## SPEC® CFP2006 Result

### Dell Inc.

PowerEdge R520 (Intel Xeon E5-2440, 2.40 GHz)

| SPECfp®2006 = | 66.7 |
| SPECfp_base2006 = | 63.7 |

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

### Hardware

- **CPU Name:** Intel Xeon E5-2440  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 2.90 GHz  
- **CPU MHz:** 2400  
- **FPU:** Integrated  
- **CPU(s) enabled:** 12 cores, 2 chips, 6 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 SP2 (x86_64)  
  3.0.13-0.9-default  
- **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  
- **Auto Parallel:** Yes  
- **File System:** ext3  
- **System State:** Run level 3 (add definition here)

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**SPECfp_base2006 = 63.7**  
**SPECfp2006 = 66.7**

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Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
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L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz)
Disk Subsystem: 2 x 600 GB 15000 RPM SAS, RAID 1
Other Hardware: None

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

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<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>59.9</td>
<td>320</td>
<td>61.0</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 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on Silk-2P Mon Mar 12 18:12:54 2012

This section contains SUT (System Under Test) info as seen by
Dell Inc.  
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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 E5-2440 0 @ 2.40GHz
  2 "physical id"s (chips)
  24 "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
  cache size : 15360 KB

From /proc/meminfo
  MemTotal: 49381468 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 Silk-2P 3.0.13-0.9-default #1 SMP Mon Jan 16 17:33:03 UTC 2012
    (54ddfaf) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 12 10:58 last=S

SPEC is set to: /root/CPU2006-1.2
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda1 ext3 493G 9.1G 459G 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 = "12"

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General Notes (Continued)

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 R520 and the Bull NovaScale R450 F3 models are electronically equivalent.
The results have been measured on a Dell PowerEdge R520 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
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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
# SPEC CFP2006 Result

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## 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

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## Peak Portability Flags

Same as Base Portability Flags

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## 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

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**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: -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 -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

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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
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http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120410.00.xml

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