



SPEC CPU®2017 Floating Point Rate Result

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Inspur Electronic Information Industry Co., Ltd.
(IEI)

SPECrate®2017_fp_base = 3650

TS860G7 (Intel Xeon Platinum 8490H)

SPECrate®2017_fp_peak = 3670

CPU2017 License: 3358

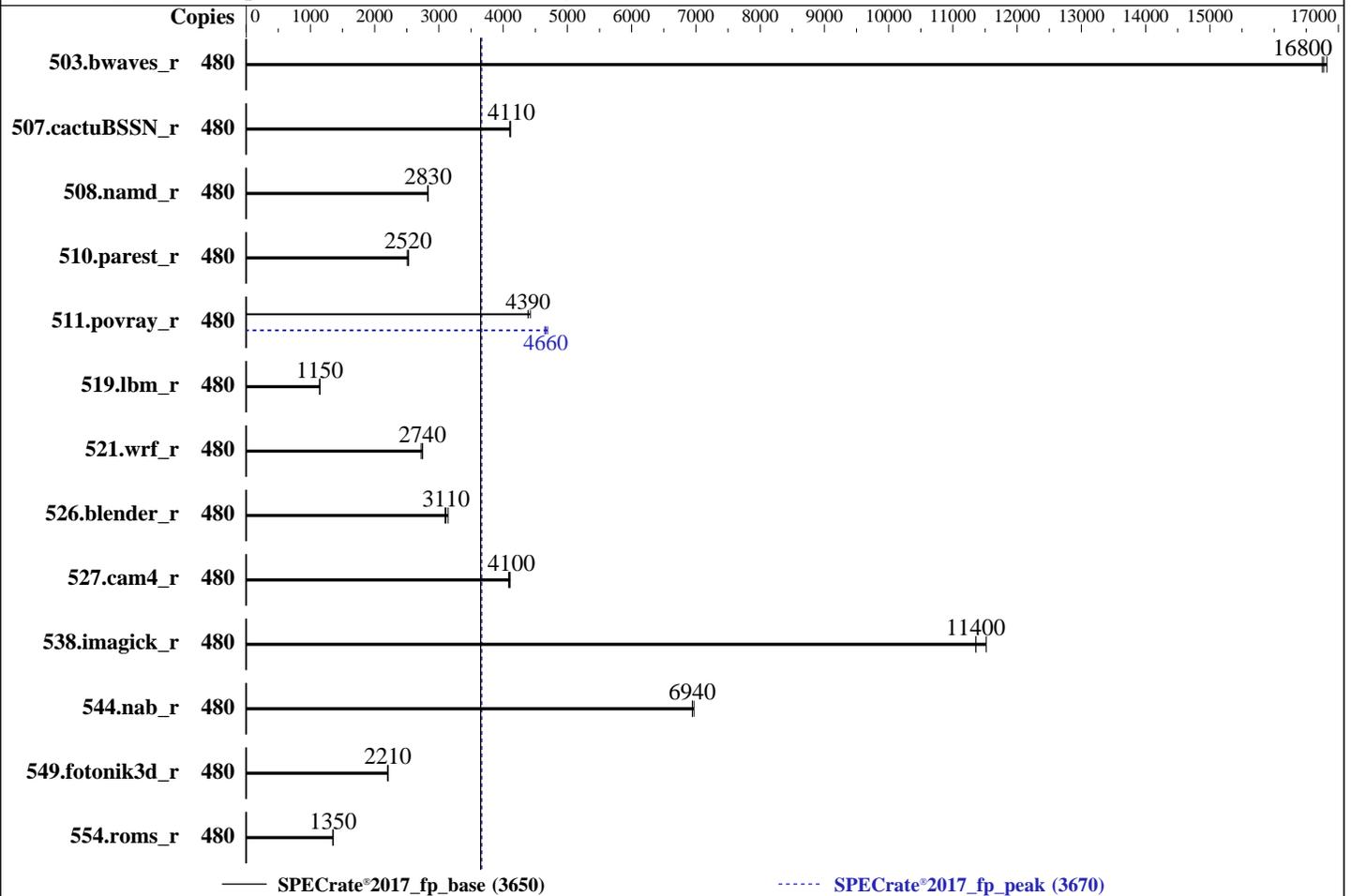
Test Date: May-2023

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Hardware Availability: Jul-2023

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Software Availability: Dec-2022



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: 64-bit
 Other: jemalloc memory allocator V5.0.1
 Power Management: BIOS and OS set to prefer performance at the cost
 of additional power usage.



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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	286	16800	<u>287</u>	<u>16800</u>	287	16800	480	286	16800	<u>287</u>	<u>16800</u>	287	16800
507.cactuBSSN_r	480	148	4100	<u>148</u>	<u>4110</u>	148	4120	480	148	4100	<u>148</u>	<u>4110</u>	148	4120
508.namd_r	480	161	2830	161	2830	<u>161</u>	<u>2830</u>	480	161	2830	161	2830	<u>161</u>	<u>2830</u>
510.parest_r	480	501	2510	497	2530	<u>498</u>	<u>2520</u>	480	501	2510	497	2530	<u>498</u>	<u>2520</u>
511.povray_r	480	253	4420	<u>255</u>	<u>4390</u>	256	4390	480	239	4690	241	4650	<u>240</u>	<u>4660</u>
519.lbm_r	480	442	1150	441	1150	<u>442</u>	<u>1150</u>	480	442	1150	441	1150	<u>442</u>	<u>1150</u>
521.wrf_r	480	392	2750	<u>392</u>	<u>2740</u>	395	2720	480	392	2750	<u>392</u>	<u>2740</u>	395	2720
526.blender_r	480	236	3100	<u>235</u>	<u>3110</u>	233	3140	480	236	3100	<u>235</u>	<u>3110</u>	233	3140
527.cam4_r	480	<u>205</u>	<u>4100</u>	205	4090	204	4110	480	<u>205</u>	<u>4100</u>	205	4090	204	4110
538.imagick_r	480	105	11400	<u>105</u>	<u>11400</u>	104	11500	480	105	11400	<u>105</u>	<u>11400</u>	104	11500
544.nab_r	480	116	6940	116	6970	<u>116</u>	<u>6940</u>	480	116	6940	116	6970	<u>116</u>	<u>6940</u>
549.fotonik3d_r	480	849	2200	846	2210	<u>848</u>	<u>2210</u>	480	849	2200	846	2210	<u>848</u>	<u>2210</u>
554.roms_r	480	<u>563</u>	<u>1350</u>	563	1360	566	1350	480	<u>563</u>	<u>1350</u>	563	1360	566	1350

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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) is mitigated in the system as tested and documented.

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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.

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/l9cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Sun May 7 03:34:31 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
   03:34:31 up 9 min,  1 user,  load average: 0.00, 0.21, 0.22
USER  TTY      LOGIN@  IDLE   JCPU   PCPU   WHAT
root  ttyL    03:27   6.00s  1.42s  0.02s  -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 smt-on --define cores=240 --define physicalfirst
     --define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 --configfile
     ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=240 --define physicalfirst
     --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
     --runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
     $$SPEC/tmp/CPU2017.008/temlogs/preenv.fprate.008.0.log --lognum 008.0 --from_runcpu 2
   specperl $$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)
   physical id 0: core ids 0-59

```

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Platform Notes (Continued)

```

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
Socket(s):              8

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Platform Notes (Continued)

```

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_lld 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
Vulnerability L1tf: Not affected

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Platform Notes (Continued)

Vulnerability Mds: Not affected
 Vulnerability Meltdown: Not affected
 Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
 Vulnerability Spectre v1: Mitigation; usercopy/swaps 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: 63774 MB
node 1 cpus: 15-29
node 1 size: 64508 MB
node 1 free: 64349 MB
node 2 cpus: 30-44
node 2 size: 64508 MB
node 2 free: 64367 MB
node 3 cpus: 45-59
node 3 size: 64508 MB
node 3 free: 64369 MB
node 4 cpus: 60-74
node 4 size: 64508 MB
node 4 free: 64325 MB
node 5 cpus: 75-89
node 5 size: 64508 MB
node 5 free: 64332 MB
node 6 cpus: 90-104
node 6 size: 64508 MB
node 6 free: 64356 MB
node 7 cpus: 105-119
node 7 size: 64508 MB
node 7 free: 64341 MB
node 8 cpus: 120-134
node 8 size: 64508 MB
node 8 free: 63575 MB
node 9 cpus: 135-149
node 9 size: 64472 MB
node 9 free: 64051 MB
node 10 cpus: 150-164
node 10 size: 64508 MB
node 10 free: 63463 MB
node 11 cpus: 165-179
node 11 size: 64508 MB
node 11 free: 63746 MB
node 12 cpus: 180-194
node 12 size: 64508 MB
node 12 free: 64334 MB
node 13 cpus: 195-209
node 13 size: 64508 MB

```

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Platform Notes (Continued)

```

node 13 free: 64332 MB
node 14 cpus: 210-224
node 14 size: 64508 MB
node 14 free: 64356 MB
node 15 cpus: 225-239
node 15 size: 64508 MB
node 15 free: 64195 MB
node 16 cpus: 240-254
node 16 size: 64508 MB
node 16 free: 64372 MB
node 17 cpus: 255-269
node 17 size: 64508 MB
node 17 free: 64339 MB
node 18 cpus: 270-284
node 18 size: 64508 MB
node 18 free: 64354 MB
node 19 cpus: 285-299
node 19 size: 64508 MB
node 19 free: 64315 MB
node 20 cpus: 300-314
node 20 size: 64508 MB
node 20 free: 64367 MB
node 21 cpus: 315-329
node 21 size: 64508 MB
node 21 free: 64375 MB
node 22 cpus: 330-344
node 22 size: 64508 MB
node 22 free: 64366 MB
node 23 cpus: 345-359
node 23 size: 64508 MB
node 23 free: 64379 MB
node 24 cpus: 360-374
node 24 size: 64508 MB
node 24 free: 64356 MB
node 25 cpus: 375-389
node 25 size: 64508 MB
node 25 free: 64379 MB
node 26 cpus: 390-404
node 26 size: 64508 MB
node 26 free: 64372 MB
node 27 cpus: 405-419
node 27 size: 64508 MB
node 27 free: 64357 MB
node 28 cpus: 420-434
node 28 size: 64508 MB
node 28 free: 64372 MB
node 29 cpus: 435-449
node 29 size: 64508 MB
node 29 free: 64201 MB
node 30 cpus: 450-464
node 30 size: 64508 MB
node 30 free: 64366 MB
node 31 cpus: 465-479
node 31 size: 64479 MB
node 31 free: 64316 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 31 31 31 31 31 31 31 31 21 21 21 21 21
21 21 21 31 31 31 31

```

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SPECrate®2017_fp_base = 3650

TS860G7 (Intel Xeon Platinum 8490H)

SPECrate®2017_fp_peak = 3670

CPU2017 License: 3358

Test Date: May-2023

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Hardware Availability: Jul-2023

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Software Availability: Dec-2022

Platform Notes (Continued)

```

1: 12 10 12 12 21 21 21 21 21 21 21 21 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 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 21 21 21 21 21
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4: 21 21 21 21 21 10 12 12 12 31 31 31 21 21 21 21 21 21 21 21 31 31 31 31
31 31 31 21 21 21 21
5: 21 21 21 21 12 10 12 12 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 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 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 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 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 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 31 31 31 31 31
31 31 31 21 21 21 21
12: 31 31 31 31 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 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 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 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 31 31 31 31 10 12 12 12 21 21 21 21 21
21 21 21 31 31 31 31
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21 21 21 31 31 31 31
20: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 21 10 12 12 12 31
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23: 21 21 21 21 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
24: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 21 31 31 31 31 10
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25: 21 21 21 21 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
26: 21 21 21 21 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
27: 21 21 21 21 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
28: 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 31 31 31 31 21 21 21 21 21
21 21 21 10 12 12 12
29: 31 31 31 31 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
30: 31 31 31 31 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 10 12

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Platform Notes (Continued)

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

9. /proc/meminfo
MemTotal: 2113300784 kB

10. who -r
run-level 3 May 7 03:25

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-sysex
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

17. sysctl

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Platform Notes (Continued)

```

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+advise [advise] never
enabled         [always] advise 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  597G  2.3T  21% /home

```

```

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

```

```

-----
23. dmidecode
Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you interpret this section.

```

(Continued on next page)



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Platform Notes (Continued)

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, 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
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=====

=====
C++, C | 511.povray_r(base, peak) 526.blender_r(base, peak)
=====

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

=====
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
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=====

=====
Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
=====

(Continued on next page)



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SPECrate®2017_fp_base = 3650

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SPECrate®2017_fp_peak = 3670

CPU2017 License: 3358

Test Date: May-2023

Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)

Hardware Availability: Jul-2023

Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Software Availability: Dec-2022

Compiler Version Notes (Continued)

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

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

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



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Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

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
```

Peak Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

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Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Software Availability: Dec-2022

Peak 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

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: basepeak = yes

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: basepeak = yes

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_r: basepeak = yes

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++:

507.cactuBSSN_r: basepeak = yes

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

<http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html>

<http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-intel-V3.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.xml>

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Tested with SPEC CPU®2017 v1.1.9 on 2023-05-07 03:34:31-0400.

Report generated on 2023-05-23 19:11:12 by CPU2017 PDF formatter v6716.

Originally published on 2023-05-23.