



SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Fujitsu

PRIMEQUEST 3800E, Intel Xeon Platinum 8180,
2.50GHz

SPECrate2017_fp_base = 977

SPECrate2017_fp_peak = Not Run

CPU2017 License: 19

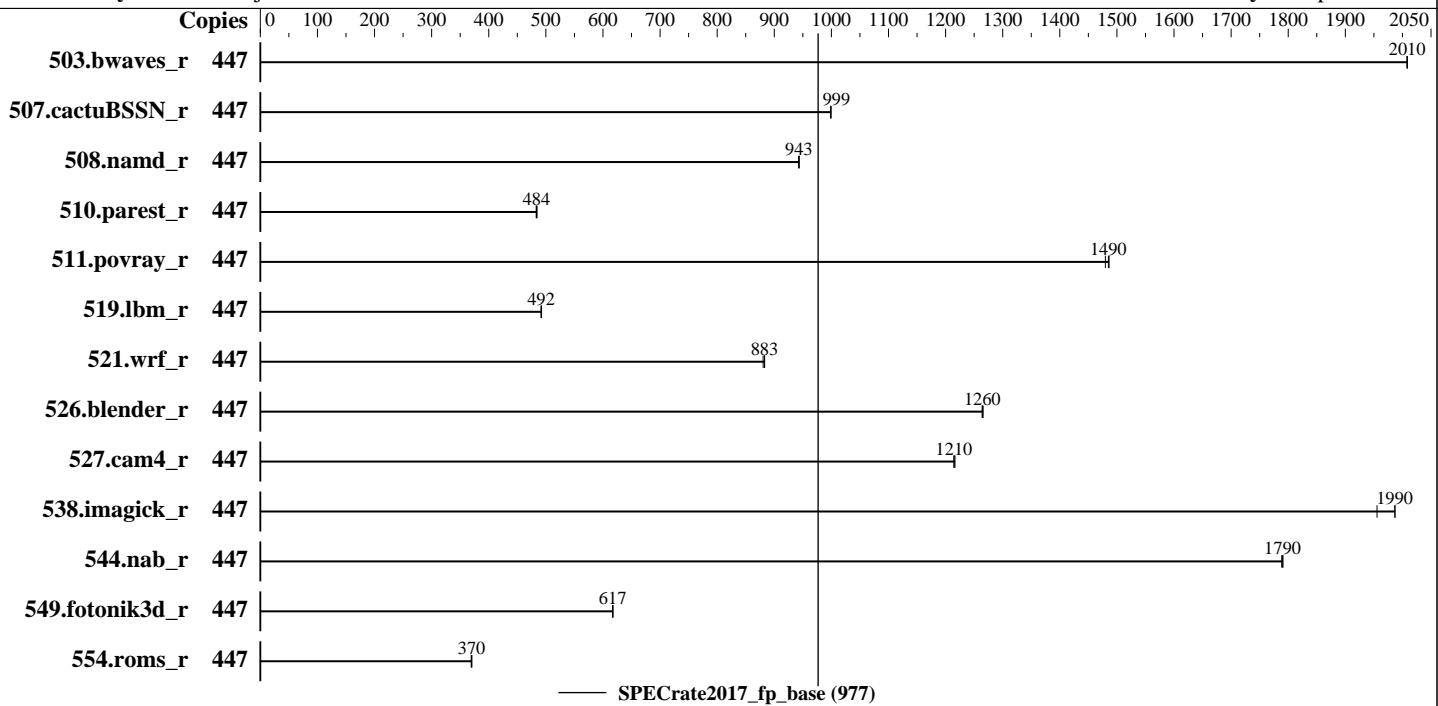
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Oct-2017

Hardware Availability: Nov-2017

Software Availability: Sep-2017



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 (96 x 16 GB 2Rx4 PC4-2666V-R)
 Storage: 768 GB tmpfs
 Other: 1 x SAS HDD, 900 GB, 10K RPM, used for swap

Software

OS: SUSE Linux Enterprise Server 12 SP2
 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: No
 Firmware: PRIMEQUEST 3800E Unified Firmware Version PA18011, Released Feb-2018
 File System: tmpfs
 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						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	447	2232	2010	<u>2232</u>	<u>2010</u>	2232	2010							
507.cactusBSSN_r	447	<u>567</u>	<u>999</u>	567	998	566	999							
508.namd_r	447	<u>450</u>	<u>943</u>	450	943	450	943							
510.parest_r	447	2413	485	2421	483	<u>2417</u>	<u>484</u>							
511.povray_r	447	705	1480	<u>703</u>	<u>1490</u>	702	1490							
519.lbm_r	447	957	492	958	492	<u>958</u>	<u>492</u>							
521.wrf_r	447	1134	883	<u>1134</u>	<u>883</u>	1137	881							
526.blender_r	447	539	1260	<u>538</u>	<u>1260</u>	538	1270							
527.cam4_r	447	644	1210	643	1220	<u>644</u>	<u>1210</u>							
538.imagick_r	447	<u>560</u>	<u>1990</u>	559	1990	568	1960							
544.nab_r	447	421	1790	420	1790	<u>420</u>	<u>1790</u>							
549.fotonik3d_r	447	2821	618	<u>2823</u>	<u>617</u>	2824	617							
554.roms_r	447	1923	369	<u>1919</u>	<u>370</u>	1918	370							

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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"
Set Kernel Boot Parameter : nohz_full=1-447 isolcpus=1-447
Set tmpfs filesystem with:
mkdir /home/memory
mount -t tmpfs -o size=768g,rw tmpfs /home/memory
Process tuning setting:
echo 0 > /proc/sys/kernel numa_balancing
echo never > /sys/kernel/mm/transparent_hugepage/enabled
cpu idle state set with:
cpupower idle-set -d 1
cpupower idle-set -d 2
set affinity of rcu threads to the cpu0:
for i in `pgrep rcu` ; do taskset -pc 0 $i ; done
```



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General Notes

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

LD_LIBRARY_PATH = "/home/memory/speccpu/lib/ia32:/home/memory/speccpu/lib/intel64"

LD_LIBRARY_PATH = "\$LD_LIBRARY_PATH:/home/memory/speccpu/je5.0.1-32:/home/memory/speccpu/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>

Platform Notes

BIOS configuration:

DCU Streamer Prefetcher = Disabled

Sub NUMA Clustering = Enabled

Stale AtoS = Enabled

LLC Dead Line Alloc = Disabled

Fan Control = Full

Sysinfo program /home/memory/speccpu/bin/sysinfo

Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f

running on linux-wzbo Sat Oct 28 19:30:33 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 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

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Platform Notes (Continued)

```
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
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: 3199.999
CPU max MHz: 3800.0000
CPU min MHz: 1000.0000
BogoMIPS: 5000.09
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):
```

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Platform Notes (Continued)

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):

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 aperfmpfperf eagerfpu pnipclmulqdq 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 hwp hwp_act_window hwp_epp hwp_pkg_req intel_pt tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqmqmpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqmqllc cqmqoccup_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: 95504 MB
node 0 free: 85678 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: 96763 MB
node 1 free: 96457 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: 96763 MB
node 2 free: 96453 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: 96763 MB
node 3 free: 96457 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: 96763 MB
node 4 free: 96455 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

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Platform Notes (Continued)

```
299 300 304 305 306 307
node 5 size: 96763 MB
node 5 free: 96441 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: 96763 MB
node 6 free: 96453 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: 96763 MB
node 7 free: 96468 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: 96763 MB
node 8 free: 96456 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: 96763 MB
node 9 free: 96458 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: 96763 MB
node 10 free: 96436 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: 96763 MB
node 11 free: 96440 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: 96763 MB
node 12 free: 96452 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: 96763 MB
node 13 free: 96451 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: 96763 MB
node 14 free: 96431 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: 96614 MB
node 15 free: 96308 MB
node distances:
node 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
 0: 10 11 35 35 35 35 40 40 35 35 40 40 40 40 40 40
 1: 11 10 35 35 35 35 40 40 35 35 40 40 40 40 40 40
```

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Platform Notes (Continued)

2:	35	35	10	11	40	40	35	35	40	40	40	40	40	40	35	35
3:	35	35	11	10	40	40	35	35	40	40	40	40	40	40	35	35
4:	35	35	40	40	10	11	35	35	40	40	40	40	35	35	40	40
5:	35	35	40	40	11	10	35	35	40	40	40	40	35	35	40	40
6:	40	40	35	35	35	35	10	11	40	40	35	35	40	40	40	40
7:	40	40	35	35	35	35	11	10	40	40	35	35	40	40	40	40
8:	35	35	40	40	40	40	40	40	10	11	35	35	35	35	40	40
9:	35	35	40	40	40	40	40	40	11	10	35	35	35	35	40	40
10:	40	40	40	40	40	40	35	35	35	35	10	11	40	40	35	35
11:	40	40	40	40	40	40	35	35	35	35	11	10	40	40	35	35
12:	40	40	40	40	35	35	40	40	35	35	40	40	10	11	35	35
13:	40	40	40	40	35	35	40	40	35	35	40	40	11	10	35	35
14:	40	40	35	35	40	40	40	40	40	40	35	35	35	35	10	11
15:	40	40	35	35	40	40	40	40	40	35	35	35	35	11	10	

From /proc/meminfo

```
MemTotal:      1583932372 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-wzbo 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 Oct 27 23:10

SPEC is set to: /home/memory/speccpu

```
Filesystem      Type  Size  Used Avail Use% Mounted on
```

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Platform Notes (Continued)

tmpfs tmpfs 768G 8.8G 760G 2% /home/memory

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 FUJITSU V1.0.0.0 R90.28.0 for D3858-A1x 10/25/2017

Memory:

48x Hynix HMA42GR7BJR4N-VK 16 GB 2 rank 2666

48x Samsung M393A2G40EB2-CTD 16 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) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

=====

=====

CXXC 508.namd_r(base) 510.parest_r(base)

=====

icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

=====

=====

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

=====

=====

FC 507.cactubSSN_r(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

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Compiler Version Notes (Continued)

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

=====

FC 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)

=====

ifort (IFORT) 18.0.0 20170811

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

=====

CC 521.wrf_r(base) 527.cam4_r(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

C++ benchmarks:

icpc

Fortran benchmarks:

fort

Benchmarks using both Fortran and C:

fort icc

Benchmarks using both C and C++:

icpc icc

Benchmarks using Fortran, C, and C++:

icpc icc fort

Base Portability Flags

503.bwaves_r: -DSPEC_LP64

507.cactuBSSN_r: -DSPEC_LP64

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Base Portability Flags (Continued)

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
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 -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 -nostandard-realloc-lhs -align array32byte
```

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 -nostandard-realloc-lhs -align array32byte
```

Base Other Flags

C benchmarks:

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

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Base Other Flags (Continued)

C++ benchmarks:

-m64

Fortran benchmarks:

-m64

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-linux64.2017-10-19.html>
<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevC.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/Fujitsu-Platform-Settings-V1.2-SKL-RevC.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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