



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

IBM Flex System x220  
(Intel Xeon E5-2418L, 2.00 GHz)

**SPECfp<sup>®</sup>2006 = 50.9**

**SPECfp\_base2006 = 48.9**

CPU2006 license: 11

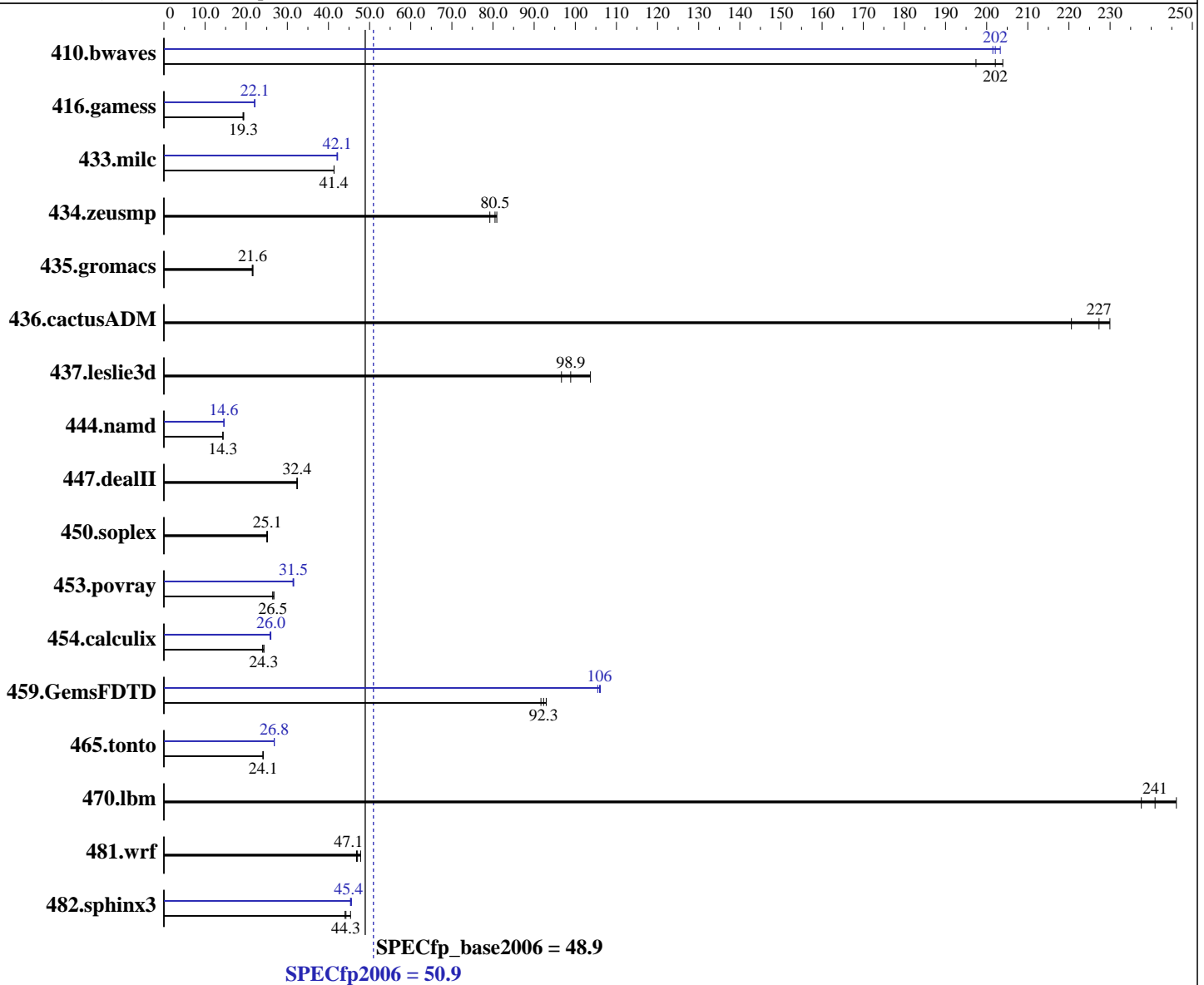
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Aug-2012

Hardware Availability: Jun-2012

Software Availability: Dec-2011



### Hardware

CPU Name: Intel Xeon E5-2418L  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.10 GHz  
 CPU MHz: 2000  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 chips  
 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: Red Hat Enterprise Linux Server release 6.2 (Santiago)  
 2.6.32-220.el6.x86\_64  
 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: ext4

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L3 Cache: 10 MB I+D on chip per chip  
Other Cache: None  
Memory: 96 GB (12 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz)  
Disk Subsystem: 1 x 500 GB SAS, 7200 RPM  
Other Hardware: None

System State: Run level 3 (multi-user)  
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	68.8	197	66.6	204	<b>67.2</b>	<b>202</b>	67.4	201	<b>67.2</b>	<b>202</b>	66.8	203
416.gamess	1019	19.2	1009	19.4	<b>1012</b>	<b>19.3</b>	890	22.0	<b>886</b>	<b>22.1</b>	886	22.1
433.milc	222	41.4	<b>222</b>	<b>41.4</b>	222	41.4	217	42.2	<b>218</b>	<b>42.1</b>	218	42.1
434.zeusmp	<b>113</b>	<b>80.5</b>	112	80.9	115	79.2	<b>113</b>	<b>80.5</b>	112	80.9	115	79.2
435.gromacs	333	21.5	330	21.6	<b>331</b>	<b>21.6</b>	333	21.5	330	21.6	<b>331</b>	<b>21.6</b>
436.cactusADM	52.0	230	54.2	221	<b>52.6</b>	<b>227</b>	52.0	230	54.2	221	<b>52.6</b>	<b>227</b>
437.leslie3d	<b>95.1</b>	<b>98.9</b>	90.7	104	97.3	96.6	<b>95.1</b>	<b>98.9</b>	90.7	104	97.3	96.6
444.namd	559	14.4	<b>559</b>	<b>14.3</b>	559	14.3	550	14.6	<b>550</b>	<b>14.6</b>	550	14.6
447.dealII	353	32.4	354	32.3	<b>353</b>	<b>32.4</b>	353	32.4	354	32.3	<b>353</b>	<b>32.4</b>
450.soplex	334	25.0	<b>332</b>	<b>25.1</b>	331	25.2	334	25.0	<b>332</b>	<b>25.1</b>	331	25.2
453.povray	<b>201</b>	<b>26.5</b>	201	26.5	199	26.8	169	31.6	170	31.4	<b>169</b>	<b>31.5</b>
454.calculix	340	24.3	<b>340</b>	<b>24.3</b>	344	24.0	320	25.8	317	26.0	<b>317</b>	<b>26.0</b>
459.GemsFDTD	116	91.6	<b>115</b>	<b>92.3</b>	114	92.9	101	105	<b>100</b>	<b>106</b>	100	106
465.tonto	408	24.1	<b>408</b>	<b>24.1</b>	409	24.1	367	26.8	367	26.8	<b>367</b>	<b>26.8</b>
470.lbm	57.8	238	55.8	246	<b>57.0</b>	<b>241</b>	57.8	238	55.8	246	<b>57.0</b>	<b>241</b>
481.wrf	234	47.8	239	46.8	<b>237</b>	<b>47.1</b>	234	47.8	239	46.8	<b>237</b>	<b>47.1</b>
482.sphinx3	443	44.0	<b>440</b>	<b>44.3</b>	430	45.4	<b>429</b>	<b>45.4</b>	430	45.4	427	45.6

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

Operating Mode set to Maximum Performance in BIOS  
Sysinfo program /cpu2006.1.2/config/sysinfo.rev6800  
\$Rev: 6800 \$ \$Date:: 2011-10-11 #\$ 6f2ebdff5032aaa42e583f96b07f99d3  
running on kestral-pete Sun Aug 5 16:27:11 2012

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>

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### Platform Notes (Continued)

```

From /proc/cpuinfo
  model name : Intel(R) Xeon(R) CPU E5-2418L 0 @ 2.00GHz
    2 "physical id"s (chips)
    16 "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 : 4
    siblings  : 8
    physical 0: cores 0 1 2 3
    physical 1: cores 0 1 2 3
  cache size : 10240 KB

From /proc/meminfo
MemTotal:      99044260 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

/usr/bin/lsb_release -d
  Red Hat Enterprise Linux Server release 6.2 (Santiago)

From /etc/*release* /etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
  Linux kestral-pete 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST 2011
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 3 14:43

SPEC is set to: /cpu2006.1.2
  Filesystem      Type      Size  Used Avail Use% Mounted on
  /dev/mapper/vg_kestralpete-lv_root
    ext4          449G    6.1G  420G   2% /

Additional information from dmidecode:
Memory:
  12x Micron 36JSF1G72PZ-1G6M1 8 GB 1600 MHz 2 rank

(End of data from sysinfo program)

```

### General Notes

Environment variables set by runspec before the start of the run:

```

KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/cpu2006.1.2/libs/32:/cpu2006.1.2/libs/64"
OMP_NUM_THREADS = "8"

```

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

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## General Notes (Continued)

memory using RHEL5.5  
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

## 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.deallI: -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

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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:

`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`

C++ benchmarks:

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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: -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-linux64.20120425.html>

<http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-SNB-C.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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