



# SPEC<sup>®</sup> CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Supermicro

Supermicro A+ Server 4022G-6F  
(H8DG6-F, AMD Opteron 6274)

SPECfp<sup>®</sup>\_rate2006 = 372

SPECfp\_rate\_base2006 = 344

CPU2006 license: 001176

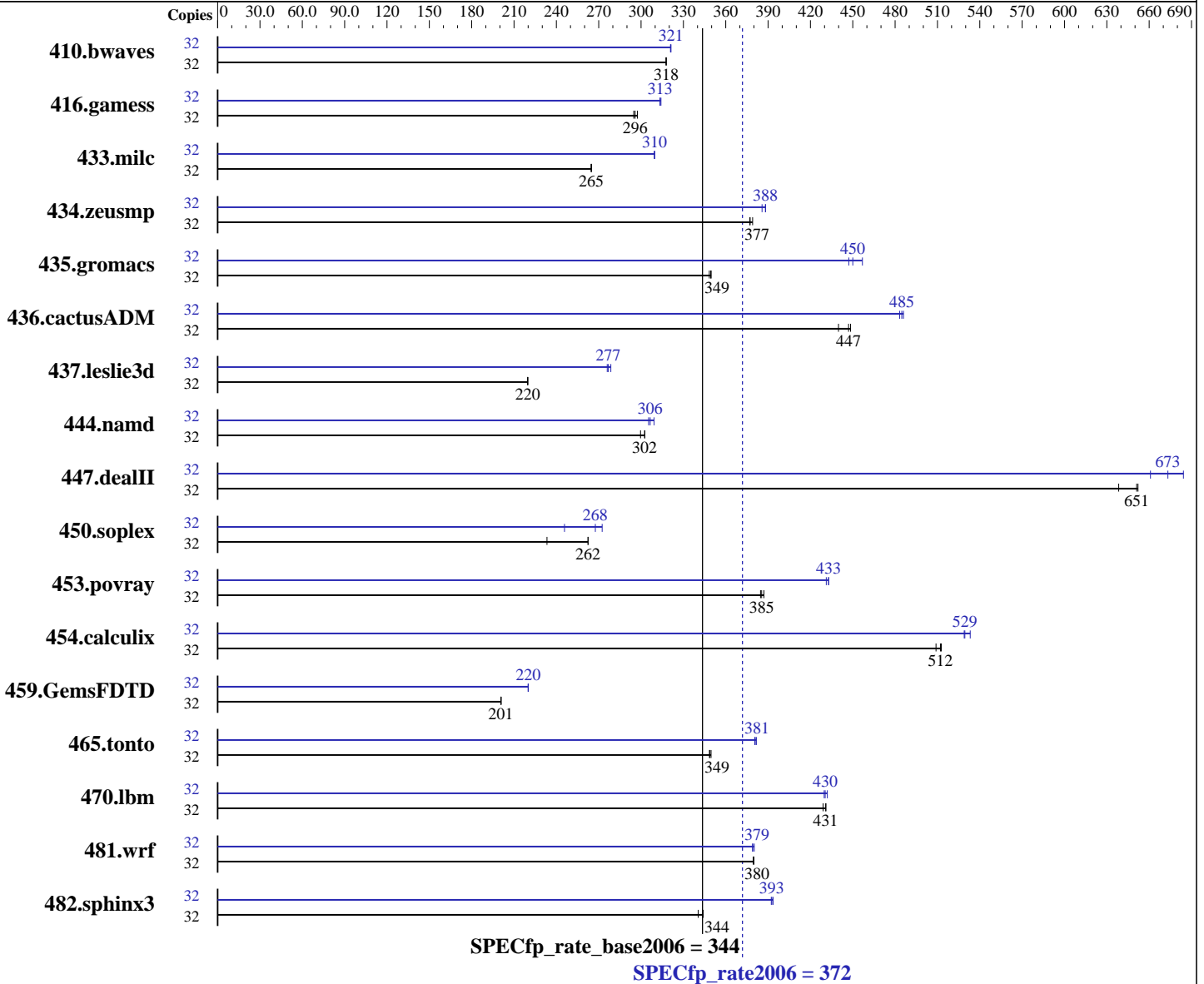
Test sponsor: Supermicro

Tested by: Supermicro

Test date: May-2012

Hardware Availability: Nov-2011

Software Availability: Dec-2011



### Hardware

CPU Name: AMD Opteron 6274  
 CPU Characteristics: AMD Turbo CORE technology up to 3.10 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 2 chips, 16 cores/chip  
 CPU(s) orderable: 1,2 chips

Continued on next page

### Software

Operating System: Red Hat Enterprise Linux Server release 6.2, Kernel 2.6.32-220.el6.x86\_64  
 Compiler: C/C++/Fortran: Version 4.5.1 of x86 Open64 Compiler Suite (from AMD)  
 Auto Parallel: No  
 File System: ext4  
 System State: Run level 3 (Full multiuser with network)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Supermicro

Supermicro A+ Server 4022G-6F  
(H8DG6-F, AMD Opteron 6274)

SPECfp\_rate2006 = 372

SPECfp\_rate\_base2006 = 344

CPU2006 license: 001176

Test sponsor: Supermicro

Tested by: Supermicro

Test date: May-2012

Hardware Availability: Nov-2011

Software Availability: Dec-2011

Primary Cache: 512 KB I on chip per chip,  
64 KB I shared / 2 cores;  
16 KB D on chip per core

Secondary Cache: 16 MB I+D on chip per chip, 2 MB shared / 2 cores

L3 Cache: 16 MB I+D on chip per chip, 8 MB shared / 8 cores

Other Cache: None

Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)

Disk Subsystem: 1 x 500 GB SATA, 7200 RPM

Other Hardware: None

Other Software: None

## Results Table

| Benchmark     | Base   |                    |                   |                    |                   |                    |                   |        | Peak               |                   |                    |                   |                    |                   |  |  |
|---------------|--------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--|--|
|               | Copies | Seconds            | Ratio             | Seconds            | Ratio             | Seconds            | Ratio             | Copies | Seconds            | Ratio             | Seconds            | Ratio             | Seconds            | Ratio             |  |  |
| 410.bwaves    | 32     | <b><u>1368</u></b> | <b><u>318</u></b> | 1368               | 318               | 1369               | 318               | 32     | 1354               | 321               | 1355               | 321               | <b><u>1354</u></b> | <b><u>321</u></b> |  |  |
| 416.gamess    | 32     | 2125               | 295               | <b><u>2118</u></b> | <b><u>296</u></b> | 2107               | 297               | 32     | 1999               | 313               | 1995               | 314               | <b><u>1999</u></b> | <b><u>313</u></b> |  |  |
| 433.milc      | 32     | 1109               | 265               | <b><u>1110</u></b> | <b><u>265</u></b> | 1110               | 265               | 32     | <b><u>949</u></b>  | <b><u>310</u></b> | 949                | 309               | 949                | 310               |  |  |
| 434.zeusmp    | 32     | 772                | 377               | <b><u>772</u></b>  | <b><u>377</u></b> | 768                | 379               | 32     | <b><u>750</u></b>  | <b><u>388</u></b> | 750                | 388               | 755                | 386               |  |  |
| 435.gromacs   | 32     | 656                | 348               | 653                | 350               | <b><u>654</u></b>  | <b><u>349</u></b> | 32     | <b><u>508</u></b>  | <b><u>450</u></b> | 511                | 447               | 500                | 457               |  |  |
| 436.cactusADM | 32     | <b><u>855</u></b>  | <b><u>447</u></b> | 853                | 448               | 869                | 440               | 32     | 787                | 486               | 791                | 483               | <b><u>789</u></b>  | <b><u>485</u></b> |  |  |
| 437.leslie3d  | 32     | <b><u>1369</u></b> | <b><u>220</u></b> | 1369               | 220               | 1369               | 220               | 32     | 1080               | 279               | <b><u>1087</u></b> | <b><u>277</u></b> | 1090               | 276               |  |  |
| 444.namd      | 32     | 857                | 300               | <b><u>848</u></b>  | <b><u>302</u></b> | 848                | 303               | 32     | <b><u>837</u></b>  | <b><u>306</u></b> | 841                | 305               | 830                | 309               |  |  |
| 447.dealII    | 32     | 561                | 652               | 573                | 638               | <b><u>562</u></b>  | <b><u>651</u></b> | 32     | 554                | 661               | <b><u>544</u></b>  | <b><u>673</u></b> | 535                | 684               |  |  |
| 450.soplex    | 32     | 1144               | 233               | 1017               | 262               | <b><u>1017</u></b> | <b><u>262</u></b> | 32     | 1086               | 246               | <b><u>997</u></b>  | <b><u>268</u></b> | 980                | 272               |  |  |
| 453.povray    | 32     | 440                | 387               | <b><u>442</u></b>  | <b><u>385</u></b> | 443                | 385               | 32     | <b><u>393</u></b>  | <b><u>433</u></b> | 393                | 433               | 395                | 431               |  |  |
| 454.calculix  | 32     | <b><u>516</u></b>  | <b><u>512</u></b> | 519                | 509               | 515                | 513               | 32     | <b><u>499</u></b>  | <b><u>529</u></b> | 499                | 529               | 495                | 533               |  |  |
| 459.GemsFDTD  | 32     | 1692               | 201               | 1690               | 201               | <b><u>1691</u></b> | <b><u>201</u></b> | 32     | 1543               | 220               | 1543               | 220               | <b><u>1543</u></b> | <b><u>220</u></b> |  |  |
| 465.tonto     | 32     | 904                | 348               | <b><u>903</u></b>  | <b><u>349</u></b> | 901                | 350               | 32     | 825                | 382               | <b><u>827</u></b>  | <b><u>381</u></b> | 827                | 381               |  |  |
| 470.lbm       | 32     | 1020               | 431               | 1025               | 429               | <b><u>1021</u></b> | <b><u>431</u></b> | 32     | 1018               | 432               | <b><u>1021</u></b> | <b><u>430</u></b> | 1023               | 430               |  |  |
| 481.wrf       | 32     | 942                | 380               | <b><u>941</u></b>  | <b><u>380</u></b> | 941                | 380               | 32     | 943                | 379               | 940                | 380               | <b><u>943</u></b>  | <b><u>379</u></b> |  |  |
| 482.sphinx3   | 32     | 1832               | 340               | 1813               | 344               | <b><u>1815</u></b> | <b><u>344</u></b> | 32     | <b><u>1588</u></b> | <b><u>393</u></b> | 1585               | 394               | 1590               | 392               |  |  |

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

## Submit Notes

The config file option 'submit' was used.  
'numactl' was used to bind copies to the cores.  
See the configuration file for details.

## Operating System Notes

'ulimit -s unlimited' was used to set environment stack size  
'ulimit -l 2097152' was used to set environment locked pages in memory limit

Set transparent\_hugepage=never as a boot parameter in /boot/grub/menu.lst  
Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Supermicro

Supermicro A+ Server 4022G-6F  
(H8DG6-F, AMD Opteron 6274)

SPECfp\_rate2006 = 372

SPECfp\_rate\_base2006 = 344

CPU2006 license: 001176  
Test sponsor: Supermicro  
Tested by: Supermicro

Test date: May-2012  
Hardware Availability: Nov-2011  
Software Availability: Dec-2011

## Operating System Notes (Continued)

```
Set vm/nr_hugepages=28672 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

## General Notes

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

```
HUGETLB_LIMIT = "896"
```

```
LD_LIBRARY_PATH = "/home/test/cpu2006/amd1104-rate-libs-revC/32:/home/test/cpu2006/amd1104-rate-libs-revC/64"
```

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at <http://developer.amd.com/cpu/open64>

Binaries were compiled on a system with 2x AMD Opteron 6274 chips + 64GB Memory using RHEL 6.1

## Base Compiler Invocation

C benchmarks:  
opencc

C++ benchmarks:  
openCC

Fortran benchmarks:  
openf95

Benchmarks using both Fortran and C:  
opencc openf95

## 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
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.deallI: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
```

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Supermicro

Supermicro A+ Server 4022G-6F  
(H8DG6-F, AMD Opteron 6274)

SPECfp\_rate2006 = 372

SPECfp\_rate\_base2006 = 344

CPU2006 license: 001176

Test sponsor: Supermicro

Tested by: Supermicro

Test date: May-2012

Hardware Availability: Nov-2011

Software Availability: Dec-2011

## Base Portability Flags (Continued)

481.wrf: -DSPEC\_CPU\_LINUX -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LP64  
-fno-second-underscore  
482.sphinx3: -DSPEC\_CPU\_LP64

## Base Optimization Flags

### C benchmarks:

-march=bdver1 -Ofast -OPT:malloc\_alg=1 -HP:bd=2m:heap=2m  
-IPA:plimit=8000 -IPA:small\_pu=100 -mso

### C++ benchmarks:

-march=bdver1 -Ofast -static -CG:load\_exe=0 -OPT:malloc\_alg=1  
-INLINE:aggressive=on -HP:bd=2m:heap=2m -D\_\_OPEN64\_FAST\_SET

### Fortran benchmarks:

-march=bdver1 -Ofast -LNO:blocking=off -OPT:rsqrt=2  
-OPT:unroll\_size=256 -HP:bd=2m:heap=2m -mso

### Benchmarks using both Fortran and C:

-march=bdver1 -Ofast -OPT:malloc\_alg=1 -HP:bd=2m:heap=2m  
-IPA:plimit=8000 -IPA:small\_pu=100 -mso -LNO:blocking=off  
-OPT:rsqrt=2 -OPT:unroll\_size=256

## Peak Compiler Invocation

### C benchmarks:

opencc

### C++ benchmarks:

openCC

### Fortran benchmarks:

openf95

### Benchmarks using both Fortran and C:

opencc openf95

## Peak Portability Flags

410.bwaves: -DSPEC\_CPU\_LP64  
416.gamess: -DSPEC\_CPU\_LP64  
433.milc: -DSPEC\_CPU\_LP64  
434.zeusmp: -DSPEC\_CPU\_LP64

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Supermicro

Supermicro A+ Server 4022G-6F  
(H8DG6-F, AMD Opteron 6274)

SPECfp\_rate2006 = 372

SPECfp\_rate\_base2006 = 344

CPU2006 license: 001176

Test sponsor: Supermicro

Tested by: Supermicro

Test date: May-2012

Hardware Availability: Nov-2011

Software Availability: Dec-2011

## Peak Portability Flags (Continued)

```

435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LP64
      -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

## Peak Optimization Flags

C benchmarks:

```

433.milc: -march=bdver1 -Ofast -CG:movnti=1 -CG:locs_best=on
      -HP:bdt=2m:heap=2m -IPA:plimit=7000 -IPA:callee_limit=1200
      -OPT:struct_array_copy=2 -OPT:alias=field_sensitive -mso

470.lbm: -march=bdver1 -Ofast -CG:cmp_peep=on
      -OPT:unroll_times_max=8 -OPT:unroll_size=256
      -OPT:unroll_level=2 -OPT:keep_ext=on -HP:bdt=2m:heap=2m
      -IPA:plimit=8000 -IPA:small_pu=100 -mso

482.sphinx3: -march=bdver1 -fb_create fbdata(pass 1)
      -fb_opt fbdata(pass 2) -Ofast -IPA:plimit=1000
      -OPT:malloc_alg=2 -CG:cmp_peep=on -CG:local_sched_alg=2
      -CG:p2align=0 -INLINE:aggressive=on -LNO:prefetch=2
      -LNO:prefetch_ahead=4 -mso

```

C++ benchmarks:

```

444.namd: -march=bdver1 -fb_create fbdata(pass 1)
      -fb_opt fbdata(pass 2) -Ofast -IPA:plimit=3000
      -LNO:ignore_feedback=off -CG:local_sched_alg=2
      -CG:load_exe=0 -OPT:unroll_size=256 -fno-exceptions
      -HP:bdt=2m:heap=2m

447.dealIII: -march=bdver1 -Ofast -D__OPEN64_FAST_SET -static
      -INLINE:aggressive=on -LNO:opt=0 -LNO:simd=0
      -fno-emit-exceptions -m32 -OPT:unroll_times_max=8
      -OPT:unroll_size=256 -OPT:unroll_level=2 -HP:bdt=2m:heap=2m
      -GRA:unspill=on -CG:cmp_peep=on -CG:movext_icmp=off
      -TENV:frame_pointer=off

```

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Supermicro

Supermicro A+ Server 4022G-6F  
(H8DG6-F, AMD Opteron 6274)

SPECfp\_rate2006 = 372

SPECfp\_rate\_base2006 = 344

CPU2006 license: 001176

Test sponsor: Supermicro

Tested by: Supermicro

Test date: May-2012

Hardware Availability: Nov-2011

Software Availability: Dec-2011

## Peak Optimization Flags (Continued)

450.soplex: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -O3 -LNO:ignore\_feedback=off  
-INLINE:aggressive=on -OPT:RO=1 -OPT:IEEE\_arith=3  
-OPT:IEEE\_NaN\_Inf=off -OPT:fold\_unsigned\_relops=on  
-fno-exceptions -CG:p2align=0 -m32 -HP:bd=2m:heap=2m  
-WOPT:sib=on

453.povray: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -CG:pre\_local\_sched=off  
-CG:p2align=0 -CG:p2align\_split=on -CG:dsched=on  
-INLINE:aggressive=on -HP:bd=2m:heap=2m -OPT:transform=2  
-OPT:alias=disjoint -WOPT:aggcm=0

### Fortran benchmarks:

410.bwaves: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -OPT:Ofast -OPT:treeheight=on  
-LNO:blocking=off -LNO:ignore\_feedback=off -LNO:fu=4  
-LNO:loop\_model\_simd=on -LNO:simd\_rm\_unity\_remainder=on  
-WOPT:aggstr=0 -HP:bd=2m:heap=2m -CG:cmp\_peep=on

416.gamess: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -O3 -LNO:fu=6 -LNO:blocking=0  
-LNO:simd=0 -OPT:Ofast -OPT:ro=3 -OPT:unroll\_size=256  
-OPT:unroll\_times\_max=2 -CG:local\_sched\_alg=1  
-HP:bd=2m:heap=2m -WOPT:sib=on

434.zeusmp: -march=bdver1 -Ofast -LNO:blocking=off -LNO:interchange=off  
-IPA:plimit=1500 -HP:bd=2m:heap=2m

437.leslie3d: -march=bdver1 -Ofast -CG:pre\_minreg\_level=2 -LNO:simd=0  
-LNO:fusion=2 -HP:bd=2m:heap=2m -mso

459.GemsFDTD: -march=bdver1 -Ofast -IPA:plimit=1500 -OPT:unroll\_size=0  
-LNO:fission=2 -CG:load\_exe=0 -CG:local\_sched\_alg=2 -HP

465.tonto: -march=bdver1 -Ofast -OPT:alias=no\_f90\_pointer\_alias  
-LNO:blocking=off -CG:load\_exe=1 -IPA:plimit=525  
-HP:bd=2m:heap=2m

### Benchmarks using both Fortran and C:

435.gromacs: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -OPT:rsqrt=2  
-HP:bd=2m:heap=2m -CG:local\_sched\_alg=2 -GRA:unspill=ON  
-CG:load\_exe=3 -LNO:simd=3

436.cactusADM: -march=bdver1 -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -LNO:blocking=off  
-LNO:prefetch=2 -HP -CG:locs\_shallow\_depth=1 -CG:load\_exe=0  
-CG:dsched=on -WOPT:sib=on

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Supermicro

Supermicro A+ Server 4022G-6F  
(H8DG6-F, AMD Opteron 6274)

SPECfp\_rate2006 = 372

SPECfp\_rate\_base2006 = 344

CPU2006 license: 001176

Test sponsor: Supermicro

Tested by: Supermicro

Test date: May-2012

Hardware Availability: Nov-2011

Software Availability: Dec-2011

## Peak Optimization Flags (Continued)

454.calculix: -march=bdver1 -Ofast -OPT:unroll\_size=256  
-GRA:optimize\_boundary=on -CG:dsched=on -HP:bdt=2m:heap=2m

481.wrf: -march=bdver1 -Ofast -LNO:blocking=off -LANG:copyinout=off  
-IPA:callee\_limit=5000 -GRA:prioritize\_by\_density=on  
-CG:load\_exe=1 -HP -WOPT:sib=on

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC-I.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC-I.xml>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.  
Report generated on Thu Jul 24 09:57:48 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 3 July 2012.