Fujitsu
PRIMERGY CX2550 M7, Intel Xeon Platinum 8468V, 2.40GHz

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

SPECrates
SPECrate®2017_fp_base = 876
SPECrate®2017_fp_peak = Not Run

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

Hardware
CPU Name: Intel Xeon Platinum 8468V
Max MHz: 3800
Nominal: 2400
Enabled: 96 cores, 2 chips
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: 97.5 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 set to prefer performance at
the cost of additional power usage
# SPEC CPU®2017 Floating Point Rate Result

## Fujitsu

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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
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</tr>
</tbody>
</table>

**SPECrate®2017_fp_base =** 876

**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`

- 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)
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Test Date: May-2023
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Software Availability: Dec-2022

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

Platform Notes

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

Sysinfo program /home/Benchmark/speccpu/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue May 30 10:30:48 2023

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

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12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
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17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/transparent
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
10:30:48 up 7 min, 1 user, load average: 0.21, 0.08, 0.04
USER     TTY     FROM  LOGIN@   IDLE   JCPU   PCPU WHAT
(Continued on next page)
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---

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>User</th>
<th>Time</th>
<th>CPU Usage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>root</td>
<td>10:30</td>
<td>8.00s</td>
<td></td>
</tr>
<tr>
<td>tty1</td>
<td>1:99s</td>
<td>0.16s</td>
<td></td>
</tr>
</tbody>
</table>

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: (-l) 4125333
   - 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) 412533
   - 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=96 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define cores=96 --define physicalfirst --define
   invoke_with_interleave --define drop_caches --tune base -o all fprate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=96 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define cores=96 --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 8468V
   - vendor_id: GenuineIntel
   - cpu family: 6
   - model: 143
   - stepping: 6
   - microcode: 0x2b000161
   - bugs: spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
   - cpu cores: 48
   - siblings: 48
   - 2 physical ids (chips)
   - 96 processors (hardware threads)
   - physical id 0: core ids 0-47
   - physical id 1: core ids 0-47
   - physical id 0: apicids

(Continued on next page)
Platform Notes (Continued)

physical id 1: apicids
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):                          96
On-line CPU(s) list:             0-95
Vendor ID:                       GenuineIntel
Model name:                      Intel(R) Xeon(R) Platinum 8468V
CPU family:                      6
Model:                           143
Thread(s) per core:              1
Core(s) per socket:              48
Socket(s):                       2
Stepping:                        6
CPU max MHz:                     3800.0000
CPU min MHz:                     800.0000
BogoMIPS:                        4800.00
Flags:                           fpu vme de pse tsc msr pae mca cmov pat pse36
                                 cliinal ds cpl tm pbe syscall nx p柄elgb rdtscp
                                 lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology
                                 nonstop_tsc cpuid aperffperf tsc_known_freq pni pclmulqdq dtes64 monitor
datacpl vbox 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 cd cpz cornerstone
                                 invpcid_single intel_pinn cdp_l2 abd mba ibs ibs_enhanced
                                 tpr_shadow vnumi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bm1 hle
                                 avx2 smep bmi2 erms invpcid rtm cmq dtt_a avx512f avx512dq rdseed adx smack
                                 avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
                                 xsaveopt xsave xsavec xsaves cmq_llc cmq_cxcomp llc cmq_mbm_total
                                 cmq_mbm_local split_lock detect_avx512fx avx512f vsfx dmem adx movbm
                                 avx512_vbmi4 sse4_3 128 bitῳ onChangeText segmented_segmentation	
Virtualization:                  VT-x
L1d cache:                       4.5 MiB (96 instances)
L1i cache:                       3 MiB (96 instances)
L2 cache:                        192 MiB (96 instances)
L3 cache:                        195 MiB (2 instances)
NUMA node(s):                    8
NUMA node0 CPU(s):               0-11
NUMA node1 CPU(s):               12-23
NUMA node2 CPU(s):               24-35
NUMA node3 CPU(s):               36-47
NUMA node4 CPU(s):               48-59
NUMA node5 CPU(s):               60-71
NUMA node6 CPU(s):               72-83
NUMA node7 CPU(s):               84-95
Vulnerability Itlb multihit:     Not affected

(Continued on next page)
Platform Notes (Continued)

- Vulnerability L1tf: Not affected
- Vulnerability Mds: Not affected
- Vulnerability Meltdown: Not affected
- Vulnerability Mmio stale data: Not affected
- Vulnerability Retbleed: 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, PBRSB-eIBRS SW sequence
- Vulnerability Srbds: Not affected
- Vulnerability Tsx async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME ONE-SIZE ALL-SIZE WAYS TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHYS-LINE</th>
<th>COHERENCY-SIZE</th>
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<td>L1d 48K 4.5M 12 Data</td>
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<td>64</td>
<td>1</td>
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<tr>
<td>L1i 32K 3M 8 Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2 2M 192M 16 Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3 97.5M 195M 15 Unified</td>
<td>3</td>
<td>106496</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

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

8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 8 nodes (0-7)
node 0 cpus: 0-11
node 0 size: 128601 MB
node 0 free: 128177 MB
node 1 cpus: 12-23
node 1 size: 129020 MB
node 1 free: 128723 MB
node 2 cpus: 24-35
node 2 size: 128986 MB
node 2 free: 128670 MB
node 3 cpus: 36-47
node 3 size: 129020 MB
node 3 free: 128700 MB
node 4 cpus: 48-59
node 4 size: 129020 MB
node 4 free: 128696 MB
node 5 cpus: 60-71
node 5 size: 129020 MB
node 5 free: 128721 MB
node 6 cpus: 72-83
node 6 size: 129020 MB
node 6 free: 128709 MB
node 7 cpus: 84-95
node 7 size: 128666 MB
node 7 free: 128329 MB
node distances:
node 0 distances:
0: 10 12 12 12 21 21 21 21 21 21 21 21
1: 12 10 12 12 21 21 21 21 21 21 21 21
2: 12 12 10 12 21 21 21 21 21 21 21 21
3: 12 12 12 10 21 21 21 21 21 21 21 21
4: 21 21 21 21 10 12 12 12 12 12 12 12
5: 21 21 21 21 12 10 12 12 12 12 12 12
6: 21 21 21 21 12 10 12 12 12 12 12 12
7: 21 21 21 21 12 12 12 12 12 12 12 12

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

9. /proc/meminfo

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MemTotal: 1056111484 kB

Platform Notes (Continued)

10. who -r
run-level 3 May 30 10:23

11. Systemd service manager version: systemd 249 (249.11+stable.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 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@ havedev irqbalance iscsi issue-generator kbdsettings kdump
dkdump-early klog lvm2-monitor nscd postfix purge-kernels rollback rayslog sep5 smartd sshd
wicked wicked-autom04 wickedd-dhcp4 wickedd-nanny wpa_supplicant
   enabled-runtime systemd-remount-fs
   disabled 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
debugee-dmraid-activation dnsmasq ebtetables exchange-hmc-os-info firewall gpm
grub2-once haviged-switch-root ipmi ipmiestatus iscsi-init iscsiio issue-ssh-keys
kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nm-cloud-setup omb openvpn@
on-tree-remount pppoe pppoe-server rdisc r pandbind rpmconfigcheck rayncd rtkit-daemon
serial-getty@ smartd_generate_opts smb smnmpd snmptrpd speech-dispatcher
   systemd-boot-check-no-failures systemd-network-generator systemd-sysexec
   systemd-time-wait-sync systemd-timesyncd udisks2 upower wpa_supplicant@
   pcacc saned wicked
   indirect

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 3.80 GHz.
   The governor "powersave" may decide which speed to use
   within this range.
   boost state support:
   Supported: yes
   Active: yes

16. sysctl
   kernel numa_balancing 1

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Platform Notes (Continued)

```
kernel.randomize_va_space           2
vm.compaction_proactiveness        20
vm.dirty_background_bytes           0
vm.dirty_background_ratio          10
vm.dirty_bytes                      0
vm.dirty_expire_centisecs        3000
vm.dirty_ratio                     20
vm.dirty_writeback_centisecs      500
vm.dirtytime_expire_seconds     43200
vm.extfrag_threshold              500
vm.min_unmapped_ratio               1
vm.nr_hugepages                     0
vm.nr_hugepages_mempolicy           0
vm.nr_overcommit_hugepages          0
vm.swappiness                      60
vm.watermark_boost_factor       15000
vm.watermark_scale_factor          10
vm.zone_reclaim_mode                0

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/klhugepaged
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.

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Fujitsu
PRIMERGY CX2550 M7, Intel Xeon Platinum 8468V, 2.40GHz

SPECrate®2017_fp_base = 876
SPECrate®2017_fp_peak = Not Run

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

Platform Notes (Continued)

Memory:
14x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800
2x 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 R0.30.0 for D3988-A1x
BIOS Date: 02/11/2023
BIOS Revision: 0.30
Firmware Revision: 2.20

Compiler Version Notes

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<tr>
<th>Language</th>
<th>Programs</th>
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<td>C</td>
<td>519.lblm_r(base) 538.imagick_r(base) 544.nab_r(base)</td>
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<td>C++</td>
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<td>C++, C</td>
<td>511.povray_r(base) 526.blender_r(base)</td>
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<tr>
<td>C++, Fortran</td>
<td>507.cactusBSSN_r(base)</td>
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(Continued on next page)
Fujitsu
PRIMERGY CX2550 M7, Intel Xeon Platinum 8468V, 2.40GHz

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Test Date: May-2023
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Compiler Version Notes (Continued)

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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

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.llvm_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
**SPEC CPU®2017 Floating Point Rate Result**

**Fujitsu**

PRIMERGY CX2550 M7, Intel Xeon Platinum 8468V, 2.40GHz

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

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

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### 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`
- `-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/Intel-ic2023-official-linux64.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/Intel-ic2023-official-linux64.xml)
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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 2023-05-29 21:30:47-0400.
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