



# SPEC<sup>®</sup> CFP2006 Result

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Dell Inc.

SPECfp<sup>®</sup>\_rate2006 = 133

PowerEdge R810 (Intel Xeon E6510, 1.73 GHz)

SPECfp\_rate\_base2006 = 128

CPU2006 license: 55

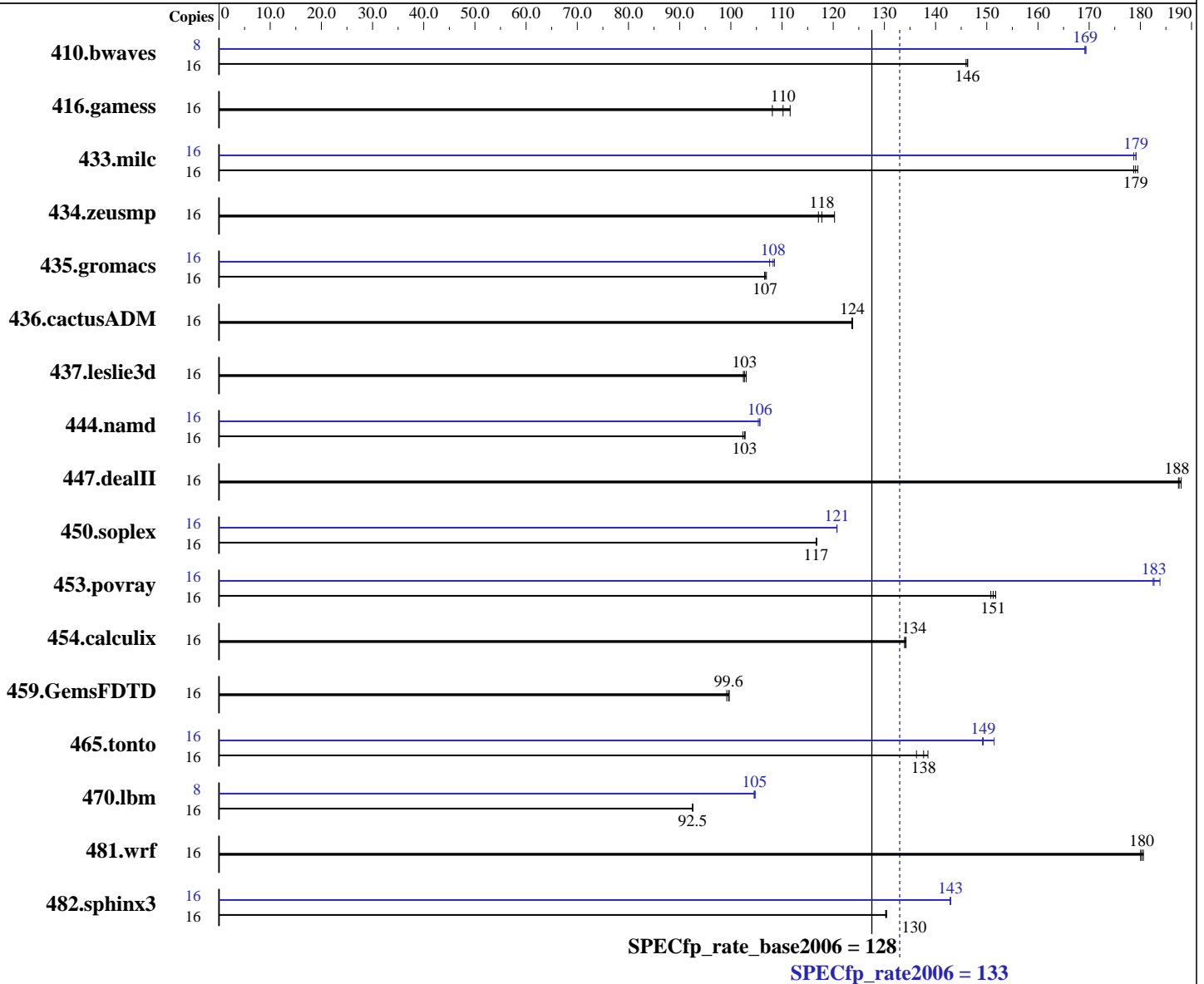
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Jun-2010

Hardware Availability: Mar-2010

Software Availability: Dec-2009



## Hardware

CPU Name: Intel Xeon E6510  
 CPU Characteristics:  
 CPU MHz: 1733  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core  
 CPU(s) orderable: 2,4 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

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## Software

Operating System: SUSE Linux Enterprise Server 11 (x86\_64), Kernel 2.6.27.19-5-smp  
 Compiler: Intel C++ and Fortran Professional Compiler for IA32 and Intel 64, Version 11.1 Build 20091130 Package ID: l\_cproc\_p\_11.1.064, l\_cprof\_p\_11.1.064  
 Auto Parallel: No  
 File System: ext3  
 System State: Run level 3 (multi-user)

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L3 Cache: 12 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 128 GB (32 x 4 GB DDR3-1066 QR RDIMM, CL7, ECC, downclocked to 800 MHz)  
 Disk Subsystem: 1 x 146 GB 15000 RPM SAS  
 Other Hardware: None

Base Pointers: 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    | 16     | 1490               | 146                | <b><u>1487</u></b> | <b><u>146</u></b>  | 1486               | 146               | 8      | <b><u>642</u></b>  | <b><u>169</u></b> | 643                | 169                | 642                | 169               |  |  |
| 416.gamess    | 16     | <b><u>2843</u></b> | <b><u>110</u></b>  | 2898               | 108                | 2808               | 112               | 16     | <b><u>2843</u></b> | <b><u>110</u></b> | 2898               | 108                | 2808               | 112               |  |  |
| 433.milc      | 16     | 822                | 179                | <b><u>820</u></b>  | <b><u>179</u></b>  | 818                | 180               | 16     | 820                | 179               | <b><u>820</u></b>  | <b><u>179</u></b>  | 822                | 179               |  |  |
| 434.zeusmp    | 16     | <b><u>1236</u></b> | <b><u>118</u></b>  | 1243               | 117                | 1211               | 120               | 16     | <b><u>1236</u></b> | <b><u>118</u></b> | 1243               | 117                | 1211               | 120               |  |  |
| 435.gromacs   | 16     | 1068               | 107                | 1072               | 107                | <b><u>1071</u></b> | <b><u>107</u></b> | 16     | <b><u>1055</u></b> | <b><u>108</u></b> | 1053               | 109                | 1062               | 108               |  |  |
| 436.cactusADM | 16     | 1547               | 124                | <b><u>1545</u></b> | <b><u>124</u></b>  | 1545               | 124               | 16     | 1547               | 124               | <b><u>1545</u></b> | <b><u>124</u></b>  | 1545               | 124               |  |  |
| 437.leslie3d  | 16     | 1468               | 102                | 1460               | 103                | <b><u>1465</u></b> | <b><u>103</u></b> | 16     | 1468               | 102               | 1460               | 103                | <b><u>1465</u></b> | <b><u>103</u></b> |  |  |
| 444.namd      | 16     | 1248               | 103                | 1254               | 102                | <b><u>1250</u></b> | <b><u>103</u></b> | 16     | 1218               | 105               | <b><u>1214</u></b> | <b><u>106</u></b>  | 1214               | 106               |  |  |
| 447.dealII    | 16     | <b><u>976</u></b>  | <b><u>188</u></b>  | 977                | 187                | 974                | 188               | 16     | <b><u>976</u></b>  | <b><u>188</u></b> | 977                | 187                | 974                | 188               |  |  |
| 450.soplex    | 16     | 1143               | 117                | <b><u>1144</u></b> | <b><u>117</u></b>  | 1144               | 117               | 16     | 1105               | 121               | <b><u>1105</u></b> | <b><u>121</u></b>  | 1106               | 121               |  |  |
| 453.povray    | 16     | 564                | 151                | <b><u>563</u></b>  | <b><u>151</u></b>  | 561                | 152               | 16     | 463                | 184               | <b><u>466</u></b>  | <b><u>183</u></b>  | 466                | 183               |  |  |
| 454.calculix  | 16     | 983                | 134                | 986                | 134                | <b><u>984</u></b>  | <b><u>134</u></b> | 16     | 983                | 134               | 986                | 134                | <b><u>984</u></b>  | <b><u>134</u></b> |  |  |
| 459.GemsFDTD  | 16     | 1703               | 99.7               | <b><u>1705</u></b> | <b><u>99.6</u></b> | 1711               | 99.2              | 16     | 1703               | 99.7              | <b><u>1705</u></b> | <b><u>99.6</u></b> | 1711               | 99.2              |  |  |
| 465.tonto     | 16     | 1155               | 136                | <b><u>1144</u></b> | <b><u>138</u></b>  | 1137               | 139               | 16     | <b><u>1054</u></b> | <b><u>149</u></b> | 1055               | 149                | 1040               | 151               |  |  |
| 470.lbm       | 16     | <b><u>2376</u></b> | <b><u>92.5</u></b> | 2376               | 92.5               | 2375               | 92.6              | 8      | 1049               | 105               | <b><u>1051</u></b> | <b><u>105</u></b>  | 1051               | 105               |  |  |
| 481.wrf       | 16     | 990                | 181                | 993                | 180                | <b><u>991</u></b>  | <b><u>180</u></b> | 16     | 990                | 181               | 993                | 180                | <b><u>991</u></b>  | <b><u>180</u></b> |  |  |
| 482.sphinx3   | 16     | 2391               | 130                | 2394               | 130                | <b><u>2394</u></b> | <b><u>130</u></b> | 16     | <b><u>2182</u></b> | <b><u>143</u></b> | 2181               | 143                | 2183               | 143               |  |  |

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

## Submit Notes

The config file option 'submit' was used.  
numactl was used to bind copies to the cores

## Operating System Notes

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

## Platform Notes

vm.zone\_reclaim\_mode = 1 in /etc/sysctl.conf file  
BIOS Settings:  
Power Management = Maximum Performance (Default = Active Power Controller)



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## General Notes

Binaries were compiled on SLES 10 with Binutils 2.18.50.0.7.20080502

## 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

C++ benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static

Fortran benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

-xSSE4.2 -ipo -O3 -no-prec-div -static

## Peak Compiler Invocation

C benchmarks (except as noted below):

icc -m64

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32

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.deallI: -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

## Peak Optimization Flags

C benchmarks:

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## Peak Optimization Flags (Continued)

433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-fno-alias -opt-prefetch

470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3 -ansi-alias -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2

### C++ benchmarks:

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

447.dealII: basepeak = yes

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll4 -ansi-alias

### Fortran benchmarks:

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

416.gamess: basepeak = yes

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll4 -auto -inline-calloc -opt-malloc-options=3

### 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) -static(pass 2) -prof-use(pass 2)  
-opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

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## Peak Optimization Flags (Continued)

454.calculix: basepeak = yes

481.wrf: basepeak = yes

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100330.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100330.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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