# Supermicro

(Test Sponsor: Advanced Micro Devices)

## A+ Server 1021M-UR+B, AMD Opteron 2386 SE

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>139</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>116</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 49

**Test sponsor:** Advanced Micro Devices

**Tested by:** Advanced Micro Devices

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## Hardware

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name:</strong></td>
<td>AMD Opteron 2386 SE</td>
</tr>
<tr>
<td><strong>CPU Characteristics:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CPU MHz:</strong></td>
<td>2800</td>
</tr>
<tr>
<td><strong>FPU:</strong></td>
<td>Integrated</td>
</tr>
<tr>
<td><strong>CPU(s) enabled:</strong></td>
<td>8 cores, 2 chips, 4 cores/chip</td>
</tr>
<tr>
<td><strong>CPU(s) orderable:</strong></td>
<td>1,2 chips</td>
</tr>
<tr>
<td><strong>Primary Cache:</strong></td>
<td>64 KB I + 64 KB D on chip per core</td>
</tr>
<tr>
<td><strong>Secondary Cache:</strong></td>
<td>512 KB I+D on chip per core</td>
</tr>
<tr>
<td><strong>L3 Cache:</strong></td>
<td>6 MB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>Other Cache:</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Memory:</strong></td>
<td>32 GB (8x4 GB, DDR2-800, CL5, Reg, Dual Rank)</td>
</tr>
<tr>
<td><strong>Disk Subsystem:</strong></td>
<td>1 x 250 GB SATA, 7200 RPM</td>
</tr>
<tr>
<td><strong>Other Hardware:</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating System:</strong></td>
<td>SuSE Linux Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16.60-0.21-smp</td>
</tr>
<tr>
<td><strong>Compiler:</strong></td>
<td>PGI Server Complete Version 7.2, PathScale Compiler Suite Version 3.2</td>
</tr>
<tr>
<td><strong>Auto Parallel:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>System State:</strong></td>
<td>Run level 3 (Full multiuser with network)</td>
</tr>
<tr>
<td><strong>Base Pointers:</strong></td>
<td>32/64-bit</td>
</tr>
<tr>
<td><strong>Peak Pointers:</strong></td>
<td>32/64-bit</td>
</tr>
<tr>
<td><strong>Other Software:</strong></td>
<td>binutils 2.18, 32-bit and 64-bit libhugetlbfs libraries, SmartHeap 8.1 32-bit Library for Linux</td>
</tr>
</tbody>
</table>

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**Test date:** Dec-2008

**Hardware Availability:** Jan-2009

**Software Availability:** Jun-2008

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(Test Sponsor: Advanced Micro Devices)
A+ Server 1021M-UR+B, AMD Opteron 2386 SE

SPEC CINT2006 Result

SPECint_rate2006 = 139
SPECint_rate_base2006 = 116

CPU2006 license: 49
Test sponsor: Advanced Micro Devices
Tested by: Advanced Micro Devices

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base</td>
<td></td>
<td></td>
<td>Peak</td>
<td></td>
</tr>
<tr>
<td>400.perlbench</td>
<td>8</td>
<td>624</td>
<td>125</td>
<td>623</td>
<td>125</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>8</td>
<td>776</td>
<td><strong>99.5</strong></td>
<td>776</td>
<td>99.5</td>
</tr>
<tr>
<td>403.gcc</td>
<td>8</td>
<td>746</td>
<td>86.4</td>
<td>747</td>
<td><strong>86.2</strong></td>
</tr>
<tr>
<td>429.mcf</td>
<td>8</td>
<td>871</td>
<td><strong>83.7</strong></td>
<td>871</td>
<td>83.8</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>8</td>
<td>737</td>
<td>114</td>
<td>737</td>
<td>114</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>8</td>
<td>479</td>
<td>156</td>
<td><strong>481</strong></td>
<td><strong>155</strong></td>
</tr>
<tr>
<td>458.sjeng</td>
<td>8</td>
<td>789</td>
<td>123</td>
<td><strong>789</strong></td>
<td><strong>123</strong></td>
</tr>
<tr>
<td>462.libquantum</td>
<td>8</td>
<td>940</td>
<td>176</td>
<td>942</td>
<td>176</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>8</td>
<td>894</td>
<td><strong>198</strong></td>
<td>891</td>
<td>199</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>8</td>
<td>586</td>
<td>85.4</td>
<td>586</td>
<td><strong>85.3</strong></td>
</tr>
<tr>
<td>473.astar</td>
<td>8</td>
<td>652</td>
<td><strong>86.1</strong></td>
<td>654</td>
<td>85.9</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>8</td>
<td>477</td>
<td>116</td>
<td><strong>478</strong></td>
<td><strong>115</strong></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

Operating System Notes
The libhugetlbfs libraries were installed using the installation rpms that came with the distribution.

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

Set vm/nr_hugepages=7168 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

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

HUGETLB_MORECORE = "yes"
LD_LIBRARY_PATH = "/root/work/cpu2006v1.1/amd909gh-libs/64:/root/work/cpu2006v1.1/amd909gh-libs/32"
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SPECint_rate2006 = 139  
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CPU2006 license: 49
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Test date: Dec-2008
Hardware Availability: Jan-2009
Software Availability: Jun-2008

Base Compiler Invocation

C benchmarks:
pgcc

C++ benchmarks:
pgcpp

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
--zc_eh -Mipa=fast -Mipa=inline:10 -tp barcelona-32 -Bstatic_pgi

Base Other Flags

C benchmarks:
-Mipa=jobs:4

C++ benchmarks:
-Mipa=jobs:4

Peak Compiler Invocation

C benchmarks (except as noted below):
pathcc

Continued on next page
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Peak Compiler Invocation (Continued)

456.hmmer: pgcc
462.libquantum: pgcc

C++ benchmarks (except as noted below):
pgcpp
483.xalancbmk: pathCC

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -march=barcelona -fb_create fbdata(pass 1)
-mb_opt fbdata(pass 2)
-W1=-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT(pass 2)
-L/usr/lib64 -lhugetlbfs(pass 2) -Ofast -IPA:plimit=20000
-IPA:field_reorder=on -LNO:opt=0 -WOPT:if_conv=0
-CG:local_sched_alg=1

401.bzip2: -march=barcelona -O3 -OPT:alias=disjoint -OPT:Ofast
-OPT:goto=off -INLINE:aggressive=on -CG:local_sched_alg=1
-m32now
-W1=-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
-L/usr/lib64 -lhugetlbfs

403.gcc: -march=barcelona -fb_create fbdata(pass 1)
-mb_opt fbdata(pass 2) -Ofast -OPT:malloc_alg=1
-LNO:trip_count=256 -LNO:prefetch_ahead=10
-CG:prefer_lru_reg=off -m32

429.mcf: -march=barcelona -O3 -ipa -INLINE:aggressive=on
-CG:gm=off -GRA:prioritize_by_density=on -m32
-L/usr/lib -lhugetlbfs

Continued on next page
Peak Optimization Flags (Continued)

445.gobmk: -march=barcelona -fb_create fbdata(pass 1)
        -fb_opt fbdata(pass 2)
        -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT(pass 2)
        -L/usr/lib64 -lhugetlbfs(pass2) -O3 -OPT:alias=restrict
        -LNO:prefetch=1 -LNO:ignore_feedback=off -CG:p2align=on

456.hmmer: -Mvect=cachesize:6291456 -fastsse -Mvect=partial
          -Munroll=n:8 -Msmartralloc=huge -Msafeptr -Mprefetch=t0
          -Mfprelaxed -Mipa=const -Mipa=ptr -Mipa=arg -Mipa=inline
          -tp barcellona-64 -Bstatic_pgi

458.sjeng: -march=barcelona -fb_create fbdata(pass 1)
            -fb_opt fbdata(pass 2)
            -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT(pass 2)
            -L/usr/lib64 -lhugetlbfs(pass2) -O3 -ipa
            -LNO:ignore_feedback=off -LNO:full_unroll=10 -LNO:fusion=0
            -LNO:fusion=2 -IPA:pu_reorder=2 -CG:ptr_load_use=0
            -OPT:unroll_times_max=8 -INLINE:aggressive=on

462.libquantum: -Mvect=cachesize:6291456 -fastsse -Munroll=m:8
                -Msmartralloc=huge -Mprefetch=distance:4 -Mfprelaxed
                -Mipa=fast -Mipa=inline -Mipa=noarg -tp barcellona-64
                -Bstatic_pgi

464.h264ref: -march=barcelona -fb_create fbdata(pass 1)
               -fb_opt fbdata(pass 2)
               -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT(pass 2)
               -L/usr/lib64 -lhugetlbfs(pass2) -O3 -IPA:plimit=20000
               -OPT:alias=disjoint -LNO:prefetch=0 -CG:ptr_load_use=0
               -CG:push_pop_int_saved_regs=off -CG:prefer_lru_reg=off

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: -MpfI(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
          -Mipa=inline:6(pass 2) -Mvect=cachesize:6291456 -fastsse
          -O4 -Msmartralloc=huge -Msafeptr=global -Mfprelaxed
          --zc_eh -tp barcellona-32 -Bstatic_pgi

483.xalancbmk: -march=barcelona -Ofast -INLINE:aggressive=on -m32
                -L/root/work/libraries/SmartHeap_8.1/lib -lsmartheap

Peak Other Flags

C benchmarks:
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Peak Other Flags (Continued)

456.hmmer: -Mipa=jobs:4

462.libquantum: -Mipa=jobs:4

C++ benchmarks (except as noted below):
- -Mipa=jobs:4 (pass 2)

483.xalancbmk: No flags used

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.html
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.xml
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.xml
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.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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