xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

SPECraten®2017_fp_base = 328
SPECraten®2017_fp_peak = 329

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

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

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_fp_base (328)</th>
<th>SPECrate®2017_fp_peak (329)</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r 48</td>
<td></td>
<td>387</td>
</tr>
<tr>
<td>507.cactuBSSN_r 48</td>
<td></td>
<td>160</td>
</tr>
<tr>
<td>508.namd_r 48</td>
<td></td>
<td>192</td>
</tr>
<tr>
<td>510.parest_r 48</td>
<td></td>
<td>260</td>
</tr>
<tr>
<td>511.povray_r 48</td>
<td></td>
<td>231</td>
</tr>
<tr>
<td>519.lbm_r 48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>521.wrf_r 48</td>
<td></td>
<td>303</td>
</tr>
<tr>
<td>526.blender_r 48</td>
<td></td>
<td>249</td>
</tr>
<tr>
<td>527.cam4_r 48</td>
<td></td>
<td>289</td>
</tr>
<tr>
<td>538.imagick_r 48</td>
<td></td>
<td>694</td>
</tr>
<tr>
<td>544.nab_r 48</td>
<td></td>
<td>489</td>
</tr>
<tr>
<td>549.fotonik3d_r 48</td>
<td></td>
<td>356</td>
</tr>
<tr>
<td>554.roms_r 48</td>
<td></td>
<td>171</td>
</tr>
</tbody>
</table>

---

Hardware

- CPU Name: Intel Xeon Silver 4410Y
- Max MHz: 3900
- 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 PC5-4800B-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: No
- Firmware: Version 2.00.55 Released Mar-2023
- File System: xfs
- System State: Run level 3 (multi-user)
- Base Pointers: 64-bit
- Peak Pointers: 64-bit
- Other: jemalloc memory allocator V5.0.1
- Power Management: BIOS and OS set to prefer performance at the cost of additional power usage
## SPEC CPU®2017 Floating Point Rate Result

xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>48</td>
<td>310</td>
<td>1550</td>
<td>307</td>
<td>1570</td>
<td>308</td>
<td>1560</td>
<td>48</td>
<td>310</td>
<td>1550</td>
<td>307</td>
<td>1570</td>
<td>308</td>
<td>1560</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>48</td>
<td>157</td>
<td>387</td>
<td>158</td>
<td>385</td>
<td>157</td>
<td>388</td>
<td>48</td>
<td>157</td>
<td>387</td>
<td>158</td>
<td>385</td>
<td>157</td>
<td>388</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>48</td>
<td>284</td>
<td>160</td>
<td>284</td>
<td>161</td>
<td>285</td>
<td>160</td>
<td>48</td>
<td>284</td>
<td>160</td>
<td>284</td>
<td>161</td>
<td>285</td>
<td>160</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>48</td>
<td>656</td>
<td>192</td>
<td>655</td>
<td>192</td>
<td>655</td>
<td>192</td>
<td>48</td>
<td>656</td>
<td>191</td>
<td>655</td>
<td>192</td>
<td>655</td>
<td>192</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>48</td>
<td>431</td>
<td>260</td>
<td>431</td>
<td>260</td>
<td>430</td>
<td>261</td>
<td>48</td>
<td>420</td>
<td>267</td>
<td>419</td>
<td>267</td>
<td>422</td>
<td>266</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>48</td>
<td>220</td>
<td>230</td>
<td>219</td>
<td>231</td>
<td>219</td>
<td>231</td>
<td>48</td>
<td>220</td>
<td>230</td>
<td>219</td>
<td>231</td>
<td>219</td>
<td>231</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>48</td>
<td>358</td>
<td>300</td>
<td>354</td>
<td>304</td>
<td>354</td>
<td>303</td>
<td>48</td>
<td>347</td>
<td>309</td>
<td>356</td>
<td>302</td>
<td>353</td>
<td>305</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>48</td>
<td>293</td>
<td>249</td>
<td>293</td>
<td>249</td>
<td>294</td>
<td>249</td>
<td>48</td>
<td>293</td>
<td>249</td>
<td>293</td>
<td>249</td>
<td>294</td>
<td>249</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>48</td>
<td>172</td>
<td>694</td>
<td>172</td>
<td>693</td>
<td>172</td>
<td>694</td>
<td>48</td>
<td>172</td>
<td>694</td>
<td>172</td>
<td>693</td>
<td>172</td>
<td>694</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>48</td>
<td>165</td>
<td>489</td>
<td>165</td>
<td>490</td>
<td>165</td>
<td>489</td>
<td>48</td>
<td>165</td>
<td>489</td>
<td>165</td>
<td>490</td>
<td>165</td>
<td>489</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>48</td>
<td>524</td>
<td>357</td>
<td>526</td>
<td>356</td>
<td>525</td>
<td>356</td>
<td>48</td>
<td>524</td>
<td>357</td>
<td>526</td>
<td>356</td>
<td>525</td>
<td>356</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>48</td>
<td>448</td>
<td>170</td>
<td>445</td>
<td>171</td>
<td>445</td>
<td>172</td>
<td>48</td>
<td>445</td>
<td>171</td>
<td>445</td>
<td>171</td>
<td>444</td>
<td>172</td>
</tr>
</tbody>
</table>

SPECrater®2017_fp_base = 328

SPECrater®2017_fp_peak = 329

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 = */spec2017-icc2023.0/lib/intel64:/spec2017-icc2023.0/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)
SPEC CPU®2017 Floating Point Rate Result

xFusion
FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

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

SPECrater®2017_fp_base = 328
SPECrater®2017_fp_peak = 329

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

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.

ejemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

BIOS configuration:
Performance Profile Set to Performance
SNC Set to Enable SNC2 (2-clusters)

Sysinfo program /spec2017-icc2023.0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c6ae2c92cc097bec197
running on localhost.localdomain Wed Aug 16 14:52:27 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. numacl --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/hasugepaged
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 GNU/Linux

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

2. w
14:52:27 up 3:03, 1 user, load average: 29.96, 43.42, 46.06
USER  TTY   LOGIN@  IDLE JCPU  PCPU WHAT
root  tty1   11:50   3:01m  1.29s  0.04s -bash

(Continued on next page)
**SPEC CPU®2017 Floating Point Rate Result**

xFusion
FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

<table>
<thead>
<tr>
<th>CPU2017 License: 6488</th>
<th>Test Date: Aug-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: xFusion</td>
<td>Hardware Availability: Jan-2023</td>
</tr>
<tr>
<td>Tested by: xFusion</td>
<td>Software Availability: Dec-2022</td>
</tr>
</tbody>
</table>

---

**Platform Notes (Continued)**

3. Username
   - From environment variable $USER: root

---

4. ulimit -a
   
   real-time non-blocking time (microseconds, -R) unlimited
   core file size (blocks, -c) 0
   data seg size (kbytes, -d) unlimited
   scheduling priority (-e) 0
   file size (blocks, -f) unlimited
   pending signals (-i) 2060169
   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) 2060169
   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 --copies 48 -c ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=24 --define physicalfirst --define invoke_with_interleave --define drop_caches --tune base,peak --iterations 3 --o all fprate
   specperl $SPEC/bin/sysinfo
   $SPEC = /spec2017-icc2023.0

---

6. /proc/cpuinfo
   
   model name : Intel(R) Xeon(R) Silver 4410Y
   vendor_id : GenuineIntel
   cpu family : 6
   model : 143
   stepping : 7
   microcode : 0x2b000111
   bugs : spectre_v1 spectre_v2 spec_store_bypass swapgs
   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
   physical id 1: apicids 128-151
   Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

(Continued on next page)
Spec CPU®2017 Floating Point Rate Result

xFusion
FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

SPECrate®2017_fp_base = 328
SPECrate®2017_fp_peak = 329

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

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

Platform Notes (Continued)

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 4410Y
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 12
Socket(s): 2
Stepping: 7
BogoMIPS: 4000.00

Flags:

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):
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 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:

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

xFusion
FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

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

SPECrate®2017_fp_base = 328
SPECrate®2017_fp_peak = 329

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

Platform Notes (Continued)

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>48K</td>
<td>1.1M</td>
<td>12</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>768K</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>2M</td>
<td>48M</td>
<td>16</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>30M</td>
<td>60M</td>
<td>15</td>
<td>Unified</td>
<td>3</td>
<td>32768</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

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: 128046 MB
node 0 free: 123104 MB
node 1 cpus: 6-11,30-35
node 1 size: 129021 MB
node 1 free: 125618 MB
node 2 cpus: 12-17,36-41
node 2 size: 129021 MB
node 2 free: 125804 MB
node 3 cpus: 18-23,42-47
node 3 size: 129010 MB
node 3 free: 125855 MB
node distances:

9. /proc/meminfo
MemTotal: 527462252 kB

10. who -r
run-level 3 Aug 16 11:48

11. Systemd service manager version: systemd 250 (250-6.e19_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 NetworkManagerNetworkManager-dispatcher NetworkManager-wait-online accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker gdbm getty@ insights-client-boot irqbalance iscsi iscsi-onboot kdump libstoragemgmt low-memory-monitor lvm2-monitor mcelog mdmonitor mcode multipathd nis-domainname nvmefc-boot-connections ostree-remount power-profiles-daemon qemu-guest-agent rhmcentd rsyslog rtkit-daemon selinux-autorelabel-mark sep5 smartd sshd sshd switchchero-control sysstat systemd-network-generator udisks2 upower vgauthd vmtoolsd

enabled-runtime systemd-remount-fs

disabled arp-ethers blk-availability brtty canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed

(Continued on next page)
### SPEC CPU®2017 Floating Point Rate Result

**xFusion**

FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>6488</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>xFusion</td>
</tr>
<tr>
<td>Tested by:</td>
<td>xFusion</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Aug-2023</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jan-2023</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2022</td>
</tr>
</tbody>
</table>

**SPECrate®2017_fp_base = 328**

**SPECrate®2017_fp_peak = 329**

### Platform Notes (Continued)

- `dbus-daemon debug-shell dnsmasq firewall idipdump iprinit iprupdate iscsid iscsiuioc kpatch kvm_stat ledmon man-db-restart-cache-update nftables nvme-autoconnect podman podman-auto-update podman-restart paccct ras-mc-ctl rasdaemon rdisc rhcd rhsm rhsm-facts rpmdb-rebuild serial-getty@ speech-dispatcher@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext wpa_supplicant`

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>14. Linux kernel boot-time arguments, from /proc/cmdline</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>BOOT_IMAGE=(hd0,gpt3)/boot/vmlinuz-5.14.0-70.13.1.el9_0.x86_64</code></td>
</tr>
<tr>
<td><code>root=UUID=cc4bab05-907e-44ef-b818-2b2874390234</code></td>
</tr>
<tr>
<td><code>ro</code></td>
</tr>
<tr>
<td><code>crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M</code></td>
</tr>
<tr>
<td><code>resume=UUID=5ba347ca-8beb-4f6e-9c11-de63dc4ddf5f</code></td>
</tr>
<tr>
<td><code>rhgb</code></td>
</tr>
<tr>
<td><code>quiet</code></td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>15. cpufrequency-info</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>analyzing CPU 0</strong>:</td>
</tr>
<tr>
<td>Unable to determine current policy</td>
</tr>
<tr>
<td>Supported: yes</td>
</tr>
<tr>
<td>Active: yes</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>16. sysctl</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>kernel.numa_balancing</code></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><code>kernel.randomize_va_space</code></td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td><code>vm.compression_proactiveness</code></td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td><code>vm.dirty_background_bytes</code></td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td><code>vm.dirty_background_ratio</code></td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td><code>vm.dirty_bytes</code></td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td><code>vm.dirty_expire_centisecs</code></td>
</tr>
<tr>
<td>3000</td>
</tr>
<tr>
<td><code>vm.dirty_ratio</code></td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td><code>vm.dirty_writeback_centisecs</code></td>
</tr>
<tr>
<td>500</td>
</tr>
<tr>
<td><code>vm.dirtytime_expire_seconds</code></td>
</tr>
<tr>
<td>43200</td>
</tr>
<tr>
<td><code>vm.extrfrag_threshold</code></td>
</tr>
<tr>
<td>500</td>
</tr>
<tr>
<td><code>vm.min_unmapped_ratio</code></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><code>vm.nr_hugepages</code></td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td><code>vm.nr_hugepages_mempolicy</code></td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td><code>vm.nr_overcommit_mempolicy</code></td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td><code>vm.swappiness</code></td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td><code>vm.watermark_boost_factor</code></td>
</tr>
<tr>
<td>15000</td>
</tr>
<tr>
<td><code>vm.watermark_scale_factor</code></td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td><code>vm.zone_reclaim_mode</code></td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>17. /sys/kernel/mm/transparent_hugepage</th>
</tr>
</thead>
<tbody>
<tr>
<td>defrag always defer defer+madvice [madvice] never</td>
</tr>
<tr>
<td>enabled [always] madvice never</td>
</tr>
<tr>
<td>hpage_pmd_size 2097152</td>
</tr>
<tr>
<td>shmem_enabled always within_size advise [never] deny force</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>18. /sys/kernel/mm/transparent_hugepage/klhugepaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>alloc_sleep_millisecs 60000</td>
</tr>
<tr>
<td>defrag 1</td>
</tr>
<tr>
<td>max_ptes_none 511</td>
</tr>
<tr>
<td>max_ptes_shared 256</td>
</tr>
</tbody>
</table>

(Continued on next page)
Platform Notes (Continued)

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
/dev/sda3      xfs   420G   73G  347G  18% /

21. /sys/devices/virtual/dmi/id
Vendor:         XFUSION
Product:        5288 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

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.
**xFusion**

**FusionServer 5288 V7 (Intel Xeon Silver 4410Y)**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>6488</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>xFusion</td>
</tr>
<tr>
<td>Tested by:</td>
<td>xFusion</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Aug-2023</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jan-2023</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2022</td>
</tr>
</tbody>
</table>

---

### Compiler Version Notes (Continued)

**C++, C**

- 511.povray_r(base, peak) 526.blender_r(base, peak)

---

**Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201**

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

---

**C++, C, Fortran**

- 507.cactusBSSN_r(base, peak)

---

**Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201**

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

---

**Fortran**

- 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

---

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

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

---

**Fortran, C**

- 521.wrf_r(base, peak) 527.cam4_r(base, peak)

---

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

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

---

**Base 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

(Continued on next page)
**Base Compiler Invocation (Continued)**

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`

**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`

(Continued on next page)
xFusion

FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

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

SPECrater®2017_fp_base = 328
SPECrater®2017_fp_peak = 329

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

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-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

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

Fortran benchmarks:

503.bwaves_r: basepeak = yes
549.fotonik3d_r: basepeak = yes

Benchmarks using both Fortran and C:


Benchmarks using both C and C++:

511.povray_r: -w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -profile-generate(pass 1) -profile-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

(Continued on next page)
## SPEC CPU®2017 Floating Point Rate Result

**xFusion**

FusionServer 5288 V7 (Intel Xeon Silver 4410Y)

---

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 328</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak = 329</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License: 6488</th>
<th>Test Date: Aug-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: xFusion</td>
<td>Hardware Availability: Jan-2023</td>
</tr>
<tr>
<td>Tested by: xFusion</td>
<td>Software Availability: Dec-2022</td>
</tr>
</tbody>
</table>

---

### Peak Optimization Flags (Continued)

526.blender_r:basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: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/Intel-ic2023-official-linux64.html)

You can also download the XML flags sources by saving the following links:

- [http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml)

---

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2023-08-16 14:52:27-0400.


Originally published on 2023-09-13.