



SPEC[®] CFP2006 Result

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IBM Corporation

IBM System x3650 M4
(Intel Xeon E5-2637 v2, 3.50 GHz)

SPECfp[®]2006 = **97.5**

SPECfp_base2006 = **94.0**

CPU2006 license: 11

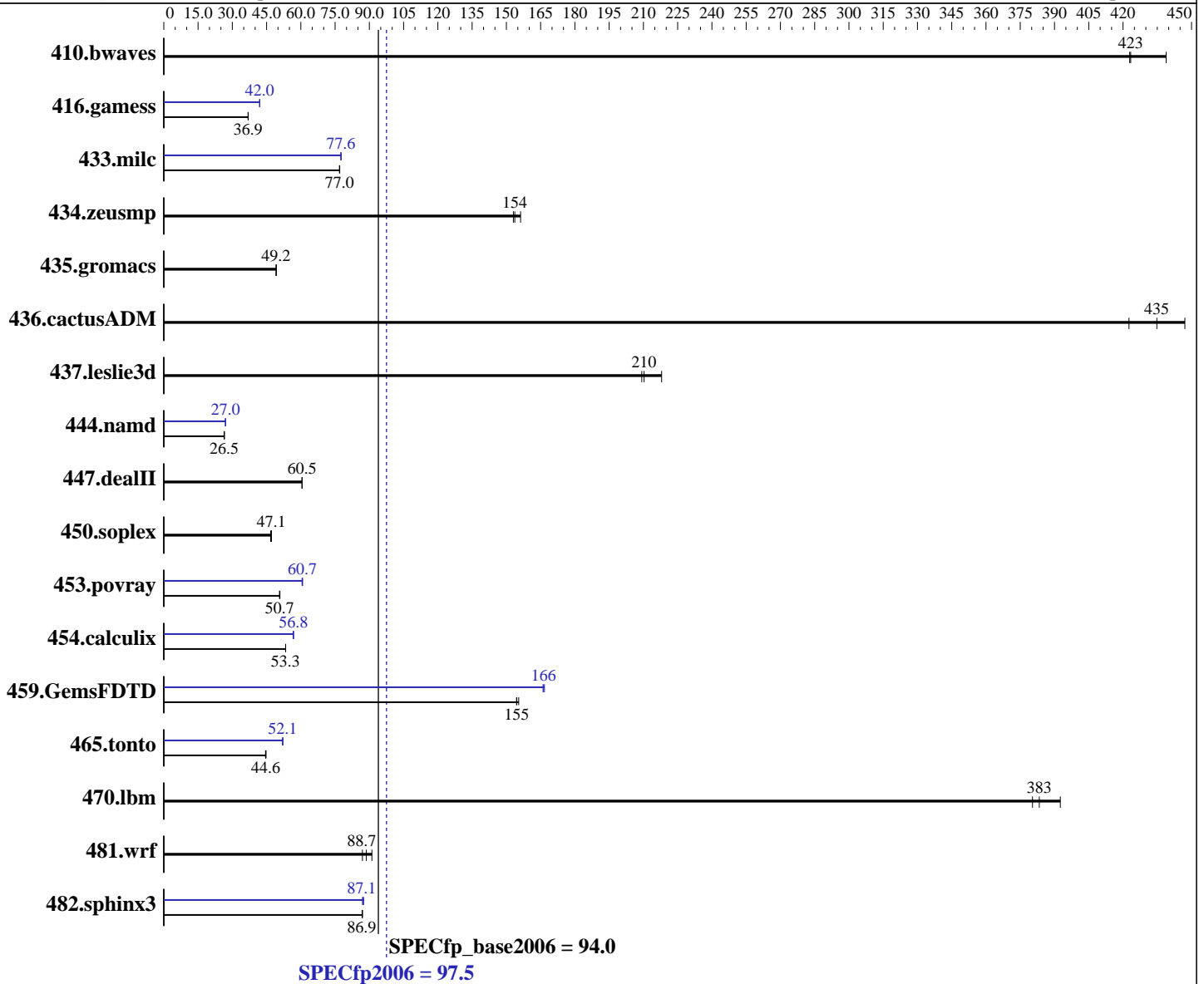
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jan-2014

Hardware Availability: Dec-2013

Software Availability: Sep-2013



Hardware

CPU Name: Intel Xeon E5-2637 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 3.80 GHz
 CPU MHz: 3500
 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

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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: 15 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem: 1 x 400 GB SAS SSD, 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	32.1	423	<u>32.1</u>	<u>423</u>	31.0	439	32.1	423	<u>32.1</u>	<u>423</u>	31.0	439
416.gamess	530	36.9	<u>530</u>	<u>36.9</u>	529	37.0	<u>466</u>	<u>42.0</u>	467	42.0	466	42.0
433.milc	<u>119</u>	<u>77.0</u>	119	76.9	119	77.0	118	77.6	<u>118</u>	<u>77.6</u>	118	77.5
434.zeusmp	58.3	156	59.4	153	<u>59.2</u>	<u>154</u>	58.3	156	59.4	153	<u>59.2</u>	<u>154</u>
435.gromacs	145	49.3	<u>145</u>	<u>49.2</u>	145	49.2	145	49.3	<u>145</u>	<u>49.2</u>	145	49.2
436.cactusADM	26.7	447	28.3	423	<u>27.5</u>	<u>435</u>	26.7	447	28.3	423	<u>27.5</u>	<u>435</u>
437.leslie3d	43.1	218	<u>44.7</u>	<u>210</u>	44.9	209	43.1	218	<u>44.7</u>	<u>210</u>	44.9	209
444.namd	303	26.5	303	26.5	<u>303</u>	<u>26.5</u>	<u>297</u>	<u>27.0</u>	297	27.0	297	27.0
447.dealII	189	60.5	<u>189</u>	<u>60.5</u>	189	60.6	189	60.5	<u>189</u>	<u>60.5</u>	189	60.6
450.soplex	177	47.1	<u>177</u>	<u>47.1</u>	178	46.8	177	47.1	<u>177</u>	<u>47.1</u>	178	46.8
453.povray	<u>105</u>	<u>50.7</u>	105	50.8	105	50.7	87.5	60.8	87.9	60.5	<u>87.7</u>	<u>60.7</u>
454.calculix	<u>155</u>	<u>53.3</u>	155	53.3	155	53.4	145	56.8	<u>145</u>	<u>56.8</u>	146	56.6
459.GemsFDTD	68.7	154	<u>68.6</u>	<u>155</u>	68.3	155	<u>63.8</u>	<u>166</u>	63.9	166	63.7	167
465.tonto	221	44.5	<u>221</u>	<u>44.6</u>	220	44.8	<u>189</u>	<u>52.1</u>	189	52.2	189	52.0
470.lbm	36.1	380	35.0	393	<u>35.8</u>	<u>383</u>	36.1	380	35.0	393	<u>35.8</u>	<u>383</u>
481.wrf	123	91.1	128	87.0	<u>126</u>	<u>88.7</u>	123	91.1	128	87.0	<u>126</u>	<u>88.7</u>
482.sphinx3	224	87.0	224	86.9	<u>224</u>	<u>86.9</u>	<u>224</u>	<u>87.1</u>	223	87.5	224	87.0

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 x3650M4 Tue Jan 21 11:45:28 2014

This section contains SUT (System Under Test) info as seen by
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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 E5-2637 v2 @ 3.50GHz
 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 1 2 3 4
  physical 1: cores 1 2 3 4
cache size : 15360 KB
```

```
From /proc/meminfo
MemTotal:      264343640 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 x3650M4 2.6.32-358.18.1.el6.x86_64 #1 SMP Fri Aug 2 17:04:38 EDT 2013
x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Jan 20 14:53
```

```
SPEC is set to: /home/SPECcpu-new
Filesystem      Type      Size Used Avail Use% Mounted on
/dev/mapper/vg_x3650m4-lv_home
                ext4      313G  204G   94G  69% /home
```

```
Additional information from dmidecode:
BIOS IBM -[TESTBUILD-1.50]- 08/09/2013
Memory:
 8x Not Specified Not Specified
16x Samsung M393B2G70QH0-CMA 16 GB 1867 MHz 2 rank
```

(End of data from sysinfo program)
"Not Specified" memory information from dmidecode indicates unused DIMM slots.
The BIOS IBM -[TESTBUILD-1.50] is equivalent to production version [VVE134TUS-1.51]



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General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/SPECcpu-new/libs/32:/home/SPECcpu-new/libs/64:/home/SPECcpu-new/sh"
OMP_NUM_THREADS = "8"

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.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



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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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