SPEC® CPU2017 Floating Point Speed Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)
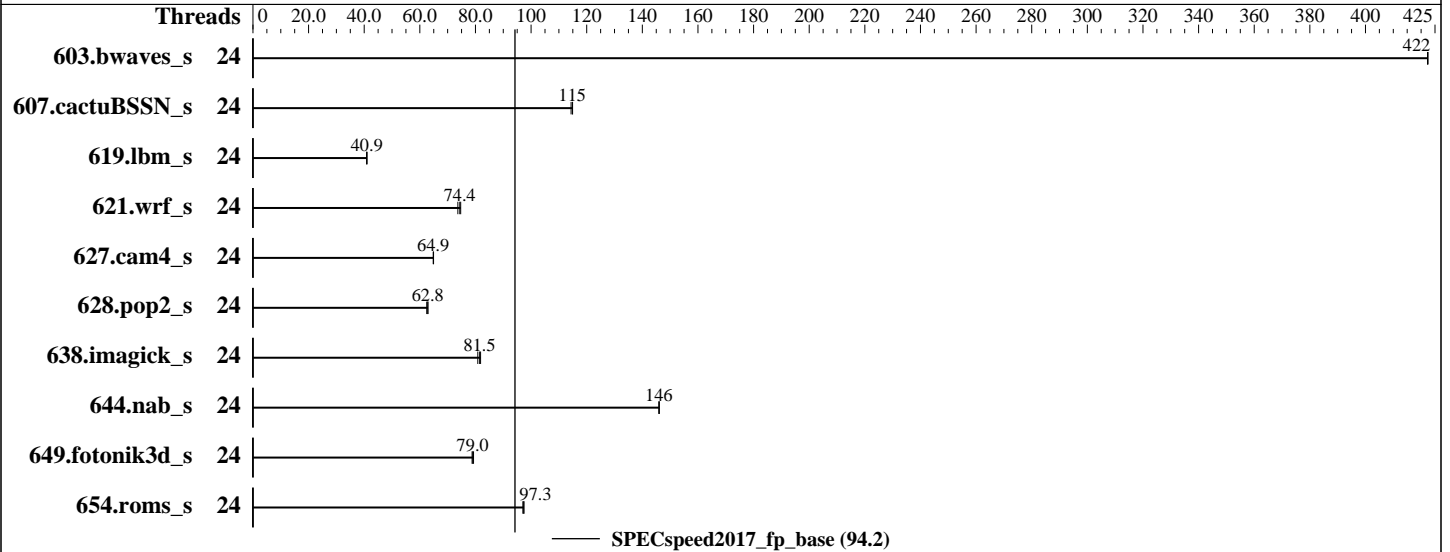
Synergy 480 Gen10
(2.60 GHz, Intel Xeon Gold 6126)

$SPECspeed2017\_fp\_base =$ 94.2

$SPECspeed2017\_fp\_peak =$ Not Run

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Dec-2017
Hardware Availability: Oct-2017
Software Availability: Sep-2017

Threads

Benchmark	Threads	Result
603.bwaves_s	24	422
607.cactuBSSN_s	24	115
619.lbm_s	24	40.9
621.wrf_s	24	74.4
627.cam4_s	24	64.9
628.pop2_s	24	62.8
638.imagick_s	24	81.5
644.nab_s	24	146
649.fotonik3d_s	24	79.0
654.roms_s	24	97.3

SPECspeed2017_fp_base (94.2)

Hardware

CPU Name: Intel Xeon Gold 6126
 Max MHz.: 3700
 Nominal: 2600
Enabled: 24 cores, 2 chips
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: 19.25 MB I+D on chip per chip
 Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 1 x 960 GB SATA SSD, RAID 0
Other: None

Software

OS: SUSE Linux Enterprise Server 12 (x86_64) SP2
 Kernel 4.4.21-69-default
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
 Compiler for Linux;
 Fortran: Version 18.0.0.128 of Intel Fortran
 Compiler for Linux
Parallel: Yes
Firmware: HPE BIOS Version I42 09/27/2017 released Oct-2017
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None

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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	24	140	422	140	422	**140**	**422**							
607.cactuBSSN_s	24	**145**	**115**	145	115	146	114							
619.lbm_s	24	128	40.9	128	41.0	**128**	**40.9**							
621.wrf_s	24	180	73.7	**178**	**74.4**	177	74.7							
627.cam4_s	24	136	64.9	**137**	**64.9**	137	64.9							
628.pop2_s	24	190	62.5	189	62.9	**189**	**62.8**							
638.imagick_s	24	178	80.8	176	81.8	**177**	**81.5**							
644.nab_s	24	120	146	120	146	**120**	**146**							
649.fotonik3d_s	24	**115**	**79.0**	116	78.8	115	79.3							
654.roms_s	24	**162**	**97.3**	162	97.5	162	97.0							

SPECspeed2017_fp_base =	**94.2**
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"
Transparent Huge Pages enabled by default
Filesystem page cache cleared with:
 shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
irqbalance service stopped using "systemctl stop irqbalance.service"
Used throughput-performance profile for tuned-adm: "tuned-adm profile throughput-performance profile"
```

General Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=core,compact"
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"


 Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.4
No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
No: 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.
No: 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.



This benchmark result is intended to provide perspective on
past performance using the historical hardware and/or
software described on this result page.
```

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CPU2017 License:	3	**Test Date:**	Dec-2017
Test Sponsor:	HPE	**Hardware Availability:**	Oct-2017
Tested by:	HPE	**Software Availability:**	Sep-2017

General Notes (Continued)

The system as described on this result page was formerly
generally available. At the time of this publication, it may
not be shipping, and/or may not be supported, and/or may fail
to meet other tests of General Availability described in the
SPEC OSG Policy document, http://wwww.spec.org/osg/policy.htm.

This measured result may not be representative of the result
that would be measured were this benchmark run with hardware
and software available as of the publication date.

Platform Notes

```
BIOS Configuration:
 Intel Hyper-Threading set to Disabled
 Thermal Configuration set to Maximum Cooling
 LLC Prefetch set to Enabled
 LLC Dead Line Allocation set to Disabled
 Memory Patrol Scrubbing set to Disabled
 Workload Profile set to General Peak Frequency Compute
  Energy/Performance Bias set to Maximum Performance
 Workload Profile set to Custom
  NUMA Group Size Optimization set to Flat
 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on linux-0f29 Wed Dec 20 13:41:55 2017

 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 6126 CPU @ 2.60GHz
       2  "physical id"s (chips)
       24 "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 : 12
       siblings  : 12
       physical 0: cores 0 1 3 5 6 8 9 10 11 12 13 14
       physical 1: cores 0 1 2 3 4 5 6 8 9 11 12 13

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
```

(Continued on next page)

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Platform Notes (Continued)

```
       Byte Order:          Little Endian
       CPU(s):              24
       On-line CPU(s) list: 0-23
       Thread(s) per core:  1
       Core(s) per socket:  12
       Socket(s):           2
       NUMA node(s):        2
       Vendor ID:           GenuineIntel
       CPU family:          6
       Model:               85
       Model name:          Intel(R) Xeon(R) Gold 6126 CPU @ 2.60GHz
       Stepping:            4
       CPU MHz:             2593.914
       BogoMIPS:            5187.82
       Virtualization:      VT-x
       L1d cache:           32K
       L1i cache:           32K
       L2 cache:            1024K
       L3 cache:            19712K
       NUMA node0 CPU(s):   0-11
       NUMA node1 CPU(s):   12-23
       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 pln pts dtherm intel_pt
    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 : 19712 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
   node 0 size: 193117 MB
   node 0 free: 189669 MB
   node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
   node 1 size: 193533 MB
   node 1 free: 191945 MB
   node distances:
   node   0   1
     0:  10  21
     1:  21  10
```

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Platform Notes (Continued)

```
  From /proc/meminfo
     MemTotal:       395930852 kB
     HugePages_Total:        0
     Hugepagesize:        2048 kB

  /usr/bin/lsb_release -d
     SUSE Linux Enterprise Server 12 SP2

  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-0f29 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
     x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Dec 20 11:01

  SPEC is set to: /home/cpu2017
     Filesystem      Type  Size  Used Avail Use% Mounted on
     /dev/sda4       xfs   852G   35G  817G   5% /home

  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 HPE I42 09/27/2017
     Memory:
      24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666

  (End of data from sysinfo program)
```

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Compiler Version Notes

```
==============================================================================
  CC   619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  FC   607.cactuBSSN_s(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------


==============================================================================
  FC   603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  CC   621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

(Continued on next page)

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Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
`icpc icc ifort`

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:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only`
`-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`

Fortran benchmarks:
`-DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`
`-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp`
`-nostandard-realloc-lhs -align array32byte`

Benchmarks using both Fortran and C:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only`
`-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
`-nostandard-realloc-lhs -align array32byte`

Benchmarks using Fortran, C, and C++:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only`
`-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
`-nostandard-realloc-lhs -align array32byte`

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Base Other Flags

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

Fortran benchmarks:
```
-m64
```

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

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

The flags files that were used to format this result can be browsed at
```
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.html
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-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-linux64.2017-10-19.xml
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.xml
```

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

Tested with SPEC CPU2017 v1.0.2 on 2017-12-20 14:41:54-0500.
Report generated on 2018-10-31 18:05:50 by CPU2017 PDF formatter v6067.
Originally published on 2018-06-13.