SPEC® CPU2017 Floating Point Rate Result

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Huawei

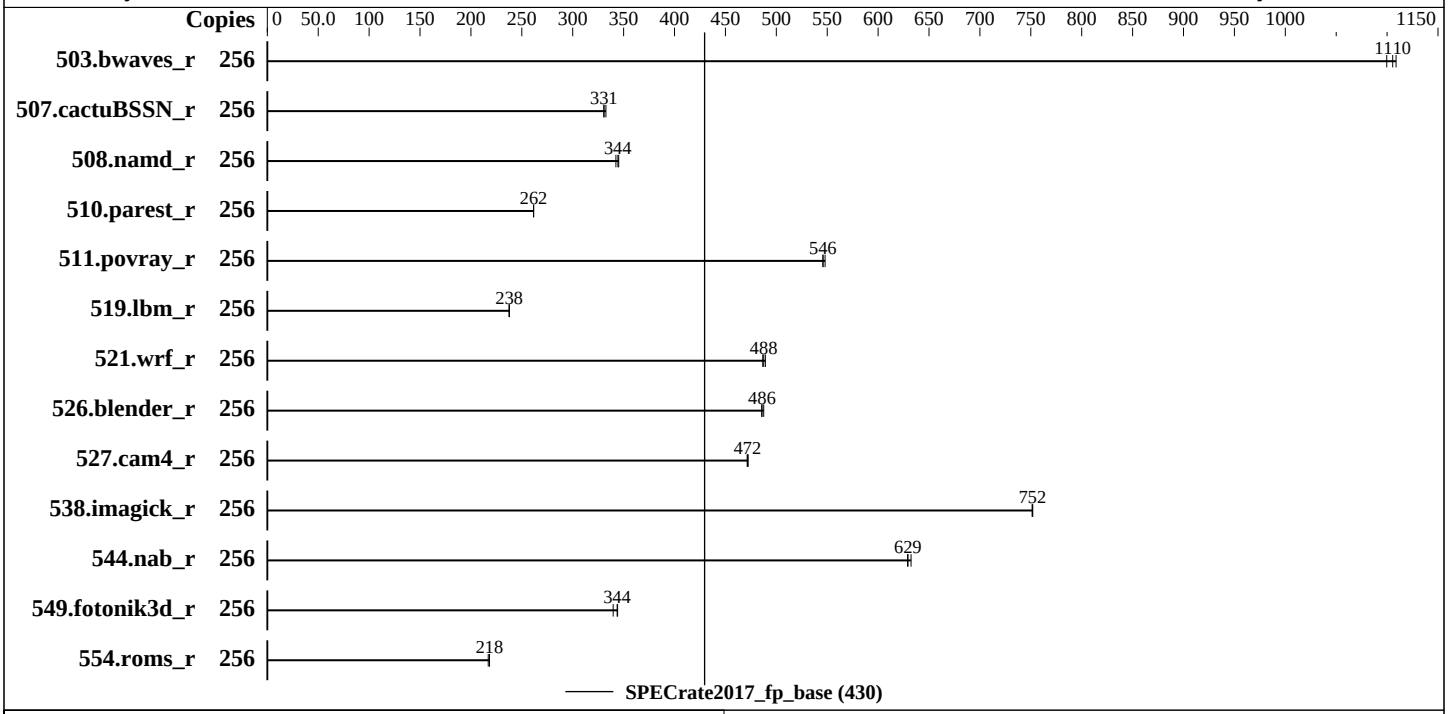
KunLun 9008 (Intel Xeon E7-4850 v4)

SPECrate2017_fp_base = 430

SPECrate2017_fp_peak = Not Run

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

Test Date: May-2018
Hardware Availability: Mar-2018
Software Availability: Mar-2018



Hardware

CPU Name:	Intel Xeon E7-4850 v4
Max MHz.:	2800
Nominal:	2100
Enabled:	128 cores, 8 chips, 2 threads/core
Orderable:	4,8 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	256 KB I+D on chip per core
L3:	40 MB I+D on chip per chip
Other:	None
Memory:	2 TB (64 x 32 GB 2Rx4 PC4-2400T-R, running at 1333)
Storage:	3 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 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
Parallel:	No
Firmware:	Version BLXSV320 released Feb-2018
File System:	ext4
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	256	2315	1110	**2322**	**1110**	2335	1100							
507.cactuBSSN_r	256	981	331	974	333	**980**	**331**							
508.namd_r	256	705	345	**706**	**344**	710	342							
510.parest_r	256	**2560**	**262**	2561	262	2560	262							
511.povray_r	256	1095	546	**1095**	**546**	1091	548							
519.lbm_r	256	1136	238	**1135**	**238**	1135	238							
521.wrf_r	256	1178	487	1172	489	**1176**	**488**							
526.blender_r	256	**802**	**486**	800	488	803	486							
527.cam4_r	256	948	472	**949**	**472**	950	471							
538.imagick_r	256	847	752	847	751	**847**	**752**							
544.nab_r	256	**685**	**629**	681	632	685	629							
549.fotonik3d_r	256	2937	340	**2903**	**344**	2899	344							
554.roms_r	256	**1864**	**218**	1875	217	1864	218							

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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:
 Set Power Efficiency Mode to Performance
 Memory Patrol Scrub set to Disable
 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on linux-i5c0 Thu Jul  5 17:49:13 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) CPU E7-4850 v4 @ 2.10GHz
       8  "physical id"s (chips)
       256 "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 : 16
       siblings  : 32
       physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
       physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
       physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
       physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
       physical 4: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
       physical 5: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
       physical 6: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
       physical 7: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                256
      On-line CPU(s) list:   0-255
      Thread(s) per core:    2
      Core(s) per socket:    16
      Socket(s):             8
```

(Continued on next page)

Platform Notes (Continued)

```
      NUMA node(s):          8
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 79
      Model name:            Intel(R) Xeon(R) CPU E7-4850 v4 @ 2.10GHz
      Stepping:              1
      CPU MHz:               2099.976
      CPU max MHz:           2800.0000
      CPU min MHz:           1200.0000
      BogoMIPS:              4199.87
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              256K
      L3 cache:              40960K
      NUMA node0 CPU(s):     0-15,128-143
      NUMA node1 CPU(s):     16-31,144-159
      NUMA node2 CPU(s):     32-47,160-175
      NUMA node3 CPU(s):     48-63,176-191
      NUMA node4 CPU(s):     64-79,192-207
      NUMA node5 CPU(s):     80-95,208-223
      NUMA node6 CPU(s):     96-111,224-239
      NUMA node7 CPU(s):     112-127,240-255
      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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf
      eagerfpu mce_recovery 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 arat epb invpcid_single pln pts
      dtherm intel_pt spec_ctrl stibp retpoline kaiser tpr_shadow vnmi flexpriority ept
      vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdseed adx
      smap xsaveopt cqm_llc cqm_occup_llc

  /proc/cpuinfo cache data
     cache size : 40960 KB

  From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 128 129 130 131 132 133 134 135 136
    137 138 139 140 141 142 143
    node 0 size: 257400 MB
    node 0 free: 248536 MB
    node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 144 145 146 147 148 149
    150 151 152 153 154 155 156 157 158 159
    node 1 size: 258001 MB
    node 1 free: 251271 MB
```

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Platform Notes (Continued)

```
   node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 160 161 162 163 164 165
   166 167 168 169 170 171 172 173 174 175
   node 2 size: 258001 MB
   node 2 free: 251106 MB
   node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 176 177 178 179 180 181
   182 183 184 185 186 187 188 189 190 191
   node 3 size: 258001 MB
   node 3 free: 251270 MB
   node 4 cpus: 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 192 193 194 195 196 197
   198 199 200 201 202 203 204 205 206 207
   node 4 size: 258001 MB
   node 4 free: 251362 MB
   node 5 cpus: 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 208 209 210 211 212 213
   214 215 216 217 218 219 220 221 222 223
   node 5 size: 258001 MB
   node 5 free: 251417 MB
   node 6 cpus: 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 224 225 226
   227 228 229 230 231 232 233 234 235 236 237 238 239
   node 6 size: 258001 MB
   node 6 free: 251375 MB
   node 7 cpus: 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 240 241
   242 243 244 245 246 247 248 249 250 251 252 253 254 255
   node 7 size: 257833 MB
   node 7 free: 251253 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  21  31  21  41  41  51  51
     1:  21  10  21  31  41  41  51  51
     2:  31  21  10  21  51  51  41  41
     3:  21  31  21  10  51  51  41  41
     4:  41  41  51  51  10  21  31  21
     5:  41  41  51  51  21  10  21  31
     6:  51  51  41  41  31  21  10  21
     7:  51  51  41  41  21  31  21  10

 From /proc/meminfo
    MemTotal:       2112758448 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
```

(Continued on next page)

Platform Notes (Continued)

```
       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-i5c0 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 Jul 5 10:04

 SPEC is set to: /home/cpu2017
    Filesystem     Type   Size  Used Avail Use% Mounted on
    /dev/sda4      btrfs  2.4T  210G  2.2T   9% /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 American Megatrends Inc. BLXSV320 2/23/2018
   Memory:
    49x Hynix HMA84GR7MFR4N-UH 32 GB 2 rank 2400, configured at 1333
    9x Micron 36ASF4G72PZ-2G3B1 32 GB 2 rank 2400, configured at 1333
    128x NO DIMM NO DIMM
    6x Samsung M393A4K40BB1-CRC 32 GB 2 rank 2400, configured at 1333

 (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)
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
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
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

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Base Compiler Invocation (Continued)

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.cactuBSSN_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
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

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Base Optimization Flags (Continued)

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

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.html
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-V1.2-BDW-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.xml
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-V1.2-BDW-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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