SPEC CPU®2017 Floating Point Rate Result

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Inspur Electronic Information Industry Co., Ltd.

TS860G7 (Intel Xeon Platinum 8490H)

$SPECrate^{®}2017\_fp\_base =$ 3770

$SPECrate^{®}2017\_fp\_peak =$ Not Run

CPU2017 License: 3358	**Test Date:** Jun-2023
Test Sponsor: Inspur Electronic Information Industry Co., Ltd.	**Hardware Availability:** Jul-2023
Tested by: Inspur Electronic Information Industry Co., Ltd.	**Software Availability:** Dec-2022

Copies

Benchmark	Copies	Result
503.bwaves_r	480	17400
507.cactuBSSN_r	480	4250
508.namd_r	480	2840
510.parest_r	480	2620
511.povray_r	480	4570
519.lbm_r	480	1180
521.wrf_r	480	2820
526.blender_r	480	3230
527.cam4_r	480	4320
538.imagick_r	480	11800
544.nab_r	480	7080
549.fotonik3d_r	480	2280
554.roms_r	480	1380

SPECrate®2017_fp_base (3770)

Hardware

CPU Name: Intel Xeon Platinum 8490H
 Max MHz: 3500
 Nominal: 1900
Enabled: 480 cores, 8 chips
Orderable: 2,4,8 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 112.5 MB I+D on chip per chip
 Other: None
Memory: 2 TB (64 x 32 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 3.2 TB NVME SSD
Other: None

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
5.14.0-70.22.1.el9_0.x86_64
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 05.00.00 released Apr-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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

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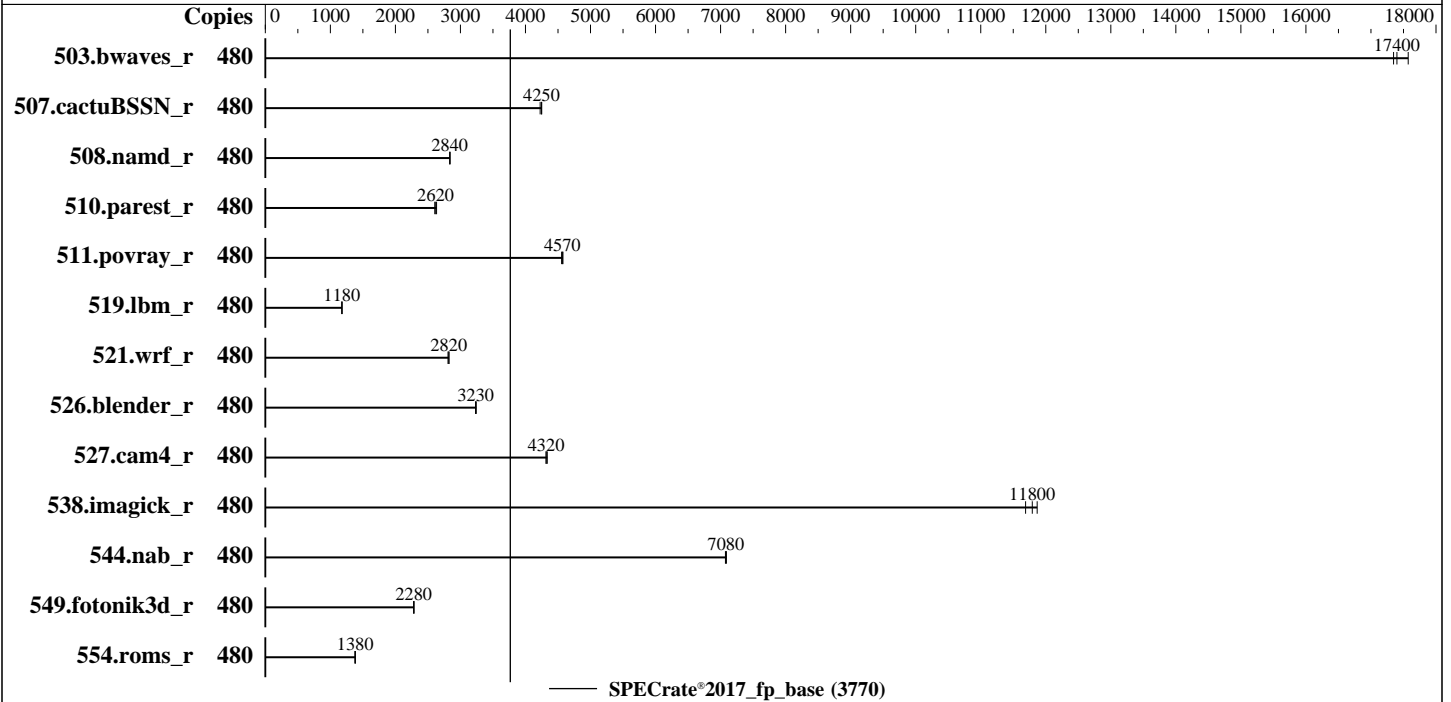|	
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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	480	274	17600	277	17300	**277**	**17400**							
507.cactuBSSN_r	480	**143**	**4250**	144	4230	143	4250							
508.namd_r	480	**161**	**2840**	161	2840	161	2840							
510.parest_r	480	**479**	**2620**	482	2610	477	2630							
511.povray_r	480	245	4580	**245**	**4570**	246	4560							
519.lbm_r	480	**430**	**1180**	430	1180	429	1180							
521.wrf_r	480	381	2820	383	2810	**381**	**2820**							
526.blender_r	480	225	3240	226	3230	**226**	**3230**							
527.cam4_r	480	194	4320	194	4340	**194**	**4320**							
538.imagick_r	480	101	11900	**101**	**11800**	102	11700							
544.nab_r	480	114	7090	114	7070	**114**	**7080**							
549.fotonik3d_r	480	820	2280	**820**	**2280**	818	2290							
554.roms_r	480	551	1380	**552**	**1380**	553	1380							

SPECrate®2017_fp_base =	**3770**
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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/19cpu2017/lib/intel64:/home/19cpu2017/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)

(Continued on next page)

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General Notes (Continued)

```
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 configuration:
ENERGY_PERF_BIAS_CFG mode set to Performance
Hardware Prefetch set to Disable
VT Support set to Disable
Sub NUMA Cluster (SNC) set to SNC4
Intel Hyper Threading Technology set to Disabled

Sysinfo program /home/19cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Thu Aug  3 15:35:38 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 250 (250-6.el9_0)
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. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent_hugepage
19. /sys/kernel/mm/transparent_hugepage/khugepaged
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS
------------------------------------------------------------

------------------------------------------------------------
 1. uname -a
   Linux localhost.localdomain 5.14.0-70.22.1.el9_0.x86_64 #1 SMP PREEMPT Tue Aug 2 10:02:12 EDT 2022 x86_64
   x86_64 x86_64 GNU/Linux
```

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Platform Notes (Continued)

```
  ----------------------------------------------------------
  2. w
    15:35:38 up 1 min,  1 user,  load average: 0.85, 0.46, 0.17
   USER     TTY          LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1         15:34    7.00s  1.23s  0.01s -bash

  ----------------------------------------------------------
  3. Username
    From environment variable $USER:  root

  ----------------------------------------------------------
  4. ulimit -a
    real-time non-blocking time  (microseconds, -R) unlimited
    core file size              (blocks, -c) 0
    data seg size               (kbytes, -d) unlimited
    scheduling priority              (-e) 0
    file size                   (blocks, -f) unlimited
    pending signals                  (-i) 8254923
    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) 8254923
    virtual memory              (kbytes, -v) unlimited
    file locks                       (-x) unlimited

  ----------------------------------------------------------
  5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 28
   login -- root
   -bash
   -bash
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 -c
     ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define cores=480 --define physicalfirst --define
     invoke_with_interleave --define drop_caches --tune base -o all fprate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 --configfile
     ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define cores=480 --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/CPU2017.022/templogs/preenv.fprate.022.0.log --lognum 022.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
  $SPEC = /home/19cpu2017

  ----------------------------------------------------------
  6. /proc/cpuinfo
     model name      : Intel(R) Xeon(R) Platinum 8490H
     vendor_id       : GenuineIntel
     cpu family      : 6
     model           : 143
     stepping        : 6
     microcode       : 0x2b0001b0
     bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
     cpu cores       : 60
     siblings        : 60
     8 physical ids (chips)
     480 processors (hardware threads)
```

(Continued on next page)

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Platform Notes (Continued)

```
      physical id 0: core ids 0-59
      physical id 1: core ids 0-59
      physical id 2: core ids 0-59
      physical id 3: core ids 0-59
      physical id 4: core ids 0-59
      physical id 5: core ids 0-59
      physical id 6: core ids 0-59
      physical id 7: 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
      128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174,176,178,1
      80,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212,214,216,218,220,222,224,226,228,230,23
      2,234,236,238,240,242,244,246
      physical id 2: apicids
      256,258,260,262,264,266,268,270,272,274,276,278,280,282,284,286,288,290,292,294,296,298,300,302,304,306,3
      08,310,312,314,316,318,320,322,324,326,328,330,332,334,336,338,340,342,344,346,348,350,352,354,356,358,36
      0,362,364,366,368,370,372,374
      physical id 3: apicids
      384,386,388,390,392,394,396,398,400,402,404,406,408,410,412,414,416,418,420,422,424,426,428,430,432,434,4
      36,438,440,442,444,446,448,450,452,454,456,458,460,462,464,466,468,470,472,474,476,478,480,482,484,486,48
      8,490,492,494,496,498,500,502
      physical id 4: apicids
      512,514,516,518,520,522,524,526,528,530,532,534,536,538,540,542,544,546,548,550,552,554,556,558,560,562,5
      64,566,568,570,572,574,576,578,580,582,584,586,588,590,592,594,596,598,600,602,604,606,608,610,612,614,61
      6,618,620,622,624,626,628,630
      physical id 5: apicids
      640,642,644,646,648,650,652,654,656,658,660,662,664,666,668,670,672,674,676,678,680,682,684,686,688,690,6
      92,694,696,698,700,702,704,706,708,710,712,714,716,718,720,722,724,726,728,730,732,734,736,738,740,742,74
      4,746,748,750,752,754,756,758
      physical id 6: apicids
      768,770,772,774,776,778,780,782,784,786,788,790,792,794,796,798,800,802,804,806,808,810,812,814,816,818,8
      20,822,824,826,828,830,832,834,836,838,840,842,844,846,848,850,852,854,856,858,860,862,864,866,868,870,87
      2,874,876,878,880,882,884,886
      physical id 7: apicids
      896,898,900,902,904,906,908,910,912,914,916,918,920,922,924,926,928,930,932,934,936,938,940,942,944,946,9
      48,950,952,954,956,958,960,962,964,966,968,970,972,974,976,978,980,982,984,986,988,990,992,994,996,998,10
      00,1002,1004,1006,1008,1010,1012,1014
    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 2.37.4:
      Architecture:                 x86_64
      CPU op-mode(s):               32-bit, 64-bit
      Address sizes:                52 bits physical, 57 bits virtual
      Byte Order:                   Little Endian
      CPU(s):                       480
      On-line CPU(s) list:          0-479
      Vendor ID:                    GenuineIntel
      BIOS Vendor ID:               Intel(R) Corporation
      Model name:                   Intel(R) Xeon(R) Platinum 8490H
      BIOS Model name:              Intel(R) Xeon(R) Platinum 8490H
      CPU family:                   6
      Model:                        143
      Thread(s) per core:           1
      Core(s) per socket:           60
```

(Continued on next page)

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Platform Notes (Continued)

```
Socket(s):                     8
Stepping:                      6
CPU max MHz:                   3500.0000
CPU min MHz:                   800.0000
BogoMIPS:                      3800.00
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 ds_cpl
                               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 fsgsbase
                               tsc_adjust bmi1 avx2 smep bmi2 erms invpcid 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
L1d cache:                     22.5 MiB (480 instances)
L1i cache:                     15 MiB (480 instances)
L2 cache:                      960 MiB (480 instances)
L3 cache:                      900 MiB (8 instances)
NUMA node(s):                  32
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
NUMA node16 CPU(s):            240-254
NUMA node17 CPU(s):            255-269
NUMA node18 CPU(s):            270-284
NUMA node19 CPU(s):            285-299
NUMA node20 CPU(s):            300-314
NUMA node21 CPU(s):            315-329
NUMA node22 CPU(s):            330-344
NUMA node23 CPU(s):            345-359
NUMA node24 CPU(s):            360-374
NUMA node25 CPU(s):            375-389
NUMA node26 CPU(s):            390-404
NUMA node27 CPU(s):            405-419
NUMA node28 CPU(s):            420-434
NUMA node29 CPU(s):            435-449
NUMA node30 CPU(s):            450-464
NUMA node31 CPU(s):            465-479
Vulnerability Itlb multihit:   Not affected
```

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Platform Notes (Continued)

```
   Vulnerability L1tf:              Not affected
   Vulnerability Mds:              Not affected
   Vulnerability Meltdown:         Not affected
   Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
   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    22.5M   12 Data            1     64        1             64
     L1i      32K      15M    8 Instruction     1     64        1             64
     L2        2M     960M   16 Unified         2   2048        1             64
     L3    112.5M     900M   15 Unified         3 122880        1             64

   -------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 32 nodes (0-31)
   node 0 cpus: 0-14
   node 0 size: 64066 MB
   node 0 free: 63800 MB
   node 1 cpus: 15-29
   node 1 size: 64508 MB
   node 1 free: 64332 MB
   node 2 cpus: 30-44
   node 2 size: 64508 MB
   node 2 free: 64360 MB
   node 3 cpus: 45-59
   node 3 size: 64508 MB
   node 3 free: 64321 MB
   node 4 cpus: 60-74
   node 4 size: 64508 MB
   node 4 free: 64353 MB
   node 5 cpus: 75-89
   node 5 size: 64508 MB
   node 5 free: 64339 MB
   node 6 cpus: 90-104
   node 6 size: 64508 MB
   node 6 free: 64359 MB
   node 7 cpus: 105-119
   node 7 size: 64508 MB
   node 7 free: 64362 MB
   node 8 cpus: 120-134
   node 8 size: 64508 MB
   node 8 free: 64363 MB
   node 9 cpus: 135-149
   node 9 size: 64508 MB
   node 9 free: 64357 MB
   node 10 cpus: 150-164
   node 10 size: 64508 MB
   node 10 free: 64357 MB
   node 11 cpus: 165-179
   node 11 size: 64508 MB
   node 11 free: 64355 MB
   node 12 cpus: 180-194
   node 12 size: 64508 MB
   node 12 free: 64353 MB
   node 13 cpus: 195-209
```

(Continued on next page)

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Platform Notes (Continued)

```
    node 13 size: 64508 MB
    node 13 free: 64363 MB
    node 14 cpus: 210-224
    node 14 size: 64508 MB
    node 14 free: 64361 MB
    node 15 cpus: 225-239
    node 15 size: 64508 MB
    node 15 free: 64352 MB
    node 16 cpus: 240-254
    node 16 size: 64508 MB
    node 16 free: 64346 MB
    node 17 cpus: 255-269
    node 17 size: 64508 MB
    node 17 free: 64344 MB
    node 18 cpus: 270-284
    node 18 size: 64508 MB
    node 18 free: 64338 MB
    node 19 cpus: 285-299
    node 19 size: 64508 MB
    node 19 free: 64332 MB
    node 20 cpus: 300-314
    node 20 size: 64508 MB
    node 20 free: 63686 MB
    node 21 cpus: 315-329
    node 21 size: 64508 MB
    node 21 free: 64333 MB
    node 22 cpus: 330-344
    node 22 size: 64508 MB
    node 22 free: 64338 MB
    node 23 cpus: 345-359
    node 23 size: 64508 MB
    node 23 free: 64338 MB
    node 24 cpus: 360-374
    node 24 size: 64508 MB
    node 24 free: 64307 MB
    node 25 cpus: 375-389
    node 25 size: 64508 MB
    node 25 free: 64313 MB
    node 26 cpus: 390-404
    node 26 size: 64508 MB
    node 26 free: 64322 MB
    node 27 cpus: 405-419
    node 27 size: 64508 MB
    node 27 free: 64302 MB
    node 28 cpus: 420-434
    node 28 size: 64508 MB
    node 28 free: 62865 MB
    node 29 cpus: 435-449
    node 29 size: 64508 MB
    node 29 free: 64050 MB
    node 30 cpus: 450-464
    node 30 size: 64472 MB
    node 30 free: 64014 MB
    node 31 cpus: 465-479
    node 31 size: 64479 MB
    node 31 free: 63983 MB
    node distances:
    node   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
      0:  10  12  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
```

(Continued on next page)

Inspur Electronic Information Industry Co., Ltd.

TS860G7 (Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3770

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 3358
Test Sponsor: Inspur Electronic Information Industry Co., Ltd.
Tested by: Inspur Electronic Information Industry Co., Ltd.

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

Platform Notes (Continued)

```
       21  21  21  31  31  31  31
   1:  12  10  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
       21  21  21  31  31  31  31
   2:  12  12  10  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
       21  21  21  31  31  31  31
   3:  12  12  12  10  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
       21  21  21  31  31  31  31
   4:  21  21  21  21  10  12  12  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
       31  31  31  21  21  21  21
   5:  21  21  21  21  12  10  12  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
       31  31  31  21  21  21  21
   6:  21  21  21  21  12  12  10  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
       31  31  31  21  21  21  21
   7:  21  21  21  21  12  12  12  10  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
       31  31  31  21  21  21  21
   8:  21  21  21  21  31  31  31  31  10  12  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31
       31  31  31  21  21  21  21
   9:  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31
       31  31  31  21  21  21  21
  10:  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21  21  21  21  31  31  31  31  31
       31  31  31  21  21  21  21
  11:  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21  21  21  21  31  31  31  31  31
       31  31  31  21  21  21  21
  12:  31  31  31  31  21  21  21  21  21  21  21  21  10  12  12  12  31  31  31  31  21  21  21  21  21
       21  21  21  31  31  31  31
  13:  31  31  31  31  21  21  21  21  21  21  21  21  12  10  12  12  31  31  31  31  21  21  21  21  21
       21  21  21  31  31  31  31
  14:  31  31  31  31  21  21  21  21  21  21  21  21  12  12  10  12  31  31  31  31  21  21  21  21  21
       21  21  21  31  31  31  31
  15:  31  31  31  31  21  21  21  21  21  21  21  21  12  12  12  10  31  31  31  31  21  21  21  21  21
       21  21  21  31  31  31  31
  16:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  10  12  12  12  21  21  21  21  21
       21  21  21  31  31  31  31
  17:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21
       21  21  21  31  31  31  31
  18:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21
       21  21  21  31  31  31  31
  19:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21
       21  21  21  31  31  31  31
  20:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  10  12  12  12  31
       31  31  31  21  21  21  21
  21:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  10  12  12  31
       31  31  31  21  21  21  21
  22:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  12  10  12  31
       31  31  31  21  21  21  21
  23:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  12  12  10  31
       31  31  31  21  21  21  21
  24:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  10
       12  12  12  21  21  21  21
  25:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
       10  12  12  21  21  21  21
  26:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
       12  10  12  21  21  21  21
  27:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
       12  12  10  21  21  21  21
  28:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  21  21  21  21  21  21  21  21  31
       31  31  31  10  12  12  12
  29:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  21  21  21  21  21  21  21  21  31
       31  31  31  12  10  12  12
  30:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  21  21  21  21  21  21  21  21  31
```

(Continued on next page)

Inspur Electronic Information Industry Co., Ltd.

TS860G7 (Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base =   3770

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 3358
Test Sponsor: Inspur Electronic Information Industry Co., Ltd.
Tested by: Inspur Electronic Information Industry Co., Ltd.

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

Platform Notes (Continued)

```
    21  21  21  12  12  10  12
  31:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
    21  21  21  12  12  12  10


  ----------------------------------------------------------
  9. /proc/meminfo
     MemTotal:       2113300780 kB


  ----------------------------------------------------------
  10. who -r
    run-level 3 Aug 3 15:34


  ----------------------------------------------------------
  11. Systemd service manager version: systemd 250 (250-6.el9_0)
    Default Target  Status
    multi-user      degraded


  ----------------------------------------------------------
  12. Failed units, from systemctl list-units --state=failed
      UNIT                           LOAD   ACTIVE SUB    DESCRIPTION
    * NetworkManager-wait-online.service loaded failed failed Network Manager Wait Online


  ----------------------------------------------------------
  13. Services, from systemctl list-unit-files
    STATE             UNIT FILES
    enabled           NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
                      dbus-broker firewalld getty@ kdump lvm2-monitor mdmonitor microcode nis-domainname
                      rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd systemd-network-generator tuned
                      udisks2 upower
    enabled-runtime   systemd-remount-fs
    disabled          blk-availability canberra-system-bootup canberra-system-shutdown
                      canberra-system-shutdown-reboot chrony-wait console-getty cpupower debug-shell irqbalance
                      kvm_stat man-db-restart-cache-update nftables powertop rdisc rhsm rhsm-facts rpmdb-rebuild
                      serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext
    indirect          sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo


  ----------------------------------------------------------
  14. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.22.1.el9_0.x86_64
    root=/dev/mapper/rhel-root
    ro
    resume=/dev/mapper/rhel-swap
    rd.lvm.lv=rhel/root
    rd.lvm.lv=rhel/swap


  ----------------------------------------------------------
  15. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 800 MHz and 3.50 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
        Supported: yes
        Active: yes


  ----------------------------------------------------------
  16. tuned-adm active
    Current active profile: throughput-performance


  ----------------------------------------------------------
```

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TS860G7 (Intel Xeon Platinum 8490H)

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Platform Notes (Continued)

```
17. 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_bytes                   0
  vm.dirty_expire_centisecs     3000
  vm.dirty_ratio                  40
  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                   10
  vm.watermark_boost_factor    15000
  vm.watermark_scale_factor       10
  vm.zone_reclaim_mode             0


  ----------------------------------------------------------
18. /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


  ----------------------------------------------------------
19. /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


  ----------------------------------------------------------
20. OS release
  From /etc/*-release /etc/*-version
  os-release     Red Hat Enterprise Linux 9.0 (Plow)
  redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
  system-release Red Hat Enterprise Linux release 9.0 (Plow)


  ----------------------------------------------------------
21. Disk information
SPEC is set to: /home/19cpu2017
  Filesystem            Type  Size  Used Avail Use% Mounted on
  /dev/mapper/rhel-home xfs   2.9T  598G  2.3T  21% /home


  ----------------------------------------------------------
22. /sys/devices/virtual/dmi/id
    Vendor:        IEI
    Product:       TS860G7
    Product Family: Not specified
    Serial:        000000000


  ----------------------------------------------------------
23. dmidecode
```

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Inspur Electronic Information Industry Co., Ltd.

TS860G7 (Intel Xeon Platinum 8490H)

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Platform Notes (Continued)

```
   Additional information from dmidecode 3.3 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:
     64x Samsung M321R4GA3BB6-CQKEG 32 GB 2 rank 4800


  ------------------------------------------------------------
  24. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       American Megatrends International, LLC.
    BIOS Version:      05.00.00
    BIOS Date:         04/07/2023
```

Compiler Version Notes

```
==============================================================================================================
C              | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
--------------------------------------------------------------------------------------------------------------
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) 510.parest_r(base)
--------------------------------------------------------------------------------------------------------------
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) 526.blender_r(base)
--------------------------------------------------------------------------------------------------------------
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)
--------------------------------------------------------------------------------------------------------------
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) 549.fotonik3d_r(base) 554.roms_r(base)
--------------------------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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--------------------------------------------------------------------------------------------------------------


==============================================================================================================
```

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SPEC CPU®2017 Floating Point Rate Result

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TS860G7 (Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base =   3770

SPECrate®2017_fp_peak = Not Run

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

Compiler Version Notes (Continued)

```
Fortran, C     | 521.wrf_r(base) 527.cam4_r(base)
-------------------------------------------------------------------------------
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.
-------------------------------------------------------------------------------
```

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`

SPEC CPU®2017 Floating Point Rate Result
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CPU2017 License: 3358		**Test Date:**	Jun-2023
Test Sponsor: Inspur Electronic Information Industry Co., Ltd.		**Hardware Availability:**	Jul-2023
Tested by: Inspur Electronic Information Industry Co., Ltd.		**Software Availability:**	Dec-2022

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
```

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
```

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/Inspur-Platform-Settings-intel-V3.2.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/Inspur-Platform-Settings-intel-V3.2.xml

SPEC CPU®2017 Floating Point Rate Result

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Software Availability: Dec-2022

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