SPEC® CFP2006 Result

ACTION S.A.

ACTINA SOLAR 220 X5 (Intel Xeon E5-2640 v2, 2.00 GHz)

$SPECfp^{®}\_rate2006 = \quad 454$

$SPECfp\_rate\_base2006 = \quad 448$

CPU2006 license: 9008	**Test date:** Jan-2005
Test sponsor: ACTION S.A.	**Hardware Availability:** Oct-2013
Tested by: ACTION S.A.	**Software Availability:** Sep-2013

Copies — 0 30.0 60.0 90.0 120 150 180 210 240 270 300 330 360 390 420 450 480 510 540 570 600 630 660 690 750

Benchmark	Copies	Result
410.bwaves	32	434
416.gamess	32 / 32	413 / 409
433.milc	32 / 32	417 / 416
434.zeusmp	32	538
435.gromacs	32 / 32	517 / 509
436.cactusADM	32	493
437.leslie3d	16 / 32	315 / 286
444.namd	32 / 32	321 / 324
447.dealII	32	742
450.soplex	16 / 32	311 / 298
453.povray	32 / 32	659 / 572
454.calculix	32	623
459.GemsFDTD	32	268
465.tonto	32 / 32	502 / 478
470.lbm	32	529
481.wrf	32 / 32	514 / 513
482.sphinx3	32 / 32	416 / 466

SPECfp_rate_base2006 = 448

SPECfp_rate2006 = 454

Hardware

CPU Name:	Intel Xeon E5-2640 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 2.50 GHz
CPU MHz:	2000
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 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) 2.6.32-358.11.1.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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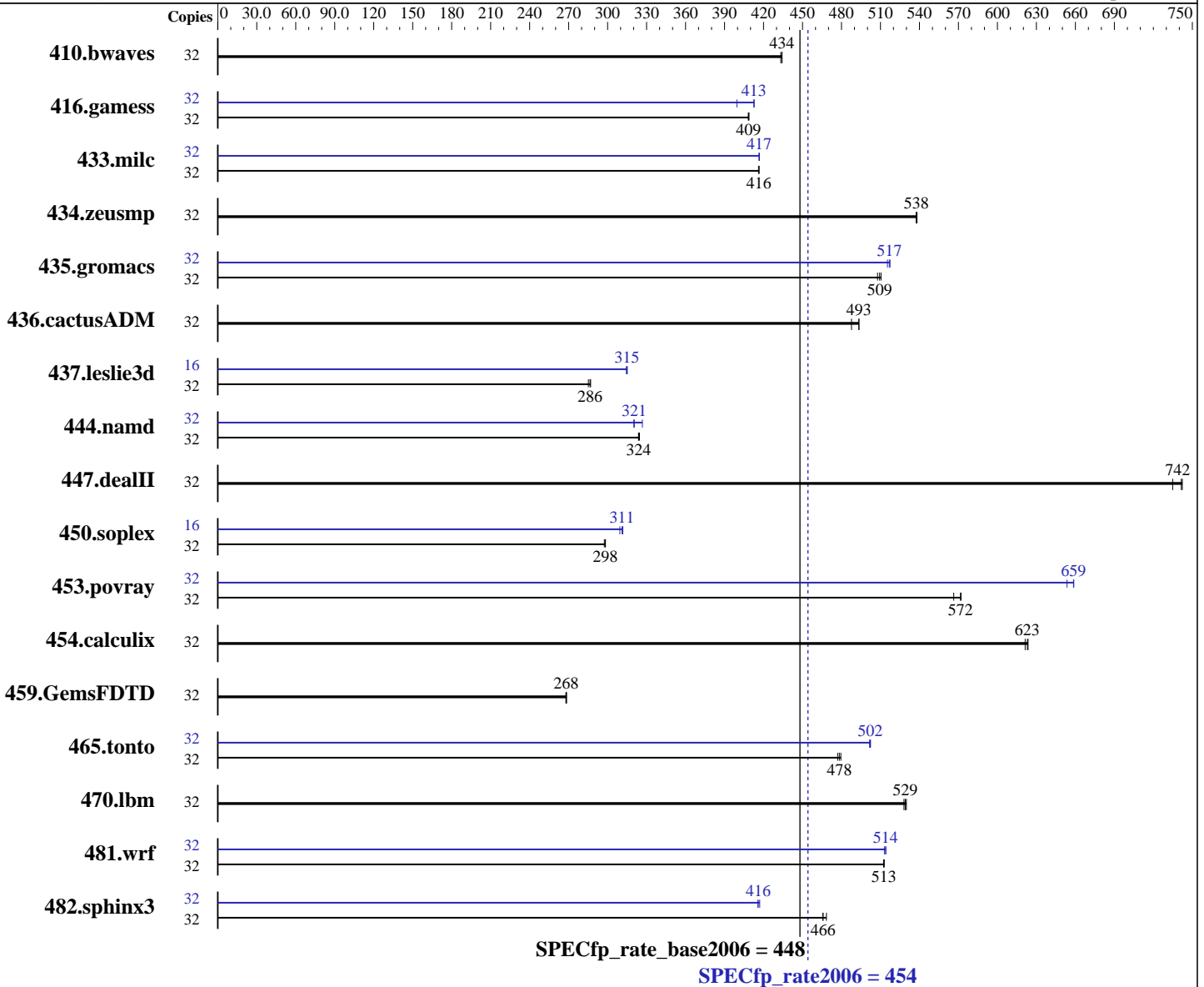**CPU2006 license:** 9008
Test sponsor: ACTION S.A.
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Test date: Jan-2005
Hardware Availability: Oct-2013
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L3 Cache:	20 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	128 GB (16 x 8 GB 2Rx4 PC3-14900R-13, ECC, running at 1600 MHz and CL11)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 x 240 GB SATA II SSD		
Other Hardware:	None		

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	**1002**	**434**	1004	433	1002	434	32	**1002**	**434**	1004	433	1002	434
416.gamess	32	1532	409	1535	408	**1534**	**409**	32	1518	413	**1519**	**413**	1568	399
433.milc	32	705	417	706	416	**705**	**416**	32	705	417	**705**	**417**	705	417
434.zeusmp	32	541	538	542	537	**542**	**538**	32	541	538	542	537	**542**	**538**
435.gromacs	32	448	510	**449**	**509**	450	508	32	**442**	**517**	442	517	443	515
436.cactusADM	32	775	493	784	488	**775**	**493**	32	775	493	784	488	**775**	**493**
437.leslie3d	32	1055	285	1048	287	**1050**	**286**	16	478	314	**477**	**315**	477	315
444.namd	32	791	325	793	324	**792**	**324**	32	785	327	802	320	**801**	**321**
447.dealII	32	498	735	493	742	**494**	**742**	32	498	735	493	742	**494**	**742**
450.soplex	32	897	297	894	298	**895**	**298**	16	**429**	**311**	428	312	431	309
453.povray	32	298	572	301	566	**298**	**572**	32	**259**	**659**	258	659	260	654
454.calculix	32	423	624	**424**	**623**	425	621	32	423	624	**424**	**623**	425	621
459.GemsFDTD	32	1265	268	**1266**	**268**	1267	268	32	1265	268	**1266**	**268**	1267	268
465.tonto	32	**658**	**478**	660	477	657	480	32	627	502	628	502	**627**	**502**
470.lbm	32	**831**	**529**	833	528	830	530	32	**831**	**529**	833	528	830	530
481.wrf	32	698	512	**697**	**513**	697	513	32	695	514	**695**	**514**	697	513
482.sphinx3	32	1339	466	1332	468	**1339**	**466**	32	1500	416	**1500**	**416**	1495	417

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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CPU2006 license: 9008		**Test date:**	Jan-2005
Test sponsor: ACTION S.A.		**Hardware Availability:**	Oct-2013
Tested by: ACTION S.A.		**Software Availability:**	Sep-2013

Platform Notes

```
Bios Settings:
System Acoustic and Performance Configuration = Performance
Select Memory RAS Configuration = Maximum Performance
Intel(R) Turbo Boost Technology = Enabled
Processor C3 = Disabled
Processor C6 = Disabled

Sysinfo program /cpu2006.1.2/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on localhost.localdomain Sat Jan  1 17:37:26 2005

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 E5-2640 v2 @ 2.00GHz
      2 "physical id"s (chips)
      32 "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
      physical 1: cores 0 1 2 3 4 5 6 7
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       132053000 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 localhost.localdomain 2.6.32-358.11.1.el6.x86_64 #1 SMP Tue Nov 19
   17:43:04 CET 2013 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 1 03:35

SPEC is set to: /cpu2006.1.2
   Filesystem     Type    Size  Used Avail Use% Mounted on
   /dev/sda1      ext4    193G   78G  105G  43% /
```

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Platform Notes (Continued)

```
  Additional information from dmidecode:
    BIOS Intel Corp. SE5C600.86B.02.03.0003.041920141333 04/19/2014
    Memory:
    16x    8 GB
    16x Hynix HMT31GR7EFR4C-RD 8 GB 1867 MHz 2 rank

  (End of data from sysinfo program)
  dmidecode does not properly detect memory modules
  16 modules of 8 GB were used to run the test (128 GB total)
  memory modules operate at speed 1600 MHz while dmidecode shows 1867 MHz
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/cpu2006.1.2/libs/32:/cpu2006.1.2/libs/64:/cpu2006.1.2/sh"

 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>
 Binaries compiled on a system with 2x Xeon E5-2650 v2 chips + 256 GB memory
 using RedHat EL 6.4
```

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
```

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ACTION S.A.

ACTINA SOLAR 220 X5 (Intel Xeon E5-2640 v2, 2.00 GHz)

SPECfp_rate2006 =   454

SPECfp_rate_base2006 =   448

CPU2006 license: 9008

Test sponsor: ACTION S.A.

Tested by: ACTION S.A.

Test date: Jan-2005

Hardware Availability: Oct-2013

Software Availability: Sep-2013

Base Portability Flags (Continued)

```
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
```

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 (except as noted below):
```
icc    -m64
```

```
482.sphinx3: icc -m32
```

C++ benchmarks (except as noted below):
```
icpc   -m64
```

```
450.soplex: icpc -m32
```

Fortran benchmarks:
```
ifort -m64
```

ACTION S.A.

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Software Availability: Sep-2013

Peak Compiler Invocation (Continued)

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
          465.tonto: -DSPEC_CPU_LP64
           470.lbm: -DSPEC_CPU_LP64
           481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
```

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: -xAVX -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
                   -unroll2
```

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
```

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Peak Optimization Flags (Continued)

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`

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/ACTION.SA-Platform-Flags-RevB-apr-2014-For-Intel-Platform.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/ACTION.SA-Platform-Flags-RevB-apr-2014-For-Intel-Platform.xml

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$SPECfp\_rate2006 = \quad 454$

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

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