# SPEC® CPU2017 Floating Point Rate Result



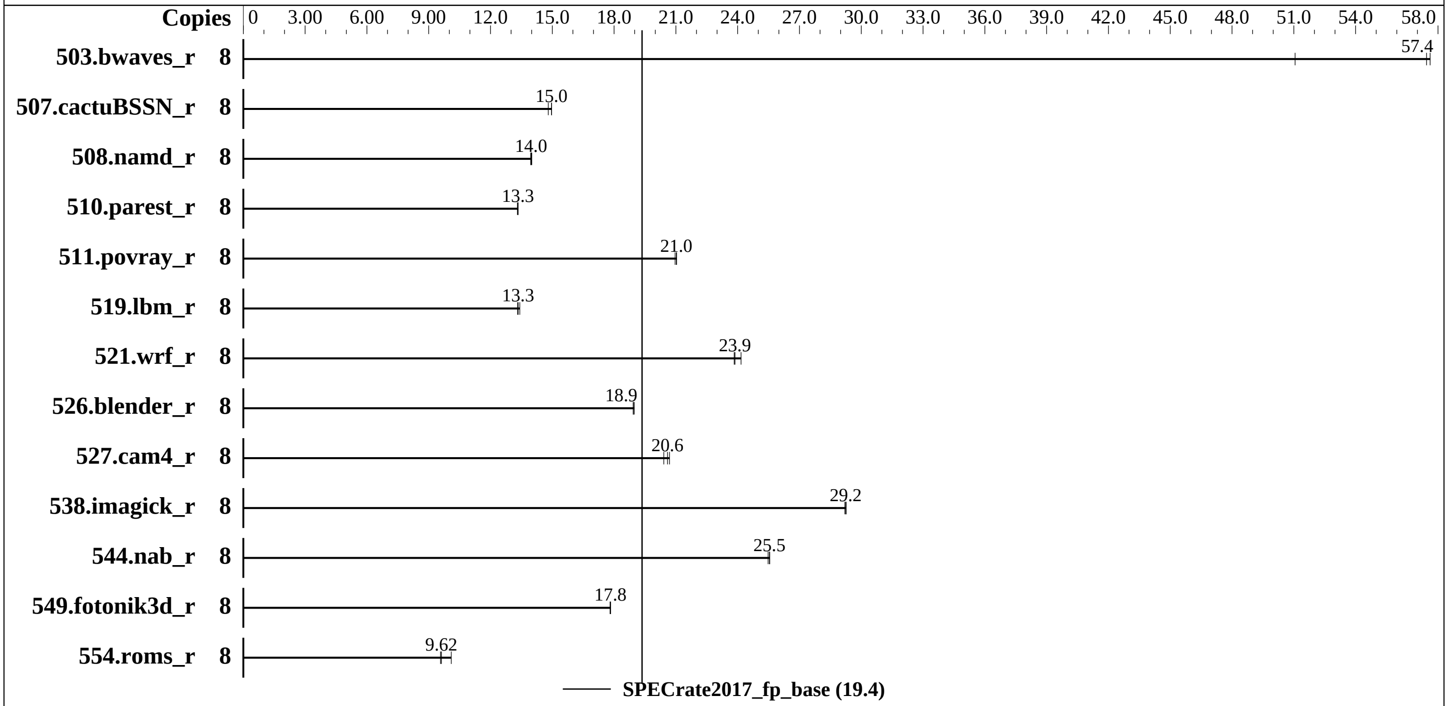
## Fujitsu

PRIMERGY CX1430 M1, Intel Xeon D-1521, 2.40GHz

SPECrate2017_fp_base = 19.4

SPECrate2017_fp_peak = Not Run

| | | | |
|---|---|---|---|
| **CPU2017 License:** | 19 | **Test Date:** | Jun-2018 |
| **Test Sponsor:** | Fujitsu | **Hardware Availability:** | May-2018 |
| **Tested by:** | Fujitsu | **Software Availability:** | Apr-2018 |




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon D-1521 |
| Max MHz.: | 2700 |
| Nominal: | 2400 |
| Enabled: | 4 cores, 1 chip, 2 threads/core |
| Orderable: | 1 chip |
| Cache L1: | 32 KB I + 32 KB D on chip per core |
| L2: | 256 KB I+D on chip per core |
| L3: | 6 MB I+D on chip per chip |
| Other: | None |
| Memory: | 128 GB (4 x 32 GB 2Rx4 PC4-2400T-R, running at 2133) |
| Storage: | 1 x SAS HDD, 1 TB, 7200 RPM |
| Other: | None |

## Software

| | |
|---|---|
| OS: | SUSE Linux Enterprise Server 12 SP2<br>4.4.114-92.64-default |
| Compiler: | C/C++: Version 18.0.1.163 of Intel C/C++ Compiler for Linux;<br>Fortran: Version 18.0.1.163 of Intel Fortran Compiler for Linux |
| Parallel: | No |
| Firmware: | American Megatrends BIOS Version C419A020. Released Apr-2018 |
| File System: | xfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | Not Applicable |
| Other: | None |

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**CPU2017 License:** 19
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**Hardware Availability:** May-2018
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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 | 8 | 1571 | 51.1 | 1392 | 57.6 | **1397** | **57.4** | | | | | | | |
| 507.cactuBSSN_r | 8 | 684 | 14.8 | **677** | **15.0** | 677 | 15.0 | | | | | | | |
| 508.namd_r | 8 | 543 | 14.0 | **544** | **14.0** | 545 | 14.0 | | | | | | | |
| 510.parest_r | 8 | **1569** | **13.3** | 1568 | 13.3 | 1573 | 13.3 | | | | | | | |
| 511.povray_r | 8 | **888** | **21.0** | 888 | 21.0 | 891 | 21.0 | | | | | | | |
| 519.lbm_r | 8 | 633 | 13.3 | 628 | 13.4 | **632** | **13.3** | | | | | | | |
| 521.wrf_r | 8 | 742 | 24.2 | **751** | **23.9** | 752 | 23.8 | | | | | | | |
| 526.blender_r | 8 | 642 | 19.0 | 644 | 18.9 | **643** | **18.9** | | | | | | | |
| 527.cam4_r | 8 | **679** | **20.6** | 685 | 20.4 | 676 | 20.7 | | | | | | | |
| 538.imagick_r | 8 | 680 | 29.3 | **680** | **29.2** | 681 | 29.2 | | | | | | | |
| 544.nab_r | 8 | **527** | **25.5** | 527 | 25.6 | 528 | 25.5 | | | | | | | |
| 549.fotonik3d_r | 8 | 1748 | 17.8 | **1749** | **17.8** | 1751 | 17.8 | | | | | | | |
| 554.roms_r | 8 | **1322** | **9.62** | 1328 | 9.57 | 1259 | 10.1 | | | | | | | |

**SPECrate2017_fp_base =** **19.4**

**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 CPU frequency governor to maximum performance with:
cpupower -c all frequency-set -g performance
cpu idle state set with:
cpupower idle-set -d 1
```

## General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/SPECcpu/speccpu2017-ic18.1-20171215/icc18.1-lib/intel64"
 Binaries compiled on a system with 4x Intel Xeon Platinum 8180 CPU + 768GB RAM
 memory using SUSE Linux Enterprise Server 12 SP2
 Transparent Huge Pages enabled by default
 Prior to runcpu invocation
 Filesystem page cache synced and cleared with:
 sync; echo 1 > /proc/sys/vm/drop_caches
 runcpu command invoked through numactl i.e.:
```

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## General Notes (Continued)

```
 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:
Intel Virtualization Technology = Disabled
HWPM Support = Disabled
Sysinfo program /home/SPECcpu/speccpu2017-ic18.1-20171215/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-grrg Tue Jun 19 13:39:58 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 D-1521 @ 2.40GHz
      1  "physical id"s (chips)
      8 "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 0 1 2 3

From lscpu:
     Architecture:          x86_64
     CPU op-mode(s):        32-bit, 64-bit
     Byte Order:            Little Endian
     CPU(s):                8
     On-line CPU(s) list:   0-7
     Thread(s) per core:    2
     Core(s) per socket:    4
     Socket(s):             1
     NUMA node(s):          1
     Vendor ID:             GenuineIntel
     CPU family:            6
     Model:                 86
     Model name:            Intel(R) Xeon(R) CPU D-1521 @ 2.40GHz
     Stepping:              3
```

(Continued on next page)

## Platform Notes (Continued)

```
     CPU MHz:               2382.528
     CPU max MHz:           2700.0000
     CPU min MHz:           800.0000
     BogoMIPS:              4799.54
     Virtualization:        VT-x
     L1d cache:             32K
     L1i cache:             32K
     L2 cache:              256K
     L3 cache:              6144K
     NUMA node0 CPU(s):     0-7
     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 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 spec_ctrl 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 : 6144 KB

From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 1 nodes (0)
  node 0 cpus: 0 1 2 3 4 5 6 7
  node 0 size: 128659 MB
  node 0 free: 128152 MB
  node distances:
  node   0
    0:  10

From /proc/meminfo
   MemTotal:       131746916 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.
```

**(Continued on next page)**

## Platform Notes (Continued)

```
      # 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-grrg 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 Jun 19 13:37

SPEC is set to: /home/SPECcpu/speccpu2017-ic18.1-20171215
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda9      xfs   530G   18G  513G   4% /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. C419A020 04/03/2018
  Memory:
   4x Hynix Semiconductor HMA84GR7AFR4N-UH 32 GB 2 rank 2400, configured at 2133

(End of data from sysinfo program)
```

## Compiler Version Notes

```
==============================================================================
 CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CXXC 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

(Continued on next page)

## Compiler Version Notes (Continued)

```
==============================================================================
 CC  511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 FC  507.cactuBSSN_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
ifort (IFORT) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CC  521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

## Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

**(Continued on next page)**

## Base Compiler Invocation (Continued)

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`

Fortran benchmarks:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

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## Base Optimization Flags (Continued)

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-RevD.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-RevD.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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