



# SPEC® CPU2017 Floating Point Speed Result

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## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL360 Gen10

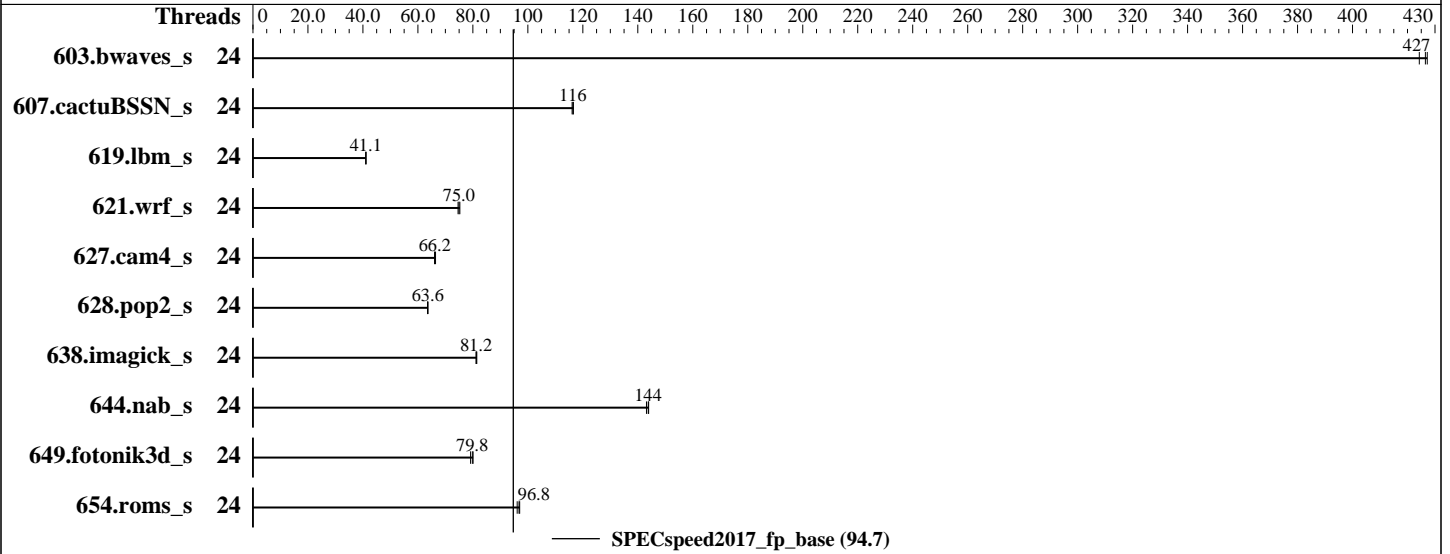
(2.60 GHz, Intel Xeon Gold 6126)

SPECspeed2017\_fp\_base = 94.7

SPECspeed2017\_fp\_peak = Not Run

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

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



### 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: 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R)  
Storage: 1 x 480 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	24	138	427	<b>138</b>	<b>427</b>	139	424							
607.cactuBSSN_s	24	143	117	144	116	<b>143</b>	<b>116</b>							
619.lbm_s	24	127	41.1	128	41.1	<b>128</b>	<b>41.1</b>							
621.wrf_s	24	<b>176</b>	<b>75.0</b>	176	75.3	177	74.6							
627.cam4_s	24	133	66.4	<b>134</b>	<b>66.2</b>	134	66.1							
628.pop2_s	24	187	63.6	187	63.5	<b>187</b>	<b>63.6</b>							
638.imagick_s	24	177	81.4	178	81.2	<b>178</b>	<b>81.2</b>							
644.nab_s	24	121	144	<b>122</b>	<b>144</b>	122	143							
649.fotonik3d_s	24	114	80.1	115	79.2	<b>114</b>	<b>79.8</b>							
654.roms_s	24	162	97.0	<b>163</b>	<b>96.8</b>	164	96.1							

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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  
Filesystem page cache cleared with:  
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop\_caches' prior to run  
irqbalance disabled with "systemctl stop irqbalance"  
tuned profile set with "tuned-adm profile throughput-performance"

## General Notes

Environment variables set by runcpu before the start of the run:  
KMP\_AFFINITY = "granularity=core,compact"  
LD\_LIBRARY\_PATH = "/home/specuser/cpu2017/lib/ia32:/home/specuser/cpu2017/lib/intel64"  
LD\_LIBRARY\_PATH = "\$LD\_LIBRARY\_PATH:/home/specuser/cpu2017/je5.0.1-32:/home/specuser/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  
Memory Patrol Scrubbing set to Disabled  
LLC Prefetcher set to Enabled  
LLC Dead Line Allocation 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  
Uncore Frequency Scaling set to Auto  
Workload Profile set to General Peak Frequency Compute  
NUMA Group Size Optimization set to Flat

Sysinfo program /home/specuser/cpu2017/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f  
running on dl360gen10rhel73 Sun Oct 15 13:10:09 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 2 3 4 5 6 8 9 11 12 13

physical 1: cores 0 1 3 5 6 8 9 10 11 12 13 14

From lscpu:

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

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: 2600.000

BogoMIPS: 5205.28

Virtualization: VT-x

L1d cache: 32K

L1i cache: 32K

L2 cache: 1024K

L3 cache: 19712K

NUMA node0 CPU(s): 0-11

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## Platform Notes (Continued)

NUMA node1 CPU(s): 12-23

```
/proc/cpuinfo cache data
cache size : 19712 KB
```

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

```
From /proc/meminfo
MemTotal: 197573776 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 dl360gen10rhel73 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 Oct 13 13:25

```
SPEC is set to: /home/specuser/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 392G 37G 356G 10% /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-revD.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-revD.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

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