SPEC® CFP2006 Result

Dell Inc.

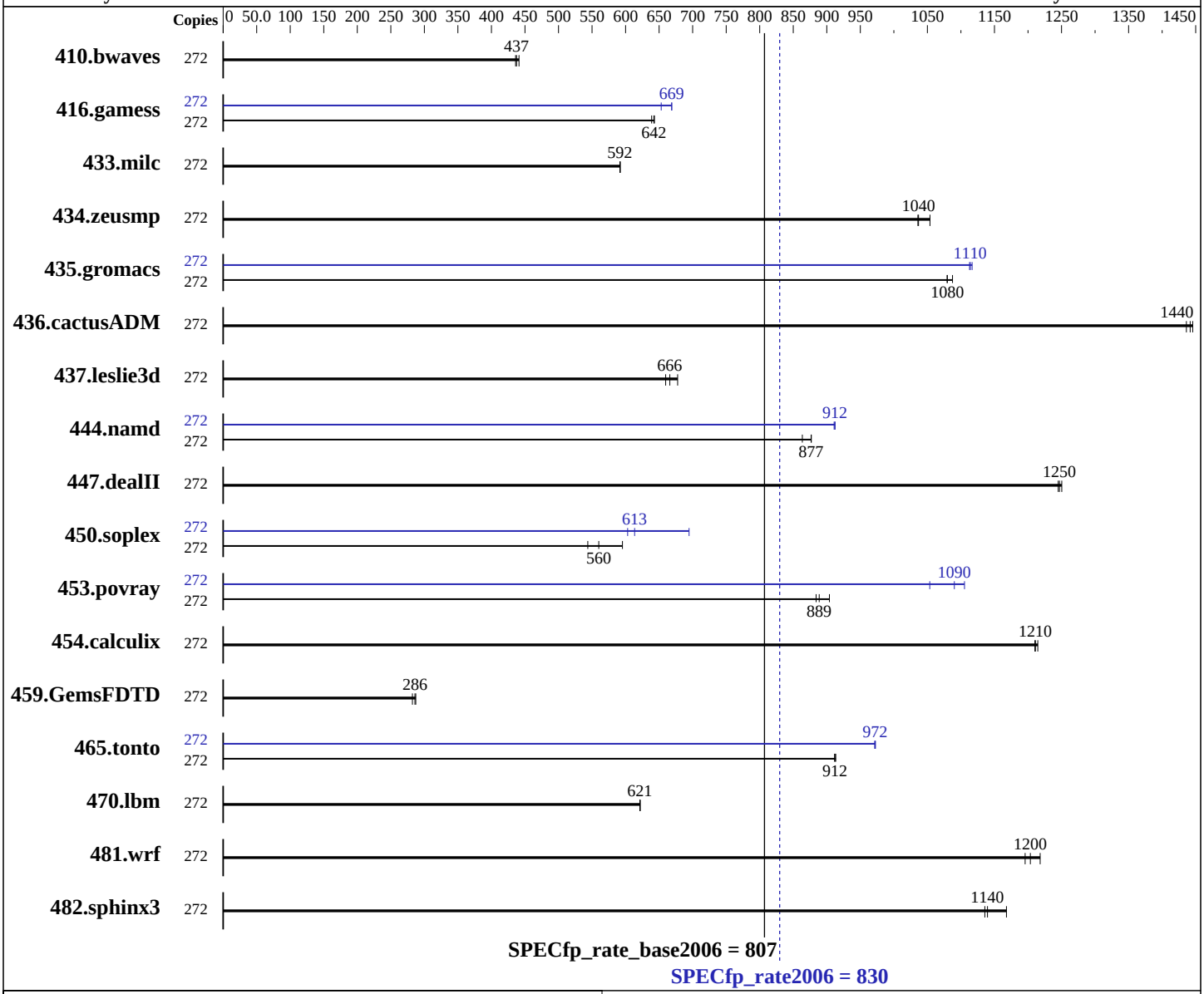
PowerEdge C6320p (Intel Xeon Phi 7250F 1.40 GHz)

SPECfp®_rate2006 = 830

SPECfp_rate_base2006 = 807

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Mar-2017
Hardware Availability: Mar-2017
Software Availability: Jan-2017



Hardware

CPU Name:	Intel Xeon Phi 7250F
CPU Characteristics:	Intel Turbo Boost Technology up to 1.60 GHz
CPU MHz:	1400
FPU:	Integrated
CPU(s) enabled:	68 cores, 1 chip, 68 cores/chip, 4 threads/core
CPU(s) orderable:	1 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per two cores

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Software

Operating System:	SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.16-56-default
Compiler:	C/C++: Version 16.0.2.181 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.2.181 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	btrfs
System State:	Run level 3 (multi-user)

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L3 Cache: None
Other Cache: None
Memory: 400 GB (6 x 64 GB 2Rx8 PC4-2400T-R + 8 x 2 GB 7200 MHz MCDRAM)
Disk Subsystem: 1 x 1 TB 7.2K RPM SATA
Other Hardware: None

Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	272	8478	436	8380	441	**8450**	**437**	272	8478	436	8380	441	**8450**	**437**
416.gamess	272	**8294**	**642**	8282	643	8336	639	272	7963	669	8154	653	**7964**	**669**
433.milc	272	4220	592	4218	592	**4220**	**592**	272	4220	592	4218	592	**4220**	**592**
434.zeusmp	272	**2387**	**1040**	2390	1040	2349	1050	272	**2387**	**1040**	2390	1040	2349	1050
435.gromacs	272	**1799**	**1080**	1786	1090	1799	1080	272	1739	1120	**1743**	**1110**	1745	1110
436.cactusADM	272	2263	1440	2248	1450	**2254**	**1440**	272	2263	1440	2248	1450	**2254**	**1440**
437.leslie3d	272	**3839**	**666**	3875	660	3773	678	272	**3839**	**666**	3875	660	3773	678
444.namd	272	**2488**	**877**	2488	877	2526	864	272	**2392**	**912**	2391	912	2395	911
447.dealII	272	2499	1250	**2496**	**1250**	2489	1250	272	2499	1250	**2496**	**1250**	2489	1250
450.soplex	272	4173	544	**4051**	**560**	3810	595	272	3762	603	**3698**	**613**	3266	695
453.povray	272	1601	904	**1628**	**889**	1637	884	272	1374	1050	**1327**	**1090**	1309	1110
454.calculix	272	1848	1210	**1853**	**1210**	1854	1210	272	1848	1210	**1853**	**1210**	1854	1210
459.GemsFDTD	272	**10093**	**286**	10226	282	10048	287	272	**10093**	**286**	10226	282	10048	287
465.tonto	272	2930	913	**2934**	**912**	2936	912	272	2755	971	2752	973	**2754**	**972**
470.lbm	272	6009	622	6016	621	**6015**	**621**	272	6009	622	6016	621	**6015**	**621**
481.wrf	272	2541	1200	**2524**	**1200**	2494	1220	272	2541	1200	**2524**	**1200**	2494	1220
482.sphinx3	272	4668	1140	**4652**	**1140**	4539	1170	272	4668	1140	**4652**	**1140**	4539	1170

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"
```

Platform Notes

```
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-z6tq Sun Mar 26 13:59:58 2017
```

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Platform Notes (Continued)

```
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 Phi(TM) CPU 7250F @ 1.40GHz
      1 "physical id"s (chips)
      272 "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 : 68
      siblings  : 272
      physical 0: cores 0 1 8 9 10 11 12 13 14 15 18 19 20 21 22 23 24 25 26 27
      28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
      53 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73
   cache size : 1024 KB

From /proc/meminfo
   MemTotal:       396134156 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"
      CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
   Linux linux-z6tq 4.4.16-56-default #1 SMP Mon Aug 8 14:24:26 UTC 2016
   (5b281a8) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 23 17:34

SPEC is set to: /root/cpu2006-1.2
   Filesystem     Type   Size  Used Avail Use% Mounted on
   /dev/sdb2      btrfs  930G  533G  394G  58% /
Additional information from dmidecode:
```

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Platform Notes (Continued)

```
      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 Dell Inc. 1.1.7 003/003/2017
    Memory:
     6x Hynix HMAA8GL7MMR4N-UH 64 GB 4 rank 2400 MHz
     8x INTEL N/A 2 GB 7200 MHz

  (End of data from sysinfo program)
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

  Binaries compiled on a system with
  Intel 2nd Generation Xeon Phi CPU
  with 96 GB DDR4 memory using RedHat EL 7.2
  Filesystem page cache cleared with:
  echo 1>       /proc/sys/vm/drop_caches
  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

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Base Portability Flags (Continued)

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:
-xMIC-AVX512 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias

C++ benchmarks:
-xMIC-AVX512 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias

Fortran benchmarks:
-xMIC-AVX512 -ipo -O3 -no-prec-div -opt-prefetch

Benchmarks using both Fortran and C:
-xMIC-AVX512 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks (except as noted below):
icpc -m64

450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64

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

Peak 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: -D_FILE_OFFSET_BITS=64
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

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen(pass 1)
-prof-use(pass 2) -par-num-threads=1(pass 1) -fno-alias
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen(pass 1)
-prof-use(pass 2) -par-num-threads=1(pass 1)
-opt-malloc-options=3

453.povray: -xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen(pass 1)
-prof-use(pass 2) -par-num-threads=1(pass 1) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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Peak Optimization Flags (Continued)

416.gamess: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-par-num-threads=1`(pass 1) `-prof-use`(pass 2) `-unroll2 -inline-level=0 -scalar-rep-`

434.zeusmp: `basepeak = yes`

437.leslie3d: `basepeak = yes`

459.GemsFDTD: `basepeak = yes`

465.tonto: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-par-num-threads=1`(pass 1) `-prof-use`(pass 2) `-unroll4 -auto -inline-calloc -opt-malloc-options=3`

Benchmarks using both Fortran and C:

435.gromacs: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-prof-use`(pass 2) `-par-num-threads=1`(pass 1) `-opt-prefetch -auto-ilp32`

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

481.wrf: `basepeak = yes`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64-revB.html
http://www.spec.org/cpu2006/flags/Default-Platform-Flags.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64-revB.xml
http://www.spec.org/cpu2006/flags/Default-Platform-Flags.xml

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

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