### Dell Inc.

**PowerEdge M520 (Intel Xeon E5-2450, 2.10 GHz)**

**SPECfp®2006 = 68.8**  
**SPECfp_base2006 = 65.4**

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

<table>
<thead>
<tr>
<th>Software Availability</th>
<th>CPU Name: Intel Xeon E5-2450</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0.13-0.27-default</td>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz</td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server 11 SP2 (x86_64)</td>
<td>CPU MHZ: 2100</td>
</tr>
<tr>
<td>C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux;</td>
<td>FPU: Integrated</td>
</tr>
<tr>
<td>Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux</td>
<td>CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>Yes</td>
<td>CPU(s) orderable: 1,2 chip</td>
</tr>
<tr>
<td>ext3</td>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Run level 3 (add definition here)</td>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

**SPECfp_base2006 = 65.4**

**SPECfp2006 = 68.8**

### Hardware

<table>
<thead>
<tr>
<th>410.bwaves</th>
<th>29.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>416.games</td>
<td>24.7</td>
</tr>
<tr>
<td>433.milc</td>
<td>53.6</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>126</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>24.6</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>113</td>
</tr>
<tr>
<td>444.namd</td>
<td>20.1</td>
</tr>
<tr>
<td>447.dealII</td>
<td>44.0</td>
</tr>
<tr>
<td>450.soplex</td>
<td>38.1</td>
</tr>
<tr>
<td>453.povray</td>
<td>43.5</td>
</tr>
<tr>
<td>454.calculix</td>
<td>32.8</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td></td>
</tr>
<tr>
<td>465.tonto</td>
<td>37.1</td>
</tr>
<tr>
<td>470.lbm</td>
<td>29.2</td>
</tr>
<tr>
<td>481.wrf</td>
<td>57.6</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>59.4</td>
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**Software**

<table>
<thead>
<tr>
<th>Operating System: SUSE Linux Enterprise Server 11 SP2 (x86_64) 3.0.13-0.27-default</th>
<th>Compiler: 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</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Parallel: Yes</td>
<td>File System: ext3</td>
</tr>
<tr>
<td>System State: Run level 3 (add definition here)</td>
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</tr>
</tbody>
</table>
**SPEC CFP2006 Result**

**Dell Inc.**

PowerEdge M520 (Intel Xeon E5-2450, 2.10 GHz)

**SPECfp2006 =** 68.8

**SPECfp_base2006 =** 65.4

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<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>20 MB I+D on chip per chip</td>
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<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>96 GB (12 x 8 GB 2Rx4 PC3-12800R-11, ECC)</td>
</tr>
<tr>
<td>Disk Subsystem:</td>
<td>1 x 600 GB 10000 RPM SAS</td>
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<tr>
<td>Other Hardware:</td>
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<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
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<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
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<td>Other Software:</td>
<td>None</td>
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**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>
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<tbody>
<tr>
<td>410.bwaves</td>
<td>47.1</td>
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<td><strong>46.9</strong></td>
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<td>416.gamess</td>
<td>795</td>
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<td>24.8</td>
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<td>24.7</td>
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<td>433.milc</td>
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<td><strong>174</strong></td>
<td>52.8</td>
<td>174</td>
<td>52.8</td>
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<tr>
<td>434.zeusmp</td>
<td>72.1</td>
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<tr>
<td>435.gromacs</td>
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<tr>
<td>436.cactusADM</td>
<td><strong>37.2</strong></td>
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<td>320</td>
<td>37.2</td>
<td>321</td>
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<tr>
<td>437.leslie3d</td>
<td>83.3</td>
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<td>82.9</td>
<td>113</td>
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<td>113</td>
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<tr>
<td>444.namd</td>
<td>404</td>
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<td>19.8</td>
<td><strong>405</strong></td>
<td>19.8</td>
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<tr>
<td>447.dealII</td>
<td>260</td>
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<td>450.soplex</td>
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<td>38.0</td>
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<td>38.1</td>
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<tr>
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<td>37.0</td>
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<tr>
<td>454.calculix</td>
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<td>33.0</td>
<td><strong>251</strong></td>
<td>32.8</td>
<td>256</td>
<td>32.2</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td><strong>99.9</strong></td>
<td>106</td>
<td>99.7</td>
<td>106</td>
<td>99.9</td>
<td>106</td>
</tr>
<tr>
<td>465.tonto</td>
<td>336</td>
<td>29.3</td>
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<td>470.lbm</td>
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<tr>
<td>481.wrf</td>
<td><strong>194</strong></td>
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<tr>
<td>482.sphinx3</td>
<td><strong>336</strong></td>
<td>58.0</td>
<td>332</td>
<td>58.7</td>
<td>339</td>
<td>57.5</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**

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 $ $Date:: 2011-10-11 #$ $Id:: 6f2ebdfff5032aaa42e583f96b07f99d3$
running on linux-SLES11 Tue Mar 27 05:30:00 2012

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
Continued on next page
Dell Inc.  
PowerEdge M520 (Intel Xeon E5-2450, 2.10 GHz)  

<table>
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**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)**

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From `/proc/cpuinfo`

```
model name : Intel(R) Xeon(R) CPU E5-2450 0 @ 2.10GHz
  2 "physical id"s (chips)
  32 "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
cache size : 20480 KB
```

From `/proc/meminfo`

```
MemTotal:       99027020 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 Linux Enterprise Server 11 (x86_64)
  VERSION = 11
  PATCHLEVEL = 2
```

```
uname -a:
  Linux linux-SLES11 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 26 22:06 last=5
```

**SPEC is set to:** /root/CPU2006-1.2

```
Filesystem          Type Size  Used Avail Use% Mounted on
/dev/sdi1           ext3  546G  9.2G  509G   2% /
```

**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 = "16"
```

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
SPEC CFP2006 Result

Dell Inc.
PowerEdge M520 (Intel Xeon E5-2450, 2.10 GHz)

SPECfp2006 = 68.8
SPECfp_base2006 = 65.4

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

General Notes (Continued)

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

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

Continued on next page
Dell Inc.

PowerEdge M520 (Intel Xeon E5-2450, 2.10 GHz)

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Base Optimization Flags (Continued)

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:
icc -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

C++ benchmarks:

Continued on next page
Dell Inc.  
PowerEdge M520 (Intel Xeon E5-2450, 2.10 GHz)  

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### Peak Optimization Flags (Continued)

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: 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)  
-`-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)  
-`-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`

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
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#### PowerEdge M520 (Intel Xeon E5-2450, 2.10 GHz)

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

Tested with SPEC CPU2006 v1.2.