# Dell Inc.

**PowerEdge R820 (Intel Xeon E5-4610, 2.40 GHz)**

**SPECfp®2006 = 68.5**  
**SPECfp_base2006 = 64.5**

<table>
<thead>
<tr>
<th>Application</th>
<th>SPECfp2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>29.9</td>
<td>23.5</td>
</tr>
<tr>
<td>416.games</td>
<td>52.6</td>
<td>51.8</td>
</tr>
<tr>
<td>433.milc</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>16.8</td>
<td></td>
</tr>
<tr>
<td>435.gromacs</td>
<td>334</td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>444.namd</td>
<td>20.1</td>
<td>19.8</td>
</tr>
<tr>
<td>447.dealII</td>
<td>43.9</td>
<td></td>
</tr>
<tr>
<td>450.soplex</td>
<td>34.6</td>
<td></td>
</tr>
<tr>
<td>453.povray</td>
<td>43.8</td>
<td>37.0</td>
</tr>
<tr>
<td>454.calculix</td>
<td>30.8</td>
<td>35.5</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>36.8</td>
<td>118</td>
</tr>
<tr>
<td>465.tonto</td>
<td>29.1</td>
<td></td>
</tr>
<tr>
<td>470.lbm</td>
<td>36.7</td>
<td></td>
</tr>
<tr>
<td>481.wrf</td>
<td>57.1</td>
<td>56.1</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test date:** Mar-2012  
**Hardware Availability:** May-2012  
**Test sponsor:** Dell Inc.  
**Software Availability:** Feb-2012  
**Tested by:** Dell Inc.
SPEC CFP2006 Result

Dell Inc.
PowerEdge R820 (Intel Xeon E5-4610, 2.40 GHz)

SPECfp2006 = 68.5
SPECfp_base2006 = 64.5

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.
L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (32 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz)
Disk Subsystem: 4 x 300 GB 10000 RPM SAS, RAID 0
Other Hardware: None
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Operating System Notes
Stack size set to unlimited using "ulimit -s unlimited"

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>27.1</td>
<td>501</td>
<td>26.9</td>
<td>501</td>
<td>27.1</td>
<td>501</td>
<td>26.9</td>
<td>505</td>
<td>27.1</td>
<td>501</td>
</tr>
<tr>
<td>416.gamess</td>
<td>833</td>
<td>23.5</td>
<td>831</td>
<td>23.6</td>
<td>832</td>
<td>23.5</td>
<td>653</td>
<td>30.0</td>
<td>655</td>
<td>29.9</td>
</tr>
<tr>
<td>433.milc</td>
<td>177</td>
<td>51.8</td>
<td>177</td>
<td>51.9</td>
<td>177</td>
<td>51.8</td>
<td>175</td>
<td>52.6</td>
<td>175</td>
<td>52.6</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>87.7</td>
<td>104</td>
<td>87.5</td>
<td>104</td>
<td>87.5</td>
<td>104</td>
<td>87.7</td>
<td>104</td>
<td>87.5</td>
<td>104</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>423</td>
<td>16.9</td>
<td>426</td>
<td>16.8</td>
<td>425</td>
<td>16.8</td>
<td>423</td>
<td>16.9</td>
<td>426</td>
<td>16.8</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>35.8</td>
<td>334</td>
<td>35.8</td>
<td>334</td>
<td>36.0</td>
<td>332</td>
<td>35.8</td>
<td>334</td>
<td>36.0</td>
<td>332</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>92.5</td>
<td>102</td>
<td>92.5</td>
<td>102</td>
<td>92.5</td>
<td>102</td>
<td>92.5</td>
<td>102</td>
<td>92.5</td>
<td>102</td>
</tr>
<tr>
<td>444.namd</td>
<td>405</td>
<td>19.8</td>
<td>405</td>
<td>19.8</td>
<td>405</td>
<td>19.8</td>
<td>399</td>
<td>20.1</td>
<td>399</td>
<td>20.1</td>
</tr>
<tr>
<td>447.dealII</td>
<td>260</td>
<td>43.9</td>
<td>260</td>
<td>44.0</td>
<td>262</td>
<td>43.7</td>
<td>260</td>
<td>43.9</td>
<td>260</td>
<td>44.0</td>
</tr>
<tr>
<td>450.soplex</td>
<td>240</td>
<td>34.7</td>
<td>241</td>
<td>34.6</td>
<td>241</td>
<td>34.5</td>
<td>240</td>
<td>34.7</td>
<td>241</td>
<td>34.6</td>
</tr>
<tr>
<td>453.povray</td>
<td>143</td>
<td>37.1</td>
<td>145</td>
<td>36.8</td>
<td>144</td>
<td>37.0</td>
<td>121</td>
<td>43.9</td>
<td>121</td>
<td>43.8</td>
</tr>
<tr>
<td>454.calcuix</td>
<td>268</td>
<td>30.8</td>
<td>269</td>
<td>30.6</td>
<td>268</td>
<td>30.8</td>
<td>231</td>
<td>35.7</td>
<td>233</td>
<td>35.4</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>89.7</td>
<td>118</td>
<td>89.5</td>
<td>119</td>
<td>89.7</td>
<td>118</td>
<td>76.4</td>
<td>139</td>
<td>76.4</td>
<td>139</td>
</tr>
<tr>
<td>465.tonto</td>
<td>338</td>
<td>29.1</td>
<td>338</td>
<td>29.1</td>
<td>340</td>
<td>28.9</td>
<td>270</td>
<td>36.5</td>
<td>267</td>
<td>36.8</td>
</tr>
<tr>
<td>470.lbm</td>
<td>20.6</td>
<td>666</td>
<td>20.6</td>
<td>666</td>
<td>20.6</td>
<td>666</td>
<td>20.6</td>
<td>666</td>
<td>20.6</td>
<td>666</td>
</tr>
<tr>
<td>481.wrf</td>
<td>302</td>
<td>37.0</td>
<td>305</td>
<td>36.6</td>
<td>305</td>
<td>36.7</td>
<td>302</td>
<td>37.0</td>
<td>305</td>
<td>36.6</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>346</td>
<td>56.4</td>
<td>348</td>
<td>56.1</td>
<td>349</td>
<td>55.8</td>
<td>341</td>
<td>57.2</td>
<td>342</td>
<td>57.1</td>
</tr>
</tbody>
</table>

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

Operating System Notes
Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

System Profile set to Custom
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost set to Enabled
C States/C1E set to Enabled
Sysinfo program /root/CPU2006-1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on icon4p Thu Mar 15 20:17:04 2012

Continued on next page
Dell Inc. PowerEdge R820 (Intel Xeon E5-4610, 2.40 GHz) SPECfp2006 = 68.5
SPECfp_base2006 = 64.5

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

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(R) CPU E5-4610 0 @ 2.40GHz
  4 "physical id"s (chips)
  48 "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 : 6
  siblings  : 12
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5
  physical 2: cores 0 1 2 3 4 5
  physical 3: cores 0 1 2 3 4 5
  cache size : 15360 KB

From /proc/meminfo
  MemTotal:       264501512 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
SuSE-release:
  SuSE-release:
    SUSE Linux Enterprise Server 11 (x86_64)
    VERSION = 11
    PATCHLEVEL = 2

uname -a:
  Linux icon4p 3.0.13-0.27-default #1 SMP Wed Feb 15 13:33:49 UTC 2012
  (d73692b) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 15 13:14 last=S

SPEC is set to: /root/CPU2006-1.2

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      ext3  1.1T  123G  917G  12% /

Additional information from dmidecode:
(End of data from sysinfo program)
## General Notes

Environment variables set by runspec before the start of the run:

- `KMP_AFFINITY = "granularity=fine,scatter"
- `LD_LIBRARY_PATH = "/root/CPU2006-1.2/libs/32:/root/CPU2006-1.2/libs/64"
- `OMP_NUM_THREADS = "24"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RHEL5.5

Transparent Huge Pages disabled with:
- `echo never > /sys/kernel/mm/transparent_hugepage/enabled`

Filesystem page cache cleared with:
- `echo 1 > /proc/sys/vm/drop_caches`

The Dell PowerEdge R820 and the Bull NovaScale R470 F3 Models are electronically equivalent. The results have been measured on a Dell PowerEdge R820 model.

## 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.mlci: -DSPEC_CPU_LP64`
- `434.zesmp: -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.criculix: -DSPEC_CPU_LP64 -nofor_main`
- `459.GemsFD: -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`

Continued on next page
Dell Inc.

PowerEdge R820 (Intel Xeon E5-4610, 2.40 GHz)

SPECfp2006 = 68.5
SPECfp_base2006 = 64.5

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

Test date: Mar-2012
Hardware Availability: May-2012
Software Availability: Feb-2012

Base Portability Flags (Continued)

482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

Fortran benchmarks:
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xAVX -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: -xAVX(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

Continued on next page
Dell Inc.  
PowerEdge R820 (Intel Xeon E5-4610, 2.40 GHz)  

SPECfp2006 = 68.5  
SPECfp_base2006 = 64.5

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

Test date: Mar-2012  
Hardware Availability: May-2012  
Software Availability: Feb-2012

Peak Optimization Flags (Continued)

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
-parallel

C++ benchmarks:

444.namd: -xAVX(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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

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

416.gamess: -xAVX(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: -xAVX(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

465.tonto: -xAVX(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

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

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

Continued on next page
Dell Inc.

PowerEdge R820 (Intel Xeon E5-4610, 2.40 GHz)

<table>
<thead>
<tr>
<th>SPECfp2006 = 68.5</th>
<th>SPECfp_base2006 = 64.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 license: 55</td>
<td>Test date: Mar-2012</td>
</tr>
<tr>
<td>Test sponsor: Dell Inc.</td>
<td>Hardware Availability: May-2012</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Feb-2012</td>
</tr>
</tbody>
</table>

Peak Optimization Flags (Continued)

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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.xml

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Originally published on 5 June 2012.