## SPEC CPU®2017 Integer Speed Result

**Tyrone Systems**  
(Test Sponsor: Netweb Pte Ltd)  
Tyrone Camarero DS400E1U-224R4  
(2.50 GHz, Intel Xeon Gold 6248)

**Copyright 2017-2021 Standard Performance Evaluation Corporation**

**SPECspeed®2017_int_base = 9.07**  
**SPECspeed®2017_int_peak = 9.30**

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (9.07)</th>
<th>SPECspeed®2017_int_peak (9.30)</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>80</td>
<td>6.48</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>80</td>
<td>8.63</td>
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<tr>
<td>605.mcf_s</td>
<td>80</td>
<td>9.02</td>
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<tr>
<td>620.omnetpp_s</td>
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<td>6.56</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>80</td>
<td>11.2</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>80</td>
<td>12.6</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>80</td>
<td>4.83</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>80</td>
<td>3.93</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>80</td>
<td>13.5</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>80</td>
<td>20.9</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name**: Intel Xeon Gold 6248  
- **Max MHz**: 3900  
- **Nominal**: 2500  
- **Enabled**: 40 cores, 2 chips, 2 threads/core  
- **Orderable**: 1.2 (chip)  
- **Cache L1**: 32 KB I + 32 KB D on chip per core  
- **L2**: 1 MB I+D on chip per core  
- **L3**: 27.5 MB I+D on chip per chip  
- **Other**: None  
- **Memory**: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage**: 1 x 480 GB SATA SSD  
- **Other**: None

**Software**

- **OS**: CentOS Linux release 8.3.2011  
  4.18.0-240.el8.x86_64  
- **Compiler**: C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux Build 20200306;  
  Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux Build 20200306;  
- **Parallel**: Yes  
- **Firmware**: Version 3.4 released Oct-2020  
- **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
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>462</td>
<td>8.62</td>
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<td>8.63</td>
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<td>605.mcf_s</td>
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<td><strong>297</strong></td>
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<td>126</td>
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<td><strong>126</strong></td>
<td><strong>11.2</strong></td>
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<td>625.x264_s</td>
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<td><strong>12.6</strong></td>
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<td><strong>126</strong></td>
<td><strong>12.6</strong></td>
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<td>631.deepsjeng_s</td>
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<td>296</td>
<td><strong>4.84</strong></td>
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<td><strong>297</strong></td>
<td><strong>4.83</strong></td>
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<tr>
<td>641.leela_s</td>
<td>80</td>
<td>434</td>
<td><strong>3.93</strong></td>
<td>434</td>
<td><strong>3.93</strong></td>
<td><strong>434</strong></td>
<td><strong>3.93</strong></td>
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<tr>
<td>648.exchange2_s</td>
<td>80</td>
<td>218</td>
<td><strong>13.5</strong></td>
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<td><strong>13.5</strong></td>
<td><strong>217</strong></td>
<td><strong>13.5</strong></td>
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<tr>
<td>657.xz_s</td>
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<td>296</td>
<td><strong>20.9</strong></td>
<td>295</td>
<td><strong>21.0</strong></td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base** = 9.07

**SPECspeed®2017_int_peak** = 9.30

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.

The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

## 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"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

## General Notes

Binaries compiled on a system with 2x Intel Cascade Lake CPU + 384GB RAM memory using Centos 8.2 x86_64

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
```
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General Notes (Continued)
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.
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 Centos 8.2 x86_64, and the system compiler gcc 8.3.1 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases

Platform Notes

BIOS Settings:
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Extreme Performance
SNC = Enable
Stale AtoS = Disable
IMC Interleaving = 1-way Interleave
Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on spec Thu Feb 4 18:48:59 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) Gold 6248 CPU @ 2.50GHz
  2 "physical id"s (chips)
  80 "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 : 20
siblings : 40
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian

(Continued on next page)
Platform Notes (Continued)

CPU(s): 80
On-line CPU(s) list: 0-79
Thread(s) per core: 2
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6248 CPU @ 2.50GHz
Stepping: 7
CPU MHz: 3199.990
CPU max MHz: 3900.0000
CPU min MHz: 1000.0000
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0, 1, 2, 5, 6, 10-12, 15, 16, 40-42, 45, 46, 50-52, 55, 56
NUMA node1 CPU(s): 3, 4, 7, 9, 13, 14, 17-19, 25, 26, 30-32, 35, 36, 60-62, 65, 66, 70-72, 75, 76
NUMA node2 CPU(s): 20, 21, 22, 25, 26, 30-32, 35, 36, 60-62, 65, 66, 70-72, 75, 76
NUMA node3 CPU(s): 23, 24, 27-29, 33, 34, 37-39, 63, 64, 67-69, 73, 74, 77-79
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 nni pclmulqdq dtets64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 lse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm stp rop pti intel_p8 intel_p6 lp64 a2tp 3now pdflush denbe ds_cpl lan mepx cmip cmipviz via_dvfs zmask cpr xapic smep bmi2 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 xsaveopt xsaveprec xsavec xcompr xsaveas cqm_llc cqm_occocc_l1c cqm_mmb_total cqm_mmb_local dtmfar ida arat pln pts pku ospke avx512_vnni md_clear flush_l1d arch_capabilities

/platform/cpuinfo cache data
  cache size: 28160 KB

From numa...
SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017_int_peak = 9.30

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

Test Date: Feb-2021
Hardware Availability: Aug-2020
Software Availability: Dec-2020

Platform Notes (Continued)

node 1 free: 84306 MB
node 2 cpus: 20 21 22 25 26 30 31 32 35 36 60 61 62 65 66 70 71 72 75 76
node 2 size: 92199 MB
node 2 free: 84373 MB
node 3 cpus: 23 24 27 28 29 33 34 37 38 63 64 67 68 69 73 74 77 78 79
node 3 size: 92036 MB
node 3 free: 84412 MB
node distances:
node 0 1 2 3
0: 10 11 21 21
1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 394858824 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 8.3.2011
centos-release-upstream: Derived from Red Hat Enterprise Linux 8.3
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 8.3.2011
system-release: CentOS Linux release 8.3.2011
system-release-cpe: cpe:/o:centos:centos:8

uname -a:
Linux spec 4.18.0-240.el8.x86_64 #1 SMP Fri Sep 25 19:48:47 UTC 2020 x86_64 x86_64
x86_64 GNU/Linux

Kernel self-reported vulnerability status:

(Continued on next page)
Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

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

Platform Notes (Continued)
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): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store
  Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swaps barriers and __user pointer
  sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected

run-level 3 Feb 3 12:31
SPEC is set to: /home/cpu2017

Filesyste Type  Size  Used Avail Use% Mounted on
/dev/mapper/cl-home xfs 372G 156G 216G 42% /home
From /sys/devices/virtual/dmi/id
Vendor: Tyrone Systems
Product: Tyrone Camarero DS400E1
Serial: S263875X9527668

Additional information from dmidecode 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 NO DIMM NO DIMM
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

BIOS:
  BIOS Vendor: American Megatrends Inc.
  BIOS Version: 3.4
  BIOS Date: 10/30/2020
  BIOS Revision: 5.14

(End of data from sysinfo program)

Compiler Version Notes
==============================================================================
C | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)

(Continued on next page)
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**CPU2017 License:** 006042  
**Test Sponsor:** Netweb Pte Ltd  
**Tested by:** Tyrone Systems

**Test Date:** Feb-2021  
**Hardware Availability:** Aug-2020  
**Software Availability:** Dec-2020

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**Compiler Version Notes (Continued)**

<table>
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<tr>
<th>625.x264_s(base, peak)</th>
<th>657.xz_s(base, peak)</th>
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Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---

<table>
<thead>
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<th>600.perlbench_s(peak)</th>
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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<th>623.xalancbmk_s(base, peak)</th>
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<tbody>
<tr>
<td>631.deepsjeng_s(base, peak)</td>
<td>641.leela_s(base, peak)</td>
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C++ Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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<table>
<thead>
<tr>
<th>648.exchange2_s(base, peak)</th>
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</table>

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,  
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**CPU2017 License:** 006042  
**Test Date:** Feb-2021  
**Test Sponsor:** Netweb Pte Ltd  
**Tested by:** Tyrone Systems  
**Hardware Availability:** Aug-2020  
**Software Availability:** Dec-2020  

### Compiler Version Notes (Continued)

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### Base Compiler Invocation

- **C benchmarks:**
  - icc

- **C++ benchmarks:**
  - icpc

- **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:**
  - -m64 -qnextgen -std=c11  
  - -Wl, -plugin-opt=-x86-branches-within-32B-bounds -Wl, -z, muldefs  
  - -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops  
  - -fuse=ld=gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP  
  - -L/usr/local/je5.0.1-64/lib -ljemalloc

- **C++ benchmarks:**
  - -m64 -qnextgen -Wl, -plugin-opt=-x86-branches-within-32B-bounds  
  - -Wl, -z, muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse  
  - -funroll-loops -fuse=ld=gold -qopt-mem-layout-trans=4  
  - -L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin  
  - -lqkmalloc

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

### Tyrone Systems

(Trusted Sponsor: Netweb Pte Ltd)

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<thead>
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<tr>
<td><strong>Test Sponsor</strong></td>
<td>Netweb Pte Ltd</td>
</tr>
<tr>
<td><strong>Tested by</strong></td>
<td>Tyrone Systems</td>
</tr>
</tbody>
</table>

**Base Optimization Flags (Continued)**

Fortran benchmarks:

- `-m64`  
- `-Wl,-plugin-opt=-x86-branches-within-32B-boundaries`  
- `-xCORE-AVX512`  
- `-O3`  
- `-ipo`  
- `-no-prec-div`  
- `-qopt-mem-layout-trans=4`  
- `-nostandard-realloc-lhs`  
- `-align array32byte`  
- `-mbranches-within-32B-boundaries`

**Peak Compiler Invocation**

- **C benchmarks:** `icc`
- **C++ benchmarks:** `icpc`

**Fortran benchmarks:** `ifort`

**Peak Portability Flags**

- `600.perlbench_s`: `-DSPEC_LP64 -DSPEC_LINUX_X64`
- `602.gcc_s`: `-DSPEC_LP64(*) -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`

(*) Indicates a portability flag that was found in a non-portability variable.

**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`

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

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
Tyrone Camarero DS400E1U-224R4
(2.50 GHz, Intel Xeon Gold 6248)

SPECspeed®2017_int_base = 9.07
SPECspeed®2017_int_peak = 9.30

CPU2017 License: 006042
Test Date: Feb-2021
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems
Hardware Availability: Aug-2020
Software Availability: Dec-2020

Peak Optimization Flags (Continued)

600.perlbench_s (continued):
-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 -qnextgen -std=c11 -fuse-ld=gold
-Wl, -plugin-opt=-x86-branches-within-32B-boundaries
-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
-L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_s: basepeak = yes

625.x264_s: -m64 -qnextgen -std=c11
-Wl, -plugin-opt=-x86-branches-within-32B-boundaries
-Wl, -z, muldefs -xCORE-AVX512 -flto -O3 -ffast-math
-ffuse-ld=gold -qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/je5.0.1-64/lib -ljemalloc

657.xz_s: basepeak = yes

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-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-CLX-revB.xml
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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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