SPEC® CPU2017 Floating Point Speed Result

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Fujitsu

PRIMERGY RX2540 M4, Intel Xeon Gold 6126, 2.60GHz

$SPECspeed2017\_fp\_base =$ **110**

$SPECspeed2017\_fp\_peak =$ Not Run

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

Test Date: Oct-2018
Hardware Availability: Jul-2017
Software Availability: Sep-2018

Threads		
603.bwaves_s	24	454
607.cactuBSSN_s	24	113
619.lbm_s	24	85.7
621.wrf_s	24	115
627.cam4_s	24	65.4
628.pop2_s	24	65.1
638.imagick_s	24	86.2
644.nab_s	24	168
649.fotonik3d_s	24	79.9
654.roms_s	24	107

Scale: 0, 20.0, 40.0, 60.0, 80.0, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 460

——— SPECspeed2017_fp_base (110)

Hardware

CPU Name: Intel Xeon Gold 6126
 Max MHz.: 3700
 Nominal: 2600
Enabled: 24 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 19.25 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)
Storage: 1 x SATA HDD, 1TB, 7200 RPM
Other: None

Software

OS: Red Hat Enterprise Linux Server release 7.5 (Maipo)
 3.10.0-862.el7.x86_64
Compiler: C/C++: Version 19.0.0.117 of Intel C/C++ Compiler for Linux;
 Fortran: Version 19.0.0.117 of Intel Fortran Compiler for Linux
Parallel: Yes
Firmware: Fujitsu BIOS Version V5.0.0.12 R1.22.0 for D3384-A1x. Released Jun-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator library V5.0.1

Standard Performance Evaluation Corporation (info@spec.org)
https://www.spec.org/

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SPECspeed2017_fp_base =   110

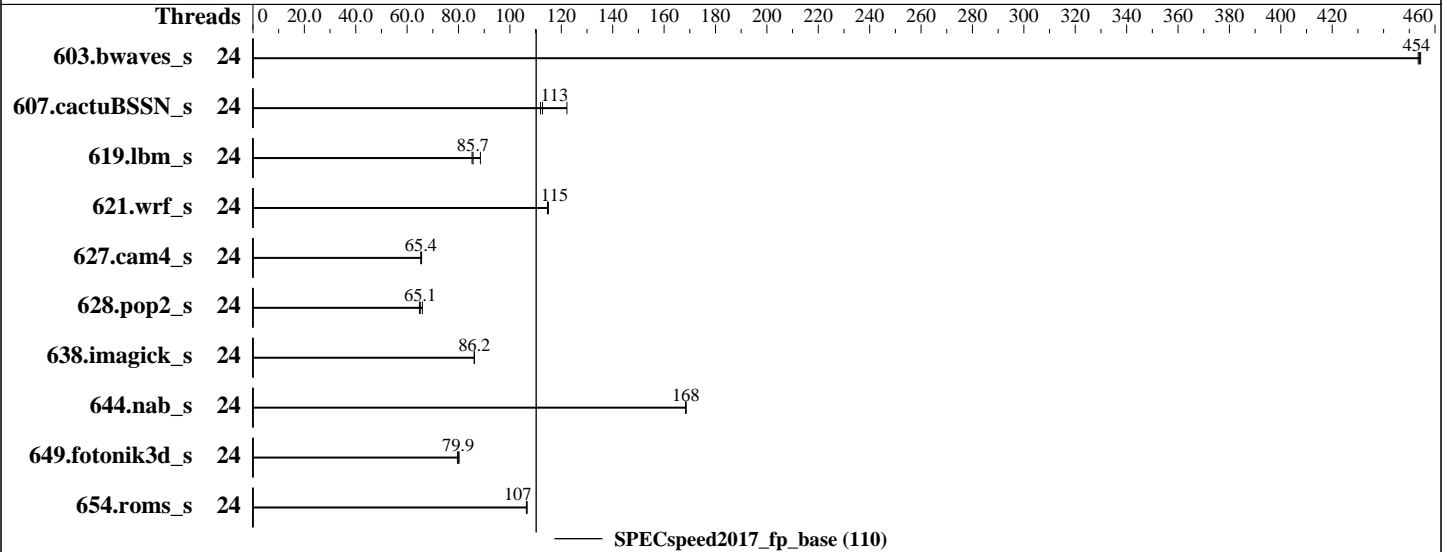SPECspeed2017_fp_peak =   Not Run

CPU2017 License: 19
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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	24	130	453	130	454	**130**	**454**							
607.cactuBSSN_s	24	136	122	149	112	**148**	**113**							
619.lbm_s	24	59.2	88.5	**61.2**	**85.7**	61.4	85.3							
621.wrf_s	24	115	115	115	115	**115**	**115**							
627.cam4_s	24	135	65.6	**135**	**65.4**	136	65.3							
628.pop2_s	24	183	64.8	**182**	**65.1**	180	65.9							
638.imagick_s	24	168	86.1	**167**	**86.2**	167	86.2							
644.nab_s	24	104	168	**104**	**168**	104	168							
649.fotonik3d_s	24	**114**	**79.9**	115	79.6	114	80.2							
654.roms_s	24	**148**	**107**	148	107	148	106							
SPECspeed2017_fp_base =		**110**												
SPECspeed2017_fp_peak =		**Not Run**												

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

General Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/speccpu/icc19-lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/speccpu/je5.0.1-64"
OMP_STACKSIZE = "192M"

 Binaries compiled on a system with 2x Intel Xeon Gold 6126 CPU + 384GB RAM
 memory using Red Hat Enterprise Linux Server 7.5
 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
 jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
 jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;
 jemalloc: sources available via jemalloc.net;

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.
```

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Test Sponsor:	Fujitsu	**Hardware Availability:**	Jul-2017
Tested by:	Fujitsu	**Software Availability:**	Sep-2018

Platform Notes

```
BIOS configuration:
Hyper-Threading = Disabled
Adjacent Cache Line Prefetch = Disabled
DCU Streamer Prefetcher = Disabled
Override OS Energy Performance = Disabled
Energy Performance = Performance
LLC Dead Line Alloc = Disabled
Fan Control = Full
Patrol Scrub = Disabled
Sub NUMA Clustering = Disabled
IMC Interleaving = 2-way
Sysinfo program /home/speccpu/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Fri Oct 26 03:10:27 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 6126 CPU @ 2.60GHz
      2  "physical id"s (chips)
      24 "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
      siblings  : 12
      physical 0: cores 0 1 3 4 5 6 8 9 10 11 12 13
      physical 1: cores 0 1 3 5 6 8 9 10 11 12 13 14

From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                24
      On-line CPU(s) list:   0-23
      Thread(s) per core:    1
      Core(s) per socket:    12
      Socket(s):             2
      NUMA node(s):          2
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Gold 6126 CPU @ 2.60GHz
      Stepping:              4
      CPU MHz:               3050.524
      CPU max MHz:           3700.0000
```

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Platform Notes (Continued)

```
      CPU min MHz:           1000.0000
      BogoMIPS:              5200.00
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              19712K
      NUMA node0 CPU(s):     0-11
      NUMA node1 CPU(s):     12-23
      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 epb cat_l3 cdp_l3 intel_ppin
   intel_pt mba tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2
   smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt
   clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc
   cqm_mbm_total cqm_mbm_local ibpb ibrs stibp dtherm ida arat pln pts hwp
   hwp_act_window hwp_epp hwp_pkg_req pku ospke spec_ctrl intel_stibp

 /proc/cpuinfo cache data
    cache size : 19712 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.

 From /proc/meminfo
    MemTotal:       394435180 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 From /etc/*release* /etc/*version*
    os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.5 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VARIANT="Server"
      VARIANT_ID="server"
      VERSION_ID="7.5"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.5 (Maipo)"
    redhat-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
    system-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:7.5:ga:server

 uname -a:
```

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Platform Notes (Continued)

```
    Linux localhost.localdomain 3.10.0-862.el7.x86_64 #1 SMP Wed Mar 21 18:14:51 EDT 2018
    x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Oct 26 03:09

  SPEC is set to: /home/speccpu
    Filesystem                Type   Size  Used Avail Use% Mounted on
    /dev/mapper/rhel00-home xfs    876G   16G  860G   2% /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 FUJITSU // American Megatrends Inc. V5.0.0.12 R1.22.0 for D3384-A1x
       06/04/2018
   Memory:
    15x Hynix HMA42GR7BJR4N-VK 16 GB 2 rank 2666
    9x Samsung M393A2G40EB2-CTD 16 GB 2 rank 2666

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
  CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
------------------------------------------------------------------------------
icc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  FC  607.cactuBSSN_s(base)
------------------------------------------------------------------------------
icpc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
icc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
ifort (IFORT) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
```

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Compiler Version Notes (Continued)

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


  ==========================================================================
   CC   621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
  ------------------------------------------------------------------------
  ifort (IFORT) 19.0.0.117 20180804
  Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
  icc (ICC) 19.0.0.117 20180804
  Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
  ------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icc -m64 -std=c11`

Fortran benchmarks:
`ifort -m64`

Benchmarks using both Fortran and C:
`ifort -m64 icc -m64 -std=c11`

Benchmarks using Fortran, C, and C++:
`icpc -m64 icc -m64 -std=c11 ifort -m64`

Base Portability Flags

  603.bwaves_s: `-DSPEC_LP64`
  607.cactuBSSN_s: `-DSPEC_LP64`
  619.lbm_s: `-DSPEC_LP64`
  621.wrf_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
  627.cam4_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
  628.pop2_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
`-assume byterecl`
  638.imagick_s: `-DSPEC_LP64`
  644.nab_s: `-DSPEC_LP64`
  649.fotonik3d_s: `-DSPEC_LP64`
  654.roms_s: `-DSPEC_LP64`

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Base Optimization Flags

C benchmarks:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

Fortran benchmarks:
```
-Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

Benchmarks using both Fortran and C:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.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-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevE.xml

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

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