



# SPEC<sup>®</sup> CFP2006 Result

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## ACTION S.A.

ACTINA SOLAR 220 X6 (Intel Xeon E5-2699 v3, 2.30 GHz)

SPECfp<sup>®</sup>2006 = **110**

SPECfp\_base2006 = **104**

CPU2006 license: 9008

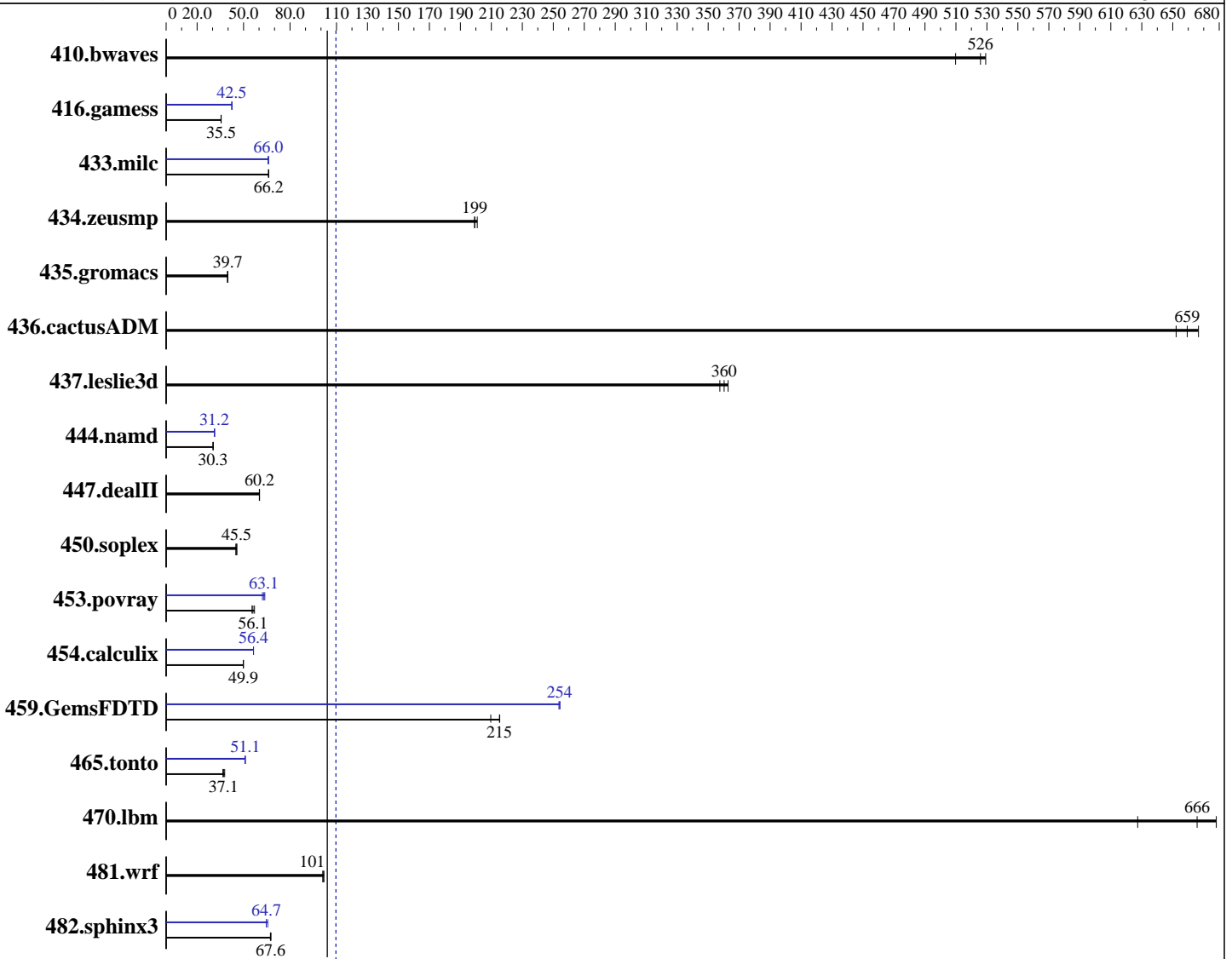
Test sponsor: ACTION S.A.

Tested by: ACTION S.A.

Test date: Dec-2015

Hardware Availability: Sep-2014

Software Availability: Aug-2015



### Hardware

CPU Name: Intel Xeon E5-2699 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 36 cores, 2 chips, 18 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 7.1 (Maipo)  
 3.10.0-229.11.1.el7.x86\_64  
 Compiler: C/C++: Version 16.0.0.047 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.047 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4

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L3 Cache: 45 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)  
Disk Subsystem: 1 x 240 GB SATA II SSD  
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    | 26.7        | 510         | 25.7        | 529         | <u>25.8</u> | <u>526</u>  | 26.7        | 510         | 25.7        | 529         | <u>25.8</u> | <u>526</u>  |
| 416.gamess    | <u>551</u>  | <u>35.5</u> | 551         | 35.5        | 552         | 35.4        | <u>461</u>  | <u>42.5</u> | 461         | 42.4        | 461         | 42.5        |
| 433.milc      | 139         | 66.1        | <u>139</u>  | <u>66.2</u> | 138         | 66.3        | 139         | 65.9        | 139         | 66.1        | <u>139</u>  | <u>66.0</u> |
| 434.zeusmp    | 45.3        | 201         | <u>45.7</u> | <u>199</u>  | 45.7        | 199         | 45.3        | 201         | <u>45.7</u> | <u>199</u>  | 45.7        | 199         |
| 435.gromacs   | 180         | 39.7        | 180         | 39.8        | <u>180</u>  | <u>39.7</u> | 180         | 39.7        | 180         | 39.8        | <u>180</u>  | <u>39.7</u> |
| 436.cactusADM | 17.9        | 667         | <u>18.1</u> | <u>659</u>  | 18.3        | 652         | 17.9        | 667         | <u>18.1</u> | <u>659</u>  | 18.3        | 652         |
| 437.leslie3d  | <u>26.1</u> | <u>360</u>  | 26.3        | 358         | 25.9        | 363         | <u>26.1</u> | <u>360</u>  | 26.3        | 358         | 25.9        | 363         |
| 444.namd      | 264         | 30.3        | <u>264</u>  | <u>30.3</u> | 264         | 30.3        | 257         | 31.2        | 257         | 31.2        | <u>257</u>  | <u>31.2</u> |
| 447.dealII    | 190         | 60.3        | 190         | 60.2        | <u>190</u>  | <u>60.2</u> | 190         | 60.3        | 190         | 60.2        | <u>190</u>  | <u>60.2</u> |
| 450.soplex    | 183         | 45.6        | 185         | 45.0        | <u>183</u>  | <u>45.5</u> | 183         | 45.6        | 185         | 45.0        | <u>183</u>  | <u>45.5</u> |
| 453.povray    | <u>94.9</u> | <u>56.1</u> | 93.2        | 57.1        | 95.9        | 55.5        | 83.5        | 63.7        | <u>84.3</u> | <u>63.1</u> | 85.5        | 62.2        |
| 454.calculix  | 165         | 49.9        | <u>165</u>  | <u>49.9</u> | 165         | 49.9        | 146         | 56.4        | 146         | 56.4        | <u>146</u>  | <u>56.4</u> |
| 459.GemsFDTD  | 50.6        | 210         | <u>49.3</u> | <u>215</u>  | 49.3        | 215         | 41.7        | 254         | <u>41.7</u> | <u>254</u>  | 41.8        | 254         |
| 465.tonto     | 268         | 36.7        | <u>266</u>  | <u>37.1</u> | 260         | 37.8        | <u>193</u>  | <u>51.1</u> | 192         | 51.2        | 193         | 50.9        |
| 470.lbm       | 20.3        | 678         | 21.9        | 627         | <u>20.6</u> | <u>666</u>  | 20.3        | 678         | 21.9        | 627         | <u>20.6</u> | <u>666</u>  |
| 481.wrf       | <u>110</u>  | <u>101</u>  | 110         | 101         | 110         | 102         | <u>110</u>  | <u>101</u>  | 110         | 101         | 110         | 102         |
| 482.sphinx3   | 288         | 67.6        | <u>288</u>  | <u>67.6</u> | 289         | 67.3        | 297         | 65.6        | <u>301</u>  | <u>64.7</u> | 301         | 64.7        |

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"

## Platform Notes

Bios Settings:  
Intel(R) Hyper-Threading Tech = Disabled  
Power & Performance = Performance  
Enforce POR = Disabled  
Memory Operating Speed Selection = 2133  
Cluster-on-Die = Disabled  
Set Fan Profile = Performance  
Fan PWM Offset = 0

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SPECfp\_base2006 = 104

CPU2006 license: 9008

Test sponsor: ACTION S.A.

Tested by: ACTION S.A.

Test date: Dec-2015

Hardware Availability: Sep-2014

Software Availability: Aug-2015

### Platform Notes (Continued)

Sysinfo program /cpu2006.1.2/config/sysinfo.rev6818  
\$Rev: 6818 \$ \$Date:: 2012-07-17 # \$ e86d102572650a6e4d596a3cee98f191  
running on SUT Tue Dec 8 16:18:56 2015

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 E5-2699 v3 @ 2.30GHz
 2 "physical id"s (chips)
 36 "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 : 18
  siblings  : 18
  physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 46080 KB
```

From /proc/meminfo

```
MemTotal:      263866848 kB
HugePages_Total:      1
Hugepagesize:    2048 kB
```

From /etc/\*release\* /etc/\*version\*

```
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.0 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.0"
PRETTY_NAME="Red Hat Enterprise Linux"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
os-release.rpmnew:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.1 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.1"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.1:ga:server
```

uname -a:

```
Linux SUT 3.10.0-229.11.1.el7.x86_64 #5 SMP Mon Sep 14 17:11:19 CEST 2015
x86_64 x86_64 x86_64 GNU/Linux
```

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## Platform Notes (Continued)

run-level 3 Dec 8 11:15

SPEC is set to: /cpu2006.1.2

| Filesystem | Type | Size | Used | Avail | Use% | Mounted on |
|------------|------|------|------|-------|------|------------|
| /dev/sdal  | ext4 | 212G | 38G  | 163G  | 19%  | /          |

Additional information from dmidecode:

BIOS Intel Corporation SE5C610.86B.01.01.0009.060120151350 06/01/2015

Memory:

16x 16 GB

16x Micron 36ASF2G72PZ-2G1A2 16 GB 2134 MHz 2 rank

8x NO DIMM NO DIMM

(End of data from sysinfo program)

dmidecode does not properly detect memory modules

16 modules of 16 GB were used to run the test (256 GB total)

## 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"

OMP\_NUM\_THREADS = "36"

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>

Binaries compiled on a system with 2x Xeon E5-2650 v3 chips + 256 GB memory

using RedHat EL 7.1

## 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



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## 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
```

## Base Optimization Flags

C benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
-ansi-alias

C++ benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:  
-xCORE-AVX2 -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

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## Peak Compiler Invocation (Continued)

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: -xCORE-AVX2(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: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel

C++ benchmarks:

444.namd: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2(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

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## Peak Optimization Flags (Continued)

459.GemsFDTD: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2 -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-ic16.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/ACTION.SA-Platform-Flags-RevB-aug-2015-For-Intel-Platform.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/ACTION.SA-Platform-Flags-RevB-aug-2015-For-Intel-Platform.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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