



SPEC® CPU2017 Floating Point Rate Result

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Fujitsu

PRIMEQUEST 3800B, Intel Xeon Platinum 8156, 3.60GHz

SPECrate2017_fp_base = 278

SPECrate2017_fp_peak = Not Run

CPU2017 License: 19

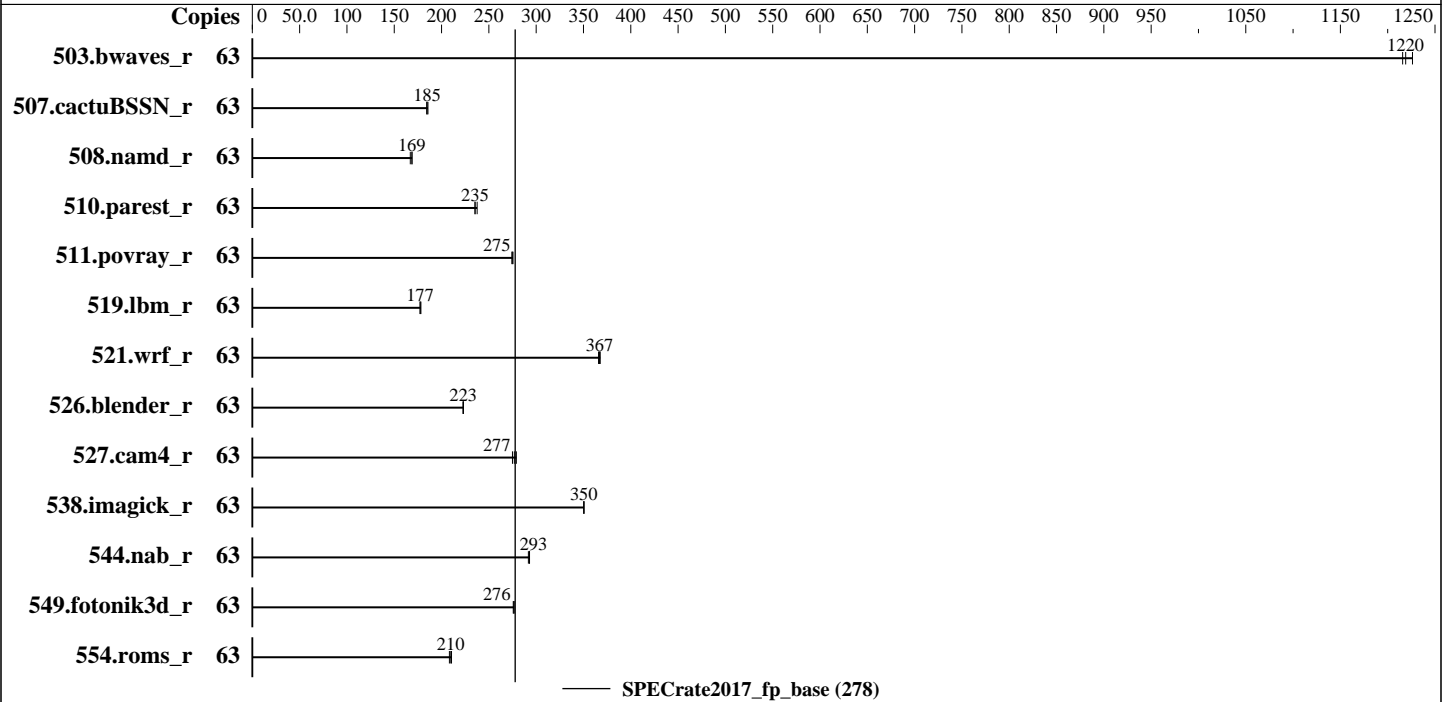
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Oct-2017

Hardware Availability: Jul-2017

Software Availability: Sep-2017



Hardware

CPU Name: Intel Xeon Platinum 8156
 Max MHz.: 3700
 Nominal: 3600
 Enabled: 32 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: 16.5 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, 600 GB, 10.5K 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: Fujitsu BIOS Version V1.0.0.0 R1.21.0 for D3858-A1x. Released Dec-2017
 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	63	<u>518</u>	<u>1220</u>	515	1230	520	1220							
507.cactuBSSN_r	63	433	184	<u>432</u>	<u>185</u>	430	186							
508.namd_r	63	358	167	<u>355</u>	<u>169</u>	354	169							
510.parest_r	63	694	238	<u>700</u>	<u>235</u>	700	235							
511.povray_r	63	536	274	534	276	<u>535</u>	<u>275</u>							
519.lbm_r	63	373	178	374	177	<u>374</u>	<u>177</u>							
521.wrf_r	63	384	368	386	366	<u>385</u>	<u>367</u>							
526.blender_r	63	<u>430</u>	<u>223</u>	430	223	431	223							
527.cam4_r	63	<u>398</u>	<u>277</u>	395	279	401	275							
538.imagick_r	63	447	350	<u>447</u>	<u>350</u>	447	350							
544.nab_r	63	363	292	<u>362</u>	<u>293</u>	362	293							
549.fotonik3d_r	63	<u>888</u>	<u>276</u>	887	277	890	276							
554.roms_r	63	<u>477</u>	<u>210</u>	476	211	481	208							

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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=1-63 isolcpus=1-63
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
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-k55j Tue Oct 24 04:21:16 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 8156 CPU @ 3.60GHz
8 "physical id"s (chips)
64 "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 : 4
siblings : 8
physical 0: cores 1 5 9 13
physical 1: cores 1 5 9 13
physical 2: cores 1 5 9 13
physical 3: cores 1 2 5 11
physical 4: cores 5 8 10 11
physical 5: cores 0 8 11 12
physical 6: cores 1 5 9 13
physical 7: cores 1 5 9 13

From lscpu:
Architecture: x86_64

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Platform Notes (Continued)

```

CPU op-mode(s):      32-bit, 64-bit
Byte Order:          Little Endian
CPU(s):              64
On-line CPU(s) list: 0-63
Thread(s) per core:  2
Core(s) per socket: 4
Socket(s):           8
NUMA node(s):        16
Vendor ID:           GenuineIntel
CPU family:          6
Model:               85
Model name:          Intel(R) Xeon(R) Platinum 8156 CPU @ 3.60GHz
Stepping:            4
CPU MHz:             3699.999
CPU max MHz:         3700.0000
CPU min MHz:         1200.0000
BogoMIPS:            7200.32
Virtualization:      VT-x
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            16896K
NUMA node0 CPU(s):  0,2,32,34
NUMA node1 CPU(s):  1,3,33,35
NUMA node2 CPU(s):  4,6,36,38
NUMA node3 CPU(s):  5,7,37,39
NUMA node4 CPU(s):  8,10,40,42
NUMA node5 CPU(s):  9,11,41,43
NUMA node6 CPU(s):  12,13,44,45
NUMA node7 CPU(s):  14,15,46,47
NUMA node8 CPU(s):  16,19,48,51
NUMA node9 CPU(s):  17,18,49,50
NUMA node10 CPU(s): 20,21,52,53
NUMA node11 CPU(s): 22,23,54,55
NUMA node12 CPU(s): 24,26,56,58
NUMA node13 CPU(s): 25,27,57,59
NUMA node14 CPU(s): 28,30,60,62
NUMA node15 CPU(s): 29,31,61,63
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
aperfmpperf 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 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 cqm mpx avx512f
avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec

```

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Platform Notes (Continued)

```
xgetbv1 cqm_llc cqm_occup_llc
```

```
/proc/cpuinfo cache data  
cache size : 16896 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 2 32 34  
node 0 size: 95380 MB  
node 0 free: 85835 MB  
node 1 cpus: 1 3 33 35  
node 1 size: 96765 MB  
node 1 free: 96546 MB  
node 2 cpus: 4 6 36 38  
node 2 size: 96765 MB  
node 2 free: 96543 MB  
node 3 cpus: 5 7 37 39  
node 3 size: 96765 MB  
node 3 free: 96546 MB  
node 4 cpus: 8 10 40 42  
node 4 size: 96765 MB  
node 4 free: 96543 MB  
node 5 cpus: 9 11 41 43  
node 5 size: 96765 MB  
node 5 free: 96546 MB  
node 6 cpus: 12 13 44 45  
node 6 size: 96765 MB  
node 6 free: 96543 MB  
node 7 cpus: 14 15 46 47  
node 7 size: 96765 MB  
node 7 free: 96545 MB  
node 8 cpus: 16 19 48 51  
node 8 size: 96765 MB  
node 8 free: 96546 MB  
node 9 cpus: 17 18 49 50  
node 9 size: 96765 MB  
node 9 free: 96544 MB  
node 10 cpus: 20 21 52 53  
node 10 size: 96765 MB  
node 10 free: 96543 MB  
node 11 cpus: 22 23 54 55  
node 11 size: 96765 MB  
node 11 free: 96545 MB  
node 12 cpus: 24 26 56 58  
node 12 size: 96765 MB  
node 12 free: 96544 MB
```

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Platform Notes (Continued)

```

node 13 cpus: 25 27 57 59
node 13 size: 96765 MB
node 13 free: 96546 MB
node 14 cpus: 28 30 60 62
node 14 size: 96765 MB
node 14 free: 96544 MB
node 15 cpus: 29 31 61 63
node 15 size: 96617 MB
node 15 free: 96397 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 40 40 40 40 35 35 40 40
1:  11 10 35 35 35 35 40 40 40 40 40 40 35 35 40 40
2:  35 35 10 11 40 40 35 35 40 40 35 35 40 40 40 40
3:  35 35 11 10 40 40 35 35 40 40 35 35 40 40 40 40
4:  35 35 40 40 10 11 35 35 35 35 40 40 40 40 40 40
5:  35 35 40 40 11 10 35 35 35 35 40 40 40 40 40 40
6:  40 40 35 35 35 35 10 11 40 40 40 40 40 40 35 35
7:  40 40 35 35 35 35 11 10 40 40 40 40 40 40 35 35
8:  40 40 40 40 35 35 40 40 10 11 35 35 35 35 40 40
9:  40 40 40 40 35 35 40 40 11 10 35 35 35 35 40 40
10: 40 40 35 35 40 40 40 40 35 35 10 11 40 40 35 35
11: 40 40 35 35 40 40 40 40 35 35 11 10 40 40 35 35
12: 35 35 40 40 40 40 40 40 35 35 40 40 10 11 35 35
13: 35 35 40 40 40 40 40 40 35 35 40 40 11 10 35 35
14: 40 40 40 40 40 40 35 35 40 40 35 35 35 35 10 11
15: 40 40 40 40 40 40 35 35 40 40 35 35 35 35 11 10

```

```

From /proc/meminfo
MemTotal: 1583837096 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

```

```

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"

```

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Platform Notes (Continued)

CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:

```
Linux linux-k55j 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 24 04:10

SPEC is set to: /home/memory/speccpu

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
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 R1.21.0 for D3858-A1x 09/15/2017

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

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icc (ICC) 18.0.0 20170811

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Compiler Version Notes (Continued)

=====
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

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

ifort icc

Benchmarks using both C and C++:

icpc icc

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Base Compiler Invocation (Continued)

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

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

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Base Optimization Flags (Continued)

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-linux64.2017-10-19.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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