SPEC CPU®2017 Floating Point Rate Result

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Fusionstor
(Test Sponsor: Meganet)
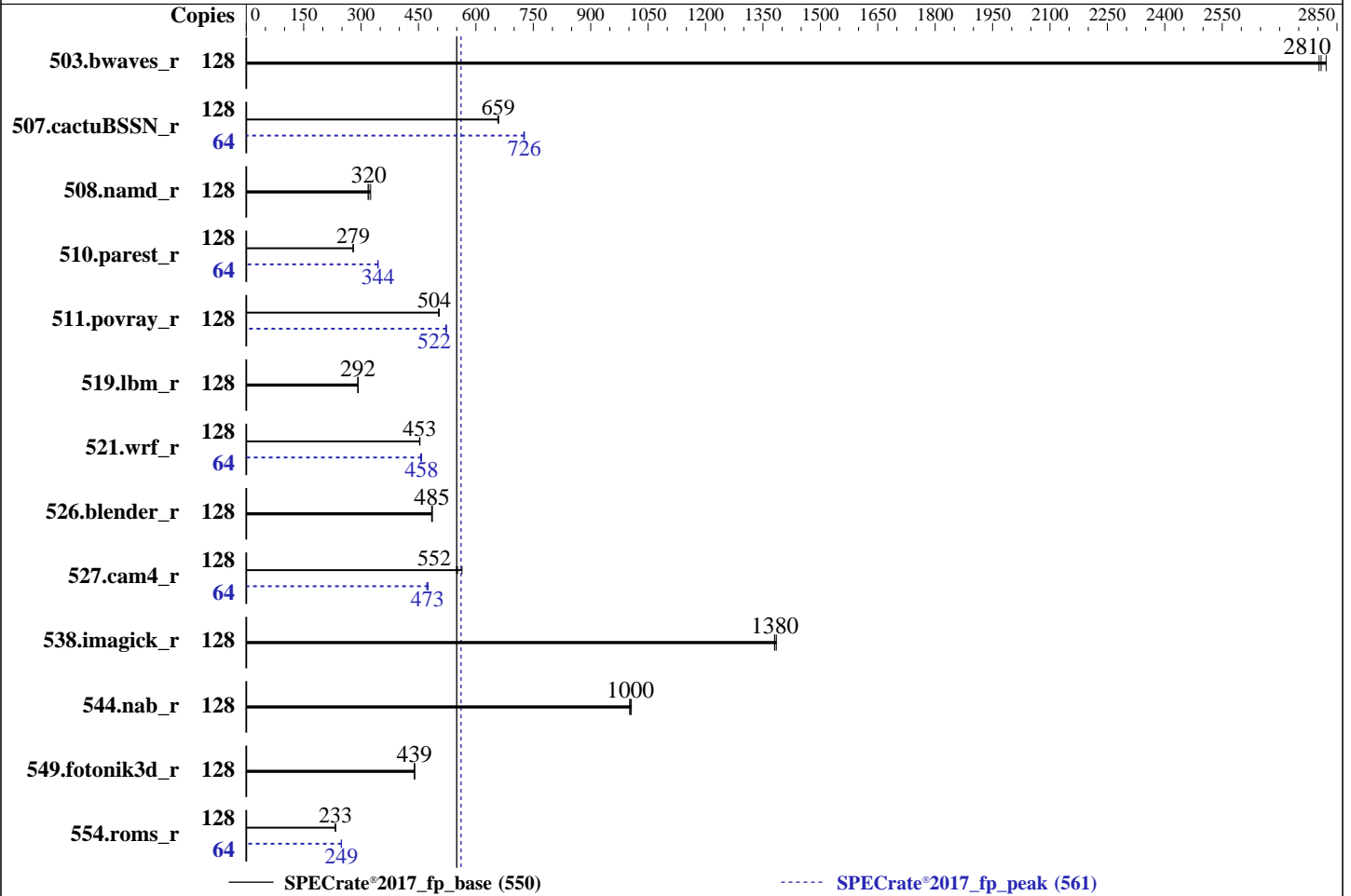
Invento i6000 (Intel Xeon Gold 6430)

$SPECrate®2017\_fp\_base = 550$

$SPECrate®2017\_fp\_peak = 561$

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

Test Date: Jul-2024
Hardware Availability: Dec-2022
Software Availability: Jun-2024

Copies		
503.bwaves_r	**128**	2810
507.cactuBSSN_r	**128**	659
	64	726
508.namd_r	**128**	320
510.parest_r	**128**	279
	64	344
511.povray_r	**128**	504
		522
519.lbm_r	**128**	292
521.wrf_r	**128**	453
	64	458
526.blender_r	**128**	485
527.cam4_r	**128**	552
	64	473
538.imagick_r	**128**	1380
544.nab_r	**128**	1000
549.fotonik3d_r	**128**	439
554.roms_r	**128**	233
	64	249

─── SPECrate®2017_fp_base (550)   ----- SPECrate®2017_fp_peak (561)

Hardware

CPU Name: Intel Xeon Gold 6430
 Max MHz: 3400
 Nominal: 2100
Enabled: 64 cores, 2 chips, 2 threads/core
Orderable: 1-2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 60 MB I+D on chip per chip
 Other: None
Memory: 2 TB (32 x 64 GB 2Rx4 PC5-4800B-R, running at 4400)
Storage: 960 GB SATA SSD
Other: CPU Cooling: Air

Software

OS: Ubuntu 22.04.2 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 EG25.05.01 released Oct-2023
File System: ext4
System State: Run level 5 (multi user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: Default

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SPECrate®2017_fp_base = 550

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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	458	2800	**457**	**2810**	455	2820	128	458	2800	**457**	**2810**	455	2820
507.cactuBSSN_r	128	**246**	**659**	247	657	246	659	64	112	725	112	727	**112**	**726**
508.namd_r	128	**380**	**320**	374	325	382	318	128	**380**	**320**	374	325	382	318
510.parest_r	128	**1198**	**279**	1198	280	1199	279	64	486	344	487	344	**487**	**344**
511.povray_r	128	**593**	**504**	595	503	593	504	128	573	521	**573**	**522**	571	523
519.lbm_r	128	461	293	463	291	**462**	**292**	128	461	293	463	291	**462**	**292**
521.wrf_r	128	633	453	**633**	**453**	632	454	64	313	458	**313**	**458**	315	456
526.blender_r	128	**402**	**485**	401	486	403	484	128	**402**	**485**	401	486	403	484
527.cam4_r	128	**406**	**552**	397	564	407	550	64	237	472	**237**	**473**	235	475
538.imagick_r	128	230	1390	231	1380	**230**	**1380**	128	230	1390	231	1380	**230**	**1380**
544.nab_r	128	214	1010	**215**	**1000**	215	1000	128	214	1010	**215**	**1000**	215	1000
549.fotonik3d_r	128	**1135**	**439**	1134	440	1135	439	128	**1135**	**439**	1134	440	1135	439
554.roms_r	128	874	233	871	233	**872**	**233**	64	**409**	**249**	410	248	409	249
SPECrate®2017_fp_base =		**550**												
SPECrate®2017_fp_peak =		**561**												

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/speccpu/cpu2017/lib/intel64:/home/speccpu/cpu2017/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>
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
```

(Continued on next page)

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General Notes (Continued)

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 Thu Jul 11 23:00:58 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. Failed units, from systemctl list-units --state=failed
 13. Services, from systemctl list-unit-files
 14. Linux kernel boot-time arguments, from /proc/cmdline
 15. 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 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
  23:00:58 up 2 days, 11:34,  2 users,  load average: 68.80, 112.08, 121.19
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  intel    :1       :1               Tue18    ?xdm?  1:05m  0.00s /usr/libexec/gdm-x-session --run-script env
  GNOME_SHELL_SESSION_MODE=ubuntu /usr/bin/gnome-session --session=ubuntu
  intel    pts/2    -                14:39    8:21m  1.44s  0.05s sudo
  ./reportable-ic2023.2.3-lin-sapphirerapids-rate-smt-on-20231121.sh

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


-------------------------------------------------------------
4. ulimit -a
```

(Continued on next page)

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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)  264178884
  process                8255288
  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-sapphirerapids-rate-smt-on-20231121.sh
  sudo ./reportable-ic2023.2.3-lin-sapphirerapids-rate-smt-on-20231121.sh
  sh ./reportable-ic2023.2.3-lin-sapphirerapids-rate-smt-on-20231121.sh
  runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 -c
    ic2023.2.3-lin-sapphirerapids-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-sapphirerapids-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 --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.022/templogs/preenv.fprate.022.0.log --lognum 022.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
  $SPEC = /home/speccpu/cpu2017


  ------------------------------------------------------------
6. /proc/cpuinfo
    model name       : Intel(R) Xeon(R) Gold 6430
    vendor_id        : GenuineIntel
    cpu family       : 6
    model            : 143
    stepping         : 8
    microcode        : 0x2b0005c0
    bugs             : coma tlb_mmatch spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb 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
  Address sizes:                   52 bits physical, 57 bits virtual
```

(Continued on next page)

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Platform Notes (Continued)

```
Byte Order:                        Little Endian
CPU(s):                            128
On-line CPU(s) list:               0-127
Vendor ID:                         GenuineIntel
Model name:                        Intel(R) Xeon(R) Gold 6430
CPU family:                        6
Model:                             143
Thread(s) per core:                2
Core(s) per socket:                32
Socket(s):                         2
Stepping:                          8
CPU max MHz:                        2100.0000
CPU min MHz:                        800.0000
BogoMIPS:                          4200.00
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 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
                                   arat pln pts vnmi 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 ibt amx_bf16 avx512_fp16 amx_tile
                                   amx_int8 flush_l1d arch_capabilities
Virtualization:                    VT-x
L1d cache:                         3 MiB (64 instances)
L1i cache:                         2 MiB (64 instances)
L2 cache:                          128 MiB (64 instances)
L3 cache:                          120 MiB (2 instances)
NUMA node(s):                      2
NUMA node0 CPU(s):                 0-31,64-95
NUMA node1 CPU(s):                 32-63,96-127
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:       Not affected
Vulnerability L1tf:                Not affected
Vulnerability Mds:                 Not affected
Vulnerability Meltdown:            Not affected
Vulnerability Mmio stale data:     Not affected
Vulnerability Retbleed:            Not affected
Vulnerability Spec rstack overflow: 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 / Automatic IBRS; IBPB conditional; RSB filling;
                                   PBRSB-eIBRS SW sequence; BHI BHI_DIS_S
Vulnerability Srbds:               Not affected
Vulnerability Tsx async abort:     Not affected

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

(Continued on next page)

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Platform Notes (Continued)

```
     L3          60M      120M    15 Unified          3 65536          1               64


          ------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0-31,64-95
  node 0 size: 1031781 MB
  node 0 free: 998317 MB
  node 1 cpus: 32-63,96-127
  node 1 size: 1032115 MB
  node 1 free: 1003372 MB
  node distances:
  node   0   1
    0:  10  21
    1:  21  10


          ------------------------------------------------------------
9. /proc/meminfo
  MemTotal:       2113431080 kB


          ------------------------------------------------------------
10. who -r
  run-level 5 Jul 9 11:27


          ------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.12)
  Default Target  Status
  graphical       degraded


          ------------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
    UNIT                              LOAD   ACTIVE SUB    DESCRIPTION
  * NetworkManager-wait-online.service loaded failed failed Network Manager Wait Online


          ------------------------------------------------------------
13. 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-oomd systemd-pstore
                   systemd-resolved systemd-timesyncd teamviewerd 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 tlp upower wpa_supplicant-nl80211@ wpa_supplicant-wired@
                   wpa_supplicant@
  generated        apport cpufrequtils loadcpufreq speech-dispatcher
  indirect         saned@ spice-vdagentd uuidd
  masked           alsa-utils cryptdisks cryptdisks-early hwclock pulseaudio-enable-autospawn rc rcS saned
                   screen-cleanup sudo systemd-rfkill x11-common


          ------------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-6.5.0-41-generic
  root=UUID=073562bb-1438-42b9-adfa-6a6f7f3d3559
```

(Continued on next page)

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Platform Notes (Continued)

```
   ro
   quiet
   splash
   vt.handoff=7

    ----------------------------------------------------------
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        1500
   vm.dirty_ratio                   20
   vm.dirty_writeback_centisecs     1500
   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


    ----------------------------------------------------------
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 Ubuntu 22.04.4 LTS


    ----------------------------------------------------------
19. Disk information
SPEC is set to: /home/speccpu/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      ext4  879G  524G  310G  63% /


    ----------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:         Fusionstor
    Product:        Invento_i6000
    Product Family: SG_Intel_EagleStream
```

(Continued on next page)

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Platform Notes (Continued)

```
     Serial:          HQ3110001BDA03CD0002


     -------------------------------------------------------------
 21. 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:
       32x Samsung M321R8GA0BB0-CQKZJ 64 GB 2 rank 4800, configured at 4400



     -------------------------------------------------------------
 22. BIOS
 (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:      American Megatrends International, LLC.
    BIOS Version:     EG25.05.01
    BIOS Date:        10/30/2023
    BIOS Revision:    5.31
```

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

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Compiler Version Notes (Continued)

```
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, 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
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.
------------------------------------------------------------------------------------------------
```

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`

(Continued on next page)

https://www.spec.org/

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Fusionstor
(Test Sponsor: Meganet)

Invento i6000 (Intel Xeon Gold 6430)

SPECrate®2017_fp_base = 550

SPECrate®2017_fp_peak = 561

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

Test Date: Jul-2024
Hardware Availability: Dec-2022
Software Availability: Jun-2024

Base Portability Flags (Continued)

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
-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
```

SPEC CPU®2017 Floating Point Rate Result

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Fusionstor
(Test Sponsor: Meganet)

Invento i6000 (Intel Xeon Gold 6430)

$SPECrate^{®}2017\_fp\_base = 550$

$SPECrate^{®}2017\_fp\_peak = 561$

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

Test Date: Jul-2024
Hardware Availability: Dec-2022
Software Availability: Jun-2024

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`

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`

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SPEC CPU®2017 Floating Point Rate Result

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Invento i6000 (Intel Xeon Gold 6430)

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CPU2017 License: 6221		**Test Date:**	Jul-2024
Test Sponsor: Meganet		**Hardware Availability:**	Dec-2022
Tested by: Fusionstor system		**Software Availability:**	Jun-2024

Peak Optimization Flags (Continued)

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: `-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++:

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`
`-mprefer-vector-width=512 -ljemalloc`
`-L/usr/local/jemalloc64-5.0.1/lib`

526.blender_r: basepeak = yes

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-ic2023p2-official-linux64.html
http://www.spec.org/cpu2017/flags/Fusionstor-Platform-Flags-Intel-ICX-rev5.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-rev5.xml

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CPU2017 License:	6221	**Test Date:**	Jul-2024
Test Sponsor:	Meganet	**Hardware Availability:**	Dec-2022
Tested by:	Fusionstor system	**Software Availability:**	Jun-2024

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

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