# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

## xFusion

FusionServer 1288H V7 (Intel Xeon Gold 6428N)

$SPECspeed®2017\_fp\_base = 286$

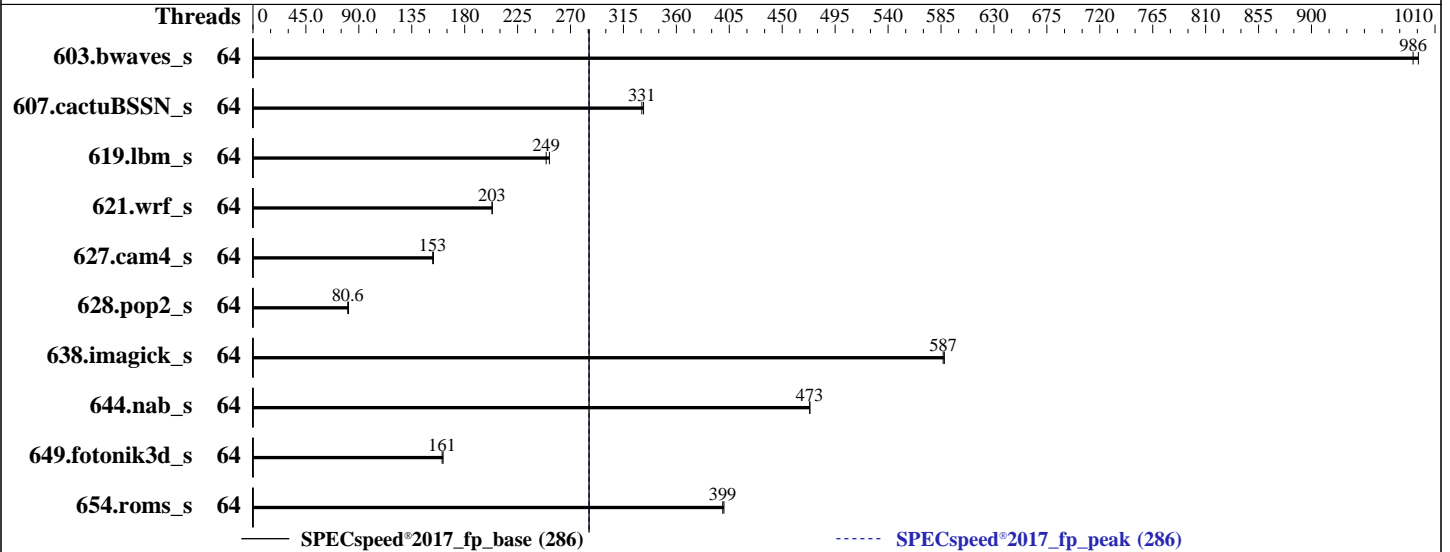$SPECspeed®2017\_fp\_peak = 286$

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

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

Threads scale: 0 45.0 90.0 135 180 225 270 315 360 405 450 495 540 585 630 675 720 765 810 855 900 1010

| Benchmark | Threads | Result |
|---|---|---|
| 603.bwaves_s | 64 | 986 |
| 607.cactuBSSN_s | 64 | 331 |
| 619.lbm_s | 64 | 249 |
| 621.wrf_s | 64 | 203 |
| 627.cam4_s | 64 | 153 |
| 628.pop2_s | 64 | 80.6 |
| 638.imagick_s | 64 | 587 |
| 644.nab_s | 64 | 473 |
| 649.fotonik3d_s | 64 | 161 |
| 654.roms_s | 64 | 399 |

SPECspeed®2017_fp_base (286)          SPECspeed®2017_fp_peak (286)

## Hardware

CPU Name: Intel Xeon Gold 6428N
 Max MHz: 3800
 Nominal: 1800
Enabled: 64 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: 60 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R, running at 4000)
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: Yes
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: OS set to prefer performance at the cost of additional power usage

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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 603.bwaves_s | 64 | **59.8** | **986** | 59.5 | 991 | | | 64 | **59.8** | **986** | 59.5 | 991 | | |
| 607.cactuBSSN_s | 64 | 50.2 | 332 | **50.4** | **331** | | | 64 | 50.2 | 332 | **50.4** | **331** | | |
| 619.lbm_s | 64 | **21.0** | **249** | 20.8 | 252 | | | 64 | **21.0** | **249** | 20.8 | 252 | | |
| 621.wrf_s | 64 | **65.1** | **203** | 65.0 | 204 | | | 64 | **65.1** | **203** | 65.0 | 204 | | |
| 627.cam4_s | 64 | 57.8 | 153 | **58.0** | **153** | | | 64 | 57.8 | 153 | **58.0** | **153** | | |
| 628.pop2_s | 64 | 146 | 81.3 | **147** | **80.6** | | | 64 | 146 | 81.3 | **147** | **80.6** | | |
| 638.imagick_s | 64 | 24.5 | 588 | **24.6** | **587** | | | 64 | 24.5 | 588 | **24.6** | **587** | | |
| 644.nab_s | 64 | 36.9 | 474 | **36.9** | **473** | | | 64 | 36.9 | 474 | **36.9** | **473** | | |
| 649.fotonik3d_s | 64 | **56.7** | **161** | 56.4 | 162 | | | 64 | **56.7** | **161** | 56.4 | 162 | | |
| 654.roms_s | 64 | 39.3 | 400 | **39.4** | **399** | | | 64 | 39.3 | 400 | **39.4** | **399** | | |
| SPECspeed®2017_fp_base = | | **286** | | | | | | | | | | | | |
| SPECspeed®2017_fp_peak = | | **286** | | | | | | | | | | | | |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## 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:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/spec2017-icc2023.0/lib/intel64:/spec2017-icc2023.0/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"
```

## 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
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
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
```

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## Platform Notes

```
BIOS configuration:
Performance Profile Set to Load Balance
Enable LP [Global] Set to Single LP

Sysinfo program /spec2017-icc2023.0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Thu Aug 10 11:07:25 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. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. 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
  11:07:25 up 3 min,  1 user,  load average: 0.03, 0.12, 0.06
  USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1       11:07   13.00s  0.92s  0.00s -bash


------------------------------------------------------------
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
```

# xFusion

$SPECspeed^{®}2017\_fp\_base = 286$

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| | | | |
|---|---|---|---|
| **CPU2017 License:** 6488 | | **Test Date:** | Aug-2023 |
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## Platform Notes (Continued)

```
   pending signals                       (-i) 2060157
   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) 2060157
   virtual memory             (kbytes, -v) unlimited
   file locks                            (-x) unlimited

   ------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
 login -- root
 -bash
 -bash
 runcpu --define default-platform-flags -c ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=64
   --tune base,peak --iterations 2 -o all --define drop_caches fpspeed
 runcpu --define default-platform-flags --configfile ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define
   cores=64 --tune base,peak --iterations 2 --output_format all --define drop_caches --nopower --runmode
   speed --tune base:peak --size refspeed fpspeed --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.139/templogs/preenv.fpspeed.139.0.log --lognum 139.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /spec2017-icc2023.0

   ------------------------------------------------------------
6. /proc/cpuinfo
   model name        : Intel(R) Xeon(R) Gold 6428N
   vendor_id         : GenuineIntel
   cpu family        : 6
   model             : 143
   stepping          : 7
   microcode         : 0x2b000111
   bugs              : spectre_v1 spectre_v2 spec_store_bypass swapgs
   cpu cores         : 32
   siblings          : 32
   2 physical ids (chips)
   64 processors (hardware threads)
   physical id 0: core ids 0-31
   physical id 1: core ids 0-31
   physical id 0: apicids
   0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62
   physical id 1: apicids
   128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174,176,178,1
   80,182,184,186,188,190
  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 2.37.4:
   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
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
On-line CPU(s) list:          0-63
Vendor ID:                    GenuineIntel
BIOS Vendor ID:               Intel(R) Corporation
Model name:                   Intel(R) Xeon(R) Gold 6428N
BIOS Model name:              Intel(R) Xeon(R) Gold 6428N
CPU family:                   6
Model:                        143
Thread(s) per core:           1
Core(s) per socket:           32
Socket(s):                    2
Stepping:                     7
Frequency boost:              enabled
CPU max MHz:                  1801.0000
CPU min MHz:                  800.0000
BogoMIPS:                     3600.00
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 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 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:                    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
NUMA node1 CPU(s):            32-63
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 v1:     Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:     Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds:          Not affected
Vulnerability Tsx async abort: Not affected

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
    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.
```

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**Test Date:** Aug-2023
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## Platform Notes (Continued)

```
   available: 2 nodes (0-1)
   node 0 cpus: 0-31
   node 0 size: 257103 MB
   node 0 free: 256107 MB
   node 1 cpus: 32-63
   node 1 size: 257993 MB
   node 1 free: 257197 MB
   node distances:
   node   0   1
     0:  10  21
     1:  21  10


   ------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       527459196 kB


   ------------------------------------------------------------
10. who -r
   run-level 3 Aug 10 11:03


   ------------------------------------------------------------
11. Systemd service manager version: systemd 250 (250-6.el9_0)
   Default Target  Status
   multi-user      degraded


   ------------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
     UNIT          LOAD    ACTIVE SUB    DESCRIPTION
   * sep5.service loaded failed failed systemd script to load sep5 driver at boot time


   ------------------------------------------------------------
13. Services, from systemctl list-unit-files
   STATE             UNIT FILES
   enabled           ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                     accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker gdm
                     getty@ insights-client-boot irqbalance iscsi iscsi-onboot kdump libstoragemgmt
                     low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname
                     nvmefc-boot-connections ostree-remount power-profiles-daemon qemu-guest-agent rhsmcertd
                     rsyslog rtkit-daemon selinux-autorelabel-mark sep5 smartd sshd sssd switcheroo-control
                     sysstat systemd-network-generator udisks2 upower vgauthd vmtoolsd
   enabled-runtime   systemd-remount-fs
   disabled          arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown
                     canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed
                     dbus-daemon debug-shell dnsmasq firewalld iprdump iprinit iprupdate iscsid iscsiuio kpatch
                     kvm_stat ledmon man-db-restart-cache-update nftables nvmf-autoconnect podman
                     podman-auto-update podman-restart psacct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts
                     rpmdb-rebuild serial-getty@ speech-dispatcherd sshd-keygen@ systemd-boot-check-no-failures
                     systemd-pstore systemd-sysext wpa_supplicant
   indirect          spice-vdagentd 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,gpt3)/boot/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
   root=UUID=cc4bab05-907e-44ef-b818-2b2874390234
   ro
   crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
   resume=UUID=5ba347ca-8beb-4f6e-9c11-de63dc4ddf5f
   rhgb
   quiet
```

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## xFusion

FusionServer 1288H V7 (Intel Xeon Gold 6428N)

$SPECspeed®2017\_fp\_base = 286$

$SPECspeed®2017\_fp\_peak = 286$

## Platform Notes (Continued)

```
--------------------------------------------------------------
15. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 800 MHz and 1.80 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes


--------------------------------------------------------------
16. 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


--------------------------------------------------------------
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/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


--------------------------------------------------------------
19. 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)


--------------------------------------------------------------
20. Disk information
SPEC is set to: /spec2017-icc2023.0
  Filesystem      Type  Size  Used Avail Use% Mounted on
```

**(Continued on next page)**

## xFusion

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## Platform Notes (Continued)

```
  /dev/sda3      xfs   420G   56G  365G  14% /


  -------------------------------------------------------------
 21. /sys/devices/virtual/dmi/id
     Vendor:        XFUSION
     Product:       1288H V7
     Product Family: Eagle Stream
     Serial:        serial


  -------------------------------------------------------------
 22. dmidecode
   Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
   determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
   "DMTF SMBIOS" standard.
   Memory:
     16x Samsung M321R4GA3BB6-CQKDG 32 GB 2 rank 4800, configured at 4000


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

## Compiler Version Notes

```
==============================================================================
C            | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(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, Fortran | 607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran      | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(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   | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(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.
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$\text{SPECspeed}^{®}2017\_fp\_peak = 286$

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

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

## Compiler Version Notes (Continued)

```
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`

Fortran benchmarks:
`ifx`

Benchmarks using both Fortran and C:
`ifx icx`

Benchmarks using Fortran, C, and C++:
`icpx icx ifx`

# Base Portability Flags

603.bwaves_s: `-DSPEC_LP64`
607.cactuBSSN_s: `-DSPEC_LP64`
619.lbm_s: `-DSPEC_LP64`
621.wrf_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
627.cam4_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
628.pop2_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian -assume byterecl`
638.imagick_s: `-DSPEC_LP64`
644.nab_s: `-DSPEC_LP64`
649.fotonik3d_s: `-DSPEC_LP64`
654.roms_s: `-DSPEC_LP64`

# Base Optimization Flags

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

Fortran benchmarks:
`-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xsapphirerapids -Ofast`

**(Continued on next page)**

# SPEC CPU®2017 Floating Point Speed Result

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## xFusion

FusionServer 1288H V7 (Intel Xeon Gold 6428N)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 286

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

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

## Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using both Fortran and C:
```
-m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:
```
-m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -Wno-implicit-int
-mprefer-vector-width=512 -nostandard-realloc-lhs -align array32byte
-auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

## Peak Compiler Invocation

C benchmarks:
```
icx
```

Fortran benchmarks:
```
ifx
```

Benchmarks using both Fortran and C:
```
ifx icx
```

Benchmarks using Fortran, C, and C++:
```
icpx icx ifx
```

## Peak Portability Flags

```
Same as Base Portability Flags
```

# SPEC CPU®2017 Floating Point Speed Result

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## xFusion

FusionServer 1288H V7 (Intel Xeon Gold 6428N)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 286

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

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

# Peak Optimization Flags

C benchmarks:

  619.lbm_s: `basepeak = yes`

  638.imagick_s: `basepeak = yes`

  644.nab_s: `basepeak = yes`

Fortran benchmarks:

  603.bwaves_s: `basepeak = yes`

  649.fotonik3d_s: `basepeak = yes`

  654.roms_s: `basepeak = yes`

Benchmarks using both Fortran and C:

  621.wrf_s: `basepeak = yes`

  627.cam4_s: `basepeak = yes`

  628.pop2_s: `basepeak = yes`

Benchmarks using Fortran, C, and C++:

  607.cactuBSSN_s: `basepeak = yes`

---

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html`
`http://www.spec.org/cpu2017/flags/xFusion-Platform-Settings-SPR-V1.1-revC.html`

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

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