### CPU2017 Integer Rate Result

**Tyrone Systems**  
(Test Sponsor: Netweb Pte Ltd)  
Tyrone Camarero DIT400TR-436R  
(2.20 GHz, Intel Xeon Silver 4214)

<table>
<thead>
<tr>
<th>Copies</th>
<th>48</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
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<td>98.8</td>
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<tr>
<td>502.gcc_r</td>
<td>115</td>
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<tr>
<td>505.mcf_r</td>
<td>131</td>
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<tr>
<td>520.omnetpp_r</td>
<td>244</td>
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<td></td>
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<td>525.x264_r</td>
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<td></td>
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<tr>
<td>531.deepsjeng_r</td>
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<td>86.3</td>
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**Test Sponsor:** Netweb Pte Ltd  
**Hardware Availability:** Apr-2019  
**Software Availability:** Jul-2021  
**Test Date:** Aug-2021  
**CPU2017 License:** 006042  
**Tested by:** Tyrone Systems

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: CentOS Linux release 8.4.2105</td>
<td>CPU Name: Intel Xeon Silver 4214</td>
</tr>
<tr>
<td>Kernel 4.18.0-305.3.1.el8.x86_64</td>
<td>Max MHz: 3200</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux;</td>
<td>Nominal: 2200</td>
</tr>
<tr>
<td>Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;</td>
<td>Enabled: 24 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux</td>
<td>Orderable: 1.2 Chips</td>
</tr>
<tr>
<td>Parallel: No</td>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Firmware: Version V8.104 released Jul-2021</td>
<td>L2: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>File System: xfs</td>
<td>L3: 16.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Other: None</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2933P-R, running at 2400)</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>Storage: 1 x 480 GB SATA SSD</td>
</tr>
<tr>
<td>Other: jemalloc memory allocator V5.0.1</td>
<td>Other: None</td>
</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage.</td>
<td></td>
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### Results Table

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<td>591</td>
<td>87.7</td>
</tr>
</tbody>
</table>

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/lib/ia32:/home/cpu2017/je5.0.1-32"

MALLOC_CONF = "retain:true"

### General Notes

Binaries compiled locally by Netweb
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>

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

General Notes (Continued)

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

Platform Notes

BIOS Settings:
Power Technology set to Custom
Power Performance Tuning set to BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode set to Performance
LLC Dead Line Alloc set to Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaaf64d
running on spec Mon Aug 9 08:36:51 2021

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Silver 4214 CPU @ 2.20GHz
  2 "physical id"s (chips)
  48 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 12
siblings : 24
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13

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): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 2
Core(s) per socket: 12

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

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
Tyrone Camarero DIT400TR-436R
(2.20 GHz, Intel Xeon Silver 4214)

CPU2017 License: 006042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

SPECrater®2017_int_base = 144
SPECrater®2017_int_peak = 149

Platform Notes (Continued)

Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4214 CPU @ 2.20GHz
BIOS Model name: Intel(R) Xeon(R) Silver 4214 CPU @ 2.20GHz
Stepping: 7
CPU MHz: 1000.083
CPU max MHz: 3200.0000
CPU min MHz: 1000.0000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 16896K
NUMA node0 CPU(s): 0-11,24-35
NUMA node1 CPU(s): 12-23,36-47
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmonf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrc pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm ablp_dib 3nowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single intel_pinn ssbd mba ibrs ibpbt stibp ibrs_enhanced tpr_shadow vnmi
flexpriority ept vpd ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms
invpcid cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt
avx512cd avx512bw avx512vl xsxaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occu_l1c
ck0_mbl_total ck0_mbl_local dtherm ida arat plt pts hwp hwp_act_window hwp_epp
hwp_pkg_req pkp ospe avx512_vnni md_clear flush_l1d arch_capabilities

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 24 25 26 27 28 29 30 31 32 33 34 35
node 0 size: 192108 MB
node 0 free: 191381 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 36 37 38 39 40 41 42 43 44 45 46 47
node 1 size: 193493 MB
node 1 free: 193003 MB
node distances:
node 0 1

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

**Tyrone Systems**  
(Test Sponsor: Netweb Pte Ltd)  
**Tyrone Camarero DIT400TR-436R**  
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<table>
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<tr>
<th>SPECrate®2017_int_base</th>
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**CPU2017 License:** 006042  
**Test Sponsor:** Netweb Pte Ltd  
**Tested by:** Tyrone Systems  
**Test Date:** Aug-2021  
**Hardware Availability:** Apr-2019  
**Software Availability:** Jul-2021

---

### Platform Notes (Continued)

```
0: 10 21  
1: 21 10
```

From `/proc/meminfo`
- `MemTotal: 394855532 kB`
- `HugePages_Total: 0`
- `Hugepagesize: 2048 kB`

```
/sbin/tuned-adm active
  Current active profile: throughput-performance
```

```
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance
```

From `/etc/*release` /`/etc/*version`:
- `centos-release: CentOS Linux release 8.4.2105`
- `centos-release-upstream: Derived from Red Hat Enterprise Linux 8.4`
- `os-release:
  NAME="CentOS Linux"
  VERSION="8"
  ID="centos"
  ID_LIKE="rhel fedora"
  VERSION_ID="8"
  PLATFORM_ID="platform:el8"
  PRETTY_NAME="CentOS Linux 8"
  ANSI_COLOR="0;31"
  redhat-release: CentOS Linux release 8.4.2105`
- `system-release: CentOS Linux release 8.4.2105`
- `system-release-cpe: cpe:/o:centos:centos:8`

```
uname -a:
  Linux spec 4.18.0-305.3.1.el8.x86_64 #1 SMP Tue Jun 1 16:14:33 UTC 2021 x86_64 x86_64 GNU/Linux
```

**Kernel self-reported vulnerability status:**

- **CVE-2018-12207 (iTLB Multihit):**  
  - **KVM:** Mitigation: Split huge pages
  - 

- **CVE-2018-3620 (L1 Terminal Fault):**  
  - Not affected
  - 

- **Microarchitectural Data Sampling:**  
  - Not affected
  - 

- **CVE-2017-5754 (Meltdown):**  
  - Mitigation: Speculative Store Bypass disabled via prctl and seccomp
  - 

- **CVE-2018-3639 (Speculative Store Bypass):**  
  - Mitigation: usercopy/swapps barriers and __user pointer sanitization
  - 

- **CVE-2017-5753 (Spectre variant 1):**  
  - Mitigation: Enhanced IBRS, IBPB:
  - 

- **CVE-2017-5715 (Spectre variant 2):**  
  - 

(Continued on next page)
Tyrone Systems
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SPEC CPU®2017 Integer Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 144
SPECrate®2017_int_peak = 149

Platform Notes (Continued)
conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort):
Mitigation: TSX disabled

run-level 3 Aug 9 08:35
SPEC is set to: /home/cpu2017
Filesystem       Type   Size  Used Avail Use% Mounted on
/dev/mapper/cl-home  xfs   372G  193G  180G  52%   /home

From /sys/devices/virtual/dmi/id
Vendor:         Tyrone Systems
Product:        Tyrone Camarero DIT400TR-436R
Product Family: empty
Serial:         empty

Additional information from dmidecode 3.2 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:
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2400

BIOS:
  BIOS Vendor:       American Megatrends Inc.
  BIOS Version:      V8.104
  BIOS Date:         07/27/2021
  BIOS Revision:     5.14
  Firmware Revision: 6.1

(End of data from sysinfo program)

Compiler Version Notes
==============================================================================
C       | 500.perlbench_r(peak) 557.xz_r(peak)
==============================================================================
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R),
  Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================

C       | 502.gcc_r(peak)
==============================================================================
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version

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

### Compiler Version Notes (Continued)

2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

------------------------------------------------------------------
C   | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
    | 525.x264_r(base, peak) 557.xz_r(base)
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
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C   | 500.perlbench_r(peak) 557.xz_r(peak)
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## Compiler Version Notes (Continued)

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Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
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## Base Compiler Invocation

- **C benchmarks:**
  - icx

- **C++ benchmarks:**
  - icpx

- **Fortran benchmarks:**
  - ifort
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**Software Availability:** Jul-2021

### Base Portability Flags

- 500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64  
- 502.gcc_r: -DSPEC_LP64  
- 505.mcf_r: -DSPEC_LP64  
- 520.omnetpp_r: -DSPEC_LP64  
- 523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX  
- 525.x264_r: -DSPEC_LP64  
- 531.deepsjeng_r: -DSPEC_LP64  
- 541.leela_r: -DSPEC_LP64  
- 548.exchange2_r: -DSPEC_LP64  
- 557.xz_r: -DSPEC_LP64

### Base Optimization Flags

**C benchmarks:**  
- -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math  
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
- -mbranches-within-32B-boundaries  
- -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
- -lqkmalloc

**C++ benchmarks:**  
- -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto  
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
- -mbranches-within-32B-boundaries  
- -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
- -lqkmalloc

**Fortran benchmarks:**  
- -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div  
- -qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte  
- -auto -mbranches-within-32B-boundaries  
- -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
- -lqkmalloc

### Peak Compiler Invocation

**C benchmarks (except as noted below):**  
- icx

- 500.perlbench_r: icc

(Continued on next page)
## Peak Compiler Invocation (Continued)

557.xz_r: icc 

C++ benchmarks:
  icpx

Fortran benchmarks:
  ifort

## Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

## Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) 
-xCORE-AVX512 -ipo -O3 -no-prec-div 
-qopt-mem-layout-trans=4 -fno-strict-overflow 
-mbranches-within-32B-boundaries 
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin 
-lqkmalloc

502.gcc_r: -m32
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin 
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass1) 
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -fto 
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4 
-mbranches-within-32B-boundaries 
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: basepeak = yes

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Peak Optimization Flags (Continued)

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-1qkmalloc

557.xz_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-1qkmalloc

C++ benchmarks:
520.omnetpp_r: basepeak = yes
523.xalancbmk_r: basepeak = yes
531.deepsjeng_r: basepeak = yes
541.leela_r: basepeak = yes

Fortran benchmarks:
548.exchange2_r: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-CLX-revI.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-CLX-revI.xml

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