## SPEC® CFP2006 Result

**Supermicro**

Supermicro A+ Server 4042G-6RF (H8QG6-F, Opteron 6344)

### CPU2006 License:
001176

### Test Sponsor:
Supermicro

### Tested by:
Supermicro

### Test date:
Nov-2012

### Hardware Availability:
Nov-2012

### Software Availability:
Aug-2012

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp_rate2006</th>
<th>SPECfp_rate_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>587</td>
<td>643</td>
</tr>
<tr>
<td>416.gamess</td>
<td>540</td>
<td>631</td>
</tr>
<tr>
<td>433.milc</td>
<td>537</td>
<td>733</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td></td>
<td>707</td>
</tr>
<tr>
<td>435.gromacs</td>
<td></td>
<td>813</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td></td>
<td>982</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td></td>
<td>873</td>
</tr>
<tr>
<td>444.namd</td>
<td>532</td>
<td>630</td>
</tr>
<tr>
<td>447.dealII</td>
<td></td>
<td>828</td>
</tr>
<tr>
<td>450.soplex</td>
<td>526</td>
<td>828</td>
</tr>
<tr>
<td>453.povray</td>
<td></td>
<td>982</td>
</tr>
<tr>
<td>454.calculix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>465.tonto</td>
<td>464</td>
<td></td>
</tr>
<tr>
<td>470.lbm</td>
<td>415</td>
<td></td>
</tr>
<tr>
<td>481.wrf</td>
<td></td>
<td>846</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td></td>
<td>847</td>
</tr>
</tbody>
</table>

### SPECfp_rate2006 = 733

### SPECfp_rate_base2006 = 664

#### Hardware

- **CPU Name:** AMD Opteron 6344
- **CPU Characteristics:** AMD Turbo CORE technology up to 3.20 GHz
- **CPU MHz:** 2600
- **FPU:** Integrated
- **CPU(s) enabled:** 48 cores, 4 chips, 12 cores/chip
- **CPU(s) orderable:** 2,4 chips

#### Software

- **Operating System:** Red Hat Enterprise Linux Server release 6.2, Kernel 2.6.32-220.el6.x86_64
- **Compiler:** C/C++/Fortran: Version 4.5.2 of x86 Open64 Compiler Suite (from AMD)
- **Auto Parallel:** No
- **File System:** ext3
- **System State:** Run level 3 (Full multiuser with network)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 32/64-bit

---

Continued on next page
Supermicro A+ Server 4042G-6RF (H8QG6-F, Opteron 6344)
AMD Opteron 6344

CPU2006 license: 001176
Test date: Nov-2012
Test sponsor: Supermicro
Hardware Availability: Nov-2012
Tested by: Supermicro
Software Availability: Aug-2012

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>410.bwaves</td>
<td>48</td>
<td>1020</td>
<td>639</td>
<td>1015</td>
<td>643</td>
<td>1013</td>
<td>644</td>
</tr>
<tr>
<td>416.gamess</td>
<td>48</td>
<td>1740</td>
<td>540</td>
<td>1727</td>
<td>544</td>
<td>1740</td>
<td>540</td>
</tr>
<tr>
<td>433.milc</td>
<td>48</td>
<td>820</td>
<td>537</td>
<td>820</td>
<td>538</td>
<td>821</td>
<td>537</td>
</tr>
<tr>
<td>434.rpezmp</td>
<td>48</td>
<td>619</td>
<td>705</td>
<td>618</td>
<td>707</td>
<td>616</td>
<td>709</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>48</td>
<td>519</td>
<td>660</td>
<td>522</td>
<td>657</td>
<td>522</td>
<td>656</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>48</td>
<td>658</td>
<td>872</td>
<td>656</td>
<td>875</td>
<td>657</td>
<td>873</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>48</td>
<td>1018</td>
<td>443</td>
<td>1018</td>
<td>443</td>
<td>1017</td>
<td>444</td>
</tr>
<tr>
<td>444.namd</td>
<td>48</td>
<td>740</td>
<td>521</td>
<td>723</td>
<td>532</td>
<td>724</td>
<td>532</td>
</tr>
<tr>
<td>447.dealII</td>
<td>48</td>
<td>450</td>
<td>1220</td>
<td>455</td>
<td>1210</td>
<td>451</td>
<td>1220</td>
</tr>
<tr>
<td>450.soplex</td>
<td>48</td>
<td>835</td>
<td>480</td>
<td>761</td>
<td>526</td>
<td>761</td>
<td>526</td>
</tr>
<tr>
<td>453.povray</td>
<td>48</td>
<td>353</td>
<td>723</td>
<td>354</td>
<td>722</td>
<td>353</td>
<td>723</td>
</tr>
<tr>
<td>454.calculix</td>
<td>48</td>
<td>375</td>
<td>1060</td>
<td>377</td>
<td>1050</td>
<td>376</td>
<td>1050</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>48</td>
<td>1224</td>
<td>416</td>
<td>1227</td>
<td>415</td>
<td>1228</td>
<td>415</td>
</tr>
<tr>
<td>465.tonto</td>
<td>48</td>
<td>732</td>
<td>645</td>
<td>726</td>
<td>650</td>
<td>733</td>
<td>644</td>
</tr>
<tr>
<td>470.lbm</td>
<td>48</td>
<td>782</td>
<td>843</td>
<td>776</td>
<td>850</td>
<td>779</td>
<td>847</td>
</tr>
<tr>
<td>481.wrf</td>
<td>48</td>
<td>730</td>
<td>734</td>
<td>714</td>
<td>751</td>
<td>722</td>
<td>742</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>48</td>
<td>1432</td>
<td>653</td>
<td>1432</td>
<td>653</td>
<td>1431</td>
<td>654</td>
</tr>
</tbody>
</table>

Peak
<table>
<thead>
<tr>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>48</td>
<td>994</td>
<td>656</td>
<td>995</td>
<td>656</td>
<td>995</td>
</tr>
<tr>
<td>416.gamess</td>
<td>48</td>
<td>1603</td>
<td>586</td>
<td>1592</td>
<td>590</td>
<td>1600</td>
</tr>
<tr>
<td>433.milc</td>
<td>48</td>
<td>698</td>
<td>631</td>
<td>697</td>
<td>632</td>
<td>698</td>
</tr>
<tr>
<td>434.rpezmp</td>
<td>48</td>
<td>597</td>
<td>732</td>
<td>596</td>
<td>733</td>
<td>598</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>48</td>
<td>422</td>
<td>811</td>
<td>422</td>
<td>813</td>
<td>422</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>48</td>
<td>584</td>
<td>983</td>
<td>584</td>
<td>982</td>
<td>584</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>48</td>
<td>839</td>
<td>538</td>
<td>840</td>
<td>537</td>
<td>834</td>
</tr>
<tr>
<td>444.namd</td>
<td>48</td>
<td>627</td>
<td>614</td>
<td>611</td>
<td>630</td>
<td>609</td>
</tr>
<tr>
<td>447.dealII</td>
<td>48</td>
<td>425</td>
<td>1290</td>
<td>425</td>
<td>1290</td>
<td>424</td>
</tr>
<tr>
<td>450.soplex</td>
<td>48</td>
<td>944</td>
<td>424</td>
<td>715</td>
<td>560</td>
<td>702</td>
</tr>
<tr>
<td>453.povray</td>
<td>48</td>
<td>309</td>
<td>827</td>
<td>308</td>
<td>828</td>
<td>308</td>
</tr>
<tr>
<td>454.calculix</td>
<td>48</td>
<td>360</td>
<td>1100</td>
<td>361</td>
<td>1100</td>
<td>361</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>48</td>
<td>1095</td>
<td>465</td>
<td>1097</td>
<td>464</td>
<td>1098</td>
</tr>
<tr>
<td>465.tonto</td>
<td>48</td>
<td>666</td>
<td>710</td>
<td>667</td>
<td>707</td>
<td>668</td>
</tr>
<tr>
<td>470.lbm</td>
<td>48</td>
<td>782</td>
<td>843</td>
<td>777</td>
<td>849</td>
<td>780</td>
</tr>
<tr>
<td>481.wrf</td>
<td>48</td>
<td>718</td>
<td>746</td>
<td>714</td>
<td>751</td>
<td>712</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>48</td>
<td>1204</td>
<td>777</td>
<td>1194</td>
<td>784</td>
<td>1231</td>
</tr>
</tbody>
</table>

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

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
Supermicro
Supermicro A+ Server 4042G-6RF (H8QG6-F, Opteron 6344)
AMD Opteron 6344

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

SPECfp_rate2006 = 733
SPECfp_rate_base2006 = 664

Test date: Nov-2012
Hardware Availability: Nov-2012
Software Availability: Aug-2012

Operating System Notes (Continued)

Set vm/nr_hugepages=43008 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/spec/amd1206-rate-libs-revA/32:/home/spec/amd1206-rate-libs-revA/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 6386SE chips + 128GB Memory using RHEL 6.3

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
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64

Continued on next page
Supermicro

Supermicro A+ Server 4042G-6RF (H8QG6-F, Opteron 6344)
AMD Opteron 6344

SPECfp_rate2006 = 733
SPECfp_rate_base2006 = 664

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

Test date: Nov-2012
Hardware Availability: Nov-2012
Software Availability: Aug-2012

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:
-Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
-IPA:small_pu=100 -mso -march=bdver1

C++ benchmarks:
-Ofast -static -CG:load_exe=0 -OPT:malloc_alg=1 -INLINE:aggressive=on
-HP:bd=2m:heap=2m -D__OPEN64_FAST_SET -march=bdver1

Fortran benchmarks:
-Ofast -LNO:blocking=off -LNO:simd_peel_align=on -OPT:rsqrt=2
-OPT:unroll_size=256 -HP:bd=2m:heap=2m -mso -march=bdver1

Benchmarks using both Fortran and C:
-Ofast -OPT:malloc_alg=1 -HP:bd=2m:heap=2m -IPA:plimit=8000
-IPA:small_pu=100 -mso -march=bdver1 -LNO:blocking=off
-LNO:simd_peel_align=on -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

Supermicro
Supermicro A+ Server 4042G-6RF (H8QG6-F, Opteron 6344)
AMD Opteron 6344

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

SPECfp_rate2006 = 733
SPECfp_rate_base2006 = 664

Test date: Nov-2012
Hardware Availability: Nov-2012
Software Availability: Aug-2012

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

Peak Optimization Flags

C benchmarks:

433. milc: -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 -ms0
-march=bdver1

470. lbm: -Ofast -CG:cmp_peep=on -OPT:keep_ext=on -HP:bdt=2m:heap=2m
-IPA:plimit=8000 -IPA:small_pu=100 -march=bdver1 -ms0

482. sphinx3: -fb_create_fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-IPA:plimit=1000 -OPT:malloc_alg=2 -CG:cmp_peep=on
-CG:plimit=0 -CG:load_exe=1 -CG:dsched=on
-INLINE:aggressive=on -LNO:prefetch=2 -LNO:prefetch_ahead=4
-ms0 -march=bdver1

C++ benchmarks:

444. namd: -Ofast -IPA:plimit=3000 -LNO:ignore_feedback=off
-CG:local_sched_alg=0 -CG:load_exe=0 -OPT:unroll_size=256
-fno-exceptions -HP:bdt=2m:heap=2m -LNO:if_select_conv=1
-OPT:alias=disjoint -LNO:psimd_iso_unroll=ON -march=bdver1

447. dealII: -Ofast -D__OPEN64_FAST_SET -static -INLINE:aggressive=on
-LNO:opt=1 -LNO:simd=2 -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
-march=bdver1

450. soplex: -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 -mno-fma4 -HP:bdt=2m:heap=2m -WOPT:sib=on

Continued on next page
Peak Optimization Flags (Continued)

450.soplex (continued):
   -march=bdver1

453.povray:
   -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
   -CG:pre_local_sch=off -CG:p2align=0 -CG:p2align_split=on
   -CG:dsc=s=on -INLINE:aggressive=on -HP:bd=2m:heap=2m
   -OPT:transform=2 -OPT:alias=disjoint -WOPT:aggcm=0
   -march=bdver2

Fortran benchmarks:

410.bwaves:
   -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 -march=bdver1

416.gamess:
   -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
   -LNO:fu=6 -LNO:blocking=0 -LNO:simd=2 -OPT:ro=3
   -OPT:recip=on -CG:local_sched=1 -HP:bd=2m:heap=2m
   -WOPT:sib=on -march=bdver1

434.zeusmp:
   -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
   -LNO:blocking=off -LNO:interchange=off -IPA:plimit=1500
   -HP:bd=2m:heap=2m -mso -march=bdver1

437.leslie3d:
   -Ofast -CG:pre_minreg_level=2 -LNO:simd=0 -LNO:fusion=2
   -HP:bd=2m:heap=2m -march=bdver1

459.GemsFDTD:
   -IPA:plimit=1500 -OPT:unroll_size=1024
   -OPT:unroll_times_max=16 -LNO:fission=2
   -CG:local_sched=2 -HP -march=bdver1

465.tonto:
   -Ofast -OPT:alias=no_f90_pointer_alias -LNO:blocking=off
   -CG:load_exe=1 -CG:local_sched=3 -IPA:plimit=525
   -HP:bd=2m:heap=2m -march=bdver1

Benchmarks using both Fortran and C:

435.gromacs:
   -Ofast -OPT:rsqrt=2 -HP:bd=2m:heap=2m
   -CG:local_sched=2 -CG:load_exe=3 -GRA:unspill=on
   -march=bdver1 -LNO:simd=3

436.cactusADM:
   -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
   -LNO:blocking=off -LNO:prefetch=2 -LNO:pfs=0
   -LNO:prefetch_ahead=4 -HP -CG:locs_shallow_depth=1
   -CG:load_exe=0 -CG:dsched=on -WOPT:sib=on -march=bdver1

454.calculix:
   -Ofast -OPT:unroll_size=256 -OPT:alias=disjoint
   -GRA:optimize_boundary=on -CG:dsched=on -HP:bd=2m:heap=2m
   -march=bdver1

Continued on next page
### SPEC CFP2006 Result

**Supermicro**  
Supermicro A+ Server 4042G-6RF (H8QG6-F, Opteron 6344)  
AMD Opteron 6344

<table>
<thead>
<tr>
<th>SPECfp_rate2006</th>
<th>733</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006</td>
<td>664</td>
</tr>
</tbody>
</table>

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

#### Peak Optimization Flags (Continued)

481.wrf:  
-Ofast  
-LNO:blocking=off  
-LANG:copyinout=off  
-IPA:callee_limit=5000  
-GRA:prioritize_by_density=on  
-HP  
-WOPT:sib=on  
-march=bdver1

The flags file that was used to format this result can be browsed at [http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-I.html](http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-I.html)

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

---

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.

Tested with SPEC CPU2006 v1.2.  
Originally published on 2 January 2013.

---

Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/