Supermicro
Supermicro A+ Server AS-2042G-72RF4 (H8QG7-LN4F, Opteron 6348)
AMD Opteron 6348

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
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<tbody>
<tr>
<td>CPU Name:</td>
<td>AMD Opteron 6348</td>
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<tr>
<td>CPU Characteristics:</td>
<td>AMD Turbo CORE technology up to 3.40 GHz</td>
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<tr>
<td>CPU MHz:</td>
<td>2800</td>
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<tr>
<td>FPU:</td>
<td>Integrated</td>
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<tr>
<td>CPU(s) enabled:</td>
<td>48 cores, 4 chips, 12 cores/chip</td>
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<tr>
<td>CPU(s) orderable:</td>
<td>2,4 chips</td>
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| 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 |

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

SPECfprate2006 = 760
SPECfprate_base2006 = 689

### Benchmarks

- 410.bwaves
- 416.gamess
- 433.milc
- 434.zeusmp
- 435.gromacs
- 436.cactusADM
- 437.leslie3d
- 444.namd
- 447.dealII
- 450.soplex
- 453.povray
- 454.calculix
- 459.GemsFDTD
- 465.tonto
- 470.lbm
- 481.wrf
- 482.sphinx3

Continued on next page
## Results Table

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<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<th>Seconds</th>
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</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
Supermicro
Supermicro A+ Server AS-2042G-72RF4 (H8QG7-LN4F, Opteron 6348)
AMD Opteron 6348

SPECfp_rate2006 = 760
SPECfp_rate_base2006 = 689

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

Operating System Notes (Continued)

Set vm/nr_hugepages=43008 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

Platform Notes

BIOS Configuration:
C State Mode set to Disabled
HPC Mode set to Enabled
C1E Support set to Disabled
Set Memory Configuration Power Down Enable to Disabled

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

Submitted_by: Jordan Villanueva <jordanv@supermicro.com>
Submitted: Fri Aug 9 12:26:10 EDT 2013
Submission: cpu2006-20130809-26140.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.games: -DSPEC_CPU_LP64

Continued on next page
SPEC CFP2006 Result

Supermicro

Supermicro A+ Server AS-2042G-72RF4 (H8QG7-LN4F, Opteron 6348)
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SPECfp_rate2006 = 760
SPECfp_rate_base2006 = 689

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

Base Portability Flags (Continued)

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
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

Continued on next page
Peak Compiler Invocation (Continued)

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
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:locals_best=on -HP:bdt=2m:heap=2m
          -IPA:plimit=7000 -IPA:callee_limit=1200
          -OPT:struct_array_copy=2 -OPT:alias=field_sensitive -mso
          -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 -mso
          -march=bdver1

482.sphinx3: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
          -m32 -IPA:plimit=1000 -OPT:malloc_alg=2 -CG:cmp_peep=on
          -CG:p2align=0 -CG:load_exe=1 -CG:dsched=on
          -INLINE:aggressive=on -LNO:prefetch=2 -LNO:prefetch_ahead=4
          -mso -march=bdver2

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

Continued on next page
### SPEC CFP2006 Result

**Supermicro**

Supermicro A+ Server AS-2042G-72RF4 (H8QG7-LN4F, Opteron 6348)
AMD Opteron 6348

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp_rate2006</th>
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<tr>
<td></td>
<td>760</td>
<td>689</td>
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**CPU2006 license:** 001176

**Test sponsor:** Supermicro

**Tested by:** Supermicro

**CPU2006 license:** 001176

**Test date:** Dec-2012

**Hardware Availability:** Nov-2012

**Software Availability:** Aug-2012

---

**Peak Optimization Flags (Continued)**

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
- -CG:cmp_peep=on
- -CG:movext_icmp=off
- -TENV:frame_pointer=off
- -march=bdver1

453.povray:

- -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
- -WOPT:sib=on
- -march=bdver1

**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
- -HP:bdt=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_alg=1
- -HP:bdt=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:bdt=2m:heap=2m
- -march=bdver1

437.leslie3d:

- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2)
- -Ofast
- -LNO:simd=0
- -LNO:fusion=2
- -HP:bdt=2m:heap=2m
- -march=bdver1

437.leslie3d:

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

434.zeusmp:

- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2)
- -Ofast
- -LNO:simd=0
- -LNO:fusion=2
- -HP:bdt=2m:heap=2m
- -march=bdver1

437.leslie3d:

- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2)
- -Ofast
- -LNO:simd=0
- -LNO:fusion=2
- -HP:bdt=2m:heap=2m
- -march=bdver1

459.GemsFDTD:

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

465.tonto:

- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2)
- -Ofast
- -LNO:blocking=off
- -LNO:interchange=off
- -IPA:plimit=525
- -HP:bdt=2m:heap=2m
- -march=bdver1

**Benchmarks using both Fortran and C:**

Continued on next page
SPEC CFP2006 Result

Supermicro

Supermicro A+ Server AS-2042G-72RF4 (H8QG7-LN4F, Opteron 6348)
AMD Opteron 6348

SPECfp_rate2006 = 760
SPECfp_rate_base2006 = 689

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

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

Peak Optimization Flags (Continued)

435.gromacs: -Ofast -OPT:rsqrt=2 -HP:bdt=2m:heap=2m
-CG:local_sched_alg=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:pf2=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:bdt=2m:heap=2m
-march=bdver1

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 files that were used to format this result can be browsed at

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/amd-Supermicro-platform-rate-revC-I.xml

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Tested with SPEC CPU2006 v1.2.