SPEC® CFP2006 Result

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Dell Inc.

PowerEdge R710 (Intel Xeon L5609, 1.86 GHz)

$SPECfp^{®}2006 =$ 36.1

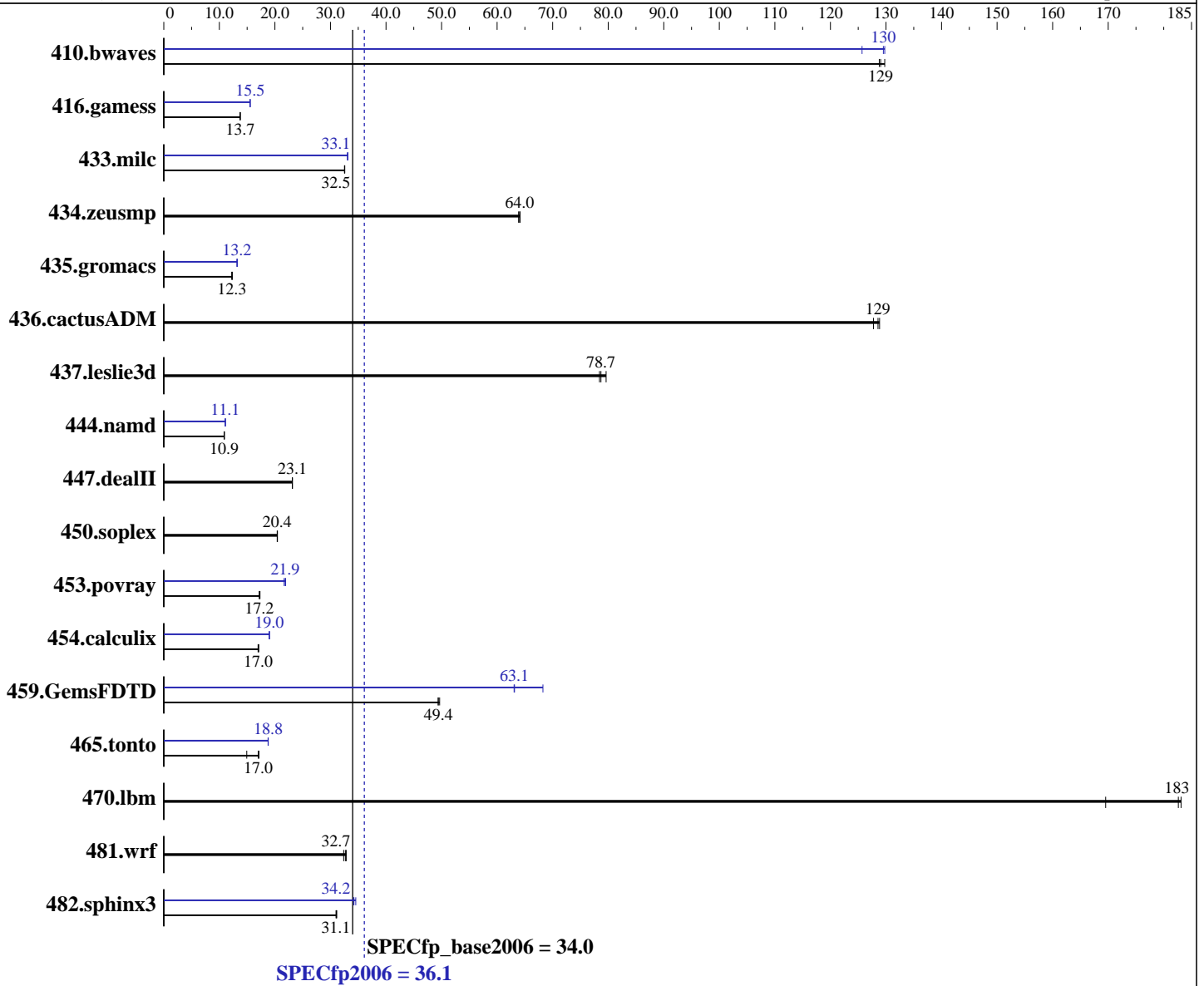$SPECfp\_base2006 =$ 34.0

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

Test date: Jun-2011
Hardware Availability: Mar-2010
Software Availability: Apr-2011

Benchmark results (scale 0 to 185):

- **410.bwaves** — 130 / 129
- **416.gamess** — 15.5 / 13.7
- **433.milc** — 33.1 / 32.5
- **434.zeusmp** — 64.0
- **435.gromacs** — 13.2 / 12.3
- **436.cactusADM** — 129
- **437.leslie3d** — 78.7
- **444.namd** — 11.1 / 10.9
- **447.dealII** — 23.1
- **450.soplex** — 20.4
- **453.povray** — 21.9 / 17.2
- **454.calculix** — 19.0 / 17.0
- **459.GemsFDTD** — 63.1 / 49.4
- **465.tonto** — 18.8 / 17.0
- **470.lbm** — 183
- **481.wrf** — 32.7
- **482.sphinx3** — 34.2 / 31.1

SPECfp_base2006 = 34.0
SPECfp2006 = 36.1

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	Peak Pointers:	32/64-bit
Other Cache:	None	Other Software:	None
Memory:	48 GB (12 x 4 GB 2Rx4 PC3-10600R-9, ECC, running at 1066 MHz)		
Disk Subsystem:	1 x 146 GB 15000 RPM SAS		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**105**	**129**	105	130	106	129	105	130	**105**	**130**	108	126
416.gamess	1425	13.7	**1424**	**13.7**	1423	13.8	**1260**	**15.5**	1259	15.6	1261	15.5
433.milc	282	32.5	282	32.6	**282**	**32.5**	**277**	**33.1**	277	33.1	278	33.1
434.zeusmp	142	63.9	142	64.1	**142**	**64.0**	142	63.9	142	64.1	**142**	**64.0**
435.gromacs	584	12.2	**581**	**12.3**	579	12.3	540	13.2	542	13.2	**542**	**13.2**
436.cactusADM	**92.9**	**129**	93.5	128	92.7	129	**92.9**	**129**	93.5	128	92.7	129
437.leslie3d	118	79.6	120	78.4	**119**	**78.7**	118	79.6	120	78.4	**119**	**78.7**
444.namd	737	10.9	**737**	**10.9**	737	10.9	725	11.1	724	11.1	**724**	**11.1**
447.dealII	494	23.1	**494**	**23.1**	495	23.1	494	23.1	**494**	**23.1**	495	23.1
450.soplex	408	20.5	409	20.4	**408**	**20.4**	408	20.5	409	20.4	**408**	**20.4**
453.povray	307	17.3	**309**	**17.2**	309	17.2	243	21.9	**243**	**21.9**	246	21.7
454.calculix	483	17.1	**484**	**17.0**	486	17.0	**434**	**19.0**	434	19.0	434	19.0
459.GemsFDTD	**215**	**49.4**	214	49.7	215	49.4	**168**	**63.1**	155	68.3	168	63.1
465.tonto	659	14.9	574	17.1	**579**	**17.0**	**524**	**18.8**	523	18.8	524	18.8
470.lbm	81.0	170	75.0	183	**75.2**	**183**	81.0	170	75.0	183	**75.2**	**183**
481.wrf	340	32.8	345	32.4	**342**	**32.7**	340	32.8	345	32.4	**342**	**32.7**
482.sphinx3	629	31.0	626	31.1	**628**	**31.1**	570	34.2	**569**	**34.2**	564	34.6

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)
```

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General Notes

```
OMP_NUM_THREADS set to number of cores
The Dell PowerEdge R710 and
the Bull NovaScale R460 F2 models are electronically equivalent.
The results have been measured on a Dell PowerEdge R710 model
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
```

Continued on next page

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Dell Inc.

PowerEdge R710 (Intel Xeon L5609, 1.86 GHz)

$SPECfp2006 =$ 36.1

$SPECfp\_base2006 =$ 34.0

CPU2006 license: 55		**Test date:**	Jun-2011
Test sponsor:	Dell Inc.	**Hardware Availability:**	Mar-2010
Tested by:	Dell Inc.	**Software Availability:**	Apr-2011

Base Optimization Flags (Continued)

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

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:

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Hardware Availability: Mar-2010
Software Availability: Apr-2011

Peak Optimization Flags (Continued)

```
     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

     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
```

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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`

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

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