



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

IBM System x iDataPlex dx360 M4  
(Intel Xeon E5-2603 v2, 1.80 GHz)

SPECfp<sup>®</sup>\_rate2006 = 203

SPECfp\_rate\_base2006 = 199

CPU2006 license: 11

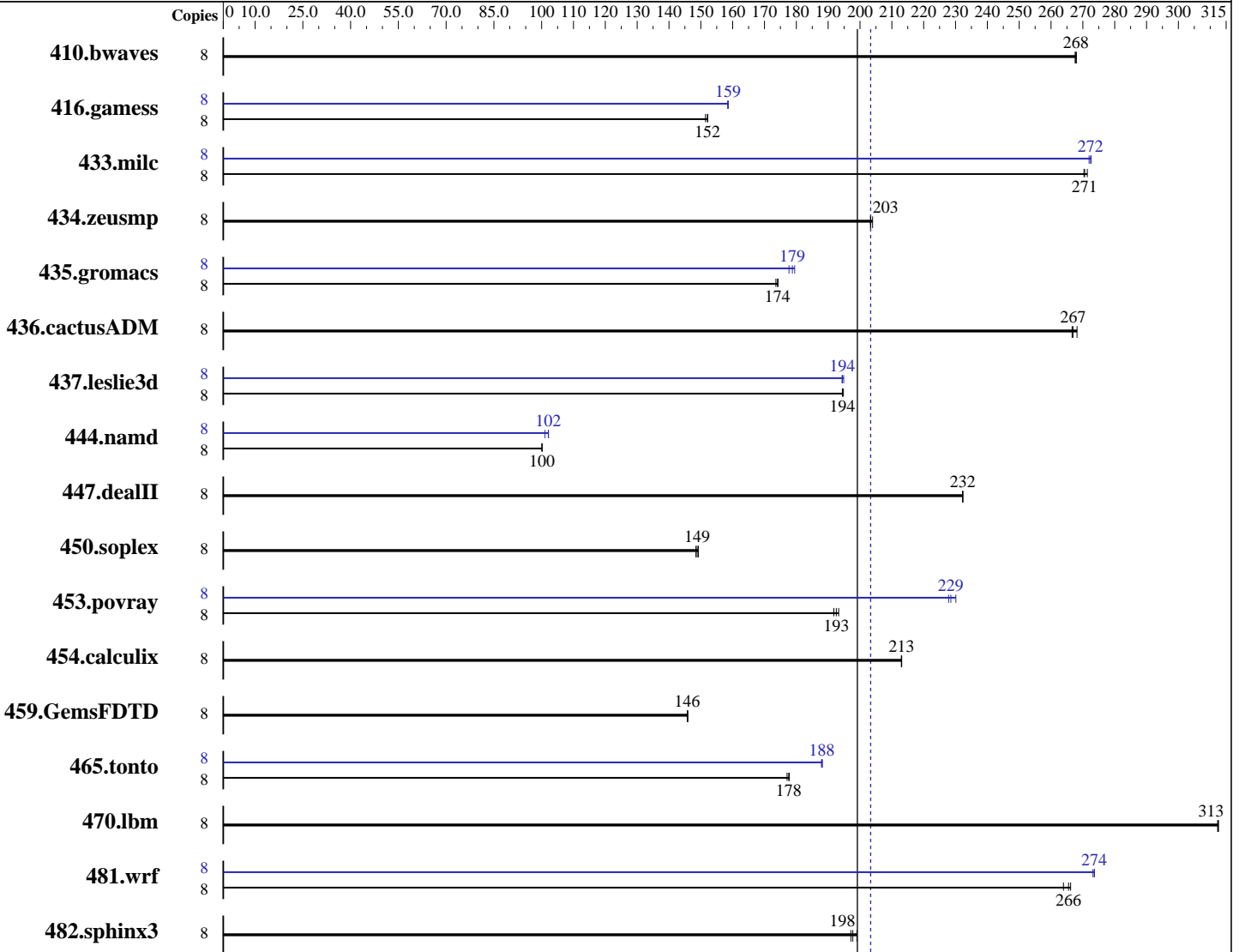
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jun-2014

Hardware Availability: Dec-2013

Software Availability: Sep-2013



SPECfp\_rate\_base2006 = 199

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### Hardware

CPU Name: Intel Xeon E5-2603 v2  
 CPU Characteristics:  
 CPU MHz: 1800  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 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

Continued on next page

### 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: No  
 File System: ext4

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L3 Cache: 10 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC3-14900R-13, ECC, running at 1333 MHz)  
Disk Subsystem: 1 x 500 GB SATA, 7200 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	8	406	268	<b>406</b>	<b>268</b>	406	268	8	406	268	<b>406</b>	<b>268</b>	406	268		
416.gamess	8	1034	151	<b>1030</b>	<b>152</b>	1029	152	8	<b>988</b>	<b>159</b>	988	158	988	159		
433.milc	8	271	271	272	270	<b>271</b>	<b>271</b>	8	269	273	270	272	<b>270</b>	<b>272</b>		
434.zeusmp	8	<b>358</b>	<b>203</b>	358	203	357	204	8	<b>358</b>	<b>203</b>	358	203	357	204		
435.gromacs	8	328	174	<b>328</b>	<b>174</b>	329	174	8	321	178	<b>320</b>	<b>179</b>	318	179		
436.cactusADM	8	359	267	356	268	<b>358</b>	<b>267</b>	8	359	267	356	268	<b>358</b>	<b>267</b>		
437.leslie3d	8	386	195	387	194	<b>387</b>	<b>194</b>	8	<b>387</b>	<b>194</b>	387	194	386	195		
444.namd	8	641	100	<b>641</b>	<b>100</b>	641	100	8	<b>628</b>	<b>102</b>	635	101	628	102		
447.dealII	8	<b>394</b>	<b>232</b>	394	232	394	232	8	<b>394</b>	<b>232</b>	394	232	394	232		
450.soplex	8	<b>448</b>	<b>149</b>	447	149	449	148	8	<b>448</b>	<b>149</b>	447	149	449	148		
453.povray	8	220	193	222	192	<b>221</b>	<b>193</b>	8	185	230	187	228	<b>186</b>	<b>229</b>		
454.calculix	8	<b>310</b>	<b>213</b>	310	213	310	213	8	<b>310</b>	<b>213</b>	310	213	310	213		
459.GemsFDTD	8	582	146	582	146	<b>582</b>	<b>146</b>	8	582	146	582	146	<b>582</b>	<b>146</b>		
465.tonto	8	445	177	<b>443</b>	<b>178</b>	443	178	8	<b>419</b>	<b>188</b>	418	188	419	188		
470.lbm	8	352	312	<b>352</b>	<b>313</b>	352	313	8	352	312	<b>352</b>	<b>313</b>	352	313		
481.wrf	8	336	266	<b>337</b>	<b>266</b>	339	264	8	327	274	327	273	<b>327</b>	<b>274</b>		
482.sphinx3	8	<b>789</b>	<b>198</b>	783	199	791	197	8	<b>789</b>	<b>198</b>	783	199	791	197		

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  
Intel Idle Driver disabled with the following Linux kernel parameter in /etc/grub.conf:  
intel\_idle.max\_cstate=0



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### Platform Notes

BIOS setting:  
Operating Mode set to Maximum Performance  
Sysinfo program /home/SPECcpu-20140116-ic14.0/config/sysinfo.rev6818  
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191  
running on dx360M4 Fri Jun 27 19:35:14 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 E5-2603 v2 @ 1.80GHz
 2 "physical id"s (chips)
 8 "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      : 4
  physical 0:   cores 0 1 2 3
  physical 1:   cores 0 1 2 3
cache size     : 10240 KB
```

```
From /proc/meminfo
MemTotal:      264644468 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 dx360M4 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 Jun 25 17:44
```

```
SPEC is set to: /home/SPECcpu-20140116-ic14.0
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/mapper/vg_td2-lv_home
  ext4          380G  174G  187G  49% /home
```

```
Additional information from dmidecode:
BIOS IBM  -[TDE139OUS-1.50]- 02/21/2014
Memory:
 16x Samsung M393B2G70QH0-CMA 16 GB 1333 MHz 2 rank
```

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## Platform Notes (Continued)

(End of data from sysinfo program)

## General Notes

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

LD\_LIBRARY\_PATH = "/home/SPECcpu-20140116-ic14.0/libs/32:/home/SPECcpu-20140116-ic14.0/libs/64:/home/SPECcpu-20140116-ic14.0/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  
 437.lelie3d: -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

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## Base Portability Flags (Continued)

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

## Peak Portability Flags

Same as Base Portability Flags



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## 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:

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

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## Peak Optimization Flags (Continued)

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-B.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-B.xml>

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

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