# SPEC CFP2006 Result

## Dell Inc.

**PowerEdge R420 (Intel Xeon E5-2440 v2, 1.90 GHz)**

<table>
<thead>
<tr>
<th>SPECfp&lt;sup&gt;®&lt;/sup&gt;_rate&lt;sub&gt;2006&lt;/sub&gt;</th>
<th>404</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base&lt;sub&gt;2006&lt;/sub&gt;</td>
<td>393</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon E5-2440 v2
- **CPU Characteristics:** Intel Turbo Boost Technology up to 2.40 GHz
- **CPU MHz:** 1900
- **FPU:** Integrated
- **CPU(s) enabled:** 16 cores, 2 chips, 8 cores/chip, 2 threads/core
- **CPU(s) orderable:** 1,2 chip
- **Primary Cache:** 32 KB I + 32 KB D on chip per core
- **Secondary Cache:** 256 KB I+D on chip per core

### Software

- **Operating System:** SUSE Linux Enterprise Server 11 (x86_64) 3.0.76-0.11-default
- **Compiler:** C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
- **Auto Parallel:** No
- **File System:** ext2
- **System State:** Run level 3 (multi-user)

### Test Information

- **CPU2006 license:** 55
- **Test sponsor:** Dell Inc.
- **Tested by:** Dell Inc.
- **Hardware Availability:** Jan-2014
- **Software Availability:** Sep-2013
- **Test date:** Oct-2013

### Test Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>32</td>
<td>344</td>
</tr>
<tr>
<td>416.gamess</td>
<td>32</td>
<td>393</td>
</tr>
<tr>
<td>433.milc</td>
<td>32</td>
<td>452</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>32</td>
<td>493</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>32</td>
<td>487</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>32</td>
<td>501</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>16</td>
<td>251</td>
</tr>
<tr>
<td>444.namd</td>
<td>32</td>
<td>310</td>
</tr>
<tr>
<td>447.dealII</td>
<td>32</td>
<td>302</td>
</tr>
<tr>
<td>450.soplex</td>
<td>16</td>
<td>269</td>
</tr>
<tr>
<td>453.povray</td>
<td>32</td>
<td>239</td>
</tr>
<tr>
<td>454.calculix</td>
<td>32</td>
<td>547</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>32</td>
<td>218</td>
</tr>
<tr>
<td>465.tonto</td>
<td>32</td>
<td>456</td>
</tr>
<tr>
<td>470.lbm</td>
<td>32</td>
<td>438</td>
</tr>
<tr>
<td>481.wrf</td>
<td>32</td>
<td>432</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>32</td>
<td>404</td>
</tr>
</tbody>
</table>

**SPECfp_rate_base<sub>2006</sub> = 393**

**SPECfp<sup>®</sup>_rate<sub>2006</sub> = 404**
### SPEC CFP2006 Result

**Dell Inc.**

PowerEdge R420 (Intel Xeon E5-2440 v2, 1.90 GHz)

**SPECfp_rate2006 = 404**

**SPECfp_rate_base2006 = 393**

---

#### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>410.bwaves</td>
<td>32</td>
<td>1264</td>
<td>344</td>
<td>1264</td>
</tr>
<tr>
<td></td>
<td></td>
<td>344</td>
<td>1266</td>
<td>343</td>
</tr>
<tr>
<td>416.gamess</td>
<td>32</td>
<td>1593</td>
<td>393</td>
<td>1594</td>
</tr>
<tr>
<td></td>
<td></td>
<td>393</td>
<td>1594</td>
<td>393</td>
</tr>
<tr>
<td>433.milc</td>
<td>32</td>
<td>898</td>
<td>327</td>
<td>899</td>
</tr>
<tr>
<td></td>
<td></td>
<td>327</td>
<td>898</td>
<td>327</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>32</td>
<td>643</td>
<td>453</td>
<td>645</td>
</tr>
<tr>
<td></td>
<td></td>
<td>451</td>
<td>644</td>
<td>452</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>32</td>
<td>466</td>
<td>490</td>
<td>470</td>
</tr>
<tr>
<td></td>
<td></td>
<td>486</td>
<td>469</td>
<td>487</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>32</td>
<td>762</td>
<td>502</td>
<td>763</td>
</tr>
<tr>
<td></td>
<td></td>
<td>501</td>
<td>767</td>
<td>499</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>32</td>
<td>1295</td>
<td>232</td>
<td>1297</td>
</tr>
<tr>
<td></td>
<td></td>
<td>232</td>
<td>1295</td>
<td>232</td>
</tr>
<tr>
<td>444.namd</td>
<td>32</td>
<td>849</td>
<td>302</td>
<td>843</td>
</tr>
<tr>
<td></td>
<td></td>
<td>305</td>
<td>864</td>
<td>297</td>
</tr>
<tr>
<td>447.dealII</td>
<td>32</td>
<td>513</td>
<td>714</td>
<td>515</td>
</tr>
<tr>
<td></td>
<td></td>
<td>711</td>
<td>519</td>
<td>705</td>
</tr>
<tr>
<td>450.soplex</td>
<td>32</td>
<td>1118</td>
<td>239</td>
<td>1119</td>
</tr>
<tr>
<td></td>
<td></td>
<td>239</td>
<td>1117</td>
<td>239</td>
</tr>
<tr>
<td>453.povray</td>
<td>32</td>
<td>438</td>
<td>602</td>
<td>439</td>
</tr>
<tr>
<td></td>
<td></td>
<td>601</td>
<td>439</td>
<td>601</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>32</td>
<td>1557</td>
<td>218</td>
<td>1557</td>
</tr>
<tr>
<td></td>
<td></td>
<td>218</td>
<td>1557</td>
<td>218</td>
</tr>
<tr>
<td>465.tonto</td>
<td>32</td>
<td>718</td>
<td>438</td>
<td>719</td>
</tr>
<tr>
<td></td>
<td></td>
<td>438</td>
<td>718</td>
<td>439</td>
</tr>
<tr>
<td>470.lbm</td>
<td>32</td>
<td>1018</td>
<td>432</td>
<td>1018</td>
</tr>
<tr>
<td></td>
<td></td>
<td>432</td>
<td>1018</td>
<td>432</td>
</tr>
<tr>
<td>481.wrf</td>
<td>32</td>
<td>885</td>
<td>404</td>
<td>894</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400</td>
<td>883</td>
<td>405</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>32</td>
<td>1530</td>
<td>408</td>
<td>1536</td>
</tr>
<tr>
<td></td>
<td></td>
<td>406</td>
<td>1535</td>
<td>406</td>
</tr>
</tbody>
</table>

#### Submit Notes

The `numactl` mechanism was used to bind copies to processors. The config file option 'submit' was used to generate `numactl` commands to bind each copy to a specific processor. For details, please see the config file.

---

**Operating System Notes**

Stack size set to unlimited using "ulimit -s unlimited"
Dell Inc.

PowerEdge R420 (Intel Xeon E5-2440 v2, 1.90 GHz)

SPECfp_rate2006 = 404
SPECfp_rate_base2006 = 393

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.
Test date: Oct-2013
Hardware Availability: Jan-2014
Software Availability: Sep-2013

Platform Notes

BIOS settings:
Virtualization Technology disabled
Execute Disable disabled
Logical Processor enabled
System Profile set to Performance

Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on linux Sun Oct 13 04:59:49 2013

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 E5-2440 v2 @ 1.90GHz
  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
cautions.)
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: 198410440 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 = 3

uname -a:
Linux linux 3.0.76-0.11-default #1 SMP Fri Jun 14 08:21:43 UTC 2013 (ccab990)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 12 14:03 last=S

SPEC is set to: /root/cpu2006-1.2

Additional information from dmidecode:
BIOS Dell Inc. 2.0.21 09/23/2013
Continued on next page
### Dell Inc. PowerEdge R420 (Intel Xeon E5-2440 v2, 1.90 GHz)

<table>
<thead>
<tr>
<th>SPECfp_rate2006</th>
<th>404</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006</td>
<td>393</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test date:** Oct-2013  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Hardware Availability:** Jan-2014  
**Software Availability:** Sep-2013

#### Platform Notes (Continued)

Memory:  
12x 00CE00B300CE M393B2G70BH0-YK0 16 GB 1600 MHz

(End of data from sysinfo program)

#### General Notes

Environment variables set by runspec before the start of the run:  
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RedHat EL 6.4  
Transparent Huge Pages enabled with:  
echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled  
Filesystem page cache cleared with:  
echo 1>/proc/sys/vm/drop_caches  
runcspec command invoked through numactl i.e.:  
numactl --interleave=all runspec <etc>
Dell Inc.

PowerEdge R420 (Intel Xeon E5-2440 v2, 1.90 GHz)

SPECfp_rate2006 = 404
SPECfp_rate_base2006 = 393

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

Test date: Oct-2013
Hardware Availability: Jan-2014
Software Availability: Sep-2013

Base Portability Flags (Continued)

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 -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

C++ benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

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

Benchmarks using both Fortran and C:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

Peak Compiler Invocation

C benchmarks:
icc  -m64

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

Continued on next page
Peak Portability Flags (Continued)

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
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

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) -opt-mem-layout-trans=3(pass 2)
          -prof-use(pass 2) -auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
          -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
          -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
          -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
          -prof-use(pass 2) -opt-malloc-options=3

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
          -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
          -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

Continued on next page
SPEC CFP2006 Result

Dell Inc.
PowerEdge R420 (Intel Xeon E5-2440 v2, 1.90 GHz)

SPECfp_rate2006 = 404
SPECfp_rate_base2006 = 393

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

Test date: Oct-2013
Hardware Availability: Jan-2014
Software Availability: Sep-2013

Peak Optimization Flags (Continued)

416.gamess: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDtd: basepeak = yes

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto
-inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revB.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 28 January 2014.