SPEC CPU®2017 Integer Speed Result

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Tyrone Systems

(Test Sponsor: Netweb Pte Ltd)

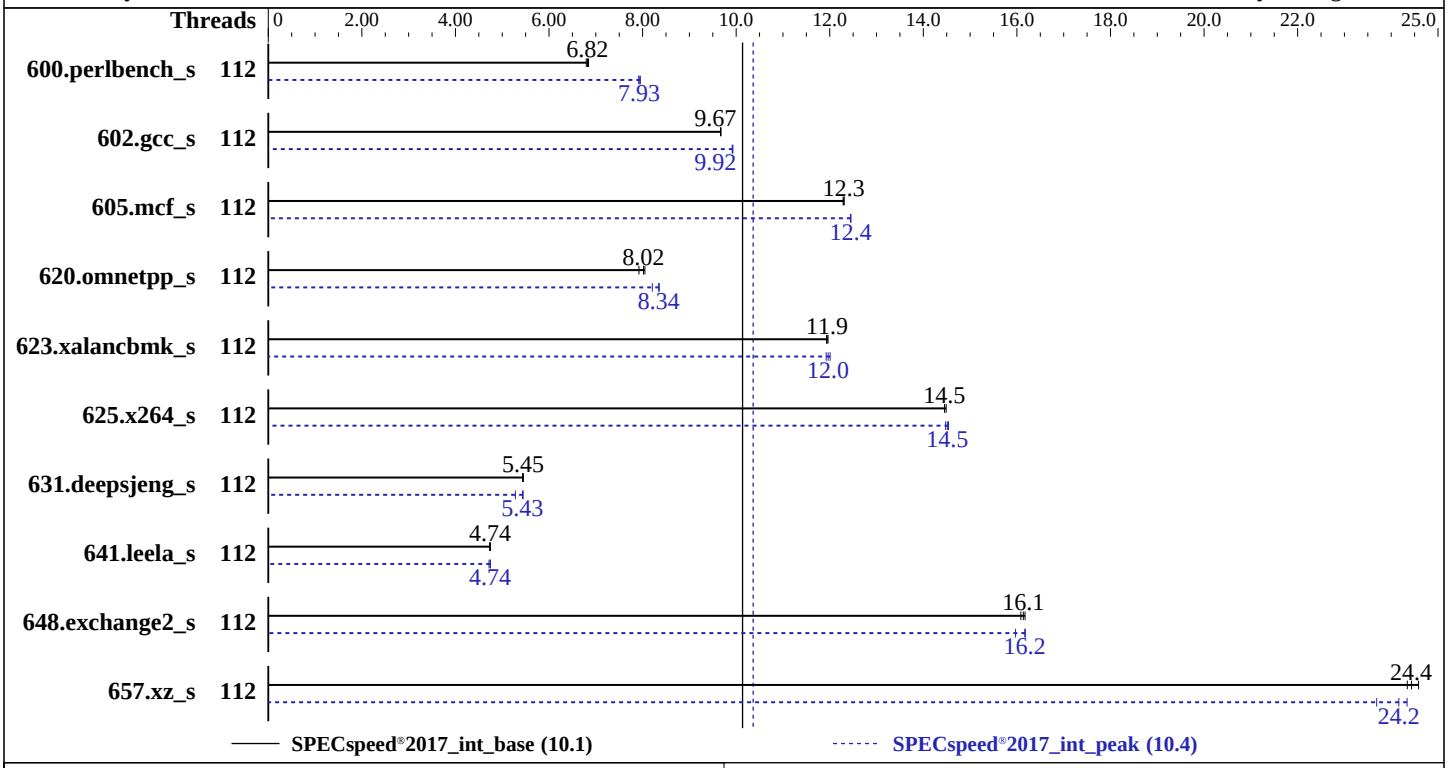
DIT400TR-48RL
(2.70 GHz, Intel Xeon Platinum 8280L)

SPECspeed®2017_int_base = 10.1

SPECspeed®2017_int_peak = 10.4

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

Test Date: Feb-2020
Hardware Availability: Sep-2019
Software Availability: Aug-2019



Hardware

CPU Name:	Intel Xeon Platinum 8280L
Max MHz:	4000
Nominal:	2700
Enabled:	56 cores, 2 chips, 2 threads/core
Orderable:	1, 2 (chip)s
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	38.5 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 SSD
Other:	None

Software

OS:	CentOS Linux release 7.7.1908 (Core) 3.10.0-1062.el7.x86_64
Compiler:	C/C++: Version 19.0.4.243 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.243 of Intel Fortran Compiler Build 20190416 for Linux
Parallel:	Yes
Firmware:	Version V8.101 released Aug-2019
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:	Default

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	112	261	6.80	259	6.84	**260**	**6.82**	112	224	7.92	223	7.95	**224**	**7.93**
602.gcc_s	112	**412**	**9.67**	412	9.67	412	9.67	112	401	9.93	**401**	**9.92**	402	9.92
605.mcf_s	112	**384**	**12.3**	384	12.3	384	12.3	112	379	12.4	379	12.5	**379**	**12.4**
620.omnetpp_s	112	**203**	**8.02**	203	8.05	206	7.92	112	199	8.21	**195**	**8.34**	195	8.36
623.xalancbmk_s	112	118	12.0	119	11.9	**119**	**11.9**	112	**118**	**12.0**	118	12.0	119	11.9
625.x264_s	112	**122**	**14.5**	122	14.5	122	14.5	112	122	14.5	**122**	**14.5**	121	14.5
631.deepsjeng_s	112	264	5.43	263	5.45	**263**	**5.45**	112	**264**	**5.43**	263	5.45	271	5.28
641.leela_s	112	361	4.73	360	4.74	**360**	**4.74**	112	360	4.74	**360**	**4.74**	362	4.72
648.exchange2_s	112	183	16.1	182	16.2	**182**	**16.1**	112	182	16.2	**182**	**16.2**	184	16.0
657.xz_s	112	251	24.6	254	24.3	**253**	**24.4**	112	254	24.3	**256**	**24.2**	261	23.7

SPECspeed®2017_int_base = 10.1

SPECspeed®2017_int_peak = 10.4

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

Compiler Notes

SPEC has learned that this result, which used an evaluation compiler, was submitted contrary to the compiler license terms.
Intel has granted a one-time waiver for this result.

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/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
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

(Continued on next page)

General Notes (Continued)

```
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 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

```
The system was tested with a pre-production version of the Intel Xeon Platinum 8280L, which
had a nominal MHz of 2.6 GHz. Production chips have a nominal MHz of 2.7 GHz and therefore
performance may be slightly faster than what was tested.

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on NODE4 Wed Feb  5 23:27:07 2020

 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 8280L CPU @ 2.60GHz
       2  "physical id"s (chips)
       112 "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 : 28
       siblings  : 56
       physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
       physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30

 From lscpu:
      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
```

(Continued on next page)

Platform Notes (Continued)

```
      NUMA node(s):          2
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Platinum 8280L CPU @ 2.60GHz
      Stepping:              5
      CPU MHz:               999.914
      CPU max MHz:           3900.0000
      CPU min MHz:           1000.0000
      BogoMIPS:              5200.00
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              39424K
      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
      aperfmperf eagerfpu 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 epb cat_l3 cdp_l3 intel_ppin
      intel_pt ssbd mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase
      tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq
      rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1
      cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts hwp
      hwp_act_window hwp_epp hwp_pkg_req pku ospke spec_ctrl intel_stibp flush_l1d
      arch_capabilities

  /proc/cpuinfo cache data
     cache size : 39424 KB

  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 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
    56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83
    node 0 size: 195228 MB
    node 0 free: 155283 MB
    node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
    53 54 55 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106
    107 108 109 110 111
    node 1 size: 196608 MB
    node 1 free: 158796 MB
    node distances:
    node   0   1
```

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Platform Notes (Continued)

```
     0:  10  21
     1:  21  10

  From /proc/meminfo
     MemTotal:       394852372 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  From /etc/*release* /etc/*version*
     centos-release: CentOS Linux release 7.7.1908 (Core)
     centos-release-upstream: Derived from Red Hat Enterprise Linux 7.7 (Source)
     os-release:
        NAME="CentOS Linux"
        VERSION="7 (Core)"
        ID="centos"
        ID_LIKE="rhel fedora"
        VERSION_ID="7"
        PRETTY_NAME="CentOS Linux 7 (Core)"
        ANSI_COLOR="0;31"
        CPE_NAME="cpe:/o:centos:centos:7"
     redhat-release: CentOS Linux release 7.7.1908 (Core)
     system-release: CentOS Linux release 7.7.1908 (Core)
     system-release-cpe: cpe:/o:centos:centos:7

  uname -a:
     Linux NODE4 3.10.0-1062.el7.x86_64 #1 SMP Wed Aug 7 18:08:02 UTC 2019 x86_64 x86_64
     x86_64 GNU/Linux

  Kernel self-reported vulnerability status:

  CVE-2018-3620 (L1 Terminal Fault):        Not affected
  Microarchitectural Data Sampling:         Vulnerable: Clear CPU buffers attempted, no
                                            microcode; SMT vulnerable
  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: Load fences, __user pointer
                                            sanitization
  CVE-2017-5715 (Spectre variant 2):        Mitigation: Full retpoline, IBPB

  run-level 3 Feb 4 06:00

  SPEC is set to: /home/cpu2017
     Filesystem              Type  Size  Used Avail Use% Mounted on
     /dev/mapper/centos-home xfs   392G  221G  171G  57% /home

  From /sys/devices/virtual/dmi/id
```

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Platform Notes (Continued)

```
     BIOS:    American Megatrends Inc. V8.101 08/02/2019
     Vendor:  Tyrone Systems
     Product: TP12XH-L2I
     Serial:  empty

  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 Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

  (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base,
        | peak) 625.x264_s(base, peak) 657.xz_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.243 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
icc: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.
------------------------------------------------------------------------------

==============================================================================
C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
        | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.243 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
icpc: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.
------------------------------------------------------------------------------

==============================================================================
Fortran | 648.exchange2_s(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.4.243 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
ifort: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.243/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
`icc -m64 -std=c11`

C++ benchmarks:
`icpc -m64`

Fortran benchmarks:
`ifort -m64`

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) `-O2 -xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc`

602.gcc_s: `-Wl,-z,muldefs -prof-gen`(pass 1) `-prof-use`(pass 2) `-O2 -xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc`

605.mcf_s: `-Wl,-z,muldefs -prof-gen`(pass 1) `-prof-use`(pass 2) `-ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc`

625.x264_s: `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc`

657.xz_s: `-Wl,-z,muldefs -prof-gen`(pass 1) `-prof-use`(pass 2) `-O2 -xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc`

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Peak Optimization Flags (Continued)

C++ benchmarks:

620.omnetpp_s: `-Wl,-z,muldefs -prof-gen`(pass 1) `-prof-use`(pass 2) `-ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.243/linux/compiler/lib/intel64 -lqkmalloc`

623.xalancbmk_s: `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.243/linux/compiler/lib/intel64 -lqkmalloc`

631.deepsjeng_s: `Same as 623.xalancbmk_s`

641.leela_s: `Same as 623.xalancbmk_s`

Fortran benchmarks:
`-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -nostandard-realloc-lhs`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/TyroneIT-Platform-Settings-V1-CLX-revA.html
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-15.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/TyroneIT-Platform-Settings-V1-CLX-revA.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-15.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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