



SPEC CPU®2017 Floating Point Rate Result

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xFusion

SPECrate®2017_fp_base = 557

FusionServer 5288 V7 (Intel Xeon Gold 5418Y)

SPECrate®2017_fp_peak = 560

CPU2017 License: 6488

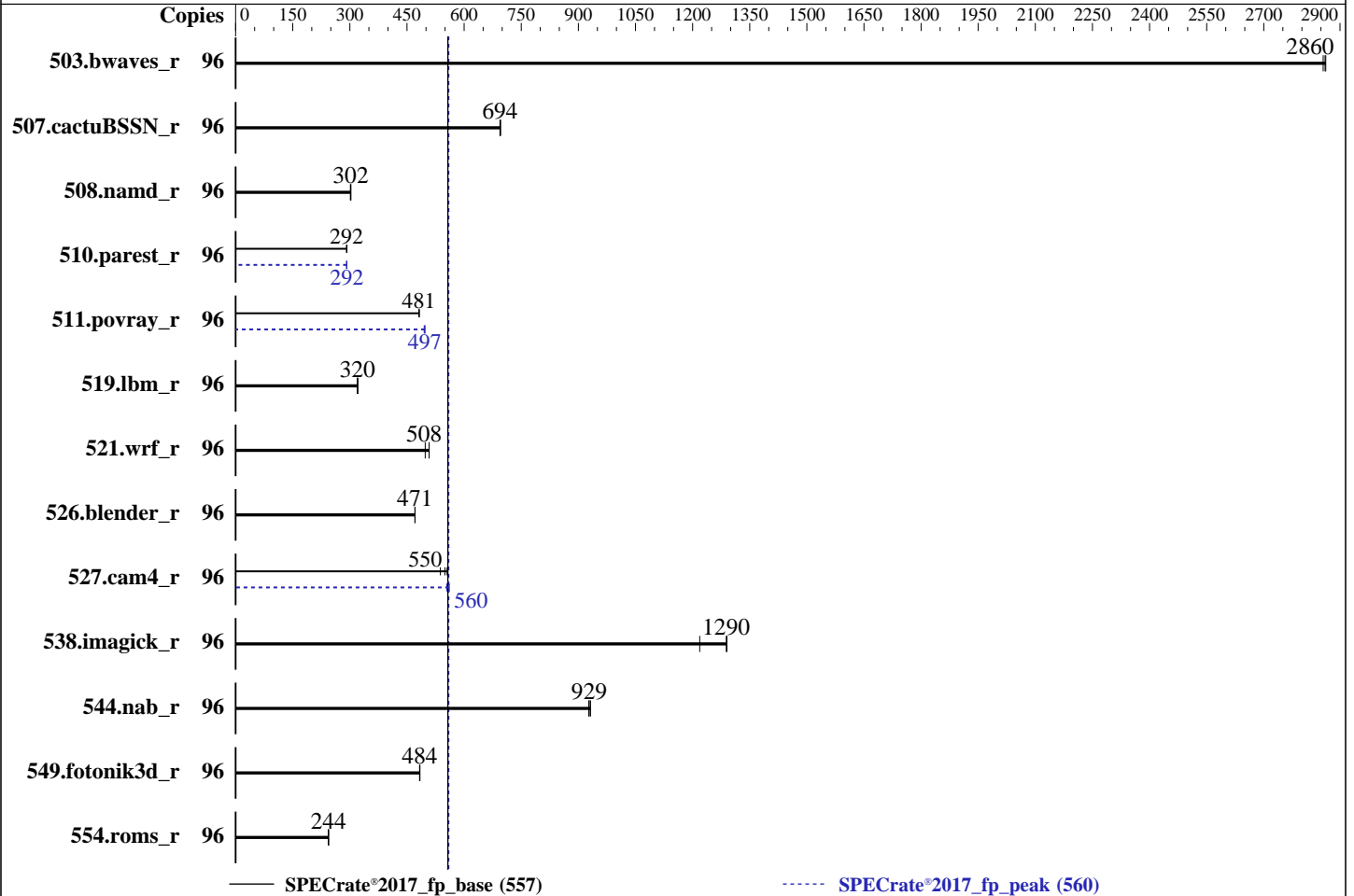
Test Sponsor: xFusion

Tested by: xFusion

Test Date: Sep-2023

Hardware Availability: Jan-2023

Software Availability: Dec-2022



Hardware

CPU Name: Intel Xeon Gold 5418Y
 Max MHz: 3800
 Nominal: 2000
 Enabled: 48 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: 45 MB I+D on chip per chip
 Other: None
 Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R, running at 4400)
 Storage: 1 x 1920 GB SATA SSD
 Other: None

Software

OS: Red Hat Enterprise Linux release 9.0 (Plow)
 5.14.0-70.13.1.el9_0.x86_64
 Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
 Parallel: No
 Firmware: Version 2.00.55 Released Mar-2023
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 Other: jemalloc memory allocator V5.0.1
 Power Management: BIOS and OS set to prefer performance at the cost of additional power usage



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Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|-----------------|--------|------------|-------------|------------|-------------|------------|------------|--------|------------|-------------|------------|-------------|------------|------------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 503.bwaves_r | 96 | 337 | 2860 | 337 | 2860 | 336 | 2860 | 96 | 337 | 2860 | 337 | 2860 | 336 | 2860 |
| 507.cactuBSSN_r | 96 | 175 | 696 | 175 | 694 | 175 | 694 | 96 | 175 | 696 | 175 | 694 | 175 | 694 |
| 508.namd_r | 96 | 301 | 303 | 303 | 301 | 302 | 302 | 96 | 301 | 303 | 303 | 301 | 302 | 302 |
| 510.parest_r | 96 | 859 | 292 | 861 | 292 | 862 | 291 | 96 | 862 | 291 | 860 | 292 | 860 | 292 |
| 511.povray_r | 96 | 465 | 483 | 466 | 481 | 466 | 481 | 96 | 451 | 497 | 453 | 495 | 451 | 497 |
| 519.lbm_r | 96 | 317 | 320 | 315 | 321 | 316 | 320 | 96 | 317 | 320 | 315 | 321 | 316 | 320 |
| 521.wrf_r | 96 | 423 | 508 | 432 | 498 | 423 | 508 | 96 | 423 | 508 | 432 | 498 | 423 | 508 |
| 526.blender_r | 96 | 310 | 471 | 310 | 471 | 310 | 471 | 96 | 310 | 471 | 310 | 471 | 310 | 471 |
| 527.cam4_r | 96 | 312 | 538 | 302 | 555 | 305 | 550 | 96 | 300 | 560 | 300 | 561 | 303 | 554 |
| 538.imagick_r | 96 | 185 | 1290 | 185 | 1290 | 196 | 1220 | 96 | 185 | 1290 | 185 | 1290 | 196 | 1220 |
| 544.nab_r | 96 | 173 | 932 | 174 | 929 | 174 | 927 | 96 | 173 | 932 | 174 | 929 | 174 | 927 |
| 549.fotonik3d_r | 96 | 774 | 483 | 773 | 484 | 773 | 484 | 96 | 774 | 483 | 773 | 484 | 773 | 484 |
| 554.roms_r | 96 | 625 | 244 | 625 | 244 | 626 | 244 | 96 | 625 | 244 | 625 | 244 | 626 | 244 |

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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/spec2017-ic2023/lib/intel64:/home/spec2017-ic2023/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:
Performance Profile Set to Performance
SNC Set to Enable SNC2 (2-clusters)

Sysinfo program /home/spec2017-ic2023/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Fri Sep 15 12:12:35 2023

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

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13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
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19. /sys/kernel/mm/transparent_hugepage/khugepaged
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24. BIOS

1. uname -a
Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14 12:42:38 EDT 2022 x86_64
x86_64 x86_64 GNU/Linux

2. w
12:12:35 up 6:04, 1 user, load average: 23.88, 72.57, 87.41
USER TTY LOGIN@ IDLE JCPU PCPU WHAT
root tty1 06:11 6:00m 1.22s 0.03s -bash

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Platform Notes (Continued)

3. Username

From environment variable \$USER: root

4. ulimit -a

```
real-time non-blocking time (microseconds, -R) unlimited
core file size (blocks, -c) 0
data seg size (kbytes, -d) unlimited
scheduling priority (-e) 0
file size (blocks, -f) unlimited
pending signals (-i) 2060198
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) 2060198
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited
```

5. sysinfo process ancestry

```
/usr/lib/systemd/systemd --switched-root --system --deserialize 28
login -- root
-bash
-bash
runcpu --define default-platform-flags --copies 96 -c ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define
smt-on --define cores=48 --define physicalfirst --define invoke_with_interleave --define drop_caches
--tune base,peak --iterations 3 -o all fprate
runcpu --define default-platform-flags --copies 96 --configfile
ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=48 --define physicalfirst
--define invoke_with_interleave --define drop_caches --tune base,peak --iterations 3 --output_format all
--nopower --runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.225/temlogs/preenv.fprate.225.0.log --lognum 225.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/spec2017-ic2023
```

6. /proc/cpuinfo

```
model name      : Intel(R) Xeon(R) Gold 5418Y
vendor_id       : GenuineIntel
cpu family      : 6
model           : 143
stepping        : 7
microcode       : 0x2b000111
bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
cpu cores       : 24
siblings        : 48
2 physical ids (chips)
96 processors (hardware threads)
physical id 0: core ids 0-23
physical id 1: core ids 0-23
physical id 0: apicids 0-47
physical id 1: apicids 128-175
```

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for

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Platform Notes (Continued)

virtualized systems. Use the above data carefully.

7. lscpu

From lscpu from util-linux 2.37.4:

```

Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Address sizes:         46 bits physical, 57 bits virtual
Byte Order:            Little Endian
CPU(s):                96
On-line CPU(s) list:   0-95
Vendor ID:             GenuineIntel
BIOS Vendor ID:       Intel(R) Corporation
Model name:            Intel(R) Xeon(R) Gold 5418Y
BIOS Model name:      Intel(R) Xeon(R) Gold 5418Y
CPU family:            6
Model:                 143
Thread(s) per core:    2
Core(s) per socket:    24
Socket(s):             2
Stepping:              7
BogoMIPS:              4000.00
Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                      clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                      lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                      nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 ds_cpl
                      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 avx2 smep bmi2 erms
                      invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt
                      clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1
                      xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local split_lock_detect
                      avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pln pts 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:             2.3 MiB (48 instances)
L1i cache:             1.5 MiB (48 instances)
L2 cache:              96 MiB (48 instances)
L3 cache:              90 MiB (2 instances)
NUMA node(s):         4
NUMA node0 CPU(s):    0-11,48-59
NUMA node1 CPU(s):    12-23,60-71
NUMA node2 CPU(s):    24-35,72-83
NUMA node3 CPU(s):    36-47,84-95
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
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

```

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Platform Notes (Continued)

From lscpu --cache:

| NAME | ONE-SIZE | ALL-SIZE | WAYS | TYPE | LEVEL | SETS | PHY-LINE | COHERENCY-SIZE |
|------|----------|----------|------|-------------|-------|-------|----------|----------------|
| L1d | 48K | 2.3M | 12 | Data | 1 | 64 | 1 | 64 |
| L1i | 32K | 1.5M | 8 | Instruction | 1 | 64 | 1 | 64 |
| L2 | 2M | 96M | 16 | Unified | 2 | 2048 | 1 | 64 |
| L3 | 45M | 90M | 15 | Unified | 3 | 49152 | 1 | 64 |

8. numactl --hardware

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

```

available: 4 nodes (0-3)
node 0 cpus: 0-11,48-59
node 0 size: 128080 MB
node 0 free: 112512 MB
node 1 cpus: 12-23,60-71
node 1 size: 129018 MB
node 1 free: 118799 MB
node 2 cpus: 24-35,72-83
node 2 size: 128982 MB
node 2 free: 118739 MB
node 3 cpus: 36-47,84-95
node 3 size: 129007 MB
node 3 free: 115715 MB
node distances:
node  0  1  2  3
 0:  10  12  21  21
 1:  12  10  21  21
 2:  21  21  10  12
 3:  21  21  12  10

```

9. /proc/meminfo

MemTotal: 527451460 kB

10. who -r

run-level 3 Sep 15 06:08

11. Systemd service manager version: systemd 250 (250-6.e19_0)

```

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        NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode
nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sep5 sshd sssd sysstat
systemd-network-generator tuned udisks2 upower
enabled-runtime systemd-remount-fs
disabled       arp-ethers blk-availability canberra-system-bootup canberra-system-shutdown
canberra-system-shutdown-reboot chrony-wait console-getty cpupower debug-shell kvm_stat
man-db-restart-cache-update nftables powertop rdisc rhsm rhsm-facts rpmdm-rebuild
serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext

```

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Platform Notes (Continued)

indirect sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

```

-----
14. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
root=/dev/mapper/rhel-root
ro
crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root
rd.lvm.lv=rhel/swap

```

```

-----
15. cpupower frequency-info
analyzing CPU 0:
  Unable to determine current policy
  boost state support:
    Supported: yes
    Active: yes

```

```

-----
16. tuned-adm active
  Current active profile: throughput-performance

```

```

-----
17. 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                   40
vm.dirty_writeback_centisecs     500
vm.dirtytime_expire_seconds     43200
vm.extfrag_threshold             500
vm.min_unmapped_ratio           1
vm.nr_hugepages                  0
vm.nr_hugepages_mempolicy       0
vm.nr_overcommit_hugepages      0
vm.swappiness                    10
vm.watermark_boost_factor       15000
vm.watermark_scale_factor       10
vm.zone_reclaim_mode            0

```

```

-----
18. /sys/kernel/mm/transparent_hugepage
defrag            always defer defer+madvice [madvice] never
enabled           [always] madvice never
hpage_pmd_size   2097152
shmem_enabled    always within_size advise [never] deny force

```

```

-----
19. /sys/kernel/mm/transparent_hugepage/khugepaged
alloc_sleep_millisecs   60000
defrag                   1
max_ptes_none           511
max_ptes_shared         256
max_ptes_swap           64

```

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Platform Notes (Continued)

pages_to_scan 4096
scan_sleep_millisecs 10000

20. OS release
From /etc/*-release /etc/*-version
os-release Red Hat Enterprise Linux 9.0 (Plow)
redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
system-release Red Hat Enterprise Linux release 9.0 (Plow)

21. Disk information
SPEC is set to: /home/spec2017-ic2023
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 1.7T 113G 1.6T 7% /home

22. /sys/devices/virtual/dmi/id
Vendor: XFUSION
Product: 5288 V7
Product Family: Eagle Stream
Serial: serial

23. dmidecode
Additional information from dmidecode 3.3 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:
16x Samsung M321R4GA3BB6-CQKDG 32 GB 2 rank 4800, configured at 4400

24. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: XFUSION
BIOS Version: 2.00.55
BIOS Date: 03/07/2023
BIOS Revision: 0.55

Compiler Version Notes

=====
C | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

=====
C++ | 508.namd_r(base, peak) 510.parest_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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=====
C++, C | 511.povray_r(base, peak) 526.blender_r(base, peak)

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Compiler Version Notes (Continued)

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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

=====
C++, C, Fortran | 507.cactuBSSN_r(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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

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

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



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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  
-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
```

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SPEC CPU®2017 Floating Point Rate Result

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xFusion

SPECrate®2017_fp_base = 557

FusionServer 5288 V7 (Intel Xeon Gold 5418Y)

SPECrate®2017_fp_peak = 560

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Sep-2023
Hardware Availability: Jan-2023
Software Availability: Dec-2022

Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):

```
-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
```

Peak 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
```

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```
519.lbm_r: basepeak = yes
```

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Hardware Availability: Jan-2023
Software Availability: Dec-2022

Peak Optimization Flags (Continued)

538.imagick_r: basepeak = yes

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -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:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: basepeak = yes

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_r: -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++:

511.povray_r: -w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profddata(pass 2) -xCORE-AVX2(pass 1)
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int
-mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

(Continued on next page)



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CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Sep-2023
Hardware Availability: Jan-2023
Software Availability: Dec-2022

Peak Optimization Flags (Continued)

507.cactuBSSN_r: basepeak = yes

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

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

<http://www.spec.org/cpu2017/flags/xFusion-Platform-Settings-SPR-V1.1-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/xFusion-Platform-Settings-SPR-V1.1-revC.xml>

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Tested with SPEC CPU®2017 v1.1.9 on 2023-09-15 12:12:34-0400.

Report generated on 2023-10-11 12:28:33 by CPU2017 PDF formatter v6716.

Originally published on 2023-10-10.