# SPEC® CFP2006 Result

## Huawei

### Huawei CH222 V3 (Intel Xeon E5-2698 v3)

$SPECfp®\_rate2006 = $ **885**

$SPECfp\_rate\_base2006 = $ **859**

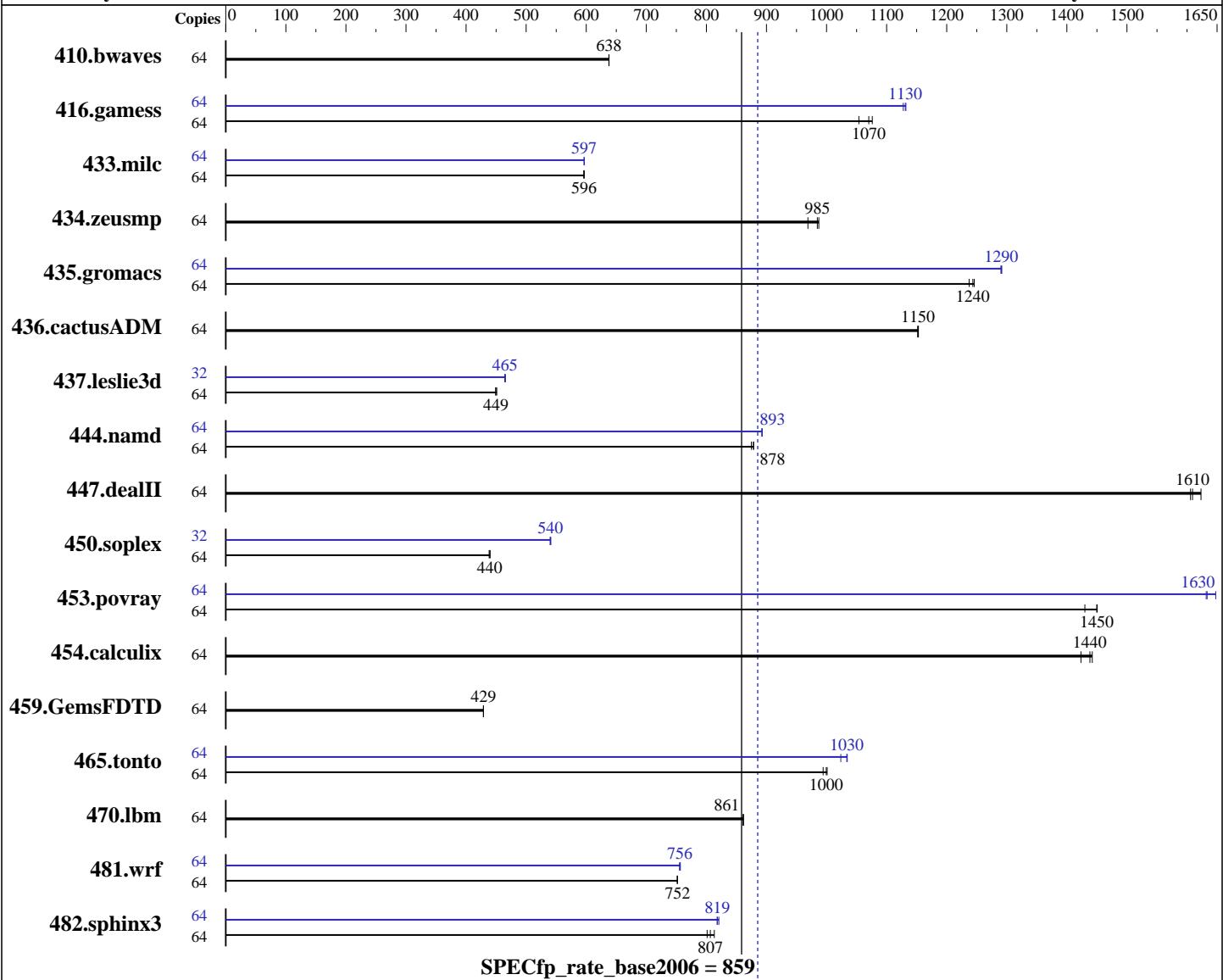| | |
|---|---|
| **CPU2006 license:** 3175 | **Test date:** Sep-2014 |
| **Test sponsor:** Huawei | **Hardware Availability:** Sep-2014 |
| **Tested by:** Huawei | **Software Availability:** Nov-2013 |

| Benchmark | Copies | Result |
|---|---|---|
| 410.bwaves | 64 | 638 |
| 416.gamess | 64 | 1130 |
| 416.gamess | 64 | 1070 |
| 433.milc | 64 | 597 |
| 433.milc | 64 | 596 |
| 434.zeusmp | 64 | 985 |
| 435.gromacs | 64 | 1290 |
| 435.gromacs | 64 | 1240 |
| 436.cactusADM | 64 | 1150 |
| 437.leslie3d | 32 | 465 |
| 437.leslie3d | 64 | 449 |
| 444.namd | 64 | 893 |
| 444.namd | 64 | 878 |
| 447.dealII | 64 | 1610 |
| 450.soplex | 32 | 540 |
| 450.soplex | 64 | 440 |
| 453.povray | 64 | 1630 |
| 453.povray | 64 | 1450 |
| 454.calculix | 64 | 1440 |
| 459.GemsFDTD | 64 | 429 |
| 465.tonto | 64 | 1030 |
| 465.tonto | 64 | 1000 |
| 470.lbm | 64 | 861 |
| 481.wrf | 64 | 756 |
| 481.wrf | 64 | 752 |
| 482.sphinx3 | 64 | 819 |
| 482.sphinx3 | 64 | 807 |

**SPECfp_rate_base2006 = 859**

**SPECfp_rate2006 = 885**

## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2698 v3 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.60 GHz |
| CPU MHz: | 2300 |
| FPU: | Integrated |
| CPU(s) enabled: | 32 cores, 2 chips, 16 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1,2 chip |
| 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 |

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| | |
|---|---|
| L3 Cache: 40 MB I+D on chip per chip | System State: Run level 3 (multi-user) |
| Other Cache: None | Base Pointers: 32/64-bit |
| Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R) | Peak Pointers: 32/64-bit |
| Disk Subsystem: 1 x 500 GB SATA, 7200 RPM | Other Software: None |
| Other Hardware: None | |

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 64 | **1364** | **638** | 1363 | 638 | 1364 | 638 | 64 | **1364** | **638** | 1363 | 638 | 1364 | 638 |
| 416.gamess | 64 | 1189 | 1050 | 1164 | 1080 | **1171** | **1070** | 64 | 1111 | 1130 | 1107 | 1130 | **1108** | **1130** |
| 433.milc | 64 | **985** | **596** | 986 | 596 | 985 | 597 | 64 | 985 | 597 | **985** | **597** | 985 | 597 |
| 434.zeusmp | 64 | 590 | 987 | 601 | 969 | **591** | **985** | 64 | 590 | 987 | 601 | 969 | **591** | **985** |
| 435.gromacs | 64 | 367 | 1250 | **367** | **1240** | 369 | 1240 | 64 | 354 | 1290 | **354** | **1290** | 354 | 1290 |
| 436.cactusADM | 64 | **664** | **1150** | 664 | 1150 | 663 | 1150 | 64 | **664** | **1150** | 664 | 1150 | 663 | 1150 |
| 437.leslie3d | 64 | **1338** | **449** | 1339 | 449 | 1334 | 451 | 32 | 646 | 466 | 648 | 464 | **647** | **465** |
| 444.namd | 64 | **585** | **878** | 584 | 879 | 587 | 875 | 64 | 575 | 893 | **575** | **893** | 575 | 892 |
| 447.dealII | 64 | 456 | 1610 | **455** | **1610** | 451 | 1620 | 64 | 456 | 1610 | **455** | **1610** | 451 | 1620 |
| 450.soplex | 64 | 1218 | 438 | 1213 | 440 | **1214** | **440** | 32 | **494** | **540** | 493 | 541 | 494 | 540 |
| 453.povray | 64 | 238 | 1430 | **235** | **1450** | 235 | 1450 | 64 | **208** | **1630** | 209 | 1630 | 207 | 1650 |
| 454.calculix | 64 | 371 | 1420 | 366 | 1440 | **367** | **1440** | 64 | 371 | 1420 | 366 | 1440 | **367** | **1440** |
| 459.GemsFDTD | 64 | 1583 | 429 | **1583** | **429** | 1584 | 429 | 64 | 1583 | 429 | **1583** | **429** | 1584 | 429 |
| 465.tonto | 64 | 629 | 1000 | 633 | 994 | **630** | **1000** | 64 | 615 | 1020 | **609** | **1030** | 609 | 1030 |
| 470.lbm | 64 | 1021 | 861 | 1021 | 861 | **1021** | **861** | 64 | 1021 | 861 | 1021 | 861 | **1021** | **861** |
| 481.wrf | 64 | **951** | **752** | 952 | 751 | 951 | 752 | 64 | 945 | 757 | **946** | **756** | 947 | 755 |
| 482.sphinx3 | 64 | 1534 | 813 | 1557 | 801 | **1547** | **807** | 64 | 1520 | 821 | **1524** | **819** | 1525 | 818 |

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 configuration:
Set Power Efficiency Mode to Custom
Set Snoop Mode to COD

Continued on next page

## Huawei

Huawei CH222 V3 (Intel Xeon E5-2698 v3)

SPECfp_rate2006 = 885

SPECfp_rate_base2006 = 859

## Platform Notes (Continued)

```
Baseboard Management Controller used to adjust the fan speed to 100%
Sysinfo program /spec/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on huawei Sat Sep  6 14:39:49 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 E5-2698 v3 @ 2.30GHz
      2 "physical id"s (chips)
     64 "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 : 16
      siblings  : 32
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       264270712 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 huawei 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 Sep 5 14:08

SPEC is set to: /spec
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda1       ext4  438G   67G  349G  17% /

Additional information from dmidecode:
  BIOS Insyde Corp. 1.16 09/02/2014
  Memory:
   8x NO DIMM NO DIMM     3 rank
   8x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 1 rank
   8x Samsung M393A2G40DB0-CPB 16 GB 2133 MHz 2 rank
```

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**Tested by:** Huawei

**Test date:** Sep-2014
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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 = "/spec/libs/32:/spec/libs/64:/spec/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>
 The Huawei CH121 V3 and Huawei CH222 V3
 are electronically equivalent.
 The results have been measured on a Huawei CH121 V3 model
```

## 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
```

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SPECfp_rate2006 = 885

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| | | | |
|---|---|---|---|
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| **Test sponsor:** | Huawei | **Hardware Availability:** | Sep-2014 |
| **Tested by:** | Huawei | **Software Availability:** | Nov-2013 |

# Base Portability Flags (Continued)

```
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 -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

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

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

Benchmarks using both Fortran and C:
```
icc    -m64 ifort -m64
```

## Huawei

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**Tested by:** Huawei

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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.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: -xCORE-AVX2(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: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
          -unroll2
```

C++ benchmarks:

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

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# Peak Optimization Flags (Continued)

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: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

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) -unroll4
-auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(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: -xCORE-AVX2 -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/Huawei-Platform-Settings-V1.0-IVB-RevG.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/Huawei-Platform-Settings-V1.0-IVB-RevG.xml

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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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