SPEC CPU®2017 Floating Point Rate Result

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Cisco Systems

Cisco UCS C240 M7 (Intel Xeon Gold 6430, 2.10GHz)

SPECrate®2017_fp_base = 643

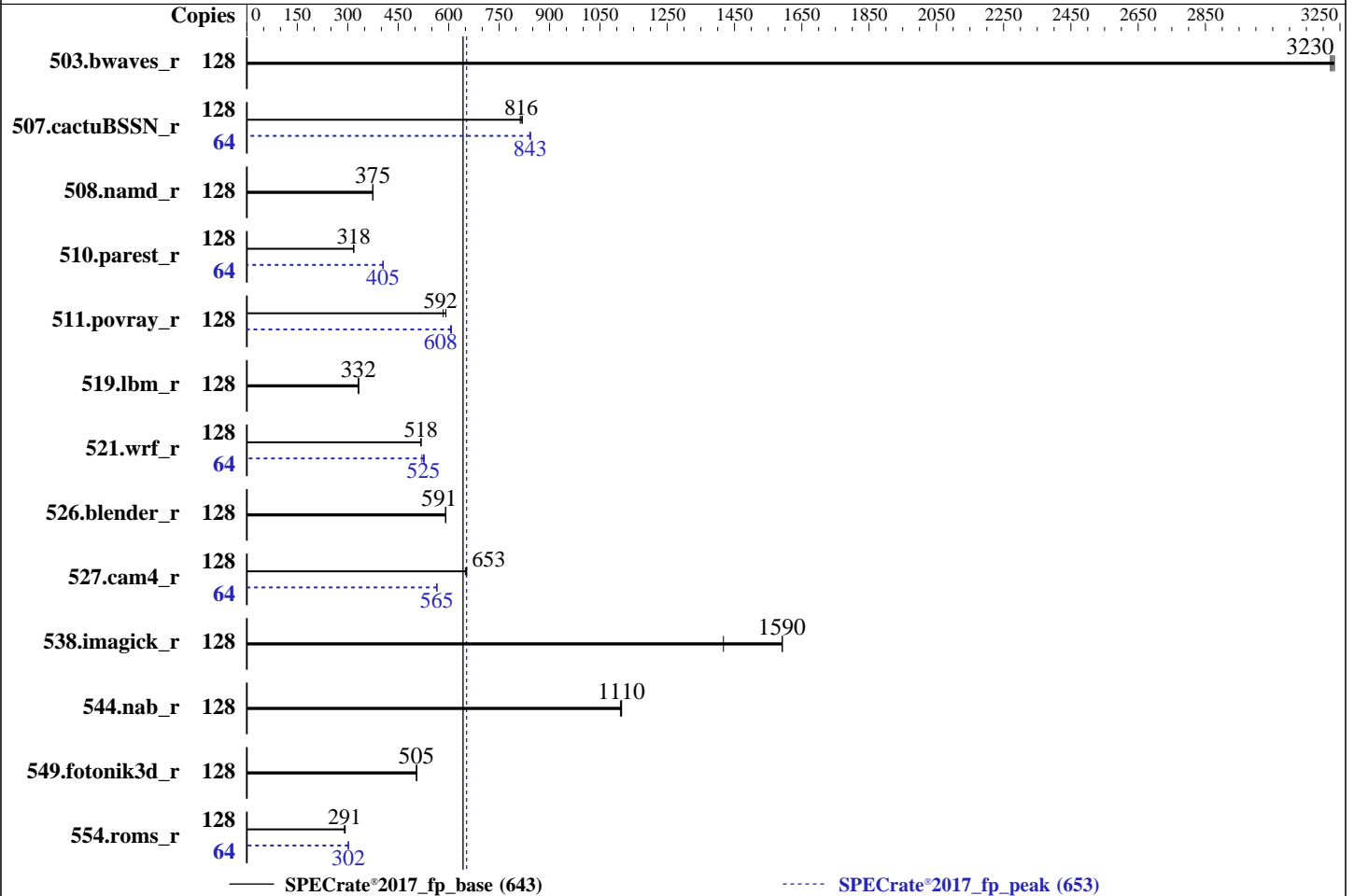SPECrate®2017_fp_peak = 653

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Copies	
503.bwaves_r	128 → 3230
507.cactuBSSN_r	128 → 816; 64 → 843
508.namd_r	128 → 375
510.parest_r	128 → 318; 64 → 405
511.povray_r	128 → 592; 64 → 608
519.lbm_r	128 → 332
521.wrf_r	128 → 518; 64 → 525
526.blender_r	128 → 591
527.cam4_r	128 → 653; 64 → 565
538.imagick_r	128 → 1590
544.nab_r	128 → 1110
549.fotonik3d_r	128 → 505
554.roms_r	128 → 291; 64 → 302

SPECrate®2017_fp_base (643)   SPECrate®2017_fp_peak (653)

Hardware

CPU Name: Intel Xeon Gold 6430
 Max MHz: 3400
 Nominal: 2100
Enabled: 64 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: 60 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R, running at 4400)
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 4.2.600 released Jan-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
			Base								**Peak**			
503.bwaves_r	128	397	3230	**398**	**3230**	398	3220	128	397	3230	**398**	**3230**	398	3220
507.cactuBSSN_r	128	**199**	**816**	199	813	198	819	64	96.3	841	96.0	844	**96.1**	**843**
508.namd_r	128	324	375	324	375	**324**	**375**	128	324	375	324	375	**324**	**375**
510.parest_r	128	1055	317	1053	318	**1055**	**318**	64	414	405	413	405	**414**	**405**
511.povray_r	128	512	584	505	592	**505**	**592**	128	493	606	**491**	**608**	491	608
519.lbm_r	128	**406**	**332**	406	332	406	332	128	**406**	**332**	406	332	406	332
521.wrf_r	128	553	518	554	517	**554**	**518**	64	**273**	**525**	272	528	275	520
526.blender_r	128	330	592	330	591	**330**	**591**	128	330	592	330	591	**330**	**591**
527.cam4_r	128	345	650	342	654	**343**	**653**	64	198	566	**198**	**565**	198	564
538.imagick_r	128	**200**	**1590**	225	1420	200	1590	128	**200**	**1590**	225	1420	200	1590
544.nab_r	128	**193**	**1110**	193	1110	194	1110	128	**193**	**1110**	193	1110	194	1110
549.fotonik3d_r	128	**988**	**505**	989	505	988	505	128	**988**	**505**	989	505	988	505
554.roms_r	128	700	291	695	293	**700**	**291**	64	336	302	337	301	**337**	**302**
SPECrate®2017_fp_base =		**643**												
SPECrate®2017_fp_peak =		**653**												

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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:

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/

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General Notes (Continued)

```
 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.
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
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS Settings:
Sub NUMA Clustering set to Enable SNC4
LLC Dead Line set to Disabled
ADDDC Sparing set to Disabled
Processor C6 Report set to Enabled
UPI Link Enablement 3
UPI Link Power Management Enabled


 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on srv04 Wed Mar  1 08:04:02 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. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
```

(Continued on next page)

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Platform Notes (Continued)

```
   14. cpupower frequency-info
   15. sysctl
   16. /sys/kernel/mm/transparent_hugepage
   17. /sys/kernel/mm/transparent_hugepage/khugepaged
   18. OS release
   19. Disk information
   20. /sys/devices/virtual/dmi/id
   21. dmidecode
   22. BIOS
   ------------------------------------------------------------


   ------------------------------------------------------------
   1. uname -a
     Linux srv04 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
      08:04:02 up 2 min,  1 user,  load average: 0.38, 0.55, 0.25
      USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
      root     tty1     -                08:02    9.00s  1.74s  0.23s -bash


   ------------------------------------------------------------
   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) 4126804
     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) 4126804
     virtual memory          (kbytes, -v) unlimited
     file locks                      (-x) unlimited


   ------------------------------------------------------------
   5. sysinfo process ancestry
```

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Cisco Systems

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CPU2017 License: 9019   **Test Date:**   Mar-2023

Test Sponsor: Cisco Systems   **Hardware Availability:** Mar-2023

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Platform Notes (Continued)

```
 /usr/lib/systemd/systemd --switched-root --system --deserialize 30
 login -- root
 -bash
 -bash
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --reportable --iterations 3 --define smt-on --define
   cores=64 --define physicalfirst --define invoke_with_interleave --define drop_caches --tune all -o all
    fprate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --reportable --iterations 3 --define smt-on --define
   cores=64 --define physicalfirst --define invoke_with_interleave --define drop_caches --tune all
   --output_format all --nopower --runmode rate --tune base:peak --size refrate fprate --nopreenv
   --note-preenv --logfile $SPEC/tmp/CPU2017.145/templogs/preenv.fprate.145.0.log --lognum 145.0
    --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017


 ------------------------------------------------------------
 6. /proc/cpuinfo
     model name       : Intel(R) Xeon(R) Gold 6430
     vendor_id        : GenuineIntel
     cpu family       : 6
     model            : 143
     stepping         : 8
     microcode        : 0x2b000161
     bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs
     cpu cores        : 32
     siblings         : 64
     2 physical ids (chips)
     128 processors (hardware threads)
     physical id 0: core ids 0-31
     physical id 1: core ids 0-31
     physical id 0: apicids 0-63
     physical id 1: apicids 128-191
  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):                   128
   On-line CPU(s) list:      0-127
```

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Platform Notes (Continued)

```
Vendor ID:                    GenuineIntel
Model name:                   Intel(R) Xeon(R) Gold 6430
CPU family:                   6
Model:                        143
Thread(s) per core:           2
Core(s) per socket:           32
Socket(s):                    2
Stepping:                     8
CPU max MHz:                  3400.0000
CPU min MHz:                  800.0000
BogoMIPS:                     4200.00
Flags:                        fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                              clflush dts 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
                               ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1
                              sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand
                                 lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3
                              invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
                              tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle
                              avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
                               avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
                                 xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                              cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
                              arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku
                              ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                              tme avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri movdir64b
                               enqcmd fsrm md_clear serialize tsxldtrk pconfig arch_lbr avx512_fp16
                                          amx_tile flush_l1d arch_capabilities
Virtualization:               VT-x
L1d cache:                    3 MiB (64 instances)
L1i cache:                    2 MiB (64 instances)
L2 cache:                     128 MiB (64 instances)
L3 cache:                     120 MiB (2 instances)
NUMA node(s):                 16
NUMA node0 CPU(s):            0-3,64-67
NUMA node1 CPU(s):            4-7,68-71
NUMA node2 CPU(s):            8-11,72-75
NUMA node3 CPU(s):            12-15,76-79
NUMA node4 CPU(s):            16-19,80-83
NUMA node5 CPU(s):            20-23,84-87
NUMA node6 CPU(s):            24-27,88-91
NUMA node7 CPU(s):            28-31,92-95
NUMA node8 CPU(s):            32-35,96-99
NUMA node9 CPU(s):            36-39,100-103
NUMA node10 CPU(s):           40-43,104-107
NUMA node11 CPU(s):           44-47,108-111
```

(Continued on next page)

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Platform Notes (Continued)

```
   NUMA node12 CPU(s):              48-51,112-115
   NUMA node13 CPU(s):              52-55,116-119
   NUMA node14 CPU(s):              56-59,120-123
   NUMA node15 CPU(s):              60-63,124-127
   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; Enhanced IBRS, IBPB conditional, RSB filling
  Vulnerability Srbds:             Not affected
  Vulnerability Tsx async abort:    Not affected


 From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL   SETS PHY-LINE COHERENCY-SIZE
      L1d      48K       3M  12 Data             1    64       1              64
      L1i      32K       2M   8 Instruction      1    64       1              64
      L2        2M     128M  16 Unified          2  2048       1              64
      L3       60M     120M  15 Unified          3 65536       1              64


   -------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 16 nodes (0-15)
   node 0 cpus: 0-3,64-67
   node 0 size: 64508 MB
   node 0 free: 63802 MB
   node 1 cpus: 4-7,68-71
   node 1 size: 64159 MB
   node 1 free: 63845 MB
   node 2 cpus: 8-11,72-75
   node 2 size: 64509 MB
   node 2 free: 64229 MB
   node 3 cpus: 12-15,76-79
   node 3 size: 64509 MB
   node 3 free: 64204 MB
   node 4 cpus: 16-19,80-83
   node 4 size: 64509 MB
   node 4 free: 64118 MB
   node 5 cpus: 20-23,84-87
   node 5 size: 64509 MB
   node 5 free: 64119 MB
   node 6 cpus: 24-27,88-91
   node 6 size: 64509 MB
   node 6 free: 64165 MB
   node 7 cpus: 28-31,92-95
```

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Platform Notes (Continued)

```
node 7 size: 64509 MB
node 7 free: 64212 MB
node 8 cpus: 32-35,96-99
node 8 size: 64509 MB
node 8 free: 64213 MB
node 9 cpus: 36-39,100-103
node 9 size: 64509 MB
node 9 free: 64230 MB
node 10 cpus: 40-43,104-107
node 10 size: 64509 MB
node 10 free: 64226 MB
node 11 cpus: 44-47,108-111
node 11 size: 64509 MB
node 11 free: 64230 MB
node 12 cpus: 48-51,112-115
node 12 size: 64509 MB
node 12 free: 64233 MB
node 13 cpus: 52-55,116-119
node 13 size: 64475 MB
node 13 free: 64173 MB
node 14 cpus: 56-59,120-123
node 14 size: 64509 MB
node 14 free: 64229 MB
node 15 cpus: 60-63,124-127
node 15 size: 64462 MB
node 15 free: 64167 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
  0:  10  20  20  20  20  20  20  20  20  20  20  20  20  20  20  20
  1:  20  10  20  20  20  20  20  20  20  20  20  20  20  20  20  20
  2:  20  20  10  20  20  20  20  20  20  20  20  20  20  20  20  20
  3:  20  20  20  10  20  20  20  20  20  20  20  20  20  20  20  20
  4:  20  20  20  20  10  20  20  20  20  20  20  20  20  20  20  20
  5:  20  20  20  20  20  10  20  20  20  20  20  20  20  20  20  20
  6:  20  20  20  20  20  20  10  20  20  20  20  20  20  20  20  20
  7:  20  20  20  20  20  20  20  10  20  20  20  20  20  20  20  20
  8:  20  20  20  20  20  20  20  20  10  20  20  20  20  20  20  20
  9:  20  20  20  20  20  20  20  20  20  10  20  20  20  20  20  20
 10:  20  20  20  20  20  20  20  20  20  20  10  20  20  20  20  20
 11:  20  20  20  20  20  20  20  20  20  20  20  10  20  20  20  20
 12:  20  20  20  20  20  20  20  20  20  20  20  20  10  20  20  20
 13:  20  20  20  20  20  20  20  20  20  20  20  20  20  10  20  20
 14:  20  20  20  20  20  20  20  20  20  20  20  20  20  20  10  20
 15:  20  20  20  20  20  20  20  20  20  20  20  20  20  20  20  10


--------------------------------------------------------------

 9. /proc/meminfo
```

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Platform Notes (Continued)

```
    MemTotal:       1056486428 kB


  -------------------------------------------------------------
10. who -r
   run-level 3 Mar 1 08:01


  -------------------------------------------------------------
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
                    issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog
                       smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
   enabled-runtime  systemd-remount-fs
   disabled         autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                       chronyd 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
                      lunmask man-db-create multipathd nfs nfs-blkmap rdisc rpcbind rpmconfigcheck rsyncd
                      serial-getty@ smartd_generate_opts snmpd snmptrapd svnserve systemd-boot-check-no-failures
                      systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd udisks2
   indirect         wickedd


  -------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=e05292c4-0a31-46de-94f3-3ad8c6a360dd
   splash=silent
   mitigations=auto
   quiet
   security=


  -------------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 800 MHz and 3.40 GHz.
                     The governor "powersave" may decide which speed to use
                     within this range.
     boost state support:
       Supported: yes
       Active: yes


  -------------------------------------------------------------
15. sysctl
```

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Platform Notes (Continued)

```
  kernel.numa_balancing                 0
  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.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


  ----------------------------------------------------------------
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/sdb3       xfs   218G   10G  208G   5% /
```

(Continued on next page)

Cisco Systems

Cisco UCS C240 M7 (Intel Xeon Gold 6430, 2.10GHz)

SPECrate®2017_fp_base = 643

SPECrate®2017_fp_peak = 653

Platform Notes (Continued)

```
   ----------------------------------------------------------------
   20. /sys/devices/virtual/dmi/id
       Vendor:        Cisco Systems Inc
       Product:       UCSC-C240-M7SX
       Serial:        WZP263592NZ


   ----------------------------------------------------------------
   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 0xAD00 HMCG94MEBRA109N 64 GB 2 rank 4800, configured at 4400



   ----------------------------------------------------------------
   22. BIOS
   (This section combines info from /sys/devices and dmidecode.)
       BIOS Vendor:        Cisco Systems, Inc.
       BIOS Version:       C240M7.4.2.600.594.0120230612
       BIOS Date:          01/20/2023
       BIOS Revision:      5.29
```

Compiler Version Notes

```
==========================================================================
C                 | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
                  | 544.nab_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++               | 508.namd_r(base, peak) 510.parest_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++, C            | 511.povray_r(base, peak) 526.blender_r(base, peak)
```

(Continued on next page)

Cisco Systems

Cisco UCS C240 M7 (Intel Xeon Gold 6430, 2.10GHz)

SPECrate®2017_fp_base = 643

SPECrate®2017_fp_peak = 653

Compiler Version Notes (Continued)

```
--------------------------------------------------------------------------
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.
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++, C, Fortran | 507.cactuBSSN_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.
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.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------


==========================================================================
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
                | 554.roms_r(base, peak)
--------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------


==========================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
--------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
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.
--------------------------------------------------------------------------
```

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS C240 M7 (Intel Xeon Gold 6430, 2.10GHz)

SPECrate®2017_fp_base = 643

SPECrate®2017_fp_peak = 653

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

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.lbm_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 -qopt-mem-layout-trans=4`
`-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

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Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

Cisco Systems

Cisco UCS C240 M7 (Intel Xeon Gold 6430, 2.10GHz)

SPECrate®2017_fp_base = 643

SPECrate®2017_fp_peak = 653

CPU2017 License: 9019

Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Mar-2023

Hardware Availability: Mar-2023

Software Availability: Dec-2022

Base Optimization Flags (Continued)

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

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
```

Peak Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

Benchmarks using both Fortran and C:
```
ifx icx
```

(Continued on next page)

Cisco Systems

Cisco UCS C240 M7 (Intel Xeon Gold 6430, 2.10GHz)

SPECrate®2017_fp_base = 643

SPECrate®2017_fp_peak = 653

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Peak Compiler Invocation (Continued)

Benchmarks using both C and C++:
`icpx icx`

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

Peak Portability Flags

`Same as Base Portability Flags`

Peak Optimization Flags

C benchmarks:

519.lbm_r: `basepeak = yes`

538.imagick_r: `basepeak = yes`

544.nab_r: `basepeak = yes`

C++ benchmarks:

508.namd_r: `basepeak = yes`

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

Fortran benchmarks:

503.bwaves_r: `basepeak = yes`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `-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`

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Cisco Systems

Cisco UCS C240 M7 (Intel Xeon Gold 6430, 2.10GHz)

SPECrate®2017_fp_base = 643

SPECrate®2017_fp_peak = 653

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

Test Date: Mar-2023
Hardware Availability: Mar-2023
Software Availability: Dec-2022

Peak Optimization Flags (Continued)

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++:

```
511.povray_r: -w -std=c++14 -m64 -std=c11 -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 -Wno-implicit-int
-mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

```
526.blender_r: basepeak = yes
```

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/Cisco-Platform-Settings-V1.0-SPR-revE.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/Cisco-Platform-Settings-V1.0-SPR-revE.xml

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

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