 CPU(s): | 30-44 |
| NUMA node3 CPU(s): | 45-59 |
| NUMA node4 CPU(s): | 60-74 |
| NUMA node5 CPU(s): | 75-89 |
| NUMA node6 CPU(s): | 90-104 |
| NUMA node7 CPU(s): | 105-119 |
| NUMA node8 CPU(s): | 120-134 |
| NUMA node9 CPU(s): | 135-149 |
| NUMA node10 CPU(s): | 150-164 |
| NUMA node11 CPU(s): | 165-179 |
| NUMA node12 CPU(s): | 180-194 |
| NUMA node13 CPU(s): | 195-209 |
| NUMA node14 CPU(s): | 210-224 |
| NUMA node15 CPU(s): | 225-239 |
| Vulnerability Itlb multihit: | Not affected |
| Vulnerability L1f: | 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 Tlx async abort: | Not affected |

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>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>48K</td>
<td>11.3M</td>
<td>12</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1l</td>
<td>32K</td>
<td>7.5M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>2M</td>
<td>480M</td>
<td>16</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>112.5M</td>
<td>450M</td>
<td>15</td>
<td>Unified</td>
<td>3</td>
<td>122880</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

8. numactl --hardware
Note: a numactl 'node' might or might not correspond to a physical chip.

---

(Continued on next page)
Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

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

SPECrate®2017_fp_base = 1850
SPECrate®2017_fp_peak = Not Run

Platform Notes (Continued)

node 6 size: 129020 MB
node 6 free: 128810 MB
node 7 cpus: 105-119
node 7 size: 129020 MB
node 7 free: 128821 MB
node 8 cpus: 120-134
node 8 size: 129020 MB
node 8 free: 128833 MB
node 9 cpus: 135-149
node 9 size: 129020 MB
node 9 free: 128763 MB
node 10 cpus: 150-164
node 10 size: 129020 MB
node 10 free: 128825 MB
node 11 cpus: 165-179
node 11 size: 129020 MB
node 11 free: 128826 MB
node 12 cpus: 180-194
node 12 size: 129020 MB
node 12 free: 128685 MB
node 13 cpus: 195-209
node 13 size: 129020 MB
node 13 free: 128759 MB
node 14 cpus: 210-224
node 14 size: 129020 MB
node 14 free: 128759 MB
node 15 cpus: 225-239
node 15 size: 128973 MB
node 15 free: 128640 MB
node distances:
node 0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
0: 10 12 12 12 21 21 21 21 21 21 21 21 21 21 21 21
1: 12 10 12 12 21 21 21 21 21 21 21 21 21 21 21 21
2: 12 12 10 12 21 21 21 21 21 21 21 21 21 21 21 21
3: 12 12 12 10 21 21 21 21 21 21 21 21 21 21 21 21
4: 21 21 21 21 10 12 12 12 21 21 21 21 21 21 21 21
5: 21 21 21 21 12 10 12 12 21 21 21 21 21 21 21 21
6: 21 21 21 21 12 12 10 12 21 21 21 21 21 21 21 21
7: 21 21 21 21 12 12 12 10 21 21 21 21 21 21 21 21
8: 21 21 21 21 12 12 12 10 21 21 21 21 21 21 21 21
9: 21 21 21 21 21 21 21 21 12 10 12 12 21 21 21 21
10: 21 21 21 21 21 21 21 21 12 10 12 12 21 21 21 21
11: 21 21 21 21 21 21 21 21 12 12 12 10 21 21 21 21
12: 21 21 21 21 21 21 21 21 21 21 21 21 10 12 12 12
13: 21 21 21 21 21 21 21 21 21 21 21 21 12 10 12 12
14: 21 21 21 21 21 21 21 21 21 21 21 21 12 12 10 12
15: 21 21 21 21 21 21 21 21 21 21 21 21 12 12 12 10

9. /proc/meminfo
   MemTotal: 2113417376 kB

10. who -r
    run-level 3 May 7 01:13

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

(Continued on next page)
Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

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<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
</table>
| 12. Failed units, from systemctl list-units --state=failed
| * sep5.service loaded failed failed systemd script to load sep5 driver at boot time |
| 13. Services, from systemctl list-unit-files
| STATE | UNIT FILES |
| enabled | auditd cron getty@ haveged irqbalance issue-generator kbdsettings lvm2-monitor nscd nvme-boot-connections postfix purge-kernels rollback rsyslog sep5 smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny |
| enabled-runtime | systemd-remount-fs |
| indirect | wicked |
| 14. Linux kernel boot-time arguments, from /proc/cmdline |
| BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default |
| root=UUID=f5d7bf41-1d73-4f7e-a75a-9dd867bc14ba |
| splash=silent |
| mitigations=auto |
| quiet |
| security= |
| 15. cpupower frequency-info |
| analyzing CPU 0: |
| current policy: frequency should be within 800 MHz and 3.50 GHz. |
| The governor "powersave" may decide which speed to use within this range. |
| boost state support: |
| Supported: yes |
| Active: yes |
| 16. sysct1 |
| 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_bytes | 0 |
| vm.dirty_expire_centisecs | 3000 |
| vm.dirty_ratio | 20 |
| vm.dirty_writeback_centisecs | 500 |
| vm.dirtytime_expire_seconds | 43200 |
| vm.extravg_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 |

(Continued on next page)
Cisco Systems
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Platform Notes (Continued)

vm.zone_reclaim_mode 0

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

18. /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

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

20. Disk information
SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p2 xfs 1.5T 108G 1.4T 8% /

21. /sys/devices/virtual/dmi/id
Vendor: Cisco Systems Inc
Product: UCSX-410C-M7
Serial: FCH264873NP

22. 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:
4x 0xAD00 HMCG94MEBRA121N 64 GB 2 rank 4800
28x 0xAD00 HMCG94MEBRA123N 64 GB 2 rank 4800

23. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: Cisco Systems, Inc.
BIOS Version: X410W7.5.1.1S.10.0424230829
BIOS Date: 04/24/2023
BIOS Revision: 5.29

Compiler Version Notes
C 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)

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Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

SPECratenet®2017_fp_base = 1850
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Tested by: Cisco Systems

Test Date: May-2023
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Compiler Version Notes (Continued)

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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>C benchmarks</td>
</tr>
<tr>
<td>icx</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>C++ benchmarks</td>
</tr>
<tr>
<td>icpx</td>
</tr>
</tbody>
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(Continued on next page)
Cisco Systems
Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

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

Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Base Compiler Invocation (Continued)

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifx

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.ibm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -gopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-gopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

(Continued on next page)
## SPEC CPU®2017 Floating Point Rate Result

### Cisco Systems

Cisco UCS X410c M7 (Intel Xeon Platinum 8490H, 1.90GHz)

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<thead>
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<th>SPECrate®2017_fp_base</th>
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**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Test Date:** May-2023  
**Tested by:** Cisco Systems  
**Hardware Availability:** Jun-2023  
**Software Availability:** Dec-2022

### Base Optimization Flags (Continued)

**Fortran benchmarks:**
- `-w -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto`  
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`  
- `-nostandard-realloc-lhs -align array32byte -auto -ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using both Fortran and C:**
- `-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto`  
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`  
- `-Wno-implicit-int -mprefer-vector-width=512 -nostandard-realloc-lhs`  
- `-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using both C and C++:**
- `-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast`  
- `-ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`  
- `-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using Fortran, C, and C++:**
- `-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast`  
- `-ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`  
- `-Wno-implicit-int -mprefer-vector-width=512 -nostandard-realloc-lhs -align array32byte -auto -ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

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.