



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

IBM NeXtScale nx360 M4  
(Intel Xeon E5-2667 v2, 3.30 GHz)

**SPECfp<sup>®</sup>2006 = 105**

**SPECfp\_base2006 = 101**

CPU2006 license: 11

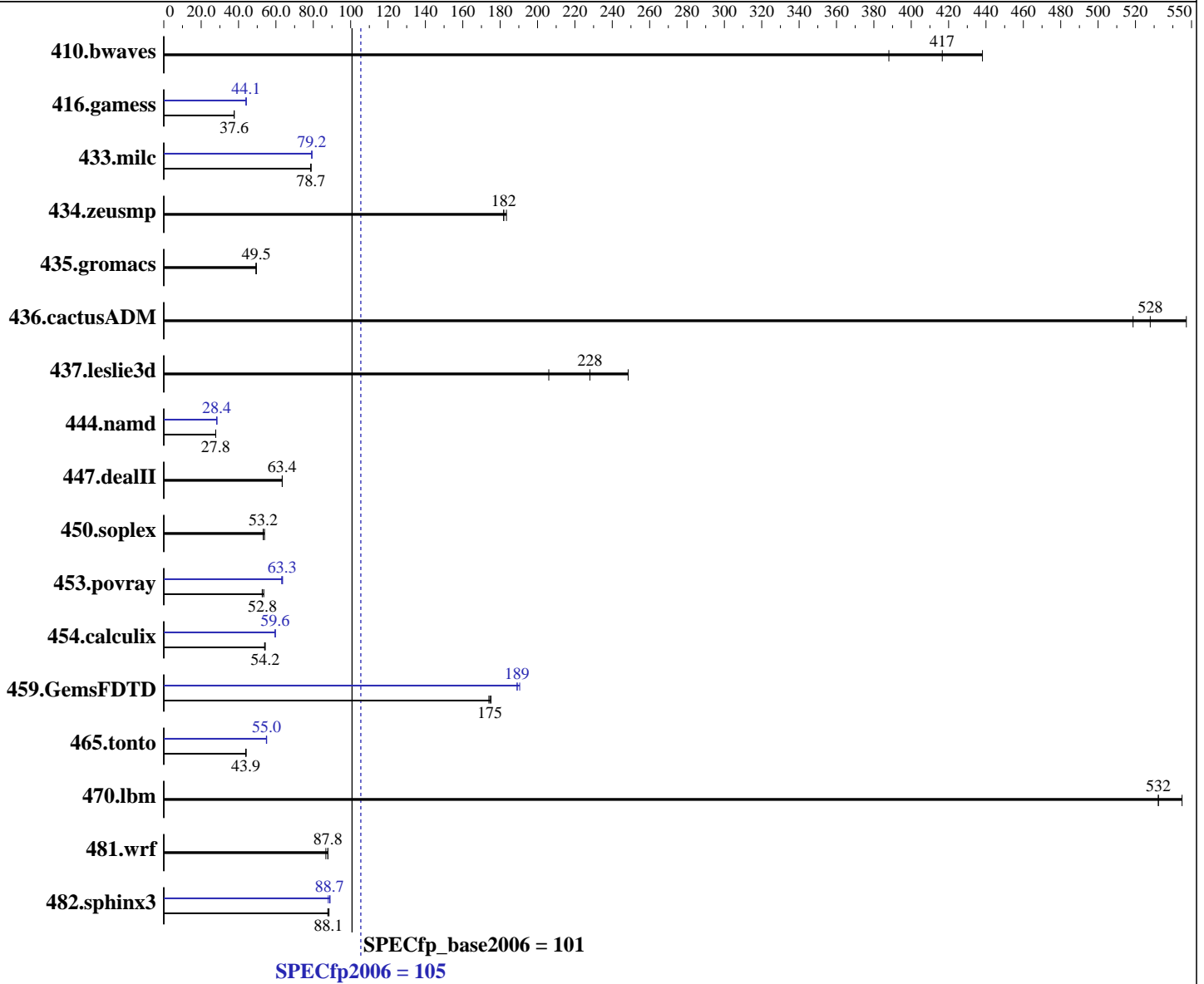
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Apr-2014

Hardware Availability: Nov-2013

Software Availability: Sep-2013



### Hardware

CPU Name: Intel Xeon E5-2667 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 4.00 GHz  
 CPU MHz: 3300  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip  
 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 6.4 (Santiago)  
 2.6.32-358.el6.x86\_64  
 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: Yes  
 File System: ext4

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L3 Cache: 25 MB I+D on chip per chip  
Other Cache: None  
Memory: 128 GB (8 x 16 GB 2Rx4 PC3-14900R-13, ECC)  
Disk Subsystem: 2 x 250 GB SATA, 7200RPM, RAID 0  
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    | 31.0               | 438                | 35.0               | 388                | <b><u>32.6</u></b> | <b><u>417</u></b>  | 31.0               | 438                | 35.0               | 388                | <b><u>32.6</u></b> | <b><u>417</u></b>  |
| 416.gamess    | 519                | 37.7               | 521                | 37.6               | <b><u>520</u></b>  | <b><u>37.6</u></b> | <b><u>444</u></b>  | <b><u>44.1</u></b> | 444                | 44.1               | 445                | 44.0               |
| 433.milc      | <b><u>117</u></b>  | <b><u>78.7</u></b> | 117                | 78.7               | 117                | 78.8               | 116                | 79.2               | 116                | 79.2               | <b><u>116</u></b>  | <b><u>79.2</u></b> |
| 434.zeusmp    | 49.6               | 183                | <b><u>50.0</u></b> | <b><u>182</u></b>  | 50.0               | 182                | 49.6               | 183                | <b><u>50.0</u></b> | <b><u>182</u></b>  | 50.0               | 182                |
| 435.gromacs   | <b><u>144</u></b>  | <b><u>49.5</u></b> | 144                | 49.5               | 145                | 49.3               | <b><u>144</u></b>  | <b><u>49.5</u></b> | 144                | 49.5               | 145                | 49.3               |
| 436.cactusADM | 23.0               | 519                | 21.8               | 547                | <b><u>22.6</u></b> | <b><u>528</u></b>  | 23.0               | 519                | 21.8               | 547                | <b><u>22.6</u></b> | <b><u>528</u></b>  |
| 437.leslie3d  | <b><u>41.2</u></b> | <b><u>228</u></b>  | 45.6               | 206                | 37.8               | 249                | <b><u>41.2</u></b> | <b><u>228</u></b>  | 45.6               | 206                | 37.8               | 249                |
| 444.namd      | 289                | 27.8               | 288                | 27.8               | <b><u>288</u></b>  | <b><u>27.8</u></b> | 283                | 28.4               | <b><u>283</u></b>  | <b><u>28.4</u></b> | 283                | 28.4               |
| 447.dealII    | 181                | 63.3               | 180                | 63.4               | <b><u>180</u></b>  | <b><u>63.4</u></b> | 181                | 63.3               | 180                | 63.4               | <b><u>180</u></b>  | <b><u>63.4</u></b> |
| 450.soplex    | <b><u>157</u></b>  | <b><u>53.2</u></b> | 157                | 53.2               | 155                | 53.9               | <b><u>157</u></b>  | <b><u>53.2</u></b> | 157                | 53.2               | 155                | 53.9               |
| 453.povray    | 101                | 52.7               | <b><u>101</u></b>  | <b><u>52.8</u></b> | 99.4               | 53.5               | 83.7               | 63.6               | <b><u>84.0</u></b> | <b><u>63.3</u></b> | 84.3               | 63.1               |
| 454.calculix  | <b><u>152</u></b>  | <b><u>54.2</u></b> | 153                | 53.9               | 152                | 54.2               | <b><u>138</u></b>  | <b><u>59.6</u></b> | 138                | 59.6               | 138                | 59.6               |
| 459.GemsFDTD  | 60.6               | 175                | <b><u>60.8</u></b> | <b><u>175</u></b>  | 61.0               | 174                | 56.1               | 189                | <b><u>56.1</u></b> | <b><u>189</u></b>  | 55.7               | 190                |
| 465.tonto     | 223                | 44.1               | 225                | 43.8               | <b><u>224</u></b>  | <b><u>43.9</u></b> | 179                | 54.9               | 179                | 55.0               | <b><u>179</u></b>  | <b><u>55.0</u></b> |
| 470.lbm       | 25.2               | 545                | <b><u>25.8</u></b> | <b><u>532</u></b>  | 25.8               | 532                | 25.2               | 545                | <b><u>25.8</u></b> | <b><u>532</u></b>  | 25.8               | 532                |
| 481.wrf       | 127                | 87.8               | 129                | 86.7               | <b><u>127</u></b>  | <b><u>87.8</u></b> | 127                | 87.8               | 129                | 86.7               | <b><u>127</u></b>  | <b><u>87.8</u></b> |
| 482.sphinx3   | 220                | 88.4               | 222                | 87.8               | <b><u>221</u></b>  | <b><u>88.1</u></b> | <b><u>220</u></b>  | <b><u>88.7</u></b> | 219                | 89.0               | 221                | 88.0               |

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"  
Zone reclaim mode enabled with:  
echo 1 > /proc/sys/vm/zone\_reclaim\_mode

## Platform Notes

BIOS setting:  
Operating Mode set to Maximum Performance  
Hyper-Threading set to Disabled  
Sysinfo program /home/SPECcpu-new/config/sysinfo.rev6818  
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191  
running on nx360M4 Tue Apr 1 08:08:21 2014

This section contains SUT (System Under Test) info as seen by  
Continued on next page



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**Test date:** Apr-2014  
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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 E5-2667 v2 @ 3.30GHz
 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 : 8
siblings : 8
physical 0: cores 1 2 3 4 8 9 10 11
physical 1: cores 1 2 3 4 8 9 10 11
cache size : 25600 KB
```

```
From /proc/meminfo
MemTotal: 132090172 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

```
/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.4 (Santiago)
```

```
From /etc/*release* /etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

```
uname -a:
Linux nx360M4 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013
x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Mar 31 11:53
```

```
SPEC is set to: /home/SPECcpu-new
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vg_nx360m4-lv_home
ext4 403G 66G 318G 18% /home
```

```
Additional information from dmidecode:
BIOS IBM -[FHE105GUS-1.00]- 08/23/2013
Memory:
8x Samsung M393B2G70QH0-CMA 16 GB 1867 MHz 2 rank
```

(End of data from sysinfo program)



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## General Notes

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

KMP\_AFFINITY = "granularity=fine,compact,1,0"

LD\_LIBRARY\_PATH = "/home/SPECcpu-new/libs/32:/home/SPECcpu-new/libs/64:/home/SPECcpu-new/sh"

OMP\_NUM\_THREADS = "16"

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

runspec command invoked through numactl i.e.:

numactl --interleave=all runspec <etc>

## 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



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## Base Optimization Flags

C benchmarks:

`-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias`

C++ benchmarks:

`-xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias`

Fortran benchmarks:

`-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch`

Benchmarks using both Fortran and C:

`-xAVX -ipo -O3 -no-prec-div -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) -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.dealIII: 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-

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-ic14.0-official-linux64.20140128.html>

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

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

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