



# SPEC CPU®2017 Floating Point Rate Result

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**Fusionstor**  
(Test Sponsor: Meganet)

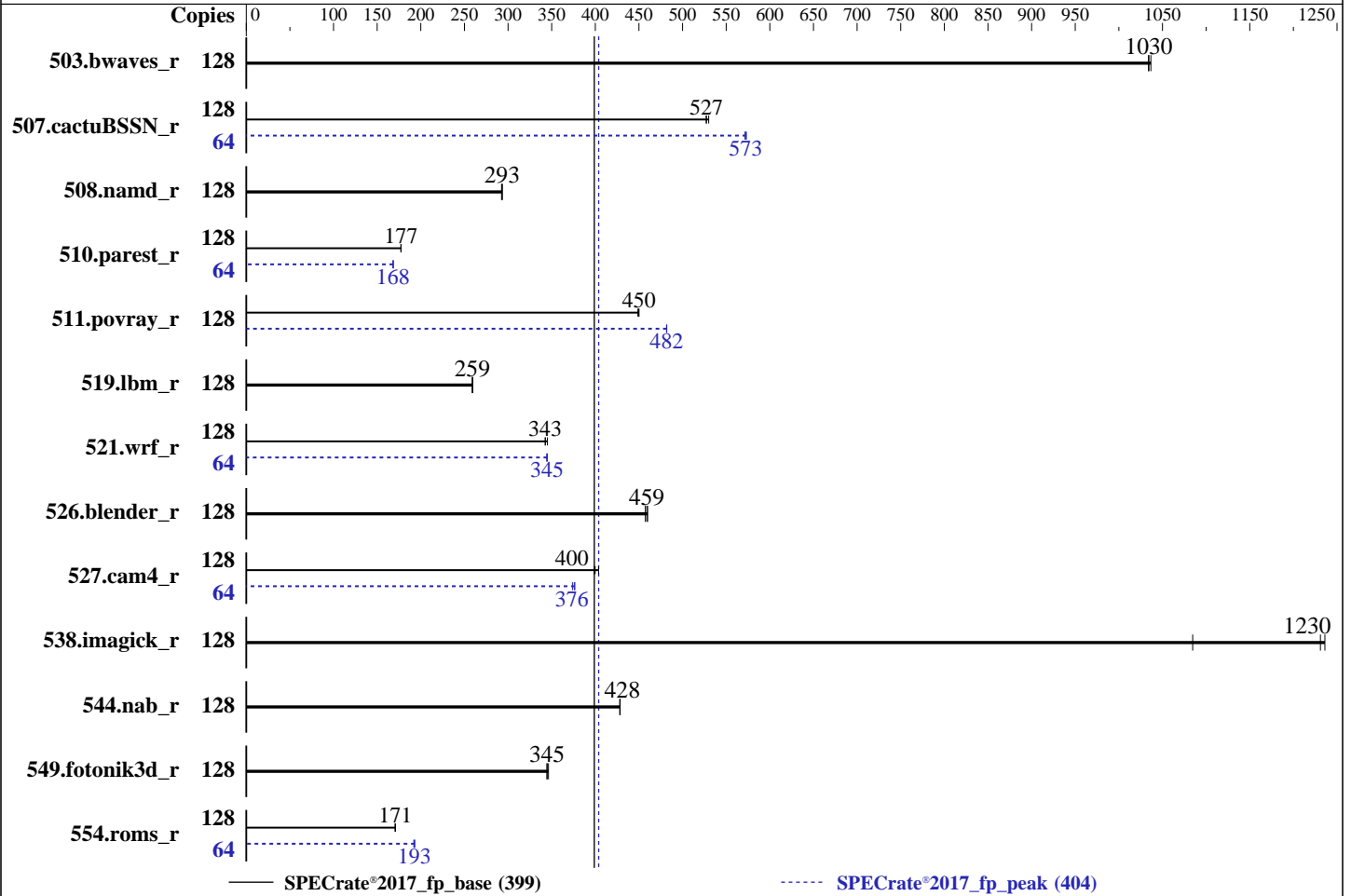
**SPECrate®2017\_fp\_base = 399**

**Invento i6327 (Intel Xeon Gold 6338)**

**SPECrate®2017\_fp\_peak = 404**

**CPU2017 License:** 6221  
**Test Sponsor:** Meganet  
**Tested by:** Fusionstor system

**Test Date:** Jul-2024  
**Hardware Availability:** Dec-2021  
**Software Availability:** Nov-2023



### Hardware

CPU Name: Intel Xeon Gold 6338  
Max MHz: 3200  
Nominal: 2000  
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: 1.25 MB I+D on chip per core  
L3: 48 MB I+D on chip per chip  
Other: None  
Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)  
Storage: 960 GB SATA SSD  
Other: CPU Cooling: Air

### Software

OS: Ubuntu 22.04.4 LTS  
6.5.0-41-generic  
Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;  
Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;  
Parallel: No  
Firmware: version w25.33.03 5.22 released Nov-2023  
File System: ext4  
System State: Run level 5 (multi-user mode)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: jemalloc memory allocator V5.0.1  
Power Management: Default



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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	1238	1040	1242	1030	<u>1241</u>	<u>1030</u>	128	1238	1040	1242	1030	<u>1241</u>	<u>1030</u>
507.cactuBSSN_r	128	307	527	<u>307</u>	<u>527</u>	306	530	64	141	573	<u>141</u>	<u>573</u>	142	571
508.namd_r	128	<u>415</u>	<u>293</u>	416	293	415	293	128	<u>415</u>	<u>293</u>	416	293	415	293
510.parest_r	128	1889	177	<u>1888</u>	<u>177</u>	1888	177	64	995	168	<u>995</u>	<u>168</u>	994	168
511.povray_r	128	666	449	<u>664</u>	<u>450</u>	664	450	128	620	482	621	482	<u>620</u>	<u>482</u>
519.lbm_r	128	520	259	521	259	<u>521</u>	<u>259</u>	128	520	259	521	259	<u>521</u>	<u>259</u>
521.wrf_r	128	837	343	<u>837</u>	<u>343</u>	831	345	64	416	345	<u>416</u>	<u>345</u>	416	344
526.blender_r	128	424	460	<u>425</u>	<u>459</u>	426	457	128	424	460	<u>425</u>	<u>459</u>	426	457
527.cam4_r	128	555	404	561	399	<u>560</u>	<u>400</u>	64	299	374	297	377	<u>298</u>	<u>376</u>
538.imagick_r	128	294	1080	258	1240	<u>259</u>	<u>1230</u>	128	294	1080	258	1240	<u>259</u>	<u>1230</u>
544.nab_r	128	503	428	503	428	<u>503</u>	<u>428</u>	128	503	428	503	428	<u>503</u>	<u>428</u>
549.fotonik3d_r	128	1440	346	<u>1447</u>	<u>345</u>	1448	345	128	1440	346	<u>1447</u>	<u>345</u>	1448	345
554.roms_r	128	<u>1190</u>	<u>171</u>	1193	171	1190	171	64	527	193	530	192	<u>528</u>	<u>193</u>

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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"  
Kernel version used in not LTS and patch xx is applied

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
LD\_LIBRARY\_PATH = "/home/speccpu/cpu2017/lib/intel64:/home/speccpu/cpu2017/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>  
jemalloc, a general purpose malloc implementation

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## General Notes (Continued)

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

Sysinfo program /home/speccpu/cpu2017/bin/sysinfo  
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
running on intel Wed Jul 10 04:52:03 2024

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 (249.11-0ubuntu3.12)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. sysctl
15. /sys/kernel/mm/transparent\_hugepage
16. /sys/kernel/mm/transparent\_hugepage/khugepaged
17. OS release
18. Disk information
19. /sys/devices/virtual/dmi/id
20. dmidecode
21. BIOS

```
1. uname -a
Linux intel 6.5.0-41-generic #41~22.04.2-Ubuntu SMP PREEMPT_DYNAMIC Mon Jun  3 11:32:55 UTC 2 x86_64 x86_64
x86_64 GNU/Linux
```

```
2. w
04:52:03 up 17:11,  2 users,  load average: 73.95, 114.25, 122.43
USER   TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
intel  :1      :1               Tue11   ?xdm? 50:04  0.02s /usr/libexec/gdm-x-session --run-script env
GNOME_SHELL_SESSION_MODE=ubuntu /usr/bin/gnome-session --session=ubuntu
intel pts/1    -                20:20   8:31m 1.67s 0.17s sudo
./reportable-ic2023.2.3-lin-core-avx512-rate-smt-on-20231121.sh
```

```
3. Username
From environment variable $USER:  root
From the command 'logname':      intel
```

```
4. ulimit -a
```

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## Platform Notes (Continued)

```

time(seconds)          unlimited
file(blocks)           unlimited
data(kbytes)           unlimited
stack(kbytes)          unlimited
coredump(blocks)       0
memory(kbytes)         unlimited
locked memory(kbytes) 132056320
process                4126457
nofiles                1024
vmemory(kbytes)        unlimited
locks                  unlimited
rtprio                 0

```

```

-----
5. sysinfo process ancestry
/sbin/init splash
/lib/systemd/systemd --user
/usr/libexec/gnome-terminal-server
bash
sudo ./reportable-ic2023.2.3-lin-core-avx512-rate-smt-on-20231121.sh
sudo ./reportable-ic2023.2.3-lin-core-avx512-rate-smt-on-20231121.sh
sh ./reportable-ic2023.2.3-lin-core-avx512-rate-smt-on-20231121.sh
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
  ic2023.2.3-lin-core-avx512-rate-20231121.cfg --define smt-on --define cores=64 --define physicalfirst
  --define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
  ic2023.2.3-lin-core-avx512-rate-20231121.cfg --define smt-on --define cores=64 --define physicalfirst
  --define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
  --runmode rate --tune base:peak --size refrate fprate --note-preenv --logfile
  $SPEC/tmp/CPU2017.012/templogs/preenv.fprate.012.0.log --lognum 012.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/speccpu/cpu2017

```

```

-----
6. /proc/cpuinfo
model name      : Intel(R) Xeon(R) Gold 6338 CPU @ 2.00GHz
vendor_id      : GenuineIntel
cpu family     : 6
model          : 106
stepping       : 6
microcode      : 0xd0003d1
bugs           : apic_cle spectre_v1 spectre_v2 spec_store_bypass swapgs mmio_stale_data eibrs_pbrsb gds
               bhi
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.

```

```

-----
7. lscpu

From lscpu from util-linux 2.37.2:
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit

```

(Continued on next page)



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## Platform Notes (Continued)

```

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 6338 CPU @ 2.00GHz
CPU family:            6
Model:                 106
Thread(s) per core:    2
Core(s) per socket:    32
Socket(s):             2
Stepping:              6
CPU max MHz:           3200.0000
CPU min MHz:           800.0000
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 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 invpcid_single
                        intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow
                        flexpriority ept vpid ept_ad fsrsgbase 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
                        xsaves xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                        split_lock_detect wbnoinvd dtherm ida arat pln pts hwp hwp_act_window
                        hwp_epp hwp_pkg_req vnni avx512vbmi umip pku ospke avx512_vbmi2 gfni
                        vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57
                        rdpid fsrm md_clear pconfig flush_l1d arch_capabilities
Virtualization:        VT-x
L1d cache:             3 MiB (64 instances)
L1i cache:             2 MiB (64 instances)
L2 cache:              80 MiB (64 instances)
L3 cache:              96 MiB (2 instances)
NUMA node(s):         2
NUMA node0 CPU(s):    0-31,64-95
NUMA node1 CPU(s):    32-63,96-127
Vulnerability Gather data sampling: Mitigation; Microcode
Vulnerability Itlb multihit:        Not affected
Vulnerability L1tf:                 Not affected
Vulnerability Mds:                  Not affected
Vulnerability Meltdown:             Not affected
Vulnerability Mmio stale data:      Mitigation; Clear CPU buffers; SMT vulnerable
Vulnerability Retbleed:             Not affected
Vulnerability Spec rstack overflow: Not affected
Vulnerability Spec store bypass:    Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1:           Mitigation; usercopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2:           Mitigation; Enhanced / Automatic IBRS; IBPB conditional; RSB filling;
                                      PBR SB-eIBRS SW sequence; BHI Syscall hardening, KVM SW loop
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	1.3M	80M	20	Unified	2	1024	1	64
L3	48M	96M	12	Unified	3	65536	1	64

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## Platform Notes (Continued)

8. numactl --hardware

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

```
available: 2 nodes (0-1)
node 0 cpus: 0-31,64-95
node 0 size: 515669 MB
node 0 free: 485382 MB
node 1 cpus: 32-63,96-127
node 1 size: 516020 MB
node 1 free: 488486 MB
node distances:
node 0 1
0: 10 20
1: 20 10
```

9. /proc/meminfo

```
MemTotal: 1056450580 kB
```

10. who -r

```
run-level 5 Jul 9 11:41
```

11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.12)

```
Default Target Status
graphical running
```

12. Services, from systemctl list-unit-files

```
STATE UNIT FILES
enabled ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
accounts-daemon anacron anydesk apparmor avahi-daemon bluetooth console-setup cron cups
cups-browsed dmesg e2scrub_reap getty@ gpu-manager grub-common grub-initrd-fallback
irqbalance kerneloops keyboard-setup networkd-dispatcher openvpn power-profiles-daemon
rsyslog secureboot-db setvtrgb snapd ssh switcheroo-control systemd-oom systemd-pstore
systemd-resolved systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw
unattended-upgrades wpa_supplicant
enabled-runtime netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
disabled acpid brltty console-getty debug-shell nftables openvpn-client@ openvpn-server@ openvpn@
rsync rtkit-daemon serial-getty@ speech-dispatcherd systemd-boot-check-no-failures
systemd-network-generator systemd-networkd systemd-networkd-wait-online systemd-sysext
systemd-time-wait-sync upower wpa_supplicant-nl80211@ wpa_supplicant-wired@
wpa_supplicant@
generated apport speech-dispatcher
indirect saned@ spice-vdagentd uidd
masked alsa-utils cryptdisks cryptdisks-early hwclock pulseaudio-enable-autospawn rc rcS saned
screen-cleanup sudo x11-common
```

13. Linux kernel boot-time arguments, from /proc/cmdline

```
BOOT_IMAGE=/boot/vmlinuz-6.5.0-41-generic
root=UUID=eed05ad7-3678-4b37-aff7-318ba9064a38
ro
quiet
splash
vt.handoff=7
```

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## Platform Notes (Continued)

```

14. 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

-----
15. /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

-----
16. /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

-----
17. OS release
   From /etc/*-release /etc/*-version
   os-release Ubuntu 22.04.4 LTS

-----
18. Disk information
   SPEC is set to: /home/speccpu/cpu2017
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext4  879G  244G  591G  30% /

-----
19. /sys/devices/virtual/dmi/id
   Vendor:      Fusionstor
   Product:     Invento i6327
   Product Family: Family
   Serial:      i6327240317

-----
20. 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

```

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## Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

**Memory:**

16x NO DIMM NO DIMM  
16x Samsung M393A8G40CB4-CWE 64 GB 2 rank 3200

-----  
21. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: American Megatrends International, LLC.  
BIOS Version: W25.33.03  
BIOS Date: 11/16/2023  
BIOS Revision: 5.22

## 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 2023.2.3 Build x  
Copyright (C) 1985-2023 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 2023.2.3 Build x  
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.  
-----

=====  
C++, C | 511.povray\_r(base, peak) 526.blender\_r(base, peak)  
-----

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.  
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
Copyright (C) 1985-2023 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 2023.2.3 Build x  
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.  
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.  
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
Copyright (C) 1985-2023 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 2023.2.3 Build x  
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## Compiler Version Notes (Continued)

Fortran, C | 521.wrf\_r(base, peak) 527.cam4\_r(base, peak)

-----  
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
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## 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



# SPEC CPU®2017 Floating Point Rate Result

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**Fusionstor**  
(Test Sponsor: Meganet)

**SPECrate®2017\_fp\_base = 399**

**Invento i6327 (Intel Xeon Gold 6338 )**

**SPECrate®2017\_fp\_peak = 404**

**CPU2017 License:** 6221  
**Test Sponsor:** Meganet  
**Tested by:** Fusionstor system

**Test Date:** Jul-2024  
**Hardware Availability:** Dec-2021  
**Software Availability:** Nov-2023

## Base Optimization Flags

### C benchmarks:

```
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

### C++ benchmarks:

```
-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

### Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -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 -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -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 -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

### Benchmarks using Fortran, C, and C++:

```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -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

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**Test Sponsor:** Meganet  
**Tested by:** Fusionstor system

**Test Date:** Jul-2024  
**Hardware Availability:** Dec-2021  
**Software Availability:** Nov-2023

## Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

519.lbm\_r: basepeak = yes

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 -xCORE-AVX512 -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves\_r: basepeak = yes

549.fotonik3d\_r: basepeak = yes

554.roms\_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops

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# SPEC CPU®2017 Floating Point Rate Result

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## Peak Optimization Flags (Continued)

554.roms\_r (continued):

```
-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 -xCORE-AVX512 -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-Wno-implicit-int -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.profdata(pass 2) -xCORE-AVX2(pass 1)  
-flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse  
-funroll-loops -qopt-mem-layout-trans=4 -Wno-implicit-int  
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

526.blender\_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -Wno-implicit-int -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-ic2023p2-official-linux64.html>  
<http://www.spec.org/cpu2017/flags/Fusionstor-Platform-Flags-Intel-ICX-rev3.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml>  
<http://www.spec.org/cpu2017/flags/Fusionstor-Platform-Flags-Intel-ICX-rev3.xml>

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