SPEC CPU®2017 Floating Point Speed Result

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xFusion

FusionServer 2288H V7 (Intel Xeon Platinum 8592+)

$SPECspeed®2017\_fp\_base = 428$

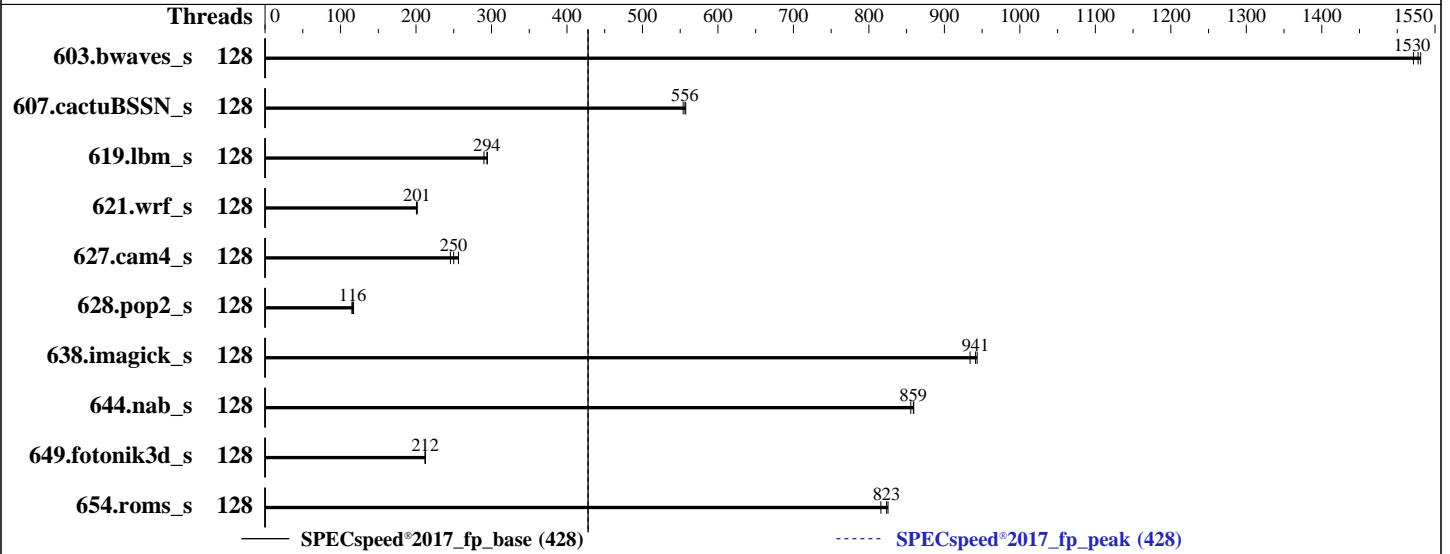$SPECspeed®2017\_fp\_peak = 428$

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

Test Date: Jun-2024
Hardware Availability: Dec-2023
Software Availability: Apr-2024

Threads

Benchmark	Threads	Result
603.bwaves_s	128	1530
607.cactuBSSN_s	128	556
619.lbm_s	128	294
621.wrf_s	128	201
627.cam4_s	128	250
628.pop2_s	128	116
638.imagick_s	128	941
644.nab_s	128	859
649.fotonik3d_s	128	212
654.roms_s	128	823

SPECspeed®2017_fp_base (428)   SPECspeed®2017_fp_peak (428)

Hardware

CPU Name: Intel Xeon Platinum 8592+
  Max MHz: 3900
  Nominal: 1900
Enabled: 128 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: 320 MB I+D on chip per chip
  Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-5600B-R)
Storage: 1 x 960 GB SATA SSD
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.2 (Plow)
  5.14.0-284.11.1.el9_2.x86_64
Compiler: C/C++: Version 2024.0.2 of Intel oneAPI DPC++/C++ Compiler for Linux;
  Fortran: Version 2024.0.2 of Intel Fortran Compiler for Linux;
Parallel: Yes
Firmware: Version 01.01.03.05 Released Apr-2024
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					
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	128	**38.6**	**1530**	38.8	1520	38.5	1530	128	**38.6**	**1530**	38.8	1520	38.5	1530
607.cactuBSSN_s	128	29.9	557	**30.0**	**556**	30.1	554	128	29.9	557	**30.0**	**556**	30.1	554
619.lbm_s	128	17.8	295	**17.8**	**294**	18.1	290	128	17.8	295	**17.8**	**294**	18.1	290
621.wrf_s	128	**65.7**	**201**	65.9	201	65.6	201	128	**65.7**	**201**	65.9	201	65.6	201
627.cam4_s	128	34.6	256	36.1	246	**35.5**	**250**	128	34.6	256	36.1	246	**35.5**	**250**
628.pop2_s	128	101	117	**102**	**116**	103	115	128	101	117	**102**	**116**	103	115
638.imagick_s	128	15.3	943	15.4	934	**15.3**	**941**	128	15.3	943	15.4	934	**15.3**	**941**
644.nab_s	128	**20.3**	**859**	20.4	855	20.3	859	128	**20.3**	**859**	20.4	855	20.3	859
649.fotonik3d_s	128	**43.0**	**212**	42.9	213	43.0	212	128	**43.0**	**212**	42.9	213	43.0	212
654.roms_s	128	19.1	825	19.3	816	**19.1**	**823**	128	19.1	825	19.3	816	**19.1**	**823**
SPECspeed®2017_fp_base =		428											
SPECspeed®2017_fp_peak =		428											

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"
Kernel Boot Parameter set with : nohz_full=1-127
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017_2024/lib/intel64:/home/cpu2017_2024/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 Redhat Enterprise Linux 8.0
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.
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
ADDDC Sparing Set to Disabled

 Sysinfo program /home/cpu2017_2024/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Sat Jun 29 12:44:22 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 252 (252-13.el9_2)
 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 5.14.0-284.11.1.el9_2.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 12 10:45:03 EDT
   2023 x86_64 x86_64 x86_64 GNU/Linux


 ------------------------------------------------------------
 2. w
    12:44:22 up 18:50,  1 user,  load average: 5.47, 4.48, 2.68
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1       Fri18    18:31m 1.06s  0.01s sh run_speed.sh


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

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Platform Notes (Continued)

```
   scheduling priority             (-e) 0
   file size             (blocks, -f) unlimited
   pending signals                 (-i) 2060172
   max locked memory     (kbytes, -l) 8192
   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) 2060172
   virtual memory        (kbytes, -v) unlimited
   file locks                      (-x) unlimited


  ------------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 31
 login -- root
 -bash
 sh 2.sh
 sh run_speed.sh
 runcpu --nobuild --action validate --define default-platform-flags -c
   ic2024.0.2-lin-sapphirerapids-speed-20231213.cfg --define cores=128 --tune base,peak -o all --define
   drop_caches fpspeed
 runcpu --nobuild --action validate --define default-platform-flags --configfile
   ic2024.0.2-lin-sapphirerapids-speed-20231213.cfg --define cores=128 --tune base,peak --output_format all
   --define drop_caches --nopower --runmode speed --tune base:peak --size refspeed fpspeed --nopreenv
   --note-preenv --logfile $SPEC/tmp/CPU2017.002/templogs/preenv.fpspeed.002.0.log --lognum 002.0
   --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017_2024


  ------------------------------------------------------------
6. /proc/cpuinfo
   model name      : INTEL(R) XEON(R) PLATINUM 8592+
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 207
   stepping        : 2
   microcode       : 0x21000200
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
   cpu cores       : 64
   siblings        : 64
   2 physical ids (chips)
   128 processors (hardware threads)
   physical id 0: core ids 0-63
   physical id 1: core ids 0-63
   physical id 0: apicids
   0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70,72
   ,74,76,78,80,82,84,86,88,90,92,94,96,98,100,102,104,106,108,110,112,114,116,118,120,122,124,126
   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
   80,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212,214,216,218,220,222,224,226,228,230,23
   2,234,236,238,240,242,244,246,248,250,252,254
 Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
 virtualized systems.  Use the above data carefully.


  ------------------------------------------------------------
 7. lscpu
```

(Continued on next page)

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Test Date: Jun-2024

Hardware Availability: Dec-2023

Software Availability: Apr-2024

Platform Notes (Continued)

```
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):                      128
  On-line CPU(s) list:         0-127
  Vendor ID:                   GenuineIntel
  BIOS Vendor ID:              Intel(R) Corporation
  Model name:                  INTEL(R) XEON(R) PLATINUM 8592+
  BIOS Model name:             INTEL(R) XEON(R) PLATINUM 8592+
  CPU family:                  6
  Model:                       207
  Thread(s) per core:          1
  Core(s) per socket:          64
  Socket(s):                   2
  Stepping:                    2
  Frequency boost:             enabled
  CPU max MHz:                 1901.0000
  CPU min MHz:                 800.0000
  BogoMIPS:                    3800.00
  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 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 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 ibt amx_bf16
                               avx512_fp16 amx_tile amx_int8 flush_l1d arch_capabilities
  Virtualization:              VT-x
  L1d cache:                   6 MiB (128 instances)
  L1i cache:                   4 MiB (128 instances)
  L2 cache:                    256 MiB (128 instances)
  L3 cache:                    640 MiB (2 instances)
  NUMA node(s):                2
  NUMA node0 CPU(s):           0-63
  NUMA node1 CPU(s):           64-127
  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 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, PBRSB-eIBRS SW
                               sequence
  Vulnerability Srbds:         Not affected
  Vulnerability Tsx async abort: Not affected
```

(Continued on next page)

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Platform Notes (Continued)

```
From lscpu --cache:
    NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL   SETS PHY-LINE COHERENCY-SIZE
    L1d      48K       6M   12 Data             1     64       1              64
    L1i      32K       4M    8 Instruction      1     64       1              64
    L2        2M     256M   16 Unified          2   2048       1              64
    L3      320M     640M   20 Unified          3 262144       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: 0-63
      node 0 size: 257052 MB
      node 0 free: 256230 MB
      node 1 cpus: 64-127
      node 1 size: 258029 MB
      node 1 free: 255145 MB
      node distances:
      node   0   1
        0:  10  21
        1:  21  10


    ----------------------------------------------------------------
    9. /proc/meminfo
       MemTotal:       527443780 kB


    ----------------------------------------------------------------
    10. who -r
       run-level 3 Jun 28 17:54


    ----------------------------------------------------------------
    11. Systemd service manager version: systemd 252 (252-13.el9_2)
      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 firewalld getty@ insights-client-boot irqbalance kdump low-memory-monitor
                       mdmonitor microcode nis-domainname rhsmcertd rsyslog rtkit-daemon selinux-autorelabel-mark
                       sep5 smartd sshd sssd sysstat systemd-boot-update systemd-network-generator tuned udisks2
                       upower
      enabled-runtime  systemd-remount-fs
      disabled         canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot
                       chrony-wait console-getty cpupower debug-shell dnf-system-upgrade kvm_stat
                       man-db-restart-cache-update nftables pesign rdisc rhcd rhsm rhsm-facts rpmdb-rebuild
                       selinux-check-proper-disable serial-getty@ sshd-keygen@ systemd-boot-check-no-failures
                       systemd-pstore systemd-sysext
      indirect         sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo systemd-sysupdate
                       systemd-sysupdate-reboot


    ----------------------------------------------------------------
    14. Linux kernel boot-time arguments, from /proc/cmdline
      BOOT_IMAGE=(hd0,gpt5)/boot/vmlinuz-5.14.0-284.11.1.el9_2.x86_64
```

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Platform Notes (Continued)

```
  root=UUID=e7cc1b7d-5946-4ed4-8306-b2d382dc5709
  ro
  crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
  resume=UUID=937c2e4e-930c-4489-9a6c-cd05c9a2c08a
  nohz_full=1-127


  ----------------------------------------------------------
15. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 800 MHz and 1.90 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    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
  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


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

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Platform Notes (Continued)

```
  20. OS release
    From /etc/*-release /etc/*-version
    os-release     Red Hat Enterprise Linux 9.2 (Plow)
    redhat-release Red Hat Enterprise Linux release 9.2 (Plow)
    system-release Red Hat Enterprise Linux release 9.2 (Plow)

  ----------------------------------------------------------------
  21. Disk information
  SPEC is set to: /home/cpu2017_2024
    Filesystem    Type  Size  Used Avail Use% Mounted on
    /dev/sda5     xfs   690G  129G  562G  19% /

  ----------------------------------------------------------------
  22. /sys/devices/virtual/dmi/id
      Product:       2288H V7
      Product Family: Eagle Stream

  ----------------------------------------------------------------
  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:
      6x Samsung M321R4GA3PB0-CWMCH 32 GB 2 rank 5600
      8x Samsung M321R4GA3PB0-CWMJH 32 GB 2 rank 5600
      2x Samsung M321R4GA3PB0-CWMKH 32 GB 2 rank 5600


  ----------------------------------------------------------------
  24. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       INSYDE Corp.
    BIOS Version:      01.01.03.05
    BIOS Date:         04/12/2024
    BIOS Revision:     3.5
```

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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran        | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)
```

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Compiler Version Notes (Continued)

```
----------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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----------------------------------------------------------------------------------------


========================================================================================
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 2024.0.2 Build 20231213
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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----------------------------------------------------------------------------------------
```

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`

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SPEC CPU®2017 Floating Point Speed Result

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xFusion

FusionServer 2288H V7 (Intel Xeon Platinum 8592+)

$SPECspeed®2017\_fp\_base = 428$

$SPECspeed®2017\_fp\_peak = 428$

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

Test Date: Jun-2024
Hardware Availability: Dec-2023
Software Availability: Apr-2024

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 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -DSPEC_OPENMP -xsapphirerapids -Ofast
-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:
```
-w -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++:
```
-w -std=c++14 -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
```

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
```

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SPEC CPU®2017 Floating Point Speed Result

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xFusion

FusionServer 2288H V7 (Intel Xeon Platinum 8592+)

$SPECspeed^{®}2017\_fp\_base = 428$

$SPECspeed^{®}2017\_fp\_peak = 428$

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

Test Date: Jun-2024
Hardware Availability: Dec-2023
Software Availability: Apr-2024

Peak Portability Flags

Same as Base Portability Flags

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/xFusion-Platform-Settings-EMR-V1.1.html
 http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.html

You can also download the XML flags sources by saving the following links:
 http://www.spec.org/cpu2017/flags/xFusion-Platform-Settings-EMR-V1.1.xml
 http://www.spec.org/cpu2017/flags/Intel-ic2024-official-linux64.xml

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FusionServer 2288H V7 (Intel Xeon Platinum 8592+)

$SPECspeed®2017\_fp\_base = 428$

$SPECspeed®2017\_fp\_peak = 428$

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

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