



# SPEC CPU®2017 Floating Point Rate Result

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## Fujitsu

PRIMEQUEST 4400E, Intel Xeon Platinum 8454H,  
2.10GHz

SPECrate®2017\_fp\_base = 1330

SPECrate®2017\_fp\_peak = Not Run

CPU2017 License: 19

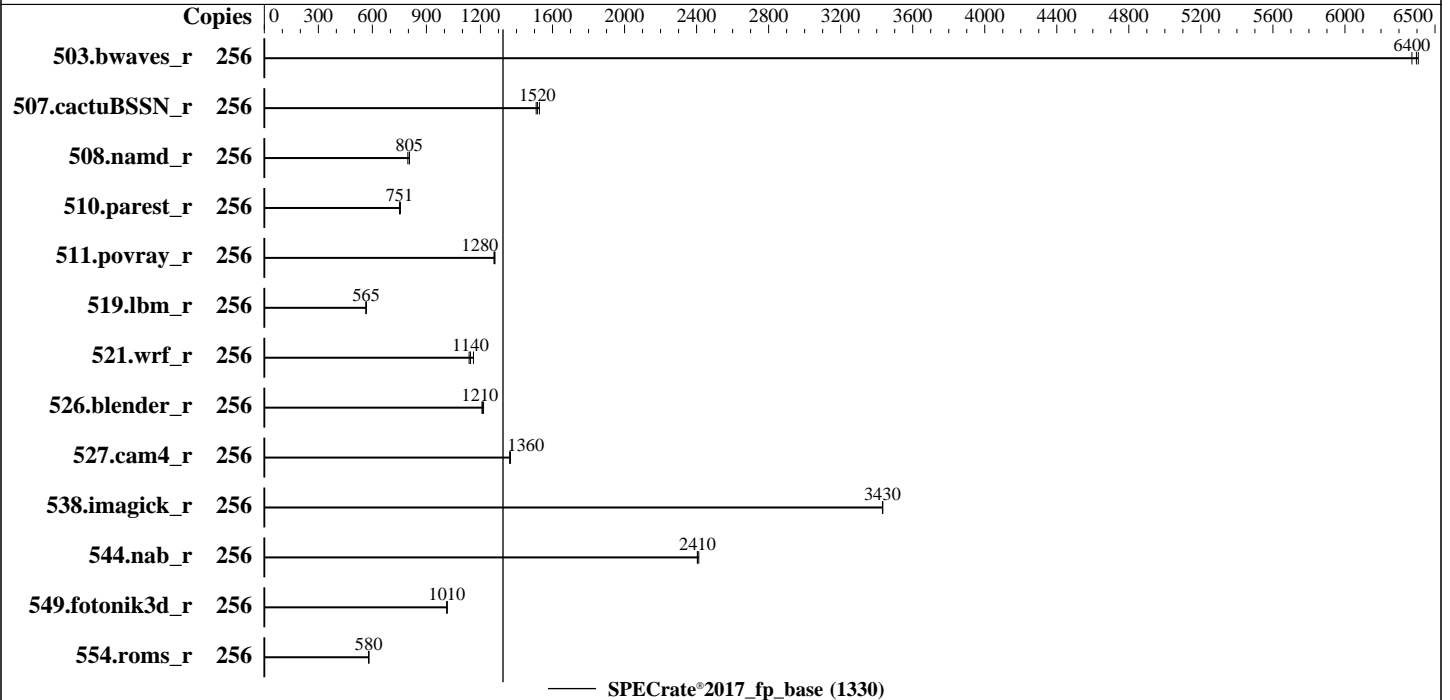
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2023

Hardware Availability: Sep-2023

Software Availability: Dec-2022



### Hardware

CPU Name: Intel Xeon Platinum 8454H  
 Max MHz: 3400  
 Nominal: 2100  
 Enabled: 128 cores, 4 chips, 2 threads/core  
 Orderable: 2,4 chips  
 Cache L1: 32 KB I + 48 KB D on chip per core  
 L2: 2 MB I+D on chip per core  
 L3: 82.5 MB I+D on chip per chip  
 Other: None  
 Memory: 2 TB (32 x 64 GB 2Rx4 PC5-4800B-R)  
 Storage: 1 x 1.92 TB SATA 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: No  
 Firmware: Fujitsu BIOS Version V1.0.0.0 R1.10.0 for  
 D3986-A1x. Released Sep-2023  
 tested as V1.0.0.0 R1.0.0 for D3986-A1x May-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 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	256	401	6410	<b>401</b>	<b>6400</b>	403	6370							
507.cactuBSSN_r	256	212	1530	<b>214</b>	<b>1520</b>	215	1510							
508.namd_r	256	302	805	305	797	<b>302</b>	<b>805</b>							
510.parest_r	256	892	751	<b>892</b>	<b>751</b>	886	756							
511.povray_r	256	467	1280	469	1280	<b>468</b>	<b>1280</b>							
519.lbm_r	256	477	566	<b>477</b>	<b>565</b>	478	564							
521.wrf_r	256	<b>501</b>	<b>1140</b>	504	1140	494	1160							
526.blender_r	256	<b>322</b>	<b>1210</b>	320	1220	323	1210							
527.cam4_r	256	329	1360	328	1370	<b>328</b>	<b>1360</b>							
538.imagick_r	256	186	3430	185	3430	<b>185</b>	<b>3430</b>							
544.nab_r	256	179	2410	179	2400	<b>179</b>	<b>2410</b>							
549.fotonik3d_r	256	985	1010	<b>984</b>	<b>1010</b>	983	1020							
554.roms_r	256	<b>702</b>	<b>580</b>	701	580	702	579							

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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/Benchmark/speccpu/lib/intel64:/home/Benchmark/speccpu/je5.0.1-64"  
MALLOCONF = "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:  
Package C State limit = C0  
CPU Performance Boost = Aggressive  
SNC (Sub NUMA) = Enable SNC4  
FAN Control = Full  
System date was wrongly set. The actual date is Jun-2023

Sysinfo program /home/Benchmark/speccpu/bin/sysinfo  
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
running on localhost Fri Apr 29 21:01:47 2022

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

-----  
Table of contents  
-----

1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
  10. who -r
  11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
  12. Failed units, from systemctl list-units --state=failed
  13. Services, from systemctl list-unit-files
  14. Linux kernel boot-time arguments, from /proc/cmdline
  15. cpupower frequency-info
  16. sysctl
  17. /sys/kernel/mm/transparent\_hugepage
  18. /sys/kernel/mm/transparent\_hugepage/khugepaged
  19. OS release
  20. Disk information
  21. /sys/devices/virtual/dmi/id
  22. dmidecode
  23. BIOS
- 
1. uname -a  
Linux 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  
21:01:47 up 1 min, 1 user, load average: 13.93, 7.91, 3.04

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### Platform Notes (Continued)

```

USER      TTY      FROM          LOGIN@  IDLE   JCPU   PCPU WHAT
root      tty1    -             21:01  11.00s 1.72s  0.27s /home/Benchmark/ptu-unified/ptat -i 5000000
-filter 0x3f -ts -csv -log -logdir . -logname ptu_fprate_SPR_2017_withptu_202204292101

```

#### 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) 8253726
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) 8253726
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 --define numcopies=256 -c
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=128 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base -o all fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=256 --configfile
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=128 --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/CPU2017.001/templogs/preenv.fprate.001.0.log --lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/Benchmark/speccpu

```

#### 6. /proc/cpuinfo

```

model name      : Intel(R) Xeon(R) Platinum 8454H
vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping       : 6
microcode      : 0x2b0001b0
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores      : 32
siblings       : 64
4 physical ids (chips)
256 processors (hardware threads)
physical id 0: core ids 0-31
physical id 1: core ids 0-31
physical id 2: core ids 0-31

```

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### Platform Notes (Continued)

physical id 3: core ids 0-31  
physical id 0: apicids 0-63  
physical id 1: apicids 128-191  
physical id 2: apicids 256-319  
physical id 3: apicids 384-447

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

#### 7. lscpu

From lscpu from util-linux 2.37.2:

```

Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Address sizes:         46 bits physical, 57 bits virtual
Byte Order:            Little Endian
CPU(s):                256
On-line CPU(s) list:  0-255
Vendor ID:             GenuineIntel
Model name:            Intel(R) Xeon(R) Platinum 8454H
CPU family:            6
Model:                 143
Thread(s) per core:   2
Core(s) per socket:   32
Socket(s):             4
Stepping:              6
CPU max MHz:          3400.0000
CPU min MHz:          800.0000
BogoMIPS:              4200.00
Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                        clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                        lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                        nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                        ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1
                        sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand
                        lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3
                        invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
                        tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle
                        avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
                        avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
                        xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                        cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
                        arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku
                        ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                        tme avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri movdir64b
                        enqcmd fsrm md_clear serialize tsxldtrk pconfig arch_lbr avx512_fp16
                        amx_tile flush_lld arch_capabilities

Virtualization:        VT-x
L1d cache:             6 MiB (128 instances)
L1i cache:             4 MiB (128 instances)
L2 cache:              256 MiB (128 instances)
L3 cache:              330 MiB (4 instances)
NUMA node(s):         16
NUMA node0 CPU(s):    0-7,128-135
NUMA node1 CPU(s):    8-15,136-143
NUMA node2 CPU(s):    16-23,144-151
NUMA node3 CPU(s):    24-31,152-159
NUMA node4 CPU(s):    32-39,160-167
NUMA node5 CPU(s):    40-47,168-175
NUMA node6 CPU(s):    48-55,176-183

```

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### Platform Notes (Continued)

```

NUMA node7 CPU(s):          56-63,184-191
NUMA node8 CPU(s):          64-71,192-199
NUMA node9 CPU(s):          72-79,200-207
NUMA node10 CPU(s):         80-87,208-215
NUMA node11 CPU(s):         88-95,216-223
NUMA node12 CPU(s):         96-103,224-231
NUMA node13 CPU(s):         104-111,232-239
NUMA node14 CPU(s):         112-119,240-247
NUMA node15 CPU(s):         120-127,248-255
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:         Not affected
Vulnerability Mds:          Not affected
Vulnerability Meltdown:     Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1:    Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:    Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds:        Not affected
Vulnerability Tsx async abort: Not affected

```

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	6M	12	Data	1	64	1	64
L1i	32K	4M	8	Instruction	1	64	1	64
L2	2M	256M	16	Unified	2	2048	1	64
L3	82.5M	330M	15	Unified	3	90112	1	64

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

```

available: 16 nodes (0-15)
node 0 cpus: 0-7,128-135
node 0 size: 128599 MB
node 0 free: 127265 MB
node 1 cpus: 8-15,136-143
node 1 size: 129019 MB
node 1 free: 128285 MB
node 2 cpus: 16-23,144-151
node 2 size: 129019 MB
node 2 free: 128310 MB
node 3 cpus: 24-31,152-159
node 3 size: 129019 MB
node 3 free: 128464 MB
node 4 cpus: 32-39,160-167
node 4 size: 129019 MB
node 4 free: 128562 MB
node 5 cpus: 40-47,168-175
node 5 size: 129019 MB
node 5 free: 128544 MB
node 6 cpus: 48-55,176-183
node 6 size: 128985 MB
node 6 free: 128513 MB
node 7 cpus: 56-63,184-191
node 7 size: 129019 MB
node 7 free: 128569 MB
node 8 cpus: 64-71,192-199
node 8 size: 129019 MB
node 8 free: 128541 MB
node 9 cpus: 72-79,200-207
node 9 size: 129019 MB
node 9 free: 128551 MB

```

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### Platform Notes (Continued)

```

node 10 cpus: 80-87,208-215
node 10 size: 129019 MB
node 10 free: 128546 MB
node 11 cpus: 88-95,216-223
node 11 size: 129019 MB
node 11 free: 128565 MB
node 12 cpus: 96-103,224-231
node 12 size: 129019 MB
node 12 free: 128720 MB
node 13 cpus: 104-111,232-239
node 13 size: 129019 MB
node 13 free: 128717 MB
node 14 cpus: 112-119,240-247
node 14 size: 129019 MB
node 14 free: 128741 MB
node 15 cpus: 120-127,248-255
node 15 size: 128612 MB
node 15 free: 128317 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
0:  10 12 12 12 21 21 21 21 21 21 21 21 31 31 31 31
1:  12 10 12 12 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
3:  12 12 12 10 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
5:  21 21 21 21 12 10 12 12 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
7:  21 21 21 21 12 12 12 10 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
9:  21 21 21 21 31 31 31 31 12 10 12 12 21 21 21 21
10: 21 21 21 21 31 31 31 31 12 12 10 12 21 21 21 21
11: 21 21 21 21 31 31 31 31 12 12 10 12 21 21 21 21
12: 31 31 31 31 21 21 21 21 21 21 21 21 10 12 12 12
13: 31 31 31 31 21 21 21 21 21 21 21 21 12 10 12 12
14: 31 31 31 31 21 21 21 21 21 21 21 21 12 12 10 12
15: 31 31 31 31 21 21 21 21 21 21 21 21 12 12 12 10

```

```

-----
9. /proc/meminfo
MemTotal:      2112978772 kB

```

```

-----
10. who -r
run-level 3 Apr 29 21:00

```

```

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

```

```

-----
12. Failed units, from systemctl list-units --state=failed
UNIT          LOAD    ACTIVE SUB    DESCRIPTION
* sep5.service loaded failed failed systemd script to load sep5 driver at boot time

```

```

-----
13. Services, from systemctl list-unit-files
STATE          UNIT FILES
enabled        YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron display-manager getty@
                haveged irqbalance iscsi issue-generator kbdsettings kdump kdump-early klog lvm2-monitor

```

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### Platform Notes (Continued)

```

nscd postfix purge-kernels rollback rsyslog sep5 smartd sshd wickd wickedd-auto4
wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime  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 iscsiui issue-add-ssh-keys kexec-load
                 lunmask man-db-create multipathd nfs nfs-blkmap nmb numad ostree-remount rdisc rpcbind
                 rpmconfigcheck rsyncd rtkit-daemon serial-getty@ smartd_generate_opts smb snmpd snmptrapd
                 speech-dispatcherd systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                 systemd-time-wait-sync systemd-timesyncd udisks2 upower
indirect         wickedd

```

```

-----
14. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=8b4cfla0-f943-46c1-a409-c2bca0c1173e
splash=silent
mitigations=auto
quiet
security=apparmor
crashkernel=324M,high
crashkernel=72M,low

```

```

-----
15. cpupower frequency-info
analyzing CPU 0:
  current policy: frequency should be within 800 MHz and 3.40 GHz.
                   The governor "performance" may decide which speed to use
                   within this range.

  boost state support:
    Supported: yes
    Active: yes

```

```

-----
16. 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                 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

```

```

-----
17. /sys/kernel/mm/transparent_hugepage
defrag      always defer defer+madvice [madvice] never
enabled     [always] madvice never

```

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## Platform Notes (Continued)

hpage\_pmd\_size 2097152  
shmem\_enabled always within\_size advise [never] deny force

-----  
18. /sys/kernel/mm/transparent\_hugepage/khugepaged  
alloc\_sleep\_millisecs 60000  
defrag 1  
max\_ptes\_none 511  
max\_ptes\_shared 256  
max\_ptes\_swap 64  
pages\_to\_scan 4096  
scan\_sleep\_millisecs 10000  
-----

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

-----  
20. Disk information  
SPEC is set to: /home/Benchmark/specccpu  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sda2 xfs 1.8T 55G 1.7T 4% /  
-----

-----  
21. /sys/devices/virtual/dmi/id  
Vendor: FUJITSU  
-----

-----  
22. dmidecode  
Additional information from dmidecode 3.2 follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.  
Memory:  
9x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800  
4x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800  
1x Samsung M321R8GA0BB0-CQKMG 64 GB 2 rank 4800  
18x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800  
-----

-----  
23. BIOS  
(This section combines info from /sys/devices and dmidecode.)  
BIOS Vendor: FUJITSU  
BIOS Version: V1.0.0.0 R1.0.0 for D3986-A1  
BIOS Date: 05/27/2023  
BIOS Revision: 1.0  
Firmware Revision: 1.2  
-----

## 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  
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-----

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# SPEC CPU®2017 Floating Point Rate Result

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## Fujitsu

PRIMEQUEST 4400E, Intel Xeon Platinum 8454H, 2.10GHz

SPECrate®2017\_fp\_base = 1330

SPECrate®2017\_fp\_peak = Not Run

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu

**Test Date:** Jun-2023  
**Hardware Availability:** Sep-2023  
**Software Availability:** Dec-2022

### Compiler Version Notes (Continued)

=====  
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  
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=====

=====  
C++, C, Fortran | 507.cactuBSSN\_r(base)  
=====

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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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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  
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.  
=====

=====  
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

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

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CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2023

Hardware Availability: Sep-2023

Software Availability: Dec-2022

## Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

## Base Portability Flags

503.bwaves\_r: -DSPEC\_LP64  
 507.cactuBSSN\_r: -DSPEC\_LP64  
 508.namd\_r: -DSPEC\_LP64  
 510.parest\_r: -DSPEC\_LP64  
 511.povray\_r: -DSPEC\_LP64  
 519.lbm\_r: -DSPEC\_LP64  
 521.wrf\_r: -DSPEC\_LP64 -DSPEC\_CASE\_FLAG -convert big\_endian  
 526.blender\_r: -DSPEC\_LP64 -DSPEC\_LINUX -funsigned-char  
 527.cam4\_r: -DSPEC\_LP64 -DSPEC\_CASE\_FLAG  
 538.imagick\_r: -DSPEC\_LP64  
 544.nab\_r: -DSPEC\_LP64  
 549.fotonik3d\_r: -DSPEC\_LP64  
 554.roms\_r: -DSPEC\_LP64

## Base Optimization Flags

C benchmarks:

-w -std=c11 -m64 -Wl,-z,muldefs -xsaphirerapids -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 -xsaphirerapids -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 -xsaphirerapids -Ofast -ffast-math -flto  
 -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4

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# SPEC CPU®2017 Floating Point Rate Result

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**Fujitsu**

PRIMEQUEST 4400E, Intel Xeon Platinum 8454H,  
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SPECrate®2017\_fp\_base = 1330

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CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jun-2023

Hardware Availability: Sep-2023

Software Availability: Dec-2022

## Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-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 -xsaphirerapids -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 -xsaphirerapids -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 -xsaphirerapids -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/Fujitsu-Platform-Settings-V1.0-SPR-RevB.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/Fujitsu-Platform-Settings-V1.0-SPR-RevB.xml>

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