# SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

## Fujitsu

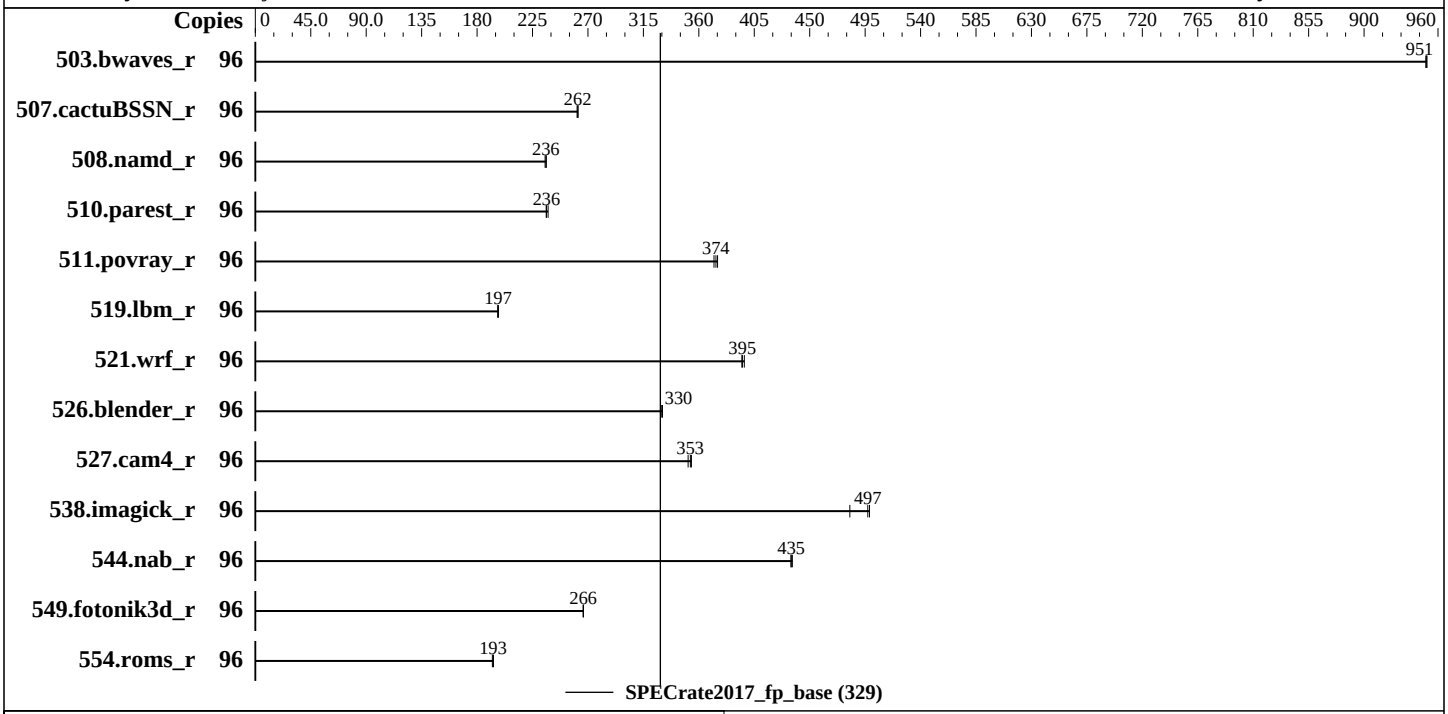
PRIMERGY RX4770 M4, Intel Xeon Gold 6146, 3.20GHz

SPECrate2017_fp_base = 329

SPECrate2017_fp_peak = Not Run

**CPU2017 License:** 19
**Test Sponsor:** Fujitsu
**Tested by:** Fujitsu

**Test Date:** May-2018
**Hardware Availability:** Jul-2017
**Software Availability:** Mar-2018




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon Gold 6146 |
| Max MHz.: | 4200 |
| Nominal: | 3200 |
| Enabled: | 48 cores, 4 chips, 2 threads/core |
| Orderable: | 2,4 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 (48 x 16 GB 2Rx4 PC4-2666V-R) |
| Storage: | 384 GB tmpfs |
| Other: | 1 x SAS HDD, 1.2 TB, 10500 RPM, used for swap |

## Software

| | |
|---|---|
| OS: | SUSE Linux Enterprise Server 12 SP2 4.4.114-92.64-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 V5.0.0.12 R1.9.0 for D3753-A1x. Released Mar-2018 |
| File System: | tmpfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | Not Applicable |
| Other: | None |

# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

## Fujitsu

PRIMERGY RX4770 M4, Intel Xeon Gold 6146, 3.20GHz

SPECrate2017_fp_base = 329

SPECrate2017_fp_peak = Not Run

**CPU2017 License:** 19
**Test Sponsor:** Fujitsu
**Tested by:** Fujitsu

**Test Date:** May-2018
**Hardware Availability:** Jul-2017
**Software Availability:** Mar-2018

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 503.bwaves_r | 96 | 1012 | 951 | 1013 | 950 | **1013** | **951** | | | | | | | |
| 507.cactuBSSN_r | 96 | 465 | 261 | **464** | **262** | 464 | 262 | | | | | | | |
| 508.namd_r | 96 | 388 | 235 | **387** | **236** | 386 | 236 | | | | | | | |
| 510.parest_r | 96 | 1057 | 238 | **1062** | **236** | 1064 | 236 | | | | | | | |
| 511.povray_r | 96 | **600** | **374** | 597 | 375 | 602 | 372 | | | | | | | |
| 519.lbm_r | 96 | 513 | 197 | 514 | 197 | **513** | **197** | | | | | | | |
| 521.wrf_r | 96 | 542 | 397 | 544 | 395 | **544** | **395** | | | | | | | |
| 526.blender_r | 96 | 442 | 330 | **443** | **330** | 444 | 329 | | | | | | | |
| 527.cam4_r | 96 | 478 | 351 | 474 | 354 | **475** | **353** | | | | | | | |
| 538.imagick_r | 96 | 479 | 499 | 495 | 483 | **480** | **497** | | | | | | | |
| 544.nab_r | 96 | **371** | **435** | 371 | 436 | 372 | 435 | | | | | | | |
| 549.fotonik3d_r | 96 | 1406 | 266 | **1405** | **266** | 1405 | 266 | | | | | | | |
| 554.roms_r | 96 | 793 | 192 | **790** | **193** | 789 | 193 | | | | | | | |

**SPECrate2017_fp_base = 329**

**SPECrate2017_fp_peak = Not Run**

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=1-95
Set CPU frequency governor to maximum performance with:
cpupower -c all frequency-set -g performance
Set tmpfs filesystem with:
mkdir /home/memory
mount -t tmpfs -o size=384g,rw tmpfs /home/memory
cpu idle state set with:
cpupower idle-set -d 1
cpupower idle-set -d 2
```

## 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"
```

**(Continued on next page)**

## General Notes (Continued)

```
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/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>

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:
 DCU Streamer Prefetcher = Disabled
 Intel Virtualization Technology = Disabled
 HWPM Support = Disabled
 Package C State limit = C0
 LLC Dead Line Alloc = Disabled
 Stale AtoS = Enabled
 Patrol Scrub = Disabled
 IMC Interleaving = 1-way
 Sub NUMA Clustering = Enabled
 Fan Control = Full
 Sysinfo program /home/memory/speccpu/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on RX4770M4 Thu May 31 12:18:04 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) Gold 6146 CPU @ 3.20GHz
       4  "physical id"s (chips)
       96 "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 : 12
```

**(Continued on next page)**

## Platform Notes (Continued)

```
       siblings  : 24
       physical 0: cores 0 1 2 3 4 9 10 16 18 19 25 26
       physical 1: cores 0 1 2 3 4 9 10 16 18 19 25 26
       physical 2: cores 0 1 2 3 4 8 9 11 17 18 19 20
       physical 3: cores 0 1 2 3 4 9 10 16 18 19 25 26

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                96
      On-line CPU(s) list:   0-95
      Thread(s) per core:    2
      Core(s) per socket:    12
      Socket(s):             4
      NUMA node(s):          8
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Gold 6146 CPU @ 3.20GHz
      Stepping:              4
      CPU MHz:               3201.000
      CPU max MHz:           3201.0000
      CPU min MHz:           1200.0000
      BogoMIPS:              6384.97
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              25344K
      NUMA node0 CPU(s):     0-2,5,7,10,48-50,53,55,58
      NUMA node1 CPU(s):     3,4,6,8,9,11,51,52,54,56,57,59
      NUMA node2 CPU(s):     12-14,17,19,22,60-62,65,67,70
      NUMA node3 CPU(s):     15,16,18,20,21,23,63,64,66,68,69,71
      NUMA node4 CPU(s):     24-26,29,30,32,72-74,77,78,80
      NUMA node5 CPU(s):     27,28,31,33-35,75,76,79,81-83
      NUMA node6 CPU(s):     36-38,41,43,46,84-86,89,91,94
      NUMA node7 CPU(s):     39,40,42,44,45,47,87,88,90,92,93,95
      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 ida arat epb invpcid_single pln pts
      dtherm intel_pt rsb_ctxsw spec_ctrl 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
```

**(Continued on next page)**

## Platform Notes (Continued)

```
      xsavec xgetbv1 cqm_llc cqm_occup_llc

 /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: 8 nodes (0-7)
   node 0 cpus: 0 1 2 5 7 10 48 49 50 53 55 58
   node 0 size: 95018 MB
   node 0 free: 93297 MB
   node 1 cpus: 3 4 6 8 9 11 51 52 54 56 57 59
   node 1 size: 96760 MB
   node 1 free: 96477 MB
   node 2 cpus: 12 13 14 17 19 22 60 61 62 65 67 70
   node 2 size: 96760 MB
   node 2 free: 95981 MB
   node 3 cpus: 15 16 18 20 21 23 63 64 66 68 69 71
   node 3 size: 96760 MB
   node 3 free: 90398 MB
   node 4 cpus: 24 25 26 29 30 32 72 73 74 77 78 80
   node 4 size: 96760 MB
   node 4 free: 95579 MB
   node 5 cpus: 27 28 31 33 34 35 75 76 79 81 82 83
   node 5 size: 96760 MB
   node 5 free: 96549 MB
   node 6 cpus: 36 37 38 41 43 46 84 85 86 89 91 94
   node 6 size: 96760 MB
   node 6 free: 96588 MB
   node 7 cpus: 39 40 42 44 45 47 87 88 90 92 93 95
   node 7 size: 96609 MB
   node 7 free: 96430 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  11  31  31  21  21  21  21
     1:  11  10  31  31  21  21  21  21
     2:  31  31  10  11  21  21  21  21
     3:  31  31  11  10  21  21  21  21
     4:  21  21  21  21  10  11  31  31
     5:  21  21  21  21  11  10  31  31
     6:  21  21  21  21  31  31  10  11
     7:  21  21  21  21  31  31  11  10

 From /proc/meminfo
    MemTotal:       790723368 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB
```

**(Continued on next page)**

## Platform Notes (Continued)

```
 /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 RX4770M4 4.4.114-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db)
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 May 31 07:56

 SPEC is set to: /home/memory/speccpu
    Filesystem     Type   Size  Used Avail Use% Mounted on
    tmpfs          tmpfs  384G  8.9G  376G   3% /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 // American Megatrends Inc. V5.0.0.12 R1.9.0 for D3753-A1x
       03/29/2018
   Memory:
    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)
------------------------------------------------------------------------------
```

**(Continued on next page)**

## Compiler Version Notes (Continued)

```
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
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

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

**(Continued on next page)**

## Base Optimization Flags (Continued)

C++ benchmarks (continued):
-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

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-RevE.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-RevE.xml


SPEC is a registered trademark 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.

Tested with SPEC CPU2017 v1.0.2 on 2018-05-31 12:18:03-0400.
Report generated on 2018-10-31 17:32:29 by CPU2017 PS formatter v6067.
Originally published on 2018-06-26.