SPEC CPU®2017 Floating Point Rate Result

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero TDI100C3R-212
(2.00 GHz,Intel Xeon Gold 6330)

$SPECrate®2017\_fp\_base = 406$
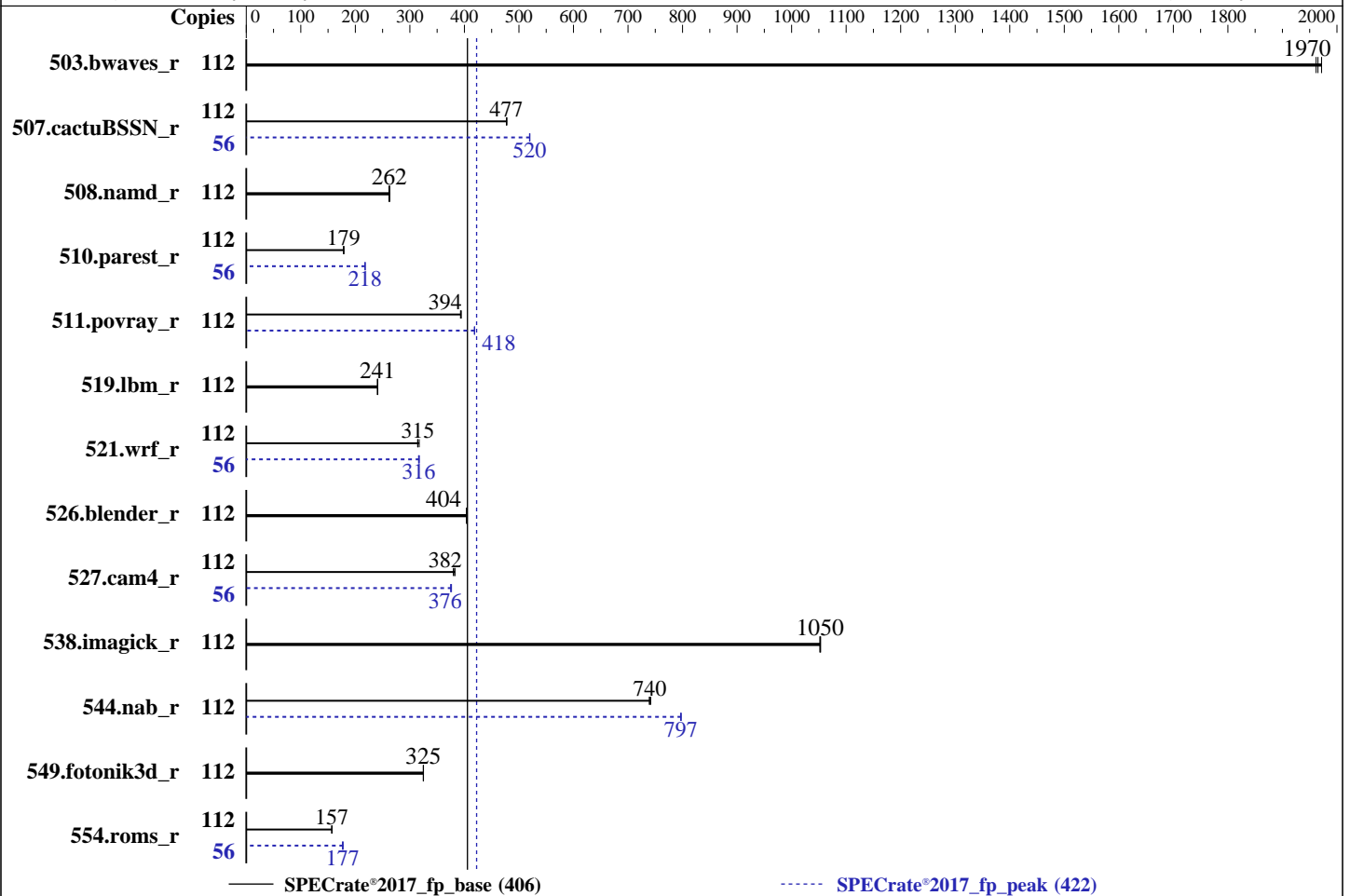
$SPECrate®2017\_fp\_peak = 422$

CPU2017 License: 006042

Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Mar-2023

Hardware Availability: Apr-2021

Software Availability: May-2022

Benchmark	Copies	base	peak
503.bwaves_r	112	1970	
507.cactuBSSN_r	112 / 56	477	520
508.namd_r	112	262	
510.parest_r	112 / 56	179	218
511.povray_r	112	394	418
519.lbm_r	112	241	
521.wrf_r	112 / 56	315	316
526.blender_r	112	404	
527.cam4_r	112 / 56	382	376
538.imagick_r	112	1050	
544.nab_r	112	740	797
549.fotonik3d_r	112	325	
554.roms_r	112 / 56	157	177

SPECrate®2017_fp_base (406) ----- SPECrate®2017_fp_peak (422)

Hardware

CPU Name: Intel Xeon Gold 6330
Max MHz: 3100
Nominal: 2000
Enabled: 56 cores, 2 chips, 2 threads/core
Orderable: 1,2 Chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 1.25 MB I+D on chip per core
 L3: 42 MB I+D on chip per chip
 Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R, running at 2933)
Storage: 1 x 512 GB NVMe SSD
Other: None

Software

OS: Red Hat Enterprise Linux release 8.5 (Ootpa) Kernel 4.18.0-348.el8.x86_64
Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2022.1 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Version PEGC0042 released Jan-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 set to prefer performance at the cost of additional power usage.

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Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	112	570	1970	573	1960	**572**	**1970**	112	570	1970	573	1960	**572**	**1970**
507.cactuBSSN_r	112	297	478	297	477	**297**	**477**	56	**136**	**520**	136	520	137	519
508.namd_r	112	404	263	407	262	**406**	**262**	112	404	263	407	262	**406**	**262**
510.parest_r	112	1644	178	**1639**	**179**	1636	179	56	673	218	**672**	**218**	672	218
511.povray_r	112	663	394	**664**	**394**	666	393	112	625	419	625	418	**625**	**418**
519.lbm_r	112	491	241	490	241	**490**	**241**	112	491	241	490	241	**490**	**241**
521.wrf_r	112	798	314	**798**	**315**	791	317	56	**397**	**316**	395	317	397	316
526.blender_r	112	421	405	422	404	**422**	**404**	112	421	405	422	404	**422**	**404**
527.cam4_r	112	**513**	**382**	516	380	512	383	56	261	375	260	376	**261**	**376**
538.imagick_r	112	**265**	**1050**	264	1050	265	1050	112	**265**	**1050**	264	1050	265	1050
544.nab_r	112	254	742	**255**	**740**	255	739	112	236	798	**236**	**797**	237	796
549.fotonik3d_r	112	**1344**	**325**	1345	325	1343	325	112	**1344**	**325**	1345	325	1343	325
554.roms_r	112	1135	157	1133	157	**1133**	**157**	56	**503**	**177**	501	178	504	176
SPECrate®2017_fp_base =		**406**												
SPECrate®2017_fp_peak =		**422**												

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/cpu2017/lib/intel64:/home/cpu2017/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:

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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General Notes (Continued)

```
 sync; echo 1>        /proc/sys/vm/drop_caches
 runcpu command invoked through numactl i.e.:
 numactl --interleave=all runcpu <etc>
```
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.

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.

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) 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 Settings:
Power Technology = Custom
ENERGY_PERF_BIAS_CFG mode = Maximum Performance
KTI Prefetch = Enable
LLC Dead Line Alloc = Disable
Hyper-Threading = Enabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on Tyronespec Tue Mar 21 13:44:07 2023

 SUT (System Under Test) info as seen by some common utilities.

 -------------------------------------------------------------
 Table of contents
 -------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 239 (239-51.el8)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
```

(Continued on next page)

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Platform Notes (Continued)

```
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
 21. Disk information
 22. /sys/devices/virtual/dmi/id
 23. dmidecode
 24. BIOS
      -----------------------------------------------------------


      -----------------------------------------------------------
 1. uname -a
   Linux Tyronespec 4.18.0-348.el8.x86_64 #1 SMP Mon Oct 4 12:17:22 EDT 2021 x86_64 x86_64 x86_64 GNU/Linux


      -----------------------------------------------------------
 2. w
    13:44:07 up  8:21,  2 users,  load average: 71.32, 102.21, 108.26
    USER      TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root      tty1     -                05:23    8:20m  1.32s  0.02s -bash
    root      tty2     -                05:23    7:09m  0.02s  0.02s -bash


      -----------------------------------------------------------
 3. Username
   From environment variable $USER:  root


      -----------------------------------------------------------
 4. ulimit -a
   core file size          (blocks, -c) 0
   data seg size           (kbytes, -d) unlimited
   scheduling priority             (-e) 0
   file size               (blocks, -f) unlimited
   pending signals                 (-i) 4126640
   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) 4126640
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited


      -----------------------------------------------------------
 5. sysinfo process ancestry
```

(Continued on next page)

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Tested by:	Tyrone Systems	**Software Availability:**	May-2022

Platform Notes (Continued)

```
 /usr/lib/systemd/systemd --switched-root --system --deserialize 18
 login -- root
 -bash
 -bash
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 -c
   ic2022.1-lin-core-avx512-rate-20220316.cfg --define smt-on --define cores=56 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak -o all fprate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=112 --configfile
   ic2022.1-lin-core-avx512-rate-20220316.cfg --define smt-on --define cores=56 --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/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017


 ----------------------------------------------------------------
6. /proc/cpuinfo
    model name        : Intel(R) Xeon(R) Gold 6330 CPU @ 2.00GHz
    vendor_id         : GenuineIntel
    cpu family        : 6
    model             : 106
    stepping          : 6
    microcode         : 0xd0002e0
    bugs              : spectre_v1 spectre_v2 spec_store_bypass swapgs
    cpu cores         : 28
    siblings          : 56
    2 physical ids (chips)
    112 processors (hardware threads)
    physical id 0: core ids 0-27
    physical id 1: core ids 0-27
    physical id 0: apicids 0-55
    physical id 1: apicids 128-183
  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 2.32.1:
   Architecture:        x86_64
   CPU op-mode(s):      32-bit, 64-bit
   Byte Order:          Little Endian
   CPU(s):              112
   On-line CPU(s) list: 0-111
   Thread(s) per core:  2
   Core(s) per socket:  28
   Socket(s):           2
```

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Platform Notes (Continued)

```
    NUMA node(s):          2
    Vendor ID:             GenuineIntel
    BIOS Vendor ID:        Intel(R) Corporation
    CPU family:            6
    Model:                 106
    Model name:            Intel(R) Xeon(R) Gold 6330 CPU @ 2.00GHz
    BIOS Model name:       Intel(R) Xeon(R) Gold 6330 CPU @ 2.00GHz
    Stepping:              6
    CPU MHz:               2000.000
    CPU max MHz:           3100.0000
    CPU min MHz:           800.0000
    BogoMIPS:              4000.00
    Virtualization:        VT-x
    L1d cache:             48K
    L1i cache:             32K
    L2 cache:              1280K
    L3 cache:              43008K
    NUMA node0 CPU(s):     0-27,56-83
    NUMA node1 CPU(s):     28-55,84-111
  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 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 invpcid_single intel_ppin ssbd mba ibrs ibpb
                           stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust
                           sgx bmi1 hle 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
                           wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vbmi
                            umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme
                           avx512_vpopcntdq la57 rdpid sgx_lc fsrm md_clear pconfig flush_l1d arch_capabilities


    -----------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 2 nodes (0-1)
   node 0 cpus: 0-27,56-83
   node 0 size: 515637 MB
   node 0 free: 490426 MB
   node 1 cpus: 28-55,84-111
   node 1 size: 516081 MB
   node 1 free: 492719 MB
   node distances:
   node   0   1
     0:  10  20
     1:  20  10
```

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Platform Notes (Continued)

```
    ----------------------------------------------------------
9. /proc/meminfo
   MemTotal:        1056480196 kB


    ----------------------------------------------------------
10. who -r
    run-level 3 Mar 21 05:23


    ----------------------------------------------------------
11. Systemd service manager version: systemd 239 (239-51.el8)
    Default Target  Status
    multi-user      running


    ----------------------------------------------------------
12. Services, from systemctl list-unit-files
    STATE        UNIT FILES
   enabled     ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon
                atd auditd autovt@ avahi-daemon bluetooth chronyd crond cups display-manager firewalld gdm
                getty@ import-state insights-client-boot irqbalance iscsi iscsi-onboot kdump ksm ksmtuned
                libstoragemgmt libvirtd loadmodules lvm2-monitor mcelog mdmonitor microcode multipathd
                nis-domainname nvidia-hibernate nvidia-resume nvidia-suspend nvmefc-boot-connections
                ostree-remount qemu-guest-agent rhsmcertd rpcbind rsyslog rtkit-daemon selinux-autorelabel-mark
                sep5 smartd sshd sssd syslog timedatex tuned udisks2 vdo vgauthd vmtoolsd
   disabled    arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown
                canberra-system-shutdown-reboot chrony-wait console-getty cpupower cups-browsed debug-shell
                dnsmasq ebtables gssproxy httpd httpd@ initial-setup initial-setup-reconfiguration iprdump
                iprinit iprupdate iscsid iscsiuio kpatch kvm_stat ledmon man-db-restart-cache-update
                ndctl-monitor netcf-transaction nfs-blkmap nfs-convert nfs-server nftables numad nvidia-powerd
                nvmf-autoconnect oddjobd podman podman-auto-update podman-restart psacct radvd ras-mc-ctl
                rasdaemon rdisc rhcd rhsm rhsm-facts saslauthd serial-getty@ snmpd snmptrapd speech-dispatcherd
                sshd-keygen@ switcheroo-control systemd-nspawn@ systemd-resolved tcsd tog-pegasus upower
                virtinterfaced virtnetworkd virtnodedevd virtnwfilterd virtproxyd virtqemud virtsecretd
                virtstoraged wpa_supplicant
   generated   SystemTap compile-server gcc-toolset-10-stap-server gcc-toolset-10-systemtap
                gcc-toolset-11-stap-server gcc-toolset-11-systemtap gcc-toolset-9-stap-server
                gcc-toolset-9-systemtap scripts startup
   indirect    spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo virtlockd
                virtlogd
   masked      systemd-timedated


    ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=(hd1,gpt2)/vmlinuz-4.18.0-348.el8.x86_64
    root=/dev/mapper/rhel-root
    ro
    resume=/dev/mapper/rhel-swap
```

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Platform Notes (Continued)

```
   rd.lvm.lv=rhel/root
   rd.lvm.lv=rhel/swap
   rhgb
   quiet


  ----------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
      current policy: frequency should be within 800 MHz and 3.10 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
        Supported: yes
        Active: yes


  ----------------------------------------------------------
15. tuned-adm active
   Current active profile: throughput-performance


  ----------------------------------------------------------
16. sysctl
   kernel.numa_balancing            1
   kernel.randomize_va_space        2
   vm.compaction_proactiveness      0
   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


  ----------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage
   defrag          always defer defer+madvise [madvise] never
   enabled         [always] madvise never
   hpage_pmd_size  2097152
   shmem_enabled   always within_size advise [never] deny force
```

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Platform Notes (Continued)

```
     ----------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs   60000
   defrag                      1
   max_ptes_none             511
   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 8.5 (Ootpa)
   redhat-release Red Hat Enterprise Linux release 8.5 (Ootpa)
   system-release Red Hat Enterprise Linux release 8.5 (Ootpa)


     ----------------------------------------------------------
20. Kernel self-reported vulnerability status, from /sys/devices/system/cpu/vulnerabilities
   itlb_multihit          Not affected
   l1tf                   Not affected
   mds                    Not affected
   meltdown               Not affected
   spec_store_bypass      Mitigation: Speculative Store Bypass disabled via prctl and seccomp
   spectre_v1             Mitigation: usercopy/swapgs barriers and __user pointer sanitization
   spectre_v2             Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
   srbds                  Not affected
   tsx_async_abort        Not affected
 For more information, see the Linux documentation on hardware vulnerabilities, for example
       https://www.kernel.org/doc/html/latest/admin-guide/hw-vuln/index.html


     ----------------------------------------------------------
21. Disk information
 SPEC is set to: /home/cpu2017
   Filesystem           Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   402G  228G  174G  57% /home


     ----------------------------------------------------------
22. /sys/devices/virtual/dmi/id
     Vendor:         TyroneSystems
     Product:        TDI100C3R-212
     Product Family: Family
     Serial:         2X20022302


     ----------------------------------------------------------
23. dmidecode
   Additional information from dmidecode 3.2 follows.  WARNING: Use caution when you interpret this section.
```

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Platform Notes (Continued)

```
   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 Micron 36ASF8G72PZ-3G2F1 64 GB 2 rank 3200, configured at 2933



  ----------------------------------------------------------------
 24. BIOS
 (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:        American Megatrends International, LLC.
   BIOS Version:       PEGC0042
   BIOS Date:          01/16/2023
   BIOS Revision:      5.22
```

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 2022.1.0 Build 20220316
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------------------------------------------------------------------------------


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


==============================================================================
C++, C             | 511.povray_r(base, peak) 526.blender_r(base, peak)
------------------------------------------------------------------------------
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------------------------------------------------------------------------------


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

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Tyrone Systems

(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero TDI100C3R-212
(2.00 GHz,Intel Xeon Gold 6330)

SPECrate®2017_fp_base = 406

SPECrate®2017_fp_peak = 422

CPU2017 License: 006042

Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Mar-2023

Hardware Availability: Apr-2021

Software Availability: May-2022

Compiler Version Notes (Continued)

```
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2022.1.0 Build 20220316
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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2022.1.0 Build 20220316
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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
  2022.1.0 Build 20220316
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------------------------------------------------------------------------


==============================================================================
Fortran, C       | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version
  2022.1.0 Build 20220316
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2022.1.0 Build 20220316
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
```

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero TDI100C3R-212
(2.00 GHz,Intel Xeon Gold 6330)

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Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Mar-2023

Hardware Availability: Apr-2021

Software Availability: May-2022

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 -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

C++ benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -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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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero TDI100C3R-212
(2.00 GHz,Intel Xeon Gold 6330)

SPECrate®2017_fp_base = 406

SPECrate®2017_fp_peak = 422

CPU2017 License: 006042		**Test Date:**	Mar-2023
Test Sponsor:	Netweb Pte Ltd	**Hardware Availability:**	Apr-2021
Tested by:	Tyrone Systems	**Software Availability:**	May-2022

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -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 C and C++:
```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:
```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -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
```

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
```

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero TDI100C3R-212
(2.00 GHz,Intel Xeon Gold 6330)

SPECrate®2017_fp_base = 406

SPECrate®2017_fp_peak = 422

CPU2017 License: 006042

Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Mar-2023

Hardware Availability: Apr-2021

Software Availability: May-2022

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_r: basepeak = yes

544.nab_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -qopt-zmm-usage=high -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -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 -xCORE-AVX512 -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 C and C++:

511.povray_r: -w -m64 -std=c11 -Wl,-z,muldefs
-fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512
-Ofast -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

Tyrone Camarero TDI100C3R-212
(2.00 GHz,Intel Xeon Gold 6330)

SPECrate®2017_fp_base = 406

SPECrate®2017_fp_peak = 422

CPU2017 License: 006042		**Test Date:**	Mar-2023
Test Sponsor:	Netweb Pte Ltd	**Hardware Availability:**	Apr-2021
Tested by:	Tyrone Systems	**Software Availability:**	May-2022

Peak Optimization Flags (Continued)

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

```
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -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
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.html
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-ICX-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-ICX-revA.xml

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

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