



SPEC® CPU2017 Integer Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS B480 M5 (Intel Xeon Platinum 8176, 2.10 GHz)

SPECspeed2017_int_base = 9.27

SPECspeed2017_int_peak = 9.54

CPU2017 License: 9019

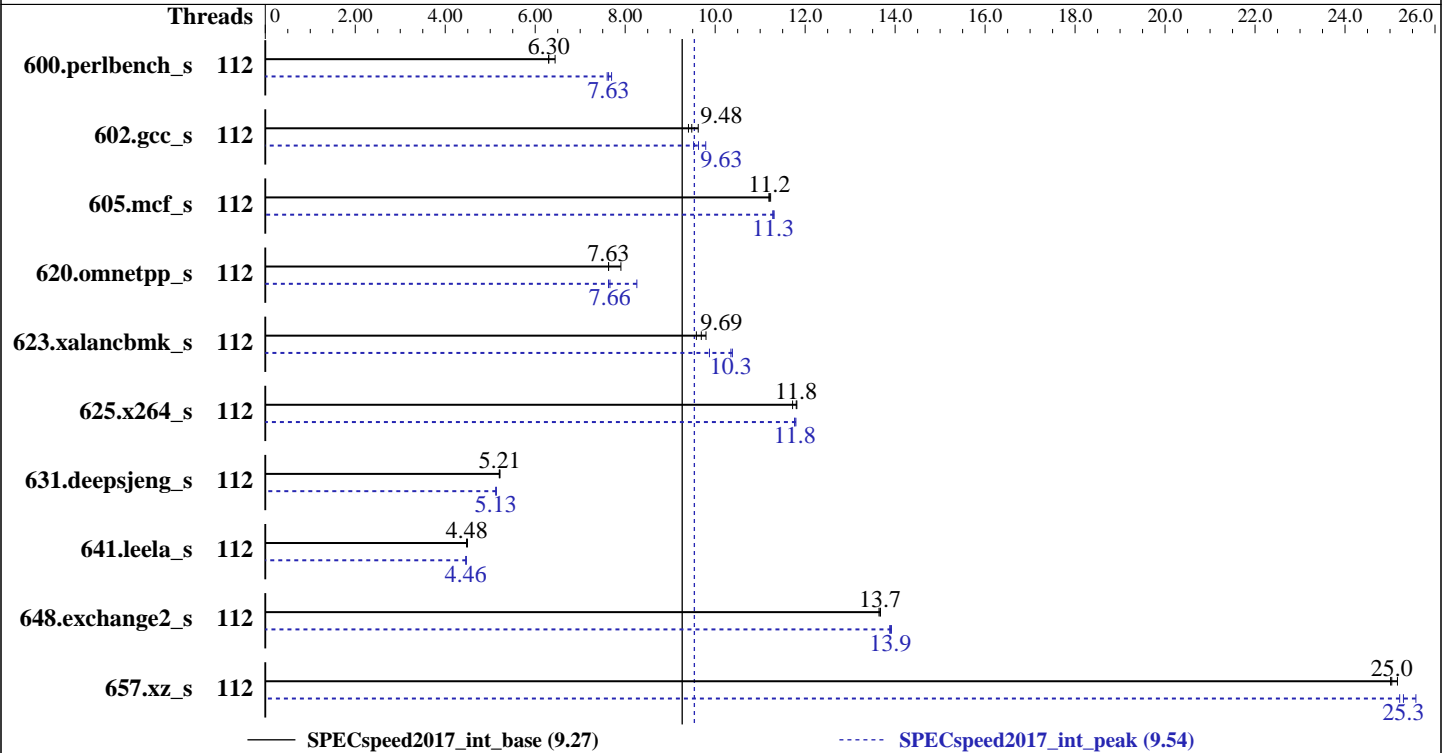
Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Nov-2018

Hardware Availability: Aug-2017

Software Availability: Mar-2018



Hardware

CPU Name: Intel Xeon Platinum 8176
 Max MHz.: 3800
 Nominal: 2100
 Enabled: 112 cores, 4 chips
 Orderable: 2,4 Chips
 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: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)
 Storage: 1 x 400 GB SSD SAS
 Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.120-92.70-default
 Compiler: C/C++: Version 18.0.2.199 of Intel C/C++ Compiler for Linux;
 Fortran: Version 18.0.2.199 of Intel Fortran Compiler for Linux
 Parallel: Yes
 Firmware: Version 3.2.3c released Mar-2018
 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



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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	282	6.30	<u>282</u>	<u>6.30</u>	276	6.44	112	<u>233</u>	<u>7.63</u>	231	7.70	234	7.60
602.gcc_s	112	414	9.62	<u>420</u>	<u>9.48</u>	423	9.41	112	418	9.52	407	9.79	<u>414</u>	<u>9.63</u>
605.mcf_s	112	422	11.2	420	11.2	<u>421</u>	<u>11.2</u>	112	419	11.3	<u>418</u>	<u>11.3</u>	417	11.3
620.omnetpp_s	112	206	7.91	<u>214</u>	<u>7.63</u>	214	7.63	112	<u>213</u>	<u>7.66</u>	214	7.63	197	8.26
623.xalancbmk_s	112	148	9.58	145	9.80	<u>146</u>	<u>9.69</u>	112	136	10.4	144	9.87	<u>137</u>	<u>10.3</u>
625.x264_s	112	<u>149</u>	<u>11.8</u>	151	11.7	149	11.8	112	150	11.8	<u>150</u>	<u>11.8</u>	150	11.8
631.deepsjeng_s	112	<u>275</u>	<u>5.21</u>	276	5.20	275	5.21	112	<u>279</u>	<u>5.13</u>	280	5.13	279	5.14
641.leela_s	112	381	4.47	380	4.49	<u>381</u>	<u>4.48</u>	112	383	4.46	<u>382</u>	<u>4.46</u>	382	4.47
648.exchange2_s	112	215	13.7	<u>215</u>	<u>13.7</u>	216	13.6	112	212	13.9	211	13.9	<u>212</u>	<u>13.9</u>
657.xz_s	112	<u>247</u>	<u>25.0</u>	247	25.0	246	25.2	112	<u>244</u>	<u>25.3</u>	245	25.2	242	25.6

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

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

General 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"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-6700K 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

Yes: 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>



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Platform Notes

BIOS Settings:

Intel HyperThreading Technology set to Disabled

CPU performance set to Enterprise

Power Performance Tuning set to OS Controls

SNC set to Disabled

Patrol Scrub set to Disabled

Sysinfo program /home/cpu2017/bin/sysinfo

Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f

running on linux-xy4f Mon Nov 12 21:30:57 2018

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 8176 CPU @ 2.10GHz

4 "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 : 28

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

physical 2: 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 3: 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: 1

Core(s) per socket: 28

Socket(s): 4

NUMA node(s): 4

Vendor ID: GenuineIntel

CPU family: 6

Model: 85

Model name: Intel(R) Xeon(R) Platinum 8176 CPU @ 2.10GHz

Stepping: 4

CPU MHz: 1000.091

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Platform Notes (Continued)

CPU max MHz: 3800.0000
CPU min MHz: 1000.0000
BogoMIPS: 4199.98
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 39424K
NUMA node0 CPU(s): 0-27
NUMA node1 CPU(s): 28-55
NUMA node2 CPU(s): 56-83
NUMA node3 CPU(s): 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 sse3 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 ida arat epb invpcid_single pln pts dtherm hwp hwp_act_window hwp_epp hwp_pkg_req intel_pt rsb_ctxsw spec_ctrl stibp retpoline kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

```
/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: 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 20 21 22 23 24 25 26 27
node 0 size: 385624 MB
node 0 free: 385273 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
node 1 size: 387057 MB
node 1 free: 386716 MB
node 2 cpus: 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 2 size: 387057 MB
node 2 free: 386827 MB
node 3 cpus: 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 3 size: 387054 MB
node 3 free: 386846 MB
node distances:
node 0 1 2 3
0: 10 21 21 21
```

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Platform Notes (Continued)

```

1: 21 10 21 21
2: 21 21 10 21
3: 21 21 21 10

```

From /proc/meminfo

```

MemTotal:      1583916004 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

From /etc/*release* /etc/*version*

SuSE-release:

```

SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2

```

```

# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

```

os-release:

```

NAME="SLES"
VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

```

uname -a:

```

Linux linux-xy4f 4.4.120-92.70-default #1 SMP Wed Mar 14 15:59:43 UTC 2018 (52a83de)
x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Dec 31 19:06

SPEC is set to: /home/cpu2017

```

Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sda1        xfs       224G      70G  154G  32% /

```

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.

BIOS Cisco Systems, Inc. B480M5.3.2.3c.0.0307181316 03/07/2018

Memory:

48x 0xCE00 M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)



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Compiler Version Notes

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

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====
CC 600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====
CXXC 620.omnetpp_s(peak) 623.xalancbmk_s(peak) 631.deepsjeng_s(peak) 641.leela_s(peak)

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

=====
FC 648.exchange2_s(base, peak)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:

icc -m64 -std=c11

C++ benchmarks:

icpc -m64

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Base Compiler Invocation (Continued)

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=3 -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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc
```

Fortran benchmarks:

```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

Peak Compiler Invocation

C benchmarks:

```
icc -m64 -std=c11
```

C++ benchmarks (except as noted below):

```
icpc -m64
```

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Peak Compiler Invocation (Continued)

```
623.xalancbmk_s: icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin
```

Fortran benchmarks:

```
ifort -m64
```

Peak 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: -D_FILE_OFFSET_BITS=64 -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
```

Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -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-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_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-prefetch
-qopt-mem-layout-trans=3 -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-prefetch -qopt-mem-layout-trans=3 -qopenmp
```

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Peak Optimization Flags (Continued)

625.x264_s (continued):

```
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc
```

657.xz_s: Same as 602.gcc_s

C++ benchmarks:

```
620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch  
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc
```

```
623.xalancbmk_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch  
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP -L/usr/local/je5.0.1-32/lib -ljemalloc
```

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: Same as 620.omnetpp_s

Fortran benchmarks:

```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

The flag files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.html>

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revH.html>

You can also download the XML flag sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml>

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revH.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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