



SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Huawei

SPECrate2017_fp_base = 1070

SPECrate2017_fp_peak = Not Run

CPU2017 License: 3175

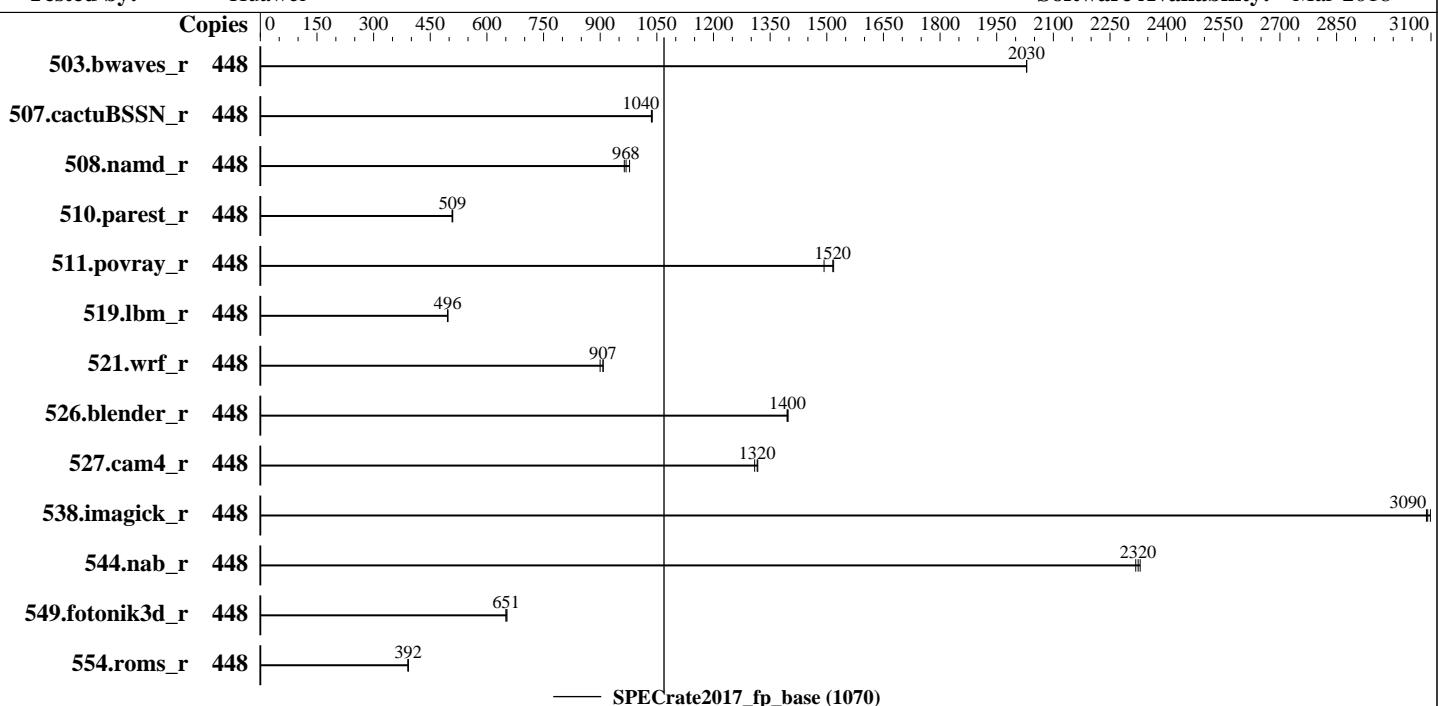
Test Sponsor: Huawei

Tested by: Huawei

Test Date: Jun-2018

Hardware Availability: Jul-2018

Software Availability: Mar-2018



SPECrate2017_fp_base (1070)

Hardware

CPU Name: Intel Xeon Platinum 8180
 Max MHz.: 3800
 Nominal: 2500
 Enabled: 224 cores, 8 chips, 2 threads/core
 Orderable: 2,4,6,8 chips
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 38.5 MB I+D on chip per chip
 Other: None
 Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)
 Storage: 2 x 900 GB SAS HDD 10K RPM, RAID 0
 Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP2 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: No
 Firmware: Version 8.92 released May-2018
 File System: btrfs
 System State: Run level 5 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: None



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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	448	2214	2030	2214	2030	2214	2030							
507.cactusBSSN_r	448	546	1040	548	1040	548	1040							
508.namd_r	448	442	964	439	968	435	978							
510.parest_r	448	2303	509	2308	508	2300	510							
511.povray_r	448	701	1490	689	1520	690	1520							
519.lbm_r	448	951	497	951	496	953	496							
521.wrf_r	448	1115	900	1106	907	1105	908							
526.blender_r	448	489	1390	489	1400	488	1400							
527.cam4_r	448	599	1310	595	1320	596	1320							
538.imagick_r	448	361	3090	360	3100	360	3090							
544.nab_r	448	324	2320	325	2320	324	2330							
549.fotonik3d_r	448	2684	651	2673	653	2682	651							
554.roms_r	448	1821	391	1817	392	1817	392							

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Numa balancing was disabled using "echo 0 > /proc/sys/kernel/numa_balancing"

General Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
```

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

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
```

runcpu command invoked through numactl i.e.:

```
numactl --interleave=all runcpu <etc>
```

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General Notes (Continued)

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.

Platform Notes

BIOS configuration:

Sub NUMA Cluster (SNC) set to enabled

IMC (Integrated memory controller) Interleaving set to 1 way interleave

Xtended Prediction Table (XPT) Prefetch set to Enable

Memory Patrol Scrub set to Disable

Last Level Cache (LLC) Prefetch set to Disable

Sysinfo program /home/cpu2017/bin/sysinfo

Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f

running on linux-0mnb Fri Oct 26 00:08:47 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) Platinum 8180 CPU @ 2.50GHz

8 "physical id"s (chips)

448 "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 : 28

siblings : 56

physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30

physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30

physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30

physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30

physical 4: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30

physical 5: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30

physical 6: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30

physical 7: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27

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Platform Notes (Continued)

28 29 30

From lscpu:

Architecture:	x86_64
CPU op-mode(s):	32-bit, 64-bit
Byte Order:	Little Endian
CPU(s):	448
On-line CPU(s) list:	0-447
Thread(s) per core:	2
Core(s) per socket:	28
Socket(s):	8
NUMA node(s):	16
Vendor ID:	GenuineIntel
CPU family:	6
Model:	85
Model name:	Intel(R) Xeon(R) Platinum 8180 CPU @ 2.50GHz
Stepping:	4
CPU MHz:	1000.000
CPU max MHz:	2501.0000
CPU min MHz:	1000.0000
BogoMIPS:	4999.95
Virtualization:	VT-x
L1d cache:	32K
L1i cache:	32K
L2 cache:	1024K
L3 cache:	39424K
NUMA node0 CPU(s):	0-3,7-9,14-17,21-23,224-227,231-233,238-241,245-247
NUMA node1 CPU(s):	4-6,10-13,18-20,24-27,228-230,234-237,242-244,248-251
NUMA node2 CPU(s):	28-31,35-37,42-45,49-51,252-255,259-261,266-269,273-275
NUMA node3 CPU(s):	32-34,38-41,46-48,52-55,256-258,262-265,270-272,276-279
NUMA node4 CPU(s):	56-59,63-65,70-73,77-79,280-283,287-289,294-297,301-303
NUMA node5 CPU(s):	60-62,66-69,74-76,80-83,284-286,290-293,298-300,304-307
NUMA node6 CPU(s):	84-87,91-93,98-101,105-107,308-311,315-317,322-325,329-331
NUMA node7 CPU(s):	88-90,94-97,102-104,108-111,312-314,318-321,326-328,332-335
NUMA node8 CPU(s):	112-115,119-121,126-129,133-135,336-339,343-345,350-353,357-359
NUMA node9 CPU(s):	116-118,122-125,130-132,136-139,340-342,346-349,354-356,360-363
NUMA node10 CPU(s):	140-143,147-149,154-157,161-163,364-367,371-373,378-381,385-387
NUMA node11 CPU(s):	144-146,150-153,158-160,164-167,368-370,374-377,382-384,388-391
NUMA node12 CPU(s):	168-171,175-177,182-185,189-191,392-395,399-401,406-409,413-415
NUMA node13 CPU(s):	172-174,178-181,186-188,192-195,396-398,402-405,410-412,416-419
NUMA node14 CPU(s):	

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Platform Notes (Continued)

196-199, 203-205, 210-213, 217-219, 420-423, 427-429, 434-437, 441-443

NUMA node15 CPU(s):

200-202, 206-209, 214-216, 220-223, 424-426, 430-433, 438-440, 444-447

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 aperfmpfper eargerfpu pni pclmulqdq dtes64 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 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 : 39424 KB

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

available: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 7 8 9 14 15 16 17 21 22 23 224 225 226 227 231 232 233 238 239 240 241 245 246 247
node 0 size: 95025 MB
node 0 free: 94094 MB
node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 228 229 230 234 235 236 237 242 243 244 248 249 250 251
node 1 size: 96762 MB
node 1 free: 96345 MB
node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 252 253 254 255 259 260 261 266 267 268 269 273 274 275
node 2 size: 96762 MB
node 2 free: 96464 MB
node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 256 257 258 262 263 264 265 270 271 272 276 277 278 279
node 3 size: 96762 MB
node 3 free: 96461 MB
node 4 cpus: 56 57 58 59 63 64 65 70 71 72 73 77 78 79 280 281 282 283 287 288 289 294 295 296 297 301 302 303
node 4 size: 96762 MB
node 4 free: 96475 MB
node 5 cpus: 60 61 62 66 67 68 69 74 75 76 80 81 82 83 284 285 286 290 291 292 293 298 299 300 304 305 306 307
node 5 size: 96762 MB
node 5 free: 96388 MB
node 6 cpus: 84 85 86 87 91 92 93 98 99 100 101 105 106 107 308 309 310 311 315 316 317 322 323 324 325 329 330 331
node 6 size: 96762 MB

(Continued on next page)



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Platform Notes (Continued)

```
node 6 free: 96556 MB
node 7 cpus: 88 89 90 94 95 96 97 102 103 104 108 109 110 111 312 313 314 318 319 320
321 326 327 328 332 333 334 335
node 7 size: 96762 MB
node 7 free: 96544 MB
node 8 cpus: 112 113 114 115 119 120 121 126 127 128 129 133 134 135 336 337 338 339
343 344 345 350 351 352 353 357 358 359
node 8 size: 96762 MB
node 8 free: 96529 MB
node 9 cpus: 116 117 118 122 123 124 125 130 131 132 136 137 138 139 340 341 342 346
347 348 349 354 355 356 360 361 362 363
node 9 size: 96762 MB
node 9 free: 96472 MB
node 10 cpus: 140 141 142 143 147 148 149 154 155 156 157 161 162 163 364 365 366 367
371 372 373 378 379 380 381 385 386 387
node 10 size: 96762 MB
node 10 free: 96426 MB
node 11 cpus: 144 145 146 150 151 152 153 158 159 160 164 165 166 167 368 369 370 374
375 376 377 382 383 384 388 389 390 391
node 11 size: 96762 MB
node 11 free: 96406 MB
node 12 cpus: 168 169 170 171 175 176 177 182 183 184 185 189 190 191 392 393 394 395
399 400 401 406 407 408 409 413 414 415
node 12 size: 96762 MB
node 12 free: 96559 MB
node 13 cpus: 172 173 174 178 179 180 181 186 187 188 192 193 194 195 396 397 398 402
403 404 405 410 411 412 416 417 418 419
node 13 size: 96762 MB
node 13 free: 96553 MB
node 14 cpus: 196 197 198 199 203 204 205 210 211 212 213 217 218 219 420 421 422 423
427 428 429 434 435 436 437 441 442 443
node 14 size: 96762 MB
node 14 free: 96536 MB
node 15 cpus: 200 201 202 206 207 208 209 214 215 216 220 221 222 223 424 425 426 430
431 432 433 438 439 440 444 445 446 447
node 15 size: 96605 MB
node 15 free: 96386 MB
node distances:
node 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
0: 10 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
1: 20 10 20 20 20 20 20 20 20 20 20 20 20 20 20 20
2: 20 20 10 20 20 20 20 20 20 20 20 20 20 20 20 20
3: 20 20 20 10 20 20 20 20 20 20 20 20 20 20 20 20
4: 20 20 20 20 10 20 20 20 20 20 20 20 20 20 20 20
5: 20 20 20 20 20 10 20 20 20 20 20 20 20 20 20 20
6: 20 20 20 20 20 20 10 20 20 20 20 20 20 20 20 20
7: 20 20 20 20 20 20 20 10 20 20 20 20 20 20 20 20
```

(Continued on next page)



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Platform Notes (Continued)

```
8: 20 20 20 20 20 20 20 20 10 20 20 20 20 20 20 20 20 20  
9: 20 20 20 20 20 20 20 20 20 10 20 20 20 20 20 20 20 20  
10: 20 20 20 20 20 20 20 20 20 20 10 20 20 20 20 20 20 20  
11: 20 20 20 20 20 20 20 20 20 20 10 20 20 20 20 20 20 20  
12: 20 20 20 20 20 20 20 20 20 20 20 10 20 20 20 20 20 20  
13: 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 10 20 20  
14: 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 10 20  
15: 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 10
```

From /proc/meminfo

```
MemTotal: 1583410940 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-0mnb 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 5 Oct 25 17:20

SPEC is set to: /home/cpu2017

```
Filesystem      Type  Size  Used Avail Use% Mounted on  
/dev/sda4       btrfs  1.5T  25G  1.5T   2%  /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.

(Continued on next page)



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Platform Notes (Continued)

BIOS INSYDE Corp. 8.92 05/02/2018

Memory:

48x NO DIMM NO DIMM

48x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

```
=====
CC 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
-----
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----

=====
CXXC 508.namd_r(base) 510.parest_r(base)
-----
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----

=====
CC 511.povray_r(base) 526.blender_r(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.
-----

=====
FC 507.cactubSSN_r(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 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
-----
```

(Continued on next page)



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Compiler Version Notes (Continued)

```
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

```
=====
CC 521.wrf_r(base) 527.cam4_r(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
```

C++ benchmarks:

```
icpc
```

Fortran benchmarks:

```
ifort
```

Benchmarks using both Fortran and C:

```
ifort icc
```

Benchmarks using both C and C++:

```
icpc icc
```

Benchmarks using Fortran, C, and C++:

```
icpc icc ifort
```

Base Portability Flags

```
503.bwaves_r: -DSPEC_LP64
507.cactusBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
```

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Base Portability Flags (Continued)

527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG

538.imagick_r: -DSPEC_LP64

544.nab_r: -DSPEC_LP64

549.fotonik3d_r: -DSPEC_LP64

554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Benchmarks using both C and C++:

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

Benchmarks using Fortran, C, and C++:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Base Other Flags

C benchmarks:

```
-m64 -std=c11
```

C++ benchmarks:

```
-m64
```

Fortran benchmarks:

```
-m64
```

(Continued on next page)



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Base Other Flags (Continued)

Benchmarks using both Fortran and C:

-m64 -std=c11

Benchmarks using both C 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.html>

<http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.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.xml>

<http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml>

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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 2018-10-25 12:08:46-0400.

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