# SPEC® CFP2006 Result

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## Fujitsu

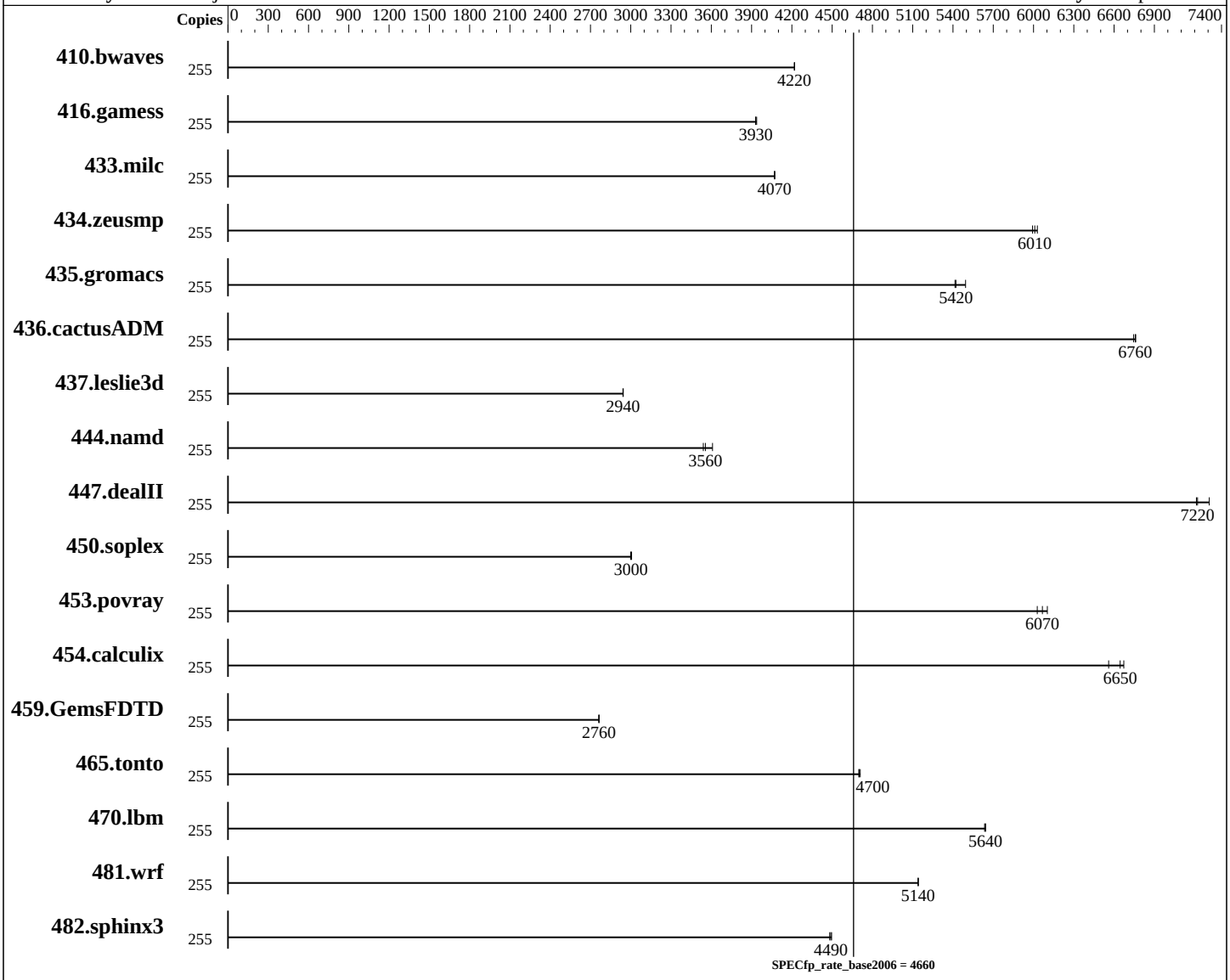
PRIMEQUEST 3800B, Intel Xeon Platinum 8153, 2.00GHz

SPECfp®_rate2006 = Not Run

SPECfp_rate_base2006 = 4660

**CPU2006 license:** 19
**Test sponsor:** Fujitsu
**Tested by:** Fujitsu

**Test date:** Nov-2017
**Hardware Availability:** Jul-2017
**Software Availability:** Sep-2017




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon Platinum 8153 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.80 GHz |
| CPU MHz: | 2000 |
| FPU: | Integrated |
| CPU(s) enabled: | 128 cores, 8 chips, 16 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2,4,6,8 chips |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 1 MB I+D on chip per core |

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### Software

| | |
|---|---|
| Operating System: | 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 |
| Auto Parallel: | No |
| File System: | tmpfs |
| System State: | Run level 3 (multi-user) |

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L3 Cache: 22 MB I+D on chip per chip
Other Cache: None
Memory: 1536 GB (96 x 16 GB 2Rx4 PC4-2666V-R)
Disk Subsystem: 768 GB tmpfs
Other Hardware: 1 x SAS HDD, 600 GB, 10.5K RPM, used for swap

Base Pointers: 32/64-bit
Peak Pointers: Not Applicable
Other Software: None

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 255 | **821** | **4220** | 821 | 4220 | 821 | 4220 | | | | | | | |
| 416.gamess | 255 | 1268 | 3940 | **1270** | **3930** | 1270 | 3930 | | | | | | | |
| 433.milc | 255 | **575** | **4070** | 575 | 4070 | 575 | 4070 | | | | | | | |
| 434.zeusmp | 255 | 385 | 6030 | **386** | **6010** | 387 | 5990 | | | | | | | |
| 435.gromacs | 255 | **336** | **5420** | 336 | 5420 | 331 | 5490 | | | | | | | |
| 436.cactusADM | 255 | 451 | 6760 | 452 | 6750 | **451** | **6760** | | | | | | | |
| 437.leslie3d | 255 | 815 | 2940 | **814** | **2940** | 814 | 2940 | | | | | | | |
| 444.namd | 255 | 578 | 3540 | 567 | 3610 | **575** | **3560** | | | | | | | |
| 447.dealII | 255 | 404 | 7210 | 399 | 7310 | **404** | **7220** | | | | | | | |
| 450.soplex | 255 | **708** | **3000** | 709 | 3000 | 707 | 3010 | | | | | | | |
| 453.povray | 255 | **224** | **6070** | 225 | 6030 | 222 | 6100 | | | | | | | |
| 454.calculix | 255 | 315 | 6670 | 321 | 6560 | **317** | **6650** | | | | | | | |
| 459.GemsFDTD | 255 | 979 | 2760 | **979** | **2760** | 979 | 2760 | | | | | | | |
| 465.tonto | 255 | **534** | **4700** | 533 | 4710 | 534 | 4700 | | | | | | | |
| 470.lbm | 255 | **621** | **5640** | 621 | 5640 | 622 | 5640 | | | | | | | |
| 481.wrf | 255 | **554** | **5140** | 554 | 5140 | 554 | 5140 | | | | | | | |
| 482.sphinx3 | 255 | 1105 | 4500 | **1107** | **4490** | 1109 | 4480 | | | | | | | |

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=1-255 isolcpus=1-255
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=768g,rw tmpfs /home/memory
Process tuning settings:
```

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## Operating System Notes (Continued)

```
echo 10000000 > /proc/sys/kernel/sched_min_granularity_ns
echo 15000000 > /proc/sys/kernel/sched_wakeup_granularity_ns
echo 0 > /proc/sys/kernel/numa_balancing
echo always > /sys/kernel/mm/transparent_hugepage/enabled
cpu idle state set with:
cpupower idle-set -d 2
cpupower idle-set -d 3
set affinity of rcu threads to the cpu0:
for i in ‘pgrep rcu‘ ; do taskset -pc 0 $i ; done
```

## Platform Notes

```
BIOS configuration:
Intel Virtualization Technology = Disabled
HWPM Support = Disabled
DCU Streamer Prefetcher = Disabled
Stale AtoS = Enabled
LLC dead line alloc = Disabled
Sub NUMA Clustering = Enabled
Fan Control = Full
Sysinfo program /home/memory/speccpu/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-k55j Wed Nov  8 14:52:58 2017

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Platinum 8153 CPU @ 2.00GHz
      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
   cache size : 22528 KB

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

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## Platform Notes (Continued)

```
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 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 Nov 8 06:03

SPEC is set to: /home/memory/speccpu
   Filesystem     Type   Size  Used Avail Use% Mounted on
   tmpfs          tmpfs  768G  9.7G  759G   2% /home/memory
Additional information from dmidecode:

   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:
   45x Hynix HMA42GR7BJR4N-VK 16 GB 2 rank 2666 MHz
   51x Samsung M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz

(End of data from sysinfo program)
```

## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/memory/speccpu/icc2018lib/ia32:/home/memory/speccpu/icc2018lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/memory/speccpu/sh10.2"
 Binaries compiled on a system with 2x Intel Xeon Platinum 8180 CPU + 384GB RAM
 memory using SUSE Linux Enterprise Server 12 SP2
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
 Filesystem page cache cleared with:
```

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## General Notes (Continued)

```
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>
```

## Base Compiler Invocation

C benchmarks:
```
icc -m64
```

C++ benchmarks:
```
icpc -m64
```

Fortran benchmarks:
```
ifort -m64
```

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

## Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

## Base Optimization Flags

C benchmarks:
```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

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## Base Optimization Flags (Continued)

Fortran benchmarks:
`-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`

Benchmarks using both Fortran and C:
`-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32 -qopt-mem-layout-trans=3`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevC.html
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevC.xml
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml


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