# SPEC CPU®2017 Floating Point Rate Result

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## Fujitsu

PRIMERGY CX2550 M7, Intel Xeon Gold 6454S, 2.20GHz

SPECrate®2017_fp_base = 684

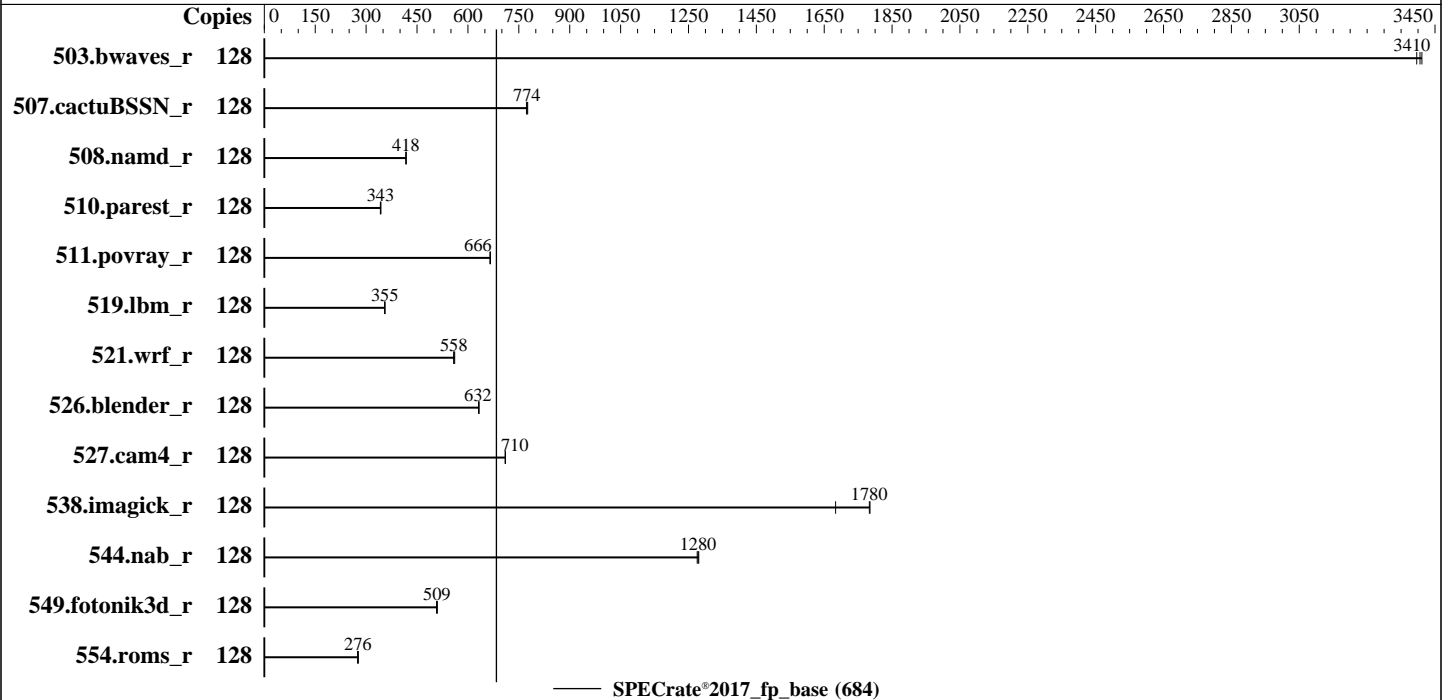SPECrate®2017_fp_peak = Not Run

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test Date:** Jun-2023

**Hardware Availability:** May-2023

**Software Availability:** Dec-2022

| Benchmark | Copies | Result |
|-----------|--------|--------|
| 503.bwaves_r | 128 | 3410 |
| 507.cactuBSSN_r | 128 | 774 |
| 508.namd_r | 128 | 418 |
| 510.parest_r | 128 | 343 |
| 511.povray_r | 128 | 666 |
| 519.lbm_r | 128 | 355 |
| 521.wrf_r | 128 | 558 |
| 526.blender_r | 128 | 632 |
| 527.cam4_r | 128 | 710 |
| 538.imagick_r | 128 | 1780 |
| 544.nab_r | 128 | 1280 |
| 549.fotonik3d_r | 128 | 509 |
| 554.roms_r | 128 | 276 |

SPECrate®2017_fp_base (684)

## Hardware

CPU Name: Intel Xeon Gold 6454S
 Max MHz: 3400
 Nominal: 2200
Enabled: 64 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 60 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x SATA M.2 SSD, 480GB
Other: None

## Software

OS: SUSE Linux Enterprise Server 15 SP4
 5.14.21-150400.24.33-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 D3988-A1x. Released May-2023
 tested as V1.0.0.0 R1.1.0 for D3988-A1x Apr-2023
File System: btrfs
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 ofadditional 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 | 128 | 378 | 3400 | 376 | 3410 | **377** | **3410** | | | | | | | |
| 507.cactuBSSN_r | 128 | 210 | 772 | 209 | 776 | **209** | **774** | | | | | | | |
| 508.namd_r | 128 | 291 | 417 | **291** | **418** | 291 | 418 | | | | | | | |
| 510.parest_r | 128 | 975 | 344 | **977** | **343** | 979 | 342 | | | | | | | |
| 511.povray_r | 128 | 449 | 666 | 449 | 665 | **449** | **666** | | | | | | | |
| 519.lbm_r | 128 | **380** | **355** | 380 | 355 | 380 | 355 | | | | | | | |
| 521.wrf_r | 128 | **513** | **558** | 511 | 561 | 513 | 558 | | | | | | | |
| 526.blender_r | 128 | **308** | **632** | 308 | 633 | 309 | 632 | | | | | | | |
| 527.cam4_r | 128 | 315 | 711 | **315** | **710** | 315 | 710 | | | | | | | |
| 538.imagick_r | 128 | **179** | **1780** | 189 | 1680 | 178 | 1780 | | | | | | | |
| 544.nab_r | 128 | 169 | 1280 | **169** | **1280** | 168 | 1280 | | | | | | | |
| 549.fotonik3d_r | 128 | 983 | 508 | 979 | 510 | **980** | **509** | | | | | | | |
| 554.roms_r | 128 | 740 | 275 | 735 | 277 | **736** | **276** | | | | | | | |

**SPECrate®2017_fp_base = 684**

**SPECrate®2017_fp_peak = Not Run**

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"
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:
CPU Performance Boost = Aggressive
SNC (Sub NUMA) = Enable SNC4
Package C State limit = C0

Sysinfo program /home/Benchmark/speccpu/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Fri Jun 16 16:41:42 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. 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 5.14.21-150400.24.33-default #1 SMP PREEMPT_DYNAMIC Fri Nov 4 13:55:06 UTC 2022 (76cfe60)
  x86_64 x86_64 x86_64 GNU/Linux


------------------------------------------------------------
2. w
   16:41:42 up 49 min,  1 user,  load average: 0.00, 0.00, 0.00
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                16:41   14.00s  1.29s  0.13s -bash
```

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# Platform Notes (Continued)

```
        ----------------------------------------------------------
        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) 4125229
          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) 4125229
          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=128 -c
           ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=64 --define physicalfirst
           --define invoke_with_interleave --define drop_caches --tune base -o all fprate
         runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
           ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=64 --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) Gold 6454S
            vendor_id       : GenuineIntel
            cpu family      : 6
            model           : 143
            stepping        : 8
            microcode       : 0x2b0001b0
            bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
            cpu cores       : 32
            siblings        : 64
            2 physical ids (chips)
            128 processors (hardware threads)
            physical id 0: core ids 0-31
            physical id 1: core ids 0-31
            physical id 0: apicids 0-63
            physical id 1: apicids 128-191
          Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
          virtualized systems.  Use the above data carefully.
```

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## Platform Notes (Continued)

```
      -------------------------------------------------------------
      7. lscpu

      From lscpu from util-linux 2.37.2:
        Architecture:              x86_64
        CPU op-mode(s):            32-bit, 64-bit
        Address sizes:             46 bits physical, 57 bits virtual
        Byte Order:                Little Endian
        CPU(s):                    128
        On-line CPU(s) list:       0-127
        Vendor ID:                 GenuineIntel
        Model name:                Intel(R) Xeon(R) Gold 6454S
        CPU family:                6
        Model:                     143
        Thread(s) per core:        2
        Core(s) per socket:        32
        Socket(s):                 2
        Stepping:                  8
        CPU max MHz:               3400.0000
        CPU min MHz:               800.0000
        BogoMIPS:                  4400.00
        Flags:                     fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                                   clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                                   lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                                   nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                                   ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1
                                   sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand
                                   lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3
                                   invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
                                   tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle
                                   avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
                                   avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
                                   xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                                   cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
                                   arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku
                                   ospke waitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                   tme avx512_vpopcntdq la57 rdpid bus_lock_detect cldemote movdiri movdir64b
                                   enqcmd fsrm md_clear serialize tsxldtrk pconfig arch_lbr avx512_fp16
                                   amx_tile flush_l1d arch_capabilities
        Virtualization:            VT-x
        L1d cache:                 3 MiB (64 instances)
        L1i cache:                 2 MiB (64 instances)
        L2 cache:                  128 MiB (64 instances)
        L3 cache:                  120 MiB (2 instances)
        NUMA node(s):              8
        NUMA node0 CPU(s):         0-7,64-71
        NUMA node1 CPU(s):         8-15,72-79
        NUMA node2 CPU(s):         16-23,80-87
        NUMA node3 CPU(s):         24-31,88-95
        NUMA node4 CPU(s):         32-39,96-103
        NUMA node5 CPU(s):         40-47,104-111
        NUMA node6 CPU(s):         48-55,112-119
        NUMA node7 CPU(s):         56-63,120-127
        Vulnerability Itlb multihit:   Not affected
        Vulnerability L1tf:            Not affected
        Vulnerability Mds:             Not affected
        Vulnerability Meltdown:        Not affected
        Vulnerability Mmio stale data: Not affected
        Vulnerability Retbleed:        Not affected
```

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## Platform Notes (Continued)

```
   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, PBRSB-eIBRS SW
                                    sequence
   Vulnerability Srbds:             Not affected
   Vulnerability Tsx async abort:   Not affected

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


   ------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 8 nodes (0-7)
   node 0 cpus: 0-7,64-71
   node 0 size: 128600 MB
   node 0 free: 128073 MB
   node 1 cpus: 8-15,72-79
   node 1 size: 129019 MB
   node 1 free: 128647 MB
   node 2 cpus: 16-23,80-87
   node 2 size: 129019 MB
   node 2 free: 128636 MB
   node 3 cpus: 24-31,88-95
   node 3 size: 129019 MB
   node 3 free: 128650 MB
   node 4 cpus: 32-39,96-103
   node 4 size: 128985 MB
   node 4 free: 128655 MB
   node 5 cpus: 40-47,104-111
   node 5 size: 129019 MB
   node 5 free: 128634 MB
   node 6 cpus: 48-55,112-119
   node 6 size: 129019 MB
   node 6 free: 128647 MB
   node 7 cpus: 56-63,120-127
   node 7 size: 128647 MB
   node 7 free: 128304 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  12  12  12  21  21  21  21
     1:  12  10  12  12  21  21  21  21
     2:  12  12  10  12  21  21  21  21
     3:  12  12  12  10  21  21  21  21
     4:  21  21  21  21  10  12  12  12
     5:  21  21  21  21  12  10  12  12
     6:  21  21  21  21  12  12  10  12
     7:  21  21  21  21  12  12  12  10


   ------------------------------------------------------------
 9. /proc/meminfo
    MemTotal:      1056084984 kB


   ------------------------------------------------------------
 10. who -r
   run-level 3 Jun 16 15:52
```

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## Platform Notes (Continued)

```
----------------------------------------------------------
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            ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor auditd bluetooth cron
                     display-manager getty@ haveged irqbalance iscsi issue-generator kbdsettings kdump
                     kdump-early klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog sep5 smartd sshd
                     wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant
  enabled-runtime    systemd-remount-fs
  disabled           NetworkManager NetworkManager-dispatcher NetworkManager-wait-online 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 dmraid-activation dnsmasq ebtables exchange-bmc-os-info firewalld gpm
                     grub2-once haveged-switch-root ipmi ipmievd iscsi-init iscsid iscsiuio issue-add-ssh-keys
                     kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nm-cloud-setup nmb openvpn@
                     ostree-remount pppoe pppoe-server 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 wpa_supplicant@
  indirect           pcscd saned@ wickedd


----------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.24.33-default
  root=UUID=d977c1aa-2de5-45da-b4b1-9732e87ed311
  splash=silent
  mitigations=auto
  quiet
  security=apparmor
  crashkernel=325M,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
```

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## Platform Notes (Continued)

```
   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+madvise [madvise] never
   enabled         [always] madvise never
   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/speccpu
   Filesystem      Type   Size  Used Avail Use% Mounted on
   /dev/sda2       btrfs  445G   72G  373G  17% /home


   ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
   Vendor:         FUJITSU
   Product:        PRIMERGY CX2550 M7
   Product Family: SERVER
   Serial:         BBBB000001


   ----------------------------------------------------------
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:
     14x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800
     2x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800
```

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## Platform Notes (Continued)

```
    ---------------------------------------------------------------
    23. BIOS
    (This section combines info from /sys/devices and dmidecode.)
       BIOS Vendor:      FUJITSU
       BIOS Version:     V1.0.0.0 R1.1.0 for D3988-A1x
       BIOS Date:        04/07/2023
       BIOS Revision:    1.1
       Firmware Revision: 2.20
```

## 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
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.
```

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# SPEC CPU®2017 Floating Point Rate Result

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## Fujitsu

PRIMERGY CX2550 M7, Intel Xeon Gold 6454S, 2.20GHz

SPECrate®2017_fp_base = 684

SPECrate®2017_fp_peak = Not Run

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

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

## Compiler Version Notes (Continued)

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

## Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Benchmarks using both Fortran and C:
`ifx icx`

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

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

## Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`
508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`
519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
526.blender_r: `-DSPEC_LP64 -DSPEC_LINUX -funsigned-char`
527.cam4_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
538.imagick_r: `-DSPEC_LP64`
544.nab_r: `-DSPEC_LP64`
549.fotonik3d_r: `-DSPEC_LP64`
554.roms_r: `-DSPEC_LP64`

## Base Optimization Flags

C benchmarks:
`-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math`

**(Continued on next page)**

## Fujitsu
PRIMERGY CX2550 M7, Intel Xeon Gold 6454S, 2.20GHz

SPECrate®2017_fp_base = 684

SPECrate®2017_fp_peak = Not Run

| | |
|---|---|
| **CPU2017 License:** 19 | **Test Date:** Jun-2023 |
| **Test Sponsor:** Fujitsu | **Hardware Availability:** May-2023 |
| **Tested by:** Fujitsu | **Software Availability:** Dec-2022 |

# Base Optimization Flags (Continued)

C benchmarks (continued):
```
-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/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

# SPEC CPU®2017 Floating Point Rate Result

## Fujitsu

PRIMERGY CX2550 M7, Intel Xeon Gold 6454S, 2.20GHz

**SPECrate®2017_fp_base =** 684

**SPECrate®2017_fp_peak =** Not Run

| | | | |
|---|---|---|---|
| **CPU2017 License:** | 19 | **Test Date:** | Jun-2023 |
| **Test Sponsor:** | Fujitsu | **Hardware Availability:** | May-2023 |
| **Tested by:** | Fujitsu | **Software Availability:** | Dec-2022 |

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

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