SPEC® CPU2017 Floating Point Speed Result

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Cisco Systems

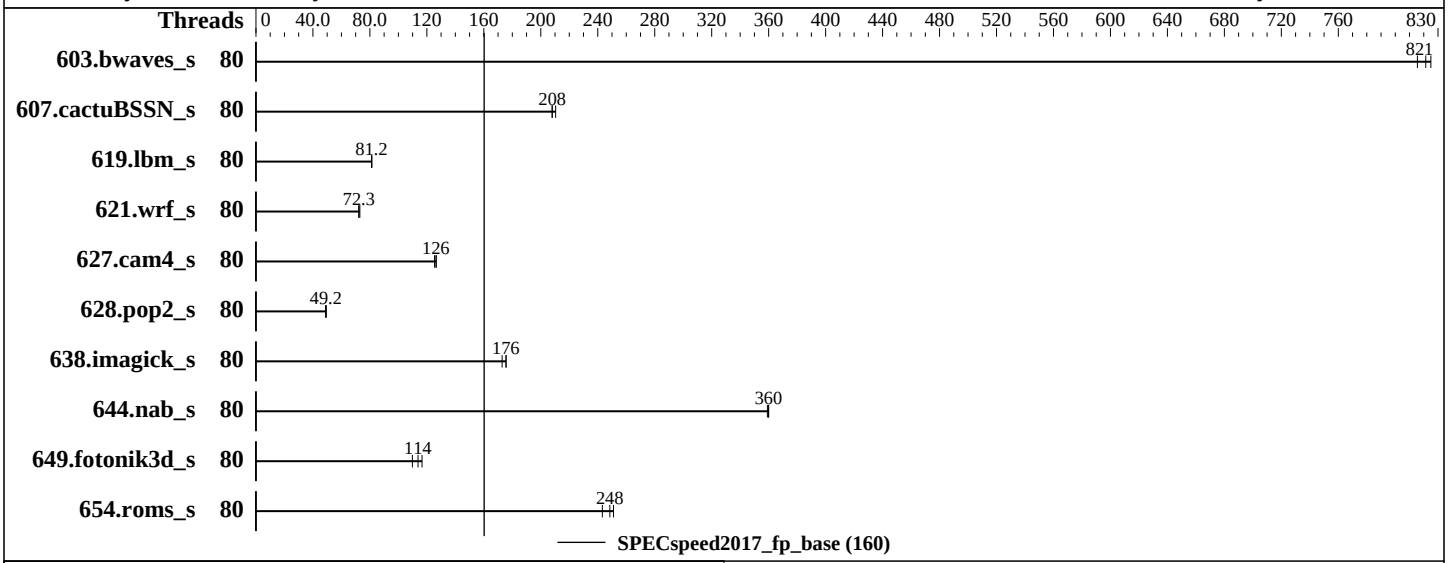
Cisco UCS B480 M5 (Intel Xeon Gold 6138 2.00 GHz)

SPECspeed2017_fp_base = 160

SPECspeed2017_fp_peak = Not Run

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 Gold 6138
Max MHz.:	3700
Nominal:	2000
Enabled:	80 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:	27.5 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:	Not Applicable
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
603.bwaves_s	80	71.5	825	72.3	816	**71.8**	**821**							
607.cactuBSSN_s	80	80.2	208	79.2	210	**80.1**	**208**							
619.lbm_s	80	**64.5**	**81.2**	64.5	81.1	64.4	81.4							
621.wrf_s	80	**183**	**72.3**	183	72.2	181	73.0							
627.cam4_s	80	70.0	127	**70.1**	**126**	70.7	125							
628.pop2_s	80	**241**	**49.2**	243	48.9	241	49.3							
638.imagick_s	80	82.2	176	83.5	173	**82.2**	**176**							
644.nab_s	80	48.7	359	**48.5**	**360**	48.5	360							
649.fotonik3d_s	80	78.2	117	**80.1**	**114**	83.0	110							
654.roms_s	80	64.7	243	62.7	251	**63.4**	**248**							

SPECspeed2017_fp_base = 160

SPECspeed2017_fp_peak = Not Run

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,compact"
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
```

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 Thu Nov 29 22:32:29 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) Gold 6138 CPU @ 2.00GHz
       4  "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  : 20
       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
       physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
       physical 3: 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
      CPU(s):                80
      On-line CPU(s) list:   0-79
      Thread(s) per core:    1
      Core(s) per socket:    20
      Socket(s):             4
      NUMA node(s):          4
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Gold 6138 CPU @ 2.00GHz
      Stepping:              4
      CPU MHz:               1462.058
      CPU max MHz:           3700.0000
      CPU min MHz:           1000.0000
      BogoMIPS:              3999.97
      Virtualization:        VT-x
```

(Continued on next page)

Platform Notes (Continued)

```
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              28160K
      NUMA node0 CPU(s):     0-19
      NUMA node1 CPU(s):     20-39
      NUMA node2 CPU(s):     40-59
      NUMA node3 CPU(s):     60-79
      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 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 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 : 28160 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
    node 0 size: 385624 MB
    node 0 free: 382866 MB
    node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
    node 1 size: 387057 MB
    node 1 free: 385654 MB
    node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59
    node 2 size: 387057 MB
    node 2 free: 384181 MB
    node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
    node 3 size: 387054 MB
    node 3 free: 386018 MB
    node distances:
    node   0   1   2   3
      0:  10  21  21  21
      1:  21  10  21  21
      2:  21  21  10  21
      3:  21  21  21  10

  From /proc/meminfo
     MemTotal:       1583916132 kB
     HugePages_Total:       0
```

(Continued on next page)

Platform Notes (Continued)

```
    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   76G  148G  34% /

 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)
```

Compiler Version Notes

```
==============================================================================
 CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
 FC  607.cactuBSSN_s(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

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

Fortran benchmarks:
`ifort -m64`

Benchmarks using both Fortran and C:
`ifort -m64 icc -m64 -std=c11`

Benchmarks using Fortran, C, and C++:
`icpc -m64 icc -m64 -std=c11 ifort -m64`

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc

Benchmarks using both Fortran and C:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc

The flags 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 flags 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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