



# SPEC<sup>®</sup> CFP2006 Result

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## Inspur Corporation

SPECfp<sup>®</sup>\_rate2006 = 876

### Inspur NF5270M4 (Intel Xeon E5-2660 v4)

SPECfp\_rate\_base2006 = 847

CPU2006 license: 3358

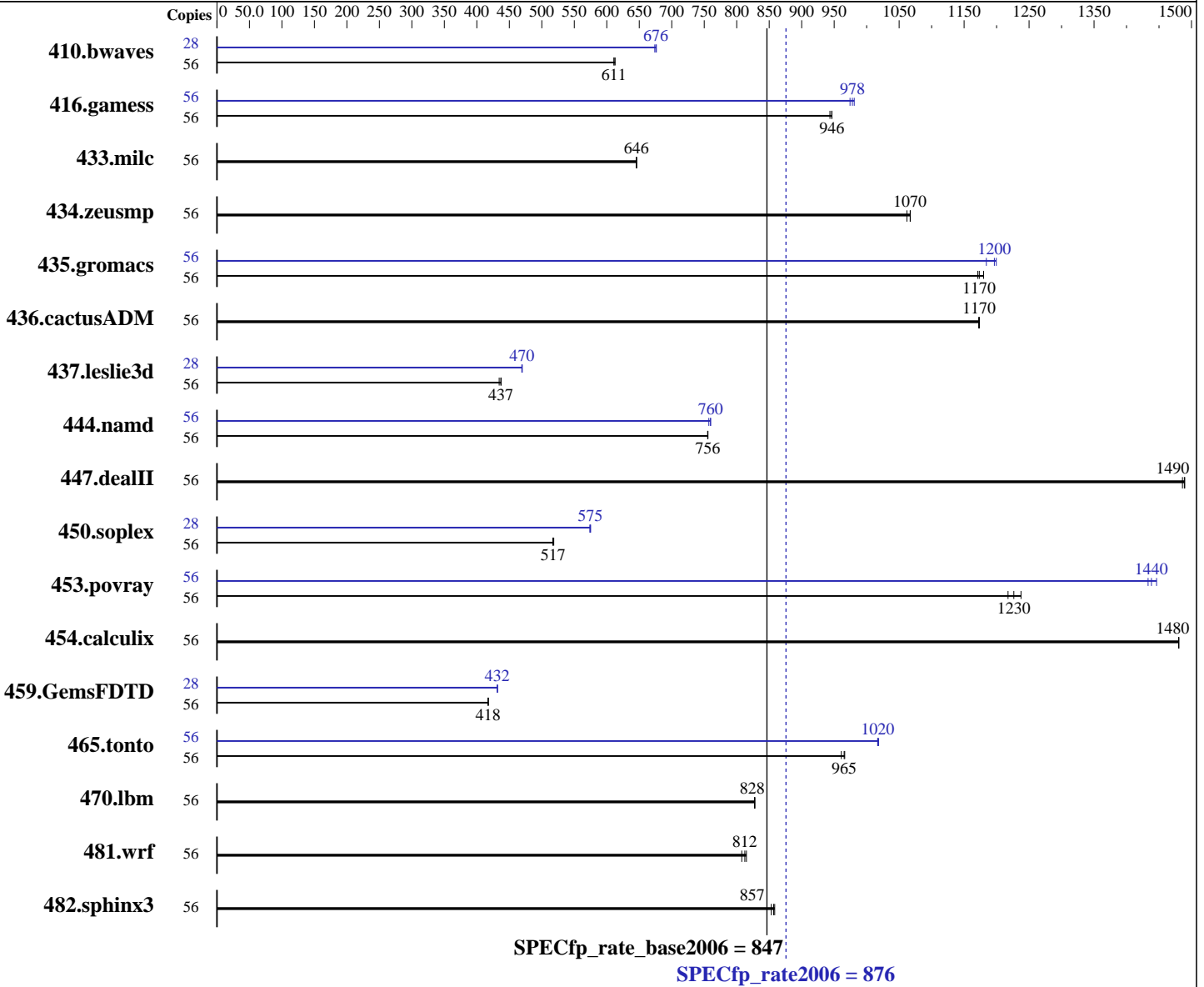
Test date: May-2017

Test sponsor: Inspur Corporation

Hardware Availability: Mar-2016

Tested by: Inspur Corporation

Software Availability: Nov-2016



### Hardware

CPU Name: Intel Xeon E5-2660 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz  
 CPU MHz: 2000  
 FPU: Integrated  
 CPU(s) enabled: 28 cores, 2 chips, 14 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

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### Software

Operating System: Red Hat Enterprise Linux Server release 7.3 (Maipo)  
 3.10.0-514.el7.x86\_64  
 Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux  
 Auto Parallel: No  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 32/64-bit

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SPECfp\_rate2006 = **876**

## Inspur NF5270M4 (Intel Xeon E5-2660 v4)

SPECfp\_rate\_base2006 = **847**

CPU2006 license: 3358

Test date: May-2017

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L3 Cache: 35 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)  
Disk Subsystem: 1 x 900 GB SATA SSD  
Other Hardware: None

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    | 56     | 1242        | 613         | <u>1245</u> | <u>611</u>  | 1245       | 611         | 28     | 565        | 674         | 563         | 676         | <u>563</u>  | <u>676</u>  |
| 416.gamess    | 56     | 1162        | 944         | <u>1159</u> | <u>946</u>  | 1159       | 946         | 56     | 1125       | 974         | 1118        | 981         | <u>1121</u> | <u>978</u>  |
| 433.milc      | 56     | <u>796</u>  | <u>646</u>  | 796         | 646         | 797        | 645         | 56     | <u>796</u> | <u>646</u>  | 796         | 646         | 797         | 645         |
| 434.zeusmp    | 56     | <u>478</u>  | <u>1070</u> | 480         | 1060        | 477        | 1070        | 56     | <u>478</u> | <u>1070</u> | 480         | 1060        | 477         | 1070        |
| 435.gromacs   | 56     | <u>341</u>  | <u>1170</u> | 339         | 1180        | 341        | 1170        | 56     | 338        | 1180        | 333         | 1200        | <u>334</u>  | <u>1200</u> |
| 436.cactusADM | 56     | 570         | 1170        | 571         | 1170        | <u>570</u> | <u>1170</u> | 56     | 570        | 1170        | 571         | 1170        | <u>570</u>  | <u>1170</u> |
| 437.leslie3d  | 56     | 1204        | 437         | <u>1205</u> | <u>437</u>  | 1212       | 434         | 28     | <u>560</u> | <u>470</u>  | 560         | 470         | 561         | 469         |
| 444.namd      | 56     | 594         | 756         | <u>594</u>  | <u>756</u>  | 595        | 755         | 56     | 593        | 757         | <u>591</u>  | <u>760</u>  | 591         | 760         |
| 447.dealII    | 56     | 430         | 1490        | <u>430</u>  | <u>1490</u> | 431        | 1490        | 56     | 430        | 1490        | <u>430</u>  | <u>1490</u> | 431         | 1490        |
| 450.soplex    | 56     | 903         | 517         | <u>902</u>  | <u>517</u>  | 901        | 518         | 28     | 406        | 575         | 407         | 574         | <u>406</u>  | <u>575</u>  |
| 453.povray    | 56     | <u>243</u>  | <u>1230</u> | 245         | 1220        | 241        | 1240        | 56     | 206        | 1450        | <u>207</u>  | <u>1440</u> | 208         | 1430        |
| 454.calculix  | 56     | <u>312</u>  | <u>1480</u> | 312         | 1480        | 312        | 1480        | 56     | <u>312</u> | <u>1480</u> | 312         | 1480        | 312         | 1480        |
| 459.GemsFDTD  | 56     | <u>1423</u> | <u>418</u>  | 1422        | 418         | 1424       | 417         | 28     | 689        | 431         | <u>688</u>  | <u>432</u>  | 688         | 432         |
| 465.tonto     | 56     | 570         | 966         | <u>571</u>  | <u>965</u>  | 573        | 961         | 56     | 542        | 1020        | <u>542</u>  | <u>1020</u> | 541         | 1020        |
| 470.lbm       | 56     | 929         | 828         | 930         | 827         | <u>930</u> | <u>828</u>  | 56     | 929        | 828         | 930         | 827         | <u>930</u>  | <u>828</u>  |
| 481.wrf       | 56     | 774         | 808         | 768         | 815         | <u>770</u> | <u>812</u>  | 56     | 774        | 808         | 768         | 815         | <u>770</u>  | <u>812</u>  |
| 482.sphinx3   | 56     | 1271        | 858         | <u>1274</u> | <u>857</u>  | 1279       | 853         | 56     | 1271       | 858         | <u>1274</u> | <u>857</u>  | 1279        | 853         |

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"

## Platform Notes

BIOS and OS configuration:  
SCALING\_GOVNOR set to Performance  
Hardware Prefetch set to Disable

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SPECfp\_rate\_base2006 = 847

CPU2006 license: 3358

Test date: May-2017

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Hardware Availability: Mar-2016

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## Platform Notes (Continued)

```

VT Support set to Disable
ClE Support set to Disable
Sysinfo program /home/CPU2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on localhost.localdomain Fri May 12 16:23:59 2017

```

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 E5-2660 v4 @ 2.00GHz
 2 "physical id"s (chips)
 56 "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    : 14
  siblings     : 28
  physical 0   : cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  physical 1   : cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size     : 17920 KB

```

```

From /proc/meminfo
MemTotal:      263847504 kB
HugePages_Total: 0
Hugepagesize:  2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

```

```

uname -a:
Linux localhost.localdomain 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13
EDT 2016 x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 May 12 04:07

```

SPEC is set to: /home/CPU2006
Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs      877G      55G  822G   7% /home

```

Additional information from dmidecode:

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## Platform Notes (Continued)

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS American Megatrends Inc. 4.1.11 08/11/2016

Memory:

8x NO DIMM NO DIMM

16x Samsung M393A2G40EB1-CRC 16 GB 2 rank 2400 MHz

(End of data from sysinfo program)

## General Notes

Environment variables set by runspec before the start of the run:

LD\_LIBRARY\_PATH = "/home/CPU2006/libs/32:/home/CPU2006/libs/64:/home/CPU2006/sh10.2"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM  
memory using Redhat Enterprise Linux 7.2  
Transparent Huge Pages enabled by default  
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

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## Base Portability Flags (Continued)

```

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 -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

```

C++ benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

```

Fortran benchmarks:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

```

Benchmarks using both Fortran and C:

```

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

```

## Peak Compiler Invocation

C benchmarks:

```

icc -m64

```

C++ benchmarks (except as noted below):

```

icpc -m64

```

```

450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

```

Fortran benchmarks:

```

ifort -m64

```

Benchmarks using both Fortran and C:

```

icc -m64 ifort -m64

```



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## 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.lelie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -D_FILE_OFFSET_BITS=64
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

```

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

```

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
         -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -fno-alias -auto-ilp32
         -qopt-mem-layout-trans=3

```

447.dealII: basepeak = yes

```

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
           -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
           -no-prec-div(pass 2) -qopt-malloc-options=3
           -qopt-mem-layout-trans=3

```

```

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
           -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
           -no-prec-div(pass 2) -unroll4 -qopt-mem-layout-trans=3

```

Fortran benchmarks:

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## Peak Optimization Flags (Continued)

410.bwaves: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: Same as 410.bwaves

459.GemsFDTD: Same as 410.bwaves

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -unroll4 -auto -inline-calloc  
-qopt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)  
-par-num-threads=1(pass 1) -qopt-prefetch -auto-ilp32  
-qopt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

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-ic17.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/Inspur-Platform-Settings-V1.0-HSW.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/Inspur-Platform-Settings-V1.0-HSW.xml>

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