**SPEC CPU®2017 Integer Speed Result**

**Tyrone Systems**
(Test Sponsor: Netweb Pte Ltd)

**Tyrone Camarero DIT400TR-436R**
(2.20 GHz, Intel Xeon Silver 4214)

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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:** Jun-2021

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**Threads**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>48</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>48</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>48</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>48</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>48</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>48</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>48</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>48</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>48</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>48</td>
</tr>
</tbody>
</table>

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**CPU Name:** Intel Xeon Silver 4214  
**Max MHz:** 3200  
**Nominal:** 2200  
**Enabled:** 24 cores, 2 chips, 2 threads/core  
**Orderable:** 1,2 Chips  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 1 MB I+D on chip per core  
**L3:** 16.5 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933P-R, running at 2400)  
**Storage:** 1 x 480 GB SATA SSD  
**Other:** None  

---

**OS:** CentOS Linux release 8.4.2105  
**Kernel:** 4.18.0-305.3.1.el8.x86_64  
**Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;  
**Parallel:** Yes  
**Firmware:** Version V8.104 released Jul-2021  
**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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**SPECspeed®2017_int_base = 9.03**  
**SPECspeed®2017_int_peak = 9.26**  

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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
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<td>5.38</td>
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<td>602.gcc_s</td>
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<td>8.59</td>
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<tr>
<td>605.mcf_s</td>
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<td>16.3</td>
<td>292</td>
<td>16.2</td>
<td>293</td>
<td>16.1</td>
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<td>11.4</td>
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<td>11.3</td>
<td>126</td>
<td>11.2</td>
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<tr>
<td>625.x264_s</td>
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<td>13.1</td>
<td>135</td>
<td>13.1</td>
<td>134</td>
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<td>631.deepsjeng_s</td>
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<td>4.93</td>
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<td>4.93</td>
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<tr>
<td>641.leela_s</td>
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<td>657.xz_s</td>
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<td>19.1</td>
<td>322</td>
<td>19.2</td>
<td>322</td>
<td>19.2</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 9.03  
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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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
MALLOCONF = "retain:true"
OMP_STACKSIZE = "192M"

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.:  
umactl --interleave=all runcpu <etc>

(Continued on next page)
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SPECspeed®2017_int_base = 9.03
SPECspeed®2017_int_peak = 9.26

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 982a61ec0915b5589ef0e16aca6c64d
running on spec Wed Aug 11 01:11:25 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)
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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: 2745.554
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
aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
x2apic pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm ablp mmse PREFETCH페이스 cpuid_fault epb cat_l3 cdp_l3
invpcid_single intel_pni ssbd mba ibrs ibpb stibp ibrs enhanced tpr_shadow vmx
flexpriority ept vpid ept_ad fsgsbase tsc_adjust bsm1 hle avx2 smep bmi2 erms
invpcid cqm mxp rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt
avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsave vcsaves cqm_llc cqm_occup_llc
vmbd_total vmbd_local dutherm ida arat pnp pts hw info act_window hw_info
hw_perf_req pku ovpke avx512_vnni md_clear flush_lld 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: 173505 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: 176642 MB
node distances:
node 0 1

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<tr>
<th>Test Date</th>
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<th>Software Availability</th>
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<tbody>
<tr>
<td>Aug-2021</td>
<td>Apr-2019</td>
<td>Jun-2021</td>
</tr>
</tbody>
</table>

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**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"
  - 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/swappgs barriers and __user pointer sanitization
- CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB:
- CVE-2017-5715 (Spectre variant 2):

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Platform Notes (Continued)

conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected

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       | 600.perlbench_s(peak)
==============================================================================

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
C       | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)
       | 625.x264_s(base, peak)  657.xz_s(base, peak)

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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

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Hardware Availability: Apr-2019
Software Availability: Jun-2021

Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-DSPEC_OPENMP -std=c11 -m64 -fopenmp -Wl,-z,muldefs -xCORE-AVX512
-03 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-Fl/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -ffast-math
-ffast-math=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-Fl/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/
-lqkmalloc

Fortran benchmarks:
-m64 -xCORE-AVX512 -03 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries

Page 8 Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/
### Peak Compiler Invocation

C benchmarks (except as noted below):
- icx
- 600.perlbench_s: icc

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifort

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

C benchmarks:
- 600.perlbench_s: -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/usr/local/je5.0.1-64/lib -ljemalloc
- 602.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)  
  -fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto  
  -Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4  
  -mbranches-within-32B-boundaries  
  -L/usr/local/je5.0.1-64/lib -ljemalloc
- 605.mcf_s: basepeak = yes
- 625.x264_s: -DSPEC_OPENMP -fiopenmp -std=c11 -m64 -Wl,-z,muldefs  
  -xCORE-AVX512 -flto -O3 -ffast-math  
  -qopt-mem-layout-trans=4 -fno-alias  
  -mbranches-within-32B-boundaries  
  -L/usr/local/je5.0.1-64/lib -ljemalloc
- 657.xz_s: basepeak = yes

(Continued on next page)
Peak Optimization Flags (Continued)

C++ benchmarks:

620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: 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