SPEC® CFP2006 Result

Dell Inc.

$SPECfp^{®}2006 =$ 36.3

PowerEdge M610 (Intel Xeon L5609, 1.86 GHz)

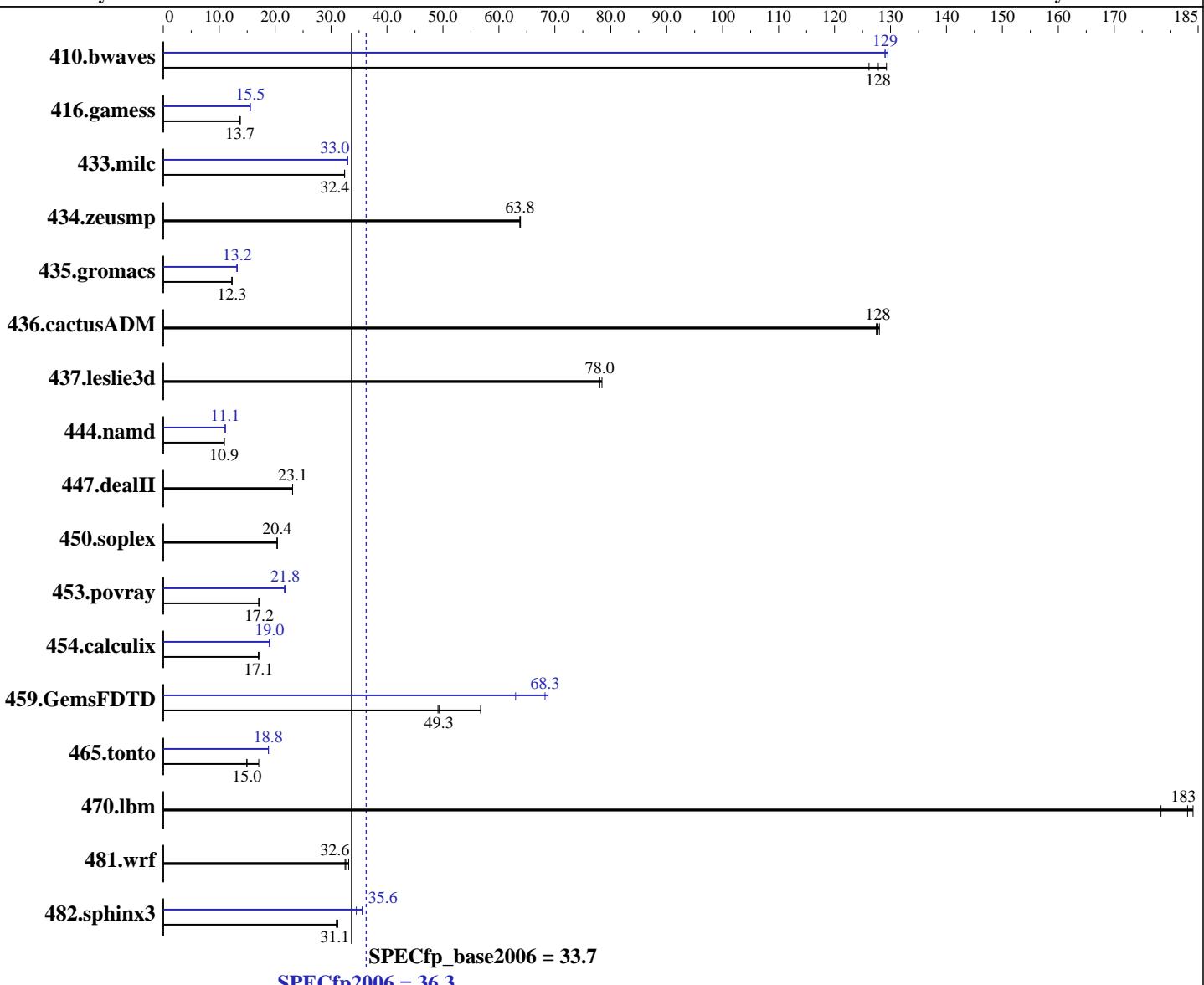$SPECfp\_base2006 =$ 33.7

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

Test date: Jul-2011
Hardware Availability: Mar-2010
Software Availability: Dec-2009

Benchmark	Result
410.bwaves	129 / 128
416.gamess	15.5 / 13.7
433.milc	33.0 / 32.4
434.zeusmp	63.8
435.gromacs	13.2 / 12.3
436.cactusADM	128
437.leslie3d	78.0
444.namd	11.1 / 10.9
447.dealII	23.1
450.soplex	20.4
453.povray	21.8 / 17.2
454.calculix	19.0 / 17.1
459.GemsFDTD	68.3 / 49.3
465.tonto	18.8 / 15.0
470.lbm	183
481.wrf	32.6
482.sphinx3	35.6 / 31.1

SPECfp_base2006 = 33.7
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Hardware

CPU Name: Intel Xeon L5609
CPU Characteristics:
CPU MHz: 1867
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
CPU(s) orderable: 1,2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

Continued on next page

Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0 Update 3
Auto Parallel: Yes
File System: ext3
System State: Run level 3 (multi-user)
Base Pointers: 64-bit

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L3 Cache:	12 MB I+D on chip per chip
Other Cache:	None
Memory:	48 GB (12 x 4 GB 2Rx4 PC3-10600R-9, ECC, running at 1066 MHz)
Disk Subsystem:	1 x 146 GB 10000 RPM SAS
Other Hardware:	None

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

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	108	126	105	129	**106**	**128**	105	129	**105**	**129**	105	130
416.gamess	**1426**	**13.7**	1428	13.7	1424	13.8	1259	15.6	1262	15.5	**1259**	**15.5**
433.milc	283	32.4	**283**	**32.4**	283	32.4	279	33.0	279	33.0	**279**	**33.0**
434.zeusmp	142	63.9	**143**	**63.8**	143	63.8	142	63.9	**143**	**63.8**	143	63.8
435.gromacs	**581**	**12.3**	581	12.3	582	12.3	541	13.2	**541**	**13.2**	542	13.2
436.cactusADM	**93.6**	**128**	93.7	127	93.3	128	**93.6**	**128**	93.7	127	93.3	128
437.leslie3d	121	77.9	**120**	**78.0**	120	78.4	121	77.9	**120**	**78.0**	120	78.4
444.namd	737	10.9	736	10.9	**737**	**10.9**	724	11.1	724	11.1	**724**	**11.1**
447.dealII	495	23.1	**495**	**23.1**	495	23.1	495	23.1	**495**	**23.1**	495	23.1
450.soplex	**410**	**20.4**	409	20.4	410	20.4	**410**	**20.4**	409	20.4	410	20.4
453.povray	312	17.0	309	17.2	**310**	**17.2**	244	21.8	**244**	**21.8**	246	21.7
454.calculix	483	17.1	**483**	**17.1**	485	17.0	**434**	**19.0**	435	19.0	434	19.0
459.GemsFDTD	216	49.1	**215**	**49.3**	187	56.7	168	63.0	**155**	**68.3**	154	68.8
465.tonto	576	17.1	**657**	**15.0**	659	14.9	523	18.8	**524**	**18.8**	524	18.8
470.lbm	74.6	184	77.0	178	**75.0**	**183**	74.6	184	77.0	178	**75.0**	**183**
481.wrf	**342**	**32.6**	337	33.2	344	32.5	**342**	**32.6**	337	33.2	344	32.5
482.sphinx3	625	31.2	**626**	**31.1**	630	30.9	547	35.6	565	34.5	**548**	**35.6**

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

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run

'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

```
BIOS Settings:
Power Management = Maximum Performance (Default = Active Power Controller)
Data Reuse = Disabled (Default = Enabled)
```

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$SPECfp_base2006 = $ 33.7

General Notes

```
OMP_NUM_THREADS set to number of cores
Binaries were compiled on RHEL5.5
```

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:
    -xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
    -ansi-alias

C++ benchmarks:
    -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

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Tested by: Dell Inc.		**Software Availability:**	Dec-2009

Base Optimization Flags (Continued)

Fortran benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

Peak Compiler Invocation

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

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

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

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

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
    433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
              -ansi-alias

    470.lbm: basepeak = yes

  482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
              -parallel
```

C++ benchmarks:

```
    444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias
              -auto-ilp32
```

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Peak Optimization Flags (Continued)

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
        -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -parallel
        -static

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
        -inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
        -inline-level=0 -opt-prefetch -parallel
        -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc
        -opt-malloc-options=3 -auto -unroll4
        -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

435.gromacs: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
        -ansi-alias

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

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-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.xml

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