SPEC CPU®2017 Floating Point Rate Result

xFusion

FusionServer 2288H V7 (Intel Xeon Platinum 8558)

$SPECrate^{®}2017\_fp\_base = 1040$

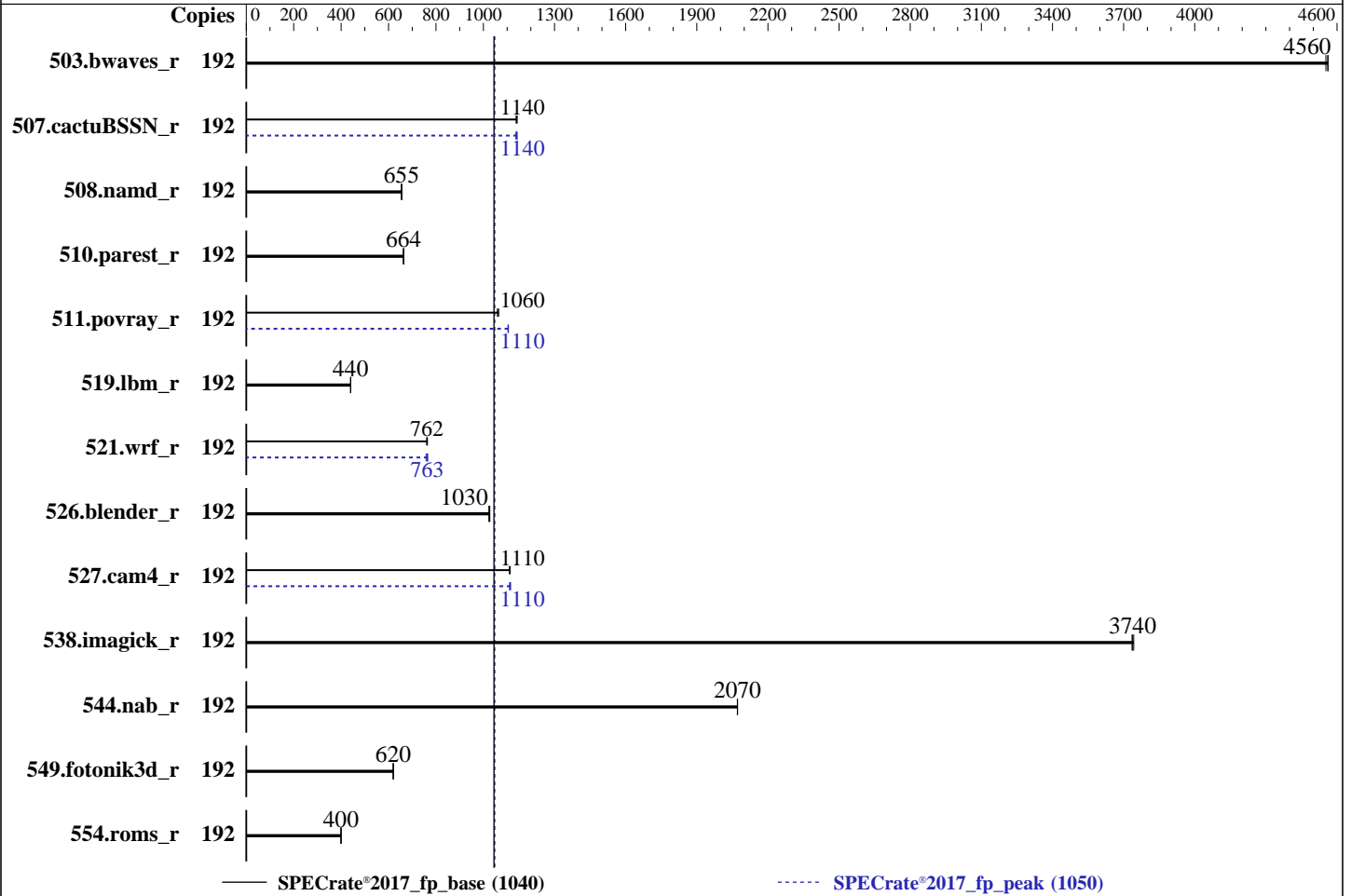$SPECrate^{®}2017\_fp\_peak = 1050$

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

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

Benchmark	Copies	base	peak
503.bwaves_r	192	4560	
507.cactuBSSN_r	192	1140	1140
508.namd_r	192	655	
510.parest_r	192	664	
511.povray_r	192	1060	1110
519.lbm_r	192	440	
521.wrf_r	192	762	763
526.blender_r	192	1030	
527.cam4_r	192	1110	1110
538.imagick_r	192	3740	
544.nab_r	192	2070	
549.fotonik3d_r	192	620	
554.roms_r	192	400	

SPECrate®2017_fp_base (1040)   SPECrate®2017_fp_peak (1050)

Hardware

CPU Name: Intel Xeon Platinum 8558
 Max MHz: 4000
 Nominal: 2100
Enabled: 96 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: 260 MB I+D on chip per chip
 Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-5600B-R,
 running at 5200)
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.

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Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
503.bwaves_r	192	423	4550	422	4560	**422**	**4560**	192	423	4550	422	4560	**422**	**4560**
507.cactuBSSN_r	192	214	1140	213	1140	**213**	**1140**	192	214	1140	213	1140	**213**	**1140**
508.namd_r	192	278	656	**279**	**655**	279	654	192	278	656	**279**	**655**	279	654
510.parest_r	192	757	664	**757**	**664**	758	662	192	757	664	**757**	**664**	758	662
511.povray_r	192	423	1060	**422**	**1060**	421	1060	192	406	1100	406	1110	**406**	**1110**
519.lbm_r	192	460	440	460	440	**460**	**440**	192	460	440	460	440	**460**	**440**
521.wrf_r	192	**564**	**762**	563	764	565	761	192	567	758	**563**	**763**	562	765
526.blender_r	192	**285**	**1030**	286	1020	285	1030	192	**285**	**1030**	286	1020	285	1030
527.cam4_r	192	303	1110	302	1110	**302**	**1110**	192	302	1110	**302**	**1110**	301	1110
538.imagick_r	192	**128**	**3740**	128	3740	128	3740	192	**128**	**3740**	128	3740	128	3740
544.nab_r	192	**156**	**2070**	156	2070	156	2070	192	**156**	**2070**	156	2070	156	2070
549.fotonik3d_r	192	1206	620	**1207**	**620**	1208	619	192	1206	620	**1207**	**620**	1208	619
554.roms_r	192	**763**	**400**	763	400	765	399	192	**763**	**400**	763	400	765	399
SPECrate®2017_fp_base =	**1040**													
SPECrate®2017_fp_peak =	**1050**													

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/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)
is mitigated in the system as tested and documented.

(Continued on next page)

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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

```
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 Wed Jun 19 01:44:41 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
    01:44:41 up  9:13,  2 users,  load average: 123.62, 174.86, 184.64
    USER     TTY       LOGIN@   IDLE   JCPU   PCPU WHAT
    root     tty1      16:36    5:51m  1.41s  0.10s -bash
```

(Continued on next page)

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Platform Notes (Continued)

```
   root     pts/0    19:35   6:09m  0.05s  0.05s -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) 2060063
     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) 2060063
     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 192 -c ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg
      --define smt-on --define cores=96 --define physicalfirst --define invoke_with_interleave --define
      drop_caches --tune base,peak -o all fprate
    runcpu --define default-platform-flags --copies 192 --configfile
      ic2024.0.2-lin-sapphirerapids-rate-20231213.cfg --define smt-on --define cores=96 --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/CPU2017.120/templogs/preenv.fprate.120.0.log --lognum 120.0 --from_runcpu 2
    specperl $SPEC/bin/sysinfo
   $SPEC = /home/Uniautos/speccpu2017


   ------------------------------------------------------------
   6. /proc/cpuinfo
       model name        : INTEL(R) XEON(R) PLATINUM 8558
       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         : 48
       siblings          : 96
       2 physical ids (chips)
       192 processors (hardware threads)
       physical id 0: core ids 0-47
       physical id 1: core ids 0-47
       physical id 0: apicids 0-95
       physical id 1: apicids 128-223
```

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Platform Notes (Continued)

```
    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):                    192
  On-line CPU(s) list:       0-191
  Vendor ID:                 GenuineIntel
  BIOS Vendor ID:            Intel(R) Corporation
  Model name:                INTEL(R) XEON(R) PLATINUM 8558
  BIOS Model name:           INTEL(R) XEON(R) PLATINUM 8558
  CPU family:                6
  Model:                     207
  Thread(s) per core:        2
  Core(s) per socket:        48
  Socket(s):                 2
  Stepping:                  2
  BogoMIPS:                  4200.00
  Flags:                     fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                             clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                             lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                             nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 ds_cpl
                             vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2
                             x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm
                             abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3 invpcid_single
                             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:                 4.5 MiB (96 instances)
  L1i cache:                 3 MiB (96 instances)
  L2 cache:                  192 MiB (96 instances)
  L3 cache:                  520 MiB (2 instances)
  NUMA node(s):              4
  NUMA node0 CPU(s):         0-23,96-119
  NUMA node1 CPU(s):         24-47,120-143
  NUMA node2 CPU(s):         48-71,144-167
  NUMA node3 CPU(s):         72-95,168-191
  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
```

(Continued on next page)

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Platform Notes (Continued)

```
                                 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     4.5M  12 Data              1     64        1             64
      L1i       32K       3M   8 Instruction       1     64        1             64
      L2         2M     192M  16 Unified           2   2048        1             64
      L3       260M     520M  20 Unified           3 212992        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: 0-23,96-119
  node 0 size: 128071 MB
  node 0 free: 97066 MB
  node 1 cpus: 24-47,120-143
  node 1 size: 129013 MB
  node 1 free: 106323 MB
  node 2 cpus: 48-71,144-167
  node 2 size: 128974 MB
  node 2 free: 103208 MB
  node 3 cpus: 72-95,168-191
  node 3 size: 128999 MB
  node 3 free: 106380 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:      527419860 kB

  ----------------------------------------------------------------
10. who -r
   run-level 3 Jun 18 16:31

  ----------------------------------------------------------------
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
   enabled-runtime  systemd-remount-fs
```

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Platform Notes (Continued)

```
  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

  ----------------------------------------------------------------
  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

  ----------------------------------------------------------------
  19. /sys/kernel/mm/transparent_hugepage/khugepaged
```

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Platform Notes (Continued)

```
   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  240G  1.5T  14% /home


  ----------------------------------------------------------
  22. /sys/devices/virtual/dmi/id
     Vendor:        XFUSION
     Product:       2288H V7
     Product Family: Eagle Stream
     Serial:        2106182101X3N8000001


  ----------------------------------------------------------
  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 5200
     14x Samsung M321R4GA3PB0-CWMXH 32 GB 2 rank 5600, configured at 5200


  ----------------------------------------------------------
  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.
------------------------------------------------------------------------------------------


==========================================================================================
C++           | 508.namd_r(base, peak) 510.parest_r(base, peak)
------------------------------------------------------------------------------------------
```

(Continued on next page)

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Compiler Version Notes (Continued)

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

==============================================================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------------------------------------------
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2024.0.2 Build 20231213
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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 2024.0.2 Build 20231213
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==============================================================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------------------------------------
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------------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

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

xFusion

SPECrate®2017_fp_base = 1040

FusionServer 2288H V7 (Intel Xeon Platinum 8558)

SPECrate®2017_fp_peak = 1050

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

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

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`
`-L/usr/local/jemalloc64-5.0.1/lib`

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xFusion

FusionServer 2288H V7 (Intel Xeon Platinum 8558)

SPECrate®2017_fp_base = 1040

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CPU2017 License: 6488
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Test Date: Jun-2024
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Base Optimization Flags (Continued)

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 2288H V7 (Intel Xeon Platinum 8558)

SPECrate®2017_fp_base = 1040

SPECrate®2017_fp_peak = 1050

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:

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: basepeak = yes

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`

526.blender_r: basepeak = yes

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SPEC CPU®2017 Floating Point Rate Result

xFusion

FusionServer 2288H V7 (Intel Xeon Platinum 8558)

SPECrate®2017_fp_base = 1040

SPECrate®2017_fp_peak = 1050

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

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

Peak Optimization Flags (Continued)

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.

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