SPEC® CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3500 M4
(Intel Xeon E5-2650 v2, 2.60 GHz)

$SPECfp®\_rate2006 = 284$

$SPECfp\_rate\_base2006 = 277$

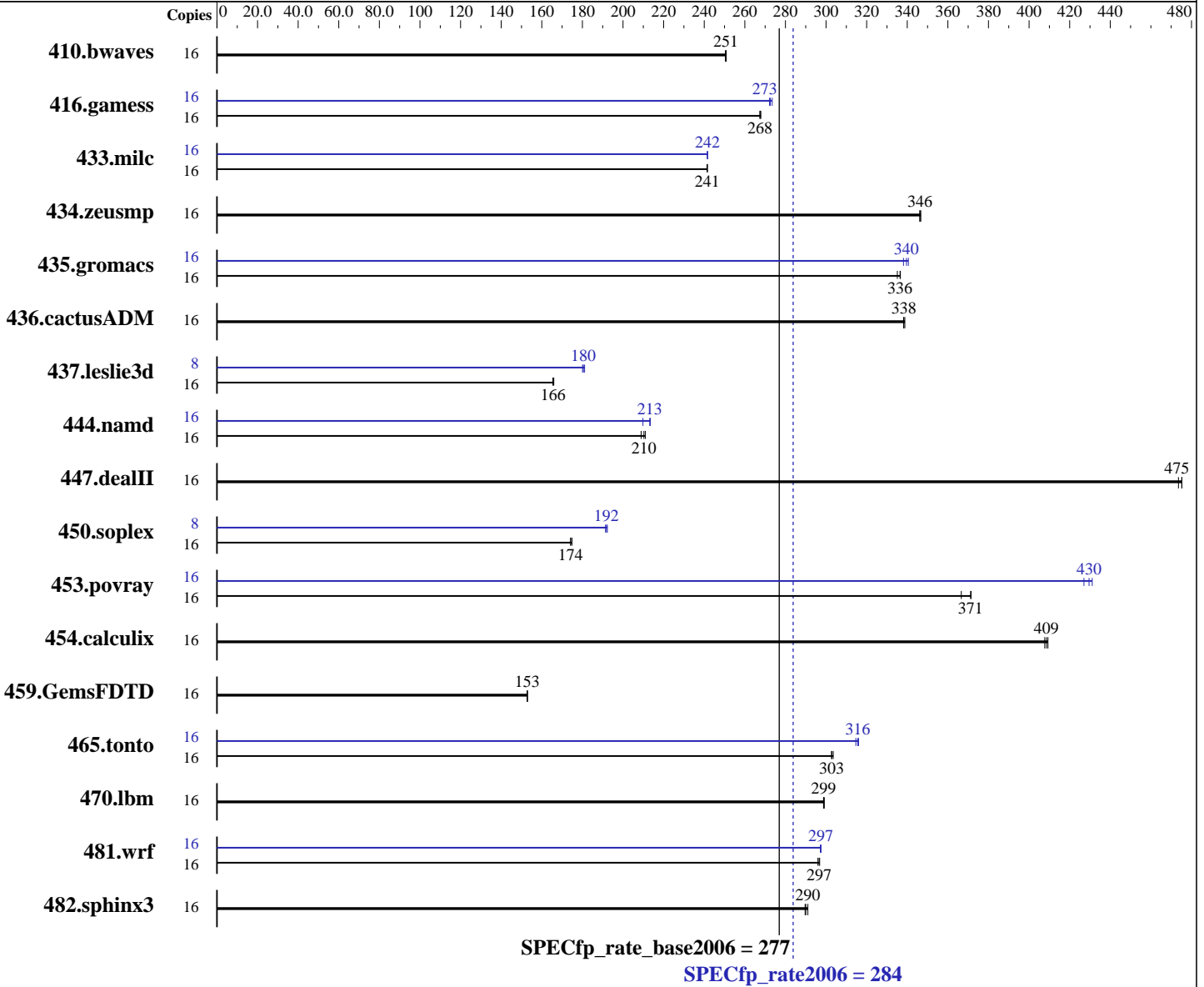| **CPU2006 license:** 11	**Test date:** Jul-2014
Test sponsor: IBM Corporation	**Hardware Availability:** Dec-2013
Tested by: IBM Corporation	**Software Availability:** Sep-2013

Copies

410.bwaves 16 — 251

416.gamess 16 — 273 / 16 — 268

433.milc 16 — 242 / 16 — 241

434.zeusmp 16 — 346

435.gromacs 16 — 340 / 16 — 336

436.cactusADM 16 — 338

437.leslie3d 8 — 180 / 16 — 166

444.namd 16 — 213 / 16 — 210

447.dealII 16 — 475

450.soplex 8 — 192 / 16 — 174

453.povray 16 — 430 / 16 — 371

454.calculix 16 — 409

459.GemsFDTD 16 — 153

465.tonto 16 — 316 / 16 — 303

470.lbm 16 — 299

481.wrf 16 — 297 / 16 — 297

482.sphinx3 16 — 290

SPECfp_rate_base2006 = 277

SPECfp_rate2006 = 284

Hardware

CPU Name:	Intel Xeon E5-2650 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.40 GHz
CPU MHz:	2600
FPU:	Integrated
CPU(s) enabled:	8 cores, 1 chip, 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 6.4 (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

Continued on next page

SPEC CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3500 M4
(Intel Xeon E5-2650 v2, 2.60 GHz)

$SPECfp\_rate2006 = \quad 284$

$SPECfp\_rate\_base2006 = \quad 277$

CPU2006 license: 11	**Test date:** Jul-2014
Test sponsor: IBM Corporation	**Hardware Availability:** Dec-2013
Tested by: IBM Corporation	**Software Availability:** Sep-2013

L3 Cache:	20 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	128 GB (8 x 16 GB 2Rx4 PC3-14900R-13, ECC)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 1 TB SATA, 7200 RPM	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	868	250	**868**	**251**	867	251	16	868	250	**868**	**251**	867	251
416.gamess	16	1169	268	1172	267	**1171**	**268**	16	1151	272	**1149**	**273**	1146	273
433.milc	16	608	241	608	242	**608**	**241**	16	608	242	**608**	**242**	608	242
434.zeusmp	16	420	347	421	346	**420**	**346**	16	420	347	421	346	**420**	**346**
435.gromacs	16	**340**	**336**	339	337	341	335	16	**336**	**340**	335	341	338	338
436.cactusADM	16	565	338	**565**	**338**	564	339	16	565	338	**565**	**338**	564	339
437.leslie3d	16	909	166	906	166	**909**	**166**	8	415	181	418	180	**417**	**180**
444.namd	16	614	209	608	211	**610**	**210**	16	612	210	**602**	**213**	601	213
447.dealII	16	387	474	385	475	**385**	**475**	16	387	474	385	475	**385**	**475**
450.soplex	16	763	175	766	174	**766**	**174**	8	349	191	**348**	**192**	347	192
453.povray	16	232	367	229	371	**229**	**371**	16	199	427	**198**	**430**	197	431
454.calculix	16	**323**	**409**	324	408	322	409	16	**323**	**409**	324	408	322	409
459.GemsFDTD	16	**1111**	**153**	1111	153	1110	153	16	**1111**	**153**	1111	153	1110	153
465.tonto	16	519	304	**520**	**303**	520	303	16	500	315	**499**	**316**	498	316
470.lbm	16	736	299	735	299	**736**	**299**	16	736	299	735	299	**736**	**299**
481.wrf	16	602	297	604	296	**603**	**297**	16	601	297	**601**	**297**	601	297
482.sphinx3	16	**1075**	**290**	1077	290	1071	291	16	**1075**	**290**	1077	290	1071	291

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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

SPEC CFP2006 Result

IBM Corporation

IBM System x3500 M4
(Intel Xeon E5-2650 v2, 2.60 GHz)

$SPECfp\_rate2006 =$ 284

$SPECfp\_rate\_base2006 =$ 277

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

Test date: Jul-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013

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 x3500M4 Sun Jul 27 02:34:19 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 E5-2650 v2 @ 2.60GHz
      1 "physical id"s (chips)
      16 "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
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       132274064 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 x3500M4 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 Jul 25 17:53

SPEC is set to: /home/SPECcpu-20140116-ic14.0
   Filesystem    Type    Size  Used Avail Use% Mounted on
   /dev/mapper/vg_intelcrb-lv_home
                 ext4    863G   40G  780G   5% /home

Additional information from dmidecode:
   BIOS IBM -[TKE133FUS-1.50]- 07/26/2013
   Memory:
   16x Not Specified Not Specified
   8x Samsung M393B2G70QH0-CMA 16 GB 1867 MHz 2 rank
```

SPEC CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3500 M4
(Intel Xeon E5-2650 v2, 2.60 GHz)

$SPECfp_rate2006 = $ 284

$SPECfp_rate_base2006 = $ 277

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

Test date: Jul-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013

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
```

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
```

SPEC CFP2006 Result
Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3500 M4
(Intel Xeon E5-2650 v2, 2.60 GHz)

SPECfp_rate2006 =   284

SPECfp_rate_base2006 =   277

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

Test date: Jul-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013

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 (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.dealII: -DSPEC_CPU_LP64
    453.povray: -DSPEC_CPU_LP64
   454.calculix: -DSPEC_CPU_LP64 -nofor_main
  459.GemsFDTD: -DSPEC_CPU_LP64
```

Continued on next page

IBM Corporation

IBM System x3500 M4
(Intel Xeon E5-2650 v2, 2.60 GHz)

SPECfp_rate2006 = 284

SPECfp_rate_base2006 = 277

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

Test date: Jul-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013

Peak 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
```

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: -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-malloc-options=3
```

```
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
```

IBM Corporation

IBM System x3500 M4
(Intel Xeon E5-2650 v2, 2.60 GHz)

SPECfp_rate2006 = 284

SPECfp_rate_base2006 = 277

CPU2006 license: 11	**Test date:** Jul-2014
Test sponsor: IBM Corporation	**Hardware Availability:** Dec-2013
Tested by: IBM Corporation	**Software Availability:** Sep-2013

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) -opt-mem-layout-trans=3(pass 2)`
`-prof-use(pass 2) -opt-prefetch -auto-ilp32`

436.cactusADM: `basepeak = yes`

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

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Tue Aug 12 13:17:06 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 12 August 2014.