



# SPEC® CFP2006 Result

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## IBM Corporation

### SPECfp®\_rate2006 = 463

### IBM System x3500 M4 (Intel Xeon E5-2665)

### SPECfp\_rate\_base2006 = 451

CPU2006 license: 11

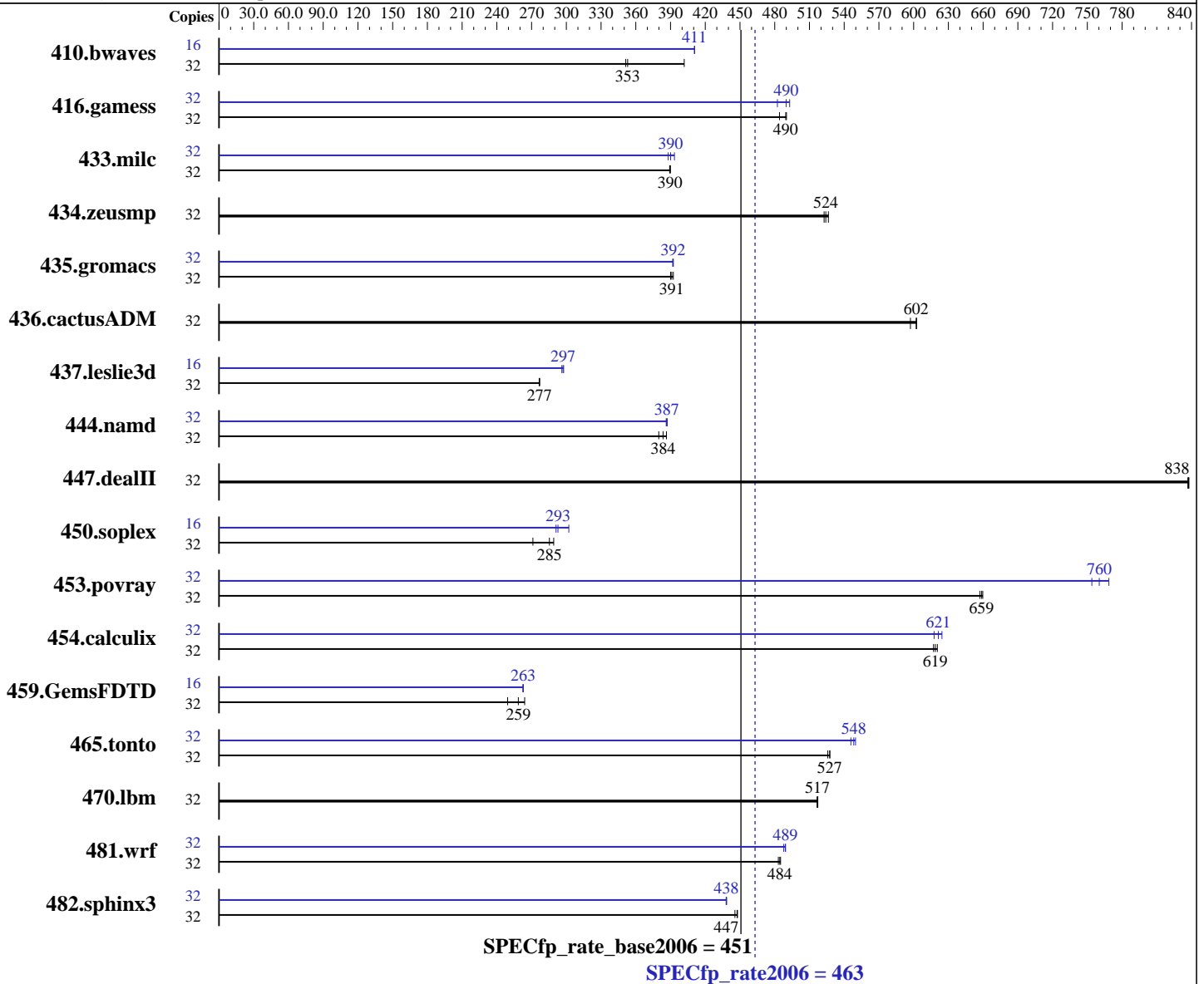
Test date: Apr-2012

Test sponsor: IBM Corporation

Hardware Availability: Mar-2012

Tested by: IBM Corporation

Software Availability: Oct-2011



#### Hardware

CPU Name: Intel Xeon E5-2665  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz  
 CPU MHz: 2400  
 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

Continued on next page

#### Software

Operating System: Red Hat Enterprise Linux Server release 6.1 (Santiago)  
 2.6.32-131.0.15.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: No  
 File System: ext4

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L3 Cache: 20 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 64 GB (16 x 4 GB 2Rx8 PC3-12800R-11, ECC)  
 Disk Subsystem: 1 x 300 GB SAS, 15000 RPM  
 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	32	1082	402	<u>1232</u>	<u>353</u>	1238	351	16	529	411	529	411	<u>529</u>	<u>411</u>
416.gamess	32	1278	490	1294	484	<u>1280</u>	<u>490</u>	32	<u>1279</u>	<u>490</u>	1271	493	1299	482
433.milc	32	753	390	<u>754</u>	<u>390</u>	755	389	32	<u>753</u>	<u>390</u>	757	388	747	393
434.zeusmp	32	557	523	<u>556</u>	<u>524</u>	553	526	32	557	523	<u>556</u>	<u>524</u>	553	526
435.gromacs	32	586	390	<u>584</u>	<u>391</u>	582	392	32	582	392	583	392	<u>583</u>	<u>392</u>
436.cactusADM	32	<u>635</u>	<u>602</u>	640	597	635	603	32	<u>635</u>	<u>602</u>	640	597	635	603
437.leslie3d	32	1086	277	1088	277	<u>1087</u>	<u>277</u>	16	505	298	508	296	<u>506</u>	<u>297</u>
444.namd	32	664	386	<u>669</u>	<u>384</u>	676	380	32	<u>664</u>	<u>387</u>	663	387	664	386
447.dealII	32	<u>437</u>	<u>838</u>	437	837	437	838	32	<u>437</u>	<u>838</u>	437	837	437	838
450.soplex	32	<u>935</u>	<u>285</u>	984	271	923	289	16	<u>456</u>	<u>293</u>	442	302	458	291
453.povray	32	258	660	259	657	<u>258</u>	<u>659</u>	32	226	754	221	769	<u>224</u>	<u>760</u>
454.calculix	32	428	617	<u>427</u>	<u>619</u>	425	620	32	<u>425</u>	<u>621</u>	427	618	423	624
459.GemsFDTD	32	1362	249	1286	264	<u>1313</u>	<u>259</u>	16	647	263	<u>646</u>	<u>263</u>	646	263
465.tonto	32	<u>597</u>	<u>527</u>	599	526	597	528	32	573	550	<u>574</u>	<u>548</u>	577	546
470.lbm	32	850	517	<u>850</u>	<u>517</u>	851	517	32	850	517	<u>850</u>	<u>517</u>	851	517
481.wrf	32	740	483	<u>738</u>	<u>484</u>	737	485	32	<u>731</u>	<u>489</u>	733	488	730	489
482.sphinx3	32	1400	446	1393	448	<u>1394</u>	<u>447</u>	32	1424	438	<u>1423</u>	<u>438</u>	1422	438

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



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## Platform Notes

### BIOS Settings:

Operating Mode set to Maximum Performance

Sysinfo program /root/SPECcpu-v1.2/config/sysinfo.rev6800

\$Rev: 6800 \$ \$Date:: 2011-10-11 #\$ 6f2ebdff5032aaa42e583f96b07f99d3

running on x3500M4 Tue Apr 10 06:03:17 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

model name : Intel(R) Xeon(R) CPU E5-2665 0 @ 2.40GHz

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: 66044804 kB

HugePages\_Total: 0

Hugepagesize: 2048 kB

### /usr/bin/lsc\_release -d

Red Hat Enterprise Linux Server release 6.1 (Santiago)

### From /etc/\*release\* /etc/\*version\*

redhat-release: Red Hat Enterprise Linux Server release 6.1 (Santiago)

system-release: Red Hat Enterprise Linux Server release 6.1 (Santiago)

system-release-cpe: cpe:/o:redhat:enterprise\_linux:6server:ga:server

### uname -a:

Linux x3500M4 2.6.32-131.0.15.el6.x86\_64 #1 SMP Tue May 10 15:42:40 EDT 2011  
x86\_64 x86\_64 x86\_64 GNU/Linux

### run-level 3 Apr 9 17:14

### SPEC is set to: /root/SPECcpu-v1.2

Filesystem Type Size Used Avail Use% Mounted on

/dev/mapper/vg\_x3500m4-lv\_root

ext4 210G 69G 130G 35% /

### Additional information from dmidecode:

#### Memory:

16x Samsung M393B5273DH0-CK0 4 GB 1600 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:  
LD\_LIBRARY\_PATH = "/root/SPECcpu-v1.2/libs/32:/root/SPECcpu-v1.2/libs/64"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB 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  
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 -static -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:

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

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

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

## Peak Compiler Invocation

C benchmarks (except as noted below):

icc -m64

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## Peak 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

453.povray: -DSPEC\_CPU\_LP64

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## Peak Portability Flags (Continued)

454.calculix: -DSPEC\_CPU\_LP64 -nofor\_main  
 465.tonto: -DSPEC\_CPU\_LP64  
 470.lbm: -DSPEC\_CPU\_LP64  
 481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX

## 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  
 -opt-mem-layout-trans=3

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2

### 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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

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(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -prof-use(pass 2) -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: -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

459.GemsFDTD: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

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## Peak Optimization Flags (Continued)

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:

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

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -static -auto-ilp32  
-opt-mem-layout-trans=3

481.wrf: Same as 454.calculix

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

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