## SPEC® CFP2006 Result

**Dell Inc.**

**PowerEdge R820 (Intel Xeon E5-4650L, 2.60 GHz)**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70.5</td>
<td>65.8</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55

**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test date:** Mar-2012

**Hardware Availability:** May-2012

**Software Availability:** Feb-2012

### Hardware

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E5-4650L</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.10 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2600</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>32 cores, 4 chips, 8 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>2,4 chip</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>SUSE Linux Enterprise Server 11 SP2 (x86_64) 3.0.13-0.27-default</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++; Version 12.1.0.225 of Intel C++ Studio XE for Linux; Fortran; Version 12.1.0.225 of Intel Fortran Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>File System</td>
<td>ext3</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

---

## Continued on next page
Dell Inc.

PowerEdge R820 (Intel Xeon E5-4650L, 2.60 GHz)

SPECfp2006 = 70.5
SPECfp_base2006 = 65.8

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.
L3 Cache: 20 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (32 x 8 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem: 4 x 300 GB 10000 RPM SAS, RAID 0
Other Hardware: None
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

### 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>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>25.1</td>
<td>542</td>
<td>24.9</td>
<td>546</td>
<td>24.9</td>
<td>546</td>
<td>25.1</td>
<td>542</td>
<td>24.9</td>
<td>546</td>
<td>24.9</td>
<td>546</td>
</tr>
<tr>
<td>416.gamess</td>
<td>826</td>
<td>23.7</td>
<td>823</td>
<td>23.8</td>
<td>826</td>
<td>23.7</td>
<td>614</td>
<td>31.9</td>
<td>611</td>
<td>32.0</td>
<td>615</td>
<td>31.8</td>
</tr>
<tr>
<td>433.milc</td>
<td>164</td>
<td>56.0</td>
<td>164</td>
<td>56.1</td>
<td>164</td>
<td>56.0</td>
<td>161</td>
<td>56.9</td>
<td>162</td>
<td>56.7</td>
<td>162</td>
<td>56.8</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>84.9</td>
<td>107</td>
<td>84.9</td>
<td>107</td>
<td>85.1</td>
<td>107</td>
<td>84.9</td>
<td>107</td>
<td>84.9</td>
<td>107</td>
<td>85.1</td>
<td>107</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>41.8</td>
<td>286</td>
<td>41.8</td>
<td>286</td>
<td>41.8</td>
<td>286</td>
<td>41.8</td>
<td>286</td>
<td>41.8</td>
<td>286</td>
<td></td>
<td></td>
</tr>
<tr>
<td>439.leslie3d</td>
<td>90.9</td>
<td>103</td>
<td>91.1</td>
<td>103</td>
<td>90.9</td>
<td>103</td>
<td>90.9</td>
<td>103</td>
<td>90.9</td>
<td>103</td>
<td>90.9</td>
<td>103</td>
</tr>
<tr>
<td>447.dealII</td>
<td>244</td>
<td>47.0</td>
<td>245</td>
<td>46.8</td>
<td>244</td>
<td>47.0</td>
<td>244</td>
<td>47.0</td>
<td>245</td>
<td>46.8</td>
<td>244</td>
<td>47.0</td>
</tr>
<tr>
<td>450.soplex</td>
<td>208</td>
<td>40.1</td>
<td>207</td>
<td>40.3</td>
<td>207</td>
<td>40.2</td>
<td>208</td>
<td>40.1</td>
<td>207</td>
<td>40.3</td>
<td>207</td>
<td>40.2</td>
</tr>
<tr>
<td>453.povray</td>
<td>135</td>
<td>39.3</td>
<td>135</td>
<td>39.5</td>
<td>140</td>
<td>38.1</td>
<td>114</td>
<td>46.6</td>
<td>114</td>
<td>46.8</td>
<td>114</td>
<td>46.5</td>
</tr>
<tr>
<td>454.calculix</td>
<td>267</td>
<td>31.0</td>
<td>267</td>
<td>30.9</td>
<td>269</td>
<td>30.7</td>
<td>216</td>
<td>38.3</td>
<td>216</td>
<td>38.3</td>
<td>215</td>
<td>38.3</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>87.9</td>
<td>121</td>
<td>88.1</td>
<td>120</td>
<td>87.7</td>
<td>121</td>
<td>75.2</td>
<td>141</td>
<td>75.0</td>
<td>142</td>
<td>75.2</td>
<td>141</td>
</tr>
<tr>
<td>465.tonto</td>
<td>324</td>
<td>30.4</td>
<td>325</td>
<td>30.3</td>
<td>325</td>
<td>30.3</td>
<td>249</td>
<td>39.6</td>
<td>248</td>
<td>39.7</td>
<td>248</td>
<td>39.7</td>
</tr>
<tr>
<td>481.wrf</td>
<td>329</td>
<td>33.9</td>
<td>323</td>
<td>34.6</td>
<td>327</td>
<td>34.2</td>
<td>329</td>
<td>33.9</td>
<td>323</td>
<td>34.6</td>
<td>327</td>
<td>34.2</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>335</td>
<td>58.1</td>
<td>339</td>
<td>57.4</td>
<td>338</td>
<td>57.6</td>
<td>324</td>
<td>60.2</td>
<td>325</td>
<td>60.1</td>
<td>328</td>
<td>59.4</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 $ $Date:: 2011-10-11 #$ 6f2ebdf5032aaa42e583f96b07f99d3
running on icon4p Mon Mar 5 16:20:28 2012

This section contains SUT (System Under Test) info as seen by
Continued on next page
SPEC CFP2006 Result

Dell Inc.

PowerEdge R820 (Intel Xeon E5-4650L, 2.60 GHz)

| SPECfp2006 = | 70.5 |
| SPECfp_base2006 = | 65.8 |

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

Platform Notes (Continued)

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 E5-4650L 0 @ 2.60GHz
- 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 0 1 2 3 4 5 6 7
- physical 1: cores 0 1 2 3 4 5 6 7
- physical 2: cores 0 1 2 3 4 5 6 7
- physical 3: cores 0 1 2 3 4 5 6 7
- cache size : 20480 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:
- 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 5 09:38 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"
Continued on next page
General Notes (Continued)

OMP_NUM_THREADS = "32"

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.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 -nofor_main
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
466.lbm:  -DSPEC_CPU_LP64 482.sphinx3: -DSPEC_CPU_LP64
481.wrf:  -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
Dell Inc.  
PowerEdge R820 (Intel Xeon E5-4650L, 2.60 GHz)  

SPECfp2006 = 70.5  
SPECfp_base2006 = 65.8

**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

470.lbm: basepeak = yes

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

Continued on next page
Dell Inc.

PowerEdge R820 (Intel Xeon E5-4650L, 2.60 GHz)

SPECfp2006 = 70.5
SPECfp_base2006 = 65.8

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)

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) -unroll14 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
    -no-prec-div(pass 2) -prof-use(pass 2) -unroll12
    -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) -unroll12
    -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 -unroll14

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
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
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPEC CFP2006 Result</strong></td>
<td></td>
<td>Dell Inc.</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>PowerEdge R820 (Intel Xeon E5-4650L, 2.60 GHz)</td>
<td>SPECfp2006 =</td>
<td>SPECfp_base2006 =</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>70.5</td>
<td>65.8</td>
</tr>
<tr>
<td>CPU2006 license:</td>
<td>55</td>
<td>Test date:</td>
<td>Mar-2012</td>
</tr>
<tr>
<td>Test sponsor:</td>
<td>Dell Inc.</td>
<td>Hardware Availability:</td>
<td>May-2012</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
<td>Software Availability:</td>
<td>Feb-2012</td>
</tr>
</tbody>
</table>

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.