



SPEC[®] CFP2006 Result

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Supermicro

Supermicro A+ Server 4022G-6F
(H8DG6-F, AMD Opteron 6282 SE)

SPECfp[®]_rate2006 = 405

SPECfp_rate_base2006 = 372

CPU2006 license: 001176

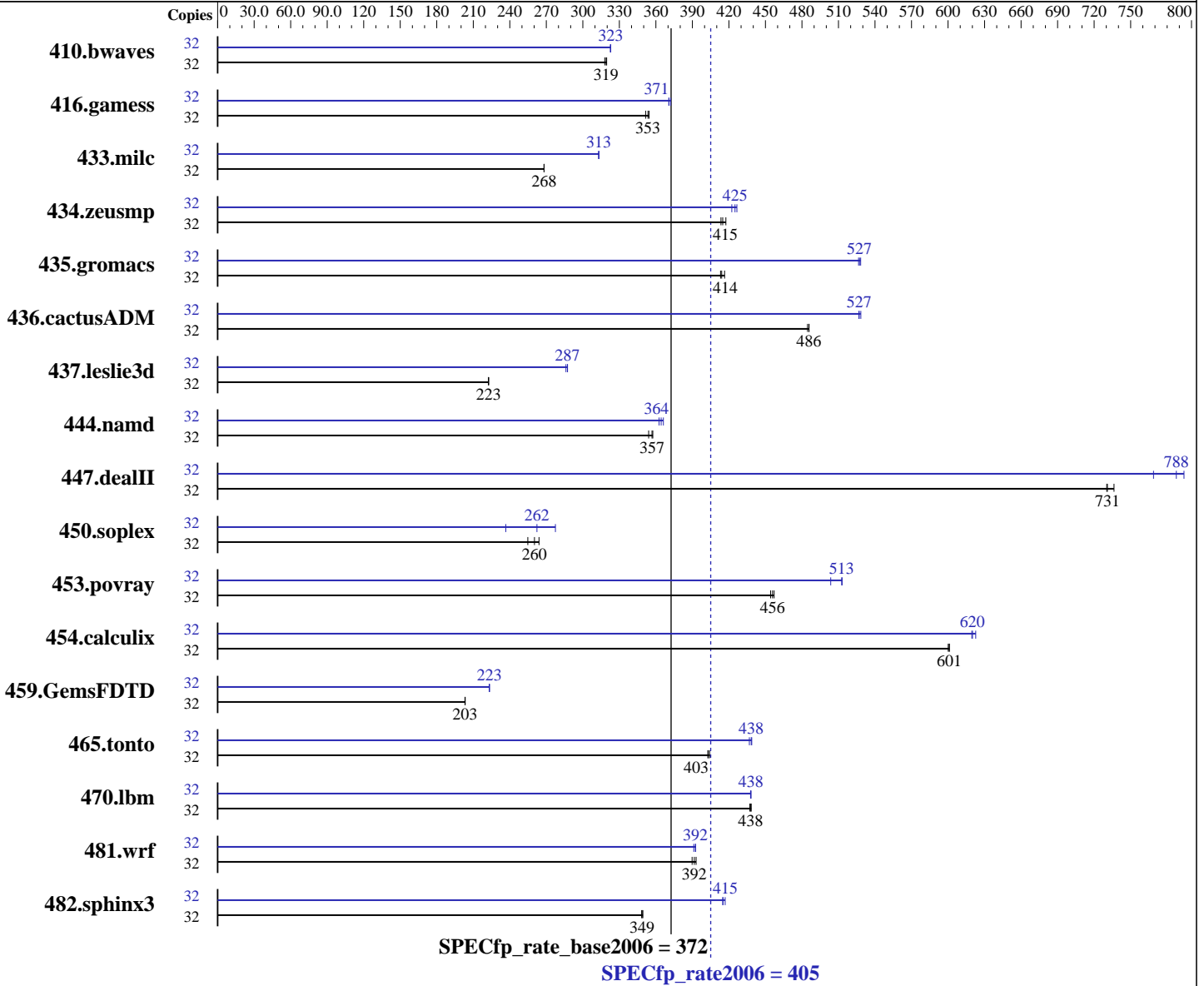
Test sponsor: Supermicro

Tested by: Supermicro

Test date: Jun-2012

Hardware Availability: Nov-2011

Software Availability: Dec-2011



Hardware

CPU Name: AMD Opteron 6282 SE
 CPU Characteristics: AMD Turbo CORE technology up to 3.30 GHz
 CPU MHz: 2600
 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



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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 | 1367 | 318 | 1361 | 320 | <u>1363</u> | <u>319</u> | 32 | 1347 | 323 | 1348 | 323 | <u>1347</u> | <u>323</u> | | |
| 416.gamess | 32 | 1782 | 352 | 1768 | 354 | <u>1773</u> | <u>353</u> | 32 | <u>1690</u> | <u>371</u> | 1691 | 371 | 1684 | 372 | | |
| 433.milc | 32 | <u>1096</u> | <u>268</u> | 1096 | 268 | 1095 | 268 | 32 | <u>938</u> | <u>313</u> | 938 | 313 | 938 | 313 | | |
| 434.zeusmp | 32 | 704 | 413 | 697 | 418 | <u>702</u> | <u>415</u> | 32 | 689 | 422 | 683 | 427 | <u>685</u> | <u>425</u> | | |
| 435.gromacs | 32 | 549 | 416 | 553 | 413 | <u>552</u> | <u>414</u> | 32 | 434 | 526 | 433 | 528 | <u>433</u> | <u>527</u> | | |
| 436.cactusADM | 32 | 789 | 485 | <u>787</u> | <u>486</u> | 787 | 486 | 32 | 724 | 528 | 726 | 527 | <u>726</u> | <u>527</u> | | |
| 437.leslie3d | 32 | 1351 | 223 | 1352 | 222 | <u>1352</u> | <u>223</u> | 32 | 1047 | 287 | <u>1047</u> | <u>287</u> | 1051 | 286 | | |
| 444.namd | 32 | 725 | 354 | <u>719</u> | <u>357</u> | 718 | 357 | 32 | 708 | 363 | <u>704</u> | <u>364</u> | 701 | 366 | | |
| 447.dealII | 32 | 501 | 730 | <u>501</u> | <u>731</u> | 497 | 736 | 32 | <u>465</u> | <u>788</u> | 476 | 769 | 461 | 794 | | |
| 450.soplex | 32 | 1047 | 255 | <u>1025</u> | <u>260</u> | 1011 | 264 | 32 | 1127 | 237 | <u>1017</u> | <u>262</u> | 962 | 277 | | |
| 453.povray | 32 | 372 | 457 | <u>373</u> | <u>456</u> | 375 | 454 | 32 | <u>332</u> | <u>513</u> | 332 | 513 | 338 | 504 | | |
| 454.calculix | 32 | 440 | 600 | <u>439</u> | <u>601</u> | 439 | 601 | 32 | <u>426</u> | <u>620</u> | 424 | 623 | 426 | 620 | | |
| 459.GemsFDTD | 32 | 1671 | 203 | <u>1670</u> | <u>203</u> | 1670 | 203 | 32 | 1520 | 223 | 1522 | 223 | <u>1521</u> | <u>223</u> | | |
| 465.tonto | 32 | 779 | 404 | 782 | 403 | <u>781</u> | <u>403</u> | 32 | <u>718</u> | <u>438</u> | 718 | 439 | 721 | 437 | | |
| 470.lbm | 32 | <u>1004</u> | <u>438</u> | 1006 | 437 | 1003 | 438 | 32 | <u>1004</u> | <u>438</u> | 1004 | 438 | 1004 | 438 | | |
| 481.wrf | 32 | <u>913</u> | <u>392</u> | 909 | 393 | 917 | 390 | 32 | 910 | 393 | 914 | 391 | <u>911</u> | <u>392</u> | | |
| 482.sphinx3 | 32 | 1790 | 348 | 1785 | 349 | <u>1789</u> | <u>349</u> | 32 | 1496 | 417 | <u>1502</u> | <u>415</u> | 1503 | 415 | | |

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



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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

Submitted_by: Jordan Villanueva <jordanv@supermicro.com>

Submitted: Fri Jun 15 19:33:27 EDT 2012

Submission: cpu2006-20120615-22904.sub

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.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
```

Continued on next page



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Base Portability Flags (Continued)

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

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:

openc

C++ benchmarks:

openCC

Fortran benchmarks:

openf95

Benchmarks using both Fortran and C:

openc openf95



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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
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

```

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Peak Optimization Flags (Continued)

447.dealIII (continued):

-TENV:frame_pointer=off

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:bdt=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:bdt=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:bdt=2m:heap=2m -WOPT:sib=on

434.zeusmp: -march=bdver1 -Ofast -LNO:blocking=off -LNO:interchange=off

-IPA:plimit=1500 -HP:bdt=2m:heap=2m

437.leslie3d: -march=bdver1 -Ofast -CG:pre_minreg_level=2 -LNO:simd=0

-LNO:fusion=2 -HP:bdt=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:bdt=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:bdt=2m:heap=2m -CG:local_sched_alg=2 -GRA:unspill=ON

-CG:load_exe=3 -LNO:simd=3

Continued on next page

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Page 6



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Peak Optimization Flags (Continued)

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

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>

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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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