# SPEC CPU®2017 Integer Rate Result

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

Tyrone Camarero IDI100C2R-28
(2.30 GHz,Intel Xeon Platinum 8380)

$SPECrate®2017\_int\_base = 550$

$SPECrate®2017\_int\_peak = 569$

**CPU2017 License:** 006042
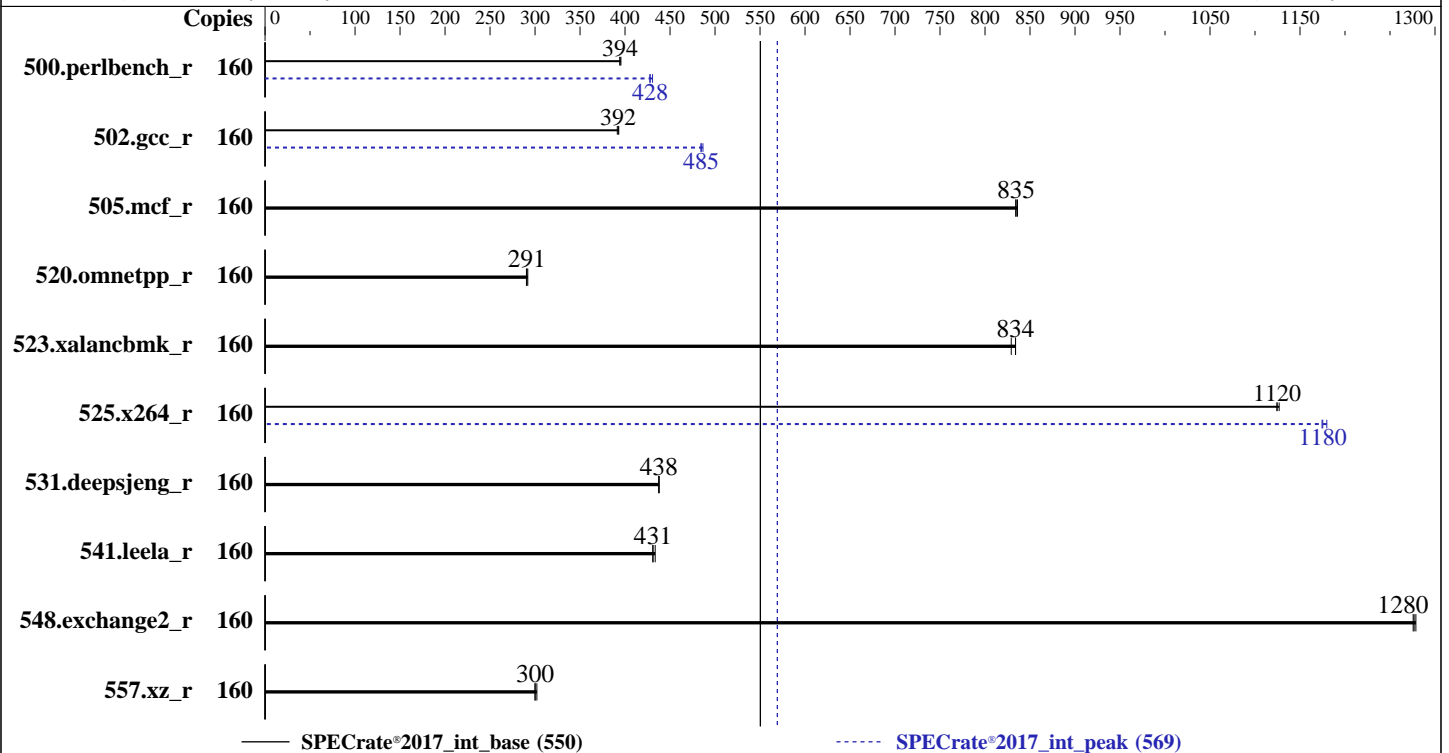
**Test Sponsor:** Netweb Pte Ltd

**Tested by:** Tyrone Systems

**Test Date:** Sep-2022

**Hardware Availability:** Jun-2021

**Software Availability:** May-2022

| Benchmark | Copies | base | peak |
|---|---|---|---|
| 500.perlbench_r | 160 | 394 | 428 |
| 502.gcc_r | 160 | 392 | 485 |
| 505.mcf_r | 160 | 835 | |
| 520.omnetpp_r | 160 | 291 | |
| 523.xalancbmk_r | 160 | 834 | |
| 525.x264_r | 160 | 1120 | 1180 |
| 531.deepsjeng_r | 160 | 438 | |
| 541.leela_r | 160 | 431 | |
| 548.exchange2_r | 160 | 1280 | |
| 557.xz_r | 160 | 300 | |

SPECrate®2017_int_base (550)          SPECrate®2017_int_peak (569)

## Hardware

CPU Name: Intel Xeon Platinum 8380

Max MHz: 3400

Nominal: 2300

Enabled: 80 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: 60 MB I+D on chip per chip

Other: None

Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)

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 SE5C620.86B.01.01.0004.2110190142 released Oct-2021

File System: xfs

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

Peak Pointers: 32/64-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 |
| 500.perlbench_r | 160 | 644 | 395 | **646** | **394** | 646 | 394 | 160 | 592 | 431 | **595** | **428** | 596 | 428 |
| 502.gcc_r | 160 | 579 | 391 | 576 | 393 | **577** | **392** | 160 | 466 | 487 | 468 | 484 | **467** | **485** |
| 505.mcf_r | 160 | 309 | 836 | **310** | **835** | 310 | 834 | 160 | 309 | 836 | **310** | **835** | 310 | 834 |
| 520.omnetpp_r | 160 | **722** | **291** | 723 | 290 | 719 | 292 | 160 | **722** | **291** | 723 | 290 | 719 | 292 |
| 523.xalancbmk_r | 160 | 203 | 834 | **203** | **834** | 204 | 829 | 160 | 203 | 834 | **203** | **834** | 204 | 829 |
| 525.x264_r | 160 | **249** | **1120** | 249 | 1120 | 249 | 1130 | 160 | 237 | 1180 | 239 | 1170 | **238** | **1180** |
| 531.deepsjeng_r | 160 | **419** | **438** | 419 | 438 | 419 | 438 | 160 | **419** | **438** | 419 | 438 | 419 | 438 |
| 541.leela_r | 160 | 615 | 431 | 611 | 434 | **615** | **431** | 160 | 615 | 431 | 611 | 434 | **615** | **431** |
| 548.exchange2_r | 160 | **328** | **1280** | 328 | 1280 | 329 | 1280 | 160 | **328** | **1280** | 328 | 1280 | 329 | 1280 |
| 557.xz_r | 160 | 572 | 302 | 576 | 300 | **576** | **300** | 160 | 572 | 302 | 576 | 300 | **576** | **300** |
| **SPECrate®2017_int_base =** | | **550** | | | | | | | | | | | | |
| **SPECrate®2017_int_peak =** | | **569** | | | | | | | | | | | | |

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

## Compiler Notes

```
SPEC has ruled that the compiler used for this result was performing a compilation
that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s
benchmarks using a priori knowledge of the SPEC code and dataset to perform a
transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4
https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer
publish results using this optimization.

This result is left in the SPEC results database for historical reference.
```

## 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"
```

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## 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>
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 = Enable
Hyper-Threading = Enabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on icelakespec Tue Sep  6 04:39:17 2022

 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) Platinum 8380 CPU @ 2.30GHz
       2  "physical id"s (chips)
       160 "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 : 40
       siblings  : 80
       physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
       physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

 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):              160
     On-line CPU(s) list: 0-159
     Thread(s) per core:  2
     Core(s) per socket:  40
     Socket(s):           2
     NUMA node(s):        4
     Vendor ID:           GenuineIntel
```

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## Platform Notes (Continued)

```
         BIOS Vendor ID:       Intel(R) Corporation
         CPU family:           6
         Model:                106
         Model name:           Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
         BIOS Model name:      Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
         Stepping:             6
         CPU MHz:              2300.000
         CPU max MHz:          3400.0000
         CPU min MHz:          800.0000
         BogoMIPS:             4600.00
         Virtualization:       VT-x
         L1d cache:            48K
         L1i cache:            32K
         L2 cache:             1280K
         L3 cache:             61440K
         NUMA node0 CPU(s):    0-19,80-99
         NUMA node1 CPU(s):    20-39,100-119
         NUMA node2 CPU(s):    40-59,120-139
         NUMA node3 CPU(s):    60-79,140-159
         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 ssbd
         mba ibrs ibpb stibp ibrs_enhanced 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

 /proc/cpuinfo cache data
    cache size : 61440 KB

 From numactl --hardware
 WARNING: a numactl 'node' might or might not correspond to a physical chip.
   available: 4 nodes (0-3)
   node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 80 81 82 83 84 85 86 87
   88 89 90 91 92 93 94 95 96 97 98 99
   node 0 size: 257664 MB
   node 0 free: 256109 MB
   node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 100 101 102
   103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119
   node 1 size: 258039 MB
   node 1 free: 257257 MB
   node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 120 121 122
   123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
   node 2 size: 258001 MB
   node 2 free: 257505 MB
   node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 140 141 142
   143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159
   node 3 size: 258034 MB
   node 3 free: 257577 MB
   node distances:
   node   0   1   2   3
     0:  10  11  20  20
     1:  11  10  20  20
     2:  20  20  10  11
```

**(Continued on next page)**

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**Test Date:** Sep-2022

**Hardware Availability:** Jun-2021

**Software Availability:** May-2022

## Platform Notes (Continued)

```
     3:  20  20  11  10

From /proc/meminfo
   MemTotal:      1056501796 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*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.5 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.5"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.5 (Ootpa)"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux release 8.5 (Ootpa)
   system-release: Red Hat Enterprise Linux release 8.5 (Ootpa)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:8::baseos

uname -a:
   Linux icelakespec 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

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):                      Not affected
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/swapgs
                                                     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
CVE-2019-11135 (TSX Asynchronous Abort):             Not affected

run-level 3 Sep 6 02:14

SPEC is set to: /home/cpu2017
   Filesystem          Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   402G  177G  225G  45% /home

From /sys/devices/virtual/dmi/id
    Vendor:          Tyrone_Systems
    Product:         Tyrone_Camarero_IDI100C2R-28
    Product Family: Family
    Serial:          2X22462203
```

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## Platform Notes (Continued)

```
 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:
     16x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

 BIOS:
    BIOS Vendor:        Intel Corporation
    BIOS Version:       SE5C620.86B.01.01.0004.2110190142
    BIOS Date:          10/19/2021

 (End of data from sysinfo program)
```

## Compiler Version Notes

```
==============================================================================================
C       | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------


==============================================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
        | 557.xz_r(base, peak)
----------------------------------------------------------------------------------------------
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.
----------------------------------------------------------------------------------------------


==============================================================================================
C       | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------


==============================================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
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----------------------------------------------------------------------------------------------


==============================================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
        | 541.leela_r(base, peak)
----------------------------------------------------------------------------------------------
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.
----------------------------------------------------------------------------------------------


==============================================================================================
Fortran | 548.exchange2_r(base, peak)
----------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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```

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## Compiler Version Notes (Continued)

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

## Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

## 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`
`-L/usr/local/intel/compiler/2022.1.0/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`
`-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin`
`-lqkmalloc`

Fortran benchmarks:
`-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto`

**(Continued on next page)**

Standard Performance Evaluation Corporation (info@spec.org)    https://www.spec.org/

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## Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

## Peak Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

## 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: `-w -std=c11 -m64 -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 -fno-strict-overflow`
`-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin`

**(Continued on next page)**

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# Peak Optimization Flags (Continued)

500.perlbench_r (continued):
-lqkmalloc

502.gcc_r: -m32
-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/ia32_lin
-std=gnu89 -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 -L/usr/local/jemalloc32-5.0.1/lib
-ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/intel/compiler/2022.1.0/linux/compiler/lib/intel64_lin
-lqkmalloc

557.xz_r: basepeak = yes

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/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

# SPEC CPU®2017 Integer Rate Result

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

Tyrone Camarero IDI100C2R-28
(2.30 GHz,Intel Xeon Platinum 8380)

### SPECrate®2017_int_base = 550

### SPECrate®2017_int_peak = 569

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

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