



SPEC CPU®2017 Floating Point Speed Result

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Supermicro

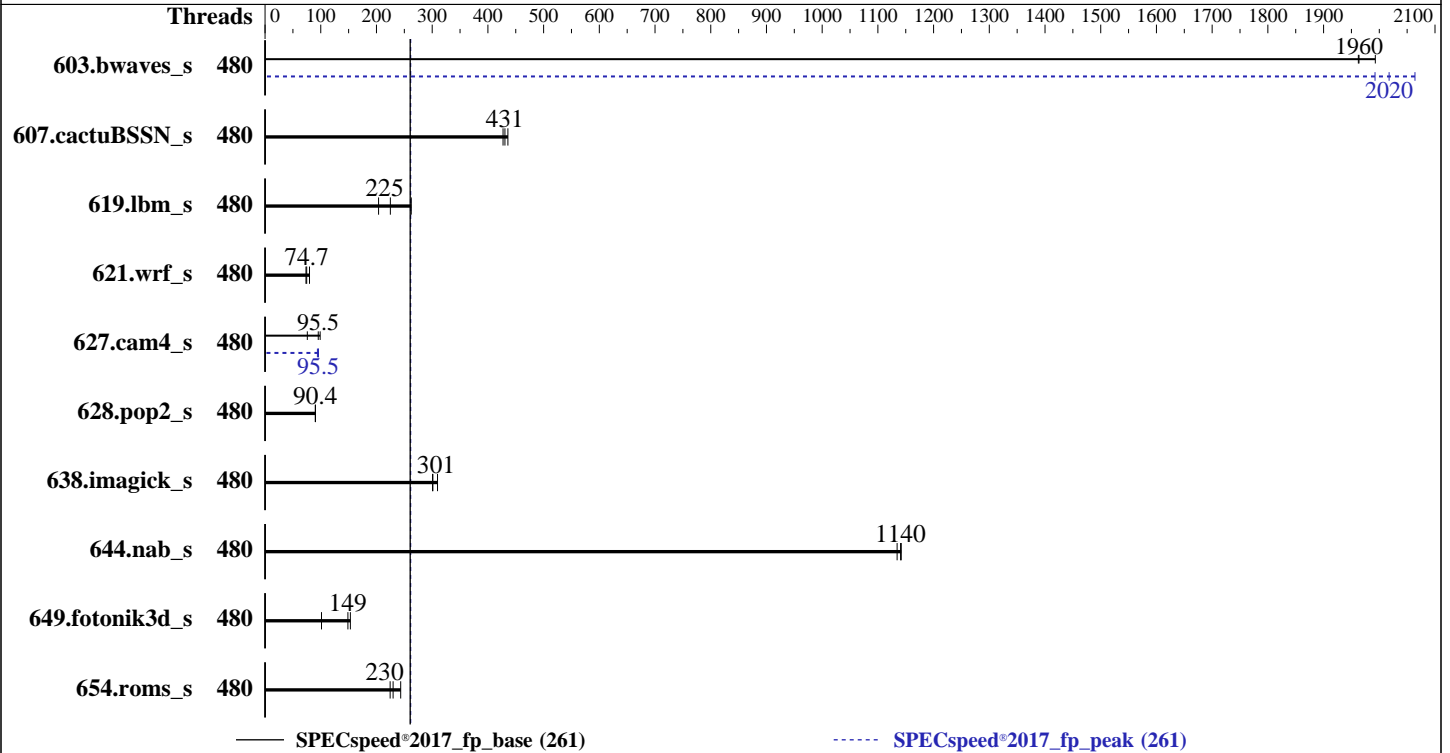
SuperServer SYS-681E-TR
(X13OEI, Intel Xeon Platinum 8490H)

SPECspeed®2017_fp_base = 261

SPECspeed®2017_fp_peak = 261

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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



Hardware

CPU Name: Intel Xeon Platinum 8490H
Max MHz: 3500
Nominal: 1900
Enabled: 480 cores, 8 chips
Orderable: 1,2,4,8 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: 4 TB
(64 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 800 GB NVMe SSD
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: Yes
Firmware: Version 1.0a released May-2023 tested as Mar-2023
File System: ext4
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						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	480	<u>30.0</u>	<u>1960</u>	29.6	1990	30.1	1960	480	<u>29.2</u>	<u>2020</u>	28.6	2060	29.6	1990
607.cactuBSSN_s	480	39.0	427	<u>38.7</u>	<u>431</u>	38.2	436	480	39.0	427	<u>38.7</u>	<u>431</u>	38.2	436
619.lbm_s	480	<u>23.3</u>	<u>225</u>	20.0	262	25.7	204	480	<u>23.3</u>	<u>225</u>	20.0	262	25.7	204
621.wrf_s	480	166	79.8	<u>177</u>	<u>74.7</u>	180	73.4	480	166	79.8	<u>177</u>	<u>74.7</u>	180	73.4
627.cam4_s	480	<u>92.8</u>	<u>95.5</u>	117	75.9	89.6	98.9	480	92.5	95.8	<u>92.8</u>	<u>95.5</u>	94.3	94.0
628.pop2_s	480	<u>131</u>	<u>90.4</u>	131	90.3	131	90.4	480	<u>131</u>	<u>90.4</u>	131	90.3	131	90.4
638.imagick_s	480	<u>47.9</u>	<u>301</u>	48.0	301	46.6	310	480	<u>47.9</u>	<u>301</u>	48.0	301	46.6	310
644.nab_s	480	15.4	1130	<u>15.3</u>	<u>1140</u>	15.3	1140	480	15.4	1130	<u>15.3</u>	<u>1140</u>	15.3	1140
649.fotonik3d_s	480	90.0	101	59.5	153	<u>61.3</u>	<u>149</u>	480	90.0	101	59.5	153	<u>61.3</u>	<u>149</u>
654.roms_s	480	<u>68.5</u>	<u>230</u>	64.7	243	70.1	225	480	<u>68.5</u>	<u>230</u>	64.7	243	70.1	225

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

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:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH =
"/root/cpu2017-1.1.9/lib/intel64:/root/cpu2017-1.1.9/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Redhat Enterprise Linux 8.0

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
```

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.

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.

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) 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

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General Notes (Continued)

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

Platform Notes

BIOS Settings:

Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Performance
SNC = Enable SNC4 (4-Clusters)
KTI Prefetch = Enable
LLC Dead Line Alloc = Disable
DCU Streamer Prefetcher = Disable
Hyper-Threading [ALL] = Disable

Sysinfo program /root/cpu2017-1.1.9/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Fri Mar 24 03:33:21 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
 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
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Platform Notes (Continued)

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

2. `w`
03:33:21 up 4:13, 1 user, load average: 4.65, 3.94, 2.35
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 23:25 4:08m 1.16s 0.01s -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) 16512517
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) 16512517
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

5. `sysinfo process ancestry`
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
-bash
runcpu --nobuild --action validate --define default-platform-flags -c
ic2023.0-lin-core-avx512-speed-20221201.cfg --define cores=480 --tune base,peak -o all --define
drop_caches fpspeed
runcpu --nobuild --action validate --define default-platform-flags --configfile
ic2023.0-lin-core-avx512-speed-20221201.cfg --define cores=480 --tune base,peak --output_format all
--define drop_caches --nopower --runmode speed --tune base:peak --size refspeed fpspeed --nopreenv

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Platform Notes (Continued)

```
--note-preenv --logfile $SPEC/tmp/CPU2017.011/templogs/preenv.fpspeed.011.0.log --lognum 011.0
--from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /root/cpu2017-1.1.9
```

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
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
```

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Platform Notes (Continued)

92,694,696,698,700,702,704,706,708,710,712,714,716,718,720,722,724,726,728,730,732,734,736,738,740,742,744,746,748,750,752,754,756,758

physical id 6: apicids

768,770,772,774,776,778,780,782,784,786,788,790,792,794,796,798,800,802,804,806,808,810,812,814,816,818,820,822,824,826,828,830,832,834,836,838,840,842,844,846,848,850,852,854,856,858,860,862,864,866,868,870,872,874,876,878,880,882,884,886

physical id 7: apicids

896,898,900,902,904,906,908,910,912,914,916,918,920,922,924,926,928,930,932,934,936,938,940,942,944,946,948,950,952,954,956,958,960,962,964,966,968,970,972,974,976,978,980,982,984,986,988,990,992,994,996,998,1000,1002,1004,1006,1008,1010,1012,1014

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 2.37.2:

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
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
Stepping: 6
Frequency boost: enabled
CPU max MHz: 1901.0000
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 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 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

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Platform Notes (Continued)

cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
arat pln pts 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

Virtualization:	VT-x
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
Vulnerability Mds:	Not affected
Vulnerability Meltdown:	Not affected

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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	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: 128648 MB

node 0 free: 127402 MB

node 1 cpus: 15-29

node 1 size: 129020 MB

node 1 free: 128497 MB

node 2 cpus: 30-44

node 2 size: 129020 MB

node 2 free: 128538 MB

node 3 cpus: 45-59

node 3 size: 129020 MB

node 3 free: 128806 MB

node 4 cpus: 60-74

node 4 size: 129020 MB

node 4 free: 128915 MB

node 5 cpus: 75-89

node 5 size: 129020 MB

node 5 free: 128848 MB

node 6 cpus: 90-104

node 6 size: 129020 MB

node 6 free: 128917 MB

node 7 cpus: 105-119

node 7 size: 129020 MB

node 7 free: 128915 MB

node 8 cpus: 120-134

node 8 size: 129020 MB

node 8 free: 128848 MB

node 9 cpus: 135-149

node 9 size: 129020 MB

node 9 free: 128864 MB

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```

node 10 cpus: 150-164
node 10 size: 129020 MB
node 10 free: 128850 MB
node 11 cpus: 165-179
node 11 size: 129020 MB
node 11 free: 128843 MB
node 12 cpus: 180-194
node 12 size: 129020 MB
node 12 free: 128867 MB
node 13 cpus: 195-209
node 13 size: 129020 MB
node 13 free: 128888 MB
node 14 cpus: 210-224
node 14 size: 129020 MB
node 14 free: 128883 MB
node 15 cpus: 225-239
node 15 size: 129020 MB
node 15 free: 128886 MB
node 16 cpus: 240-254
node 16 size: 129020 MB
node 16 free: 128878 MB
node 17 cpus: 255-269
node 17 size: 129020 MB
node 17 free: 128876 MB
node 18 cpus: 270-284
node 18 size: 129020 MB
node 18 free: 128871 MB
node 19 cpus: 285-299
node 19 size: 129020 MB
node 19 free: 128903 MB
node 20 cpus: 300-314
node 20 size: 129020 MB
node 20 free: 128922 MB
node 21 cpus: 315-329
node 21 size: 129020 MB
node 21 free: 128915 MB
node 22 cpus: 330-344
node 22 size: 129020 MB
node 22 free: 128924 MB
node 23 cpus: 345-359
node 23 size: 129020 MB
node 23 free: 119440 MB
node 24 cpus: 360-374
node 24 size: 129020 MB
node 24 free: 128904 MB
node 25 cpus: 375-389
node 25 size: 129020 MB

```

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```

node 25 free: 128917 MB
node 26 cpus: 390-404
node 26 size: 128985 MB
node 26 free: 128882 MB
node 27 cpus: 405-419
node 27 size: 129020 MB
node 27 free: 128925 MB
node 28 cpus: 420-434
node 28 size: 129020 MB
node 28 free: 128882 MB
node 29 cpus: 435-449
node 29 size: 129020 MB
node 29 free: 128873 MB
node 30 cpus: 450-464
node 30 size: 129020 MB
node 30 free: 128878 MB
node 31 cpus: 465-479
node 31 size: 128937 MB
node 31 free: 128792 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 21 21 21 21 21
  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 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
  21 21 21 31 31 31 31
4: 21 21 21 21 10 12 12 12 12 31 31 31 31 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 12 10 12 12 31 31 31 31 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 12 31 31 31 31 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 12 31 31 31 31 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

```

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SuperServer SYS-681E-TR
(X13OEI, Intel Xeon Platinum 8490H)

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SPECspeed®2017_fp_peak = 261

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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

Platform Notes (Continued)

```

21: 21 21 21 31 31 31 31
13: 31 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 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 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 21 31 31 31 31
16: 31 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 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 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 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 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 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 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 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 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 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 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 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 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:      4227228684 kB
-----

```

```

-----
10. who -r
    run-level 3 Mar 23 23:21
-----

```

(Continued on next page)



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Platform Notes (Continued)

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 bluetooth cron display-manager getty@ haveged irqbalance iscsi issue-generator kbdsettings klog lvm2-monitor nscd nvme-fc-boot-connections postfix purge-kernels rollback rsyslog smartd sshd wickd wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime	systemd-fsck-root systemd-remount-fs
disabled	accounts-daemon appstream-sync-cache autofs autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info firewallld gpm grub2-once haveged-switch-root ipmi ipmievd iscsi-init iscsid iscsiuiio issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nmb nvme-autoconnect ostree-remount rdisc rpcbind rpmconfigcheck rsyncd rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd svnservice systemd-boot-check-no-failures systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd udisks2 upower
indirect	wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline

BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=45b5dbe6-1d05-41ac-80df-f59bb33eace7
splash=silent
mitigations=auto
quiet
security=

14. cpupower frequency-info

analyzing CPU 0:
current policy: frequency should be within 800 MHz and 1.90 GHz.
The governor "ondemand" may decide which speed to use
within this range.

boost state support:
Supported: yes
Active: yes

15. sysctl

kernel.numa_balancing 1

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Platform Notes (Continued)

```

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                    60
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+advise [advise] never
enabled         [always] advise 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: /root/cpu2017-1.1.9
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/nvme1nlp2 ext4  732G  497G  199G  72% /

```

(Continued on next page)



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Platform Notes (Continued)

20. /sys/devices/virtual/dmi/id
Vendor: Supermicro
Product: Super Server
Product Family: Family

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:
64x Micron Technology MTC40F2046S1RC48BA1 64 GB 2 rank 4800

22. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 1.0a
BIOS Date: 03/16/2023
BIOS Revision: 5.29

Compiler Version Notes

=====
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
644.nab_s(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, Fortran | 607.cactuBSSN_s(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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SPECspeed®2017_fp_peak = 261

CPU2017 License: 001176
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Tested by: Supermicro

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

Compiler Version Notes (Continued)

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```
=====
Fortran          | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                  | 654.roms_s(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       | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                  | 628.pop2_s(base, peak)
=====
```

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201

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Base Compiler Invocation

C benchmarks:

icx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64

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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Mar-2023
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Base Portability Flags (Continued)

```
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
```

Base Optimization Flags

C benchmarks:

```
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc
```

Fortran benchmarks:

```
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using both Fortran and C:

```
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -Wno-implicit-int
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Peak Compiler Invocation

C benchmarks:

```
icx
```

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SPECspeed®2017_fp_peak = 261

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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

Peak Compiler Invocation (Continued)

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: basepeak = yes

638.imagick_s: basepeak = yes

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc

649.fotonik3d_s: basepeak = yes

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP

(Continued on next page)



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Tested by: Supermicro

Test Date: Mar-2023

Hardware Availability: May-2023

Software Availability: Dec-2022

Peak Optimization Flags (Continued)

627.cam4_s (continued):

```
-Wno-implicit-int -nostandard-realloc-lhs  
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib  
-ljemalloc
```

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: 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/Supermicro-Platform-Settings-V1.2-SPR-revC.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/Supermicro-Platform-Settings-V1.2-SPR-revC.xml>

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