



SPEC[®] CFP2006 Result

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IBM Corporation

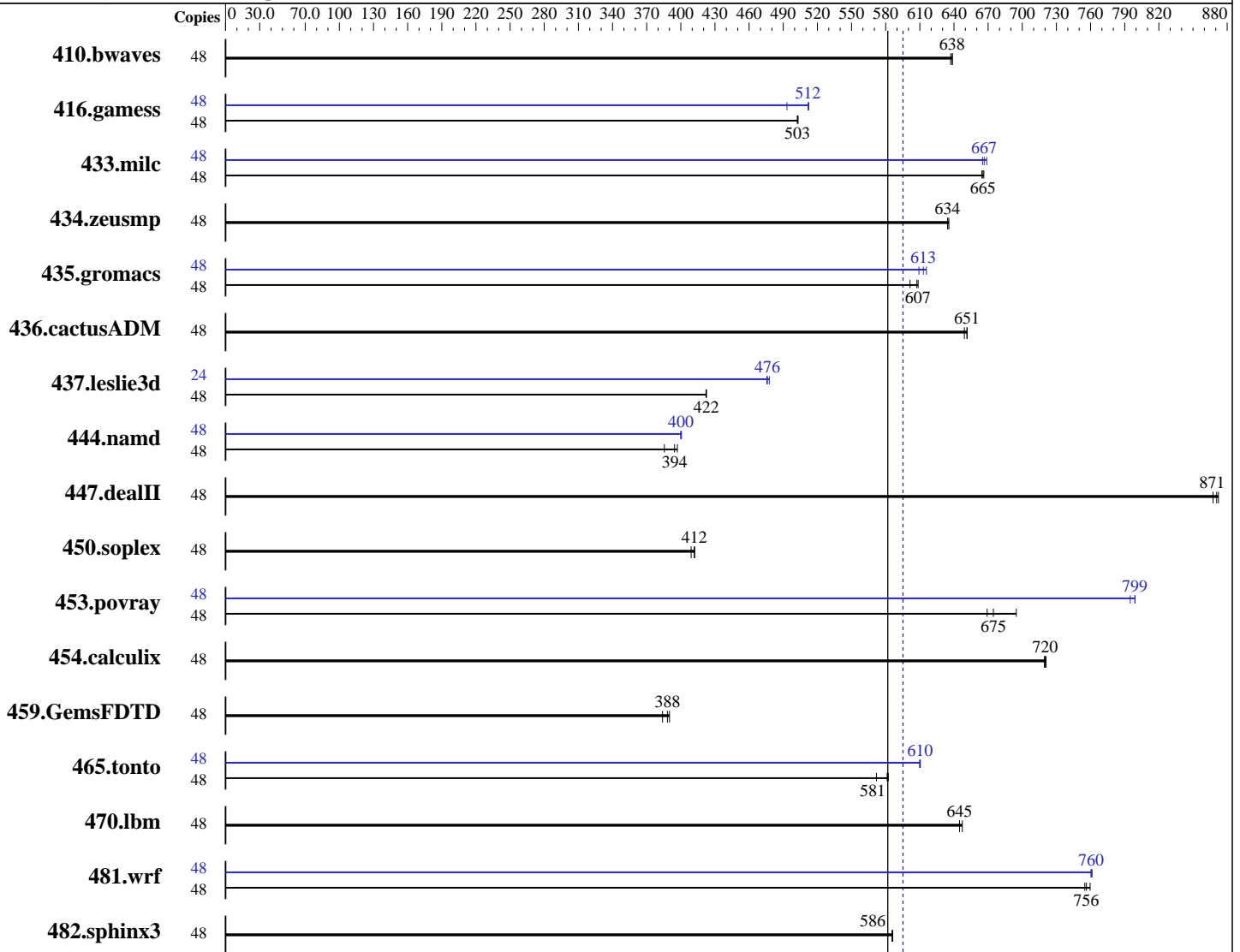
IBM System x3850 X6
(Intel Xeon E7-4809 v2, 1.90 GHz)

SPECfp[®]_rate2006 = 595

SPECfp_rate_base2006 = 582

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Jul-2014
Hardware Availability: Mar-2014
Software Availability: Nov-2013



SPECfp_rate_base2006 = 582

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Hardware

CPU Name: Intel Xeon E7-4809 v2
CPU Characteristics:
CPU MHz: 1900
FPU: Integrated
CPU(s) enabled: 24 cores, 4 chips, 6 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

Continued on next page

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

Continued on next page



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L3 Cache: 12 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 | 48 | 1024 | 637 | 1022 | 638 | 1022 | 639 | 48 | 1024 | 637 | 1022 | 638 | 1022 | 639 | | |
| 416.gamess | 48 | 1870 | 503 | 1871 | 502 | 1868 | 503 | 48 | 1834 | 512 | 1905 | 493 | 1836 | 512 | | |
| 433.milc | 48 | 663 | 665 | 662 | 665 | 661 | 666 | 48 | 659 | 669 | 662 | 665 | 661 | 667 | | |
| 434.zeusmp | 48 | 688 | 634 | 687 | 636 | 688 | 634 | 48 | 688 | 634 | 687 | 636 | 688 | 634 | | |
| 435.gromacs | 48 | 564 | 607 | 563 | 609 | 570 | 601 | 48 | 557 | 616 | 559 | 613 | 563 | 609 | | |
| 436.cactusADM | 48 | 881 | 651 | 880 | 652 | 884 | 649 | 48 | 881 | 651 | 880 | 652 | 884 | 649 | | |
| 437.leslie3d | 48 | 1068 | 422 | 1068 | 422 | 1069 | 422 | 24 | 474 | 476 | 474 | 476 | 472 | 478 | | |
| 444.namd | 48 | 976 | 394 | 998 | 386 | 970 | 397 | 48 | 961 | 401 | 962 | 400 | 963 | 400 | | |
| 447.dealII | 48 | 633 | 868 | 631 | 871 | 629 | 872 | 48 | 633 | 868 | 631 | 871 | 629 | 872 | | |
| 450.soplex | 48 | 972 | 412 | 979 | 409 | 971 | 412 | 48 | 972 | 412 | 979 | 409 | 971 | 412 | | |
| 453.povray | 48 | 379 | 675 | 368 | 695 | 382 | 669 | 48 | 321 | 795 | 320 | 799 | 320 | 799 | | |
| 454.calculix | 48 | 549 | 721 | 550 | 719 | 550 | 720 | 48 | 549 | 721 | 550 | 719 | 550 | 720 | | |
| 459.GemsFDTD | 48 | 1312 | 388 | 1327 | 384 | 1306 | 390 | 48 | 1312 | 388 | 1327 | 384 | 1306 | 390 | | |
| 465.tonto | 48 | 826 | 572 | 813 | 581 | 811 | 582 | 48 | 774 | 610 | 774 | 610 | 775 | 610 | | |
| 470.lbm | 48 | 1023 | 645 | 1023 | 645 | 1019 | 647 | 48 | 1023 | 645 | 1023 | 645 | 1019 | 647 | | |
| 481.wrf | 48 | 710 | 755 | 709 | 756 | 706 | 760 | 48 | 705 | 760 | 705 | 760 | 704 | 761 | | |
| 482.sphinx3 | 48 | 1598 | 586 | 1596 | 586 | 1596 | 586 | 48 | 1598 | 586 | 1596 | 586 | 1596 | 586 | | |

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
Sysinfo program /cpu2006.1.2_14.0_aug2013/config/sysinfo.rev6818
\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191
running on Larry-Andromeda Tue Jul 15 06:12:44 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 E7-4809 v2 @ 1.90GHz
  4 "physical id"s (chips)
  48 "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 0 1 2 3 4 5
    physical 1: cores 0 1 2 3 4 5
    physical 2: cores 0 1 2 3 4 5
    physical 3: cores 0 1 2 3 4 5
  cache size : 12288 KB
```

```
From /proc/meminfo
MemTotal:      1058476544 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 14 12:03
```

```
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:
  32x NO DIMM Unknown
  64x Samsung M393B2G70QH0-YK0 16 GB 1067 MHz 2 rank
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```



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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 = "/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
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64

Continued on next page



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Base Portability Flags (Continued)

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: -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

Continued on next page



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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-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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