SPEC CPU®2017 Floating Point Rate Result

Fujitsu

PRIMEQUEST 4400E, Intel Xeon Platinum 8490H, 1.90GHz

SPECrate®2017_fp_base = 1840

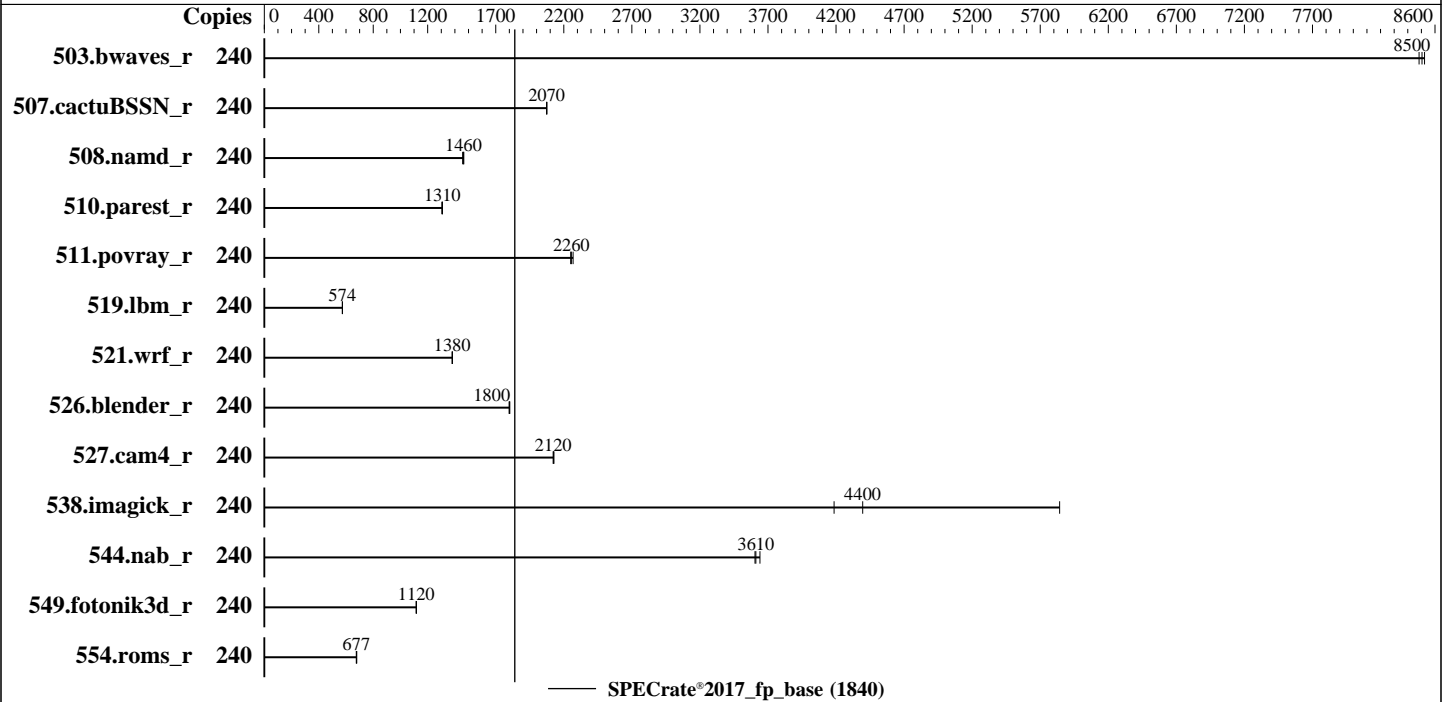SPECrate®2017_fp_peak = Not Run

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

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

Benchmark	Copies	Result
503.bwaves_r	240	8500
507.cactuBSSN_r	240	2070
508.namd_r	240	1460
510.parest_r	240	1310
511.povray_r	240	2260
519.lbm_r	240	574
521.wrf_r	240	1380
526.blender_r	240	1800
527.cam4_r	240	2120
538.imagick_r	240	4400
544.nab_r	240	3610
549.fotonik3d_r	240	1120
554.roms_r	240	677

SPECrate®2017_fp_base (1840)

Hardware

CPU Name: Intel Xeon Platinum 8490H
 Max MHz: 3500
 Nominal: 1900
Enabled: 240 cores, 4 chips
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: 112.5 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 SAS 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-A1. Released Jul-2023
tested as V1.0.0.0 R0.16.0 for D3986-A1 Mar-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	Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
503.bwaves_r	240	**283**	**8500**	284	8480	282	8520							
507.cactuBSSN_r	240	**146**	**2070**	146	2070	146	2070							
508.namd_r	240	**156**	**1460**	156	1460	157	1460							
510.parest_r	240	480	1310	481	1300	**480**	**1310**							
511.povray_r	240	247	2270	249	2250	**248**	**2260**							
519.lbm_r	240	441	573	**441**	**574**	441	574							
521.wrf_r	240	389	1380	**389**	**1380**	389	1380							
526.blender_r	240	203	1800	203	1800	**203**	**1800**							
527.cam4_r	240	198	2120	**198**	**2120**	197	2130							
538.imagick_r	240	102	5840	**136**	**4400**	143	4190							
544.nab_r	240	111	3640	**112**	**3610**	112	3600							
549.fotonik3d_r	240	837	1120	838	1120	**837**	**1120**							
554.roms_r	240	562	679	**564**	**677**	564	676							

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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"
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.
```

(Continued on next page)

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

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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:
Hyper Threading = Disabled
Package C State limit = C0
CPU Performance Boost = Aggressive
SNC (Sub NUMA) = Enable SNC4
FAN Control = Full

Sysinfo program /home/Benchmark/speccpu/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Fri Apr  7 17:15:28 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
------------------------------------------------------------


------------------------------------------------------------
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
   17:15:29 up 3 min,  2 users,  load average: 8.66, 11.33, 5.02
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
```

(Continued on next page)

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Platform Notes (Continued)

```
   root     tty1       -                  17:13   17.00s  2.87s  0.32s -bash
   root     pts/0    10.41.49.60          17:14   33.00s  0.08s  0.08s -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) 8253891
   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) 8253891
   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=240 -c
    ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define cores=240 --define physicalfirst --define
    invoke_with_interleave --define drop_caches --tune base -o all fprate
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=240 --configfile
    ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define cores=240 --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 8490H
   vendor_id        : GenuineIntel
   cpu family       : 6
   model            : 143
   stepping         : 8
   microcode        : 0x2b000161
   bugs             : spectre_v1 spectre_v2 spec_store_bypass swapgs
   cpu cores        : 60
   siblings         : 60
   4 physical ids (chips)
   240 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
```

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Platform Notes (Continued)

```
     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
   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):                          240
     On-line CPU(s) list:             0-239
     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):                       4
     Stepping:                        8
     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 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:                       11.3 MiB (240 instances)
     L1i cache:                       7.5 MiB (240 instances)
```

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Platform Notes (Continued)

```
     L2 cache:                       480 MiB (240 instances)
     L3 cache:                       450 MiB (4 instances)
     NUMA node(s):                   16
     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
     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    11.3M   12 Data             1     64       1            64
     L1i      32K     7.5M    8 Instruction      1     64       1            64
     L2        2M     480M   16 Unified          2   2048       1            64
     L3    112.5M     450M   15 Unified          3 122880       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: 0-14
  node 0 size: 128601 MB
  node 0 free: 127447 MB
  node 1 cpus: 15-29
  node 1 size: 129020 MB
  node 1 free: 128573 MB
  node 2 cpus: 30-44
  node 2 size: 129020 MB
  node 2 free: 128330 MB
  node 3 cpus: 45-59
  node 3 size: 129020 MB
  node 3 free: 128591 MB
  node 4 cpus: 60-74
  node 4 size: 128985 MB
  node 4 free: 128552 MB
  node 5 cpus: 75-89
  node 5 size: 129020 MB
  node 5 free: 128460 MB
  node 6 cpus: 90-104
  node 6 size: 129020 MB
```

(Continued on next page)

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Platform Notes (Continued)

```
     node 6 free: 128644 MB
     node 7 cpus: 105-119
     node 7 size: 129020 MB
     node 7 free: 128577 MB
     node 8 cpus: 120-134
     node 8 size: 129020 MB
     node 8 free: 128631 MB
     node 9 cpus: 135-149
     node 9 size: 129020 MB
     node 9 free: 128617 MB
     node 10 cpus: 150-164
     node 10 size: 129020 MB
     node 10 free: 128578 MB
     node 11 cpus: 165-179
     node 11 size: 129020 MB
     node 11 free: 128579 MB
     node 12 cpus: 180-194
     node 12 size: 129020 MB
     node 12 free: 128732 MB
     node 13 cpus: 195-209
     node 13 size: 129020 MB
     node 13 free: 128754 MB
     node 14 cpus: 210-224
     node 14 size: 129020 MB
     node 14 free: 128753 MB
     node 15 cpus: 225-239
     node 15 size: 128649 MB
     node 15 free: 128362 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  12  10  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:      2113021184 kB


     ------------------------------------------------------------
 10. who -r
     run-level 3 Apr 7 17:13


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

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Platform Notes (Continued)

```
      ----------------------------------------------------------------
      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 kdump kdump-early klog lvm2-monitor
                       nscd postfix purge-kernels rollback rsyslog smartd sshd wicked 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 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 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

      ----------------------------------------------------------------
      13. Linux kernel boot-time arguments, from /proc/cmdline
        BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
        root=UUID=8b4cf1a0-f943-46c1-a409-c2bca0c1173e
        splash=silent
        mitigations=auto
        quiet
        security=apparmor
        crashkernel=324M,high
        crashkernel=72M,low

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

      ----------------------------------------------------------------
      15. 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
```

(Continued on next page)

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PRIMEQUEST 4400E, Intel Xeon Platinum 8490H, 1.90GHz

SPECrate®2017_fp_base = 1840

SPECrate®2017_fp_peak = Not Run

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

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

Platform Notes (Continued)

```
  --------------------------------------------------------------
  16. /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


  --------------------------------------------------------------
  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: /home/Benchmark/speccpu
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda2      xfs   1.8T   33G  1.8T   2% /


  --------------------------------------------------------------
  20. /sys/devices/virtual/dmi/id
      Vendor:         FUJITSU LIMITED
      Product Family: SERVER
      Serial:         SM2305S00822


  --------------------------------------------------------------
  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:
      7x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800
      6x 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



  --------------------------------------------------------------
  22. BIOS
  (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:       FUJITSU
      BIOS Version:      V1.0.0.0 R0.16.0 for D3986-A1
      BIOS Date:         03/04/2023
      BIOS Revision:     0.16
      Firmware Revision: 2.2
```

SPEC CPU®2017 Floating Point Rate Result

Fujitsu

PRIMEQUEST 4400E, Intel Xeon Platinum 8490H, 1.90GHz

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SPECrate®2017_fp_peak = Not Run

CPU2017 License: 19	**Test Date:** Apr-2023
Test Sponsor: Fujitsu	**Hardware Availability:** Jul-2023
Tested by: Fujitsu	**Software Availability:** Dec-2022

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
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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)
------------------------------------------------------------------------------
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
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------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:

```
icx
```

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PRIMEQUEST 4400E, Intel Xeon Platinum 8490H, 1.90GHz

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Base Compiler Invocation (Continued)

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 -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`

(Continued on next page)

Fujitsu
PRIMEQUEST 4400E, Intel Xeon Platinum 8490H, 1.90GHz

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
```
-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

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

Tested with SPEC CPU®2017 v1.1.9 on 2023-04-07 04:15:27-0400.
Report generated on 2023-04-26 09:50:26 by CPU2017 PDF formatter v6716.
Originally published on 2023-04-25.