



# SPEC® CFP2006 Result

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## IBM Corporation

IBM System x3950 X6  
(Intel Xeon E7-8893 v2, 3.40 GHz)

SPECfp®\_rate2006 = 2070

SPECfp\_rate\_base2006 = 2010

CPU2006 license: 11

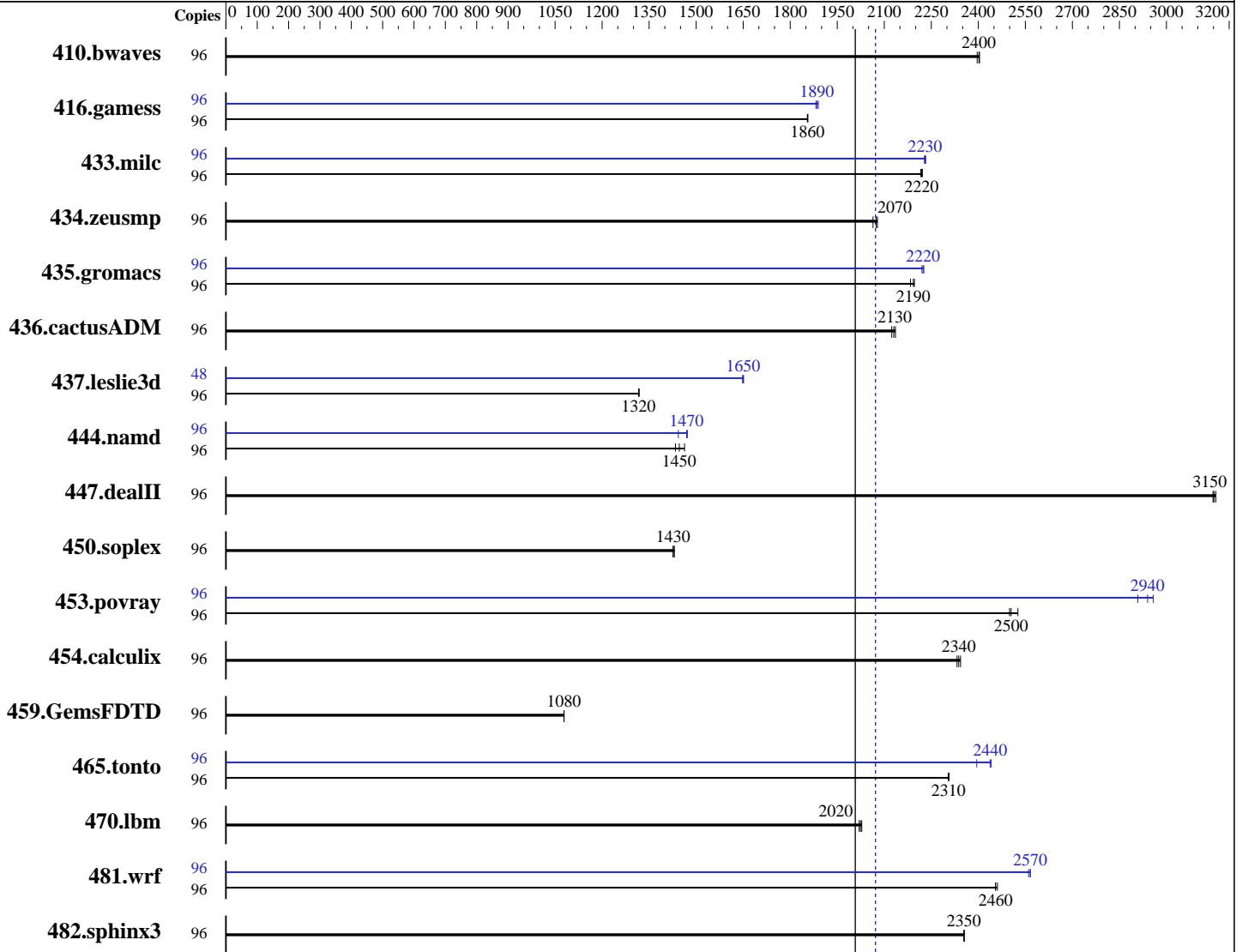
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jun-2014

Hardware Availability: Jun-2014

Software Availability: Nov-2013



SPECfp\_rate\_base2006 = 2010

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### Hardware

CPU Name: Intel Xeon E7-8893 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 3400  
 FPU: Integrated  
 CPU(s) enabled: 48 cores, 8 chips, 6 cores/chip, 2 threads/core  
 CPU(s) orderable: 4,6,8 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 6.5 (Santiago)  
 2.6.32-431.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: No  
 File System: ext4

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L3 Cache: 37.5 MB I+D on chip per chip  
Other Cache: None  
Memory: 2 TB (128 x 16 GB 2Rx4 PC3L-12800R-11, ECC, running at 1333 MHz)  
Disk Subsystem: 1 x 400 GB SATA, SSD  
Other Hardware: None

System State: Run level 3 (multi-user)  
Base Pointers: 32/64-bit  
Peak Pointers: 32/64-bit  
Other Software: None

## Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	96	<b>543</b>	<b>2400</b>	544	2400	543	2400	96	<b>543</b>	<b>2400</b>	544	2400	543	2400		
416.gamess	96	<b>1013</b>	<b>1860</b>	1013	1860	1013	1850	96	999	1880	<b>997</b>	<b>1890</b>	995	1890		
433.milc	96	398	2220	<b>397</b>	<b>2220</b>	397	2220	96	<b>395</b>	<b>2230</b>	395	2230	396	2230		
434.zeusmp	96	420	2080	<b>421</b>	<b>2070</b>	423	2060	96	420	2080	<b>421</b>	<b>2070</b>	423	2060		
435.gromacs	96	<b>313</b>	<b>2190</b>	312	2200	314	2180	96	308	2230	309	2220	<b>308</b>	<b>2220</b>		
436.cactusADM	96	540	2120	537	2140	<b>539</b>	<b>2130</b>	96	540	2120	537	2140	<b>539</b>	<b>2130</b>		
437.leslie3d	96	<b>685</b>	<b>1320</b>	684	1320	685	1320	48	<b>273</b>	<b>1650</b>	274	1650	273	1650		
444.namd	96	526	1460	<b>532</b>	<b>1450</b>	537	1430	96	523	1470	533	1440	<b>524</b>	<b>1470</b>		
447.dealII	96	349	3150	348	3160	<b>348</b>	<b>3150</b>	96	349	3150	348	3160	<b>348</b>	<b>3150</b>		
450.soplex	96	561	1430	<b>561</b>	<b>1430</b>	560	1430	96	561	1430	<b>561</b>	<b>1430</b>	560	1430		
453.povray	96	<b>204</b>	<b>2500</b>	202	2530	204	2500	96	<b>174</b>	<b>2940</b>	176	2910	173	2960		
454.calculix	96	338	2340	<b>339</b>	<b>2340</b>	340	2330	96	338	2340	<b>339</b>	<b>2340</b>	340	2330		
459.GemsFDTD	96	945	1080	<b>944</b>	<b>1080</b>	944	1080	96	945	1080	<b>944</b>	<b>1080</b>	944	1080		
465.tonto	96	410	2300	410	2310	<b>410</b>	<b>2310</b>	96	<b>388</b>	<b>2440</b>	387	2440	394	2400		
470.lbm	96	650	2030	653	2020	<b>652</b>	<b>2020</b>	96	650	2030	653	2020	<b>652</b>	<b>2020</b>		
481.wrf	96	437	2450	436	2460	<b>437</b>	<b>2460</b>	96	418	2570	419	2560	<b>418</b>	<b>2570</b>		
482.sphinx3	96	795	2350	794	2360	<b>795</b>	<b>2350</b>	96	795	2350	794	2360	<b>795</b>	<b>2350</b>		

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"



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### Platform Notes

Operating Mode set to Maximum Performance in BIOS  
Memory Data Scrambling Disabled  
Patrol Scrub Disabled  
Sysinfo program /cpu2006.1.2\_14\_aug2013/config/sysinfo.rev6818  
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191  
running on x3950x6 Sat Jun 7 02:27:13 2014

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
model name      : Intel(R) Xeon(R) CPU E7-8893 v2 @ 3.40GHz
 8 "physical id"s (chips)
 96 "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 3 4 5 6 10 11
 physical 1:   cores 3 4 5 6 10 11
 physical 2:   cores 3 4 5 6 10 11
 physical 3:   cores 3 4 5 6 10 11
 physical 4:   cores 3 4 5 6 10 11
 physical 5:   cores 3 4 5 6 10 11
 physical 6:   cores 3 4 5 6 10 11
 physical 7:   cores 3 4 5 6 10 11
 cache size    : 38400 KB
```

```
From /proc/meminfo
MemTotal:      2117464504 kB
HugePages_Total: 0
Hugepagesize:  2048 kB
```

```
/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.5 (Santiago)
```

```
From /etc/*release* /etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

```
uname -a:
Linux x3950x6 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013
x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Jun 6 16:29
```

```
SPEC is set to: /cpu2006.1.2_14_aug2013
Filesystem      Type Size Used Avail Use% Mounted on
/dev/mapper/vg_x3950x6-lv_root ext4 357G 8.6G 330G 3% /
Continued on next page
```



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## Platform Notes (Continued)

Additional information from dmidecode:  
BIOS IBM -[A8E107JUS-1.00]- 05/02/2014  
Memory:  
64x Hynix HMT42GR7AFR4A-PB 16 GB 1333 MHz 2 rank  
64x NO DIMM Unknown  
64x Samsung M393B2G70QH0-YK0 16 GB 1333 MHz 2 rank

(End of data from sysinfo program)

## General Notes

Environment variables set by runspec before the start of the run:  
LD\_LIBRARY\_PATH = "/cpu2006.1.2\_14\_aug2013/libs/32:/cpu2006.1.2\_14\_aug2013/libs/64:/cpu2006.1.2\_14\_aug2013/sh"

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  
Filesystem page cache cleared with:  
echo 1> /proc/sys/vm/drop\_caches  
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

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## Base Portability Flags (Continued)

```
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 -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3
```

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

```
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3
```

## 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

## 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) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -opt-mem-layout-trans=3(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) -opt-mem-layout-trans=3(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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto  
-inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

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## Peak Optimization Flags (Continued)

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

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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