



SPEC® CPU2017 Floating Point Speed Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL360 Gen10

(2.10 GHz, Intel Xeon Platinum 8170)

SPECspeed2017_fp_base = 121

SPECspeed2017_fp_peak = Not Run

CPU2017 License: 3

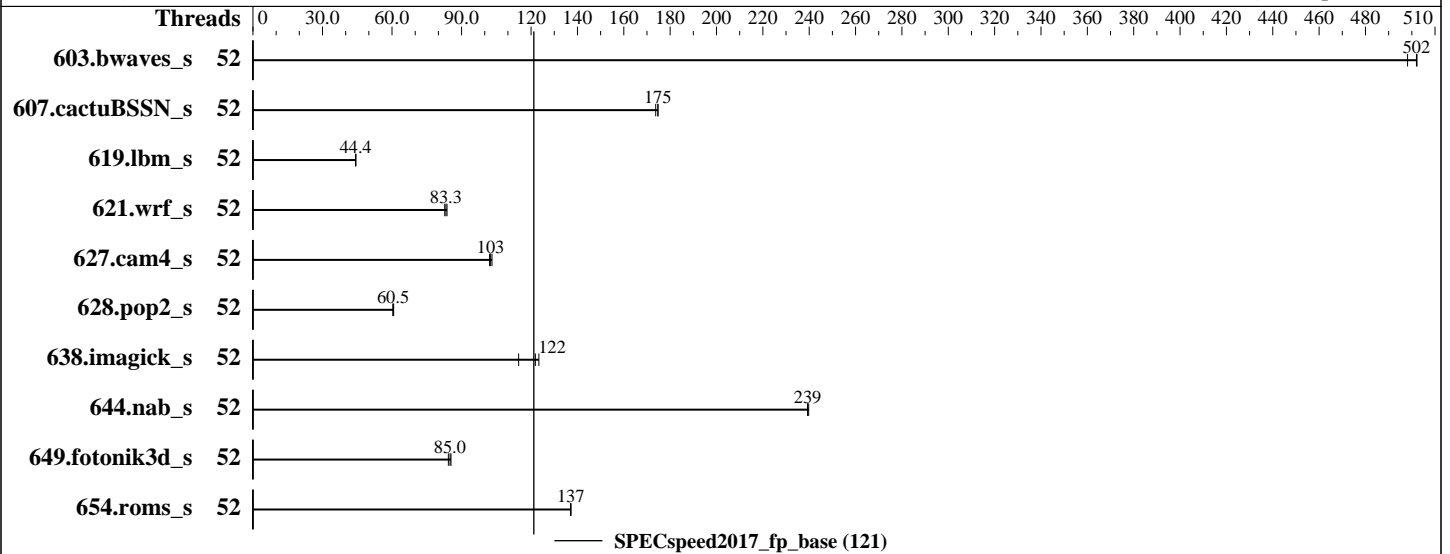
Test Sponsor: HPE

Tested by: HPE

Test Date: Nov-2017

Hardware Availability: Oct-2017

Software Availability: Sep-2017



Hardware

CPU Name: Intel Xeon Platinum 8170
 Max MHz.: 3700
 Nominal: 2100
 Enabled: 52 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: 35.75 MB I+D on chip per chip
 Other: None
 Memory: 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R)
 Storage: 1 x 600 GB SATA SSD, RAID 0
 Other: None

Software

OS: Red Hat Enterprise Linux Server release 7.3 (Maipo)
 Kernel 3.10.0-514.el7.x86_64
 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 U32 released Oct-2017 (tested with U32 9/29/2017)
 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	52	<u>118</u>	<u>502</u>	117	502	118	498							
607.cactuBSSN_s	52	<u>95.4</u>	<u>175</u>	95.4	175	95.9	174							
619.lbm_s	52	<u>118</u>	<u>44.4</u>	118	44.3	118	44.4							
621.wrf_s	52	160	82.7	<u>159</u>	<u>83.3</u>	158	83.7							
627.cam4_s	52	<u>86.4</u>	<u>103</u>	85.9	103	86.8	102							
628.pop2_s	52	196	60.7	<u>196</u>	<u>60.5</u>	197	60.4							
638.imagick_s	52	<u>118</u>	<u>122</u>	126	115	117	123							
644.nab_s	52	72.9	240	73.0	239	<u>73.0</u>	<u>239</u>							
649.fotonik3d_s	52	107	85.4	<u>107</u>	<u>85.0</u>	108	84.3							
654.roms_s	52	<u>115</u>	<u>137</u>	115	137	115	137							

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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"
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
IRQ balance service was stop using "service irqbalance stop"
Tuned-adm profile was set to Throughput-Performance

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 i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4

Platform Notes

BIOS Configuration:
Intel Hyperthreading 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

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Platform Notes (Continued)

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 DL360G10 Thu Nov 23 09:05:17 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) Platinum 8170 CPU @ 2.10GHz
 2 "physical id"s (chips)
 52 "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    : 26
  siblings     : 26
 physical 0:   cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
                29
 physical 1:   cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
                29
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                52
On-line CPU(s) list:   0-51
Thread(s) per core:    1
Core(s) per socket:    26
Socket(s):             2
NUMA node(s):         2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Platinum 8170 CPU @ 2.10GHz
Stepping:              4
CPU MHz:               2100.000
BogoMIPS:              4204.69
Virtualization:        VT-x
L1d cache:             32K
L1i cache:            32K
L2 cache:              1024K
L3 cache:              36608K
NUMA node0 CPU(s):    0-25
```

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Platform Notes (Continued)

NUMA node1 CPU(s): 26-51

```
/proc/cpuinfo cache data
cache size : 36608 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
From /proc/meminfo
MemTotal: 197746476 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

```
From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server
```

```
uname -a:
Linux DL360G10 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64 x86_64
x86_64 GNU/Linux
```

run-level 3 Nov 23 02:10

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/rhel_dl360g10-home	xfs	504G	37G	467G	8%	/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 U32 09/29/2017

Memory:

24x UNKNOWN NOT AVAILABLE 8 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

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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-revG.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-revG.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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