SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

$SPECrate®2017\_fp\_base = 334$

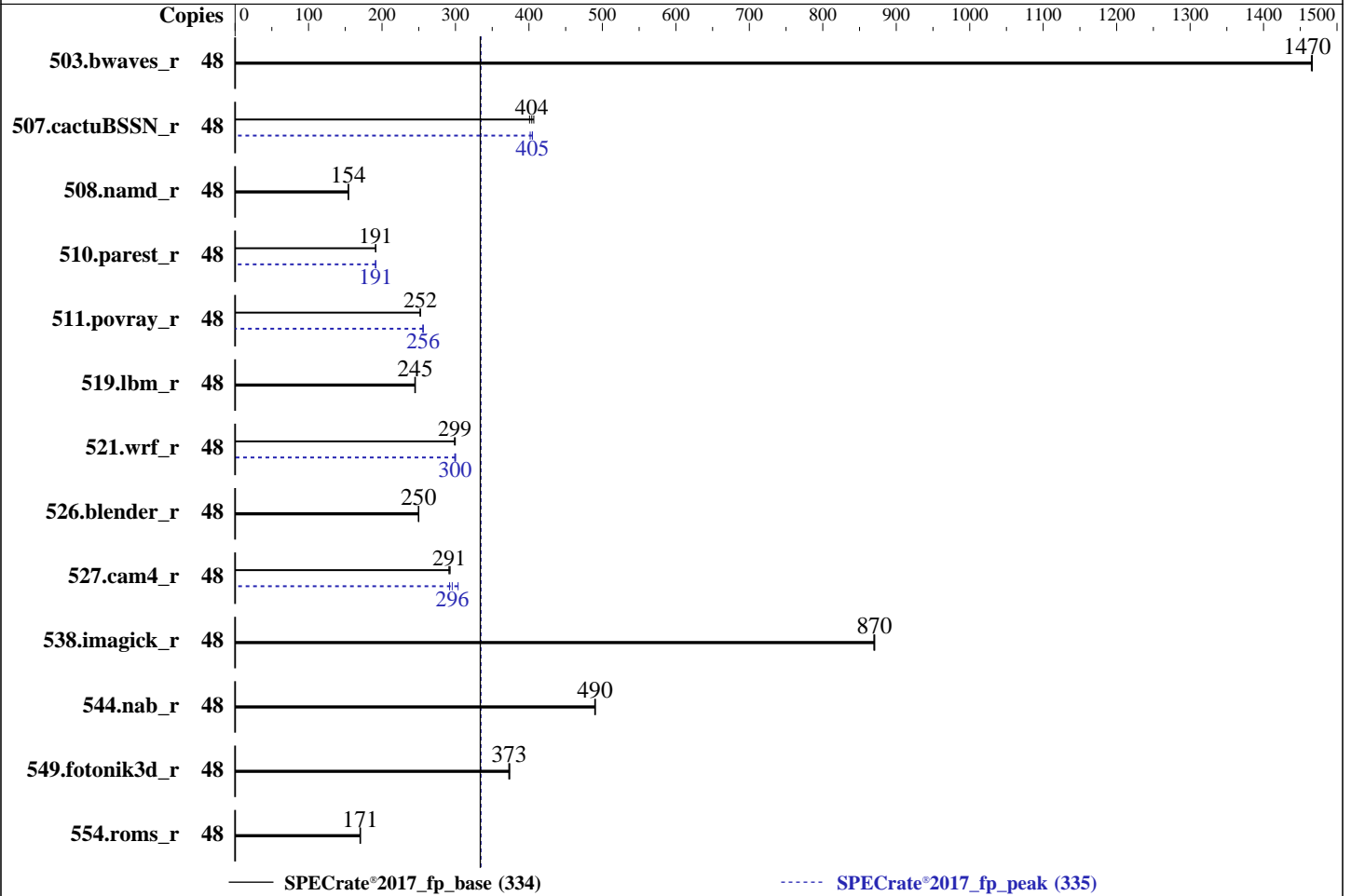$SPECrate®2017\_fp\_peak = 335$

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

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

Copies	
503.bwaves_r	48	1470
507.cactuBSSN_r	48	404 / 405
508.namd_r	48	154
510.parest_r	48	191 / 191
511.povray_r	48	252 / 256
519.lbm_r	48	245
521.wrf_r	48	299 / 300
526.blender_r	48	250
527.cam4_r	48	291 / 296
538.imagick_r	48	870
544.nab_r	48	490
549.fotonik3d_r	48	373
554.roms_r	48	171

SPECrate®2017_fp_base (334)   SPECrate®2017_fp_peak (335)

Hardware

CPU Name: Intel Xeon Silver 4510T
 Max MHz: 3700
 Nominal: 2000
Enabled: 24 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: 30 MB I+D on chip per chip
 Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-5600B-R, running at 4400)
Storage: 1 x 1.92 TB 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: No
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

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

CPU2017 License: 6488		**Test Date:**	Jun-2024
Test Sponsor:	xFusion	**Hardware Availability:**	Dec-2023
Tested by:	xFusion	**Software Availability:**	Dec-2023

Results Table

Benchmark	Base						Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	48	329	1470	**328**	**1470**	328	1470	48	329	1470	**328**	**1470**	328	1470
507.cactuBSSN_r	48	152	401	**150**	**404**	149	407	48	150	405	**150**	**405**	151	402
508.namd_r	48	**296**	**154**	296	154	296	154	48	**296**	**154**	296	154	296	154
510.parest_r	48	656	191	**656**	**191**	656	191	48	**656**	**191**	656	191	656	191
511.povray_r	48	445	252	**445**	**252**	444	252	48	**438**	**256**	438	256	438	256
519.lbm_r	48	207	245	**206**	**245**	206	245	48	207	245	**206**	**245**	206	245
521.wrf_r	48	**360**	**299**	359	300	360	299	48	**359**	**300**	360	299	358	300
526.blender_r	48	292	250	293	249	**293**	**250**	48	292	250	293	249	**293**	**250**
527.cam4_r	48	287	293	**288**	**291**	288	291	48	288	292	277	304	**284**	**296**
538.imagick_r	48	137	869	137	871	**137**	**870**	48	137	869	137	871	**137**	**870**
544.nab_r	48	165	490	165	490	**165**	**490**	48	165	490	165	490	**165**	**490**
549.fotonik3d_r	48	502	373	**501**	**373**	500	374	48	502	373	**501**	**373**	500	374
554.roms_r	48	**447**	**171**	449	170	447	171	48	**447**	**171**	449	170	447	171
SPECrate®2017_fp_base =		**334**										
SPECrate®2017_fp_peak =		**335**										

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

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
Kernel Boot Parameter set with : nohz_full=1-47
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Uniautos/speccpu2017/lib/intel64:/home/Uniautos/speccpu2017/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>
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
```

(Continued on next page)

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

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

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

General Notes (Continued)

```
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
```

Platform Notes

```
BIOS configuration:
Performance Profile Set to Performance
SNC Set to Enable SNC2 (2-clusters)
Enable LP [Global] Set to ALL LPs

 Sysinfo program /home/Uniautos/speccpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Fri Jun  7 00:57:28 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
    00:57:28 up  5:59,  1 user,  load average: 30.52, 43.51, 46.16
```

(Continued on next page)

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

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

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

Platform Notes (Continued)

```
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1       19:01    5:55m  1.42s  0.06s -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
    pending signals                     (-i) 2060223
    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) 2060223
    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
   -bash
   runcpu --define default-platform-flags --copies 48 -c ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg
     --define smt-on --define cores=24 --define physicalfirst --define invoke_with_interleave --define
     drop_caches --tune base,peak -o all fprate
   runcpu --define default-platform-flags --copies 48 --configfile
     ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=24 --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/CPU2017.077/templogs/preenv.fprate.077.0.log --lognum 077.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
  $SPEC = /home/Uniautos/speccpu2017


  -------------------------------------------------------------
  6. /proc/cpuinfo
     model name        : INTEL(R) XEON(R) SILVER 4510T
     vendor_id         : GenuineIntel
     cpu family        : 6
     model             : 143
     stepping          : 8
     microcode         : 0x2b000590
     bugs              : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
     cpu cores         : 12
     siblings          : 24
     2 physical ids (chips)
     48 processors (hardware threads)
     physical id 0: core ids 0-11
     physical id 1: core ids 0-11
     physical id 0: apicids 0-23
```

(Continued on next page)

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

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

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

Platform Notes (Continued)

```
     physical id 1: apicids 64-87
  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):                    48
    On-line CPU(s) list:       0-47
    Vendor ID:                 GenuineIntel
    BIOS Vendor ID:            Intel(R) Corporation
    Model name:                INTEL(R) XEON(R) SILVER 4510T
    BIOS Model name:           INTEL(R) XEON(R) SILVER 4510T
    CPU family:                6
    Model:                     143
    Thread(s) per core:        2
    Core(s) per socket:        12
    Socket(s):                 2
    Stepping:                  8
    BogoMIPS:                  4000.00
    Flags:                     fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                               clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                               lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                               nonstop_tsc cpuid aperfmperf 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 hfi 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:                 1.1 MiB (24 instances)
    L1i cache:                 768 KiB (24 instances)
    L2 cache:                  48 MiB (24 instances)
    L3 cache:                  60 MiB (2 instances)
    NUMA node(s):              4
    NUMA node0 CPU(s):         0-5,24-29
    NUMA node1 CPU(s):         6-11,30-35
    NUMA node2 CPU(s):         12-17,36-41
    NUMA node3 CPU(s):         18-23,42-47
    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
```

(Continued on next page)

xFusion

SPECrate®2017_fp_base = 334

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_peak = 335

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

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

Platform Notes (Continued)

```
   Vulnerability Spectre v2:        Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSB-eIBRS SW
                                    sequence
   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     1.1M   12 Data             1     64      1              64
     L1i      32K     768K    8 Instruction      1     64      1              64
     L2        2M      48M   16 Unified          2   2048      1              64
     L3       30M      60M   15 Unified          3  32768      1              64

 ----------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 4 nodes (0-3)
   node 0 cpus: 0-5,24-29
   node 0 size: 128039 MB
   node 0 free: 113747 MB
   node 1 cpus: 6-11,30-35
   node 1 size: 129021 MB
   node 1 free: 122868 MB
   node 2 cpus: 12-17,36-41
   node 2 size: 129021 MB
   node 2 free: 122963 MB
   node 3 cpus: 18-23,42-47
   node 3 size: 129016 MB
   node 3 free: 122938 MB
   node distances:
   node   0   1   2   3
     0:  10  12  21  21
     1:  12  10  21  21
     2:  21  21  10  12
     3:  21  21  12  10

 ----------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:       527460828 kB

 ----------------------------------------------------------------
 10. who -r
   run-level 3 Jun 6 18:58

 ----------------------------------------------------------------
 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 crond
                   dbus-broker getty@ insights-client-boot irqbalance kdump lvm2-monitor mdmonitor microcode
                   nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sep5 sshd sssd
                   systemd-boot-update systemd-network-generator tuned udisks2
```

(Continued on next page)

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

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

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

Platform Notes (Continued)

```
   enabled-runtime  systemd-remount-fs
   disabled         blk-availability console-getty cpupower debug-shell dnf-system-upgrade firewalld kvm_stat
                    man-db-restart-cache-update nftables 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,gpt2)/vmlinuz-5.14.0-284.11.1.el9_2.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
   nohz_full=1-47


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

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

$SPECrate^{®}2017\_fp\_base = 334$

$SPECrate^{®}2017\_fp\_peak = 335$

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

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

Platform Notes (Continued)

```
   ----------------------------------------------------------
   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 9.2 (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/Uniautos/speccpu2017
     Filesystem            Type  Size  Used Avail Use% Mounted on
     /dev/mapper/rhel-home xfs   1.7T  182G  1.5T  11% /home

   ----------------------------------------------------------
   22. /sys/devices/virtual/dmi/id
       Vendor:        XFUSION
       Product:       5288 V7
       Product Family: Eagle Stream
       Serial:        12345678

   ----------------------------------------------------------
   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:
       2x Samsung M321R4GA3PB0-CWMCH 32 GB 2 rank 5600, configured at 4400
       14x Samsung M321R4GA3PB0-CWMXH 32 GB 2 rank 5600, configured at 4400


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

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 2024.0.2 Build 20231213
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------


==================================================================================
```

(Continued on next page)

xFusion

SPECrate®2017_fp_base = 334

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_peak = 335

CPU2017 License: 6488		**Test Date:**	Jun-2024
Test Sponsor: xFusion		**Hardware Availability:** Dec-2023
Tested by: xFusion		**Software Availability:** Dec-2023

Compiler Version Notes (Continued)

```
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 2024.0.2 Build 20231213
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 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.
-------------------------------------------------------------------------------------------------


=================================================================================================
C++, C, Fortran | 507.cactuBSSN_r(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        | 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 2024.0.2 Build 20231213
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 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.
-------------------------------------------------------------------------------------------------
```

Base 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

Copyright 2017-2024 Standard Performance Evaluation Corporation

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

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

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

Base Compiler Invocation (Continued)

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
-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
```

(Continued on next page)

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

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

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

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-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
```

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
```

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

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

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

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: basepeak = yes

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

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4510T)

SPECrate®2017_fp_base = 334

SPECrate®2017_fp_peak = 335

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

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

Peak Optimization Flags (Continued)

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/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

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

Tested with SPEC CPU®2017 v1.1.9 on 2024-06-06 12:57:27-0400.
Report generated on 2024-07-03 09:24:05 by CPU2017 PDF formatter v6716.
Originally published on 2024-07-02.