SPEC® CFP2006 Result

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Dell Inc.

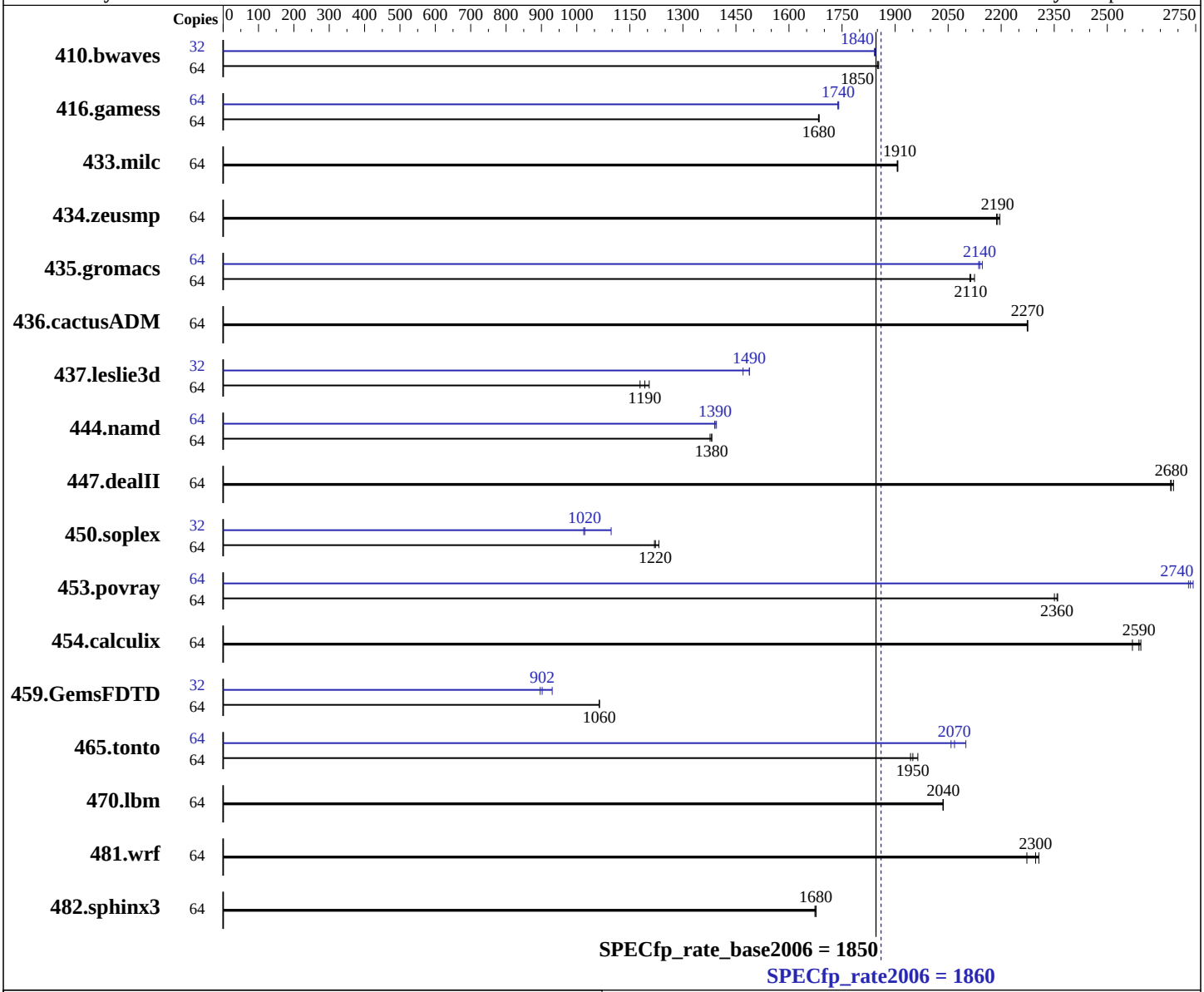
PowerEdge R940
(Intel Xeon Gold 6134, 3.20 GHz)

SPECfp®_rate2006 = 1860

SPECfp_rate_base2006 = 1850

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

Test date: Oct-2017
Hardware Availability: Sep-2017
Software Availability: Apr-2017



Hardware

CPU Name:	Intel Xeon Gold 6134
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	3200
FPU:	Integrated
CPU(s) enabled:	32 cores, 4 chips, 8 cores/chip, 2 threads/core
CPU(s) orderable:	2,4 chip
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 (x86_64) SP2 4.4.21-69-default
Compiler:	C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux; Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux
Auto Parallel:	Yes
File System:	xfs
System State:	Run level 3 (multi-user)

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L3 Cache: 24.75 MB I+D on chip per chip
Other Cache: None
Memory: 768 GB (48 x 16 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 1 x 900 GB 15K RPM SAS12
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	64	469	1850	**470**	**1850**	470	1850	32	236	1840	236	1840	**236**	**1840**
416.gamess	64	744	1680	744	1690	**744**	**1680**	64	721	1740	**721**	**1740**	720	1740
433.milc	64	**308**	**1910**	308	1910	308	1910	64	**308**	**1910**	308	1910	308	1910
434.zeusmp	64	265	2200	**266**	**2190**	266	2190	64	265	2200	**266**	**2190**	266	2190
435.gromacs	64	215	2120	**216**	**2110**	216	2110	64	**214**	**2140**	213	2150	214	2140
436.cactusADM	64	**336**	**2270**	336	2280	336	2270	64	**336**	**2270**	336	2280	336	2270
437.leslie3d	64	510	1180	499	1200	**505**	**1190**	32	205	1470	202	1490	**202**	**1490**
444.namd	64	371	1380	373	1380	**372**	**1380**	64	**369**	**1390**	369	1390	368	1400
447.dealII	64	273	2680	272	2690	**273**	**2680**	64	273	2680	272	2690	**273**	**2680**
450.soplex	64	438	1220	**437**	**1220**	433	1230	32	**261**	**1020**	262	1020	243	1100
453.povray	64	145	2350	144	2360	**144**	**2360**	64	124	2740	**124**	**2740**	125	2730
454.calculix	64	**204**	**2590**	203	2590	205	2570	64	**204**	**2590**	203	2590	205	2570
459.GemsFDTD	64	638	1060	**638**	**1060**	639	1060	32	379	897	365	930	**376**	**902**
465.tonto	64	324	1940	321	1960	**323**	**1950**	64	300	2100	**305**	**2070**	306	2060
470.lbm	64	**432**	**2040**	432	2040	432	2040	64	**432**	**2040**	432	2040	432	2040
481.wrf	64	**311**	**2300**	315	2270	310	2310	64	**311**	**2300**	315	2270	310	2310
482.sphinx3	64	744	1680	**744**	**1680**	745	1670	64	744	1680	**744**	**1680**	745	1670

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

```
Kernel boot parameter: nohz_full=1-63
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
BIOS settings:
Logical Processor Enabled
Virtualization Technology Disabled
Sub NUMA Cluster Enabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C1E Disabled
C States set to Autonomous
Uncore Frequency set to Dynamic
Memory Patrol Scrub Disabled
Energy Efficiency Policy set to Performance
CPU Interconnect Bus Link Power Management Disabled
PCI ASPM L1 Link Power Management Disabled
Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-ehog Sat Oct 21 21:40:48 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) Gold 6134 CPU @ 3.20GHz
      4 "physical id"s (chips)
      64 "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 : 8
      siblings  : 16
      physical 0: cores 1 2 9 18 19 24 27
      physical 1: cores 0 2 3 9 16 19 26 27
      physical 2: cores 0 2 4 5 6 16 20 21
      physical 3: cores 0 2 3 9 16 19 26 27
   cache size : 25344 KB

From /proc/meminfo
   MemTotal:       791224272 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.
      # Please check /etc/os-release for details about this release.
```

Continued on next page

Platform Notes (Continued)

```
      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-ehog 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 Oct 21 13:42

   SPEC is set to: /home/cpu2006
      Filesystem     Type  Size  Used Avail Use% Mounted on
      /dev/sda4      xfs   796G   17G  779G   3% /home
   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 Dell Inc. 1.1.7 08/10/2017
     Memory:
      48x 00AD00B300AD HMA82GR7AFR8N-VK 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/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"

  Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
  memory using Redhat Enterprise Linux 7.2
  Transparent Huge Pages enabled by default
  Filesystem page cache cleared with:
  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
```

Continued on next page

Base Compiler Invocation (Continued)

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-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

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_2017/linux/lib/ia32

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:

Continued on next page

Peak Optimization Flags (Continued)

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -fno-alias -auto-ilp32 -qopt-mem-layout-trans=3

447.dealII: basepeak = yes

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -qopt-malloc-options=3 -qopt-mem-layout-trans=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll4 -qopt-mem-layout-trans=3

Fortran benchmarks:

410.bwaves: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: Same as 410.bwaves

459.GemsFDTD: Same as 410.bwaves

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll4 -auto -inline-calloc -qopt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -qopt-prefetch -auto-ilp32 -qopt-mem-layout-trans=3

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-ic17.0-official-linux64-revF.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revD.20171221.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revD.20171221.xml

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