



# SPEC CPU®2017 Floating Point Rate Result

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## xFusion

SPECrate®2017\_fp\_base = 484

FusionServer 2288H V7 (Intel Xeon Platinum 8444H)

SPECrate®2017\_fp\_peak = 486

CPU2017 License: 6488

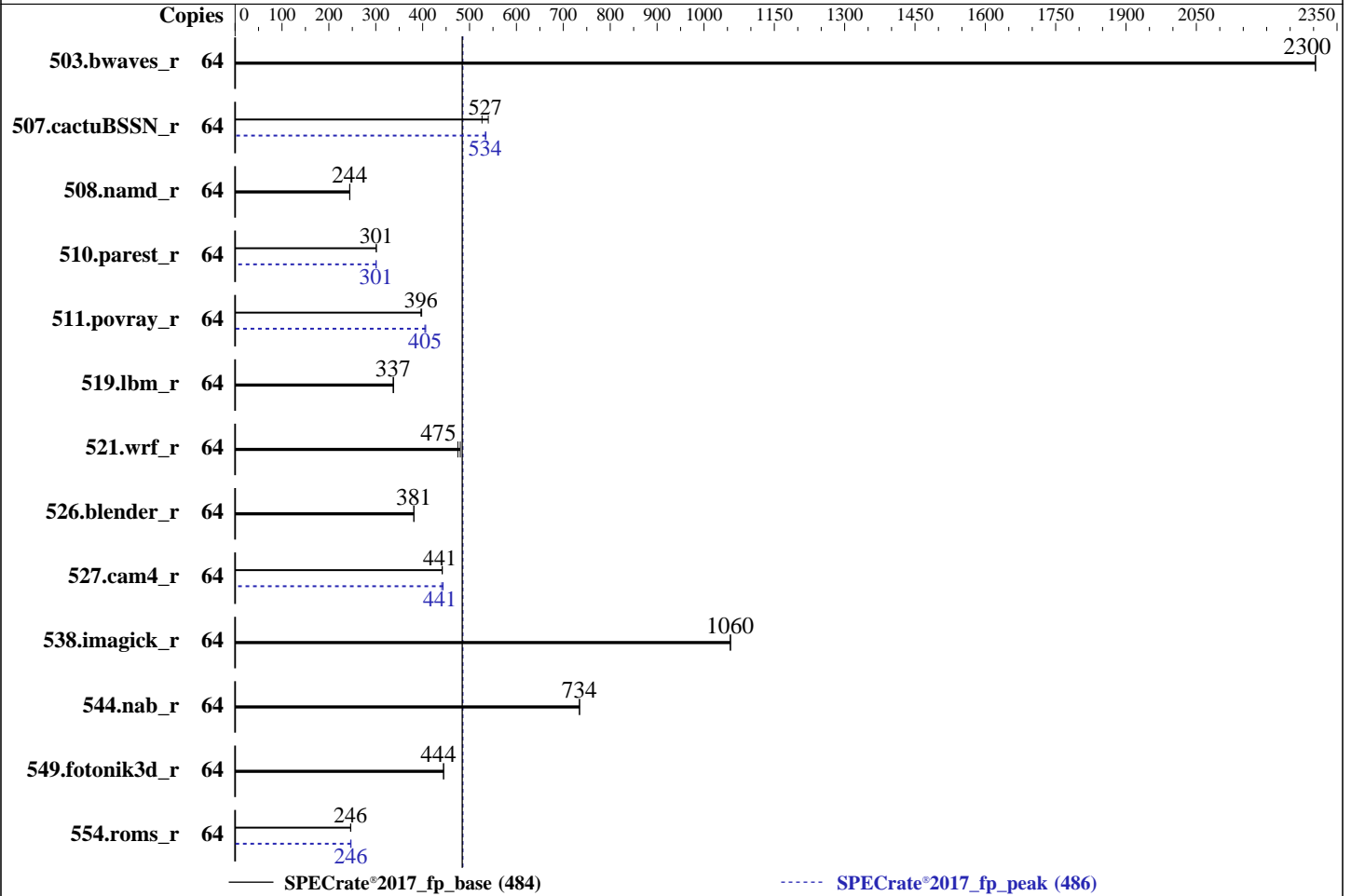
Test Sponsor: xFusion

Tested by: xFusion

Test Date: Jul-2023

Hardware Availability: Jan-2023

Software Availability: Dec-2022



### Hardware

CPU Name: Intel Xeon Platinum 8444H  
 Max MHz: 4000  
 Nominal: 2900  
 Enabled: 32 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)  
 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	64	<u>279</u>	<u>2300</u>	279	2300			64	<u>279</u>	<u>2300</u>	279	2300		
507.cactuBSSN_r	64	<u>154</u>	<u>527</u>	150	540			64	<u>152</u>	<u>534</u>	151	535		
508.namd_r	64	<u>249</u>	<u>244</u>	249	245			64	<u>249</u>	<u>244</u>	249	245		
510.parest_r	64	<u>556</u>	<u>301</u>	556	301			64	<u>557</u>	<u>301</u>	556	301		
511.povray_r	64	<u>377</u>	<u>396</u>	375	398			64	<u>369</u>	<u>405</u>	368	407		
519.lbm_r	64	200	338	<u>200</u>	<u>337</u>			64	200	338	<u>200</u>	<u>337</u>		
521.wrf_r	64	<u>302</u>	<u>475</u>	299	480			64	<u>302</u>	<u>475</u>	299	480		
526.blender_r	64	256	381	<u>256</u>	<u>381</u>			64	256	381	<u>256</u>	<u>381</u>		
527.cam4_r	64	253	442	<u>254</u>	<u>441</u>			64	252	444	<u>254</u>	<u>441</u>		
538.imagick_r	64	<u>151</u>	<u>1060</u>	151	1060			64	<u>151</u>	<u>1060</u>	151	1060		
544.nab_r	64	147	735	<u>147</u>	<u>734</u>			64	147	735	<u>147</u>	<u>734</u>		
549.fotonik3d_r	64	561	445	<u>561</u>	<u>444</u>			64	561	445	<u>561</u>	<u>444</u>		
554.roms_r	64	412	247	<u>413</u>	<u>246</u>			64	<u>413</u>	<u>246</u>	411	247		

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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/spec2017-1.1.9-ic2023/lib/intel64:/home/spec2017-1.1.9-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 SNC4 (4-clusters)

Sysinfo program /home/spec2017-1.1.9-ic2023/bin/sysinfo  
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
running on localhost.localdomain Mon Jul 17 21:05:49 2023

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

-----  
Table of contents  
-----

1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 250 (250-6.el9\_0)
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. cpupower frequency-info
16. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent\_hugepage
19. /sys/kernel/mm/transparent\_hugepage/khugepaged
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
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  
21:05:49 up 3:37, 1 user, load average: 16.13, 48.22, 57.79  
USER TTY LOGIN@ IDLE JCPU PCPU WHAT  
root tty1 17:35 3:29m 1.22s 0.07s -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) 2060221
   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) 2060221
   virtual memory              (kbytes, -v) unlimited
   file locks                  (-x) unlimited

-----
5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 18
   login -- root
   -bash
   -bash
   runcpu --define default-platform-flags --copies 64 -c ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define
   smt-on --define cores=32 --define physicalfirst --define invoke_with_interleave --define drop_caches
   --tune base,peak --iterations 2 -o all fprate
   runcpu --define default-platform-flags --copies 64 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=32 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --iterations 2 --output_format all
   --nopower --runmode rate --tune base:peak --size refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.142/templogs/preenv.fprate.142.0.log --lognum 142.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/spec2017-1.1.9-ic2023

-----
6. /proc/cpuinfo
   model name      : Intel(R) Xeon(R) Platinum 8444H
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 143
   stepping        : 6
   microcode       : 0x2b000111
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
   cpu cores       : 16
   siblings        : 32
   2 physical ids (chips)
   64 processors (hardware threads)
   physical id 0: core ids 0-15
   physical id 1: core ids 0-15
   physical id 0: apicids 0-31
   physical id 1: apicids 128-159
   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):                 64
On-line CPU(s) list:   0-63
Vendor ID:              GenuineIntel
BIOS Vendor ID:        Intel(R) Corporation
Model name:             Intel(R) Xeon(R) Platinum 8444H
BIOS Model name:       Intel(R) Xeon(R) Platinum 8444H
CPU family:            6
Model:                 143
Thread(s) per core:    2
Core(s) per socket:    16
Socket(s):              2
Stepping:               6
BogoMIPS:               5800.00
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_l1d arch_capabilities

```

```

Virtualization:        VT-x
L1d cache:             1.5 MiB (32 instances)
L1i cache:             1 MiB (32 instances)
L2 cache:              64 MiB (32 instances)
L3 cache:              90 MiB (2 instances)
NUMA node(s):         8
NUMA node0 CPU(s):    0-3,32-35
NUMA node1 CPU(s):    4-7,36-39
NUMA node2 CPU(s):    8-11,40-43
NUMA node3 CPU(s):    12-15,44-47
NUMA node4 CPU(s):    16-19,48-51
NUMA node5 CPU(s):    20-23,52-55
NUMA node6 CPU(s):    24-27,56-59
NUMA node7 CPU(s):    28-31,60-63
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 vl: Mitigation; usercopy/swaps barriers and __user pointer sanitization

```

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### Platform Notes (Continued)

Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling  
Vulnerability Srbds: Not affected  
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	1.5M	12	Data	1	64	1	64
L1i	32K	1M	8	Instruction	1	64	1	64
L2	2M	64M	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: 8 nodes (0-7)
node 0 cpus: 0-3,32-35
node 0 size: 63571 MB
node 0 free: 56537 MB
node 1 cpus: 4-7,36-39
node 1 size: 64510 MB
node 1 free: 59600 MB
node 2 cpus: 8-11,40-43
node 2 size: 64510 MB
node 2 free: 60796 MB
node 3 cpus: 12-15,44-47
node 3 size: 64510 MB
node 3 free: 60843 MB
node 4 cpus: 16-19,48-51
node 4 size: 64510 MB
node 4 free: 60819 MB
node 5 cpus: 20-23,52-55
node 5 size: 64510 MB
node 5 free: 60873 MB
node 6 cpus: 24-27,56-59
node 6 size: 64473 MB
node 6 free: 57815 MB
node 7 cpus: 28-31,60-63
node 7 size: 64499 MB
node 7 free: 60853 MB
node distances:
node  0  1  2  3  4  5  6  7
0:  10 12 12 12 21 21 21 21
1:  12 10 12 12 21 21 21 21
2:  12 12 10 12 21 21 21 21
3:  12 12 12 10 21 21 21 21
4:  21 21 21 21 10 12 12 12
5:  21 21 21 21 12 10 12 12
6:  21 21 21 21 12 12 10 12
7:  21 21 21 21 12 12 12 10

```

9. /proc/meminfo

MemTotal: 527457680 kB

10. who -r

run-level 3 Jul 17 17:28

11. Systemd service manager version: systemd 250 (250-6.e19\_0)

(Continued on next page)



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### Platform Notes (Continued)

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 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 firewallld
               kvm_stat man-db-restart-cache-update nftables powertop rdisc rhsm rhsm-facts rpmdb-rebuild
               serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysex
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
```

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### Platform Notes (Continued)

```

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+madvise [madvise] never
enabled         [always] madvise 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
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/spec2017-1.1.9-ic2023
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   1.7T  115G  1.6T   7% /home

```

```

-----
22. /sys/devices/virtual/dmi/id
Vendor:          XFUSION
Product:         2288H 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

```

```

-----
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

```





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### 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
Copyright (C) 1985-2022 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 2023.0.0 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.
-----

=====
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
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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-----

=====
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
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-----

```

### Base Compiler Invocation

C benchmarks:  
icx

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

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**xFusion**

**SPECrate®2017\_fp\_base = 484**

**FusionServer 2288H V7 (Intel Xeon Platinum 8444H)**

**SPECrate®2017\_fp\_peak = 486**

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

**Test Date:** Jul-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** Dec-2022

## Base Compiler Invocation (Continued)

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

Benchmarks using both C and C++:

icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifx

## Base Portability Flags

503.bwaves\_r: -DSPEC\_LP64  
507.cactuBSSN\_r: -DSPEC\_LP64  
508.namd\_r: -DSPEC\_LP64  
510.parest\_r: -DSPEC\_LP64  
511.povray\_r: -DSPEC\_LP64  
519.lbm\_r: -DSPEC\_LP64  
521.wrf\_r: -DSPEC\_LP64 -DSPEC\_CASE\_FLAG -convert big\_endian  
526.blender\_r: -DSPEC\_LP64 -DSPEC\_LINUX -funsigned-char  
527.cam4\_r: -DSPEC\_LP64 -DSPEC\_CASE\_FLAG  
538.imagick\_r: -DSPEC\_LP64  
544.nab\_r: -DSPEC\_LP64  
549.fotonik3d\_r: -DSPEC\_LP64  
554.roms\_r: -DSPEC\_LP64

## Base Optimization Flags

C benchmarks:

-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math  
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast  
-ffast-math -flto -mfpmath=sse -funroll-loops

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# SPEC CPU®2017 Floating Point Rate Result

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xFusion

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FusionServer 2288H V7 (Intel Xeon Platinum 8444H)

SPECrate®2017\_fp\_peak = 486

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

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

## Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc  
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xsapfirerapids -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 -xsapfirerapids -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 -xsapfirerapids -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 -xsapfirerapids -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

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

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**xFusion**

SPECrate®2017\_fp\_base = 484

FusionServer 2288H V7 (Intel Xeon Platinum 8444H)

SPECrate®2017\_fp\_peak = 486

CPU2017 License: 6488

Test Sponsor: xFusion

Tested by: xFusion

Test Date: Jul-2023

Hardware Availability: Jan-2023

Software Availability: Dec-2022

## Peak Compiler Invocation (Continued)

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

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

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# SPEC CPU®2017 Floating Point Rate Result

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xFusion

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SPECrate®2017\_fp\_peak = 486

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

**Test Date:** Jul-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** Dec-2022

## Peak Optimization Flags (Continued)

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.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-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 2023-07-17 09:05:49-0400.

Report generated on 2023-08-18 11:05:11 by CPU2017 PDF formatter v6716.

Originally published on 2023-08-18.