



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

IBM Flex System x240 (Intel Xeon E5-2680, 2.70 GHz)

SPECfp<sup>®</sup>2006 = **90.6**

SPECfp\_base2006 = **85.9**

CPU2006 license: 11

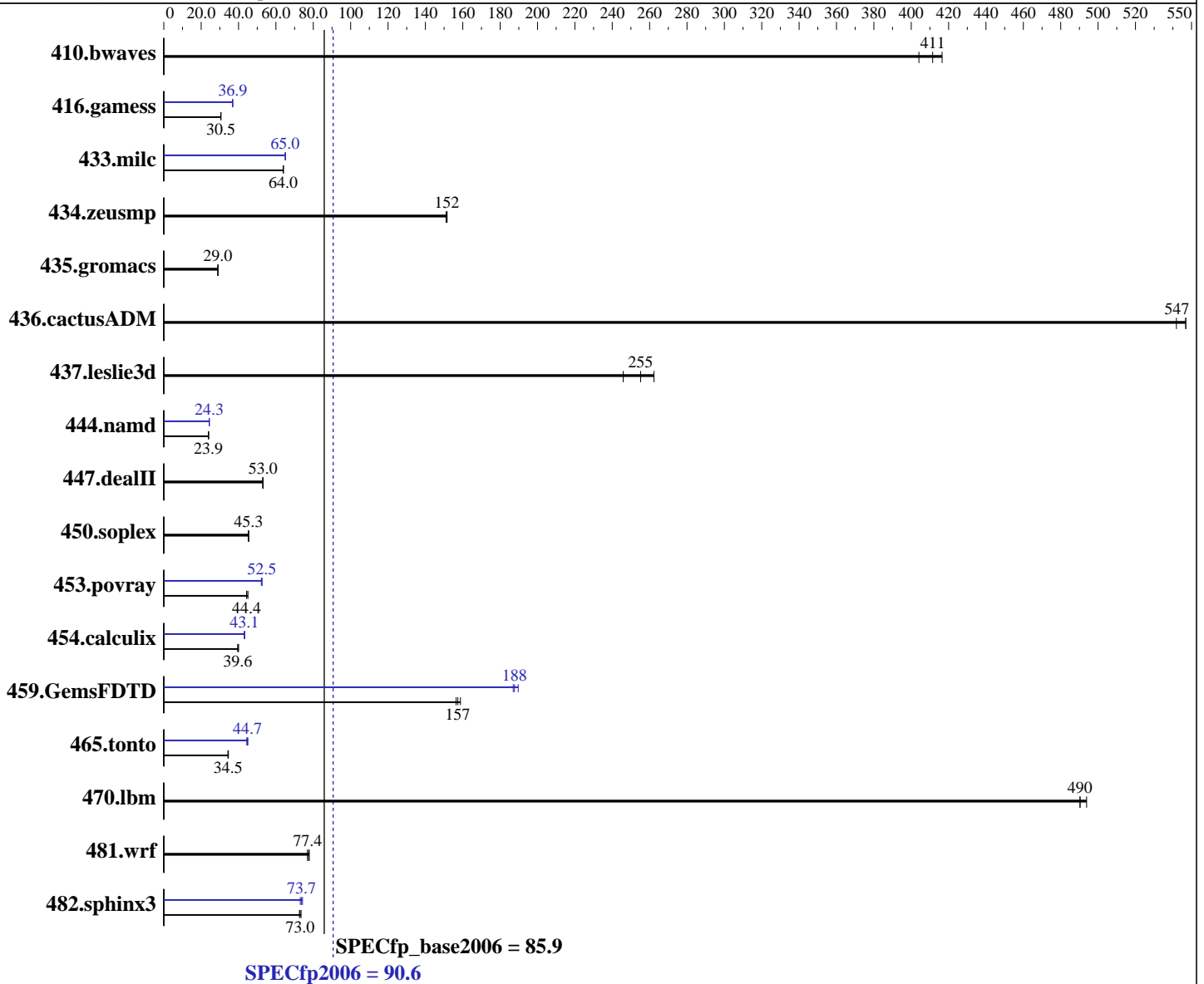
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Apr-2012

Hardware Availability: May-2012

Software Availability: Dec-2011



**Hardware**

CPU Name: Intel Xeon E5-2680  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz  
 CPU MHz: 2700  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 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: 20 MB I+D on chip per chip  
Other Cache: None  
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
Disk Subsystem: 1 x 300 GB SAS, 10000 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	<b><u>33.0</u></b>	<b><u>411</u></b>	33.6	404	32.6	417	<b><u>33.0</u></b>	<b><u>411</u></b>	33.6	404	32.6	417
416.gamess	641	30.5	641	30.6	<b><u>641</u></b>	<b><u>30.5</u></b>	531	36.9	532	36.8	<b><u>531</u></b>	<b><u>36.9</u></b>
433.milc	144	64.0	144	64.0	<b><u>144</u></b>	<b><u>64.0</u></b>	141	65.0	<b><u>141</u></b>	<b><u>65.0</u></b>	141	65.1
434.zeusmp	60.2	151	60.0	152	<b><u>60.0</u></b>	<b><u>152</u></b>	60.2	151	60.0	152	<b><u>60.0</u></b>	<b><u>152</u></b>
435.gromacs	247	29.0	247	29.0	<b><u>247</u></b>	<b><u>29.0</u></b>	247	29.0	247	29.0	<b><u>247</u></b>	<b><u>29.0</u></b>
436.cactusADM	<b><u>21.9</u></b>	<b><u>547</u></b>	22.1	542	21.9	547	<b><u>21.9</u></b>	<b><u>547</u></b>	22.1	542	21.9	547
437.leslie3d	35.8	262	38.2	246	<b><u>36.8</u></b>	<b><u>255</u></b>	35.8	262	38.2	246	<b><u>36.8</u></b>	<b><u>255</u></b>
444.namd	<b><u>335</u></b>	<b><u>23.9</u></b>	335	23.9	335	23.9	330	24.3	329	24.3	<b><u>329</u></b>	<b><u>24.3</u></b>
447.dealII	216	52.9	<b><u>216</u></b>	<b><u>53.0</u></b>	215	53.1	216	52.9	<b><u>216</u></b>	<b><u>53.0</u></b>	215	53.1
450.soplex	<b><u>184</u></b>	<b><u>45.3</u></b>	184	45.3	184	45.4	<b><u>184</u></b>	<b><u>45.3</u></b>	184	45.3	184	45.4
453.povray	118	45.0	<b><u>120</u></b>	<b><u>44.4</u></b>	120	44.3	101	52.5	102	52.2	<b><u>101</u></b>	<b><u>52.5</u></b>
454.calculix	206	40.0	<b><u>208</u></b>	<b><u>39.6</u></b>	208	39.6	<b><u>191</u></b>	<b><u>43.1</u></b>	191	43.1	190	43.3
459.GemsFDTD	<b><u>67.4</u></b>	<b><u>157</u></b>	67.8	156	66.8	159	56.7	187	55.9	190	<b><u>56.5</u></b>	<b><u>188</u></b>
465.tonto	287	34.3	<b><u>285</u></b>	<b><u>34.5</u></b>	285	34.6	<b><u>220</u></b>	<b><u>44.7</u></b>	222	44.4	219	45.0
470.lbm	27.8	494	<b><u>28.0</u></b>	<b><u>490</u></b>	28.0	490	27.8	494	<b><u>28.0</u></b>	<b><u>490</u></b>	28.0	490
481.wrf	<b><u>144</u></b>	<b><u>77.4</u></b>	143	77.9	145	76.9	<b><u>144</u></b>	<b><u>77.4</u></b>	143	77.9	145	76.9
482.sphinx3	<b><u>267</u></b>	<b><u>73.0</u></b>	269	72.6	265	73.5	<b><u>265</u></b>	<b><u>73.7</u></b>	263	74.2	267	73.0

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 blacktip-pete Thu Apr 5 06:01:45 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>

From /proc/cpuinfo

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**Test date:** Apr-2012  
**Hardware Availability:** May-2012  
**Software Availability:** Dec-2011

### Platform Notes (Continued)

```
model name : Genuine Intel(R) CPU @ 2.70GHz
  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:      132136204 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 blacktip-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 Apr 3 15:29
```

```
SPEC is set to: /cpu2006.1.2
Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/mapper/vg_blacktippete-lv_root
                ext4      265G      96G  157G  38% /
```

```
Additional information from dmidecode:
Memory:
  4x Hynix HMT31GR7CFR4C-PB 8 GB 1600 MHz 2 rank
  12x Samsung M393B1K70DH0-CK0 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 = "16"

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

### 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

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## Base Optimization Flags (Continued)

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:

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`

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## Peak Optimization Flags (Continued)

447.deallI: 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) -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/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-linux64.20111122.xml>

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



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