



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## NEC Corporation

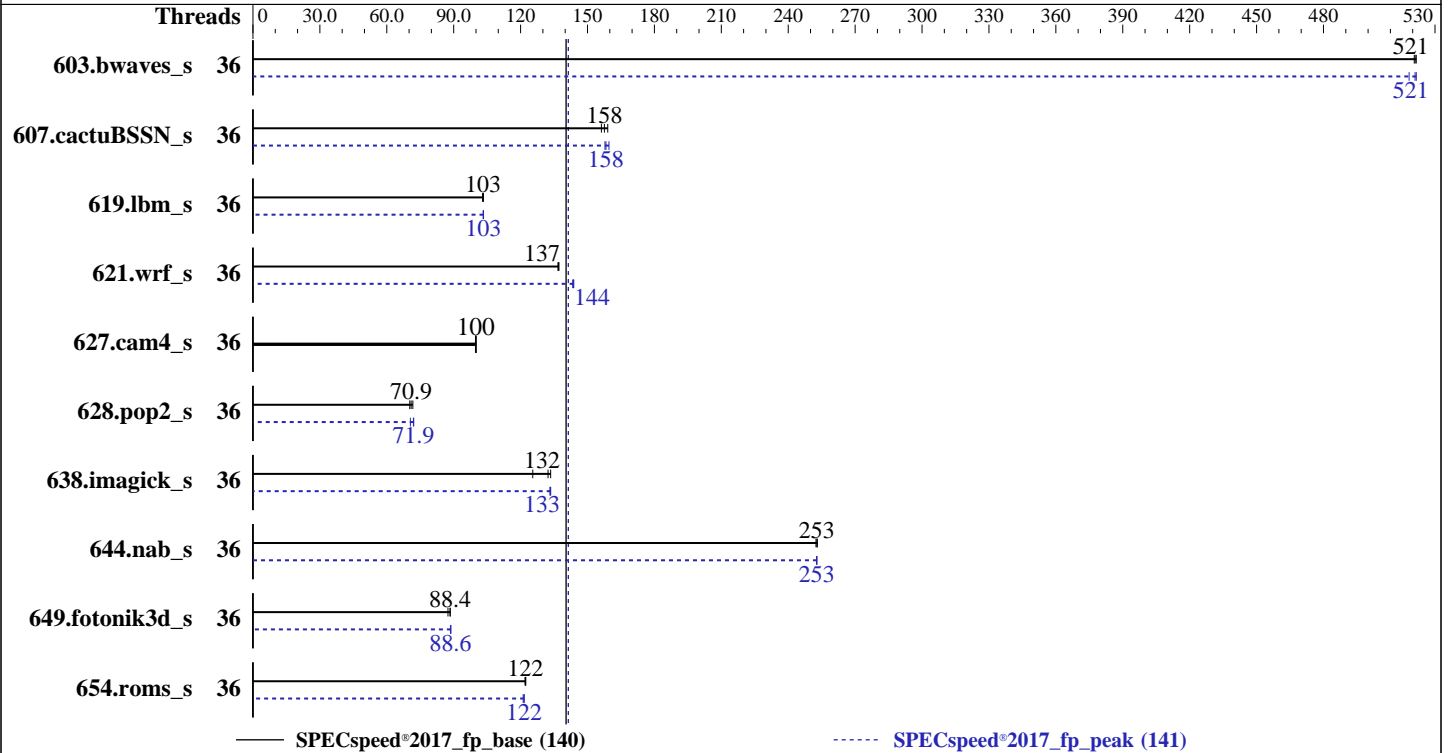
SPECspeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECspeed®2017\_fp\_peak = 141

CPU2017 License: 9006  
Test Sponsor: NEC Corporation  
Tested by: NEC Corporation

Test Date: Mar-2020  
Hardware Availability: Dec-2019  
Software Availability: Sep-2019



### Hardware

CPU Name: Intel Xeon Gold 6254  
Max MHz: 4000  
Nominal: 3100  
Enabled: 36 cores, 2 chips  
Orderable: 1,2 chips  
Cache L1: 32 KB I + 32 KB D on chip per core  
L2: 1 MB I+D on chip per core  
L3: 24.75 MB I+D on chip per chip  
Other: None  
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
Storage: 1 x 1 TB SATA, 7200 RPM, RAID 0  
Other: None

### Software

OS: Red Hat Enterprise Linux Server release 7.7 (Maipo)  
Kernel 3.10.0-1062.1.1.el7.x86\_64  
Compiler: C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux;  
Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux  
Parallel: Yes  
Firmware: NEC BIOS Version U30 v2.22 11/13/2019 released Mar-2020  
File System: ext4  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: None  
Power Management: BIOS set to prefer performance at the cost of additional power usage.



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## NEC Corporation

SPECspeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECspeed®2017\_fp\_peak = 141

CPU2017 License: 9006  
Test Sponsor: NEC Corporation  
Tested by: NEC Corporation

Test Date: Mar-2020  
Hardware Availability: Dec-2019  
Software Availability: Sep-2019

## Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	36	113	522	113	521	<b>113</b>	<b>521</b>	36	113	522	114	518	<b>113</b>	<b>521</b>
607.cactuBSSN_s	36	107	156	105	159	<b>106</b>	<b>158</b>	36	<b>105</b>	<b>158</b>	106	158	104	160
619.lbm_s	36	<b>50.7</b>	<b>103</b>	50.7	103	50.9	103	36	50.7	103	<b>50.7</b>	<b>103</b>	50.7	103
621.wrf_s	36	96.4	137	<b>96.5</b>	<b>137</b>	96.7	137	36	92.3	143	92.0	144	<b>92.0</b>	<b>144</b>
627.cam4_s	36	<b>88.7</b>	<b>100</b>	88.8	99.8	88.5	100	36	<b>88.7</b>	<b>100</b>	88.8	99.8	88.5	100
628.pop2_s	36	169	70.3	<b>167</b>	<b>70.9</b>	166	71.7	36	165	72.1	<b>165</b>	<b>71.9</b>	168	70.6
638.imagick_s	36	<b>109</b>	<b>132</b>	115	125	108	133	36	108	134	108	133	<b>108</b>	<b>133</b>
644.nab_s	36	<b>69.1</b>	<b>253</b>	69.0	253	69.2	252	36	69.1	253	69.1	253	<b>69.1</b>	<b>253</b>
649.fotonik3d_s	36	104	87.4	<b>103</b>	<b>88.4</b>	103	88.5	36	<b>103</b>	<b>88.6</b>	103	88.6	103	88.8
654.roms_s	36	<b>129</b>	<b>122</b>	129	122	129	122	36	130	121	129	122	<b>130</b>	<b>122</b>

SPECspeed®2017\_fp\_base = **140**

SPECspeed®2017\_fp\_peak = **141**

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"

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
KMP\_AFFINITY = "granularity=fine,compact"  
LD\_LIBRARY\_PATH = "/home/cpu2017/lib/intel64"  
OMP\_STACKSIZE = "192M"

## General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X 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

NA: 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.



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## NEC Corporation

SPECSpeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECSpeed®2017\_fp\_peak = 141

**CPU2017 License:** 9006  
**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation

**Test Date:** Mar-2020  
**Hardware Availability:** Dec-2019  
**Software Availability:** Sep-2019

### Platform Notes

**BIOS Settings:**

Thermal Configuration: Maximum Cooling  
Workload Profile: General Peak Frequency Compute  
Intel Hyper-Threading: Disabled  
Memory Patrol Scrubbing: Disabled  
LLC Dead Line Allocation: Disabled  
LLC Prefetch: Enabled  
Enhanced Processor Performance: Enabled  
Workload Profile: Custom  
Advanced Memory Protection: Advanced ECC Support  
NUMA Group Size Optimization: Flat

sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on r120h2m Wed Mar 25 20:00:00 2020

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 6254 CPU @ 3.10GHz
 2 "physical id"s (chips)
 36 "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 : 18
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
```

**From lscpu:**

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 36
On-line CPU(s) list: 0-35
Thread(s) per core: 1
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6254 CPU @ 3.10GHz
Stepping: 6
CPU MHz: 3100.000
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## NEC Corporation

SPECspeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECspeed®2017\_fp\_peak = 141

**CPU2017 License:** 9006  
**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation

**Test Date:** Mar-2020  
**Hardware Availability:** Dec-2019  
**Software Availability:** Sep-2019

### Platform Notes (Continued)

BogoMIPS: 6200.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 25344K  
NUMA node0 CPU(s): 0-17  
NUMA node1 CPU(s): 18-35

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 epb cat\_l3 cdp\_l3 invpcid\_single intel\_ppin intel\_pt ssbd mba ibrs ibpb stibp ibrs\_enhanced tpr\_shadow vnmi flexpriority ept vpid fsgsbase tsc\_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt\_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm\_llc cqm\_occup\_llc cqm\_mbm\_total cqm\_mbm\_local dtherm ida arat pln pts pku ospke avx512\_vnni md\_clear spec\_ctrl intel\_stibp flush\_lld arch\_capabilities

```
/proc/cpuinfo cache data
cache size : 25344 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 12 13 14 15 16 17
node 0 size: 392872 MB
node 0 free: 384001 MB
node 1 cpus: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
node 1 size: 393215 MB
node 1 free: 384451 MB
node distances:
node  0  1
 0:  10  21
 1:  21  10
```

```
From /proc/meminfo
MemTotal: 792285060 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

```
From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.7 (Maipo)"
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## NEC Corporation

SPECspeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECspeed®2017\_fp\_peak = 141

**CPU2017 License:** 9006  
**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation

**Test Date:** Mar-2020  
**Hardware Availability:** Dec-2019  
**Software Availability:** Sep-2019

### Platform Notes (Continued)

```
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.7"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.7 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.7 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.7 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.7:ga:server
```

```
uname -a:
Linux r120h2m 3.10.0-1062.1.1.el7.x86_64 #1 SMP Tue Aug 13 18:39:59 UTC 2019 x86_64
x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

```
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled
via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, usercopy/swapgs
barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full retpoline, IBPB
```

```
run-level 3 Mar 25 19:54
```

```
SPEC is set to: /home/cpu2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda3       ext4  908G   89G  773G  11% /
```

```
From /sys/devices/virtual/dmi/id
BIOS: NEC U30 11/13/2019
Vendor: NEC
Product: Express5800/R120h-2M
Serial: JPNLMCR0UF
```

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.

```
Memory:
24x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2933
```

(End of data from sysinfo program)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## NEC Corporation

SPECspeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECspeed®2017\_fp\_peak = 141

**CPU2017 License:** 9006  
**Test Sponsor:** NEC Corporation  
**Tested by:** NEC Corporation

**Test Date:** Mar-2020  
**Hardware Availability:** Dec-2019  
**Software Availability:** Sep-2019

### Compiler Version Notes

=====  
C | 619.lbm\_s(base, peak) 638.imagick\_s(base, peak)  
| 644.nab\_s(base, peak)  
=====

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.  
=====

=====  
C++, C, Fortran | 607.cactuBSSN\_s(base, peak)  
=====

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.  
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.  
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.  
=====

=====  
Fortran | 603.bwaves\_s(base, peak) 649.fotonik3d\_s(base, peak)  
| 654.roms\_s(base, peak)  
=====

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.  
=====

=====  
Fortran, C | 621.wrf\_s(base, peak) 627.cam4\_s(base, peak)  
| 628.pop2\_s(base, peak)  
=====

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.  
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.  
=====



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

**NEC Corporation**

SPECspeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECspeed®2017\_fp\_peak = 141

CPU2017 License: 9006

Test Sponsor: NEC Corporation

Tested by: NEC Corporation

Test Date: Mar-2020

Hardware Availability: Dec-2019

Software Availability: Sep-2019

## 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:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
```

```
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

Fortran benchmarks:

```
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
```

```
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
```

```
-nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
```

```
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

```
-nostandard-realloc-lhs
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

NEC Corporation

SPECspeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECspeed®2017\_fp\_peak = 141

CPU2017 License: 9006

Test Sponsor: NEC Corporation

Tested by: NEC Corporation

Test Date: Mar-2020

Hardware Availability: Dec-2019

Software Availability: Sep-2019

## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-nostandard-realloc-lhs
```

## Peak 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
```

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

Fortran benchmarks:

```
603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP  
-DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3  
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4  
-qopenmp -nostandard-realloc-lhs
```

649.fotonik3d\_s: Same as 603.bwaves\_s

```
654.roms_s: -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
```

(Continued on next page)





# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

**NEC Corporation**

SPECspeed®2017\_fp\_base = 140

Express5800/R120h-2M (Intel Xeon Gold 6254)

SPECspeed®2017\_fp\_peak = 141

CPU2017 License: 9006

Test Sponsor: NEC Corporation

Tested by: NEC Corporation

Test Date: Mar-2020

Hardware Availability: Dec-2019

Software Availability: Sep-2019

## Peak Optimization Flags (Continued)

654.roms\_s (continued):

-qopenmp -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

621.wrf\_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512  
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div  
-qopt-mem-layout-trans=4 -DSPEC\_SUPPRESS\_OPENMP -qopenmp  
-DSPEC\_OPENMP -nostandard-realloc-lhs

627.cam4\_s: basepeak = yes

628.pop2\_s: Same as 621.wrf\_s

Benchmarks using Fortran, C, and C++:

-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC\_OPENMP  
-nostandard-realloc-lhs

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

<http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.html>

<http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-V1.2-R120h-RevE.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml>

<http://www.spec.org/cpu2017/flags/NEC-Platform-Settings-V1.2-R120h-RevE.xml>

SPEC CPU and SPECspeed are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.1.0 on 2020-03-25 07:00:00-0400.

Report generated on 2020-04-14 14:01:38 by CPU2017 PDF formatter v6255.

Originally published on 2020-04-14.