



SPEC[®] CFP2006 Result

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IBM Corporation

IBM System x3850 X6
(Intel Xeon E7-4830 v2, 2.20 GHz)

SPECfp[®]_rate2006 = 1060

SPECfp_rate_base2006 = 1040

CPU2006 license: 11

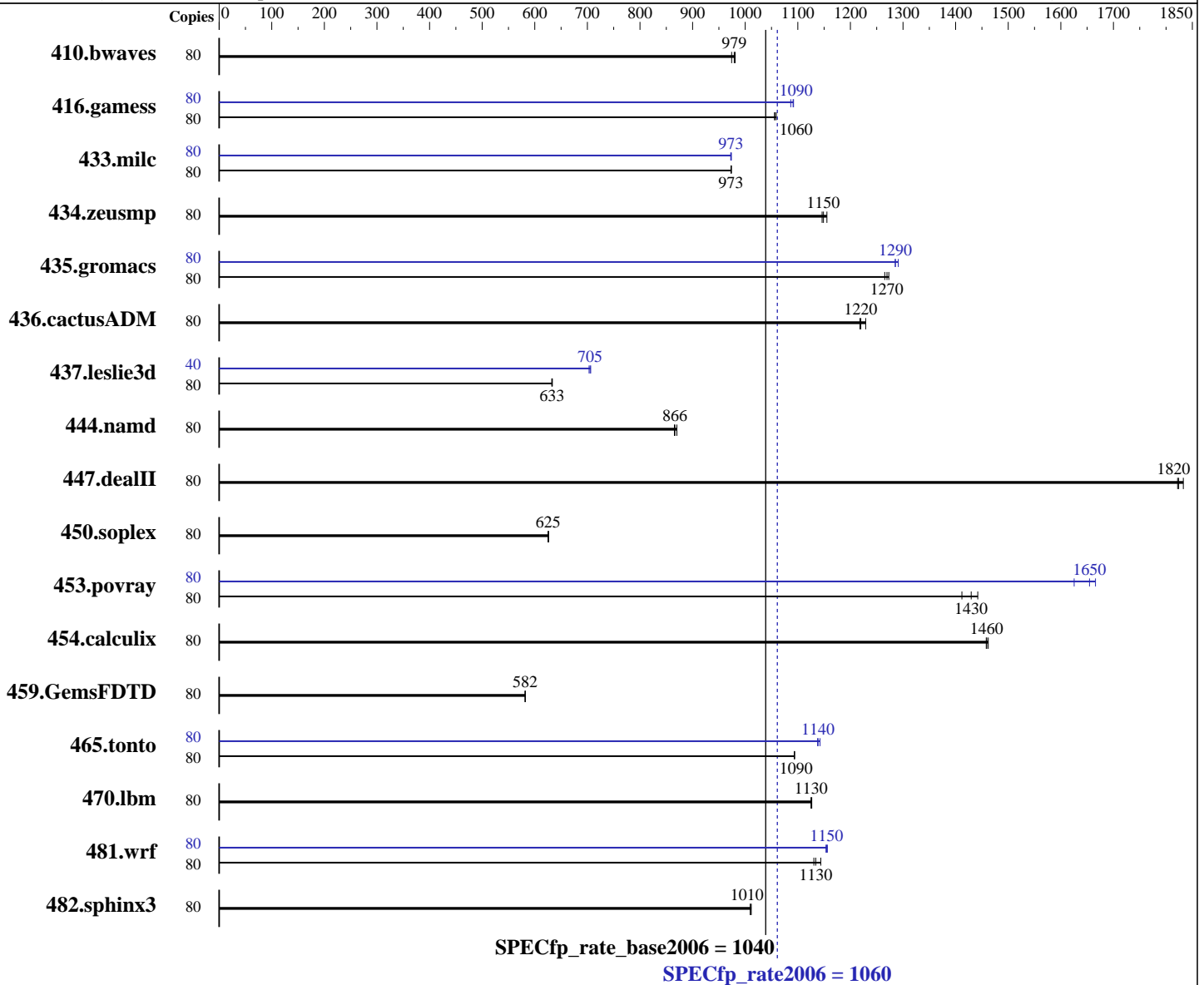
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jul-2014

Hardware Availability: Mar-2014

Software Availability: Nov-2013



Hardware

CPU Name: Intel Xeon E7-4830 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 2.70 GHz
 CPU MHz: 2200
 FPU: Integrated
 CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core
 CPU(s) orderable: 2,4 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: 20 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (64 x 16 GB 2Rx4 PC3L-12800R-11, ECC, running at 1067 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 | 80 | 1116 | 974 | 1108 | 981 | 1110 | 979 | 80 | 1116 | 974 | 1108 | 981 | 1110 | 979 |
| 416.gamess | 80 | 1483 | 1060 | 1483 | 1060 | 1479 | 1060 | 80 | 1436 | 1090 | 1442 | 1090 | 1435 | 1090 |
| 433.milc | 80 | 755 | 973 | 754 | 974 | 755 | 973 | 80 | 755 | 973 | 754 | 974 | 755 | 973 |
| 434.zeusmp | 80 | 634 | 1150 | 635 | 1150 | 630 | 1160 | 80 | 634 | 1150 | 635 | 1150 | 630 | 1160 |
| 435.gromacs | 80 | 451 | 1270 | 449 | 1270 | 450 | 1270 | 80 | 442 | 1290 | 444 | 1290 | 444 | 1290 |
| 436.cactusADM | 80 | 784 | 1220 | 778 | 1230 | 785 | 1220 | 80 | 784 | 1220 | 778 | 1230 | 785 | 1220 |
| 437.leslie3d | 80 | 1188 | 633 | 1187 | 633 | 1189 | 632 | 40 | 533 | 705 | 535 | 703 | 532 | 706 |
| 444.namd | 80 | 737 | 870 | 741 | 865 | 741 | 866 | 80 | 737 | 870 | 741 | 865 | 741 | 866 |
| 447.dealII | 80 | 502 | 1820 | 502 | 1820 | 499 | 1830 | 80 | 502 | 1820 | 502 | 1820 | 499 | 1830 |
| 450.soplex | 80 | 1067 | 625 | 1067 | 625 | 1065 | 627 | 80 | 1067 | 625 | 1067 | 625 | 1065 | 627 |
| 453.povray | 80 | 301 | 1410 | 295 | 1440 | 298 | 1430 | 80 | 257 | 1650 | 255 | 1670 | 262 | 1630 |
| 454.calculix | 80 | 452 | 1460 | 451 | 1460 | 453 | 1460 | 80 | 452 | 1460 | 451 | 1460 | 453 | 1460 |
| 459.GemsFDTD | 80 | 1459 | 582 | 1460 | 581 | 1458 | 582 | 80 | 1459 | 582 | 1460 | 581 | 1458 | 582 |
| 465.tonto | 80 | 720 | 1090 | 720 | 1090 | 720 | 1090 | 80 | 692 | 1140 | 689 | 1140 | 691 | 1140 |
| 470.lbm | 80 | 976 | 1130 | 977 | 1130 | 977 | 1130 | 80 | 976 | 1130 | 977 | 1130 | 977 | 1130 |
| 481.wrf | 80 | 790 | 1130 | 788 | 1130 | 781 | 1140 | 80 | 774 | 1150 | 773 | 1160 | 775 | 1150 |
| 482.sphinx3 | 80 | 1541 | 1010 | 1544 | 1010 | 1544 | 1010 | 80 | 1541 | 1010 | 1544 | 1010 | 1544 | 1010 |

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_14.0_aug2013/config/sysinfo.rev6818
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191
running on Larry-Andromeda Tue Jul 8 09:18:42 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 E7-4830 v2 @ 2.20GHz
 4 "physical id"s (chips)
 80 "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 : 10
  siblings  : 20
 physical 0: cores 0 1 2 3 4 8 9 10 11 12
 physical 1: cores 0 1 2 3 4 8 9 10 11 12
 physical 2: cores 0 1 2 3 4 8 9 10 11 12
 physical 3: cores 0 1 2 3 4 8 9 10 11 12
cache size : 20480 KB
```

```
From /proc/meminfo
MemTotal:      1058472600 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 Larry-Andromeda 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 Jul 7 18:27
```

```
SPEC is set to: /cpu2006.1.2_14.0_aug2013
Filesystem                Type      Size   Used Avail Use% Mounted on
/dev/mapper/vg_larryandromed-lv_root ext4      357G   233G  106G   69% /
```

```
Additional information from dmidecode:
BIOS IBM  -[A8E107JUS-1.00]- 05/02/2014
Memory:
```

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Platform Notes (Continued)

32x NO DIMM Unknown
64x Samsung M393B2G70QH0-YK0 16 GB 1067 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_14.0_aug2013/libs/32:/cpu2006.1.2_14.0_aug2013/libs/64:/cpu2006.1.2_14.0_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

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

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Base Portability Flags (Continued)

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

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: basepeak = yes

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

454.calculix: basepeak = yes

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Peak Optimization Flags (Continued)

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.

Tested with SPEC CPU2006 v1.2.
Report generated on Wed Jul 30 10:53:57 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 29 July 2014.