SPEC® CFP2006 Result

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Dell Inc.

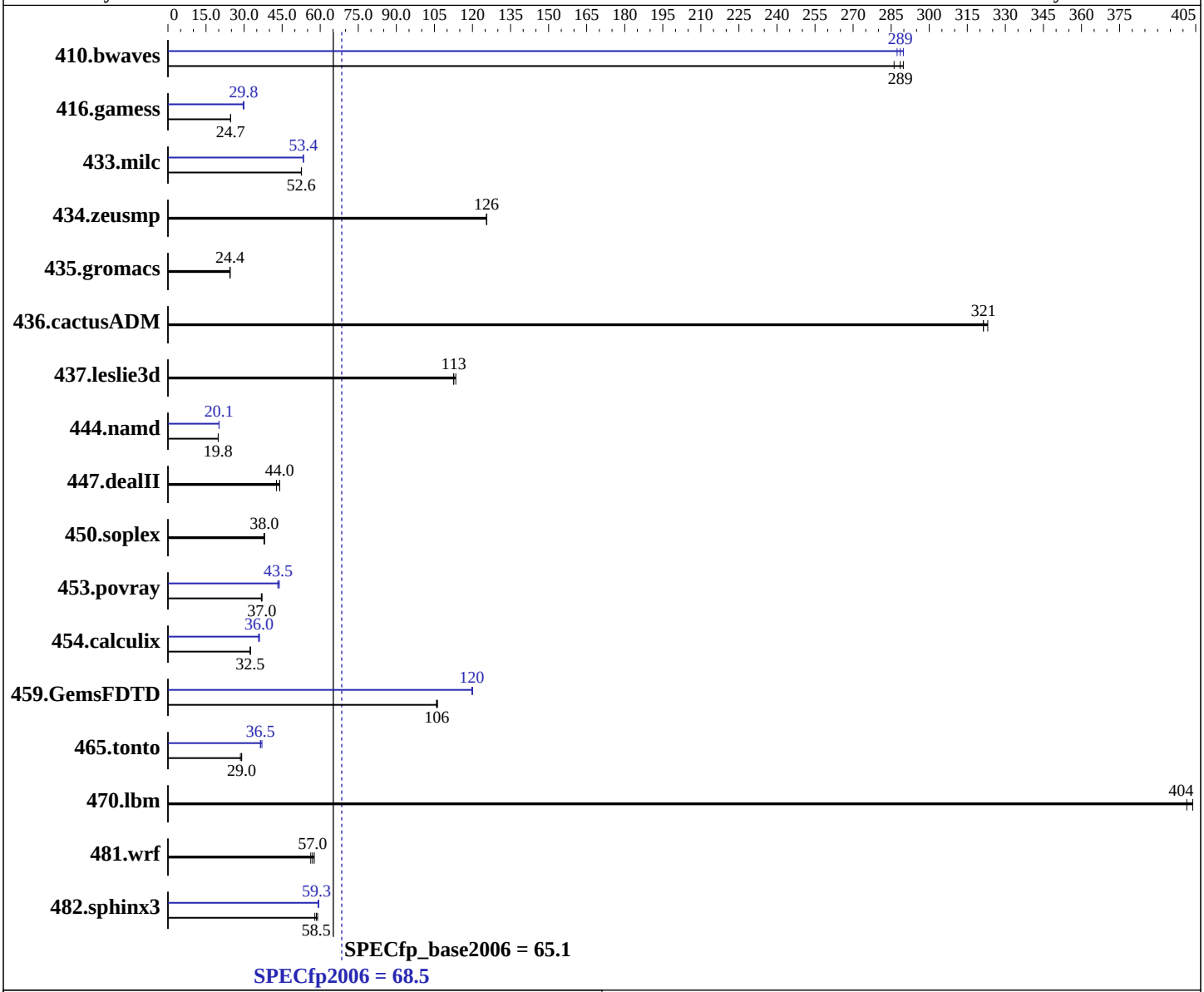
PowerEdge R420 (Intel Xeon E5-2450, 2.10 GHz)

SPECfp®2006 = 68.5

SPECfp_base2006 = 65.1

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 E5-2450
CPU Characteristics:	Intel Turbo Boost Technology up to 2.90 GHz
CPU MHz:	2100
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

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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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L3 Cache: 20 MB I+D on chip per chip
Other Cache: None
Memory: 48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC)
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

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	47.5	286	46.9	290	**47.1**	**289**	46.9	290	**47.1**	**289**	47.3	287
416.gamess	**793**	**24.7**	794	24.7	791	24.7	661	29.6	**656**	**29.8**	654	29.9
433.milc	**175**	**52.6**	174	52.6	175	52.6	172	53.3	172	53.4	**172**	**53.4**
434.zeusmp	72.5	126	**72.5**	**126**	72.5	126	72.5	126	**72.5**	**126**	72.5	126
435.gromacs	**292**	**24.4**	291	24.5	293	24.4	**292**	**24.4**	291	24.5	293	24.4
436.cactusADM	37.0	323	**37.2**	**321**	37.2	321	37.0	323	**37.2**	**321**	37.2	321
437.leslie3d	**83.5**	**113**	82.9	113	83.5	113	**83.5**	**113**	82.9	113	83.5	113
444.namd	405	19.8	405	19.8	**405**	**19.8**	**398**	**20.1**	398	20.1	398	20.1
447.dealII	260	44.1	268	42.8	**260**	**44.0**	260	44.1	268	42.8	**260**	**44.0**
450.soplex	219	38.1	**220**	**38.0**	220	37.8	219	38.1	**220**	**38.0**	220	37.8
453.povray	145	36.8	**144**	**37.0**	144	37.0	123	43.3	**122**	**43.5**	121	43.9
454.calculix	255	32.4	**254**	**32.5**	253	32.6	231	35.7	229	36.0	**229**	**36.0**
459.GemsFDTD	99.9	106	100	106	**100**	**106**	88.4	120	**88.6**	**120**	88.6	120
465.tonto	**339**	**29.0**	345	28.6	339	29.0	**270**	**36.5**	266	37.0	270	36.5
470.lbm	34.0	404	34.2	401	**34.0**	**404**	34.0	404	34.2	401	**34.0**	**404**
481.wrf	**196**	**57.0**	194	57.7	198	56.3	**196**	**57.0**	194	57.7	198	56.3
482.sphinx3	**333**	**58.5**	331	59.0	337	57.9	329	59.2	328	59.4	**329**	**59.3**

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 Slik Mon Mar 12 17:18:50 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

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:       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 Slik 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 10:24 last=S

    SPEC is set to: /root/CPU2006-1.2
       Filesystem     Type  Size  Used Avail Use% Mounted on
       /dev/sda1      ext3  266G   66G  187G  27% /

    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
```

Continued on next page

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
The Dell PowerEdge R420 and
the Bull NovaScale R430 F3 models are electronically equivalent.
The results have been measured on a Dell PowerEdge R420 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
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
```

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

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) -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

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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